MAUL FOSTER ALONGI
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April 1, 2026
Project No. M0232.17.120

Oregon Department of Environmental Quality
700 NE Multnomah St., Suite 600
Portland, OR 97232

Re: Terminal Core Redevelopment Project – Gate C5 Revised Environmental Management Plan

Maul Foster & Alongi, Inc. (MFA) has prepared this Environmental Management Plan (EMP) in accordance with the requirements of the Port of Portland (the Port) National Pollutant Discharge Elimination System (NPDES) 1200-CA Stormwater Discharge Permit issued by the State of Oregon Department of Environmental Quality (DEQ). The EMP was prepared after issuance of the NPDES 1200-CA to address areas now known or suspected to contain per-and polyfluoroalkyl substances (PFAS) associated with historical operations.

Applicability

The construction activities will be conducted on a portion of the Portland International Airport (PDX) which is assigned in the Your DEQ Online (YDO) public information database as YDO No. 3324.

The primary components of this submittal include the following:

- Contaminated media management plan (CMMP; Attachment A). Please note that Section 4.1 of the CMMP includes a discussion of unanticipated contamination. Suspect soil will be field screened for volatile organic compounds (VOCs).
- Temporary Erosion and Sediment Control Plans (Attachment B).
- Groundwater discharge, treatment, and monitoring management plan (Attachment C).
- EMP Review Application (Attachment D).

The EMP will be considered a component of the Erosion and Sediment Control Plan. The construction contractor is required to perform daily erosion, sediment, and pollution control inspections in compliance with the project's Erosion Control Plan, the Port's 1200-CA permit, and the Port's Construction Master Specifications. The contractor must also become familiar with the conditions of this EMP and assist Port staff with implementation and compliance when needed. Port Construction and Environmental staff perform periodic site inspections to verify compliance with all requirements. A construction completion report will be prepared and submitted to the DEQ.

CHECKLIST ITEMS

Section III of the EMP review applications requests a variety of information presented on a map. Each of the requested items can be found at the locations below:

- DEQ ECSI site number (if applicable)
    - YDO/ECSI 3324.
- A list or table of all known contaminants with lab tests results showing concentration and depth
    - See CMMP in Attachment A.
- A list of all disposal locations
    - See CMMP in Attachment A, Section 4.1.
- Notice of approval from local jurisdiction if discharge is to public storm system
    - Not applicable.
- A map with sample locations
    - See CMMP figures in Attachment A.
- Temporary Erosion and Sediment Control Plans specific to contaminated soils
    - See YDO for erosion control drawings.
- Plans for off-site disposal of contaminated soils
    - See CMMP in Attachment A.
- Any relevant (related) portions of erosion and sediment control plan that address the management of contaminated and potentially contaminated construction stormwater and dewatering program (if applicable)
    - See plans in YDO.
- The dewatering plan (if applicable)
    - See groundwater discharge, treatment, and monitoring management plan in Attachment C.
- All proposed point(s) of discharge to receiving waterbodies
    - See proposed discharge location shown on drawing PDX 2021-510 Sheet C3.002-F from the dewatering plan presented in Attachment C.
- All soil types within areas to be disturbed
    - See CMMP in Attachment A.
- All area of earth disturbance
    - See YDO for erosion control drawings.
- Sufficient indication of topography to indicate where stormwater flows
    - See YDO for erosion control drawings.
- Schematic drawing of the proposed treatment system
    - See groundwater discharge, treatment, and monitoring management plan in Attachment C.

Sincerely,

Maul Foster & Alongi, Inc.

EXPIRES: 1/1/2027
This digital seal certifies the signatory and document content.

Michael Pickering, RG
Principal Geologist

Attachments

Limitations

A—CMMP

B—Temporary Erosion and Sediment Control Plans

C—Groundwater Discharge, Treatment, and Monitoring Management Plan

D—EMP Review Application

Limitations

The services undertaken in completing this report were performed consistent with generally accepted professional consulting principles and practices. No other warranty, express or implied, is made. These services were performed consistent with our agreement with our client. This report is solely for the use and information of our client unless otherwise noted. Any reliance on this report by a third party is at such party's sole risk.

Opinions and recommendations contained in this report apply to conditions existing when services were performed and are intended only for the client, purposes, locations, time frames, and project parameters indicated. We are not responsible for the impacts of any changes in environmental standards, practices, or regulations subsequent to performance of services. We do not warrant the accuracy of information supplied by others, or the use of segregated portions of this report.

Attachment A

CMMP

MAUL
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ALONGI

Gate C5 Contaminated Media Management Plan

Terminal Core Redevelopment Project
Portland International Airport

Prepared for:

Port of Portland

April 1, 2026
Project No. M0232.17.120

Prepared by:

Maul Foster & Alongi, Inc.
3140 NE Broadway, Portland, OR 97232

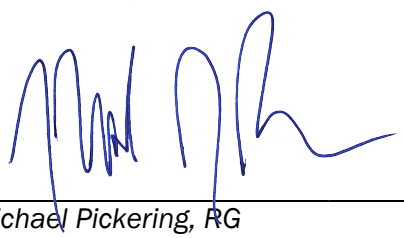
MAUL FOSTER ALONGI

Gate C5 Contaminated Media Management Plan

Terminal Core Redevelopment Project
Portland International Airport

The material and data in this report were prepared under the supervision and direction of the undersigned.

Maul Foster & Alongi, Inc.



Michael Pickering, RG
Principal Geologist

Contents

Abbreviations

bgs	below ground surface
BMPs	best management practices
CFR	Code of Federal Regulations
CMMP	contaminated media management plan
COPC	contaminants of potential concern
DEQ	Oregon Department of Environmental Quality
EMP	Environmental Management Plan
EPA	U.S. Environmental Protection Agency
ESCP	erosion and sediment control plan
HASP	health and safety plan
HFPO-DA	hexafluoropropylene oxide dimer acid
MFA	Maul Foster & Alongi, Inc.
mg/kg	milligram per kilogram
MRL	method reporting limit
ng/g	nanogram/gram
ng/L	nanogram per liter
OAR	Oregon Administrative Rule
PDX	Portland International Airport
PFAS	per- and polyfluoroalkyl substances (PFAS)
PFBS	perfluorobutane sulfonic acid
PFHxS	perfluorohexane sulfonic acid
PFNA	perfluorononanoic acid
PFOA	perfluorooctanoic acid
PFOS	perfluorooctane sulfonic acid
Port	Port of Portland
RCRA	Resource Conservation and Recovery Act
SSL	soil screening level
the Site	Terminal Core Redevelopment Project
TCORE	Terminal Core
TPH	total petroleum hydrocarbons
TCLP	toxicity characteristic leaching procedure
VOC	volatile organic compounds

1 Introduction

This contaminated media management plan (CMMP) (the "Plan") was prepared for the Port of Portland (Port) Terminal Core (TCORE) Redevelopment Project – Gate C5 (the "Site") at the Portland International Airport (PDX). The Site is shown on drawing PDX 2021-510 Sheet C3.002-F from the dewatering plan presented in Attachment C of the Environmental Management Plan (EMP). The project activities will include repairs to a grease interceptor line that has settled since installation. The project work period is expected to occur from approximately March 30 through May 1, 2026.

Contaminants of potential concern (COPCs) have been detected in shallow groundwater and soil occurring within the shallow groundwater zone, therefore, shallow groundwater and soil excavated greater than 8 feet below ground surface (bgs) will be assumed to contain COPCs and managed as described in this Plan (8 feet bgs was chosen as a conservative elevation well above the observed seasonally high groundwater level). Soils excavated above 8 feet bgs are not expected to contain COPCs. This Plan includes measures for managing soil and groundwater with COPCs.

1.1 Purpose

The purpose of this CMMP is to provide guidelines for assessing and managing contaminated media (soil and groundwater) that may be encountered during construction activities at the Site. This CMMP identifies COPCs, excavation protocols, soil-handling procedures, waste characterization and disposal requirements, and construction dewatering measures to be addressed and implemented during redevelopment of the Site. At the time the TCORE project was initiated, the only known contaminants were jet fuel hydrocarbons confined to a limited area in the southeastern portion of the project. Since then, additional investigations have been carried out in the general vicinity of the terminal which have identified the presence of per- and polyfluoroalkyl substances (PFAS).

Oregon's Environmental Quality Commission recently adopted rules to include six PFAS in the definition of hazardous substances in Oregon Administrative Rules, which allows DEQ the ability to require investigation and remediation of releases of those compounds.

The guidelines and procedures outlined in this CMMP are to be followed during any subsurface-soil-disturbing activities on the Site.

1.2 Site Assessment

In 2025, Apex Companies collected representative soil samples from temporary borings and groundwater samples from existing wells in the vicinity of the former fire stations (Apex 2025). Representative excerpts from the Apex Companies report are included in Appendix A. Soil and groundwater was analyzed for PFAS by EPA Method 1633. PFAS were not detected above the method reporting limits (MRLs) in the composite soil samples (0 to 6 feet bgs and 6 to 10 feet bgs) collected from borings B-6 and B-8. The following bullets summarize the groundwater chemical results from well MW-6.

- PFOA detected at a concentration of 4,420 nanograms per liter (ng/L)
- PFOS detected at a concentration of 135 ng/L

- PFHxS detected at a concentration of 578 ng/L
- PFNA detected at a concentration of 19.8 ng/L
- HFPO-DA was not detected above the MRL of 6.67 ng/L
- PFBS was detected at a concentration of 50.6 ng/L
- Ten other PFAS were detected at concentrations ranging from 6.73 to 910 ng/L

In 2025, GRI completed a preliminary soil assessment near Gate C15 (GRI 2026) in support of construction project planning. The GRI report is included in Appendix B. Two push probe borings (DP-1 and DP-2) were completed for the purpose of collecting soil samples for chemical analysis. Discrete samples were collected from boring DP-1 and composite samples were collected from boring DP-2. The samples were analyzed for PFAS by EPA Method 1633, metals by EPA Method 6020B, total petroleum hydrocarbons (TPH) as gasoline by Northwest Method NWTPH-Gx; diesel and oil-range TPH by Northwest Method NWTPH-Dx (with silica gel cleanup); and volatile organic compounds (VOCs) by EPA Method 8260. The following table summarizes the chemical results.

Boring ID	Sample Depth (feet bgs)	PFAS	Metals*	TPH as gasoline / diesel	VOCs
DP-1	4 to 5	ND	<CFSL	ND	ND
DP-1	30 to 31	ND	<CFSL	ND	MEK = 0.034 mg/kg Acetone = 0.1 mg/kg
DP-2	8 to 11	PFOA 0.16 ng/g PFOS 0.14 ng/g	<CFSL	ND	ND
DP-2	11.5 to 32	PFOA 1.7 ng/g** PFOS = ND Five other PFAS ranging from 0.15 to 0.72 ng/g	<CFSL	ND	ND

Notes
bgs = below ground surface
CFSL = DEQ Clean Fill Screening Level per DEQ, 2018
ND = Not detected above the method reporting limit
ng/g = nanogram per gram
mg/kg = milligram per kilogram
* DEQ is now recommending lead in soil be screened based on EPA's 2024 guidance: 530 mg/kg for occupational workers, 270 mg/kg for construction workers, 740 mg/kg for excavation workers, and 200 mg/kg for residential receptors. The highest relative lead concentration reported was 9.48 mg/kg.
** The detected PFOA concentration exceeds the draft noncancer RBC of 0.21 ng/g in an excavation work scenario. A table presenting the PFAS screening is presented in Appendix B.

1.3 Distribution of Contaminated Media Management Plan

The Port will provide this CMMP to the contractor awarded the contract for this work. It is the contractor's responsibility to provide this CMMP to their employees and sub-contractors performing activities on the Site where disturbance and/or direct contact with potentially contaminated soil or groundwater may occur. The Port or its contractor will be responsible for ensuring that all contaminated-media-handling activities have been properly planned and that additional investigations are completed, if necessary.

2 Distribution of Contaminants of Potential Concern

2.1 Site Contaminants

COPCs include TPH as diesel, TPH as oil, VOCs, and PFAS compounds.

2.2 Nature and Extent of Contamination

COPCs are suspected to be present in groundwater and in soil in the zone of seasonal groundwater fluctuation. There is no known release of COPCs that has occurred at the Site. The detections of COPCs presented in the Apex Companies and GRI reports occurred in soil within the zone of seasonal groundwater fluctuation. The upper boundary of this zone represents the highest level the water table reaches, typically during wet seasons, while the lower boundary represents the lowest level, usually during dry periods.

Estimated Volumes of Contaminated Media. Potentially impacted soils excavated from depths greater than 8 feet bgs are expected to be on the order of 975 cubic yards. Construction dewatering may be necessary during the project. If dewatering is necessary, the total volume will be minimized using a localized approach (e.g., a limited number of dewatering wells). Time allowed for dewatering is further limited since the Site is within an active aircraft movement area and during construction, adjacent gates, taxiways and runways must be shut down, impacting airport operations. Based on historical dewatering activities, the estimated maximum discharge rate, at well start up is expected to be approximately 100 gallons per minute.

3 Protocols for Soil-Disturbing Activities

The following protocols shall be followed for any activities that penetrate the ground surface and result in disturbance of or exposure to Site soil. The protocols shall apply to all individuals in the construction areas during soil-disturbing activities. The procedures listed in this section may be superseded by the requirements of a project-specific health and safety plan (HASP), if such a plan has been prepared following the guidelines described in Section 3.2.

This project will be assigned a Port construction inspector and Port environmental inspector. The Port inspectors work together and serve as the liaison between the construction contractor, Port project managers and Port environmental subject matter experts. All soil-disturbing activities during the project period shall be completed under the general oversight of the Port inspectors.

