STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

In the Matter of Remedial Action by: KIMBERLY-CLARK WORLDWIDE, INC., a Delaware Corporation.	FIRST AMENDMENT TO AGREED ORDER No. DE 9476

TO: KIMBERLY-CLARK WORLDWIDE, INC.
Attention: Lisa Morden, Senior Director
Global Sustainability
1400 Holcomb Bridge Road
Roswell, Georgia 30076-2190

EXHIBITS:

EXHIBIT F Draft Interim Action Site Diagram

EXHIBIT G Additional Interim Action Scope of Work and Schedule

I. INTRODUCTION

Agreed Order No. DE 9476 (Order) entered into by the State of Washington, Department of Ecology (Ecology) and Kimberly-Clark Worldwide, Inc. (K-C) on December 20, 2012, requires K-C to conduct a Remedial Investigation and Feasibility Study (RI/FS) per WAC 173-340-350 and develop a draft Cleanup Action Plan per WAC 173-340-350 through 173-340-380 addressing upland contamination for the Site.

Pursuant to Section VIII. K of the Order, Ecology and K-C hereby stipulate to amend the Order. By this amendment to the Order, K-C will perform additional interim remedial action at a facility where there has been a release or threatened release of hazardous substances.

This amendment does not attempt to recite all of the provisions of the Order. Provisions of the Order not specifically changed in this amendment remain in full force and effect.

VI. ECOLOGY DETERMINATIONS

E. Under WAC 173-340-430, an interim action is a remedial action that is technically necessary to reduce a threat to human health or the environment by eliminating or substantially reducing one or more pathways for exposure to a hazardous substance at a facility, that corrects a problem that may become substantially worse or cost substantially more to address if the remedial action is delayed, or that is needed to provide for completion of a site hazard assessment, remedial investigation/feasibility study or design of a cleanup action. The paragraph below provides a general description of the additional interim action.

This amended Order requires K-C to conduct an additional interim action by removing contaminated soil and/or groundwater from the Site, decommissioning (e.g., plugging) underground pipes that may act as a conduit for contaminant release or transport to the East Waterway area of Port Gardner Bay, and monitoring the pH in groundwater including the implementation of contingency action(s) if warranted. K-C is also required to allow the decommissioning of the combined sewer overflow (CSO) pipe, owned by the City of Everett, that discharges at PS04. *See* **Exhibit G** (Exhibit F is draft diagram of the interim action areas and does not necessary reflect the final boundaries of the interim actions required by this amendment). The CSO pipe transverses the Site and discharges to the East Waterway at PS04. The CSO pipe is old, deteriorated, and could act as a preferential pathway for contaminated shallow groundwater at the Site to discharge into the East Waterway. The CSO pipe's location would likely interfere with planned redevelopment of the property, and the City of Everett and KC are developing a plan to temporarily relocate the pipe to accommodate the proposed redevelopment and decommissioning of the existing pipe.

The additional interim action is being conducted to expedite the cleanup action for the Site, and will be designed to be consistent with the final cleanup action plan for the Site.

VII. WORK TO BE PERFORMED

D. Scope of Additional Interim Action: K-C shall perform an additional Interim Action to remove and transport contaminated soil and/or groundwater to an approved facility for treatment or disposal. As part of the additional interim action, K-C will collect and analyze soil samples to demonstrate compliance with MTCA industrial cleanup levels, including soil concentrations protective of groundwater (e.g., surface water beneficial uses and vapor intrusion). K-C shall also decommission underground pipes, including but not limited to pipes that historically conveyed stormwater and/or industrial process liquids. K-C shall also provide access to the City of Everett to decommission the CSO pipe to eliminate the possibility that it would create a preferential pathway for contaminated groundwater releases or transport to the East Waterway at PS04. As part of the interim action, K-C shall monitor groundwater pH during the removal of crushed material (e.g., concrete, brick, masonry etc.) that remains on Site from the facility demolition, and implement contingency action(s) to neutralize groundwater pH if warranted.

K-C shall conduct the interim action in accordance with the scope outlined in the Interim Action Work Plan contained in **Exhibit G**, and provide Ecology with updates consistent with the schedule in **Exhibit G**. The Interim Action Work Plan contains the Ecology-approved procedures for managing contaminated soil and/or groundwater during the interim action. The Work Plan also describes the procedures for decommissioning underground.

Effective date of this Order: November 25, 2019

KIMBERLY-CLARK WORLDWIDE, INC.

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11/19/2019

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STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

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Toxics Cleanup Program
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EXHIBIT F

DRAFT INTERIM ACTION SITE DIAGRAM

Proposed Interim Action Area

Previous Interim Action Excavation Extent

Pipe to be Plugged

Line to be Cleaned and Retained

Line to be Plugged

Crushed Material Boundary

Potential Crushed Material Below Surface

200 ft Shoreline Buffer

Upland Area Boundary

Pier

Interim Action Areas

K-C Worldwide Site Upland Area
Everett, Washington

Aspect CONSULTING

JUL-2018	BY: SJG / RAP	Exhibit A
PROJECT NO. 110207	REVISED BY: - - -	

Basemap Layer Credits || Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

GIS Path: T:\projects_8\KimberlyClark\Env_Support_110207\Delivered\SEPA\02 Interim Action Areas.mxd || Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet || Date Saved: 7/10/2018 || User: rpepin || Print Date: 7/10/2018

EXHIBIT G

ADDITIONAL INTERIM ACTION SCOPE OF WORK AND SCHEDULE

ADDENDUM TO EXHIBIT G

ADDITIONAL INTERIM ACTION SCOPE OF WORK and SCHEDULE

This addendum to the Exhibit G (Additional Interim Action Scope of Work and Schedule) for the First Amendment to Agreed Order No. DE 9476 adds the following provisions:

- Construction Schedule – A schedule detailing construction activities and delivery dates is presented below. The bidding and contracting along with the start date for construction schedule (shown below) begins with the removal of the crushed material which is necessary to perform the interim action.

Construction Schedule

Work Element	Delivery Dates
Bidding and Contracting	Commencing within 60 days after the execution of the First Amendment to Agreed Order No. DE 9476, and as needed to obtain any required permits or meeting permit substantive requirements. Contracting with the successful bidder within 60 days of issuing the request for bids.
Issuance of Notice to Proceed to Construction Contractor	March 31, 2020
Completion of Second Interim Action Construction	December 31, 2020

WORK PLAN FOR SECOND INTERIM ACTION

Kimberly-Clark Worldwide Site Upland Area
Everett, Washington

Prepared for: Kimberly-Clark Worldwide, Inc.

Project No. 110207-009-03 • December 13, 2019 • Final

earth + water

Aspect
CONSULTING

WORK PLAN FOR SECOND INTERIM ACTION

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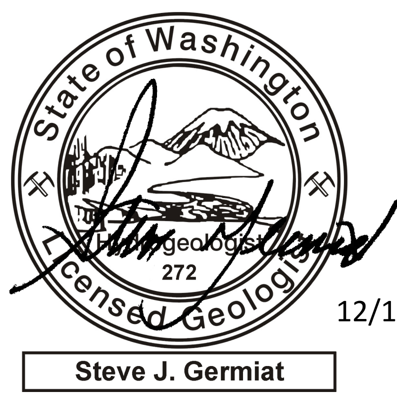
Aspect Consulting, LLC



12/13/2019

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Acronyms and Abbreviations

This list applies for the entire document, including appendices.

%R	percent recovery
ARAR	applicable or relevant and appropriate requirements
Aspect	Aspect Consulting, LLC
BBH	Boiler/Baghouse
bgs	below ground surface
BMP	best management practice
CAP	Cleanup Action Plan
CFR	Code of Federal Regulations
City	City of Everett, Washington
CM	crushed material
CMS	Central Machine Shop
COC	contaminant of concern
Corps	U.S. Army Corps of Engineers
cPAH	carcinogenic polycyclic aromatic hydrocarbon
CSGP	construction stormwater general permit
CWA	Clean Water Act
DA	discharge authorization
DAHP	Washington State Department of Archaeology and Historic Preservation
DQO	data quality objective
Ecology	Washington State Department of Ecology
EIM	Ecology's Environmental Information Management database
EPA	U.S. Environmental Protection Agency
ETCS	Everett Terminal and Cold Storage
FBI	Friedman and Bruya Inc.
FSP	Field Sampling Plan
GC-MS	gas chromatograph-mass spectrometry
GPS	global positioning system
IAWP	Interim Action Work Plan
IDW	investigation-derived waste

K-C	Kimberly-Clark Worldwide, Inc.
LCS/LCSD	laboratory control samples/laboratory control sample duplicate
M&D Plan	monitoring and discovery plan
MDL	method detection limit
mg/kg	milligrams per kilogram
µg/L	micrograms per liter
mil	millimeter
MTCA	Washington State Model Toxics Control Act Cleanup Regulation
NAVD88	North American Vertical Datum of 1988
OMS	Old Machine Shop
Order	Agreed Order No. DE 9476 between Kimberly-Clark and Ecology
PARCC	precision, accuracy, representativeness, comparability, and completeness
PCB	polychlorinated biphenyl
PCL	preliminary cleanup level
PID	photoionization detector
PQL	practical quantitation limit
PSCAA	Puget Sound Clean Air Agency
PSI	Puget Sound Initiative
QA/QC	quality assurance/quality control
QAPP	Quality Assurance Project Plan
RCW	Revised Code of Washington
RI/FS	Remedial Investigation/Feasibility Study
RL	reporting limit
RPD	relative percent difference
SAP	Sampling and Analysis Plan
SC	spiked concentration
SEPA	State Environmental Policy Act
SHSP	Site-Specific Health and Safety Plan
SIM	selective ion monitoring
Site	Kimberly-Clark Worldwide Site
SOP	standard operating procedure

SWPPP	Stormwater Pollution Prevention Plan
TPH	total petroleum hydrocarbons
U.S.	United States
VOC	volatile organic compound
WAC	Washington Administrative Code
WISHA	Washington Industrial Safety and Health Act
WSDOT	Washington State Department of Transportation

1 Introduction

Aspect Consulting, LLC (Aspect) has prepared this Work Plan for Second Interim Action, on behalf of Kimberly-Clark Worldwide, Inc. (K-C), to guide a second round of interim soil and/or groundwater cleanup activities at the Upland Area of the Kimberly-Clark Worldwide Site (Site) in preparation for potential redevelopment of parcels at the Site. The Site is located at 2600 Federal Avenue in Everett, Washington (herein referred to as the Upland Area) (Figure 1).

This Interim Action Work Plan (IAWP) is prepared as an exhibit to an Amendment to Agreed Order No. DE 9476 (Order) between K-C and Washington State Department of Ecology (Ecology). The Site and its division into the Upland Area and In-Water Area of the Site are defined in Section IV of the Order. The main Agreed Order along with the amendment can be viewed on Ecology's website using the following weblink: https://fortress.wa.gov/ecy/gsp/Sitepage.aspx?csid=2569. Note that all documents referenced throughout this report as being available on Ecology's website can be accessed using the weblink above.

The first interim action was undertaken within the Upland Area in 2013 and 2014 to proactively excavate contaminated soils based on the results of environmental investigations completed at that time. Approximately 38,500 tons of contaminated material were removed from 15 discrete areas across the Upland Area, as described in the Interim Action Report, which can be viewed on Ecology's website (Aspect, 2015). Figure 1 depicts the 15 soil excavation locations from the 2013–2014 interim action (in light brown), along with additional areas planned for soil removal under the current interim action (in blue).

Following completion of the first interim action, Aspect prepared and submitted to Ecology a draft Remedial Investigation and Feasibility Study (RI/FS) in 2016 as a comprehensive evaluation of all data collected during previous investigations and the interim action to define the nature and extent of contamination for current (post-Interim Action) conditions at the Upland Area. The draft RI, comprising Chapters 1 through 7 of the draft RI/FS (Aspect, 2016a), and the draft FS, comprising Chapters 8 through 12 of the draft RI/FS (Aspect, 2016b), were submitted separately to Ecology for review in Spring 2016. Ecology provided written comments on the draft RI and draft FS components (Ecology, 2016; Ecology, 2017a), and resolution of comments is ongoing.

In 2017, K-C leased approximately 20 acres in the southwestern portion of the Upland Area with an option to sell to a company that proposes to redevelop the property as a marine industrial terminal with cargo handling and cold storage operations (Everett Terminal and Cold Storage Facility [ETCS]). In August 2017, K-C entered into a purchase and sale agreement with another company regarding purchase of the portion of the property that includes the existing warehouse building. Figure 1 shows the boundaries of the ETCS and Warehouse redevelopment parcels.

Given the understanding of contamination developed from the draft RI/FS, and the anticipated schedule for the two pending redevelopment projects, K-C and Ecology have agreed to undertake a second interim action to remove additional soil contamination that facilitates redevelopment while the rest of the Upland Area MTCA process proceeds.

This IAWP describes the locations and general procedures for conducting the second interim action within the Upland Area. The interim cleanup actions will involve excavation and proper off-Site disposal of contaminated soil with concurrent dewatering, as needed, to facilitate soil and/or contaminated groundwater removal and handling. As such, the interim action will involve permanent removal of contaminated soil and/or groundwater from the Upland Area, and will not conflict with or eliminate reasonable alternatives for the final Site cleanup action in accordance with Washington Administrative Code (WAC) 173-340-430(3)(b). This interim action will be limited solely to the Upland Area (bounded on the west by the mean higher high water elevation), and will not include any work in the In-Water area of the Site as defined in Section IV of the Order. In addition to the soil excavations, inactive pipes discharging to the East Waterway will be plugged to prevent them from serving as a potential pathway for discharge of Upland Area groundwater to the adjacent East Waterway. In addition to the inactive pipes referenced above, K-C is also required to allow the decommissioning of the combined sewer overflow (CSO) pipe, owned by the City of Everett, that discharges at PS04 underneath the K-C wharf.

A surficial veneer of crushed demolition debris (termed crushed material; CM) exists across most of the planned soil excavation areas. Removal and off-Site disposition of the CM is being completed as a separate project, outside of the Order, in accordance with the Plan of Operations for CM Removal (K-C, 2018) and under jurisdiction of the local solid waste authority, Snohomish Health District. In addition to soil removal and plugging of shoreline pipes, this interim action includes monitoring of groundwater pH throughout the CM removal project, and potential implementation of contingency action(s) to neutralize groundwater pH if the removal action creates an increase in groundwater pH that poses a risk to the adjacent East Waterway.

Aspect is the engineering firm responsible for overseeing, monitoring, and reporting the interim action cleanup activities on behalf of K-C, and is termed the Engineer in this IAWP. A construction contractor (Contractor) selected through competitive bidding by K-C will be contracted with K-C to conduct the interim cleanup construction activities.

1.1 Plan Organization

The IAWP is organized into the following sections:

- **Section 2—Upland Area Subsurface Conditions** presents a brief description of the subsurface conditions at the Upland Area.
- **Section 3—Permits and Other Requirements** describes permitting substantive requirements for conducting the interim cleanup activities.
- **Section 4—Areas and Contaminants Targeted for Removal** describes the specific areas and contaminants of concern that are targeted to be permanently removed during the interim action.

- **Section 5—Generalized Approach for Soil Removal** describes the generalized interim cleanup activities including soil preliminary cleanup levels (PCLs), erosion, sediment, and dust controls, dewatering and water management, materials excavation and management, stockpile management, and excavation backfilling.
- **Section 6—Compliance Monitoring** presents the procedures for protection and performance monitoring to be conducted during the interim cleanup activities.
- **Section 7—Reporting** describes the reporting of interim action cleanup activities.
- **Section 8—References** lists the documents cited in this IAWP.

A Sampling and Analysis Plan (SAP) and Quality Assurance Project Plan (QAPP), included as Appendices A and B, respectively, have also been developed in support of the interim cleanup activities in accordance with WAC 173-340-820. Appendix C is a plan for plugging shoreline pipes open to the East Waterway as a component of this interim action. Appendix D is the Stormwater Pollution Prevention Plan (SWPPP) for the interim action activities. Appendix E is a plan to monitor and manage groundwater pH in conjunction with the CM removal project.

2 Upland Area Subsurface Conditions

This section provides a general description of the Upland Area subsurface conditions that have relevance for conducting the interim cleanup activities.

The local topography surrounding the Upland Area slopes westward toward the East Waterway. Property ground surface elevations above the North American Vertical Datum of 1988 (NAVD88) range from approximately 17 to 19 feet along the eastern boundary to approximately 13 to 17 feet on the western boundary.

A wedge of fill, generally thickening from approximately 10 to 15 feet on the east to 40 feet or more on the west, comprises the shallow subsurface soils across the Upland Area. The fill was placed on the Waterway tidal flats to create new upland beginning in the early 1900s. Within the west-center portion of the Upland Area, a former log pond was filled by the early 1980s to create land for wood chip and hog fuel storage. The fill across the Upland Area has variable composition, predominantly including sand and silty sand with shell fragments (dredge fill), and localized occurrences of gravel, variable debris, and wood. Overlying the fill soils on approximately 32 acres of the Upland Area is a surface veneer of crushed concrete, brick, and masonry with a small percentage of plastic/fiberglass, metal, and wood, termed CM. The approximate boundary of CM is shown on Figure 1 and, where present in the proposed interim action areas, its thickness is estimated to range between approximately 1 and 5 feet.

A shallow unconfined (water table) water-bearing zone occurs within the fill, overlying siltier native tidal flat deposits. The water table is relatively shallow, generally ranging in depth from 1 to 5 feet below grade in the eastern portion of the Upland Area to 6 to 12 feet below grade in the western portion. Groundwater flows generally from east to west across the Upland Area, with discharge to the East Waterway; however, depending on the alignment of the shoreline, groundwater directions may flow locally toward the northwest or southwest. For example, along the south end of the Upland Area, groundwater locally flows to the southwest toward the off-loading dock slip. Groundwater in the fill across most of the shoreline is hydraulically connected to the East Waterway; tidally induced water-table fluctuations near the East Waterway range between about 2 and 7 feet, depending on location, and the tidal fluctuations are generally not measurable 200 feet or more from the shoreline. Tidal fluctuations are not observed at shoreline wells within the log pond fill, due to its much lower permeability relative to the surrounding dredge-fill soils.

3 Permits and Other Requirements

When performing the interim action under the Order, K-C is exempt from the procedural requirements of Chapters 70.94 (Washington Clean Air Act), 70.95 (Solid Waste Management Act), 70.105 (Hazardous Waste Management Act), 90.48 (Water Pollution Control), and 90.58 (Shoreline Management Act) Revised Code of Washington (RCW), and of laws requiring or authorizing local government permits or approvals; however, K-C must still comply with the substantive requirements of such permits or approvals. In addition, the interim action is not exempt from federal permits.

The starting point for Applicable or Relevant and Appropriate Requirements (ARARs) is Ecology's Model Toxics Control Act (MTCA) regulations (Chapter 173-340 WAC) that address implementation of a cleanup and define cleanup standards under the MTCA statute (Chapter 173.105D RCW). Other ARARs include the following:

1. State Water Pollution Control Act (Chapter 90.48 RCW)
2. Water Resources Act (Chapter 90.54 RCW)
3. Applicable surface water quality criteria published in the water quality standards for surface waters of the State of Washington (Chapter 173-201A WAC)
4. Applicable surface water quality criteria published under Sections 303(c) and 304 of the Clean Water Act
5. Washington State Hazardous Waste Management Act (Chapter 70.105 RCW)
6. State Dangerous Waste Regulations (Chapter 173-303 WAC)
7. Solid Waste Management-Reduction and Recycling (Chapter 70.95 RCW)
8. Minimum Standards for Construction and Maintenance of Wells (Chapter 173-160 RCW)

9. Washington Clean Air Act (Chapter 70.94 RCW)
10. Puget Sound Clean Air Agency Regulations (http://www.pscleanair.org)
11. Occupational Safety and Health Act (OSHA), 29 CFR Subpart 1910.120
12. Washington Industrial Safety and Health Act (WISHA)
13. Shoreline Management Act (Chapter 90.58 RCW)
14. Archaeological and Cultural Resources Act (Chapter 27.53 RCW)
15. State Environmental Policy Act (SEPA; Chapter 43.21C RCW, Chapter 197-11 WAC, and Chapter WAC 173-802)

Section 3.1 describes the substantive permit requirements applicable to conducting the interim cleanup activities. No federal permits will be required because the interim action will be limited to the Upland Area and will not include any in-water work. Section 3.2 describes other requirements for conducting the interim cleanup actions.

3.1 Permitting and Substantive Requirements

3.1.1 State Environmental Policy Act (SEPA)

Compliance with SEPA, Chapter 43.21C RCW, will be achieved by conducting a SEPA review in accordance with applicable regulatory requirements, including WAC 197-11-268, and Ecology guidance as presented in Ecology Policy 130A (Ecology, 2004). SEPA review will be conducted concurrent with public review of the Order. It is planned that public review for the SEPA documentation will be conducted concurrently with public review for the Order.

3.1.2 Stormwater Pollution Prevention Plan (SWPPP)

A construction Stormwater Pollution Prevent Plan (SWPPP) was developed by Aspect to protect the waters of the state from degradation due to sediment transport or water pollution resulting from the interim action activities. The SWPPP, included as Appendix D to this Plan, outlines Best Management Practices (BMPs) that will be instituted in the field to help achieve these ends, although site conditions may require additional temporary BMPs or a change in the BMPs listed in the SWPPP to effectively control erosion or track out of contaminated soil and generation of fugitive dust.

3.1.3 City of Everett Discharge Authorization

K-C plans to obtain a discharge authorization (DA) from the City of Everett (City) industrial pretreatment program to allow discharge of pretreated dewatering water generated during the interim cleanup action. Groundwater treatment and disposal methods are described in Section 5.4. The DA will impose daily discharge volume limitations and numerical water quality limits for effluent discharged, and it will require sampling and analysis of the discharge water, recording of the volumes discharged, and submittal of the monitoring data at the end of the permit. Treated water not in compliance with the City discharge limits will be rerun through the treatment system, with treatment adjustments as needed, until passing discharge limits or it will be containerized, characterized, and sent for off-Site disposal.

3.1.4 City of Everett Grading Permit

Soil excavations exceeding 50 cubic yards are subject to a grading permit from the City. Substantive requirements of the grading permit include erosion control, which is addressed by the SWPPP described in Section 3.1.2.

3.1.5 Shoreline Permit

The substantive requirements of a City of Everett Shoreline Substantial Development Permit will apply for interim cleanup activities conducted within 200 feet of the East Waterway shoreline, which includes one of the proposed interim action areas discussed in Section 4 (Old Machine Shop [OMS] area; Figure 1). The substantive requirements would include compliance with the City of Everett Shoreline Management Program, noise ordinance, critical areas regulations, staging construction work outside the 200-foot shoreline buffer zone, preventing spills of hazardous materials (e.g., fuel), and use of BMPs included in the SWPPP.

3.1.6 Federal Clean Water Act (CWA)

Section 402 of the CWA requires a permit for discharge of pollutants from a project that is likely to disturb 1 acre or more of land with discharge to surface waters of the state. The estimated total area of disturbance for the proposed interim action areas (soil removal and pipe plugging) is estimated to be up to 1.5 acres, assuming some expansion of planned excavation areas. Because this a cleanup project, if stormwater comes in contact with disturbed contaminated soils and is discharged to surface waters of the state, Ecology may require additional water quality sampling through an Administrative Order that is attached to a National Pollutant Discharge Elimination System construction stormwater general permit (CSGP).

However, the plan is that any stormwater generated during the interim action activities would infiltrate on-site within each localized work area (all pervious surfaces). Because there will be no discharge to surface waters of the state, a CSGP would not be required unless Ecology determines that the activity would be a significant contributor of pollutants to waters of the state or would cause a violation of any water quality standard.

The proposed plugging of shoreline pipes will be conducted from the upland; therefore, it is anticipated that a U.S. Army Corps of Engineers (Corps) Permit and a CWA Section 401 Water Quality Certification will not be required for those activities. Any work for which a Corps permit would be required would be deferred until either: (1) East Waterway cleanup is designed and permitted under separate Agreed Order with Ecology; or (2) other redevelopment actions alter the shoreline, in consultation with Ecology.

The substantive requirements of the CSGP would be met by implementing the BMPs in the SWPPP to ensure no discharge of pollutants to surface waters of the state.

3.2 Other Requirements

This subsection provides a description of additional requirements that will be addressed during planning and execution of interim cleanup activities within the Upland Area.

Monitoring Well Decommissioning

Groundwater monitoring wells located within the footprints of interim cleanup excavations will be properly decommissioned, prior to start of excavation, in accordance with the requirements of Chapter 173-160 WAC. The need for replacement monitoring wells in interim action areas will be determined in consultation with Ecology when preparing the plan for groundwater compliance monitoring in accordance with the final Cleanup Action Plan (CAP) for the Upland Area.

Archaeological Resources Monitoring

Ecology is working with landowners/stakeholders, including local Indian tribes to clean up contaminated sites and sediments in the vicinity of the Port Gardner Bay area and the Snohomish River Estuary. Port Gardner Bay is identified as a high-priority, "early-action," cleanup area under the Puget Sound Initiative (PSI). The Kimberly-Clark Worldwide Site has been identified as a cleanup site under the PSI. Local tribes that have been actively engaged by Ecology under the PSI at Port Gardner include the Tulalip, Suquamish, Swinomish, and Lummi (the Tribes). Ecology has worked with a tribal liaison to assist in developing contacts and early engagement with cultural and natural resource sections within each of the aforementioned tribes. Engagement with the tribes has consisted of meetings to discuss PSI cleanup sites and cultural resources, providing the Tribes with draft work products for early input, and providing them with updates containing the current status of each PSI site, near-term work products for tribal review, project schedules, and a summary of tribal engagement for the Port Gardner PSI sites.

Based on Ecology's discussion with the Tribes and information provided in a 1973 Historical Survey of Everett (Dilgard and Riddle, 1973), people have inhabited the Port Gardner Bay area for thousands of years. For centuries, the northwest point of the peninsula (i.e., Preston Point) was the site of Hibulb, the principal village of the Snohomish Tribe. Its location near the mouth of the Snohomish River and next to Port Gardner Bay provided both abundant food and transportation. Native tribes used the Everett shoreline in part for subsistence activities, such as shellfish collecting, hunting, plant gathering, and fishing. According to local tribes, native long houses were located up and down the Everett waterfront. Local tribes have communicated to Ecology that the Everett waterfront is a culturally sensitive area. With that in mind, the procedures to be used in the event archaeological resources are encountered during Site activities are presented below.

Prior to initiating the previous Upland Area interim action, a professional archaeologist prepared an Archaeological Resource Assessment for the Upland Area (SWCA, 2013a) and a Cultural Resources Monitoring and Discovery Plan (M&D Plan; SWCA, 2013b) specific to the Upland Area interim actions. The assessment mapped, based on readily available information, estimated probabilities for areas of native soil within the Upland

Area to contain significant Native American archaeological materials (low, medium, high probability; the overlying fill materials would not contain such materials.

While the M&D Plan identifies the prior interim action areas, its monitoring and communication protocols remain applicable to the current interim action activities. Accordingly, the proposed interim action excavation work will be conducted in accordance with the archaeological monitoring and communication protocols outlined in the M&D Plan (SWCA, 2013b), which is available on Ecology's website for the Site.

It is likely that the proposed interim action excavation work will occur only in the nonnative fill. As such, the interim action excavations and excavated soils will be observed by an Aspect geologist overseeing the interim action activities, with attention paid to looking for evidence of non-soil materials. If an excavation advances through the fill to encounter native soils, a professional archaeologist will mobilize to the excavation location to observe and assess the materials encountered. Likewise, if the Aspect geologist observes a potential archaeological object during interim action activities, work will be stopped immediately, and a professional archaeologist will mobilize to the excavation location to observe and assess the materials encountered. If the professional archaeologist confirms that an archaeological object has been encountered, they will notify Ecology, the Department of Archaeology and Historic Preservation (DAHP), the City of Everett Planning and Community Development Department, and the Tulalip and Suquamish Tribes Cultural Resources Department in a timely manner (current day if possible) and no later than the next business day. Contact information is provided below.

- **Ecology** – Andy Kallus, Site Manager, Toxics Cleanup Program – (360) 407-7259.
- **DAHP** – (360) 586-3065.
- **City of Everett Planning and Community Development Department** – (425) 257-8731.
- **Tulalip Tribes Historic Preservation Officer** (Richard Young) – (360) 716-2652.
- **Suquamish Tribe Historic Preservation Officer (Dennis Lewarch)** – (360) 394-8529.

The professional archeologist will invite the parties to attend an on-site inspection. The archaeologist will document the discovery and provide a professionally documented site form and report and implement the discovery procedures described in the M&D Plan (SWCA, 2013b).

In the event of any discovery of human remains, work will be immediately halted in the discovery area, the remains will be covered and secured against further disturbance, and the Everett Police Department and Snohomish County Medical Examiner will be immediately contacted, along with Ecology, the DAHP Physical Anthropologist, and authorized Tribal representatives. A treatment plan by the professional archaeologist will be developed in consultation with the above-listed parties consistent with Chapter 27.44 RCW (Indian graves and records) and Chapter 27.53 RCW (Archaeological sites and resources) and implemented according to Chapter 25.48 WAC (Archaeological excavation and removal permit). The archaeologist will submit documentation regarding the discovery to DAHP so that they may control access to information regarding potential sensitive-site locations, in accordance with RCW 27.53.070.

4 Areas and Contaminants Targeted for Removal

The following nine areas are targeted for contaminated soil removal in this interim action, listed from south to north (Figure 1):

1. Old Machine Shop (OMS) area
2. Central Maintenance Shop (CMS) area
3. PM-B-6 area
4. Boiler/Baghouse (BBH) area
5. BA-MW-7 area
6. REC5-MW-1 area
7. Log Pond Chip Conveyor area
8. Hydraulic Barker area
9. Clark Nickerson (CN) area

The OMS, BBH, BA-MW-7, and REC5-MW-1 areas are located within the 20-acre ETCS parcel area, and the southernmost portion of the CMS area is located within the Warehouse parcel area (Figure 1). Each area has different contaminants of concern (COCs) that are targeted for removal, as outlined in the following sections. Table 1 presents the interim action areas, their respective COCs targeted for removal, and the preliminary estimated area and depth of excavation and quantities of materials to be removed, recognizing that the actual lateral and vertical extents of each excavation will be determined based on performance monitoring conducted within the excavation (see Section 6.2).

4.1 Old Machine Shop (OMS) Area

The OMS was historically located on the shoreline of the slip at the south end of the Upland Area (Figure 1). In Ecology's comments on the draft RI, Ecology provided statistical compliance analyses for metals in soils for each of the Upland Area Site Units A through E (from south to north) applied in the draft RI/FS. The analysis (Ecology, 2017b) identifies the OMS area as a hot spot for copper (265 milligrams per kilogram [mg/kg] maximum at OMS-B-3 location) and mercury (0.84 mg/kg maximum at OMS-B-3 location). The OMS-B-3 location also had a total PCB exceedance (1.95 mg/kg) (Figure 2).

Although there were no exceedances of these COCs detected in groundwater in the OMS area, the impacted soil encompassing the OMS-B-3, OMS-B-5, and OMS-MW-2 locations is an identified hot spot located immediately adjacent to the shoreline and is, therefore, targeted for removal in this interim action.

The COCs targeted for removal in the OMS area are copper, mercury, and PCBs in soil.

The estimated extent of the OMS area excavation is approximately 3,500 square feet, to an average depth of 5 feet, for a total volumetric removal of approximately 650 cubic yards of contaminated soil (Table 1). No CM is anticipated to occur within this proposed excavation area. The depth to water in the area is expected to be between approximately 7 and 10 feet below ground surface (bgs) with tidal influence, but groundwater is not expected to be encountered within the excavation.

4.2 Central Maintenance Shop (CMS) Area

The CMS area encompasses soils at and near the former CMS, and the eastern end of the former pulp mill screen and bleach building 2 where PCB-containing transformers were historically located. Within this area during the 2013–2014 interim action, approximately 510 tons of petroleum-contaminated soil were removed from the REC2-MW-5 area located adjacent to the former Diesel Aboveground Storage Tank (Aspect, 2015); the previous excavation area is shown on Figure 3. Total PCB aroclor concentrations in all verification soil samples from that excavation were less than a 10 mg/kg soil cleanup level based on industrial direct contact. Following completion of the interim action, PCB congeners were detected in groundwater from well DAST-MW-101, located next to the excavation (Figure 3), at concentrations exceeding the stringent groundwater cleanup level based on protection of surface water (Aspect, 2017b).

In addition, elevated groundwater concentrations of naphthalene at well CMS-MW-1 within this area exceeded the PCL based on vapor intrusion. No elevated soil naphthalene concentrations were detected in the area around this well, but, based on the high naphthalene concentrations in groundwater, it is inferred that highly localized naphthalene source material exists near the well. Removal of soil in this area, as an inferred source of groundwater contamination, was a component of remedial Alternative 3 in the draft FS (Aspect, 2016b).

