BARGHAUSEN

TECHNICAL INFORMATION REPORT
GRADING ONLY PERMIT

Fortress - Puyallup

240 15th Street SE
Puyallup, Washington 98372

Prepared for:
CREF3 Puyallup, LLC
11611 San Vicente Blvd, 10th Floor
Los Angeles, CA 90049

10/18/2023

Revised October 18, 2023
Revised August 29, 2023
Revised June 13, 2023
October 26, 2022
Our Job No. 22085

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Tab 1.0

1.0 PROJECT OVERVIEW

The proposed Fortress - Puyallup project is located on a 7.96-acre site located in the City of Puyallup, Washington. The project address is 240 15th Street SE, Puyallup, WA 98372 with the parcel numbers being 0420274126, 7845000161, and 7845000170. The site is located northwest of the intersection of 15th Street SE and East Pioneer Way. The current zoning of the project site is Limited Manufacturing (ML). Please see the enclosed Figure 1 - Vicinity Map for additional location information.

The existing site contains a cold storage warehouse that is in the process of demolition, a separate industrial building, and an office building. The majority of the site has been developed with buildings and pavement, though a small portion of the site is an undeveloped field. The property is not currently being used other than for demolition activity. There are three driveways serving the site off of 15th Street SE. The site is relatively flat and does not contain any steep slopes. The developed portion of the site drains to existing stormwater catch basins and piping, which discharge into the public stormwater systems in East Main Street and 15th Street SE, ultimately discharging to Deer Creek near the Puyallup River. The undeveloped field drains to a local low point. See Figure 2 for a map of existing site conditions.

The site is not within a flood zone. See Figure 4 for a FEAM flood map. According to Puyallup GIS mapping, the project does not contain any wetlands or potential landslide hazards. The public stormwater system in 15th Street SE discharges to a wetland. See Figure 3 for a critical areas map.

The proposal for this stage of the development is to grade the site preparatory to constructing one warehouse building, new pavement, associate utilities, and landscaping. The runoff will be collected on site and conveyed to temporary sediment ponds.

This site has some incidental run-on from adjacent property that is accounted for by the proposed stormwater improvements.

Figure 1
Vicinity Map

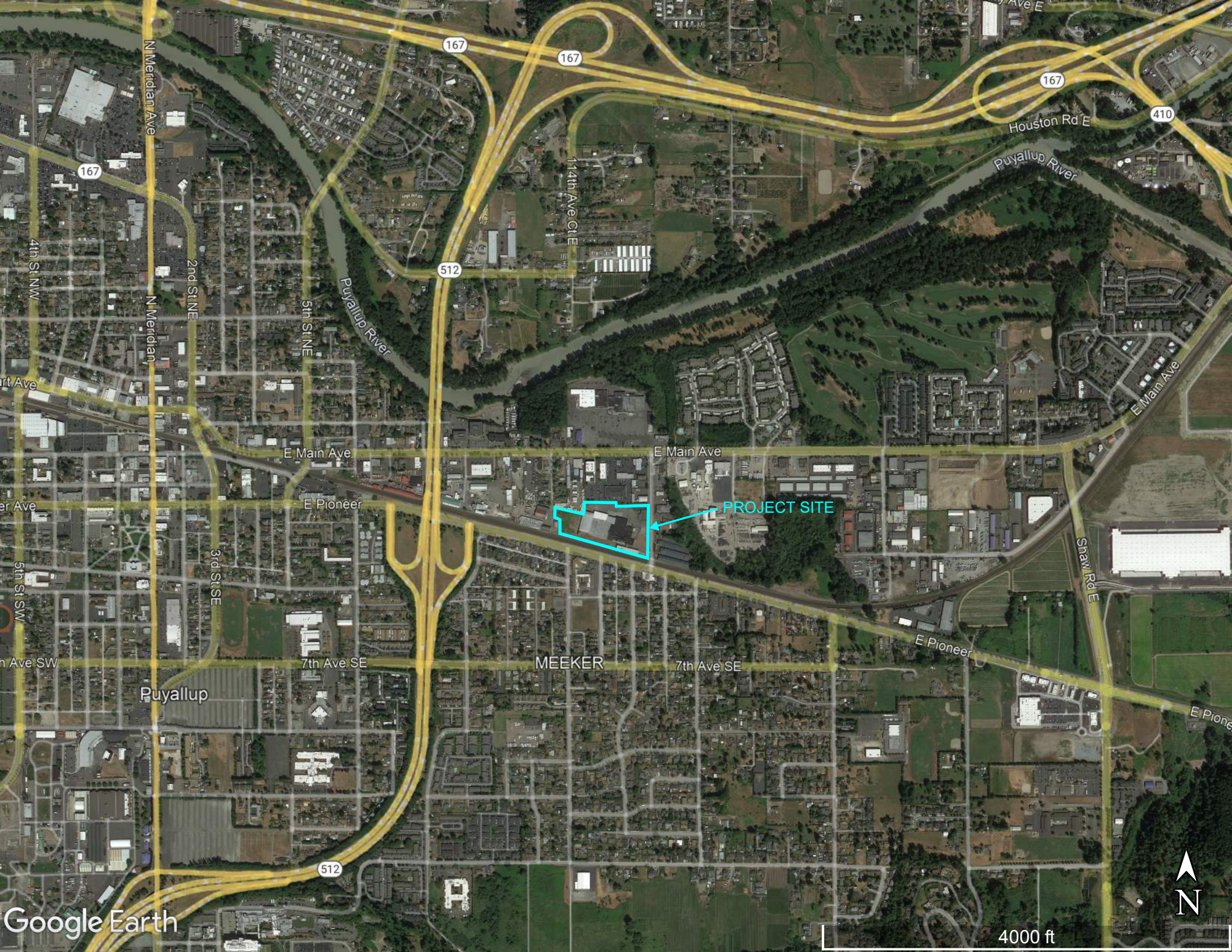
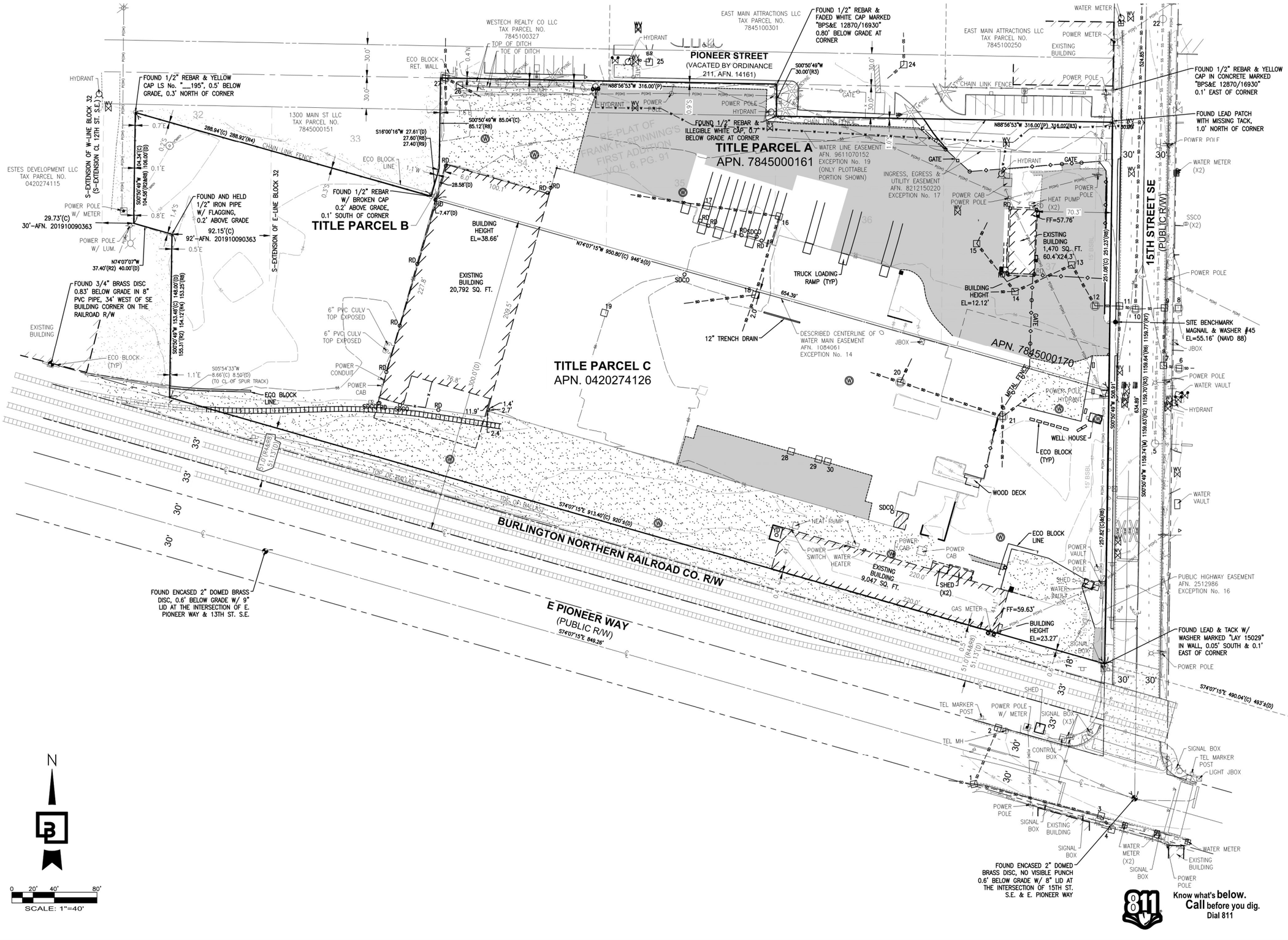

PROJECT SITE
N
4000 ft
Google Earth
Puyallup
MEEKER
E Main Ave
E Pioneer
7th Ave SE
Puyallup River
N Meridian Ave
114th Ave Ct E
Houston Rd E
Shaw Rd E
167
512
410

Figure 2
Existing Conditions Map

EXISTING CONDITION MAP EXHIBIT



No.	Date	By	Ckd.	Appr.	Revision

Title: EXISTING CONDITION MAP EXHIBIT

FORTRESS - PUYALLUP

For: CREF3 PUYALLUP OWNER LLC
11611 SAN VICENTE BLVD
10TH FLOOR
LOS ANGELES, CA 90049

Barghausen Consulting Engineers, Inc.
18215 72nd Avenue South
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Scale:		Designed	VMS
Horizontal	1"=40'	Drawn	VMS
Vertical	N/A	Checked	KEH
		Approved	KEH
		Date	10/04/22

Job Number 22085

Sheet 1 of 1

P:\22000s\22085\exhibit\ex conditions map.dwg 10/20/2022 9:20 AM KHARRIS

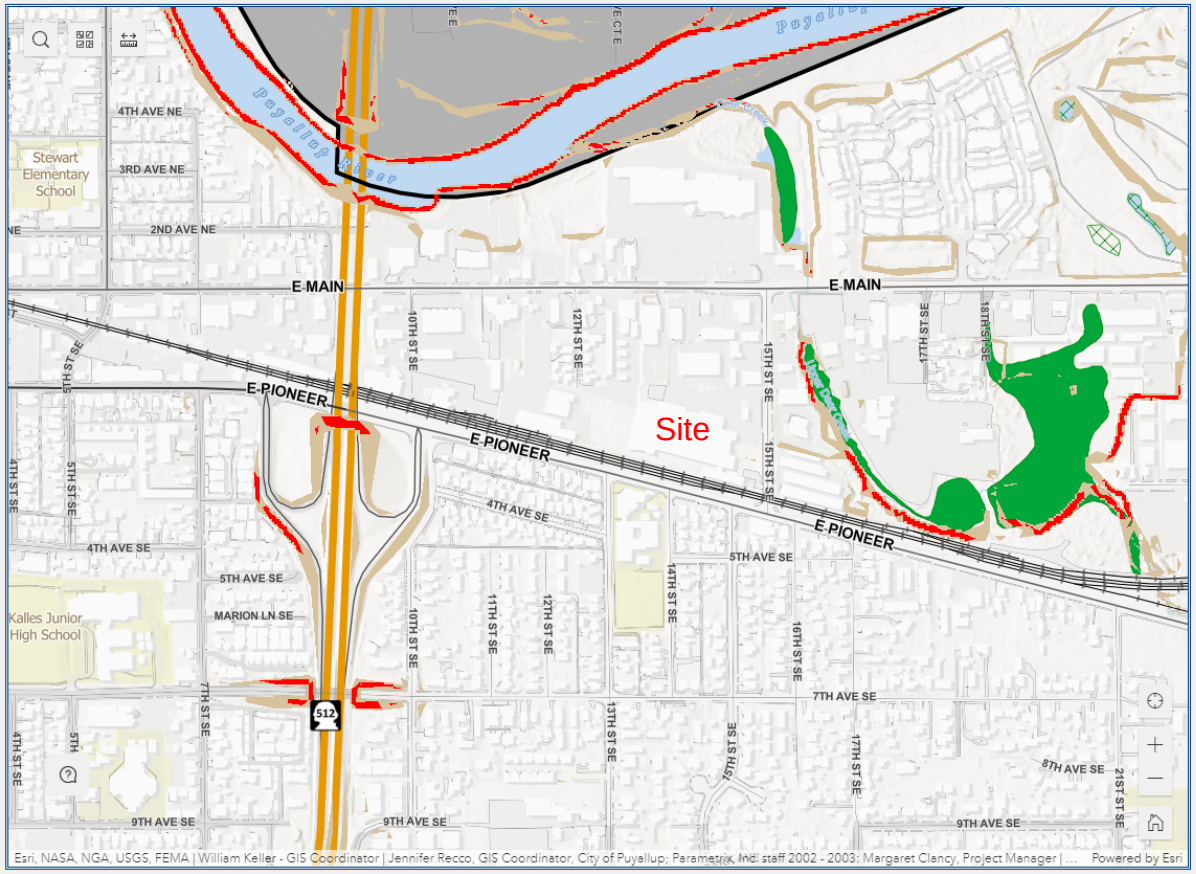

APPROXIMATE SITE BOUNDARY
EXISTING BUILDINGS UNDER DEMOLITION
15th St SE
E Pioneer
13th St SE
14th St SE
N
400 ft
Google Earth

Figure 3
Critical Areas
Map

City of Puyallup Public Data Viewer

Data layers

- Utilities
- Transportation
- Recreation
- Environment
  - City Maintained Street Trees
  - Regulated Floodplain
  - Seclusion Areas
  - General Habitat Areas
  - Potential Landslide Hazard
  - Puyallup Soils
  - Lahar Hazard Area
  - Wetlands
  - Shoreline Master Program Environments
- Zoning
- Parcels



Legend

Environment

Potential Landslide Hazard

Risk
- High
- Moderate

Wetlands

Status Code
- Field-verified Delineated
- Field-verified
- Unverified
- Unverified
- Unverified
- Buffer
- Mitigation Site

Figure 4
FEMA Flood Map

National Flood Hazard Layer FIRMette

FEMA

122°16'52"W 47°11'35"N

122°16'14"W 47°11'11"N

Feet 1:6,000

0 250 500 1,000 1,500 2,000

Basemap: USGS National Map: Orthoimagery: Data refreshed October, 2020

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 Cross Sections with 1% Annual Chance
- 17.5 Water Surface Elevation
- Coastal Transect
- 513 Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 9/29/2022 at 5:18 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

Tab 2.0

2.0 MINIMUM REQUIREMENTS SUMMARY

Per Figure 1-3.1 of the 2019 Department of Ecology Stormwater Management Manual for Western Washington (the Manual), minimum requirements #1 through #9 apply to this project. Minimum requirements (MRs) as listed in the Manual are listed in this section.

MR1 - Preparation of Stormwater Site Plans.

Stormwater site plans have been prepared and included with this submittal.

MR2 - Construction Stormwater Pollution Prevention Plan (SWPPP)

A SWPPP is included as a part of this submittal.

MR3 - Source Control of Pollution

Source Control BMPs will be selected in accordance with Volume IV of the Manual once the property has been leased and actual commercial activities are able to be identified. Good housekeeping measures will be used to keep the site clean and to reduce the chance that stormwater will come into contact with pollutants.

MR4 - Preservation of Natural Drainage Systems and Outfalls

In the existing condition the site discharges into the public stormwater systems in East Main Street and 15th Street SE, ultimately discharging to the Puyallup River. These discharge locations will be maintained.

MR5 - On-Site Stormwater Management

To satisfy this Minimum Requirement, the BMPs given by List #2 are evaluated for feasibility. In accordance with the geotechnical report prepared for this project, infiltration of stormwater on the project site is not feasible. Dispersion BMPs are also infeasible due to the absence of available dispersion areas on the project site during the temporary rough grading phase of the project. Therefore, the project proposes to manage stormwater by implementing BMP T5.13 to all landscape areas in the final phase of the project and by conveying all onsite runoff to the proposed sediment ponds during the rough grading phase of the project.

MR6 - Runoff Treatment

This phase of the project does not create any pollution generating hard or pervious surface and therefore does not meet the thresholds for Minimum Requirement #6.

MR7 - Flow Control

Flow control for the temporary grading phase of the project will be provided by the proposed temporary sediment ponds. See Section 4.3 of this report for more information.

MR8 - Wetlands Protection

In the existing condition, some runoff from the project site enters the public stormwater system in 15th Street SE, which ultimately discharges to Deer Creek at a location where it is mapped as wetlands per City GIS. In order to protect this wetland, the flow to this discharge location will be maintained in the final proposed condition of the project site.

MR9 - Operations and Maintenance

An operations and maintenance manual is included in Section 10 of this report.

Figure 5
Minimum
Requirements
Flowchart

Figure I-3.1: Flow Chart for Determining Requirements for New Development

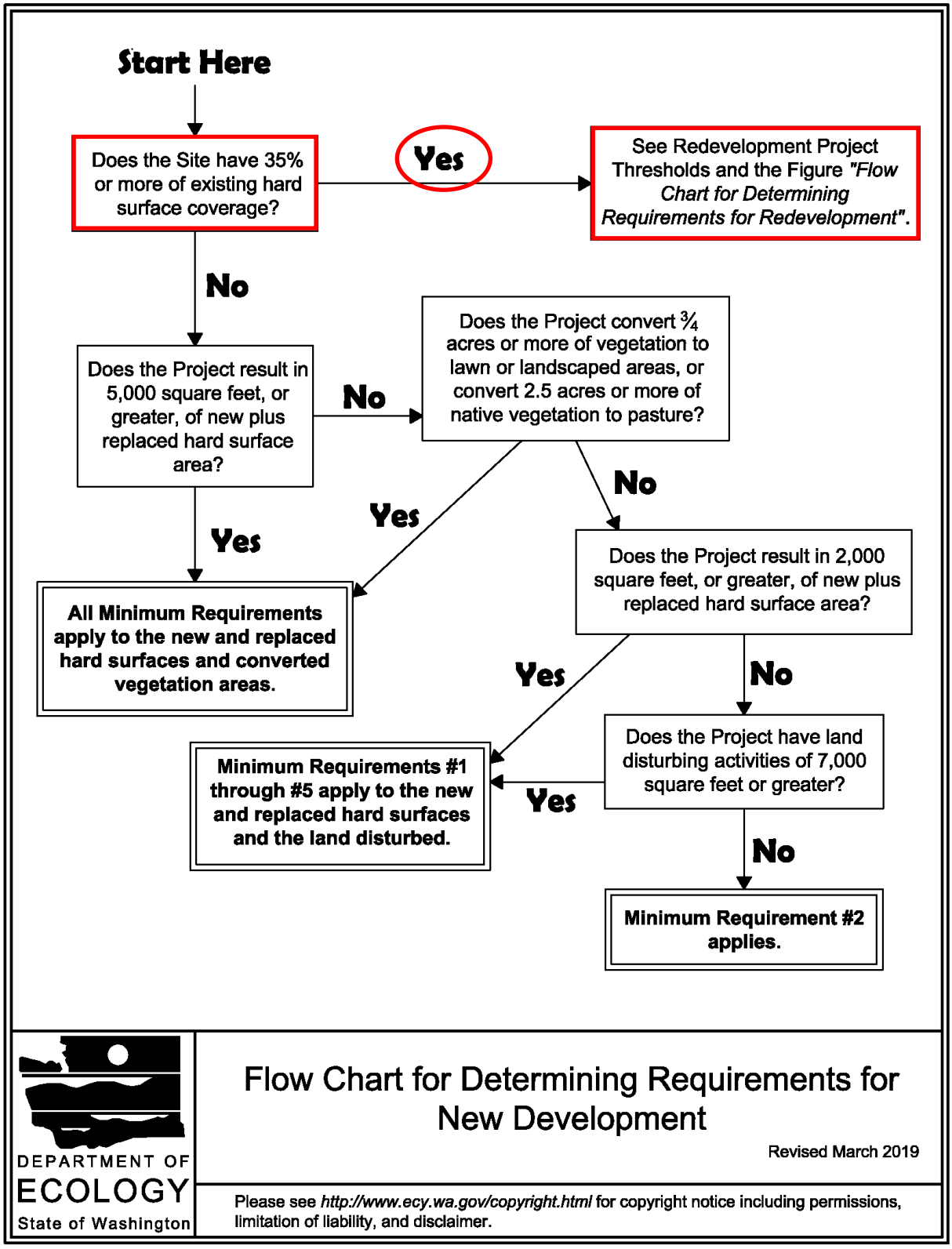
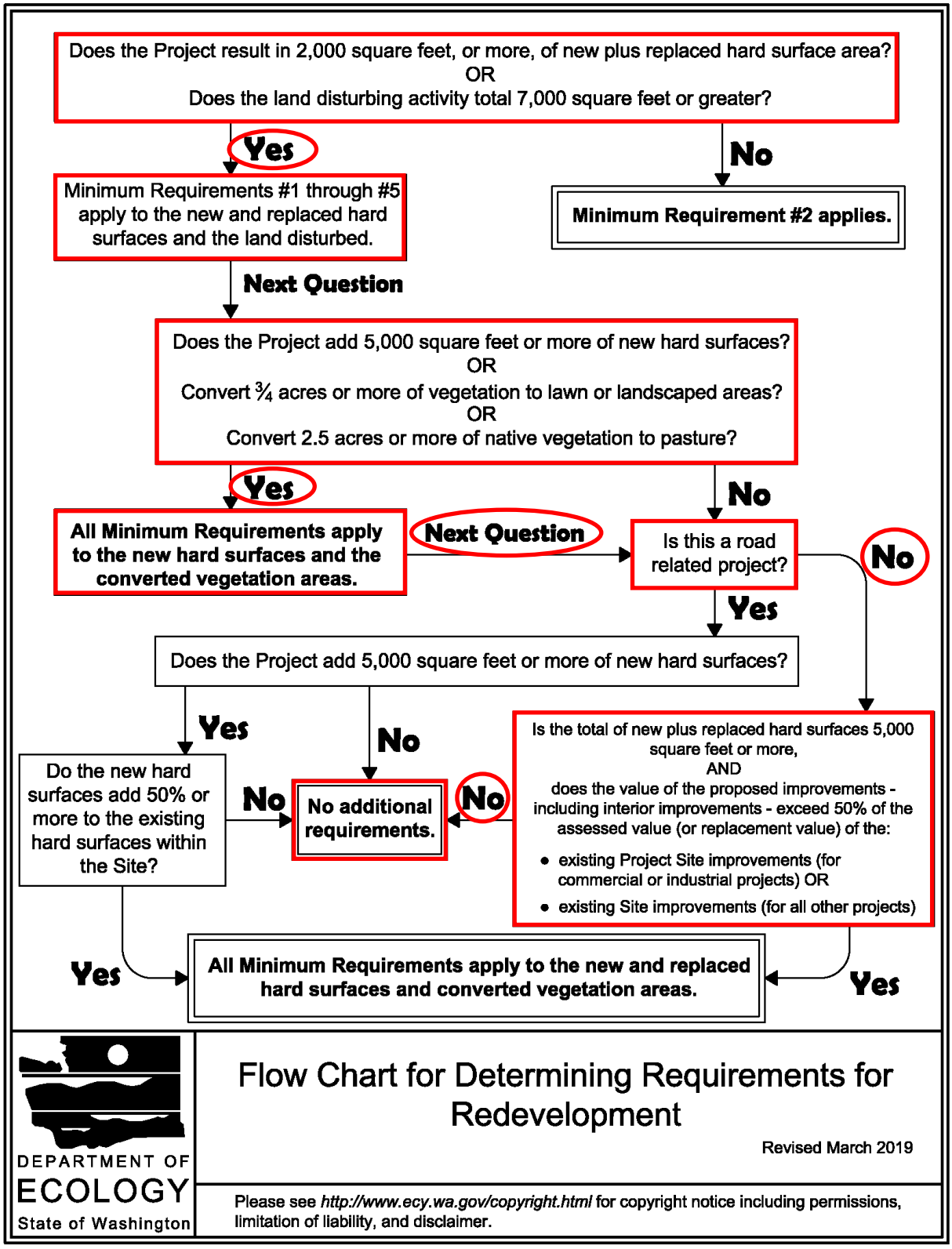


Figure I-3.2: Flow Chart for Determining Requirements for Redevelopment



Tab 3.0

3.0 OFF-SITE ANALYSIS

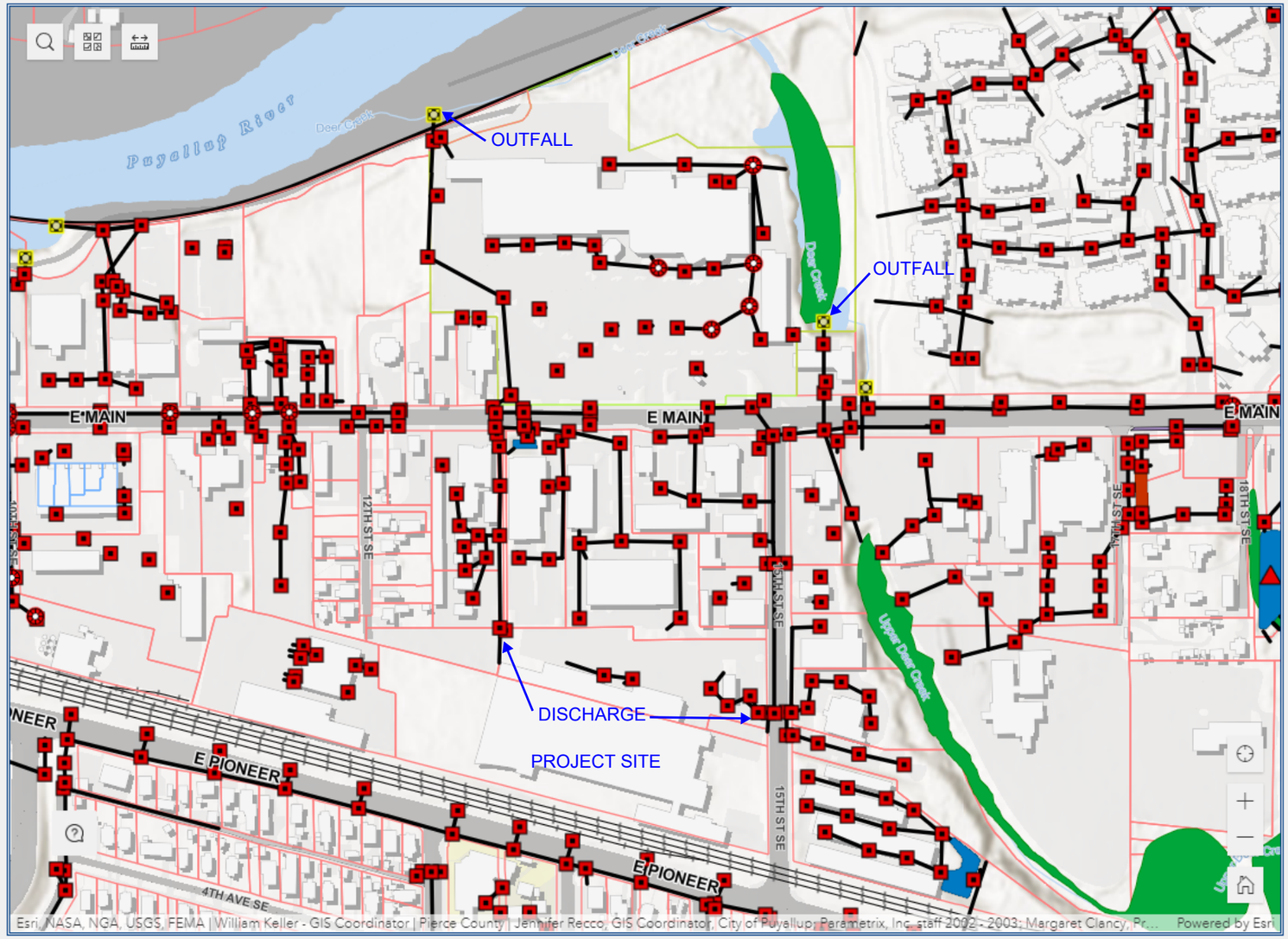
The project site drains to existing stormwater catch basins and piping, which discharge into the public stormwater systems in East Main Street and 15th Street SE, ultimately discharging to the Puyallup River. The outfall from the 15th Street SE system is location within an area classified as wetland per City of Puyallup GIS. See Figure 6. We are not aware of any known drainage issues with the existing downstream drainage systems.

Figure 6
Downstream
Drainage
Map

City of Puyallup Public Data Viewer

Data layers

- Utilities
  - Hydrants
  - Sanitary Sewer
  - Storm Water
- Transportation
- Recreation
- Environment
- Zoning
- Parcels



Legend

Utilities

Storm Water

Outfalls

Manholes

Inlets

Control Structures

Culverts

Pipes

Channels

Facilities

Facility Type

System

Tab 4.0

4.0 FLOW CONTROL AND WATER QUALITY FACILITY ANALYSIS AND DESIGN

4.1 Existing Site Hydrology

Modeling of the existing site hydrology is not needed for the proposed facilities.

4.2 Developed Site Hydrology

This phase of the development will grade the site preparatory to building. Temporary facilities including drainage swales and two sediment ponds are proposed to manage stormwater during this temporary site condition.

4.3 Flow Control System

Temporary sediment ponds are proposed to satisfy SWPPP Element #3: Control Flow Rates and Element #4: Install Sediment Controls. The Manual provides design requirements for sediment ponds (BMP C241) to meet both of these requirements. See the SWPPP included with this report for facility sizing.

4.4 Water Quality System

This phase of the development does not meet the thresholds specified in the Manual for water quality treatment, and so no water quality treatment is required.

Tab 5.0

5.0 CONVEYANCE SYSTEM ANALYSIS AND DESIGN

The conveyance system for this phase of the project will consist of interceptor swales conveying runoff to the temporary sediment ponds. Swales are to be provided and designed by the contractor as needed.

Interceptor swale sizing for the 10-year storm event is included in Section 8.

Tab 6.0

6.0 SPECIAL REPORTS AND STUDIES

The following special reports and studies are included in this section:

- *Geotechnical Report*

Figure 7
Geotechnical
Report

GEOTECHNICAL REPORT

240 – 15th Street SE Industrial
240 – 15th Street Southeast
Puyallup, Washington

Project No. T-8661

Terra Associates, Inc.

Prepared for:

Cref3 Puyallup Owner, LLC
Los Angeles, California

January 12, 2022
Revised June 23, 2023

TERRA ASSOCIATES, Inc.
Consultants in Geotechnical Engineering, Geology
and
Environmental Earth Sciences

January 12, 2022
Revised June 23, 2023
Project No. T-8661

Mr. Michael Cohn
Cref3 Puyallup Owner, LLC
11611 San Vicente Boulevard, 10th Floor
Los Angeles, California 90049

Subject: Geotechnical Report
240 – 15th Street SE Industrial
240 – 15th Street Southeast
Puyallup, Washington

Dear Mr. Cohn:

As requested, we have conducted a geotechnical engineering study for the subject project. The attached report presents our findings and recommendations for the geotechnical aspects of project design and construction.

The native soils observed in the test borings are alluvial deposits generally consisting of loose to medium dense, wet, fine sand, silty fine sand, and silt with varying proportions of fine sand. The CPT data shows similar interbedded alluvial soils extending to a depth of about 80 feet. Groundwater levels at the site range between depths of about two and one-half feet and five feet. In our opinion, the soil and groundwater conditions observed at the site would not preclude the proposed development provided the recommendations contained herein are incorporated into design and construction.

We trust the information presented in this report is sufficient for your current needs. If you have any questions or require additional information, please call.

Sincerely yours,
TERRA ASSOCIATES, INC.

John G. Shiller, L.E.G., L.H.G.
Senior Engineering Geologist

CAROLYN S. DECKER
STATE OF WASHINGTON
47016
REGISTERED
PROFESSIONAL ENGINEER

6-23-2023

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240 – 15th Street SE Industrial
240 – 15th Street Southeast
Puyallup, Washington

1.0 PROJECT DESCRIPTION

The proposed project is an industrial development consisting of a warehouse-style building and associated paved access, parking, and utility improvements. A conceptual site plan by Mackenzie, dated September 27, 2021, shows a 131,250 square-foot building in the central portion of the site. Truck and trailer parking is shown on the northern and western sides of the building, respectively. Passenger vehicle parking is shown on the eastern side of the building. Building plans are currently not available; however, we expect the building will be constructed using precast concrete tilt-up perimeter wall panels with interior columns spaced at 30 to 50 feet. Building floors will be constructed at grade with dock high access on the northern side of the building. Structural loading is expected to be light to moderate, with isolated columns carrying loads of 50 to 100 kips, and bearing walls carrying 4 to 8 kips per foot.

The recommendations in this report are based on our understanding of the design features outlined above. We should review design drawings as they become available to verify that our recommendations have been properly interpreted and to supplement them, if required.

2.0 SCOPE OF WORK

Our scope of work for this project included subsurface exploration, laboratory testing, office review, engineering analysis, and preparation of this report. Our subsurface exploration included ten test borings drilled to maximum depths of 6.5 feet and 31.5 feet with a limited access, track-mounted drill rig using hollow-stem auger drilling methods, one approximately 60-foot deep cone penetration test (CPTs), and one approximately 84-foot deep CPT.

Using the results of our subsurface explorations and laboratory testing, analyses were undertaken to develop geotechnical recommendations for project design and construction. Specifically, this report addresses the following:

- Soil and groundwater conditions.
- Geologic hazards per the City of Puyallup Municipal Code.
- Seismic Site Class.
- Site preparation and grading including recommendations for building preload or surcharge to mitigate floor and foundation settlement.

- Excavations.
- Foundations.
- Slab-on-grade floors.
- Lateral earth pressures for wall design.
- Subsurface drainage.
- Infiltration feasibility.
- Utilities.
- Pavement.

3.0 SITE CONDITIONS

3.1 Surface

The site is an approximately 8.74-acre assemblage of three parcels located northwest of and adjacent to the intersection of 15th Street Southeast and East Pioneer Avenue in Puyallup, Washington. The site location is shown on Figure 1.

Existing site improvements include a small office building in the northeastern portion of the site, a vacant industrial building in the southeast corner of the site, and the remains of a large cold-storage warehouse in the central portion of the site that was recently destroyed by fire. Areas around the buildings are typically surfaced with asphalt or concrete pavement or crushed gravel. An open area of the site located west of the cold storage building is an undeveloped grass field. Site topography is relatively flat.

3.2 Soils

The native soils observed in the test borings are alluvial deposits generally consisting of loose to medium dense, wet, fine sand, silty fine sand, and silt with varying proportions of fine sand and traces of fine organic particles. Fine-grained sand deposits encountered between depths of 20 and 21.5 feet in Borings B-1, B-2, B-6, and B-10 contained numerous fine pumice grains.

The upper approximately 3 to 4 feet of soil encountered in Borings B-7 through B-10 consists of loose to medium dense, silty fine sand that is interpreted to be fill. The fill materials observed in Borings B-7 and B-10 contain numerous wood shavings or fragments.

The CPT data shows interbedded alluvial soils extending the full 60-foot depth of CPT-2 and to a depth of about 80 feet in CPT-1. Soil behavior types determined from the CPT data generally consist of about 30 feet of sand to silty sand and silty sand to sandy silt with scattered clayey silt to silty clay interbeds underlain primarily by interbedded sandy silt to silty clay. A soil behavior type consistent with gravelly sand to sand was encountered below a depth of about 80 feet in CPT-1. In general, where cohesive silt and clay soils are indicated, correlated N_{60} values, indicate consistencies in the medium stiff to stiff range above a depth of about 72 feet and stiff to very stiff below that depth. Where cohesionless sand, silty sand, and silt soils are indicated, correlated N_{60} values indicate relative densities typically in the loose to medium dense range. The soil conditions determined from the CPTs are generally consistent with those observed in the test borings.

The *Geologic map of the Tacoma 1:100,000-scale quadrangle, Washington,* by J.E. Schuster (2015), shows surficial geology at the site mapped as Holocene alluvium (Qa). The soils observed in our subsurface explorations are consistent with this geologic map unit.

Detailed descriptions of the conditions observed in our subsurface explorations are given on the Boring Logs in Appendix A. The CPT data plots are also attached in Appendix A. The approximate test boring and CPT locations are shown on Figure 2.

3.3 Groundwater

Groundwater was encountered in all of the test borings with groundwater levels typically encountered below a depth of about 5 feet. Pore pressure dissipation testing performed in CPT-2 determined a hydrostatic level approximately 5 feet below ground surface as well. Borings B-3 through B-5 and Boring B-7 all encountered wet soils below depths of about 2.5 to 3 feet.

The depths to groundwater at the site will fluctuate on a seasonal basis with maximum levels occurring during the wet winter and spring months. Considering that our field work occurred during late November, we expect that the observed groundwater levels are approaching seasonal high levels.

3.4 Seismic Site Class

Soil conditions at the site, as discussed in the following section, will be subject to the soil liquefaction phenomenon. Because of this condition, per the current International Building Code (IBC), subsurface conditions would be assigned site class “F” which would require performing a site-specific seismic analysis to determine seismic forces for structural design. However, the IBC allows for using code derived seismic values for the soil conditions indicated if the building’s fundamental period is equal to or less than 0.5 seconds. We expect that the proposed industrial building will fall into this category. In this case, based on soil conditions encountered and our knowledge of the area geology, site class “D” can be used to determine seismic design forces.

3.5 Geologic Hazards

Chapter 21.06.1210(1) of the Puyallup Municipal Code (PMC) defines geologic hazard areas as "…areas susceptible to erosion, landsliding, earthquake, volcanic activity or other potentially hazardous geological processes." Site conditions do not meet the PMC criteria defining landslide hazard areas or erosion hazard areas. In our opinion, site conditions are susceptible to potential seismic and volcanic hazards as discussed below.

3.5.1 Seismic Hazards

Chapter 21.06.1210(3)(c) of the PMC defines seismic hazard areas as "…areas subject to severe risk of damage as a result of earthquake-induced ground shaking, slope failure, settlement or subsidence, soil liquefaction, or tsunamis. Settlement and soil liquefaction conditions occur in areas underlain by cohesionless, loose, or soft-saturated soils of low density, typically in association with a shallow ground water table."

The site conditions are not susceptible to seismically-induced slope failure and the site is not located within an area that is susceptible to tsunamis inundation. In our opinion, potential hazards associated with ground shaking would be adequately mitigated by designing with seismic forces determined by local building codes or site specific seismic analysis, if needed.

Liquefaction is a phenomenon where there is a reduction or complete loss of soil strength due to an increase in water pressure induced by vibrations. Liquefaction mainly affects geologically recent deposits of fine-grained sands underlying the groundwater table. Soils of this nature derive their strength from intergranular friction. The generated water pressure or pore pressure essentially separates the soil grains and eliminates this intergranular friction; thus, eliminating the soil's strength.

We completed a liquefaction analysis using the computer program LiquefyPro published by CivilTech Corporation. The analysis was completed using a site modified peak ground acceleration (PGA_M) of 0.60g representing the peak horizontal acceleration for the maximum considered earthquake (MCE) having a 2 percent probability of exceedance in 50 years. The value was obtained for Latitude 47.18978287°N and Longitude -122.27573704°W using the Structural Engineers Association of California (SEAOC) U.S. Seismic Design Maps website (https://seismicmaps.org/) accessed on December 27, 2021. The results of the liquefaction analysis are attached in Appendix B.

The results of our analysis indicate the site is a seismic hazard area with respect to soil liquefaction. Soil liquefaction could occur during the design earthquake event resulting in total settlements ranging between about four and one-half and seven inches with about one-half of this settlement likely being differential in nature. In our opinion, this amount of settlement has the potential to structurally impair the building. The structural engineer should review the estimated settlement to determine if additional mitigation measures are necessary. Additionally, cosmetic damage to the structure in the form of misaligned doors and windows, cracking, and floor settlement could occur. Some utility connections may also be impacted. If the owner is not willing to accept the risk of building damage requiring repair should liquefaction-induced settlements occur, foundations should be supported on ground improved using stone columns designed to mitigate soil liquefaction settlements below the building foundations.

3.5.2 Volcanic Hazards

Chapter 21.06.1210(3)(d) of the PMC defines volcanic hazard areas as "…areas subject to pyroclastic flows, lava flows, debris avalanche, inundation by debris flows, lahars, mudflows, or related flooding resulting from volcanic activity. Volcanic hazard areas shall be classified as Case I or Case II lahars per the definitions in PMC 21.06.210." The site is located in a potential Case II lahar inundation zone. Therefore, per the PMC, the site is considered a volcanic hazard area.

4.0 DISCUSSION AND RECOMMENDATIONS

4.1 General

In our opinion, there are no geotechnical considerations that would preclude development of the site as planned. The fine-grained native soils observed at the site will consolidate under static dead loads imposed by the structure and by product loading on structure floor slabs. To mitigate the potential for post-construction settlement due to this consolidation, we recommend preloading the building location. Preloading will involve placing the structural fill required to achieve the finish floor elevation and allowing settlements to occur under this load before building construction is initiated. We expect that these settlements would occur in about two to four weeks following full application of the building fill.

The preloading program will adequately mitigate post-construction settlement under static loading but will not eliminate the risk of damage resulting from seismically-induced soil liquefaction. If the owner is not willing to accept the risk of building damage requiring repair should liquefaction-induced settlements occur, foundations should be supported on ground improved using stone columns designed to mitigate soil liquefaction settlements below the building foundations. The use of stone columns to improve the foundation subgrade would preclude the need for preloading.

After completing the preload, building construction can begin. The buildings can be supported on conventional spread footings bearing on a minimum of two feet of compacted structural fill. Overexcavation of native soils and replacement with structural fill will likely be required where deeper footing depths are required, such as below the perimeter foundations adjacent to the loading dock areas or where perimeter footings are deepened for seismic resistance. In our opinion, mitigation of the weak subgrade soils in paved areas will require cement amending or excavation and replacement with imported gravel base material.

The native soils encountered at the site contain a sufficient percentage of fines that will make it difficult to compact as structural fill when too wet. The ability to use soils from site excavations as structural fill will depend on the soil moisture content and the prevailing weather conditions at the time of construction. The contractor should be prepared to dry the native soils by aeration during the normally dry summer season to facilitate compaction as structural fill. Alternatively, stabilizing the moisture in the native soil with cement or lime can be considered. If grading activities will take place during the winter season, the contractor should be prepared to import clean granular material for use as structural fill and backfill.

The following sections provide detailed recommendations regarding the above issues and other geotechnical design considerations. These recommendations should be incorporated into the final design drawings and construction specifications.

4.2 Site Preparation and Grading

In general, it will not be necessary to strip the organic surface layer where structural fill thicknesses above existing grade are a minimum of 3 feet and 2 feet in building and pavement areas, respectively. However, existing surface vegetation, such as that in the western portion of the site, should be mowed close to the ground with the cut debris removed from the site. Clearing of trees should include removal of the entire tree root ball. Where structural fill thicknesses are less than the recommended minimums, both the organic surface soil and vegetation should be stripped from below building and pavement areas. In this case surface stripping depths of four to six inches should be expected. Topsoil will not be suitable for use as structural fill, but can be used in landscaped areas.

We recommend removing existing building foundations and slabs and abandoning underground septic systems and other buried utilities from the planned development area. Abandoned utility pipes that fall outside of new building areas can be left in place provided they are sealed to prevent intrusion of groundwater seepage and soil.

Prior to placing fill or constructing footings, all exposed bearing surfaces should be observed by a representative of Terra Associates, Inc. to verify that soil conditions are as expected and suitable for support of new fill or building elements. Our representative may request proofrolling the exposed subgrade for pavement and floor slab support with a loaded ten yard dump truck. If unstable soils are observed and cannot be stabilized in place by compaction, the affected soils should be excavated and removed to firm bearing and grade restored with new structural fill.

All building footings should obtain support on a minimum of two feet of granular structural fill. The fill should extend laterally from the edge of footing a minimum distance of one-foot. Based on planned grades, for normal perimeter footings bearing at the frost depth and interior footings immediately below the slab-on-grade floor, we expect that this requirement will be met over most of the building area with the fill depth required to achieve the design floor elevations. Deeper footings such as the perimeter footings adjacent the loading docks and for shear walls may require some overexcavation and grade restoration with structural fill.

Our study indicates that the native soils contain a sufficient percentage of fines (silt and clay size particles) that will make them difficult to compact as structural fill if they are too wet or too dry. Accordingly, the ability to use these native soils from site excavations as structural fill will depend upon their moisture content and the prevailing weather conditions when site grading activities take place. Native soils that are too wet to properly compact could be dried by aeration during dry weather conditions or mixed with an additive such as cement or lime to stabilize the soil and facilitate compaction. If an additive is used, additional Best Management Practices (BMPs) for its use will need to be incorporated into the Temporary Erosion and Sedimentation Control plan (TESC) for the project. If grading activities are planned during the wet winter months, and the onsite soils become too wet to achieve adequate compaction, the owner or contractor should be prepared to treat soils with lime, cement, or import wet weather structural fill.

For this purpose, we recommend importing a granular soil that meets the following grading requirements:

U.S. Sieve Size	Percent Passing
6 inches	100
No. 4	75 maximum
No. 200	5 maximum*

*Based on the 3/4-inch fraction

Prior to use, Terra Associates, Inc. should examine and test all materials to be imported to the site for use as structural fill. If building subgrades were constructed using native soils and will be exposed during wet weather, it would be advisable to place 12 inches of this granular structural fill on the building pad to prevent deterioration of the floor subgrade.

Structural fill should be placed in uniform loose layers not exceeding 12 inches and compacted to a minimum of 95 percent of the soil's maximum dry density, as determined by American Society for Testing and Materials (ASTM) Test Designation D-698 (Standard Proctor). The moisture content of the soil at the time of compaction should be within two percent of its optimum, as determined by this same ASTM standard. In nonstructural areas the degree of compaction can be reduced to 90 percent.

4.3 Preload

We recommend preloading the building areas to limit building and floor slab settlements to tolerable levels. For this procedure, we recommend placing structural fill in the building areas to the design floor elevation, and delaying building construction until settlement under this fill load has occurred. The preload fill should extend a minimum of five feet beyond the building perimeter. A minimum of three feet of fill should be placed. If this fill depth exceeds that required to achieve design floor grade, the surplus depth would be treated as a surcharge and removed following completion of settlement as indicated by survey readings at settlement markers as discussed below.

Total settlement under the building fill is estimated in the range of one to three inches. These settlements are expected to occur in about three to four weeks following full application of the building fill.

To verify the amount of settlement and the time rate of movement, the preload program should be monitored by installing settlement markers. The settlement markers should be installed on the existing grade prior to placing any building or preload fills. Once installed, elevations of both the fill height and marker should be taken daily until the full height of the preload is in place. Once fully preloaded, readings should continue weekly until the anticipated settlements have occurred. A typical settlement marker detail is provided as Figure 3.

It is critical that the grading contractor recognize the importance of the settlement marker installations. All efforts must be made to protect the markers from damage during fill placement. It is difficult, if not impossible, to evaluate the progress of the preload program if the markers are damaged or destroyed by construction equipment. As a result, it may be necessary to install new markers and extend the surcharging time period in order to ensure that settlements have ceased and building construction can begin.

Following the successful completion of the preload program, with foundations designed as recommended in Section 4.5 of this report, you should expect maximum total and differential post-construction static settlements of 0.5 inches for perimeter foundations and 1 inch for interior columns.

4.4 Excavations

All excavations at the site associated with confined spaces, such as lower building level retaining walls, must be completed in accordance with local, state, or federal requirements. Based on current Washington Industrial Safety and Health Act (WISHA) regulations, the site soils would be classified as a Type C soil.

For properly dewatered excavations in Type C soils that are greater than 4 feet and less than 20 feet in depth, the side slopes should be laid back at an inclination of 1.5:1 (Horizontal:Vertical) or flatter. If there is insufficient room to complete the excavations in this manner, or if excavations greater than 20 feet in depth are planned, using temporary shoring to support the excavations may need to be considered.

Based on our study, groundwater seepage should be anticipated within excavations extending below depths of about two and one-half to five feet. Excavations extending below these depths will likely encounter groundwater seepage with volumes and flow rates sufficient to require some level of dewatering. Shallow excavations that do not extend more than two feet below the groundwater table can likely be dewatered by conventional sump-pumping procedures along with a system of collection trenches. Deeper excavations will likely require dewatering by well points or isolated deep-pump wells. The utility subcontractor should be prepared to implement excavation dewatering by well point or deep-pump wells, as needed. This will be an especially critical consideration for any deep excavations such as stormwater detention vaults, lift stations, and sanitary sewer tie-ins.

This information is provided solely for the benefit of the owner and other design consultants and should not be construed to imply that Terra Associates, Inc. assumes responsibility for job site safety. It is understood that job site safety is the sole responsibility of the project contractor.

4.5 Foundations

In our opinion, following the completion of a successful preload program, the building may be supported on conventional spread footing foundations bearing on a minimum of 2 feet of structural fill placed and compacted as recommended in Section 4.2 of this report. Foundations exposed to the weather should bear at a minimum depth of one and one-half feet below adjacent grades for frost protection.

We recommend designing foundations for a net allowable bearing capacity of 2,500 pounds per square foot (psf). For short-term loads, such as wind and seismic, a one-third increase in this allowable capacity can be used. With the expected building loads and this bearing stress applied, in general, total and differential settlements should not exceed 0.5 inches for perimeter foundations and 1 inch for interior column supports.

For designing foundations to resist lateral loads, a base friction coefficient of 0.35 can be used. Passive earth pressures acting on the sides of the footings can also be considered. We recommend calculating this lateral resistance using an equivalent fluid weight of 300 pounds per cubic foot (pcf). We do not recommend including the upper 12 inches of soil in this computation because it can be affected by weather or disturbed by future grading activity. This value assumes the foundation will be constructed neat against competent native soil or backfilled with structural fill, as described in Section 4.2 of this report. The values recommended include a safety factor of 1.5.

4.6 Lateral Earth Pressures for Retaining Walls

The magnitude of earth pressure development on below-grade walls, such as basement or retaining walls, will partly depend upon the quality of the wall backfill. We recommend placing and compacting wall backfill as structural fill as described in Section 4.2 of this report. To guard against hydrostatic pressure development, drainage must be installed behind the wall. A typical wall drainage detail is shown on Figure 4.

With wall backfill placed and compacted as recommended and drainage properly installed, unrestrained walls can be designed for an active earth pressure equivalent to a fluid weighing 35 pcf. For restrained walls, an additional uniform lateral pressure of 100 psf should be included. For evaluating the walls under seismic loading, a uniform earth pressure equivalent to 8H psf, where H is the height of the retained earth in feet, can be used. These values assume a horizontal backfill condition and that no other surcharge loading, such as traffic, sloping embankments, or adjacent buildings, will act on the wall. If such conditions exist, then the imposed loading must be included in the wall design.

Friction at the base of the wall foundation and passive earth pressure will provide resistance to these lateral loads. Values for these parameters are provided in Section 4.5.

4.7 Slab-on-Grade Floors

Slab-on-grade floors may be supported on subgrades prepared as recommended in Section 4.2 of this report. Immediately below the floor slabs, we recommend placing a 4-inch thick capillary break layer of clean, free-draining, coarse sand or fine gravel that has less than 5 percent passing the No. 200 sieve. This material will reduce the potential for upward capillary movement of water through the underlying soil and subsequent wetting of the floor slabs.

The capillary break layer will not prevent moisture intrusion through the slab caused by water vapor transmission. Where moisture by vapor transmission is undesirable, such as covered floor areas, a common practice is to place a durable plastic membrane on the capillary break layer and then cover the membrane with a layer of clean sand or fine gravel to protect it from damage during construction, and aid in uniform curing of the concrete slab.

It should be noted that if the sand or gravel layer overlying the membrane is saturated prior to pouring the slab, it will be ineffective in assisting in uniform curing of the slab and can actually serve as a water supply for moisture transmission through the slab and affecting floor coverings. Therefore, in our opinion, covering the membrane with a layer of sand or gravel should be avoided if floor slab construction occurs during the wet winter months and the layer cannot be effectively drained. We recommend floor designers and contractors refer to the American Concrete Institute (ACI) Manual of Concrete Practice for further information regarding vapor barrier installation below slab-on-grade floors.

For design of the floor slabs on grade, a subgrade modulus (k_s) of 100 pounds per cubic inch (pci) can be used.

4.8 Drainage

Surface

Final exterior grades should promote free and positive drainage away from the building at all times. Water must not be allowed to pond or collect adjacent to foundations or within the immediate building area. We recommend providing positive gradient away from the building perimeter.

Subsurface

We expect that building floor elevations will be above existing surface grades and that permanent hard surfaces will extend to the building over most of its perimeter. With these conditions, it is our opinion that building foundation drains would not be required. However, footing drains associated with retaining wall drainage, such as loading dock walls should be installed. Foundation drains should also be installed where landscaping is adjacent to the building.

4.9 Infiltration Feasibility

Based on the shallow seasonal water table and the fine-grained nature of the soils observed across the site, it is our opinion that infiltration is not a feasible option for stormwater management.

4.10 Utilities

Utility pipes should be bedded and backfilled in accordance with American Public Works Associates (APWA) or local jurisdictional specifications. At a minimum, trench backfill should be placed and compacted as structural fill as described in Section 4.2 of this report. At the time of our study, soil moisture contents were generally above optimum; therefore, drying back or other means to condition the material will probably be necessary to facilitate proper compaction. If utility construction takes place during the winter, it may be necessary to import suitable wet weather fill for utility trench backfilling.

For any structure installed below a depth of approximately two and one-half feet, buoyancy effects must be considered. Buoyancy or uplift will be resisted by the weight of the structure and the weight of the soil overlying its foundation or cover. For backfill placed as structural fill, a soil unit weight of 110 pcf can be used.

Buoyancy, or an unbalanced hydrostatic head, will also impact the trench bottom stability. Where an unbalanced hydrostatic head exists in the trench excavation, the trench bottom can heave and, subsequently, become unstable causing installed utility pipes to settle when overburdened stresses from utility trench backfill are replaced.

Two methods for stabilizing the trench bottoms can be considered. The first involves using well point dewatering systems to lower the groundwater table adjacent to utility excavation and prevent development of an unbalanced hydrostatic head. Single-stage well point dewatering systems are typically effective for utility excavations occurring to depths of 15 to 20 feet.

The second method that can be used to mitigate heave or unstable soil conditions at the trench bottom involves overexcavation of the affected soils and replacement with additional free-draining bedding material. As a general rule, the depth of overexcavation below the pipe invert and replacement with free-draining bedding material would be equivalent to one foot for every two feet of unbalanced hydrostatic head.

4.11 Pavements

Pavements should be constructed on subgrades prepared as recommended in Section 4.2 of this report. Regardless of the degree of relative compaction achieved, the subgrade must be firm and relatively unyielding before paving. Proofrolling the subgrade with heavy construction equipment should be completed to verify this condition.

The pavement design section is dependent upon the supporting capability of the subgrade soils and the traffic conditions to which it will be subjected. We expect traffic at the facility will consist of cars and light trucks, along with heavy traffic in the form of tractor-trailer-rigs. For design considerations, we have assumed traffic in parking and in car/light truck access pavement areas can be represented by an 18-kip Equivalent Single Axle Loading (ESAL) of 50,000 over a 20-year design life. For heavy traffic pavement areas, we have assumed an ESAL of 300,000 would be representative of the expected loading. These ESALs represent loading approximately equivalent to 3 and 18, loaded (80,000-pound GVW) tractor-trailer rigs traversing the pavement daily in each area, respectively.

With a stable subgrade prepared as recommended, for the design ESAL values, we recommend the following pavement sections:

Light Traffic/Car Access:

- 2 inches of hot mix asphalt (HMA) over 6 inches of crushed rock surfacing (CRS).
- 4 inches full depth HMA.

Heavy Traffic/Truck Access:

- 3 inches of HMA over 8 inches of CRS.
- 6 inches full depth HMA.

For exterior Portland cement concrete (PCC) pavement, we recommend the following:

- 6 inches of PCC over 2 inches of CRS.
    - 28-day compressive strength – 4,000 psi.
    - Control joints spaced at a maximum of 15 feet.

Soil cement stabilization or constructing a soil cement base for support of the pavement section can also be considered as an alternate to the above conventional pavement sections. Assuming a properly constructed soil cement base having a minimum thickness of 12 inches and a minimum 7-day compressive strength of 100 pounds per square inch (psi), the following pavement sections are recommended:

Light Traffic/Car Access:

- 2 inches of HMA over 12 inches of soil cement base (SCB).

Heavy Traffic/Truck Access:

- 3 inches of HMA over 12 inches of SCB.
- 6 inches of PCC over 12 inches of SCB.

The design of the soil cement base should be completed using samples of the subgrade exposed at the time of construction.

The paving materials used should conform to the Washington State Department of Transportation (WSDOT) specifications for ½-inch class HMA and CRS.

Long-term pavement performance will depend upon surface drainage. A poorly-drained pavement section will be subject to premature failure as a result of surface water infiltrating into the subgrade soils and reducing their supporting capability. For optimum pavement performance, we recommend surface drainage gradients of at least two percent. Some degree of longitudinal and transverse cracking of the pavement surface should be expected over time. Regular maintenance should be planned to seal cracks when they occur.

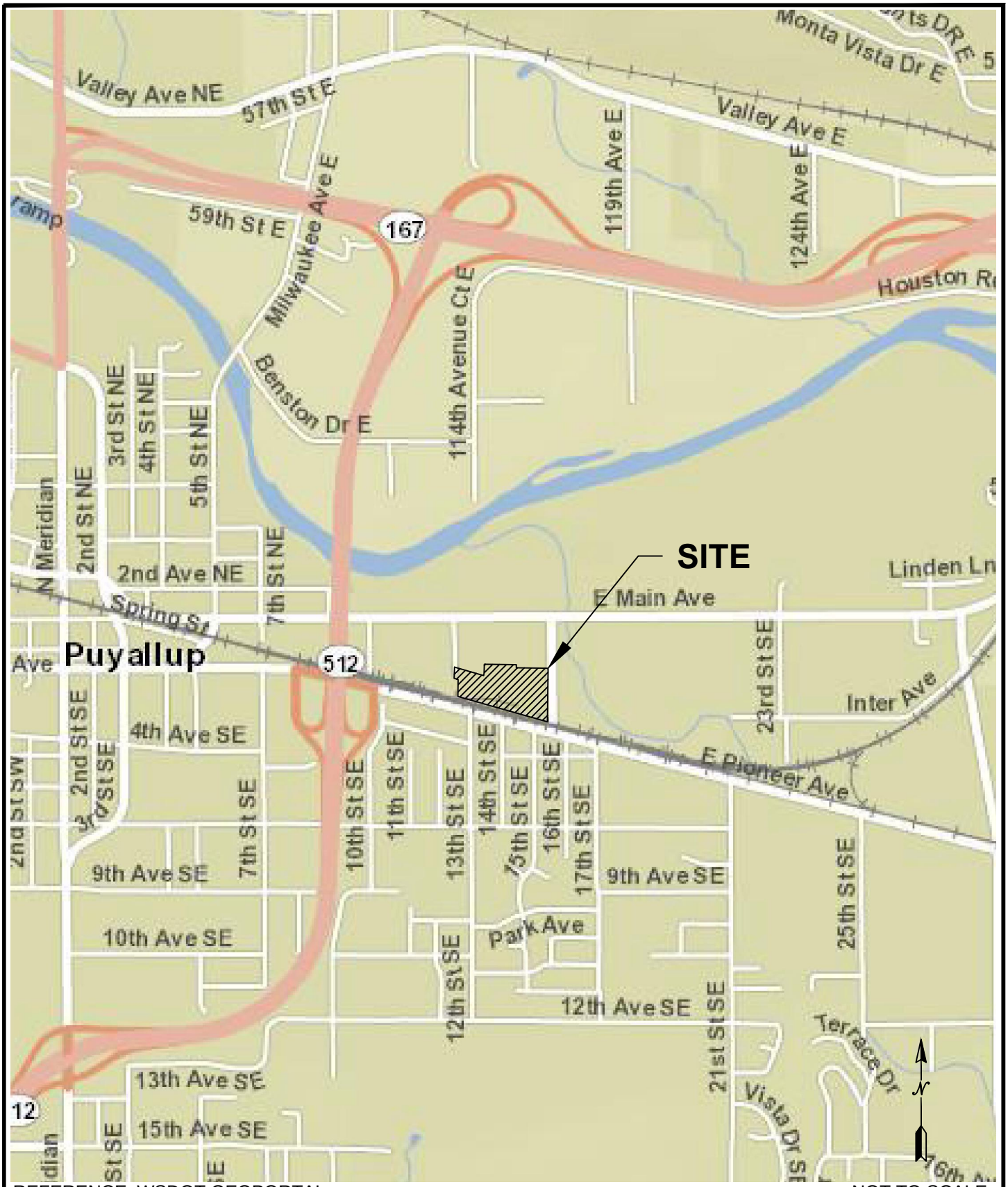
5.0 ADDITIONAL SERVICES

Terra Associates, Inc. should review the final design and specifications in order to verify that earthwork recommendations have been properly interpreted and incorporated into project design and construction. We should also provide geotechnical services during construction in order to observe compliance with the design concepts, specifications, and recommendations. This will allow for design changes if subsurface conditions differ from those anticipated prior to the start of construction.

6.0 LIMITATIONS

We prepared this report in accordance with generally accepted geotechnical engineering practices. This report is the property of Terra Associates, Inc. and is intended for specific application to the 240 – 15th Street SE Industrial project in Puyallup, Washington. This report is for the exclusive use of Fortress, LLC, and its authorized representatives.

The analyses and recommendations presented in this report are based upon data obtained from the subsurface explorations completed onsite. Variations in soil conditions can occur, the nature and extent of which may not become evident until construction. If variations appear evident, Terra Associates, Inc. should be requested to reevaluate the recommendations in this report prior to proceeding with construction.



REFERENCE: WSDOT GEOPORTAL

NOT TO SCALE

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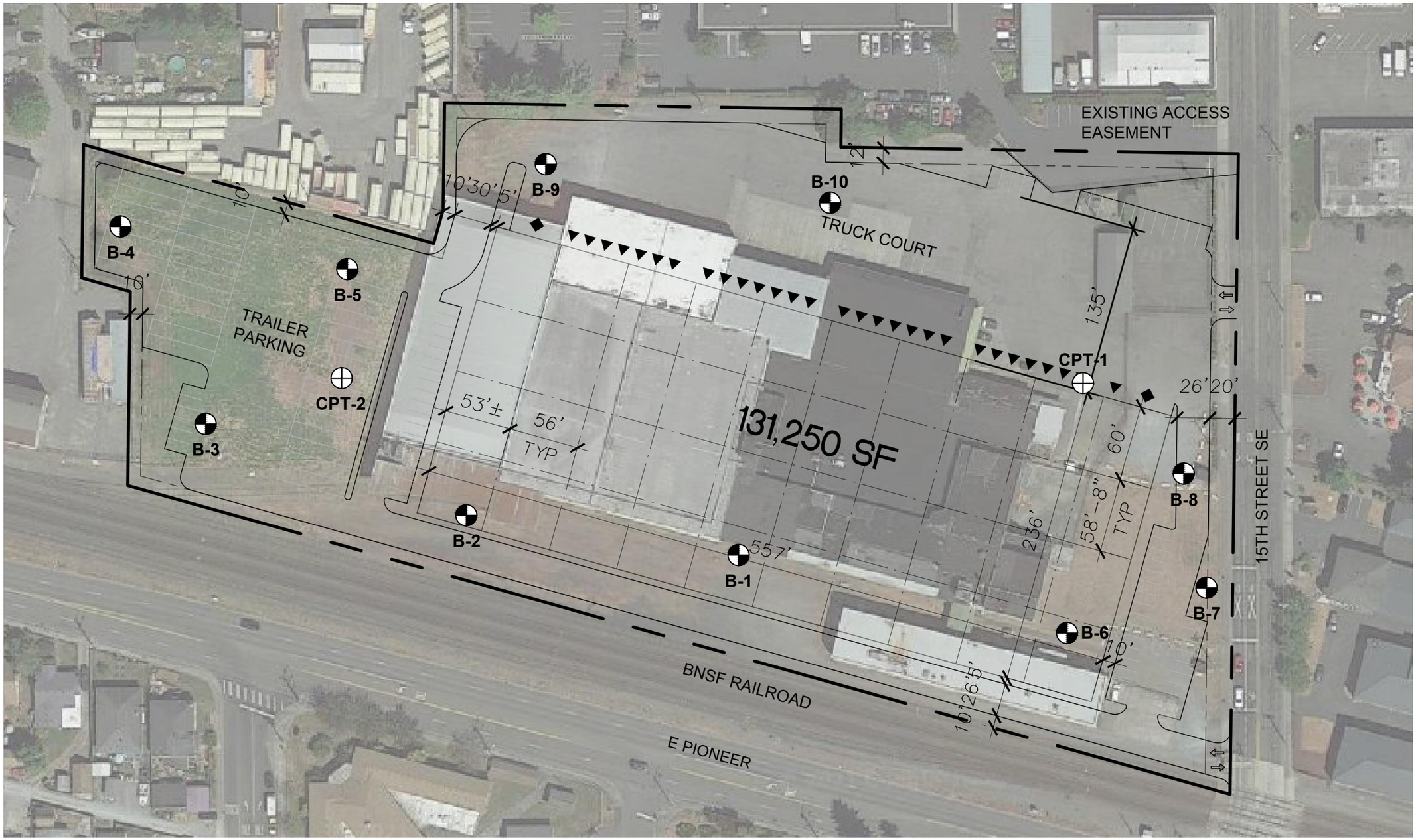
VICINITY MAP
240 - 15TH STREET SE INDUSTRIAL
PUYALLUP, WASHINGTON

Proj. No.T-8661	Date JUNE 2023	Figure 1



NOTE:

THIS SITE PLAN IS SCHEMATIC. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE. IT IS INTENDED FOR REFERENCE ONLY AND SHOULD NOT BE USED FOR DESIGN OR CONSTRUCTION PURPOSES.

REFERENCE:

MACKENZIE

LEGEND:

APPROXIMATE BORING LOCATION

APPROXIMATE CPT LOCATION

N

0 80 160

APPROXIMATE SCALE IN FEET

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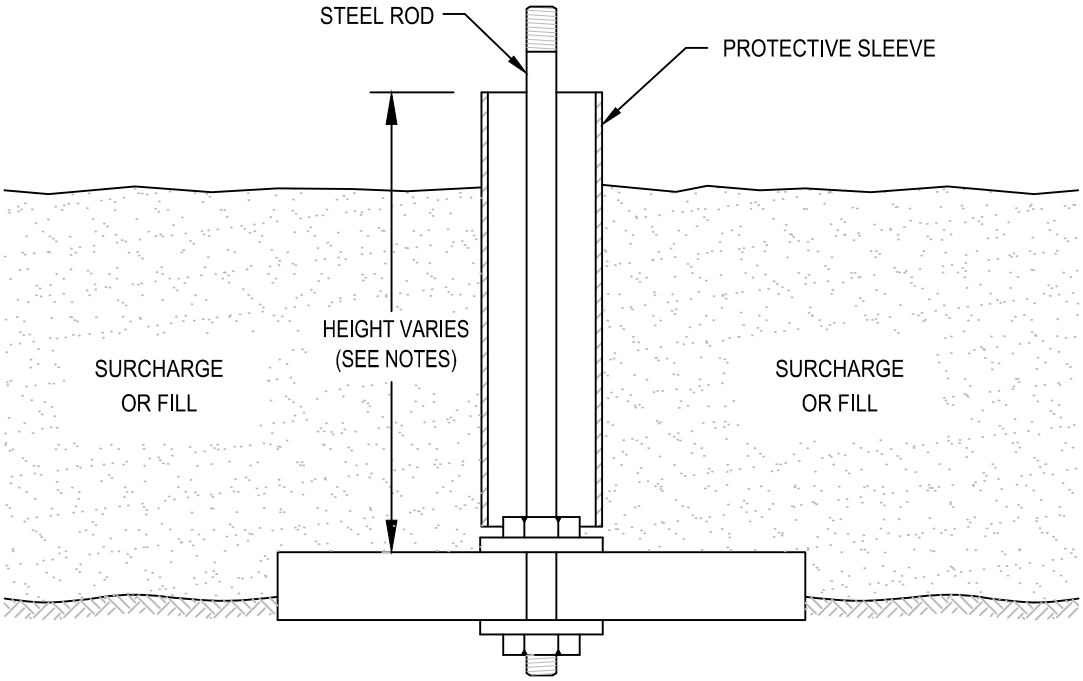
EXPLORATION LOCATION PLAN
240 - 15TH STREET SE INDUSTRIAL
PUYALLUP, WASHINGTON

Proj. No.T-8661	Date JUNE 2023	Figure 2



NOT TO SCALE

NOTES:

1. BASE CONSISTS OF 3/4" THICK, 2'x2' PLYWOOD WITH CENTER DRILLED 5/8" DIAMETER HOLE.
2. BEDDING MATERIAL, IF REQUIRED, SHOULD CONSIST OF CLEAN COARSE SAND.
3. MARKER ROD IS 1/2" DIAMETER STEEL ROD THREADED AT BOTH ENDS.
4. MARKER ROD IS ATTACHED TO BASE BY NUT AND WASHER ON EACH SIDE OF BASE.
5. PROTECTIVE SLEEVE SURROUNDING MARKER ROD SHOULD CONSIST OF 2" DIAMETER PLASTIC TUBING. SLEEVE IS NOT ATTACHED TO ROD OR BASE.
6. ADDITIONAL SECTIONS OF STEEL ROD CAN BE CONNECTED WITH THREADED COUPLINGS.
7. ADDITIONAL SECTIONS OF PLASTIC PROTECTIVE SLEEVE CAN BE CONNECTED WITH PRESS-FIT PLASTIC COUPLINGS.
8. STEEL MARKER ROD SHOULD EXTEND AT LEAST 6" ABOVE TOP OF PLASTIC PROTECTIVE SLEEVE.
9. PLASTIC PROTECTIVE SLEEVE SHOULD EXTEND AT LEAST 1" ABOVE TOP OF FILL SURFACE.

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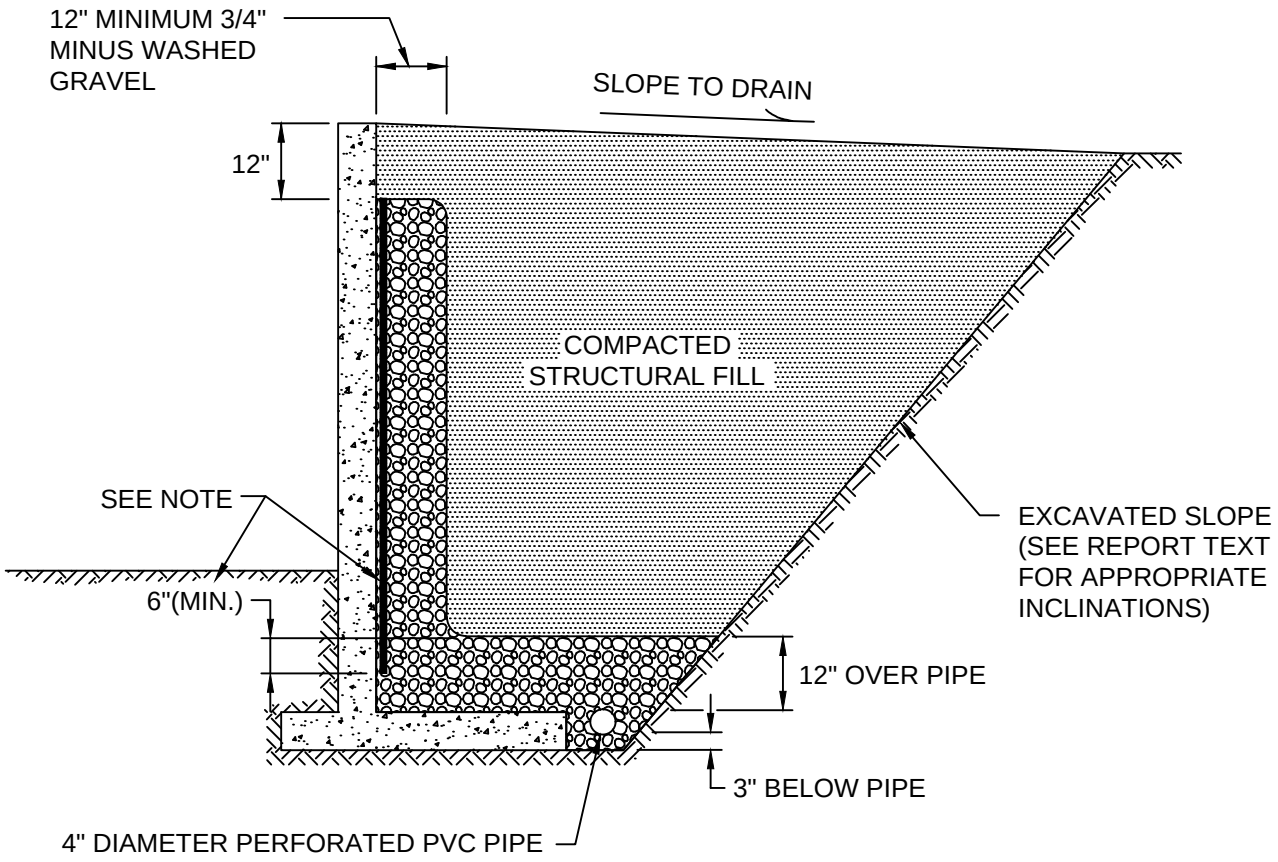
TYPICAL SETTLEMENT MARKER DETAIL
240 - 15TH STREET SE INDUSTRIAL
PUYALLUP, WASHINGTON

Proj. No.T-8661	Date JUNE 2023	Figure 3



NOT TO SCALE

NOTE:

MIRADRAIN G100N PREFABRICATED DRAINAGE PANELS OR SIMILAR PRODUCT CAN BE SUBSTITUTED FOR THE 12-INCH WIDE GRAVEL DRAIN BEHIND WALL. DRAINAGE PANELS SHOULD EXTEND A MINIMUM OF SIX INCHES INTO 12-INCH THICK DRAINAGE GRAVEL LAYER OVER PERFORATED DRAIN PIPE.

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TYPICAL WALL DRAINAGE DETAIL
240 - 15TH STREET SE INDUSTRIAL
PUYALLUP, WASHINGTON

Proj. No.T-8661	Date JUNE 2023	Figure 4

APPENDIX A

FIELD EXPLORATION AND LABORATORY TESTING

240 – 15th Street SE Industrial
Puyallup, Washington

We explored subsurface conditions at the site by drilling six 31.5-foot deep test borings and four 6.5-foot deep test borings with a track-mounted drill rig using hollow-stem auger drilling methods, and by conducting two cone penetration tests (CPTs) to maximum depths of about 60 feet and about 84 feet. The test boring and CPT locations were approximately determined in the field by pacing and sighting from existing site features. The test boring and CPT locations are shown on Figure 2. The Boring Logs are presented as Figures A-2 through A-11.

An engineering geologist from our office conducted the field exploration. Our representative classified the soil conditions encountered, maintained a log of each boring, obtained representative soil samples, and recorded groundwater levels observed during drilling. Soil samples were obtained during drilling in general accordance with ASTM Test Designation D-1586. Using this procedure, a 2-inch (outside diameter) split barrel sampler is driven into the ground 18 inches using a 140-pound hammer free falling a height of 30 inches the number of blows required to drive the sampler 12 inches after an initial 6-inch set is referred to as the Standard Penetration Resistance value or N value. This is an index related to the consistency of cohesive soils and relative density of cohesionless materials. N values obtained for each sampling interval are recorded on the Boring Logs. All soil samples were visually classified in accordance with the Unified Soil Classification System (USCS) described on Figure A-1.

Representative soil samples obtained from the test borings were placed in sealed plastic bags and taken to our laboratory for further examination and testing. The moisture content of each sample was measured and is reported on the Boring Logs. Grain size analyses were performed on eight soil samples. The results are shown on Figures A-12 through A-14.

In Situ Engineering, under subcontract to Terra Associates, Inc., performed the CPTs at locations selected by Terra Associates, Inc. The CPT consists of pushing an instrumented, approximately one and one-half inch diameter cone into the ground at a constant rate. During advancement, continuous measurements are made of the resistance to penetration of the cone and the friction of the outer surface of a sleeve. The cone is also equipped with a porous filter and a pressure transducer for measuring the generated groundwater or pore water pressure. Measurements of tip and sleeve frictional resistance, pore pressure, and interpreted soil conditions are summarized in graphical form on the attached CPT Logs.

MAJOR DIVISIONS			LETTER SYMBOL	TYPICAL DESCRIPTION
COARSE GRAINED SOILS More than 50% material larger than No. 200 sieve size	**GRAVELS** More than 50% of coarse fraction is larger than No. 4 sieve	Clean Gravels (less than 5% fines)	GW	Well-graded gravels, gravel-sand mixtures, little or no fines.
			GP	Poorly-graded gravels, gravel-sand mixtures, little or no fines.
		Gravels with fines	GM	Silty gravels, gravel-sand-silt mixtures, non-plastic fines.
			GC	Clayey gravels, gravel-sand-clay mixtures, plastic fines.
	SANDS More than 50% of coarse fraction is smaller than No. 4 sieve	Clean Sands (less than 5% fines)	SW	Well-graded sands, sands with gravel, little or no fines.
			SP	Poorly-graded sands, sands with gravel, little or no fines.
		Sands with fines	SM	Silty sands, sand-silt mixtures, non-plastic fines.
			SC	Clayey sands, sand-clay mixtures, plastic fines.
FINE GRAINED SOILS More than 50% material smaller than No. 200 sieve size	**SILTS AND CLAYS** Liquid Limit is less than 50%		ML	Inorganic silts, rock flour, clayey silts with slight plasticity.
			CL	Inorganic clays of low to medium plasticity. (Lean clay)
			OL	Organic silts and organic clays of low plasticity.
	SILTS AND CLAYS Liquid Limit is greater than 50%		MH	Inorganic silts, elastic.
			CH	Inorganic clays of high plasticity. (Fat clay)
			OH	Organic clays of high plasticity.
HIGHLY ORGANIC SOILS			PT	Peat.