3.1 Description of Soil-Disturbing Activities

Activities at the Site will include a variety of construction activities. Soil from the surface to 8 feet bgs is above the zone of seasonal groundwater fluctuation and is not known to contain COPCs, therefore,

it is considered suitable for reuse within the Site or elsewhere at PDX. Soils excavated below 8 feet bgs will be stockpiled in accordance with Section 4.2.4 and tested in accordance with Section 4.2.2. Stockpiled soils removed from the Site that meet DEQ clean fill criteria (DEQ 2018) and EPA protection of groundwater soil screening levels (SSLs) for PFAS may be reused at PDX. Stockpiled soil removed from the Site that exceeds the DEQ clean fill criteria (DEQ 2018) or EPA protection of groundwater SSLs for PFAS will be disposed of off site at a landfill selected by the Port or its contractor.

These activities may encounter areas of unknown contamination that are discovered based on visual and olfactory evidence. Any activities that disturb Site soils must be conducted in accordance with this CMMP and shall be performed by qualified personnel as described in Section 3.2 and under the general oversight of the Port inspectors. It is the responsibility of the contractor, per signed contract documents, and Port inspectors to respond to indications of potential contamination encountered during construction activities. Soil suspected of contamination based on field observations shall be presumed contaminated and managed accordingly pending analytical testing. All soils requiring excavation must be managed following the protocols defined in Section 4.

3.2 Health and Safety

All activities that have the potential to disturb contaminated Site soil or groundwater shall be completed with appropriate protections defined by a project-specific, approved HASP. The HASP shall, at a minimum, set forth requirements and protections for working in areas of chemical contamination, and shall address the following subject matters:

- COPCs/site background
- Personal protective equipment
- Personal hygiene/decontamination protocols
- Requirements for training and medical surveillance of site workers
- Identification of physical and chemical hazards
- Hazard communication and site control

4 Management of Contaminated Soil

4.1 Procedures for Identification and Response to Suspected Contaminated Soil

As discussed above, the potential exists to encounter unknown contaminated media on the Site. Soil with the following characteristics should be reported to the Port immediately:

- Unusual or chemical-like odor.
- Unusual staining.
- The presence of light nonaqueous-phase liquid.

- Creates a sheen when in contact with water.

If suspected contaminated media are encountered, the contractors should:

- Stop work in the area.
- Immediately notify the Port.
- Secure the area until notified by the Port that work may continue.
- The contractors are responsible for ceasing construction work in the area. The contractor may continue work on unaffected areas.
- Suspected contaminated media that has been excavated will be characterized, stockpiled, and handled per the following sections.
- Suspected contaminated media in stockpiles and in excavations will be characterized on a case-by-case basis.

In the event that undocumented contamination, underground storage tanks, or other potentially hazardous conditions are encountered that are not addressed in the EMP, discharges exposed to the contaminated media will cease and DEQ will be notified within 48 hours. Discharges exposed to the contaminated media will not occur until DEQ approves the updates to the CMMP.

4.2 Waste Characterization

4.2.1 Suspected Contaminated Soil

If unanticipated contamination is encountered during excavation, the affected soil will be characterized as necessary to determine appropriate management requirements. Any soil not previously characterized that is suspected of being contaminated will be sampled and evaluated to ensure it is managed in compliance with applicable requirements.

The specific sampling and analysis approach should be established and approved by the planned disposal facility to ensure that excavated soils are adequately characterized for waste profiling and disposal. Based on knowledge of historical uses of the Site, if unanticipated contamination is encountered from the surface to 8 feet bgs, characterization will include the following COPCs: TPH as diesel, TPH as oil, VOCs, and metals. Characterization of suspected contaminated soil below 8 feet bgs will include the following COPCs: TPH as diesel, TPH as oil, VOCs, metals, and PFAS.

The sampling regimen will be established based on site-specific conditions with the following general guidance: each stockpile up to 500-cubic-yards in size should be sampled using a five-point composite sampling approach (varying discrete sample locations and depths). Each composite sample should be tested for one or more of the contaminant classes listed in the preceding paragraph.

Soil removed from the Site that meet DEQ clean fill criteria (DEQ 2018) and EPA protection of groundwater SSLs for PFAS may be reused at PDX. Soil removed from the Site that exceeds the DEQ clean fill criteria (DEQ 2018) or EPA protection of groundwater SSLs for PFAS will be disposed of off site at a landfill selected by the Port or its contractor.

4.2.2 Stockpiled Soil from Excavations

Soil excavated below 8 feet bgs and not reused as backfill at the Site below 8 feet bgs will be stockpiled and sampled for laboratory analysis. The sampling regimen will be established based on site-specific conditions with the following general guidance: each stockpile up to 500-cubic-yards in size should be sampled using a five-point composite sampling approach (varying discrete sample

locations and depths). Each composite sample will be analyzed for TPH as diesel, TPH as oil, VOCs, metals and PFAS.

Stockpiled soils removed from the Site that meet DEQ clean fill criteria (DEQ 2018) and EPA protection of groundwater SSLs for PFAS may be reused at PDX. Stockpiled soil removed from the Site that exceeds the DEQ clean fill criteria (DEQ 2018) or EPA protection of groundwater SSLs for PFAS will be disposed of off site at a landfill selected by the Port or its contractor.

4.2.3 Screening/Handling

Mechanical screening methods, if conducted in a manner that minimizes dust generation, may be employed to separate contaminated soil from inert, oversized material (e.g., rocks and concrete). Contaminated soil must be managed as described in Section 4.3, but oversized rocks and concrete can be used for on-site fill or crushed and used as aggregate. Other oversized debris (wood, metal, solid waste) will be transported off site and disposed of appropriately. If any on-site or off-site recycling options are identified for other inert materials during final design or construction, the contractor conducting the work will coordinate with and seek approval from the Port before completing such recycling.

4.2.4 Stockpiling

Any suspected contaminated soil, including soil excavated below 8 feet bgs that cannot be reused on the Site will require temporary stockpiling in a manner that minimizes erosion and contact with stormwater, prevents placement near structures, and avoids workers coming in direct contact with the stockpiled soil. Temporary soil stockpiles of suspected contaminated soil shall be placed on an impervious surface or on 10-mil plastic sheeting (or similar material) with a berm around the perimeter of the stockpile to restrict stormwater run-on and runoff. The berm may be constructed by laying the bottom plastic over straw bales or wattles, Jersey Barriers or ecology blocks, or by equivalent methods. When not active, stockpiles shall be covered with plastic and secured with sandbags or an equivalent alternative. Stockpiles shall be covered with plastic sheeting and secured at the end of each workday to prevent erosion, dust generation, vapor exposure, and direct contact. The plastic sheeting that covers the stockpiles must be regularly inspected to ensure that it remains functional and protective of human health and the environment. Temporary stockpiles of suspected contaminated soil must be characterized for reuse or properly disposed of off-site within 180 days of completion of excavation work. Once a stockpile has been sampled, no soil shall be added to that stockpile.

Following the stockpile removal, the area beneath the separation material shall be inspected, and any remaining stockpile soil shall be scraped, swept, or otherwise removed and properly disposed of.

Temporary stockpiling of uncontaminated soil shall follow the best management practices (BMPs) included in the project erosion and sediment control plan (ESCP).

4.3 Disposition of Excavated Soil

Soil must be managed consistent with one of the methods described below.

4.3.1 Placement on Site

Soils shall not be redistributed across the Site without prior Port approval.

- Soil from the surface to 8 feet bgs that do not exhibit signs of suspected contamination as described in Section 4.1 above may be reused on the Site or another location at PDX designated by the Port in accordance with DEQ clean fill criteria.

- Soil excavated below 8 feet bgs will be stockpiled and sampled for laboratory analysis. Stockpiled soils removed from the Site that meet DEQ clean fill criteria (DEQ 2018) and EPA protection of groundwater SSLs for PFAS may be reused at PDX. Stockpiled soil removed from the Site that exceeds the DEQ clean fill criteria (DEQ 2018) or EPA protection of groundwater SSLs for PFAS will be disposed of off site at a landfill selected by the Port or its contractor.

4.3.2 Off-Site Disposal

Soil that is to be disposed of off-site and that is not a hazardous waste as determined by a toxicity characteristic leaching procedure (TCLP) analysis can be taken to a solid waste landfill regulated under Resource Conservation and Recovery Act (RCRA) Subtitle D. Waste soil with detected PFAS concentrations will be disposed at a Subtitle C or Subtitle D landfill (with liner and leachate collection system) based on landfill acceptance criteria and approval. Soil that is to be disposed of off-site that exhibits the characteristics of hazardous waste will be disposed of at a hazardous waste landfill regulated under RCRA Subtitle C, unless it is treated (either on-site or off-site) to render it nonhazardous. Management of soil classified as hazardous waste under either the federal or state hazardous waste regulations must comply with current regulations. Regulations will be reviewed and standard waste profiling and disposal contracting processes will be followed to ensure regulatory compliance.

Off-site management of soil will adhere to the following procedures:

- Obtain waste acceptance and disposal agreements from the landfill for the soil.
- Minimize spillage of soil onto the ground during truck loading. Scrape, clean up, and dispose of any spilled soil.
- Remove excess soil from truck and truck tires prior to leaving the soil-loading area.
- Ensure that there are no free liquids in the soil contained in trucks.
- Soil shall be transported in accordance with appropriate Department of Transportation regulations.

5 Construction Dewatering

Dewatering will be conducted using a localized approach (e.g., a limited number of dewatering wells) to help minimize the volume of water. Groundwater removed by dewatering will be filtered using adsorptive media suitable for PFAS and other COPCs. Due to restrictions governing aircraft safety, it is not practicable to discharge to the ground surface for infiltration on this project. As a result, discharge will be to the storm sewer in or adjacent to the work area. Due to the work area being within active airport operations, the equipment used for dewatering will need to be mobile. A groundwater discharge, treatment, and monitoring plan further describing this process is included in Attachment C of the EMP.

6 Reporting

A letter report summarizing the implementation of this CMMP shall be prepared at the end of the project and shared with the DEQ. The letter report shall include the results of any sampling, chemical analysis, and disposition of soils and any water treatment performed. As applicable, the letter report shall include:

- A site plan showing soil sample locations and locations of soil reuse.
- Summary tables of analytical results.
- Copies of field sampling data sheets.
- Discussion of field observations and results.
- Documentation of quantities and final disposition of soil and other media.
- Documentation of any observation, management, and disposal of “unexpected contamination” or conditions.
- Copies of soil disposal receipts.
- Analytical laboratory reports.
- A site plan showing areas where dewatering and discharge occurred.
- Dates dewatering and discharge occurred.
- Photo documentation of work.

References

Apex. 2025. *Former Fire Stations Groundwater Characterization Report, Portland International Airport, ECSI Site No. 3324, Portland, Oregon*. Prepared by Apex Companies, LLC. December 31.

DEQ. 2018. *Internal Management Directive, Clean Fill Determinations.* Prepared by Oregon DEQ.

GRI. 2026. *Draft Environmental Evaluation, Gate C15 Lift Station, Portland International Airport, Portland, Oregon*. Prepared by GRI. January 6.

Limitations

The services undertaken in completing this report were performed consistent with generally accepted professional consulting principles and practices. No other warranty, express or implied, is made. These services were performed consistent with our agreement with our client. This report is solely for the use and information of our client unless otherwise noted. Any reliance on this report by a third party is at such party's sole risk.

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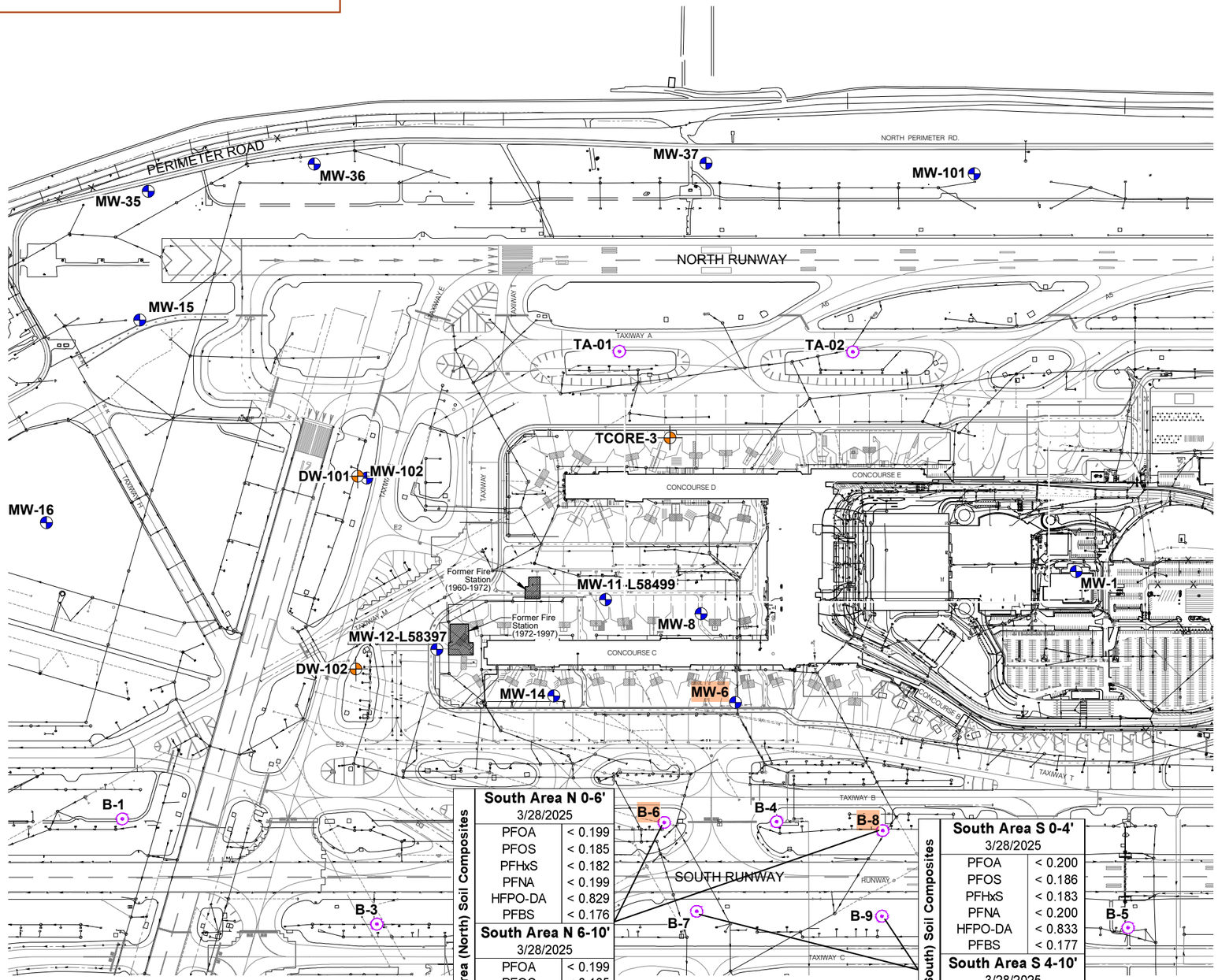
Appendix A

Excerpts from Apex Companies Report

MAUL FOSTER ALONGI

Modified by Maul Foster & Alongi, Inc. (3/30/2026) to present representative historical data applicable to the Gate C5 Contaminated Media Management Plan.