Therefore, PCB aroclors and PAHs (naphthalene) in soil are the COCs targeted for removal in this area.

The estimated extent of the CMS area excavation shown on Figure 3 is approximately 23,400 square feet (approximately 0.5 acre), to an average depth of 6 feet, for a total volumetric removal of approximately 5,200 cubic yards, of which approximately 3,330 cubic yards is contaminated soil. Within the excavation footprint, the impacted soil is assumed to be covered by a layer of CM ranging from 1 to 2.5 feet thick (1,600 cubic yards estimated). In addition, within the footprint of the prior excavation, 1 to 2 feet of imported clean backfill, referred to as clean overburden, occurs between the CM and impacted underlying soil (300 cubic yards of overburden estimated). The depth to water in the area is expected to be between approximately 1 and 4 feet bgs.

4.3 PM-B-6 Area

This boring, located within the eastern end of the former pulp mill (Figure 1), had a very high soil copper concentration (278 mg/kg) at a depth of 6 feet[1], and was identified as a hot spot in Ecology's (2017b) statistical analysis. There were no groundwater dissolved copper exceedances at the nearest two downgradient wells (PM-MW-2 and PM-MW-5) during the 2013–2014 sampling. However, dissolved copper at PM-MW-5 exceeded the cleanup level by about seven times when sampled in March 2017. The increase in dissolved copper concentrations is attributable primarily to groundwater pH increasing from about pH 8 to 11 between the 2014 and 2017 sampling events (Aspect, 2017b). There are no other soil sample data within 100 feet of PM-B-6, so the extent of the elevated copper in soil surrounding the boring is poorly defined (Figure 4).

The COCs targeted for removal in the PM-B-6 area are copper and mercury in soil.

For planning purposes, the PM-B-6 area excavation depicted on Figure 4 is estimated as 20 feet by 20 feet around the PM-B-6 location (400 square feet), with assumed depth of 10 feet, for a total volumetric removal of approximately 150 cubic yards, of which approximately 120 cubic yards is contaminated soil. Within the identified excavation footprint, the assumed impacted soil is covered by CM to approximately 2 feet thick (30 cubic yards estimated). The depth to water in the area is expected to be between approximately 7 and 9 feet bgs.

4.4 Boiler/Baghouse (BBH) Area

The 2013–2014 interim action included removal of approximately 2,380 tons of metals-contaminated soil from the BBH area (excavation area shown on Figure 5). Lead was the COC targeted for that removal, although soil concentrations of arsenic, copper, mercury, nickel, and zinc also exceeded cleanup levels based on groundwater leaching to protect surface water. The excavation extended to depths ranging between approximately 2 to 6 feet bgs, which included deeper overexcavation to remove exceedances in the eastern portion of the excavation based on verification sampling (Aspect, 2015).

Groundwater exceedances for dissolved arsenic, copper, and mercury have been consistently detected in wells BBH-MW-101 and BBH-MW-103 on the northern edge of the prior excavation; dissolved lead exceedances have also been detected inconsistently at BBH-MW-103. In addition, dissolved zinc consistently exceeds its groundwater cleanup level at well BBH-MW-104 at the southeastern edge of the excavation. The highest groundwater metals concentrations are detected in BBH-MW-103, which also has high groundwater pH that increases the solubility of metals. No groundwater metals exceedances have been detected at well BBH-MW-102 located on the southwestern edge of the prior excavation (Figure 5).

Soil concentrations of copper, mercury, and occasionally zinc exceeding soil PCLs remain within and around the prior BBH excavation area (Figure 5). Generally higher concentrations occur in the eastern portion, which is consistent with higher groundwater metals concentrations in the eastern monitoring wells. No soil exceedances for lead are

[1] The boring hit refusal at that depth and no deeper soil sample could be collected.

detected, and only one soil arsenic exceedance is detected, within the BBH area[2]. Based on the groundwater exceedances, it is inferred that high concentrations of these metals may exist in soil to a depth beneath the bottom of the prior excavation. Removal of metals-contaminated soil in this area was a component of remedial Alternative 2 in the draft FS (Aspect, 2016b).

The COCs targeted for removal in the BBH area are copper, mercury, and zinc in soil.

The estimated extent of the BBH area excavation, as shown on Figure 5, is approximately 14,100 square feet, to an assumed average depth of 10 feet, for a total volumetric removal of approximately 5,200 cubic yards, of which approximately 3,100 cubic yards is contaminated soil. Abundant subsurface foundation structure is known to exist in this area; therefore, the estimated volume of contaminated soil at depth may be overstated. Within the excavation footprint, the impacted soil is covered by a layer of CM ranging from 1 to 3 feet thick, and averaging 1.5 feet thick (710 cubic yards estimated). In addition, within the footprint of the prior excavation, 2 to 4 feet of clean backfill soil occurs between the CM and impacted underlying soil (1,400 cubic yards estimated). The depth to water in the area is expected to be between approximately 5 and 9 feet bgs.

Early in the interim action project, test-pit soil sampling will also be conducted around the perimeter of sample GF-B-12 (Figure 5) to assess whether the low-level mercury exceedance (0.21 mg/kg) there is isolated. The results of that sampling will be discussed with Ecology before finishing excavation in this area.

4.5 BA-MW-7 Area

Well BA-MW-7, located immediately adjacent to the bulkhead (Figure 6), is the one Upland Area shoreline well with carcinogenic polycyclic aromatic hydrocarbon (cPAH) exceedances in groundwater (up to 0.036 µg/L total cPAH [toxic equivalent quantity (TEQ[3])]). A total cPAH (TEQ) exceedance (0.92 mg/kg) was also detected in soil at a depth of 12.5 feet, within the well's screened interval, at this location.

Based on the groundwater data, the COC targeted for removal in the BA-MW-7 area is cPAH in soil.

The BA-MW-7 area excavation depicted on Figure 6 is constrained by the bulkhead on the west and is estimated as 10 feet by 10 feet around well BA-MW-7 (100 square feet), with an assumed depth of 13 feet, for a total volumetric removal of approximately 50 cubic yards, all of which is contaminated soil (no CM is present). The depth to water in the area is expected to be approximately 6 to 10 feet bgs and fluctuate with the tides.

4.6 REC5-MW-1 Area

This area, described in Section 6.4.2.2.1 of the draft RI/FS, includes monitoring well REC5-MW-1 that has had the highest groundwater concentrations of select metals

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[2] Given their low frequencies of exceedance, data for arsenic and lead are not presented on Figure 4, to improve readability.

[3] Total toxic equivalent concentration of benzo(a)pyrene calculated in accordance with MTCA (WAC 173-340-708[8][e]).

(arsenic in particular) detected in the Upland Area, and the concentrations were reproduced in successive groundwater sampling. Well REC5-MW-1 was damaged during mill demolition and replaced during the RI by well REC5-MW-1R, located a few feet from the original well. The detected groundwater metals concentrations in the replacement well were an order of magnitude lower than detected at REC5-MW-1, but arsenic still exceeded the groundwater cleanup level by almost six-fold. Wells REC5-MW-1/-1R are located approximately 200 feet from the East Waterway shoreline and substantially lower metals concentrations were detected in groundwater at downgradient wells.

No elevated soil metals concentrations were detected in the area around wells REC5-MW-1/-1R, but, based on the high metals concentrations in groundwater, it is inferred that highly localized metals source material exists near the original well. Removal of soil in this area, as an inferred source of groundwater contamination, was a component of remedial Alternative 3 in the draft FS (Aspect, 2016b).

Based on the groundwater data, the COCs targeted for removal in the REC5-MW-1 area are arsenic, copper, and lead in soil.

For planning purposes, the REC5-MW-1 area excavation depicted on Figure 7 is estimated as 25 feet by 25 feet around wells REC5-MW-1/-1R (approximately 630 square feet), with an assumed depth of 12 feet, for a total volumetric removal of approximately 280 cubic yards, of which approximately 240 cubic yards is contaminated soil. Within the identified excavation footprint, the assumed impacted soil is covered by CM approximately 1 to 2 feet thick (40 cubic yards estimated). The depth to water in the area is expected to be between approximately 7 and 9 feet bgs.

4.7 Log Pond Chip Conveyor Area

During the supplemental log pond investigation completed in accordance with Aspect (2017a), a pair of long trenches were excavated to identify the subsurface conditions where a pronounced geophysical anomaly was identified at the southcentral edge of the log pond fill. A pair of long trenches excavated east-west across the anomaly (LP-T-1 on the north, and LP-T-2 on the south) confirmed the geophysical anomaly as the foundation[4] for the former chip reclaim conveyor that operated after filling of the log pond (Figure 8).

Soil samples were collected on the east and west sides of the foundation in each trench (depth of 5.5 feet bgs). The trenching indicates the CM is approximately 4 feet thick in this area, with a thin layer of wood chips separating it from the underlying fill soil. Water with petroleum sheen was observed seeping into the east side of the northern trench (LP-T-1-E location). Total petroleum hydrocarbons (TPH; both gasoline-range and diesel-/oil-range) and cPAHs were detected above respective soil cleanup levels in sample LP-T-1-E collected from that location. In addition, mercury concentrations up to 3.4 mg/kg were detected in both soil samples collected from the east side of the foundation. Zinc exceeded its soil cleanup level (based on leaching) in three of four of the trench soil

[4] Concrete foundation with steel plates on the top.

samples, but zinc exceedances have never been detected in groundwater from the Log Pond area, indicating the soil zinc concentrations in the log pond fill are not creating groundwater contamination.

The COCs targeted for removal in the Chip Conveyor area are gasoline-range TPH, diesel-/oil-range TPH, cPAHs, and mercury in soil.

The estimated extent of the excavation depicted on Figure 8 is approximately 770 square feet to an assumed depth of 8 feet, for a total volumetric removal of approximately 230 cubic yards, of which approximately 130 cubic yards is contaminated soil. Within the identified excavation footprint, the impacted soil is covered by CM approximately 4 feet thick (100 cubic yards estimated). The depth to water in the area varies seasonally and is expected to be between 2 and 5 feet bgs.

4.8 Hydraulic Barker Area

At the location of the former Hydraulic Barker Building, elevated diesel-range TPH (7,700 mg/kg) was detected at a depth of 12 feet at the HB-MW-1R well location, which is within the screened-interval depth of the monitoring well. No petroleum free product was observed during drilling, nor in the completed monitoring wells, and no groundwater exceedances for TPH or PAHs were detected in the well. Concentrations of copper, mercury, and zinc in soil exceeding leaching-based cleanup levels are also detected in this area. The highest concentrations of each of those metals[5] in this area were detected in soil within the screened interval depth of well HB-MW-1, located adjacent to well HB-MW-1R[6]. No groundwater metals exceedances were detected in groundwater from well HB-MW-1 when sampled in 2012, when groundwater pH was near neutral (pH 7.1). After groundwater pH in this area increased substantially (up to pH 11.5), groundwater metals exceedances were detected at well HB-MW-1R. The fact that groundwater metals concentrations were below cleanup levels until pH increased indicates that the high groundwater pH, not the soil metals concentrations, is the cause of the elevated groundwater metals concentrations in this area.

The highest PCB concentration in Upland Area groundwater was detected at well HB-MW-1R in March 2017 (Aspect, 2017b). A low PCB concentration (0.15 mg/kg) was detected in soil from the HB-MW-1 location, but PCBs were not analyzed for in soil from the HB-MW-1R location. Based on the high PCBs concentration in groundwater, it is inferred that localized PCB source material exists adjacent to the HB-MW-1R location.

Based on the groundwater data, the COC targeted for removal in the Hydraulic Barker area is PCB. However, the excavation will proceed until field screening indicates that soil remaining in the excavation does not contain substantial petroleum contamination. Once that occurs, excavation verification soil samples will also be analyzed for diesel-/oil-range TPH, copper, mercury, and zinc to document residual concentrations of these constituents ("record samples"); however, the excavation will not be expanded based on those record sample results.

[5] 143 mg/kg copper, 0.37 mg/kg mercury, and 311 mg/kg zinc.
[6] HB-MW-1R was installed as a replacement well for HB-MW-1, which was damaged during mill decommissioning.

For planning purposes, the Hydraulic Barker area excavation depicted on Figure 9 is estimated as 20 feet by 20 feet around well HB-MW-1R (400 square feet), with an assumed depth of 13 feet, for a total volumetric removal of approximately 190 cubic yards, of which approximately 140 cubic yards is contaminated soil. Within the identified excavation footprint, the assumed impacted soil is covered by CM approximately 4 feet thick (50 cubic yards estimated). The depth to water in the area is expected to be between 6 and 9 feet bgs.

4.9 Clark Nickerson Area

A high total cPAH (TEQ) concentration of 6.4 mg/kg was detected at two sample locations near the southeast corner of the CNB2 excavation from the prior interim action: the 5-foot sample at boring CN-B-4 (6.4 mg/kg cPAH), and excavation verification sample CNB2-B27 at a depth of 4 feet bgs (Figure 10). cPAH was not detected in the 8-foot soil sample from boring CN-B-4, nor in excavation verification sample CNB2-S51 located between that boring and CNB2-B27.

The COC targeted for removal in the Clark Nickerson area is cPAH.

Because there is a clean sample between the two exceeding samples, soil will be excavated initially from two discrete locations as depicted on Figure 10. The estimated total area of the excavations is approximately 500 square feet, and the estimated depth of both excavations is 6 feet, for an estimated total volumetric removal of approximately 120 cubic yards, of which approximately 80 cubic yards is contaminated soil. Within the identified excavation footprint, the impacted soil is covered by CM on average approximately 1.5 feet thick (30 cubic yards estimated). In addition, within the footprint of the prior CNB2-B27 excavation, approximately 2.5 feet of clean backfill soil occurs between the CM and impacted underlying soil (10 cubic yards estimated). The depth to water in the area is expected to be between 2 and 5 feet bgs.

5 Generalized Approach for Soil Removal

As stated in Section 1, the cleanup actions conducted under this IAWP will involve excavation and proper off-Site disposal of contaminated soil, with concurrent dewatering to facilitate soil removal and handling. While each cleanup location will have unique physical conditions to be adapted to, this section describes the generalized procedures/approach to be conducted during the interim cleanup actions irrespective of location—including application of soil PCLs guiding the extent of excavation, erosion and sediment controls, dewatering and water management, soil excavation and handling procedures, conduit/pipe plugging within soil excavations, stockpile management, and excavation backfilling.

In addition to the excavation of contaminated soil, inactive pipes along the shoreline that remain open to the East Waterway will be plugged to prevent them from serving as a potential pathway for discharge of upland groundwater to the Waterway. Most of the pipes to be plugged occur on the Marine Terminal Use property planned for redevelopment. In addition to the inactive pipes referenced above, K-C is also required to allow the decommissioning of the combined sewer overflow (CSO) pipe, owned by the City of Everett, that discharges at PS04 underneath the K-C wharf. Appendix C describes the shoreline pipes to be plugged, and the planned general methods to be implemented for that activity.

5.1 Soil Cleanup Levels for Interim Action

The soil cleanup levels for this interim action are consistent with soil PCLs developed in the draft RI (Aspect, 2016a), but updated based on more recent changes to applicable regulatory criteria. The soil PCLs are protective of direct human contact under industrial use and leaching to groundwater, with adjustments for background concentrations and analytical practical quantitation limits (PQL) in accordance with MTCA. Table 2 presents the soil PCLs for the COCs targeted for removal in this interim action.

5.2 Erosion, Sediment, and Dust Controls

The construction stormwater BMPs described in the SWPPP (Appendix D) will be implemented during soil excavation (for both contaminated soil removal and exposing shoreline pipes to cut and plug), stockpiling, loading, and transportation on-Site during the interim action. Soil erosion due to precipitation runoff or run-on to or from soil excavations, stockpiles, or other soil areas exposed or disturbed throughout the interim cleanup activities will be prevented using silt fences, wattles, plastic covers, or other measures appropriate for the conditions. For any excavation within 200 feet of the shoreline, a silt fence or wattles will be installed between the excavation and the shoreline.

The Contractor will use the following methods, as needed, to minimize off-Site migration, as airborne dust, track out, or stormwater runoff, of any contaminated soils:

- Apply water to dry soils, as necessary, to suppress airborne dust. This will include regular use of water trucks with a spray bar and, if needed, upgrading to dust suppression misting cannons (e.g., https://bosstek.com/products/dust-control-solutions/).
- Use BMPs to prevent contaminated soils at the Site from entering the stormwater drainage systems.
- Use other erosion-control devices to prevent contaminated soils suspended in stormwater from migrating off-Site (e.g., soil piles will be covered in 10-mil plastic and placed on plastic within berms).
- Maintain excavation equipment in good working order. The Contractor must immediately clean up any contaminated soil resulting from spilled hydraulic oils or other hazardous materials from equipment.
- Minimize equipment traffic through the exclusion zone to prevent contaminated soils from being transported via track off to other parts of the Site, or off of the Site.

- Establish specific truck haul routes before beginning off-Site transport of contaminated soil. Use on-Site truck routes that minimize or prevent traffic over contaminated areas and prevent interference with other on-Site activities that may be occurring.
- Locate loading areas for contaminated soil in, or at the edge of, the exclusion zone.
- Load only soils without free liquid in trucks (soils with free water will not be loaded into trucks).
- Load trucks in a manner that prevents the spilling, tracking, or dispersing of contaminated soils. Cover all loads prior to exiting the Site.
- Remove soil from the exterior of vehicles before they leave soil-loading areas or exit the Site. Place any soil collected in the loading area back into the truck.
- Verify that loaded truck weights are within acceptable limits.

The Engineer will monitor and maintain the BMPs and apply all available and reasonable methods to control runoff from leaving the immediate area of the soil management activity.

5.3 Materials Excavation and Management

Interim cleanup activities in the Upland Area will involve conventional excavation and handling of the following material types, listed from ground surface down:

- Surficial veneer of CM, which is being addressed as a separate project with the Snohomish Health District as the lead agency.
- Imported aggregate that complied with MTCA unrestricted soil cleanup levels and was placed as excavation backfill during the 2013–2014 interim action (termed overburden)
- Contaminated soils

Each material type does not occur in each excavation area. Table 1 presents the estimated quantity of each of each material within each interim action area, based on available information.

Throughout excavation, the excavation sidewalls will be sloped, as needed, to facilitate excavation to the depths required to achieve cleanup goals. The following subsections describe the handling and disposition of each material type.

5.3.1 CM

Within each excavation area where surficial CM is present (all except the OMS area where CM is not anticipated), the CM will first be excavated and transported off-Site for recycling/reuse or landfilling in accordance with the Plan of Operations for CM Removal (K-C, 2018) overseen by the Snohomish Health District.

The removal of CM within interim action excavation areas will be conducted only to a depth at which it can be removed without also removing underlying soil. The CM that cannot be removed without mixing with underlying soil will be excavated and disposed of as contaminated soil.

5.3.2 Overburden (Backfill from Prior Excavation)

Overburden, consisting of clean sand and gravel aggregate, occurs in portions of the CMS, BBH, and Clark Nickerson excavation areas. The overburden is visually distinct from the darker-colored dredge fill soils and can be readily distinguished in the excavations. The overburden was previously determined to meet PCLs and be geotechnically suitable for use as backfill. Therefore, for excavation areas where overburden is present, it will be excavated, temporarily stockpiled by itself in accordance with Section 5.5, and then reused as backfill in the new excavation.

The removal of overburden within interim action excavation areas will be conducted only to a depth at which it can be removed without also removing underlying soil. The overburden that cannot be removed without mixing with underlying soil will be excavated and disposed of as contaminated soil.

5.3.3 Contaminated Soil

To the extent practical, contaminated soil that has been drained to an unsaturated condition will be direct loaded into waiting dump trucks or intermodal containers for off-Site transport to a licensed disposal facility, rather than stockpiled temporarily on-Site. If contaminated soils are temporarily stockpiled on-Site, the stockpiles will be managed as described in Section 5.5.

Saturated soil that is excavated will be drained directly back into the excavated area prior to loading. Care will be taken so that groundwater from the excavation bucket flows back into the excavation and not to adjacent areas.

During soil removal, the Engineer will initially make a determination of whether or not the soils being excavated are contaminated or not (meet PCLs or not), based on information from prior investigations and field-screening evidence during excavation. Field-screening methods include visual and olfactory observations, petroleum sheen tests, and, in areas where volatile organic compounds (VOCs) are present, use of a photoionization detector (PID) for determining presence/absence of VOCs.

Section 6.2 presents the protocols for performance monitoring (verification soil sampling) in the excavations and expansion of the excavation (overexcavation) based on the verification sample results.

K-C will dispose of contaminated soil generated during the interim action at an appropriate off-Site facility permitted to accept the waste. Trucks transporting contaminated soil from the Site will comply with applicable state and federal regulations and local ordinances, and will be covered from the time they are loaded on-Site until they off-load at the designated off-Site disposal facility.

Final disposal facilities for contaminated soil generated during the interim cleanup activities will be determined based on the soil's chemical characteristics relative to the disposal facilities' permit requirements. Potential disposal facilities for contaminated soil include:

- **Nonhazardous contaminated soil (special waste):** Republic Services Inc.'s Roosevelt Regional Subtitle D Landfill in Roosevelt, Washington.
  - Restrictions: Cannot accept hazardous waste.
  - Contact: Leslie Whiteman, (206) 332-7711, LWhiteman@republicservices.com.
- **Nonhazardous contaminated soil (special waste):** Waste Management Inc.'s Subtitle D landfills, including one in Wenatchee, Washington, and three in Oregon (Columbia Ridge, Riverbend, and Hillsboro).
  - Restrictions: Cannot accept hazardous waste.
  - Contact: Matt Essig, (206) 437-9460, messig@wm.com.
- **Hazardous contaminated soil (dangerous waste)[7]:** Waste Management Inc.'s Chemical Waste Management Subtitle C Landfill in Arlington, Oregon.
  - Restrictions: Waste must meet universal treatment standards prior to disposal. Note that Waste Management has technical capabilities at their Arlington facility for treating soils to achieve treatment standards prior to land disposal.
  - Contact: Matt Essig, (206) 437-9460, messig@wm.com.

Data collected during prior sampling and/or during the interim action will be used to profile the contaminated soil for off-Site disposal. Additional testing of soil may be required during the interim cleanups, if requested by the disposal facility. Irrespective of the type of soil disposed of off-Site, the Engineer will obtain and retain copies of the certificates of disposal and other disposal records for it; this documentation will be included in the Interim Action Report (Section 7).

5.4 Dewatering and Water Management

Construction dewatering will be conducted during the interim cleanup activities, as needed, to facilitate effective soil excavation/handling, performance soil sampling within the excavation, and cutting and plugging of shoreline pipes. Means and methods for dewatering will be determined by the construction Contractor specific to each location and, based on experience from the prior interim action, will very likely include use of temporary sumps within the open excavation. If there is more water than can be handled with sump(s), temporary well points can be installed outside of the excavation.

Groundwater pumped during dewatering will be pretreated on-Site using a temporary treatment system, and then discharged to City's wastewater treatment plant via their sanitary sewer, in accordance with a City DA obtained by K-C. The on-Site pretreatment

[7] No dangerous waste is anticipated to be generated during this interim action.

system will consist of a chambered weir tank(s) that removes settleable solids. Because the extracted groundwater may have elevated pH, the tanks also allow for pH adjustment—by adding carbon dioxide[8]— to meet the DA's effluent criteria prior to discharge to sanitary sewer. The soils to be excavated are not anticipated to be petroleum contaminated, but granular activated carbon vessels and/or flocculent may be used, prior to discharge to sanitary sewer, if deemed necessary by the Engineer or Contractor to meet the DA's effluent criteria prior to discharge to sanitary sewer. Any separate-phase petroleum if encountered in the groundwater during excavation activities will be collected to the extent practicable (either by vacuum truck or adsorbent material), characterized, and sent for off-Site disposal.

Treated water not in compliance with the City discharge limits will be rerun through the treatment system until passing discharge limits, or will be containerized, characterized, and sent for off-Site disposal. Rates of treated water discharge to sewer will comply with the DA. Additional storage tanks may be used to provide additional on-Site storage, if necessary.

Prior to demobilization of the temporary water-treatment system, the Contractor will clean the weir tank(s), including profiling and proper off-Site disposal at a permitted facility of any accumulated solids within the tank(s).

5.5 Stockpile Management

If soil stockpiling is needed during the interim action excavation activities, the Contractor will stockpile the excavated soils in a location (designated by Aspect) that will not hinder completion of the cleanup activities. Stockpiles will be located away from storm-drain catch basins and more than 75 feet from the East Waterway shoreline. Soil will be transported in a way to limit spillage of soil between the interim cleanup excavation location and the stockpile location.

CM removed from an excavation area will be managed in accordance with the Plan of Operations for CM Removal approved by the Snohomish Health District and may be stockpiled on in-place CM elsewhere on-Site in a location that will not hinder completion of the cleanup activities, but it will not be mixed with any other materials prior to transport off-Site. If clean overburden requires removal for an excavation area to access contaminated soils, it will be stockpiled by itself.

Each stockpile of overburden and contaminated soil will be underlain by plastic sheeting with a minimum 10-mil thickness, with adjacent sheeting sections continuously overlapped by a minimum of 3 feet. The ground surface on which the sheeting will be placed will be free of objects that could damage the sheeting. Alternatively, a layer of geotextile or plywood may be placed beneath the sheeting to protect it. The stockpile area will be surrounded by straw bales or equivalent to limit transport of sediment potentially generated from the stockpiles. The maximum individual size for a stockpile of overburden soil will be 100 cubic yards.

Each soil stockpile will be covered by plastic sheeting of minimum 10-mil thickness to prevent precipitation from entering the stockpiled soil. Each stockpile cover will be

[8] Added to the settling tank in either gas form (sparging) or solid form (dry ice).

anchored (e.g., using sand bags) sufficiently to prevent it from being removed by wind. Soil stockpiles will be covered when not in use, and as needed, during periods of rain and wind to prevent transport of soil. The stockpile management measures will be inspected regularly and maintained, as needed, as long as the stockpile remains at the Site. Alternate BMPs for stabilizing soil may be recommended by the on-Site inspector in the event the BMP(s) listed above are deemed ineffective or inappropriate, in accordance with Section 3.5 of the SWPPP (Appendix D).

5.6 Excavation Backfill and Compaction

Each excavation for contaminated soil removal or for pipe plugging will be backfilled to surrounding grade using a combination of (stockpiled) geotechnically suitable overburden from the same excavation, and/or granular aggregate (sand/gravel or crushed rock) imported from a known source of uncontaminated fill (e.g., Washington State Department of Transportation [WSDOT]-approved borrow pit).

For imported backfill, the Contractor must provide to the Engineer documentation of the fill source-area land use and operational history, as well as representative analytical testing data for the fill material, to demonstrate it is not contaminated.

Representative sampling and chemical analyses for the imported fill soil proposed for backfill will include five samples for the first 1,000 cubic yards of material, and one additional sample for every additional 1,000 cubic yards of material, with each sample analyzed for gasoline-range petroleum hydrocarbons (NWTPH-Gx method), diesel-/oil-range petroleum hydrocarbons (NWTPH-Dx method), PAHs (U.S. Environmental Protection Agency [EPA] Method 8270 with selective ion monitoring [SIM]), total metals (arsenic, copper, lead, mercury, nickel, zinc; EPA Methods 6000/7000), and PCBs (EPA Method 8082).

Depending on the geotechnical condition of the excavation bottom prior to backfill, the Engineer may determine that a layer of quarry spalls is warranted as a base for the granular backfill materials.

The excavation backfill will be placed in lifts not to exceed 12 inches in thickness, and will be compacted until the placed fill is firm and unyielding to the satisfaction of the Engineer.

6 Compliance Monitoring

In accordance with WAC 173-340-410, compliance monitoring for a cleanup action includes the following elements:

- **Protection monitoring** confirms that human health and the environment are adequately protected during the cleanup action.

- **Performance monitoring** confirms that the cleanup action has attained PCLs and/or other performance standards.
- **Confirmation monitoring** confirms the long-term effectiveness of the cleanup action once PCLs and/or other performance standards have been attained.

Protection and performance monitoring will be conducted for the interim cleanups conducted in the Upland Area. Confirmation monitoring will be conducted as part of the final cleanup remedy established in the final CAP, not as part of the interim action.

The protection and performance monitoring requirements for the interim cleanup actions are briefly described below.

6.1 Protection Monitoring

Protection monitoring will be conducted pursuant to WAC 173-340-410(1)(a) to confirm that human health and the environment are adequately protected during implementation of the interim action. On-Site workers conducting the interim action are required to be appropriately trained in hazardous waste operations in accordance with WAC 296-843-200, and follow an applicable site-specific health and safety plan (SHSP) that they develop as required by WAC 173-340-810. Activities performed under the SHSP will comply with the applicable section of 29 Code of Federal Regulations (CFR) 1910.120. In general, protection monitoring will include air monitoring within the exclusion zone (worker breathing zone) using PID to measure VOC concentrations and, if warranted based on PID information, using instruments (e.g., Draeger tubes) for measuring airborne concentrations of contaminants specific to the interim action location. Visual monitoring of fugitive dust will also be conducted, with dust control BMPs (Section 5.2) conducted as needed to minimize visible dust emissions in accordance with Puget Sound Clean Air Agency (PSCAA) rules (Section 9.15 of PSCAA Regulation I). If visible dust is generated, either work will stop until the visible dust is eliminated, or dust levels will be measured to assure that they meet appropriate action levels protective of human health. If measured VOC or dust levels exceed action levels established for the interim action, measures will be implemented to reduce the emissions to below action levels. Some of the measures may include those discussed previously in Sections 5.2 and 5.5, covering exposed soils with plastic, reducing the areal extent of soil disturbance, or use of a vapor barrier. By achieving occupational health standards within the exclusion zone and dust control during the short-term interim action excavations, the off-Site public will also be protected. Protection monitoring data collected by the Engineer during cleanup will be made available to other on-Site workers and Ecology, if requested.

Nothing in this Plan precludes other on-Site contractors/consultants from choosing to conduct additional protection monitoring. All contractors, subcontractors, and other persons on-Site are solely responsible for the safety of their employees, including training and preparation and execution of their own SHSP.

6.2 Performance Monitoring

During the interim cleanup actions, the Engineer will conduct performance monitoring consisting of collecting and analyzing verification soil samples from the limits of cleanup excavations to determine if PCLs are achieved. The Engineer will collect the performance soil samples when the combination of prior data and excavation field screening indicates that sufficient soil has been removed to meet PCLs for that portion of an excavation.

Verification soil samples will be collected from both bottom and sidewalls of the interim action excavations to document that the vertical and lateral extents of soil exceeding PCLs have been removed. Excavation bottom verification samples will be collected using the excavator bucket on a systematic 20-foot grid (i.e., one sample per 20-foot by 20-foot square), with a minimum of three samples from the bottom of each excavation. Excavation sidewall verification samples will be collected at a horizontal spacing of approximately 20 feet and at 3-foot depth intervals (e.g., 0 to 3 feet, 3 to 6 feet, 6 to 9 feet, etc.) across the full depth of excavation. A minimum of two verification samples will be collected from each sidewall at each depth interval within each excavation.

If the performance monitoring data collected from the excavation extents indicate that PCLs have not been achieved, the excavation will be expanded to remove additional soil to meet PCLs, to the extent practicable, as follows.

- Where an excavation sidewall sample exceeds a soil PCL, the length of sidewall represented by that sample will be overexcavated laterally approximately 1 foot, followed by collection of a new sidewall verification sample in that location.
- Where an excavation bottom sample exceeds a soil PCL, additional soil from the bottom sampling grid location will be overexcavated by a depth of approximately 1 foot, followed by collection of a new bottom verification soil sample at that location.
- If, after the first overexcavation, the second sidewall or bottom verification sample at a location exceeds the soil PCL, overexcavation of that location and collection of a new verification sample will be repeated.
- If, after two overexcavations at a location, the third verification sample exceeds a PCL, but is less than two times the PCL, excavation will be stopped at that location. If the third verification sample exceeds a PCL by more than two-fold, Aspect will consult with Ecology regarding whether to continue excavation at that location; that decision can consider use of a statistical compliance evaluation for that COC.

Aspect will communicate verification sample results to Ecology for discussion and agreement prior to backfilling an excavation.

The excavation verification soil samples for each interim action area will be analyzed for the area-specific COCs described in Section 4 and listed in Table 1. For the Hydraulic Barker area, after excavating to remove soil with substantial petroleum contamination as determined from field screening, the excavation verification samples will also be analyzed for diesel-/oil-range TPH, copper, mercury, and zinc[9] to document residual concentrations of these constituents ("record samples"); however, the excavation will not

[9] In addition to PCBs.

be expanded based on those results. In addition, the Engineer may expand the list of analytes if an interim action excavation area expands into an area with different contaminants based on field screening (e.g., an area targeted for metals has signs of petroleum contamination during field screening). The procedures for excavation verification soil sample collection and analysis are presented in detail in the FSP and QAPP (Appendices A and B).