DEFINITION OF TERMS AND SYMBOLS

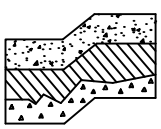
COHESIONLESS

Density	Standard Penetration Resistance in Blows/Foot
Very Loose	0-4
Loose	4-10
Medium Dense	10-30
Dense	30-50
Very Dense	>50

COHESIVE

Consistancy	Standard Penetration Resistance in Blows/Foot
Very Soft	0-2
Soft	2-4
Medium Stiff	4-8
Stiff	8-16
Very Stiff	16-32
Hard	>32

I	2" OUTSIDE DIAMETER SPILT SPOON SAMPLER
‖	2.4" INSIDE DIAMETER RING SAMPLER OR SHELBY TUBE SAMPLER
▼	WATER LEVEL (Date)
Tr	TORVANE READINGS, tsf
Pp	PENETROMETER READING, tsf
DD	DRY DENSITY, pounds per cubic foot
LL	LIQUID LIMIT, percent
PI	PLASTIC INDEX
N	STANDARD PENETRATION, blows per foot



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UNIFIED SOIL CLASSIFICATION SYSTEM
240 - 15TH STREET SE INDUSTRIAL
PUYALLUP, WASHINGTON

Proj. No.T-8661	Date JUNE 2023	Figure A-1

LOG OF BORING NO. 1

Figure No. A-2

Project: 240 - 15th Street SE Industrial **Project No:** T-8661 **Date Drilled:** November 30, 2021

Client: Fortress, LLC **Driller:** Boretec1 **Logged By:** JCS

Location: Puyallup, Washington **Depth to Groundwater:** 5 ft **Approx. Elev:** NA

Depth (ft)	Soil Description	Consistency/ Relative Density	SPT (N) Blows/foot	Moisture Content (%)
0	Dark brown to gray-brown SAND, fine grained, moist. (SP)	Medium Dense	12	23.9
5	- Becomes fine to medium grained and wet below 5 feet.		10	24.3
	- Trace of brown silt seams and gray silt pockets below 8.5 feet.		12	23.7
10			12	23.9
	Dark gray-brown silty SAND, fine grained, wet, trace of dark brown fine organic particles and wood fragments. (SM)		22	35.4
15	Dark gray-brown sandy SILT, fine sand, wet. (ML)		12	30.1
	Dark gray-brown SAND, fine grained, wet, scattered layers containing numerous fine pumice fragments, trace of silt seams. (SP)		12	24.7
20	Dark gray-brown silty SAND to sandy SILT, fine sand, wet. (SM/ML)			
25	Dark gray-brown SAND, fine to medium grained, wet. (SP)		14	26.5
	Dark gray-brown SAND with silt to silty SAND, fine sand, wet, scattered brown silt seams, trace of wood fragments and gray-brown silt pockets. (SP-SM/SM)	Loose	6	64.8
30	Boring terminated at 31.5 feet. Groundwater encountered below 5 feet.			
35				

NOTE: This borehole log has been prepared for geotechnical purposes. This information pertains only to this boring location and should not be interpeted as being indicative of other areas of the site

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LOG OF BORING NO. 2

Figure No. A-3

Project: 240 - 15th Street SE Industrial **Project No:** T-8661 **Date Drilled:** November 30, 2021

Client: Fortress, LLC **Driller:** Boretec1 **Logged By:** JCS

Location: Puyallup, Washington **Depth to Groundwater:** 5 ft **Approx. Elev:** NA

Depth (ft)	Soil Description	Consistency/ Relative Density	SPT (N) Blows/foot	Moisture Content (%)
0	Dark brown to dark gray-brown SAND, fine grained, moist, scattered silty fine sand seams and layers. (SP)	Loose	9	27.2
▼ 5	- Becomes wet below 5 feet.		10	26.4
	- Numerous silty fine sand seams and trace of dark brown organic partings and seams below 8 feet.		12	31.6
10			13	25.7
			27	
	Dark gray-brown silty SAND, fine grained, wet. (SM)			29.1
15	Interbedded dark gray-brown silty fine SAND to fine sandy SILT and fine to medium grained SAND, wet, trace of fine dark brown organic fragments. (SM/ML and SP)	Medium Dense	15	33.9
20	Dark gray-brown SAND, fine grained, wet, numerous fine pumice fragments. (SP)		12	27.4
	Dark gray SILT, wet, trace of fine black organic fragments. (ML)			
25			13	39.4
	Dark gray-brown silty SAND, fine grained, wet. (SM)			25.7
	Dark gray-brown SAND, fine grained, wet. (SP)	Loose		
30			6	31.0
	Dark gray-brown SILT, wet. (ML)			
	Boring terminated at 31.5 feet. Groundwater encountered below 5 feet.			
35				
40				

NOTE: This borehole log has been prepared for geotechnical purposes. This information pertains only to this boring location and should not be interpeted as being indicative of other areas of the site

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LOG OF BORING NO. 3

Figure No. A-4

Project: 240 - 15th Street SE Industrial **Project No:** T-8661 **Date Drilled:** November 30, 2021

Client: Fortress, LLC **Driller:** Boretec1 **Logged By:** JCS

Location: Puyallup, Washington **Depth to Groundwater:** 3 ft **Approx. Elev:** NA

Depth (ft)	Sample Interval	Soil Description	Consistency/ Relative Density	SPT (N) Blows/foot (10 / 30 / 50)	Moisture Content (%)
0		Dark gray-brown SAND with silt, fine grained, moist (wet below 3 feet), trace of gray silty fine sand layers, mottled above 3 feet. (SP-SM)	Medium Dense	11	25.2
5		- Scattered iron-oxide stained pockets below 5 feet.	Loose	9	28.8
		Dark gray SILT, wet. (ML)			
		Boring terminated at 6.5 feet. Groundwater encountered below about 3 feet.			
10					

NOTE: This borehole log has been prepared for geotechnical purposes. This information pertains only to this boring location and should not be interpeted as being indicative of other areas of the site

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Environmental Earth Sciences

LOG OF BORING NO. 4

Figure No. A-5

Project: 240 - 15th Street SE Industrial **Project No:** T-8661 **Date Drilled:** November 30, 2021

Client: Fortress, LLC **Driller:** Boretec1 **Logged By:** JCS

Location: Puyallup, Washington **Depth to Groundwater:** 2.5 ft **Approx. Elev:** NA

Depth (ft)	Sample Interval	Soil Description	Consistency/ Relative Density	SPT (N) Blows/foot (10 / 30 / 50)	Moisture Content (%)
0					
▼		Dark gray-brown SAND, fine to medium grained, wet. (SP)	Loose	• 8	25.5
5				• 5	
		Dark gray-brown SILT to sandy SILT, fine sand, wet, coarse wood fragment at 6.5 feet. (ML)			44.0
		Boring terminated at 6.5 feet. Groundwater encountered below about 2.5 feet.			
10					

NOTE: This borehole log has been prepared for geotechnical purposes. This information pertains only to this boring location and should not be interpeted as being indicative of other areas of the site

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Environmental Earth Sciences

LOG OF BORING NO. 5

Figure No. A-6

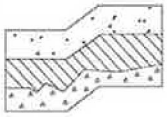
Project: 240 - 15th Street SE Industrial **Project No:** T-8661 **Date Drilled:** November 30, 2021

Client: Fortress, LLC **Driller:** Boretec1 **Logged By:** JCS

Location: Puyallup, Washington **Depth to Groundwater:** 2.5 ft **Approx. Elev:** NA

Depth (ft)	Sample Interval	Soil Description	Consistency/ Relative Density	SPT (N) Blows/foot (10 / 30 / 50)	Moisture Content (%)
0					
▼		No recovery at 2.5 feet. Sampler wet.	Medium Dense	21	
		Dark gray-brown SAND, fine to medium grained, wet. (SP)		13	22.2
5		Boring terminated at 6.5 feet. Groundwater encountered below about 2.5 feet.			
10					

NOTE: This borehole log has been prepared for geotechnical purposes. This information pertains only to this boring location and should not be interpeted as being indicative of other areas of the site



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LOG OF BORING NO. 6

Figure No. A-7

Project: 240 - 15th Street SE Industrial **Project No:** T-8661 **Date Drilled:** November 30, 2021

Client: Fortress, LLC **Driller:** Boretec1 **Logged By:** JCS

Location: Puyallup, Washington **Depth to Groundwater:** 5 ft **Approx. Elev:** NA

Depth (ft)	Soil Description	Consistency/ Relative Density	SPT (N) Blows/foot	Moisture Content (%)
0	Dark brown SAND, fine grained, moist. (SP)		12	23.8
5 ▼	Dark gray-brown SAND to SAND with silt, fine to medium grained, wet. (SP/SP-SM)		10	24.1
			10	23.2
10		Medium Dense	10	21.6
			29	26.1
	Dark gray-brown silty SAND, fine grained, wet. (SM)		10	23.4
15	Interbedded dark gray-brown fine to medium SAND and silty fine SAND, wet. (SP and SM)			25.6
	Dark gray SILT, wet, wood fragments in tip of sampler. (ML)			
20	Dark gray SAND to SAND with silt, fine grained, wet, numerous fine pumice fragments. (SP/SP-SM)		22	27.6
25	Interbedded dark gray-brown fine SAND and gray SILT, wet, trace of wood fragments. (SP and ML)	Loose	7	31.6
30	Dark gray SAND, fine grained, wet. (SP)	Medium Dense	25	25.4
	Boring terminated at 31.5 feet. Groundwater encountered below 5 feet.			
35				
40				

NOTE: This borehole log has been prepared for geotechnical purposes. This information pertains only to this boring location and should not be interpeted as being indicative of other areas of the site

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LOG OF BORING NO. 7

Figure No. A-8

Project: 240 - 15th Street SE Industrial **Project No:** T-8661 **Date Drilled:** November 30, 2021

Client: Fortress, LLC **Driller:** Boretec1 **Logged By:** JCS

Location: Puyallup, Washington **Depth to Groundwater:** 2.5 ft **Approx. Elev:** NA

Depth (ft)	Sample Interval	Soil Description	Consistency/ Relative Density	SPT (N) Blows/foot (10 / 30 / 50)	Moisture Content (%)
0					
▼		Fill: Dark brown silty SAND, fine grained, wet, numerous wood fragments. (SM)		• 9	
		Brown to gray-brown sandy SILT to silty SAND, fine grained, wet, mottled. (ML/SM)	Loose		30.8
5		Dark gray-brown SAND, fine grained, wet, scattered silty fine sand seams, trace of wood fragments. (SP)		• 8	25.2
		Boring terminated at 6.5 feet. Groundwater encountered below about 2.5 feet.			
10					

NOTE: This borehole log has been prepared for geotechnical purposes. This information pertains only to this boring location and should not be interpeted as being indicative of other areas of the site

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LOG OF BORING NO. 8

Figure No. A-9

Project: 240 - 15th Street SE Industrial **Project No:** T-8661 **Date Drilled:** November 30, 2021

Client: Fortress, LLC **Driller:** Boretec1 **Logged By:** JCS

Location: Puyallup, Washington **Depth to Groundwater:** 5 ft **Approx. Elev:** NA

Depth (ft)	Sample Interval	Soil Description	Consistency/ Relative Density	SPT (N) Blows / foot	Moisture Content (%)	Observ. Well
0		Gray-brown SAND with silt to silty SAND, fine grained, moist, mottled. (SP-SM/SM) (Possible fill)	Loose	6	21.1	
▼ 5		Dark brown SAND, fine grained, wet, numerous silty fine sand seams below 6 feet. (SP)		7	28.4	
		Dark gray-brown to dark gray SAND, fine to medium grained, wet, trace of fine to coarse gravel above 9 feet. (SP)	Medium Dense	15	20.0	
10		- Scattered brown silt pockets below 10 feet.		11	27.8	
		- Scattered wood fragments at 13 feet.		20	31.6	
15		Interbedded dark gray-brown fine SAND and gray SILT, wet. (SP and ML)		12	27.5	
		Gray sandy SILT, fine sand, moist to wet, trace of dark brown organic fragments. (ML)	Loose	9	38.2	
20		Dark gray-brown SAND, fine grained, wet. (SP)				
		Gray to gray-brown sandy SILT, fine sand, wet, trace of dark brown organic fragments. (ML)		6	36.1	
25		Dark gray SAND with silt to silty SAND, fine grained, wet, scattered gray silt seams. (SP-SM/SM)	Medium Dense	10	28.4	
30		Boring terminated at 31.5 feet. Groundwater encountered below 5 feet. Installed 2-inch diameter monitoring well to 30 feet. DOE Well ID - BMR-595				
35						
40						

NOTE: This borehole log has been prepared for geotechnical purposes. This information pertains only to this boring location and should not be interpeted as being indicative of other areas of the site

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Environmental Earth Sciences

LOG OF BORING NO. 9

Figure No. A-10

Project: 240 - 15th Street SE Industrial **Project No:** T-8661 **Date Drilled:** December 1, 2021

Client: Fortress, LLC **Driller:** Boretec1 **Logged By:** JCS

Location: Puyallup, Washington **Depth to Groundwater:** 5 ft **Approx. Elev:** NA

Depth (ft)	Sample Interval	Soil Description	Consistency/ Relative Density	SPT (N) Blows / foot (10 / 30 / 50)	Moisture Content (%)	Observ. Well
0		Brown silty SAND, fine grained, moist, scattered fine to coarse angular gravel. (SM) (Possible fill/disturbed)	Medium Dense	14	13.7	
5 ▼		Brown to dark gray-brown SAND, fine grained, moist (wet below 5.5 feet), scattered brown silt to silty fine sand seams and layers above 9 feet. (SP)		12	24.2	
				13	22.5	
10		- Trace of organic partings and fine pumice graines between 10 and 11.5 feet.		10	29.4	
		- Scattered brown silt seams below 12.5 feet.		28	28.4	
15		Interbedded dark gray-brown SAND and gray silty SAND to sandy SILT, fine sand, wet. (SP and SM/ML)	Loose	8	30.8	
20		Dark gray to green-gray SILT, wet, scattered dark gray-brown fine sand seams and layers. (ML)		9	33.9	
25			Medium Dense	13	35.9	
		Dark gray-brown SAND, fine grained, wet. (SP)			30.7	
30		- Scattered clayey silt layers between 30 and 30.5 feet.	Loose	5	30.4	
		Boring terminated at 31.5 feet. Groundwater encountered below 5 feet. Installed 2-inch diameter monitoring well to 30 feet. DOE Well ID - BMR-596				
35						
40						

NOTE: This borehole log has been prepared for geotechnical purposes. This information pertains only to this boring location and should not be interpeted as being indicative of other areas of the site

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Environmental Earth Sciences

LOG OF BORING NO. 10

Figure No. A-11

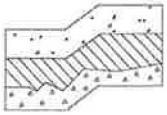
Project: 240 - 15th Street SE Industrial **Project No:** T-8661 **Date Drilled:** December 1, 2021

Client: Fortress, LLC **Driller:** Boretec1 **Logged By:** JCS

Location: Puyallup, Washington **Depth to Groundwater:** 5 ft **Approx. Elev:** NA

Depth (ft)	Soil Description	Consistency/ Relative Density	SPT (N) Blows/foot	Moisture Content (%)
0	Fill: Dark brown to tan silty SAND with gravel, fine sand, fine to coarse gravel, moist to wet, numerous wood shavings. (SM)	Medium Dense	11	16.0
5 ▼	Gray-brown SAND, fine grained, moist, mottled. (SP)	Loose	8	25.7
	Dark gray-brown SAND, fine grained, wet, mottled. (SP)		12	26.1
10	- 1-inch silt layer at 10.5 feet. - Trace of wood fragments below 10.5 feet		20	26.9
			11	27.6
15	Dark gray sandy SILT to silty SAND, fine sand, wet, trace of wood fragments. (ML/SM)		17	28.7
	Gray-brown SAND, fine to medium grained, wet, scattered fine pumice grains. (SP)	Medium Dense	12	21.6
20				
25	Interbedded gray SILT to sandy SILT and dark gray-brown SAND, fine sand, wet, trace of wood fragments. (ML and SP)		10	26.2
30			10	28.1
35	Boring terminated at 31.5 feet. Groundwater encountered below 5 feet.			
40				

NOTE: This borehole log has been prepared for geotechnical purposes. This information pertains only to this boring location and should not be interpeted as being indicative of other areas of the site



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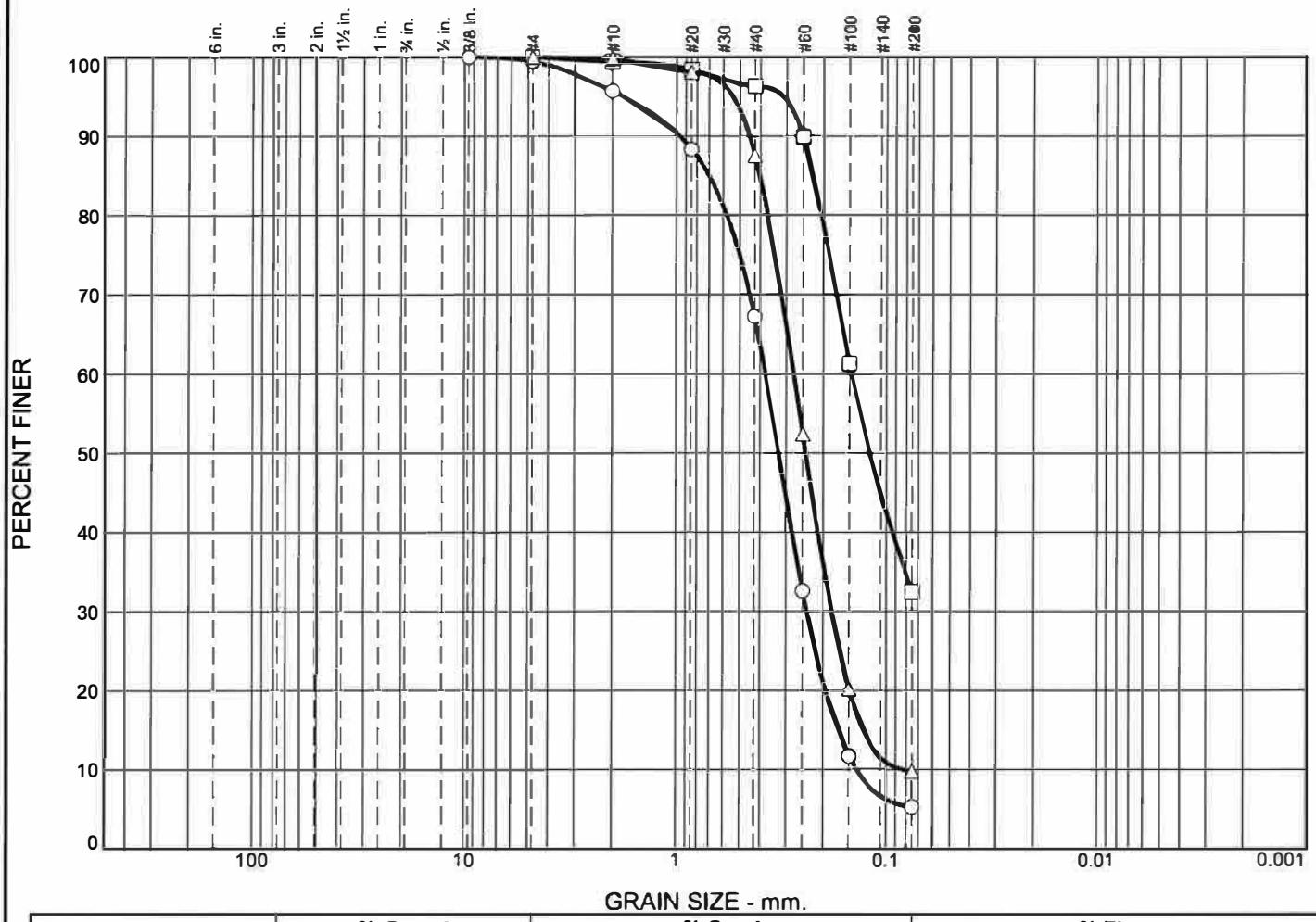
Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.6	3.7	28.5	61.9	5.3	
□	0.0	0.0	0.0	0.6	3.1	63.8	32.5	
△	0.0	0.0	0.0	0.2	12.2	77.8	9.8	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.7016	0.3770	0.3250	0.2390	0.1692	0.1384	1.09	2.72
□			0.2237	0.1466	0.1198					
△			0.4026	0.2764	0.2421	0.1812	0.1285	0.0836	1.42	3.31

	Material Description	USCS	AASHTO
○	SAND with silt	SP-SM	
□	silty SAND	SM	
△	SAND with silt	SP-SM	

Project No. T-8661 **Client:** Fortress,LLC

Project: 240 - 15 Street SE Industrial

○ **Location:** B-1 **Depth:** 5'

□ **Location:** B-1 **Depth:** 12.5'

△ **Location:** B-3 **Depth:** 2.5'

Remarks:

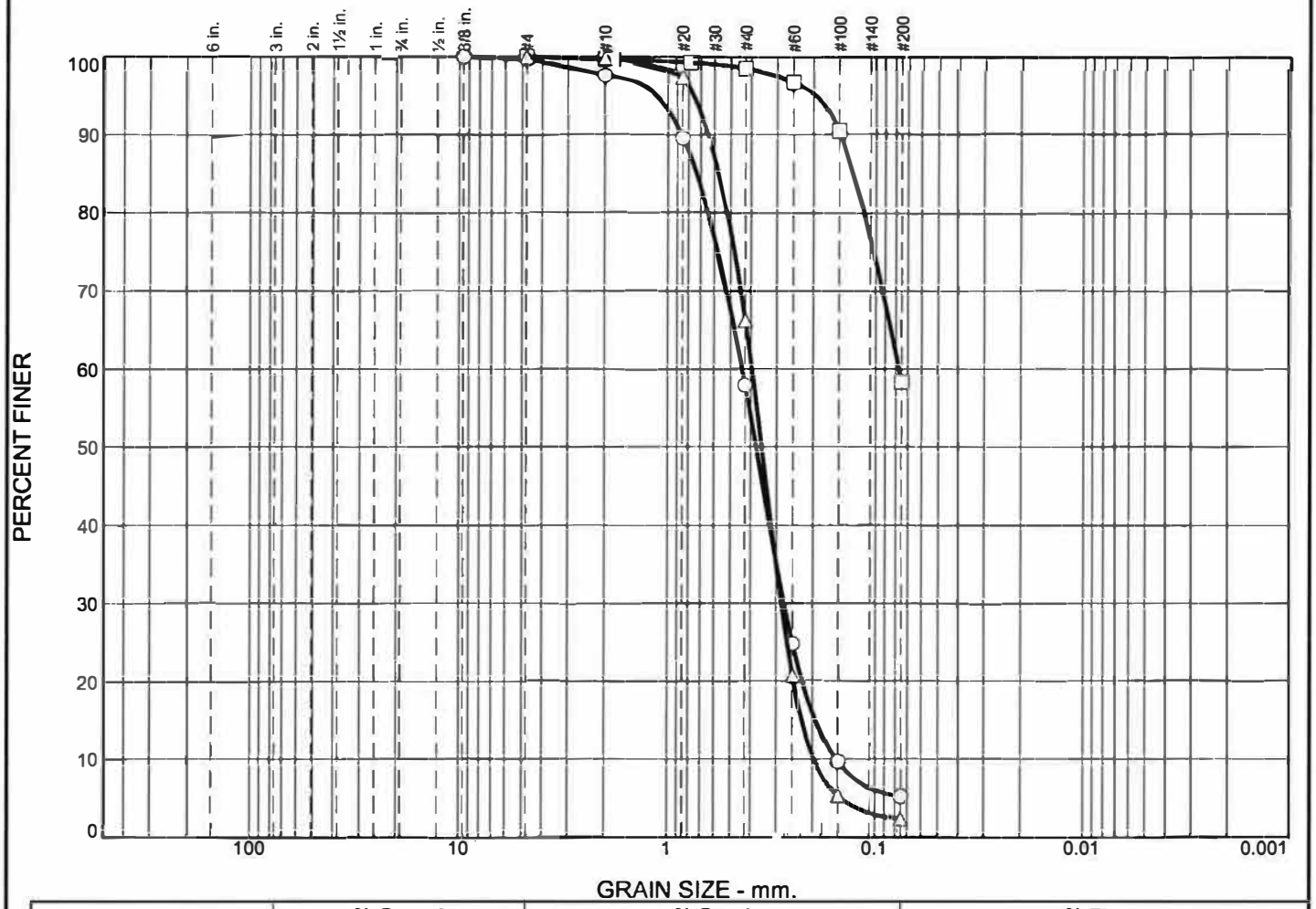
Terra Associates, Inc.

Kirkland, WA

Figure A-12

Tested By: FQ

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.3	2.1	39.7	52.6	5.3	
□	0.0	0.0	0.0	0.3	1.2	40.2	58.3	
△	0.0	0.0	0.0	0.2	33.6	63.8	2.4	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.7323	0.4396	0.3765	0.2755	0.1932	0.1530	1.13	2.87
□			0.1275	0.0773						
△			0.5722	0.3949	0.3538	0.2835	0.2252	0.1964	1.04	2.01

	Material Description	USCS	AASHTO
○	SAND with silt	SP-SM	
□	sandy SILT	ML	
△	SAND	SP	

Project No. T-8661 **Client:** Fortress,LLC

Project: 240 - 15 Street SE Industrial

○ **Location:** B-6 **Depth:** 7.5'

□ **Location:** B-7 **Depth:** 3'

△ **Location:** B-8 **Depth:** 10'

Remarks:

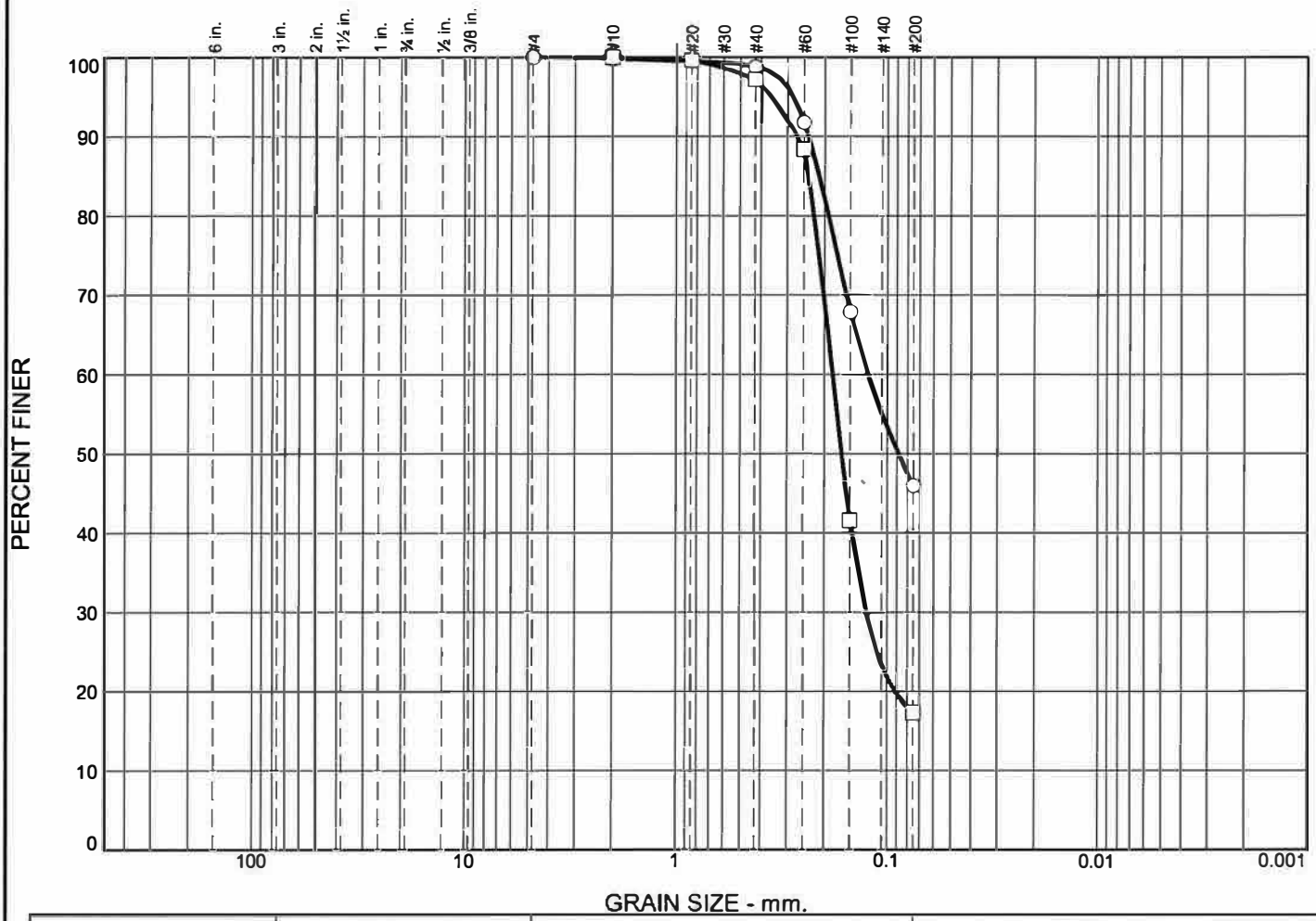
Terra Associates, Inc.

Kirkland, WA

Figure A-13

Tested By: FQ

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.2	1.0	52.8	46.0	
□	0.0	0.0	0.0	0.0	2.8	79.9	17.3	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.2117	0.1233	0.0881					
□			0.2379	0.1822	0.1648	0.1254				

	Material Description	USCS	AASHTO
○	silty SAND	SM	
□	silty SAND	SM	

Project No. T-8661 **Client:** Fortress,LLC

Project: 240 - 15 Street SE Industrial

○ **Location:** B-8 **Depth:** 30'

□ **Location:** B-9 **Depth:** 10'

Remarks:

Terra Associates, Inc.

Kirkland, WA

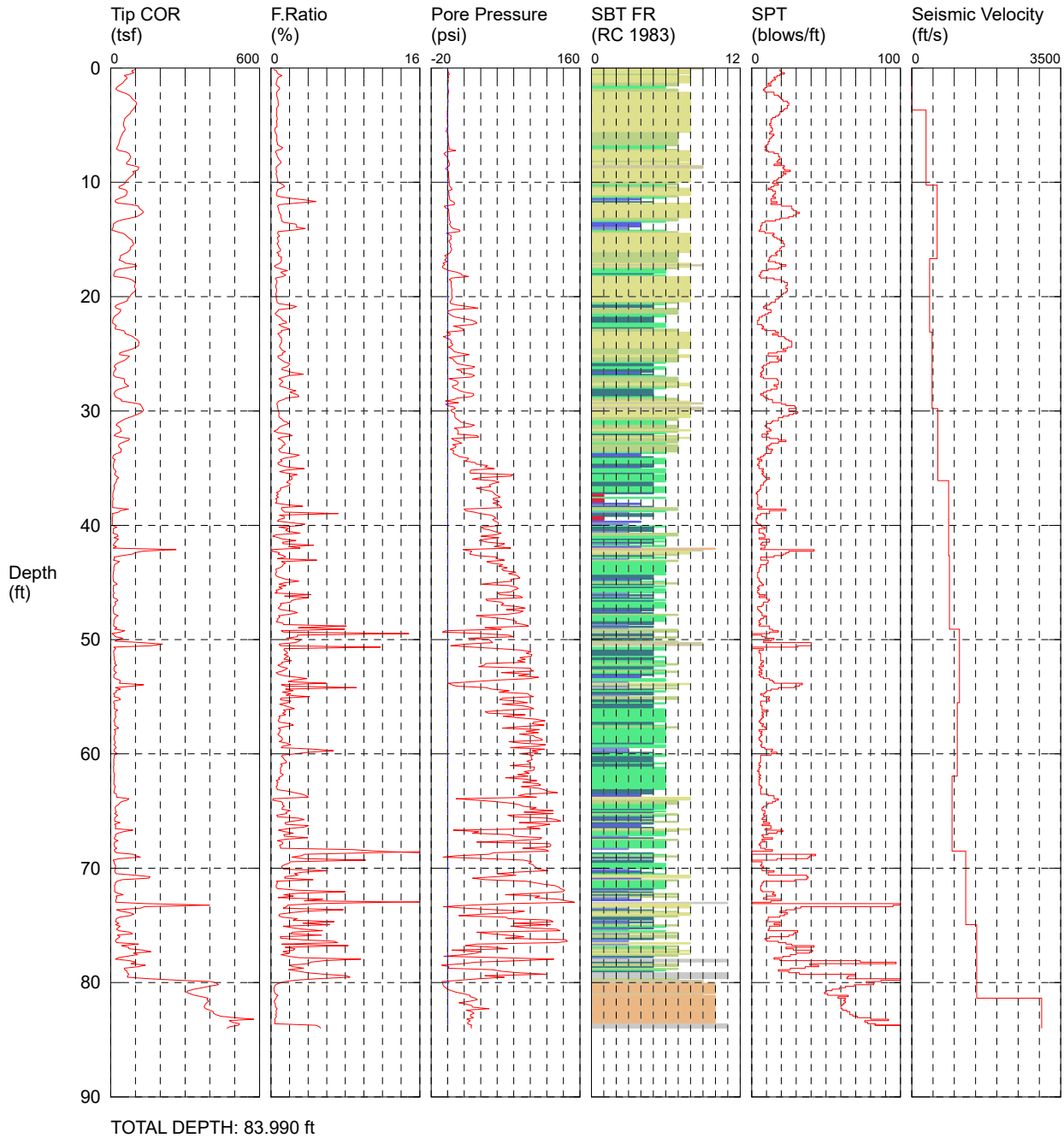
Figure A-14

Tested By: FQ

CPT- 01

CPT CONTRUCTOR: In Situ Engineering
CUSTOMER: Terra Asso
LOCATION: Puyallup
JOB NUMBER: T-8661
COMMENT: 240 - 15th St SE
COMMENT:

OPERATOR: Okbay
CONE ID: DDG1369
TEST DATE: 12/8/2021 9:38:13 AM
PREDRILL: 0 ft
BACK FILL: 20% Grout + Bentonite Chips
SURFACE PATCH: None

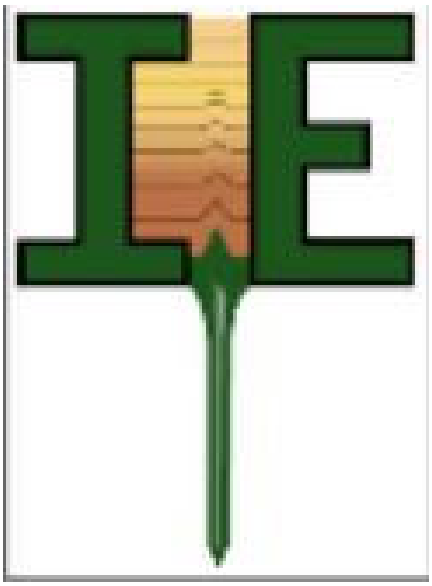


TOTAL DEPTH: 83.990 ft

1 sensitive fine grained
2 organic material
3 clay
4 silty clay to clay
5 clayey silt to silty clay
6 sandy silt to clayey silt
7 silty sand to sandy silt
8 sand to silty sand
9 sand
10 gravelly sand to sand
11 very stiff fine grained (*)
12 sand to clayey sand (*)

*SBT/SPT CORRELATION: UBC-1983

HOLE NUMBER: CPT- 01



OPERATOR: Okbay

CUSTOMER: Terra Asso

LOCATION: Puyallup

JOB NUMBER: T-8661

CPT CONTRUCTOR: In Situ Engineering

CONE ID: DDG1369

TEST DATE: 12/8/2021 9:38:13 AM

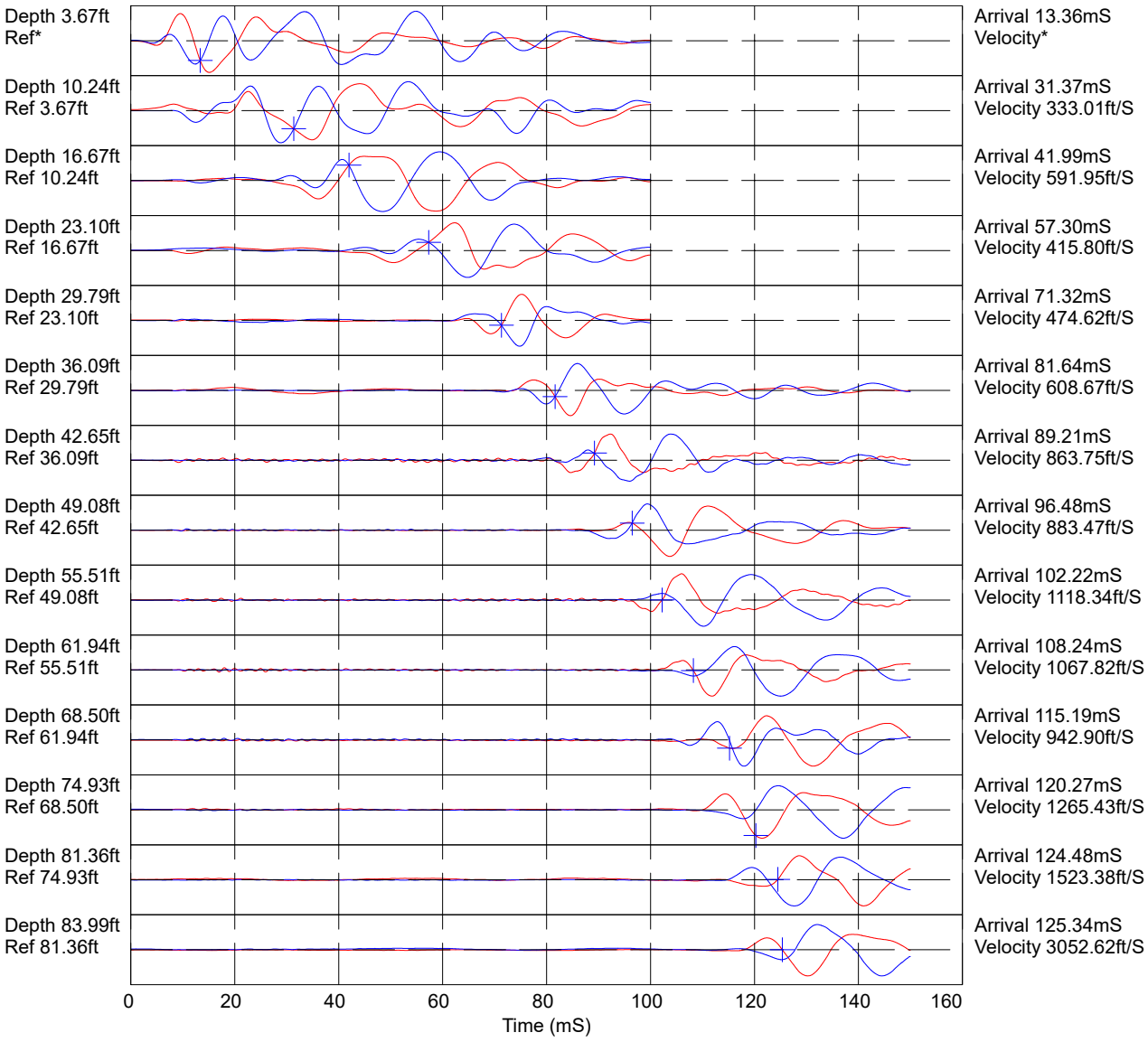
COMMENT: 240 - 15th St SE

PREDRILL0 ft

BACK FILL: 20% Grout + Bentonite Chips

SURFACE PATCH: none

HOLE NUMBER: CPT- 01



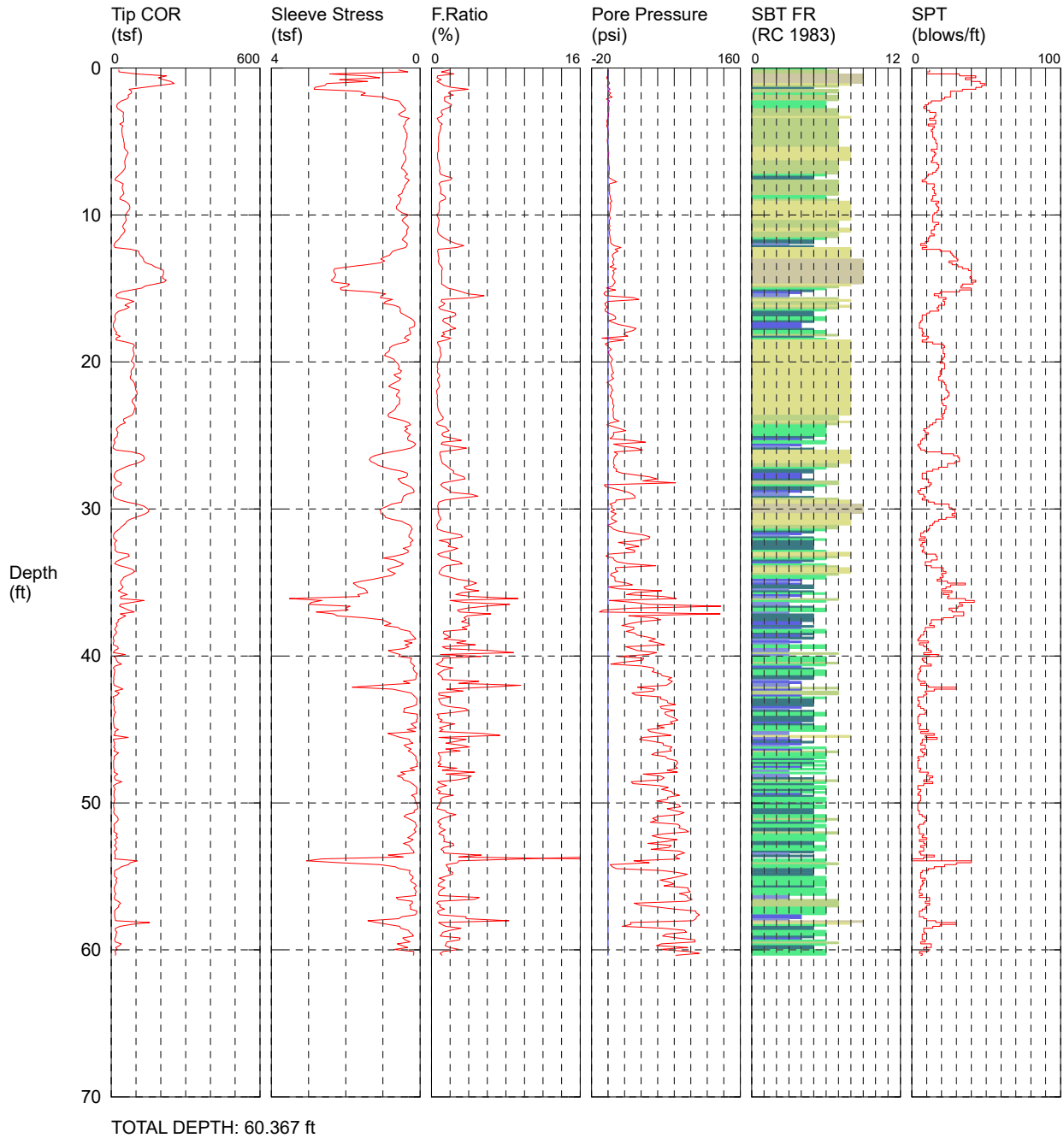
Hammer to Rod String Distance (ft): 2.79
* = Not Determined

COMMENT: 240 - 15th St SE

CPT- 02

CPT CONTRUCTOR: In Situ Engineering
CUSTOMER: Terra Asso
LOCATION: Puyallup
JOB NUMBER: T-8661
COMMENT: 240 - 15th St SE
COMMENT:

OPERATOR: Okbay
CONE ID: DDG1369
TEST DATE: 12/8/2021 12:37:48 PM
PREDRILL: 0 ft
BACK FILL: 20% Grout + Bentonite Chips
SURFACE PATCH: None



TOTAL DEPTH: 60.367 ft

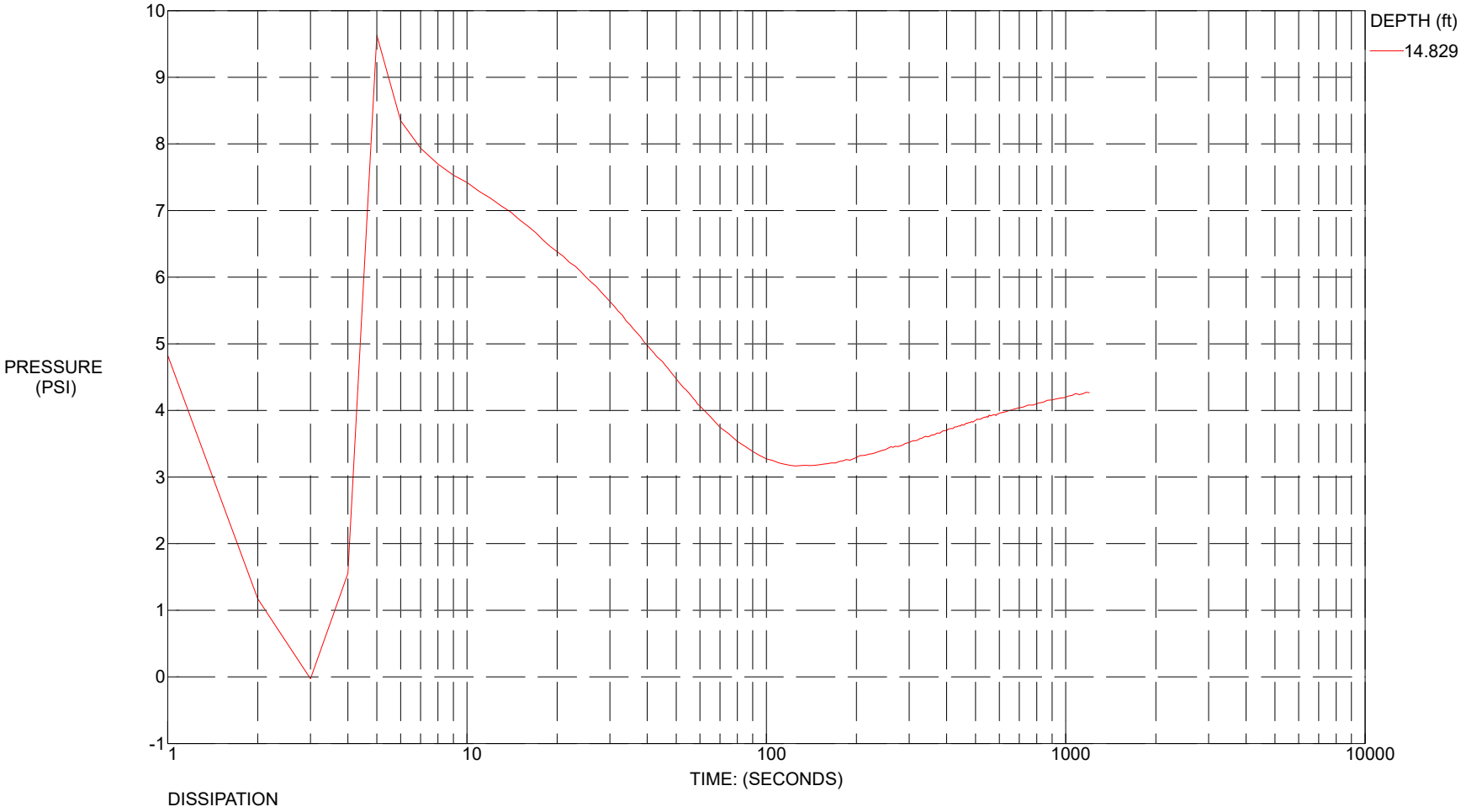
1 sensitive fine grained
2 organic material
3 clay
4 silty clay to clay
5 clayey silt to silty clay
6 sandy silt to clayey silt
7 silty sand to sandy silt
8 sand to silty sand
9 sand
10 gravelly sand to sand
11 very stiff fine grained (*)
12 sand to clayey sand (*)

*SBT/SPT CORRELATION: UBC-1983

CPT- 02

CPT CONTRUCTOR: In Situ Engineering
CUSTOMER: Terra Asso
LOCATION: Puyallup
JOB NUMBER: T-8661

OPERATOR: Okbay
CONE ID: DDG1369
TEST DATE: 12/8/2021 12:37:48 PM
PREDRILL: 0 ft
BACK FILL: 20% Grout + Bentonite Chips
SURFACE PATCH: Cold Patch



APPENDIX B

LIQUEFACTION ANALYSES

LIQUEFACTION ANALYSIS

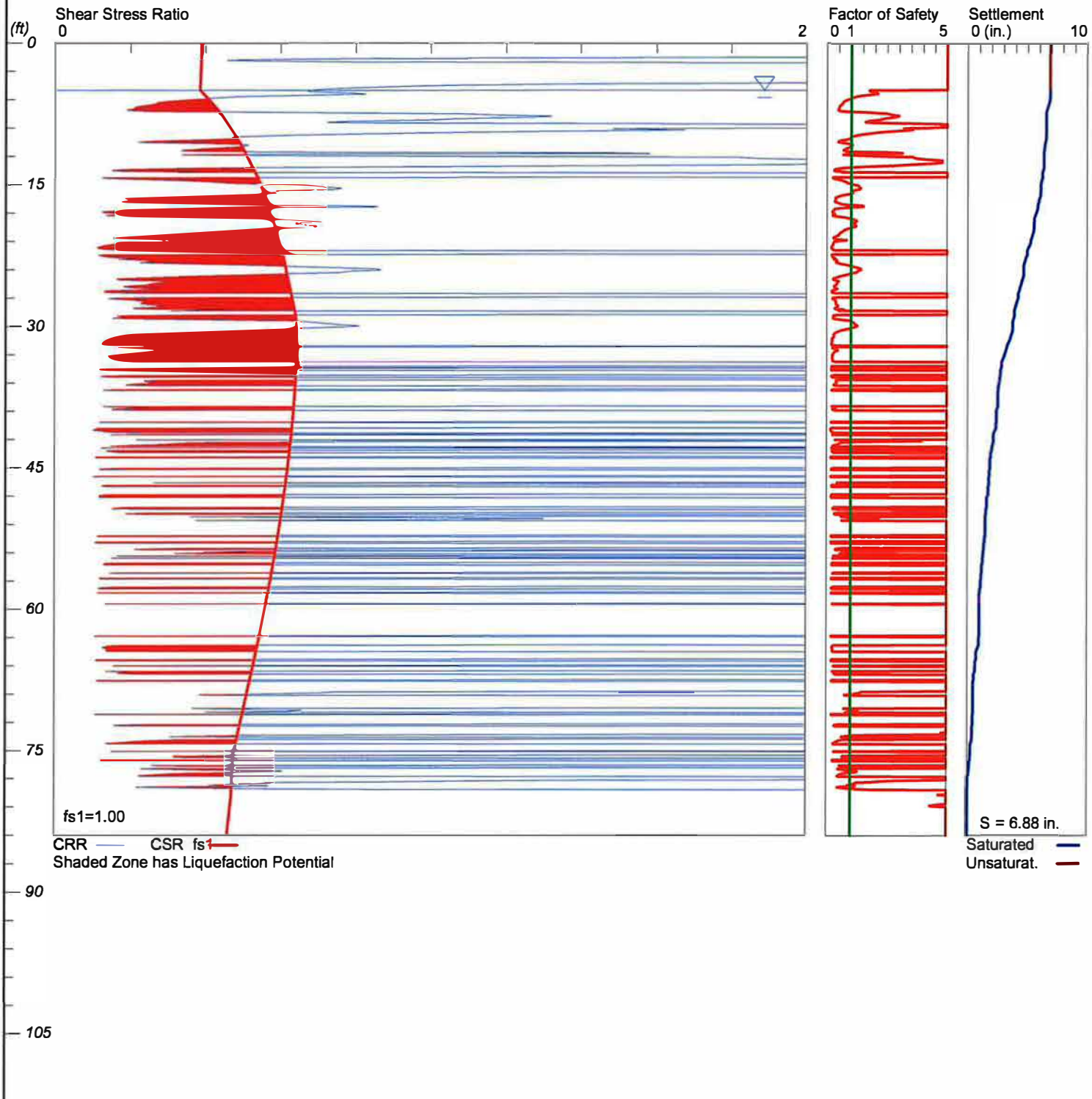
240 - 15th St SE Industrial

Hole No.=CPT-1 Water Depth=5.0 ft

Ground Improvement of Fill=3 ft

Magnitude=7

Acceleration=0.6g



LIQUEFACTION ANALYSIS

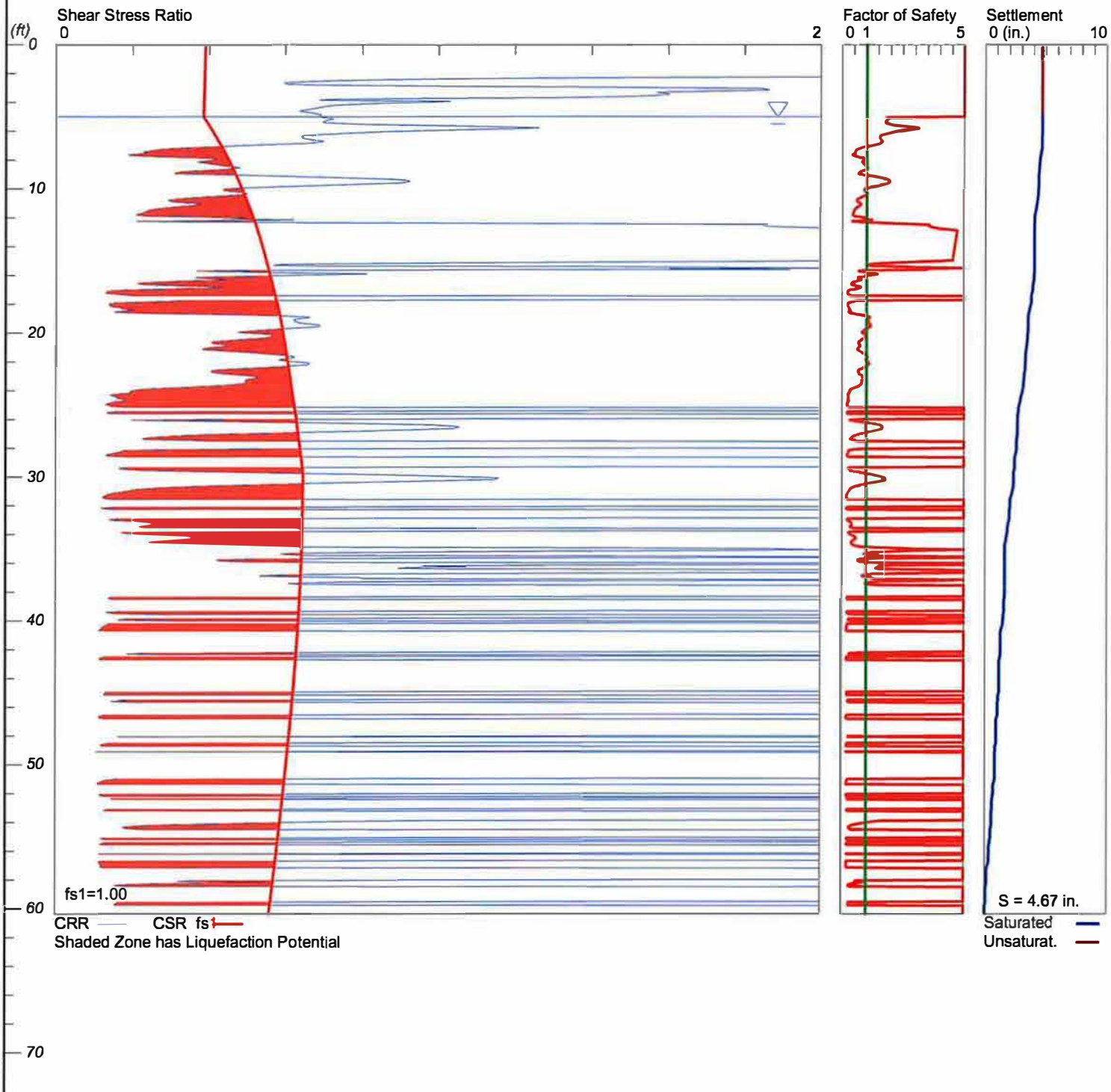
240 - 15th St SE Industrial

Hole No.=CPT-2 Water Depth=5.0 ft

Ground Improvement of Fill=3 ft

Magnitude=7

Acceleration=0.6g



Tab 7.0

7.0 OTHER PERMITS

Other permits that may be required for this project include:

- SEPA Environmental Checklist
- Civil Construction Permit
- Building Permits
- Construction Stormwater General Permit
- Fire Permit

Tab 8.0

8.0 ESC ANALYSIS AND DESIGN

An erosion and sediment control plan will be prepared as part of the civil construction plan set. These plans will follow the measures outlined in the Erosion and Sediment Control Standards. The measures outlined in the Manual are discussed below.

Clearing Limits: Prior to any site clearing or grading, the construction limits will be clearly marked with a combination of silt fencing and/or brightly colored survey tape.

Cover Measures: Temporary and permanent cover measures shall be provided when necessary to protect disturbed areas. Temporary cover shall be installed if an area is to remain unworked for more than seven days during the dry season (May 1 to September 30) or for more than two days during the wet season (October 1 to April 30), unless otherwise noted by the City. Any area to remain unworked for more than 30 days shall be seeded or sodded, unless the City determines that winter weather makes vegetation establishment unfeasible. During the wet season, slopes and stockpiles 3H:1V or steeper with more than 10 feet of vertical relief shall be covered if they are to remain unworked for more than 12 hours. The CESCL lead shall be responsible for determining what specific measures to implement to suit changing site conditions.

Perimeter Protection: Silt fence shall be installed along the property lines prior to any upstream grading to prevent and filter sediment sheet flow from adjacent areas.

Traffic Area Stabilization: A construction entrance will be installed to minimize erosion tracking of sediment offsite. Should there be parking areas used by construction traffic onsite they shall also require stabilization.

Sediment Retention: Surface water collected from disturbed areas of the site shall be routed through a sediment pond or trap prior to release from the site.

Surface Water Controls: Surface water controls shall be installed in the form of temporary "v" ditches with rock check dams to intercept and convey surface water from disturbed areas to the sediment trap.

Dust Control: Preventative measures to minimize the wind transport of soil shall be taken as necessary depending on site conditions. The most common method shall be to spray exposed soils until wet, but not so wet as to cause the soils to generate runoff from the spraying.

The following pages contain the SWPPP and accompanying calculations.

Construction Stormwater General Permit (CSWGP)

Stormwater Pollution Prevention Plan (SWPPP)

for

Fortress – Puyallup

Prepared for:

Washington State Department of Ecology

3190 160th Avenue S.E., Bellevue, WA 98008-5452

Permittee / Owner	Developer	Operator / Contractor
CREF3 Puyallup, LLC 11611 San Vicente Blvd 10th Floor Los Angeles, CA 90049	Same as Owner	TBD

Site Location

240 15th Street SE

Puyallup, WA

Certified Erosion and Sediment Control Lead (CESCL)

Name	Organization	Contact Phone Number
TBD	TBD	TBD

SWPPP Prepared By

Name	Organization	Contact Phone Number
Karen Harris, PE	Barghausen Consulting Engineers, Inc. 18215 72nd Avenue South Kent, WA 98032	425-251-6222

SWPPP Preparation Date

October 20, 2022, Rev April 4, 2023, Rev June 13, 2023, Rev 8/28/23, Rev 10/18/23

Project Construction Dates

Activity / Phase	Start Date	End Date
Site Grading	Summer 2023	Winter 2023

Table of Contents

List of Tables

List of Appendices

List of Acronyms and Abbreviations

Acronym / Abbreviation	Explanation
303(d)	Section of the Clean Water Act pertaining to Impaired Waterbodies
BFO	Bellingham Field Office of the Department of Ecology
BMP(s)	Best Management Practice(s)
CESCL	Certified Erosion and Sediment Control Lead
CO_2	Carbon Dioxide
CRO	Central Regional Office of the Department of Ecology
CSWGP	Construction Stormwater General Permit
CWA	Clean Water Act
DMR	Discharge Monitoring Report
DO	Dissolved Oxygen
Ecology	Washington State Department of Ecology
EPA	United States Environmental Protection Agency
ERO	Eastern Regional Office of the Department of Ecology
ERTS	Environmental Report Tracking System
ESC	Erosion and Sediment Control
GULD	General Use Level Designation
NPDES	National Pollutant Discharge Elimination System
NTU	Nephelometric Turbidity Units
NWRO	Northwest Regional Office of the Department of Ecology
pH	Power of Hydrogen
RCW	Revised Code of Washington
SPCC	Spill Prevention, Control, and Countermeasure
su	Standard Units
SWMMEW	Stormwater Management Manual for Eastern Washington
SWMMWW	Stormwater Management Manual for Western Washington
SWPPP	Stormwater Pollution Prevention Plan
TESC	Temporary Erosion and Sediment Control
SWRO	Southwest Regional Office of the Department of Ecology
TMDL	Total Maximum Daily Load
VFO	Vancouver Field Office of the Department of Ecology
WAC	Washington Administrative Code
WSDOT	Washington Department of Transportation
WWHM	Western Washington Hydrology Model

1 Project Information

Project/Site Name: Fortress - Puyallup
Street/Location: 240 15th Street SE, Puyallup

Receiving waterbody: Deer Creek, Puyallup River and Puget Sound

1.1 Existing Conditions

Total acreage: 7.96 acres

Disturbed acreage: 7.96 acres

Existing structures: The existing site contains a cold storage warehouse that is in the process of demolition, a separate industrial building, and an office building.

Landscape topography: The site is has flat topography.

Drainage patterns: The developed portion of the site drains to existing stormwater catch basins and piping, which discharge into the public stormwater systems in East Main Street and 15th Street SE, ultimately discharging to Deer Creek near the Puyallup River. The undeveloped field drains to a local low point.

Existing Vegetation: The majority of the site has been developed with buildings and pavement, though a small portion of the site is an undeveloped field.

Critical Areas (wetlands, streams, high erosion risk, steep or difficult to stabilize slopes):

There are no critical areas onsite.

List of known impairments for 303(d) listed or Total Maximum Daily Load (TMDL) for the receiving waterbody: The Puyallup River downstream of the site is listed for temperature and Mercury.

Table 1 includes a list of suspected and/or known contaminants associated with the construction activity.

Table 1 – Summary of Site Pollutant Constituents

Constituent (Pollutant)	Location	Depth	Concentration
TPH as DRO	See Contamination Summary prepared by Farallon for additional details.		
TPH as ORO			
TPH as GRO			
Benzene			

Tetrachloroethene			
Trichloroethene			
Cis-1,2-dichloroethene			
PFAS			

1.2 Proposed Construction Activities

Description of site development (example: subdivision):
The existing site features are being demolished and one warehouse building, new pavement, associate utilities, and landscaping are being constructed.

Description of construction activities (example: site preparation, demolition, excavation):
Demolition, grade the site, excavate and install utilities, construct building, pave the site.

Description of site drainage including flow from and onto adjacent properties. Must be consistent with Site Map in Appendix A:
Runoff from the site enters existing stormwater catch basins and piping, which discharge into the public stormwater systems in East Main Street and 15th Street SE, ultimately discharging to Deer Creek near the Puyallup River.

Description of final stabilization (example: extent of revegetation, paving, landscaping):
The disturbed areas will be stabilized with impervious surfaces and landscaping.

Contaminated Site Information:
A summary of known contamination is described in the Contamination Summary prepared by Farallon. The Property currently is enrolled in the Washington State Department of Ecology (Ecology) expedited Voluntary Cleanup Program (VCP) and has been assigned expedited VCP Project ID XS0012. Cleanup activities will be conducted in conjunction with Property redevelopment.

Cleanup activities include excavation of contaminated soil and in-situ treatment of contaminated groundwater. Contaminated soil is present on the Property and there is potential for stormwater to come in contact with contaminated soil. Stormwater that comes into contact with contaminated soil during site remediation may become contaminated. Therefore, stormwater runoff will be routed to a temporary stormwater pond, which will be treated by a construction stormwater treatment system in accordance with the Construction Stormwater General Permit and Administrative Order prior to discharge to the stormwater sewer system.

Discharge water will be sampled periodically for the Indicator Levels identified in the AO to ensure that discharge water is in compliance with the requirements of the CSWGP and AO. Sampling results will be reported to Ecology in monthly Discharge Monitoring Reports. No off-Property discharge of contaminated stormwater or groundwater will occur.

Provide the administrative order document and include the approved treatment system prior to site discharge within this report. [drainage report, pg 82]

2 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 the CESCL has noted a deficiency in BMPs or deviation from original design.

2.1 The 12 Elements

2.1.1 Element 1: Preserve Vegetation / Mark Clearing Limits

To protect adjacent properties and to reduce the area of soil exposed to construction, the limits of construction will be clearly marked before land-disturbing activities begin. Trees that are to be preserved, as well as all sensitive areas and their buffers, shall be clearly delineated, both in the field and on the plans. In general, natural vegetation and native topsoil shall be retained in an undisturbed state to the maximum extent possible.

List and describe BMPs:

- **Silt Fence (BMP C233)**
  - Clearly mark the construction limits with fencing

Installation Schedules: Prior to commencement of any construction activity

Inspection and Maintenance plan: **Inspect weekly and after storm events**. Repair any damaged silt fence immediately. Remove sediment or install additional fence when sediment accumulates to height of 1/3rd of the fence.

Responsible Staff: CESCL Lead

2.1.2 Element 2: Establish Construction Access

Construction access or activities occurring on unpaved areas shall be minimized, yet where necessary, access points shall be stabilized to minimize the tracking of sediment onto public roads, street sweeping, and street cleaning shall be employed to prevent sediment from entering state waters.

List and describe BMPs:

- **Stabilized Construction Entrance/Exit (BMP C105)**
  - Install stabilized construction entrances at locations needed for construction vehicle access to site.

Installation Schedules: ASAP after project start

Inspection and Maintenance plan: **Inspect weekly and after storm events**. Vacuum as needed to prevent tracking of sediments onto pavement.

Responsible Staff: CESCL Lead

2.1.3 Element 3: Control Flow Rates

In general, discharge rates of stormwater from the site will be controlled where increases in impervious area or soil compaction during construction could lead to downstream erosion, or where necessary to meet local agency stormwater discharge requirements (e.g. discharge to combined sewer systems).

Will you construct stormwater retention and/or detention facilities?
☒ Yes ☐ No

Will you use permanent infiltration ponds or other low impact development (example: rain gardens, bio-retention, porous pavement) to control flow during construction?
☐ Yes ☒ No

List and describe BMPs:

- **Check Dams (BMP C207)**
  - Temporary V-Ditches shall have rock check dams installed to reduce runoff velocities.
- **Outlet Protection (BMP C209)**
  - All outlet pipes shall have protection in the form of riprap pads.
- **Sediment Pond (BMP C241)**
  - Two Sediment Ponds will be used during construction.

Installation Schedules: TBD

Inspection and Maintenance plan: **Inspect weekly**. **Daily after storm events**. Clean/remove sediments that have accumulated to a depth of 1-foot. Repair damaged pond embankments.

Responsible Staff: CESCL Lead

2.1.4 Element 4: Install Sediment Controls

All stormwater runoff from disturbed areas shall pass through an appropriate sediment removal BMP before leaving the construction site.

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

Whenever possible, sediment laden water shall be discharged into onsite, relatively level, vegetated areas.

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

List and describe BMPs:

- **Silt Fence (BMP C233)**
  - Silt fence is to be installed along the perimeter of the site, wherever onsite grades are higher than the adjacent properties.
- **Storm Drain Inlet Protection (BMP C220)**
  - Catch basin inlet protection is to be installed on all new and existing catch basins within the construction limits until the site is fully stabilized. Within the right of way, catch basins may only be protected with a catch basin insert.

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

- **Sediment Pond (BMP C241)**

Installation Schedules: Install Silt Fences and Storm Drain Protection as one of the first things after construction starts.

Inspection and Maintenance plan: **Inspect weekly. Daily after storm events**. Repair damaged fence or inlet protection immediately. Clean sediments according to manufacturer recommendations.

Responsible Staff: CESCL Lead

2.1.5 Element 5: Stabilize Soils

Exposed and unworked soils shall be stabilized with the application of effective BMPs to prevent erosion throughout the life of the project.

All areas disturbed by construction activities shall be hydro-seeded upon completion of grading activities or if they will be unworked for more than 2 days in the wet season or 7 days in the dry season.

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

West of the Cascade Mountains Crest

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

Soils must be stabilized at the end of the shift before a holiday or weekend if needed based on the weather forecast.

Anticipated project dates: Start date: TBD End date: TBD

Will you construct during the wet season?
☒ Yes ☐ No

List and describe BMPs:

- **Temporary and Permanent Seeding (BMP C120)**
  - Use to reduce erosion from any unworked, exposed areas or to stabilize areas that have reached final grade.
- **Dust Control (BMP C140)**
  - Use to limit wind transport of dust onto roadway and other areas.

Installation Schedules: Installed as needed to any soils unworked per the schedule.

Inspection and Maintenance plan: **Inspect weekly. Daily during storm events**. Repair eroded soils immediately.

Responsible Staff: CESCL Lead

2.1.6 Element 6: Protect Slopes

All cut and fill slopes will be designed, constructed, and protected in a manner than minimizes erosion.

Steep slopes will be protected from erosion by not directing runoff toward them. When necessary, such as where the interceptor ditches enter the detention pond, riprap is to be used to limit the bank erosion.

Will steep slopes be present at the site during construction?
☒ Yes ☐ No

List and describe BMPs:

- **Temporary and Permanent Seeding (BMP C120)**
  - Use to limit slope erosion.
- **Interceptor Dike and Swale (BMPC200)**
  - Use temporary v-ditches as necessary to protect slopes.
- **Check Dams (BMPC207)**
  - Use to slow velocities in temporary v-ditches.

Installation Schedules: Install as needed during construction.

Inspection and Maintenance plan: **Inspect weekly. Daily during storm events**. Repair eroded slopes immediately.

Responsible Staff: CESCL Lead

2.1.7 Element 7: Protect Drain Inlets

All storm drain inlets and culverts 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 and culverts that could potentially be impacted by sediment-laden runoff on and near the project site.

List and describe BMPs:

- **Storm Drain Inlet Protection (BMPC220)**
  - This site will primarily entail the use catch basin filters. Additional measures such as culvert sediment traps, excavated inlet protection, or wooden weirs or block and gravel protection may also be necessary. Within the right of way only catch basin filters may be used as storm inlet protection.

Installation Schedules: At start of construction for existing inlets and upon installation for new inlets.

Inspection and Maintenance plan: **Inspect weekly. Inspect daily during storm events**. Clean and remove/replace any devices that have filled to 1/3 or as specified by manufacturer. Culvert sediment traps are expected to last approximately 18 months but shall be inspected weekly.

Responsible Staff: CESCL Lead

2.1.8 Element 8: Stabilize Channels and Outlets

Where site runoff is to be conveyed in channels, or discharged to a stream or some other natural drainage point, efforts will be taken to prevent downstream erosion.

Stabilization, including armoring material, adequate to prevent erosion of outlets, adjacent stream banks, slopes, and downstream reaches shall be provided at the outlets of all conveyance systems.

Provide stabilization, including armoring material, adequate to prevent erosion of outlets, adjacent stream banks, slopes, and downstream reaches, will be installed at the outlets of all conveyance systems.

List and describe BMPs:

- **Outlet Protection (BMP C209)**
  - All inlets and outlets from ponds/basins shall be protected with riprap.

Installation Schedules: Install outlet protection prior to allowing runoff to discharge from ponds.

Inspection and Maintenance plan: **Inspect Weekly. Daily during storm events**. Repair any damaged or failed BMPs immediately.

Responsible Staff: CESCL Lead

2.1.9 Element 9: Control Pollutants

The following pollutants are anticipated to be present on-site:

Table 2 – Pollutants

Pollutant (List pollutants and source, if applicable)
Sanitary Wastewater from construction workers
Solid wastes such as wood, metals, plastics from demolition/construction
Dust from excavating and grading activities.
Polluted waters and slurry from sawcutting
Agricultural chemicals such as fertilizers
Chemicals such as asphalt sealants
Site soils
Site groundwater generated during dewatering, as necessary

All pollutants, including waste materials and demolition debris, that are generated on site during construction activities shall be handled and disposed of in a manner that does not cause contamination of stormwater. Good housekeeping and preventative measures will be taken to ensure that the site will be kept clean, well-organized, and free of debris. If required, BMPs to be implemented to control specific sources of pollutants are discussed below.

Chemical storage:

- Any chemicals stored in the construction areas will conform to the appropriate source control BMPs listed in Volume II of the DOE Stormwater Management Manual. In Western WA, all chemicals shall have cover, containment, and protection provided on site, per BMP C153 for Material Delivery, Storage and Containment

- Application of agricultural chemicals, including fertilizers and pesticides, shall be conducted in a manner and at application rates that will not result in loss of chemical to stormwater runoff. Manufacturers' recommendations for application procedures and rates shall be followed.

Excavation and tunneling spoils dewatering waste:

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

Demolition:

- Dust released from demolished sidewalks, buildings, or structures will be controlled using Dust Control measures (BMP C140).

- Storm drain inlets vulnerable to stormwater discharge carrying dust, soil, or debris will be protected using Storm Drain Inlet Protection (BMP C220 as described above for Element 7).

- Process water and slurry resulting from sawcutting and surfacing operations will be prevented from entering the waters of the State by implementing Sawcutting and Surfacing Pollution Prevention measures (BMP C152).

Concrete and grout:

- Process water and slurry resulting from concrete work 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.

Solid Waste:

- Solid waste will be stored in secure, clearly marked containers.

List and describe BMPs: BMPs are described above for various types of pollutants above.

Installation Schedules: Proper storage and cover measures shall be implemented throughout construction.

Inspection and Maintenance plan: **Inspect solid pollutants weekly, daily after storm events. Inspect watery pollutants such as from saw-cutting continually while the activity is taking place.**

Responsible Staff: CESCL Lead

Will maintenance, fueling, and/or repair of heavy equipment and vehicles occur on-site?
☐ Yes ☒ No

Will wheel wash or tire bath system BMPs be used during construction?
☐ Yes ☒ No

Will pH-modifying sources be present on-site?
☒ Yes ☐ No

Table 3 – pH-Modifying Sources

☐	None
☐	Bulk cement
☐	Cement kiln dust

☐	Fly ash
☒	Other cementitious materials
☒	New concrete washing or curing waters
☒	Waste streams generated from concrete grinding and sawing
☐	Exposed aggregate processes
☐	Dewatering concrete vaults
☒	Concrete pumping and mixer washout waters
☐	Recycled concrete
☐	Recycled concrete stockpiles
☐	Other (i.e., calcium lignosulfate) [please describe:]

Process water and slurry resulting from concrete work will be prevented from entering the waters of the State by implementing Concrete Handling measures. Adjust pH of stormwater if outside range of 6.5 to 8.5 su.

Obtain written approval from Ecology before using chemical treatment with the exception of CO_2 or dry ice to modify pH.

List and describe BMPs:

- **Sawcutting and Surfacing Pollution Prevention (BMP C152)**
  - Contingent based on demolition procedures used and CESCL lead.
- **Material Delivery, Storage and Containment (BMP C153)**
  - Contingent based on site activities and CESCL lead.
- **Construction Stormwater Treatment (BMP C250)**
  - If required to treat contaminated soil or groundwater onsite
- **Construction Stormwater Filtration (BMP C251)**
  - If required to treat contaminated soil or groundwater onsite

Installation Schedules: As needed.

Inspection and Maintenance plan: **Inspect continuously during construction activities that produce water and/or slurry**.

Responsible Staff: CESCL Lead

Concrete trucks must not be washed out onto the ground, or into storm drains, open ditches, streets, or streams. Excess concrete must not be dumped on-site, except in designated concrete washout areas with appropriate BMPs installed.

Will uncontaminated water from water-only based shaft drilling for construction of building, road, and bridge foundations be infiltrated provided the wastewater is managed in a way that prohibits discharge to surface waters?
☐ Yes ☒ No

2.1.10 Element 10: Control Dewatering

Dewatering may be required for construction. Depth to groundwater measurements conducted at monitoring wells onsite since November 2021 indicate groundwater is generally encountered between depths of 3-7 feet. Dewatering efforts will be required for installation of deeper utilities.

If dewatering is required, water generated by dewatering will be filtered by sedimentation bags or transported offsite.

Table 4 – Dewatering BMPs

☐	Infiltration
☐	Transport off-site in a vehicle (vacuum truck for legal disposal)
☐	Ecology-approved on-site chemical treatment or other suitable treatment technologies
☐	Sanitary or combined sewer discharge with local sewer district approval (last resort)
☐	Use of sedimentation bag with discharge to ditch or swale (small volumes of localized dewatering)

List and describe BMPs:

- **Sedimentation Bag/Vacuum Truck**
  - Dewatering water should be stored in a vehicle for offsite disposal or sent through a sedimentation bag. Only clean, non-turbid water may be discharged from the site.

Installation Schedules: As needed.

Inspection and Maintenance plan: **Monitor dewatering water continuously during dewatering operations.**

Responsible Staff: CESCL Lead

2.1.11 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 specification (see *Volume II of the SWMMWW or Chapter 7 of the SWMMEW*).

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 site becomes inactive and is temporarily stabilized, the inspection frequency may be reduced to once every calendar month.

All temporary ESC 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.

Additionally, protection must be provided for all BMPs installed for the permanent control of stormwater from sediment and compaction. BMPs that are to remain in place following completion of construction shall be examined and restored to full operating condition. If sediment enters these BMPs during construction, the sediment shall be removed and the facility shall be returned to conditions specified in the construction documents.

2.1.12 Element 12: Manage the Project

The project will be managed based on the following principles:

- Projects will be phased to the maximum extent practicable and seasonal work limitations will be taken into account.
- Inspection and monitoring:
    - Inspection, maintenance and repair of all BMPs will occur as needed to ensure performance of their intended function.
    - Site inspections and monitoring will be conducted in accordance with Special Condition S4 of the CSWGP. Sampling locations are indicated on the Site Map. Sampling station(s) are located in accordance with applicable requirements of the CSWGP.
- Maintain an updated SWPPP.
    - 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.

Table 5 – Management

☒	Design the project to fit the existing topography, soils, and drainage patterns
☒	Emphasize erosion control rather than sediment control
☒	Minimize the extent and duration of the area exposed
☒	Keep runoff velocities low
☒	Retain sediment on-site
☒	Thoroughly monitor site and maintain all ESC measures
☒	Schedule major earthwork during the dry season
☐	Other (please describe)

Optional: Fill out Table 6 by listing the BMP associated with specific construction activities. Identify the phase of the project (if applicable). To increase awareness of seasonal requirements, indicate if the activity falls within the wet or dry season.

Table 6 – BMP Implementation Schedule

Phase of Construction Project	Stormwater BMPs	Date	Wet/Dry Season
[Insert construction activity]	[Insert BMP]	[MM/DD/YYYY]	[Insert Season]

Phase of Construction Project	Stormwater BMPs	Date	Wet/Dry Season
[Insert construction activity]	[Insert BMP]	[MM/DD/YYYY]	[Insert Season]

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

No Low Impact Developments BMPs are proposed for this project.