Note: Base map prepared from a 2013 Port of Portland AutoCAD base and Oregon Metro www.oregonmetro.gov/rlis.

Legend:

- **MW-8** — Overbank Deposit (OD) Monitoring Well Location
- **TCORE-3** — Columbia River Sand Aquifer (CRSA) Monitoring Well Location
- **TA-01** — Shallow Temporary Boring Location

West Area 10-15'	
3/28/2025	
PFOA	< 0.199
PFOS	**2.05**
PFHxS	< 0.182
PFNA	< 0.199
HFPO-DA	< 0.830
PFBS	< 0.176

- Location Identification and Sample Depth
- Date Sampled
- Concentration in Nanograms per Gram (ng/g)
- Analyte Sampled

- Underground Storm Sewer Pipeline
- Underground Subdrain Sewer Pipeline
- Abandoned Storm Sewer Pipeline
- Catch Basin
- Manhole
- Cleanout

South Area (North) Soil Composites	
South Area N 0-6'	
3/28/2025	
PFOA	< 0.199
PFOS	< 0.185
PFHxS	< 0.182
PFNA	< 0.199
HFPO-DA	< 0.829
PFBS	< 0.176
South Area N 6-10'	
3/28/2025	
PFOA	< 0.199
PFOS	< 0.185
PFHxS	< 0.182
PFNA	< 0.199
HFPO-DA	< 0.831
PFBS	< 0.176

South Area (South) Soil Composites	
South Area S 0-4'	
3/28/2025	
PFOA	< 0.200
PFOS	< 0.186
PFHxS	< 0.183
PFNA	< 0.200
HFPO-DA	< 0.833
PFBS	< 0.177
South Area S 4-10'	
3/28/2025	
PFOA	< 0.200
PFOS	< 0.186
PFHxS	< 0.183
PFNA	< 0.200
HFPO-DA	< 0.833
PFBS	< 0.177

Abbreviations	
PFOA	Perfluorooctanoic Acid
PFOS	Perfluorooctane Sulfonic Acid
PFHxS	Perfluorohexane Sulfonic Acid
PFNA	Perfluorononaoic Acid
HFPO-DA	Hexafluoropropylene Oxide dimer Acid
PFBS	Perfluorobutanesulfonic Acid

N

0 600 1,200

Scale in Feet

Soil Analytical Results

Former Fire Stations Groundwater Characterization Report
Port of Portland
Portland, Oregon

Apex Companies, LLC
15618 SW 72nd Avenue
Tigard, Oregon 97224

Project Number:	Drawn:	Approved:
32-24009923	JP	HFC

December 2025

Figure **4**

I:\Client\Port of Portland\Environmental Services Contract\Fire Training Facilities Inv\2025 Groundwater Characterization\32-24009923 02-09 (Site Plans).dwg Modified 12/3/2025 by JPoore

Table 2. Soil Analytical Results
Former Fire Stations PFAS Groundwater Delineation
Portland International Airport
Portland, Oregon

Sample ID	MW-101 (0-12)	MW-101 (12-15)	MW-101 (15-20)	SOUTH AREA N (0-6)	SOUTH AREA N (6-10)	SOUTH AREA S (0-4)	SOUTH AREA S (4-10)	WEST AREA (0-6)	WEST AREA (6-10)	WEST AREA (10-15)	Risk-Based Screening Levels	
Sample Location	MW-101	MW-101	MW-101	B-6 & B-8 Composite	B-6 & B-8 Composite	B-7 & B-9 Composite	B-7 & B-9 Composite	MW-102 & DW-102 Composite	MW-102 & DW-102 Composite	MW-102 & DW-102 Composite	Industrial Soil	Leaching to Groundwater
Sample Date	3/27/2025	3/27/2025	3/27/2025	3/28/2025	3/28/2025	3/28/2025	3/28/2025	3/28/2025	3/28/2025	3/28/2025		
Matrix	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil		
Analyte / **Acronym**	Concentrations in ng/g											
Perfluorobutanoic acid **PFBA**	< 0.798	< 0.801	< 0.795	< 0.796	< 0.797	< 0.799	< 0.799	< 0.799	< 0.796	< 0.797	1,200,000	6.5
Perfluoro-3-methoxypropanoic acid **PFMPA**	< 0.399	< 0.400	< 0.397	< 0.397	< 0.398	< 0.399	< 0.399	< 0.399	< 0.398	< 0.398	NS	NS
3-Perfluoropropyl Propanoic acid **3:3 FTCA**	< 0.996	< 1.00	< 0.993	< 0.993	< 0.995	< 0.998	< 0.998	< 0.998	< 0.994	< 0.995	NS	NS
Perfluoropentanoic acid **PFPeA**	< 0.398	< 0.399	< 0.356	< 0.356	< 0.397	< 0.398	< 0.398	< 0.398	< 0.397	< 0.397	NS	NS
Perfluoro(4-methoxybutanoic) acid **PFMBA**	< 0.399	< 0.400	< 0.397	< 0.397	< 0.398	< 0.399	< 0.399	< 0.399	< 0.398	< 0.398	NS	NS
Perfluorobutane sulfonic acid **PFBS**	< 0.176	< 0.177	< 0.176	< 0.176	< 0.176	< 0.177	< 0.177	< 0.177	< 0.176	< 0.176	250,000	3
Fluorotelomer sulfonate **4:2 FTS**	< 0.747	< 0.750	< 0.744	< 0.745	< 0.746	< 0.748	< 0.749	< 0.748	< 0.746	< 0.746	NS	NS
Perfluorohexanoic acid **PFHxA**	< 0.199	< 0.200	< 0.199	< 0.199	< 0.199	< 0.200	< 0.200	< 0.200	< 0.199	< 0.199	410,000	2.4
Perfluoro(2-ethoxyethane)sulphonic acid **PFEESA**	< 0.355	< 0.356	< 0.353	< 0.354	< 0.354	< 0.355	< 0.355	< 0.355	< 0.354	< 0.354	NS	NS
Perfluoropentane sulfonic acid **PFPeS**	< 0.187	< 0.188	< 0.187	< 0.187	< 0.187	< 0.188	< 0.188	< 0.188	< 0.187	< 0.187	NS	NS
Hexafluoropropylene oxide-dimer acid (GenX) **HFPO-DA**	< 0.832	< 0.835	< 0.829	< 0.829	< 0.831	< 0.833	< 0.833	< 0.833	< 0.830	< 0.830	3500	0.01
Nonafluoro-3,6-dioxaheptanoic acid **NFDHA**	< 0.399	< 0.400	< 0.397	< 0.397	< 0.398	< 0.399	< 0.399	< 0.399	< 0.398	< 0.398	NS	NS
5:3 Fluorotelomer carboxylic acid **5:3 FTCA**	< 4.98	< 5.00	< 4.96	< 4.97	< 4.98	< 4.99	< 4.99	< 4.99	< 4.97	< 4.97	NS	NS
Perfluoroheptanoic acid **PFHpA**	< 0.199	< 0.200	< 0.199	< 0.199	< 0.199	< 0.200	< 0.200	< 0.200	< 0.199	< 0.199	NS	NS
4,8-Dioxa-3H-perfluorononanoate **ADONA**	< 0.787	< 0.790	< 0.784	< 0.785	< 0.786	< 0.788	< 0.788	< 0.788	< 0.785	< 0.786	NS	NS
Perfluorohexane sulfonic acid **PFHxS**	< 0.182	< 0.183	< 0.182	< 0.182	< 0.182	< 0.183	< 0.183	< 0.183	< 0.182	< 0.182	16,000	0.0042
Fluorotelomer sulfonate **6:2 FTS**	< 0.756	< 0.759	< 0.753	< 0.754	< 0.755	< 0.757	< 0.758	< 0.757	< 0.755	< 0.755	NS	NS
Perfluorooctanoic acid **PFOA**	< 0.199	< 0.200	< 0.199	< 0.199	< 0.199	< 0.200	< 0.200	**0.400**	< 0.199	< 0.199	0.078	0.061
Perfluoroheptane sulfonic acid **PFHpS**	< 0.189	< 0.190	< 0.189	< 0.189	< 0.189	< 0.190	< 0.190	< 0.190	< 0.189	< 0.189	NS	NS
7:3 Fluorotelomer carboxylic acid **7:3 FTCA**	< 4.98	< 5.00	< 4.96	< 4.97	< 4.98	< 4.99	< 4.99	< 4.99	< 4.97	< 4.97	NS	NS
Perfluorononaoic acid **PFNA**	< 0.199	< 0.200	< 0.199	< 0.199	< 0.199	< 0.200	< 0.200	< 0.200	< 0.199	< 0.199	2,500	0.042
Perfluorooctane sulfonamide **PFOSA**	< 0.199	< 0.200	< 0.199	< 0.199	< 0.199	< 0.200	< 0.200	< 0.200	< 0.199	< 0.199	NS	NS
Perfluorooctane sulfonic acid **PFOS**	< 0.185	< 0.186	< 0.185	< 0.185	< 0.185	< 0.186	< 0.186	**0.194**	< 0.185	**2.05**	58	0.03
9-Chlorohexadecafluoro-3-oxanone-1-sulfonic acid **9Cl-PF3ONS**	< 0.777	< 0.780	< 0.774	< 0.775	< 0.776	< 0.778	< 0.778	< 0.778	< 0.775	< 0.776	NS	NS
Perfluorodecanoic acid **PFDA**	< 0.199	< 0.200	< 0.199	< 0.199	< 0.199	< 0.200	< 0.200	**0.364**	< 0.199	< 0.199	1.6	0.000081
Fluorotelomer sulfonate **8:2 FTS**	< 0.765	< 0.768	< 0.762	< 0.763	< 0.764	< 0.766	< 0.767	**0.964**	< 0.764	< 0.764	NS	NS
Perfluorononane sulfonic acid **PFNS**	< 0.191	< 0.192	< 0.191	< 0.191	< 0.191	< 0.192	< 0.192	< 0.192	< 0.191	< 0.191	NS	NS
Methyl perfluorooctanesulfonamidoacetic acid **MeFOSAA**	< 0.199	< 0.200	< 0.199	< 0.199	< 0.199	< 0.200	< 0.200	< 0.200	< 0.199	< 0.199	NS	NS
Ethyl perfluorooctanesulfonamidoacetic acid **EtFOSAA**	< 0.199	< 0.200	< 0.199	< 0.199	< 0.199	< 0.200	< 0.200	< 0.200	< 0.199	< 0.199	NS	NS
Perfluoroundecanoic acid **PFUnA**	< 0.199	< 0.200	< 0.199	< 0.199	< 0.199	< 0.200	< 0.200	< 0.200	< 0.199	< 0.199	250,000	45
Perfluorodecane sulfonic acid **PFDS**	< 0.192	< 0.193	< 0.192	< 0.192	< 0.192	< 0.193	< 0.193	< 0.193	< 0.192	< 0.192	NS	NS
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid **11Cl-PF3OUdS**	< 0.787	< 0.790	< 0.784	< 0.785	< 0.786	< 0.788	< 0.788	< 0.788	< 0.785	< 0.786	NS	NS
Perfluorododecanoic acid **PFDoA**	< 0.199	< 0.200	< 0.199	< 0.199	< 0.199	< 0.200	< 0.200	< 0.200	< 0.199	< 0.199	41,000	170
Methylperfluorooctanesulfonamide **MeFOSA**	< 0.199	< 0.200	< 0.199	< 0.199	< 0.199	< 0.200	< 0.200	< 0.200	< 0.199	< 0.199	NS	NS
Perfluorotridecanoic acid **PFTrDA**	< 0.199	< 0.200	< 0.199	< 0.199	< 0.199	< 0.200	< 0.200	< 0.200	< 0.199	< 0.199	NS	NS
Perfluorodecane Sulfonic Acid **PFDoS**	< 0.193	< 0.194	< 0.193	< 0.193	< 0.193	< 0.194	< 0.194	< 0.194	< 0.193	< 0.193	NS	NS
Perfluorotetradecanoic acid **PFTeDA**	< 0.199	< 0.200	< 0.199	< 0.199	< 0.199	< 0.200	< 0.200	< 0.200	< 0.199	< 0.199	820,000	9,400
Ethylperfluorooctanesulfonamide **EtFOSA**	< 0.199	< 0.200	< 0.199	< 0.199	< 0.199	< 0.200	< 0.200	< 0.200	< 0.199	< 0.199	NS	NS
Methylperfluorooctanesulfonamidoethanol **MeFOSE**	< 1.99	< 2.00	< 1.99	< 1.99	< 1.99	< 2.00	< 2.00	< 2.00	< 1.99	< 1.99	NS	NS
Ethyl perfluorooctane sulfonamido ethanol **EtFOSE**	< 1.99	< 2.00	< 1.99	< 1.99	< 1.99	< 2.00	< 2.00	< 2.00	< 1.99	< 1.99	NS	NS
Total PFAS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.92	0.0	2.05		

Notes:

Bold text, if present, indicates a detection above the reporting limit.