In addition, groundwater monitoring for pH will be conducted during the CM removal project. Appendix E presents the protocols for groundwater monitoring and for potential implementation of contingency actions in consultation with Ecology based on the monitoring data during that project.

7 Reporting

Once interim action activities begin, Aspect shall provide Ecology with weekly email updates on interim action cleanup activities that have taken place. Aspect will also be in communication with Ecology regarding verification soil sample results and decisions and excavation backfilling.

Within 90 days of completing the interim cleanup action field activities, K-C will submit to Ecology an Interim Action Report, describing the methods and outcome of the interim cleanup activities. Information provided in the Interim Action Report will include a description of the lateral and vertical limits of excavations, the volume of contaminated soil from each excavation, how the contaminated media was managed, volume of groundwater pumped during excavation dewatering, volume of any separate phase petroleum removed, and the sampling results.

The data collected during the interim action will also be uploaded to Ecology’s Environmental Information Management (EIM) database (within 60 days after it has been validated), in accordance with the Order. The results of the interim cleanup activities will subsequently be incorporated into the revised draft RI/FS for the Upland Area.

8 References

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TABLES

Table 1. Constituents of Concern and Estimated Materials Quantities Targeted for Removal

Project No.11.0207, K-C Worldwide Site Upland Area, Everett, Washington

Interim Action Area	Constituents of Concern Targeted for Removal	Estimated Areas and Depths of Excavation				Estimated Quantity of CM to Remove[(b)]		Estimated Quantity of Clean Overburden to Handle[(c)]	Estimated Quantity of Contaminated Soil to Landfill	
		Footprint Area (sq ft)	Excavation Average Depth[(a)] (ft)	Average Depth of CM (ft)	Average Thickness of Contaminated Soil (ft)	Volume (CY)	Tons	Volume (CY)	Volume (CY)	Tons
Old Machine Shop	Cu, Hg, PCBs	3,500	5	0	5	0	0	0	650	980
CMS	PCBs, PAHs	23,400	6	2	(d)	1,600	2,720	300	3,300	4,950
PM-B-6	Cu, Hg	400	10	2	8	30	50	0	120	180
Boiler/ Baghouse	Cu, Hg, Zn	14,100	10	1.5	(d)	710	1,210	1,400	3,100	4,650
BA-MW-7	PAHs	100	13	0	13	0	0	0	50	80
REC5-MW-1	As, Cu, Pb	630	12	2	10	40	70	0	240	360
Log Pond Chip Conveyor	TPH-G, TPH-D+O, cPAHs, Hg	770	8	4	4	100	170	0	130	200
Hydraulic Barker	PCBs (record samples[e]: TPH-D+O, Cu, Hg, Zn)	400	13	4	9	50	90	0	140	210
Clark Nickerson	PAHs	500	6	1.5	(d)	30	50	10	80	120
	Totals:	**43,800**				**2,560**	**4,360**	**1,710**	**7,810**	**11,730**

Notes:

(a) Estimated excavation average depths are based on existing information re: COC exceedance depths. Excavation depths are from current grade.

(b) Crushed material (CM) will be removed and managed in accordance with the approved Plan of Operations for Crushed Material Removal (K-C, 2018), recognizing that the edges (assumed 10% by volume) cannot be cleanly segregated so will be removed as contaminated soil.

(c) Clean overburden from prior interim action is present in a portion of this larger excavation area - quantity of clean overburden is estimated using info from prior IA. Clean overburden will be excavated, stockpiled temporarily, and replaced as backfill, recognizing that the edges (assumed 10% by volume) cannot be cleanly segregated so will be removed as contaminated soil. Clean overburden handling will be paid per cubic yard, thus tons are not calculated.

(d) Thickness of contaminated soil is variable because of clean overburden in part of excavation, thus a single thickness is not estimated nor used in soil quantity estimates.

(e) Hydraulic Barker Area verification samples will also be analyzed for TPH-D+O, Cu, Hg, and Zn to document residual concentrations ("record samples"), but the excavation will not be expanded based on those results.

COC: Constituent of concern; As: Arsenic; Cu: Copper; Pb: Lead; Hg: Mercury; Zn: Zinc; TPH-G: Gasoline-range TPH; TPH-D+O: Diesel-/Oil-range TPH; cPAHs: Carcinogenic polycyclic aromatic hydrocarbons; PCBs: Polychlorinated biphenyls.

CY: cubic yards; ft: feet; sq ft: square feet.

Assumed soil density: 1.5 ton/cubic yard   Assumed CM density: 1.7 ton/cubic yard

Table 2 - Soil Cleanup Levels for Interim Action

Project No. 110207, K-C Worldwide Site Upland Area, Everett, Washington

		APPLICABLE SOIL CRITERIA										Most Stringent Soil Preliminary Cleanup Level (mg/kg)	
		Soil Protective of Groundwater							Soil Protective of Human Direct Contact				
		Constants and Coefficients[a]			Calculated Values								
ANALYTE (BY GROUP)	Groundwater Preliminary Cleanup Level (ug/L)	Koc (Soil Organic Carbon-Water Partitioning Coefficient for organics) (L/kg)	K_d (Distribution Coefficient for metals) (L/kg)	Henrys Law Constant (Hcc; unitless)	Unsaturated Soil Concentration Protective of Leachability to Groundwater for Industrial Land Use (mg/kg)[b] (gwl-u)	Saturated Soil Concentration Protective of Leachability to Groundwater for Industrial Land Use (mg/kg)[c] (gwl-s)	Groundwater Exceedances Confirmed Empirically for Analyte?[d] (Y = yes; blank = no)	Soil, Method A, Industrial Land Use, Table Value (mg/kg)[e] (mA)	Soil, Method C, Most-Restrictive Standard Formula Value, Direct Contact, Industrial Land Use (mg/kg)[a] (mC)	Natural Background Concentration (mg/kg)[f] (back)	Practical Quantitation Level (PQL) (mg/kg)[g] (pql)	Unsaturated Soil	Saturated Soil
***Total Petroleum Hydrocarbons*[j]**													
Gasoline Range Hydrocarbons	1000						Y	100			5	100 (mA)	100 (mA)
Diesel Range Hydrocarbons	500						Y	2000			25	2000 (mA)	2000 (mA)
Oil Range Hydrocarbons	500						Y	2000			100	2000 (mA)	2000 (mA)
Metals													
Arsenic	5		29	0.00E+00	2.9	0.15	Y		88	20	1	20 (back)	20 (back)
Copper	3.1		22	0.00E+00	1.4	0.069	Y		140,000	36	1	36 (back)	36 (back)
Lead	8.1		10000	0.00E+00	1600	81	Y	1000		24	1	1000 (mA)	81 (gwl-s)
Mercury	0.025		52	4.70E-01	0.026	0.0013	Y		1,050	0.07	0.1	0.1 (pql)	0.1 (pql)
Nickel	8.2		65	0.00E+00	11	0.54	Y		70,000	48	1	48 (back)	48 (back)
Zinc	81		62	0.00E+00	100	5	Y		1,100,000	85	1	100 (gwl-u)	85 (back)
Polycyclic Aromatic Hydrocarbons (PAHs)													
Acenaphthene	30	4,900		6.4E-03	23	1.2	Y		210,000		0.03	23 (gwl-u)	1.2 (gwl-s)
Acenaphthylene	30	4,900			23	1.2			210,000		0.03	210,000 (mC)	210,000 (mC)
Anthracene	100	23,493		2.7E-03	370	18			1,100,000		0.03	1,100,000 (mC)	1,100,000 (mC)
Benzo(g,h,i)perylene	8								110,000		0.03	110,000 (mC)	110,000 (mC)
Fluoranthene	6	49,096		6.6E-04	46	2.3			140,000		0.03	140,000 (mC)	140,000 (mC)
Fluorene	10	7,707		2.6E-03	12	0.61			140,000		0.03	140,000 (mC)	140,000 (mC)
Phenanthrene	100								1,100,000		0.03	1,100,000 (mC)	1,100,000 (mC)
Pyrene	8	67,992		4.5E-04	85	4.3			110,000		0.03	110,000 (mC)	110,000 (mC)
1-Methylnaphthalene	1.5	2,528		2.1E-02	0.6	0.03			4,500		0.03	4,500 (mC)	4,500 (mC)
2-Methylnaphthalene	32	2,478		2.1E-02	13	0.63	Y		14,000		0.03	13 (gwl-u)	0.63 (gwl-s)
Naphthalene	89	1,191		2.0E-02	17	0.86	Y		70,000		0.03	17 (gwl-u)	0.86 (gwl-s)
Total cPAHs TEQ	0.015	1,350,000		1.3E-03	3.2	0.16	Y		131		0.015	3.2 (gwl-u)	0.16 (gwl-s)
Polychlorinated Biphenyls (PCBs)													
Total PCBs (sum of aroclors)	0.04	309,000		7.8E-03			Y	10	66		0.4	10 (mA)	10 (mA)

Notes:

a Values obtained from Ecology's CLARC database, July 2015 update.

b Calculated values from three-phase model, per MTCA Equation 747-1, with groundwater value (Cw) as most stringent land-use-specific groundwater cleanup level, site-specific f_{oc} = 0.0078, and MTCA-default dilution factor = 20. WAC 173-340-747 provides multiple additional means to evaluate soil concentrations protective of groundwater.

c Calculated values from three-phase model, per MTCA Equation 747-1, with groundwater value (Cw) as most stringent land-use-specific groundwater cleanup level, site-specific f_{oc} = 0.0078, and MTCA-default dilution factor = 1. WAC 173-340-747 provides multiple additional means to evaluate soil concentrations protective of groundwater.

d If the existing empirical groundwater data demonstrate no groundwater exceedances for a compound, the soil-leachability-to-groundwater pathway is considered incomplete for that compound across the site, and the calculated soil-protective-of-groundwater criteria are not included for establishing that compound's PCLs for the site.

e Because Upland Area groundwater is not a practicable source of drinking water, many Method A soil cleanup levels are not applicable. Method A soil cleanup levels are used for TPH, lead, and arsenic (natural background).

f Natural background values for metals from Natural Background Soil Metals Concentrations in Washington State (Ecology, 1994), except arsenic which is from MTCA (WAC 173-340-900, Table 720-1).

g Analytical method reporting limits. PQLs for total cPAH (TEQ) are adjusted for TEFs.

FIGURES

Proposed Interim Action Area
Previous Interim Action Excavation Extent
Potential Crushed Material Below Surface
Proposed Building (ETCS Redevelopment)
Warehouse Parcel Boundary
ETCS Parcel
Former Log Pond
Crushed Material Boundary
Site Unit Divider
200 ft Shoreline Buffer
Upland Area Boundary

0 200 400
Feet

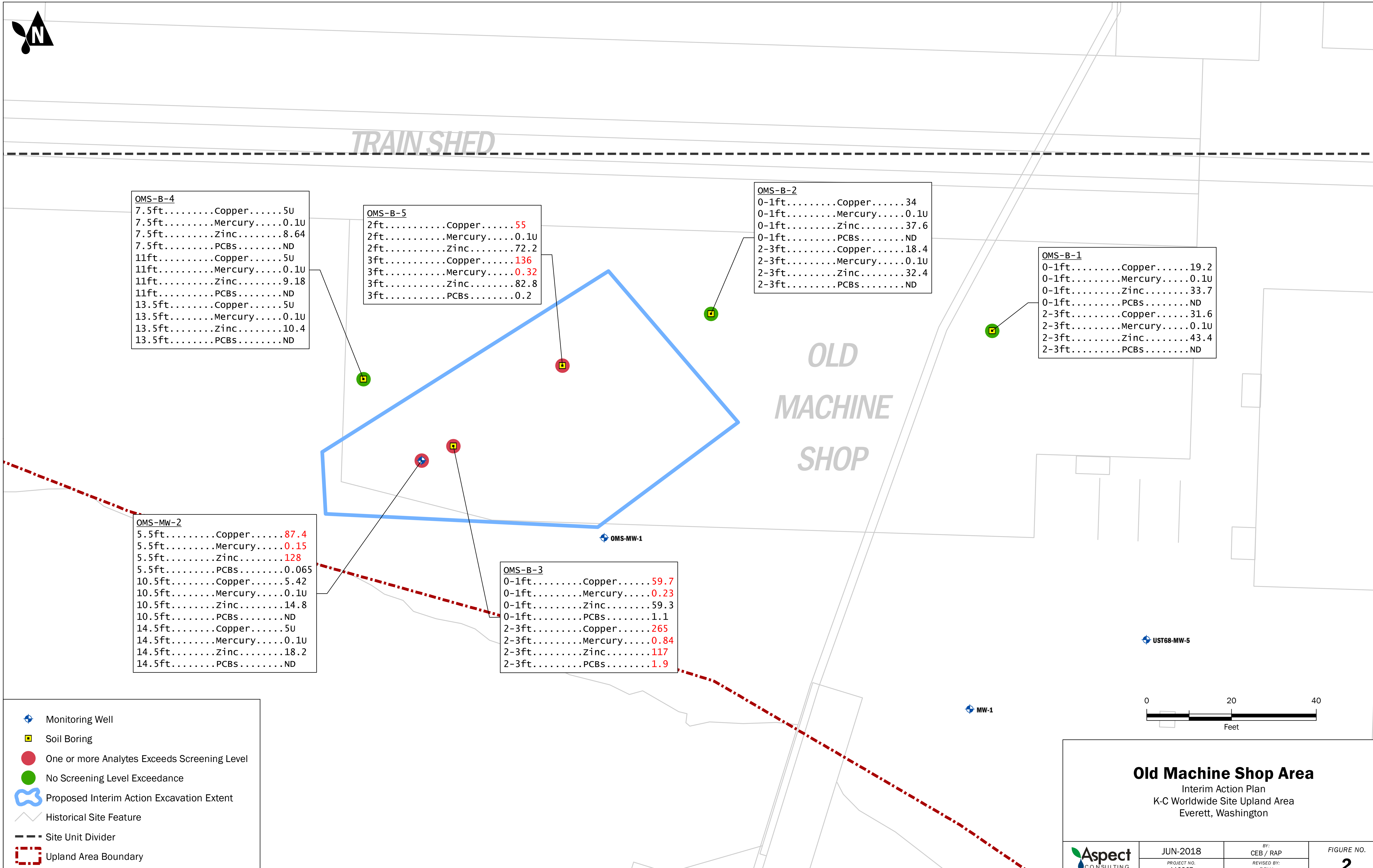
Proposed Interim Action Areas

Interim Action Plan
K-C Worldwide Site Upland Area
Everett, Washington

Aspect CONSULTING

JUL-2018	BY: PPW	FIGURE NO.
PROJECT NO. 110207	REVISED BY: SJG / RAP	1

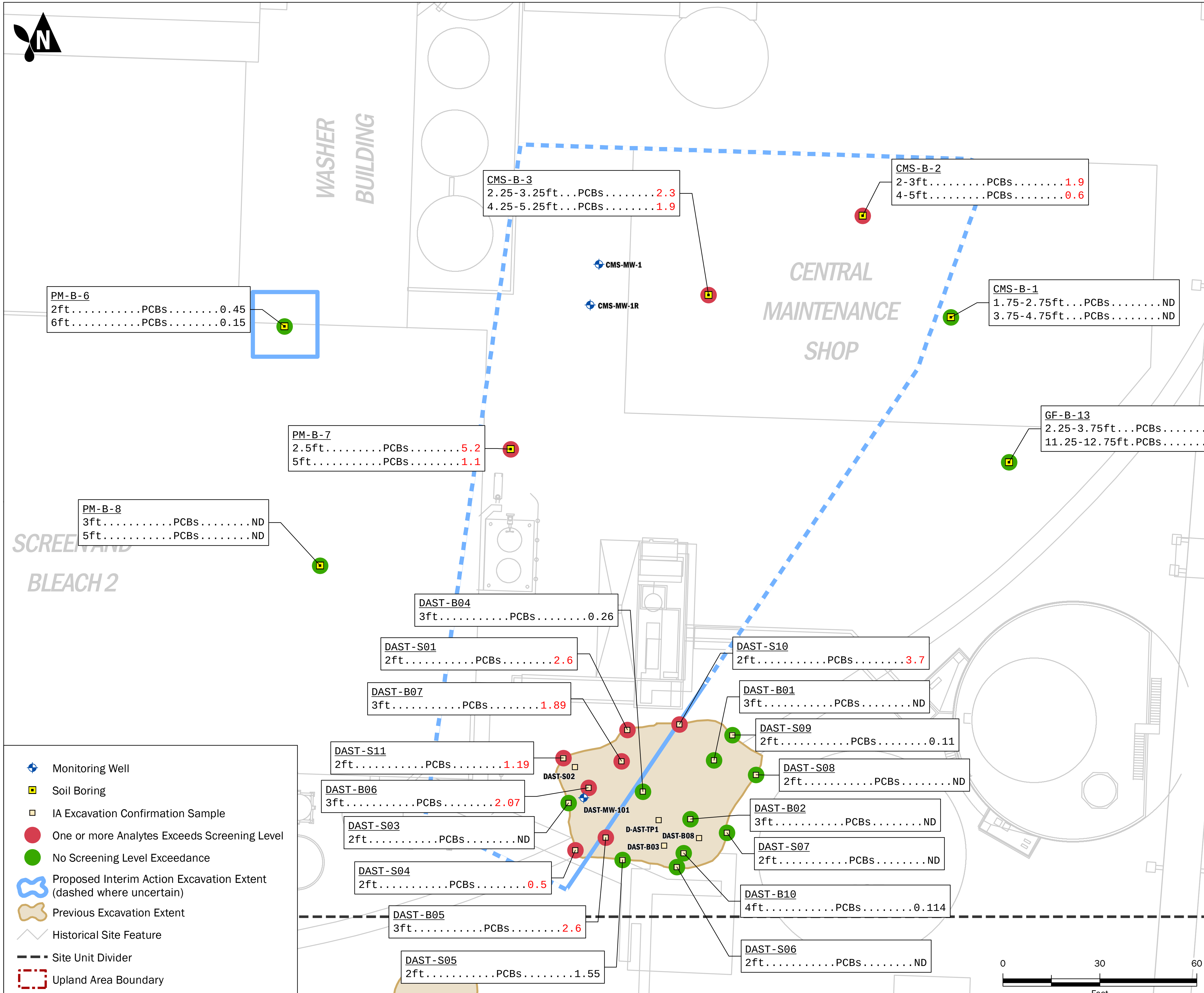
GIS Path: T:\projects_8\KimberlyClark\Env_Support_110207\Delivered\RIFS\ActionableAreas\01_ProposedInterimActionAreas.mxd || Coordinate System: NAD 1983 HARN StatePlane Washington South FIPS 4602 Feet || Date Saved: 7/11/2018 || User: rpepin || Print Date: 7/11/2018



Old Machine Shop Area

Interim Action Plan
K-C Worldwide Site Upland Area
Everett, Washington

Aspect CONSULTING	JUN-2018	BY: CEB / RAP	FIGURE NO. 2
	PROJECT NO. 110207	REVISED BY: PPW	



CMS Area

Interim Action Plan
K-C Worldwide Site Upland Area
Everett, Washington

Aspect CONSULTING

JUN-2018	BY: CEB / RAP	FIGURE NO.
PROJECT NO. 110207	REVISED BY: PPW	3

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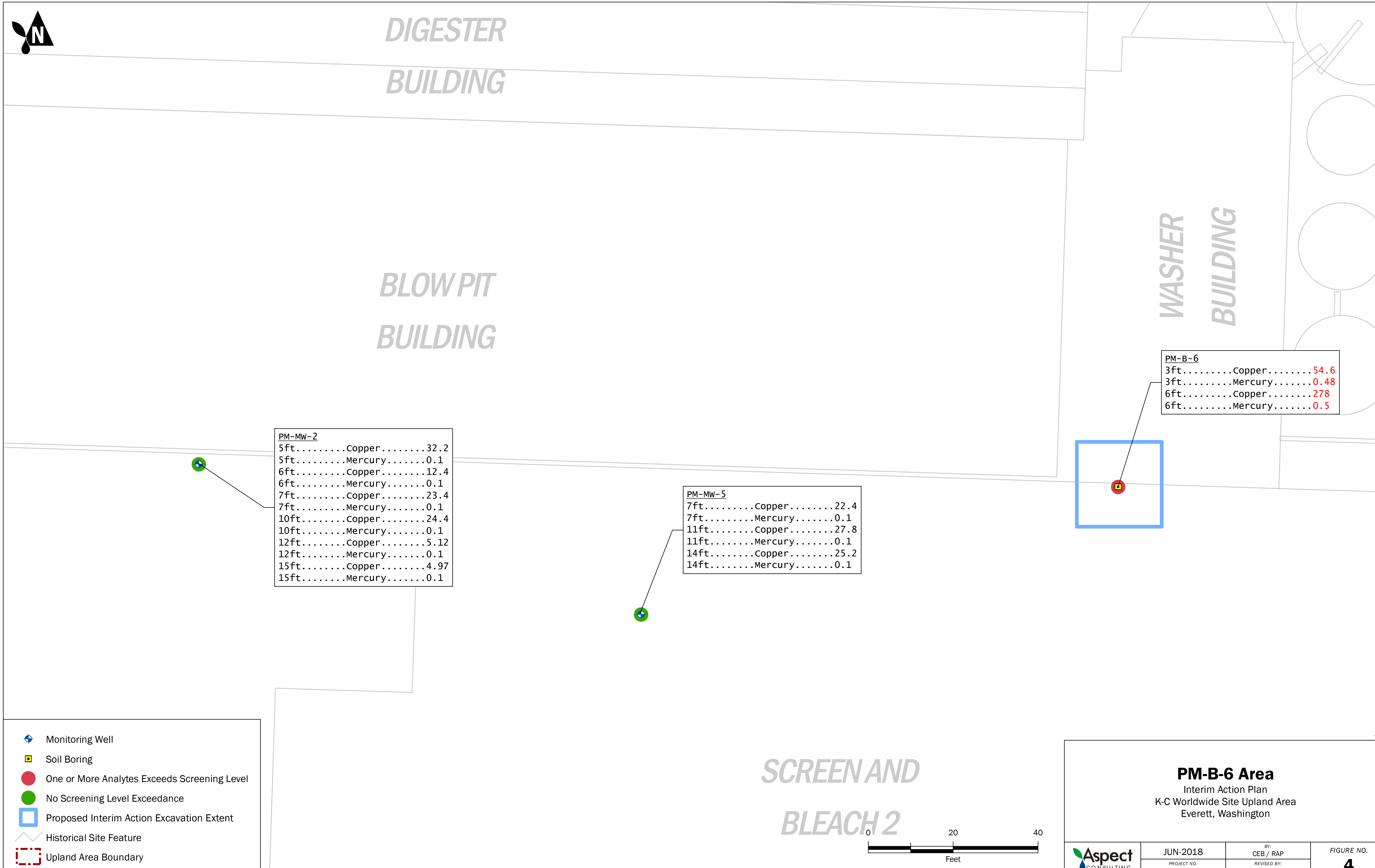


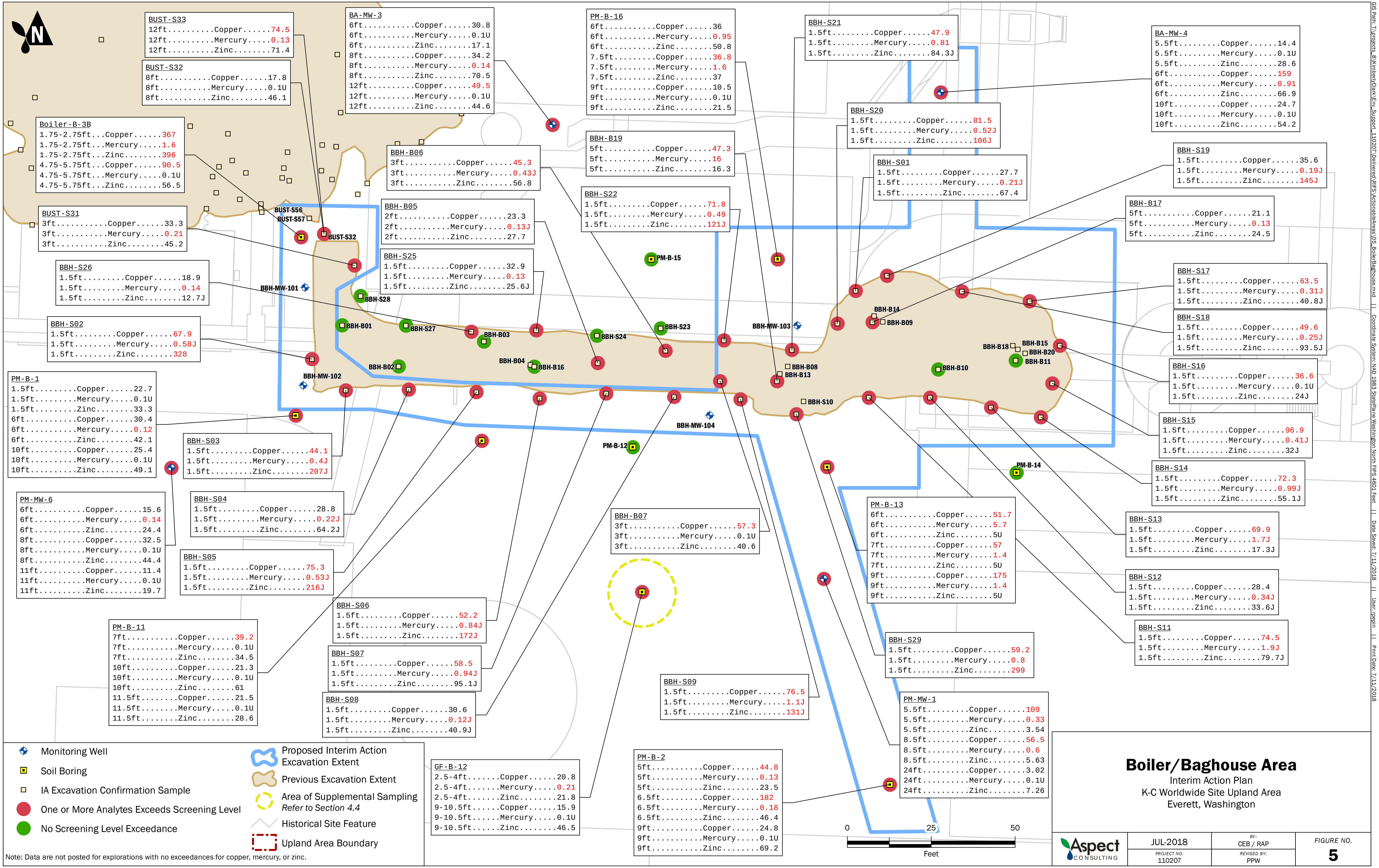
PM-B-6 Area

Interim Action Plan
K-C Worldwide Site Upland Area
Everett, Washington

Aspect CONSULTING

JUN-2018	BY: CEB / RAP	FIGURE NO. 4
PROJECT NO. 110207	REVISED BY: PPW	

GIS Path: T:\projects_8\KimberlyClark\Env_Support_110207\Delivered\RIFS\ActionableAreas\04_PM-B-6.mxd || Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet || Date Saved: 6/22/2018 || User: rpepin || Print Date: 6/29/2018