3 Pollution Prevention Team

Table 7 – Team Information

Title	Name(s)	Phone Number
Certified Erosion and Sediment Control Lead (CESCL)	[Insert Name]	[Insert Number]
Resident Engineer	Jason G. Hubbell, PE	425-251-6222
Emergency Ecology Contact		
Emergency Permittee/ Owner Contact		
Non-Emergency Owner Contact		
Monitoring Personnel		
Ecology Regional Office	[Insert Regional Office]	[Insert General Number]

4 Monitoring and Sampling Requirements

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
- Stormwater sampling data

A blank form can be found under Appendix D.

The site log book must be maintained on-site within reasonable access to the site and be made available upon request to Ecology or the local jurisdiction.

Numeric effluent limits may be required for certain discharges to 303(d) listed waterbodies. See CSWGP Special Condition S8 and Section 5 of this template.

4.1 Site Inspection

Site inspections will be conducted at least once every calendar week and within 24 hours following any discharge from the site. For sites that are temporarily stabilized and inactive, the required frequency is reduced to once per calendar month.

The discharge point(s) are indicated on the Site Map (see Appendix A) and in accordance with the applicable requirements of the CSWGP.

4.2 Stormwater Quality Sampling

4.2.1 Turbidity Sampling

Requirements include calibrated turbidity meter or transparency tube to sample site discharges for compliance with the CSWGP. Sampling will be conducted at all discharge points at least once per calendar week.

Method for sampling turbidity:

Table 8 – Turbidity Sampling Method

☒	Turbidity Meter/Turbidimeter (required for disturbances 5 acres or greater in size)
☐	Transparency Tube (option for disturbances less than 1 acre and up to 5 acres in size)

The benchmark for turbidity value is 25 nephelometric turbidity units (NTU) and a transparency less than 33 centimeters.

If the discharge's turbidity is 26 to 249 NTU **or** the transparency is less than 33 cm but equal to or greater than 6 cm, the following steps will be conducted:

1. Review the SWPPP for compliance with Special Condition S9. Make appropriate revisions within 7 days of the date the discharge exceeded the benchmark.

2. Immediately begin the process to fully implement and maintain appropriate source control and/or treatment BMPs as soon as possible. Address the problems within 10 days of the date the discharge exceeded the benchmark. If installation of necessary treatment BMPs is not feasible within 10 days, Ecology may approve additional time when the Permittee requests an extension within the initial 10-day response period.
3. Document BMP implementation and maintenance in the site log book.

If the turbidity exceeds 250 NTU **or** the transparency is 6 cm or less at any time, the following steps will be conducted:

1. Telephone or submit an electronic report to the applicable Ecology Region's Environmental Report Tracking System (ERTS) within 24 hours.
    - **Central Region** (Benton, Chelan, Douglas, Kittitas, Klickitat, Okanogan, Yakima): (509) 575-2490 or http://www.ecy.wa.gov/programs/spills/forms/nerts_online/CRO_nerts_online.html
    - **Eastern Region** (Adams, Asotin, Columbia, Ferry, Franklin, Garfield, Grant, Lincoln, Pend Oreille, Spokane, Stevens, Walla Walla, Whitman): (509) 329-3400 or http://www.ecy.wa.gov/programs/spills/forms/nerts_online/ERO_nerts_online.html
    - **Northwest Region** (King, Kitsap, Island, San Juan, Skagit, Snohomish, Whatcom): (425) 649-7000 or http://www.ecy.wa.gov/programs/spills/forms/nerts_online/NWRO_nerts_online.html
    - **Southwest Region** (Clallam, Clark, Cowlitz, Grays Harbor, Jefferson, Lewis, Mason, Pacific, Pierce, Skamania, Thurston, Wahkiakum,): (360) 407-6300 or http://www.ecy.wa.gov/programs/spills/forms/nerts_online/SWRO_nerts_online.html
2. Immediately begin the process to fully implement and maintain appropriate source control and/or treatment BMPs as soon as possible. Address the problems within 10 days of the date the discharge exceeded the benchmark. If installation of necessary treatment BMPs is not feasible within 10 days, Ecology may approve additional time when the Permittee requests an extension within the initial 10-day response period
3. Document BMP implementation and maintenance in the site log book.
4. Continue to sample discharges daily until one of the following is true:
    - Turbidity is 25 NTU (or lower).
    - Transparency is 33 cm (or greater).
    - Compliance with the water quality limit for turbidity is achieved.
        - 1 - 5 NTU over background turbidity, if background is less than 50 NTU
        - 1% - 10% over background turbidity, if background is 50 NTU or greater

The discharge stops or is eliminated.

4.2.2 pH Sampling

pH monitoring is required for “Significant concrete work” (i.e. greater than 1000 cubic yards poured concrete or recycled concrete over the life of the project).The use of engineered soils (soil amendments including but not limited to Portland cement-treated base [CTB], cement kiln dust [CKD] or fly ash) also requires pH monitoring.

For significant concrete work, pH sampling will start the first day concrete is poured and continue until it is cured, typically three (3) weeks after the last pour.

For engineered soils and recycled concrete, pH sampling begins when engineered soils or recycled concrete are first exposed to precipitation and continues until the area is fully stabilized.

If the measured pH is 8.5 or greater, the following measures will be taken:

1. Prevent high pH water from entering storm sewer systems or surface water.
2. Adjust or neutralize the high pH water to the range of 6.5 to 8.5 su using appropriate technology such as carbon dioxide (CO_2) sparging (liquid or dry ice).
3. Written approval will be obtained from Ecology prior to the use of chemical treatment other than CO_2 sparging or dry ice.

Method for sampling pH:

Table 9 – pH Sampling Method

	pH meter
	pH test kit
	Wide range pH indicator paper

5 Discharges to 303(d) or Total Maximum Daily Load (TMDL) Waterbodies

5.1 303(d) Listed Waterbodies

Is the receiving water 303(d) (Category 5) listed for turbidity, fine sediment, phosphorus, or pH?

☐ Yes ☒ No

List the impairment(s):

The Puyallup River is listed for tempurature and Mercury

5.2 TMDL Waterbodies

Waste Load Allocation for CWSGP discharges:

N/A

List and describe BMPs:

N/A

Discharges to TMDL receiving waterbodies will meet in-stream water quality criteria at the point of discharge.

The Construction Stormwater General Permit Proposed New Discharge to an Impaired Water Body form is included in Appendix F.

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
- Sample logs

6.1.2 Records Retention

Records will be retained during the life of the project and for a minimum of three (3) years following the termination of permit coverage in accordance with Special Condition S5.C of the CSWGP.

Permit documentation to be retained on-site:

- CSWGP
- Permit Coverage Letter
- 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 in accordance with Special Condition S5.G.2.b of the CSWGP.

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

Cumulative soil disturbance is one (1) acre or larger; therefore, Discharge Monitoring Reports (DMRs) will be submitted to Ecology monthly. If there was no discharge during a given monitoring period the DMR will be submitted as required, reporting "No Discharge". The DMR due date is fifteen (15) days following the end of each calendar month.

DMRs will be reported online through Ecology's WQWebDMR System.

To sign up for WQWebDMR go to:
http://www.ecy.wa.gov/programs/wq/permits/paris/webdmr.html

6.2.2 Notification of Noncompliance

If any of the terms and conditions of the permit is not met, and the resulting noncompliance may cause a threat to human health or the environment, the following actions will be taken:

1. Ecology will be notified within 24-hours of the failure to comply by calling the applicable Regional office ERTS phone number (Regional office numbers listed below).
2. Immediate action will be taken to prevent the discharge/pollution or otherwise stop or correct the noncompliance. If applicable, sampling and analysis of any noncompliance will be repeated immediately and the results submitted to Ecology within five (5) days of becoming aware of the violation.
3. A detailed written report describing the noncompliance will be submitted to Ecology within five (5) days, unless requested earlier by Ecology.

Specific information to be included in the noncompliance report is found in Special Condition S5.F.3 of the CSWGP.

Anytime turbidity sampling indicates turbidity is 250 NTUs or greater, or water transparency is 6 cm or less, the Ecology Regional office will be notified by phone within 24 hours of analysis as required by Special Condition S5.A of the CSWGP.

- **Central Region** at (509) 575-2490 for Benton, Chelan, Douglas, Kittitas, Klickitat, Okanogan, or Yakima County
- **Eastern Region** at (509) 329-3400 for Adams, Asotin, Columbia, Ferry, Franklin, Garfield, Grant, Lincoln, Pend Oreille, Spokane, Stevens, Walla Walla, or Whitman County
- **Northwest Region** at (425) 649-7000 for Island, King, Kitsap, San Juan, Skagit, Snohomish, or Whatcom County
- **Southwest Region** at (360) 407-6300 for Clallam, Clark, Cowlitz, Grays Harbor, Jefferson, Lewis, Mason, Pacific, Pierce, Skamania, Thurston, or Wahkiakum

Include the following information:

1. Your name and / Phone number
2. Permit number
3. City / County of project
4. Sample results
5. Date / Time of call
6. Date / Time of sample
7. Project name

In accordance with Special Condition S4.D.5.b of the CSWGP, the Ecology Regional office will be notified if chemical treatment other than CO_2 sparging is planned for adjustment of high pH water.

Appendix/Glossary

A. Site Map

The site map must meet the requirements of Special Condition S9.E of the CSWGP

B. BMP Detail

Insert BMPs specification sheets here.
Download BMPs from the Ecology Construction Stormwater website at:
https://www.ecology.wa.gov/Regulations-Permits/Guidance-technical-assistance/Stormwater-permittee-guidance-resources/Stormwater-manuals

C. Correspondence

Ecology
EPA
Local Government

D. Site Inspection Form

Create your own or download Ecology's template:
https://www.ecology.wa.gov/Regulations-Permits/Permits-certifications/Stormwater-general-permits/Construction-stormwater-permit

E. Construction Stormwater General Permit (CSWGP)

Download CSWGP: https://www.ecology.wa.gov/Regulations-Permits/Permits-certifications/Stormwater-general-permits/Construction-stormwater-permit

F. 303(d) List Waterbodies / TMDL Waterbodies Information

Proposed New Discharge to an Impaired Water Body form
SWPPP Addendum addressing impairment

G. Contaminated Site Information

Administrative Order
Sanitary Discharge Permit
Soil Management Plan
Soil and Groundwater Reports
Maps and Figures Depicting Contamination

H. Engineering Calculations

Appendix A
Site Plans

PORTION OF SE QUARTER OF SEC 27, TWN 20 N, RGE. 4 E, W.M.
CITY OF PUYALLUP, PIERCE COUNTY, WASHINGTON

ROUGH GRADING & TESC PLAN

N

0 20' 40' 80'
SCALE: 1"=40'

TITLE PARCEL B

TITLE PARCEL A
APN. 7845000181

TITLE PARCEL C
APN. 0420274126

RE-PLAT OF FRANK R. SPINNING'S FIRST ADDITION VOL. 6, PG. 91

1300 MAIN ST LLC TAX PARCEL NO. 7845000151

ESTES DEVELOPMENT LLC TAX PARCEL NO. 0420274115

WESTECH REALTY CO LLC TAX PARCEL NO. 7845100327

EAST MAIN ATTRACTIONS LLC TAX PARCEL NO. 7845100301

EAST MAIN ATTRACTIONS LLC TAX PARCEL NO. 7845100250

REMOVE EX. 8" (S) AND CORE DRILL FOR 12" (SE) IE=49.53

FOUND 1/2" REBAR & YELLOW CAP LS No. "__195", 0.5' BELOW GRADE, 0.3' NORTH OF CORNER

FOUND 1/2" REBAR W/ BROKEN CAP 0.2' ABOVE GRADE, 0.1' SOUTH OF CORNER

FOUND AND HELD 1/2" IRON PIPE W/ FLAGGING, 0.2' ABOVE GRADE

FOUND 3/4" BRASS DISC 0.83' BELOW GRADE IN 8" PVC PIPE, 34' WEST OF SE BUILDING CORNER ON THE RAILROAD R/W

FOUND 1/2" REBAR & FADED WHITE CAP MARKED "BPS&E 12870/16930" 0.80' BELOW GRADE AT CORNER

FOUND 1/2" REBAR & ILLEGIBLE WHITE CAP, 0.7' BELOW GRADE AT CORNER

FOUND 1/2" REBAR & YELLOW CAP IN CONCRETE MARKED "BPS&E 12870/16930" 0.1' EAST OF CORNER

FOUND LEAD PATCH WITH MISSING TACK, 1.0' NORTH OF CORNER

FOUND LEAD & TACK W/ WASHER MARKED "LAY 15029" IN WALL, 0.05' SOUTH & 0.1' EAST OF CORNER

FOUND ENCASED 2" DOMED BRASS DISC, 0.6' BELOW GRADE W/ 9" LID AT THE INTERSECTION OF E. PIONEER WAY & 13TH ST. S.E.

FOUND ENCASED 2" DOMED BRASS DISC, NO VISIBLE PUNCH 0.6' BELOW GRADE W/ 8" LID AT THE INTERSECTION OF 15TH ST. S.E. & E. PIONEER WAY

PROTECT EXISTING HYDRANT S00°50'49"W 30.00'(R3)

PROTECT EXISTING HYDRANT

CONCRETE WASHOUT PER DETAIL SHEET E5. ADJUST AS NEEDED AS CONSTRUCTION PROGRESSES.

PROTECT EXISTING POWER POLES AND APPERTANENCES.

PROTECT EXISTING POWER VAULT, POWER POLE, AND APPERTANENCES.

WATER LINE EASEMENT AFN. 9611070152 EXCEPTION No. 19 PLOTTABLE PORTION SHOWN

INGRESS, EGRESS & UTILITY EASEMENT AFN. 9212150220 EXCEPTION No. 17

PUBLIC HIGHWAY EASEMENT AFN. 2512986 EXCEPTION No. 16

122 LF TEMP. 12" CPEP SD @ 0.05%

95 LF TEMP. 12" CPEP SD @ 2.0%

54 LF TEMP. 12" CPEP SD @ 0.93%

26 LF TEMP. 12" SD @ 0.3%

CB#1–SAMPLE LOCATION
TYPE 2–54" W/SOLID LOCKING LID
RIM=60.67
IE=49.6
INSTALL TEMPORARY PLUG IN CB #1. NO DISCHARGE IS TO OCCUR FROM THE SITE UNTIL STORMWATER IN THE TESC POND HAS BEEN TESTED BY THE CESCL OR ENVIRONMENTAL CONSULTANT AND THAT RUNOFF MEETS THE DISCHARGE REQUIREMENTS OF THE GENERAL STORMWATER PERMIT.
IN ACCORDANCE WITH THE AO, DISCHARGE IS RECIRCULATED THROUGH THE TREATMENT SYSTEM UNTIL IT IS DEMONSTRATED THAT THE DISCHARGE IS IN COMPLIANCE WITH THE INDICATOR LEVELS.

CB#2 – SAMPLE LOCATION
TYPE 2–48" W/SOLID LOCKING LID
RIM=55.5
IE=49.5
INSTALL TEMPORARY PLUG IN CB #17. NO DISCHARGE IS TO OCCUR FROM THE SITE UNTIL STORMWATER IN THE TESC POND HAS BEEN TESTED BY THE CESCL OR ENVIRONMENTAL CONSULTANT AND THAT RUNOFF MEETS THE DISCHARGE REQUIREMENTS OF THE GENERAL STORMWATER PERMIT.
IN ACCORDANCE WITH THE AO, DISCHARGE IS RECIRCULATED THROUGH THE TREATMENT SYSTEM UNTIL IT IS DEMONSTRATED THAT THE DISCHARGE IS IN COMPLIANCE WITH THE INDICATOR LEVELS.

TESC BASIN BOUNDARY

SOUTH TEMPORARY SEDIMENT POND
TOP ELEV=57.0 MIN.
BOTTOM ELEV=50.0
REQUIRED AREA @ ELEV 55.0=2,688 SF
PROVIDED AREA @ ELEV 55.0=2,816 SF

NORTH TEMPORARY SEDIMENT POND
TOP ELEV=55.0 MIN.
BOTTOM ELEV=48.0
REQUIRED AREA @ 53.0= 1,248 SF
AREA PROVIDED@ 53.0= 3,125 SF

TEMPORARY SEDIMENT RISER IE=51.5

TEMPORARY SEDIMENT RISER IE=49.5

EMERGENCY OVERFLOW SEE SHT E5

EMERGENCY OVERFLOW SEE SHT E5

LOCATION OF SOUTH POND TREATMENT SYSTEM

LOCATION OF NORTH POND TREATMENT SYSTEM

EQUIPMENT DECONTAMINATION AREA

ROCK CROSSING PER DETAIL E6

DESCRIBED CENTERLINE OF WATER MAIN EASEMENT AFN. 1054061 EXCEPTION No. 14

ROUGH GRADE PAD ELEV=61.1
NEW BUILDING FF=61.1

PAD GRADE TO 5' BEYOND BUILDING FACE, TYP.

BURLINGTON NORTHERN RAILROAD CO. R/W

E PIONEER WAY
(PUBLIC ROW)

15TH STREET SE
(PUBLIC ROW)

SITE BENCHMARK
MAGNAIL & WASHER
EL=55.16' (NAVD)

T.E.S.C. LEGEND

- EXISTING TYPE II CATCH BASIN
- EXISTING TYPE I CATCH BASIN
- EXISTING STORM DRAINAGE LINE
- EXISTING SANITARY SEWER MANHOLE
- EXISTING SANITARY SEWER LINE
- EXISTING WATERMAIN
- EXISTING FIRE HYDRANT
- EXISTING WATER VALVE
- EXISTING SPOT ELEVATIONS
- EXISTING CONTOURS
- PROPOSED CONTOURS
- SILTATION FENCE
- TEMPORARY CONSTRUCTION ENTRANCE
- FLOW ARROW
- TEMPORARY DRAINAGE DITCH
- CLEARING LIMITS
- GROUND WATER MONITORING WELL
- PROPOSED SETTLEMENT MARKER
- TYPE 2 CATCH BASIN

DISCHARGE NOTE:

NO OFFSITE DISCHARGE OF CONTAMINATED STORMWATER OF GROUNDWATER SHALL OCCUR.

EROSION CONTROL BMP'S

- (CE) TEMPORARY CONSTRUCTION ENTRANCE PER DETAIL ON SHEET E5.
- (CL) CLEARING LIMITS
- (IP) STORM DRAIN INLET PROTECTION PER DETAIL ON SHEET E5.
- (SF) TEMPORARY SILT FENCE PROTECTION PER DETAIL ON SHEET E5.
- (V) TEMPORARY "V" DITCH WITH ROCK CHECK DAMS PER DETAIL ON SHEET E6. SLOPE AT 0.5% MINIMUM.
- (SM) PROPOSED SETTLEMENT MARKER (TYPICAL) PER GEOTECH RECOMMENDATIONS. SEE DETAIL SHEET E5. CONTRACTOR SHALL USE PROTECTIVE MEASURES TO ENSURE MARKERS ARE NOT DISTURBED DURING PAD GRADING. RODS TO BE PAINTED WITH BRIGHT, REFLECTIVE PAINT AND FLAGGING PLACED NEARBY TO KEEP RODS VISIBLE TO CONSTRUCTION TRAFFIC.

GRADING AND DRAINAGE NOTES:

1. THE WASHINGTON STATE DEPARTMENT OF ECOLOGY (ECOLOGY) HAS APPROVED LOCALIZED SOURCE REMOVAL EXCAVATIONS FOR REMEDIATION OF CONTAMINATED SOIL PRESENT ON THE PROPERTY. THE PROJECT ENVIRONMENTAL CONSULTANT WILL BE PRESENT DURING EXCAVATION OF KNOWN AREAS OF CONTAMINATED SOIL, AND WILL BE NOTIFIED IF ADDITIONAL SUSPECTED AREAS OF CONTAMINATED SOIL ARE DISCOVERED DURING DEVELOPMENT ACTIVITIES. SOIL SAMPLES WILL BE COLLECTED AT THE LIMITS OF CONTAMINATED SOIL EXCAVATION AREAS TO CONFIRM THAT CONTAMINATED SOIL HAS BEEN REMOVED TO THE MAXIMUM EXTENT PRACTICABLE.
2. PERSONNEL INVOLVED IN EXCAVATION AND/OR HANDLING OF CONTAMINATED SOILS MUST POSSES A CURRENT OSHA HAZWOPER 40–HOUR CERTIFICATION. CONTAMINATED SOIL WILL BE DIRECT–LOADED INTO TRUCKS FOR OFF–PROPERTY DISPOSAL AT AN AUTHORIZED WASTE DISPOSAL FACILITY. IF TEMPORARY STOCKPILING IS NECESSARY, STOCKPILED CONTAMINATED SOIL WILL BE COVERED WITH MINIMUM 10–MIL PLASTIC SHEETING.
3. STORMWATER GENERATED DURING DEVELOPMENT WILL BE CONVEYED TO AN ON–PROPERTY CONSTRUCTION STORMWATER TREATMENT SYSTEM PRIOR TO DISCHARGE TO THE MUNICIPAL STORMWATER SYSTEM. THE CONSTRUCTION STORMWATER TREATMENT SYSTEM WILL BE DESIGNED TO MEET THE DISCHARGE REQUIREMENTS OF THE CONSTRUCTION STORMWATER GENERAL PERMIT (CSWGP) AND ADMINISTRATIVE ORDER (AO) THAT WILL BE ISSUED FOR THE PROPERTY BY ECOLOGY. THE AO IS ANTICIPATED TO INCLUDE INDICATOR LEVELS FOR PH, TURBIDITY, TOTAL PETROLEUM HYDROCARBONS, BENZENE, TOLUENE, ETHYLBENZENE, XYLENES, 1,2–DICHLOROETHANE, TETRACHLOROETHENE, TRICHLOROETHENE, CIS–1,2–DICHLOROETHENE, AND TRANS–1,2–DICHLOROETHENE. (SEE ATTACHED DRAFT TABLE 1 FROM ECOLOGY FOR ANTICIPATED INDICATOR LEVELS)
4. DISCHARGE FROM THE CONSTRUCTION STORMWATER TREATMENT SYSTEM WILL BE SAMPLED PERIODICALLY FOR THE INDICATOR LEVELS IDENTIFIED IN THE AO TO ENSURE THAT DISCHARGE WATER IS IN COMPLIANCE WITH THE REQUIREMENTS OF THE CSWGP AND AO. SAMPLING RESULTS WILL BE REPORTED TO ECOLOGY IN MONTHLY DISCHARGE MONITORING REPORTS. NO OFF–PROPERTY DISCHARGE OF CONTAMINATED STORMWATER OR GROUNDWATER WILL OCCUR.

APPROVED

BY _____
CITY OF PUYALLUP
DEVELOPMENT ENGINEERING

DATE _____

NOTE: THIS APPROVAL IS VOID AFTER 180 DAYS FROM APPROVAL DATE.
THE CITY WILL NOT BE RESPONSIBLE FOR ERRORS AND/OR OMISSIONS ON THESE PLANS.
FIELD CONDITIONS MAY DICTATE CHANGES TO THESE PLANS AS DETERMINED BY THE DEVELOPMENT ENGINEERING MANAGER.

811 Know what's below. Call before you dig. Dial 811

No.	Date	By	Cckd.	Appr.	Revision
3	10/16/23	DL	JSG	JSG	REVISED PER CITY COMMENTS DATED 08-07-2023
2	09/05/23	DL	RDC	JSG	REVISED PER CITY COMMENTS DATED 05-14-2023

Title: ROUGH GRADING & TESC PLAN

FORTRESS - PUYALLUP

For: CREF3 PUYALLUP OWNER LLC
11611 SAN VICENTE BLVD
10TH FLOOR
LOS ANGELES, CA 90049

JASON GUY HUBER — STATE OF WASHINGTON — 38950 — REGISTERED PROFESSIONAL ENGINEER
10/16/2023

Scale: Horizontal 1"=40' Vertical N/A

Designed RDC Drawn RDC Checked DI Approved JGH Date 10/24/22

Barghausen Consulting Engineers, Inc.
18215 72nd Avenue South
Kent, WA 98032
425.251.6222
barghausen.com

Job Number 22085

Sheet E3 of 7

P:\22000s\22085\engineering\22085–E.dwg 10/16/2023 3:27 PM DLAMOTTE

Appendix B
BMP Details

Maintenance Standards

If the fence has been damaged or visibility reduced, it shall be repaired or replaced immediately and visibility restored.

BMP C105: Stabilized Construction Access

Purpose

Stabilized construction accesses are established to reduce the amount of sediment transported onto paved roads outside the project site by vehicles or equipment. This is done by constructing a stabilized pad of quarry spalls at entrances and exits for project sites.

Conditions of Use

Construction accesses shall be stabilized wherever traffic will be entering or leaving a construction site if paved roads or other paved areas are within 1,000 feet of the site.

For residential subdivision construction sites, provide a stabilized construction access for each residence, rather than only at the main subdivision entrance. Stabilized surfaces shall be of sufficient length/width to provide vehicle access/parking, based on lot size and configuration.

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

Design and Installation Specifications

See Figure II-3.1: Stabilized Construction Access for details. Note: the 100' minimum length of the access shall be reduced to the maximum practicable size when the size or configuration of the site does not allow the full length (100').

Construct stabilized construction accesses with a 12-inch thick pad of 4-inch to 8-inch quarry spalls, a 4-inch course of asphalt treated base (ATB), or use existing pavement. Do not use crushed concrete, cement, or calcium chloride for construction access stabilization because these products raise pH levels in stormwater and concrete discharge to waters of the State is prohibited.

A separation geotextile shall be placed under the spalls to prevent fine sediment from pumping up into the rock pad. The geotextile shall meet the standards listed in Table II-3.2: Stabilized Construction Access Geotextile Standards.

Table II-3.2: Stabilized Construction Access Geotextile Standards

Geotextile Property	Required Value
Grab Tensile Strength (ASTM D4751)	200 psi min.

Table II-3.2: Stabilized Construction Access Geotextile Standards (continued)

Geotextile Property	Required Value
Grab Tensile Elongation (ASTM D4632)	30% max.
Mullen Burst Strength (ASTM D3786-80a)	400 psi min.
AOS (ASTM D4751)	20-45 (U.S. standard sieve size)

- Consider early installation of the first lift of asphalt in areas that will be paved; this can be used as a stabilized access. Also consider the installation of excess concrete as a stabilized access. During large concrete pours, excess concrete is often available for this purpose.
- Fencing (see BMP C103: High-Visibility Fence) shall be installed as necessary to restrict traffic to the construction access.
- Whenever possible, the access shall be constructed on a firm, compacted subgrade. This can substantially increase the effectiveness of the pad and reduce the need for maintenance.
- Construction accesses should avoid crossing existing sidewalks and back of walk drains if at all possible. If a construction access must cross a sidewalk or back of walk drain, the full length of the sidewalk and back of walk drain must be covered and protected from sediment leaving the site.

Alternative Material Specification

WSDOT has raised safety concerns about the Quarry Spall rock specified above. WSDOT observes that the 4-inch to 8-inch rock sizes can become trapped between Dually truck tires, and then released off-site at highway speeds. WSDOT has chosen to use a modified specification for the rock while continuously verifying that the Stabilized Construction Access remains effective. To remain effective, the BMP must prevent sediment from migrating off site. To date, there has been no performance testing to verify operation of this new specification. Jurisdictions may use the alternative specification, but must perform increased off-site inspection if they use, or allow others to use, it.

Stabilized Construction Accesses may use material that meets the requirements of WSDOT's *Standard Specifications for Road, Bridge, and Municipal Construction* Section 9-03.9(1) (WSDOT, 2016) for ballast except for the following special requirements.

The grading and quality requirements are listed in Table II-3.3: Stabilized Construction Access Alternative Material Requirements.

Table II-3.3: Stabilized Construction Access Alternative Material Requirements

Sieve Size	Percent Passing
2½"	99-100

Table II-3.3: Stabilized Construction Access Alternative Material Requirements (continued)

Sieve Size	Percent Passing
2″	65-100
¾″	40-80
No. 4	5 max.
No. 100	0-2
% Fracture	75 min.

- All percentages are by weight.
- The sand equivalent value and dust ratio requirements do not apply.
- The fracture requirement shall be at least one fractured face and will apply the combined aggregate retained on the No. 4 sieve in accordance with FOP for AASHTO T 335.

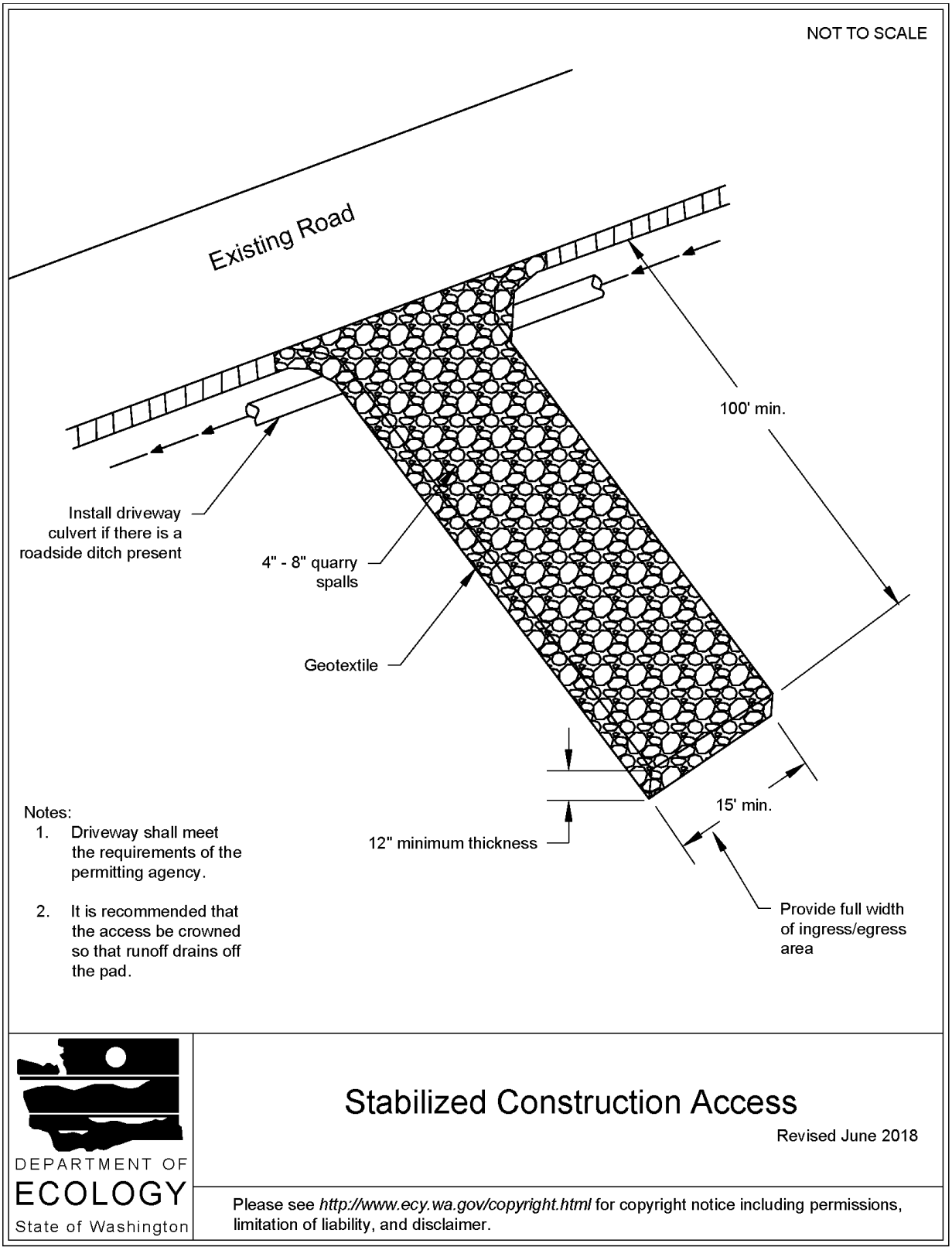
Maintenance Standards

Quarry spalls shall be added if the pad is no longer in accordance with the specifications.

- If the access is not preventing sediment from being tracked onto pavement, then alternative measures to keep the streets free of sediment shall be used. This may include replacement/cleaning of the existing quarry spalls, street sweeping, an increase in the dimensions of the access, or the installation of BMP C106: Wheel Wash.
- Any sediment that is tracked onto pavement shall be removed by shoveling or street sweeping. The sediment collected by sweeping shall be removed or stabilized on site. The pavement shall not be cleaned by washing down the street, except when high efficiency sweeping is ineffective and there is a threat to public safety. If it is necessary to wash the streets, the construction of a small sump to contain the wash water shall be considered. The sediment would then be washed into the sump where it can be controlled.
- Perform street sweeping by hand or with a high efficiency sweeper. Do not use a non-high efficiency mechanical sweeper because this creates dust and throws soils into storm systems or conveyance ditches.
- Any quarry spalls that are loosened from the pad, which end up on the roadway shall be removed immediately.
- If vehicles are entering or exiting the site at points other than the construction access(es), BMP C103: High-Visibility Fence shall be installed to control traffic.

- Upon project completion and site stabilization, all construction accesses intended as permanent access for maintenance shall be permanently stabilized.

Figure II-3.1: Stabilized Construction Access



Approved as Functionally Equivalent

Ecology has approved products as able to meet the requirements of this BMP. The products did not pass through the Technology Assessment Protocol – Ecology (TAPE) process. Local jurisdictions may choose not to accept these products, or may require additional testing prior to consideration for local use. Products that Ecology has approved as functionally equivalent are available for review on Ecology's website at:

https://ecology.wa.gov/Regulations-Permits/Guidance-technical-assistance/Stormwater-permittee-guidance-resources/Emerging-stormwater-treatment-technologies

BMP C106: Wheel Wash

Purpose

Wheel washes reduce the amount of sediment transported onto paved roads by washing dirt from the wheels of motor vehicles prior to the motor vehicles leaving the construction site.

Conditions of Use

- Use a wheel wash when BMP C105: Stabilized Construction Access is not preventing sediment from being tracked off site.
- Wheel washing is generally an effective BMP when installed with careful attention to topography. For example, a wheel wash can be detrimental if installed at the top of a slope abutting a right-of-way where the water from the dripping truck can run unimpeded into the street.
- Pressure washing combined with an adequately sized and surfaced pad with direct drainage to a large 10-foot x 10-foot sump can be very effective.
- Wheel wash wastewater is not stormwater. It is commonly called process water, and must be discharged to a separate on-site treatment system that prevents discharge to waters of the State, or to the sanitary sewer with local sewer district approval.
- Wheel washes may use closed-loop recirculation systems to conserve water use.
- Wheel wash wastewater shall not include wastewater from concrete washout areas.
- When practical, the wheel wash should be placed in sequence with BMP C105: Stabilized Construction Access. Locate the wheel wash such that vehicles exiting the wheel wash will enter directly onto BMP C105: Stabilized Construction Access. In order to achieve this, BMP C105: Stabilized Construction Access may need to be extended beyond the standard installation to meet the exit of the wheel wash.

Design and Installation Specifications

Suggested details are shown in Figure II-3.2: Wheel Wash. The Local Permitting Authority may allow other designs. A minimum of 6 inches of asphalt treated base (ATB) over crushed base material or 8 inches over a good subgrade is recommended to pave the wheel wash.

Crushed rock, gravel base, etc., shall be added as required to maintain a stable driving surface and to stabilize any areas that have eroded.

Following construction, these areas shall be restored to pre-construction condition or better to prevent future erosion.

Perform street cleaning at the end of each day or more often if necessary.

BMP C120: Temporary and Permanent Seeding

Purpose

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

Conditions of Use

Use seeding throughout the project on disturbed areas that have reached final grade or that will remain unworked for more than 30 days.

The optimum seeding windows for western Washington are April 1 through June 30 and September 1 through October 1.

Between July 1 and August 30 seeding requires irrigation until 75 percent grass cover is established.

Between October 1 and March 30 seeding requires a cover of mulch or an erosion control blanket until 75 percent grass cover is established.

Review all disturbed areas in late August to early September and complete all seeding by the end of September. Otherwise, vegetation will not establish itself enough to provide more than average protection.

Mulch is required at all times for seeding because it protects seeds from heat, moisture loss, and transport due to runoff. Mulch can be applied on top of the seed or simultaneously by hydroseeding. See BMP C121: Mulching for specifications.

Seed and mulch all disturbed areas not otherwise vegetated at final site stabilization. Final stabilization means the completion of all soil disturbing activities at the site and the establishment of a permanent vegetative cover, or equivalent permanent stabilization measures (such as pavement, riprap, gabions, or geotextiles) which will prevent erosion. See BMP T5.13: Post-Construction Soil Quality and Depth.

Design and Installation Specifications

General

- Install channels intended for vegetation before starting major earthwork and hydroseed with a Bonded Fiber Matrix. For vegetated channels that will have high flows, install erosion control blankets over the top of hydroseed. Before allowing water to flow in vegetated channels, establish 75 percent vegetation cover. If vegetated channels cannot be established by seed

before water flow; install sod in the channel bottom — over top of hydromulch and erosion control blankets.

- Confirm the installation of all required surface water control measures to prevent seed from washing away.
- Hydroseed applications shall include a minimum of 1,500 pounds per acre of mulch with 3 percent tackifier. See BMP C121: Mulching for specifications.
- Areas that will have seeding only and not landscaping may need compost or meal-based mulch included in the hydroseed in order to establish vegetation. Re-install native topsoil on the disturbed soil surface before application. See BMP T5.13: Post-Construction Soil Quality and Depth.
- When installing seed via hydroseeding operations, only about 1/3 of the seed actually ends up in contact with the soil surface. This reduces the ability to establish a good stand of grass quickly. To overcome this, consider increasing seed quantities by up to 50 percent.
- Enhance vegetation establishment by dividing the hydromulch operation into two phases:
    - Phase 1- Install all seed and fertilizer with 25-30 percent mulch and tackifier onto soil in the first lift.
    - Phase 2- Install the rest of the mulch and tackifier over the first lift.

  Or, enhance vegetation by:
    - Installing the mulch, seed, fertilizer, and tackifier in one lift.
    - Spread or blow straw over the top of the hydromulch at a rate of 800-1000 pounds per acre.
    - Hold straw in place with a standard tackifier.

  Both of these approaches will increase cost moderately but will greatly improve and enhance vegetative establishment. The increased cost may be offset by the reduced need for:
    - Irrigation.
    - Reapplication of mulch.
    - Repair of failed slope surfaces.

  This technique works with standard hydromulch (1,500 pounds per acre minimum) and Bonded Fiber Matrix/ Mechanically Bonded Fiber Matrix (BFM/MBFMs) (3,000 pounds per acre minimum).
- Seed may be installed by hand if:
    - Temporary and covered by straw, mulch, or topsoil.
    - Permanent in small areas (usually less than 1 acre) and covered with mulch, topsoil, or erosion blankets.
- The seed mixes listed in Table II-3.4: Temporary and Permanent Seed Mixes include

recommended mixes for both temporary and permanent seeding.

- Apply these mixes, with the exception of the wet area seed mix, at a rate of 120 pounds per acre. This rate can be reduced if soil amendments or slow-release fertilizers are used. Apply the wet area seed mix at a rate of 60 pounds per acre.
- Consult the local suppliers or the local conservation district for their recommendations. The appropriate mix depends on a variety of factors, including location, exposure, soil type, slope, and expected foot traffic. Alternative seed mixes approved by the local authority may be used, depending on the soil type and hydrology of the area.

Table II-3.4: Temporary and Permanent Seed Mixes

Common Name	Latin Name	% Weight	% Purity	% Germination
Temporary Erosion Control Seed Mix A standard mix for areas requiring a temporary vegetative cover.				
Chewings or annual blue grass	*Festuca rubra var. commutata* or *Poa anna*	40	98	90
Perennial rye	*Lolium perenne*	50	98	90
Redtop or colonial bentgrass	*Agrostis alba* or *Agrostis tenuis*	5	92	85
White dutch clover	*Trifolium repens*	5	98	90
Landscaping Seed Mix A recommended mix for landscaping seed.				
Perennial rye blend	*Lolium perenne*	70	98	90
Chewings and red fescue blend	*Festuca rubra var. commutata* or *Festuca rubra*	30	98	90
Low-Growing Turf Seed Mix A turf seed mix for dry situations where there is no need for watering. This mix requires very little maintenance.				
Dwarf tall fescue (several varieties)	*Festuca arundinacea var.*	45	98	90
Dwarf perennial rye (Barclay)	*Lolium perenne var. barclay*	30	98	90
Red fescue	*Festuca rubra*	20	98	90
Colonial bentgrass	*Agrostis tenuis*	5	98	90
Bioswale Seed Mix A seed mix for bioswales and other intermittently wet areas.				
Tall or meadow fes-	*Festuca arundin-*	75-80	98	90

Table II-3.4: Temporary and Permanent Seed Mixes (continued)

Common Name	Latin Name	% Weight	% Purity	% Germination
cue	*acea* or *Festuca elatior*			
Seaside/Creeping bentgrass	*Agrostis palustris*	10-15	92	85
Redtop bentgrass	*Agrostis alba* or *Agrostis gigantea*	5-10	90	80
Wet Area Seed Mix A low-growing, relatively non-invasive seed mix appropriate for very wet areas that are not regulated wetlands. Consult Hydraulic Permit Authority (HPA) for seed mixes if applicable.				
Tall or meadow fescue	*Festuca arundinacea* or *Festuca elatior*	60-70	98	90
Seaside/Creeping bentgrass	*Agrostis palustris*	10-15	98	85
Meadow foxtail	*Alepocurus pratensis*	10-15	90	80
Alsike clover	*Trifolium hybridum*	1-6	98	90
Redtop bentgrass	*Agrostis alba*	1-6	92	85
Meadow Seed Mix A recommended meadow seed mix for infrequently maintained areas or non-maintained areas where colonization by native plants is desirable. Likely applications include rural road and utility right-of-way. Seeding should take place in September or very early October in order to obtain adequate establishment prior to the winter months. Consider the appropriateness of clover, a fairly invasive species, in the mix. Amending the soil can reduce the need for clover.				
Redtop or Oregon bentgrass	*Agrostis alba* or *Agrostis oregonensis*	20	92	85
Red fescue	*Festuca rubra*	70	98	90
White dutch clover	*Trifolium repens*	10	98	90

Roughening and Rototilling

- The seedbed should be firm and rough. Roughen all soil no matter what the slope. Track walk slopes before seeding if engineering purposes require compaction. Backblading or smoothing of slopes greater than 4H:1V is not allowed if they are to be seeded.
- Restoration-based landscape practices require deeper incorporation than that provided by a simple single-pass rototilling treatment. Wherever practical, initially rip the subgrade to improve long-term permeability, infiltration, and water inflow qualities. At a minimum,

permanent areas shall use soil amendments to achieve organic matter and permeability performance defined in engineered soil/landscape systems. For systems that are deeper than 8 inches complete the rototilling process in multiple lifts, or prepare the engineered soil system per specifications and place to achieve the specified depth.

Fertilizers

- Conducting soil tests to determine the exact type and quantity of fertilizer is recommended. This will prevent the over-application of fertilizer.
- Organic matter is the most appropriate form of fertilizer because it provides nutrients (including nitrogen, phosphorus, and potassium) in the least water-soluble form.
- In general, use 10-4-6 N-P-K (nitrogen-phosphorus-potassium) fertilizer at a rate of 90 pounds per acre. Always use slow-release fertilizers because they are more efficient and have fewer environmental impacts. Do not add fertilizer to the hydromulch machine, or agitate, more than 20 minutes before use. Too much agitation destroys the slow-release coating.
- There are numerous products available that take the place of chemical fertilizers. These include several with seaweed extracts that are beneficial to soil microbes and organisms. If 100 percent cottonseed meal is used as the mulch in hydroseed, chemical fertilizer may not be necessary. Cottonseed meal provides a good source of long-term, slow-release, available nitrogen.

Bonded Fiber Matrix and Mechanically Bonded Fiber Matrix

- On steep slopes use Bonded Fiber Matrix (BFM) or Mechanically Bonded Fiber Matrix (MBFM) products. Apply BFM/MBFM products at a minimum rate of 3,000 pounds per acre with approximately 10 percent tackifier. Achieve a minimum of 95 percent soil coverage during application. Numerous products are available commercially. Most products require 24-36 hours to cure before rainfall and cannot be installed on wet or saturated soils. Generally, products come in 40-50 pound bags and include all necessary ingredients except for seed and fertilizer.
- Install products per manufacturer's instructions.
- BFMs and MBFMs provide good alternatives to blankets in most areas requiring vegetation establishment. Advantages over blankets include:
    - BFM and MBFMs do not require surface preparation.
    - Helicopters can assist in installing BFM and MBFMs in remote areas.
    - On slopes steeper than 2.5H:1V, blanket installers may require ropes and harnesses for safety.
    - Installing BFM and MBFMs can save at least $1,000 per acre compared to blankets.

Maintenance Standards

Reseed any seeded areas that fail to establish at least 75 percent cover (100 percent cover for areas that receive sheet or concentrated flows). If reseeding is ineffective, use an alternate method such as sodding, mulching, nets, or blankets.

- Reseed and protect by mulch any areas that experience erosion after achieving adequate cover. Reseed and protect by mulch any eroded area.
- Supply seeded areas with adequate moisture, but do not water to the extent that it causes run-off.

Approved as Functionally Equivalent

Ecology has approved products as able to meet the requirements of this BMP. The products did not pass through the Technology Assessment Protocol – Ecology (TAPE) process. Local jurisdictions may choose not to accept these products, or may require additional testing prior to consideration for local use. Products that Ecology has approved as functionally equivalent are available for review on Ecology's website at:

https://ecology.wa.gov/Regulations-Permits/Guidance-technical-assistance/Stormwater-permittee-guidance-resources/Emerging-stormwater-treatment-technologies

BMP C121: Mulching

Purpose

Mulching soils provides immediate temporary protection from erosion. Mulch also enhances plant establishment by conserving moisture, holding fertilizer, seed, and topsoil in place, and moderating soil temperatures. There are a variety of mulches that can be used. This section discusses only the most common types of mulch.

Conditions of Use

As a temporary cover measure, mulch should be used:

- For less than 30 days on disturbed areas that require cover.
- At all times for seeded areas, especially during the wet season and during the hot summer months.
- During the wet season on slopes steeper than 3H:1V with more than 10 feet of vertical relief.

Mulch may be applied at any time of the year and must be refreshed periodically.

For seeded areas, mulch may be made up of 100 percent:

- cottonseed meal;
- fibers made of wood, recycled cellulose, hemp, or kenaf;

BMP C140: Dust Control

Purpose

Dust control prevents wind transport of dust from disturbed soil surfaces onto roadways, drainage ways, and surface waters.

Conditions of Use

Use dust control in areas (including roadways) subject to surface and air movement of dust where on-site or off-site impacts to roadways, drainage ways, or surface waters are likely.

Design and Installation Specifications

- Vegetate or mulch areas that will not receive vehicle traffic. In areas where planting, mulching, or paving is impractical, apply gravel or landscaping rock.
- Limit dust generation by clearing only those areas where immediate activity will take place, leaving the remaining area(s) in the original condition. Maintain the original ground cover as long as practical.
- Construct natural or artificial windbreaks or windscreens. These may be designed as enclosures for small dust sources.
- Sprinkle the site with water until the surface is wet. Repeat as needed. To prevent carryout of mud onto the street, refer to BMP C105: Stabilized Construction Access and BMP C106: Wheel Wash.
- Irrigation water can be used for dust control. Irrigation systems should be installed as a first step on sites where dust control is a concern.
- Spray exposed soil areas with a dust palliative, following the manufacturer's instructions and cautions regarding handling and application. Used oil is prohibited from use as a dust suppressant. Local governments may approve other dust palliatives such as calcium chloride or PAM.
- PAM (BMP C126: Polyacrylamide (PAM) for Soil Erosion Protection) added to water at a rate of 0.5 pounds per 1,000 gallons of water per acre and applied from a water truck is more effective than water alone. This is due to increased infiltration of water into the soil and reduced evaporation. In addition, small soil particles are bonded together and are not as easily transported by wind. Adding PAM may reduce the quantity of water needed for dust control. Note that the application rate specified here applies to this BMP, and is not the same application rate that is specified in BMP C126: Polyacrylamide (PAM) for Soil Erosion Protection, but the downstream protections still apply.

  Refer to BMP C126: Polyacrylamide (PAM) for Soil Erosion Protection for conditions of use. PAM shall not be directly applied to water or allowed to enter a water body.
- Contact your local Air Pollution Control Authority for guidance and training on other dust control measures. Compliance with the local Air Pollution Control Authority constitutes

compliance with this BMP.

- Use vacuum street sweepers.
- Remove mud and other dirt promptly so it does not dry and then turn into dust.
- Techniques that can be used for unpaved roads and lots include:
    - Lower speed limits. High vehicle speed increases the amount of dust stirred up from unpaved roads and lots.
    - Upgrade the road surface strength by improving particle size, shape, and mineral types that make up the surface and base materials.
    - Add surface gravel to reduce the source of dust emission. Limit the amount of fine particles (those smaller than .075 mm) to 10 to 20 percent.
    - Use geotextile fabrics to increase the strength of new roads or roads undergoing reconstruction.
    - Encourage the use of alternate, paved routes, if available.
    - Apply chemical dust suppressants using the admix method, blending the product with the top few inches of surface material. Suppressants may also be applied as surface treatments.
    - Limit dust-causing work on windy days.
    - Pave unpaved permanent roads and other trafficked areas.

Maintenance Standards

Respray area as necessary to keep dust to a minimum.

BMP C150: Materials on Hand

Purpose

Keep quantities of erosion prevention and sediment control materials on the project site at all times to be used for regular maintenance and emergency situations such as unexpected heavy rains. Having these materials on-site reduces the time needed to replace existing or implement new BMPs when inspections indicate that existing BMPs are not meeting the Construction SWPPP requirements. In addition, contractors can save money by buying some materials in bulk and storing them at their office or yard.

Conditions of Use

- Construction projects of any size or type can benefit from having materials on hand. A small commercial development project could have a roll of plastic and some gravel available for immediate protection of bare soil and temporary berm construction. A large earthwork project, such as highway construction, might have several tons of straw, several rolls of plastic, flexible

pipe, sandbags, geotextile fabric and steel “T” posts.

- Materials should be stockpiled and readily available before any site clearing, grubbing, or earthwork begins. A large contractor or project proponent could keep a stockpile of materials that are available for use on several projects.
- If storage space at the project site is at a premium, the contractor could maintain the materials at their office or yard. The office or yard must be less than an hour from the project site.

Design and Installation Specifications

Depending on project type, size, complexity, and length, materials and quantities will vary. A good minimum list of items that will cover numerous situations includes:

- Clear Plastic, 6 mil
- Drainpipe, 6 or 8 inch diameter
- Sandbags, filled
- Straw Bales for mulching
- Quarry Spalls
- Washed Gravel
- Geotextile Fabric
- Catch Basin Inserts
- Steel "T" Posts
- Silt fence material
- Straw Wattles

Maintenance Standards

- All materials with the exception of the quarry spalls, steel “T” posts, and gravel should be kept covered and out of both sun and rain.
- Re-stock materials as needed.

BMP C151: Concrete Handling

Purpose

Concrete work can generate process water and slurry that contain fine particles and high pH, both of which can violate water quality standards in the receiving water. Concrete spillage or concrete discharge to waters of the State is prohibited. Use this BMP to minimize and eliminate concrete, concrete process water, and concrete slurry from entering waters of the State.

Conditions of Use

Any time concrete is used, utilize these management practices. Concrete construction project components include, but are not limited to:

- Curbs
- Sidewalks
- Roads
- Bridges
- Foundations
- Floors
- Runways

Disposal options for concrete, in order of preference are:

1. Off-site disposal
2. Concrete wash-out areas (see BMP C154: Concrete Washout Area)
3. De minimus washout to formed areas awaiting concrete

Design and Installation Specifications

- Wash concrete truck drums at an approved off-site location or in designated concrete washout areas only. Do not wash out concrete trucks onto the ground (including formed areas awaiting concrete), or into storm drains, open ditches, streets, or streams. Refer to BMP C154: Concrete Washout Area for information on concrete washout areas.
    - Return unused concrete remaining in the truck and pump to the originating batch plant for recycling. Do not dump excess concrete on site, except in designated concrete washout areas as allowed in BMP C154: Concrete Washout Area.
- Wash small concrete handling equipment (e.g. hand tools, screeds, shovels, rakes, floats, trowels, and wheelbarrows) into designated concrete washout areas or into formed areas awaiting concrete pour.
- At no time shall concrete be washed off into the footprint of an area where an infiltration feature will be installed.
- Wash equipment difficult to move, such as concrete paving machines, in areas that do not directly drain to natural or constructed stormwater conveyance or potential infiltration areas.
- Do not allow washwater from areas, such as concrete aggregate driveways, to drain directly (without detention or treatment) to natural or constructed stormwater conveyances.
- Contain washwater and leftover product in a lined container when no designated concrete washout areas (or formed areas, allowed as described above) are available. Dispose of contained concrete and concrete washwater (process water) properly.

- Always use forms or solid barriers for concrete pours, such as pilings, within 15-feet of surface waters.
- Refer to BMP C252: Treating and Disposing of High pH Water for pH adjustment requirements.
- Refer to the Construction Stormwater General Permit (CSWGP) for pH monitoring requirements if the project involves one of the following activities:
    - Significant concrete work (as defined in the CSWGP).
    - The use of soils amended with (but not limited to) Portland cement-treated base, cement kiln dust or fly ash.
    - Discharging stormwater to segments of water bodies on the 303(d) list (Category 5) for high pH.

Maintenance Standards

Check containers for holes in the liner daily during concrete pours and repair the same day.

BMP C152: Sawcutting and Surfacing Pollution Prevention

Purpose

Sawcutting and surfacing operations generate slurry and process water that contains fine particles and high pH (concrete cutting), both of which can violate the water quality standards in the receiving water. Concrete spillage or concrete discharge to waters of the State is prohibited. Use this BMP to minimize and eliminate process water and slurry created through sawcutting or surfacing from entering waters of the State.

Conditions of Use

Utilize these management practices anytime sawcutting or surfacing operations take place. Sawcutting and surfacing operations include, but are not limited to:

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

Design and Installation Specifications

- Vacuum slurry and cuttings during cutting and surfacing operations.
- Slurry and cuttings shall not remain on permanent concrete or asphalt pavement overnight.
- Slurry and cuttings shall not drain to any natural or constructed drainage conveyance including stormwater systems. This may require temporarily blocking catch basins.
- Dispose of collected slurry and cuttings in a manner that does not violate ground water or surface water quality standards.
- Do not allow process water generated during hydro-demolition, surface roughening or similar operations to drain to any natural or constructed drainage conveyance including stormwater systems. Dispose of process water in a manner that does not violate ground water or surface water quality standards.
- Handle and dispose of cleaning waste material and demolition debris in a manner that does not cause contamination of water. Dispose of sweeping material from a pick-up sweeper at an appropriate disposal site.

Maintenance Standards

Continually monitor operations to determine whether slurry, cuttings, or process water could enter waters of the state. If inspections show that a violation of water quality standards could occur, stop operations and immediately implement preventive measures such as berms, barriers, secondary containment, and/or vacuum trucks.

BMP C153: Material Delivery, Storage, and Containment

Purpose

Prevent, reduce, or eliminate the discharge of pollutants to the stormwater system or watercourses from material delivery and storage. Minimize the storage of hazardous materials on-site, store materials in a designated area, and install secondary containment.

Conditions of Use

Use at construction sites with delivery and storage of the following materials:

- Petroleum products such as fuel, oil and grease
- Soil stabilizers and binders (e.g., Polyacrylamide)
- Fertilizers, pesticides and herbicides
- Detergents
- Asphalt and concrete compounds

- Hazardous chemicals such as acids, lime, adhesives, paints, solvents, and curing compounds
- Any other material that may be detrimental if released to the environment

Design and Installation Specifications

- The temporary storage area should be located away from vehicular traffic, near the construction entrance(s), and away from waterways or storm drains.
- Safety Data Sheets (SDS) should be supplied for all materials stored. Chemicals should be kept in their original labeled containers.
- Hazardous material storage on-site should be minimized.
- Hazardous materials should be handled as infrequently as possible.
- During the wet weather season (Oct 1 – April 30), consider storing materials in a covered area.
- Materials should be stored in secondary containments, such as an earthen dike, horse trough, or even a children's wading pool for non-reactive materials such as detergents, oil, grease, and paints. Small amounts of material may be secondarily contained in "bus boy" trays or concrete mixing trays.
- Do not store chemicals, drums, or bagged materials directly on the ground. Place these items on a pallet and, when possible, within secondary containment.
- If drums must be kept uncovered, store them at a slight angle to reduce ponding of rainwater on the lids to reduce corrosion. Domed plastic covers are inexpensive and snap to the top of drums, preventing water from collecting.
- Liquids, petroleum products, and substances listed in 40 CFR Parts 110, 117, or 302 shall be stored in approved containers and drums and shall not be overfilled. Containers and drums shall be stored in temporary secondary containment facilities.
- Temporary secondary containment facilities shall provide for a spill containment volume able to contain 10% of the total enclosed container volume of all containers, or 110% of the capacity of the largest container within its boundary, whichever is greater.
- Secondary containment facilities shall be impervious to the materials stored therein for a minimum contact time of 72 hours.
- Sufficient separation should be provided between stored containers to allow for spill cleanup and emergency response access.
- During the wet weather season (Oct 1 – April 30), each secondary containment facility shall be covered during non-working days, prior to and during rain events.
- Keep material storage areas clean, organized and equipped with an ample supply of appropriate spill clean-up material (spill kit).
- The spill kit should include, at a minimum:

- 1-Water Resistant Nylon Bag
- 3-Oil Absorbent Socks 3”x 4’
- 2-Oil Absorbent Socks 3”x 10’
- 12-Oil Absorbent Pads 17”x19”
- 1-Pair Splash Resistant Goggles
- 3-Pair Nitrile Gloves
- 10-Disposable Bags with Ties
- Instructions

Maintenance Standards

- Secondary containment facilities shall be maintained free of accumulated rainwater and spills. In the event of spills or leaks, accumulated rainwater and spills shall be collected and placed into drums. These liquids shall be handled as hazardous waste unless testing determines them to be non-hazardous.
- Re-stock spill kit materials as needed.

BMP C154: Concrete Washout Area

Purpose

Prevent or reduce the discharge of pollutants from concrete waste to stormwater by conducting washout off-site, or performing on-site washout in a designated area.

Conditions of Use

Concrete washout areas are implemented on construction projects where:

- Concrete is used as a construction material
- It is not possible to dispose of all concrete wastewater and washout off-site (ready mix plant, etc.).
- Concrete truck drums are washed on-site.

  Note that auxiliary concrete truck components (e.g. chutes and hoses) and small concrete handling equipment (e.g. hand tools, screeds, shovels, rakes, floats, trowels, and wheel-barrows) may be washed into formed areas awaiting concrete pour.

At no time shall concrete be washed off into the footprint of an area where an infiltration feature will be installed.

Design and Installation Specifications

Implementation

- Perform washout of concrete truck drums at an approved off-site location or in designated concrete washout areas only.
- Do not wash out concrete onto non-formed areas, or into storm drains, open ditches, streets, or streams.
- Wash equipment difficult to move, such as concrete paving machines, in areas that do not directly drain to natural or constructed stormwater conveyance or potential infiltration areas.
- Do not allow excess concrete to be dumped on-site, except in designated concrete washout areas as allowed above.
- Concrete washout areas may be prefabricated concrete washout containers, or self-installed structures (above-grade or below-grade).
- Prefabricated containers are most resistant to damage and protect against spills and leaks. Companies may offer delivery service and provide regular maintenance and disposal of solid and liquid waste.
- If self-installed concrete washout areas are used, below-grade structures are preferred over above-grade structures because they are less prone to spills and leaks.
- Self-installed above-grade structures should only be used if excavation is not practical.
- Concrete washout areas shall be constructed and maintained in sufficient quantity and size to contain all liquid and concrete waste generated by washout operations.

Education

- Discuss the concrete management techniques described in this BMP with the ready-mix concrete supplier before any deliveries are made.
- Educate employees and subcontractors on the concrete waste management techniques described in this BMP.
- Arrange for the contractor's superintendent or Certified Erosion and Sediment Control Lead (CESCL) to oversee and enforce concrete waste management procedures.
- A sign should be installed adjacent to each concrete washout area to inform concrete equipment operators to utilize the proper facilities.

Contracts

Incorporate requirements for concrete waste management into concrete supplier and subcontractor agreements.

Location and Placement

- Locate concrete washout areas at least 50 feet from sensitive areas such as storm drains, open ditches, water bodies, or wetlands.
- Allow convenient access to the concrete washout area for concrete trucks, preferably near the area where the concrete is being poured.
- If trucks need to leave a paved area to access the concrete washout area, prevent track-out with a pad of rock or quarry spalls (see BMP C105: Stabilized Construction Access). These areas should be far enough away from other construction traffic to reduce the likelihood of accidental damage and spills.
- The number of concrete washout areas you install should depend on the expected demand for storage capacity.
- On large sites with extensive concrete work, concrete washout areas should be placed in multiple locations for ease of use by concrete truck drivers.

Concrete Truck Washout Procedures

- Washout of concrete truck drums shall be performed in designated concrete washout areas only.
- Concrete washout from concrete pumper bins can be washed into concrete pumper trucks and discharged into designated concrete washout areas or properly disposed of off-site.

Concrete Washout Area Installation

- Concrete washout areas should be constructed as shown in the figures below, with a recommended minimum length and minimum width of 10 ft, but with sufficient quantity and volume to contain all liquid and concrete waste generated by washout operations.
- Plastic lining material should be a minimum of 10 mil polyethylene sheeting and should be free of holes, tears, or other defects that compromise the impermeability of the material.
- Lath and flagging should be commercial type.
- Liner seams shall be installed in accordance with manufacturers' recommendations.
- Soil base shall be prepared free of rocks or other debris that may cause tears or holes in the plastic lining material.

Maintenance Standards

Inspection and Maintenance

- Inspect and verify that concrete washout areas are in place prior to the commencement of concrete work.
- Once concrete wastes are washed into the designated washout area and allowed to harden,

the concrete should be broken up, removed, and disposed of per applicable solid waste regulations. Dispose of hardened concrete on a regular basis.

- During periods of concrete work, inspect the concrete washout areas daily to verify continued performance.
    - Check overall condition and performance.
    - Check remaining capacity (% full).
    - If using self-installed concrete washout areas, verify plastic liners are intact and sidewalls are not damaged.
    - If using prefabricated containers, check for leaks.
- Maintain the concrete washout areas to provide adequate holding capacity with a minimum freeboard of 12 inches.
- Concrete washout areas must be cleaned, or new concrete washout areas must be constructed and ready for use once the concrete washout area is 75% full.
- If the concrete washout area is nearing capacity, vacuum and dispose of the waste material in an approved manner.
    - Do not discharge liquid or slurry to waterways, storm drains or directly onto ground.
    - Do not discharge to the sanitary sewer without local approval.
    - Place a secure, non-collapsing, non-water collecting cover over the concrete washout area prior to predicted wet weather to prevent accumulation and overflow of precipitation.
    - Remove and dispose of hardened concrete and return the structure to a functional condition. Concrete may be reused on-site or hauled away for disposal or recycling.
- When you remove materials from a self-installed concrete washout area, build a new structure; or, if the previous structure is still intact, inspect for signs of weakening or damage, and make any necessary repairs. Re-line the structure with new plastic after each cleaning.

Removal of Concrete Washout Areas

- When concrete washout areas are no longer required for the work, the hardened concrete, slurries and liquids shall be removed and properly disposed of.
- Materials used to construct concrete washout areas shall be removed from the site of the work and disposed of or recycled.
- Holes, depressions or other ground disturbance caused by the removal of the concrete washout areas shall be backfilled, repaired, and stabilized to prevent erosion.

Figure II-3.7: Concrete Washout Area with Wood Planks

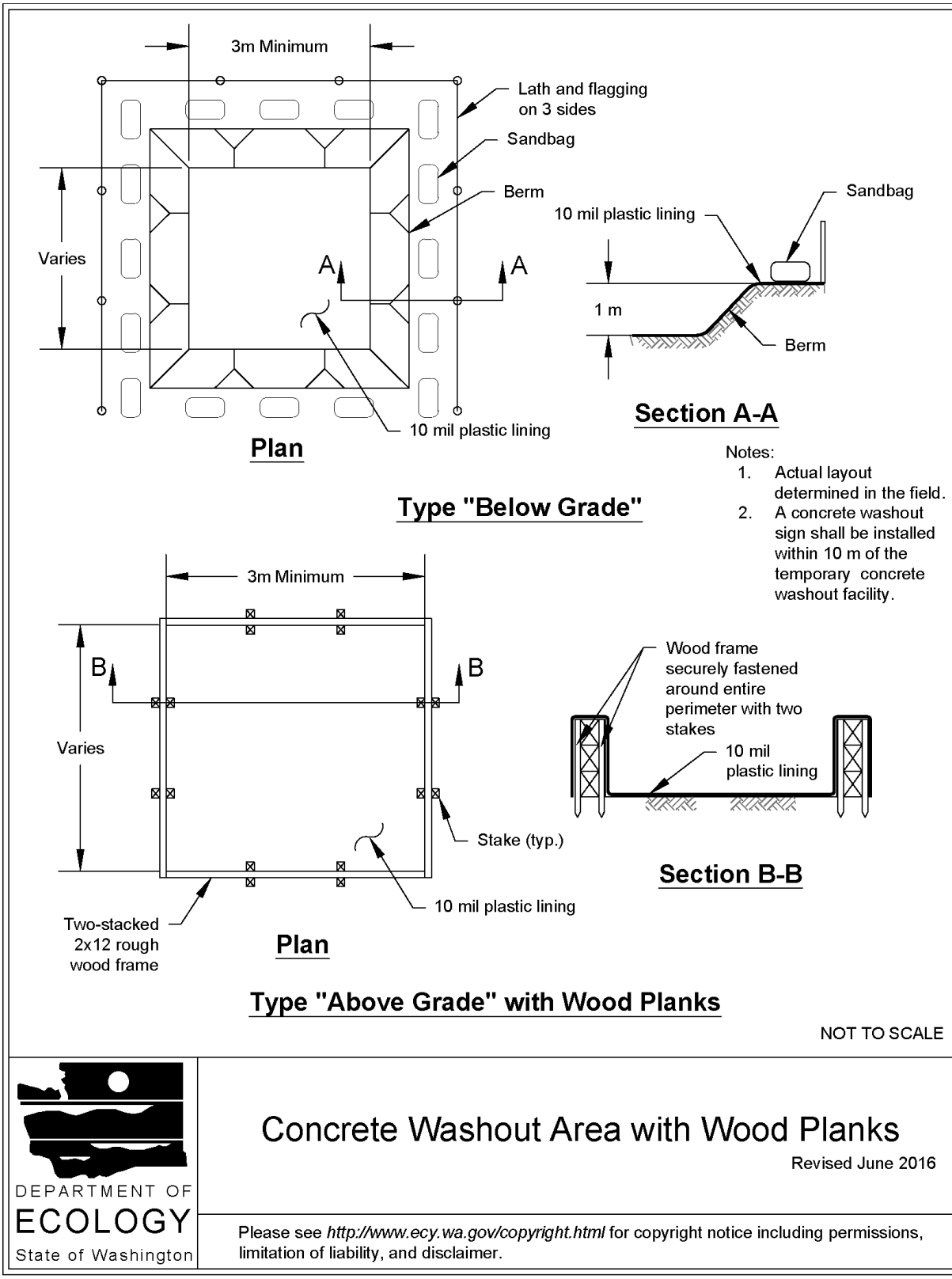


Figure II-3.8: Concrete Washout Area with Straw Bales

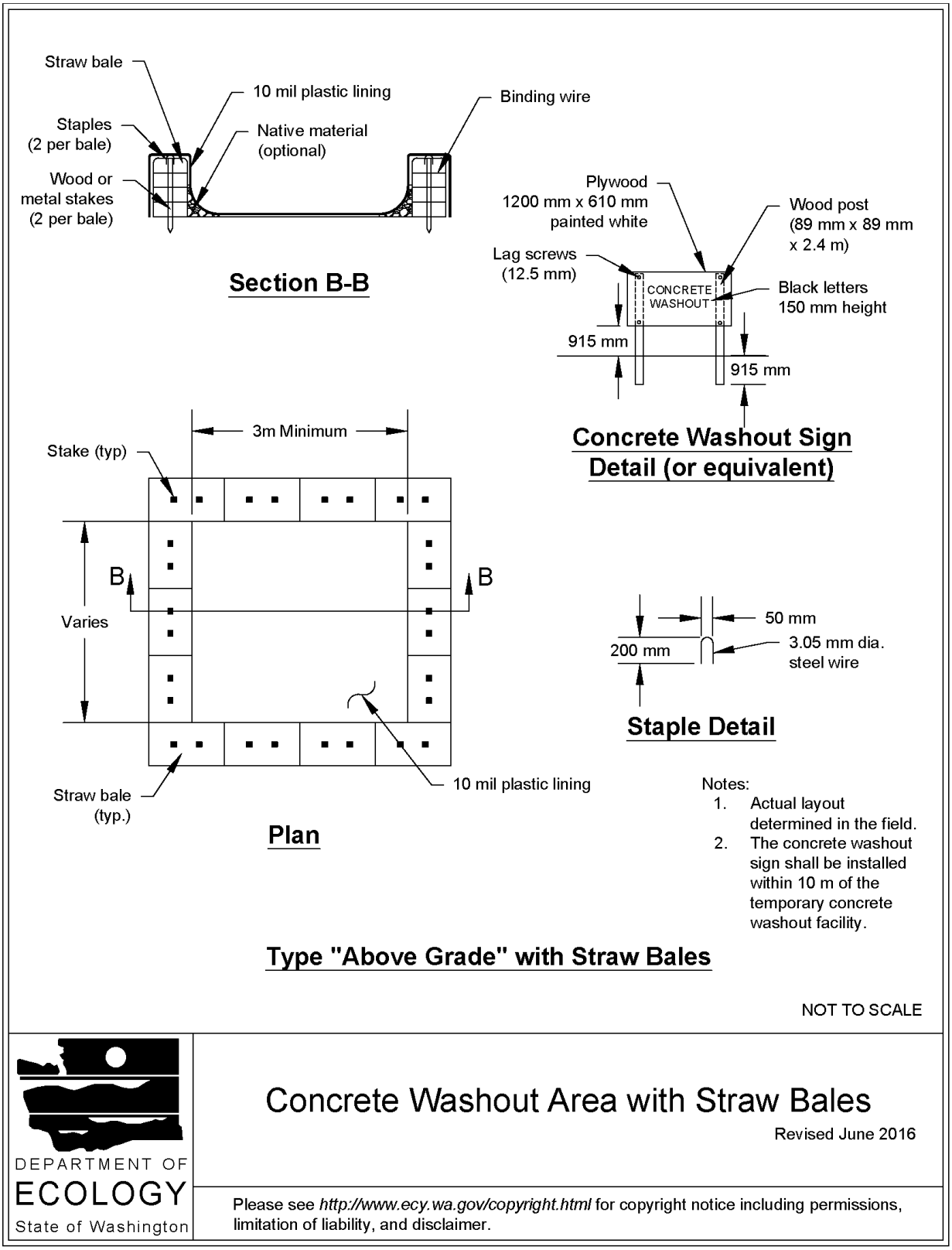
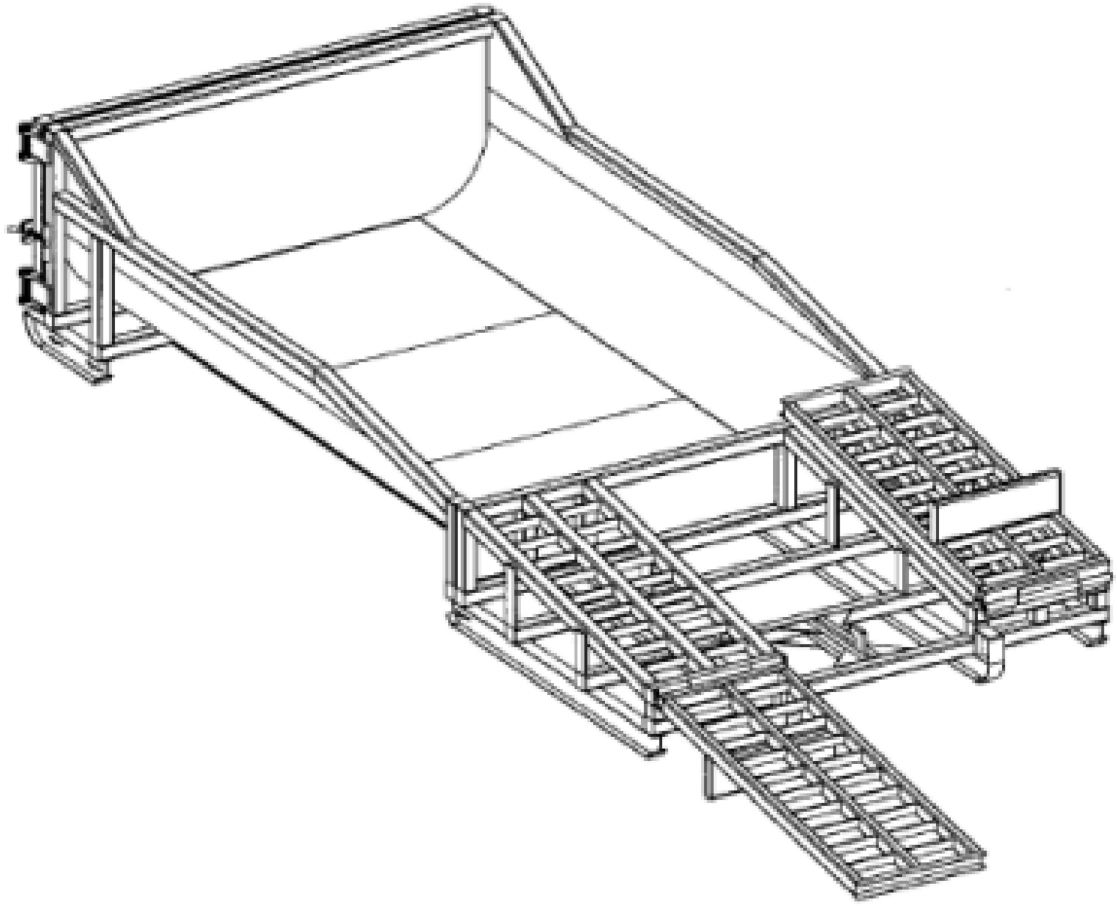


Figure II-3.9: Prefabricated Concrete Washout Container w/Ramp



NOT TO SCALE

DEPARTMENT OF ECOLOGY
State of Washington

Prefabricated Concrete Washout Container w/Ramp

Revised June 2016

BMP C160: Certified Erosion and Sediment Control Lead

Purpose

The project proponent designates at least one person as the responsible representative in charge of erosion and sediment control (ESC), and water quality protection. The designated person shall be responsible for ensuring compliance with all local, state, and federal erosion and sediment control and water quality requirements. Construction sites one acre or larger that discharge to waters of the State must designate a Certified Erosion and Sediment Control Lead (CESCL) as the responsible representative.

Conditions of Use

A CESCL shall be made available on projects one acre or larger that discharge stormwater to surface waters of the state. Sites less than one acre may have a person without CESCL certification conduct inspections.

The CESCL shall:

- Have a current certificate proving attendance in an erosion and sediment control training course that meets the minimum ESC training and certification requirements established by Ecology.

  Ecology has provided the minimum requirements for CESCL course training, as well as a list of ESC training and certification providers at:

  https://ecology.wa.gov/Regulations-Permits/Permits-certifications/Certified-erosion-sediment-control

  OR

- Be a Certified Professional in Erosion and Sediment Control (CPESC). For additional information go to:

  http://www.envirocertintl.org/cpesc/

Specifications

- CESCL certification shall remain valid for three years.
- The CESCL shall have authority to act on behalf of the contractor or project proponent and shall be available, or on-call, 24 hours per day throughout the period of construction.
- The Construction SWPPP shall include the name, telephone number, fax number, and address of the designated CESCL. See II-2 Construction Stormwater Pollution Prevention Plans (Construction SWPPPs).
- A CESCL may provide inspection and compliance services for multiple construction projects in the same geographic region, but must be on site whenever earthwork activities are

occurring that could generate release of turbid water.

- Duties and responsibilities of the CESCL shall include, but are not limited to the following:
    - Maintaining a permit file on site at all times which includes the Construction SWPPP and any associated permits and plans.
    - Directing BMP installation, inspection, maintenance, modification, and removal.
    - Updating all project drawings and the Construction SWPPP with changes made.
    - Completing any sampling requirements including reporting results using electronic Discharge Monitoring Reports (WebDMR).
    - Facilitate, participate in, and take corrective actions resulting from inspections performed by outside agencies or the owner.
    - Keeping daily logs, and inspection reports. Inspection reports should include:
        - Inspection date/time.
        - Weather information; general conditions during inspection and approximate amount of precipitation since the last inspection.
        - Visual monitoring results, including a description of discharged stormwater. The presence of suspended sediment, turbid water, discoloration, and oil sheen shall be noted, as applicable.
        - Any water quality monitoring performed during inspection.
        - General comments and notes, including a brief description of any BMP repairs, maintenance or installations made as a result of the inspection.
        - A summary or list of all BMPs implemented, including observations of all erosion/sediment control structures or practices. The following shall be noted:
            1. Locations of BMPs inspected.
            2. Locations of BMPs that need maintenance.
            3. Locations of BMPs that failed to operate as designed or intended.
            4. Locations of where additional or different BMPs are required.

BMP C162: Scheduling

Purpose

Sequencing a construction project reduces the amount and duration of soil exposed to erosion by wind, rain, runoff, and vehicle tracking.

Conditions of Use

The construction sequence schedule is an orderly listing of all major land-disturbing activities together with the necessary erosion and sedimentation control measures planned for the project. This type of schedule guides the contractor on work to be done before other work is started so that serious erosion and sedimentation problems can be avoided.

Following a specified work schedule that coordinates the timing of land-disturbing activities and the installation of control measures is perhaps the most cost-effective way of controlling erosion during construction. The removal of ground cover leaves a site vulnerable to erosion. Construction sequencing that limits land clearing, provides timely installation of erosion and sedimentation controls, and restores protective cover quickly can significantly reduce the erosion potential of a site.

Design Considerations

- Minimize construction during rainy periods.
- Schedule projects to disturb only small portions of the site at any one time. Complete grading as soon as possible. Immediately stabilize the disturbed portion before grading the next portion. Practice staged seeding in order to revegetate cut and fill slopes as the work progresses.