<: Not detected above the laboratory reporting limit

ng/g: nanograms per gram

NS: screening level not set for this analyte

Shading indicates that the value of the analyte exceeds the screening level

Screening Levels: EPA Regional Screening Levels, November 2024

Table 4. Monitoring Well Groundwater Analytical Results
Former Fire Stations PFAS Groundwater Delineation
Portland International Airport
Portland, Oregon

Sample ID	DW-101-063025	DW-102-042925	TCORE-3-042825	MW-101-042925	MW-102-042925	MW-1-042825	MW-6-042825	DUP-042825	MW-8-042825	MW-11-L58499-042825	MW-12-L58397-042825	MW-14-042825	Maximum Contaminant Levels (MCLs)
Sample Location	DW-101	DW-102	TCORE-3	MW-101	MW-102	MW-1	MW-6	MW-6	MW-8	MW-11-L58499	MW-12-L58397	MW-14	
Sample Date	6/30/2025	4/29/2025	4/28/2025	4/29/2025	4/29/2025	4/28/2025	4/28/2025	4/28/2025	4/28/2025	4/28/2025	4/28/2025	4/28/2025	
Matrix	**Groundwater**	**Groundwater**	**Groundwater**	**Groundwater**	**Groundwater**	**Groundwater**	**Groundwater**	**Groundwater**	**Groundwater**	**Groundwater**	**Groundwater**	**Groundwater**	
PFAS Analyte	**Acronym**	***Concentrations in ng/L***											
Perfluorobutanoic acid	**PFBA**	< 6.43	< 6.48	< 6.42	< 6.52	< 6.49	< 6.41	**180**	**184**	**26.9**	**104**	**22.7**	**196**	NS
Perfluoro-3-methoxypropanoic acid	**PFMPA**	< 3.22	< 3.24	< 3.21	< 3.26	< 3.24	< 3.20	< 3.20	< 3.20	< 3.22	< 3.22	< 3.23	< 3.24	NS
3-Perfluoropropyl Propanoic acid	**3:3 FTCA**	< 8.04	< 8.10	< 8.02	< 8.15	< 8.11	< 8.01	**21.8**	**23.6**	< 8.04	< 8.06	**37.1**	< 8.11	NS
Perfluoropentanoic acid	**PFPeA**	< 3.22	< 3.24	< 3.21	**3.58**	**4.36**	< 3.20 **I**	**654**	**681**	**66.8**	**429**	**94.5**	**797**	NS
Perfluoro(4-methoxybutanoic) acid	**PFMBA**	< 3.22	< 3.24	< 3.21	< 3.26	< 3.24	< 3.20	< 3.20	< 3.20	< 3.22	< 3.22	< 3.23	< 3.24	NS
Perfluorobutane sulfonic acid	**PFBS**	< 1.43	< 1.44	< 1.42	< 1.45 **I**	< 1.44	**2.26**	**50.6**	**46.6**	**1.64**	**5.53**	**2.29**	**65.4**	NS
Fluorotelomer sulfonate	**4:2 FTS**	< 6.03	< 6.07	< 6.02	< 6.11	< 6.08	< 6.01	**12.6**	**10.9**	< 6.03	< 6.04	< 6.06	**21.3**	NS
Perfluorohexanoic acid	**PFHxA**	< 1.61	< 1.62	< 1.60	**2.66**	**4.68**	**3.79**	**697**	**678**	**66.1**	**547**	**163**	**789**	NS
Perfluoro(2-ethoxyethane)sulphonic acid	**PFEESA**	< 2.87	< 2.89	< 2.86	< 2.90	< 2.89	< 2.85	< 2.85	< 2.85	< 2.86	< 2.87	< 2.88	< 2.89	NS
Perfluoropentane sulfonic acid	**PFPeS**	< 1.51	< 1.52	< 1.50	< 1.53	< 1.52	< 1.50	**38.5**	**37.5**	< 1.51	**4.26**	**8.14**	**40**	NS
Hexafluoropropylene oxide-dimer acid (GenX)	**HFPO-DA**	< 6.72	< 6.76	< 6.70	< 6.81	< 6.77	< 6.69	< 6.67	< 6.68	< 6.71	< 6.73	< 6.75	< 6.77	10
Nonafluoro-3,6-dioxaheptanoic acid	**NFDHA**	< 3.22	< 3.24	< 3.21	< 3.26	< 3.24	< 3.20	< 3.20	< 3.20	< 3.22	< 3.22	< 3.23	< 3.24	NS
5:3 Fluorotelomer carboxylic acid	**5:3 FTCA**	< 40.2	< 40.5	< 40.1	< 40.8	< 40.5	< 40.1	**910**	**901**	**84.9**	< 40.3	**126**	< 40.6	NS
Perfluoroheptanoic acid	**PFHpA**	< 1.61	< 1.62	< 1.60	< 1.63	**3.15**	**3.41**	**366**	**332**	**31.4**	**117**	**298**	**326**	NS
4,8-Dioxa-3H-perfluorononanoate	**ADONA**	< 6.35	< 6.40	< 6.34	< 6.44	< 6.40	< 6.33	< 6.31	< 6.32	< 6.35	< 6.37	< 6.39	< 6.41	NS
Perfluorohexane sulfonic acid	**PFHxS**	< 1.47	< 1.48	< 1.46	**1.82**	**3.95**	**9.45**	**578**	**557**	**7.91**	**67**	**201**	**438**	10
Fluorotelomer sulfonate	**6:2 FTS**	< 6.10	< 6.15	< 6.09	< 6.19	< 6.15	< 6.08	**906**	**1000 D**	< 6.10	< 6.11	**526**	**1330 D**	NS
Perfluorooctanoic acid	**PFOA**	< 2.01	< 2.02	< 2.01	**7.47**	**10.7**	**13.1**	**4420 D**	**4490 D**	**88.4**	**832**	**567**	**4950 D**	4.0
Perfluoroheptane sulfonic acid	**PFHpS**	< 1.53	< 1.54	< 1.52	< 1.55	< 1.54	< 1.52	**6.73**	**6.3**	< 1.53	< 1.53	< 1.54	**3.87**	NS
7:3 Fluorotelomer carboxylic acid	**7:3 FTCA**	< 40.2	< 40.5	< 40.1	< 40.8	< 40.5	< 40.1	< 39.9	< 40.0	< 40.2	< 40.3	< 40.4	< 40.6	NS
Perfluorononaoic acid	**PFNA**	< 1.61	< 1.62	< 1.60	< 1.63	< 1.62	< 1.60	**19.8**	**19.9**	**2.63**	< 1.61	**64.1**	**20.2**	10
Perfluorooctane sulfonamide	**PFOSA**	< 1.61	< 1.62	< 1.60	< 1.63	< 1.62	< 1.60	< 1.60	< 1.60	< 1.61	< 1.61	**2.44**	< 1.62	NS
Perfluorooctane sulfonic acid	**PFOS**	< 1.50	< 1.51	< 1.49	**2.83**	< 1.51	**5.36 I**	**135**	**126**	**2.10**	**1.65 I**	**1240 D**	**91.6 I**	4.0
9-Chlorohexadecafluoro-3-oxanone-1-sulfonic acid	**9Cl-PF3ONS**	< 6.27	< 6.32	< 6.26	< 6.36	< 6.32	< 6.25	< 6.23	< 6.24	< 6.27	< 6.28	< 6.30	< 6.33	NS
Perfluorodecanoic acid	**PFDA**	< 1.61	< 1.62	< 1.60	< 1.63	< 1.62	< 1.60	< 1.60	< 1.60	< 1.61	< 1.61	**14.3**	< 1.62	NS
Fluorotelomer sulfonate	**8:2 FTS**	< 6.17	< 6.22	< 6.16	< 6.26	< 6.22	< 6.15	**157**	**174**	< 6.17	< 6.18	**1580 D**	< 6.22	NS
Perfluorononane sulfonic acid	**PFNS**	< 1.55	< 1.56	< 1.54	< 1.57	< 1.56	< 1.54	< 1.54	< 1.54	< 1.55	< 1.55	< 1.56	< 1.56	NS
Methyl perfluorooctanesulfonamidoacetic acid	**MeFOSAA**	< 1.61	< 1.62	< 1.60	< 1.63	< 1.62	< 1.60	< 1.60	< 1.60	< 1.61	< 1.61	< 1.62	< 1.62	NS
Ethyl perfluorooctanesulfonamidoacetic acid	**EtFOSAA**	< 1.61	< 1.62	< 1.60	< 1.63	< 1.62	< 1.60	< 1.60	< 1.60	< 1.61	< 1.61	< 1.62	< 1.62	NS
Perfluoroundecanoic acid	**PFUnA**	< 1.61	< 1.62	< 1.60	< 1.63	< 1.62	< 1.60	< 1.60	< 1.60	< 1.61	< 1.61	< 1.62	< 1.62	NS
Perfluorodecane sulfonic acid	**PFDS**	< 1.55	< 1.56	< 1.54	< 1.57	< 1.56	< 1.54	< 1.54	< 1.54	< 1.55	< 1.55	< 1.56	< 1.56	NS
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	**11Cl-PF3OUdS**	< 6.03	< 6.07	< 6.02	< 6.11	< 6.08	< 6.01	< 5.99	< 6.00	< 6.03	< 6.04	< 6.06	< 6.08	NS
Perfluorododecanoic acid	**PFDoA**	< 1.61	< 1.62	< 1.60	< 1.63	< 1.62	< 1.60	< 1.60	< 1.60	< 1.61	< 1.61	< 1.62	< 1.62	NS
Methylperfluorooctanesulfonamide	**MeFOSA**	< 1.61	< 1.62	< 1.60	< 1.63	< 1.62	< 1.60	< 1.60	< 1.60	< 1.61	< 1.61	< 1.62	< 1.62	NS
Perfluorotridecanoic acid	**PFTrDA**	< 1.61	< 1.62	< 1.60	< 1.63	< 1.62	< 1.60	< 1.60	< 1.60	< 1.61	< 1.61	< 1.62	< 1.62	NS
Perfluorodecane Sulfonic Acid	**PFDoS**	< 1.56	< 1.57	< 1.55	< 1.58	< 1.57	< 1.55	< 1.55	< 1.55	< 1.56	< 1.56	< 1.57	< 1.57	NS
Perfluorotetradecanoic acid	**PFTeDA**	< 1.61	< 1.62	< 1.60	< 1.63	< 1.62	< 1.60	< 1.60	< 1.60	< 1.61	< 1.61	< 1.62	< 1.62	NS
Ethylperfluorooctanesulfonamide	**EtFOSA**	< 1.61	< 16.2	< 16.0	< 16.3	< 16.2	< 16.0	< 16.0	< 16.0	< 16.1	< 16.1	< 16.2	< 16.2	NS
Methylperfluorooctanesulfonamidoethanol	**MeFOSE**	< 16.1	< 16.2	< 16.0	< 16.3	< 16.2	< 16.0	< 16.0	< 16.0	< 16.1	< 16.1	< 16.2	< 16.2	NS
Ethyl perfluorooctane sulfonamido ethanol	**EtFOSE**	< 16.1	< 16.2	< 16.0	< 16.3	< 16.2	< 16.0	< 16.0	< 16.0	< 16.1	< 16.1	< 16.2	< 16.2	NS
Total PFAS		0.00	0.00	0.00	18.36	26.8	37.37	9153	9268	379	2107	4947	9068	

Notes:

Bold text, if present, indicates a detection above the reporting limit.