BUST-S33
12ft..........Copper......74.5
12ft..........Mercury.....0.13
12ft..........Zinc........71.4
BUST-S32
8ft...........Copper......17.8
8ft...........Mercury.....0.1U
8ft...........Zinc........46.1
Boiler-B-3B
1.75-2.75ft...Copper......367
1.75-2.75ft...Mercury.....1.6
1.75-2.75ft...Zinc........396
4.75-5.75ft...Copper......90.5
4.75-5.75ft...Mercury.....0.1U
4.75-5.75ft...Zinc........56.5
BUST-S31
3ft..........Copper......33.3
3ft..........Mercury.....0.21
3ft..........Zinc........45.2
BBH-S26
1.5ft.........Copper......18.9
1.5ft.........Mercury.....0.14
1.5ft.........Zinc........12.7J
BBH-S02
1.5ft.........Copper......67.9
1.5ft.........Mercury.....0.58J
1.5ft.........Zinc........328
PM-B-1
1.5ft.........Copper......22.7
1.5ft.........Mercury.....0.1U
1.5ft.........Zinc........33.3
6ft...........Copper......30.4
6ft...........Mercury.....0.12
6ft...........Zinc........42.1
10ft..........Copper......25.4
10ft..........Mercury.....0.1U
10ft..........Zinc........49.1
PM-MW-6
6ft...........Copper......15.6
6ft...........Mercury.....0.14
6ft...........Zinc........24.4
8ft...........Copper......32.5
8ft...........Mercury.....0.1U
8ft...........Zinc........44.4
11ft..........Copper......11.4
11ft..........Mercury.....0.1U
11ft..........Zinc........19.7
PM-B-11
7ft...........Copper......39.2
7ft...........Mercury.....0.1U
7ft...........Zinc........34.5
10ft..........Copper......21.3
10ft..........Mercury.....0.1U
10ft..........Zinc........61
11.5ft........Copper......21.5
11.5ft........Mercury.....0.1U
11.5ft........Zinc........28.6
BA-MW-3
6ft...........Copper......30.8
6ft...........Mercury.....0.1U
6ft...........Zinc........17.1
8ft...........Copper......34.2
8ft...........Mercury.....0.14
8ft...........Zinc........70.5
12ft..........Copper......49.5
12ft..........Mercury.....0.1U
12ft..........Zinc........44.6
BBH-B06
3ft...........Copper......45.3
3ft...........Mercury.....0.43J
3ft...........Zinc........56.8
BBH-B05
2ft...........Copper......23.3
2ft...........Mercury.....0.13J
2ft...........Zinc........27.7
BBH-S25
1.5ft.........Copper......32.9
1.5ft.........Mercury.....0.13
1.5ft.........Zinc........25.6J
BBH-S03
1.5ft.........Copper......44.1
1.5ft.........Mercury.....0.4J
1.5ft.........Zinc........207J
BBH-S04
1.5ft.........Copper......28.8
1.5ft.........Mercury.....0.22J
1.5ft.........Zinc........64.2J
BBH-S05
1.5ft.........Copper......75.3
1.5ft.........Mercury.....0.53J
1.5ft.........Zinc........216J
BBH-S06
1.5ft.........Copper......52.2
1.5ft.........Mercury.....0.84J
1.5ft.........Zinc........172J
BBH-S07
1.5ft.........Copper......58.5
1.5ft.........Mercury.....0.94J
1.5ft.........Zinc........95.1J
BBH-S08
1.5ft.........Copper......30.6
1.5ft.........Mercury.....0.12J
1.5ft.........Zinc........40.9J
GF-B-12
2.5-4ft.......Copper......20.8
2.5-4ft.......Mercury.....0.21
2.5-4ft.......Zinc........21.8
9-10.5ft......Copper......15.9
9-10.5ft......Mercury.....0.1U
9-10.5ft......Zinc........46.5
PM-B-16
6ft...........Copper......36
6ft...........Mercury.....0.95
6ft...........Zinc........50.8
7.5ft.........Copper......36.8
7.5ft.........Mercury.....1.6
7.5ft.........Zinc........37
9ft...........Copper......10.5
9ft...........Mercury.....0.1U
9ft...........Zinc........21.5
BBH-B19
5ft...........Copper......47.3
5ft...........Mercury.....16
5ft...........Zinc........16.3
BBH-S22
1.5ft.........Copper......71.8
1.5ft.........Mercury.....0.49
1.5ft.........Zinc........121J
BBH-B07
3ft...........Copper......57.3
3ft...........Mercury.....0.1U
3ft...........Zinc........40.6
BBH-S09
1.5ft.........Copper......76.5
1.5ft.........Mercury.....1.1J
1.5ft.........Zinc........131J
PM-B-2
5ft...........Copper......44.8
5ft...........Mercury.....0.13
5ft...........Zinc........23.5
6.5ft.........Copper......182
6.5ft.........Mercury.....0.18
6.5ft.........Zinc........46.4
9ft...........Copper......24.8
9ft...........Mercury.....0.1U
9ft...........Zinc........69.2
BBH-S21
1.5ft.........Copper......47.9
1.5ft.........Mercury.....0.81
1.5ft.........Zinc........84.3J
BBH-S20
1.5ft.........Copper......81.5
1.5ft.........Mercury.....0.52J
1.5ft.........Zinc........106J
BBH-S01
1.5ft.........Copper......27.7
1.5ft.........Mercury.....0.21J
1.5ft.........Zinc........67.4
PM-B-13
6ft...........Copper......51.7
6ft...........Mercury.....5.7
6ft...........Zinc........5U
7ft...........Copper......57
7ft...........Mercury.....1.4
7ft...........Zinc........5U
9ft...........Copper......175
9ft...........Mercury.....1.4
9ft...........Zinc........5U
BBH-S29
1.5ft.........Copper......59.2
1.5ft.........Mercury.....0.8
1.5ft.........Zinc........299
PM-MW-1
5.5ft.........Copper......109
5.5ft.........Mercury.....0.33
5.5ft.........Zinc........3.54
8.5ft.........Copper......56.5
8.5ft.........Mercury.....0.6
8.5ft.........Zinc........5.63
24ft..........Copper......3.02
24ft..........Mercury.....0.1U
24ft..........Zinc........7.26
BA-MW-4
5.5ft.........Copper......14.4
5.5ft.........Mercury.....0.1U
5.5ft.........Zinc........28.6
6ft...........Copper......159
6ft...........Mercury.....0.91
6ft...........Zinc........66.9
10ft..........Copper......24.7
10ft..........Mercury.....0.1U
10ft..........Zinc........54.2
BBH-S19
1.5ft.........Copper......35.6
1.5ft.........Mercury.....0.19J
1.5ft.........Zinc........145J
BBH-B17
5ft...........Copper......21.1
5ft...........Mercury.....0.13
5ft...........Zinc........24.5
BBH-S17
1.5ft.........Copper......63.5
1.5ft.........Mercury.....0.31J
1.5ft.........Zinc........40.8J
BBH-S18
1.5ft.........Copper......49.6
1.5ft.........Mercury.....0.25J
1.5ft.........Zinc........93.5J
BBH-S16
1.5ft.........Copper......36.6
1.5ft.........Mercury.....0.1U
1.5ft.........Zinc........24J
BBH-S15
1.5ft.........Copper......96.9
1.5ft.........Mercury.....0.41J
1.5ft.........Zinc........32J
BBH-S14
1.5ft.........Copper......72.3
1.5ft.........Mercury.....0.99J
1.5ft.........Zinc........55.1J
BBH-S13
1.5ft.........Copper......69.9
1.5ft.........Mercury.....1.7J
1.5ft.........Zinc........17.3J
BBH-S12
1.5ft.........Copper......28.4
1.5ft.........Mercury.....0.34J
1.5ft.........Zinc........33.6J
BBH-S11
1.5ft.........Copper......74.5
1.5ft.........Mercury.....1.9J
1.5ft.........Zinc........79.7J
BUST-S56
BUST-S57
BUST-S32
BBH-MW-101
BBH-S28
BBH-B01
BBH-S27
BBH-B03
BBH-B04
BBH-B16
BBH-B02
BBH-MW-102
BBH-S24
BBH-S23
PM-B-15
BBH-MW-103
BBH-B14
BBH-B09
BBH-B18
BBH-B15
BBH-B20
BBH-B11
BBH-B08
BBH-B13
BBH-B10
BBH-S10
BBH-MW-104
PM-B-12
PM-B-14
Monitoring Well
Soil Boring
IA Excavation Confirmation Sample
One or More Analytes Exceeds Screening Level
No Screening Level Exceedance
Proposed Interim Action Excavation Extent
Previous Excavation Extent
Area of Supplemental Sampling
Refer to Section 4.4
Historical Site Feature
Upland Area Boundary
Note: Data are not posted for explorations with no exceedances for copper, mercury, or zinc.
0
25
50
Feet
Boiler/Baghouse Area
Interim Action Plan
K-C Worldwide Site Upland Area
Everett, Washington
Aspect CONSULTING
JUL-2018
PROJECT NO. 110207
BY: CEB / RAP
REVISED BY: PPW
FIGURE NO. 5
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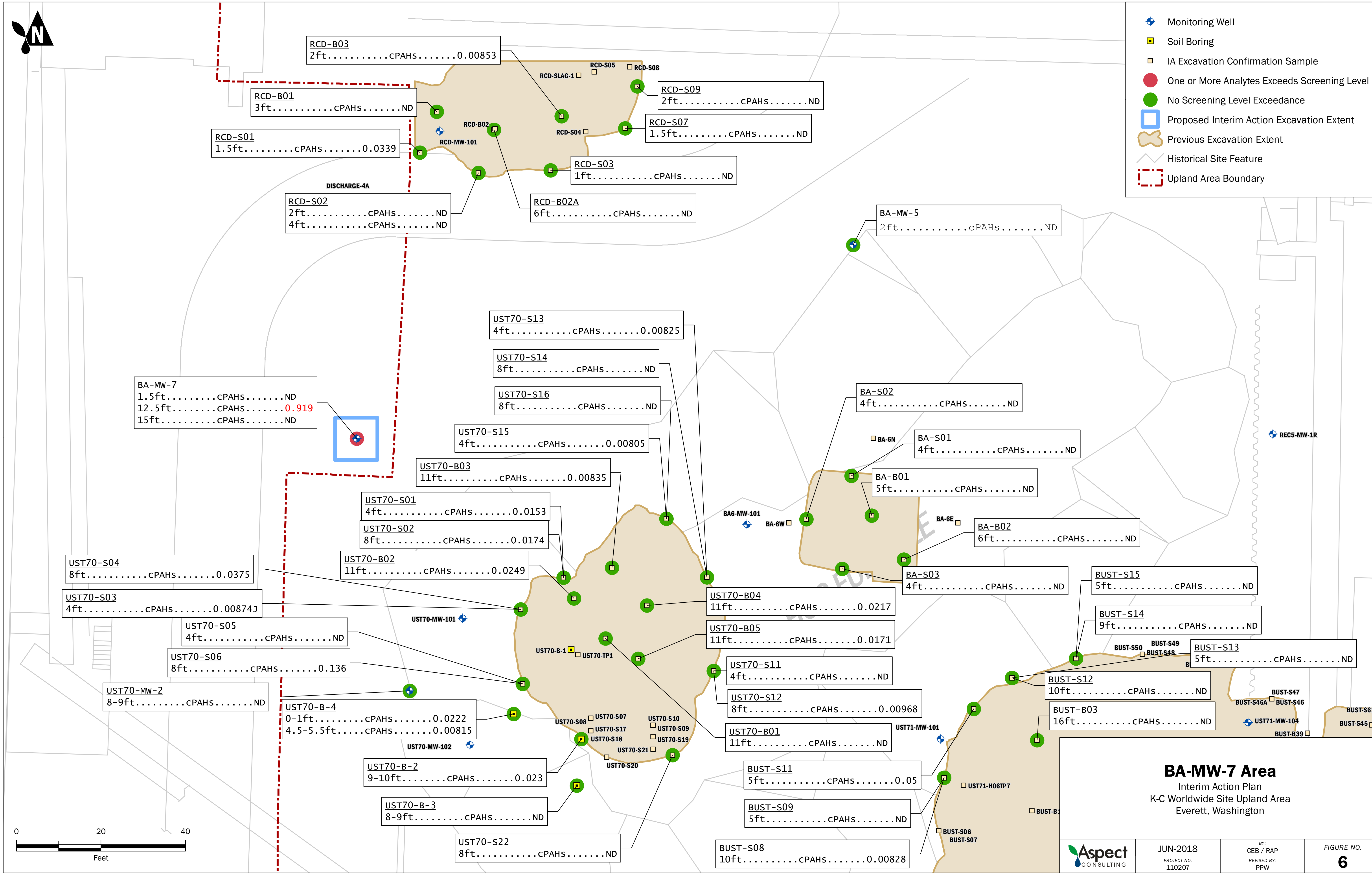
N
RCD-B03
2ft..........cPAHs.......0.00853
RCD-B01
3ft..........cPAHs.......ND
RCD-S01
1.5ft........cPAHs.......0.0339
RCD-S02
2ft..........cPAHs.......ND
4ft..........cPAHs.......ND
RCD-S09
2ft..........cPAHs.......ND
RCD-S07
1.5ft........cPAHs.......ND
RCD-S03
1ft..........cPAHs.......ND
RCD-B02A
6ft..........cPAHs.......ND
RCD-S05
RCD-S08
RCD-SLAG-1
RCD-B02
RCD-MW-101
RCD-S04
DISCHARGE-4A
BA-MW-5
2ft..........cPAHs.......ND
UST70-S13
4ft..........cPAHs.......0.00825
UST70-S14
8ft..........cPAHs.......ND
UST70-S16
8ft..........cPAHs.......ND
UST70-S15
4ft..........cPAHs.......0.00805
UST70-B03
11ft.........cPAHs.......0.00835
UST70-S01
4ft..........cPAHs.......0.0153
UST70-S02
8ft..........cPAHs.......0.0174
UST70-B02
11ft.........cPAHs.......0.0249
BA-MW-7
1.5ft........cPAHs.......ND
12.5ft.......cPAHs.......0.919
15ft.........cPAHs.......ND
UST70-S04
8ft..........cPAHs.......0.0375
UST70-S03
4ft..........cPAHs.......0.00874J
UST70-S05
4ft..........cPAHs.......ND
UST70-S06
8ft..........cPAHs.......0.136
UST70-MW-2
8-9ft........cPAHs.......ND
UST70-B-4
0-1ft........cPAHs.......0.0222
4.5-5.5ft....cPAHs.......0.00815
UST70-B-2
9-10ft.......cPAHs.......0.023
UST70-B-3
8-9ft........cPAHs.......ND
UST70-S22
8ft..........cPAHs.......ND
UST70-MW-101
UST70-MW-102
UST70-B-1
UST70-TP1
UST70-S07
UST70-S08
UST70-S17
UST70-S18
UST70-S10
UST70-S09
UST70-S19
UST70-S21
UST70-S20
BA-S02
4ft..........cPAHs.......ND
BA-S01
4ft..........cPAHs.......ND
BA-B01
5ft..........cPAHs.......ND
BA-B02
6ft..........cPAHs.......ND
BA-S03
4ft..........cPAHs.......ND
BA-6N
BA-6E
BA-6W
BA6-MW-101
REC5-MW-1R
UST70-B04
11ft.........cPAHs.......0.0217
UST70-B05
11ft.........cPAHs.......0.0171
UST70-S11
4ft..........cPAHs.......ND
UST70-S12
8ft..........cPAHs.......0.00968
UST70-B01
11ft.........cPAHs.......ND
BUST-S11
5ft..........cPAHs.......0.05
BUST-S09
5ft..........cPAHs.......ND
BUST-S08
10ft.........cPAHs.......0.00828
BUST-S15
5ft..........cPAHs.......ND
BUST-S14
9ft..........cPAHs.......ND
BUST-S13
5ft..........cPAHs.......ND
BUST-S12
10ft.........cPAHs.......ND
BUST-B03
16ft.........cPAHs.......ND
UST71-MW-101
UST71-H06TP7
BUST-S06
BUST-S07
BUST-S50
BUST-S49
BUST-S48
BUST-S47
BUST-S46A
BUST-S46
UST71-MW-104
BUST-B39
BUST-S61
BUST-S45
Monitoring Well
Soil Boring
IA Excavation Confirmation Sample
One or More Analytes Exceeds Screening Level
No Screening Level Exceedance
Proposed Interim Action Excavation Extent
Previous Excavation Extent
Historical Site Feature
Upland Area Boundary
0
20
40
Feet
BA-MW-7 Area
Interim Action Plan
K-C Worldwide Site Upland Area
Everett, Washington
Aspect CONSULTING
JUN-2018
PROJECT NO.
110207
BY:
CEB / RAP
REVISED BY:
PPW
FIGURE NO.
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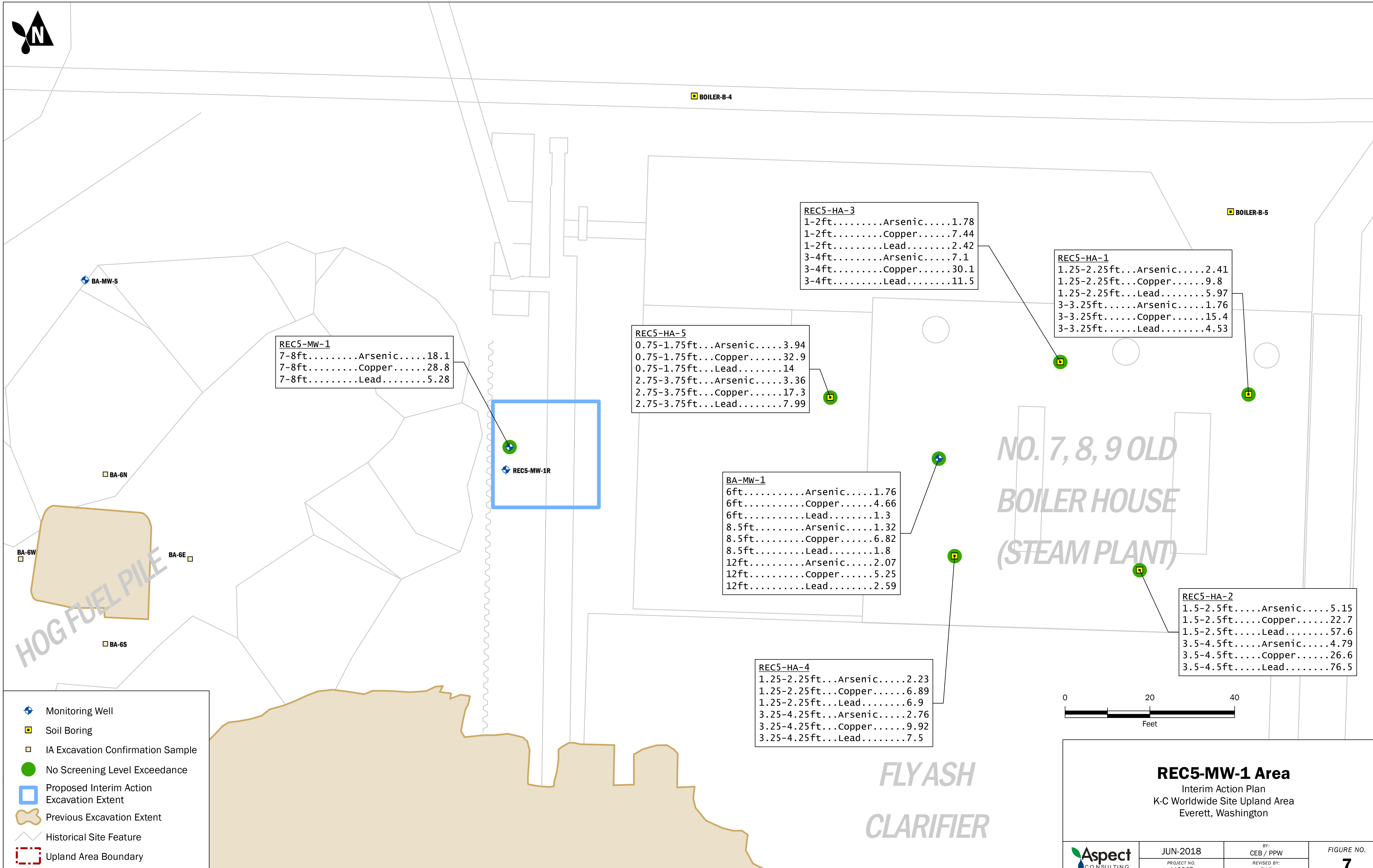

REC5-MW-1 Area

Interim Action Plan
K-C Worldwide Site Upland Area
Everett, Washington

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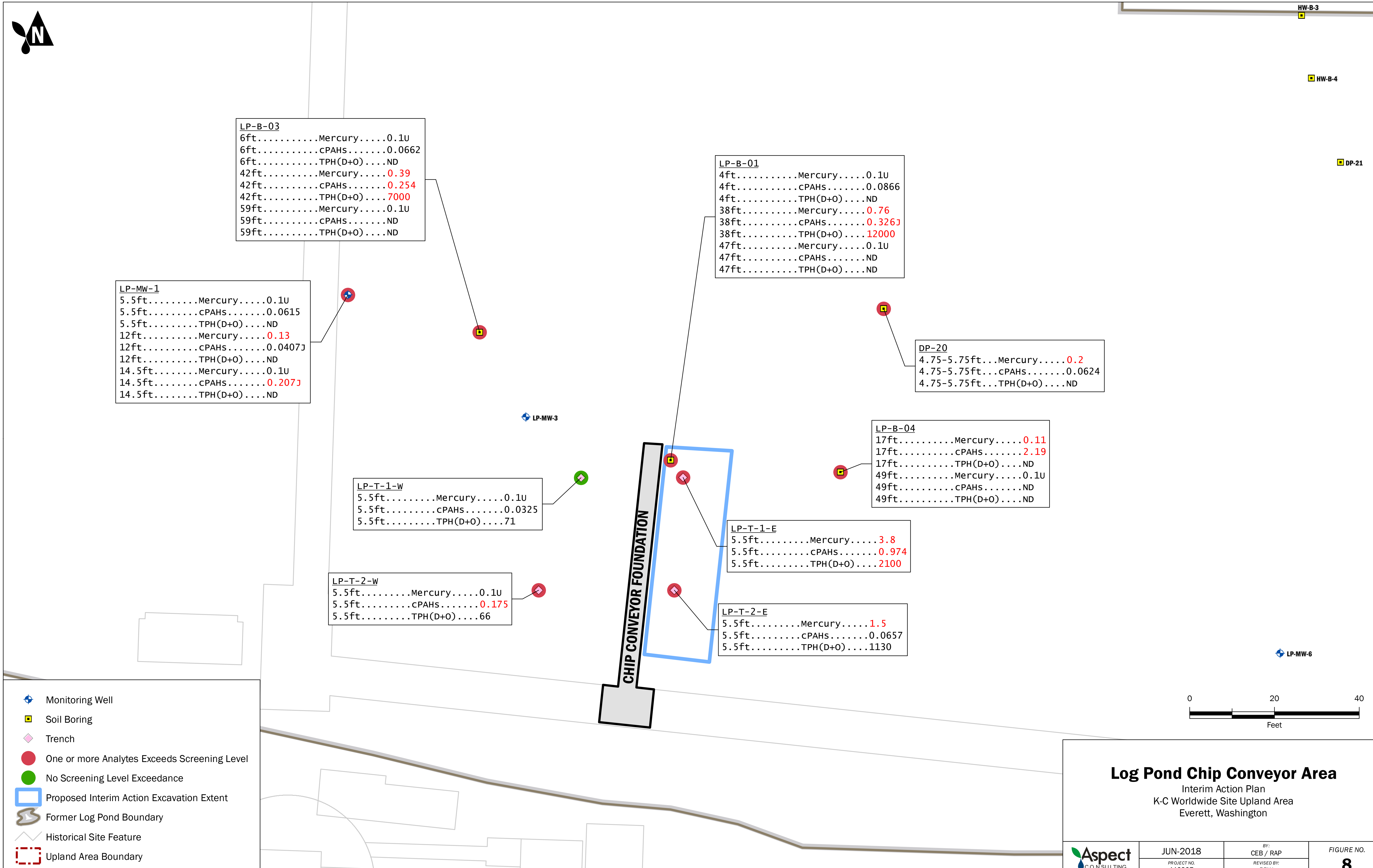
PROJECT NO. 110207 | REVISED BY: RAP



N
LP-B-03
6ft..........Mercury.....0.1U
6ft..........cPAHs.......0.0662
6ft..........TPH(D+O)....ND
42ft.........Mercury.....0.39
42ft.........cPAHs.......0.254
42ft.........TPH(D+O)....7000
59ft.........Mercury.....0.1U
59ft.........cPAHs.......ND
59ft.........TPH(D+O)....ND
LP-B-01
4ft..........Mercury.....0.1U
4ft..........cPAHs.......0.0866
4ft..........TPH(D+O)....ND
38ft.........Mercury.....0.76
38ft.........cPAHs.......0.326J
38ft.........TPH(D+O)....12000
47ft.........Mercury.....0.1U
47ft.........cPAHs.......ND
47ft.........TPH(D+O)....ND
HW-B-3
HW-B-4
DP-21
LP-MW-1
5.5ft........Mercury.....0.1U
5.5ft........cPAHs.......0.0615
5.5ft........TPH(D+O)....ND
12ft.........Mercury.....0.13
12ft.........cPAHs.......0.0407J
12ft.........TPH(D+O)....ND
14.5ft.......Mercury.....0.1U
14.5ft.......cPAHs.......0.207J
14.5ft.......TPH(D+O)....ND
DP-20
4.75-5.75ft...Mercury.....0.2
4.75-5.75ft...cPAHs.......0.0624
4.75-5.75ft...TPH(D+O)....ND
LP-MW-3
LP-B-04
17ft.........Mercury.....0.11
17ft.........cPAHs.......2.19
17ft.........TPH(D+O)....ND
49ft.........Mercury.....0.1U
49ft.........cPAHs.......ND
49ft.........TPH(D+O)....ND
LP-T-1-W
5.5ft........Mercury.....0.1U
5.5ft........cPAHs.......0.0325
5.5ft........TPH(D+O)....71
CHIP CONVEYOR FOUNDATION
LP-T-1-E
5.5ft........Mercury.....3.8
5.5ft........cPAHs.......0.974
5.5ft........TPH(D+O)....2100
LP-T-2-W
5.5ft........Mercury.....0.1U
5.5ft........cPAHs.......0.175
5.5ft........TPH(D+O)....66
LP-T-2-E
5.5ft........Mercury.....1.5
5.5ft........cPAHs.......0.0657
5.5ft........TPH(D+O)....1130
LP-MW-6
Monitoring Well
Soil Boring
Trench
One or more Analytes Exceeds Screening Level
No Screening Level Exceedance
Proposed Interim Action Excavation Extent
Former Log Pond Boundary
Historical Site Feature
Upland Area Boundary
0
20
40
Feet
Log Pond Chip Conveyor Area
Interim Action Plan
K-C Worldwide Site Upland Area
Everett, Washington
Aspect CONSULTING
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110207
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PPW
FIGURE NO.
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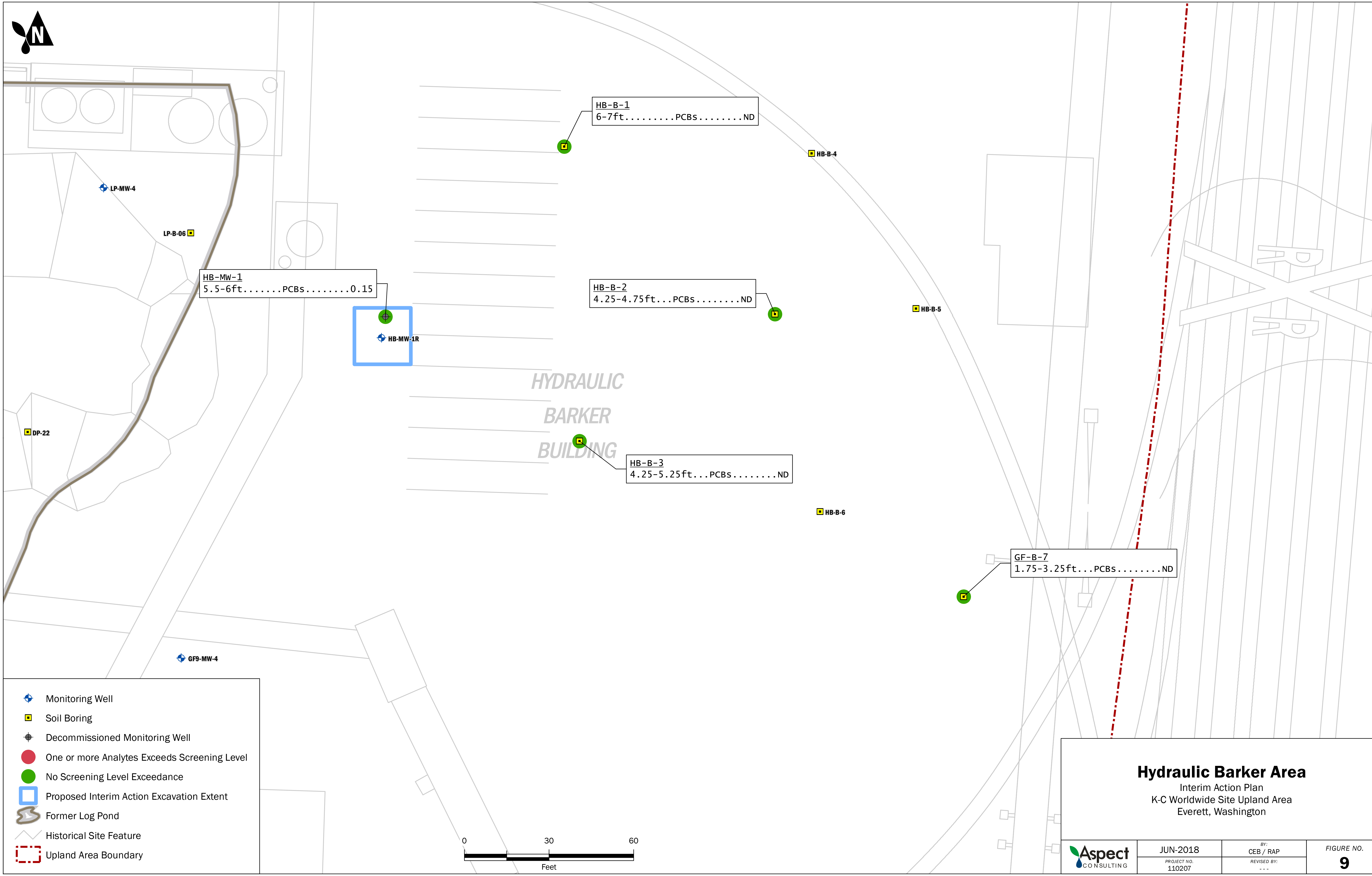

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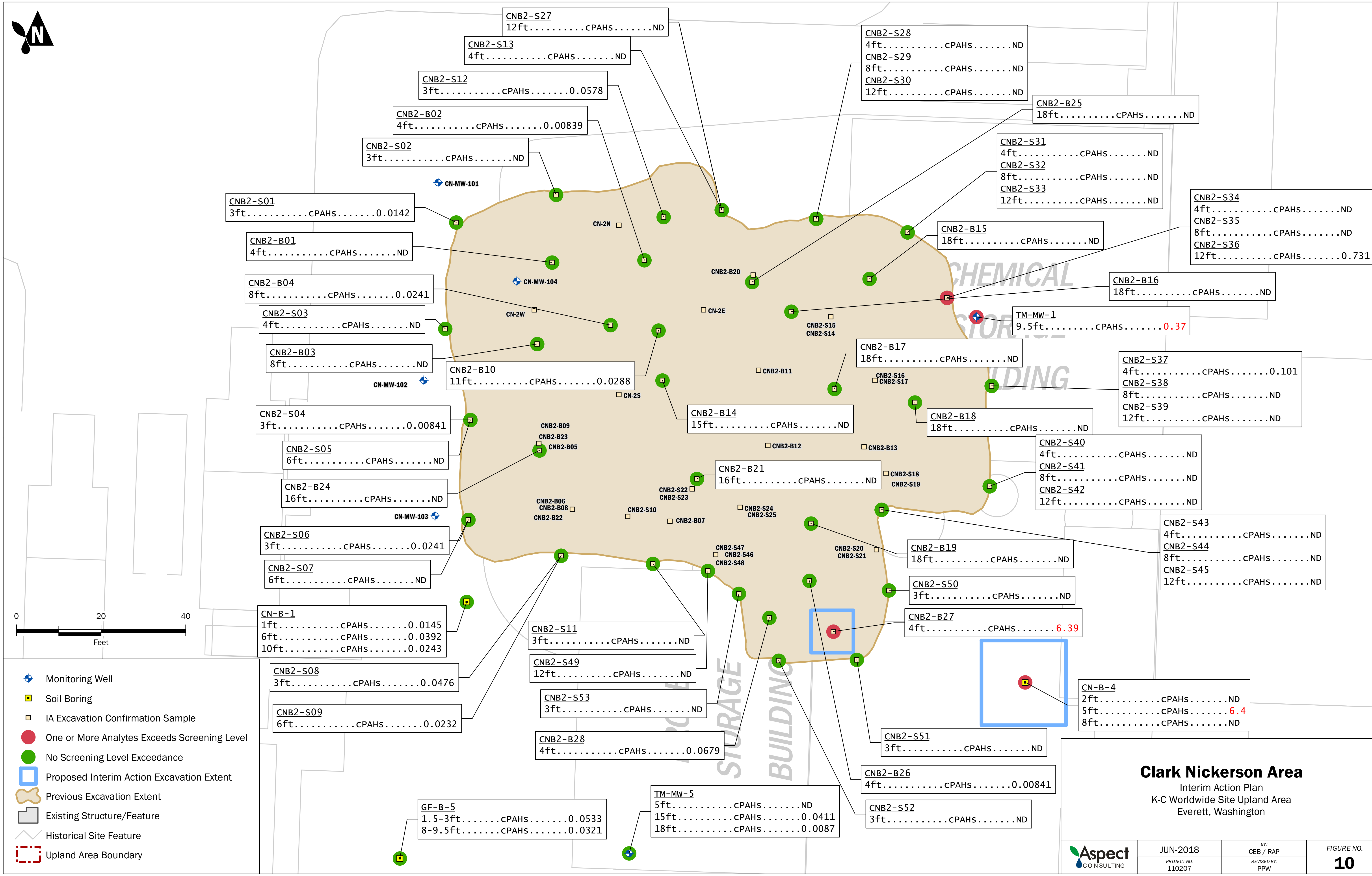

CNB2-S27
12ft..........CPAHS.......ND
CNB2-S13
4ft...........CPAHS.......ND
CNB2-S12
3ft...........CPAHS.......0.0578
CNB2-B02
4ft...........CPAHS.......0.00839
CNB2-S02
3ft...........CPAHS.......ND
CNB2-S01
3ft...........CPAHS.......0.0142
CNB2-B01
4ft...........CPAHS.......ND
CNB2-B04
8ft...........CPAHS.......0.0241
CNB2-S03
4ft...........CPAHS.......ND
CNB2-B03
8ft...........CPAHS.......ND
CNB2-B10
11ft..........CPAHS.......0.0288
CNB2-S04
3ft...........CPAHS.......0.00841
CNB2-S05
6ft...........CPAHS.......ND
CNB2-B24
16ft..........CPAHS.......ND
CNB2-S06
3ft...........CPAHS.......0.0241
CNB2-S07
6ft...........CPAHS.......ND
CN-B-1
1ft...........CPAHS.......0.0145
6ft...........CPAHS.......0.0392
10ft..........CPAHS.......0.0243
CNB2-S08
3ft...........CPAHS.......0.0476
CNB2-S09
6ft...........CPAHS.......0.0232
CNB2-S11
3ft...........CPAHS.......ND
CNB2-S49
12ft..........CPAHS.......ND
CNB2-S53
3ft...........CPAHS.......ND
CNB2-B28
4ft...........CPAHS.......0.0679
GF-B-5
1.5-3ft.......CPAHS.......0.0533
8-9.5ft.......CPAHS.......0.0321
TM-MW-5
5ft...........CPAHS.......ND
15ft..........CPAHS.......0.0411
18ft..........CPAHS.......0.0087
CNB2-S28
4ft...........CPAHS.......ND
CNB2-S29
8ft...........CPAHS.......ND
CNB2-S30
12ft..........CPAHS.......ND
CNB2-B25
18ft..........CPAHS.......ND
CNB2-S31
4ft...........CPAHS.......ND
CNB2-S32
8ft...........CPAHS.......ND
CNB2-S33
12ft..........CPAHS.......ND
CNB2-S34
4ft...........CPAHS.......ND
CNB2-S35
8ft...........CPAHS.......ND
CNB2-S36
12ft..........CPAHS.......0.731
CNB2-B15
18ft..........CPAHS.......ND
CNB2-B16
18ft..........CPAHS.......ND
TM-MW-1
9.5ft.........CPAHS.......0.37
CNB2-B17
18ft..........CPAHS.......ND
CNB2-S37
4ft...........CPAHS.......0.101
CNB2-S38
8ft...........CPAHS.......ND
CNB2-S39
12ft..........CPAHS.......ND
CNB2-B14
15ft..........CPAHS.......ND
CNB2-B18
18ft..........CPAHS.......ND
CNB2-S40
4ft...........CPAHS.......ND
CNB2-S41
8ft...........CPAHS.......ND
CNB2-S42
12ft..........CPAHS.......ND
CNB2-B21
16ft..........CPAHS.......ND
CNB2-S43
4ft...........CPAHS.......ND
CNB2-S44
8ft...........CPAHS.......ND
CNB2-S45
12ft..........CPAHS.......ND
CNB2-B19
18ft..........CPAHS.......ND
CNB2-S50
3ft...........CPAHS.......ND
CNB2-B27
4ft...........CPAHS.......6.39
CN-B-4
2ft...........CPAHS.......ND
5ft...........CPAHS.......6.4
8ft...........CPAHS.......ND
CNB2-S51
3ft...........CPAHS.......ND
CNB2-B26
4ft...........CPAHS.......0.00841
CNB2-S52
3ft...........CPAHS.......ND
CN-MW-101
CN-MW-104
CN-MW-102
CN-MW-103
CN-2N
CN-2W
CN-2E
CN-2S
CNB2-B20
CNB2-S15
CNB2-S14
CNB2-B11
CNB2-S16
CNB2-S17
CNB2-B09
CNB2-B23
CNB2-B05
CNB2-B12
CNB2-B13
CNB2-S18
CNB2-S19
CNB2-S22
CNB2-S23
CNB2-B06
CNB2-B08
CNB2-B22
CNB2-S10
CNB2-B07
CNB2-S24
CNB2-S25
CNB2-S47
CNB2-S46
CNB2-S48
CNB2-S20
CNB2-S21
CHEMICAL
STORAGE
BUILDING
STORAGE
BUILDING
0
20
40
Feet
Monitoring Well
Soil Boring
IA Excavation Confirmation Sample
One or More Analytes Exceeds Screening Level
No Screening Level Exceedance
Proposed Interim Action Excavation Extent
Previous Excavation Extent
Existing Structure/Feature
Historical Site Feature
Upland Area Boundary
Clark Nickerson Area
Interim Action Plan
K-C Worldwide Site Upland Area
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FIGURE NO.
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APPENDIX A

Field Sampling Plan

Contents – Appendix A

A.1. Introduction

This Field Sampling Plan (FSP) describes field sampling and quality control (QC) procedures to be followed during the second interim action cleanup conducted in the Upland Area of the Kimberly-Clark Worldwide Site located at 2600 Federal Avenue in Everett, Washington (herein referred to as the Upland Area). Additional information on laboratory analytical methods and QC are provided in the Quality Assurance Project Plan (QAPP), included as Appendix B of the Interim Action Plan.