II-3.3 Construction Runoff BMPs

BMP C200: Interceptor Dike and Swale

Purpose

Provide a dike of compacted soil or a swale at the top or base of a disturbed slope or along the perimeter of a disturbed construction area to convey stormwater. Use the dike and/or swale to intercept the runoff from unprotected areas and direct it to areas where erosion can be controlled. This can prevent storm runoff from entering the work area or sediment-laden runoff from leaving the construction site.

Conditions of Use

Use an interceptor dike or swale where runoff from an exposed site or disturbed slope must be conveyed to an erosion control BMP which can safely convey the stormwater.

- Locate upslope of a construction site to prevent runoff from entering the disturbed area.
- When placed horizontally across a disturbed slope, it reduces the amount and velocity of runoff flowing down the slope.
- Locate downslope to collect runoff from a disturbed area and direct it to a sediment BMP (e.g. BMP C240: Sediment Trap or BMP C241: Sediment Pond (Temporary)).

Design and Installation Specifications

- Dike and/or swale and channel must be stabilized with temporary or permanent vegetation or other channel protection during construction.
- Steep grades require channel protection and check dams.
- Review construction for areas where overtopping may occur.
- Can be used at the top of new fill before vegetation is established.
- May be used as a permanent diversion channel to carry the runoff.
- Contributing area for an individual dike or swale should be one acre or less.
- Design the dike and/or swale to contain flows calculated by one of the following methods:
    - Single Event Hydrograph Method: The peak volumetric flow rate calculated using a 10-minute time step from a Type 1A, 10-year, 24-hour frequency storm for the worst-case land cover condition.

      OR

    - Continuous Simulation Method: The 10-year peak flow rate, as determined by an approved continuous runoff model with a 15-minute time step for the worst-case land cover condition.

  Worst-case land cover conditions (i.e., producing the most runoff) should be used for analysis (in most cases, this would be the land cover conditions just prior to final landscaping).

Interceptor Dikes

Interceptor dikes shall meet the following criteria:

- Top Width: 2 feet minimum.
- Height: 1.5 feet minimum on berm.
- Side Slope: 2H:1V or flatter.
- Grade: Depends on topography, however, dike system minimum is 0.5%, and maximum is 1%.
- Compaction: Minimum of 90 percent ASTM D698 standard proctor.
- Stabilization: Depends on velocity and reach. Inspect regularly to ensure stability.
- Ground Slopes <5%: Seed and mulch applied within 5 days of dike construction (see BMP C121: Mulching).
- Ground Slopes 5 - 40%: Dependent on runoff velocities and dike materials. Stabilization should be done immediately using either sod or riprap, or other measures to avoid erosion.
- The upslope side of the dike shall provide positive drainage to the dike outlet. No erosion shall

occur at the outlet. Provide energy dissipation measures as necessary. Sediment-laden runoff must be released through a sediment trapping facility.

- Minimize construction traffic over temporary dikes. Use temporary cross culverts for channel crossing.
- See Table II-3.8: Horizontal Spacing of Interceptor Dikes Along Ground Slope for recommended horizontal spacing between dikes.

Table II-3.8: Horizontal Spacing of Interceptor Dikes Along Ground Slope

Average Slope	Slope Percent	Flowpath Length
20H:1V or less	3-5%	300 feet
(10 to 20)H:1V	5-10%	200 feet
(4 to 10)H:1V	10-25%	100 feet
(2 to 4)H:1V	25-50%	50 feet

Interceptor Swales

Interceptor swales shall meet the following criteria:

- Bottom Width: 2 feet minimum; the cross-section bottom shall be level.
- Depth: 1-foot minimum.
- Side Slope: 2H:1V or flatter.
- Grade: Maximum 5 percent, with positive drainage to a suitable outlet (such as BMP C241: Sediment Pond (Temporary)).
- Stabilization: Seed as per BMP C120: Temporary and Permanent Seeding, or BMP C202: Riprap Channel Lining, 12 inches thick riprap pressed into the bank and extending at least 8 inches vertical from the bottom.

Maintenance Standards

- Inspect diversion dikes and interceptor swales once a week and after every rainfall. Immediately remove sediment from the flow area.
- Damage caused by construction traffic or other activity must be repaired before the end of each working day.
- Check outlets and make timely repairs as needed to avoid gully formation. When the area below the temporary diversion dike is permanently stabilized, remove the dike and fill and stabilize the channel to blend with the natural surface.

BMP C207: Check Dams

Purpose

Construction of check dams across a swale or ditch reduces the velocity of concentrated flow and dissipates energy at the check dam.

Conditions of Use

Use check dams where temporary or permanent channels are not yet vegetated, channel lining is infeasible, and/or velocity checks are required.

- Check dams may not be placed in streams unless approved by the State Department of Fish and Wildlife.
- Check dams may not be placed in wetlands without approval from a permitting agency.
- Do not place check dams below the expected backwater from any salmonid bearing water between October 1 and May 31 to ensure that there is no loss of high flow refuge habitat for overwintering juvenile salmonids and emergent salmonid fry.

Design and Installation Specifications

- Construct rock check dams from appropriately sized rock. The rock used must be large enough to stay in place given the expected design flow through the channel. The rock must be placed by hand or by mechanical means (do not dump the rock to form the dam) to achieve complete coverage of the ditch or swale and to ensure that the center of the dam is lower than the edges.
- Check dams may also be constructed of either rock or pea-gravel filled bags. Numerous new products are also available for this purpose. They tend to be re-usable, quick and easy to install, effective, and cost efficient.
- Place check dams perpendicular to the flow of water.
- The check dam should form a triangle when viewed from the side. This prevents undercutting as water flows over the face of the check dam rather than falling directly onto the ditch bottom.
- Before installing check dams, impound and bypass upstream water flow away from the work area. Options for bypassing include pumps, siphons, or temporary channels.
- Check dams combined with sumps work more effectively at slowing flow and retaining sediment than a check dam alone. A deep sump should be provided immediately upstream of the check dam.
- In some cases, if carefully located and designed, check dams can remain as permanent installations with very minor regrading. They may be left as either spillways, in which case accumulated sediment would be graded and seeded, or as check dams to prevent further sediment from leaving the site.
- The maximum spacing between check dams shall be such that the downstream toe of the

upstream dam is at the same elevation as the top of the downstream dam.

- Keep the maximum height at 2 feet at the center of the check dam.
- Keep the center of the check dam at least 12 inches lower than the outer edges at natural ground elevation.
- Keep the side slopes of the check dam at 2H:1V or flatter.
- Key the stone into the ditch banks and extend it beyond the abutments a minimum of 18 inches to avoid washouts from overflow around the dam.
- Use filter fabric foundation under a rock or sand bag check dam. If a blanket ditch liner is used, filter fabric is not necessary. A piece of organic or synthetic blanket cut to fit will also work for this purpose.
- In the case of grass-lined ditches and swales, all check dams and accumulated sediment shall be removed when the grass has matured sufficiently to protect the ditch or swale - unless the slope of the swale is greater than 4 percent. The area beneath the check dams shall be seeded and mulched immediately after dam removal.
- Ensure that channel appurtenances, such as culvert entrances below check dams, are not subject to damage or blockage from displaced stones.
- See Figure II-3.16: Rock Check Dam.

Maintenance Standards

Check dams shall be monitored for performance and sediment accumulation during and after each rainfall that produces runoff. Sediment shall be removed when it reaches one half the sump depth.

- Anticipate submergence and deposition above the check dam and erosion from high flows around the edges of the dam.
- If significant erosion occurs between dams, install a protective riprap liner in that portion of the channel. See BMP C202: Riprap Channel Lining.

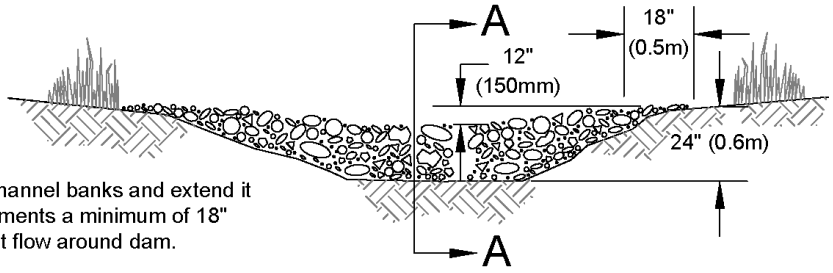
Approved as Functionally Equivalent

Ecology has approved products as able to meet the requirements of this BMP. The products did not pass through the Technology Assessment Protocol – Ecology (TAPE) process. Local jurisdictions may choose not to accept these products, or may require additional testing prior to consideration for local use. Products that Ecology has approved as functionally equivalent are available for review on Ecology's website at:

https://ecology.wa.gov/Regulations-Permits/Guidance-technical-assistance/Stormwater-permittee-guidance-resources/Emerging-stormwater-treatment-technologies

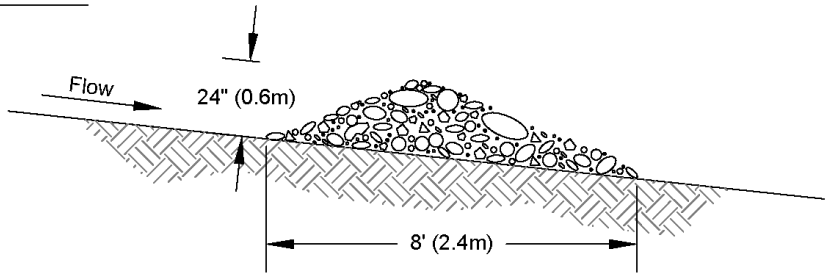
Figure II-3.16: Rock Check Dam

View Looking Upstream

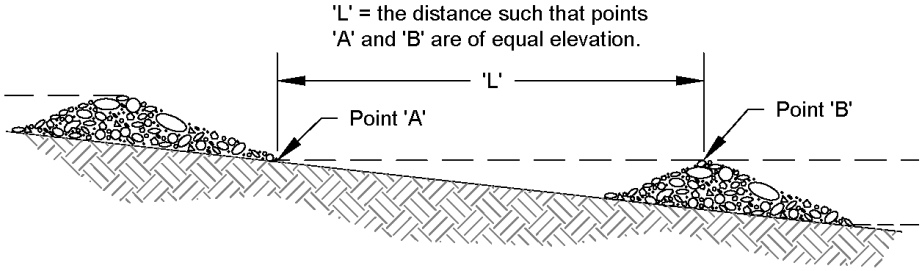


Note:
Key stone into channel banks and extend it beyond the abutments a minimum of 18" (0.5m) to prevent flow around dam.

Section A-A



Spacing Between Check Dams



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Rock Check Dam

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and staples.

- In the case of grass-lined ditches and swales, check dams and accumulated sediment shall be removed when the grass has matured sufficiently to protect the ditch or swale unless the slope of the swale is greater than 4 percent. The area beneath the check dams shall be seeded and mulched immediately after dam removal.

Maintenance Standards

- Inspect TSDs for performance and sediment accumulation during and after each rainfall that produces runoff. Remove sediment when it reaches one half the height of the TSD.
- Anticipate submergence and deposition above the TSD and erosion from high flows around the edges of the TSD. Immediately repair any damage or any undercutting of the TSD.

BMP C209: Outlet Protection

Purpose

Outlet protection prevents scour at conveyance outlets and minimizes the potential for downstream erosion by reducing the velocity of concentrated stormwater flows.

Conditions of Use

Use outlet protection at the outlets of all ponds, pipes, ditches, or other conveyances that discharge to a natural or manmade drainage feature such as a stream, wetland, lake, or ditch.

Design and Installation Specifications

- The receiving channel at the outlet of a pipe shall be protected from erosion by lining a minimum of 6 feet downstream and extending up the channel sides a minimum of 1–foot above the maximum tailwater elevation, or 1-foot above the crown, whichever is higher. For pipes larger than 18 inches in diameter, the outlet protection lining of the channel shall be four times the diameter of the outlet pipe.
- Standard wingwalls, tapered outlets, and paved channels should also be considered when appropriate for permanent culvert outlet protection (WSDOT, 2015).
- BMP C122: Nets and Blankets or BMP C202: Riprap Channel Lining provide suitable options for lining materials.
- With low flows, BMP C201: Grass-Lined Channels can be an effective alternative for lining material.
- The following guidelines shall be used for outlet protection with riprap:
  - If the discharge velocity at the outlet is less than 5 fps, use 2-inch to 8-inch riprap. Minimum thickness is 1-foot.
  - For 5 to 10 fps discharge velocity at the outlet, use 24-inch to 48-inch riprap. Minimum

thickness is 2 feet.

- For outlets at the base of steep slope pipes (pipe slope greater than 10 percent), use an engineered energy dissipator.
- Filter fabric or erosion control blankets should always be used under riprap to prevent scour and channel erosion. See BMP C122: Nets and Blankets.

- Bank stabilization, bioengineering, and habitat features may be required for disturbed areas. This work may require a Hydraulic Project Approval (HPA) from the Washington State Department of Fish and Wildlife. See I-2.11 Hydraulic Project Approvals.

Maintenance Standards

- Inspect and repair as needed.
- Add rock as needed to maintain the intended function.
- Clean energy dissipator if sediment builds up.

BMP C220: Inlet Protection

Purpose

Inlet protection prevents coarse sediment from entering drainage systems prior to permanent stabilization of the disturbed area.

Conditions of Use

Use inlet protection at inlets that are operational before permanent stabilization of the disturbed areas that contribute runoff to the inlet. Provide protection for all storm drain inlets downslope and within 500 feet of a disturbed or construction area, unless those inlets are preceded by a sediment trapping BMP.

Also consider inlet protection for lawn and yard drains on new home construction. These small and numerous drains coupled with lack of gutters can add significant amounts of sediment into the roof drain system. If possible, delay installing lawn and yard drains until just before landscaping, or cap these drains to prevent sediment from entering the system until completion of landscaping. Provide 18-inches of sod around each finished lawn and yard drain.

Table II-3.10: Storm Drain Inlet Protection lists several options for inlet protection. All of the methods for inlet protection tend to plug and require a high frequency of maintenance. Limit contributing drainage areas for an individual inlet to one acre or less. If possible, provide emergency overflows with additional end-of-pipe treatment where stormwater ponding would cause a hazard.

Table II-3.10: Storm Drain Inlet Protection

Type of Inlet Protection	Emergency Overflow	Applicable for Paved/ Earthen Surfaces	Conditions of Use
Drop Inlet Protection			
Excavated drop inlet protection	Yes, temporary flooding may occur	Earthen	Applicable for heavy flows. Easy to maintain. Large area requirement: 30'x30'/acre
Block and gravel drop inlet protection	Yes	Paved or Earthen	Applicable for heavy concentrated flows. Will not pond.
Gravel and wire drop inlet protection	No	Paved or Earthen	Applicable for heavy concentrated flows. Will pond. Can withstand traffic.
Catch basin filters	Yes	Paved or Earthen	Frequent maintenance required.
Curb Inlet Protection			
Curb inlet protection with wooden weir	Small capacity overflow	Paved	Used for sturdy, more compact installation.
Block and gravel curb inlet protection	Yes	Paved	Sturdy, but limited filtration.
Culvert Inlet Protection			
Culvert inlet sediment trap	N/A	N/A	18 month expected life.

Design and Installation Specifications

Excavated Drop Inlet Protection

Excavated drop inlet protection consists of an excavated impoundment around the storm drain inlet. Sediment settles out of the stormwater prior to entering the storm drain. Design and installation specifications for excavated drop inlet protection include:

- Provide a depth of 1-2 ft as measured from the crest of the inlet structure.
- Slope sides of excavation should be no steeper than 2H:1V.
- Minimum volume of excavation is 35 cubic yards.
- Shape the excavation to fit the site, with the longest dimension oriented toward the longest inflow area.
- Install provisions for draining to prevent standing water.
- Clear the area of all debris.

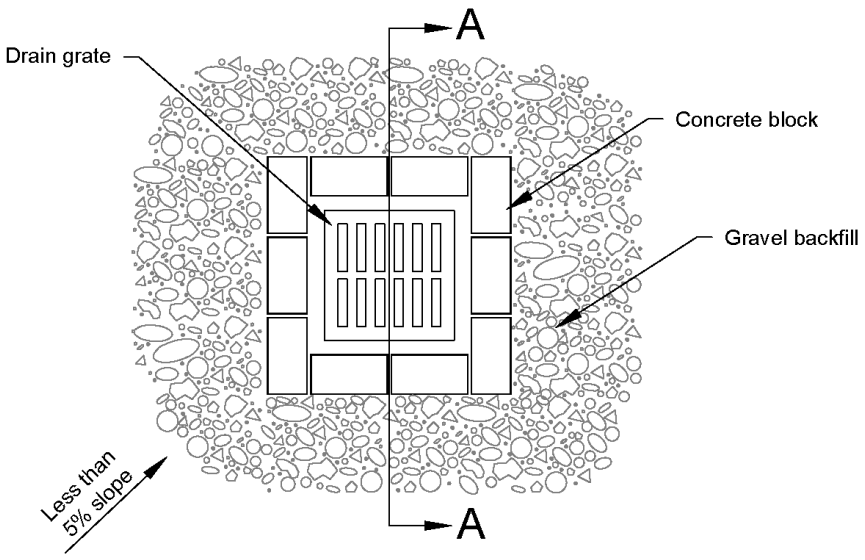
- Grade the approach to the inlet uniformly.
- Drill weep holes into the side of the inlet.
- Protect weep holes with screen wire and washed aggregate.
- Seal weep holes when removing structure and stabilizing area.
- Build a temporary dike, if necessary, to the down slope side of the structure to prevent bypass flow.

Block and Gravel Filter

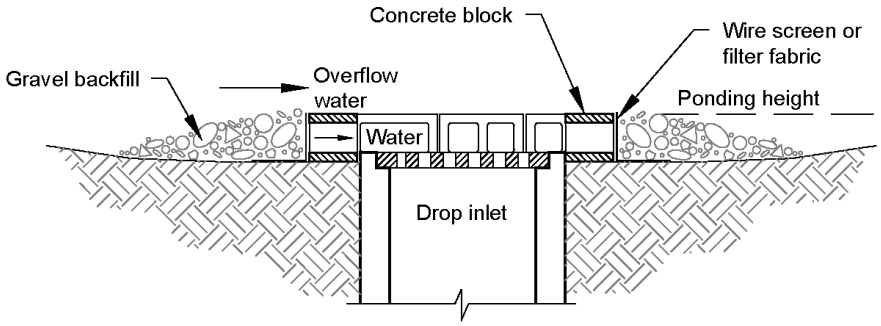
A block and gravel filter is a barrier formed around the inlet with standard concrete blocks and gravel. See Figure II-3.17: Block and Gravel Filter. Design and installation specifications for block gravel filters include:

- Provide a height of 1 to 2 feet above the inlet.
- Recess the first row of blocks 2-inches into the ground for stability.
- Support subsequent courses by placing a pressure treated wood 2x4 through the block opening.
- Do not use mortar.
- Lay some blocks in the bottom row on their side to allow for dewatering the pool.
- Place hardware cloth or comparable wire mesh with ½-inch openings over all block openings.
- Place gravel to just below the top of blocks on slopes of 2H:1V or flatter.
- An alternative design is a gravel berm surrounding the inlet, as follows:
    - Provide a slope of 3H:1V on the upstream side of the berm.
    - Provide a slope of 2H:1V on the downstream side of the berm.
    - Provide a 1-foot wide level stone area between the gravel berm and the inlet.
    - Use stones 3 inches in diameter or larger on the upstream slope of the berm.
    - Use gravel ½- to ¾-inch at a minimum thickness of 1-foot on the downstream slope of the berm.

Figure II-3.17: Block and Gravel Filter



Plan View



Section A-A

Notes:

1. Drop inlet sediment barriers are to be used for small, nearly level drainage areas. (less than 5%)
2. Excavate a basin of sufficient size adjacent to the drop inlet.
3. The top of the structure (ponding height) must be well below the ground elevation downslope to prevent runoff from bypassing the inlet. A temporary dike may be necessary on the downslope side of the structure.

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Block and Gravel Filter

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Gravel and Wire Mesh Filter

Gravel and wire mesh filters are gravel barriers placed over the top of the inlet. This method does not provide an overflow. Design and installation specifications for gravel and wire mesh filters include:

- Use a hardware cloth or comparable wire mesh with ½-inch openings.
    - Place wire mesh over the drop inlet so that the wire extends a minimum of 1-foot beyond each side of the inlet structure.
    - Overlap the strips if more than one strip of mesh is necessary.
- Place coarse aggregate over the wire mesh.
    - Provide at least a 12-inch depth of aggregate over the entire inlet opening and extend at least 18-inches on all sides.

Catch Basin Filters

Catch basin filters are designed by manufacturers for construction sites. The limited sediment storage capacity increases the amount of inspection and maintenance required, which may be daily for heavy sediment loads. To reduce maintenance requirements, combine a catch basin filter with another type of inlet protection. This type of inlet protection provides flow bypass without overflow and therefore may be a better method for inlets located along active rights-of-way. Design and installation specifications for catch basin filters include:

- Provides 5 cubic feet of storage.
- Requires dewatering provisions.
- Provides a high-flow bypass that will not clog under normal use at a construction site.
- Insert the catch basin filter in the catch basin just below the grating.

Curb Inlet Protection with Wooden Weir

Curb inlet protection with wooden weir is an option that consists of a barrier formed around a curb inlet with a wooden frame and gravel. Design and installation specifications for curb inlet protection with wooden weirs include:

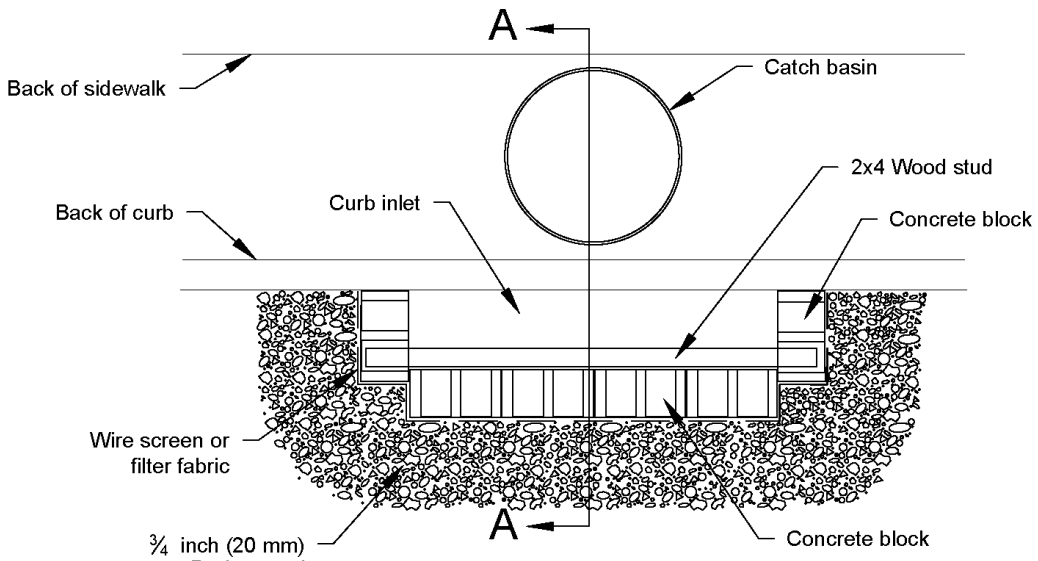
- Use wire mesh with ½-inch openings.
- Use extra strength filter cloth.
- Construct a frame.
- Attach the wire and filter fabric to the frame.
- Pile coarse washed aggregate against the wire and fabric.
- Place weight on the frame anchors.

Block and Gravel Curb Inlet Protection

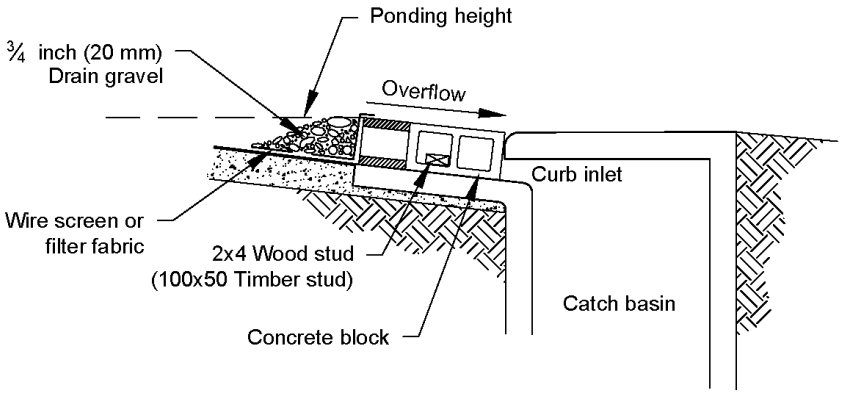
Block and gravel curb inlet protection is a barrier formed around a curb inlet with concrete blocks and gravel. See Figure II-3.18: Block and Gravel Curb Inlet Protection. Design and installation specifications for block and gravel curb inlet protection include:

- Use wire mesh with ½-inch openings.
- Place two concrete blocks on their sides abutting the curb at either side of the inlet opening. These are spacer blocks.
- Place a 2x4 stud through the outer holes of each spacer block to align the front blocks.
- Place blocks on their sides across the front of the inlet and abutting the spacer blocks.
- Place wire mesh over the outside vertical face.
- Pile coarse aggregate against the wire to the top of the barrier.

Figure II-3.18: Block and Gravel Curb Inlet Protection



Plan View



Section A-A

Notes:

1. Use block and gravel type sediment barrier when curb inlet is located in gently sloping street segment, where water can pond and allow sediment to separate from runoff.
2. Barrier shall allow for overflow from severe storm event.
3. Inspect barriers and remove sediment after each storm event. Sediment and gravel must be removed from the traveled way immediately.

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Block and Gravel Curb Inlet Protection

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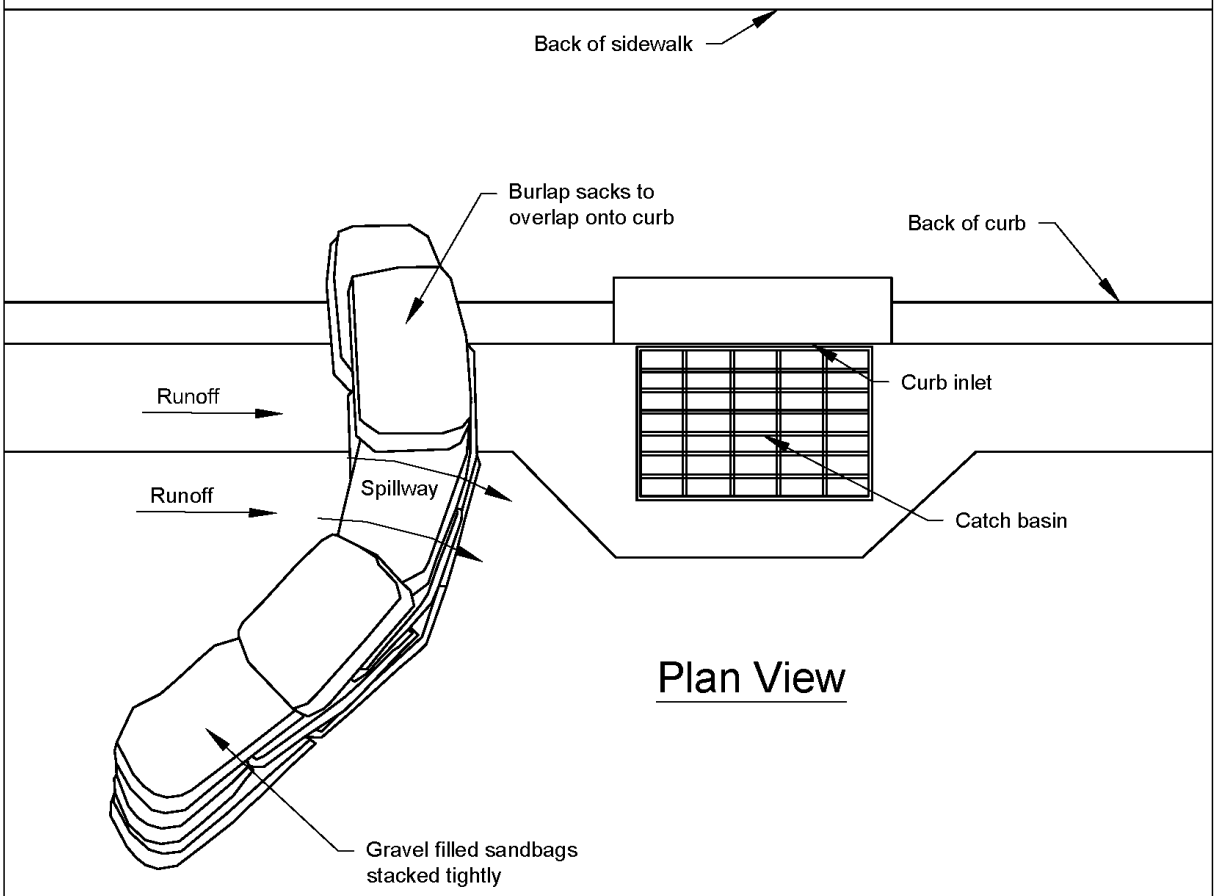
Curb and Gutter Sediment Barrier

Curb and gutter sediment barrier is a sandbag or rock berm (riprap and aggregate) 3 feet high and 3 feet wide in a horseshoe shape. See Figure II-3.19: Curb and Gutter Barrier. Design and installation specifications for curb and gutter sediment barrier include:

- Construct a horseshoe shaped berm, faced with coarse aggregate if using riprap, 3 feet high and 3 feet wide, at least 2 feet from the inlet.
- Construct a horseshoe shaped sedimentation trap on the upstream side of the berm. Size the trap to sediment trap standards for protecting a culvert inlet.

Figure II-3.19: Curb and Gutter Barrier



Notes:

1. Place curb type sediment barriers on gently sloping street segments, where water can pond and allow sediment to separate from runoff.
2. Sandbags of either burlap or woven 'geotextile' fabric, are filled with gravel, layered and packed tightly.
3. Leave a one sandbag gap in the top row to provide a spillway for overflow.
4. Inspect barriers and remove sediment after each storm event. Sediment and gravel must be removed from the traveled way immediately.

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Curb and Gutter Barrier

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Maintenance Standards

- Inspect all forms of inlet protection frequently, especially after storm events. Clean and replace clogged catch basin filters. For rock and gravel filters, pull away the rocks from the inlet and clean or replace. An alternative approach would be to use the clogged rock as fill and put fresh rock around the inlet.
- Do not wash sediment into storm drains while cleaning. Spread all excavated material evenly over the surrounding land area or stockpile and stabilize as appropriate.

Approved as Functionally Equivalent

Ecology has approved products as able to meet the requirements of this BMP. The products did not pass through the Technology Assessment Protocol – Ecology (TAPE) process. Local jurisdictions may choose not to accept these products, or may require additional testing prior to consideration for local use. Products that Ecology has approved as functionally equivalent are available for review on Ecology's website at:

https://ecology.wa.gov/Regulations-Permits/Guidance-technical-assistance/Stormwater-permittee-guidance-resources/Emerging-stormwater-treatment-technologies

BMP C231: Brush Barrier

Purpose

The purpose of brush barriers is to reduce the transport of coarse sediment from a construction site by providing a temporary physical barrier to sediment and reducing the runoff velocities of overland flow.

Conditions of Use

- Brush barriers may be used downslope of disturbed areas that are less than one-quarter acre.
- Brush barriers are not intended to treat concentrated flows, nor are they intended to treat substantial amounts of overland flow. Any concentrated flows must be directed to a sediment trapping BMP. The only circumstance in which overland flow can be treated solely by a brush barrier, rather than by a sediment trapping BMP, is when the area draining to the barrier is small.
- Brush barriers should only be installed on contours.

Design and Installation Specifications

- Height: 2 feet (minimum) to 5 feet (maximum).
- Width: 5 feet at base (minimum) to 15 feet (maximum).
- Filter fabric (geotextile) may be anchored over the brush berm to enhance the filtration ability of the barrier. Ten-ounce burlap is an adequate alternative to filter fabric.

BMP C233: Silt Fence

Purpose

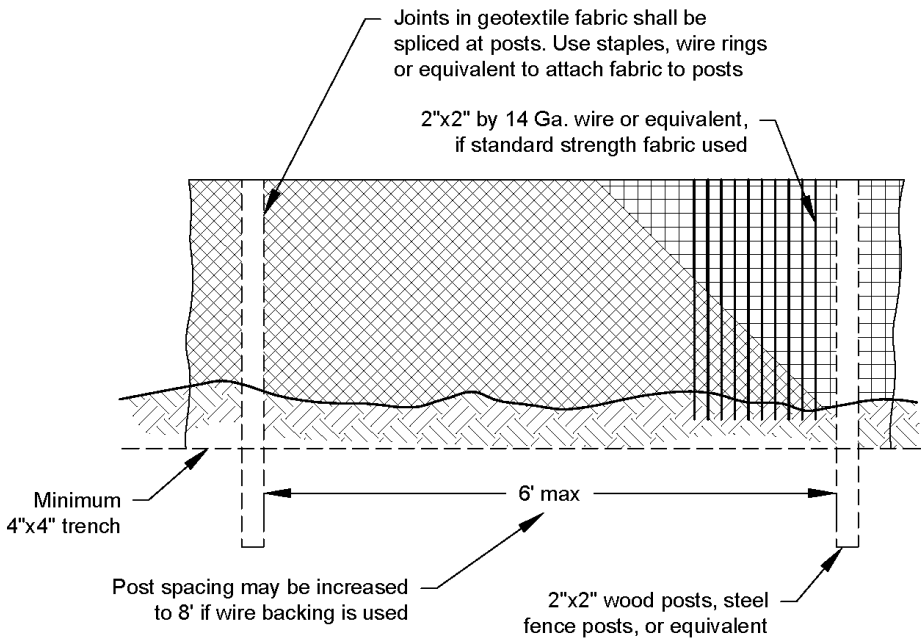
Silt fence reduces the transport of coarse sediment from a construction site by providing a temporary physical barrier to sediment and reducing the runoff velocities of overland flow.

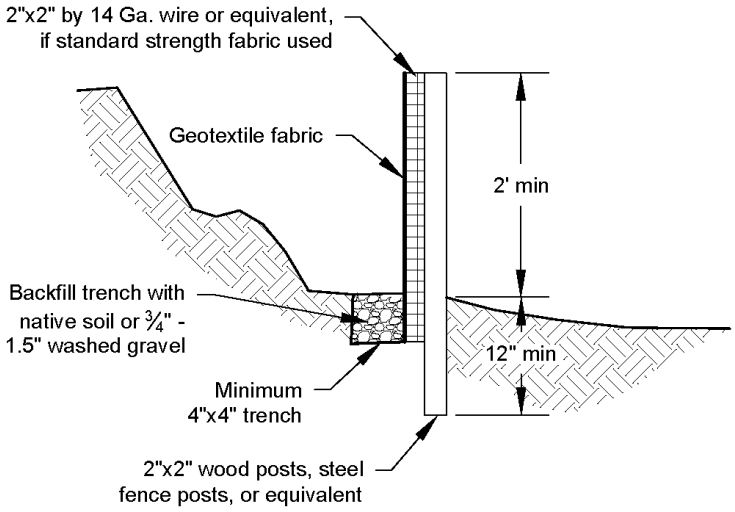
Conditions of Use

Silt fence may be used downslope of all disturbed areas.

- Silt fence shall prevent sediment carried by runoff from going beneath, through, or over the top of the silt fence, but shall allow the water to pass through the fence.
- Silt fence is not intended to treat concentrated flows, nor is it intended to treat substantial amounts of overland flow. Convey any concentrated flows through the drainage system to a sediment trapping BMP.
- Do not construct silt fences in streams or use in V-shaped ditches. Silt fences do not provide an adequate method of silt control for anything deeper than sheet or overland flow.

Figure II-3.22: Silt Fence





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State of Washington

Silt Fence

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Design and Installation Specifications

- Use in combination with other construction stormwater BMPs.
- Maximum slope steepness (perpendicular to the silt fence line) 1H:1V.
- Maximum sheet or overland flow path length to the silt fence of 100 feet.
- Do not allow flows greater than 0.5 cfs.
- Use geotextile fabric that meets the following standards. All geotextile properties listed below are minimum average roll values (i.e., the test result for any sampled roll in a lot shall meet or exceed the values shown in Table II-3.11: Geotextile Fabric Standards for Silt Fence):

Table II-3.11: Geotextile Fabric Standards for Silt Fence

Geotextile Property	Minimum Average Roll Value
Polymeric Mesh AOS (ASTM D4751)	0.60 mm maximum for slit film woven (#30 sieve). 0.30 mm maximum for all other geotextile types (#50 sieve). 0.15 mm minimum for all fabric types (#100 sieve).
Water Permittivity (ASTM D4491)	0.02 sec^{-1} minimum
Grab Tensile Strength (ASTM D4632)	180 lbs. Minimum for extra strength fabric. 100 lbs minimum for standard strength fabric.
Grab Tensile Strength (ASTM D4632)	30% maximum
Ultraviolet Resistance (ASTM D4355)	70% minimum

- Support standard strength geotextiles with wire mesh, chicken wire, 2-inch x 2-inch wire, safety fence, or jute mesh to increase the strength of the geotextile. Silt fence materials are available that have synthetic mesh backing attached.
- Silt fence material shall contain ultraviolet ray inhibitors and stabilizers to provide a minimum of six months of expected usable construction life at a temperature range of 0°F to 120°F.
- One-hundred percent biodegradable silt fence is available that is strong, long lasting, and can be left in place after the project is completed, if permitted by the local jurisdiction.
- Refer to Figure II-3.22: Silt Fence for standard silt fence details. Include the following Standard Notes for silt fence on construction plans and specifications:

    1. The Contractor shall install and maintain temporary silt fences at the locations shown in the Plans.
    2. Construct silt fences in areas of clearing, grading, or drainage prior to starting those activities.

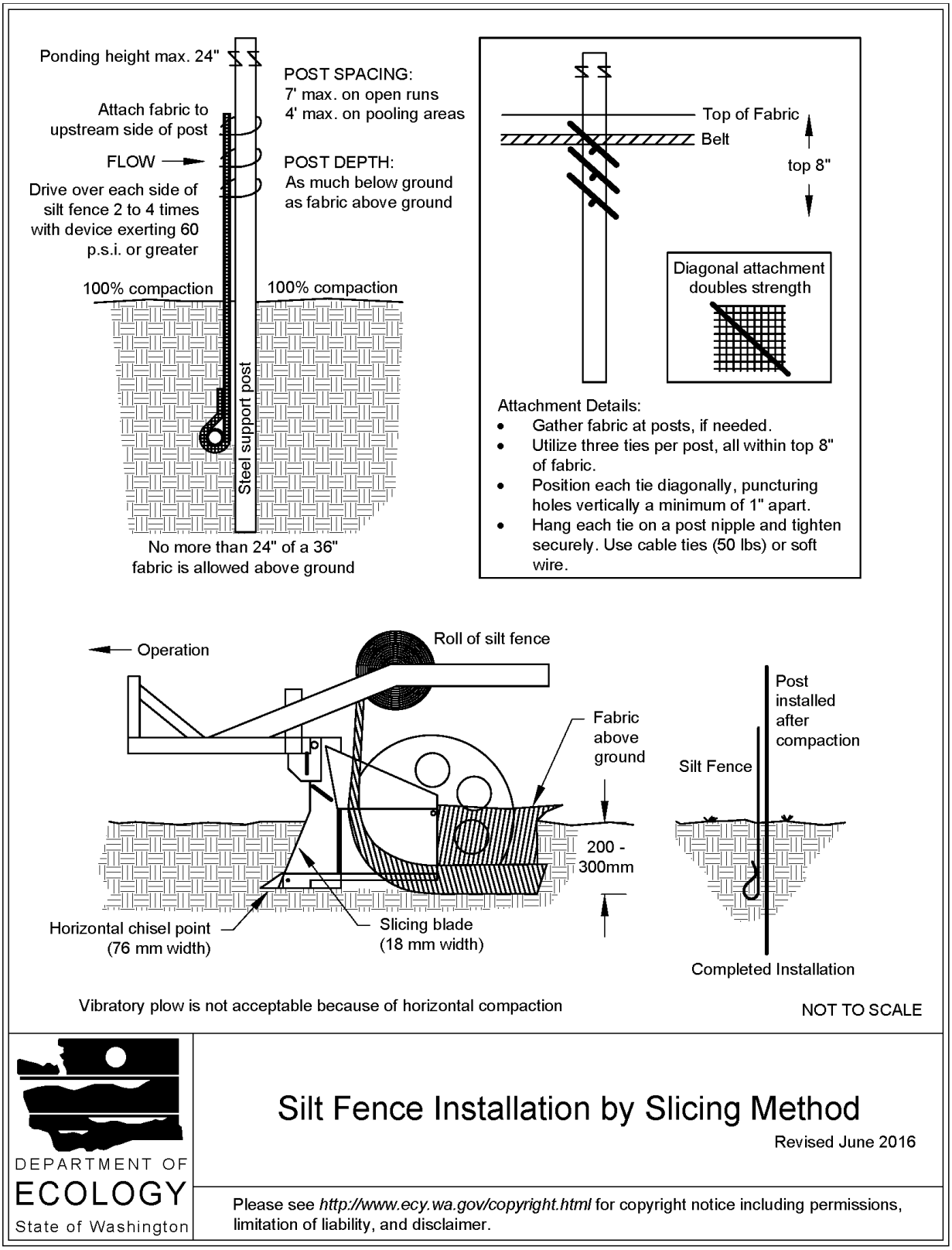
3. The silt fence shall have a 2-feet min. and a 2½-feet max. height above the original ground surface.
4. The geotextile fabric shall be sewn together at the point of manufacture to form fabric lengths as required. Locate all sewn seams at support posts. Alternatively, two sections of silt fence can be overlapped, provided that the overlap is long enough and that the adjacent silt fence sections are close enough together to prevent silt laden water from escaping through the fence at the overlap.
5. Attach the geotextile fabric on the up-slope side of the posts and secure with staples, wire, or in accordance with the manufacturer's recommendations. Attach the geotextile fabric to the posts in a manner that reduces the potential for tearing.
6. Support the geotextile fabric with wire or plastic mesh, dependent on the properties of the geotextile selected for use. If wire or plastic mesh is used, fasten the mesh securely to the up-slope side of the posts with the geotextile fabric up-slope of the mesh.
7. Mesh support, if used, shall consist of steel wire with a maximum mesh spacing of 2-inches, or a prefabricated polymeric mesh. The strength of the wire or polymeric mesh shall be equivalent to or greater than 180 lbs. grab tensile strength. The polymeric mesh must be as resistant to the same level of ultraviolet radiation as the geotextile fabric it supports.
8. Bury the bottom of the geotextile fabric 4-inches min. below the ground surface. Backfill and tamp soil in place over the buried portion of the geotextile fabric, so that no flow can pass beneath the silt fence and scouring cannot occur. When wire or polymeric back-up support mesh is used, the wire or polymeric mesh shall extend into the ground 3-inches min.
9. Drive or place the silt fence posts into the ground 18-inches min. A 12–inch min. depth is allowed if topsoil or other soft subgrade soil is not present and 18-inches cannot be reached. Increase fence post min. depths by 6 inches if the fence is located on slopes of 3H:1V or steeper and the slope is perpendicular to the fence. If required post depths cannot be obtained, the posts shall be adequately secured by bracing or guying to prevent overturning of the fence due to sediment loading.
10. Use wood, steel or equivalent posts. The spacing of the support posts shall be a maximum of 6-feet. Posts shall consist of either:
    - Wood with minimum dimensions of 2 inches by 2 inches by 3 feet. Wood shall be free of defects such as knots, splits, or gouges.
    - No. 6 steel rebar or larger.
    - ASTM A 120 steel pipe with a minimum diameter of 1-inch.
    - U, T, L, or C shape steel posts with a minimum weight of 1.35 lbs./ft.
    - Other steel posts having equivalent strength and bending resistance to the post sizes listed above.
11. Locate silt fences on contour as much as possible, except at the ends of the fence,

where the fence shall be turned uphill such that the silt fence captures the runoff water and prevents water from flowing around the end of the fence.

12. If the fence must cross contours, with the exception of the ends of the fence, place check dams perpendicular to the back of the fence to minimize concentrated flow and erosion. The slope of the fence line where contours must be crossed shall not be steeper than 3H:1V.
    - Check dams shall be approximately 1-foot deep at the back of the fence. Check dams shall be continued perpendicular to the fence at the same elevation until the top of the check dam intercepts the ground surface behind the fence.
    - Check dams shall consist of crushed surfacing base course, gravel backfill for walls, or shoulder ballast. Check dams shall be located every 10 feet along the fence where the fence must cross contours.

- Refer to Figure II-3.23: Silt Fence Installation by Slicing Method for slicing method details. The following are specifications for silt fence installation using the slicing method:
    1. The base of both end posts must be at least 2- to 4-inches above the top of the geotextile fabric on the middle posts for ditch checks to drain properly. Use a hand level or string level, if necessary, to mark base points before installation.
    2. Install posts 3- to 4-feet apart in critical retention areas and 6- to 7-feet apart in standard applications.
    3. Install posts 24-inches deep on the downstream side of the silt fence, and as close as possible to the geotextile fabric, enabling posts to support the geotextile fabric from upstream water pressure.
    4. Install posts with the nipples facing away from the geotextile fabric.
    5. Attach the geotextile fabric to each post with three ties, all spaced within the top 8-inches of the fabric. Attach each tie diagonally 45 degrees through the fabric, with each puncture at least 1-inch vertically apart. Each tie should be positioned to hang on a post nipple when tightening to prevent sagging.
    6. Wrap approximately 6-inches of the geotextile fabric around the end posts and secure with 3 ties.
    7. No more than 24-inches of a 36-inch geotextile fabric is allowed above ground level.
    8. Compact the soil immediately next to the geotextile fabric with the front wheel of the tractor, skid steer, or roller exerting at least 60 pounds per square inch. Compact the upstream side first and then each side twice for a total of four trips. Check and correct the silt fence installation for any deviation before compaction. Use a flat-bladed shovel to tuck the fabric deeper into the ground if necessary.

Figure II-3.23: Silt Fence Installation by Slicing Method



Maintenance Standards

- Repair any damage immediately.
- Intercept and convey all evident concentrated flows uphill of the silt fence to a sediment trapping BMP.
- Check the uphill side of the silt fence for signs of the fence clogging and acting as a barrier to flow and then causing channelization of flows parallel to the fence. If this occurs, replace the fence and remove the trapped sediment.
- Remove sediment deposits when the deposit reaches approximately one-third the height of the silt fence, or install a second silt fence.
- Replace geotextile fabric that has deteriorated due to ultraviolet breakdown.

BMP C234: Vegetated Strip

Purpose

Vegetated strips reduce the transport of coarse sediment from a construction site by providing a physical barrier to sediment and reducing the runoff velocities of overland flow.

Conditions of Use

- Vegetated strips may be used downslope of all disturbed areas.
- Vegetated strips are not intended to treat concentrated flows, nor are they intended to treat substantial amounts of overland flow. Any concentrated flows must be conveyed through the drainage system to BMP C241: Sediment Pond (Temporary) or other sediment trapping BMP. The only circumstance in which overland flow can be treated solely by a vegetated strip, rather than by a sediment trapping BMP, is when the following criteria are met (see Table II-3.12: Contributing Drainage Area for Vegetated Strips):

Table II-3.12: Contributing Drainage Area for Vegetated Strips

Average Contributing Area Slope	Average Contributing Area Percent Slope	Max Contributing area Flowpath Length
1.5H : 1V or flatter	67% or flatter	100 feet
2H : 1V or flatter	50% or flatter	115 feet
4H : 1V or flatter	25% or flatter	150 feet
6H : 1V or flatter	16.7% or flatter	200 feet
10H : 1V or flatter	10% or flatter	250 feet

BMP C241: Sediment Pond (Temporary)

Purpose

Sediment ponds are temporary ponds used during construction to remove sediment from runoff originating from disturbed areas of the project site. Sediment ponds are typically designed to remove sediment no smaller than medium silt (0.02 mm). Consequently, they usually reduce turbidity only slightly.

Conditions of Use

- Use a sediment pond where the contributing drainage area to the pond is 3 acres or more. Ponds must be used in conjunction with other Construction Stormwater BMPs to reduce the amount of sediment flowing into the pond.
- Do not install sediment ponds on sites where failure of the BMP would result in loss of life, damage to homes or buildings, or interruption of use or service of public roads or utilities. Also, sediment ponds are attractive to children and can be dangerous. Compliance with local ordinances regarding health and safety must be addressed. If fencing of the pond is required, show the type of fence and its location on the drawings in the Construction SWPPP.
- Sediment ponds that can impound 10 acre-ft (435,600 cu-ft, or 3.26 million gallons) or more, or have an embankment of more than 6 feet, are subject to the Washington Dam Safety Regulations (Chapter 173-175 WAC). See BMP D.1: Detention Ponds for more information regarding dam safety considerations for detention ponds.
- Projects that are constructing permanent Flow Control BMPs or Runoff Treatment BMPs that use ponding for treatment may use the rough-graded or final-graded permanent BMP footprint for the temporary sediment pond. When permanent BMP footprints are used as temporary sediment ponds, the surface area requirement of the temporary sediment pond must be met. If the surface area requirement of the sediment pond is larger than the surface area of the permanent BMP, then the sediment pond shall be enlarged beyond the permanent BMP footprint to comply with the surface area requirement.

  The permanent control structure must be temporarily replaced with a control structure that only allows water to leave the temporary sediment pond from the surface or by pumping. Alternatively, the permanent control structure may used if it is temporarily modified by plugging any outlet holes below the riser. The permanent control structure must be installed as part of the permanent BMP after the site is fully stabilized.

Design and Installation Specifications

General

- See Figure II-3.28: Sediment Pond Plan View, Figure II-3.29: Sediment Pond Cross Section, and Figure II-3.30: Sediment Pond Riser Detail for details.
- Use of permanent infiltration BMP footprints for temporary sediment ponds during

construction tends to clog the soils and reduce their capacity to infiltrate. If permanent infiltration BMP footprints are used, the sides and bottom of the temporary sediment pond must only be rough excavated to a minimum of 2 feet above final grade of the permanent infiltration BMP. Final grading of the permanent infiltration BMP shall occur only when all contributing drainage areas are fully stabilized. Any proposed permanent pretreatment BMP prior to the infiltration BMP should be fully constructed and used with the temporary sediment pond to help prevent clogging of the soils. See Element 13: Protect Low Impact Development BMPs for more information about protecting permanent infiltration BMPs.

- The pond shall be divided into two roughly equal volume cells by a permeable divider that will reduce turbulence while allowing movement of water between the cells. The divider shall be at least one-half the height of the riser, and at least one foot below the top of the riser. Wire-backed, 2- to 3-foot high, high strength geotextile fabric supported by treated 4"x4"s can be used as a divider. Alternatively, staked straw bales wrapped with geotextile fabric may be used. If the pond is more than 6 feet deep, a different divider design must be proposed. A riprap embankment is one acceptable method of separation for deeper ponds. Other designs that satisfy the intent of this provision are allowed as long as the divider is permeable, structurally sound, and designed to prevent erosion under and around the divider.
- The most common structural failure of sediment ponds is caused by piping. Piping refers to two phenomena: (1) water seeping through fine-grained soil, eroding the soil grain by grain and forming pipes or tunnels; and, (2) water under pressure flowing upward through a granular soil with a head of sufficient magnitude to cause soil grains to lose contact and capability for support.

  The most critical construction practices to prevent piping are:

  - Tight connections between the riser and outlet pipe, and other pipe connections.
  - Adequate anchoring of the riser.
  - Proper soil compaction of the embankment and riser footing.
  - Proper construction of anti-seep devices.

Sediment Pond Geometry

To determine the sediment pond geometry, first calculate the design surface area (SA) of the pond, measured at the top of the riser pipe. Use the following equation:

$$SA = 2 \times Q_2/0.00096$$

or

2080 square feet per cfs of inflow

See BMP C240: Sediment Trap for more information on the above equation.

The basic geometry of the pond can now be determined using the following design criteria:

- Required surface area SA (from the equation above) at the top of the riser.
- Minimum 3.5-foot depth from the top of the riser to the bottom of the pond.

- Maximum 3H:1V interior side slopes and maximum 2H:1V exterior slopes. The interior slopes can be increased to a maximum of 2H:1V if fencing is provided at or above the maximum water surface.
- One foot of freeboard between the top of the riser and the crest of the emergency spillway.
- Flat bottom.
- Minimum 1-foot deep spillway.
- Length-to-width ratio between 3:1 and 6:1.

Sediment Pond Discharge

The outlet for the pond consists of a combination of principal and emergency spillways. These outlets must pass the peak runoff expected from the contributing drainage area for a 100-year storm. If, due to site conditions and basin geometry, a separate emergency spillway is not feasible, the principal spillway must pass the entire peak runoff expected from the 100-year storm. However, an attempt to provide a separate emergency spillway should always be made. Base the runoff calculations on the site conditions during construction. The flow through the dewatering orifice cannot be utilized when calculating the 100-year storm elevation because of its potential to become clogged; therefore, available spillway storage must begin at the principal spillway riser crest.

The principal spillway designed by the procedures described below will result in some reduction in the peak rate of runoff. However, the design will not control the discharge flow rates to the extent required to comply with I-3.4.7 MR7: Flow Control. The size of the contributing basin, the expected life of the construction project, the anticipated downstream effects, and the anticipated weather conditions during construction should be considered to determine the need for additional discharge control.

Principal Spillway: Determine the required diameter for the principal spillway (riser pipe). The diameter shall be the minimum necessary to pass the peak volumetric flow rate using a 15-minute time step from a Type 1A, 10-year, 24-hour frequency storm for the developed condition. Use Figure II-3.31: Riser Inflow Curves to determine the riser diameter.

To aid in determining sediment depth, one-foot intervals shall be prominently marked on the riser.

Emergency Overflow Spillway: Size the emergency overflow spillway for the peak volumetric flow rate using a 10-minute time step from a Type 1A, 100-year, 24-hour frequency storm for the developed condition. See BMP D.1: Detention Ponds for additional guidance for Emergency Overflow Spillway design

Dewatering Orifice: Size of the dewatering orifice(s) (minimum 1-inch diameter) using a modified version of the discharge equation for a vertical orifice and a basic equation for the area of a circular orifice. Determine the required area of the orifice with the following equation:

$$A_o = \frac{A_S(2h)^{0.5}}{0.6 \times 3600 T g^{0.5}}$$

where

A_o = orifice area (square feet)

A_S = pond surface area (square feet)

h = head of water above orifice (height of riser in feet)

T = dewatering time (24 hours)

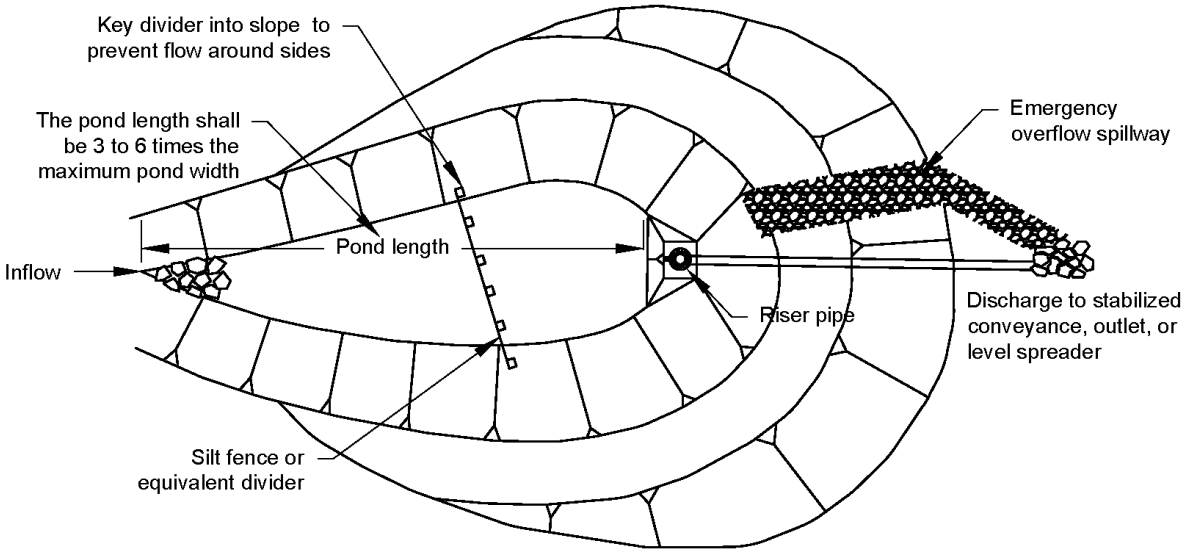
g = acceleration of gravity (32.2 feet/second^2)

Convert the orifice area (in square feet) to the orifice diameter D (in inches):

$$D = 24 \times \sqrt{\frac{A_o}{\pi}} = 13.54 \times \sqrt{A_o}$$

The vertical, perforated tubing connected to the dewatering orifice must be at least 2 inches larger in diameter than the orifice to improve flow characteristics. The size and number of perforations in the tubing should be large enough so that the tubing does not restrict flow. The orifice should control the flow rate.

Figure II-3.28: Sediment Pond Plan View



Note: Pond may be formed by berm or by partial or complete excavation

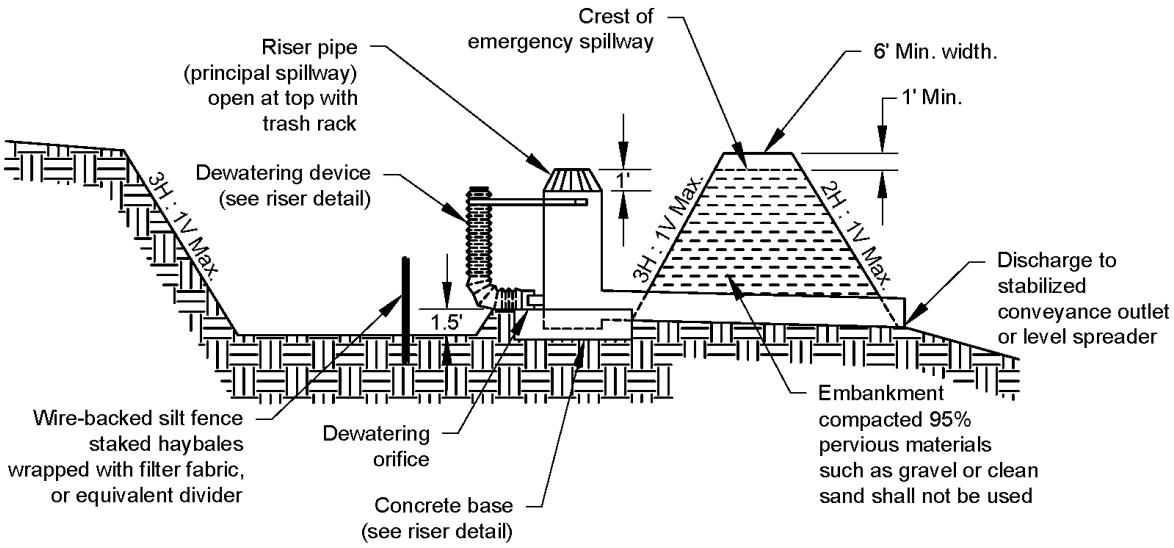
NOT TO SCALE

DEPARTMENT OF ECOLOGY
State of Washington

Sediment Pond Plan View

Revised June 2016

Figure II-3.29: Sediment Pond Cross Section



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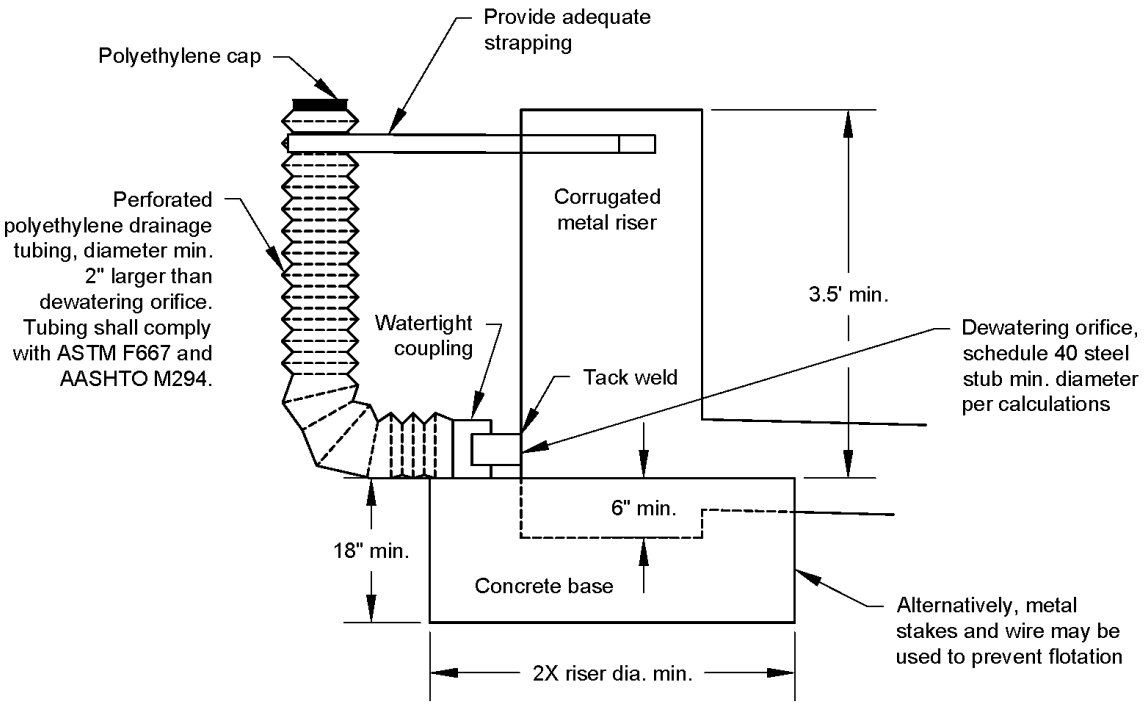
ECOLOGY
State of Washington

Sediment Pond Cross Section

Revised June 2016

Figure II-3.30: Sediment Pond Riser Detail



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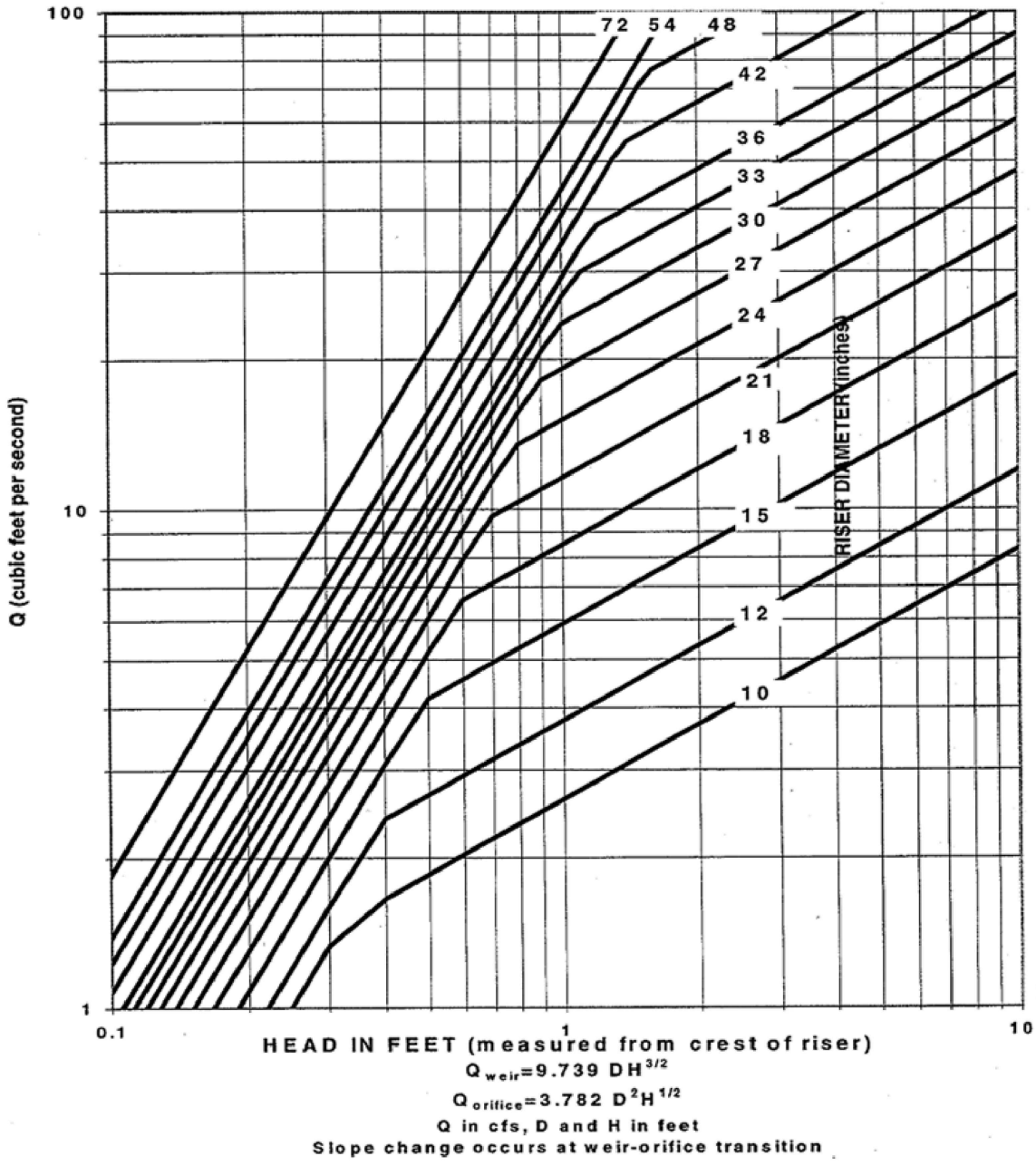
State of Washington

Sediment Pond Riser Detail

Revised June 2016

Figure II-3.31: Riser Inflow Curves



DEPARTMENT OF ECOLOGY
State of Washington

Riser Inflow Curves

Revised June 2016

Maintenance Standards

- Remove sediment from the pond when it reaches 1 foot in depth.
- Repair any damage to the pond embankments or slopes.

BMP C250: Construction Stormwater Chemical Treatment

Purpose

This BMP applies when using chemicals to treat turbidity in stormwater by either batch or flow-through chemical treatment.

Turbidity is difficult to control once fine particles are suspended in stormwater runoff from a construction site. BMP C241: Sediment Pond (Temporary) is effective at removing larger particulate matter by gravity settling, but is ineffective at removing smaller particulates such as clay and fine silt. Traditional Construction Stormwater BMPs may not be adequate to ensure compliance with the water quality standards for turbidity in the receiving water.

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

Conditions of Use

Formal written approval from Ecology is required for the use of chemical treatment, regardless of site size. See https://fortress.wa.gov/ecy/publications/SummaryPages/ecy070258.html for a copy of the Request for Chemical Treatment form. The Local Permitting Authority may also require review and approval. When authorized, the chemical treatment systems must be included in the Construction Stormwater Pollution Prevention Plan (SWPPP).

Chemically treated stormwater discharged from construction sites must be nontoxic to aquatic organisms. The Chemical Technology Assessment Protocol - Ecology (CTAPE) must be used to evaluate chemicals proposed for stormwater treatment. Only chemicals approved by Ecology under the CTAPE may be used for stormwater treatment. The approved chemicals, their allowable application techniques (batch treatment or flow-through treatment), allowable application rates, and conditions of use can be found at the Department of Ecology Emerging Technologies website:

https://ecology.wa.gov/Regulations-Permits/Guidance-technical-assistance/Stormwater-permittee-guidance-resources/Emerging-stormwater-treatment-technologies

Background on Chemical Treatment Systems

Coagulation and flocculation have been used for over a century to treat water. The use of coagulation and flocculation to treat stormwater is a very recent application. Experience with the treatment of water and wastewater has resulted in a basic understanding of the process, in particular factors

Appendix C
Correspondence

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
Southwest Region Office
PO Box 47775, Olympia, WA 98504-7775 • 360-407-6300

October 17, 2023

Andy Bley
Sierra Construction Company, Inc
14800 NE North Woodinville Way
Woodinville, WA 98072

Order Docket No.	22353
Site Location	240 15th Street SE, Puyallup, WA 98372

Re: Administrative Order

Dear Andy Bley:

The Department of Ecology has issued this Administrative Order requiring Sierra Construction Company, Inc to comply with:

- Chapter 90.48 Revised Code of Washington (RCW) – State of Washington Water Pollution Control Act.
- Chapter 173-201A Washington Administrative Code (WAC) – Water Quality Standards for Surface Waters of the State of Washington.
- National Pollutant Discharge Elimination System (NPDES) Construction Stormwater General Permit WAR312294.

Please contact Evan Wood at evan.wood@ecy.wa.gov or (360) 706-4599 if you have questions.

Sincerely,

Andrew Kolosseus
Southwest Region Section Manager
Water Quality Program

Enclosure: Administrative Order Docket No. 22353

Certified Mail: 9489 0090 0027 6093 9342 42

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

IN THE MATTER OF AN ADMINISTRATIVE ORDER AGAINST Sierra Construction Company, Inc Andy Bley	)))))	ADMINISTRATIVE ORDER DOCKET #22353

To: Andy Bley
Sierra Construction Company, Inc
14800 NE North Woodinville Way
Woodinville, WA 98072

Order Docket #	22353
Site Location	240 15th Street SE, Puyallup, WA 98372 – WA Cold Storage

The Washington State Department of Ecology (Ecology) has issued this Administrative Order (Order) requiring the Sierra Construction Company, Inc to comply with:

- Chapter 90.48 Revised Code of Washington (RCW) – State of Washington Water Pollution Control Act.
- Chapter 173-201A Washington Administrative Code (WAC) – Water Quality Standards for Surface Waters of the State of Washington.
- Construction Stormwater General Permit WAR312402: National Pollutant Discharge Elimination System (NPDES) and State Waste Discharge General Permit for Stormwater Discharges Associated with Construction Activity.

This is an Administrative Order in accordance with General Condition G12 (Additional Monitoring) as set forth in the Construction Stormwater General Permit. RCW 90.48.120(2) authorizes Ecology to issue Administrative Orders to accomplish the purposes of Chapter 90.48 RCW.

ORDER TO COMPLY

Sierra Construction Company, Inc is subject to coverage under NPDES Construction Stormwater General Permit WAR312402 for construction activities associated with the construction site known as WA Cold Storage (CSID: 16703, FSID: 99997041). Sierra Construction Company, Inc reported that the site contains contaminated groundwater and soil which has the potential to discharge stormwater and dewatering water due to the proposed construction activity. The Construction Stormwater General Permit does not have water quality sampling or benchmarks for benzene, toluene, ethylbenzene, xylenes, 1,2-Dichloroethane, Tetrachloroethylene, Trichloroethylene, 1,2-Cis-Dichloroethylene, 1,2-Trans-Dichloroethylene, Perfluorooctanoic Acid (PFOA), Perfluorooctane Sulfonic Acid (PFOS), Perfluorononanoic Acid (PFNA), Oil-Range Hydrocarbons or Gasoline-Range Hydrocarbons; however, the permit requires compliance with the Water Quality Standards for Surface Water of the State of Washington (Water Quality Standards).

The Order establishes Indicator Levels for the WA Cold Storage. Indicator Levels express a pollutant concentration used as a threshold, below which a pollutant is considered unlikely to cause a water quality violation, and above which it may. Indicator Levels in this Administrative Order were derived from the Water Quality Standards for Surface Water of the State of Washington (173-201A WAC) and practical quantitation level.

For these reasons and in accordance with RCW 90.48.120(2) it is ordered that the Sierra Construction Company, Inc take the following actions. These actions are required at the location known as WA Cold Storage, located at 240 15th St SE, Puyallup, WA 98372. In the event of a permit transfer to another Permittee, compliance with this Administrative Order and the actions listed below is required.

Sierra Construction Company, Inc must take the following actions to remain in compliance with NPDES Permit WAR312402:

- Land disturbance activities shall include the demolition of existing structures, excavation of contaminated soils, grading of the site, construction of new structures and paving of the property.

- Install temporary erosion and sediment control best management practices (BMPs) as one of the first steps in the construction and demolition process.

- Any potentially contaminated soils that are not immediately hauled off site shall be stockpiled on a minimum 10 mil plastic sheeting and covered with an anchored plastic sheeting.

- Install all pre-treatment and treatment systems prior to any discharge of dewatering water or contaminated construction stormwater to Deer Creek.

- Capture, contain, and treat all contaminated dewatering or contaminated stormwater prior to discharge to the Deer Creek.

- Sierra Construction Company, Inc shall obtain written approval from an Ecology Environmental Engineer for any proposed treatment system. Ecology shall be notified in advance if any changes in the treatment are made, with the exception of routine maintenance.

- The treatment system must have enough capacity to hold the treated dewatering water or stormwater until it has been tested to determine if any of the Indicator Levels listed in Table 1 have been exceeded. No dewatering water or stormwater may be discharge before it has been tested for the parameters listed in Table 1. If any of the Indicator Levels listed in Table 1 are exceeded, Sierra Construction Company shall stop the discharge of treated dewatering water or contaminated stormwater to the Deer Creek, until it has been retested to determine that all parameters are equal to or below the Indicator Levels in Table 1. If any of the Indicator Levels are exceeded after being retested, Sierra Construction Company, Inc shall install an additional treatment system with the written approval of an Ecology Environmental Engineer.

- Once the effectiveness of the treatment system has been determined, Sierra Construction Company may revert to a flow-through treatment system after the minimum three sampling and

testing events and upon written approval from Ecology. The flow-through treatment system design must be submitted to Ecology for review prior to use.

- If a flow-through treatment system is adopted, all dewatering water or contaminated stormwater must be sampled weekly while discharging and tested for the parameters listed in Table 1.
- When using a flow-through treatment system, if any of the Indicator Levels listed in Table 1 are exceeded, Sierra Construction Company, Inc must stop the discharge of treated dewatering water or stormwater to Deer Creek until it has been retested to determine that all parameters are equal to or below the Indicator Levels in Table 1. If any of the Indicator Levels are exceeded after being retested, Sierra Construction Company, Inc shall modify the existing flow-through treatment system to increase its effectiveness or install an Ecology-approved treatment system or truck the contaminated stormwater or groundwater off-site for disposal in an approved manner.
- If sampling is conducted more frequently than required by this Order, the results of this monitoring must be included in the calculation and reporting of the data that is submitted in the Discharge Monitoring Reports (DMRs).
- Any discharge to waters of the state above the Indicator Levels for contaminants listed in Table 1 must be immediately reported to the Department of Ecology.
- All captured sediment from the treatment of the dewatering water or contaminated stormwater must be transported to an approved disposal facility based on the level of contamination.
- All monitoring data must be prepared by a laboratory registered or accredited under the provisions of *Accreditation of Environmental Laboratories*, Chapter 137-50 WAC.
- All sampling data must be reported monthly on Discharge Monitoring Reports (DMRs) electronically using Ecology's secure online system WQWebDMR, in accordance to permit condition S5.B. If the measured concentration is below the detection level, then Sierra Construction Company, Inc shall report single analytical values below detection as "less than the detection level (DL)" by entering "<" followed by the numeric value of the detection level (e.g. "<0.1"). All other values above DL must be reported as the numeric value.
- Noncompliance with permit requirements or the provisions of this Order must be immediately reported to the Southwest Regional Office of the Department of Ecology in accordance with Permit Condition S5.F, Noncompliance Notification.
- The Stormwater Pollution Prevention Plan (SWPPP) prepared for Sierra Construction Company, Inc dated 2023-04-04 shall be fully implemented and amended as needed for the duration of the project.
- If a modification of the Order is desired, a written request shall be submitted to Ecology and if approved, Ecology will issue an amendment to this Order.

Ecology retains the right to make modifications to this Order through supplemental Order, or amendment to this Order, if it appears necessary to further protect the public interest.
This Order does not exempt Sierra Construction Company, Inc from any Construction Stormwater General Permit requirement. This Order automatically terminates when NPDES Construction Stormwater General Permit WAR312402 is terminated.

Table 1 DRAFT. WA Cold Storage

Sierra Construction Company, Inc must use the specified analytical methods, detection limits (DLs) and quantitation levels (QLs) in the following table for monitoring unless the method used produces measurable results in the sample and EPA has listed it as an EPA-approved method in 40 CFR Part 136. If the Sierra Construction Company, Inc uses an alternative method, not specified in the order and as allowed above, it must report the test method, DL, and QL on the discharge monitoring report.

Pollutant & CAS No. (if available)	Sampling Frequency*	Sample Type	Indicator Level, µg/L unless otherwise noted	Required Analytical Protocol	Detection Level, µg/L	Quantitation Level, µg/L
NONCONVENTIONAL POLLUTANTS						
BTEX (benzene +toluene + ethylbenzene + m,o,p xylenes)	Batch/ Weekly	Grab	2.0 [a, b]	EPA SW 846 8021/8260	1.0	2.0
VOLATILE COMPOUNDS						
1,2-Dichloroethane (107-06-2)	Batch/ Weekly	Grab	8.4 [a]	624.1	2.8	8.4
Tetrachloroethylene (127-18-4)	Batch/ Weekly	Grab	12.3 [a]	624.1	4.1	12.3
Trichloroethylene (76-01-6)	Batch/ Weekly	Grab	5.7 [a]	624.1	1.9	5.7
1,2-Cis-Dichloroethylene (cDCE) (156-59-2)	Batch/ Weekly	Grab	4.8 [a]	624.1	1.6	4.8

1,2-Trans-Dichloroethylene (Ethylene dichloride) (156-60-5)	Batch/ Weekly	Grab	4.8 [a]	624.1	1.6	4.8
PETROLEUM HYDROCARBONS						
Oil-Range Hydrocarbons (NWTPH-Dx) [c]	Batch/ Weekly	Grab	250 [a]	NWTPH-Dx	250	250
Gasoline-Range Hydrocarbons (NWTPH-Gx) [d]	Batch/ Weekly	Grab	250 [a]	NWTPH-Gx	250	250
PER- AND POLYFLUOROALKYL SUBSTANCES						
Perfluorooctanoic Acid (PFOA) (335-67-1)	Batch/ Weekly	Grab	Report Only [i]	1633 [h]	0.302 ng/L	1.6 ng/L
Perfluorooctane Sulfonic Acid (PFOS) (1763-23-1)	Batch/ Weekly	Grab	Report Only [i]	1633 [h]	0.327 ng/L	1.6 ng/L
Perfluorononanoic Acid (PFNA) (375-95-1)	Batch/ Weekly	Grab	Report Only [i]	1633 [h]	0.221 ng/L	1.6 ng/L

Construction Stormwater General Permit Benchmarks				
Parameter			**Benchmark**	**Analytical Method**
Turbidity [f]	Batch/ Weekly	Grab	25 NTU	SM2130 [e]
pH [g]	Batch/ Weekly	Grab	6.5 - 8.5 SU	SM4500-H^+ B

a	No surface water standard, value is laboratory quantitation level.
b	The detection level and quantitation levels for this pollutant are representative of the sum of its components. The detection level must be set with assurances that the standard is met.
c	NWTPH-Dx = Northwest Total Petroleum Hydrocarbons – Semi-volatile ("diesel") for diesel range organics and heavy oils (includes jet fuels, kerosene, diesel-oils, hydraulic fluids, mineral oils, lubricating oils, and fuel oils).
d	NWTPH-Gx = Northwest Total Petroleum Hydrocarbons –Volatile petroleum products (includes aviation and automotive gasolines, mineral spirits, Stoddard solvent and naphtha).
e	Or equivalent.
f	Report the average turbidity for each day a discharge occurs while the flow through system is in operation.
g	Report the daily minimum and maximum pH for each day a discharge occurs while the flow through system is in operation.
h	Method 1633 is currently in draft, dated June 2022. If a laboratory that can analyze PFAS chemicals via Method 1633 is not reasonably available, then an alternate method can be requested to Ecology and is approvable by email.
i	Indicator not established for this analyte. Analytical results will be reported only and include influent to the treatment system and effluent for all Per- and Polyfluoroalkyl analytes.
*	If permission granted for flow-through, sampling will then be weekly. If an analyte is Report Only than analytical results will need to submitted monthly.