<: Not detected above the laboratory reporting limit

D: Sample was diluted

Shading indicates that the value of the analyte exceeds the screening level

E: The associated compound concentration exceeded the calibration range of the instrument

I: Ion transition ratio is outside of the acceptance criteria

ng/L: nanograms per liter

Screening Levels: EPA Regional Screening Levels, November 2024

FORMER FIRE STATIONS
GROUNDWATER CHARACTERIZATION
PORTLAND, OREGON

APEX PROJECT NUMBER:
24009923

APEX

BORING B-6

BORING B-6 LOCATION:
(See Site Plan)

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
0.0		Loose, brown, well-graded SAND (SW); moist						
2.0					B-6 (0-6)		60	
4.0								
6.0								
8.0					B-6 (6-10)		70	
10.0		becomes wet	▽		B-6-032725			Temporary screen set to sample groundwater
12.0		Soft to medium stiff, dark brown SILT (ML); medium plasticity; wet			B-6 (10-15)		80	
14.0		Soft, dark brown SILT (ML) with sand; non-plastic; wet						
16.0		Final depth 15.0 feet bgs; boring backfilled with bentonite.						
18.0								
20.0								
22.0								
24.0								

BORING METHOD: Direct Push
DRILLED BY: Anderson Environmental Consulting LLC
BORING BIT DIAMETER: 2¼-inch

LOGGED BY: R. Paul
COMPLETED: 3/27/25

BORING LOG-ENV CORE 24009923 B6-9 MW DW 20250814.GPJ DATATMPL.GDT PRINT DATE: 8/14/25:RPG

FORMER FIRE STATIONS
GROUNDWATER CHARACTERIZATION
PORTLAND, OREGON

APEX PROJECT NUMBER:
24009923

APEX

BORING B-8

BORING B-8 LOCATION:
(See Site Plan)

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
0.0		Loose, brown, well-graded SAND (SW); moist						
2.0					B-8 (0-6)		65	
4.0		1-inch lens with trace gravel						
6.0		Medium stiff, gray, lean CLAY (CL); medium plasticity; moist						
		becomes wet	▽		B-8 (6-10)		70	
8.0		Soft, dark gray SILT (ML); medium plasticity; wet						
10.0					B-8-032725			Temporary screen set to sample groundwater
12.0		Loose, dark gray, silty SAND (SM); fine sand; wet			B-8 (10-15)		100	
14.0								
		Final depth 15.0 feet bgs; boring backfilled with bentonite.						
16.0								
18.0								
20.0								
22.0								
24.0								

BORING METHOD: Direct Push
DRILLED BY: Anderson Environmental Consulting LLC
BORING BIT DIAMETER: 2¼-inch

LOGGED BY: R. Paul
COMPLETED: 3/27/25

BORING LOG-ENV CORE 24009923 B6-9 MW DW 20250814.GPJ DATATMPL.GDT PRINT DATE: 8/14/25:RPG

Appendix B

GRI Report

MAUL
FOSTER
ALONGI

16520 SW Upper Boones Ferry Road, Suite 100
Tigard, OR 97224
503-641-3478 | www.gri.com

MEMORANDUM

To: Matt MacRostie, PE | Century West Engineering

Date: January 6, 2026
(REVISED)

GRI Project No.: 7064-A

From: Jason Bock, PE; and Greg Martin, CEG

Re: Environmental Evaluation
Gate C15 Lift Station
Portland International Airport
Portland, Oregon

DRAFT

GRI conducted soil sampling and chemical data analysis in support of the design and construction of a sanitary lift station at Gate C15 at the Portland International Airport (PDX) in Portland, Oregon. The purpose of our environmental evaluation was to assess potential impacts at the site from past land use practices, including the use of potentially undocumented fill materials. To inform material handling procedures and disposal options for soil excavated during construction, chemical data generated during this evaluation were compared to Oregon Department of Environmental Quality (DEQ) Clean Fill Screening Levels (CFSLs) and Risk-Based Concentrations (RBCs) for the *Excavation Worker—Soil Ingestion, Inhalation, and Dermal Contact Exposure Pathway Scenario*. The location of the project is shown on the Vicinity Map, Figure 1.

PROJECT DESCRIPTION

Our understanding based on information provided by Century West Engineering is that a new sanitary lift station will be installed at Gate C15 at PDX. Installation of the lift station and associated vaults will require excavations of up to about 30 feet below existing site grades. Based on discussions with the design team and our understanding of subsurface conditions, the excavations will likely require dewatering and a temporary shoring system for sidewall support. In addition, based on previous work completed in the project vicinity and GRI's experience at PDX, there is the potential for per- and polyfluoroalkyl substances (PFAS) and other contaminants to be present at the site.

ENVIRONMENTAL SAMPLING

To evaluate subsurface conditions, GRI completed soil sampling activities, including two soil borings, DP-1 and DP-2, on two separate mobilizations: March 31 and November 5, 2025 (for DP-1 and DP-2, respectively), at the locations shown on the Site Map, Figure 2. Drilling was completed using direct-push methods by Anderson Environmental Contracting of Kelso, Washington. Soil samples were collected and analyzed at ALS Environmental, an analytical laboratory in Kelso, Washington, to evaluate the potential for residual contamination. Before the subsurface

explorations were conducted, potential boring locations were marked in the field and assessed for possible conflicts with underground utilities. The Oregon Utility Notification Center was notified prior to drilling.

An experienced environmental representative from GRI supervised the exploration activities, recorded soil descriptions, and collected samples for analytical testing. Samples were field-screened for the presence of volatile organic compounds (VOCs) using a portable photo-ionization detector and evaluated for chemical odor, staining, and sheen. Exploration logs documenting material descriptions and sample depths are included in Appendix A.

Non-disposable equipment was washed and rinsed between sample intervals, while fresh disposable equipment was used for each sample. The direct-push sampling apparatus was fitted with hollow acetate sleeves advanced in 5-foot runs. Upon completion of a run, the sleeve was removed and cut open to expose the material at the specified interval. Samples for chemical testing were subsequently collected from the exposed soil material. Clean, laboratory-supplied sample containers were filled with soil, sealed with airtight caps, labeled with a ballpoint pen, and recorded on a chain-of-custody form. Samples were placed in a cooler with wet ice and later transported under chain-of-custody to ALS Environmental in Kelso, Washington, for analysis. All samples were transported by GRI and arrived at the laboratory undamaged and cooled to 4°C.

Boring DP-1 was completed to a total depth of approximately 36.1 feet. A total of four samples were collected, generally representing soils above and below the groundwater table. Samples DP-1A and DP-1AA were collected between depths of 4 feet and 5 feet and represent soils above the groundwater table. Samples DP-1B and DP-1BB were collected between depths of 30 feet and 31 feet and represent soils below the groundwater table. At the time of the exploration, the groundwater table was observed at a depth of about 11 feet .

Boring DP-2 was completed to a total depth of approximately 32.3 feet. A total of two samples were collected for chemical analysis, generally representing soil above and below the groundwater table. Sample S-1 is a composite soil sample collected from depths between 8 feet to 11 feet . Sample S-2 is a composite sample collected from depths below 11.5 feet to the termination of the boring. Groundwater was observed at a depth of approximately 11 feet during drilling.

Samples were analyzed for PFAS constituents using U.S. Environmental Protection Agency (EPA) Method 1633, Northwest Total Petroleum Hydrocarbons-diesel (NWTPH-Dx) with silica gel cleanup; gasoline using NWTPH-Gx; Resource Conservation and Recovery Act (RCRA) metals (arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver) using EPA Methods 6020B and 7471B (mercury only); and VOCs using EPA method 8260C. ALS Environmental laboratory analytical results are included in Appendix B.

Soil Analytical Results

Metals

Laboratory testing results of soil samples indicate metals were detected above laboratory detection limits at levels generally consistent with published natural background concentrations. Detected metals were present at concentrations below the DEQ CFSLs and the Excavation Worker RBCs. The results of metals testing have been summarized in Table 1.

Table 1: METALS DETECTED IN SOIL

	Laboratory Testing Result, mg/kg				DEQ Screening Level	
	Boring DP-1		Boring DP-2			
Analyte	DP-1AA	DP-1BB	S-1	S-2	CFSL	RBC[(a)]
Arsenic	**1.79**	**3.29**	**1.72**	**3.58**	8.8	420
Barium	**50**	**180**	**59.2**	**130**	790	>Max
Cadmium	**0.106**	**0.283**	**0.113**	**0.205**	0.63	9,700
Chromium	**7.82**	**27.4**	**7.79**	**19.2**	76	NE
Lead	**2.85**	**9.48**	**2.92**	**6.72**	27	800
Mercury	ND	**0.029**	ND	**0.026**	0.23	2,900
Selenium	ND	ND	ND	ND	0.71	NE
Silver	**0.056**	**0.103**	ND	**0.075**	2.6	49,000

Abbreviations: mg/kg = milligrams per kilogram; DEQ = Oregon Department of Environmental Quality; CFSL = Clean Fill Screening Level; RBC = Risk-Based Concentration; ND = not detected; NE = not established

Notes:

Bold = Detected analyte

>Max = Constituent RBC for this pathway is calculated as greater than 1,000,000 mg/kg or 1,000,000 mg/L; this substance is therefore not considered to pose risks under this exposure scenario.

[(a)] DEQ's RBCs for soil ingestion, dermal contact, and inhalation under the Excavation Worker exposure pathway

Volatile Organic Compounds

Laboratory testing results indicate low concentrations of 2-Butanone (MEK; 0.034 milligrams per kilogram [mg/kg]) and acetone (0.1 mg/kg) in sample DP-1BB. Both detections were well below the CFSLs. No DEQ Excavation Worker RBCs are established for either constituent. No other VOCs were detected above laboratory reporting limits. Results are summarized in Table 2, below.

Table 2: VOLATILE ORGANIC COMPOUNDS DETECTED IN SOIL

Analyte	Laboratory Testing Result, mg/kg				DEQ Screening Level	
	Boring DP-1		Boring DP-2			
	DP-1AA	DP-1BB	S-1	S-2	CFSL	RBC[(a)]
1,1,1,2-Tetrachloroethane	ND	ND	ND	ND	0.013	NE
1,1,1-Trichloroethane (TCA)	ND	ND	ND	ND	190	>max
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	0.0018	NE
1,1,2-Trichloroethane	ND	ND	ND	ND	0.0063	1,500
1,1-Dichloroethane	ND	ND	ND	ND	0.044	89,000
1,1-Dichloroethene	ND	ND	ND	ND	NE	370000
1,1-Dichloropropene	ND	ND	ND	ND	NE	NE
1,2,3-Trichlorobenzene	ND	ND	ND	ND	1.3	NE
1,2,3-Trichloropropane	ND	ND	ND	ND	0.000019	NE
1,2,4-Trichlorobenzene	ND	ND	ND	ND	0.2	NE
1,2,4-Trimethylbenzene	ND	ND	ND	ND	10	81,000
1,2-Dibromo 3-Chloropropane	ND	ND	ND	ND	0.0000084	NE
1,2-Dibromoethane (EDB)	ND	ND	ND	ND	0.00012	250
1,2-Dichlorobenzene	ND	ND	ND	ND	0.92	560,000
1,2-Dichloroethane (EDC)	ND	ND	ND	ND	0.0028	5600
1,2-Dichloropropane	ND	ND	ND	ND	0.017	NE
1,3,5-Trimethylbenzene	ND	ND	ND	ND	11	81000
1,3-Dichlorobenzene	ND	ND	ND	ND	0.74	NE
1,3-Dichloropropane	ND	ND	ND	ND	7.8	NE
1,4-Dichlorobenzene	ND	ND	ND	ND	0.057	36000
2,2-Dichloropropane	ND	ND	ND	ND	0.017	NE
2-Butanone (MEK)	ND	**0.034**	ND	ND	72	NE
2-Chlorotoluene	ND	ND	ND	ND	14	NE
2-Hexanone	ND	ND	ND	ND	0.36	NE
4-Chlorotoluene	ND	ND	ND	ND	14	NE
4-Isopropyltoluene	ND	ND	ND	ND	NE	NE
4-Methyl-2-pentanone (MIBK)	ND	ND	ND	ND	84	NE
Acetone	ND	**0.1**	ND	ND	1.2	NE
Benzene	ND	ND	ND	ND	0.023	11,000
Bromobenzene	ND	ND	ND	ND	2.5	NE
Bromochloromethane	ND	ND	ND	ND	1.3	NE
Bromodichloromethane	ND	ND	ND	ND	0.002	6,300
Bromoform	ND	ND	ND	ND	0.046	74,000
Bromomethane	ND	ND	ND	ND	0.083	10,000
Carbon Disulfide	ND	ND	ND	ND	0.81	NE
Carbon Tetrachloride	ND	ND	ND	ND	0.013	8,900
Chlorobenzene	ND	ND	ND	ND	2.4	130,000
Chloroethane	ND	ND	ND	ND	NE	>Max
Chloroform	ND	ND	ND	ND	0.0034	11,000

Analyte	Laboratory Testing Result, mg/kg				DEQ Screening Level	
	Boring DP-1		Boring DP-2			
	DP-1AA	DP-1BB	S-1	S-2	CFSL	RBC[a]
Chloromethane	ND	ND	ND	ND	2.2	700,000
cis-1,2-Dichloroethene	ND	ND	ND	ND	NE	20,000
cis-1,3-Dichloropropene	ND	ND	ND	ND	0.01	NE
Dibromochloromethane	ND	ND	ND	ND	NE	NE
Dibromomethane	ND	ND	ND	ND	0.13	NE
Dichlorodifluoromethane	ND	ND	ND	ND	18	NE
Dichloromethane (Methylene Chloride)	ND	ND	ND	ND	0.14	58,000
Ethylbenzene	ND	ND	ND	ND	0.22	49,000
Hexachlorobutadiene	ND	ND	ND	ND	0.016	NE
Isopropylbenzene	ND	ND	ND	ND	NE	750,000
m,p-Xylenes	ND	ND	ND	ND	11	NE
Naphthalene	ND	ND	ND	ND	0.077	16,000
n-Butylbenzene	ND	ND	ND	ND	190	NE
n-Propylbenzene	ND	ND	ND	ND	72	NE
o-Xylene	ND	ND	ND	ND	1	NE
sec-Butylbenzene	ND	ND	ND	ND	350	NE
Styrene	ND	ND	ND	ND	1.2	>Max
tert-Butylbenzene	ND	ND	ND	ND	96	NE
Tetrachloroethene (PCE)	ND	ND	ND	ND	0.18	50,000
Toluene	ND	ND	ND	ND	23	770,000
trans-1,2-Dichloroethene	ND	ND	ND	ND	NE	200,000
trans-1,3-Dichloropropene	ND	ND	ND	ND	NE	NE
Trichloroethene (TCE)	ND	ND	ND	ND	0.013	3,700
Trichlorofluoromethane	ND	ND	ND	ND	52	>Max
Vinyl Chloride	ND	ND	ND	ND	0.00057	950

Abbreviations: mg/kg = milligrams per kilogram; DEQ = Oregon Department of Environmental Quality; CFSL = Clean Fill Screening Level; RBC = Risk-Based Concentration; ND = not detected; NE = not established

Notes:

Bold = Detected analyte

>Max = Constituent RBC for this pathway is calculated as greater than 1,000,000 mg/kg or 1,000,000 mg/L; this substance is therefore not considered to pose risks under this exposure scenario.