A.1.1. Purpose of FSP

The purpose of this FSP is to ensure that field sample collection, handling, and analysis conducted during the interim action will generate data to meet project-specific data quality objectives (DQOs) in accordance with Model Toxics Control Act (MTCA) requirements (Washington Administrative Code [WAC] 173-340-350). The FSP includes requirements for sampling activities, such as sampling frequency and location, analytical testing, documentation, and quality assurance/quality control (QA/QC) for performance monitoring and waste characterization

A.2. Excavation Verification Soil Sampling Procedures

Soil sampling will be collected from the bottoms and sidewalls of the interim cleanup excavations to determine if interim action cleanup levels are achieved, as described in Section 4.1 of the Interim Action Plan. The Engineer will collect the verification soil samples when field screening indicates that soils within a segment of the excavation may be clean (i.e., below interim action cleanup levels). The Engineer's field screening will include visual and olfactory observations of the soil, and using a photionization detector (PID) to monitor for the presence of volatile organic compounds (VOCs). In addition, when excavating within the Central Maintenance Shop (CMS) polychlorinated biphenyl (PCB) area, where the volatile organic compound (VOC) naphthalene is a constituent of concern targeted for removal, field screening will also include use of a photoionization detector (PID) to monitor for the presence of VOCs. When using the PID, an aliquot of soil will be placed in a sealable plastic bag, sealed, briefly shaken, and then allowed to equilibrate to allow vaporous head accumulations to become representative. Field personnel will then measure the potential presence of VOCs in the head space air in a manner that minimizes escape of VOCs from the bag. In areas of known or suspected petroleum contamination, soil samples will also be field screened for the presence of petroleum using a sheen test: placing a small aliquot of soil into a plastic cup containing water, gently shaking, and watching for presence of petroleum sheen. Care will be taken to differentiate sheen created by petroleum (iridescent swirl of colors, does coalesce after being disturbed) versus other organic matter (angular "waxy sheets," do not coalesce after being disturbed), and recording the information appropriately.

The excavation verification soil samples will be collected using the excavator bucket, unless an excavation is shallow enough (less than 4 feet) and/or appropriately sloped/shored to allow safe entry and egress of the Engineer. Soil samples will be obtained directly from the center of excavator bucket, avoiding contact with the bucket itself.

All soil samples to be submitted for VOC analyses will be collected in accordance with Environmental Protection Agency (EPA) Method 5035A. The soil aliquot for VOC analysis will be collected from the undisturbed soil sample core using a laboratory-supplied modified disposable plastic syringe as required by the 5035A method, and placed in pre-weighed laboratory-supplied vials.

For all other analyses, the soil samples will be collected using a stainless-steel spoon and placed in a stainless-steel bowl for homogenization with the stainless-steel spoon. Gravel-sized material greater than approximately 0.5 inches will be removed from the sample during mixing. A representative aliquot of the homogenized soil will be placed into certified-clean jars supplied by the analytical laboratory.

QC soil samples (blind field duplicates) will be collected at the respective frequencies prescribed in Section B5 of the QAPP (Appendix B).

Each excavation verification soil sample collected for chemical analysis will be assigned a unique sample identification number including a prefix designating the interim action cleanup area, a designation for bottom sample (B) or sidewall sample (S) with sequential numbers for each, and the sample depth below surrounding grade, and the date the sample was collected. Recording sample date helps track progress of the excavation, particularly when sample locations need to be subsequently overexcavated to meet cleanup levels

A.3. Stockpile Sampling and Analysis Procedures

In areas where an excavation is advanced through import backfill material placed during the prior (2013–2014) interim action, the backfill material (termed overburden) will be excavated, stockpiled, and sampled to confirm compliance with cleanup levels prior to reusing it as backfill in the new excavation. Care will be taken to not include underlying fill soil as part of the overburden; therefore, it is expected that some overburden will be removed as contaminated soil to be disposed of.

The Engineer will conduct sampling and analysis of each stockpile of overburden soil (i.e., previously backfilled material) to characterize it for compliance with cleanup levels and, thus, reuse as backfill or off-site disposition. For each soil stockpile (100 cubic yards or less in size), three (3) representative grab samples of soil will be collected, in accordance with stockpile sampling requirements provided in Washington State Department of Ecology’s (Ecology) (2011). Each soil sample will be collected from a minimum of 6 inches below the exposed surface of the stockpile, with decontamination of sampling utensils, or replacement of disposal utensils, between each sample location. The location of each of the grab samples will be where field-instrument readings indicate contamination is most likely to be present. If field instruments do not indicate contamination, the pile will be divided into sections and each section sampled.

The soil samples will be submitted under chain of custody to an analytical laboratory, accredited by Ecology, for the following chemical analyses:

- Metals (arsenic, copper, lead, mercury, nickel, and zinc; EPA Methods 6010/mercury by 7471)
- Polycyclic aromatic hydrocarbons (PAHs; EPA Method 8270 with selective ion monitoring [SIM])
- PCBs (EPA Method 8082)

The Engineer may add analytes (e.g., VOC and petroleum) to this list based on field-screening information (e.g., PID or sheen test results) and/or analytical-data requirements of an intended disposal facility.

A.4. Monitoring Well Decommissioning

Any groundwater monitoring wells located within the footprints of the interim cleanup action excavations will be properly decommissioned in accordance with the requirements of Chapter 173-160 WAC. The need for replacement of monitoring wells will be determined in consultation with Ecology during preparation of the Compliance Monitoring Plan for the Upland Area final cleanup action.

A.5. Sample Custody and Field Documentation

A.5.1. Sample Custody

Upon collection, samples will be placed upright in a cooler. Ice or blue ice will be placed in each cooler to meet sample preservation requirements. Inert cushioning material will be placed in the remaining space of the cooler, as needed, to limit movement of the sample containers. If the sample coolers are being shipped, not hand carried, to the laboratory, the chain-of-custody (COC) form will be placed in waterproof bag taped to the inside lid of the cooler for shipment.

After collection, samples will be maintained in Aspect's custody until formally transferred to the analytical laboratory. For purposes of this work, custody of the samples will be defined as follows.

- In plain view of field representatives;
- Inside a cooler that is in plain view of the field representative; or
- Inside any locked space, such as a cooler, locker, car, or truck to which the field representative has the only immediately available key(s).

A COC record provided by the laboratory will be initiated at the time of sampling for all samples collected. The record will be signed by the field representative and others who subsequently take custody of the sample. Couriers or other professional shipping representatives are not required to sign the COC form; however, shipping receipts will becollected and maintained as a part of custody documentation in project files. A copy of the COC form with appropriate signatures will be kept by Aspect's project manager.

Upon sample receipt, the laboratory will fill out a cooler receipt form to document sample delivery conditions. A designated sample custodian will accept custody of the shipped samples and will verify that the COC form matches the samples received. The laboratory will notify the Aspect project manager as soon as possible of any issues noted with the sample shipment or custody

A.5.2. Field Documentation

Throughout the interim action field work, Aspect's field representative will document pertinent observations and events in a field notebook, and provide photographic documentation of specific excavation efforts. Field notes will include a description of the field activity, sample descriptions, and associated details, such as the date, time, and field conditions.

A.6. Documenting Excavation and Sample Locations

The final as-built perimeter of each interim action excavation will be recorded using a hand-held global position system (GPS) with real-time differential correction. The location of each excavation verification soil sample will be recorded at the time of sample collection using GPS or other measurement techniques (tape measure) based on its accessibility.

A.7. Decontamination and Investigative-Derived Waste Management

All nondisposable sampling equipment (stainless-steel spoons and bowls) will be decontaminated before collection of each sample. The decontamination sequence consists of a scrub with a non-phosphate (Alconox) solution, followed by tap water (potable) rinse, and finished with thorough spraying with deionized or distilled water. Investigation- derived waste (IDW) water generated during equipment decontamination will be conveyed to the dewatering pretreatment system for pretreatment and discharge to City of Everett sanitary sewer under the Discharge Authorization (DA), as described in Section 4.4 of the Interim Action Plan. If the treatment plant is not operating, and/or the water cannot be conveyed to City sewer under DA, the IDW water may be placed in labeled Washington Department of Transportation-approved drums and disposed of appropriately at a permitted off-Site disposal facility.

Soil cuttings from test pits will be stockpiled pending receipt of analytical results to determine appropriate disposition. Disposable personal protective equipment (PPE) will be placed in labeled DOT-approved drums pending the analytical results to determine appropriate disposal. The drums will be temporarily consolidated on-Site, profiled based on available analytical data, and disposed of appropriately at a permitted off-Site disposal facility

APPENDIX B

Quality Assurance Project Plan

Contents – Appendix B

List of Tables

B.1. Introduction

This Quality Assurance Project Plan (QAPP) identifies quality control (QC) procedures and criteria required to ensure that data collected during the opportunistic interim actions are of known quality and acceptable to achieve project objectives. Specific protocols and criteria are also set forth in this QAPP for data quality evaluation, upon the completion of data collection, to determine the level of completeness and usability of the data.

B.1.1. Purpose of the QAPP

As stated in Washington State Department of Ecology's (Ecology) *Guidelines for Preparation of Quality Assurance Project Plans for Environmental Studies* (Ecology Publication No. 04-03-030, July 2004), specific goals of this QAPP are to:

- Focus project manager and project team to factors affecting data quality during the planning stage of the project.
- Facilitate communication among field, laboratory, and management staff as the project progresses.
- Document the planning, implementation, and assessment procedures for QA/QC activities for the investigation.
- Ensure that the data quality objectives (DQOs) are achieved.
- Provide a record of the project to facilitate final report preparation.

DQOs dictate sampling and analysis designs and sample collection procedures are presented in the Interim Action Plan and Field Sampling Plan (FSP). The DQOs for the project include both qualitative and quantitative objectives, which define the appropriate type of data, and specify the tolerable levels of potential decision errors that will be used as a basis for establishing the quality and quantity of data needed to support the environmental assessment. To ensure that the DQOs are achieved, this QAPP details aspects of data collection, including analytical methods, QA/QC procedures, and data quality reviews. This QAPP describes both quantitative and qualitative measures of data to ensure that the DQOs are achieved. DQOs dictate data collection rationale, sampling and analysis designs that are presented in the Interim Action Plan, and sample collection procedures that are presented in the FSP (Appendix A).

B.2. Project Organization and Responsibilities

The project consultant team involved with data generation includes representatives from Aspect Consulting, LLC (Aspect) and Friedman and Bruya Inc. (FBI), an Ecology-accredited laboratory. Key individuals and their roles on this project are as follows:

Aspect Project Manager – Steve Germiat, Aspect. The project manager is responsible for the successful completion of all aspects of this project, including day-to-day management, production of reports, liaison with Kimberly-Clark (K-C) and regulatory agencies, and coordination with the project team members. The Aspect project manager is also responsible for resolution of nonconformance issues, is the lead author on project plans and reports, and will provide regular, up-to-date progress reports and other requested project information to K-C and Ecology.

Field **Manager – Carla Brock or Bob Hanford, Aspect.** The Field Manager is responsible for overseeing the sampling and analysis program outlined in the FSP and QAPP, including collecting representative samples and ensuring that they are handled properly prior to transfer of custody to the project laboratory. The field manager will manage procurement of necessary field supplies, assure that field equipment is operational and calibrated in accordance with the specifications provided herein, and act as the Site Health and Safety Officer.

Data Quality **Manager – Lea Beard, Aspect.** The Data Quality Manager is responsible for coordinating with the analytical laboratory, overseeing laboratory performance, and approving quality assurance/quality control (QA/QC) procedures. The data quality manager is also responsible for conducting independent QA validation of the analytical data reports received from the project laboratory.

Laboratory Project Manager – Mike Erdahl, FBI. The laboratory project manager is responsible for ensuring that all laboratory analytical work complies with project requirements, and acting as a liaison with the project manager, field manager, and data quality manager to fulfill project needs on the analytical laboratory work. This responsibility applies to work the laboratory project manager subcontracts to another laboratory

B.3. Analytical Methods and Reporting Limits

Analytical methodologies applied to the analyses of samples collected during the opportunistic interim action are in accordance with the following documents:

- U.S. Environmental Protection Agency (EPA) SW Methods –EPA Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, Third Edition, December 1996.
- EPA Method 1631, Revision E: Mercury in Water by Oxidation, Purge and Trap, and Cold Vapor Atomic Fluorescence Spectrometry, Office of Water, U.S. Environmental Protection Agency, August 2002, EPA-821-R-02-019.
- Ecology (Washington State Department of), 1997, Analytical Methods for Petroleum Hydrocarbons, Publication No. ECY 97-602, June 1997.

Table B-1 lists the laboratory analytical methods for chemical analyses to be performed during the interim action, along with samples containers, preservation, and analytical holding times for each analysis.

The analytical method detection limit (MDL) is the minimum concentration of a compound that can be measured and reported with a 99 percent confidence that the analyte concentration is greater than zero; MDLs are established by the laboratory using prepared samples, not samples of environmental media. The analytical reporting limit (RL) is defined as the lowest concentration at which a chemical can be accurately and reproducibly quantified, within specified limits of precision and accuracy, for a given environmental sample. The RL can vary from sample to sample, depending on sample size, sample dilution, matrix interferences, moisture content, and other sample-specific conditions. Operationally, it is equivalent to the concentration of the lowest calibration standard (at a minimum) in the initial calibration curve. In accordance with MTCA, the RL is equivalent to a practical quantitation limit (PQL) which cannot be greater than 10 times the MDL.

B.4. Data Quality Objectives

DQOs, including indicators for precision, accuracy, representativeness, comparability, and completeness (PARCC parameters), and data RLs are dictated by the data quality objectives, project requirements, and intended uses of the data. For this project, the analytical data must be of sufficient technical quality to determine whether contaminants are present and, if present, whether their concentrations are above or below applicable cleanup levels for the interim action.

An assessment of data quality is based upon quantitative (precision, accuracy, and completeness) and qualitative (representativeness and comparability) data quality indicators. Definitions of these parameters and the applicable QC procedures are presented below.

B.4.1. Precision

Precision measures the reproducibility of measurements under a given set of conditions. Specifically, it is a quantitative measure of the variability of a group of measurements compared with their average values. Analytical precision is measured through matrix spike/matrix spike duplicate (MS/MSD) samples and laboratory control samples/laboratory control sample duplicate (LCS/LCSD) for organic analysis and through laboratory duplicate samples for inorganic analyses.

Analytical precision is quantitatively expressed as the relative percent difference (RPD) between the LCS/LCSD, MS/MSD, or lab duplicate pairs and is calculated with the following formula:

$$RPD\ (\%) = 100 \times \frac{|S - D|}{(S + D)/2}$$

Where:

S = analyte concentration in sample
D = analyte concentration in duplicate sample

Analytical precision measurements will be carried out at a minimum frequency of 1 per 20 samples for each matrix sampled, or 1 per laboratory analysis group. Laboratory precision will be evaluated against laboratory quantitative RPD performance criteria provided with the lab’s analytical data report. If the control criteria are not met, the laboratory will supply a justification of why the limits were exceeded and implement the appropriate corrective actions. The RPD will be evaluated during data quality validation. The data validator will note deviations from the specified limits and will comment on the effect of the deviations on reported data.

B.4.2. Accuracy

Accuracy measures the closeness of the measured value to the true value. The accuracy of chemical test results is assessed by “spiking” samples with known standards (surrogates, blank spikes, or matrix spikes) and establishing the average recovery. Accuracy is quantified as the percent recovery (%R). The closer the %R is to 100%, the more accurate the data.

Surrogate recovery will be calculated as follows:

$$\text{Recovery (\%)} = \frac{MC}{SC} \times 100$$

Where:

SC = spiked concentration
MC = measured concentration

MS percent recovery will be calculated as follows:

$$\text{Recovery (\%)} = \frac{MC - USC}{SC} \times 100$$

Where:

SC = spiked concentration
MC = measured concentration
USC = unspiked sample concentration

Accuracy measurements on MS samples will be carried out at a minimum frequency of one in 20 samples per matrix analyzed. Blank spikes will also be analyzed at a minimum frequency of one in 20 samples per matrix analyzed. Surrogate recoveries for organic compounds will be determined for each sample analyzed for respective compounds. Laboratory accuracy will be evaluated against the lab’s quantitative matrix spike and surrogate spike recovery performance criteria as provided with the lab’s analytical data report. If the control criteria are not met, the laboratory will supply a justification of why the limits were exceeded and implement the appropriate corrective actions. Percent recoveries will be evaluated during data review and validation, and the data reviewer will comment on the effect of the deviations on the reported data

B.4.3. Representativeness

Representativeness measures how closely the measured results reflect the actual concentration or distribution of the chemical compounds in the matrix sampled. The Interim Action Plan sampling plan design, sampling techniques, and sample handling protocols (e.g., homogenizing, storage, preservation, and use of duplicates) have been developed to ensure representative samples. Sampling locations for interim action activities are described in the main body of the Interim Action Plan. The field sampling procedures are described in the FSP (Appendix A).

B.4.4. Comparability

Comparability is a qualitative parameter expressing the confidence with which one data set can be compared with another. This goal will be achieved through the use of standard techniques to collect samples, EPA-approved standard methods to analyze samples, and consistent units to report analytical results. Data comparability also depends on data quality. Data of unknown quality cannot be compared.

B.4.5. Completeness

Completeness is defined as the percentage of measurements made that are judged to be valid. Results will be considered valid if the precision, accuracy, and representativeness objectives are met and if RLs are sufficient for the intended uses of the data. Completeness is calculated as follows

$$\textit{Completeness}\ (\%) = \frac{V}{P} \times 100$$

Where:

V = number of valid measurements
P = number of measurements taken

Valid and invalid data (i.e., data qualified with the R flag [rejected]) will be identified during data validation. The target completeness goal for this project is 95 percent.

B.5. Quality Control Procedures

Field and laboratory QC procedures are outlined below.

B.5.1. Field Quality Control

Beyond use of standard sampling protocols defined in the FSP, field QC procedures include maintaining the field instrumentation used. Field instruments (e.g., PID for evaluating presence of VOCs in soil samples) are maintained and calibrated regularly in accordance with manufacturer recommendations prior to use. In addition, field QC is accomplished through the analysis of controlled samples that are introduced to the laboratory from the field. Field duplicates will be collected and submitted for analysis as described below.

Blind field duplicate samples are used to check for sampling and analysis reproducibility; however, the field duplicate sample results included variability introduced during both field sampling and laboratory preparation and analysis, and EPA data validation guidance provides no RPD control limits for field duplicate samples. Duplicates for all media will be submitted “blind” to the laboratory as discrete samples (i.e., given unique sample identifiers to keep the duplicate identity unknown to the laboratory), but will be clearly identified in the field log. **Blind field duplicate samples will be collected at a frequency of 5 percent (1 per 20 samples) of the field samples for each analytical method during the interim action.**

B.5.2. Laboratory Quality Control

The laboratories’ analytical procedures must meet requirements specified in the respective analytical methods or approved laboratory standard operating procedures (SOPs), e.g., instrument performance check, initial calibration, calibration check, blanks, surrogate spikes, internal standards, and/or labeled compound spikes. The laboratory QC procedures used for this project will consist of the following at a minimum:

- Instrument calibration and standards as defined in the laboratory standard operating procedures (SOPs).
- Laboratory method blank measurements at a minimum frequency of 5 percent or 1 per 20 samples.
- Accuracy and precision measurements as defined above, at a minimum frequency of 5 percent or 1 per 20 samples per matrix.

The laboratory’s QA officers are responsible for ensuring that the laboratory implements the internal QC and QA procedures detailed in FBI’s SOPs.

B.6. Corrective Actions

If routine QC audits by the laboratory result in detection of unacceptable conditions or data, actions specified in the laboratory SOPs will be taken. Specific corrective actions are outlined in each SOP used and can include the following:

- Identifying the source of the violation
- Reanalyzing samples if holding time criteria permit
- Resampling and analyzing
- Evaluating and amending sampling and analytical procedures
- Accepting but qualifying data to indicate the level of uncertainty

If unacceptable conditions occur, the laboratory will contact Aspect’s project manager to discuss the issues and determine the appropriate corrective action. Corrective actions taken by the laboratory during analysis of samples for this project will be documented by the laboratory in the case narrative associated with the affected samples.

In addition, the project data quality manager will review the laboratory data generated for this investigation to ensure that project DQOs are met. If the review indicates that non-conformances in the data have resulted from field sampling or documentation procedures or laboratory analytical or documentation procedures, the impact of those non-conformances on the overall project data usability will be assessed. Appropriate actions, including re-sampling and/or re-analysis of samples may be recommended to the project manager to achieve project objectives

B.7. Data Reduction, Quality Review, and Reporting

All data will undergo a QA/QC evaluation at the laboratory which will then be reviewed by the Aspect database manager. Initial data reduction, evaluation, and reporting at the laboratory will be carried out as described in the appropriate analytical protocols. Quality control data resulting from methods and procedures described in this document will also be reported.

B.7.1. Minimum Data Reporting Requirements

The following sections describe the minimum data reporting requirements necessary to allow proper data quality validation and analytical data documentation.

Sample Receipt. Cooler receipt forms will be filled out for all sample shipments to document problems in sample packaging, chain of custody, and sample preservation.

Reporting. For each analytical method run, analytes for each sample will be reported as a detected concentration or as less than the specific RL. Solid data will be reported on a dry weight basis except that from gas chromatograph-mass spectrometry (GC-MS) methods (e.g., EPA Method 8270SIM). The laboratories will report dilution factors for each sample as well as date of extraction (if applicable), date of analysis, extraction method, any cleanup methods performed, and confirmation results where required. If a sample must be diluted to quantify higher concentration(s) of individual analytes, the laboratory will report the original undiluted results with the dilution results. The laboratory will also report any corrective actions taken if unacceptable conditions or data are detected.

Internal Quality Control Reporting. Internal quality control samples will be analyzed at the rates specified in the applicable analytical method.

- **Laboratory Method Blanks.** Analytes will be reported for each laboratory blank. Non-blank sample results shall be designated as corresponding to a particular laboratory blank in terms of analytical batch processing.
- **Surrogate Spike Samples.** Surrogate spike recoveries will be reported with organic reports where appropriate. The report shall also specify the control limits for surrogate spike results as well as the spiking concentration. Spike recoveries outside of specified control limits (as defined in the laboratory SOP) will result in the sample being rerun.

- **Laboratory Duplicate and/or Matrix Spike Duplicate Pairs.** Relative percent differences will be reported for duplicate pairs relative to analyte/matrix-specific control limits defined in the laboratory SOP.
- **Laboratory Control Samples (LCS).** LCS recoveries will be reported for organic analyses. LCS results and control limits will be reported with the corresponding sample data.

B.7.2. Data Quality Verification and Validation

Reported analytical results will be qualified by the laboratory to identify QC concerns in accordance with the specifications of the analytical methods. Additional laboratory data qualifiers may be defined and reported by the laboratory to more completely explain QC concerns regarding a particular sample result. All data qualifiers will be defined in the laboratory’s narrative reports associated with each case.

The project data quality manager will conduct an independent Stage 2A data verification and validation for all chemical data submitted by the analytical laboratories in general accordance with *National Functional Guidelines for Inorganic Data Review* (EPA, 2017a), and *National Functional Guidelines for Organic Data Review* (EPA, 2017b). The data validation will examine and verify the following parameters against the method requirements and laboratory control limits.

- Sample management and holding times
- Instrument performance check, calibration, and calibration verification
- Laboratory and field blank results
- Detection and reporting limits
- Laboratory replicate results
- MS/MSD results
- LCS and/or standard reference material results
- Field duplicate results
- Surrogate spike recovery (organic analyses only)
- Internal standard recovery (internal calibration methods only)
- Inter-element interference check (ICP analyses only)
- Serial dilution (metals only)
- Labeled compound recovery (isotope dilution methods only)
- Ion ratios for detected compounds (high-resolution GC/MS methods only)

Data qualifiers will be assigned based on outcome of the data validation. Data qualifiers are limited to and defined as follows:

- U – The analyte was analyzed for but was determined to be nondetect above the reported sample quantitation limit, or the quantitation limit was raised to the concentration found in the sample due to blank contamination.

- J – The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
- UJ – The analyte was not detected above the reported quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
- R – The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet QC criteria. The presence or absence of the analyte cannot be verified.
- DNR – Do not report from this analysis; the result for this analyte is to be reported from an alternative analysis.

In cases of multiple analyses (such as an undiluted and a diluted analysis) performed on one sample, the optimal result will be determined and only the determined result will be reported for the sample.

The scope and findings of the data validation will be documented in the Data Validation Report for the project.

B.8. Preventative Maintenance Procedures and Schedules

Preventative maintenance in the laboratory will be the responsibility of the laboratory personnel and analysts. This maintenance includes routine care and cleaning of instruments and inspection and monitoring of carrier gases, solvents, and glassware used in analyses. Details of the maintenance procedures are addressed in the respective laboratory SOPs.

Precision and accuracy data are examined for trends and excursions beyond control limits to determine evidence of instrument malfunction. Maintenance will be performed when an instrument begins to change as indicated by the degradation of peak resolution, shift in calibration curves, decrease in sensitivity, or failure to meet one or another of the method-specific QC criteria.

Maintenance and calibration of instruments used in the field for sampling (e.g., PID for evaluating presence of VOCs in soil samples, and the YSI meter for measuring field parameters during groundwater sampling) will be conducted regularly in accordance with manufacturer recommendations prior to use

B.9. Performance and System Audits

The Aspect project manager has responsibility for reviewing the performance of the laboratory QA program. This will be achieved through regular contact with the analytical laboratory’s project manager. To ensure comparable data, all samples of a given matrix to be analyzed by each specified analytical method will be processed consistently by the same analytical laboratory.

B.10. Data and Records Management

Records will be maintained documenting all activities and data related to field sampling and chemical analyses.

B.10.1. Field Documentation

The Aspect project manager will ensure that the field team receives the final approved version of this QAPP, the site health and safety plan (HASP), and the FSP prior to the initiation of field activities. Field records are discussed in the FSP (Appendix A) and include:

- Daily Field Report forms
- Boring completion logs
- Field data and sample collection information, including photographs
- Chain-of-custody forms

Field documents will be maintained in the project file.

B.10.2. Analytical Data Management

Raw data received from the analytical laboratory will be reviewed, entered into the project database, and verified for consistency and correctness. The database will be updated based on data review and independent validation if necessary.

The following field data will be included in the database:

- Sample location coordinates.
- Sample type (i.e., soil).
- Soil sampling depth interval.

Data will be submitted to Ecology's Environmental Information Management (EIM) database once all data have been validated.

B.11. References for Appendix B

U.S. Environmental Protection Agency (EPA), 2017a, National Functional Guidelines for Inorganic Superfund Methods Data Review, Office of Superfund Remediation and Technical Innovation, U.S. Environmental Protection Agency, USEPA-540-R-2017-001, January 2017.

U.S. Environmental Protection Agency (EPA), 2017b, National Functional Guidelines for Organic Superfund Methods Data Review, Office of Superfund Remediation and Technical Innovation, U.S. Environmental Protection Agency, USEPA-540-R-2017-002, January 2017.

TABLE

Table B-1. Analytical Methods, Sample Containers, Preservation, and Holding Times

Project No. 110207, K-C Worldwide Site Upland Area, Everett, Washington

Sample Matrix	Analytical Parameter	Analytical Method	Sample Container	No. Containers	Preservation Requirements	Holding Time
Soil	Gasoline Range TPH	NWTPH-Gx	Method 5035A, 40-ml vials	4	4°C ±2°C, Freeze within 48 hours to <-7°C	14 days
	Diesel- and Motor-Oil Range TPH	NWTPH-Dx/SW846 Method 3630 (Silica Gel Cleanup)	4 ounce jar	1	4°C ±2°C	14 days for extraction; 40 days for analysis
	Low-level PAHs	Method 8270D-SIM	4 ounce jar	1	4°C ±2°C	14 days for extraction; 40 days
	Total Metals other than Hg	Method 200.8	4 ounce jar	1	4°C ±2°C	6 months
	Total Mercury	Method 1631E	4 ounce jar	1	4°C ±2°C	28 days
	PCBs	Method 8082A	4 ounce jar	1	4°C ±2°C	NA

APPENDIX C

Approach for Plugging Open Pipes at Shoreline

MEMORANDUM

Project No.: 110207-007-02

June 27, 2018

To: Andy Kallus, Washington State Department of Ecology

cc: Cindy Jernigan and Bryan Lust, Kimberly-Clark

From:

Bob Hanford and Steve Germiat (Aspect Consulting)

Heather Page (Anchor QEA)

Re: **Approach for Plugging Open Pipes at Shoreline**
Kimberly-Clark Worldwide Site, Everett, Washington

Each remedial alternative in the April 2016 draft Feasibility Study (FS) for the Upland Area of the Kimberly-Clark (K-C) Worldwide Site (Site) includes removal of accumulated sediment from accessible upland catch basins/manholes for remaining stormwater lines that flow to the East Waterway, as well as plugging and catch basin removal for stormwater lines that are no longer in use. Since submittal of the draft FS, K-C has committed to add to each Upland Area FS alternative the plugging of inactive pipes at the shoreline that remain open to the East Waterway, to prevent them from serving as a potential pathway for discharge of upland groundwater to the East Waterway.

As requested by the Washington State Department of Ecology (Ecology), this memorandum proposes K-C’s general construction and permitting approach for plugging such pipes that are open to the East Waterway along the Upland Area shoreline, which will be conducted as a component of the second interim action for the K-C Upland Area.

The City of Everett (City) owns and operates a combined sewer outfall (CSO) pipe that traverses the Upland Area and discharges to the East Waterway (PS04) beneath K-C’s pier in the southwest portion of the Site, within the footprint of the planned Everett Terminal and Cold Storage Facility (ETCS) redevelopment project (Figure 1). In consultation with K-C, the City is evaluating options to temporarily reroute and then permanently relocate that CSO pipe, in possible conjunction with the ETCS redevelopment project. Once the existing CSO is successfully relocated, the City will plug the existing pipe to prevent it being a conduit for groundwater discharge to the East Waterway. Any CSO work and/or relocation will be permitted and conducted in accordance with Chapter 173-245 Washington Administrative Code (WAC) and other applicable requirements. The City and K-C will keep Ecology apprised of plans and implementation for the CSO work. As part of the interim action, K-C will plug lateral pipes entering the existing CSO line at manholes, as described below, unless the entire pipe can be decommissioned by that time.

Proposed Approach to Plug Each Open Shoreline Pipe

Figure 1 depicts the pipes identified[1] at the Upland Area shoreline that remain in place, some of which are currently capped. Each pipe to be addressed is labeled on the figure, from south to north, with a letter[2] for reference in this memorandum. Figure 1 also shows the location of the historical Outfall 004 (white water discharge) that was decommissioned during filling of the Log Pond in 1981, once the industrial wastewater treatment plant[3] was put online in January 1980. Consequently, the Outfall 004 pipe is not further addressed during the Upland Area cleanup. If additional pipes beyond those depicted on Figure 1 are encountered at the shoreline, they will also be plugged using the means and methods described in this memorandum as appropriate to the pipe size and configuration. A series of pipes historically used for fire suppression are present beneath the wooden pier, but do not extend inland below the water table. These pipes will be removed in future rehabilitation of the pier structure but, because they do not represent a potential conduit for groundwater flow, they will not be addressed as part of this pipe plugging action.

The purpose of plugging open pipes at the shoreline is to eliminate potential upland groundwater discharges from pipes and associated pipe bedding to the East Waterway. In a meeting on November 29, 2017, Ecology indicated that, in addition to plugging the pipes at the shoreline, they would like the inland extensions of those pipes plugged approximately 75 feet inland from shoreline as well. Because numerous changes to subsurface piping occurred at the former mill over its 80-year history, often with limited documentation of older changes, and because the demolition contract specifications required that all mill infrastructure in the upper 2 feet (and some at greater depths) be removed during the 2012–2013 mill demolition, the presence and location of pipes inland from where they are visible at the shoreline is uncertain. However, the proposed approach includes filling the pipes where breached a distance of five times the diameter of the pipe both inland from the seawall and 75 feet inland, if present. If pipe length is less than 25 feet, the entire length will be filled with controlled density fill (CDF).