FAILURE TO COMPLY WITH THIS ORDER

Failure to comply with this Order may result in the issuance of civil penalties or other actions, whether administrative or judicial, to enforce the terms of this Order.

YOUR RIGHT TO APPEAL

You have a right to appeal this Order to the Pollution Control Hearing Board (PCHB) within 30 days of the date of receipt of this Order. The appeal process is governed by Chapter 43.21B RCW and Chapter 371-08 WAC. "Date of receipt" is defined in RCW 43.21B.001(2).

To appeal you must do both of the following within 30 days of the date of receipt of this Order:

- File your appeal and a copy of this Order with the PCHB (see addresses below). Filing means actual receipt by the PCHB during regular business hours.
- Serve a copy of your appeal and this Order on Ecology in paper form – by mail or in person (see addresses below). Email is not accepted.

You must also comply with other applicable requirements in Chapter 43.21B RCW and Chapter 371-08 WAC.

Your appeal alone will not stay the effectiveness of this Order. Stay requests must be submitted in accordance with RCW 43.21B.320.

ADDRESS AND LOCATION INFORMATION

Street Addresses	Mailing Addresses
Department of Ecology Attn: Appeals Processing Desk 300 Desmond Drive SE Lacey, WA 98503 **Pollution Control Hearings Board** 1111 Israel Road SW Suite 301 Tumwater, WA 98501	**Department of Ecology** Attn: Appeals Processing Desk PO Box 47608 Olympia, WA 98504-7608 **Pollution Control Hearings Board** PO Box 40903 Olympia, WA 98504-0903

CONTACT INFORMATION

Please direct all questions about this Order to:

Evan Wood
Department of Ecology
Southwest Regional Office
300 Desmond Drive, Lacey, WA 98503

Phone: (360) 706-4599
Email: evan.wood@ecy.wa.gov

MORE INFORMATION

- **Pollution Control Hearings Board Website**
  www.eho.wa.gov/Boards_PCHB.aspx
- **Chapter 43.21B RCW – Environmental Hearings Office – Pollution Control Hearings Board**
  http://apps.leg.wa.gov/RCW/default.aspz?cite=43.21B
- **Chapter 371-08 WAC – Practice and Procedure**
  http://apps.leg.wa.gov/WAC/default.aspx?cite=371-08
- **Chapter 34.05 RCW – Administrative Procedure Act**
  http://apps.leg.wa.gov/RCW/default.aspx?cite=34.05
- **Laws:** www.ecy.wa.gov/laws-rules/ecyrcw.html
- **Rules:** www.ecy.wa.gov/laws-rules/ecywac.html

SIGNATURE

Andrew Kolosseus
Southwest Region Section Manager
Water Quality Program

October 17, 2023
Date

Appendix D
Site Inspection Form

Construction Stormwater Site Inspection Form

Project Name _____ Permit # _____ Inspection Date _____ Time _____

Name of Certified Erosion Sediment Control Lead (CESCL) or qualified inspector if *less than one acre*
Print Name: _____

Approximate rainfall amount since the last inspection (in inches): _____

Approximate rainfall amount in the last 24 hours (in inches): _____

Current Weather Clear ☐ Cloudy ☐ Mist ☐ Rain ☐ Wind ☐ Fog ☐

A. Type of inspection: Weekly ☐ Post Storm Event ☐ Other ☐

B. Phase of Active Construction (*check all that apply*):

Pre Construction/installation of erosion/sediment controls	☐	Clearing/Demo/Grading	☐	Infrastructure/storm/roads	☐
Concrete pours	☐	Vertical Construction/buildings	☐	Utilities	☐
Offsite improvements	☐	Site temporary stabilized	☐	Final stabilization	☐

C. Questions:

1. Were all areas of construction and discharge points inspected? Yes ___ No ___
2. Did you observe the presence of suspended sediment, turbidity, discoloration, or oil sheen Yes ___ No ___
3. Was a water quality sample taken during inspection? (*refer to permit conditions S4 & S5*) Yes ___ No ___
4. Was there a turbid discharge 250 NTU or greater, or Transparency 6 cm or less?* Yes ___ No ___
5. If yes to #4 was it reported to Ecology? Yes ___ No ___
6. Is pH sampling required? pH range required is 6.5 to 8.5. Yes ___ No ___

If answering yes to a discharge, describe the event. Include when, where, and why it happened; what action was taken, and when.

_____

_____

_____

_____

*If answering yes to # 4 record NTU/Transparency with continual sampling daily until turbidity is 25 NTU or less/ transparency is 33 cm or greater.

Sampling Results: Date: _____

Parameter	Method (circle one)	Result			Other/Note
		NTU	cm	pH	
Turbidity	tube, meter, laboratory				
pH	Paper, kit, meter				

Construction Stormwater Site Inspection Form

D. Check the observed status of all items. Provide "Action Required "details and dates.

Element #	Inspection	BMPs Inspected			BMP needs maintenance	BMP failed	Action required (describe in section F)
		yes	no	n/a			
1 Clearing Limits	Before beginning land disturbing activities are all clearing limits, natural resource areas (streams, wetlands, buffers, trees) protected with barriers or similar BMPs? (high visibility recommended)						
2 Construction Access	Construction access is stabilized with quarry spalls or equivalent BMP to prevent sediment from being tracked onto roads?						
	Sediment tracked onto the road way was cleaned thoroughly at the end of the day or more frequent as necessary.						
3 Control Flow Rates	Are flow control measures installed to control stormwater volumes and velocity during construction and do they protect downstream properties and waterways from erosion?						
	If permanent infiltration ponds are used for flow control during construction, are they protected from siltation?						
4 Sediment Controls	All perimeter sediment controls (e.g. silt fence, wattles, compost socks, berms, etc.) installed, and maintained in accordance with the Stormwater Pollution Prevention Plan (SWPPP).						
	Sediment control BMPs (sediment ponds, traps, filters etc.) have been constructed and functional as the first step of grading.						
	Stormwater runoff from disturbed areas is directed to sediment removal BMP.						
5 Stabilize Soils	Have exposed un-worked soils been stabilized with effective BMP to prevent erosion and sediment deposition?						

Construction Stormwater Site Inspection Form

Element #	Inspection	BMPs Inspected			BMP needs maintenance	BMP failed	Action required (describe in section F)
		yes	no	n/a			
5 Stabilize Soils Cont.	Are stockpiles stabilized from erosion, protected with sediment trapping measures and located away from drain inlet, waterways, and drainage channels?						
	Have soils been stabilized at the end of the shift, before a holiday or weekend if needed based on the weather forecast?						
6 Protect Slopes	Has stormwater and ground water been diverted away from slopes and disturbed areas with interceptor dikes, pipes and or swales?						
	Is off-site storm water managed separately from stormwater generated on the site?						
	Is excavated material placed on uphill side of trenches consistent with safety and space considerations?						
	Have check dams been placed at regular intervals within constructed channels that are cut down a slope?						
7 Drain Inlets	Storm drain inlets made operable during construction are protected.						
	Are existing storm drains within the influence of the project protected?						
8 Stabilize Channel and Outlets	Have all on-site conveyance channels been designed, constructed and stabilized to prevent erosion from expected peak flows?						
	Is stabilization, including armoring material, adequate to prevent erosion of outlets, adjacent stream banks, slopes and downstream conveyance systems?						
9 Control Pollutants	Are waste materials and demolition debris handled and disposed of to prevent contamination of stormwater?						
	Has cover been provided for all chemicals, liquid products, petroleum products, and other material?						
	Has secondary containment been provided capable of containing 110% of the volume?						
	Were contaminated surfaces cleaned immediately after a spill incident?						
	Were BMPs used to prevent contamination of stormwater by a pH modifying sources?						

Construction Stormwater Site Inspection Form

Element #	Inspection	BMPs Inspected			BMP needs maintenance	BMP failed	Action required (describe in section F)
		yes	no	n/a			
9 Cont.	Wheel wash wastewater is handled and disposed of properly.						
10 Control Dewatering	Concrete washout in designated areas. No washout or excess concrete on the ground.						
	Dewatering has been done to an approved source and in compliance with the SWPPP.						
	Were there any clean non turbid dewatering discharges?						
11 Maintain BMP	Are all temporary and permanent erosion and sediment control BMPs maintained to perform as intended?						
12 Manage the Project	Has the project been phased to the maximum degree practicable?						
	Has regular inspection, monitoring and maintenance been performed as required by the permit?						
	Has the SWPPP been updated, implemented and records maintained?						

E. Check all areas that have been inspected. ✔

All in place BMPs ☐ All disturbed soils ☐ All concrete wash out area ☐ All material storage areas ☐
All discharge locations ☐ All equipment storage areas ☐ All construction entrances/exits ☐

F. Elements checked "Action Required" (section D) describe corrective action to be taken. List the element number; be specific on location and work needed. Document, initial, and date when the corrective action has been completed and inspected.

Element #	Description and Location	Action Required	Completion Date	Initials

Attach additional page if needed

Sign the following certification:

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

Inspected by: (print) _____ (Signature) _____ Date: _____

Title/Qualification of Inspector: _____

Appendix E Construction Stormwater General Permit

Issuance Date: November 18, 2020
Effective Date: January 1, 2021
Expiration Date: December 31, 2025

CONSTRUCTION STORMWATER GENERAL PERMIT

National Pollutant Discharge Elimination System (NPDES) and State Waste Discharge General Permit for Stormwater Discharges Associated with Construction Activity

State of Washington
Department of Ecology
Olympia, Washington 98504

In compliance with the provisions of
Chapter 90.48 Revised Code of Washington
(State of Washington Water Pollution Control Act)
and
Title 33 United States Code, Section 1251 et seq.
The Federal Water Pollution Control Act (The Clean Water Act)

Until this permit expires, is modified, or revoked, Permittees that have properly obtained coverage under this general permit are authorized to discharge in accordance with the special and general conditions that follow.

Vincent McGowan, P.E.
Water Quality Program Manager
Washington State Department of Ecology

TABLE OF CONTENTS

LIST OF TABLES

SUMMARY OF PERMIT REPORT SUBMITTALS

Refer to the Special and General Conditions within this permit for additional submittal requirements. Appendix A provides a list of definitions. Appendix B provides a list of acronyms.

Table 1 Summary of Required Submittals

Permit Section	Submittal	Frequency	First Submittal Date
S5.A and S8	High Turbidity/Transparency Phone Reporting	As Necessary	Within 24 hours
S5.B	Discharge Monitoring Report	Monthly*	Within 15 days following the end of each month
S5.F and S8	Noncompliance Notification – Telephone Notification	As necessary	Within 24 hours
S5.F	Noncompliance Notification – Written Report	As necessary	Within 5 Days of non-compliance
S9.D	Request for Chemical Treatment Form	As necessary	Written approval from Ecology is required prior to using chemical treatment (with the exception of dry ice, CO_2 or food grade vinegar to adjust pH)
G2	Notice of Change in Authorization	As necessary	
G6	Permit Application for Substantive Changes to the Discharge	As necessary	
G8	Application for Permit Renewal	1/permit cycle	No later than 180 days before expiration
S2.A	Notice of Permit Transfer	As necessary	
G19	Notice of Planned Changes	As necessary	
G21	Reporting Anticipated Non-compliance	As necessary	

NOTE: *Permittees must submit electronic Discharge Monitoring Reports (DMRs) to the Washington State Department of Ecology monthly, regardless of site discharge, for the full duration of permit coverage. Refer to Section S5.B of this General Permit for more specific information regarding DMRs.

Table 2 Summary of Required On-site Documentation

Document Title	Permit Conditions
Permit Coverage Letter	See Conditions S2, S5
Construction Stormwater General Permit (CSWGP)	See Conditions S2, S5
Site Log Book	See Conditions S4, S5
Stormwater Pollution Prevention Plan (SWPPP)	See Conditions S5, S9
Site Map	See Conditions S5, S9

SPECIAL CONDITIONS

S1. PERMIT COVERAGE

A. Permit Area

This Construction Stormwater General Permit (CSWGP) covers all areas of Washington State, except for federal operators and Indian Country as specified in Special Condition S1.E.3 and 4.

B. Operators Required to Seek Coverage Under this General Permit

1. Operators of the following construction activities are required to seek coverage under this CSWGP:

    a. Clearing, grading and/or excavation that results in the disturbance of one or more acres (including off-site disturbance acreage related to construction-support activity as authorized in S1.C.2) and discharges stormwater to surface waters of the State; and clearing, grading and/or excavation on sites smaller than one acre that are part of a larger common plan of development or sale, if the common plan of development or sale will ultimately disturb one acre or more and discharge stormwater to surface waters of the State.

        i. This category includes forest practices (including, but not limited to, class IV conversions) that are part of a construction activity that will result in the disturbance of one or more acres, and discharge to surface waters of the State (that is, forest practices that prepare a site for construction activities); and

    b. Any size construction activity discharging stormwater to waters of the State that the Washington State Department of Ecology (Ecology):

        i. Determines to be a significant contributor of pollutants to waters of the State of Washington.

        ii. Reasonably expects to cause a violation of any water quality standard.

2. Operators of the following activities are not required to seek coverage under this CSWGP (unless specifically required under Special Condition S1.B.1.b, above):

    a. Construction activities that discharge all stormwater and non-stormwater to groundwater, sanitary sewer, or combined sewer, and have no point source discharge to either surface water or a storm sewer system that drains to surface waters of the State.

    b. Construction activities covered under an Erosivity Waiver (Special Condition S1.F).

    c. Routine maintenance that is performed to maintain the original line and grade, hydraulic capacity, or original purpose of a facility.

C. Authorized Discharges

1. ***Stormwater Associated with Construction Activity.*** Subject to compliance with the terms and conditions of this permit, Permittees are authorized to discharge stormwater associated with construction activity to surface waters of the State or to a storm sewer system that drains to surface waters of the State. (Note that "surface waters of the

State" may exist on a construction site as well as off site; for example, a creek running through a site.)

2. ***Stormwater Associated with Construction Support Activity.*** This permit also authorizes stormwater discharge from support activities related to the permitted construction site (for example, an on-site portable rock crusher, off-site equipment staging yards, material storage areas, borrow areas, etc.) provided:

    a. The support activity relates directly to the permitted construction site that is required to have an NPDES permit; and

    b. The support activity is not a commercial operation serving multiple unrelated construction projects, and does not operate beyond the completion of the construction activity; and

    c. Appropriate controls and measures are identified in the Stormwater Pollution Prevention Plan (SWPPP) for the discharges from the support activity areas.

3. ***Non-Stormwater Discharges.*** The categories and sources of non-stormwater discharges identified below are authorized conditionally, provided the discharge is consistent with the terms and conditions of this permit:

    a. Discharges from fire-fighting activities.

    b. Fire hydrant system flushing.

    c. Potable water, including uncontaminated water line flushing.

    d. Hydrostatic test water.

    e. Uncontaminated air conditioning or compressor condensate.

    f. Uncontaminated groundwater or spring water.

    g. Uncontaminated excavation dewatering water (in accordance with S9.D.10).

    h. Uncontaminated discharges from foundation or footing drains.

    i. Uncontaminated or potable water used to control dust. Permittees must minimize the amount of dust control water used.

    j. Routine external building wash down that does not use detergents.

    k. Landscape irrigation water.

The SWPPP must adequately address all authorized non-stormwater discharges, except for discharges from fire-fighting activities, and must comply with Special Condition S3. At a minimum, discharges from potable water (including water line flushing), fire hydrant system flushing, and pipeline hydrostatic test water must undergo the following: dechlorination to a concentration of 0.1 parts per million (ppm) or less, and pH adjustment to within 6.5 – 8.5 standard units (su), if necessary.

D. Prohibited Discharges

The following discharges to waters of the State, including groundwater, are prohibited:

1. Concrete wastewater

2. Wastewater from washout and clean-up of stucco, paint, form release oils, curing compounds and other construction materials.

3. Process wastewater as defined by 40 Code of Federal Regulations (CFR) 122.2 (See Appendix A of this permit).

4. Slurry materials and waste from shaft drilling, including process wastewater from shaft drilling for construction of building, road, and bridge foundations unless managed according to Special Condition S9.D.9.j.

5. Fuels, oils, or other pollutants used in vehicle and equipment operation and maintenance.

6. Soaps or solvents used in vehicle and equipment washing.

7. Wheel wash wastewater, unless managed according to Special Condition S9.D.9.

8. Discharges from dewatering activities, including discharges from dewatering of trenches and excavations, unless managed according to Special Condition S9.D.10.

E. Limits on Coverage

Ecology may require any discharger to apply for and obtain coverage under an individual permit or another more specific general permit. Such alternative coverage will be required when Ecology determines that this CSWGP does not provide adequate assurance that water quality will be protected, or there is a reasonable potential for the project to cause or contribute to a violation of water quality standards.

The following stormwater discharges are not covered by this permit:

1. Post-construction stormwater discharges that originate from the site after completion of construction activities and the site has undergone final stabilization.

2. Non-point source silvicultural activities such as nursery operations, site preparation, reforestation and subsequent cultural treatment, thinning, prescribed burning, pest and fire control, harvesting operations, surface drainage, or road construction and maintenance, from which there is natural runoff as excluded in 40 CFR Subpart 122.

3. Stormwater from any federal operator.

4. Stormwater from facilities located on ***Indian Country*** as defined in 18 U.S.C.§1151, except portions of the Puyallup Reservation as noted below.

   Indian Country includes:

   a. All land within any Indian Reservation notwithstanding the issuance of any patent, and, including rights-of-way running through the reservation. This includes all federal, tribal, and Indian and non-Indian privately owned land within the reservation.

   b. All off-reservation Indian allotments, the Indian titles to which have not been extinguished, including rights-of-way running through the same.

   c. All off-reservation federal trust lands held for Native American Tribes.

Puyallup Exception: Following the *Puyallup Tribes of Indians Land Settlement Act of 1989*, 25 U.S.C. §1773; the permit does apply to land within the Puyallup Reservation except for discharges to surface water on land held in trust by the federal government.

5. Stormwater from any site covered under an existing NPDES individual permit in which stormwater management and/or treatment requirements are included for all stormwater discharges associated with construction activity.

6. Stormwater from a site where an applicable Total Maximum Daily Load (TMDL) requirement specifically precludes or prohibits discharges from construction activity.

F. Erosivity Waiver

Construction site operators may qualify for an Erosivity Waiver from the CSWGP if the following conditions are met:

1. The site will result in the disturbance of fewer than five (5) acres and the site is not a portion of a common plan of development or sale that will disturb five (5) acres or greater.

2. Calculation of Erosivity "R" Factor and Regional Timeframe:

    a. The project's calculated rainfall erosivity factor ("R" Factor) must be less than five (5) during the period of construction activity, (See the CSWGP homepage http://www.ecy.wa.gov/programs/wq/stormwater/construction/index.html for a link to the EPA's calculator and step by step instructions on computing the "R" Factor in the *EPA Erosivity Waiver Fact Sheet*). The period of construction activity starts when the land is first disturbed and ends with final stabilization. In addition:

    b. The entire period of construction activity must fall within the following timeframes:

        i. For sites west of the Cascades Crest: June 15 – September 15.

        ii. For sites east of the Cascades Crest, excluding the Central Basin: June 15 – October 15.

        iii. For sites east of the Cascades Crest, within the Central Basin: no timeframe restrictions apply. The Central Basin is defined as the portions of Eastern Washington with mean annual precipitation of less than 12 inches. For a map of the Central Basin (Average Annual Precipitation Region 2), refer to: http://www.ecy.wa.gov/programs/wq/stormwater/construction/resourcesguidance.html.

3. Construction site operators must submit a complete Erosivity Waiver certification form at least one week before disturbing the land. Certification must include statements that the operator will:

    a. Comply with applicable local stormwater requirements; and

    b. Implement appropriate erosion and sediment control BMPs to prevent violations of water quality standards.

4. This waiver is not available for facilities declared significant contributors of pollutants as defined in Special Condition S1.B.1.b or for any size construction activity that could

reasonably expect to cause a violation of any water quality standard as defined in Special Condition S1.B.1.b.ii.

5. This waiver does not apply to construction activities which include non-stormwater discharges listed in Special Condition S1.C.3.

6. If construction activity extends beyond the certified waiver period for any reason, the operator must either:

   a. Recalculate the rainfall erosivity "R" factor using the original start date and a new projected ending date and, if the "R" factor is still under 5 *and* the entire project falls within the applicable regional timeframe in Special Condition S1.F.2.b, complete and submit an amended waiver certification form before the original waiver expires; *or*

   b. Submit a complete permit application to Ecology in accordance with Special Condition S2.A and B before the end of the certified waiver period.

S2. APPLICATION REQUIREMENTS

A. Permit Application Forms

1. *Notice of Intent Form*

a. Operators of new or previously unpermitted construction activities must submit a complete and accurate permit application (Notice of Intent, or NOI) to Ecology.

b. Operators must apply using the electronic application form (NOI) available on Ecology's website (http://ecy.wa.gov/programs/wq/stormwater/construction/index.html). Permittees unable to submit electronically (for example, those who do not have an internet connection) must contact Ecology to request a waiver and obtain instructions on how to obtain a paper NOI.

Department of Ecology
Water Quality Program - Construction Stormwater
PO Box 47696
Olympia, Washington 98504-7696

c. The operator must submit the NOI at least 60 days before discharging stormwater from construction activities and must submit it prior to the date of the first public notice (See Special Condition S2.B, below, for details). The 30-day public comment period begins on the publication date of the second public notice. Unless Ecology responds to the complete application in writing, coverage under the general permit will automatically commence on the 31st day following receipt by Ecology of a *completed* NOI, or the issuance date of this permit, whichever is later; unless Ecology specifies a later date in writing as required by WAC173-226-200(2). See S8.B for Limits on Coverage for New Discharges to TMDL or 303(d)-Listed Waters.

d. If an applicant intends to use a Best Management Practice (BMP) selected on the basis of Special Condition S9.C.4 ("demonstrably equivalent" BMPs), the applicant must notify Ecology of its selection as part of the NOI. In the event the applicant selects BMPs after submission of the NOI, the applicant must provide notice of the

selection of an equivalent BMP to Ecology at least 60 days before intended use of the equivalent BMP.

e. Applicants must notify Ecology if they are aware of contaminated soils and/or groundwater associated with the construction activity. Provide detailed information with the NOI (as known and readily available) on the nature and extent of the contamination (concentrations, locations, and depth), as well as pollution prevention and/or treatment BMPs proposed to control the discharge of soil and/or groundwater contaminants in stormwater. Examples of such detail may include, but are not limited to:

   i. List or table of all known contaminants with laboratory test results showing concentration and depth,

   ii. Map with sample locations,

   iii. Related portions of the Stormwater Pollution Prevention Plan (SWPPP) that address the management of contaminated and potentially contaminated construction stormwater and dewatering water,

   iv. Dewatering plan and/or dewatering contingency plan.

2. ***Transfer of Coverage Form***

The Permittee can transfer current coverage under this permit to one or more new operators, including operators of sites within a Common Plan of Development, provided:

   i. The Permittee submits a complete Transfer of Coverage Form to Ecology, signed by the current and new discharger and containing a specific date for transfer of permit responsibility, coverage and liability (including any Administrative Orders associated with the permit); and

   ii. Ecology does not notify the current discharger and new discharger of intent to revoke coverage under the general permit. If this notice is not given, the transfer is effective on the date specified in the written agreement.

When a current discharger (Permittee) transfers a portion of a permitted site, the current discharger must also indicate the remaining permitted acreage after the transfer. Transfers do not require public notice.

3. ***Modification of Coverage Form***

Permittees must notify Ecology regarding any changes to the information provided on the NOI by submitting an Update/Modification of Permit Coverage form in accordance with General Conditions G6 and G19. Examples of such changes include, but are not limited to:

   i. Changes to the Permittee's mailing address,

   ii. Changes to the on-site contact person information, and

   iii. Changes to the area/acreage affected by construction activity.

B. Public Notice

For new or previously unpermitted construction activities, the applicant must publish a public notice at least one time each week for two consecutive weeks, at least 7 days apart, in a newspaper with general circulation in the county where the construction is to take place. The notice must be run after the NOI has been submitted and must contain:

1. A statement that "*The applicant is seeking coverage under the Washington State Department of Ecology's Construction Stormwater NPDES and State Waste Discharge General Permit*."
2. The name, address, and location of the construction site.
3. The name and address of the applicant.
4. The type of construction activity that will result in a discharge (for example, residential construction, commercial construction, etc.), and the total number of acres to be disturbed over the lifetime of the project.
5. The name of the receiving water(s) (that is, the surface water(s) to which the site will discharge), or, if the discharge is through a storm sewer system, the name of the operator of the system and the receiving water(s) the system discharges to.
6. The statement: *Any persons desiring to present their views to the Washington State Department of Ecology regarding this application, or interested in Ecology's action on this application, may notify Ecology in writing no later than 30 days of the last date of publication of this notice. Ecology reviews public comments and considers whether discharges from this project would cause a measurable change in receiving water quality, and, if so, whether the project is necessary and in the overriding public interest according to Tier II antidegradation requirements under WAC 173-201A-320. Comments can be submitted to: Department of Ecology, PO Box 47696, Olympia, Washington 98504-7696 Attn: Water Quality Program, Construction Stormwater*.

S3. COMPLIANCE WITH STANDARDS

A. Discharges must not cause or contribute to a violation of surface water quality standards (Chapter 173-201A WAC), groundwater quality standards (Chapter 173-200 WAC), sediment management standards (Chapter 173-204 WAC), and human health-based criteria in the Federal water quality criteria applicable to Washington. (40 CFR Part 131.45) Discharges that are not in compliance with these standards are prohibited.

B. Prior to the discharge of stormwater and non-stormwater to waters of the State, the Permittee must apply All Known, Available, and Reasonable methods of prevention, control, and Treatment (AKART). This includes the preparation and implementation of an adequate SWPPP, with all appropriate BMPs installed and maintained in accordance with the SWPPP and the terms and conditions of this permit.

C. Ecology presumes that a Permittee complies with water quality standards unless discharge monitoring data or other site-specific information demonstrates that a discharge causes or contributes to a violation of water quality standards, when the Permittee complies with the following conditions. The Permittee must fully:

1. Comply with all permit conditions, including; planning, sampling, monitoring, reporting, and recordkeeping conditions.

2. Implement stormwater BMPs contained in stormwater management manuals published or approved by Ecology, or BMPs that are demonstrably equivalent to BMPs contained in stormwater management manuals published or approved by Ecology, including the proper selection, implementation, and maintenance of all applicable and appropriate BMPs for on-site pollution control. (For purposes of this section, the stormwater manuals listed in Appendix 10 of the *Phase I Municipal Stormwater Permit* are approved by Ecology.)

D. Where construction sites also discharge to groundwater, the groundwater discharges must also meet the terms and conditions of this CSWGP. Permittees who discharge to groundwater through an injection well must also comply with any applicable requirements of the Underground Injection Control (UIC) regulations, Chapter 173-218 WAC.

S4. MONITORING REQUIREMENTS, BENCHMARKS, AND REPORTING TRIGGERS

A. Site Log Book

The Permittee must maintain a site log book that contains a record of the implementation of the SWPPP and other permit requirements, including the installation and maintenance of BMPs, site inspections, and stormwater monitoring.

B. Site Inspections

Construction sites one (1) acre or larger that discharge stormwater to surface waters of the State must have site inspections conducted by a Certified Erosion and Sediment Control Lead (CESCL). Sites less than one (1) acre may have a person without CESCL certification conduct inspections. (See Special Conditions S4.B.3 and B.4, below, for detailed requirements of the Permittee's CESCL.)

Site inspections must include all areas disturbed by construction activities, all BMPs, and all stormwater discharge points under the Permittee's operational control.

1. The Permittee must have staff knowledgeable in the principles and practices of erosion and sediment control. The CESCL (sites one acre or more) or inspector (sites less than one acre) must have the skills to assess the:

    a. Site conditions and construction activities that could impact the quality of stormwater; and

    b. Effectiveness of erosion and sediment control measures used to control the quality of stormwater discharges. The SWPPP must identify the CESCL or inspector, who must be present on site or on-call at all times. The CESCL (sites one (1) acre or more) must obtain this certification through an approved erosion and sediment control training program that meets the minimum training standards established by Ecology. (See BMP C160 in the manual, referred to in Special Condition S9.C.1 and 2.)

2. The CESCL or inspector must examine stormwater visually for the presence of suspended sediment, turbidity, discoloration, and oil sheen. BMP effectiveness must be evaluated to

determine if it is necessary to install, maintain, or repair BMPs to improve the quality of stormwater discharges.

Based on the results of the inspection, the Permittee must correct the problems identified, by:

a. Reviewing the SWPPP for compliance with Special Condition S9 and making appropriate revisions within 7 days of the inspection.

b. Immediately beginning the process of fully implementing and maintaining appropriate source control and/or treatment BMPs, within 10 days of the inspection. If installation of necessary treatment BMPs is not feasible within 10 days, Ecology may approve additional time when an extension is requested by a Permittee within the initial 10-day response period.

c. Documenting BMP implementation and maintenance in the site log book.

3. The CESCL or inspector must inspect all areas disturbed by construction activities, all BMPs, and all stormwater discharge points at least once every calendar week and within 24 hours of any discharge from the site. (For purposes of this condition, individual discharge events that last more than one (1) day do not require daily inspections. For example, if a stormwater pond discharges continuously over the course of a week, only one (1) inspection is required that week.) Inspection frequency may be reduced to once every calendar month for inactive sites that are temporarily stabilized.

4. The Permittee must summarize the results of each inspection in an inspection report or checklist and enter the report/checklist into, or attach it to, the site log book. At a minimum, each inspection report or checklist must include:

   a. Inspection date and time.

   b. Weather information.

   c. The general conditions during inspection.

   d. The approximate amount of precipitation since the last inspection.

   e. The approximate amount of precipitation within the last 24 hours.

   f. A summary or list of all implemented BMPs, including observations of all erosion/sediment control structures or practices.

   g. A description of:

      i. BMPs inspected (including location).

      ii. BMPs that need maintenance and why.

      iii. BMPs that failed to operate as designed or intended, and

      iv. Where additional or different BMPs are needed, and why.

   h. A description of stormwater discharged from the site. The Permittee must note the presence of suspended sediment, turbidity, discoloration, and oil sheen, as applicable.

i. Any water quality monitoring performed during inspection.

j. General comments and notes, including a brief description of any BMP repairs, maintenance, or installations made following the inspection.

k. An implementation schedule for the remedial actions that the Permittee plans to take if the site inspection indicates that the site is out of compliance. The remedial actions taken must meet the requirements of the SWPPP and the permit.

l. A summary report of the inspection.

m. The name, title, and signature of the person conducting the site inspection, a phone number or other reliable method to reach this person, and the following statement: *I certify that this report is true, accurate, and complete to the best of my knowledge and belief.*

Table 3 Summary of Primary Monitoring Requirements

Size of Soil Disturbance[1]	Weekly Site Inspections	Weekly Sampling w/ Turbidity Meter	Weekly Sampling w/ Transparency Tube	Weekly pH Sampling[2]	CESCL Required for Inspections?
Sites that disturb less than 1 acre, but are part of a larger Common Plan of Development	Required	Not Required	Not Required	Not Required	No
Sites that disturb 1 acre or more, but fewer than 5 acres	Required	Sampling Required – either method[3]		Required	Yes
Sites that disturb 5 acres or more	Required	Required	Not Required[4]	Required	Yes

[1] Soil disturbance is calculated by adding together all areas that will be affected by construction activity. Construction activity means clearing, grading, excavation, and any other activity that disturbs the surface of the land, including ingress/egress from the site.

[2] If construction activity results in the disturbance of 1 acre or more, and involves significant concrete work (1,000 cubic yards of concrete or recycled concrete placed or poured over the life of a project) or the use of engineered soils (soil amendments including but not limited to Portland cement-treated base [CTB], cement kiln dust [CKD], or fly ash), and stormwater from the affected area drains to surface waters of the State or to a storm sewer stormwater collection system that drains to other surface waters of the State, the Permittee must conduct pH sampling in accordance with Special Condition S4.D.

[3] Sites with one or more acres, but fewer than 5 acres of soil disturbance, must conduct turbidity or transparency sampling in accordance with Special Condition S4.C.4.a or b.

[4] Sites equal to or greater than 5 acres of soil disturbance must conduct turbidity sampling using a turbidity meter in accordance with Special Condition S4.C.4.a.

C. Turbidity/Transparency Sampling Requirements

1. Sampling Methods

    a. If construction activity involves the disturbance of five (5) acres or more, the Permittee must conduct turbidity sampling per Special Condition S4.C.4.a, below.

    b. If construction activity involves one (1) acre or more but fewer than five (5) acres of soil disturbance, the Permittee must conduct either transparency sampling *or* turbidity sampling per Special Condition S4.C.4.a or b, below.

2. Sampling Frequency

    a. The Permittee must sample all discharge points at least once every calendar week when stormwater (or authorized non-stormwater) discharges from the site or enters any on-site surface waters of the state (for example, a creek running through a site); sampling is not required on sites that disturb less than an acre.

    b. Samples must be representative of the flow and characteristics of the discharge.

    c. Sampling is not required when there is no discharge during a calendar week.

    d. Sampling is not required outside of normal working hours or during unsafe conditions.

    e. If the Permittee is unable to sample during a monitoring period, the Permittee must include a brief explanation in the monthly Discharge Monitoring Report (DMR).

    f. Sampling is not required before construction activity begins.

    g. The Permittee may reduce the sampling frequency for temporarily stabilized, inactive sites to once every calendar month.

3. Sampling Locations

    a. Sampling is required at all points where stormwater associated with construction activity (or authorized non-stormwater) is discharged off site, including where it enters any on-site surface waters of the state (for example, a creek running through a site).

    b. The Permittee may discontinue sampling at discharge points that drain areas of the project that are fully stabilized to prevent erosion.

    c. The Permittee must identify all sampling point(s) in the SWPPP and on the site map and clearly mark these points in the field with a flag, tape, stake or other visible marker.

    d. Sampling is not required for discharge that is sent directly to sanitary or combined sewer systems.

    e. The Permittee may discontinue sampling at discharge points in areas of the project where the Permittee no longer has operational control of the construction activity.

4. Sampling and Analysis Methods

   a. The Permittee performs turbidity analysis with a calibrated turbidity meter (turbidimeter) either on site or at an accredited lab. The Permittee must record the results in the site log book in nephelometric turbidity units (NTUs).

   b. The Permittee performs transparency analysis on site with a 1¾ inch diameter, 60 centimeter (cm)-long transparency tube. The Permittee will record the results in the site log book in centimeters (cm).

Table 4 Monitoring and Reporting Requirements

Parameter	Unit	Analytical Method	Sampling Frequency	Benchmark Value
Turbidity	NTU	SM2130	Weekly, if discharging	25 NTUs
Transparency	Cm	Manufacturer instructions, or Ecology guidance	Weekly, if discharging	33 cm

5. Turbidity/Transparency Benchmark Values and Reporting Triggers

   The benchmark value for turbidity is 25 NTUs. The benchmark value for transparency is 33 centimeters (cm). Note: Benchmark values do not apply to discharges to segments of water bodies on Washington State's 303(d) list (Category 5) for turbidity, fine sediment, or phosphorus; these discharges are subject to a numeric effluent limit for turbidity. Refer to Special Condition S8 for more information and follow S5.F – Noncompliance Notification for reporting requirements applicable to discharges which exceed the numeric effluent limit for turbidity.

   a. Turbidity 26 – 249 NTUs, or Transparency 32 – 7 cm:

      If the discharge turbidity is 26 to 249 NTUs; or if discharge transparency is 32 to 7 cm, the Permittee must:

      i. Immediately begin the process to fully implement and maintain appropriate source control and/or treatment BMPs, and no later than 10 days of the date the discharge exceeded the benchmark. If installation of necessary treatment BMPs is not feasible within 10 days, Ecology may approve additional time when the Permittee requests an extension within the initial 10-day response period.

      ii. Review the SWPPP for compliance with Special Condition S9 and make appropriate revisions within 7 days of the date the discharge exceeded the benchmark.

      iii. Document BMP implementation and maintenance in the site log book.

   b. Turbidity 250 NTUs or greater, or Transparency 6 cm or less:

      If a discharge point's turbidity is 250 NTUs or greater, or if discharge transparency is less than or equal to 6 cm, the Permittee must complete the reporting and adaptive

management process described below. For discharges which are subject to a numeric effluent limit for turbidity, see S5.F – Noncompliance Notification.

i. Within 24 hours, telephone or submit an electronic report to the applicable Ecology Region's Environmental Report Tracking System (ERTS) number (or through Ecology's Water Quality Permitting Portal [WQWebPortal] – Permit Submittals when the form is available), in accordance with Special Condition S5.A.

- **Central Region** (Okanogan, Chelan, Douglas, Kittitas, Yakima, Klickitat, Benton): (509) 575-2490
- **Eastern Region** (Adams, Asotin, Columbia, Ferry, Franklin, Garfield, Grant, Lincoln, Pend Oreille, Spokane, Stevens, Walla Walla, Whitman): (509) 329-3400
- **Northwest Region** (Kitsap, Snohomish, Island, King, San Juan, Skagit, Whatcom): (425) 649-7000
- **Southwest Region** (Grays Harbor, Lewis, Mason, Thurston, Pierce, Clark, Cowlitz, Skamania, Wahkiakum, Clallam, Jefferson, Pacific): (360) 407-6300

These numbers and a link to the ERTS reporting page are also listed at the following website: http://www.ecy.wa.gov/programs/wq/stormwater/construction/index.html.

ii. Immediately begin the process to fully implement and maintain appropriate source control and/or treatment BMPs as soon as possible, addressing the problems within 10 days of the date the discharge exceeded the benchmark. If installation of necessary treatment BMPs is not feasible within 10 days, Ecology may approve additional time when the Permittee requests an extension within the initial 10-day response period.

iii. Sample discharges daily until:

a) Turbidity is 25 NTUs (or lower); or

b) Transparency is 33 cm (or greater); or

c) The Permittee has demonstrated compliance with the water quality standard for turbidity:

1) No more than 5 NTUs over background turbidity, if background is less than 50 NTUs, or

2) No more than 10% over background turbidity, if background is 50 NTUs or greater; or

*Note: background turbidity in the receiving water must be measured immediately upstream (upgradient) or outside of the area of influence of the discharge.

d) The discharge stops or is eliminated.

iv. Review the SWPPP for compliance with Special Condition S9 and make appropriate revisions within seven (7) days of the date the discharge exceeded the benchmark.

v. Document BMP implementation and maintenance in the site log book.

Compliance with these requirements does not relieve the Permittee from responsibility to maintain continuous compliance with permit benchmarks.

D. pH Sampling Requirements – Significant Concrete Work or Engineered Soils

If construction activity results in the disturbance of 1 acre or more, *and* involves significant concrete work (significant concrete work means greater than 1000 cubic yards placed or poured concrete or recycled concrete used over the life of a project) or the use of engineered soils (soil amendments including but not limited to Portland cement-treated base [CTB], cement kiln dust [CKD], or fly ash), and stormwater from the affected area drains to surface waters of the State or to a storm sewer system that drains to surface waters of the State, the Permittee must conduct pH sampling as set forth below. Note: In addition, discharges to segments of water bodies on Washington State's 303(d) list (Category 5) for high pH are subject to a numeric effluent limit for pH; refer to Special Condition S8.

1. The Permittee must perform pH analysis on site with a calibrated pH meter, pH test kit, or wide range pH indicator paper. The Permittee must record pH sampling results in the site log book.

2. During the applicable pH monitoring period defined below, the Permittee must obtain a representative sample of stormwater and conduct pH analysis at least once per week.

    a. For sites with significant concrete work, the Permittee must begin the pH sampling period when the concrete is first placed or poured and exposed to precipitation, and continue weekly throughout and after the concrete placement, pour and curing period, until stormwater pH is in the range of 6.5 to 8.5 (su).

    b. For sites with recycled concrete where monitoring is required, the Permittee must begin the weekly pH sampling period when the recycled concrete is first exposed to precipitation and must continue until the recycled concrete is fully stabilized with the stormwater pH in the range of 6.5 to 8.5 (su).

    c. For sites with engineered soils, the Permittee must begin the pH sampling period when the soil amendments are first exposed to precipitation and must continue until the area of engineered soils is fully stabilized.

3. The Permittee must sample pH in the sediment trap/pond(s) or other locations that receive stormwater runoff from the area of significant concrete work or engineered soils before the stormwater discharges to surface waters.

4. The benchmark value for pH is 8.5 standard units. Anytime sampling indicates that pH is 8.5 or greater, the Permittee must either:

    a. Prevent the high pH water (8.5 or above) from entering storm sewer systems or surface waters of the state; *or*

    b. If necessary, adjust or neutralize the high pH water until it is in the range of pH 6.5 to 8.5 (su) using an appropriate treatment BMP such as carbon dioxide (CO_2) sparging, dry ice or food grade vinegar. The Permittee must obtain written approval from Ecology before using any form of chemical treatment other than CO_2 sparging, dry ice or food grade vinegar.

S5. REPORTING AND RECORDKEEPING REQUIREMENTS

A. High Turbidity Reporting

Anytime sampling performed in accordance with Special Condition S4.C indicates turbidity has reached the 250 NTUs or more (or transparency less than or equal to 6 cm), high turbidity reporting level, the Permittee must notify Ecology within 24 hours of analysis either by calling the applicable Ecology Region's Environmental Report Tracking System (ERTS) number by phone or by submitting an electronic ERTS report (through Ecology's Water Quality Permitting Portal (WQWebPortal) – Permit Submittals when the form is available). See the CSWGP website for links to ERTS and the WQWebPortal. (http://www.ecy.wa.gov/programs/wq/stormwater/construction/index.html) Also, see phone numbers in Special Condition S4.C.5.b.i.

B. Discharge Monitoring Reports (DMRs)

Permittees required to conduct water quality sampling in accordance with Special Conditions S4.C (Turbidity/Transparency), S4.D (pH), S8 (303[d]/TMDL sampling), and/or G12 (Additional Sampling) must submit the results to Ecology.

Permittees must submit monitoring data using Ecology's WQWebDMR web application accessed through Ecology's Water Quality Permitting Portal.

Permittees unable to submit electronically (for example, those who do not have an internet connection) must contact Ecology to request a waiver and obtain instructions on how to obtain a paper copy DMR at:

Department of Ecology
Water Quality Program - Construction Stormwater
PO Box 47696
Olympia, WA 98504-7696

Permittees who obtain a waiver not to use WQWebDMR must use the forms provided to them by Ecology; submittals must be mailed to the address above. Permittees must submit DMR forms to be received by Ecology within 15 days following the end of each month.

If there was no discharge during a given monitoring period, all Permittees must submit a DMR as required with "no discharge" entered in place of the monitoring results. DMRs are required for the full duration of permit coverage (from the first full month following the effective date of permit coverage up until Ecology has approved termination of the coverage). For more information, contact Ecology staff using information provided at the following website: www.ecy.wa.gov/programs/wq/permits/paris/contacts.html.

C. Records Retention

The Permittee must retain records of all monitoring information (site log book, sampling results, inspection reports/checklists, etc.), Stormwater Pollution Prevention Plan, copy of the permit coverage letter (including Transfer of Coverage documentation) and any other documentation of compliance with permit requirements for the entire life of the construction project and for a minimum of five (5) years following the termination of permit coverage. Such information must include all calibration and maintenance records, and records of all data used to complete the application for this permit. This period of retention must be extended during

the course of any unresolved litigation regarding the discharge of pollutants by the Permittee or when requested by Ecology.

D. Recording Results

For each measurement or sample taken, the Permittee must record the following information:

1. Date, place, method, and time of sampling or measurement.
2. The first and last name of the individual who performed the sampling or measurement.
3. The date(s) the analyses were performed.
4. The first and last name of the individual who performed the analyses.
5. The analytical techniques or methods used.
6. The results of all analyses.

E. Additional Monitoring by the Permittee

If the Permittee samples or monitors any pollutant more frequently than required by this permit using test procedures specified by Special Condition S4 of this permit, the sampling results for this monitoring must be included in the calculation and reporting of the data submitted in the Permittee's DMR.

F. Noncompliance Notification

In the event the Permittee is unable to comply with any part of the terms and conditions of this permit, and the resulting noncompliance may cause a threat to human health or the environment (such as but not limited to spills or fuels or other materials, catastrophic pond or slope failure, and discharges that violate water quality standards), or exceed numeric effluent limitations (see S8 – Discharges to 303(d) or TMDL Waterbodies), the Permittee must, upon becoming aware of the circumstance:

1. Notify Ecology within 24 hours of the failure to comply by calling the applicable Regional office ERTS phone number (refer to Special Condition S4.C.5.b.i, or go to https://ecology.wa.gov/About-us/Get-involved/Report-an-environmental-issue to find contact information for the regional offices.)
2. Immediately take action to prevent the discharge/pollution, or otherwise stop or correct the noncompliance, and, if applicable, repeat sampling and analysis of any noncompliance immediately and submit the results to Ecology within five (5) days of becoming aware of the violation (See S5.F.3, below, for details on submitting results in a report).
3. Submit a detailed written report to Ecology within five (5) days of the time the Permittee becomes aware of the circumstances, unless requested earlier by Ecology. The report must be submitted using Ecology's Water Quality Permitting Portal (WQWebPortal) – Permit Submittals, unless a waiver from electronic reporting has been granted according to S5.B. The report must contain a description of the noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and the steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.

The Permittee must report any unanticipated bypass and/or upset that exceeds any effluent limit in the permit in accordance with the 24-hour reporting requirement contained in 40 C.F.R. 122.41(l)(6).

Compliance with these requirements does not relieve the Permittee from responsibility to maintain continuous compliance with the terms and conditions of this permit or the resulting liability for failure to comply. Upon request of the Permittee, Ecology may waive the requirement for a written report on a case-by-case basis, if the immediate notification is received by Ecology within 24 hours.

G. Access to Plans and Records

1. The Permittee must retain the following permit documentation (plans and records) on site, or within reasonable access to the site, for use by the operator or for on-site review by Ecology or the local jurisdiction:

    a. General Permit

    b. Permit Coverage Letter

    c. Stormwater Pollution Prevention Plan (SWPPP)

    d. Site Log Book

    e. Erosivity Waiver (if applicable)

2. The Permittee must address written requests for plans and records listed above (Special Condition S5.G.1) as follows:

    a. The Permittee must provide a copy of plans and records to Ecology within 14 days of receipt of a written request from Ecology.

    b. The Permittee must provide a copy of plans and records to the public when requested in writing. Upon receiving a written request from the public for the Permittee's plans and records, the Permittee must either:

        i. Provide a copy of the plans and records to the requester within 14 days of a receipt of the written request; *or*

        ii. Notify the requester within 10 days of receipt of the written request of the location and times within normal business hours when the plans and records may be viewed; and provide access to the plans and records within 14 days of receipt of the written request; *or*

            Within 14 days of receipt of the written request, the Permittee may submit a copy of the plans and records to Ecology for viewing and/or copying by the requester at an Ecology office, or a mutually agreed location. If plans and records are viewed and/or copied at a location other than at an Ecology office, the Permittee will provide reasonable access to copying services for which a reasonable fee may be charged. The Permittee must notify the requester within 10 days of receipt of the request where the plans and records may be viewed and/or copied.

S6. PERMIT FEES

The Permittee must pay permit fees assessed by Ecology. Fees for stormwater discharges covered under this permit are established by Chapter 173-224 WAC. Ecology continues to assess permit fees until the permit is terminated in accordance with Special Condition S10 or revoked in accordance with General Condition G5.

S7. SOLID AND LIQUID WASTE DISPOSAL

The Permittee must handle and dispose of solid and liquid wastes generated by construction activity, such as demolition debris, construction materials, contaminated materials, and waste materials from maintenance activities, including liquids and solids from cleaning catch basins and other stormwater facilities, in accordance with:

A. Special Condition S3, Compliance with Standards.

B. WAC 173-216-110.

C. Other applicable regulations.

S8. DISCHARGES TO 303(d) OR TMDL WATERBODIES

A. Sampling and Numeric Effluent Limits For Certain Discharges to 303(d)-Listed Water Bodies

1. Permittees who discharge to segments of water bodies listed as impaired by the State of Washington under Section 303(d) of the Clean Water Act for turbidity, fine sediment, high pH, or phosphorus, must conduct water quality sampling according to the requirements of this section, and Special Conditions S4.C.2.b-f and S4.C.3.b-d, and must comply with the applicable numeric effluent limitations in S8.C and S8.D.

2. All references and requirements associated with Section 303(d) of the Clean Water Act mean the most current listing by Ecology of impaired waters (Category 5) that exists on January 1, 2021, or the date when the operator's complete permit application is received by Ecology, whichever is later.

B. Limits on Coverage for New Discharges to TMDL or 303(d)-Listed Waters

Construction sites that discharge to a TMDL or 303(d)-listed waterbody are not eligible for coverage under this permit *unless* the operator:

1. Prevents exposing stormwater to pollutants for which the waterbody is impaired, and retains documentation in the SWPPP that details procedures taken to prevent exposure on site; *or*

2. Documents that the pollutants for which the waterbody is impaired are not present at the site, and retains documentation of this finding within the SWPPP; *or*

3. Provides Ecology with data indicating the discharge is not expected to cause or contribute to an exceedance of a water quality standard, and retains such data on site with the SWPPP. The operator must provide data and other technical information to Ecology that sufficiently demonstrate:

    a. For discharges to waters without an EPA-approved or -established TMDL, that the discharge of the pollutant for which the water is impaired will meet in-stream water quality criteria at the point of discharge to the waterbody; *or*

    b. For discharges to waters with an EPA-approved or -established TMDL, that there is sufficient remaining wasteload allocation in the TMDL to allow construction stormwater discharge and that existing dischargers to the waterbody are subject to compliance schedules designed to bring the waterbody into attainment with water quality standards.

    Operators of construction sites are eligible for coverage under this permit only after Ecology makes an affirmative determination that the *discharge will not cause or contribute to the existing impairment or exceed the TMDL.*

C. Sampling and Numeric Effluent Limits for Discharges to Water Bodies on the 303(d) List for Turbidity, Fine Sediment, or Phosphorus

1. Permittees who discharge to segments of water bodies on the 303(d) list (Category 5) for turbidity, fine sediment, or phosphorus must conduct turbidity sampling in accordance with Special Condition S4.C.2 and comply with either of the numeric effluent limits noted in Table 5 below.

2. As an alternative to the 25 NTUs effluent limit noted in Table 5 below (applied at the point where stormwater [or authorized non-stormwater] is discharged off-site), Permittees may choose to comply with the surface water quality standard for turbidity. The standard is: no more than 5 NTUs over background turbidity when the background turbidity is 50 NTUs or less, or no more than a 10% increase in turbidity when the background turbidity is more than 50 NTUs. In order to use the water quality standard requirement, the sampling must take place at the following locations:

    a. Background turbidity in the 303(d)-listed receiving water immediately upstream (upgradient) or outside the area of influence of the discharge.

    b. Turbidity at the point of discharge into the 303(d)-listed receiving water, inside the area of influence of the discharge**.**

3. Discharges that exceed the numeric effluent limit for turbidity constitute a violation of this permit.

4. Permittees whose discharges exceed the numeric effluent limit must sample discharges daily until the violation is corrected and comply with the non-compliance notification requirements in Special Condition S5.F.

Table 5 Turbidity, Fine Sediment & Phosphorus Sampling and Limits for 303(d)-Listed Waters

Parameter identified in 303(d) listing	Parameter Sampled	Unit	Analytical Method	Sampling Frequency	Numeric Effluent Limit[1]
• Turbidity • Fine Sediment • Phosphorus	Turbidity	NTU	SM2130	Weekly, if discharging	25 NTUs, at the point where stormwater is discharged from the site; ***OR*** In compliance with the surface water quality standard for turbidity (S8.C.2.a)

[1] Permittees subject to a numeric effluent limit for turbidity may, at their discretion, choose either numeric effluent limitation based on site-specific considerations including, but not limited to, safety, access and convenience.

D. Discharges to Water Bodies on the 303(d) List for High pH

1. Permittees who discharge to segments of water bodies on the 303(d) list (Category 5) for high pH must conduct pH sampling in accordance with the table below, and comply with the numeric effluent limit of pH 6.5 to 8.5 su (Table 6).

Table 6 pH Sampling and Limits for 303(d)-Listed Waters

Parameter identified in 303(d) listing	Parameter Sampled/Units	Analytical Method	Sampling Frequency	Numeric Effluent Limit
High pH	pH /Standard Units	pH meter	Weekly, if discharging	In the range of 6.5 – 8.5 su

2. At the Permittee's discretion, compliance with the limit shall be assessed at one of the following locations:

   a. Directly in the 303(d)-listed waterbody segment, inside the immediate area of influence of the discharge; *or*

   b. Alternatively, the Permittee may measure pH at the point where the discharge leaves the construction site, rather than in the receiving water.

3. Discharges that exceed the numeric effluent limit for pH (outside the range of 6.5 – 8.5 su) constitute a violation of this permit.

4. Permittees whose discharges exceed the numeric effluent limit must sample discharges daily until the violation is corrected and comply with the non-compliance notification requirements in Special Condition S5.F.

E. Sampling and Limits for Sites Discharging to Waters Covered by a TMDL or another Pollution Control Plan

1. Discharges to a waterbody that is subject to a Total Maximum Daily Load (TMDL) for turbidity, fine sediment, high pH, or phosphorus must be consistent with the TMDL. Refer to http://www.ecy.wa.gov/programs/wq/tmdl/TMDLsbyWria/TMDLbyWria.html for more information on TMDLs.

    a. Where an applicable TMDL sets specific waste load allocations or requirements for discharges covered by this permit, discharges must be consistent with any specific waste load allocations or requirements established by the applicable TMDL.

        i. The Permittee must sample discharges weekly, unless otherwise specified by the TMDL, to evaluate compliance with the specific waste load allocations or requirements.

        ii. Analytical methods used to meet the monitoring requirements must conform to the latest revision of the *Guidelines Establishing Test Procedures for the Analysis of Pollutants* contained in 40 CFR Part 136.

        iii. Turbidity and pH methods need not be accredited or registered unless conducted at a laboratory which must otherwise be accredited or registered.

    b. Where an applicable TMDL has established a general waste load allocation for construction stormwater discharges, but has not identified specific requirements, compliance with Special Conditions S4 (Monitoring) and S9 (SWPPPs) will constitute compliance with the approved TMDL.

    c. Where an applicable TMDL has not specified a waste load allocation for construction stormwater discharges, but has not excluded these discharges, compliance with Special Conditions S4 (Monitoring) and S9 (SWPPPs) will constitute compliance with the approved TMDL.

    d. Where an applicable TMDL specifically precludes or prohibits discharges from construction activity, the operator is not eligible for coverage under this permit.

S9. STORMWATER POLLUTION PREVENTION PLAN

The Permittee must prepare and properly implement an adequate Stormwater Pollution Prevention Plan (SWPPP) for construction activity in accordance with the requirements of this permit beginning with initial soil disturbance and until final stabilization.

A. The Permittee's SWPPP must meet the following objectives:

1. To identify best management practices (BMPs) which prevent erosion and sedimentation, and to reduce, eliminate or prevent stormwater contamination and water pollution from construction activity.

2. To prevent violations of surface water quality, groundwater quality, or sediment management standards.

3. To control peak volumetric flow rates and velocities of stormwater discharges.

B. General Requirements

1. The SWPPP must include a narrative and drawings. All BMPs must be clearly referenced in the narrative and marked on the drawings. The SWPPP narrative must include documentation to explain and justify the pollution prevention decisions made for the project. Documentation must include:

    a. Information about existing site conditions (topography, drainage, soils, vegetation, etc.).

    b. Potential erosion problem areas.

    c. The 13 elements of a SWPPP in Special Condition S9.D.1-13, including BMPs used to address each element.

    d. Construction phasing/sequence and general BMP implementation schedule.

    e. The actions to be taken if BMP performance goals are not achieved—for example, a contingency plan for additional treatment and/or storage of stormwater that would violate the water quality standards if discharged.

    f. Engineering calculations for ponds, treatment systems, and any other designed structures. When a treatment system requires engineering calculations, these calculations must be included in the SWPPP. Engineering calculations do not need to be included in the SWPPP for treatment systems that do not require such calculations.

2. The Permittee must modify the SWPPP if, during inspections or investigations conducted by the owner/operator, or the applicable local or state regulatory authority, it is determined that the SWPPP is, or would be, ineffective in eliminating or significantly minimizing pollutants in stormwater discharges from the site. The Permittee must then:

    a. Review the SWPPP for compliance with Special Condition S9 and make appropriate revisions within 7 days of the inspection or investigation.

    b. Immediately begin the process to fully implement and maintain appropriate source control and/or treatment BMPs as soon as possible, addressing the problems no later than 10 days from the inspection or investigation. If installation of necessary treatment BMPs is not feasible within 10 days, Ecology may approve additional time when an extension is requested by a Permittee within the initial 10-day response period.

    c. Document BMP implementation and maintenance in the site log book.

    The Permittee must modify the SWPPP whenever there is a change in design, construction, operation, or maintenance at the construction site that has, or could have, a significant effect on the discharge of pollutants to waters of the State.

C. Stormwater Best Management Practices (BMPs)

BMPs must be consistent with:

1. *Stormwater Management Manual for Western Washington* (most current approved edition at the time this permit was issued), for sites west of the crest of the Cascade Mountains; *or*

2. *Stormwater Management Manual for Eastern Washington* (most current approved edition at the time this permit was issued), for sites east of the crest of the Cascade Mountains; *or*

3. Revisions to the manuals listed in Special Condition S9.C.1 & 2, or other stormwater management guidance documents or manuals which provide an equivalent level of pollution prevention, that are approved by Ecology and incorporated into this permit in accordance with the permit modification requirements of WAC 173-226-230; *or*

4. Documentation in the SWPPP that the BMPs selected provide an equivalent level of pollution prevention, compared to the applicable stormwater management manuals, including:

    a. The technical basis for the selection of all stormwater BMPs (scientific, technical studies, and/or modeling) that support the performance claims for the BMPs being selected.

    b. An assessment of how the selected BMP will satisfy AKART requirements and the applicable federal technology-based treatment requirements under 40 CFR part 125.3.

D. SWPPP – Narrative Contents and Requirements

The Permittee must include each of the 13 elements below in Special Condition S9.D.1-13 in the narrative of the SWPPP and implement them unless site conditions render the element unnecessary and the exemption from that element is clearly justified in the SWPPP.

1. Preserve Vegetation/Mark Clearing Limits

    a. Before beginning land-disturbing activities, including clearing and grading, clearly mark all clearing limits, sensitive areas and their buffers, and trees that are to be preserved within the construction area.

    b. Retain the duff layer, native topsoil, and natural vegetation in an undisturbed state to the maximum degree practicable.

2. Establish Construction Access

    a. Limit construction vehicle access and exit to one route, if possible.

    b. Stabilize access points with a pad of quarry spalls, crushed rock, or other equivalent BMPs, to minimize tracking sediment onto roads.

    c. Locate wheel wash or tire baths on site, if the stabilized construction entrance is not effective in preventing tracking sediment onto roads.

    d. If sediment is tracked off site, clean the affected roadway thoroughly at the end of each day, or more frequently as necessary (for example, during wet weather). Remove sediment from roads by shoveling, sweeping, or pickup and transport of the sediment to a controlled sediment disposal area.

    e. Conduct street washing only after sediment removal in accordance with Special Condition S9.D.2.d.

    f. Control street wash wastewater by pumping back on site or otherwise preventing it from discharging into systems tributary to waters of the State.

3. Control Flow Rates

    a. Protect properties and waterways downstream of construction sites from erosion and the associated discharge of turbid waters due to increases in the velocity and peak volumetric flow rate of stormwater runoff from the project site, as required by local plan approval authority.

    b. Where necessary to comply with Special Condition S9.D.3.a, construct stormwater infiltration or detention BMPs as one of the first steps in grading. Assure that detention BMPs function properly before constructing site improvements (for example, impervious surfaces).

    c. If permanent infiltration ponds are used for flow control during construction, protect these facilities from sedimentation during the construction phase.

4. Install Sediment Controls

    The Permittee must design, install and maintain effective erosion controls and sediment controls to minimize the discharge of pollutants. At a minimum, the Permittee must:

    a. Construct sediment control BMPs (sediment ponds, traps, filters, infiltration facilities, etc.) as one of the first steps in grading. These BMPs must be functional before other land disturbing activities take place.

    b. Minimize sediment discharges from the site. The design, installation and maintenance of erosion and sediment controls must address factors such as the amount, frequency, intensity and duration of precipitation, the nature of resulting stormwater runoff, and soil characteristics, including the range of soil particle sizes expected to be present on the site.

    c. Direct stormwater runoff from disturbed areas through a sediment pond or other appropriate sediment removal BMP, before the runoff leaves a construction site or before discharge to an infiltration facility. Runoff from fully stabilized areas may be discharged without a sediment removal BMP, but must meet the flow control performance standard of Special Condition S9.D.3.a.

    d. Locate BMPs intended to trap sediment on site in a manner to avoid interference with the movement of juvenile salmonids attempting to enter off-channel areas or drainages.

    e. Provide and maintain natural buffers around surface waters, direct stormwater to vegetated areas to increase sediment removal and maximize stormwater infiltration, unless infeasible.

    f. Where feasible, design outlet structures that withdraw impounded stormwater from the surface to avoid discharging sediment that is still suspended lower in the water column.

5. Stabilize Soils

    a. The Permittee must stabilize exposed and unworked soils by application of effective BMPs that prevent erosion. Applicable BMPs include, but are not limited to: temporary and permanent seeding, sodding, mulching, plastic covering, erosion

control fabrics and matting, soil application of polyacrylamide (PAM), the early application of gravel base on areas to be paved, and dust control.

b. The Permittee must control stormwater volume and velocity within the site to minimize soil erosion.

c. The Permittee must control stormwater discharges, including both peak flow rates and total stormwater volume, to minimize erosion at outlets and to minimize downstream channel and stream bank erosion.

d. Depending on the geographic location of the project, the Permittee must not allow soils to remain exposed and unworked for more than the time periods set forth below to prevent erosion.

West of the Cascade Mountains Crest
During the dry season (May 1 - September 30): 7 days
During the wet season (October 1 - April 30): 2 days

East of the Cascade Mountains Crest, except for Central Basin*
During the dry season (July 1 - September 30): 10 days
During the wet season (October 1 - June 30): 5 days

The Central Basin*, East of the Cascade Mountains Crest
During the dry Season (July 1 - September 30): 30 days
During the wet season (October 1 - June 30): 15 days

***Note: The Central Basin** is defined as the portions of Eastern Washington with mean annual precipitation of less than 12 inches.

e. The Permittee must stabilize soils at the end of the shift before a holiday or weekend if needed based on the weather forecast.

f. The Permittee must stabilize soil stockpiles from erosion, protected with sediment trapping measures, and where possible, be located away from storm drain inlets, waterways, and drainage channels.

g. The Permittee must minimize the amount of soil exposed during construction activity.

h. The Permittee must minimize the disturbance of steep slopes.

i. The Permittee must minimize soil compaction and, unless infeasible, preserve topsoil.

6. Protect Slopes

a. The Permittee must design and construct cut-and-fill slopes in a manner to minimize erosion. Applicable practices include, but are not limited to, reducing continuous length of slope with terracing and diversions, reducing slope steepness, and roughening slope surfaces (for example, track walking).

b. The Permittee must divert off-site stormwater (run-on) or groundwater away from slopes and disturbed areas with interceptor dikes, pipes, and/or swales. Off-site stormwater should be managed separately from stormwater generated on the site.

c. At the top of slopes, collect drainage in pipe slope drains or protected channels to prevent erosion.

i. West of the Cascade Mountains Crest: Temporary pipe slope drains must handle the peak 10-minute flow rate from a Type 1A, 10-year, 24-hour frequency storm for the developed condition. Alternatively, the 10-year, 1-hour flow rate predicted by an approved continuous runoff model, increased by a factor of 1.6, may be used. The hydrologic analysis must use the existing land cover condition for predicting flow rates from tributary areas outside the project limits. For tributary areas on the project site, the analysis must use the temporary or permanent project land cover condition, whichever will produce the highest flow rates. If using the Western Washington Hydrology Model (WWHM) to predict flows, bare soil areas should be modeled as "landscaped area."

ii. East of the Cascade Mountains Crest: Temporary pipe slope drains must handle the expected peak flow rate from a 6-month, 3-hour storm for the developed condition, referred to as the short duration storm.

d. Place excavated material on the uphill side of trenches, consistent with safety and space considerations.

e. Place check dams at regular intervals within constructed channels that are cut down a slope.

7. Protect Drain Inlets

a. Protect all storm drain inlets made operable during construction so that stormwater runoff does not enter the conveyance system without first being filtered or treated to remove sediment.

b. Clean or remove and replace inlet protection devices when sediment has filled one-third of the available storage (unless a different standard is specified by the product manufacturer).

8. Stabilize Channels and Outlets

a. Design, construct and stabilize all on-site conveyance channels to prevent erosion from the following expected peak flows:

i. West of the Cascade Mountains Crest: Channels must handle the peak 10-minute flow rate from a Type 1A, 10-year, 24-hour frequency storm for the developed condition. Alternatively, the 10-year, 1-hour flow rate indicated by an approved continuous runoff model, increased by a factor of 1.6, may be used. The hydrologic analysis must use the existing land cover condition for predicting flow rates from tributary areas outside the project limits. For tributary areas on the project site, the analysis must use the temporary or permanent project land cover condition, whichever will produce the highest flow rates. If using the WWHM to predict flows, bare soil areas should be modeled as "landscaped area."

ii. East of the Cascade Mountains Crest: Channels must handle the expected peak flow rate from a 6-month, 3-hour storm for the developed condition, referred to as the short duration storm.

b. Provide stabilization, including armoring material, adequate to prevent erosion of outlets, adjacent stream banks, slopes, and downstream reaches at the outlets of all conveyance systems.

9. Control Pollutants

Design, install, implement and maintain effective pollution prevention measures to minimize the discharge of pollutants. The Permittee must:

a. Handle and dispose of all pollutants, including waste materials and demolition debris that occur on site in a manner that does not cause contamination of stormwater.

b. Provide cover, containment, and protection from vandalism for all chemicals, liquid products, petroleum products, and other materials that have the potential to pose a threat to human health or the environment. Minimize storage of hazardous materials on-site. Safety Data Sheets (SDS) should be supplied for all materials stored. Chemicals should be kept in their original labeled containers. On-site fueling tanks must include secondary containment. Secondary containment means placing tanks or containers within an impervious structure capable of containing 110% of the volume of the largest tank within the containment structure. Double-walled tanks do not require additional secondary containment.

c. Conduct maintenance, fueling, and repair of heavy equipment and vehicles using spill prevention and control measures. Clean contaminated surfaces immediately following any spill incident.

d. Discharge wheel wash or tire bath wastewater to a separate on-site treatment system that prevents discharge to surface water, such as closed-loop recirculation or upland land application, or to the sanitary sewer with local sewer district approval.

e. Apply fertilizers and pesticides in a manner and at application rates that will not result in loss of chemical to stormwater runoff. Follow manufacturers' label requirements for application rates and procedures.

f. Use BMPs to prevent contamination of stormwater runoff by pH-modifying sources. The sources for this contamination include, but are not limited to: bulk cement, cement kiln dust, fly ash, new concrete washing and curing waters, recycled concrete stockpiles, waste streams generated from concrete grinding and sawing, exposed aggregate processes, dewatering concrete vaults, concrete pumping and mixer washout waters. (Also refer to the definition for "concrete wastewater" in Appendix A – Definitions.)

g. Adjust the pH of stormwater or authorized non-stormwater if necessary to prevent an exceedance of groundwater and/or surface water quality standards.

h. Assure that washout of concrete trucks is performed off-site or in designated concrete washout areas only. Do not wash out concrete truck drums onto the ground, or into storm drains, open ditches, streets, or streams. Washout of small concrete handling equipment may be disposed of in a formed area awaiting concrete where it will not contaminate surface or groundwater. Do not dump excess concrete on site, except in designated concrete washout areas. Concrete spillage or concrete discharge directly to groundwater or surface waters of the State is

prohibited. At no time shall concrete be washed off into the footprint of an area where an infiltration BMP will be installed.

i. Obtain written approval from Ecology before using any chemical treatment, with the exception of CO_2, dry ice or food grade vinegar, to adjust pH.

j. Uncontaminated water from water-only based shaft drilling for construction of building, road, and bridge foundations may be infiltrated provided the wastewater is managed in a way that prohibits discharge to surface waters. Prior to infiltration, water from water-only based shaft drilling that comes into contact with curing concrete must be neutralized until pH is in the range of 6.5 to 8.5 (su).

10. Control Dewatering

a. Permittees must discharge foundation, vault, and trench dewatering water, which have characteristics similar to stormwater runoff at the site, in conjunction with BMPs to reduce sedimentation before discharge to a sediment trap or sediment pond.

b. Permittees may discharge clean, non-turbid dewatering water, such as well-point groundwater, to systems tributary to, or directly into surface waters of the State, as specified in Special Condition S9.D.8, provided the dewatering flow does not cause erosion or flooding of receiving waters. Do not route clean dewatering water through stormwater sediment ponds. Note that "surface waters of the State" may exist on a construction site as well as off site; for example, a creek running through a site.

c. Other dewatering treatment or disposal options may include:

i. Infiltration

ii. Transport off site in a vehicle, such as a vacuum flush truck, for legal disposal in a manner that does not pollute state waters.

iii. Ecology-approved on-site chemical treatment or other suitable treatment technologies (See S9.D.9.i, regarding chemical treatment written approval).

iv. Sanitary or combined sewer discharge with local sewer district approval, if there is no other option.

v. Use of a sedimentation bag with discharge to a ditch or swale for small volumes of localized dewatering.

d. Permittees must handle highly turbid or contaminated dewatering water separately from stormwater.

11. Maintain BMPs

a. Permittees must maintain and repair all temporary and permanent erosion and sediment control BMPs as needed to assure continued performance of their intended function in accordance with BMP specifications.

b. Permittees must remove all temporary erosion and sediment control BMPs within 30 days after achieving final site stabilization or after the temporary BMPs are no longer needed.

12. Manage the Project

    a. Phase development projects to the maximum degree practicable and take into account seasonal work limitations.

    b. Inspect, maintain and repair all BMPs as needed to assure continued performance of their intended function. Conduct site inspections and monitoring in accordance with Special Condition S4.

    c. Maintain, update, and implement the SWPPP in accordance with Special Conditions S3, S4, and S9.

13. Protect Low Impact Development (LID) BMPs

    The primary purpose of on-site LID Stormwater Management is to reduce the disruption of the natural site hydrology through infiltration. LID BMPs are permanent facilities.

    a. Permittees must protect all LID BMPs (including, but not limited to, Bioretention and Rain Garden facilities) from sedimentation through installation and maintenance of erosion and sediment control BMPs on portions of the site that drain into the Bioretention and/or Rain Garden facilities. Restore the BMPs to their fully functioning condition if they accumulate sediment during construction. Restoring the facility must include removal of sediment and any sediment-laden bioretention/ rain garden soils, and replacing the removed soils with soils meeting the design specification.

    b. Permittees must maintain the infiltration capabilities of LID BMPs by protecting against compaction by construction equipment and foot traffic. Protect completed lawn and landscaped areas from compaction due to construction equipment.

    c. Permittees must control erosion and avoid introducing sediment from surrounding land uses onto permeable pavements. Do not allow muddy construction equipment on the base material or pavement. Do not allow sediment-laden runoff onto permeable pavements or base materials.

    d. Permittees must clean permeable pavements fouled with sediments or no longer passing an initial infiltration test using local stormwater manual methodology or the manufacturer's procedures.

    e. Permittees must keep all heavy equipment off existing soils under LID BMPs that have been excavated to final grade to retain the infiltration rate of the soils.

E. SWPPP – Map Contents and Requirements

The Permittee's SWPPP must also include a vicinity map or general location map (for example, a USGS quadrangle map, a portion of a county or city map, or other appropriate map) with enough detail to identify the location of the construction site and receiving waters within one mile of the site.

The SWPPP must also include a legible site map (or maps) showing the entire construction site. The following features must be identified, unless not applicable due to site conditions.

1. The direction of north, property lines, and existing structures and roads.

2. Cut and fill slopes indicating the top and bottom of slope catch lines.

3. Approximate slopes, contours, and direction of stormwater flow before and after major grading activities.

4. Areas of soil disturbance and areas that will not be disturbed.

5. Locations of structural and nonstructural controls (BMPs) identified in the SWPPP.

6. Locations of off-site material, stockpiles, waste storage, borrow areas, and vehicle/equipment storage areas.

7. Locations of all surface water bodies, including wetlands.

8. Locations where stormwater or non-stormwater discharges off-site and/or to a surface waterbody, including wetlands.

9. Location of water quality sampling station(s), if sampling is required by state or local permitting authority.

10. Areas where final stabilization has been accomplished and no further construction-phase permit requirements apply.

11. Location or proposed location of LID facilities.

S10. NOTICE OF TERMINATION

Partial terminations of permit coverage are not authorized.

A. The site is eligible for termination of coverage when it has met any of the following conditions:

1. The site has undergone final stabilization, the Permittee has removed all temporary BMPs (except biodegradable BMPs clearly manufactured with the intention for the material to be left in place and not interfere with maintenance or land use), and all stormwater discharges associated with construction activity have been eliminated; *or*

2. All portions of the site that have not undergone final stabilization per Special Condition S10.A.1 have been sold and/or transferred (per Special Condition S2.A), and the Permittee no longer has operational control of the construction activity; *or*

3. For residential construction only, the Permittee has completed temporary stabilization and the homeowners have taken possession of the residences.

B. When the site is eligible for termination, the Permittee must submit a complete and accurate Notice of Termination (NOT) form, signed in accordance with General Condition G2, to:

Department of Ecology
Water Quality Program - Construction Stormwater
PO Box 47696
Olympia, WA 98504-7696

When an electronic termination form is available, the Permittee may choose to submit a complete and accurate Notice of Termination (NOT) form through the Water Quality Permitting Portal rather than mailing a hardcopy as noted above.

The termination is effective on the 31st calendar day following the date Ecology receives a complete NOT form, unless Ecology notifies the Permittee that termination request is denied because the Permittee has not met the eligibility requirements in Special Condition S10.A.

Permittees are required to comply with all conditions and effluent limitations in the permit until the permit has been terminated.

Permittees transferring the property to a new property owner or operator/Permittee are required to complete and submit the Notice of Transfer form to Ecology, but are not required to submit a Notice of Termination form for this type of transaction.

GENERAL CONDITIONS

G1. DISCHARGE VIOLATIONS

All discharges and activities authorized by this general permit must be consistent with the terms and conditions of this general permit. Any discharge of any pollutant more frequent than or at a level in excess of that identified and authorized by the general permit must constitute a violation of the terms and conditions of this permit.

G2. SIGNATORY REQUIREMENTS

A. All permit applications must bear a certification of correctness to be signed:

1. In the case of corporations, by a responsible corporate officer.
2. In the case of a partnership, by a general partner of a partnership.
3. In the case of sole proprietorship, by the proprietor.
4. In the case of a municipal, state, or other public facility, by either a principal executive officer or ranking elected official.

B. All reports required by this permit and other information requested by Ecology (including NOIs, NOTs, and Transfer of Coverage forms) must be signed by a person described above or by a duly authorized representative of that person. A person is a duly authorized representative only if:

1. The authorization is made in writing by a person described above and submitted to Ecology.
2. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility, such as the position of plant manager, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters.

C. Changes to authorization. If an authorization under paragraph G2.B.2 above is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of paragraph G2.B.2 above must be submitted to Ecology prior to or together with any reports, information, or applications to be signed by an authorized representative.

D. Certification. Any person signing a document under this section must make the following certification:

I certify under penalty of law, that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

G3. RIGHT OF INSPECTION AND ENTRY

The Permittee must allow an authorized representative of Ecology, upon the presentation of credentials and such other documents as may be required by law:

A. To enter upon the premises where a discharge is located or where any records are kept under the terms and conditions of this permit.

B. To have access to and copy, at reasonable times and at reasonable cost, any records required to be kept under the terms and conditions of this permit.

C. To inspect, at reasonable times, any facilities, equipment (including monitoring and control equipment), practices, methods, or operations regulated or required under this permit.

D. To sample or monitor, at reasonable times, any substances or parameters at any location for purposes of assuring permit compliance or as otherwise authorized by the Clean Water Act.

G4. GENERAL PERMIT MODIFICATION AND REVOCATION

This permit may be modified, revoked and reissued, or terminated in accordance with the provisions of Chapter 173-226 WAC. Grounds for modification, revocation and reissuance, or termination include, but are not limited to, the following:

A. When a change occurs in the technology or practices for control or abatement of pollutants applicable to the category of dischargers covered under this permit.

B. When effluent limitation guidelines or standards are promulgated pursuant to the CWA or Chapter 90.48 RCW, for the category of dischargers covered under this permit.

C. When a water quality management plan containing requirements applicable to the category of dischargers covered under this permit is approved, or

D. When information is obtained that indicates cumulative effects on the environment from dischargers covered under this permit are unacceptable.

G5. REVOCATION OF COVERAGE UNDER THE PERMIT

Pursuant to Chapter 43.21B RCW and Chapter 173-226 WAC, the Director may terminate coverage for any discharger under this permit for cause. Cases where coverage may be terminated include, but are not limited to, the following:

A. Violation of any term or condition of this permit.

B. Obtaining coverage under this permit by misrepresentation or failure to disclose fully all relevant facts.

C. A change in any condition that requires either a temporary or permanent reduction or elimination of the permitted discharge.

D. Failure or refusal of the Permittee to allow entry as required in RCW 90.48.090.

E. A determination that the permitted activity endangers human health or the environment, or contributes to water quality standards violations.