[a] DEQ's RBCs for soil ingestion, dermal contact, and inhalation under the Excavation Worker Exposure Pathway

Gasoline and Diesel

Laboratory testing results indicate that gasoline or diesel range organics were not detected above laboratory reporting limits.

Per- and Polyfluoroalkyl Substances

Laboratory testing results indicate that PFAS compounds were not detected above laboratory reporting limits in samples from boring DP-1. PFAS compounds were detected in samples S-1 and S-2 from boring DP-2. Perfluorooctanesulfonic acid and perfluorooctanoic acid were present in S-1 at concentrations of 0.14 nanograms per gram (ng/g) and 0.16 ng/g, respectively. Results from sample S-2 from boring DP-2 indicate the presence of 1H, 1H, 2H, 2H-Perfluorooctanesulfonic acid (0.72 ng/g), perfluoroheptanoic acid (0.15 ng/g), perfluorohexanesulfonic acid (0.16 ng/g), perfluorohexanoic acid (0.39 ng/g), perfluorooctanoic acid (1.7 ng/g), and perfluoropentanoic acid (0.41 ng/g). There are no established CFSLs or RBCs for PFAS compounds. Sample results are summarized in Table 3, below.

Table 3: PER- AND POLYFLUOROALKYL SUBSTANCES DETECTED IN SOIL

	Laboratory Testing Results, ng/g			
	Boring DP-1		Boring DP-2	
Analyte	DP-1A	DP-1B	S-1	S-2
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11-Cl-PF3OUdS)	ND	ND	ND	ND
1H, 1H, 2H, 2H-Perfluorodecanesulfonic acid (8:2 FTS)	ND	ND	ND	ND
1H, 1H, 2H, 2H-Perfluorohexanesulfonic acid (4:2 FTS)	ND	ND	ND	ND
1H, 1H, 2H, 2H-Perfluorooctanesulfonic acid (6:2 FTS)	ND	ND	ND	**0.72**
2H,2H,3H,3H-Perfluorodecanoic acid (7:3 FTCA)	ND	ND	ND	ND
2H,2H,3H,3H-Perfluorooctanoic acid (5:3 FTCA)	ND	ND	ND	ND
4,4,5,5,6,6,6-Heptafluorohexanoic acid (3:3 FTCA)	ND	ND	ND	ND
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	ND	ND	ND	ND
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9-Cl-PF3ONS)	ND	ND	ND	ND
Hexafluoropropyleneoxide dimer acid (HFPO-DA) (GenX)	ND	ND	ND	ND
N-Ethylperfluorooctane sulfonamide (EtFOSAm)	ND	ND	ND	ND
N-Ethylperfluorooctane sulfonamido acetic acid (NEtFOSAA)	ND	ND	ND	ND
N-Ethylperfluorooctane sulfonamido ethanol (EtFOSE)	ND	ND	ND	ND
N-Methylperfluorooctane sulfonamide (MeFOSA)	ND	ND	ND	ND
N-Methylperfluorooctane sulfonamido acetic acid (NMeFOSAA)	ND	ND	ND	ND
N-Methylperfluorooctane sulfonamido ethanol (MeFOSE)	ND	ND	ND	ND
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	ND	ND	ND
Perfluoro(2-ethoxyethane) sulfonic acid (PFEESA)	ND	ND	ND	ND
Perfluoro-3-methoxypropanoic acid (PFMPA)	ND	ND	ND	ND

Analyte	Laboratory Testing Results, ng/g			
	Boring DP-1		Boring DP-2	
	DP-1A	DP-1B	S-1	S-2
Perfluoro-4-methoxybutanoic acid (PFMBA)	ND	ND	ND	ND
Perfluorobutanesulfonic Acid	ND	ND	ND	ND
Perfluorobutanoic Acid	ND	ND	ND	ND
Perfluorodecane Sulfonate	ND	ND	ND	ND
Perfluorodecanoic Acid	ND	ND	ND	ND
Perfluorododecane sulfonic acid (PFDoS)	ND	ND	ND	ND
Perfluorododecanoic acid (PFDOA)	ND	ND	ND	ND
Perfluoroheptane sulfonate	ND	ND	ND	ND
Perfluoroheptanoic Acid	ND	ND	ND	**0.15**
Perfluorohexanesulfonic Acid	ND	ND	ND	**0.16**
Perfluorohexanoic Acid	ND	ND	ND	**0.39**
Perfluorononane sulfonic acid (PFNS)	ND	ND	ND	ND
Perfluorononanoic Acid	ND	ND	ND	ND
Perfluoro-n-tridecanoic acid	ND	ND	ND	ND
Perfluorooctane sulfonamide (PFOSAm)	ND	ND	ND	ND
Perfluorooctanesulfonic Acid	ND	ND	**0.14**	ND
Perfluorooctanoic Acid	ND	ND	**0.16**	**1.7**
Perfluoropentane sulfonic acid (PFPeS)	ND	ND	ND	ND
Perfluoropentanoic Acid	ND	ND	ND	**0.41**
Perfluorotetradecanoic acid (PFTDA)	ND	ND	ND	ND
Perfluoroundecanoic Acid	ND	ND	ND	ND

Abbreviations: ng/g = nanograms per gram; ND = not detected; FTS = fluorotelomer sulfonate; FTCA = fluorotelomer carboxylic acid

Note:

Bold = Detected analyte

CONCLUSIONS AND RECOMMENDATIONS

The following conclusions and recommendations are based on our explorations completed to date and are provided to assist the design team with project planning for the proposed development.

- GRI collected a total of six soil samples from two direct-push soil borings at the project site. Samples were submitted to ALS Environmental in Kelso, Washington, for chemical analysis.
- No detected analytes were present above DEQ regulatory thresholds, where applicable.
- The following PFASs were detected in DP-2:
    - 1H, 1H, 2H, 2H-perfluorooctanesulfonic acid (6:2 fluorotelomer sulfonate)
    - Perfluoroheptanoic acid
    - Perfluorohexanesulfonic acid
    - Perfluorohexanoic acid
    - Perfluorooctanesulfonic acid
    - Perfluorooctanoic acid
    - Perfluoropentanoic acid
- Based on field screening observed during field exploration work, the soil evaluated at the site does not show obvious signs of contamination. If landfill disposal of excavated soil is required, individual landfills may have specific limitations regarding disposal of soil with detectable PFAS levels. Soil should be managed in accordance with Port of Portland PFAS-contaminated soil procedures.

LIMITATIONS

This memorandum has been prepared to aid the project team in the design of the proposed sanitary list station at Gate C15 at PDX. The scope is limited to the specific project and location described herein. Our description of the project represents our understanding of the significant aspects of the project relevant to the design and construction of the sanitation lift station at Gate C15 at PDX. In the event that any changes in the design and location of the proposed improvements outlined in this memorandum are planned, we should be given the opportunity to review the changes and modify or reaffirm the conclusions and recommendations of this memorandum in writing.

In the performance of an assessment of this type, specific information is obtained at specific locations at specific times. Judgments leading to conclusions are generally made with an incomplete knowledge of the subsurface and historical conditions applicable to the project area. A more extensive assessment, including additional historical review, site exploration, soil and groundwater sampling, and chemical analyses, may be used to supplement the information

presented by this assessment. Our assessment of the property may also change as new data become available during additional site exploration or development.

The findings and considerations provided in this memorandum are based on the data obtained from the subsurface explorations advanced at the locations indicated on Figure 2 and from other sources of information discussed in this memorandum. In the performance of subsurface explorations, specific information is obtained at specific locations at specific times. However, variations in subsurface conditions may exist between exploration locations. This memorandum does not reflect variations that may occur between these explorations. The nature and extent of variation may not become evident until construction. If subsurface conditions different from those encountered in the explorations are observed or encountered during construction, we should be advised at once so that we can observe and review these conditions and reconsider our recommendations where necessary.

We have included as Appendix C the Geoprofessional Business Association guidance document "Important Information about This Geoenvironmental Report" to assist you and others in understanding the use and limitations of this memorandum. We recommend you read this document. Please contact the undersigned if you have any questions.

Submitted for GRI,

Jason D. Bock, PE
Principal

Gregory D. Martin, CEG
Senior Geologist

This document has been submitted electronically.

7064-A – PDX GATE C15 ENVIRONMENTAL MEMORANDUM

Enclosures:
Figure 1, Vicinity Map
Figure 2, Site Plan
Appendix A, Boring Logs
Appendix B, ALS Environmental Laboratory Reports
Appendix C, Geoprofessional Business Association Guidance Document

REFERENCES

Oregon Department of Environmental Quality (DEQ). *Risk-Based Concentrations (RBC) Table*. Portland, OR: Oregon DEQ, 2025.

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U.S. Environmental Protection Agency (EPA), 2006, Method 8260D: Volatile organic compounds by gas chromatography/mass spectrometry (gc/ms), revision 3: Washington, D.C.

EPA, 2007, Method 7471B: Mercury in solid or semisolid waste (manual cold-vapor technique): Washington, D.C.

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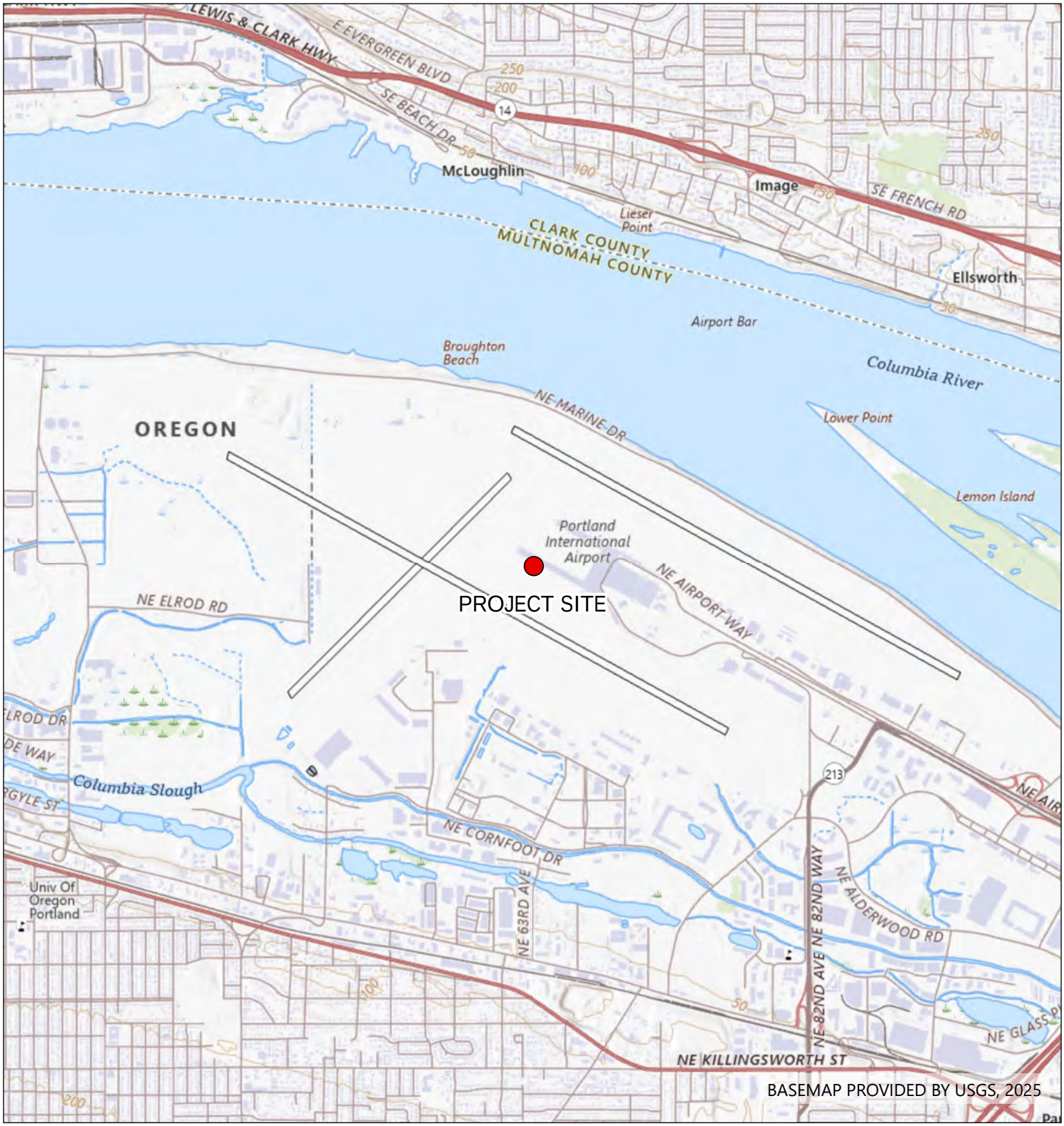
EPA, 2024, Method 1633: Analysis of per- and polyfluoroalkyl substances (PFS) in aqueous, solid, biosolids, and tissue samples by LC-MS/MS: EPA Office of Water, Washington, D.C.