Considerations for conducting this work include access and safety beneath the pier and avoiding releases to the Waterway of materials proposed for filling of pipes. It is anticipated that small pipes open at the shoreline can effectively be plugged manually during a lower low tide cycle, using pneumatic pipe plugs or flexible polyvinyl chloride (PVC) caps (e.g., Fernco Qwik Caps) without discharge of material to the water or obstruction of navigable waters.

All the cutting and filling of pipes will be completed by excavation in the upland, east of the bulkhead, to avoid impacts to the shoreline from equipment and materials handling and to avoid impacts to the East Waterway. A temporary trench box can be used if workers need to enter any

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[1] Pipes identified during reconnaissances conducted in August and October 2016, and June 1, 2018.
[2] Letters I and O are not used to avoid potential confusion with the numbers one and zero.
[3] Treatment plant discharged to newly constructed Outfall 008 (pipe R on Figure 1)

excavation greater than 4 feet deep to complete the work. Although we recommend that the pipe plugging work be conducted during the dry season, temporary dewatering may be required using sumps within upland excavations, depending on the pipe depth relative to the water table depth at specific locations. All water extracted during dewatering will be contained in a portable tank until analytical testing is conducted and appropriate disposal determined[4]. Throughout upland excavation, erosion and spill prevention control using best management practices (BMPs) will be carefully followed to ensure no discharges to the East Waterway. BMPs to be applied during this work are described in the construction Stormwater Pollution Prevention Plan (SWPPP), which is Appendix C to the Interim Action Work Plan, but will include silt fencing, reinforced plastic sheathing, spill containment and sorbent booms.

Field screening using visual/olfactory methods and a photoionization detector (PID) will be employed during excavation of soil to expose subsurface pipes. If field screening indicates visual or olfactory evidence of potential contamination (discoloration, chemical odors, or elevated PID readings), the soil will be temporarily stockpiled on a plastic liner and securely covered with plastic for follow up analytical testing. In this case, K-C will notify Ecology of the occurrence, share and discuss the analytical results, and agree upon the approach for managing the excavated soil and additional follow up action if warranted. If field screening indicates no evidence of potential contamination in excavated soil, it will be replaced in the excavation and lightly compacted using the excavator bucket.

Excavating near the bulkhead to expose and cut pipes may encounter steel tiebacks for the bulkhead, which cannot be compromised. Excavation will be terminated if there is potential for damaging bulkhead tie backs from continuing the work. If that situation occurs, Ecology will be notified and a cap on the open pipe end at the shoreline will serve as the plug until bulkhead improvements are implemented for redevelopment purposes. Such a pipe will still be plugged 75 feet inland if it is found there.

To the extent practical, a video camera survey with a locating sonde, which allows for surface locating of the pipe, will be used to assess and document the pipe material, condition, and linear extent of each pipe to a distance approximately 75 feet inland. Any video survey will be completed through accessible catch basins or through a breach in the pipe inland from the bulkhead, the latter being dependent on maintaining safety of the video crew working within a trench. Health and safety concerns with trenching, access, and/or the condition of the pipes may restrict the survey. In addition, for each pipe being plugged, accumulated solids will be removed to the extent practical from the upstream and downstream length of pipe at each location it is breached or at accessible catch basins, using a vacuum excavator ("vactor"). Accumulated solids will also be removed from pipes being preserved for future use, as outlined in the follow sections.

The following sections outline the proposed approach to plug each of the remaining open shoreline pipes, followed by a discussion regarding permitting of the proposed work.

Pipe A: (Active) 12-Inch Storm Drain

This stormwater drain line for the Warehouse structure remains operational, so will not be plugged or otherwise altered as part of the cleanup. However, each of the upland catch basins/manholes for

[4] Anticipated to be disposed to City of Everett sanitary sewer under Discharge Authorization.

this stormwater system will be inspected using video, and accumulated sediment will be removed from the catch basins and accessible portion of the downstream pipe.

Pipe B1, B2, and B3: 8-Inch Steel

These three stormwater catch basins and drain lines located on the south end of the Site are no longer needed for stormwater management, so will be decommissioned. Accumulated sediment within each of the upland catch basins and the accessible portion of the downstream pipe will first be removed. Then, pipes exiting them will be plugged by filling them five times the diameter of the pipe with controlled density fill (CDF) and the catch basins will be removed.

Pipe C: 36-Inch Wood Stave (Outfall 002)

The remaining portion of the historical 36-inch wood stave Outfall 002 terminates at the upland shoreline, above grade and well above the high tide level. The end of the wood stave pipe is exposed at the edge of the upland, covered with a makeshift wooden “door,” and partly surrounded by rip rap (see photo below).

Attachment A includes available historical drawings for the Outfall 002 structure. Drawing B-4014 shows the entire Outfall 002 alignment plus a vertical profile along it. Drawing B-4016 is a closer view of the portion along the shoreline; a distance approximately 75 feet inland from the shoreline is annotated on B-4016. As noted on Drawing B-4016, station 10+98, a 45-degree bend in the alignment, is approximately 75 feet from the shoreline. The drawings show that the pipe runs parallel to the shoreline of the slip, then turns north at the former location of the South Office Building, and then turns east toward the Warehouse.

The third page in Attachment A illustrates groundwater depth below ground surface over time (hydrographs) at five monitoring wells located adjacent to Outfall 002 within 75 feet of the shoreline. Groundwater in that area is tidally influenced, with groundwater depths ranging between 6 and 12 feet below grade over the five years of monitoring (2012–2017). The third page in Attachment A also maps the minimum depth to water—highest groundwater level—measured in those wells over the 5-year period. The data indicate that groundwater depth generally becomes shallower with distance away from the shoreline, with a minimum depth of about 6 feet measured at well UST68-MW-5, approximately 75 feet inland, and minimum depths between 7 and 8 feet in the westernmost portion of the alignment.

The fourth page in Attachment A is a zoomed-in version of the B-4014 vertical profile, which is annotated to note the portion within approximately 75 feet of shoreline and show the measured high groundwater levels there (6 feet below grade on upstream end, 7 feet on downstream end). Based on the data, the majority of Outfall 002 within 75 feet of the shoreline is above the high groundwater level, except potentially near 75 feet inland. As such, it will not represent a preferred pathway for groundwater movement, except potentially in the portion near 75 feet inland.

Therefore, decommissioning of the pipe will include exposing and breaching the pipe approximately 75 feet inland from the shoreline (at station 10+98) and filling it with CDF to station 11+31. At the point where the pipe is breached, a perpendicular trench will be excavated and backfilled with CDF to prevent fluid migration through pipe backfill if present.

Pipe C (Outfall 002) at shoreline

Small-Diameter Pipes D, E, G, H, J, L, N, P, and Q[5]: 2- to 8-Inch Steel/PVC Above High Tide

Many of the pipes to be plugged are of relatively small diameter (8 inches or less), located above the high tide level, and will be plugged using the same basic procedure, so are grouped for this discussion. Plugging of the ends of these small-diameter pipes will be completed using a Fernco-type cap at the discharge and will result in no discharge of material to the water and no obstructions to navigable waters. In addition, a portion of the pipe will be exposed just inland (east) from the bulkhead by excavating from the uplands. The excavation will be a short trench excavated perpendicular to the pipe to ensure that pipe backfill (bedding) materials, if present, are also exposed. Once exposed, a section of the pipe will be cut and removed. The trench will then be filled with CDF to fill both ends of pipe a minimum of five times the diameter of the pipe and to prevent fluid migration through pipe backfill, if present. The same trenching and CDF-filling (5 times the diameter) approach will be repeated in the pipe approximately 75 feet inland from the shoreline, if it is found, thus isolating the section of pipe between the CDF plugs.

Pipe D (4-inch steel)

Pipe E (8-inch steel)

[5] There are six small-diameter pipes grouped in a small area, and denoted Q through Q5 (Figure 1).

Pipe G (4-inch steel)

Pipe H (8-inch steel)

Pipe J[6] (4-inch PVC)

Pipe L (8-inch PVC)

Pipe N (4-inch steel)

Pipes P (6-inch steel) and Q (2-inch steel)

[6] Fire suppression pipe in foreground.

Pipe Q1 (4-inch steel) and Q2 (8-inch steel)

Pipe Q3 (2- and 1-inch steel, inside 12-inch casing)

Pipes Q4 (3-inch steel) and Q5 (4-inch steel)

Pipe F: 54-Inch Wood Stave (Outfall 003)

The historical 54-inch-diameter wood-stave Outfall 003 pipe beneath the pier is anticipated to be the greatest challenge to plug. The pipe outward of the seawall is in disrepair and is disconnected from the wood stave header structure (diffusers) that it historically discharged through (headers are displayed on Figure 1). The pipe at the bulkhead is encased in concrete and difficult to assess. In concurrence with Ecology on the June 1, 2018, Site visit, Pipe F will need to be accessed from the uplands behind the seawall. An attempt will be made to locate the pipe 75 feet inland from the seawall where the pipe will be breached. Reportedly, the entire length of the pipe was encased in concrete, but this is not confirmed. If concrete is present, a hydraulic breaker will be used to expose the wood stave pipe. The wood stave pipe will be accessed, and a video survey completed. Prior to filling the pipe at the 75-foot line, the lower portion of the pipe will be exposed landward of the seawall and a pneumatic plug or other mechanical methods will be used to prevent any release of material to the waterway. The upper portion at the 75-foot line will be filled with CDF to five times the pipe diameter along with a perpendicular trench to stop potential migration through pipe bedding. Once the pipe is plugged at the 75-foot mark, the same technique will be used to fill the upstream portion of the pipe to five times the pipe diameter. The use of a tremie pipe or other means may be necessary to pump the CDF the required five times the diameter of the pipe upstream of the seawall. During all work on the pipe containment equipment and other spill prevention BMPs in accordance with the SWPPP will be employed to ensure no material is discharged into the adjacent surface water. If any water is extracted during the plugging of the pipe, it will be managed consistent with that produced from other dewatering, as described above.

Pipe F (Outfall 003) beneath the pier

Pipe K: 15-Inch Concrete

Pipe K is an open 15-inch-diameter concrete pipe, with a steel extension at its end, that is located within the intertidal zone near the base of the bulkhead beneath the pier and is accessible at lower low tide conditions. Monitoring of water discharging from the pipe was saline (between 30,000 and 32,000 microsiemens/centimeter [µS/cm]) during five measurements spanning outgoing and incoming tides on August 31, 2016, indicating the water was tidal water draining back out during lower tidal stages. Preparatory work will involve insertion of a temporary pneumatic pipe plug at the discharge point during lower low tide to avoid discharges to the East Waterway during plugging, and upland excavation to expose the pipe east of the bulkhead. The excavation will be a short trench excavated perpendicular to the pipes to ensure that pipe backfill (bedding) materials, if present, are also exposed. Once exposed, a section of the pipe will be cut and removed. The trench will then be filled with CDF and both ends of pipe to five times the pipe diameter. The same trenching and CDF-filling approach will be repeated in the pipe approximately 75 feet inland from the shoreline, if it is found, thus isolating the section of pipe between the CDF plugs.

Pipe K

Pipe M: 12-inch PVC, Capped

Pipe M is a capped 12-inch-diameter green PVC pipe located on the intertidal beach between the pier and the barge unloading dock and is accessible at lower low tide conditions. No water was observed discharging from this pipe during the August or October 2016 intertidal seep monitoring activities.

PacSteve has requested that this pipe be retained for potential reuse as an outfall for their redevelopment. To accommodate this request while ensuring, for upland cleanup purposes, that it is not a preferred groundwater pathway until redevelopment occurs, upland excavation will be conducted to expose the pipe approximately 75 feet east (inland) of the bulkhead. The excavation will be a short trench excavated perpendicular to the pipe to ensure that pipe backfill (bedding) materials, if present, are also exposed. Once exposed, a section of the pipe will be cut and removed and the upstream end of the pipe filled five times the diameter of the pipe. The use of a pump and tremie pipe will likely be necessary to fill the upstream portion of the pipe. The 75-foot section of pipe downstream of that location (to the existing cap at the shoreline) will be videoed and solids in it removed by vacuum truck to the extent practical from the upstream end. The upstream end of the cut pipe at that location will be capped with a PVC cap to allow the 75-foot section to be reused by PacSteve. The newly capped end will be surveyed and staked at the surface, and the excavation backfilled, pending PacSteve's future work.

Pipe M

Pipe R: 36-Inch Steel (Outfall 008)

This former outfall for the K-C mill's industrial wastewater treatment plant operated under National Pollutant Discharge Elimination System (NPDES) permit until mill closure in 2012. The wastewater treatment infrastructure is no longer operational, but it remains in place and is in consideration for future reuse, potentially for stormwater management, as redevelopment of the property progresses. Therefore, this pipe will not be plugged or otherwise altered as part of the cleanup. However, the upland catch basins/manholes for this system will be inspected and accumulated sediment removed from them as part of the cleanup action. A video camera survey of the pipe downstream of the catch basin/manhole will also be conducted to the extent practical.

Plugging Lateral Pipes Entering City CSO Line

In consultation with City of Everett who owns and operates the CSO line, K-C will plug the ends of lateral pipelines where they enter the CSO line at accessible manholes, unless the City has already decommissioned the entire pipe. If done by K-C, the ends of the lateral pipes will be plugged with CDF for a distance equal to 5 times the pipe diameter. If it is impracticable to fill a lateral pipe in a manhole with CDF, the pipe end will be capped with a Fernco-type plug or equivalent. Entry to each manhole for completing the work will be conducted as permit-required confined space entry by appropriately trained personnel.

Lateral Pipe Entering City CSO Line at Easternmost Manhole on K-C Property

Permitting Considerations

The activities described above for removal of accumulated sediment from accessible upland catch basins/manholes and pipes, along with plugging and catch basin removal for stormwater lines that are no longer in use, will be accomplished as part of the 2018 interim action, the amended Agreed Order DE 9476 for the Upland Area, subject to Ecology's discretion. Pursuant to Revised Code of Washington (RCW) 70.105D.090(1), these activities will therefore be exempt from the procedural requirements of Chapters 70.94, 70.95, 70.105, 77.55, 90.48, and 90.58 RCW and of any laws requiring or authorizing local government permits or approvals. However, these activities must comply with the substantive requirements of such permits or approvals. The exempt permits or approvals and the applicable substantive requirements of those permits or approvals, as they are known at the time, for the proposed pipe plugging activities are identified below.

State Environmental Policy Act

The State Environmental Policy Act (SEPA; RCW 43.21C; WAC 197-11) and the SEPA procedures (WAC 173-802) are intended to ensure that state and local government officials consider environmental values when making decisions. Under WAC 197-11-250, Model Toxics Control Act and SEPA procedural requirements are integrated to reduce duplication. This memorandum will be an appendix to the Interim Action Plan, which will undergo SEPA review and determination by the lead agency determined by Ecology and the City.

Local Government Permit Exemptions

As stated previously, these activities will be exempt from the procedural requirements of the Shoreline Management Act (RCW 90.58) and from obtaining a Hydraulic Project Approval (RCW 77.55 and WAC 220-110-035(5). It is anticipated that Ecology will consult with the City of Everett and Washington Department of Fish and Wildlife, with input from K-C and Aspect Consulting, during the remedial design phase to ensure substantive requirements of these laws are met.

Federal Clean Water Act

The Clean Water Act (CWA) regulations provide requirements for the discharge of dredged or fill material to waters of the United States and are applicable to any in-water work. The CWA regulations also prescribe permitting requirements for point source and nonpoint source discharges.

Section 402 of the CWA requires a permit for discharge of pollutants pursuant to 33 United States Code (USC) § 1342 that is likely to disturb 1 acre or more of land with discharge to waters of the state. On previous cleanup projects, Ecology has determined that a NPDES construction stormwater general permit does not meet the requirements for the permit exemptions in RCW 70.105D.090; and, thus, a project-specific (NPDES) construction stormwater general permit will be required if land disturbance greater than 1 acre is necessary. Depending on the extent of upland land disturbance, the Upland Area cleanup may be required to obtain an NPDES construction stormwater general permit, if the action would include discharge to surface waters of the State. If stormwater comes in contact with disturbed contaminated soils and is discharged to surface waters of the state, then Ecology may require additional water quality sampling through an Administrative Order (attached to the NPDES construction stormwater general permit). However, the plan is that any stormwater generated during this action will infiltrate on-Site within each localized work area (all pervious surfaces). Because there will be no discharge to surface waters of the state, a construction stormwater general permit will not be required, unless Ecology reasonably determines that the activity will be a significant contributor of pollutants to waters of the state or would cause a violation of any water quality standard.

Section 404 of the CWA requires permits from the U.S. Army Corps of Engineers (Corps) for discharges of dredged or fill material into waters of the United States, including wetlands (33 USC § 1344). Additionally, work within navigable waters of the United States is regulated under Section 10 of the Rivers and Harbors Act (33 USC § 403). CWA Section 401 requires the state to certify that federal permits are consistent with water quality standards (33 USC § 1341). It is anticipated that a Corps permit and 401 Water Quality Certification will not be required because these activities will either remove pipe or plug pipe, not result in additional discharge to waters of the United States, and not modify or obstruct navigable waters of the United States.

If the Corps determines that they have jurisdiction over these activities, then a Nationwide Permit 38 (Cleanup of Hazardous and Toxics Waste) could be obtained. Any work for which a Corps permit would be required will be deferred until either (1) East Waterway cleanup is designed and permitted; or (2) other permitted redevelopment actions alter the shoreline.

Limitations

Work for this project was performed for the Kimberly-Clark Worldwide Inc. (Client), and this memorandum was prepared in accordance with generally accepted professional practices for the nature and conditions of work completed in the same or similar localities, at the time the work was performed. This memorandum does not represent a legal opinion. No other warranty, expressed or implied, is made.

All reports prepared by Aspect Consulting for the Client apply only to the services described in the Agreement(s) with the Client. Any use or reuse by any party other than the Client is at the sole risk of that party, and without liability to Aspect Consulting. Aspect Consulting's original files/reports shall govern in the event of any dispute regarding the content of electronic documents furnished to others.

Attachments

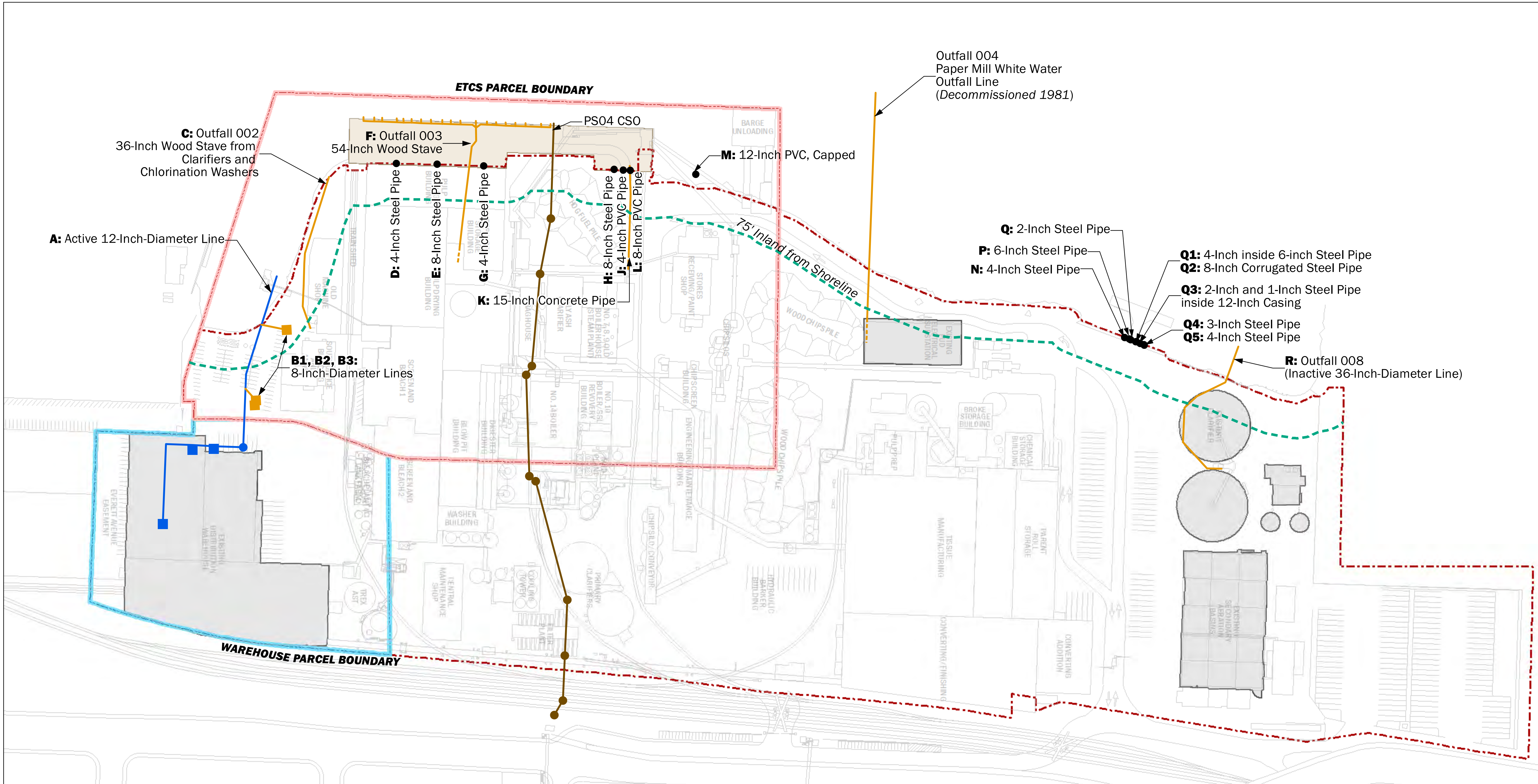
Figure 1 Pipes at Shoreline to be Addressed During Cleanup

Attachment A Annotated Drawings for Outfall 002 Alignment

Attachment B Examples of Temporary Pneumatic Plugs

V:\110207 KC Everett Mill\Deliverables\Work Plan - Second IA\DRAFT IA WP\Appendices\App C\App C to IA Plan - Pipe Plugging Approach_20180627.docx

FIGURE



- Storm Catch Basin
- Storm Manhole
- Inactive Catch Basin
- CSO Manhole
- Active Stormwater Line
- Historical Sewer or Stormwater Line
- Pier
- Site Unit Divider
- Upland Area Boundary
- Existing Structure/Feature
- Historical Site Feature

Notes:
1) Information from Layout Plan, Underground Utilities (K-C dwg. no. C277-L-8), communications with K-C, and site reconnaissance beneath the pier.
2) Inland portions of lines are not shown except for the active stormwater lines.

0 200 400
Feet

Pipes at Shoreline to be Addressed During Cleanup

Approach for Plugging Shoreline Pipes
K-C Worldwide Site Upland Area
Everett, Washington

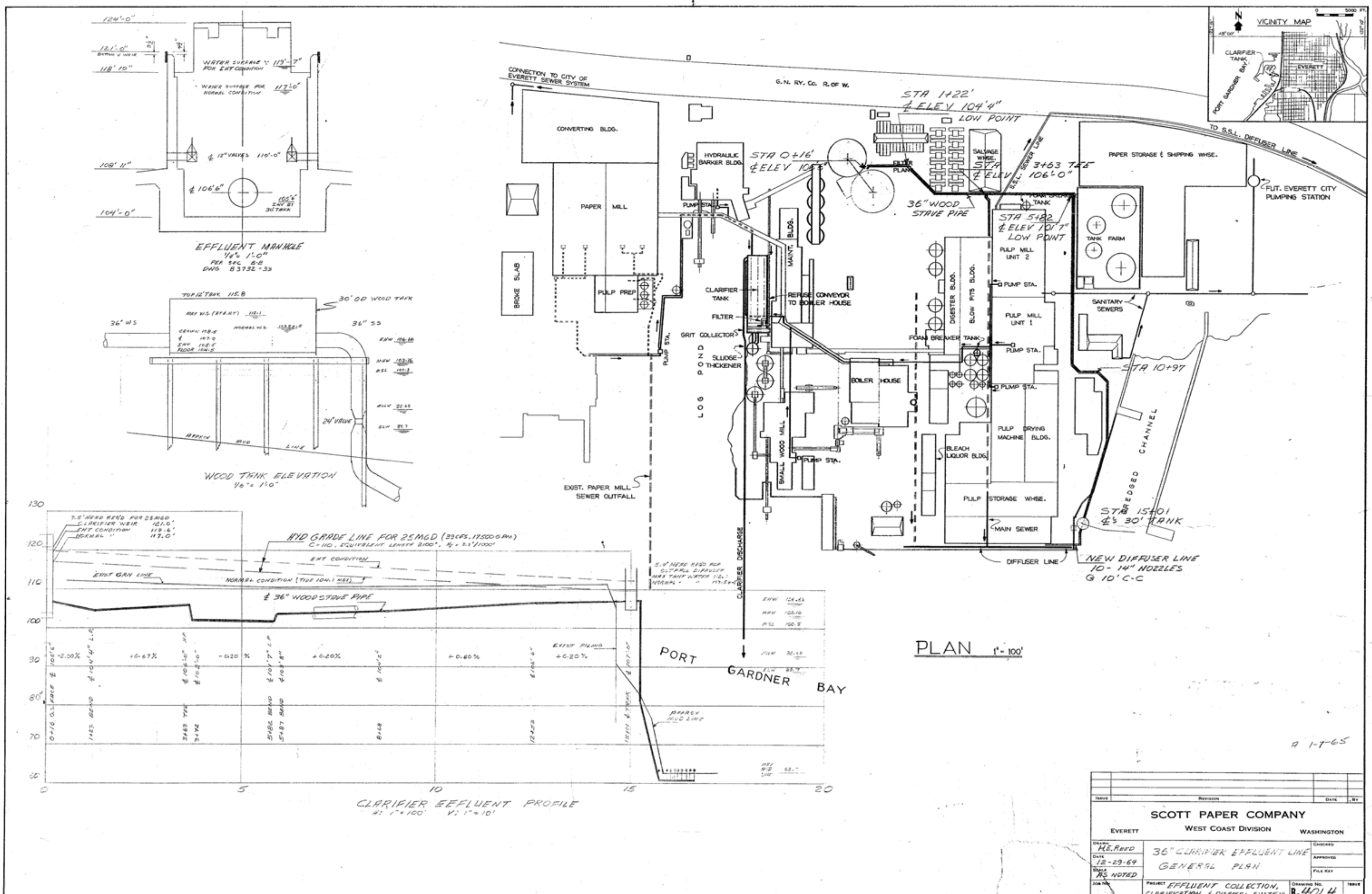
Aspect CONSULTING

JUN-2018	BY: SJG / RAP	FIGURE NO.
PROJECT NO. 110207	REVISED BY: - - -	1

GIS Path: T:\projects_8\KimberlyClark\Env_Support_110207\Delivered\ApproachforPluggingShorelinePipes\01 Stormwater and Sewer Lines to be Addressed.mxd || Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet || Date Saved: 6/25/2018 || User: rpepin || Print Date: 6/25/2018

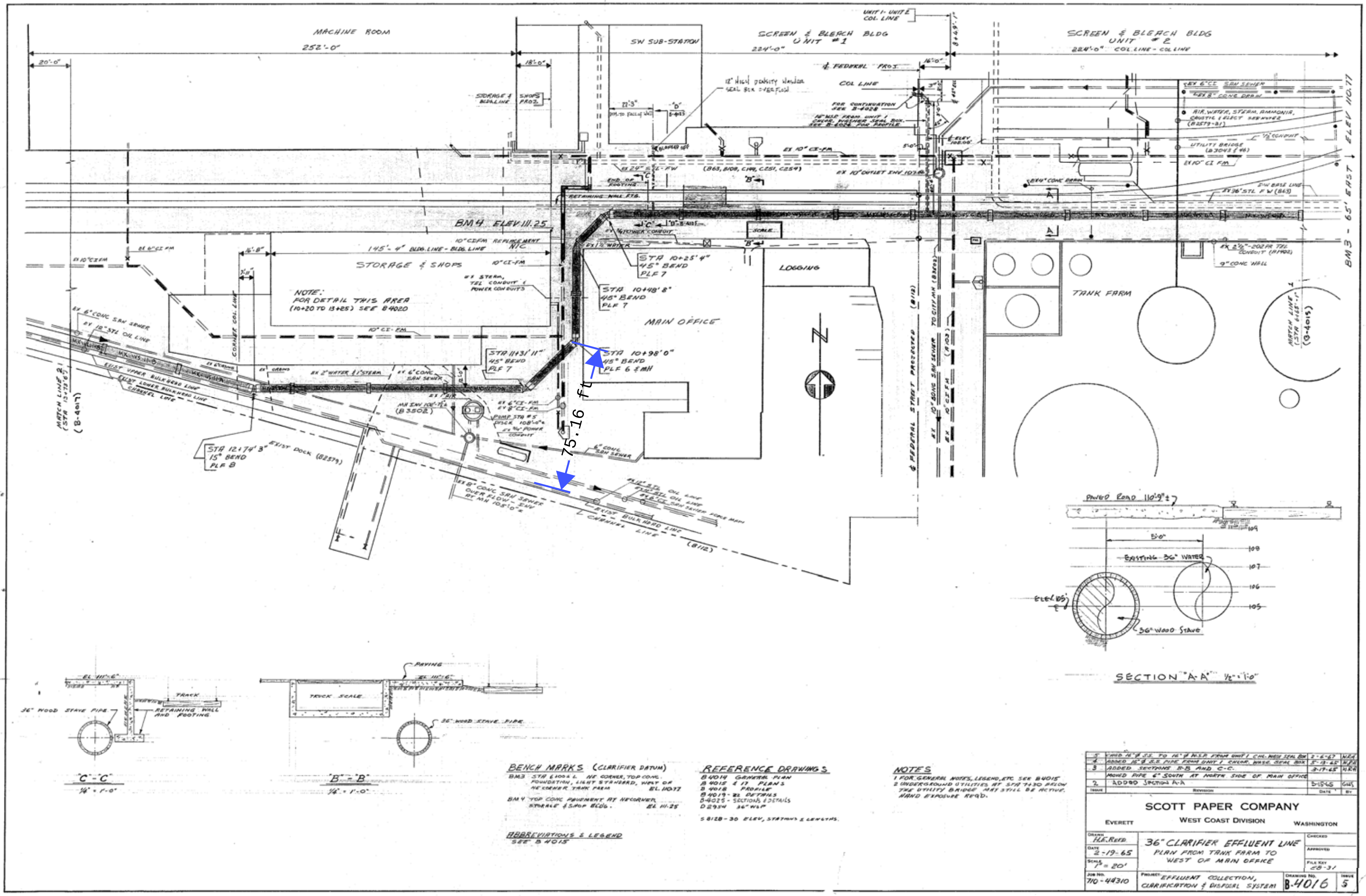
ATTACHMENT A

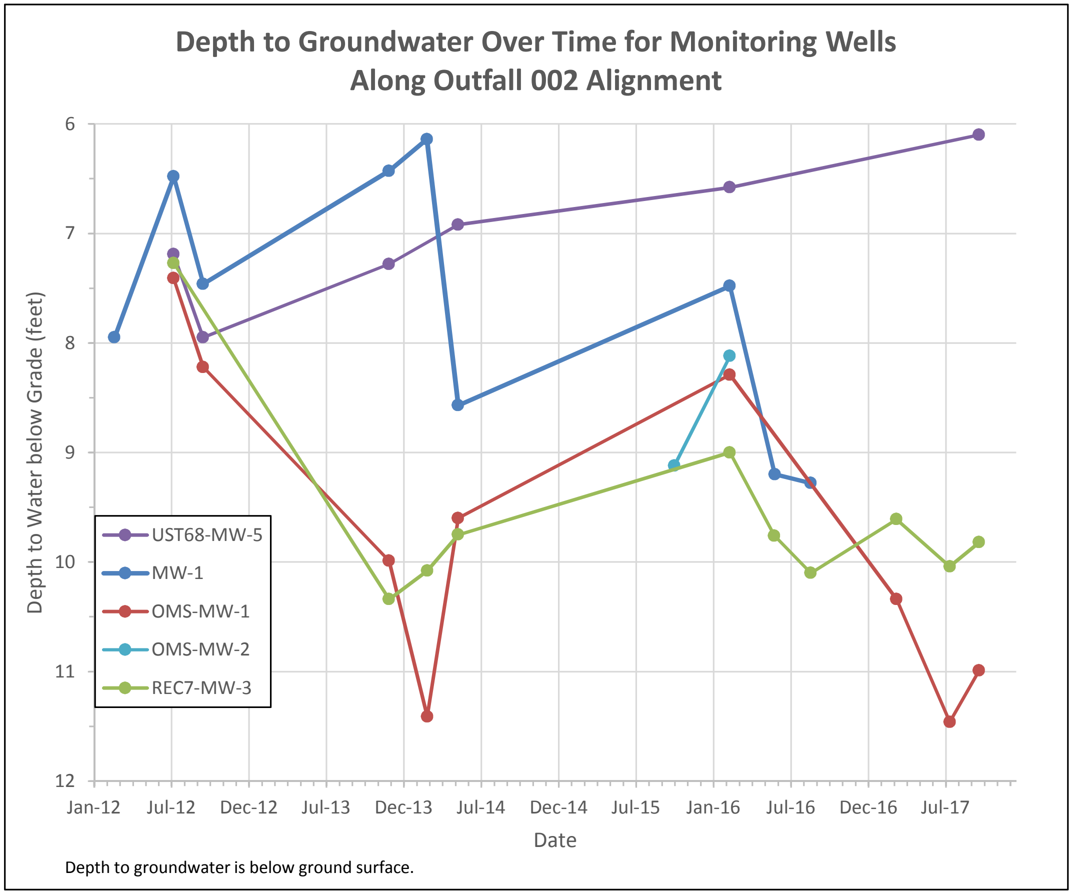
Annotated Drawings for Outfall 002 Alignment