F. Nonpayment of permit fees or penalties assessed pursuant to RCW 90.48.465 and Chapter 173-224 WAC.

G. Failure of the Permittee to satisfy the public notice requirements of WAC 173-226-130(5), when applicable.

The Director may require any discharger under this permit to apply for and obtain coverage under an individual permit or another more specific general permit. Permittees who have their coverage revoked for cause according to WAC 173-226-240 may request temporary coverage under this permit during the time an individual permit is being developed, provided the request is made within ninety (90) days from the time of revocation and is submitted along with a complete individual permit application form.

G6. REPORTING A CAUSE FOR MODIFICATION

The Permittee must submit a new application, or a supplement to the previous application, whenever a material change to the construction activity or in the quantity or type of discharge is anticipated which is not specifically authorized by this permit. This application must be submitted at least sixty (60) days prior to any proposed changes. Filing a request for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not relieve the Permittee of the duty to comply with the existing permit until it is modified or reissued.

G7. COMPLIANCE WITH OTHER LAWS AND STATUTES

Nothing in this permit will be construed as excusing the Permittee from compliance with any applicable federal, state, or local statutes, ordinances, or regulations.

G8. DUTY TO REAPPLY

The Permittee must apply for permit renewal at least 180 days prior to the specified expiration date of this permit. The Permittee must reapply using the electronic application form (NOI) available on Ecology's website. Permittees unable to submit electronically (for example, those who do not have an internet connection) must contact Ecology to request a waiver and obtain instructions on how to obtain a paper NOI.

Department of Ecology
Water Quality Program - Construction Stormwater
PO Box 47696
Olympia, WA 98504-7696

G9. REMOVED SUBSTANCE

The Permittee must not re-suspend or reintroduce collected screenings, grit, solids, sludges, filter backwash, or other pollutants removed in the course of treatment or control of stormwater to the final effluent stream for discharge to state waters.

G10. DUTY TO PROVIDE INFORMATION

The Permittee must submit to Ecology, within a reasonable time, all information that Ecology may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The Permittee must also submit to Ecology, upon request, copies of records required to be kept by this permit [40 CFR 122.41(h)].

G11. OTHER REQUIREMENTS OF 40 CFR

All other requirements of 40 CFR 122.41 and 122.42 are incorporated in this permit by reference.

G12. ADDITIONAL MONITORING

Ecology may establish specific monitoring requirements in addition to those contained in this permit by administrative order or permit modification.

G13. PENALTIES FOR VIOLATING PERMIT CONDITIONS

Any person who is found guilty of willfully violating the terms and conditions of this permit shall be deemed guilty of a crime, and upon conviction thereof shall be punished by a fine of up to ten thousand dollars ($10,000) and costs of prosecution, or by imprisonment at the discretion of the court. Each day upon which a willful violation occurs may be deemed a separate and additional violation.

Any person who violates the terms and conditions of a waste discharge permit shall incur, in addition to any other penalty as provided by law, a civil penalty in the amount of up to ten thousand dollars ($10,000) for every such violation. Each and every such violation shall be a separate and distinct offense, and in case of a continuing violation, every day's continuance shall be deemed to be a separate and distinct violation.

G14. UPSET

Definition – "Upset" means an exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the Permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

An upset constitutes an affirmative defense to an action brought for noncompliance with such technology-based permit effluent limitations if the requirements of the following paragraph are met.

A Permittee who wishes to establish the affirmative defense of upset must demonstrate, through properly signed, contemporaneous operating logs or other relevant evidence that: 1) an upset occurred and that the Permittee can identify the cause(s) of the upset; 2) the permitted facility was being properly operated at the time of the upset; 3) the Permittee submitted notice of the upset as required in Special Condition S5.F, and; 4) the Permittee complied with any remedial measures required under this permit.

In any enforcement proceeding, the Permittee seeking to establish the occurrence of an upset has the burden of proof.

G15. PROPERTY RIGHTS

This permit does not convey any property rights of any sort, or any exclusive privilege.

G16. DUTY TO COMPLY

The Permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application.

G17. TOXIC POLLUTANTS

The Permittee must comply with effluent standards or prohibitions established under Section 307(a) of the Clean Water Act for toxic pollutants within the time provided in the regulations that establish those standards or prohibitions, even if this permit has not yet been modified to incorporate the requirement.

G18. PENALTIES FOR TAMPERING

The Clean Water Act provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than two years per violation, or by both. If a conviction of a person is for a violation committed after a first conviction of such person under this condition, punishment shall be a fine of not more than $20,000 per day of violation, or imprisonment of not more than four (4) years, or both.

G19. REPORTING PLANNED CHANGES

The Permittee must, as soon as possible, give notice to Ecology of planned physical alterations, modifications or additions to the permitted construction activity. The Permittee should be aware that, depending on the nature and size of the changes to the original permit, a new public notice and other permit process requirements may be required. Changes in activities that require reporting to Ecology include those that will result in:

A. The permitted facility being determined to be a new source pursuant to 40 CFR 122.29(b).

B. A significant change in the nature or an increase in quantity of pollutants discharged, including but not limited to: a 20% or greater increase in acreage disturbed by construction activity.

C. A change in or addition of surface water(s) receiving stormwater or non-stormwater from the construction activity.

D. A change in the construction plans and/or activity that affects the Permittee's monitoring requirements in Special Condition S4.

Following such notice, permit coverage may be modified, or revoked and reissued pursuant to 40 CFR 122.62(a) to specify and limit any pollutants not previously limited. Until such modification is effective, any new or increased discharge in excess of permit limits or not specifically authorized by this permit constitutes a violation.

G20. REPORTING OTHER INFORMATION

Where the Permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to Ecology, it must promptly submit such facts or information.

G21. REPORTING ANTICIPATED NON-COMPLIANCE

The Permittee must give advance notice to Ecology by submission of a new application or supplement thereto at least forty-five (45) days prior to commencement of such discharges, of any facility expansions, production increases, or other planned changes, such as process modifications, in the permitted facility or activity which may result in noncompliance with permit limits or conditions. Any maintenance of facilities, which might necessitate unavoidable interruption of

operation and degradation of effluent quality, must be scheduled during non-critical water quality periods and carried out in a manner approved by Ecology.

G22. REQUESTS TO BE EXCLUDED FROM COVERAGE UNDER THE PERMIT

Any discharger authorized by this permit may request to be excluded from coverage under the general permit by applying for an individual permit. The discharger must submit to the Director an application as described in WAC 173-220-040 or WAC 173-216-070, whichever is applicable, with reasons supporting the request. These reasons will fully document how an individual permit will apply to the applicant in a way that the general permit cannot. Ecology may make specific requests for information to support the request. The Director will either issue an individual permit or deny the request with a statement explaining the reason for the denial. When an individual permit is issued to a discharger otherwise subject to the construction stormwater general permit, the applicability of the construction stormwater general permit to that Permittee is automatically terminated on the effective date of the individual permit.

G23. APPEALS

A. The terms and conditions of this general permit, as they apply to the appropriate class of dischargers, are subject to appeal by any person within 30 days of issuance of this general permit, in accordance with Chapter 43.21B RCW, and Chapter 173-226 WAC.

B. The terms and conditions of this general permit, as they apply to an individual discharger, are appealable in accordance with Chapter 43.21B RCW within 30 days of the effective date of coverage of that discharger. Consideration of an appeal of general permit coverage of an individual discharger is limited to the general permit's applicability or nonapplicability to that individual discharger.

C. The appeal of general permit coverage of an individual discharger does not affect any other dischargers covered under this general permit. If the terms and conditions of this general permit are found to be inapplicable to any individual discharger(s), the matter shall be remanded to Ecology for consideration of issuance of an individual permit or permits.

G24. SEVERABILITY

The provisions of this permit are severable, and if any provision of this permit, or application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit shall not be affected thereby.

G25. BYPASS PROHIBITED

A. Bypass Procedures

Bypass, which is the intentional diversion of waste streams from any portion of a treatment facility, is prohibited for stormwater events below the design criteria for stormwater management. Ecology may take enforcement action against a Permittee for bypass unless one of the following circumstances (1, 2, 3 or 4) is applicable.

1. Bypass of stormwater is consistent with the design criteria and part of an approved management practice in the applicable stormwater management manual.

2. Bypass for essential maintenance without the potential to cause violation of permit limits or conditions.

Bypass is authorized if it is for essential maintenance and does not have the potential to cause violations of limitations or other conditions of this permit, or adversely impact public health.

3. Bypass of stormwater is unavoidable, unanticipated, and results in noncompliance of this permit.

   This bypass is permitted only if:

   a. Bypass is unavoidable to prevent loss of life, personal injury, or severe property damage. "Severe property damage" means substantial physical damage to property, damage to the treatment facilities which would cause them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass.

   b. There are no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, maintenance during normal periods of equipment downtime (but not if adequate backup equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventative maintenance), or transport of untreated wastes to another treatment facility.

   c. Ecology is properly notified of the bypass as required in Special Condition S5.F of this permit.

4. A planned action that would cause bypass of stormwater and has the potential to result in noncompliance of this permit during a storm event.

   The Permittee must notify Ecology at least thirty (30) days before the planned date of bypass. The notice must contain:

   a. A description of the bypass and its cause

   b. An analysis of all known alternatives which would eliminate, reduce, or mitigate the need for bypassing.

   c. A cost-effectiveness analysis of alternatives including comparative resource damage assessment.

   d. The minimum and maximum duration of bypass under each alternative.

   e. A recommendation as to the preferred alternative for conducting the bypass.

   f. The projected date of bypass initiation.

   g. A statement of compliance with SEPA.

   h. A request for modification of water quality standards as provided for in WAC 173-201A-110, if an exceedance of any water quality standard is anticipated.

   i. Steps taken or planned to reduce, eliminate, and prevent reoccurrence of the bypass.

5. For probable construction bypasses, the need to bypass is to be identified as early in the planning process as possible. The analysis required above must be considered during

preparation of the Stormwater Pollution Prevention Plan (SWPPP) and must be included to the extent practical. In cases where the probable need to bypass is determined early, continued analysis is necessary up to and including the construction period in an effort to minimize or eliminate the bypass.

Ecology will consider the following before issuing an administrative order for this type bypass:

a. If the bypass is necessary to perform construction or maintenance-related activities essential to meet the requirements of this permit.

b. If there are feasible alternatives to bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, stopping production, maintenance during normal periods of equipment down time, or transport of untreated wastes to another treatment facility.

c. If the bypass is planned and scheduled to minimize adverse effects on the public and the environment.

After consideration of the above and the adverse effects of the proposed bypass and any other relevant factors, Ecology will approve, conditionally approve, or deny the request. The public must be notified and given an opportunity to comment on bypass incidents of significant duration, to the extent feasible. Approval of a request to bypass will be by administrative order issued by Ecology under RCW 90.48.120.

B. Duty to Mitigate

The Permittee is required to take all reasonable steps to minimize or prevent any discharge or sludge use or disposal in violation of this permit that has a reasonable likelihood of adversely affecting human health or the environment.

APPENDIX A – DEFINITIONS

AKART is an acronym for "**A**ll **K**nown, **A**vailable, and **R**easonable methods of prevention, control, and **T**reatment." AKART represents the most current methodology that can be reasonably required for preventing, controlling, or abating the pollutants and controlling pollution associated with a discharge.

Applicable TMDL means a TMDL for turbidity, fine sediment, high pH, or phosphorus, which was completed and approved by EPA before January 1, 2021, or before the date the operator's complete permit application is received by Ecology, whichever is later. TMDLs completed after a complete permit application is received by Ecology become applicable to the Permittee only if they are imposed through an administrative order by Ecology, or through a modification of permit coverage.

Applicant means an *operator* seeking coverage under this permit.

Benchmark means a pollutant concentration used as a permit threshold, below which a pollutant is considered unlikely to cause a water quality violation, and above which it may. When pollutant concentrations exceed benchmarks, corrective action requirements take effect. Benchmark values are not water quality standards and are not numeric effluent limitations; they are indicator values.

Best Management Practices (BMPs) means schedules of activities, prohibitions of practices, maintenance procedures, and other physical, structural and/or managerial practices to prevent or reduce the pollution of waters of the State. BMPs include treatment systems, operating procedures, and practices to control stormwater associated with construction activity, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

Buffer means an area designated by a local jurisdiction that is contiguous to and intended to protect a sensitive area.

Bypass means the intentional diversion of waste streams from any portion of a treatment facility.

Calendar Day A period of 24 consecutive hours starting at 12:00 midnight and ending the following 12:00 midnight.

Calendar Week (same as **Week**) means a period of seven consecutive days starting at 12:01 a.m. (0:01 hours) on Sunday.

Certified Erosion and Sediment Control Lead (CESCL) means a person who has current certification through an approved erosion and sediment control training program that meets the minimum training standards established by Ecology (See BMP C160 in the SWMM).

Chemical Treatment means the addition of chemicals to stormwater and/or authorized non-stormwater prior to filtration and discharge to surface waters.

Clean Water Act (CWA) means the Federal Water Pollution Control Act enacted by Public Law 92-500, as amended by Public Laws 95-217, 95-576, 96-483, and 97-117; USC 1251 et seq.

Combined Sewer means a sewer which has been designed to serve as a sanitary sewer and a storm sewer, and into which inflow is allowed by local ordinance.

Common Plan of Development or Sale means a site where multiple separate and distinct construction activities may be taking place at different times on different schedules and/or by different contractors, but still under a single plan. Examples include: 1) phased projects and projects with multiple filings or lots, even if the separate phases or filings/lots will be constructed under separate contract or by separate owners (e.g., a development where lots are sold to separate builders); 2) a development plan that may be phased over multiple years, but is still under a consistent plan for long-term development; 3) projects in a contiguous area that may be unrelated but still under the same contract, such as construction of a building extension and a new parking lot at the same facility; and 4) linear projects such as roads, pipelines, or utilities. If the project is part of a common plan of development or sale, the disturbed area of the entire plan must be used in determining permit requirements.

Composite Sample means a mixture of grab samples collected at the same sampling point at different times, formed either by continuous sampling or by mixing discrete samples. May be "time-composite" (collected at constant time intervals) or "flow-proportional" (collected either as a constant sample volume at time intervals proportional to stream flow, or collected by increasing the volume of each aliquot as the flow increases while maintaining a constant time interval between the aliquots.

Concrete Wastewater means any water used in the production, pouring and/or clean-up of concrete or concrete products, and any water used to cut, grind, wash, or otherwise modify concrete or concrete products. Examples include water used for or resulting from concrete truck/mixer/pumper/tool/chute rinsing or washing, concrete saw cutting and surfacing (sawing, coring, grinding, roughening, hydro-demolition, bridge and road surfacing). When stormwater comingles with concrete wastewater, the resulting water is considered concrete wastewater and must be managed to prevent discharge to waters of the State, including groundwater.

Construction Activity means land disturbing operations including clearing, grading or excavation which disturbs the surface of the land (including off-site disturbance acreage related to construction-support activity). Such activities may include road construction, construction of residential houses, office buildings, or industrial buildings, site preparation, soil compaction, movement and stockpiling of topsoils, and demolition activity.

Construction Support Activity means off-site acreage that will be disturbed as a direct result of the construction project and will discharge stormwater. For example, off-site equipment staging yards, material storage areas, borrow areas, and parking areas.

Contaminant means any hazardous substance that does not occur naturally or occurs at greater than natural background levels. See definition of “hazardous substance” and WAC 173-340-200.

Contaminated soil means soil which contains contaminants, pollutants, or hazardous substances that do not occur naturally or occur at levels greater than natural background.

Contaminated groundwater means groundwater which contains contaminants, pollutants, or hazardous substances that do not occur naturally or occur at levels greater than natural background.

Demonstrably Equivalent means that the technical basis for the selection of all stormwater BMPs is documented within a SWPPP, including:

1. The method and reasons for choosing the stormwater BMPs selected.
2. The pollutant removal performance expected from the BMPs selected.

3. The technical basis supporting the performance claims for the BMPs selected, including any available data concerning field performance of the BMPs selected.
4. An assessment of how the selected BMPs will comply with state water quality standards.
5. An assessment of how the selected BMPs will satisfy both applicable federal technology-based treatment requirements and state requirements to use all known, available, and reasonable methods of prevention, control, and treatment (AKART).

Department means the Washington State Department of Ecology.

Detention means the temporary storage of stormwater to improve quality and/or to reduce the mass flow rate of discharge.

Dewatering means the act of pumping groundwater or stormwater away from an active construction site.

Director means the Director of the Washington State Department of Ecology or his/her authorized representative.

Discharger means an owner or operator of any facility or activity subject to regulation under Chapter 90.48 RCW or the Federal Clean Water Act.

Domestic Wastewater means water carrying human wastes, including kitchen, bath, and laundry wastes from residences, buildings, industrial establishments, or other places, together with such groundwater infiltration or surface waters as may be present.

Ecology means the Washington State Department of Ecology.

Engineered Soils means the use of soil amendments including, but not limited, to Portland cement treated base (CTB), cement kiln dust (CKD), or fly ash to achieve certain desirable soil characteristics.

Equivalent BMPs means operational, source control, treatment, or innovative BMPs which result in equal or better quality of stormwater discharge to surface water or to groundwater than BMPs selected from the SWMM.

Erosion means the wearing away of the land surface by running water, wind, ice, or other geological agents, including such processes as gravitational creep.

Erosion and Sediment Control BMPs means BMPs intended to prevent erosion and sedimentation, such as preserving natural vegetation, seeding, mulching and matting, plastic covering, filter fences, sediment traps, and ponds. Erosion and sediment control BMPs are synonymous with stabilization and structural BMPs.

Federal Operator is an entity that meets the definition of "Operator" in this permit and is either any department, agency or instrumentality of the executive, legislative, and judicial branches of the Federal government of the United States, or another entity, such as a private contractor, performing construction activity for any such department, agency, or instrumentality.

Final Stabilization (same as **fully stabilized** or **full stabilization**) means the completion of all soil disturbing activities at the site and the establishment of permanent vegetative cover, or equivalent permanent stabilization measures (such as pavement, riprap, gabions, or geotextiles) which will prevent erosion. See the applicable Stormwater Management Manual for more information on vegetative cover expectations and equivalent permanent stabilization measures.

Groundwater means water in a saturated zone or stratum beneath the land surface or a surface waterbody.

Hazardous Substance means any dangerous or extremely hazardous waste as defined in RCW 70.105.010 (5) and (6), or any dangerous or extremely dangerous waste as designated by rule under chapter 70.105 RCW; any hazardous sub-stance as defined in RCW 70.105.010(14) or any hazardous substance as defined by rule under chapter 70.105 RCW; any substance that, on the effective date of this section, is a hazardous substance under section 101(14) of the federal cleanup law, 42U.S.C., Sec. 9601(14); petroleum or petroleum products; and any substance or category of substances, including solid waste decomposition products, determined by the director by rule to present a threat to human health or the environment if released into the environment. The term hazardous substance does not include any of the following when contained in an underground storage tank from which there is not a release: crude oil or any fraction thereof or petroleum, if the tank is in compliance with all applicable federal, state, and local law.

Injection Well means a well that is used for the subsurface emplacement of fluids. (See **Well**.)

Jurisdiction means a political unit such as a city, town or county; incorporated for local self-government.

National Pollutant Discharge Elimination System (NPDES) means the national program for issuing, modifying, revoking and reissuing, terminating, monitoring, and enforcing permits, and imposing and enforcing pretreatment requirements, under sections 307, 402, 318, and 405 of the Federal Clean Water Act, for the discharge of pollutants to surface waters of the State from point sources. These permits are referred to as NPDES permits and, in Washington State, are administered by the Washington State Department of Ecology.

Notice of Intent (NOI) means the application for, or a request for coverage under this general permit pursuant to WAC 173-226-200.

Notice of Termination (NOT) means a request for termination of coverage under this general permit as specified by Special Condition S10 of this permit.

Operator means any party associated with a construction project that meets either of the following two criteria:

- The party has operational control over construction plans and specifications, including the ability to make modifications to those plans and specifications; or
- The party has day-to-day operational control of those activities at a project that are necessary to ensure compliance with a SWPPP for the site or other permit conditions (e.g., they are authorized to direct workers at a site to carry out activities required by the SWPPP or comply with other permit conditions).

Permittee means individual or entity that receives notice of coverage under this general permit.

pH means a liquid's measure of acidity or alkalinity. A pH of 7 is defined as neutral. Large variations above or below this value are considered harmful to most aquatic life.

pH Monitoring Period means the time period in which the pH of stormwater runoff from a site must be tested a minimum of once every seven days to determine if stormwater pH is between 6.5 and 8.5.

Point Source means any discernible, confined, and discrete conveyance, including but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, and container from which pollutants are or may be discharged to surface waters of the State. This term does not include return flows from irrigated agriculture. (See the Fact Sheet for further explanation)

Pollutant means dredged spoil, solid waste, incinerator residue, filter backwash, sewage, garbage, domestic sewage sludge (biosolids), munitions, chemical wastes, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt, and industrial, municipal, and agricultural waste. This term does not include sewage from vessels within the meaning of section 312 of the CWA, nor does it include dredged or fill material discharged in accordance with a permit issued under section 404 of the CWA.

Pollution means contamination or other alteration of the physical, chemical, or biological properties of waters of the State; including change in temperature, taste, color, turbidity, or odor of the waters; or such discharge of any liquid, gaseous, solid, radioactive or other substance into any waters of the State as will or is likely to create a nuisance or render such waters harmful, detrimental or injurious to the public health, safety or welfare; or to domestic, commercial, industrial, agricultural, recreational, or other legitimate beneficial uses; or to livestock, wild animals, birds, fish or other aquatic life.

Process Wastewater means any non-stormwater which, during manufacturing or processing, comes into direct contact with or results from the production or use of any raw material, intermediate product, finished product, byproduct, or waste product. If stormwater commingles with process wastewater, the commingled water is considered process wastewater.

Receiving Water means the waterbody at the point of discharge. If the discharge is to a storm sewer system, either surface or subsurface, the receiving water is the waterbody to which the storm system discharges. Systems designed primarily for other purposes such as for groundwater drainage, redirecting stream natural flows, or for conveyance of irrigation water/return flows that coincidentally convey stormwater are considered the receiving water.

Representative means a stormwater or wastewater sample which represents the flow and characteristics of the discharge. Representative samples may be a grab sample, a time-proportionate *composite sample*, or a flow proportionate sample. Ecology's Construction Stormwater Monitoring Manual provides guidance on representative sampling.

Responsible Corporate Officer for the purpose of signatory authority means: (i) a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy- or decision-making functions for the corporation, or (ii) the manager of one or more manufacturing, production, or operating facilities, provided, the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures (40 CFR 122.22).

Sanitary Sewer means a sewer which is designed to convey domestic wastewater.

Sediment means the fragmented material that originates from the weathering and erosion of rocks or unconsolidated deposits, and is transported by, suspended in, or deposited by water.

Sedimentation means the depositing or formation of sediment.

Sensitive Area means a waterbody, wetland, stream, aquifer recharge area, or channel migration zone.

SEPA (State Environmental Policy Act) means the Washington State Law, RCW 43.21C.020, intended to prevent or eliminate damage to the environment.

Significant Amount means an amount of a pollutant in a discharge that is amenable to available and reasonable methods of prevention or treatment; or an amount of a pollutant that has a reasonable potential to cause a violation of surface or groundwater quality or sediment management standards.

Significant Concrete Work means greater than 1000 cubic yards placed or poured concrete or recycled concrete used over the life of a project.

Significant Contributor of Pollutants means a facility determined by Ecology to be a contributor of a significant amount(s) of a pollutant(s) to waters of the State of Washington.

Site means the land or water area where any "facility or activity" is physically located or conducted.

Source Control BMPs means physical, structural or mechanical devices or facilities that are intended to prevent pollutants from entering stormwater. A few examples of source control BMPs are erosion control practices, maintenance of stormwater facilities, constructing roofs over storage and working areas, and directing wash water and similar discharges to the sanitary sewer or a dead end sump.

Stabilization means the application of appropriate BMPs to prevent the erosion of soils, such as, temporary and permanent seeding, vegetative covers, mulching and matting, plastic covering and sodding. See also the definition of Erosion and Sediment Control BMPs.

Storm Drain means any drain which drains directly into a *storm sewer system*, usually found along roadways or in parking lots.

Storm Sewer System means a means a conveyance, or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, manmade channels, or storm drains designed or used for collecting or conveying stormwater. This does not include systems which are part of *a combined sewer* or Publicly Owned Treatment Works (POTW), as defined at 40 CFR 122.2.

Stormwater means that portion of precipitation that does not naturally percolate into the ground or evaporate, but flows via overland flow, interflow, pipes, and other features of a stormwater drainage system into a defined surface waterbody, or a constructed infiltration facility.

Stormwater Management Manual (SWMM) or **Manual** means the technical Manual published by Ecology for use by local governments that contain descriptions of and design criteria for BMPs to prevent, control, or treat pollutants in stormwater.

Stormwater Pollution Prevention Plan (SWPPP) means a documented plan to implement measures to identify, prevent, and control the contamination of point source discharges of stormwater.

Surface Waters of the State includes lakes, rivers, ponds, streams, inland waters, salt waters, and all other surface waters and water courses within the jurisdiction of the state of Washington.

Temporary Stabilization means the exposed ground surface has been covered with appropriate materials to provide temporary stabilization of the surface from water or wind erosion. Materials include, but are not limited to, mulch, riprap, erosion control mats or blankets and temporary cover crops. Seeding alone is not considered stabilization. Temporary stabilization is not a substitute for the more permanent “final stabilization.”

Total Maximum Daily Load (TMDL) means a calculation of the maximum amount of a pollutant that a waterbody can receive and still meet state water quality standards. Percentages of the total maximum daily load are allocated to the various pollutant sources. A TMDL is the sum of the allowable loads of a single pollutant from all contributing point and nonpoint sources. The TMDL calculations must include a "margin of safety" to ensure that the waterbody can be protected in case there are unforeseen events or unknown sources of the pollutant. The calculation must also account for seasonable variation in water quality.

Transfer of Coverage (TOC) means a request for transfer of coverage under this general permit as specified by Special Condition S2.A of this permit.

Treatment BMPs means BMPs that are intended to remove pollutants from stormwater. A few examples of treatment BMPs are detention ponds, oil/water separators, biofiltration, and constructed wetlands.

Transparency means a measurement of water clarity in centimeters (cm), using a 60 cm transparency tube. The transparency tube is used to estimate the relative clarity or transparency of water by noting the depth at which a black and white Secchi disc becomes visible when water is released from a value in the bottom of the tube. A transparency tube is sometimes referred to as a “turbidity tube.”

Turbidity means the clarity of water expressed as nephelometric turbidity units (NTUs) and measured with a calibrated turbidimeter.

Uncontaminated means free from any contaminant. See definition of “contaminant” and WAC 173-340-200.

Upset means an exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the Permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

Waste Load Allocation (WLA) means the portion of a receiving water’s loading capacity that is allocated to one of its existing or future point sources of pollution. WLAs constitute a type of water quality based effluent limitation (40 CFR 130.2[h]).

Water-Only Based Shaft Drilling is a shaft drilling process that uses water only and no additives are involved in the drilling of shafts for construction of building, road, or bridge foundations.

Water Quality means the chemical, physical, and biological characteristics of water, usually with respect to its suitability for a particular purpose.

Waters of the State includes those waters as defined as "waters of the United States" in 40 CFR Subpart 122.2 within the geographic boundaries of Washington State and "waters of the State" as defined in Chapter 90.48 RCW, which include lakes, rivers, ponds, streams, inland waters, underground waters, salt

waters, and all other surface waters and water courses within the jurisdiction of the state of Washington.

Well means a bored, drilled or driven shaft, or dug hole whose depth is greater than the largest surface dimension. (See **Injection Well**.)

Wheel Wash Wastewater means any water used in, or resulting from the operation of, a tire bath or wheel wash (BMP C106: Wheel Wash), or other structure or practice that uses water to physically remove mud and debris from vehicles leaving a construction site and prevent track-out onto roads. When stormwater comingles with wheel wash wastewater, the resulting water is considered wheel wash wastewater and must be managed according to Special Condition S9.D.9.

APPENDIX B – ACRONYMS

AKART	All Known, Available, and Reasonable Methods of Prevention, Control, and Treatment
BMP	Best Management Practice
CESCL	Certified Erosion and Sediment Control Lead
CFR	Code of Federal Regulations
CKD	Cement Kiln Dust
cm	Centimeters
CPD	Common Plan of Development
CTB	Cement-Treated Base
CWA	Clean Water Act
DMR	Discharge Monitoring Report
EPA	Environmental Protection Agency
ERTS	Environmental Report Tracking System
ESC	Erosion and Sediment Control
FR	Federal Register
LID	Low Impact Development
NOI	Notice of Intent
NOT	Notice of Termination
NPDES	National Pollutant Discharge Elimination System
NTU	Nephelometric Turbidity Unit
RCW	Revised Code of Washington
SEPA	State Environmental Policy Act
SWMM	Stormwater Management Manual
SWPPP	Stormwater Pollution Prevention Plan
TMDL	Total Maximum Daily Load
UIC	Underground Injection Control
USC	United States Code
USEPA	United States Environmental Protection Agency
WAC	Washington Administrative Code
WQ	Water Quality
WWHM	Western Washington Hydrology Model

Appendix F 303(d) and TMDL Waterbodies Information

Listing ID: 10862

Main Listing Information

Listing ID: 10862
Waterbody Name: PUYALLUP RIVER
Medium: Water
Parameter: Temperature
WQI Project: None Assigned
Designated Use: None Assigned

2014 Category: 5
2012 Category: 3
2008 Category: 3
2004 Category: 1
On 1998 303(d) List?: N
On 1996 303(d) List?: N

Assessment Unit

Assessment Unit ID: 17110014000028

Location Identification

Counties: Pierce
WRIA: 10 - Puyallup-White
Waterbody ID (WBID): None Assigned
Waterbody Class: RA
Town/Range/Section (Legacy): 20N-4E-18

Basis

Location ID: 10A050 -- In 2003, between 7/25/2003 and 9/24/2003, the 7-day mean of daily maximum values (7DADmax) exceeded the criterion for this waterbody (16°C) on 39 of 62 da (63%); The maximum exceedance during this period was 18.4°C for the 7-day period centere 7/29/2003;

Location ID: 10A050 -- In 2002, between 7/18/2002 and 9/25/2002, the 7-day mean of daily maximum values (7DADmax) exceeded the criterion for this waterbody (16°C) on 19 of 70 da (27%); The maximum exceedance during this period was 17.46°C for the 7-day period cente on 8/11/2002;

Puyallup Tribe of Indians unpublished data at RM 10.3 (submitted by Char Naylor on 3 Marc 2003) show a 7-day mean of maximum daily temperature of 17.48 degrees C for the week e 15 August 2002, with a maximum daily maximum temperature of 18.18 degrees C collected August 2002.

Ebbert, 2002. Shows no excursions beyond the criterion from measurements collected in 20 and 2001.

Hallock (2001) Dept. of Ecology Ambient Monitoring Station 10A070 (PUYALLUP RIVER AT MERIDIAN ST) shows 0 excursions beyond the criterion out of 62 samples collected betwee 1993 - 2001.

Hallock (2001) Dept. of Ecology Ambient Monitoring Station 10A050 (Puyallup R @ Puyallup (USGS)) shows 0 excursions beyond the criterion out of 6 samples collected between 1993 - 2001.

Remarks

Remark	Modified By	Modified On	Visib

Combined Listing: Listing IDs 36172, 10871 were rolled into this listing	Chad Brown	9/24/2015	Public
As a result of merging of three stream reaches into a single assessment unit in 2014, this record was merged with the records formerly associated with Listing IDs 10871 and 36172.	Patrick Lizon	10/29/2014	Public
The Category 5 impairment determination is based on the application of the current temperature criterion to data from the years 2003 and 2003.	Patrick Lizon	10/29/2014	Public
Data for 2002 and 2003 does not cover the core critical season for temperature. Maximum temperatures may be higher than observed data;	Nicholas Groebner	4/24/2014	Public

EIM

User Study ID:	User Location ID:
AMS001E	10A070
AMS004	10A050

Print

Listing ID: 10874

Main Listing Information

Listing ID: 10874
Waterbody Name: PUYALLUP RIVER
Medium: Water
Parameter: Mercury
WQI Project: None Assigned
Designated Use: None Assigned

2014 Category: 5
2012 Category: 5
2008 Category: 5
2004 Category: 2
On 1998 303(d) List?: N
On 1996 303(d) List?: N

Assessment Unit

Assessment Unit ID: 17110014000028

Location Identification

Counties: Pierce
WRIA: 10 - Puyallup-White
Waterbody ID (WBID): None Assigned
Waterbody Class: RA
Town/Range/Section (Legacy): 20N-4E-22

Basis

Location ID(s) [10A070] -- In 2006, 1 of 3 sample event(s) exceeded Washington's Aquatic Life Chronic criterion.
Location ID(s) [10A070] -- In 2005, 2 of 2 sample event(s) did not exceed Washington's Aquatic Life Chronic criterion.
Location ID(s) [10A050] -- In 2003, 1 of 4 sample event(s) exceeded Washington's Aquatic Life Chronic criterion.
Location ID(s) [10A050] -- In 2002, 2 of 2 sample event(s) did not exceed Washington's Aquatic Life Chronic criterion.

Puyallup Tribe of Indians unpublished data (submitted by Char Naylor on 3 March 2003) show 1 excursion beyond the chronic criterion from 3 samples collected in 2002 at RM 5.8 and no excursions beyond the chronic criterion from 2 samples collected in 2002 at RM 10.3.

Hallock (2001) Dept. of Ecology Ambient Monitoring Station 10A070 (PUYALLUP RIVER AT MERIDIAN ST) shows 1 excursions beyond the criterion out of 11 samples collected between 1993 - 2001.

Location ID(s) [10A070] -- A sample collected on 09/28/1994 exceeded the chronic criterion: 0.017 ug/L.

Remarks

Remark	Modified By	Modified On	Visibility
Combined Listing: Listing IDs 45375, 35421, 35332 were rolled into this listing	Chad Brown	9/24/2015	Public
Two or more samples collected in a three-year period exceeded the Aquatic Life criterion; therefore the Assessment Unit meets the requirements for a Category 5 determination.	Brandee Era-Miller	12/15/2014	Public
Samples obtained after 1996 must be collected using EPA Method 1669 for sampling and EPA Method 1631 for analysis of the sample. As a result, this listing is moved from Category 5 to Category 3 - insufficient data.	Jessica Archer	10/27/2014	Private

EIM	
User Study ID:	**User Location ID:**
AMS001	10A070
AMS001	10A070
AMS001E	10A070

Print

Appendix G Contaminated Site Information

SWPPP Contaminated Soils Map

Approximate areas containing constitients of concern in soil and/or groundwater at concentrations exceeding MTCA cleanup and/or screening levels

Sediment Pond Sampling Location

No discharge from the tesc pond is allowed until runoff has been tested and meets discharge requirements.

Contaminated Soil Area
The contaminated soil is within the excavation proposed for the future building and site development and will be disturbed. Contaminated soils are to be excavated and/or mixed per Department of Ecology remediation standards.
No stockpiling of contaminated soils is allowed.
If contaminated soils are exposed and will remain unworked, the area shall be covered with a minimum 10 mil plastic cover with a berm around the area to prevent rainfall from contacting the contaminated soils and from runoff being directed toward the contaminated soils or excavation. Plastic covering the contaminated soils is not to be driven on. The Environmental consultant shall be onsite during the removal and/or remediation of contaminated soils to ensure contaminated soils are fully removed from the site.

Stormwater runoff will be routed to a temporary stormwater pond, which will be treated in accordance with the Construction Stormwater General Permit and Administrative Order prior to discharge to the stormwater sewer system.

No discharge from the tesc pond is allowed until runoff has been tested and meets discharge requirements.

Sediment Pond Sampling Location

Construction Access

Equipment decontamination area

Notify Ecology on date, time and location of pre-construction meeting.
Southwest Regional Office,
Sheila Marcoe
360.522.2987

Note:
No offsite discharge of contaminated storm or groundwater shall occur.

FORMER BUILDING A (DESTROYED/DEMOLISHED DURING AUGUST 2021 FIRE INCIDENT)

FORMER FREEZER

OFFICE BUILDING

BUILDING B COPPER RIVER SMOKING CO.

PARCEL ID: 7845000161

PARCEL ID: 7845000170

PARCEL ID: 0420274126

15TH STREET SOUTHEAST

14TH STREET SOUTHEAST

13TH STREET SOUTHEAST

EAST PIONEER

11TH AVENUE SOUTHEAST

FMW-08, FMW-09, FMW-10, FMW-11, FMW-12, FMW-13, MW-1, MW-2, MW-3, MW-4, MW-5, MW-6, MW-7, B-8, B-9, A-1, A-2, A-4, A-5, A-6, A-7, A-10, A-11, A-12, A-13, A-14, A-15, A-16, A-17, A-18, A-19, A-20, A-21, A-22, A-23, A-24, A-25, A-26, A-27, A-28, A-29, A-30, A-31, A-32, A-33, A-34, A-35, A-36, A-37, A-38, A-39, FB-01, FB-02, FB-03, FB-04, FB-05, FB-06

LEGEND

- GEOTECHNICAL WELL (TERRA 2021)
- MONITORING WELL (ATLAS 2021)
- MONITORING WELL (FARALLON 2023)
- BORING (ATLAS 2021, 2022)
- BORING (FARALLON 2023)
- FORMER TRENCH DRAINS
- EXISTING BUILDING
- FORMER BUILDING
- APPROXIMATE SUBJECT PROPERTY BOUNDARY
- PIERCE COUNTY PARCEL BOUNDARIES

100 50 0 100
APPROXIMATE SCALE IN FEET

N

AERIAL IMAGERY: NEARMAP, 7/20/2022

NOTES:
1. ALL LOCATIONS ARE APPROXIMATE.
2. FIGURES WERE PRODUCED IN COLOR. GRAYSCALE COPIES MAY NOT REPRODUCE ALL ORIGINAL INFORMATION.

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FIGURE 2
PROPERTY PLAN

WASHINGTON COLD STORAGE
240 15TH STREET SOUTHEAST
PUYALLUP, WASHINGTON

DRAWN BY: VBACHMANN	CHECKED BY: YP	DATE: 3/10/2023	FARALLON PN: 2636-001

Path: Q:\Projects\2636 Fortress Entities\001 Fmr Wa Cold Storage Bldg\ArcPro\2636-001\2636-001\MapFiles\2023_Q1\2636-001_Fig02_PropertyMap_2023_Locs.aprx

A T T A C H M E N T

NOI APPLICATION – SITE CONDITIONS: NATURE AND EXTENT OF CONTAMINATION SUMMARY

WASHINGTON COLD STORAGE
240 15TH STREET SOUTHEAST
PUYALLUP, WASHINGTON 98372

Farallon Consulting, L.L.C. has prepared this document on behalf of CREF3 Puyallup Owner LLC to summarize remedial investigation (RI) activities conducted at the Washington Cold Storage property at 240 15th Street Southeast (the Property) since 2021. The Property currently is enrolled in the Washington State Department of Ecology (Ecology) expedited Voluntary Cleanup Program (VCP) and has been assigned expedited VCP Project ID XS0012. Cleanup activities will be conducted in conjunction with Property redevelopment.

This document provides a summary of RI activities conducted by Farallon Consulting, LLC (Farallon) and Atlas Technical Consultants, LLC (Atlas), and RI results including Property geology and hydrogeology, and soil and groundwater analytical results. Borings and monitoring wells advanced during RI activities are shown on Figure 2, and analytical results collected during RI activities are presented in Figures 3 through 9 and Tables 1 through 7.

GEOLOGY AND HYDROGEOLOGY

The Property is approximately 0.29 mile south of the Puyallup River, in an area of relatively flat topography at an elevation of approximately 55 feet above mean sea level. The Property is within the Puget Sound region, which is underlain by Quaternary sediments deposited by a number of glacial episodes. Due to the proximity of the Site to the Puyallup River, the most recent deposits consist of post-glacial river sediments.

Soil encountered beneath the Property during the RI generally consisted of poorly graded sand with varying amounts of silt and gravel to the maximum explored depth of 31.5 feet below ground surface (bgs).

Groundwater was encountered during drilling at depths ranging from approximately 3 to 11 feet bgs. Groundwater was measured in monitoring wells at depths ranging from 3.72 to 9.26 feet below top of casing during the most recent groundwater monitoring event conducted in February 2022, corresponding to groundwater elevations between 51.58 to 49.02 feet North American Vertical Datum of 1988 (NAVD88) (Table 1). Groundwater beneath the Property has been interpreted to flow to the north (Figure 3).

ATLAS SUBSURFACE INVESTIGATIONS

Atlas conducted RI activities at the Property between September 2021 and March 2022, which included advancing 36 borings (A-1, A-2, A-4 through A-7, and A-10 through A-39) to depths of up to 21 feet bgs for collection of soil and reconnaissance groundwater samples, and installing 7 permanent groundwater monitoring wells (MW-1 through MW-7) to depths of up to 20 feet bgs. Atlas also conducted three groundwater monitoring events at monitoring wells between November 2021 and September 2022. Only a portion of this work was summarized in the *Interim Remedial Investigation Report, Former Washington Cold Storage Facility, 240 15th Street Southeast, Puyallup, Washington* dated January 20, 2022 submitted to Ecology by Atlas.

Soil and groundwater samples collected by Atlas indicated the following:

- Total petroleum hydrocarbons (TPH) as oil-range organics (ORO) were detected at a concentration of 26,100 milligrams per kilogram (mg/kg), exceeding the MTCA Method A cleanup level in a single soil sample collected from boring A-2 at a depth of 0.5 feet below ground surface (bgs) (Figure 4, Table 2).
- Benzene was detected at concentrations exceeding the MTCA Method A cleanup level in soil samples collected from a single boring (A-22) at depths of 1 and 8 feet bgs (Figure 4, Table 2).
- Per- and poly-fluoroalkyl substances (PFAS) were detected at a concentration exceeding the MTCA Method B cleanup level for soil protective of groundwater (vadose zone) in a single soil sample collected from boring A-1 at a depth of 0.5 feet bgs (Figure 6, Table 4).
- Reconnaissance groundwater analytical results collected from borings on the Property indicated that TPH as diesel-range organics (DRO), ORO, and/or benzene were detected at concentrations exceeding MTCA Method A cleanup levels in borings A-5, A-7, A-10,

A-15, A-20 through A-24, A-29, A-31 through A-35, and A-38 advanced across the Property (Figure 7, Table 5).

- DRO, GRO, and/or benzene were detected at concentrations exceeding MTCA Method A cleanup levels in groundwater samples collected from monitoring wells MW-1, MW-2, MW-4, and MW-7 during a groundwater monitoring event conducted in November 2021. By September 2022, monitoring well MW-1 was the only monitoring well containing petroleum hydrocarbons and/or benzene at concentrations exceeding MTCA Method A cleanup levels, indicating a decreasing trend of petroleum contamination in groundwater at the Property (Figure 7, Table 5). However, monitoring well MW-7 was likely not sampled during the September 2022 monitoring event as Farallon suspects that Atlas sampled a nearby geotechnical well with a deeper well screen by mistake.
- PFAS were detected at concentrations slightly exceeding Washington State Action Levels in a single reconnaissance groundwater sample collected from boring A-7 in the southeastern portion of the Property (Figure 9, Table 7). PFAS was non-detect at the laboratory practical quantitation limit in the soil samples collected from this location.

FARALLON SUBSURFACE INVESTIGATIONS

Farallon conducted RI activities at the Property between November 2022 and February 2023 including conducting a passive soil gas survey, advancing six borings (FB-01 through FB-06), installing six permanent groundwater monitoring wells (FMW-08 through FMW-13), and conducting two groundwater monitoring events. RI activities conducted by Farallon are summarized in the following sections.

Passive Soil Gas Survey

Farallon conducted a passive soil gas survey between November 16 and November 22, 2022, which including installing 103 passive soil gas samplers to depths of approximately 3 feet below ground surface across the Property. This work was conducted to identify potential sources of petroleum-contaminated groundwater at the Property. Passive soil gas survey results indicated the following:

- TPH was detected at a maximum concentration of 2,500 micrograms per cubic meter ($\mu g/m^3$) in the eastern portion of the Property, less than the Washington State Model Toxics Control Act Cleanup Regulation (MTCA) Method B subslab soil gas screening level for commercial exposure of 13,000 $\mu g/m^3$.

- Benzene was detected at a maximum concentration of 1,050 µg/m^3 in the central portion of the Property, exceeding the MTCA Method B subslab soil gas screening level for commercial exposure of 50 µg/m^3.
- Tetrachloroethene (PCE) was detected at a maximum concentration of 824 µg/m^3, less than the MTCA Method B subslab soil gas screening level for commercial exposure of 1,500 µg/m^3.
- Trichloroethene (TCE) was detected at a maximum concentration of 711 µg/m^3 in the central portion of the Property, exceeding both the MTCA Method B subslab soil gas screening level for commercial exposure of 95 µg/m^3 and the short-term screening level of 250 µg/m^3.
- 1,2-dichloroethane (EDC) was detected at a maximum concentration of 478 µg/m^3 in the central portion of the Property, exceeding the MTCA Method B subslab soil gas screening level for commercial exposure of 15 µg/m^3.

The passive soil gas survey results presented above indicated potential sources of petroleum hydrocarbons and/or benzene in the eastern and central portions of the Property, and potential sources of halogenated volatile organic compounds (HVOCs) in the northern and central portions of the Site warranting additional investigation.

Shallow Borings and Monitoring Well Installation

Farallon conducted a supplemental subsurface investigation in February 2023 to evaluate potential source areas of hazardous substances identified during the passive soil gas survey, and to further evaluate groundwater conditions beneath the Property.

Borings FB-01 through FB-06 and monitoring wells FMW-8 through FMW-13 were advanced by a Washington-state licensed drilling contractor using a direct-push drill rig at the locations shown on Figure 2. Borings FB-01 through FB-06 were advanced to depths of up to 24 feet below ground surface (bgs), and monitoring wells FMW-8 through FMW-13 were installed to total depths between 13 and 15 feet bgs at the locations shown on Figure 2.

A summary of soil analytical results collected during Farallon's supplemental subsurface investigation is presented below:

- Tetrachloroethene (PCE) was detected at a concentration slightly exceeding the MTCA Method A cleanup level of 0.05 milligrams per kilogram (mg/kg) in the soil sample collected from monitoring well FMW-10 at a depth of 10 feet bgs. PCE was reported non-detect at the laboratory practical quantitation limit (PQL) in the remaining soil samples analyzed (Figure 5, Table 3).
- Trichloroethene (TCE) was detected at concentrations exceeding the MTCA Method A cleanup level of 0.03 mg/kg in soil samples collected from boring FB-03 at a depth of 3 feet bgs, and from monitoring FMW-10 at a depth of 7 feet bgs. TCE was reported non-detect at the laboratory PQL in the remaining soil samples analyzed (Figure 5, Table 3).
- DRO, ORO, GRO, and benzene either were detected at concentrations less than their respective MTCA Method A cleanup levels, or were reported non-detect at the laboratory PQL in all soil samples analyzed (Figure 4, Table 2).

Soil analytical results indicate that HVOCs are present in shallow soil at concentrations proximate to potential source areas of HVOCs identified during the passive soil gas survey. The lack of exceedances of petroleum hydrocarbons and benzene in soil samples collected by Farallon indicates that the elevated concentrations of TPH and benzene identified in the central and eastern portions of the Property during the passive soil gas survey do not represent sources of TPH and benzene in soil.

Groundwater Monitoring Events

Farallon conducted two groundwater monitoring events at monitoring wells on the Property. The first groundwater monitoring event was conducted between December 27, 2022 and January 4, 2023 and included measuring groundwater elevations and collecting groundwater samples from monitoring wells MW-1 through MW-7 and geotechnical well B-9. The second groundwater monitoring event was conducted on February 13 and 14, 2023 and included measuring groundwater elevations and collecting groundwater samples from monitoring wells MW-1 through MW-7 and FMW-08 through FMW-13.

A summary of the groundwater monitoring events conducted by Farallon is presented below:

- Benzene was detected in the northwestern portion of the Property at concentrations exceeding the MTCA Method A cleanup level in groundwater samples collected from MW-1 in December 2022, MW-7 in January and February 2022, and FMW-09 in

February 2022. Benzene was detected at concentrations less than the MTCA Method A cleanup level or was reported non-detect at the laboratory practical quantitation limit (PQL) in the remaining groundwater samples analyzed (Figure 7, Table 6).

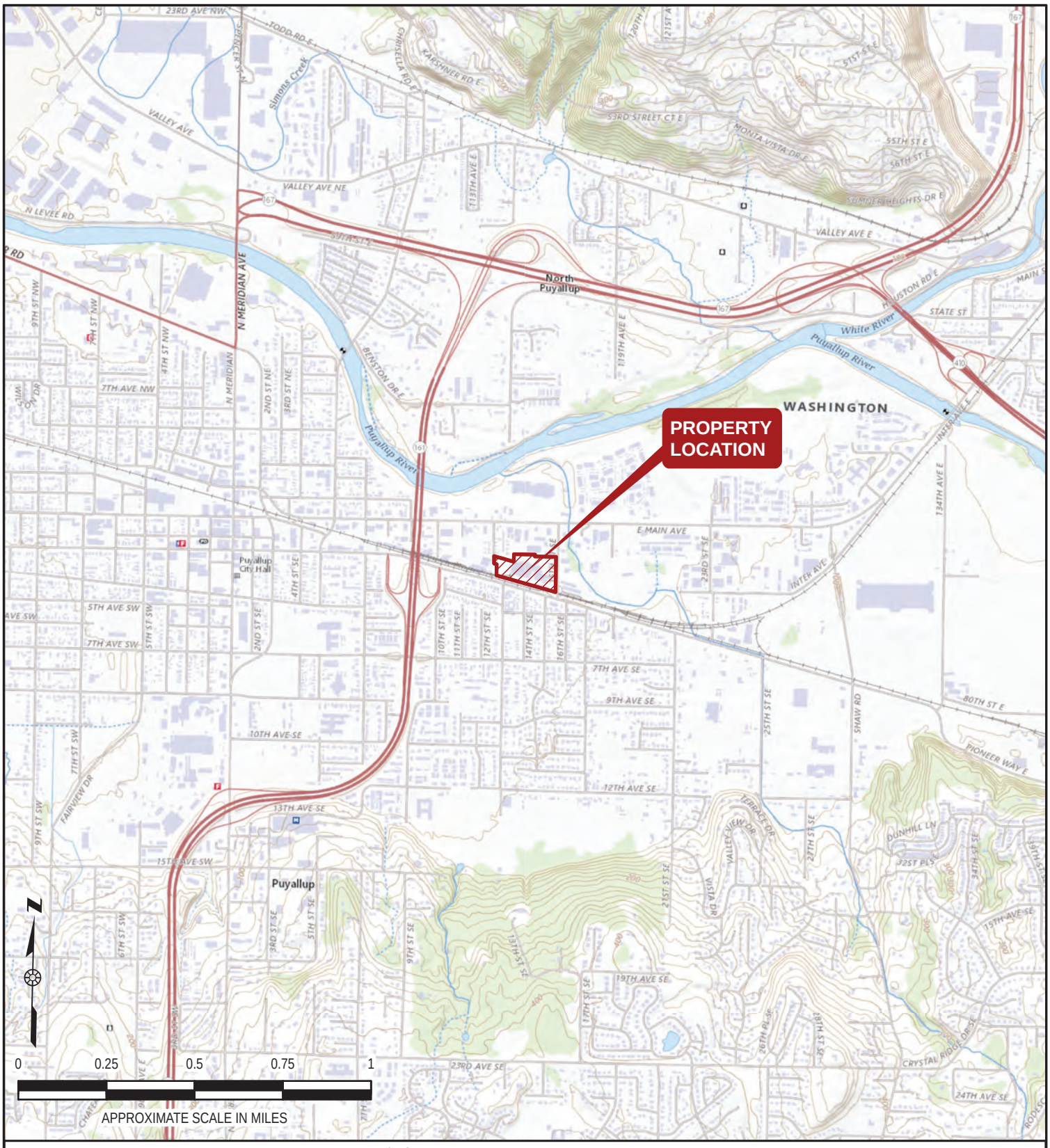
- TCE and cis-1,2-dichloroethene (cis-1,2-DCE) were detected at concentrations exceeding their respective MTCA Method A cleanup levels in monitoring FMW-10, located along the northern Property boundary in February 2023 (Figure 8, Table 7).
- PCE was detected at a concentration less than the MTCA Method A cleanup level in monitoring well FMW-10 in February 2023, and was reported non-detect at the laboratory PQL in the remaining groundwater samples analyzed (Figure 8, Table 7).
- 1,2-dichloroethane (EDC) was detected at a concentration less than the MTCA Method A cleanup level in monitoring well MW-7 in January and February 2023, and was reported non-detect at the laboratory PQL in the remaining groundwater samples analyzed (Figure 8, Table 7).
- DRO and/or ORO were detected at concentrations less than the MTCA Method A cleanup level in monitoring wells MW-1, MW-2, MW-3, MW-7, FMW-09, and FMW-10, between December 2022 and February 2023 and were reported non-detect at the laboratory PQL in the remaining groundwater samples analyzed (Figure 7, Table 6).
- GRO was detected at a concentration less than the MTCA Method A cleanup level in monitoring well MW-1 in December 2022 and in monitoring well MW-7 between January 2022 and February 2023, and was reported non-detect at the laboratory PQL in the remaining groundwater samples analyzed (Figure 7, Table 6).

Groundwater analytical results indicate concentrations of petroleum hydrocarbons and benzene have declined significantly since the initial groundwater monitoring event conducted by Atlas in November 2021. In addition, based on the additional data collected by Farallon, exceedances of DRO, ORO, and benzene identified in reconnaissance groundwater samples collected by Atlas are not representative of current groundwater conditions. Monitoring wells FMW-9 through FMW-12 were installed proximate to borings A-15, A-21, A-23, A-24, A-33, and A-38, which contained concentrations of DRO, ORO, and/or benzene at concentrations exceeding MTCA Method A cleanup levels in reconnaissance groundwater samples collected by Atlas between November 2021 and March 2022 (Figure 7, Table 6). Groundwater samples collected from Farallon's newly installed wells did not contain petroleum hydrocarbons or benzene at concentrations exceeding MTCA Method A cleanup levels, except for FMW-9 which contained benzene at a concentration

slightly exceeding the MTCA Method A cleanup level proximate to boring A-23 (Figure 7). Groundwater samples collected from Atlas monitoring wells MW-3 through MW-5, located proximate to reconnaissance groundwater exceedances, also did not contain petroleum hydrocarbons or benzene at concentrations exceeding MTCA Method A cleanup levels. The most recent groundwater analytical results indicate that petroleum hydrocarbon and/or benzene impacts in groundwater are limited to the northern portion of the Property proximate to monitoring wells MW-1, MW-7, and FMW-9.

Groundwater analytical results indicate that HVOC impacts in groundwater exceeding MTCA Method A cleanup levels are limited to the northern portion of the Property proximate to monitoring well FMW-10. HVOCs were not detected at concentrations exceeding MTCA Method A cleanup levels in any other monitoring wells on the Property (Figure 8). The lateral extent of HVOC exceedances in groundwater east and north of FMW-10 has not been defined.

Attachments:
Figure 1, *Property Vicinity Map*
Figure 2, *Property Plan*
Figure 3, *Groundwater Elevation Contours – February 13, 2023*
Figure 4, *Soil Analytical Results for TPH and Benzene*
Figure 5, *Soil Analytical Results for Halogenated VOCs*
Figure 6, *Soil Analytical Results for PFAS Compounds*
Figure 7, *Groundwater Analytical results for Petroleum Hydrocarbons and Benzene*
Figure 8, *Groundwater Analytical Results for Halogenated VOCs*
Figure 9, *Groundwater Analytical Results for PFAS Compounds*
Table 1, *Groundwater Elevations*
Table 2, *Soil Analytical Results for TPH and BTEX*
Table 3, *Soil Analytical Results for Halogenated Volatile Organic Compounds*
Table 4, *Soil Analytical Results for PFAS*
Table 5, *Groundwater Analytical Results for TPH and BTEX*
Table 6, *Groundwater Analytical Results for Halogenated Volatile Organic Compounds*
Table 7, *Reconnaissance Groundwater Analytical Results for PFAS*



LEGEND

PROPERTY BOUNDARY

NOTES:

1. ALL LOCATIONS ARE APPROXIMATE.

2. FIGURES WERE PRODUCED IN COLOR. GRAYSCALE COPIES MAY NOT REPRODUCE ALL ORIGINAL INFORMATION.

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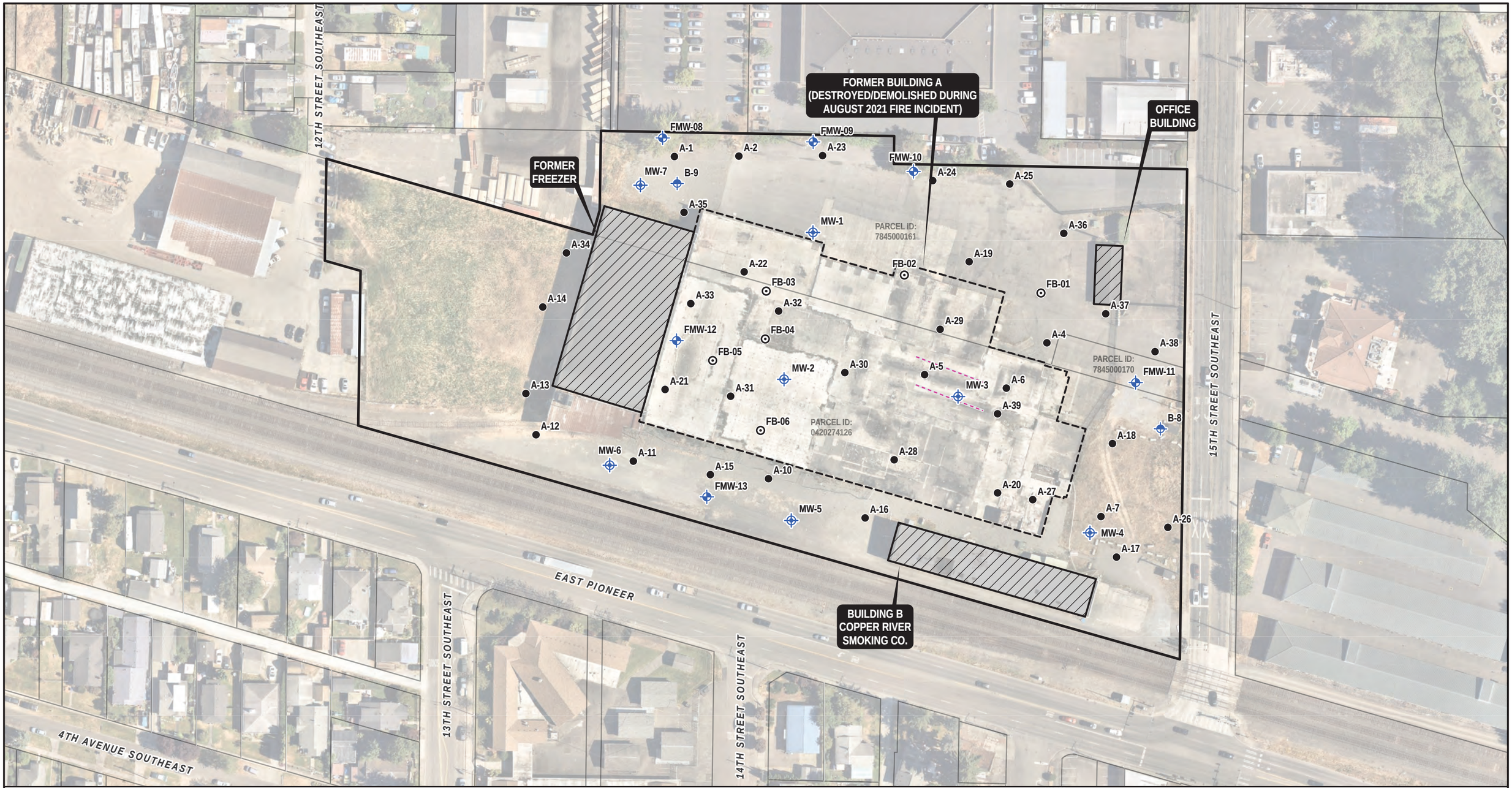
FIGURE 1

PROPERTY VICINITY MAP

WASHINGTON COLD STORAGE
240 15TH STREET SOUTHEAST
PUYALLUP, WASHINGTON

DRAWN BY: VBACHMANN	CHECKED BY: YP	DATE: 3/9/2023	FARALLON PN: 2636-001

Path: Q:\Projects\2636 Fortress Entities\001 Fmr Wa Cold Storage Bldg\ArcPro\2636-001\2636-001\MapFiles\2023_Q1\2636-001_Fig01_VicinityMap.aprx



LEGEND

- GEOTECHNICAL WELL (TERRA 2021)
- MONITORING WELL (ATLAS 2021)
- MONITORING WELL (FARALLON 2023)
- BORING (ATLAS 2021, 2022)
- BORING (FARALLON 2023)
- FORMER TRENCH DRAINS
- EXISTING BUILDING
- FORMER BUILDING
- APPROXIMATE SUBJECT PROPERTY BOUNDARY
- PIERCE COUNTY PARCEL BOUNDARIES

100 50 0 100

APPROXIMATE SCALE IN FEET

N

AERIAL IMAGERY: NEARMAP, 7/20/2022

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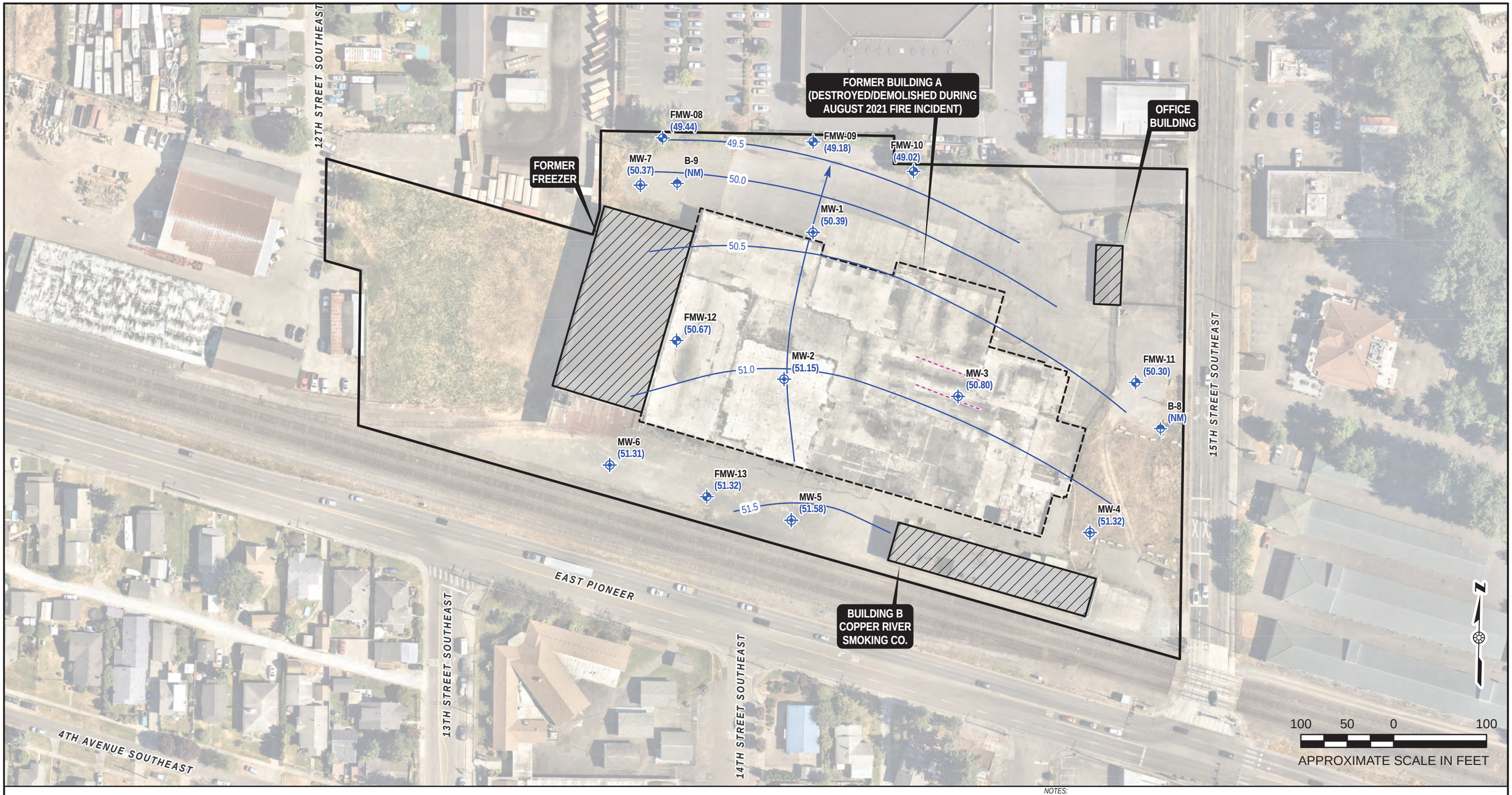
FIGURE 2

PROPERTY PLAN

WASHINGTON COLD STORAGE
240 15TH STREET SOUTHEAST
PUYALLUP, WASHINGTON

DRAWN BY: VBACHMANN	CHECKED BY: YP	DATE: 3/10/2023	FARALLON PN: 2636-001

Path: Q:\Projects\2636 Fortress Entities\001 Fmr Wa Cold Storage Bldg\ArcPro\2636-001\2636-001\MapFiles\2023_Q1\2636-001_Fig02_PropertyMap_2023_Locs.aprx



LEGEND

- GEOTECHNICAL WELL (TERRA 2021)
- MONITORING WELL (ATLAS 2021)
- MONITORING WELL (FARALLON 2023)
- INFERRED GROUNDWATER FLOW DIRECTION
- INFERRED GROUNDWATER ELEVATION CONTOUR (0.5-FOOT INTERVAL)
- FORMER TRENCH DRAINS
- EXISTING BUILDING
- FORMER BUILDING
- APPROXIMATE PROPERTY BOUNDARY
- PIERCE COUNTY PARCEL BOUNDARIES

(50.49) GROUNDWATER ELEVATION IN FEET AS MEASURED 2/13/2023, VERTICAL DATUM: NAVD88

(NM) GROUNDWATER ELEVATION NOT MEASURED

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FIGURE 3

GROUNDWATER ELEVATION CONTOURS
FEBRUARY 13, 2023

WASHINGTON COLD STORAGE
240 15TH STREET SOUTHEAST
PUYALLUP, WASHINGTON

DRAWN BY: VBACHMANN	CHECKED BY: YP	DATE: 3/10/2023	FARALLON PN: 2636-001

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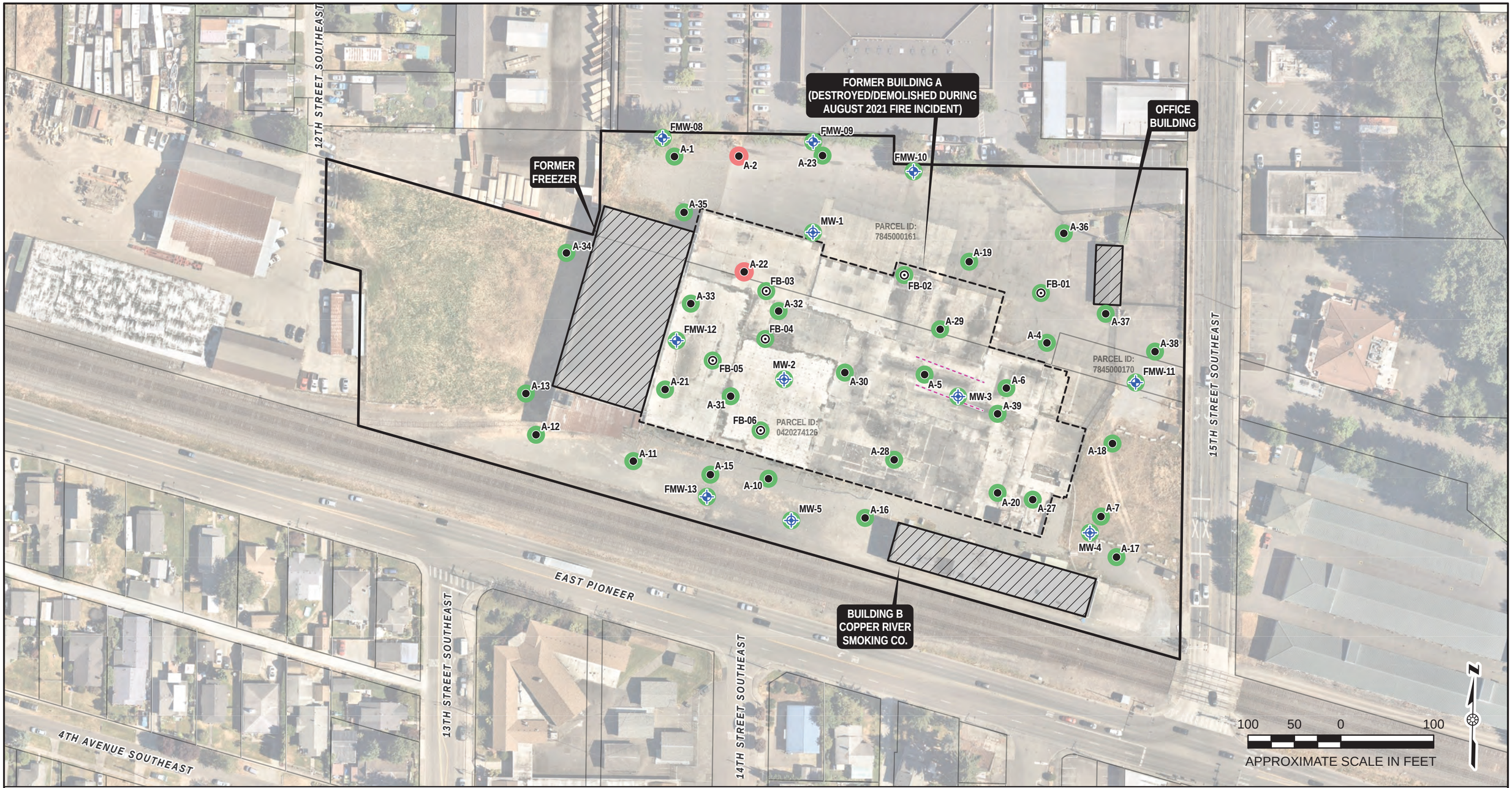

LEGEND

- MONITORING WELL (ATLAS 2021)
- MONITORING WELL (FARALLON 2023)
- BORING (ATLAS 2021, 2022)
- BORING (FARALLON 2023)
- INDICATES TPH AND BENZENE WERE NOT DETECTED AT CONCENTRATIONS EXCEEDING MTCA CLEANUP LEVELS
- INDICATES ONE OR MORE MTCA EXCEEDANCES OF TPH AND/OR BENZENE IN SOIL
- FORMER TRENCH DRAINS
- EXISTING BUILDING
- FORMER BUILDING
- APPROXIMATE PROPERTY BOUNDARY
- PIERCE COUNTY PARCEL BOUNDARIES

MTCA = MODEL TOXICS CONTROL ACT

AERIAL IMAGERY: NEARMAP, 7/20/2022

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FIGURE 4

SOIL ANALYTICAL RESULTS FOR TPH AND BENZENE

WASHINGTON COLD STORAGE
240 15TH STREET SOUTHEAST
PUYALLUP, WASHINGTON

DRAWN BY: VBACHMANN	CHECKED BY: YP	DATE: 3/10/2023	FARALLON PN: 2636-001

Path: Q:\Projects\2636 Fortress Entities\001 Fmr Wa Cold Storage Bldg\ArcPro\2636-001\2636-001\MapFiles\2023_Q1\2636-001_Fig04_TPH_Benz_SoilAnalytical.aprx

Sample Location	Sampled By	Sample Depth (feet)[1]	Sample Date	Analytical Results (milligrams per kilogram)[2] PCE	TCE	cDCE	tDCE	Vinyl Chloride	EDC
A-1	Atlas	0.5	9/24/2021	< 0.0437	< 0.0219	< 0.0273	< 0.0328	< 0.0273	< 0.0251
A-2	Atlas	0.5	9/24/2021	< 0.0722	< 0.0361	< 0.0451	< 0.0542	< 0.0451	< 0.0415
A-4	Atlas	0.5	9/23/2021	< 0.0533	< 0.0266	< 0.0333	< 0.0400	< 0.0333	0.0306
A-5	Atlas	6.0	9/24/2021	< 0.0578	< 0.0289	< 0.0361	< 0.0433	< 0.0361	< 0.0332
A-6	Atlas	0.5	9/23/2021	< 0.0418	< 0.0209	< 0.0261	< 0.0313	< 0.0261	< 0.0240
A-7	Atlas	0.5	9/24/2021	< 0.0501	< 0.0250	< 0.0313	< 0.0376	< 0.0313	< 0.0288
A-10	Atlas	5.0	9/23/2021	< 0.0266	< 0.0532	< 0.0332	< 0.0399	< 0.0332	< 0.0306
A-12	Atlas	1.0	9/23/2021	< 0.0594	< 0.0297	< 0.0371	< 0.0446	< 0.0371	< 0.0342
A-13	Atlas	5.0	9/23/2021	< 0.0586	< 0.0293	< 0.0367	< 0.0440	< 0.0367	< 0.0037
2023 Subsurface Investigation									
FB-02	Farallon	7.0	2/7/2023	< 0.0144	< 0.0144	< 0.0144	< 0.0144	< 0.0144	< 0.0144
	Farallon	13.0	2/7/2023	< 0.0154	< 0.0154	< 0.0154	< 0.0154	< 0.0154	< 0.0154
FB-04	Farallon	7.0	2/8/2023	< 0.0215	< 0.0215	< 0.0215	< 0.0215	< 0.0215	< 0.0215
	Farallon	13.0	2/8/2023	< 0.0200	< 0.0200	< 0.0200	< 0.0200	< 0.0200	< 0.0200
	Farallon	17.0	2/8/2023	< 0.0205	< 0.0205	< 0.0205	< 0.0205	< 0.0205	< 0.0205
FB-05	Farallon	3.0	2/8/2023	< 0.0128	**0.120**	< 0.0128	< 0.0128	< 0.0128	< 0.0128
	Farallon	7.5	2/8/2023	< 0.0193	< 0.0193	< 0.0193	< 0.0193	< 0.0193	< 0.0193
FB-06	Farallon	3.0	2/8/2023	< 0.0199	< 0.0199	< 0.0199	< 0.0199	< 0.0199	< 0.0199
	Farallon	7.0	2/8/2023	< 0.0183	< 0.0183	< 0.0183	< 0.0183	< 0.0183	< 0.0183
FMW-10	Farallon	3.0	2/7/2023	< 0.0197	< 0.0197	< 0.0197	< 0.0197	< 0.0197	< 0.0197
	Farallon	7.0	2/7/2023	**0.0832**	**0.0451**	< 0.0219	< 0.0219	< 0.0219	< 0.0219
	Farallon	13.0	2/7/2023	< 0.0165 H	< 0.0165 H	< 0.0165 H	< 0.0165 H	< 0.0165 H	< 0.0165 H
FMW-12	Farallon	7.0	2/8/2023	< 0.0216	< 0.0216	< 0.0216	< 0.0216	< 0.0216	< 0.0216
	Farallon	13.0	2/8/2023	< 0.0213	< 0.0213	< 0.0213	< 0.0213	< 0.0213	< 0.0213
MTCA Cleanup Levels for Soil				**0.05**[3]	**0.03**[3]	**160**[4]	**1,600**[4]	**0.67**[4]	**11**[4]

NOTES:

Results in **bold** and highlighted yellow denote concentrations exceeding applicable cleanup levels.

< denotes analyte not detected at or exceeding the reporting limit listed.

[1]Depth in feet below ground surface.

[2]Analyzed by U.S. Environmental Protection Agency Method 8260D.

[3]Washington State Model Toxics Control Act Cleanup Regulation (MTCA) Method A Soil Cleanup Levels for Unrestricted Land Uses, Table 740-1 of Section 900 of Chapter 173-340 of the Washington Administrative Code, as revised 2013.

[4]Washington State Cleanup Levels and Risk Calculations (CLARC) under Washington State MTCA, Standard Method B Formula Values for Soil from CLARC Master spreadsheet, https://ecology.wa.gov/Regulations-Permits/Guidance-technical-assistance/Contamination-clean-up-tools/CLARC

Atlas = Atlas Technical Consultants, LLC

Farallon = Farallon Consulting, L.L.C.