N

0 0.5 1

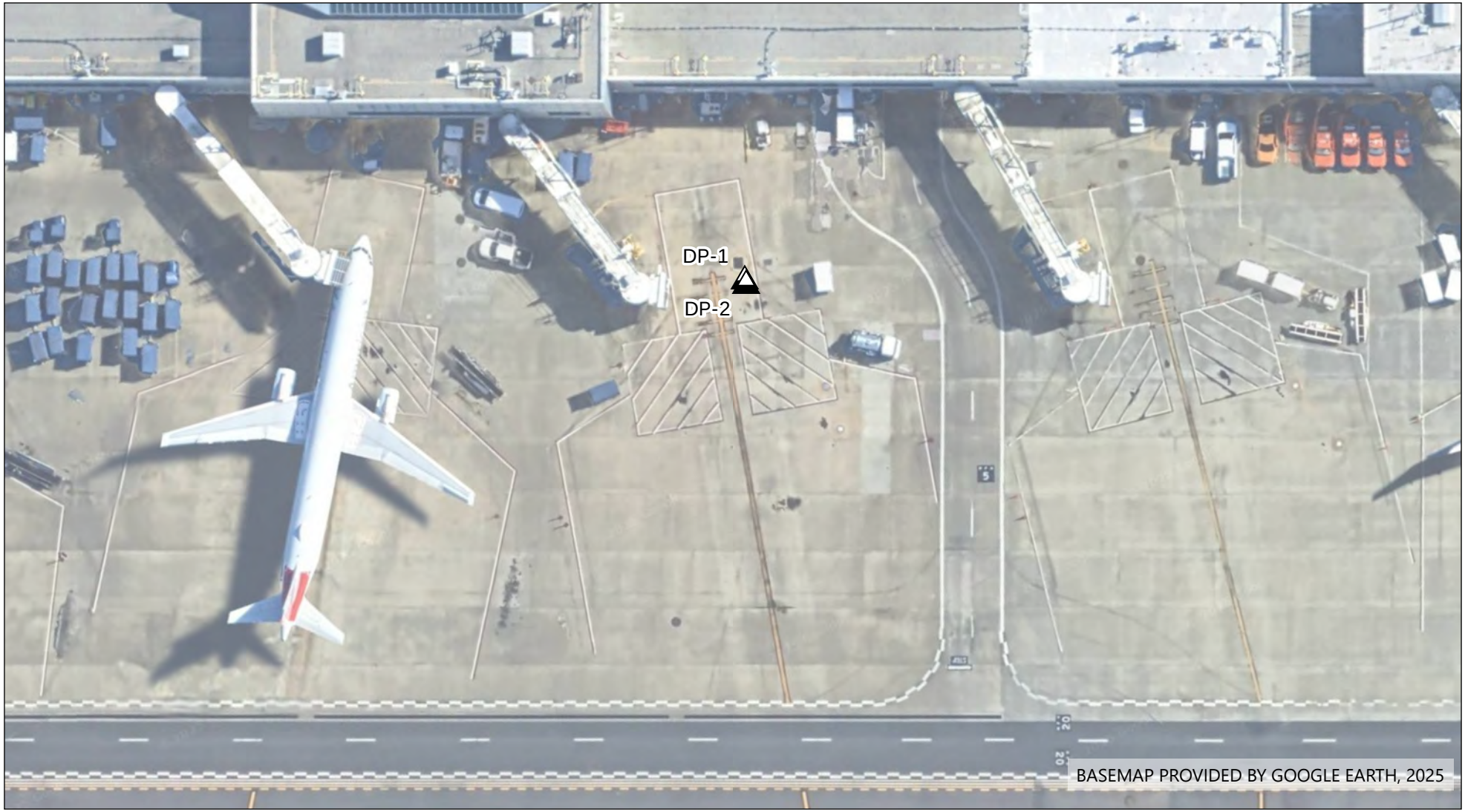
1 INCH = 0.5 MILES

GRI

PORT OF PORTLAND
PDX GATE C15 LIFT STATION

VICINITY MAP

JAN. 2026 JOB NO. 7064-A FIG. 1



LEGEND:

▲ APPROXIMATE LOCATION OF BORING COMPLETED BY GRI

N

0 50 100

1 INCH = 50 FEET

GRI

PORT OF PORTLAND
PDX GATE C15 LIFT STATION

SITE MAP

JAN. 2026 JOB NO. 7064-A FIG. 2

APPENDIX A

Boring Logs

BORING AND TEST PIT LOG LEGEND

SOIL SYMBOLS

Symbol	Typical Description
	LANDSCAPE MATERIALS
	FILL
	GRAVEL; clean to some silt, clay, and sand
	Sandy GRAVEL; clean to some silt and clay
	Silty GRAVEL; up to some clay and sand
	Clayey GRAVEL; up to some silt and sand
	SAND; clean to some silt, clay, and gravel
	Gravelly SAND; clean to some silt and clay
	Silty SAND; up to some clay and gravel
	Clayey SAND; up to some silt and gravel
	SILT; up to some clay, sand, and gravel
	Gravelly SILT; up to some clay and sand
	Sandy SILT; up to some clay and gravel
	Clayey SILT; up to some sand and gravel
	CLAY; up to some silt, sand, and gravel
	Gravelly CLAY; up to some silt and sand
	Sandy CLAY; up to some silt and gravel
	Silty CLAY; up to some sand and gravel
	PEAT

BEDROCK SYMBOLS

Symbol	Typical Description
	BASALT
	MUDSTONE
	SILTSTONE
	SANDSTONE

SURFACE MATERIAL SYMBOLS

Symbol	Typical Description
	Asphalt concrete PAVEMENT
	Portland cement concrete PAVEMENT
	Crushed rock BASE COURSE

SAMPLER SYMBOLS

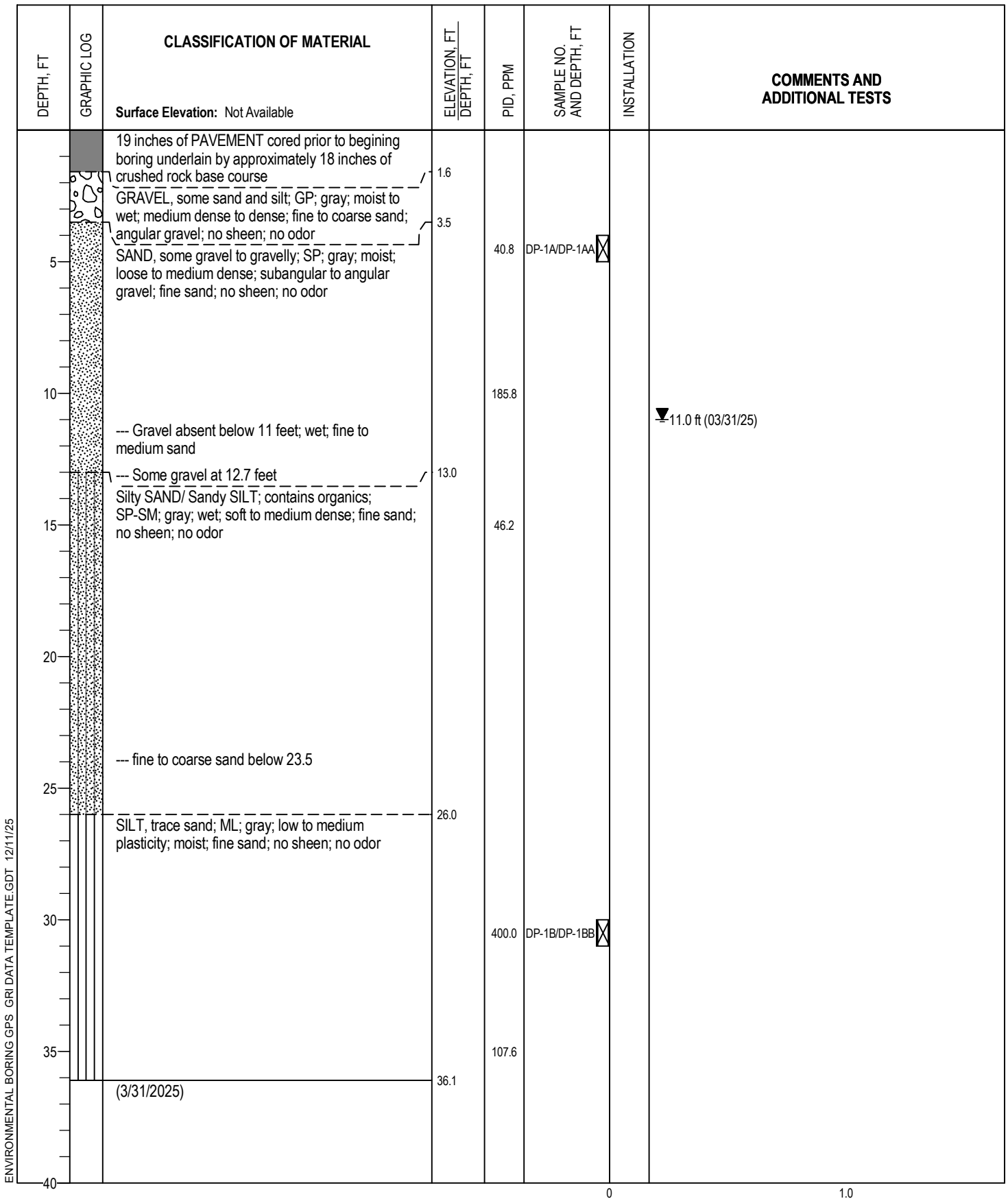
Symbol	Sampler Description
	2.0 in. O.D. split-spoon sampler and Standard Penetration Test with recovery (ASTM D1586)
	Shelby tube sampler with recovery (ASTM D1587)
	3.0 in. O.D. split-spoon sampler with recovery (ASTM D3550)
	Grab Sample
	Rock core sample interval
	Sonic core sample interval
	Push probe sample interval

INSTALLATION SYMBOLS

Symbol	Symbol Description
	Flush-mount monument set in concrete
	Concrete, well casing shown where applicable
	Bentonite seal, well casing shown if applicable
	Filter pack, machine-slotted well casing shown where applicable
	Grout, vibrating-wire transducer cable shown where applicable
	Vibrating-wire pressure transducer
	1-in.-diameter solid PVC
	1-in.-diameter hand-slotted PVC
	Grout, inclinometer casing shown where applicable

FIELD MEASUREMENTS

Symbol	Typical Description
	Groundwater level during drilling and date measured
	Groundwater level after drilling and date measured
	Rock/sonic core or push probe recovery (%)
	Rock quality designation (RQD, %)

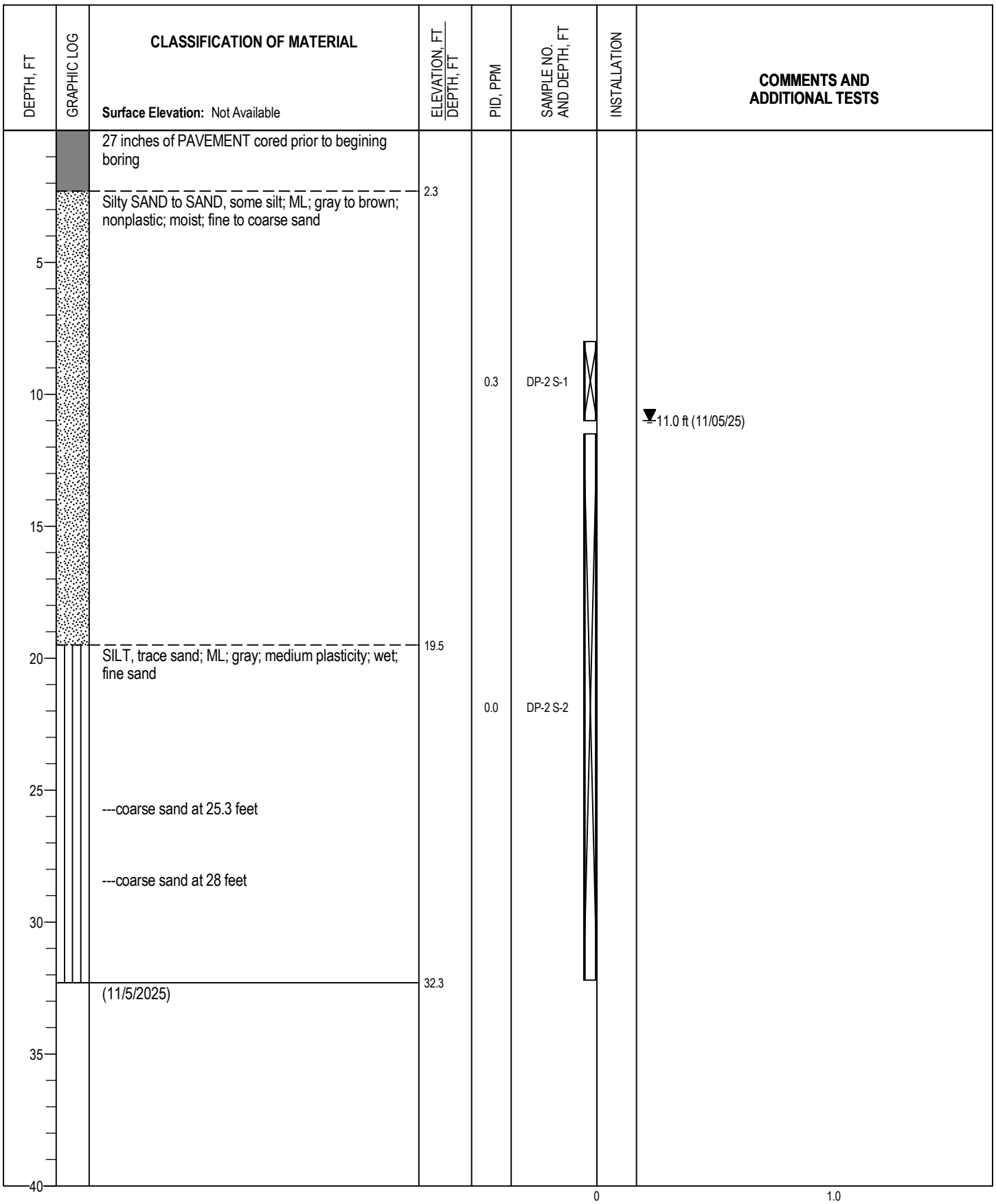


ENVIRONMENTAL BORING GPS GRI DATA TEMPLATE.GDT 12/11/25

Logged By: D. Verduzco		**Drilled by:** Anderson Environmental Contracting	
Date Started: 3/31/25	**GPS Coordinates:** 45.5893014° N -122.5983969° W (WGS84)		
Drilling Method: Direct Push Probe **Equipment:** Geoprobe 7822 DT **Hole Diameter:** 1.5 in.		**Hammer Type:** **Weight:** **Drop:** **Energy Ratio:**	
Note: See Legend for Explanation of Symbols			