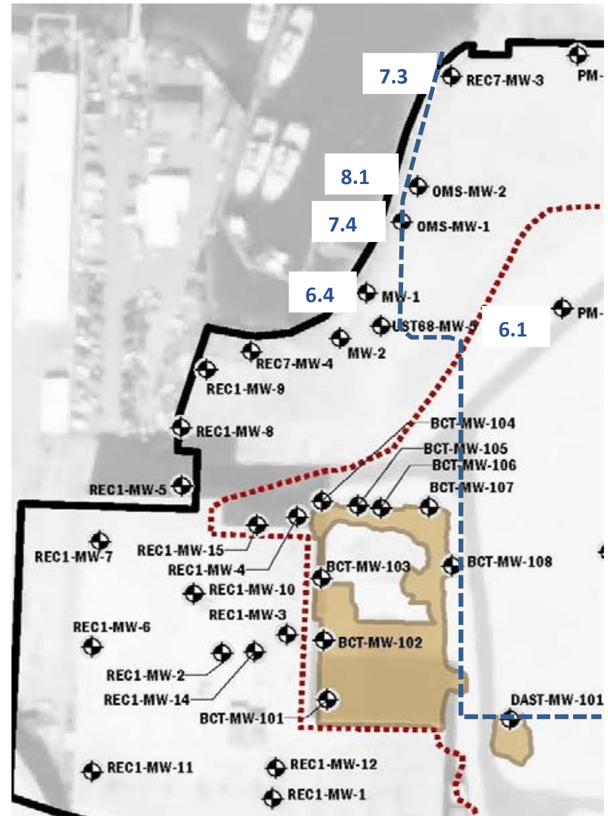
SCOTT PAPER COMPANY
EVERETT — WEST COAST DIVISION — WASHINGTON

Drawn	H.E. Reed
Date	12-29-64
Scale	As noted
Title	36" Clarifier Effluent Line General Plan
Project	Effluent Collection, Clarification, & Disposal System
Drawing No.	B-4014


MACHINE ROOM
252'-0"
20'-0"
18'-0"
SW SUB-STATION
SCREEN & BLEACH BLDG UNIT #1
224'-0"
SCREEN & BLEACH BLDG UNIT #2
224'-0" COL LINE - COL LINE
UNIT I - UNIT II COL. LINE
16'-0"
℄ FEDERAL PROJ.
COL LINE
STORAGE & SHOPS
145'-4" BLDG LINE - BLDG LINE
BM 4 ELEV 111.25
NOTE: FOR DETAIL THIS AREA (10+20 TO 13+25) SEE B4020
STA 10+25'4" 45° BEND PLF 7
STA 10+48'8" 45° BEND PLF 7
STA 10+98'0" 45° BEND PLF 6 & MH
STA 11+31'11" 45° BEND PLF 7
STA 12+74'3" 15° BEND PLF 8
MAIN OFFICE
LOGGING
TANK FARM
EXIST DOCK (B2579)
EXIST BULKHEAD LINE
CHANNEL LINE
MATCH LINE 2 (STA 13+75'6") (B-4017)
BM 3 - 65' EAST ELEV 110.77
75.16 ft
SECTION "A-A" 1/2" = 1'-0"
EXISTING 36" WATER
36" WOOD STAVE
"C"-"C" 1/4" = 1'-0"
"B"-"B" 1/4" = 1'-0"
36" WOOD STAVE PIPE
RETAINING WALL AND FOOTING
TRUCK SCALE
BENCH MARKS (CLARIFIER DATUM)
BM3 STA 6+00 ℄ NE CORNER, TOP CONC. FOUNDATION, LIGHT STANDARD, WEST OF NE CORNER TANK FARM EL. 110.77
BM 4 TOP CONC PAVEMENT AT NE CORNER STORAGE & SHOP BLDG. EL 111.25
ABBREVIATIONS & LEGEND SEE B 4015
REFERENCE DRAWINGS
B 4014 GENERAL PLAN
B 4015 & 17 PLANS
B 4018 PROFILE
B 4019-22 DETAILS
B-4025 - SECTIONS & DETAILS
D 2954 36" WSP
S 8128-30 ELEV, STATIONS & LENGTHS.
NOTES
1 FOR GENERAL NOTES, LEGEND, ETC SEE B4015
2 UNDERGROUND UTILITIES AT STA 7+30 BELOW THE UTILITY BRIDGE MAY STILL BE ACTIVE. HAND EXPOSURE REQ'D.
5 CHGD 16"⌀ S.S. TO 16"⌀ W.S.P. FROM UNIT 1 CHL. WASH SEAL BOX 2-6-67 W.F.R.
4 ADDED 16"⌀ S.S. PIPE FROM UNIT 1 CHLOR. WASH. SEAL BOX 5-13-65 W.F.R.
3 ADDED SECTIONS B-B AND C-C. 3-17-65 W.R.R.
MOVED PIPE 6" SOUTH AT NORTH SIDE OF MAIN OFFICE
2 ADDED SECTION A-A 5-15-65 GWS
ISSUE REVISION DATE BY
SCOTT PAPER COMPANY
EVERETT WEST COAST DIVISION WASHINGTON
DRAWN H.E. REED
DATE 2-19-65
SCALE 1" = 20'
36" CLARIFIER EFFLUENT LINE
PLAN FROM TANK FARM TO WEST OF MAIN OFFICE
CHECKED
APPROVED
FILE KEY CB-31
JOB NO. 710-44310
PROJECT: EFFLUENT COLLECTION, CLARIFICATION & DISPOSAL SYSTEM
DRAWING NO. B-4016
ISSUE 5



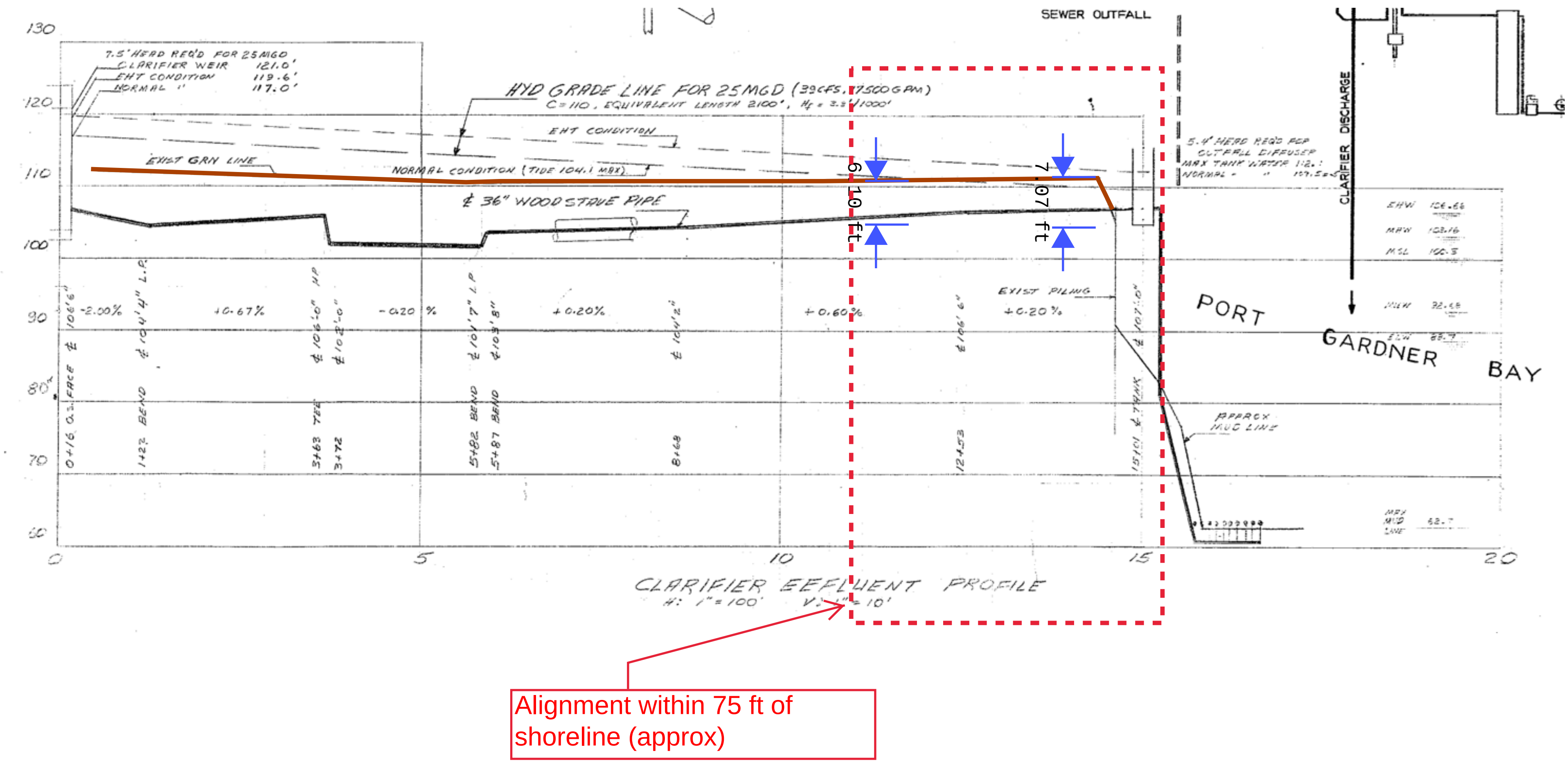
Minimum Depth to Groundwater at Monitoring Wells Along Outfall 002 Alignment (2012-2017)



8.1 = Minimum depth to water (highest groundwater level) measured to date, in feet below grade

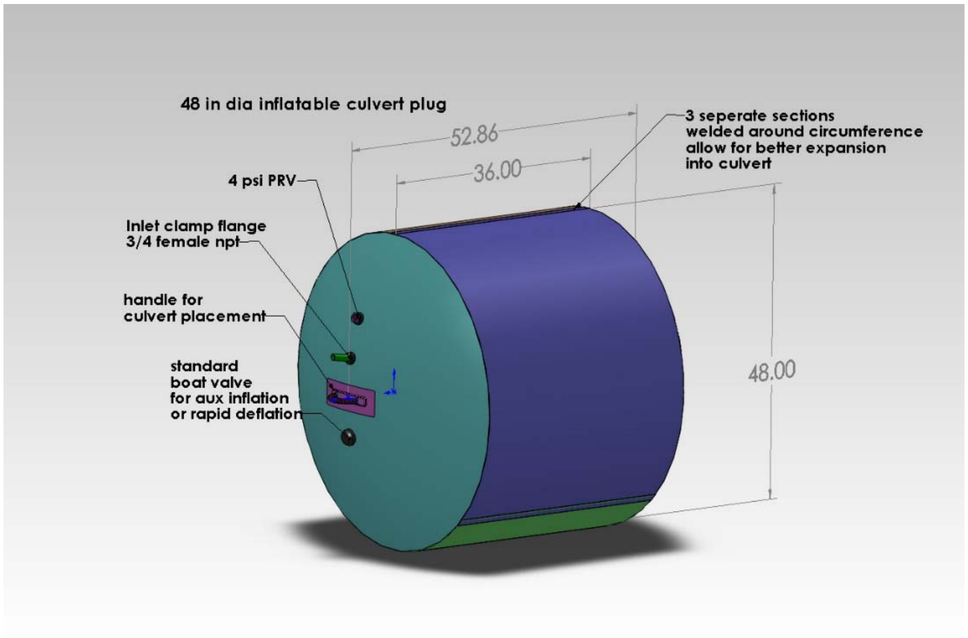
Aspect Consulting
5/4/18
S:\Kimberly Clark\Everett Mill 110207\Draft Deliverables\Pipe Plugging Approach Memo\Photos + Maps\Fig A-1 - WL data for wells adjacent Outfall 002.xlsx

Figure A-1
Pipe Plugging Approach


SEWER OUTFALL
7.5' HEAD REQ'D FOR 25 MGD
CLARIFIER WEIR 121.0'
EHT CONDITION 119.6'
NORMAL " 117.0'
HYD GRADE LINE FOR 25 MGD (39 CFS, 17500 GPM)
C = 110, EQUIVALENT LENGTH 2100'
EHT CONDITION
EXIST GRN LINE
NORMAL CONDITION (TIDE 104.1 MAX)
℄ 36" WOOD STAVE PIPE
6.10 ft
7.07 ft
5.4' HEAD REQ'D FOR OUTFALL DIFFUSER
CLARIFIER DISCHARGE
EXIST PILING
PORT GARDNER BAY
APPROX MUD LINE
+0.67%
-0.20 %
+0.20%
+0.60%
+0.20%
CLARIFIER EFFLUENT PROFILE
Alignment within 75 ft of shoreline (approx)

ATTACHMENT B

Examples of Temporary Pneumatic Plugs



Photograph 1. Pneumatic Pipe Plug Schematic

Photograph 2. Pneumatic Pipe Plug Application

Photograph 3. Pipe Plug with Bypass

APPENDIX D

Stormwater Pollution Prevention Plan

Stormwater Pollution Prevention Plan (SWPPP)

for

Kimberly Clark Everett Pulp and Paper Mill
Second Interim Action

Prepared for:

Kimberly Clark Worldwide, Inc.
351 Phelps Drive
Irving, TX 75038

Owner:

Kimberly Clark Worldwide, Inc.
351 Phelps Drive
Irving, TX 75038

Site Operator:

Kimberly Clark Everett Pulp and Paper Mill
2600 Federal Avenue
Everett, WA 98201

Contractor:

TBD

Project Site Location:
2600 Federal Avenue
Everett, WA 98201

SWPPP Prepared By:
Aspect Consulting, LLC
401 Second Street South, Suite 201
Seattle, WA 98104
(206) 328-7443
Will Guyton, CESCL

Preparation Date:
June 15, 2018

Approximate Construction Dates:

Begin Construction: September 2018

End Construction: January 2019

Table of Contents

List of Attachments

A. Site Map (TESC Plan)

B. Erosion and Sediment Control Inspection Form (WSDOT Form 220-030)

1 Introduction

This Surface Water Pollution Prevention Plan (SWPPP) and associated documents have been prepared for the Second Interim Action project at the Kimberly-Clark (K-C) Everett Worldwide Site Upland Area (Site). The site address is 2600 Federal Avenue, Everett, Washington. The interim action construction activities will include the removal of contaminated soils and associated groundwater, and the plugging of unused pipes that are open at the shoreline to the East Waterway.

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

1. 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.

2. Prevent violations of surface water quality, groundwater quality, or sediment management standards. In order to prevent violations, the construction Contractor will have spill kits on site, the on-site Contractor employees will be trained in their proper use, and equipment will be maintained as appropriate to minimize spill risks.

This SWPPP was prepared using the Washington State Department of Ecology (Ecology) SWPPP template, downloaded from the Ecology website March 14, 2018. This SWPPP generally follows the requirements outlined in the *Construction Stormwater General Permit and Stormwater Management Manual for Western Washington* (SWMMWW).

2 Project Information

Project/Site Name: Kimberly Clark Everett Pulp and Paper Mill

Street/Location: 2600 Federal Avenue

City: Everett **State:** WA **Zip code:** 98201

Receiving waterbody: Groundwater

2.1 Existing Conditions

The Site comprises approximately 56 acres of upland located on the western waterfront in the City of Everett with adjacent property uses that include the Everett Naval Station to the north, Burlington Northern-Santa Fe railway to the east, the Port of Everett to the south. Port Gardner Bay (East Waterway) is adjacent to the west. There are two main vehicle entrances for access to the site: the north gate and south gate. A Site vicinity map is provided in Attachment A.

During the interim action, soil removal construction activities are planned in____specific areas, and pipe inspection/solids removal and/or plugging activities are planned at 22 locations, as shown on Figure 1.

It is anticipated that there could be up to 1.4 acres of disturbed area from the combined soil removal and pipe plugging activities.

2.1.1 Soil Type(s)

The soils are classified by the NRCS Soil Survey as predominately urban land with underlying Everett gravelly sandy loam. The Site history also includes areas of fill. A veneer of crushed demolition debris (termed “crushed material”) is present at the surface, extending to depths ranging from 1 to 5 feet, across approximately 32 of the 55 acres. Temporary excavations will extend below groundwater.

2.1.2 Drainage Patterns

The Site is gently sloped from east to west, but is primarily pervious with very limited active stormwater infrastructure. Stormwater at the Site infiltrates on-Site, except for precipitation falling on the roof of the Warehouse that is conveyed to the East Waterway.

Prior to the commencement of any work activities at the project Site, the Contractor will confirm the existing drainage patterns, identify all potential drainage patterns, and ensure that appropriate measures have been taken to eliminate and control potential discharges.

2.1.3 Existing Vegetation

The Site was previously fully developed; therefore, very limited vegetation exists on-Site, limited to portions of the shoreline, and is absent in the planned work locations. Construction activities will not disturb vegetated areas. During the completion of the proposed work, the Site will be properly protected using BMPs outlined in this SWPPP.

2.1.4 Critical Areas

There are no critical areas on the Site, such as high erosion-risk areas, wetlands, streams, or steep slopes (potential landslide area). Some limited hand-construction activities will take place on the shoreline of Port Gardner Bay during pipe plugging activities.

2.1.5 303(d) Listings and TMDLs

Based on review of Ecology’s 303(d) list, the East Waterway adjacent to the project Site is currently listed as Category 5 for dissolved oxygen, bacteria, and temperature.

2.1.6 Known or Suspected Contaminants

Several known contaminants are expected to be found at this Site and during this project. The goal of the project is to complete interim remedial cleanup activities. For more detail on the types, locations, depths, and concentrations of known contaminants within construction areas, see Section 4.2 of the Work Plan for Second Interim Action.

2.2 Proposed Construction Activities

K-C is completing interim remedial cleanup activities at the Upland Area in preparation for pending redevelopment projects. The interim cleanup actions will involve excavation and proper off-Site disposal of contaminated soil, with concurrent dewatering, as needed, to facilitate soil removal and handling. As such, the interim action will involve permanent removal of contaminated soil and/or groundwater from specific upland areas. This interim action will be limited solely to the Upland Area (bounded on the west by the mean higher high-water elevation) and will not include any work in the in-water area (East Waterway). In addition to these excavations, pipes at the shoreline that are open to the East Waterway will be plugged to prevent them from serving as a potential pathway for discharge of Upland Area groundwater to the East Waterway.

Work performed by the Contractor shall consist of providing all labor, supervision, material, and equipment necessary for all excavation, dewatering, disposal, demolition, and reconstruction activities as specified by the contract.

It is the Contractor's responsibility to furnish, install, protect, maintain, remove, control, and dispose of construction stormwater and erosion controls, vegetation and soil protection, and pollutant prevention and countermeasures. These controls will prevent erosion, and prevent conveyance of pollutants and sediment into surface waters, drainage systems, and environmentally critical areas. All work performed by the Contractor and subcontractors shall be performed per Contract Specifications.

3 Construction Stormwater Best Management Practices (BMPs)

The SWPPP is a living document reflecting current conditions and changes throughout the life of the project. These changes may be informal (i.e., hand-written notes and deletions). Update the SWPPP when a deficiency in BMPs or deviation from original design occurs.

3.1 Element 1: Preserve Vegetation / Mark Clearing Limits

To protect adjacent properties and to reduce the area of soil exposed to construction, the limits of construction will be marked with temporary construction fencing or traffic cones before land-disturbing activities begin. Existing trees and vegetation are present in a narrow strip along the shoreline in the center of the Site. The vegetated area is protected by ecology block, is not accessible, and will not be disturbed during construction. (BMP C103).

Alternate BMPs for marking clearing limits may be recommended by the on-Site inspector in the event the BMP(s) listed above are deemed ineffective or inappropriate. To avoid potential erosion and sediment control issues, the Contractor will promptly initiate the implementation of one or more alternative BMPs after the first sign that existing BMPs are ineffective.

3.2 Element 2: Establish Construction Access

Stabilized Construction Entrance/Exit (BMP C105) consisting of a stabilized pad of quarry spalls or wheel wash will be installed at each entrance/exit used during construction to reduce the amount of sediment transported onto paved roads by vehicles or equipment. Stabilized construction entrances shall be installed at the beginning of construction and maintained for the duration of the project. Additional measures may be required to ensure that all paved areas are kept clean for the duration of the project (e.g., rumble strips, or street cleaning).

3.3 Element 3: Control Flow Rates

In order to protect the properties and waterways downstream of the project Site, all stormwater in excavation areas will be contained and infiltrated in the immediate excavation area or, if infiltration is not effective, collected for treatment as described in Element 10.

3.4 Element 4: Install Sediment Controls

The specific BMPs to be used for controlling sediment on this project include:

- Silt Fence (BMP C233) or Wattles (BMP C235) will be installed between the excavation/disturbance areas and the shoreline. (Attachment A).
- If sediment-laden water from within the work zone cannot be infiltrated within an excavation area, it will be collected for treatment following Elements 3 and 10.

Alternate sediment control BMPs may be recommended by the on-Site inspector in the event the BMP(s) listed above are deemed ineffective or inappropriate. To avoid potential erosion and sediment control, the Contractor will promptly initiate the implementation of one or more alternative BMPs after the first sign that existing BMPs are ineffective.

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

3.5 Element 5: Stabilize Soils

As needed, Site management personnel will assess weather and Site conditions on a daily basis to determine if water needs to be applied for dust control, or if specific areas require additional BMP implementation to protect soil from erosion from rain, wind, or off-Site water sources.

The specific BMPs to be used for stabilizing soils or stockpiles on this project include: Mulching (BMP C121), Plastic Covering (BMP C123), Dust Control (BMP C140), and Wattles (BMP C235).

Season	Dates	Number of Days Soils Can be Left Exposed
During the Dry Season	May 1 – September 30	7 days
During the Wet Season	October 1 – April 30	2 days

If soil stockpiling is needed during the interim cleanup excavation activities, the Contractor will stockpile the excavated soils in Engineer-approved locations away from the shoreline, which will not hinder completion of the cleanup activities.

If crushed material or potentially uncontaminated soils (overburden) require removal to access contaminated soils, separate stockpiles will be designated for crushed material, overburden soil, and contaminated soil based on the Engineer's field screening and direction.

Stockpiles will be located away from storm-drain catch basins and a minimum of 75 feet from the East Waterway shoreline. Material will be transported in a way so as to limit spillage of material between the interim cleanup excavation location and the stockpile location.

Crushed material removed from an excavation area may be stockpiled on in-place crushed material in a location that will not hinder completion of the cleanup activities.

Each stockpile of overburden soil and contaminated soil will be underlain by plastic sheeting with a minimum thickness of 10-mils, with adjacent sheeting sections continuously overlapped by a minimum of 3 feet. The ground surface on which the sheeting will be placed will be free of objects that could damage the sheeting. Alternatively, a layer of geotextile or plywood may be placed beneath the sheeting to protect it.

Each soil stockpile will be covered by plastic sheeting of minimum 10-mil thickness to prevent precipitation from entering the stockpiled soil. Each stockpile cover will be anchored (e.g., using sand bags) sufficiently to prevent it from being removed by wind. Soil stockpiles will be covered when not in use and as needed during periods of rain and wind to prevent transport of soil. The stockpile management measures will be inspected regularly and maintained as needed as long as the stockpile remains at the Site.

Alternate BMPs for stabilizing soil may be recommended by the on-Site inspector in the event the BMP(s) listed above are deemed ineffective or inappropriate. To avoid potential erosion and sediment control issues, the Contractor will promptly initiate the implementation of one or more alternative BMPs after the first sign that existing BMPs are ineffective.

3.6 Element 6: Protect Slopes

The ground surfaces that will be disturbed are generally flat, and all excavations will be internally draining. Slope protection is not anticipated to be applicable to the project scope, but if necessary, the following BMPs will be implemented to prevent erosion on slopes: Plastic Sheeting (BMP C123) and Mulching (BMP C121). Maintenance will be performed on a weekly basis, following storm events, or any time that Site conditions indicate the need for maintenance (i.e., sheeting becomes damaged or displaced). All excavations are temporary and will be backfilled to match surrounding grade after excavation activities are complete.

Alternate BMPs for protecting slopes may be recommended by the on-Site inspector in the event the BMP(s) listed above are deemed ineffective or inappropriate. To avoid potential erosion and sediment control issues, the Contractor will promptly initiate the implementation of one or more alternative BMPs after the first sign that existing BMPs are ineffective.

3.7 Element 7: Protect Drain Inlets

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

Alternate BMPs for protecting drain inlets may be recommended by the on-Site inspector in the event the BMP(s) listed above are deemed ineffective or inappropriate. To avoid potential erosion and sediment control issues, the Contractor will promptly initiate the implementation of one or more alternative BMPs after the first sign that existing BMPs are ineffective.

3.8 Element 8: Stabilize Channels and Outlets

This element does not apply because no storm drainage channels or ditches shall be constructed either temporary or permanent. No BMPs are proposed for stabilizing channels and outlets at this time.

3.9 Element 9: Control Pollutants

Several known contaminants are expected to be found at this Site and during this project. The goal of the project is to complete interim remedial cleanup activities. For more detail on the types, locations, depths, and concentrations of known contaminants, see Plan for Second Interim Action (Aspect, 2018).

The project will prevent, reduce, or eliminate the discharge of pollutants to the stormwater system or waters of the state. The project will also minimize impacts from storage of hazardous materials on-Site, storage of materials in designated areas, and delivery of materials to and from the Site. Temporary storage areas will be located away from vehicular traffic, near the construction entrance(s), and away from waterways and storm drains. Material Safety Data Sheets (MSDS) will be supplied for all materials stored. Chemicals will be kept in their original labeled containers. Hazardous material storage on-Site will be minimized and handled as infrequently as possible.

The project will utilize BMP C153 Material Delivery, Storage, and Containment. Good housekeeping and preventative measures will be taken to ensure that the project location will be kept clean, well-organized, and free of debris.

If required, BMPs to be implemented to control specific sources of pollutants are as follows:

Vehicles, construction equipment, and/or petroleum product storage/dispensing:

- All vehicles, equipment, and petroleum product storage/dispensing areas will be inspected regularly to detect any leaks or spills, and to identify maintenance needs to prevent leaks or spills.

- Spill prevention measures, such as drip pans, will be used when conducting maintenance and repair of vehicles or equipment.
- In order to perform emergency repairs on site, temporary plastic will be placed beneath and, if raining, over the vehicle.
- Contaminated surfaces shall be cleaned immediately following any discharge or spill incident.

Excavation dewatering waste:

- Dewatering BMPs and BMPs specific to the excavation (including handling of contaminated soils) are discussed under Element 10.

Concrete and grout:

- Process water and slurry resulting from concrete work, as part of pipe plugging efforts, will be prevented from entering the waters of the state by implementing Concrete Handling measures (BMP C151).

Sanitary wastewater:

- Portable sanitation facilities will be firmly secured, regularly maintained, and emptied, when necessary.
- If a wheel wash is used, its wastewater shall be discharged to a separate on-Site treatment system or to the sanitary sewer as part of Wheel Wash implementation (BMP C106).

Solid Waste:

- Solid waste other than soil generated during excavation will be stored in secure, clearly marked containers.

Other:

- Other BMPs will be administered, as necessary, to address any additional pollutant sources on-Site.

3.10 Element 10: Control Dewatering

K-C will obtain a discharge authorization (DA) from the City of Everett (City) industrial pretreatment program to allow discharge of pretreated excavation dewatering water, and stormwater if needed, generated during the interim action. All water collected from dewatering activities will be collected and pretreated on-Site using a temporary treatment system appropriately sized by the Contractor to accommodate required dewatering water flow rates, meet any flow or water quality restrictions under the DA, and include redundancy. After settling and treatment, the water will then be discharged to the City's wastewater treatment plant via their sanitary sewer in accordance with the DA requirements. Treated water not in compliance with the City discharge limits will be rerun through the treatment system, with treatment adjustments, as needed, until passing discharge limits or it will be containerized, characterized, and sent for off-Site disposal. No dewatering water or other sediment-laden water will be allowed to enter surface waters.

3.11 Element 11: Maintain BMPs

All temporary and permanent Erosion and Sediment Control (ESC) BMPs shall be maintained and repaired as needed to ensure continued performance of their intended function. Maintenance and repair shall be conducted in accordance with each particular BMP's specification (see *Volume II of the SWMMWW*).

Visual monitoring of all BMPs installed at the Site will be conducted at least once every calendar week and within 24 hours of any stormwater or non-stormwater discharge from the Site. If the project Site becomes inactive and is temporarily stabilized, the inspection frequency may be reduced to once every calendar month.

All temporary erosion and sediment control BMPs shall be removed within 30 days after final Site stabilization is achieved or after the temporary BMPs are no longer needed. Trapped sediment shall be stabilized on-Site or removed. Disturbed soil resulting from removal of either BMPs or vegetation shall be permanently stabilized.

3.12 Element 12: Manage the Project

The project will be managed based on the following principles:

- Inspection, maintenance, and repair of all BMPs will occur, as needed, to ensure performance of their intended function.
- Should any BMP fail, or prove to be inadequate, the Engineer and Contractor will evaluate and determine the next viable BMP or method to use.
- The SWPPP will be updated, maintained, and implemented in accordance with Special Conditions S3, S4, and S9 of the CSWGP.
- As Site work progresses the SWPPP will be modified routinely to reflect changing Site conditions. The SWPPP will be reviewed monthly to ensure the content is current.

3.13 Element 13: Protect Low Impact Development (LID) BMPs

This element does not apply. No LID BMPs will be impacted or constructed.

4 Pollution Prevention Team

Names and contact information for those identified as members of the stormwater pollution prevention team are provided in the following table.

Contact Name	Agency/Company	Phone Number
Bob Hanford	Aspect Consulting, LLC	206-276-9256
Steve Germiat	Aspect Consulting, LLC	206-619-6743

Contractor: ___________________________

Contact Name	Title	Phone Number
TBD		

Kimberly Clark Worldwide, Inc.

Contact Name	Title	Phone Number
Bryan Lust	K-C Site Manager	425-210-3284

Additional Contacts

Contact Name	Agency/Company	Phone Number
Andy Kallus	Ecology Site Manager	360-407-7259
Mark Sadler	City of Everett	425-257-8967

5 Site Inspection and Monitoring

Monitoring includes visual inspection, sampling for water quality parameters of concern, and documentation of the inspection and sampling findings in a Site log book. A Site log book will be maintained for all on-Site construction activities and will include:

- A record of the implementation of the SWPPP and other permit requirements;
- Site inspections; and
- Stormwater sampling data (if appropriate).

For convenience, the inspection form included in this SWPPP (Attachment B) includes the required information for the Site log book. This SWPPP will function as the Site log book.

5.1 Site Inspection

All BMPs will be inspected, maintained, and repaired as needed to assure continued performance of their intended function. Site inspections will be conducted by a Certified Erosion and Sediment Control Lead (CESCL), or equivalent. The on-Site inspector will have the skills to assess the potential for water quality impacts as a result of the type of construction activities occurring on-Site and the knowledge of the appropriate and effective ESC measures needed to control the quality of stormwater discharges.

Site inspection will occur in all areas disturbed by construction activities and at all stormwater discharge points. Stormwater will be examined for the presence of suspended sediment, turbidity, discoloration, and oily sheen. Should any bodies of water of the state become turbid from any construction-related activities, work shall immediately stop until the source has been controlled and the NTU has dropped to background levels.

The Site inspector will evaluate and document the effectiveness of the installed BMPs and determine if it is necessary to repair or replace any of the BMPs to improve the quality of stormwater discharges. All maintenance and repairs will be documented in the Site log book. All new BMPs or design changes will be documented in the SWPPP as soon as possible.

5.1.1 Site Inspection Frequency

Visual monitoring of all BMPs installed at the Site will be conducted at least once every calendar week and within 24 hours of any stormwater or non-stormwater discharge from the Site. For inactive sites that have been temporarily stabilized, the Site inspection frequency may be reduced to once every month.