H = sample analyzed outside of holding time

PCE = tetrachloroethene

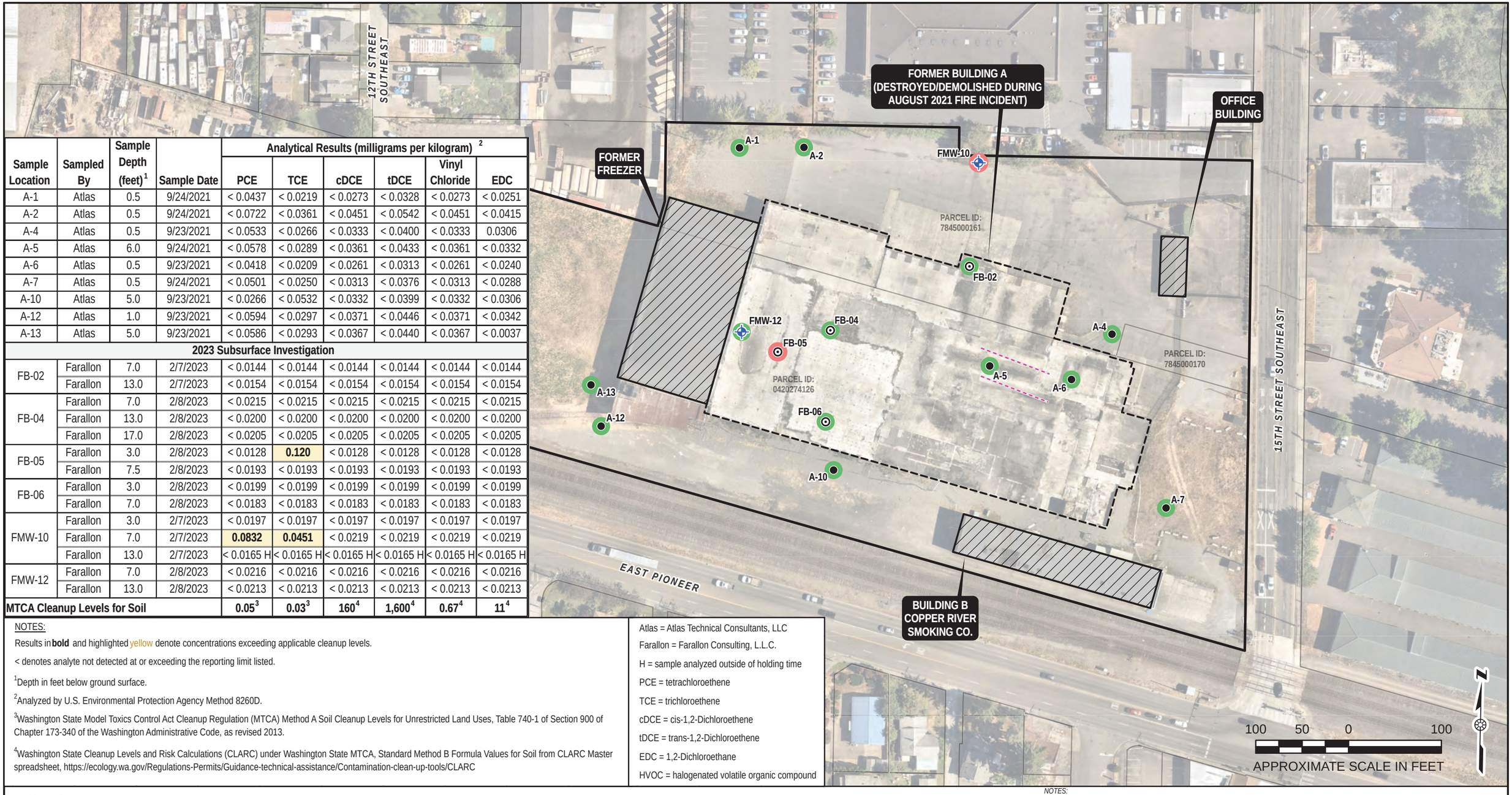
TCE = trichloroethene

cDCE = cis-1,2-Dichloroethene

tDCE = trans-1,2-Dichloroethene

EDC = 1,2-Dichloroethane

HVOC = halogenated volatile organic compound



LEGEND

- MONITORING WELL (FARALLON 2023)
- BORING (ATLAS 2021, 2022)
- BORING (FARALLON 2023)
- FORMER TRENCH DRAINS
- INDICATES NO DETECTIONS OF HVOCs IN SOIL EXCEEDING MTCA CLEANUP LEVELS
- INDICATES ONE OR MORE DETECTIONS OF HVOCs IN SOIL EXCEEDING CLEANUP LEVELS
- EXISTING BUILDING
- FORMER BUILDING
- APPROXIMATE PROPERTY BOUNDARY
- PIERCE COUNTY PARCEL BOUNDARIES

NOTES:

1. ALL LOCATIONS ARE APPROXIMATE.

2. FIGURES WERE PRODUCED IN COLOR. GRAYSCALE COPIES MAY NOT REPRODUCE ALL ORIGINAL INFORMATION.

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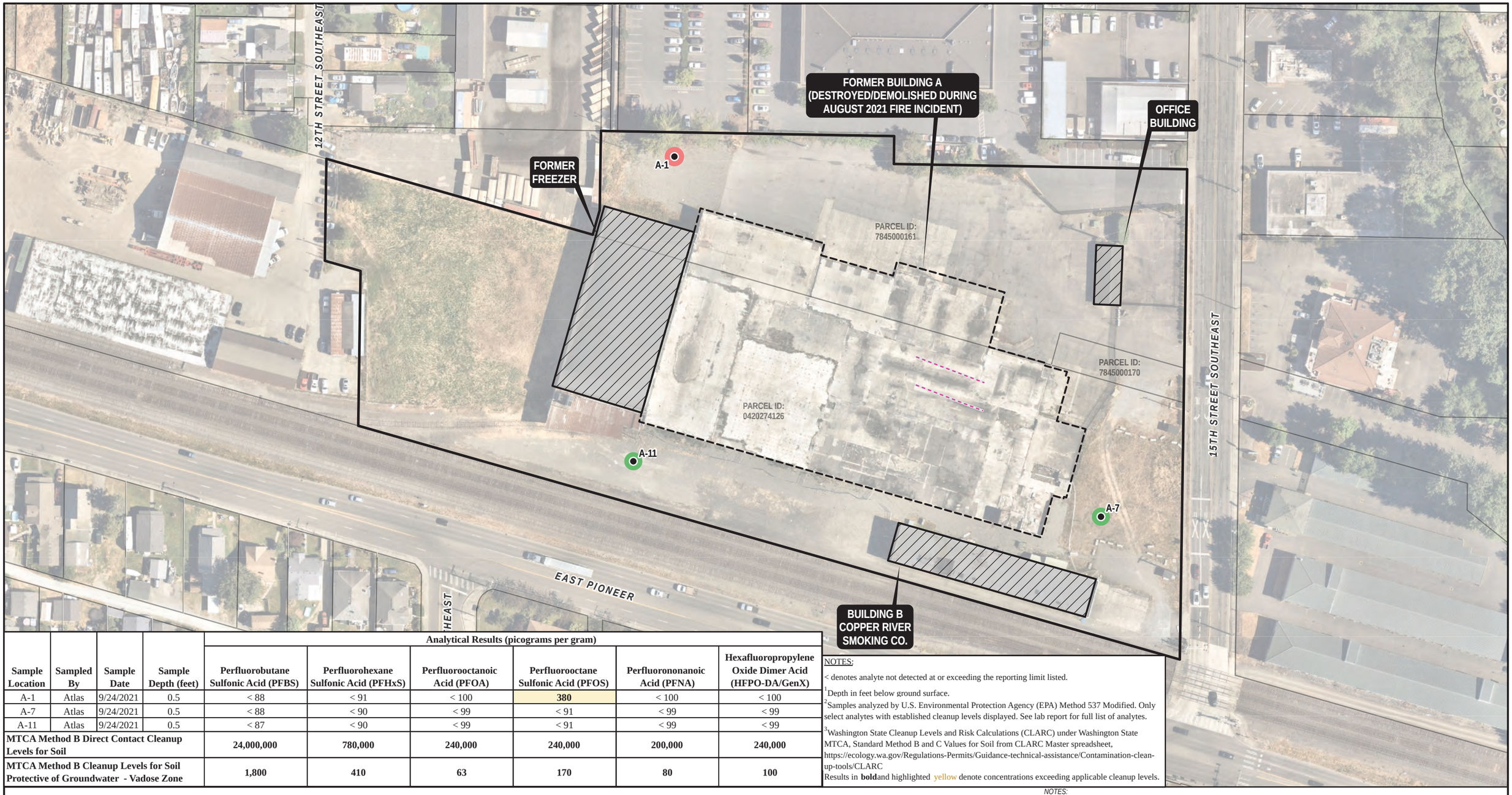
FIGURE 5

SOIL ANALYTICAL RESULTS FOR HALOGENATED VOCS

WASHINGTON COLD STORAGE
240 15TH STREET SOUTHEAST
PUYALLUP, WASHINGTON

DRAWN BY: VBACHMANN	CHECKED BY: YP	DATE: 3/10/2023	FARALLON PN: 2636-001

Path: Q:\Projects\2636 Fortress Entities\001 Fmr Wa Cold Storage Bldg\ArcPro\2636-001\2636-001\MapFiles\2023_Q1\2636-001_Fig05_VOCs_SoilAnalytical.aprx



Sample Location	Sampled By	Sample Date	Sample Depth (feet)	Analytical Results (picograms per gram)					
				Perfluorobutane Sulfonic Acid (PFBS)	Perfluorohexane Sulfonic Acid (PFHxS)	Perfluorooctanoic Acid (PFOA)	Perfluorooctane Sulfonic Acid (PFOS)	Perfluorononanoic Acid (PFNA)	Hexafluoropropylene Oxide Dimer Acid (HFPO-DA/GenX)
A-1	Atlas	9/24/2021	0.5	< 88	< 91	< 100	**380**	< 100	< 100
A-7	Atlas	9/24/2021	0.5	< 88	< 90	< 99	< 91	< 99	< 99
A-11	Atlas	9/24/2021	0.5	< 87	< 90	< 99	< 91	< 99	< 99
MTCA Method B Direct Contact Cleanup Levels for Soil				**24,000,000**	**780,000**	**240,000**	**240,000**	**200,000**	**240,000**
MTCA Method B Cleanup Levels for Soil Protective of Groundwater - Vadose Zone				**1,800**	**410**	**63**	**170**	**80**	**100**

NOTES:

< denotes analyte not detected at or exceeding the reporting limit listed.

[1]Depth in feet below ground surface.

[2]Samples analyzed by U.S. Environmental Protection Agency (EPA) Method 537 Modified. Only select analytes with established cleanup levels displayed. See lab report for full list of analytes.

[3]Washington State Cleanup Levels and Risk Calculations (CLARC) under Washington State MTCA, Standard Method B and C Values for Soil from CLARC Master spreadsheet, https://ecology.wa.gov/Regulations-Permits/Guidance-technical-assistance/Contamination-clean-up-tools/CLARC

Results in **bold**and highlighted yellow denote concentrations exceeding applicable cleanup levels.

LEGEND

- BORING (ATLAS 2021, 2022)
- INDICATES PFAS COMPOUNDS WERE NOT DETECTED AT CONCENTRATIONS EXCEEDING MTCA CLEANUP LEVELS IN SOIL
- INDICATES ONE OR MORE MTCA EXCEEDANCES OF PFAS COMPOUNDS IN SOIL
- FORMER TRENCH DRAINS
- EXISTING BUILDING
- FORMER BUILDING
- APPROXIMATE PROPERTY BOUNDARY
- PIERCE COUNTY PARCEL BOUNDARIES

AERIAL IMAGERY: NEARMAP, 7/20/2022

Atlas = Atlas Technical Consultants, LLC

PFAS = per- and poly-fluoroalkyl substances

MTCA = Model Toxics Control Act

100 50 0 100

APPROXIMATE SCALE IN FEET

N

NOTES:

1. ALL LOCATIONS ARE APPROXIMATE.

2. FIGURES WERE PRODUCED IN COLOR. GRAYSCALE COPIES MAY NOT REPRODUCE ALL ORIGINAL INFORMATION.

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FIGURE 6

SOIL ANALYTICAL RESULTS FOR PFAS COMPOUNDS

WASHINGTON COLD STORAGE
240 15TH STREET SOUTHEAST
PUYALLUP, WASHINGTON

DRAWN BY: VBACHMANN	CHECKED BY: YP	DATE: 3/9/2023	FARALLON PN: 2636-001

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Sample Location	Sampled By	Sample Date	Analytical Results (micrograms per liter) DRO[1]	ORO[1]	GRO[2]	Benzene[3]
Monitoring Well Groundwater Samples						
B-9	Atlas	9/2/2022	< 94.0	106 C	< 50.0 J	< 0.440
	Farallon	12/27/2022	< 83.3	< 167	< 100	< 0.200
MW-1	Atlas	11/4/2021	**620** P	< 117	< 50.0	3.18
	Atlas	2/9/2022	**4,310** C	< 118	< 50.0	**39.8**
	Atlas	9/2/2022	**4,350** M	< 93.2	288 JL	**14.6**
	Farallon	12/27/2022	298 M X	< 157	266	**5.40**
	Farallon	2/14/2023	193 X	< 151	< 100 J	3.20 J
MW-2	Atlas	11/4/2021	**1,540** M	< 118	166	**28.5**
	Atlas	2/9/2022	**1,930** C	< 119	< 50.0	**50.2**
	Atlas	9/1/2022	141 M	< 93.3	< 50.0	2.40
	Farallon	12/27/2022	91.2 X	< 154	< 100	1.53
	Farallon	2/14/2023	< 76.9	< 154	< 100	0.690
MW-3	Atlas	11/4/2021	288 M	< 115	< 50.0	**12.9**
	Atlas	2/9/2022	249	< 119	< 50.0	4.49
	Atlas	9/1/2022	< 92.5	238 C	< 50.0	0.479
	Farallon	12/28/2022	< 76.9	159 X	< 100	< 0.200
	Farallon	2/13/2023	104	< 151	< 100	< 0.200
MW-4	Atlas	11/4/2021	**1,130**	< 108	< 50.0	1.13
	Atlas	2/9/2022	294	< 119	< 50.0	< 0.440
	Atlas	9/1/2022	< 93.3	214 C	< 50.0 J	< 0.440
	Farallon	1/4/2023	< 80.0	< 160	< 100	< 0.200
	Farallon	2/13/2023	< 75.5	< 151	< 100	< 0.200
MW-5	Atlas	11/4/2021	230 P	< 117	< 50.0	1.18
	Atlas	2/9/2022	< 122	< 122	< 50.0	< 0.440
	Atlas	9/1/2022	< 94.2	< 94.2	< 50.0	< 0.440
	Farallon	12/28/2022	< 80.0	< 160	< 100	< 0.200
	Farallon	2/13/2023	< 75.5	< 151	< 100	< 0.200
MW-6	Atlas	11/15/2021	267 G	< 99.3	< 50.0	2.90
	Atlas	2/9/2022	< 118	< 118	< 50.0	1.05
	Atlas	9/1/2022	< 93.8	171 C	< 50.0	1.01
	Farallon	12/28/2022	< 80.8	< 162	< 100	0.340
	Farallon	2/13/2023	< 75.5	< 151	< 100	< 0.200
MW-7	Atlas	11/15/2021	**4,620** M	< 98.9	**1,440**	**120**
	Atlas	2/9/2022	**7,210** C	< 119	< 50.0	**76.4**
	Atlas	9/2/2022	< 94.0	106 C	< 50.0 J	< 0.440
	Farallon	1/4/2023	311 M X	< 160	213	**21.1**
	Farallon	2/14/2023	335 X	< 157	159	**13.7**
FMW-08	Farallon	2/14/2023	< 75.5	< 151	< 100	0.340
FMW-09	Farallon	2/14/2023	387 M X	< 151	< 100 J	**6.64** J
FMW-10	Farallon	2/14/2023	114 N X	177 Q	< 100 J	0.260 J
FMW-11	Farallon	2/13/2023	< 76.9	< 154	< 100	< 0.200
FMW-12	Farallon	2/14/2023	< 75.5	< 151	< 100	< 0.200
FMW-13	Farallon	2/13/2023	< 76.9	< 154	< 100	1.38
MTCA Method A Cleanup Level for Groundwater[4]			**500**	**500**	**800/1,000[5]**	**5**

Sample Location	Sampled By	Sample Date	Analytical Results (micrograms per liter) DRO[1]	ORO[1]	GRO[2]	Benzene[3]
Reconnaissance Boring Groundwater Samples						
A-1	Atlas	9/24/2021	< 247*	< 495*	< 247*	< 0.440
A-2	Atlas	9/24/2021	< 248*	< 497*	< 248*	< 0.440
A-4	Atlas	9/23/2021	< 248*	< 496*	< 248*	< 0.440
A-5	Atlas	9/24/2021	**3,050** P	< 98.7	157	**31.7**
A-6	Atlas	9/24/2021	< 246*	< 491*	< 246*	< 0.440
A-7	Atlas	9/24/2021	**1,680**	< 100	< 250*	< 0.440
A-10	Atlas	9/23/2021	**1,500** M	445	396	**62.3**
A-12	Atlas	9/23/2021	< 249*	< 498*	< 249*	< 0.440
A-13	Atlas	9/23/2021	< 248*	< 496*	< 248*	< 0.440
A-14	Atlas	9/23/2021	< 250*	< 499*	< 250*	---
A-15	Atlas	11/3/2021	**1,510** M	< 99.4	402	**47.2**
A-16	Atlas	11/3/2021	< 98.4	< 98.4	< 50.0	< 0.440
A-17	Atlas	11/2/2021	< 99.5	125	< 50.0	< 0.440
A-18	Atlas	11/2/2021	< 99.7	185	< 50.0	< 0.440
A-19	Atlas	11/2/2021	< 99.0	364	< 50.0	< 0.440
A-20	Atlas	11/2/2021	**828** M	< 98.9	64.4	**18.8**
A-21	Atlas	11/2/2021	**3,270** M	< 99.4	367	**50.0**
A-22	Atlas	11/2/2021	**4,510** M	< 98.7	761	**137**
A-23	Atlas	11/13/2021	**4,050** M	< 98.5	350	**41.2**
A-24	Atlas	11/13/2021	**650** C	< 99.2	< 50.0	< 0.440
A-25	Atlas	11/13/2021	< 103	< 103	< 50.0	< 0.440
A-26	Atlas	11/13/2021	< 98.6	< 98.6	< 50.0	< 0.440
A-27	Atlas	3/7/2022	496 M	< 119	< 50.0	< 0.440
A-28	Atlas	3/7/2022	245 M	258	< 50.0	2.28
A-29	Atlas	3/7/2022	< 116	**962**	< 50.0	1.92
A-30	Atlas	3/7/2022	< 122	231	< 50.0	0.710
A-31	Atlas	3/7/2022	**937** M	< 118	92.4	**14.3**
A-32	Atlas	3/7/2022	**975** M	< 120	243	**51.1**
A-33	Atlas	3/7/2022	**1,650** M	< 119	86.1	**16.3**
A-34	Atlas	3/7/2022	261 M	206	< 50.0	**8.59**
A-35	Atlas	3/8/2022	**1,290** M	< 122	197	**28.0**
A-36	Atlas	3/8/2022	< 120	259	< 50.0	< 0.440
A-37	Atlas	3/8/2022	< 118	178	< 50.0	< 0.440
A-38	Atlas	3/8/2022	< 120	**700**	< 50.0	< 0.440
A-39	Atlas	3/7/2022	< 122	191	< 50.0	1.07

NOTES:

Results in **bold** and highlighted yellow denote concentrations above applicable cleanup levels.

--- denotes sample not analyzed or chromatographic pattern not quantified as listed analyte.

< denotes analyte not detected at or above the reporting limit listed.

* denotes analyzed by Northwest Method NWTPH-HCID

[1]Analyzed by Northwest Method NWTPH-Dx unless otherwise noted.

[2]Analyzed by Northwest Method NWTPH-Gx unless otherwise noted.

[3]Analyzed by U.S. Environmental Protection Agency Method 8260D.

[4]Washington State Model Toxics Control Act Cleanup Regulation Method A Cleanup Levels for Groundwater, Table 720-1 of Section 900 of Chapter 173-340 of the Washington Administrative Code, as amended 2013.

[5]Cleanup level is 800 micrograms per liter if benzene is detected and 1,000 micrograms per liter if benzene is not detected.

Atlas = Atlas Technical Consultants, LLC

BTEX = benzene, toluene, ethylbenzene, and xylenes

C = chromatographic pattern indicates unresolved compound(s), or an unresolved complex mixture in the range

DRO = total petroleum hydrocarbons (TPH) as diesel-range organics

G = chromatographic pattern resembles weathered gasoline-range material

GRO = TPH as gasoline-range organics

J = result is an estimate

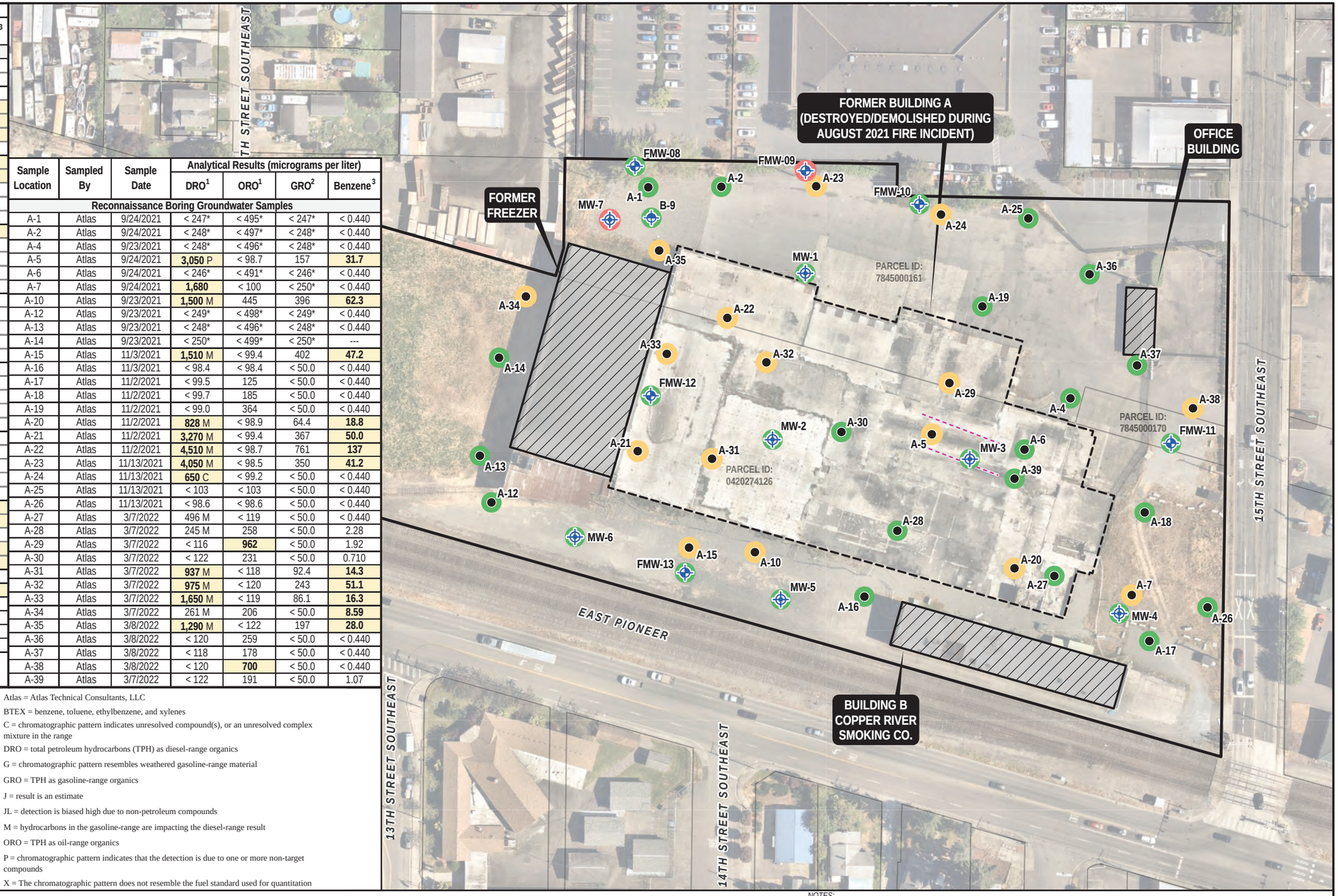
JL = detection is biased high due to non-petroleum compounds

M = hydrocarbons in the gasoline-range are impacting the diesel-range result

ORO = TPH as oil-range organics

P = chromatographic pattern indicates that the detection is due to one or more non-target compounds

X = The chromatographic pattern does not resemble the fuel standard used for quantitation



LEGEND

- INDICATES TPH AND BENZENE WERE NOT DETECTED AT CONCENTRATIONS EXCEEDING MTCA CLEANUP LEVELS IN GROUNDWATER
- INDICATES ONE OR MORE MTCA EXCEEDANCES OF TPH AND/OR BENZENE IN GROUNDWATER
- BORING (ATLAS 2021, 2022)
- GEOTECHNICAL WELL (TERRA 2021)
- MONITORING WELL (ATLAS 2021)
- MONITORING WELL (FARALLON 2023)
- INDICATES ONE OR MORE MTCA EXCEEDANCES OF TPH AND/OR BENZENE IN RECONNAISSANCE GROUNDWATER
- FORMER BUILDING
- APPROXIMATE PROPERTY BOUNDARY
- PIERCE COUNTY PARCEL BOUNDARIES
- MTCA = MODEL TOXICS CONTROL ACT
- FORMER TRENCH DRAINS
- EXISTING BUILDING

100 50 0 100

APPROXIMATE SCALE IN FEET

N

NOTES:

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FIGURE 7

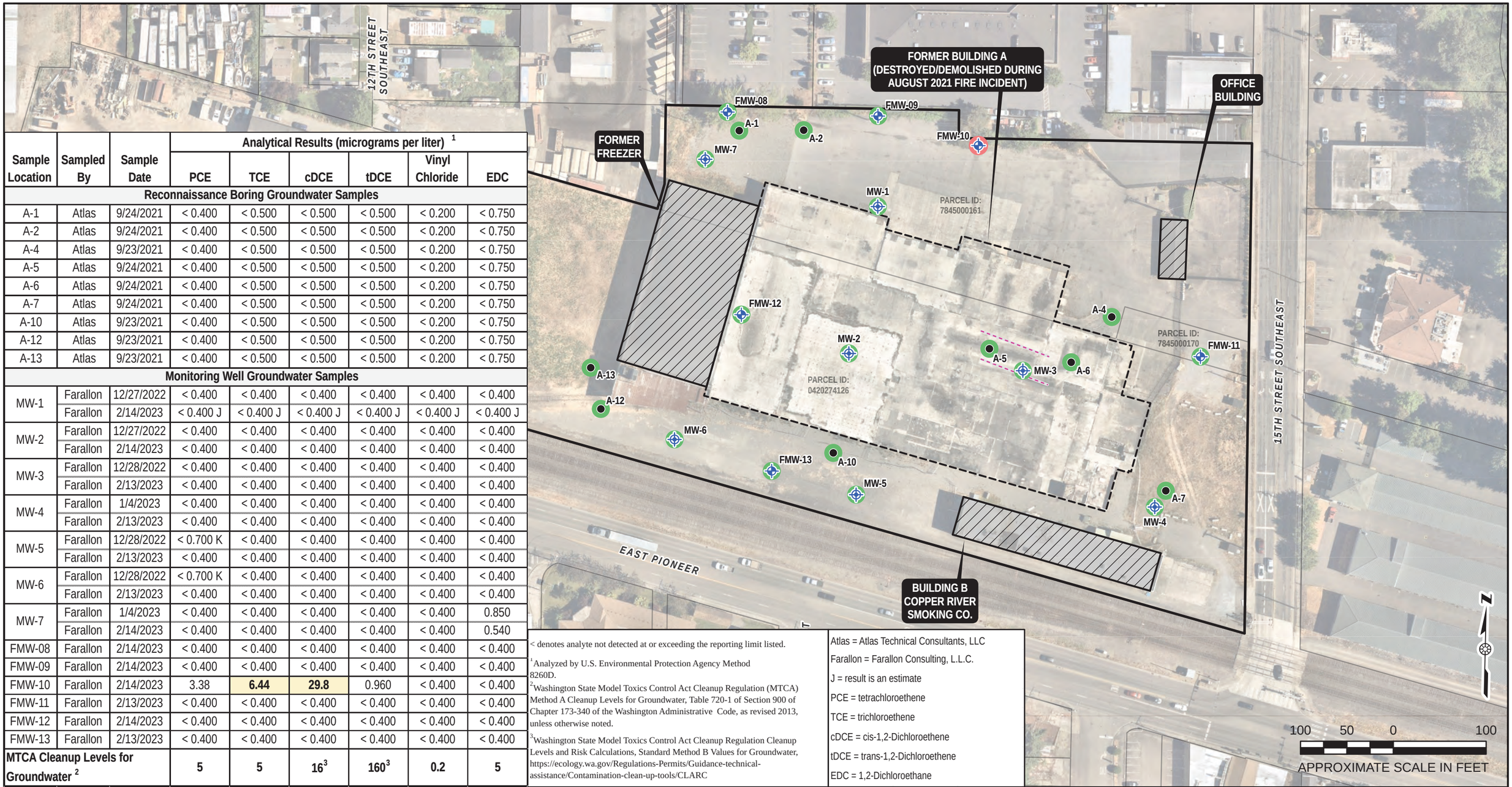
GROUNDWATER ANALYTICAL RESULTS FOR PETROLEUM HYDROCARBONS AND BENZENE

WASHINGTON COLD STORAGE
240 15TH STREET SOUTHEAST
PUYALLUP, WASHINGTON

DRAWN BY: VBACHMANN	CHECKED BY: YP	DATE: 3/30/2023	FARALLON PN: 2636-001

Path: Q:\Projects\2636 Fortress Entities\001 Fmr Wa Cold Storage Bldg\ArcPro\2636-001\2636-001\MapFiles\2023_Q1\2636-001_Fig07_TPH_Benz_GW_Analytical.aprx

Sample Location	Sampled By	Sample Date	Analytical Results (micrograms per liter) [1]					
			PCE	TCE	cDCE	tDCE	Vinyl Chloride	EDC
Reconnaissance Boring Groundwater Samples								
A-1	Atlas	9/24/2021	< 0.400	< 0.500	< 0.500	< 0.500	< 0.200	< 0.750
A-2	Atlas	9/24/2021	< 0.400	< 0.500	< 0.500	< 0.500	< 0.200	< 0.750
A-4	Atlas	9/23/2021	< 0.400	< 0.500	< 0.500	< 0.500	< 0.200	< 0.750
A-5	Atlas	9/24/2021	< 0.400	< 0.500	< 0.500	< 0.500	< 0.200	< 0.750
A-6	Atlas	9/24/2021	< 0.400	< 0.500	< 0.500	< 0.500	< 0.200	< 0.750
A-7	Atlas	9/24/2021	< 0.400	< 0.500	< 0.500	< 0.500	< 0.200	< 0.750
A-10	Atlas	9/23/2021	< 0.400	< 0.500	< 0.500	< 0.500	< 0.200	< 0.750
A-12	Atlas	9/23/2021	< 0.400	< 0.500	< 0.500	< 0.500	< 0.200	< 0.750
A-13	Atlas	9/23/2021	< 0.400	< 0.500	< 0.500	< 0.500	< 0.200	< 0.750
Monitoring Well Groundwater Samples								
MW-1	Farallon	12/27/2022	< 0.400	< 0.400	< 0.400	< 0.400	< 0.400	< 0.400
	Farallon	2/14/2023	< 0.400 J	< 0.400 J	< 0.400 J	< 0.400 J	< 0.400 J	< 0.400 J
MW-2	Farallon	12/27/2022	< 0.400	< 0.400	< 0.400	< 0.400	< 0.400	< 0.400
	Farallon	2/14/2023	< 0.400	< 0.400	< 0.400	< 0.400	< 0.400	< 0.400
MW-3	Farallon	12/28/2022	< 0.400	< 0.400	< 0.400	< 0.400	< 0.400	< 0.400
	Farallon	2/13/2023	< 0.400	< 0.400	< 0.400	< 0.400	< 0.400	< 0.400
MW-4	Farallon	1/4/2023	< 0.400	< 0.400	< 0.400	< 0.400	< 0.400	< 0.400
	Farallon	2/13/2023	< 0.400	< 0.400	< 0.400	< 0.400	< 0.400	< 0.400
MW-5	Farallon	12/28/2022	< 0.700 K	< 0.400	< 0.400	< 0.400	< 0.400	< 0.400
	Farallon	2/13/2023	< 0.400	< 0.400	< 0.400	< 0.400	< 0.400	< 0.400
MW-6	Farallon	12/28/2022	< 0.700 K	< 0.400	< 0.400	< 0.400	< 0.400	< 0.400
	Farallon	2/13/2023	< 0.400	< 0.400	< 0.400	< 0.400	< 0.400	< 0.400
MW-7	Farallon	1/4/2023	< 0.400	< 0.400	< 0.400	< 0.400	< 0.400	0.850
	Farallon	2/14/2023	< 0.400	< 0.400	< 0.400	< 0.400	< 0.400	0.540
FMW-08	Farallon	2/14/2023	< 0.400	< 0.400	< 0.400	< 0.400	< 0.400	< 0.400
FMW-09	Farallon	2/14/2023	< 0.400	< 0.400	< 0.400	< 0.400	< 0.400	< 0.400
FMW-10	Farallon	2/14/2023	3.38	**6.44**	**29.8**	0.960	< 0.400	< 0.400
FMW-11	Farallon	2/13/2023	< 0.400	< 0.400	< 0.400	< 0.400	< 0.400	< 0.400
FMW-12	Farallon	2/14/2023	< 0.400	< 0.400	< 0.400	< 0.400	< 0.400	< 0.400
FMW-13	Farallon	2/13/2023	< 0.400	< 0.400	< 0.400	< 0.400	< 0.400	< 0.400
MTCA Cleanup Levels for Groundwater [2]			**5**	**5**	**16[3]**	**160[3]**	**0.2**	**5**



< denotes analyte not detected at or exceeding the reporting limit listed.

[1]Analyzed by U.S. Environmental Protection Agency Method 8260D.

[2]Washington State Model Toxics Control Act Cleanup Regulation (MTCA) Method A Cleanup Levels for Groundwater, Table 720-1 of Section 900 of Chapter 173-340 of the Washington Administrative Code, as revised 2013, unless otherwise noted.

[3]Washington State Model Toxics Control Act Cleanup Regulation Cleanup Levels and Risk Calculations, Standard Method B Values for Groundwater, https://ecology.wa.gov/Regulations-Permits/Guidance-technical-assistance/Contamination-clean-up-tools/CLARC

Atlas = Atlas Technical Consultants, LLC

Farallon = Farallon Consulting, L.L.C.

J = result is an estimate

PCE = tetrachloroethene

TCE = trichloroethene

cDCE = cis-1,2-Dichloroethene

tDCE = trans-1,2-Dichloroethane

EDC = 1,2-Dichloroethane

LEGEND

- BORING (ATLAS 2021, 2022)
- MONITORING WELL (ATLAS 2021)
- MONITORING (FARALLON 2023)
- INDICATES HVOCs WERE NOT DETECTED AT CONCENTRATIONS EXCEEDING MTCA CLEANUP LEVELS IN GROUNDWATER
- INDICATES ONE OR MORE HVOCs WERE DETECTED AT CONCENTRATIONS EXCEEDING MTCA CLEANUP LEVELS IN GROUNDWATER
- FORMER BUILDING
- APPROXIMATE SUBJECT PROPERTY BOUNDARY
- PIERCE COUNTY PARCEL BOUNDARIES
- FORMER TRENCH DRAINS
- EXISTING BUILDING

HVOCs = HALOGENATED VOLATILE ORGANIC COMPOUNDS

AERIAL IMAGERY: NEARMAP, 7/20/2022

NOTES:

1. ALL LOCATIONS ARE APPROXIMATE.

2. FIGURES WERE PRODUCED IN COLOR. GRAYSCALE COPIES MAY NOT REPRODUCE ALL ORIGINAL INFORMATION.

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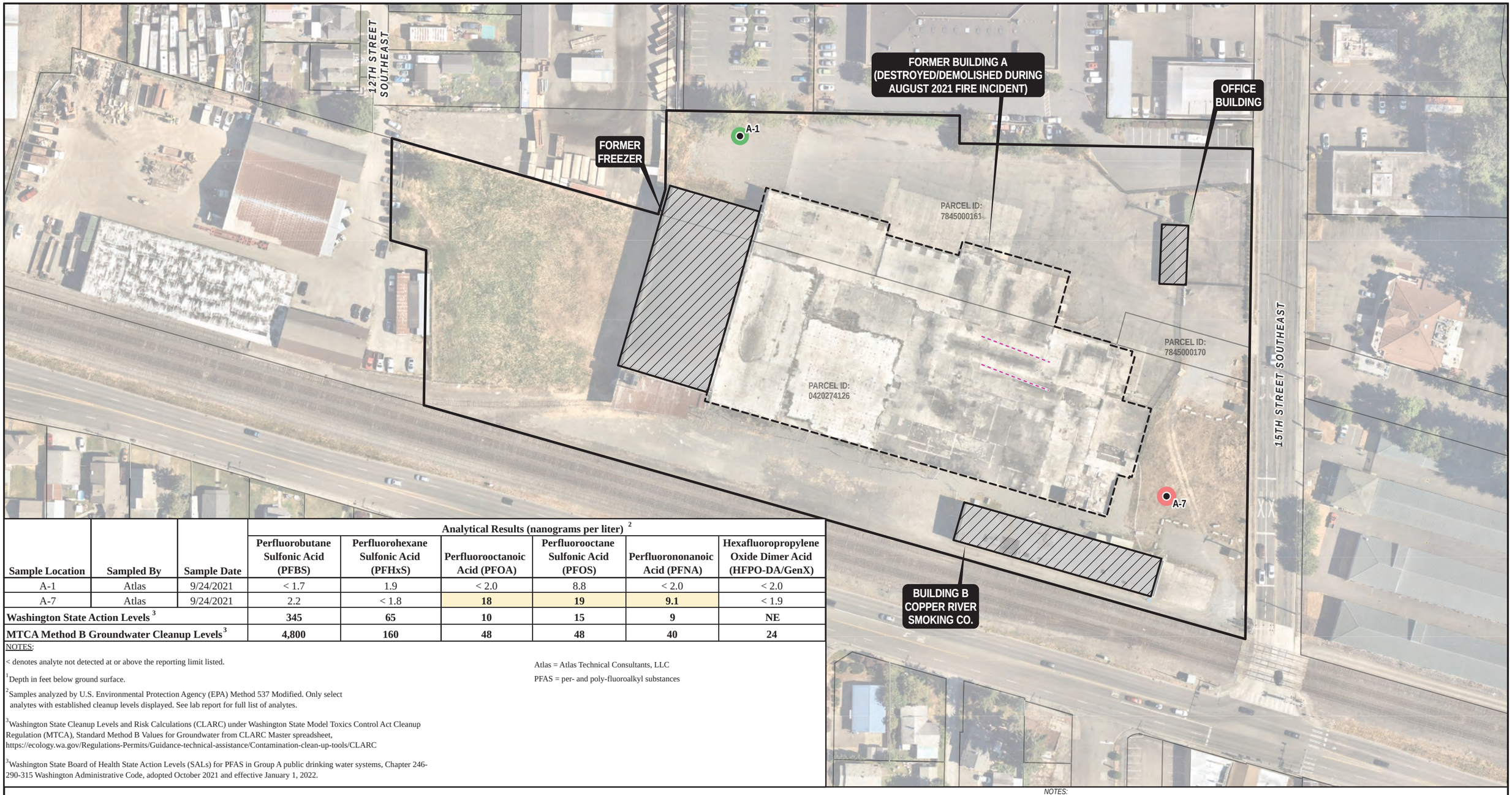
FIGURE 8

GROUNDWATER ANALYTICAL RESULTS FOR HALOGENATED VOCs

WASHINGTON COLD STORAGE
240 15TH STREET SOUTHEAST
PUYALLUP, WASHINGTON

DRAWN BY: VBACHMANN	CHECKED BY: YP	DATE: 3/10/2023	FARALLON PN: 2636-001

Path: Q:\Projects\2636 Fortress Entities\001 Fmr Wa Cold Storage Bldg\ArcPro\2636-001\2636-001\MapFiles\2023_Q1\2636-001_Fig08_VOCs_GW_Analytical.aprx



Sample Location	Sampled By	Sample Date	Analytical Results (nanograms per liter) [2] Perfluorobutane Sulfonic Acid (PFBS)	Perfluorohexane Sulfonic Acid (PFHxS)	Perfluorooctanoic Acid (PFOA)	Perfluorooctane Sulfonic Acid (PFOS)	Perfluorononanoic Acid (PFNA)	Hexafluoropropylene Oxide Dimer Acid (HFPO-DA/GenX)
A-1	Atlas	9/24/2021	< 1.7	1.9	< 2.0	8.8	< 2.0	< 2.0
A-7	Atlas	9/24/2021	2.2	< 1.8	**18**	**19**	**9.1**	< 1.9
Washington State Action Levels [3]			**345**	**65**	**10**	**15**	**9**	**NE**
MTCA Method B Groundwater Cleanup Levels [3]			**4,800**	**160**	**48**	**48**	**40**	**24**

NOTES:

< denotes analyte not detected at or above the reporting limit listed.

[1]Depth in feet below ground surface.

[2]Samples analyzed by U.S. Environmental Protection Agency (EPA) Method 537 Modified. Only select analytes with established cleanup levels displayed. See lab report for full list of analytes.

[3]Washington State Cleanup Levels and Risk Calculations (CLARC) under Washington State Model Toxics Control Act Cleanup Regulation (MTCA), Standard Method B Values for Groundwater from CLARC Master spreadsheet, https://ecology.wa.gov/Regulations-Permits/Guidance-technical-assistance/Contamination-clean-up-tools/CLARC

[3]Washington State Board of Health State Action Levels (SALs) for PFAS in Group A public drinking water systems, Chapter 246-290-315 Washington Administrative Code, adopted October 2021 and effective January 1, 2022.

Atlas = Atlas Technical Consultants, LLC

PFAS = per- and poly-fluoroalkyl substances

LEGEND

- BORING (ATLAS 2021, 2022)
- INDICATES PFAS COMPOUNDS WERE NOT DETECTED AT CONCENTRATIONS EXCEEDING MTCA CLEANUP LEVELS IN GROUNDWATER
- INDICATES ONE OR MORE MTCA EXCEEDANCES OF PFAS COMPOUNDS IN GROUNDWATER
- FORMER TRENCH DRAINS
- EXISTING BUILDING
- FORMER BUILDING
- APPROXIMATE PROPERTY BOUNDARY
- PIERCE COUNTY PARCEL BOUNDARIES

AERIAL IMAGERY: NEARMAP, 7/20/2022

100 50 0 100

APPROXIMATE SCALE IN FEET

N

NOTES:

1. ALL LOCATIONS ARE APPROXIMATE.

2. FIGURES WERE PRODUCED IN COLOR. GRAYSCALE COPIES MAY NOT REPRODUCE ALL ORIGINAL INFORMATION.

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FIGURE 9

GROUNDWATER ANALYTICAL RESULTS FOR PFAS COMPOUNDS

WASHINGTON COLD STORAGE
240 15TH STREET SOUTHEAST
PUYALLUP, WASHINGTON

DRAWN BY: VBACHMANN	CHECKED BY: YP	DATE: 3/9/2023	FARALLON PN: 2636-001

Path: Q:\Projects\2636 Fortress Entities\001 Fmr Wa Cold Storage Bldg\ArcPro\2636-001\2636-001\MapFiles\2023_Q1\2636-001_Fig09_PFAS_GW_Analytical.aprx

Table 1
Groundwater Elevations
Former Washington Cold Storage Building
Puyallup, Washington
Farallon PN: 2636-001

Location	Top of Casing Elevation (feet NAVD88)[1]	Well Screen Interval (feet bgs)	Measured By	Monitoring Date	Depth to Water (feet)[2]	Water Level Elevation (feet NAVD88)[1]
MW-1	55.251	5 to 20	Atlas	11/9/2021	5.23	50.02
			Atlas	2/9/2022	3.99	51.26
			Atlas	9/1/2022	5.70	49.55
			Atlas	9/22/2022	4.93	50.32
			Atlas	12/27/2022	5.14	50.11
			Farallon	1/4/2023	4.76	50.49
			Farallon	2/13/2023	4.86	50.39
MW-2	60.410	5 to 20	Atlas	11/9/2021	1.03	59.38
			Atlas	2/9/2022	8.27	52.14
			Atlas	9/1/2022	10.60	49.81
			Atlas	9/22/2022	9.56	50.85
			Atlas	12/27/2022	9.24	51.17
			Farallon	1/4/2023	8.85	51.56
			Farallon	2/13/2023	9.26	51.15
MW-3	59.304	5 to 20	Atlas	11/9/2021	8.57	50.73
			Atlas	2/9/2022	7.30	52.00
			Atlas	9/1/2022	9.42	49.88
			Atlas	9/22/2022	9.82	49.48
			Atlas	12/27/2022	8.52	50.78
			Farallon	1/4/2023	8.08	51.22
			Farallon	2/13/2023	8.50	50.80
MW-4	55.999	5 to 20	Atlas	11/9/2021	4.87	51.13
			Atlas	2/9/2022	3.71	52.29
			Atlas	9/1/2022	5.96	50.04
			Atlas	9/22/2022	6.41	49.59
			Farallon	1/4/2023	4.40	51.60
			Farallon	2/13/2023	4.68	51.32
MW-5	55.932	5 to 20	Atlas	11/9/2021	4.51	51.42
			Atlas	2/9/2022	3.34	52.59
			Atlas	9/1/2022	7.87	48.06
			Atlas	9/22/2022	6.21	49.72
			Atlas	12/27/2022	4.59	51.34
			Farallon	1/4/2023	3.92	52.01
			Farallon	2/13/2023	4.35	51.58
MW-6	55.027	4 to 12	Atlas	11/22/2021	2.52	52.51
			Atlas	2/9/2022	2.95	52.08
			Atlas	9/1/2022	5.31	49.72
			Atlas	9/22/2022	7.33	47.70
			Atlas	12/27/2022	3.44	51.59
			Farallon	1/4/2023	3.15	51.88
			Farallon	2/13/2023	3.72	51.31

Table 1
Groundwater Elevations
Former Washington Cold Storage Building
Puyallup, Washington
Farallon PN: 2636-001

Location	Top of Casing Elevation (feet NAVD88)[1]	Well Screen Interval (feet bgs)	Measured By	Monitoring Date	Depth to Water (feet)[2]	Water Level Elevation (feet NAVD88)[1]
MW-7	54.127	4 to 13	Atlas	11/22/2021	1.71	52.42
			Atlas	2/9/2022	3.12	51.01
			Atlas	9/1/2022	6.97	47.16
			Atlas	9/22/2022	7.88	46.25
			Farallon	1/4/2023	3.46	50.67
			Farallon	2/13/2023	3.76	50.37
FMW-08	53.82	3 to 13	Farallon	2/13/2023	4.38	49.44
FMW-09	54.54	3 to 13	Farallon	2/13/2023	5.36	49.18
FMW-10	54.32	3 to 13	Farallon	2/13/2023	5.30	49.02
FMW-11	56.77	3 to 13	Farallon	2/13/2023	6.47	50.30
FMW-12	59.10	5 to 15	Farallon	2/13/2023	8.43	50.67
FMW-13	55.91	3 to 13	Farallon	2/13/2023	4.59	51.32
B-8	NA	20 to 30	Farallon	2/13/2023	8.41	NA
B-9	NA	20 to 30	Farallon	12/27/2022	6.28	NA
			Farallon	2/13/2023	6.61	NA

Notes:

[1] In feet referenced to North American Vertical Datum of 1988 (NAVD88).

[2] In feet below top of well casing.

Atlas = Atlas Technical Consultants, LLC
bgs = below ground surface
Farallon = Farallon Consulting, LLC
NA = not applicable

Table 2
Soil Analytical Results for TPH and BTEX
Former Washington Cold Storage Building
Puyallup, Washington
Farallon PN: 2636-001

Sample Location	Sampled By	Sample Identification	Sample Depth (feet)[1]	Sample Date	Analytical Results (milligrams per kilogram)							
					DRO[2]	ORO[2]	GRO[3]	Benzene[4]	Toluene[4]	Ethylbenzene[4]	Xylenes[4]	Naphthalene
A-1	Atlas	A1-0.5'	0.5	9/24/2021	< 48.2*	< 96.5*	< 28.9*	< 0.0219	< 0.0328	< 0.0273	< 0.0819	< 0.109
A-2	Atlas	A2-0.5'	0.5	9/24/2021	< 560	**26,100**	< 336*	< 0.0361	< 0.0542	< 0.0451	< 0.1354	< 0.181
A-4	Atlas	A4-0.5'	0.5	9/23/2021	< 53.4*	< 107*	< 32.0*	< 0.0266	< 0.0400	< 0.0333	< 0.0999	< 0.133
A-5	Atlas	A5-6'	6.0	9/24/2021	< 52.8*	< 106*	< 31.7*	< 0.0289	< 0.0433	< 0.0361	< 0.1083	< 0.144
A-6	Atlas	A6-0.5'	0.5	9/23/2021	< 48.0*	< 96.0*	< 28.8*	< 0.0209	< 0.0313	< 0.0261	< 0.0783	< 0.104
A-7	Atlas	A7-0.5'	0.5	9/24/2021	< 52.0*	< 104*	< 31.2*	< 0.0250	< 0.0376	< 0.0313	< 0.0939	< 0.125
A-10	Atlas	A10-5'	5.0	9/23/2021	< 54.3*	< 109*	< 32.6*	< 0.0266	< 0.0399	< 0.0332	< 0.0997	< 0.133
A-12	Atlas	A12-1'	1.0	9/23/2021	< 55.1*	< 110*	< 33.0*	< 0.0297	< 0.0446	< 0.0371	< 0.1114	< 0.149
A-13	Atlas	A13-5'	5.0	9/23/2021	< 52.4*	< 105*	< 31.5*	< 0.0293	< 0.0440	< 0.0367	< 0.110	< 0.147
A-15	Atlas	A15-4'	4.0	11/3/2021	< 57.7	< 115	< 7.26	< 0.0291	< 0.0436	< 0.0363	< 0.1089	---
A-16	Atlas	A16-3'	3.0	11/3/2021	< 61.1	< 122	< 6.72	< 0.0269	< 0.0403	< 0.0336	< 0.1008	---
A-17	Atlas	A17-5.5'	5.5	11/2/2021	< 54.3	484	< 5.00	< 0.0200	< 0.0300	< 0.0250	< 0.0750	---
A-18	Atlas	A18-4.5'	4.5	11/2/2021	< 60.6	260	< 6.49	< 0.0259	< 0.0389	< 0.0324	< 0.0973	---
A-19	Atlas	A19-1'	1.0	11/2/2021	< 67.4	618	24.2 C	< 0.0337	0.0955	< 0.0421	< 0.1264	---
	Atlas	A19-6'	6.0	11/2/2021	< 53.8	1,470	< 6.39	< 0.0256	< 0.0383	< 0.0319	< 0.0958	---
A-20	Atlas	A20-1'	1.0	11/2/2021	< 46.1	< 92.2	< 6.43	< 0.0257	< 0.0386	< 0.0322	< 0.0965	---
A-21	Atlas	A21-1'	1.0	11/2/2021	< 48.1	< 96.3	7.23 C	< 0.0225	< 0.0337	< 0.0281	< 0.0842	---
	Atlas	A21-8'	8.0	11/2/2021	< 48.8	< 97.7	< 6.94	< 0.0277	< 0.0416	< 0.0347	< 0.1041	---
A-22	Atlas	A22-1'	1.0	11/2/2021	< 47.7	< 95.4	19.5 P	**0.0760**	0.127	< 0.0325	< 0.0974	---
	Atlas	A22-8'	8.0	11/2/2021	< 66.0	< 132	< 6.53	**0.0547**	< 0.0392	< 0.0326	< 0.0979	---
A-23	Atlas	A23-0.5'	0.5	11/13/2021	< 45.9	738	29.2 P	< 0.0297	< 0.0445	< 0.0371	< 0.1113	---
	Atlas	A23-2'	2.0	11/13/2021	< 54.0	< 108	< 7.43	< 0.0297	< 0.0446	< 0.0371	< 0.1114	---
	Atlas	A23-4'	4.0	11/13/2021	< 50.6	< 101	14.7 P	< 0.0294	< 0.0441	< 0.0368	< 0.1103	---
A-27	Atlas	A27-2.5'	2.5	3/7/2022	< 60.0	< 120	< 5.43	< 0.0217	< 0.0326	< 0.0272	< 0.0815	---
	Atlas	A27-7'	7.0	3/7/2022	< 63.0	< 126	< 5.39	< 0.0216	< 0.0324	< 0.0270	< 0.0809	---
A-28	Atlas	A28-3'	3.0	3/7/2022	< 65.4	< 131	< 5.53	< 0.0221	0.0441	< 0.0276	0.1287	---
	Atlas	A28-6'	6.0	3/7/2022	< 58.7	< 117	< 5.14	< 0.0205	0.0369	< 0.0257	0.1105	---
A-29	Atlas	A29-2'	2.0	3/7/2022	< 60.9	339	< 6.82	< 0.0273	< 0.0409	< 0.0341	0.0929	---
	Atlas	A29-6'	6.0	3/7/2022	< 50.4	< 101	< 5.04	< 0.0201	< 0.0302	< 0.0252	0.0639	---
A-30	Atlas	A30-2'	2.0	3/7/2022	< 59.3	< 119	< 4.88	< 0.0195	< 0.0293	< 0.0244	0.0543	---
	Atlas	A30-6'	6.0	3/7/2022	< 56.7	< 113	13.2 P	< 0.0226	< 0.0339	< 0.0283	< 0.0849	---
A-31	Atlas	A31-2'	2.0	3/7/2022	< 58.6	< 117	< 5.47	< 0.0219	0.0750	0.0295	0.1812	---
	Atlas	A31-7'	7.0	3/7/2022	< 61.4	< 123	< 4.43	< 0.0177	0.0418	< 0.0222	0.1175	---
A-32	Atlas	A32-2'	2.0	3/7/2022	< 57.6	< 115	< 5.46	< 0.0218	< 0.0328	< 0.0273	< 0.0819	---
A-33	Atlas	A33-1'	1.0	3/7/2022	< 51.7	< 103	< 7.02	< 0.0281	0.128	0.0452	0.3123	---
	Atlas	A33-7'	7.0	3/7/2022	< 59.9	< 120	< 6.27	< 0.0251	0.0945	0.0355	0.2471	---
MTCA Method A Cleanup Levels for Soil[5]					**2,000**	**2,000**	**30/100[6]**	**0.03**	**7**	**6**	**9**	**5**

Table 2
Soil Analytical Results for TPH and BTEX
Former Washington Cold Storage Building
Puyallup, Washington
Farallon PN: 2636-001

Sample Location	Sampled By	Sample Identification	Sample Depth (feet)[1]	Sample Date	Analytical Results (milligrams per kilogram)							
					DRO[2]	ORO[2]	GRO[3]	Benzene[4]	Toluene[4]	Ethylbenzene[4]	Xylenes[4]	Naphthalene
A-34	Atlas	A34-1.5'	1.5	3/7/2022	< 58.8	< 118	< 4.49	< 0.0180	0.0489	< 0.0225	0.0487	---
	Atlas	A34-3'	3.0	3/7/2022	< 60.1	< 120	< 6.04	< 0.0242	< 0.0363	< 0.0302	< 0.0906	---
	Atlas	A34-14'	14.0	3/7/2022	< 58.4	< 117	< 5.75	< 0.0230	< 0.0345	< 0.0287	< 0.0862	---
A-35	Atlas	A35-1.5'	1.5	3/8/2022	< 67.0	< 134	< 6.08	< 0.0243	< 0.0365	< 0.0304	< 0.0912	---
	Atlas	A35-7'	7.0	3/8/2022	< 58.6	< 117	< 5.26	< 0.0210	< 0.0316	< 0.0263	< 0.0789	---
	Atlas	A35-14'	14.0	3/8/2022	< 60.6	< 121	< 5.84	< 0.0234	< 0.0350	< 0.0292	< 0.0876	---
A-36	Atlas	A36-1'	1.0	3/8/2022	< 62.5	< 125	< 5.59	< 0.0224	< 0.0335	< 0.0280	< 0.0839	---
	Atlas	A36-6'	6.0	3/8/2022	< 53.8	< 242	24.7 P	< 0.0182	< 0.0273	< 0.0228	< 0.0683	---
A-37	Atlas	A37-1'	1.0	3/8/2022	< 57.8	< 116	< 5.42	< 0.0217	< 0.0325	< 0.0271	< 0.0813	---
	Atlas	A37-5'	5.0	3/8/2022	< 55.6	< 111	< 4.54	< 0.0181	< 0.0272	< 0.0227	< 0.0681	---
A-38	Atlas	A38-1.5'	1.5	3/8/2022	< 57.5	438	< 5.26	< 0.0211	< 0.0316	< 0.0263	< 0.0789	---
	Atlas	A38-5'	5.0	3/8/2022	< 55.9	178	< 4.54	< 0.0182	< 0.0273	< 0.0227	< 0.0681	---
A-39	Atlas	A39-2'	2.0	3/7/2022	< 53.1	< 106	< 4.75	< 0.0190	< 0.0285	< 0.0238	< 0.0713	---
	Atlas	A39-6'	6.0	3/7/2022	< 57.2	< 114	< 5.26	< 0.0210	< 0.0316	< 0.0263	< 0.0789	---
MW-1	Atlas	MW1-0.5'	0.5	11/2/2021	< 58.3	< 117	< 7.45	< 0.0298	< 0.0447	< 0.0373	< 0.0118	---
MW-2	Atlas	MW2-7'	7.0	11/2/2021	< 61.4	< 123	< 7.20	< 0.0288	< 0.0432	< 0.0360	< 0.1080	---
MW-3	Atlas	MW3-1'	1.0	11/2/2021	< 45.2	< 90.3	< 5.97	< 0.0239	< 0.0358	< 0.0298	< 0.0895	---
MW-4	Atlas	MW4-0.5'	0.5	11/2/2021	< 53.7	23.4 J	< 11.5	< 0.0459	< 0.0689	< 0.0574	< 0.1724	---
MW-5	Atlas	MW5-4'	4.0	11/3/2021	< 57.5	< 115	< 6.77	< 0.0271	< 0.0406	< 0.0338	< 0.1015	---
HA-1	Atlas	HA1-0.5'	0.5	11/3/2021	< 65.9	223	< 8.10	< 0.0324	< 0.0486	< 0.0405	< 0.1215	---
2023 Subsurface Investigation												
FB-01	Farallon	FB-01-3.0	3.0	2/7/2023	23.6 X	< 45.0	< 2.51	< 0.00501	< 0.0251	< 0.0125	< 0.0376	< 0.0501
	Farallon	FB-01-7.0	7.0	2/7/2023	< 23.7	< 47.5	< 3.37	< 0.00673	< 0.0337	< 0.0168	< 0.0505	< 0.0673
FB-02	Farallon	FB-02-7.0	7.0	2/7/2023	< 22.2	< 44.5	< 2.89	< 0.00578	< 0.0289	< 0.0144	< 0.0433	< 0.0578
	Farallon	FB-02-13.0	13.0	2/7/2023	< 24.1	< 48.1	< 3.09	< 0.00618	< 0.0309	< 0.0154	< 0.0463	< 0.0618
FB-03	Farallon	FB-03-7.0	7.0	2/8/2023	< 25.6	< 51.2	< 4.22	0.0207	< 0.0422	< 0.0211	< 0.0634	< 0.0845
	Farallon	FB-03-13.0	13.0	2/8/2023	< 24.3	< 48.6	< 3.63	< 0.00725	< 0.0363	< 0.0181	< 0.0544	< 0.0725
	Farallon	FB-03-17.0	17.0	2/8/2023	< 33.7	< 67.5	< 6.80	< 0.0136	< 0.0680	< 0.0340	< 0.102	< 0.136
	Farallon	FB-03-24.0	24.0	2/8/2023	< 24.1	< 48.2	< 3.68	< 0.00736	< 0.0368	< 0.0184	< 0.0552	< 0.0736
FB-04	Farallon	FB-04-7.0	7.0	2/8/2023	< 26.0	< 51.9	< 4.30	< 0.00860	< 0.0430	< 0.0215	< 0.0645	< 0.0860
	Farallon	FB-04-13.0	13.0	2/8/2023	< 26.1	< 52.2	< 3.99	< 0.00798	< 0.0399	< 0.0200	< 0.0599	< 0.0798
	Farallon	FB-04-17.0	17.0	2/8/2023	< 26.2	< 52.4	< 4.11	< 0.00821	< 0.0411	< 0.0205	< 0.0616	< 0.0821
FB-05	Farallon	FB-05-3.0	3.0	2/8/2023	< 104	417	< 2.56	< 0.00513	< 0.0256	< 0.0128	< 0.0385	< 0.0513
	Farallon	FB-05-7.5	7.5	2/8/2023	< 25.2	< 50.4	< 3.85	< 0.00770	< 0.0385	< 0.0193	< 0.0578	< 0.0770
FB-06	Farallon	FB-06-3.0	3.0	2/8/2023	< 26.1	< 52.2	< 3.99	< 0.00798	< 0.0399	< 0.0199	< 0.0598	< 0.0798
	Farallon	FB-06-7.0	7.0	2/8/2023	< 24.6	< 49.3	< 3.67	< 0.00733	< 0.0367	< 0.0183	< 0.0550	< 0.0733
MTCA Method A Cleanup Levels for Soil[5]					**2,000**	**2,000**	**30/100[6]**	**0.03**	**7**	**6**	**9**	**5**

Table 2
Soil Analytical Results for TPH and BTEX
Former Washington Cold Storage Building
Puyallup, Washington
Farallon PN: 2636-001

Sample Location	Sampled By	Sample Identification	Sample Depth (feet)[1]	Sample Date	Analytical Results (milligrams per kilogram)							
					DRO[2]	ORO[2]	GRO[3]	Benzene[4]	Toluene[4]	Ethylbenzene[4]	Xylenes[4]	Naphthalene
FMW-08	Farallon	FMW-08-3.0	3.0	2/7/2023	< 25.7	80.2 F	< 3.89	< 0.00779	< 0.0389	< 0.0195	< 0.0584	< 0.0779
	Farallon	FMW-08-7.0	7.0	2/7/2023	< 26.6	< 53.1	< 4.53	< 0.00905	< 0.0453	< 0.0226	< 0.0679	< 0.0905
FMW-09	Farallon	FMW-09-3.0	3.0	2/7/2023	< 42.9	368	< 2.67	< 0.00534	< 0.0267	< 0.0133	< 0.0400	< 0.0534
	Farallon	FMW-09-7.0	7.0	2/7/2023	< 23.2	< 46.3	< 3.29	< 0.00659	< 0.0329	< 0.0165	< 0.0494	< 0.0659
	Farallon	FMW-09-13.0	13.0	2/7/2023	< 28.6	66.3 X	< 4.70	< 0.00939	< 0.0470	< 0.0235	< 0.0704	< 0.0939
FMW-10	Farallon	FMW-10-3.0	3.0	2/7/2023	< 23.8	< 47.6	< 3.94	< 0.00787	< 0.0394	< 0.0197	< 0.0590	< 0.0787
	Farallon	FMW-10-7.0	7.0	2/7/2023	< 25.8	< 51.6	< 4.38	< 0.00876	< 0.0438	< 0.0219	< 0.0657	< 0.0876
	Farallon	FMW-10-13.0	13.0	2/7/2023	< 25.4 H	< 50.9 H	< 3.31 H	< 0.00661 H	< 0.0331 H	< 0.0165 H	< 0.0496 H	< 0.0661 H
FMW-11	Farallon	FMW-11-3.0	3.0	2/7/2023	< 21.2	< 42.3	< 1.99	< 0.00398	< 0.0199	< 0.00995	< 0.0298	< 0.0398
	Farallon	FMW-11-7.0	7.0	2/7/2023	< 48.2	122 J	< 3.04	< 0.00609	< 0.0304	< 0.0152	< 0.0457	< 0.0609
FMW-12	Farallon	FMW-12-7.0	7.0	2/8/2023	< 26.7	< 53.5	< 4.32	< 0.00863	< 0.0432	< 0.0216	< 0.0647	< 0.0863
	Farallon	FMW-12-13.0	13.0	2/8/2023	< 25.9	< 51.9	< 4.26	< 0.00853	< 0.0426	< 0.0213	< 0.0640	< 0.0853
FMW-13	Farallon	FMW-13-3.0	3.0	2/7/2023	< 22.6	355	< 3.12	< 0.00623	< 0.0312	< 0.0156	< 0.0467	< 0.0623
	Farallon	FMW-13-7.0	7.0	2/7/2023	< 24.4	< 48.7	< 4.12	< 0.00823	< 0.0412	< 0.0206	< 0.0618	< 0.0823
MTCA Method A Cleanup Levels for Soil[5]					**2,000**	**2,000**	**30/100[6]**	**0.03**	**7**	**6**	**9**	**5**

NOTES:

Results in **bold** and highlighted yellow denote concentrations exceeding applicable cleanup levels.

< denotes analyte not detected at or exceeding the laboratory reporting limit listed.

— denotes sample not analyzed.

* denotes analyzed by Northwest Method NWTPH-HCID

[1]Depth in feet below ground surface.

[2]Analyzed by Northwest Method NWTPH-Dx unless otherwise noted.

[3]Analyzed by Northwest Method NWTPH-Gx unless otherwise noted.

[4]Analyzed by U.S. Environmental Protection Agency Method 8260D.

[5]Washington State Model Toxics Control Act Cleanup Regulation (MTCA) Method A Soil Cleanup Levels for Unrestricted Land Uses, Table 740-1 of Section 900 of Chapter 173-340 of the Washington Administrative Code, as revised 2013.

[6]Cleanup level is 30 milligrams per kilogram if benzene is detected and 100 milligrams per kilogram if benzene is not detected.

Atlas = Atlas Technical Consultants, LLC

BTEX = benzene, toluene, ethylbenzene and xylenes

C = chromatographic pattern indicates unresolved compound(s), or an unresolved complex mixture in the range

DRO = total petroleum hydrocarbons (TPH) as diesel-range organics

F = result is elevated due to individual analyte peaks in the quantitation range

Farallon = Farallon Consulting, L.L.C.

GRO = TPH as gasoline-range organics

H = sample analyzed outside of holding time

J = result is an estimate

ORO = TPH as oil-range organics

P = chromatographic pattern indicates that the detection is due to one or more non-target compounds

X = the chromatographic pattern does not resemble the fuel standard used for quantitation

Table 3
Soil Analytical Results for Halogenated Volatile Organic Compounds
Former Washington Cold Storage Building
Puyallup, Washington
Farallon PN: 2636-001

Sample Location	Sampled By	Sample Identification	Sample Depth (feet)[1]	Sample Date	Analytical Results (milligrams per kilogram)[2]					
					PCE	TCE	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Vinyl Chloride	1,2-Dichloroethane
A-1	Atlas	A1-0.5'	0.5	9/24/2021	< 0.0437	< 0.0219	< 0.0273	< 0.0328	< 0.0273	< 0.0251
A-2	Atlas	A2-0.5'	0.5	9/24/2021	< 0.0722	< 0.0361	< 0.0451	< 0.0542	< 0.0451	< 0.0415
A-4	Atlas	A4-0.5'	0.5	9/23/2021	< 0.0533	< 0.0266	< 0.0333	< 0.0400	< 0.0333	0.0306
A-5	Atlas	A5-6'	6.0	9/24/2021	< 0.0578	< 0.0289	< 0.0361	< 0.0433	< 0.0361	< 0.0332
A-6	Atlas	A6-0.5'	0.5	9/23/2021	< 0.0418	< 0.0209	< 0.0261	< 0.0313	< 0.0261	< 0.0240
A-7	Atlas	A7-0.5'	0.5	9/24/2021	< 0.0501	< 0.0250	< 0.0313	< 0.0376	< 0.0313	< 0.0288
A-10	Atlas	A10-5'	5.0	9/23/2021	< 0.0266	< 0.0532	< 0.0332	< 0.0399	< 0.0332	< 0.0306
A-12	Atlas	A12-1'	1.0	9/23/2021	< 0.0594	< 0.0297	< 0.0371	< 0.0446	< 0.0371	< 0.0342
A-13	Atlas	A13-5'	5.0	9/23/2021	< 0.0586	< 0.0293	< 0.0367	< 0.0440	< 0.0367	< 0.0037
2023 Subsurface Investigation										
FB-02	Farallon	FB-02-7.0	7.0	2/7/2023	< 0.0144	< 0.0144	< 0.0144	< 0.0144	< 0.0144	< 0.0144
	Farallon	FB-02-13.0	13.0	2/7/2023	< 0.0154	< 0.0154	< 0.0154	< 0.0154	< 0.0154	< 0.0154
FB-04	Farallon	FB-04-7.0	7.0	2/8/2023	< 0.0215	< 0.0215	< 0.0215	< 0.0215	< 0.0215	< 0.0215
	Farallon	FB-04-13.0	13.0	2/8/2023	< 0.0200	< 0.0200	< 0.0200	< 0.0200	< 0.0200	< 0.0200
	Farallon	FB-04-17.0	17.0	2/8/2023	< 0.0205	< 0.0205	< 0.0205	< 0.0205	< 0.0205	< 0.0205
FB-05	Farallon	FB-05-3.0	3.0	2/8/2023	< 0.0128	**0.120**	< 0.0128	< 0.0128	< 0.0128	< 0.0128
	Farallon	FB-05-7.5	7.5	2/8/2023	< 0.0193	< 0.0193	< 0.0193	< 0.0193	< 0.0193	< 0.0193
FB-06	Farallon	FB-06-3.0	3.0	2/8/2023	< 0.0199	< 0.0199	< 0.0199	< 0.0199	< 0.0199	< 0.0199
	Farallon	FB-06-7.0	7.0	2/8/2023	< 0.0183	< 0.0183	< 0.0183	< 0.0183	< 0.0183	< 0.0183
FMW-10	Farallon	FMW-10-3.0	3.0	2/7/2023	< 0.0197	< 0.0197	< 0.0197	< 0.0197	< 0.0197	< 0.0197
	Farallon	FMW-10-7.0	7.0	2/7/2023	**0.0832**	**0.0451**	< 0.0219	< 0.0219	< 0.0219	< 0.0219
	Farallon	FMW-10-13.0	13.0	2/7/2023	< 0.0165 H	< 0.0165 H	< 0.0165 H	< 0.0165 H	< 0.0165 H	< 0.0165 H
FMW-12	Farallon	FMW-12-7.0	7.0	2/8/2023	< 0.0216	< 0.0216	< 0.0216	< 0.0216	< 0.0216	< 0.0216
	Farallon	FMW-12-13.0	13.0	2/8/2023	< 0.0213	< 0.0213	< 0.0213	< 0.0213	< 0.0213	< 0.0213
MTCA Cleanup Levels for Soil					**0.05**[3]	**0.03**[3]	**160**[4]	**1,600**[4]	**0.67**[4]	**11**[4]

NOTES:

Results in **bold** and highlighted yellow denote concentrations exceeding applicable cleanup levels.

< denotes analyte not detected at or exceeding the reporting limit listed.

[1]Depth in feet below ground surface.

[2]Analyzed by U.S. Environmental Protection Agency Method 8260D.

[3]Washington State Model Toxics Control Act Cleanup Regulation (MTCA) Method A Soil Cleanup Levels for Unrestricted Land Uses, Table 740-1 of Section 900 of Chapter 173-340 of the Washington Administrative Code, as revised 2013.

[4]Washington State Cleanup Levels and Risk Calculations (CLARC) under Washington State MTCA, Standard Method B Formula Values for Soil from CLARC Master spreadsheet, https://ecology.wa.gov/Regulations-Permits/Guidance-technical-assistance/Contamination-clean-up-tools/CLARC

Atlas = Atlas Technical Consultants, LLC
Farallon = Farallon Consulting, L.L.C.
H = sample analyzed outside of holding time
J = result is an estimate
NE = not established
PCE = tetrachloroethene
TCE = trichloroethene
VOC = volatile organic compound

Table 4
Soil Analytical Results for PFAS
Former Washington Cold Storage Building
Puyallup, Washington
Farallon PN: 2636-001

Sample Location	Sampled By	Sample Date	Sample Identification	Sample Depth (feet)[1]	Analytical Results (picograms per gram)[1]					
					Perfluorobutane Sulfonic Acid (PFBS)	Perfluorohexane Sulfonic Acid (PFHxS)	Perfluorooctanoic Acid (PFOA)	Perfluorooctane Sulfonic Acid (PFOS)	Perfluorononanoic Acid (PFNA)	Hexafluoropropylene Oxide Dimer Acid (HFPO-DA/GenX)
A-1	Atlas	9/24/2021	A1-0.5'	0.5	< 88	< 91	< 100	**380**	< 100	< 100
A-7	Atlas	9/24/2021	A7-0.5'	0.5	< 88	< 90	< 99	< 91	< 99	< 99
A-11	Atlas	9/24/2021	A11-0.5'	0.5	< 87	< 90	< 99	< 91	< 99	< 99
MTCA Method B Direct Contact Cleanup Levels for Soil[3]					**24,000,000**	**780,000**	**240,000**	**240,000**	**200,000**	**240,000**
MTCA Method B Cleanup Levels for Soil Protective of Groundwater - Vadose Zone[3]					**1,800**	**410**	**63**	**170**	**80**	**100**

NOTES:
< denotes analyte not detected at or exceeding the reporting limit listed.
[1]Depth in feet below ground surface.
[2]Samples analyzed by U.S. Environmental Protection Agency (EPA) Method 537 Modified. Only select analytes with established cleanup levels displayed. See lab report for full list of analytes.
[3]Washington State Cleanup Levels and Risk Calculations (CLARC) under Washington State MTCA, Standard Method B and C Values for Soil from CLARC Master spreadsheet, https://ecology.wa.gov/Regulations-Permits/Guidance-technical-assistance/Contamination-clean-up-tools/CLARC

Atlas = Atlas Technical Consultants, LLC
PFAS = per- and poly-fluoroalkyl substances

Table 5
Groundwater Analytical Results for TPH and BTEX
Former Washington Cold Storage Building
Puyallup, Washington
Farallon PN: 2636-001

Sample Location	Sampled By	Sample Date	Sample Identification	Analytical Results (micrograms per liter)							
				DRO[1]	ORO[1]	GRO[2]	Benzene[3]	Toluene[3]	Ethylbenzene[3]	Xylenes[3]	Naphthalene
Reconnaissance Boring Groundwater Samples											
A-1	Atlas	9/24/2021	A-1	< 247*	< 495*	< 247*	< 0.440	< 0.750	< 0.400	< 1.50	< 1.25
A-2	Atlas	9/24/2021	A-2	< 248*	< 497*	< 248*	< 0.440	< 0.750	< 0.400	< 1.50	< 1.25
A-4	Atlas	9/23/2021	A-4	< 248*	< 496*	< 248*	< 0.440	< 0.750	< 0.400	< 1.50	< 1.25
A-5	Atlas	9/24/2021	A-5	**3,050** P	< 98.7	157	**31.7**	3.82	< 0.400	< 1.50	1.60
A-6	Atlas	9/24/2021	A-6	< 246*	< 491*	< 246*	< 0.440	< 0.750	< 0.400	< 1.50	< 1.25
A-7	Atlas	9/24/2021	A-7	**1,680**	< 100	< 250*	< 0.440	< 0.750	< 0.400	< 1.50	< 1.25
A-10	Atlas	9/23/2021	A-10	**1,500** M	445	396	**62.3**	12.7	< 0.400	< 1.50	< 1.25
A-12	Atlas	9/23/2021	A-12	< 249*	< 498*	< 249*	< 0.440	< 0.750	< 0.400	< 1.50	< 1.25
A-13	Atlas	9/23/2021	A-13	< 248*	< 496*	< 248*	< 0.440	< 0.750	< 0.400	< 1.50	< 1.25
A-14	Atlas	9/23/2021	A-14	< 250*	< 499*	< 250*	---	---	---	---	---
A-15	Atlas	11/3/2021	A-15	**1,510** M	< 99.4	402	**47.2**	9.52	< 0.400	< 1.50	---
A-16	Atlas	11/3/2021	A-16	< 98.4	< 98.4	< 50.0	< 0.440	< 0.750	< 0.400	< 1.50	---
A-17	Atlas	11/2/2021	A-17	< 99.5	125	< 50.0	< 0.440	< 0.750	< 0.400	< 1.50	---
A-18	Atlas	11/2/2021	A-18	< 99.7	185	< 50.0	< 0.440	< 0.750	< 0.400	< 1.50	---
A-19	Atlas	11/2/2021	A-19	< 99.0	364	< 50.0	< 0.440	< 0.750	< 0.400	< 1.50	---
A-20	Atlas	11/2/2021	A-20	**828** M	< 98.9	64.4	**18.8**	4.05	2.07	< 1.50	---
A-21	Atlas	11/2/2021	A-21	**3,270** M	< 99.4	367	**50.0**	8.89	0.592	< 1.50	---
A-22	Atlas	11/2/2021	A-22	**4,510** M	< 98.7	761	**137**	32.6	1.51	0.820	---
A-23	Atlas	11/13/2021	A-23	**4,050** M	< 98.5	350	**41.2**	12.3	1.47	0.728	---
A-24	Atlas	11/13/2021	A-24	**650** C	< 99.2	< 50.0	< 0.440	< 0.750	< 0.400	< 1.50	---
A-25	Atlas	11/13/2021	A-25	< 103	< 103	< 50.0	< 0.440	< 0.750	< 0.400	< 1.50	---
A-26	Atlas	11/13/2021	A-26	< 98.6	< 98.6	< 50.0	< 0.440	< 0.750	< 0.400	< 1.50	---
A-27	Atlas	3/7/2022	A-27	496 M	< 119	< 50.0	< 0.440	< 0.750	< 0.400	< 1.50	---
A-28	Atlas	3/7/2022	A-28	245 M	258	< 50.0	2.28	< 0.750	< 0.400	< 1.50	---
A-29	Atlas	3/7/2022	A-29	< 116	**962**	< 50.0	1.92	< 0.750	< 0.400	< 1.50	---
A-30	Atlas	3/7/2022	A-30	< 122	231	< 50.0	0.710	< 0.750	< 0.400	< 1.50	---
A-31	Atlas	3/7/2022	A-31	**937** M	< 118	92.4	**14.3**	1.49	< 0.400	< 1.50	---
A-32	Atlas	3/7/2022	A-32	**975** M	< 120	243	**51.1**	7.69	1.05	< 1.50	---
A-33	Atlas	3/7/2022	A-33	**1,650** M	< 119	86.1	**16.3**	5.19	0.657	< 1.50	---
A-34	Atlas	3/7/2022	A-34	261 M	206	< 50.0	**8.59**	0.761	< 0.400	< 1.50	---
A-35	Atlas	3/8/2022	A-35	**1,290** M	< 122	197	**28.0**	5.29	0.906	< 1.50	---
A-36	Atlas	3/8/2022	A-36	< 120	259	< 50.0	< 0.440	< 0.750	< 0.400	< 1.50	---
A-37	Atlas	3/8/2022	A-37	< 118	178	< 50.0	< 0.440	< 0.750	< 0.400	< 1.50	---
A-38	Atlas	3/8/2022	A-38	< 120	**700**	< 50.0	< 0.440	< 0.750	< 0.400	< 1.50	---
A-39	Atlas	3/7/2022	A-39	< 122	191	< 50.0	1.07	< 0.750	< 0.400	< 1.50	---
MTCA Method A Cleanup Level for Groundwater[4]				**500**	**500**	**800/1,000[5]**	**5**	**1,000**	**700**	**1,000**	**160**

Table 5
Groundwater Analytical Results for TPH and BTEX
Former Washington Cold Storage Building
Puyallup, Washington
Farallon PN: 2636-001

Sample Location	Sampled By	Sample Date	Sample Identification	Analytical Results (micrograms per liter)							
				DRO[1]	ORO[1]	GRO[2]	Benzene[3]	Toluene[3]	Ethylbenzene[3]	Xylenes[3]	Naphthalene
Monitoring Well Groundwater Samples											
B-9	Atlas	9/2/2022	MW-7	< 94.0	106 C	< 50.0 J	< 0.440	< 0.750	< 0.400	< 1.50	---
	Farallon	12/27/2022	B-9-122722	< 83.3	< 167	< 100	< 0.200	< 1.00	< 0.500	< 1.50	< 2.00
MW-1	Atlas	11/4/2021	MW-1	**620** P	< 117	< 50.0	3.18	1.28	0.671	1.37	---
	Atlas	2/9/2022	MW-1	**4,310** C	< 118	< 50.0	**39.8**	5.44	< 0.400	< 1.50	---
	Atlas	9/2/2022	MW-1	**4,350** M	< 93.2	288 JL	**14.6**	36.4	0.660	< 1.50	---
	Farallon	12/27/2022	MW-1-122722	298 M X	< 157	266	**5.40**	46.8	< 0.500	< 1.50	< 2.00
	Farallon	2/14/2023	MW-1-021423	193 X	< 151	< 100 J	3.20 J	7.52 J	< 0.500 J	< 1.50 J	< 2.00 J
MW-2	Atlas	11/4/2021	MW-2	**1,540** M	< 118	166	**28.5**	9.68	2.62	3.19	---
	Atlas	2/9/2022	MW-2	**1,930** C	< 119	< 50.0	**50.2**	20.3	7.67	< 1.50	---
	Atlas	9/1/2022	MW-2	141 M	< 93.3	< 50.0	2.40	1.04	1.90	< 1.50	---
	Farallon	12/27/2022	MW-2-122722	91.2 X	< 154	< 100	1.53	< 1.00	< 0.500	< 1.50	< 2.00
	Farallon	2/14/2023	MW-2-021423	< 76.9	< 154	< 100	0.690	< 1.00	0.610	< 1.50	< 2.00
MW-3	Atlas	11/4/2021	MW-3	288 M	< 115	< 50.0	**12.9**	2.76	0.941	2.205	---
	Atlas	2/9/2022	MW-3	249	< 119	< 50.0	4.49	< 0.750	< 0.400	< 1.50	---
	Atlas	9/1/2022	MW-3	< 92.5	238 C	< 50.0	0.479	< 0.750	< 0.400	< 1.50	---
	Farallon	12/28/2022	MW-3-122822	< 76.9	159 X	< 100	< 0.200	< 1.00	< 0.500	< 1.50	< 2.00
	Farallon	2/13/2023	MW-3-021323	104	< 151	< 100	< 0.200	< 1.00	< 0.500	< 1.50	< 2.00
MW-4	Atlas	11/4/2021	MW-4	**1,130**	< 108	< 50.0	1.13	< 0.750	< 0.400	< 1.50	---
	Atlas	2/9/2022	MW-4	294	< 119	< 50.0	< 0.440	< 0.750	< 0.400	< 1.50	---
	Atlas	9/1/2022	MW-4	< 93.3	214 C	< 50.0 J	< 0.440	< 0.750	< 0.400	< 1.50	---
	Farallon	1/4/2023	MW-4-010423	< 80.0	< 160	< 100	< 0.200	< 1.00	< 0.500	< 1.50	< 2.00
	Farallon	2/13/2023	MW-4-021323	< 75.5	< 151	< 100	< 0.200	< 1.00	< 0.500	< 1.50	< 2.00
MW-5	Atlas	11/4/2021	MW-5	230 P	< 117	< 50.0	1.18	< 0.750	< 0.400	< 1.50	---
	Atlas	2/9/2022	MW-5	< 122	< 122	< 50.0	< 0.440	< 0.750	< 0.400	< 1.50	---
	Atlas	9/1/2022	MW-5	< 94.2	< 94.2	< 50.0	< 0.440	< 0.750	< 0.400	< 1.50	---
	Farallon	12/28/2022	MW-5-122822	< 80.0	< 160	< 100	< 0.200	< 1.00	< 0.500	< 1.50	< 2.00
	Farallon	2/13/2023	MW-5-021323	< 75.5	< 151	< 100	< 0.200	< 1.00	< 0.500	< 1.50	< 2.00
MW-6	Atlas	11/15/2021	MW-6	267 G	< 99.3	< 50.0	2.90	< 0.750	< 0.400	< 1.50	---
	Atlas	2/9/2022	MW-6	< 118	< 118	< 50.0	1.05	< 0.750	< 0.400	< 1.50	---
	Atlas	9/1/2022	MW-6	< 93.8	171 C	< 50.0	1.01	< 0.750	< 0.400	< 1.50	---
	Farallon	12/28/2022	MW-6-122822	< 80.8	< 162	< 100	0.340	< 1.00	< 0.500	< 1.50	< 2.00
	Farallon	2/13/2023	MW-6-021323	< 75.5	< 151	< 100	< 0.200	< 1.00	< 0.500	< 1.50	< 2.00
MTCA Method A Cleanup Level for Groundwater[4]				**500**	**500**	**800/1,000[5]**	**5**	**1,000**	**700**	**1,000**	**160**

Table 5
Groundwater Analytical Results for TPH and BTEX
Former Washington Cold Storage Building
Puyallup, Washington
Farallon PN: 2636-001

Sample Location	Sampled By	Sample Date	Sample Identification	Analytical Results (micrograms per liter)							
				DRO[1]	ORO[1]	GRO[2]	Benzene[3]	Toluene[3]	Ethylbenzene[3]	Xylenes[3]	Naphthalene
MW-7	Atlas	11/15/2021	MW-7	**4,620** M	< 98.9	**1,440**	**120**	37.6	6.67	4.25	---
	Atlas	2/9/2022	MW-7	**7,210** C	< 119	< 50.0	**76.4**	28.2	8.82	< 1.50	---
	Atlas	9/2/2022	MW-7	< 94.0	106 C	< 50.0 J	< 0.440	< 0.750	< 0.400	< 1.50	---
	Farallon	1/4/2023	MW-7-010423	311 M X	< 160	213	**21.1**	29.8	9.51	< 1.50	2.13
	Farallon	2/14/2023	MW-7-021423	335 X	< 157	159	**13.7**	6.11	6.93	< 1.50	3.01
FMW-08	Farallon	2/14/2023	FMW-08-021423	< 75.5	< 151	< 100	0.340	< 1.00	< 0.500	< 1.50	< 2.00
FMW-09	Farallon	2/14/2023	FMW-09-021423	387 M X	< 151	< 100 J	**6.64** J	1.42 J	< 0.500 J	< 1.50 J	< 2.00 J
FMW-10	Farallon	2/14/2023	FMW-10-021423	114 N X	177 Q	< 100 J	0.260 J	< 1.00 J	< 0.500 J	< 1.50 J	< 2.00 J
FMW-11	Farallon	2/13/2023	FMW-11-021323	< 76.9	< 154	< 100	< 0.200	< 1.00	< 0.500	< 1.50	< 2.00
FMW-12	Farallon	2/14/2023	FMW-12-021423	< 75.5	< 151	< 100	< 0.200	< 1.00	< 0.500	< 1.50	< 2.00
FMW-13	Farallon	2/13/2023	FMW-13-021323	< 76.9	< 154	< 100	1.38	< 1.00	< 0.500	< 1.50	< 2.00
MTCA Method A Cleanup Level for Groundwater[4]				**500**	**500**	**800/1,000[5]**	**5**	**1,000**	**700**	**1,000**	**160**

NOTES:

Results in **bold** and highlighted yellow denote concentrations above applicable cleanup levels.
--- denotes sample not analyzed or chromatographic pattern not quantified as listed analyte.
< denotes analyte not detected at or above the reporting limit listed.
* denotes analyzed by Northwest Method NWTPH-HCID

[1]Analyzed by Northwest Method NWTPH-Dx unless otherwise noted.
[2]Analyzed by Northwest Method NWTPH-Gx unless otherwise noted.
[3]Analyzed by U.S. Environmental Protection Agency Method 8260D.
[4]Washington State Model Toxics Control Act Cleanup Regulation Method A Cleanup Levels for Groundwater, Table
[5]Cleanup level is 800 micrograms per liter if benzene is detected and 1,000 micrograms per liter if benzene is not detected.