5.1.2 Site Inspection Documentation

The Site inspector will record each Site inspection using the inspection forms provided in Attachment B or of similar format.

6 Reporting and Record Keeping

6.1 Record Keeping

6.1.1 Site Log Book
A Site log book will be maintained for all on-Site construction activities and will include:

- A record of the implementation of the SWPPP and other permit requirements
- Site inspections forms

6.1.2 Records Retention
Records will be retained during the life of the project and for a minimum of three (3) years. Permit documentation to be retained on-Site:

- SWPPP
- Site Log Book

Permit documentation will be provided within 14 days of receipt of a written request from Ecology. A copy of the SWPPP or access to the SWPPP will be provided to the public when requested in writing.

6.1.3 Updating the SWPPP
The SWPPP will be modified if:

- Found ineffective in eliminating or significantly minimizing pollutants in stormwater discharges from the Site.
- 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.

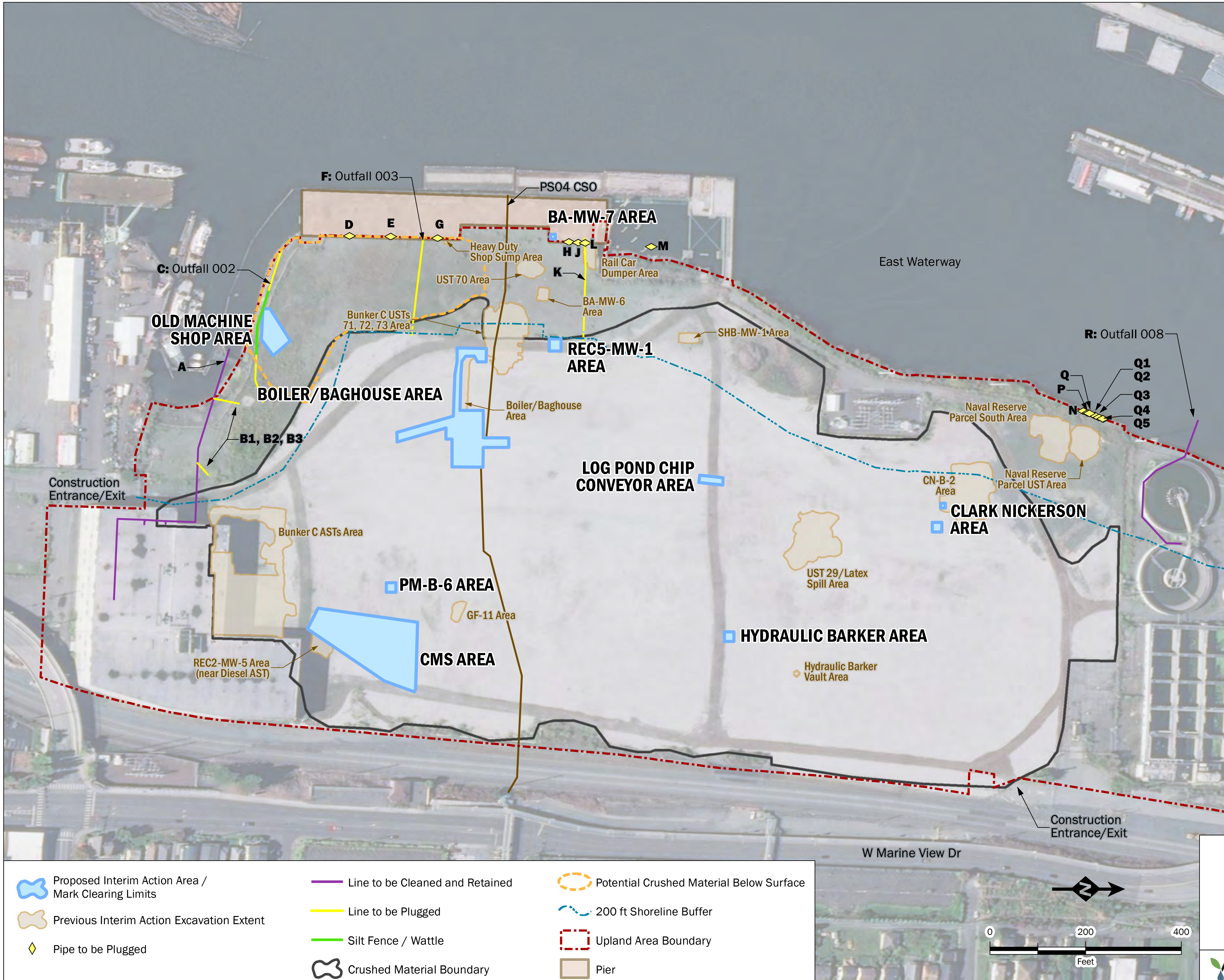
The SWPPP will be modified within seven (7) days if inspection(s) or investigation(s) determine additional or modified BMPs are necessary for compliance. An updated timeline for BMP implementation will be prepared.

6.2 Reporting

6.2.1 Discharge Monitoring Reports
No discharge to surface waters of the State of Washington will occur; therefore, there is no monitoring to be conducted.

ATTACHMENT A

Site Map (TESC Plan)



Basemap Layer Credits || Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Notes:

1. Contractor to install and maintain all erosion control BMPs as shown on this plan and described in the construction SWPPP.

2. Observe erosion and sediment control measures at the beginning and end of each day. Repair and or replace as necessary to assure proper function; additional or different BMPs may be required if existing measures are found to be ineffective.

3. Comply with all Department of Ecology and City of Everett requirements for discharge of construction stormwater.

4. The limits of excavation shall be marked with temporary construction fencing or traffic cones before land-disturbing activities.

5. At each construction entrance/exit a stabilized pad of quarry spalls or wheel wash shall be installed to control sediment track-out.

6. Silt fence or wattles shall be installed between the excavation and shoreline. The CESCL may elect to forego sediment controls on excavations located away from the shoreline where stormwater is anticipated to fully infiltrate.

7. Alternate sediment control BMPs may be recommended by the on-Site inspector in the event the proposed BMPs are deemed ineffective or inappropriate. To avoid potential erosion and sediment control, the Contractor will promptly initiate the implementation of one or more alternative BMPs after the first sign that existing BMPs are ineffective.

8. Each stockpile of overburden soil and contaminated soil will be underlain by plastic sheeting with a minimum thickness of 10-mils, with adjacent sheeting sections continuously overlapped by a minimum of 3 feet.

9. Each soil stockpile will be covered by plastic sheeting of minimum 10-mil thickness to prevent precipitation from entering the stockpiled soil. Each stockpile cover will be anchored (e.g., using sand bags) sufficiently to prevent it from being removed by wind.

10. Stockpiles shall be located away from storm drain catch basins and a minimum of 75 feet from the East Waterway shoreline.

11. All storm drain inlets and culverts existing or made operable during construction shall be protected to prevent unfiltered or untreated water from entering the drainage conveyance system. Storm Drain Inlet Protection (BMP C220) will be implemented for all drainage inlets that could potentially be impacted by sediment-laden runoff from the project site.

12. Temporary treatment system for dewatering / stormwater shall be located at the discretion of the contractor/CESCL.

TESC Plan

K-C Worldwide Site Upland Area
Everett, Washington

Aspect Consulting	JUL-2018	BY: EBP / SJG / RAP	ATTACHMENT NO.
	PROJECT NO. 110207	REVISED BY: - - -	A

GIS Path: T:\projects_8\KimberlyClark\Env_Support_110207\Delivered\TESC\01 TESCPlan.mxd || Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet || Date Saved: 7/11/2018 || User: dpronda || Print Date: 7/11/2018

ATTACHMENT B

Erosion and Sediment Control Inspection Form (WSDOT Form 220-030)

WashIngton State
Department of Transportation

Erosion and Sediment Control Inspection

Project Name			Contract Number
ESC Lead Name		Inspection Location	
Date	Time	Current Weather Conditions	Precipitation in 24 Hours

BMP Designation		Status	BMP Location & Condition, Corrective Action, General Notes
1. **Mark Clearing Limits:** Are clearing limits marked and being respected? Are protected areas clearly <!elineated with high visibility fence?		☐ OK 0 Not OK ON/A	
2.**Construction Access Stabilized:** Is track-out of sediment prevented? If track-out is evident is it being cleaned up?		☐ OK 0 Not OK ON/A	
3. **Control Flow Rates:** Are flow rates causing erosion on slopes, in conveyances, outlets, etc?		☐ OK 0 Not OK ON/A	
4. **Install Sediment Controls:** Are sediment controls installed at all discharge points and functioning properly?		☐ OK 0 Not OK ON/A	
5. **Stabilize Soils:** Are unworked soils effectively stabilized?		☐ OK 0 Not OK ON/A	
6.**Protect Slopes:** Are slopes effectively stabilized and protected from concentrated flows?		☐ OK 0 Not OK ON/A	
7. **Protect Drain Inlets:** Are sediment controls at inlets functioning as intended?	below grate filters	☐ OK 0 Not OK ☐ NIA	
	above grate protection	☐ OK 0 Not OK ON/A	
	grate covers	☐ OK 0 Not OK ☐ NIA	
	check dams or curbs	☐ OK 0 Not OK ON/A	
8.**Stabilize Channels & Outlets:** Are BMPs preventing concentrated flows from developing or preventing erosion?		☐ OK 0 Not OK ON/A	

BMP Designation	Status	BMP Location & Condition, Corrective Action, General Notes
9. **Control Pollutants:** Are all pollutants handled and disposed of in a way that doesn't contaminate waters of the state?	☐ OK 0 Not OK ON/A	
10. **Control Dewatering/Water Management:** Are clean and dirty sources of water being kept separate and being managed appropriately?	☐ OK 0 Not OK ON/A	
11. **Maintain BMPs:** Are all BMPs performing as required?	☐ OK 0 Not OK ON/A	
12. **Manage the Project:** Is required site documentation up to date?	☐ OK 0 Not OK ON/A	
13. **Protect Low-Impact Development BMPs:** Are LID BMPs being protected from siltation and compaction?	☐ OK 0 Not OK ON/A	
Is erosion evident? Are BMPs functioning as intended?	☐ OK 0 Not OK ON/A	
Are there visible signs of suspended sediment, turbidity, discoloration, or oil sheen in the stormwater runoff?	☐ OK 0 Not OK ON/A	

Comments

I certify that this report is true, accurate, and complete, to the best of my knowledge and belief.

ESC Lead Signature

[redacted]

Reviewed By

APPENDIX E

Approach to Monitor and Manage Groundwater pH in Conjunction with the CM Removal Project

MEMORANDUM

Project No.: 110207-009-05

January 9, 2019

To: Andy Kallus, Washington State Department of Ecology

cc: Mike Brose, PE, Kimberly-Clark
Bryan Lust, Kimberly-Clark

From:

Steve Germiat, LHG, CGWP
Principal Hydrogeologist
sgermiat@aspectconsulting.com

Re: **Approach to Monitor and Manage Groundwater pH in Conjunction with the CM Removal Project**
Kimberly-Clark Former Mill Property, Everett, Washington

As discussed in the November 29, 2018, teleconference between Kimberly-Clark (K-C) and the Washington State Department of Ecology (Ecology), K-C believes that completing full removal of the estimated 200,000 tons of crushed material (CM) from the K-C former mill property will result in rapid improvement in groundwater pH across the property. As a follow-up to the teleconference, this document describes K-C's groundwater pH monitoring to be conducted during the CM removal project and, based on the monitoring data, contingency action(s) to neutralize groundwater pH to be conducted if the removal action creates an increase in groundwater pH that poses a risk to the adjacent East Waterway.

Background

As discussed in Aspect Consulting, LLC's (Aspect) October 6, 2017, memorandum "Data from March 2017 Wet Season Groundwater Monitoring, and July and September 2017 Groundwater pH Monitoring" (Aspect, 2017), the long-term groundwater monitoring data indicate that, on average across the Site, groundwater pH is declining even with the CM in place, as is expected (i.e., carbonation of exposed cement surfaces is occurring).

Despite the overall gradual improvement, groundwater pH hot spots remain where CM is below the water table. Figure 1, attached, illustrates the general spatial correlation (albeit not perfect) between areas with elevated groundwater pH (>10) based on 2017 data and the estimated extents of CM below the seasonally high groundwater level. Figure 2 (reproduced from Aspect [2017]) depicts fluctuating groundwater pH measurements and corresponding groundwater levels (relative to the bottom of the CM) collected at Log Pond well LP-MW01 from late 2013 through late 2017. The data illustrate clearly the cause-effect relationship between direct contact of CM with groundwater and resulting groundwater pH. When the groundwater level seasonally drops below the base of the CM, during the summers of 2016 and 2017, the groundwater pH drops from about pH 12 to below pH 9. We expect similar rapid pH reductions in areas where CM is removed from below groundwater. Furthermore, excavation dewatering will be conducted during removal of CM below groundwater, which will rapidly and effectively remove high pH groundwater from those areas. High pH groundwater will also be coincidentally removed by dewatering during soil removal in some planned interim action areas (for reference, the planned interim action excavation areas are shown in yellow on Figure 1).

Based on the available data, we have confidence that with permanent removal of the pH source and much of the highest-pH groundwater, the residual lower-pH groundwater across the property will continue to attenuate naturally in a reasonable timeframe such that there will be negligible risk for pH impact to the East Waterway. A contingency action for active groundwater treatment, implemented along the shoreline if needed, will be an element of the Cleanup Action Plan's selected remedy for the K-C Upland Area.

Ecology has stated concerns that the ground disturbance created during CM removal may create releases of pH. We agree this is possible, but the concern is primarily limited to areas where CM is removed from below the water table. We also fully expect that such effects would be short-term in duration and would not create a risk for impact to the East Waterway.

For example, a short-term release of petroleum hydrocarbons was created by large-scale soil removal during the 2013-2014 interim action in the Bunker C above-ground storage tank (AST) area located immediately north of the Warehouse. During the first round of confirmation groundwater monitoring conducted following the soil removal, groundwater exceedances were detected for gasoline-range total petroleum hydrocarbons (TPH) in monitoring well BCT-MW-103 and naphthalene in well BCT-MW-108. However, concentrations of both constituents declined to below cleanup levels by the next monitoring event 3 months later, and they subsequently remained below cleanup levels for seven consecutive monitoring rounds spanning 2 years. No exceedances were detected in immediately downgradient wells during any of the eight groundwater monitoring rounds, demonstrating no migration risk to the Waterway from the temporary release. We likewise expect that any groundwater pH spikes created during CM removal would be short-term, would occur far from the East Waterway, and would not represent a migration risk to the East Waterway.

Groundwater pH Monitoring

In response to Ecology concerns, K-C will monitor groundwater pH during the CM removal project and implement contingency action(s) to neutralize groundwater pH if impacts are identified that pose a migration risk to the East Waterway.

In accordance with the July 2018 "Plan of Operations, Crushed Material Removal" (K-C, 2018), CM removal will be conducted within Excavation Sequencing Areas, which allows for smaller sections of the property to be managed separately and sequentially. The labeling of the Excavation Areas (A1 through O; Figure 1) is for identification purposes and does not dictate the order of Areas in which CM will be removed. Rather, in order to allow groundwater monitoring and potential contingency action, CM removal will start in Excavation Areas on the eastern side of the property (Areas A1, B1, F, G, L, and M)—500 feet or more upgradient of the East Waterway shoreline—and then move west to the center line of Excavation Areas (Areas A2, B2, E, H, K, and N) and finally to the westernmost line of Areas (Areas C, D, I, J, and O).

The CM extending below seasonally high groundwater generally occurs in the eastern Excavation Areas, where the water table is shallowest. However, CM below groundwater also occurs within the footprint of the former Log Pond (depicted on Figure 1) where the fill soils have very low permeability that limits infiltration and thus creates localized groundwater mounding during the wet season. Conversely, the CM present in the western Areas, outside of the former Log Pond, is typically a thin veneer that is several feet above the water table. Therefore, we expect that there is a far greater likelihood for pH spikes to occur during CM removal in the eastern Excavation Areas (first to be completed) than in the western Areas located closest to shoreline.

All existing monitoring wells (shown on Figure 1) will be initially retained and will be decommissioned within a specific Excavation Area only when CM removal is preparing to start in that Area. The four monitoring wells that are screened in the deep sawdust layer within the Log Pond area[1] are too deep to observe potential pH-related impacts from CM removal and will therefore not be used for this monitoring program. In addition, wells located within the planned interim action soil excavation areas (shown on Figure 1) will be decommissioned and are also not included in this monitoring program. Additional wells may need to be decommissioned if the limits of interim action soil excavation are expanded.

Monitoring for groundwater pH will be conducted in existing monitoring wells positioned as close as possible downgradient (west) of an Excavation Area in which CM removal is occurring. For this monitoring program, these wells are identified as "proximal wells" and each Excavation Area has one or more designated for it. In addition, each Excavation Area has designated "downgradient wells" that are located further downgradient (generally west) of the proximal well(s). Table 1 identifies proximal wells and downgradient wells for each Excavation Area, organized by eastern, central, and western Excavation Areas. Figures 3A, 3B, and 3C, respectively, depict the proximal and downgradient wells to be monitored during CM removal in the eastern Excavation Areas (A1, B1, F, G, L, and M), central Excavation Areas (A2, B2, E, H, K, and N), and western Excavation Areas (C, D, I, J, and O). Different wells may be added to the groundwater pH monitoring program as the CM removal and the monitoring program evolves (adaptive management approach). Because the two proximal wells for central Excavation Area K are located on its northern and southern edges, prior to starting CM removal in Area K, K-C will consult with Ecology regarding whether installation of a new proximal well(s) for Area K is warranted based on the data collected to that time (e.g. during CM removal in Eastern Areas etc.).

Prior to the start of CM removal in each Excavation Area, monitoring will be conducted in designated proximal and downgradient wells three times within a 1-week period to provide baseline pH measurements. Throughout the duration of CM removal in an Excavation Area, and for a period of 3 weeks following completion of removal in that Area, pH monitoring will be conducted at least weekly. However, during CM removal in the first Excavation Area (one of the Eastern Areas

[1] Wells LP-MW3, LP-MW5, LP-MW6, and LP-MW7 (not shown on Figure 1 because they will not be used in the pH monitoring program).

A1/B1[2], F, G, L, or M as determined by CM removal contractor), pH monitoring will be conducted daily during work days (CM excavation occurring) to obtain a robust initial dataset that will be discussed with Ecology and from which decisions will be made regarding whether changes to monitoring frequency are warranted.

If CM removal occurs in more than one Excavation Area at a time, groundwater monitoring will be conducted for both Areas.

If groundwater pH in a downgradient monitoring well is observed to increase by 0.5 pH unit or more relative to baseline over a period of 3 weeks, the measurement frequency in that well will increase to daily. In addition, pH monitoring will also commence in designated downgradient wells for the Area to assess whether higher-pH groundwater is migrating toward the shoreline.

Potential Contingency Action

If groundwater with pH 0.5 unit or more above baseline persists for 1 week at downgradient wells, or at proximal wells for Excavation Area A2 or any of the Western Excavation Areas, K-C will notify Ecology to discuss the information and decide whether to implement a contingency action considering proximity of the groundwater to the shoreline. Recognize that the rate of groundwater flow is slow (tens of feet per year), so there is ample time to monitor and respond before there would be a risk of impact to the East Waterway.

A contingency action would be determined in consultation with Ecology on a case-by-case basis considering the magnitude of pH impact, its location, the apparent rate of pH migration, etc. Potential contingency actions could include pumping additional groundwater (likely from sumps in new excavations) for *ex situ* treatment, or *in situ* pH neutralization via chemical amendment of excavation backfill with solid-phase ferrous sulfate heptahydrate, injection of liquid-phase ferrous sulfate into groundwater, or air sparging of groundwater (where carbon dioxide achieves the neutralization).

References

Aspect Consulting, LLC (Aspect), 2017, Data from March 2017 Wet Season Groundwater Monitoring, and July and September 2017 Groundwater pH Monitoring, October 6, 2017.

Kimberly-Clark Worldwide, Inc. (K-C), 2018, Plan of Operations, Crushed Material Removal, Kimberly-Clark Former Mill Property, Everett, Washington, July 10, 2018.

[2] Because Area A1 contains such a small quantity of CM, it is highly likely that CM will be removed from it and Area B1 simultaneously.

Limitations

Work for this project was performed for Kimberly-Clark Worldwide Inc. (Client), and this memorandum was prepared in accordance with generally accepted professional practices for the nature and conditions of work completed in the same or similar localities, at the time the work was performed. This memorandum does not represent a legal opinion. No other warranty, expressed or implied, is made.

All reports prepared by Aspect Consulting for the Client apply only to the services described in the Agreement(s) with the Client. Any use or reuse by any party other than the Client is at the sole risk of that party, and without liability to Aspect Consulting. Aspect Consulting's original files/reports shall govern in the event of any dispute regarding the content of electronic documents furnished to others.

Attachments:

Table 1 – Wells to Monitor for pH during CM Removal Project

Figure 1 – Average Groundwater pH (2017) and Estimated Area of Saturated Crushed Material

Figure 2 – Log Pond Well LP-MW01 Groundwater Levels and pH Over Time

Figure 3A – Wells to Monitor for pH during CM Removal in Eastern Excavation Areas A1, B1, F, G, L, and M

Figure 3B – Wells to Monitor for pH during CM Removal in Central Excavation Areas A2, B2, E, H, K, and N

Figure 3C – Wells to Monitor for pH during CM Removal in Western Excavation Areas C, D, I, J, and O

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TABLES

Table 1. Wells to Monitor for pH during CM Removal Project

Project No. 110207-009-05, K-C Former Mill Property, Bellingham, Washington

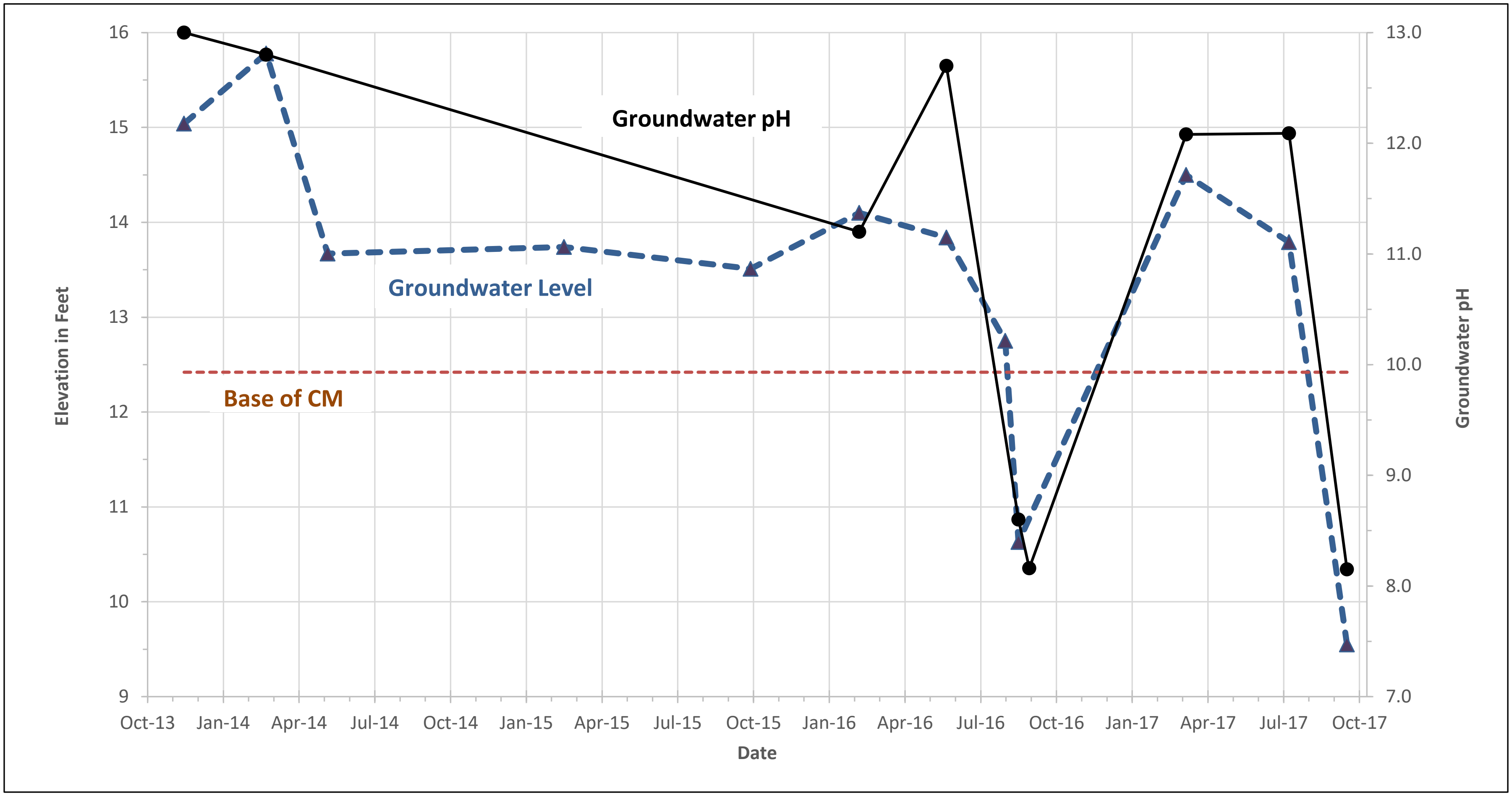
Excavation Sequencing Area	Proximal Wells	Downgradient Wells to Monitor if pH Increases are Observed in Proximal Well(s)
Eastern Excavation Areas		
A1	BCT-MW-106, BCT-MW-104	OMS-MW-1; UST68-MW-5; REC7-MW-4
B1	PM-MW-5, BCT-MW-108	PM-MW-2; PM-MW-4
F	AP-MW-1R; PM-MW-3	BA-MW-2; BA-MW-3; PM-MW-6
G	GF9-MW-3	GF9-MW-1; GF9-MW-2
L	UST29-MW-103; LP-MW-4	UST29-MW-101; UST29-MW-102
M	TM-MW-2	TM-MW-1; CN-MW-103; TM-MW-5
Central Excavation Areas		
A2	UST68-MW-5; MW-2; REC7-MW-4	OMS-MW-1; MW-1
B2	PM-MW-4	REC7-MW-3; PM-MW-7
E	BM-MW-2; BA-MW-3	BA-MW-1; UST71-MW-104; UST-MW-103; PM-MW-6
H	LP-MW-1; SHB-MW-102	LP-MW-2; SHB-MW-101; SHB-MW-2
K	TM-MW-5; LP-MW-1	TM-MW-6; REC6-MW-2; MW-6
N	CN-MW-101; TM-MW-5	NRU-MW-102; NRS-MW-102; REC7-MW-2; TM-MW-6
Western Excavation Areas		
C	PM-MW-7; REC7-MW-3; OMS-MW-1; UST68-MW-5	MW-1
D	BA-MW-5; UT71-MW-101; UST71-MW-103	RCD-MW-101; UST-MW-2; REC3-MW-1R; PM-MW-8
I	LP-MW-2; SHB-MW-2	N/A
J	TM-MW-6; REC6-MW-2; MW-6	N/A
O	NRU-MW-102; NRS-MW-102; REC7-MW-2; TM-MW-6	N/A

Notes:

N/A: Not applicable because there are no further downgradient wells (proximal wells are shoreline wells).

FIGURES

Monitoring Well pH
< 8.5
8.5-10
10-11.5
≥ 11.5
Monitoring Wells
Estimated Extent of Crushed Material Below Seasonally High Groundwater
Groundwater pH 8.5 - 10
Groundwater pH >10
Proposed Interim Action Area
CM Removal Sequencing Area (CM Removal Plan of Operations, July 2017)
Former Log Pond
Crushed Material Boundary
Upland Area Boundary
N
CN-MW-3
CN-MW-2
CN-MW-1
REC7-MW-1
NRP-MW-3
NRU-MW-102
MW-5
NRP-MW-2
NRU-MW-101
NRS-MW-101
NRS-MW-102
UG-MW-1
CN-MW-101
CN-MW-104
CN-MW-102
CN-MW-103
TM-MW-1
TM-MW-2
TM-MW-3
TM-MW-5
TM-MW-6
TM-MW-4
REC7-MW-2
REC6-MW-2
UST29-MW-101
UST29-MW-102
UST29-MW-103
HBV-MW-101
MW-6
LP-MW-2
LP-MW-1
LP-MW-4
HB-MW-1R
SHB-MW-101
SHB-MW-102
SHB-MW-2
GF9-MW-1
GF9-MW-2
GF9-MW-3
GF9-MW-4
UG-MW-2R
AP-MW-1R
RCD-MW-101
BA-MW-5
BA6-MW-101
BA-MW-7
UST70-MW-101
UST70-MW-2
UST70-MW-102
UST71-MW-101
UST71-MW-102
UST71-MW-103
UST71-MW-104
REC5-MW-1R
BA-MW-1
BA-MW-2
BA-MW-3
BA-MW-4
REC3-MW-1R
BBH-MW-101
BBH-MW-102
BBH-MW-103
BBH-MW-104
GF11-MW-101
PM-MW-3
PM-MW-8
PM-MW-6
PM-MW-1
OPS-MW-1
CMS-MW-1R
CMS-MW-2
PM-MW-2
PM-MW-5
PM-MW-4
PM-MW-7
DAST-MW-101
BCT-MW-108
BCT-MW-107
REC7-MW-3
OMS-MW-2
OMS-MW-1
UST68-MW-5
BCT-MW-106
BCT-MW-103
BCT-MW-102
BCT-MW-101
BCT-MW-105
BCT-MW-104
MW-1
MW-2
REC1-MW-3
REC1-MW-4
REC1-MW-15
REC1-MW-14
REC1-MW-2
REC1-MW-1
REC1-MW-12
REC7-MW-4
REC1-MW-9
REC1-MW-8
REC1-MW-5
REC1-MW-10
REC1-MW-7
REC1-MW-11
REC1-MW-6
A1
A2
B1
B2
C
D
E
F
G
H
I
J
K
L
M
N
O
0
100
200
Feet
Notes: Data represent averages of groundwater pH measurements collected in Mar, July, and Sept 2017 monitoring events. Only wells measured in all three monitoring events are used. Because pH is a logarithmic term, each pH value was converted to its hydrogen ion concentration ([H+] = 10^(-pH)); the geometric mean [H+] was calculated at each well, and then its inverse log calculated to represent average pH value (pH = -log[H+]). Contours interpolated using the ANUDEM algorithm.
Saturated crushed material thickness estimated from field measurements, and interpolated using the ArcGIS Topo to Raster tool which utilizes ANUDEM algorithm. Includes manual adjustments based on best professional judgement.
Wells screened in the deep sawdust layer beneath the Log Pond area are not displayed.
Average Groundwater pH (2017) and Estimated Area of Saturated Crushed Material
K-C Worldwide Site Upland Area
Everett, Washington
Aspect CONSULTING
DEC-2018
PROJECT NO.
110207-009
BY:
SJG / RAP
REVISED BY:
RAP
FIGURE NO.
1
GIS Path: T:\projects_8\KimberlyClark\Env_Support_110207\Delivered\GWpHandCMRemovalMemo\01 Average GW pH 2017 and Area of Sat CM.mxd || Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet || Date Saved: 12/31/2018 || User: rpepin || Print Date: 12/31/2018



Aspect Consulting
1/9/2019
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Figure 2
Log Pond Well LP-MW01 Groundwater Levels and pH Over Time
Approach to Monitor and Manage Groundwater pH

Wells to Monitor for pH during CM Removal in Eastern Excavation Areas A1, B1, F, G, L, and M

K-C Worldwide Site Upland Area
Everett, Washington

Aspect CONSULTING	JAN-2019	BY: SJG / RAP	FIGURE NO.
	PROJECT NO. 110207-009	REVISED BY: RAP	3A

GIS Path: T:\projects_8\KimberlyClark\Env_Support_110207\Delivered\GW\UplandCMRemovalMemo\03A Wells to Monitor for pH - East.mxd || Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet || Date Saved: 1/2/2019 || User: rpepin || Print Date: 1/2/2019

Wells to Monitor for pH during CM Removal in Central Excavation Areas A2, B2, E, H, K, and N

K-C Worldwide Site Upland Area
Everett, Washington

Aspect CONSULTING	DEC-2018	BY: SJG / RAP	FIGURE NO.
	PROJECT NO. 110207-009	REVISED BY: RAP	3B

GIS Path: T:\projects_8\KimberlyClark\Env_Support_110207\Delivered\GWplandCMRemovalMemo\03C Wells to Monitor for pH - West.mxd || Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet || Date Saved: 1/7/2019 || User: rpepin || Print Date: 1/7/2019

Wells to Monitor for pH during CM Removal in Western Excavation Areas C, D, I, J, and O

K-C Worldwide Site Upland Area
Everett, Washington

Aspect CONSULTING	JAN-2019	BY: SJG / RAP	FIGURE NO.
	PROJECT NO. 110207-009	REVISED BY: RAP	3C