Atlas = Atlas Technical Consultants, LLC
BTEX = benzene, toluene, ethylbenzene, and xylenes
C = chromatographic pattern indicates unresolved compound(s), or an unresolved complex mixture in the range
DRO = total petroleum hydrocarbons (TPH) as diesel-range organics
Farallon = Farallon Consulting, L.L.C.
G = chromatographic pattern resembles weathered gasoline-range material
GRO = TPH as gasoline-range organics
J = result is an estimate
JL = detection is biased high due to non-petroleum compounds
M = hydrocarbons in the gasoline-range are impacting the diesel-range result
N = hydrocarbons in the oil-range are impacting the diesel-range result
ORO = TPH as oil-range organics

Table 6
Groundwater Analytical Results for Halogenated Volatile Organic Compounds
Former Washington Cold Storage Building
Puyallup, Washington
Farallon PN: 2636-001

Sample Location	Sampled By	Sample Date	Sample Identification	Analytical Results (micrograms per liter)[1]					
				PCE	TCE	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Vinyl Chloride	1,2-Dichloroethane
Reconnaissance Boring Groundwater Samples									
A-1	Atlas	9/24/2021	A-1	< 0.400	< 0.500	< 0.500	< 0.500	< 0.200	< 0.750
A-2	Atlas	9/24/2021	A-2	< 0.400	< 0.500	< 0.500	< 0.500	< 0.200	< 0.750
A-4	Atlas	9/23/2021	A-4	< 0.400	< 0.500	< 0.500	< 0.500	< 0.200	< 0.750
A-5	Atlas	9/24/2021	A-5	< 0.400	< 0.500	< 0.500	< 0.500	< 0.200	< 0.750
A-6	Atlas	9/24/2021	A-6	< 0.400	< 0.500	< 0.500	< 0.500	< 0.200	< 0.750
A-7	Atlas	9/24/2021	A-7	< 0.400	< 0.500	< 0.500	< 0.500	< 0.200	< 0.750
A-10	Atlas	9/23/2021	A-10	< 0.400	< 0.500	< 0.500	< 0.500	< 0.200	< 0.750
A-12	Atlas	9/23/2021	A-12	< 0.400	< 0.500	< 0.500	< 0.500	< 0.200	< 0.750
A-13	Atlas	9/23/2021	A-13	< 0.400	< 0.500	< 0.500	< 0.500	< 0.200	< 0.750
Monitoring Well Groundwater Samples									
MW-1	Farallon	12/27/2022	MW-1-122722	< 0.400	< 0.400	< 0.400	< 0.400	< 0.400	< 0.400
	Farallon	2/14/2023	MW-1-021423	< 0.400 J	< 0.400 J	< 0.400 J	< 0.400 J	< 0.400 J	< 0.400 J
MW-2	Farallon	12/27/2022	MW-2-122722	< 0.400	< 0.400	< 0.400	< 0.400	< 0.400	< 0.400
	Farallon	2/14/2023	MW-2-021423	< 0.400	< 0.400	< 0.400	< 0.400	< 0.400	< 0.400
MW-3	Farallon	12/28/2022	MW-3-122822	< 0.400	< 0.400	< 0.400	< 0.400	< 0.400	< 0.400
	Farallon	2/13/2023	MW-3-021323	< 0.400	< 0.400	< 0.400	< 0.400	< 0.400	< 0.400
MW-4	Farallon	1/4/2023	MW-4-010423	< 0.400	< 0.400	< 0.400	< 0.400	< 0.400	< 0.400
	Farallon	2/13/2023	MW-4-021323	< 0.400	< 0.400	< 0.400	< 0.400	< 0.400	< 0.400
MW-5	Farallon	12/28/2022	MW-5-122822	< 0.700 K	< 0.400	< 0.400	< 0.400	< 0.400	< 0.400
	Farallon	2/13/2023	MW-5-021323	< 0.400	< 0.400	< 0.400	< 0.400	< 0.400	< 0.400
MW-6	Farallon	12/28/2022	MW-6-122822	< 0.700 K	< 0.400	< 0.400	< 0.400	< 0.400	< 0.400
	Farallon	2/13/2023	MW-6-021323	< 0.400	< 0.400	< 0.400	< 0.400	< 0.400	< 0.400
MTCA Cleanup Levels for Groundwater[2]				**5**	**5**	**16[3]**	**160[3]**	**0.2**	**5**

Table 6
Groundwater Analytical Results for Halogenated Volatile Organic Compounds
Former Washington Cold Storage Building
Puyallup, Washington
Farallon PN: 2636-001

Sample Location	Sampled By	Sample Date	Sample Identification	Analytical Results (micrograms per liter)[1]					
				PCE	TCE	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Vinyl Chloride	1,2-Dichloroethane
MW-7	Farallon	1/4/2023	MW-7-010423	< 0.400	< 0.400	< 0.400	< 0.400	< 0.400	0.850
	Farallon	2/14/2023	MW-7-021423	< 0.400	< 0.400	< 0.400	< 0.400	< 0.400	0.540
FMW-08	Farallon	2/14/2023	FMW-08-021423	< 0.400	< 0.400	< 0.400	< 0.400	< 0.400	< 0.400
FMW-09	Farallon	2/14/2023	FMW-09-021423	< 0.400	< 0.400	< 0.400	< 0.400	< 0.400	< 0.400
FMW-10	Farallon	2/14/2023	FMW-10-021423	3.38	**6.44**	**29.8**	0.960	< 0.400	< 0.400
FMW-11	Farallon	2/13/2023	FMW-11-021323	< 0.400	< 0.400	< 0.400	< 0.400	< 0.400	< 0.400
FMW-12	Farallon	2/14/2023	FMW-12-021423	< 0.400	< 0.400	< 0.400	< 0.400	< 0.400	< 0.400
FMW-13	Farallon	2/13/2023	FMW-13-021323	< 0.400	< 0.400	< 0.400	< 0.400	< 0.400	< 0.400
MTCA Cleanup Levels for Groundwater[2]				**5**	**5**	**16[3]**	**160[3]**	**0.2**	**5**

NOTES:

Results in **bold** and highlighted yellow denote concentrations above applicable cleanup levels.

< denotes analyte not detected at or exceeding the reporting limit listed.

[1]Analyzed by U.S. Environmental Protection Agency Method 8260D.

[2]Washington State Model Toxics Control Act Cleanup Regulation (MTCA) Method A Cleanup Levels for Groundwater, Table 720-1 of Section 900 of Chapter 173-340 of the Washington Administrative Code, as revised 2013, unless otherwise noted.

[3]Washington State Model Toxics Control Act Cleanup Regulation Cleanup Levels and Risk Calculations, Standard Method B Values for Groundwater, https://ecology.wa.gov/Regulations-Permits/Guidance- technical-assistance/Contamination-clean-up-tools/CLARC

Atlas = Atlas Technical Consultants, LLC

Farallon = Farallon Consulting, L.L.C.

J = result is an estimate

K = reporting limit raised due to possible carryover from a previous sample

NE = not established

PCE = tetrachloroethene

TCE = trichloroethene

VOC = volatile organic compound

Table 7
Reconnaissance Groundwater Analytical Results for PFAS
Former Washington Cold Storage Building
Puyallup, Washington
Farallon PN: 2636-001

Sample Location	Sampled By	Sample Date	Sample Identification	Analytical Results (nanograms per liter)[2]					
				Perfluorobutane Sulfonic Acid (PFBS)	Perfluorohexane Sulfonic Acid (PFHxS)	Perfluorooctanoic Acid (PFOA)	Perfluorooctane Sulfonic Acid (PFOS)	Perfluorononanoic Acid (PFNA)	Hexafluoropropylene Oxide Dimer Acid (HFPO-DA/GenX)
A-1	Atlas	9/24/2021	A-1	< 1.7	1.9	< 2.0	8.8	< 2.0	< 2.0
A-7	Atlas	9/24/2021	A-7	2.2	< 1.8	**18**	**19**	**9.1**	< 1.9
Washington State Action Levels[3]				**345**	**65**	**10**	**15**	**9**	**NE**
MTCA Method B Groundwater Cleanup Levels[3]				**4,800**	**160**	**48**	**48**	**40**	**24**

NOTES:

< denotes analyte not detected at or above the reporting limit listed.

[1]Depth in feet below ground surface.

[2]Samples analyzed by U.S. Environmental Protection Agency (EPA) Method 537 Modified. Only select analytes with established cleanup levels displayed. See lab report for full list of analytes.

[3]Washington State Cleanup Levels and Risk Calculations (CLARC) under Washington State Model Toxics Control Act Cleanup Regulation (MTCA), Standard Method B Values for Groundwater from CLARC Master spreadsheet, https://ecology.wa.gov/Regulations-Permits/Guidance-technical-assistance/Contamination-clean-up-tools/CLARC

Atlas = Atlas Technical Consultants, LLC

PFAS = per- and poly-fluoroalkyl substances

Appendix H
Engineering Calculations

PORTION OF SE QUARTER OF SEC 27, TWN 20 N, RGE. 4 E, W.M.
CITY OF PUYALLUP, PIERCE COUNTY, WASHINGTON

ROUGH GRADING & TESC PLAN

NORTH BASIN=2.52 ACRES

SOUTH BASIN=5.44 ACRES

TESC BASIN BOUNDARY

ROUGH GRADE PAD ELEV=61.1
NEW BUILDING FF=61.1

TITLE PARCEL A
APN. 7845000161

TITLE PARCEL B

TITLE PARCEL C
APN. 0420274126

PIONEER STREET
(VACATED BY ORDINANCE 211, AFN. 14161)

15TH STREET SE
(PUBLIC R/W)

E PIONEER WAY
(PUBLIC R/W)

BURLINGTON NORTHERN RAILROAD CO. R/W

RE-PLAT OF FRANK R. SPINNING'S FIRST ADDITION VOL. 6, PG. 91

WESTECH REALTY CO LLC TAX PARCEL NO. 7845100327

EAST MAIN ATTRACTIONS LLC TAX PARCEL NO. 7845100301

EAST MAIN ATTRACTIONS LLC TAX PARCEL NO. 7845100250

1300 MAIN ST LLC TAX PARCEL NO. 7845000151

ESTES DEVELOPMENT LLC TAX PARCEL NO. 0420274115

REMOVE EX. 8" S AND CORE DRILL FOR 12" SE IE=49.53

PROTECT EXISTING HYDRANT

PROTECT EXISTING POWER POLES AND APPERTANENCES.

PROTECT EXISTING POWER VAULT, POWER POLE, AND APPERTANENCES.

TEMPORARY SEDIMENT RISER IE=51.5

TEMPORARY SEDIMENT POND TOP ELEV=57.0 MIN. BOTTOM ELEV=50.0

TEMPORARY SEDIMENT POND TOP ELEV=55.0 MIN. BOTTOM ELEV=48.0

TEMPORARY SEDIMENT RISER IE=49.5

EMERGENCY OVERFLOW SEE SHT E5

TEMPORARY 12" SD

CB#1 FUTURE CONTROL STRUCTURE TYPE 2-60" W/4' SUMP IE=49.6

CB#17

ROCK CROSSING PER DETAIL E5

54 LF 12" TEMP SD

12" SD @ 0.3%

IE=49.0

PAD GRADE TO 5' BEYOND BUILDING FACE, TYP.

TOP OF BALLAST

TOE OF BALLAST

FOUND ENCASED 2" DOMED BRASS DISC, 0.6' BELOW GRADE W/ 9" LID AT THE INTERSECTION OF E. PIONEER WAY & 13TH ST. S.E.

FOUND ENCASED 2" DOMED BRASS DISC, NO VISIBLE PUNCH 0.6' BELOW GRADE W/ 8" LID AT THE INTERSECTION OF 15TH ST. S.E. & E. PIONEER WAY

FOUND 1/2" REBAR & YELLOW CAP LS No. "__195", 0.5' BELOW GRADE, 0.3' NORTH OF CORNER

FOUND 1/2" REBAR & FADED WHITE CAP MARKED "BPS&E 12870/16930" 0.80' BELOW GRADE AT CORNER

FOUND 1/2" REBAR & YELLOW CAP IN CONCRETE MARKED "BPS&E 12870/16930" 0.1' EAST OF CORNER

FOUND LEAD PATCH WITH MISSING TACK, 1.0' NORTH OF CORNER

FOUND LEAD & TACK W/ WASHER MARKED "LAY 15029" IN WALL, 0.05' SOUTH & 0.1' EAST OF CORNER

FOUND 3/4" BRASS DISC 0.83' BELOW GRADE IN 8" PVC PIPE, 34' WEST OF SE BUILDING CORNER ON THE RAILROAD R/W

FOUND AND HELD 1/2" IRON PIPE W/ FLAGGING, 0.2' ABOVE GRADE

FOUND 1" IRON PIPE W/ BRASS CAP, 0.2' ABOVE GRADE, 0.1' SOUTH OF CORNER

SITE BENCHMARK MAGNAIL & WASHER #45 EL=55.16' (NAVD 88)

EMERGENCY OVERFLOW SEE SHT E5

WATER METER

POWER METER

EXISTING BUILDING

POWER POLE

POWER POLE W/ METER

POWER POLE W/ LUM.

POWER POLE W/ METER 29.73'(C) 30'-AFN. 201910090363

POWER POLE W/ METER 92.15'(C) 91'-AFN. 201910090163

POWER CAB/ POWER POLE

WATER VAULT

HYDRANT

SSCO (X2)

WATER METER (X2)

SIGNAL BOX

SIGNAL BOX (X3)

TEL MARKER POST

TEL MH

CONTROL BOX

LIGHT JBOX

JBOX

SHED

EXISTING BUILDING

ECO BLOCK (TYP)

ECO BLOCK RET. WALL

ECO BLOCK LINE

S-EXTENSION OF W-LINE BLOCK 32 (S-EXTENSION OF E-LINE BLOCK 12TH ST. S.E.)

EXTENSION OF E-LINE BLOCK 32

DESCRIBED CENTERLINE OF WATER MAIN EASEMENT AFN. 1084061 EXCEPTION No. 14

WATER LINE EASEMENT AFN. 9611070152 EXCEPTION No. 19

INGRESS, EGRESS & UTILITY EASEMENT AFN. 9212150220 EXCEPTION No. 17

PUBLIC HIGHWAY EASEMENT AFN. 2512986 EXCEPTION No. 16

S05°54'33"W 8.66'(C) 8.50'(D) (TO CL OF SPUR TRACK)

S51°13'10"E 300.0'(D)

N51°13'10"W 300.0'(D)

EROSION CONTROL BMP'S

- (CE) TEMPORARY CONSTRUCTION ENTRANCE PER DETAIL ON SHEET E5.
- (CL) CLEARING LIMITS
- (IP) STORM DRAIN INLET PROTECTION PER DETAIL ON SHEET E5.
- (SF) TEMPORARY SILT FENCE PROTECTION PER DETAIL ON SHEET E5.
- (V) TEMPORARY "V" DITCH WITH ROCK CHECK DAMS PER DETAIL ON SHEET E6. SLOPE AT 0.5% MINIMUM.

N

0 20' 40' 80'
SCALE: 1"=40'

APPROVED

BY _____
CITY OF PUYALLUP
DEVELOPMENT ENGINEERING

DATE _____

NOTE: THIS APPROVAL IS VOID AFTER 180 DAYS FROM APPROVAL DATE.
THE CITY WILL NOT BE RESPONSIBLE FOR ERRORS AND/OR OMISSIONS ON THESE PLANS.
FIELD CONDITIONS MAY DICTATE CHANGES TO THESE PLANS AS DETERMINED BY THE DEVELOPMENT ENGINEERING MANAGER.

811 Know what's below. Call before you dig. Dial 811

No.	Date	By	Ckd.	Appr.	Revision
1	06/14/23	DL	JSG		REVISED PER NEW SITE PLAN

Title: ROUGH GRADING & TESC PLAN

FORTRESS - PUYALLUP

For: CREF3 PUYALLUP OWNER LLC
11611 SAN VICENTE BLVD
10TH FLOOR
LOS ANGELES, CA 90049

JASON GUY HUBBELL — STATE OF WASHINGTON — 38950 — REGISTERED PROFESSIONAL ENGINEER
6/14/2023

Scale: Horizontal 1"=40' Vertical N/A

Designed RDC Drawn RDC Checked DL Approved JGH Date 10/24/22

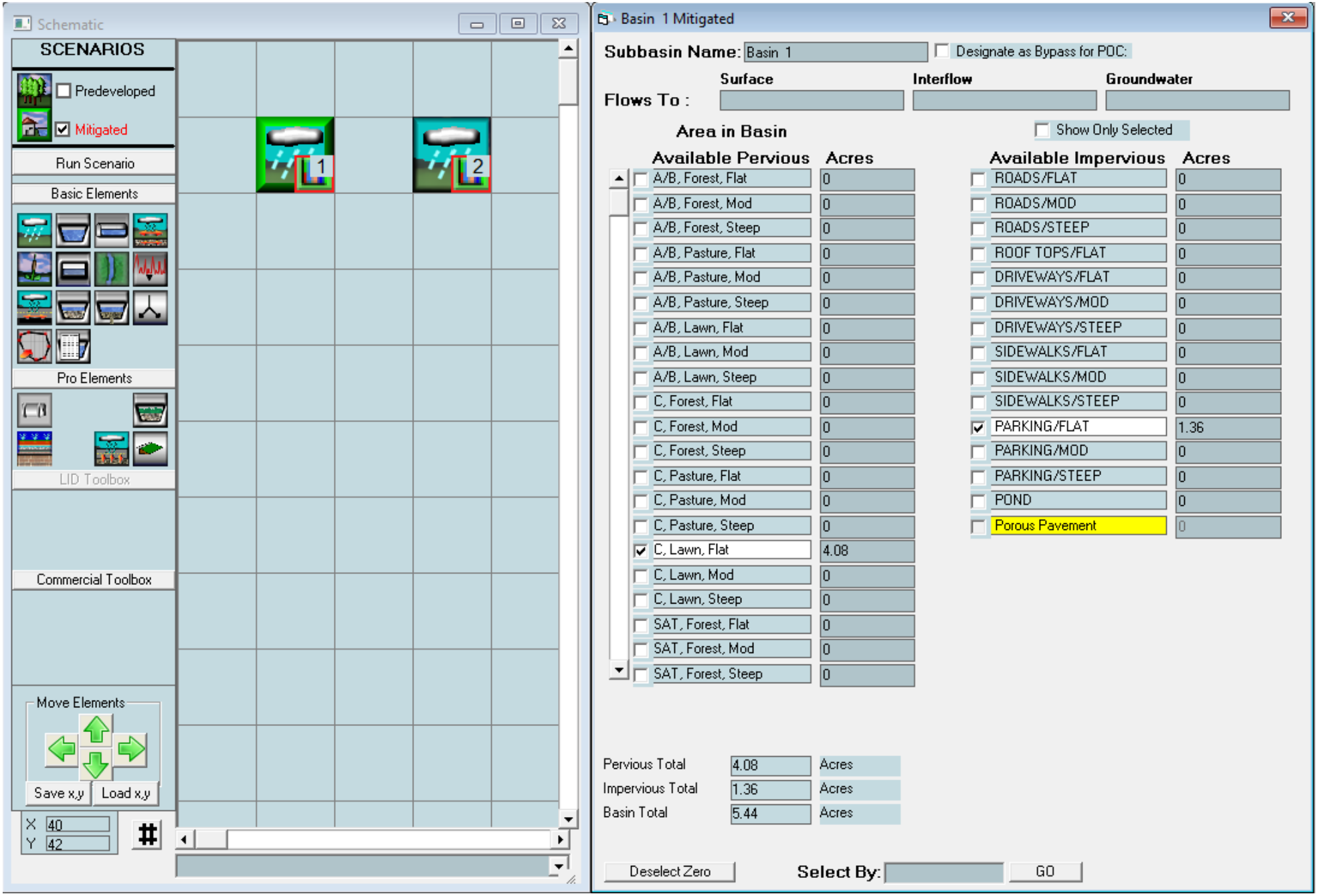
Barghausen Consulting Engineers, Inc.
18215 72nd Avenue South
Kent, WA 98032
425.251.6222
barghausen.com

Job Number 22085

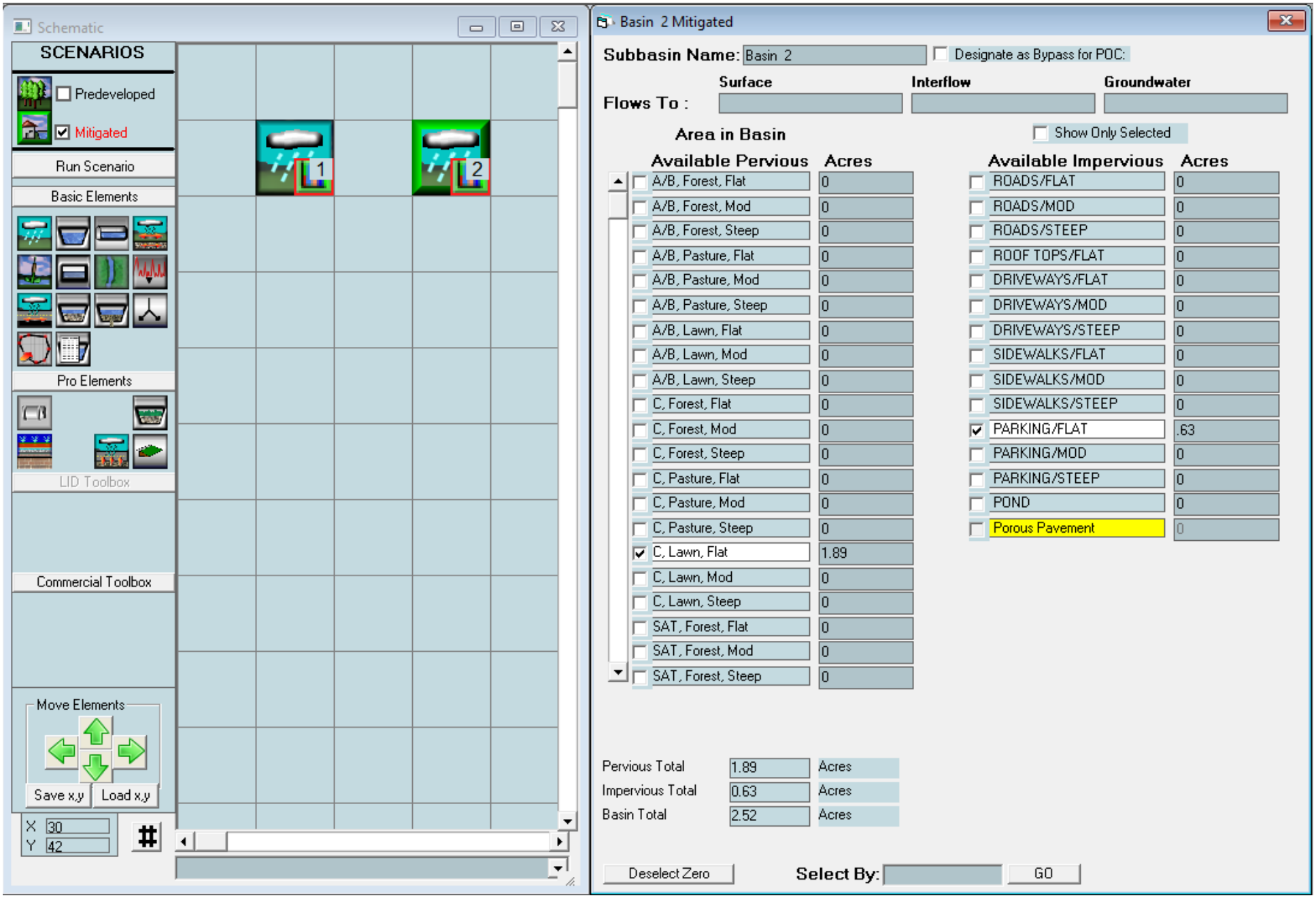
Sheet E3 of 6

P:\22000s\22085\engineering\22085-E.dwg 6/13/2023 11:25 AM DLAMOTTE

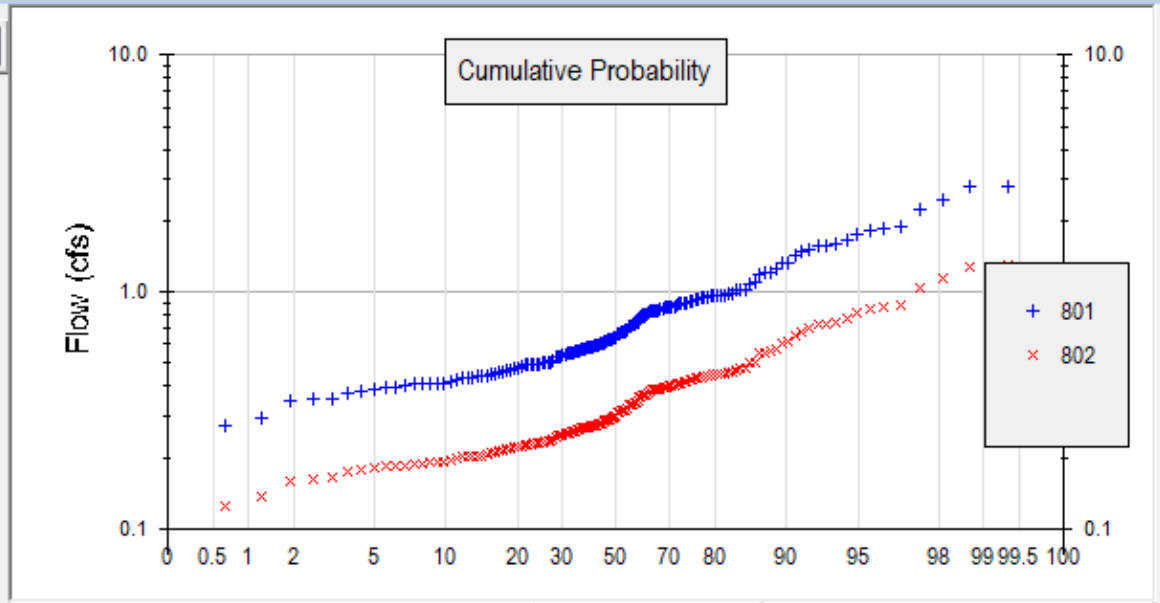
SOUTH POND BASIN



NORTH POND BASIN



Analysis



Stream Protection Duration | LID Duration | Flow Frequency | Water Quality | Hydrograph

Wetland Input Volumes | LID Report | Recharge Duration | Recharge Predeveloped | Recharge Mitigated

Analyze datasets Compact WDM | Delete Selected | Monthly FF

1 158 YR EVAP TIMESERIES, 40 IN EAST, 24 HR
2 158 YR PRECIP TIMESERIES, 40 IN EAST, 15 MIN
501 POC 1 Predeveloped flow
502 POC 2 Predeveloped flow
801 POC 1 Mitigated flow
802 POC 2 Mitigated flow
1000 Trapezoidal Pond 1 ALL OUTLETS Mitigated
1001 Trapezoidal Pond 1 STAGE Mitigated

All Datasets | Flow | Stage | Precip

Evap | POC 1 | POC 2

Flood Frequency Method

- (•) Log Pearson Type III 17B
- ( ) Weibull
- ( ) Cunnane
- ( ) Gringorten

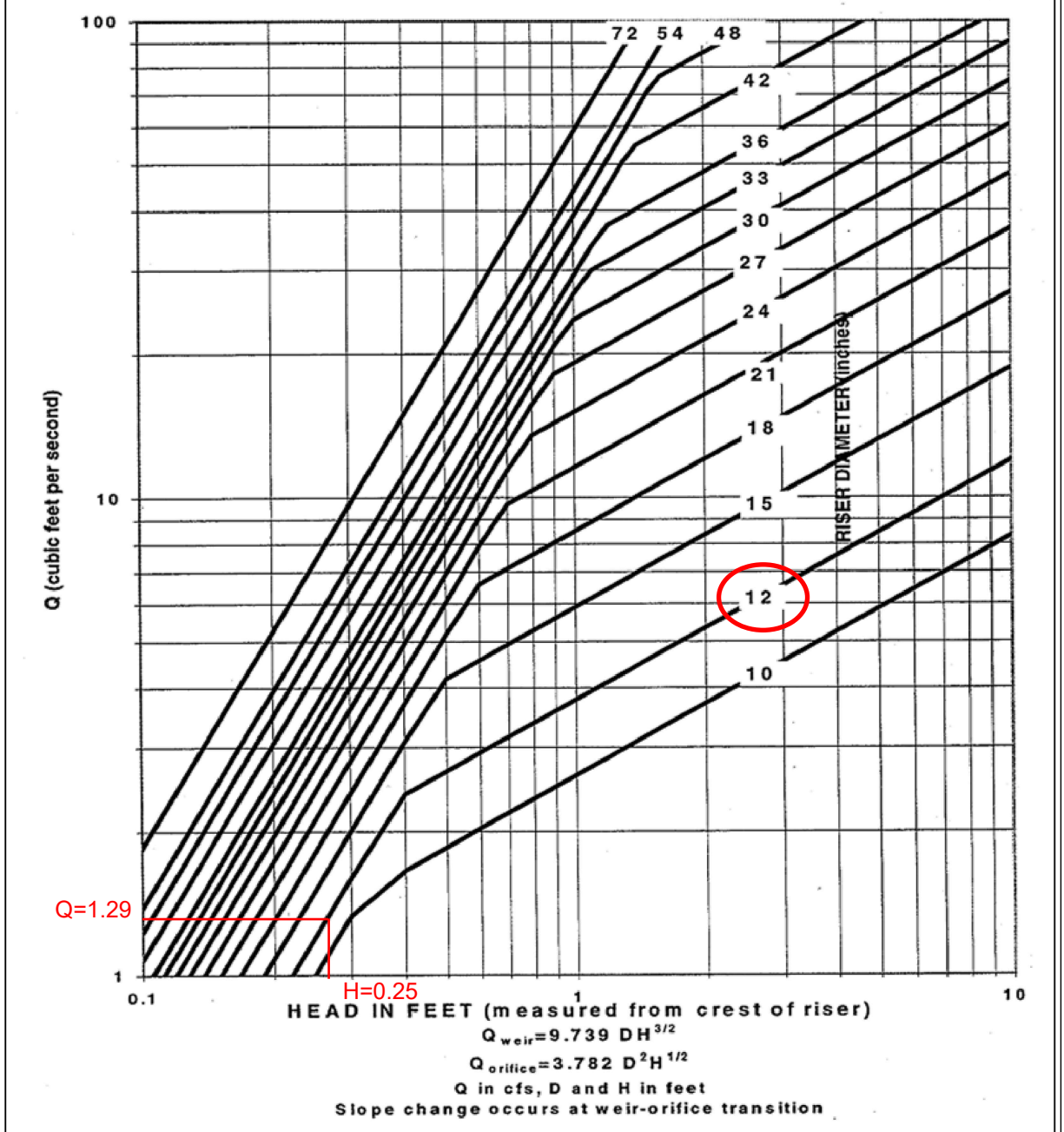
Flow Frequency

Flow(cfs)	0801 15m	0802 15m
2 Year =	0.6678	0.3094
5 Year =	1.0105	0.4681
10 Year =	1.2893	0.5972
25 Year =	1.7080	0.7912
50 Year =	2.0729	0.9602
100 Year =	2.4875	1.1523

Annual Peaks

1902	0.5886	0.2727
1903	0.6703	0.3105
1904	1.4714	0.6816
1905	0.4100	0.1899
1906	0.3873	0.1794
1907	0.8693	0.4027
1908	0.5531	0.2562
1909	0.5920	0.2742
1910	0.8920	0.4132
1911	0.8236	0.3815
1912	2.4414	1.1309
1913	0.4078	0.1889
1914	2.8005	1.2973
1915	0.4364	0.2022
1916	0.6863	0.3179
1917	0.2697	0.1250
1918	0.4928	0.2283
1919	0.4278	0.1982
1920	0.6756	0.3130
1921	0.5435	0.2518
1922	1.0299	0.4771
1923	0.6047	0.2801
1924	0.7475	0.3463
1925	0.3977	0.1843
1926	0.5793	0.2684
1927	0.5146	0.2384
1928	0.4899	0.2269
1929	1.0885	0.5042

Figure II-3.31: Riser Inflow Curves



DEPARTMENT OF ECOLOGY
State of Washington

Riser Inflow Curves

Revised June 2016

SOUTH POND TESC CALCULATIONS

Basin Area = 5.44 acres

75% Lawn = 4.08 acres

25% Impervious = 1.36 acres

Sediment Pond Sizing

$Q_{10} = 1.29\ cfs$ (from WWHM)

$$SA = \frac{2Q_{10}}{0.00096} = 2{,}688\ sf$$

Principal Spillway

From Figure II-3.31 use 12" riser.

Emergency Overflow Spillway

$$L = \frac{Q_{100}}{3.21H^{1.5}} - 2.4H$$

$Q_{100} = 2.49\ cfs$

$H = 0.30\ ft$

$L = 2.10\ ft\ \rightarrow use\ 6ft\ minimum$

Orifice Design

$$A_O = \frac{A_S(2h)^{0.5}}{0.6 \times 3600Tg^{0.5}}$$

$A_S = 2{,}688\ sf$

$h = 3.5\ ft$

$T = 24\ hrs$

$g = 32.2\ ft/s^2$

$A_O = 0.02417\ sq\ ft$

$Orifice\ Diameter = 2.10\ in$

NORTH POND TESC CALCULATIONS

Basin Area = 2.52 acres

75% Lawn = 1.89 acres

25% Impervious = 0.63 acres

Sediment Pond Sizing

$Q_{10} = 0.60\ cfs$ (from WWHM)

$$SA = \frac{2Q_{10}}{0.00096} = 1{,}248\ sf$$

Principal Spillway

From Figure II-3.31 use 12" riser.

Emergency Overflow Spillway

$$L = \frac{Q_{100}}{3.21H^{1.5}} - 2.4H$$

$Q_{100} = 1.15\ cfs$

$H = 0.30\ ft$

$L = 1.46\ ft \rightarrow use\ 6ft\ minimum$

Orifice Design

$$A_O = \frac{A_S(2h)^{0.5}}{0.6 \times 3600Tg^{0.5}}$$

$A_S = 1{,}248\ sf$

$h = 3.5\ ft$

$T = 24\ hrs$

$g = 32.2\ ft/s^2$

$A_O = 0.01124\ sq\ ft$

$Orifice\ Diameter = 1.43\ in$

Interceptor Ditch Sizing

Q = 1.6 times the Q_{10} from WWHM output

Minimum bottom width = 2 feet

Side slopes = 2:1 minimum

Longitudinal slope = 0.50%

Basin Areas:

Using the developed condition west basin for worst case land cover

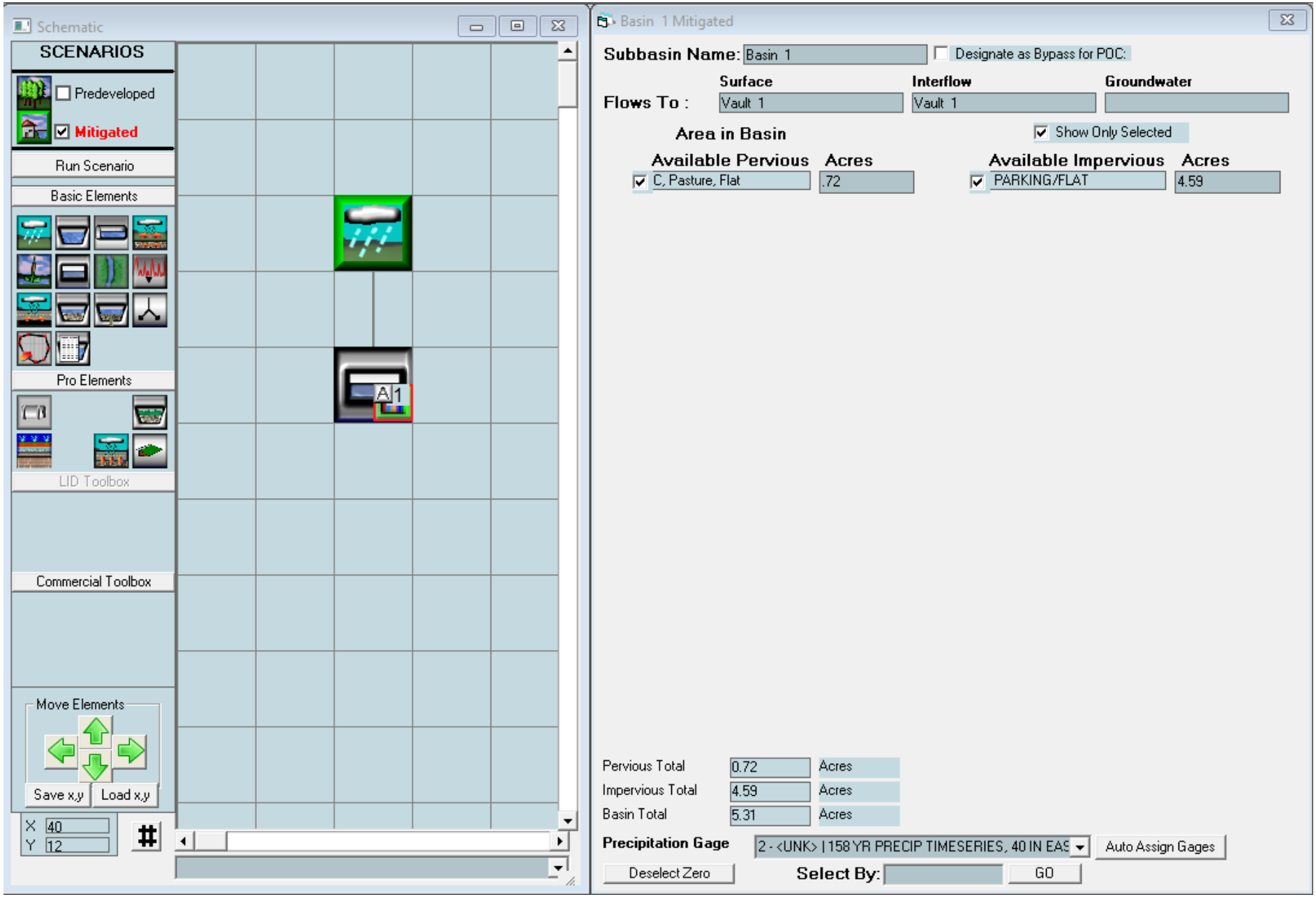
Q_{10} from WWHM = 2.63 cfs

Per 2019 DOE BMP C200, the worst case land cover on the larger basin (west basin from developed conditions) was modeled to determine the ditch flow rates. The minimum interceptor ditch (2:1 side slopes, 2' bottom width and 0.50% slope) had a maximum capacity of 8.7 cfs at 1 feet deep in the 1 foot minimum depth swale. This is well above the anticipated flow for the basin.

Therefore the minimum TESC interceptor ditches will be adequate.

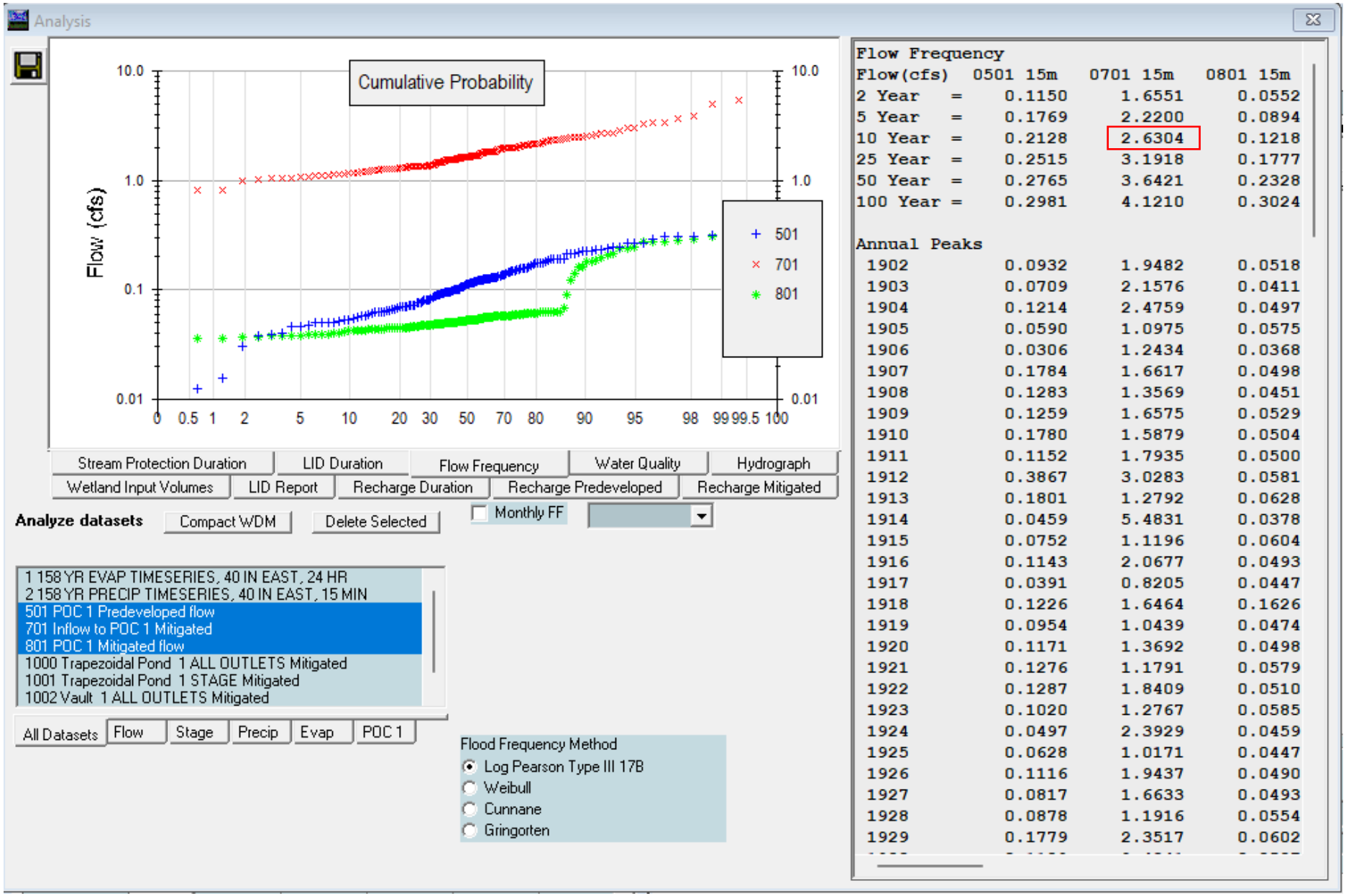
West Basin -Proposed Conditions

Worst case land cover for interceptor swale sizing



West Basin -Flows

Worst case land cover for interceptor swale sizing



Flow Frequency

Flow(cfs)	0501 15m	0701 15m	0801 15m
2 Year =	0.1150	1.6551	0.0552
5 Year =	0.1769	2.2200	0.0894
10 Year =	0.2128	2.6304	0.1218
25 Year =	0.2515	3.1918	0.1777
50 Year =	0.2765	3.6421	0.2328
100 Year =	0.2981	4.1210	0.3024

Annual Peaks

1902	0.0932	1.9482	0.0518
1903	0.0709	2.1576	0.0411
1904	0.1214	2.4759	0.0497
1905	0.0590	1.0975	0.0575
1906	0.0306	1.2434	0.0368
1907	0.1784	1.6617	0.0498
1908	0.1283	1.3569	0.0451
1909	0.1259	1.6575	0.0529
1910	0.1780	1.5879	0.0504
1911	0.1152	1.7935	0.0500
1912	0.3867	3.0283	0.0581
1913	0.1801	1.2792	0.0628
1914	0.0459	5.4831	0.0378
1915	0.0752	1.1196	0.0604
1916	0.1143	2.0677	0.0493
1917	0.0391	0.8205	0.0447
1918	0.1226	1.6464	0.1626
1919	0.0954	1.0439	0.0474
1920	0.1171	1.3692	0.0498
1921	0.1276	1.1791	0.0579
1922	0.1287	1.8409	0.0510
1923	0.1020	1.2767	0.0585
1924	0.0497	2.3929	0.0459
1925	0.0628	1.0171	0.0447
1926	0.1116	1.9437	0.0490
1927	0.0817	1.6633	0.0493
1928	0.0878	1.1916	0.0554
1929	0.1779	2.3517	0.0602

Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Tuesday, Aug 29 2023

<Name>

Trapezoidal

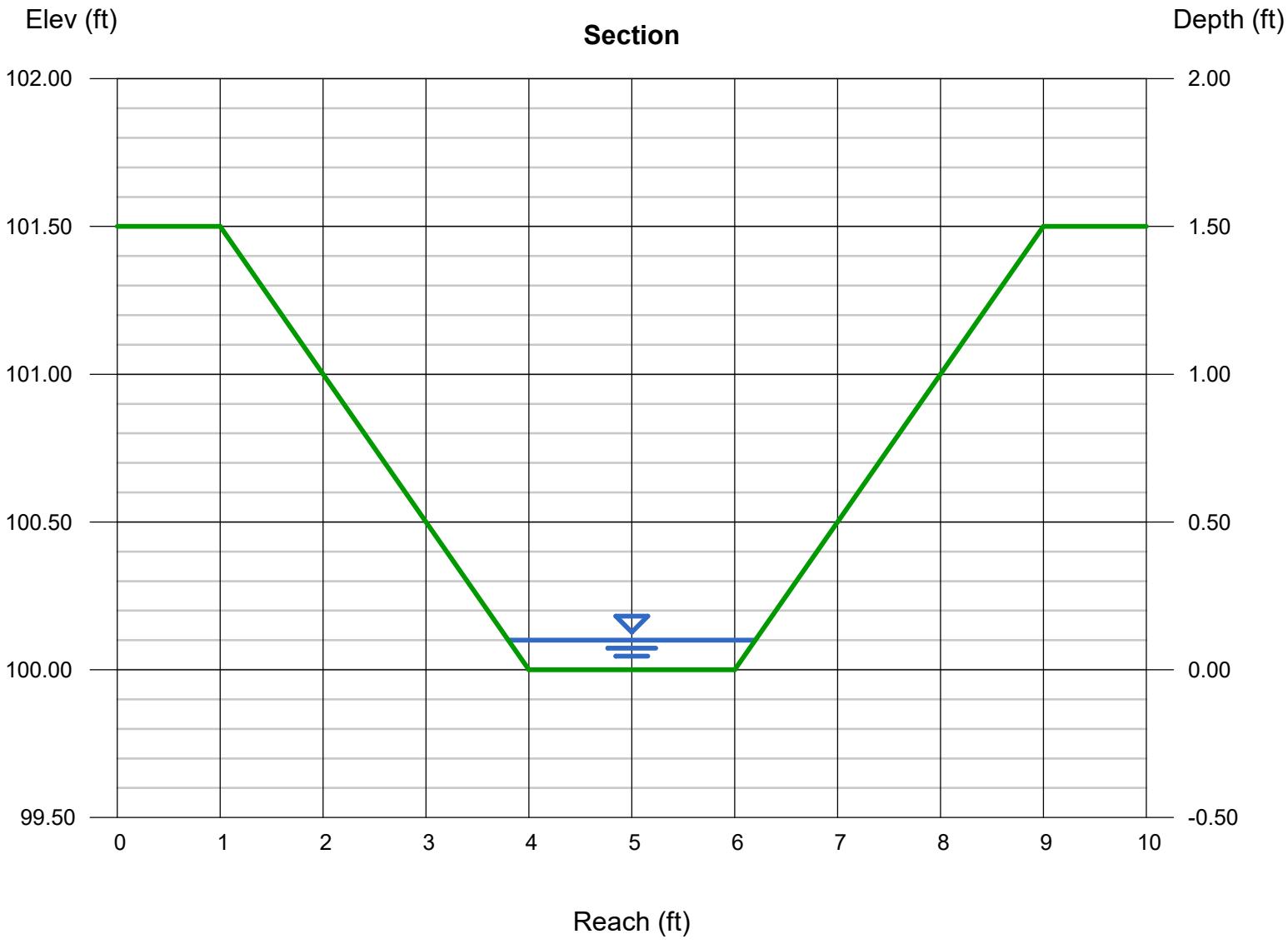
Bottom Width (ft)	= 2.00
Side Slopes (z:1)	= 2.00, 2.00
Total Depth (ft)	= 1.50
Invert Elev (ft)	= 100.00
Slope (%)	= 0.50
N-Value	= 0.035

Calculations

Compute by:	Q vs Depth
No. Increments	= 15

Highlighted

Depth (ft)	= 0.10
Q (cfs)	= 0.132
Area (sqft)	= 0.22
Velocity (ft/s)	= 0.60
Wetted Perim (ft)	= 2.45
Crit Depth, Yc (ft)	= 0.06
Top Width (ft)	= 2.40
EGL (ft)	= 0.11



Depth	Q	Area	Veloc	Wp
(ft)	(cfs)	(sqft)	(ft/s)	(ft)
0.10	0.132	0.220	0.60	2.45
0.20	0.435	0.480	0.91	2.89
0.30	0.887	0.780	1.14	3.34
0.40	1.491	1.120	1.33	3.79
0.50	2.253	1.500	1.50	4.24
0.60	3.180	1.920	1.66	4.68
0.70	4.281	2.380	1.80	5.13
0.80	5.564	2.880	1.93	5.58
0.90	7.038	3.420	2.06	6.02
1.00	8.712	4.000	2.18	6.47
1.10	10.59	4.620	2.29	6.92
1.20	12.69	5.280	2.40	7.37
1.30	15.02	5.980	2.51	7.81
1.40	17.58	6.720	2.62	8.26
1.50	20.38	7.500	2.72	8.71

Yc	TopWidth	Energy
(ft)	(ft)	(ft)
0.06	2.40	0.11
0.11	2.80	0.21
0.18	3.20	0.32
0.24	3.60	0.43
0.31	4.00	0.54
0.38	4.40	0.64
0.45	4.80	0.75
0.52	5.20	0.86
0.60	5.60	0.97
0.67	6.00	1.07
0.75	6.40	1.18
0.82	6.80	1.29
0.90	7.20	1.40
0.98	7.60	1.51
1.06	8.00	1.61

Tab 9.0

9.0 BOND QUANTITIES, FACILITY SUMMARIES, AND DECLARATION OF COVENANT

All required bonding and financial guarantees will be provided as required by the City of Puyallup.

Tab 10.0

10.0 OPERATIONS AND MAINTENANCE MANUAL

An Operations and Maintenance Manual is included below.

GRADING ONLY PERMIT
OPERATIONS AND MAINTENANCE MANUAL

Fortress - Puyallup

240 15th Street SE
Puyallup, Washington 98372

Prepared for:
CREF3 Puyallup, LLC
11611 San Vicente Blvd, 10th Floor
Los Angeles, CA 90049

Revised June 13, 2023
October 24, 2022
Our Job No. 22085

1.0 STORMWATER OPERATIONS AND MAINTENANCE SUMMARY

The proposed Fortress - Puyallup project is located on a 7.96-acre site located in the City of Puyallup, Washington. The project address is 240 15th Street SE, Puyallup, WA 98372 with the parcel numbers being 0420274126, 7845000161, and 7845000170. The site is located northwest of the intersection of 15th Street SE and East Pioneer Way.

The site has a drainage system that needs periodic maintenance in order to function properly. This report describes the storm drainage system and delineates operation and maintenance responsibilities and requirements for the site.

The design of the drainage facilities discussed in this manual can be found in the Fortress – Puyallup project construction drawings and stormwater site plan on file with the City of Puyallup.

The site is approximately 7.96 acres in size. The purpose of this manual is to address maintenance of stormwater facilities installed with the grading of the Fortress - Puyallup project. These facilities are intended to detain and treat the runoff from the graded site. Runoff on the project site is sent to the temporary sediment ponds via temporary v-ditch conveyance swales.

2.0 PLAN GOAL

The specific purpose of the storm water facilities is to minimize pollution that is typically associated with modern development. Stormwater runoff contains pollutants harmful to humans and aquatic life. The majority of pollution is generated by motor vehicles and lawn / landscape maintenance.

3.0 MAINTENANCE AND OPERATIONAL RESPONSIBILITIES

Owners/Tenants have the following Operations and Maintenance responsibilities, which include:

I. Inspection and maintenance of all on-site drainage facility components (catch basins, fencing, storm manholes, pipes, vaults, and ponds) at least twice annually:

   A. Remove accumulated sediment and debris from all pipes, structures, ponds and vaults (any debris and/or sediment collected shall be disposed of in accordance with applicable State and Federal requirements).

   B. Inspect and repair any damage, including; cracks, unsealed joints and pipes that deviate from their design shape

   C. Maintain access points including manhole hole lids, grates and ladders

   D. Debris and leaves shall be removed from catch basin grates

   E. Control structures shall be kept in good repair and ensure that the outlet orifice is unobstructed

   F. General site surroundings:

      1) Maintaining good housekeeping practices on the site will reduce the amount of trash, debris, and sediment that reaches the storm system.

      2) The owner, tenants and anyone doing landscaping on the property must be careful to avoid introducing landscape fertilizer to receiving waters or groundwater.

G. The temporary sediment ponds should be checked regularly for sediment accumulation and inlet and outlet blockages. Inspect these facilities for any nuisance plants or animals during regular inspection.

The operation and maintenance of all stormwater facilities shall be completed pursuant to the standards and requirements of the 2019 Stormwater Management Manual for Western Washington and any additional manufacturer's guidance. Additional information is included in the following pages for reference.

4.0 REPORTING

The above maintenance activities will be documented each year and kept in a log book. Maintenance logs shall be made available to the City of Puyallup upon request. This manual and the logs should be kept on-site, preferably in an office belonging to the person tasked with ensuring the system is function as intended. This manual shall be transferred to the new property owner if the property is sold.

5.0 RESPONSIBLE PARTY/ORGANIZATION

Fortress Investment Group, Inc.
11611 San Vicente Blvd, 10th Floor
Los Angeles, CA 90049

INSPECTION/MAINTENANCE CHECKLIST

The items in this checklist will be inspected at least twice per year and maintenance performed as necessary. Refer to the Maintenance Standards included in this manual for a detailed list of inspection tasks and descriptions of when maintenance is required to be performed.

STRUCTURE/ FACILITY		**DATE OF INSPECTION MAINTENANCE**		
	Maintenance Standard(s)	**RESULTS/ MAINTENANCE**	**DATE**	**COMMENTS**
Conveyance Swales	Sediment/Debris Shape/Damage	Inspection Results		
		Maintenance Done		
Sediment Ponds	Sediment/Debris Outlet Riser Access Riser Shape/Damage	Inspection Results		
		Maintenance Done		
General Site	Landscaping Trash Fertilizer Use	Inspection Results		
		Maintenance Done		

I hereby certify that the above noted inspections and maintenance was performed in accordance with the approved Operations and Maintenance Manual for the Fortress - Puyallup project, Puyallup, Washington.

_____

Signature Date

_____

Title

PORTION OF SE QUARTER OF SEC 27, TWN 20 N, RGE. 4 E, W.M.
CITY OF PUYALLUP, PIERCE COUNTY, WASHINGTON

ROUGH GRADING & TESC PLAN

N

0 20' 40' 80'
SCALE: 1"=40'

T.E.S.C. LEGEND

- EXISTING TYPE II CATCH BASIN
- EXISTING TYPE I CATCH BASIN
- EXISTING STORM DRAINAGE LINE
- EXISTING SANITARY SEWER MANHOLE
- EXISTING SANITARY SEWER LINE (SS)
- EXISTING WATERMAIN (W)
- EXISTING FIRE HYDRANT
- EXISTING WATER VALVE (WV)
- EXISTING SPOT ELEVATIONS (+59.0)
- EXISTING CONTOURS (100)
- PROPOSED CONTOURS (100)
- SILTATION FENCE
- TEMPORARY CONSTRUCTION ENTRANCE
- FLOW ARROW
- TEMPORARY DRAINAGE DITCH
- CLEARING LIMITS
- GROUND WATER MONITORING WELL
- PROPOSED SETTLEMENT MARKER
- TYPE 2 CATCH BASIN

DISCHARGE NOTE:

NO OFFSITE DISCHARGE OF CONTAMINATED STORMWATER OF GROUNDWATER SHALL OCCUR.

EROSION CONTROL BMP'S

- (CE) TEMPORARY CONSTRUCTION ENTRANCE PER DETAIL ON SHEET E5.
- (CL) CLEARING LIMITS
- (IP) STORM DRAIN INLET PROTECTION PER DETAIL ON SHEET E5.
- (SF) TEMPORARY SILT FENCE PROTECTION PER DETAIL ON SHEET E5.
- (V) TEMPORARY "V" DITCH WITH ROCK CHECK DAMS PER DETAIL ON SHEET E6. SLOPE AT 0.5% MINIMUM.
- (SM) PROPOSED SETTLEMENT MARKER (TYPICAL) PER GEOTECH RECOMMENDATIONS. SEE DETAIL SHEET E5. CONTRACTOR SHALL USE PROTECTIVE MEASURES TO ENSURE MARKERS ARE NOT DISTURBED DURING PAD GRADING. RODS TO BE PAINTED WITH BRIGHT, REFLECTIVE PAINT AND FLAGGING PLACED NEARBY TO KEEP RODS VISIBLE TO CONSTRUCTION TRAFFIC.

GRADING AND DRAINAGE NOTES:

1. THE WASHINGTON STATE DEPARTMENT OF ECOLOGY (ECOLOGY) HAS APPROVED LOCALIZED SOURCE REMOVAL EXCAVATIONS FOR REMEDIATION OF CONTAMINATED SOIL PRESENT ON THE PROPERTY. THE PROJECT ENVIRONMENTAL CONSULTANT WILL BE PRESENT DURING EXCAVATION OF KNOWN AREAS OF CONTAMINATED SOIL, AND WILL BE NOTIFIED IF ADDITIONAL SUSPECTED AREAS OF CONTAMINATED SOIL ARE DISCOVERED DURING DEVELOPMENT ACTIVITIES. SOIL SAMPLES WILL BE COLLECTED AT THE LIMITS OF CONTAMINATED SOIL EXCAVATION AREAS TO CONFIRM THAT CONTAMINATED SOIL HAS BEEN REMOVED TO THE MAXIMUM EXTENT PRACTICABLE.
2. PERSONNEL INVOLVED IN EXCAVATION AND/OR HANDLING OF CONTAMINATED SOILS MUST POSSES A CURRENT OSHA HAZWOPER 40-HOUR CERTIFICATION. CONTAMINATED SOIL WILL BE DIRECT-LOADED INTO TRUCKS FOR OFF-PROPERTY DISPOSAL AT AN AUTHORIZED WASTE DISPOSAL FACILITY. IF TEMPORARY STOCKPILING IS NECESSARY, STOCKPILED CONTAMINATED SOIL WILL BE COVERED WITH MINIMUM 10-MIL PLASTIC SHEETING.
3. STORMWATER GENERATED DURING DEVELOPMENT WILL BE CONVEYED TO AN ON-PROPERTY CONSTRUCTION STORMWATER TREATMENT SYSTEM PRIOR TO DISCHARGE TO THE MUNICIPAL STORMWATER SYSTEM. THE CONSTRUCTION STORMWATER TREATMENT SYSTEM WILL BE DESIGNED TO MEET THE DISCHARGE REQUIREMENTS OF THE CONSTRUCTION STORMWATER GENERAL PERMIT (CSWGP) AND ADMINISTRATIVE ORDER (AO) THAT WILL BE ISSUED FOR THE PROPERTY BY ECOLOGY. THE AO IS ANTICIPATED TO INCLUDE INDICATOR LEVELS FOR PH, TURBIDITY, TOTAL PETROLEUM HYDROCARBONS, BENZENE, TOLUENE, ETHYLBENZENE, XYLENES, 1,2-DICHLOROETHANE, TETRACHLOROETHENE, TRICHLOROETHENE, CIS-1,2-DICHLOROETHENE, AND TRANS-1,2-DICHLOROETHENE. (SEE ATTACHED DRAFT TABLE 1 FROM ECOLOGY FOR ANTICIPATED INDICATOR LEVELS)
4. DISCHARGE FROM THE CONSTRUCTION STORMWATER TREATMENT SYSTEM WILL BE SAMPLED PERIODICALLY FOR THE INDICATOR LEVELS IDENTIFIED IN THE AO TO ENSURE THAT DISCHARGE WATER IS IN COMPLIANCE WITH THE REQUIREMENTS OF THE CSWGP AND AO. SAMPLING RESULTS WILL BE REPORTED TO ECOLOGY IN MONTHLY DISCHARGE MONITORING REPORTS. NO OFF-PROPERTY DISCHARGE OF CONTAMINATED STORMWATER OR GROUNDWATER WILL OCCUR.

APPROVED

BY _____
CITY OF PUYALLUP
DEVELOPMENT ENGINEERING

DATE _____

NOTE: THIS APPROVAL IS VOID AFTER 180 DAYS FROM APPROVAL DATE.
THE CITY WILL NOT BE RESPONSIBLE FOR ERRORS AND/OR OMISSIONS ON THESE PLANS.
FIELD CONDITIONS MAY DICTATE CHANGES TO THESE PLANS AS DETERMINED BY THE DEVELOPMENT ENGINEERING MANAGER.

811 Know what's below. Call before you dig. Dial 811

No.	Date	By	Ckd.	Appr.	Revision
2	09/05/23	ROC	DL	JSG	REVISED PER CITY COMMENTS DATED 06-14-2023
1	06/14/23	DL	DL	JSG	REVISED PER NEW SITE PLAN

Title: ROUGH GRADING & TESC PLAN

FORTRESS - PUYALLUP

For: CREF3 PUYALLUP OWNER LLC
11611 SAN VICENTE BLVD
10TH FLOOR
LOS ANGELES, CA 90049

JASON GUY HUBBARD — STATE OF WASHINGTON — 38950 — REGISTERED PROFESSIONAL ENGINEER
9/05/2023

Scale: Horizontal 1"=40' Vertical N/A

Designed ROC Drawn ROC Checked DL Approved JGH Date 10/24/22

Barghausen Consulting Engineers, Inc.
18215 72nd Avenue South
Kent, WA 98032
425.251.6222
barghausen.com

Job Number 22085

Sheet E3 of 7

P:\22000s\22085\engineering\22085-E.dwg 9/5/2023 1:01 PM DLAMOTTE

Appendix V-A: BMP Maintenance Tables

Ecology intends the facility-specific maintenance standards contained in this section to be conditions for determining if maintenance actions are required as identified through inspection. Recognizing that Permittees have limited maintenance funds and time, Ecology does not require that a Permittee perform all these maintenance activities on all their stormwater BMPs. We leave the determination of importance of each maintenance activity and its priority within the stormwater program to the Permittee. We do expect, however, that sufficient maintenance will occur to ensure that the BMPs continue to operate as designed to protect ground and surface waters.

Ecology doesn't intend that these measures identify the facility's required condition at all times between inspections. In other words, exceedance of these conditions at any time between inspections and/or maintenance does not automatically constitute a violation of these standards. However, based upon inspection observations, the Permittee shall adjust inspection and maintenance schedules to minimize the length of time that a facility is in a condition that requires a maintenance action.

Table V-A.1: Maintenance Standards - Detention Ponds

Maintenance Component	Defect	Conditions When Maintenance Is Needed	Results Expected When Maintenance Is Performed
General	Trash & Debris	Any trash and debris which exceed 1 cubic feet per 1,000 square feet. In general, there should be no visual evidence of dumping. If less than threshold all trash and debris will be removed as part of next scheduled maintenance.	Trash and debris cleared from site
	Poisonous Vegetation and noxious weeds	Any poisonous or nuisance vegetation which may constitute a hazard to maintenance personnel or the public. Any evidence of noxious weeds as defined by State or local regulations. (Apply requirements of adopted IPM policies for the use of herbicides).	No danger of poisonous vegetation where maintenance personnel or the public might normally be. (Coordinate with local health department) Complete eradication of noxious weeds may not be possible. Compliance with State or local eradication policies required
	Contaminants and Pollution	Any evidence of oil, gasoline, contaminants or other pollutants (Coordinate removal/cleanup with local water quality response agency).	No contaminants or pollutants present.
	Rodent Holes	Any evidence of rodent holes if facility is acting as a dam or berm, or any evidence of water piping through dam or berm via rodent holes.	Rodents destroyed and dam or berm repaired. (Coordinate with local health department; coordinate with Ecology Dam Safety Office if pond exceeds 10 acre-feet.)
	Beaver Dams	Dam results in change or function of the facility.	Facility is returned to design function. (Coordinate trapping of beavers and removal of dams with appropriate permitting agencies)
	Insects	When insects such as wasps and hornets interfere with maintenance activities.	Insects destroyed or removed from site. Apply insecticides in compliance with adopted IPM policies
	Tree Growth and Hazard Trees	Tree growth does not allow maintenance and inspection access or interferes with maintenance activity (i.e., slope mowing, silt removal, vactoring, or equipment movements). If trees are not interfering with access or maintenance, do not remove If dead, diseased, or dying trees are identified (Use a certified Arborist to determine health of tree or removal requirements)	Trees do not hinder maintenance activities. Harvested trees should be recycled into mulch or other beneficial uses (e.g., alders for firewood). Remove hazard Trees
Side Slopes of Pond	Erosion	Eroded damage over 2 inches deep where cause of damage is still present or where there is potential for continued erosion. Any erosion observed on a compacted berm embankment.	Slopes should be stabilized using appropriate erosion control measure(s); e.g.,rock reinforcement, planting of grass, compaction. If erosion is occurring on compacted berms a licensed engineer in the state of Washington should be consulted to resolve source of erosion.
Storage Area	Sediment	Accumulated sediment that exceeds 10% of the designed pond depth unless otherwise specified or affects inletting or outletting condition of the facility.	Sediment cleaned out to designed pond shape and depth; pond reseeded if necessary to control erosion.

Table V-A.1: Maintenance Standards - Detention Ponds (continued)

Maintenance Component	Defect	Conditions When Maintenance Is Needed	Results Expected When Maintenance Is Performed
	Liner (if Applicable)	Liner is visible and has more than three 1/4-inch holes in it.	Liner repaired or replaced. Liner is fully covered.
Ponds Berms (Dikes)	Settlements	Any part of berm which has settled 4 inches lower than the design elevation If settlement is apparent, measure berm to determine amount of settlement Settling can be an indication of more severe problems with the berm or outlet works. A licensed engineer in the state of Washington should be consulted to determine the source of the settlement.	Dike is built back to the design elevation.
	Piping	Discernable water flow through pond berm. Ongoing erosion with potential for erosion to continue. (Recommend a Goethechnical engineer be called in to inspect and evaluate condition and recommend repair of condition.	Piping eliminated. Erosion potential resolved.
Emergency Overflow/ Spillway and Berms over 4 feet in height	Tree Growth	Tree growth on emergency spillways creates blockage problems and may cause failure of the berm due to uncontrolled overtopping. Tree growth on berms over 4 feet in height may lead to piping through the berm which could lead to failure of the berm.	Trees should be removed. If root system is small (base less than 4 inches) the root system may be left in place. Otherwise the roots should be removed and the berm restored. A licensed engineer in the state of Washington should be consulted for proper berm/spillway restoration.
	Piping	Discernable water flow through pond berm. Ongoing erosion with potential for erosion to continue. (Recommend a Geotechnical engineer be called in to inspect and evaluate condition and recommend repair of condition.	Piping eliminated. Erosion potential resolved.
Emergency Overflow/Spillway	Emergency Overflow/Spillway	Only one layer of rock exists above native soil in area five square feet or larger, or any exposure of native soil at the top of out flow path of spillway. (Rip-rap on inside slopes need not be replaced.)	Rocks and pad depth are restored to design standards.
	Erosion	See "Side Slopes of Pond"	

Table V-A.2: Maintenance Standards - Infiltration

Maintenance Component	Defect	Conditions When Maintenance Is Needed	Results Expected When Maintenance Is Performed
General	Trash & Debris	See Table V-A.1: Maintenance Standards - Detention Ponds	See Table V-A.1: Maintenance Standards - Detention Ponds
	Poisonous/Noxious Vegetation	See Table V-A.1: Maintenance Standards - Detention Ponds	See Table V-A.1: Maintenance Standards - Detention Ponds
	Contaminants and Pollution	See Table V-A.1: Maintenance Standards - Detention Ponds	See Table V-A.1: Maintenance Standards - Detention Ponds
	Rodent Holes	See Table V-A.1: Maintenance Standards - Detention Ponds	See Table V-A.1: Maintenance Standards - Detention Ponds
Storage Area	Sediment	Water ponding in infiltration pond after rainfall ceases and appropriate time allowed for infiltration. Treatment basins should infiltrate Water Quality Design Storm Volume within 48 hours, and empty within 24 hours after cessation of most rain events.	Sediment is removed and/or facility is cleaned so that infiltration system works according to design.

Table V-A.3: Maintenance Standards - Closed Detention Systems (Tanks/Vaults) (continued)

Maintenance Component	Defect	Conditions When Maintenance is Needed	Results Expected When Maintenance is Performed
Manhole	Cover Not in Place	Cover is missing or only partially in place. Any open manhole requires maintenance.	Manhole is closed.
	Locking Mechanism Not Working	Mechanism cannot be opened by one maintenance person with proper tools. Bolts into frame have less than 1/2 inch of thread (may not apply to self-locking lids).	Mechanism opens with proper tools.
	Cover Difficult to Remove	One maintenance person cannot remove lid after applying normal lifting pressure. Intent is to keep cover from sealing off access to maintenance.	Cover can be removed and reinstalled by one maintenance person.
	Ladder Rungs Unsafe	Ladder is unsafe due to missing rungs, misalignment, not securely attached to structure wall, rust, or cracks.	Ladder meets design standards. Allows maintenance person safe access.
Catch Basins	See Table V-A.5: Maintenance Standards - Catch Basins	See Table V-A.5: Maintenance Standards - Catch Basins	See Table V-A.5: Maintenance Standards - Catch Basins

Table V-A.4: Maintenance Standards - Control Structure/Flow Restrictor

Maintenance Component	Defect	Condition When Maintenance is Needed	Results Expected When Maintenance is Performed
General	Trash and Debris (Includes Sediment)	Material exceeds 25% of sump depth or 1 foot below orifice plate.	Control structure orifice is not blocked. All trash and debris removed.
	Structural Damage	Structure is not securely attached to manhole wall. Structure is not in upright position (allow up to 10% from plumb). Connections to outlet pipe are not watertight and show signs of rust. Any holes - other than designed holes - in the structure.	Structure securely attached to wall and outlet pipe. Structure in correct position. Connections to outlet pipe are water tight; structure repaired or replaced and works as designed. Structure has no holes other than designed holes.
Cleanout Gate	Damaged or Missing	Cleanout gate is not watertight or is missing. Gate cannot be moved up and down by one maintenance person. Chain/rod leading to gate is missing or damaged. Gate is rusted over 50% of its surface area.	Gate is watertight and works as designed. Gate moves up and down easily and is watertight. Chain is in place and works as designed. Gate is repaired or replaced to meet design standards.
Orifice Plate	Damaged or Missing	Control device is not working properly due to missing, out of place, or bent orifice plate.	Plate is in place and works as designed.
	Obstructions	Any trash, debris, sediment, or vegetation blocking the plate.	Plate is free of all obstructions and works as designed.
Overflow Pipe	Obstructions	Any trash or debris blocking (or having the potential of blocking) the overflow pipe.	Pipe is free of all obstructions and works as designed.
Manhole	See Table V-A.3: Maintenance Standards - Closed Detention Systems (Tanks/Vaults)	See Table V-A.3: Maintenance Standards - Closed Detention Systems (Tanks/Vaults)	See Table V-A.3: Maintenance Standards - Closed Detention Systems (Tanks/Vaults)
Catch Basin	See Table V-A.5: Maintenance Standards - Catch Basins	See Table V-A.5: Maintenance Standards - Catch Basins	See Table V-A.5: Maintenance Standards - Catch Basins