BORING DP-1

DEC. 2025 JOB NO. 7064-A FIG. 1A



ENVIRONMENTAL BORING GPS GRI DATA TEMPLATE.GDT 12/11/25

Logged By: D. Verduzco	**Drilled by:** Anderson Environmental Contracting	
Date Started: 11/5/25	**GPS Coordinates:** 45.589298° N -122.598399° W (WGS84)	
Drilling Method: Direct Push Probe **Equipment:** Geoprobe 7822 DT **Hole Diameter:** 1.5 in.		**Hammer Type:** **Weight:** **Drop:** **Energy Ratio:**
Note: See Legend for Explanation of Symbols		

BORING DP-2

DEC. 2025 JOB NO. 7064-A FIG. 2A

DEQ Cleanup Program - Draft PFAS Soil RBCs and Hot Spots (ng/g)
December 2025

Analyte	**PFOA**	**PFOS**	**PFHxS**	**PFNA**	**HFPO-DA (GenX)**	**PFBS**
DP-2, Sample S-1 (collected 8 to 11 feet bgs)	0.16	0.14	<0.086	<0.086	<0.086	<0.086
DP-2, Sample S-2 (collected 11.5 to 32 feet bgs)	1.7	<0.12	0.16	<0.12	<0.12	<0.12
Excavation Worker RBCs and Hot Spot Values						
Cancer **RBC**	NA	NA	NA	NA	NA	NA
Cancer **Hot Spot**	NA	NA	NA	NA	NA	NA
Noncancer **RBC**	0.21	0.71	140	21	280	6,400
Noncancer **Hot Spot**	2.1	7.1	1,400	210	2,800	64,000

Notes:

NA = not applicable (not a carcinogen)
Cancer Hot Spot = 100 x Cancer RBC
Noncancer Hot Spot = 10 x Noncancer RBC
RBC = risk-based concentration
PFOA = perfluorooctanoic acid
PFOS = perfluorooctanesulfonic acid
PFHxS = perfluorohexane sulfonic acid
PFNA = perfluorononanoic acid
HFPO-DA (GenX) = hexafluoropropylene oxide dimer acid
PFBS = perfluorobutanesulfonic acid

Attachment B

Temporary Erosion and Sediment Control Plans

See plans already submitted through YDO.

MAUL FOSTER ALONGI

Attachment C

Groundwater Discharge, Treatment, and Monitoring Management Plan

MAUL FOSTER ALONGI

Gate C5 Groundwater Discharge, Treatment, and Monitoring Management Plan

Terminal Core Redevelopment Project
Portland International Airport

Prepared for:

Port of Portland

April 1, 2026

Project No. M0232.17.120

Prepared by:

Maul Foster & Alongi, Inc.
3140 NE Broadway, Portland, OR 97232

MAUL FOSTER ALONGI

Gate C5 Groundwater Discharge, Treatment, and Monitoring Management Plan

Terminal Core Redevelopment Project
Portland International Airport

The material and data in this report were prepared under the supervision and direction of the undersigned.

Maul Foster & Alongi, Inc.

Michael Pickering, RG
Principal Geologist

Contents

Abbreviations

BMPs	best management practices
Clear Creek	Clear Creek Systems, Inc.
CMMP	contaminated media management plan
Coffman	Coffman Excavation Inc.
COPC	contaminants of potential concern
DEQ	Oregon Department of Environmental Quality
ECSI	Environmental Cleanup Site Information database
EMP	Environmental Management Plan
EPA	U.S. Environmental Protection Agency
gpm	gallons per minute
HFPO-DA	hexafluoropropylene oxide dimer acid
MFA	Maul Foster & Alongi, Inc.
MRL	method reporting limit
NPDES	National Pollution Discharge Elimination System
OAR	Oregon Administrative Rule
PDX	Portland International Airport
PFAS	per- and polyfluoroalkyl substances
PFBS	perfluorobutane sulfonic acid
PFHxS	perfluorohexane sulfonic acid
PFNA	perfluorononanoic acid
PFOA	perfluorooctanoic acid
PFOS	perfluorooctane sulfonic acid
the Plan	groundwater discharge, treatment, and monitoring management plan
Port	Port of Portland
Project Team	Port project construction team
PVC	polyvinyl chloride
RBC	risk-based concentration
RSL	risk-based screening level
the Site	Terminal Core Redevelopment Project
TPH	total petroleum hydrocarbons
VCP	Voluntary Cleanup Program
VOC	volatile organic compounds
YDO	Your DEQ Online

1 Introduction

This groundwater discharge, treatment, and monitoring management plan (the "Plan") was prepared for the Port of Portland (Port) Terminal Core Redevelopment Project PKG F – Gate C5 (the "Site") at the Portland International Airport (PDX). The Site is presented on drawing PDX 2021-510 Sheet C3.002-F in Appendix A.

1.1 Project Description and Background

A description of the project including background information is presented in the contaminated media management plan (CMMP) presented in Attachment A of the Environmental Management Plan (EMP).

2 Project Organization

The following information generally describes the duties, responsibilities, authorities, and qualifications of the personnel involved in the dewatering project; project organization; identification of reporting relationships; lines of communication; and authorities.

2.1 Oregon Department of Environmental Quality

The Oregon Department of Environmental Quality (DEQ) is the regulatory agency. This Plan is being submitted to DEQ for review and approval under the National Pollution Discharge Elimination System (NPDES) 1200-CA permit EMP requirements.

The Port is also engaged with DEQ's Voluntary Cleanup Program (VCP) investigating historical contaminant releases at PDX including per- and polyfluoroalkyl substances (PFAS) compounds. The Environmental Cleanup Site Information database/Your DEQ Online (ECSI/YDO) site identification number for this work is #3324 (the VCP Site). The Oregon Environmental Quality Commission recently adopted rule revisions that include six PFAS compounds within the definition of hazardous substances under Oregon regulations. These revisions provide DEQ with authority to require investigation and remediation of releases of those compounds. The Port will continue to coordinate with DEQ under the VCP as this work progresses.

2.2 Port of Portland Construction Project Team

The Port project team includes Coffman Excavation Inc. (Coffman; the construction contractor) who will be responsible for dewatering their work areas to facilitate construction. The Coffman construction dewatering plan, presented in Appendix A, describes the means and methods proposed for dewatering their work area including estimated dates and flow rates.

2.3 Maul Foster & Alongi, Inc.

Maul Foster & Alongi, Inc. (MFA) prepared the Plan on behalf of the Port and will assist the Port with implementation and strategic assistance throughout the project. MFA will conduct the sampling and reporting activities discussed in Section 6.

MFA will subcontract the following operations to Clear Creek Systems, Inc (Clear Creek):

- Turbidity control operation
- Water treatment system operation and discharge

The Port, including through its contractors, will be responsible for implementing the Plan. Clear Creek will provide equipment for turbidity controls (e.g., weir tanks) and water treatment. Daily observations and required operations and maintenance associated with the treatment equipment will be provided by Clear Creek. Contaminants of potential concern (COPCs) in groundwater include total petroleum hydrocarbons (TPH) as diesel, volatile organic compounds (VOCs), and listed PFAS compounds.

3 Construction Dewatering

Construction dewatering may be necessary in areas where excavation reaches or extends below the groundwater table. It is anticipated that if dewatering is necessary, the total volume will be minimal and it will be conducted using a localized approach (e.g., localized dewatering wells) to help to further minimize the volume of water. The project work period is expected to occur from approximately March 30 through May 1, 2026.

Groundwater removed by dewatering will be filtered using adsorptive media suitable for PFAS and other COPCs and will be discharged to the storm sewer (e.g., catch basin) in the vicinity of the work area. The proposed location is shown on dewatering plan drawing PDX 2021-510 Sheet C3.002-F in Appendix A. The receiving manhole on the stormwater system is located in PDX Basin 6. All stormwater from Basin 6 flows through a regional stormwater treatment facility before it discharges to the Columbia Slough. Appendix A also includes a plan showing stormwater Basin 6. Due to the work area being within active airport operations, the equipment used for dewatering will need to be mobile. Typical treatment system components will include turbidity control, sand filtration, bag filters, and vessels containing adsorptive media.

All known, available, and reasonable methods, of prevention, control, and treatment are being implemented to ensure compliance with water quality requirements under the NPDES permit. As discussed in Section 2.2, the Coffman construction dewatering plan describes the means and methods proposed for dewatering their work area including estimated dates and flow rates.

4 Treatment System

Construction dewatering performed during project activities will be directed to a holding tank for treatment of turbidity and potential contaminants, as discussed in this section and shown on the

process flow drawing in Appendix B. Low concentrations of TPH as diesel, TPH as oil, and VOCs are expected to be present in groundwater. PFAS compounds were detected in groundwater from well MW-6 adjacent to the Site in April 2025. More details are presented in Section 1.2 of the CMMP in Attachment A of the EMP.

4.1 Treatment Design Parameters

The treatment system was sized based on the parameters from the Coffman construction dewatering plan. The specific volume and number of tanks were selected to optimize treatment during construction dewatering. The system was designed to remove turbidity through passive gravity separation, flocculation, and filtration. If present, TPH, VOCs and PFAS will be treated by adsorptive media vessels prior to discharge to the storm sewer. Cut sheets for system equipment are included in Appendix C.

4.2 Treatment Approach

Groundwater removed by construction dewatering will, at minimum, be treated for turbidity and potential contaminants through the use of a weir tank and adsorptive media filtration. A process flow diagram is shown in Appendix B. The treatment system includes chitosan-enhanced sediment removal, sand filters, bag/cartridge filters (for polishing), two 2,000 pound carbon/organoclay vessels, two 2,000 pound Fluro-Sorb 200 vessels, valving, and controls. The carbon/organoclay vessels and Fluro-Sorb 200 vessels will be plumbed in series to increase the bed contact time. As needed, carbon dioxide injection will be used for pH adjustment. The system also includes a recirculation line. Safety Data Sheets for the proposed treatment system additives are included in Appendix D.

- Chitosan-Enhanced Turbidity Treatment – Fine particles (e.g., silts and clays) can remain in suspension without settling due to their relative size and ionic charge. Chitosan will be used as a coagulant/flocculant to modify the surface charge of soil particles and cause them to bind together to create larger, heavier particles. These larger particles will then be removed through gravity settling in the tanks plumbed to receive influent below the water surface (to reduce aeration).
- Sand and Bag/Cartridge Filtration – Additional particle removal can be performed by including sand, bag, or cartridge filters plumbed in series from the discharge of the tanks. Use of these additional filter types may be required to prevent excessive loading and subsequent blinding of the adsorptive media treatment. Filters also require additional maintenance, such as backwashing and recirculation of backwash waters through the turbidity treatment system.
- Adsorptive Media Treatment – Adsorptive media vessels will be used to remove potential TPH, VOCs, and PFAS in the collected groundwater prior to discharge. The quantity, sizing, and layout of tanks will be selected to treat the quantity of water removed from the construction project. The media type, pore size, and vessel sizing will be specified by the adsorptive media vendor based on their review of the design parameters. Maintenance for the adsorptive media vessels is discussed further in Section 5.1. The estimated maximum discharge rate at well start up is 100 gallons per minute (gpm). Flow rates over 100 gpm are not anticipated based on historical dewatering/treatment at PDX. The system influent will be throttled, where necessary, to limit the input flow rate to 100 gpm.

The equipment will be piped using either flexible hose and quick-connect fittings or hard plumbed using rigid polyvinyl chloride (PVC) pipe. The system layout design will accommodate modification to the system as project need requires. A flow totalizer will be located prior to the system discharge to quantify the volume of water treated and discharged.

The water treatment system will be equipped with monitoring modules throughout the treatment train that measure turbidity, pH and temperature and trigger recirculation of the treated water based on pre-programmed parameters. Discharge from the water treatment system for pH will be limited to 5.5 to 9.0. The treatment system is equipped with CO2 sparging (see process flow diagram) to be used, as necessary.

5 Maintenance–Adsorptive Media Vessels, Turbidity Treatment System, and Discharge

5.1 Daily Observations and Daily Routine Maintenance

Visual monitoring of the treatment system operation will be conducted on a daily basis (during system operation) until the dewatering system is no longer required. The discharge (storm drain; discussed in Section 3) and holding tank(s) will be inspected prior to every discharge event. The inspections will include observations for the following:

- Visual parameters, including sheen, discoloration, floating solids, and odor.
- Inspection of system components (including valves, piping, and other connections) for signs of degradation, leaking, or failure.
- Tracking of the total volume quantified by the flow totalizer.
- Conditions of erosion control best management practices (BMPs) (as specified in the erosion control plan).
- Conditions of the discharge, specifically noting signs of overflow, surface runoff, and other observations such as leaks or spills. Flow rates will be adjusted, as discussed in Section 6, to prevent fugitive discharges of treated water.

Daily routine maintenance will include the following:

- System pressure readings will be recorded and flow rates through the adsorptive media vessels will be adjusted to optimize residence time and corresponding removal efficiency. The pressure readings will also be used to determine when backwashing of adsorptive media vessels is needed.
- Bag filter changes will be completed based on observed pressure readings.

The daily inspection form will be maintained and submitted to the Port. The daily inspection forms will be developed after the treatment system design is finalized so that all required inspection items can be included on the forms.

5.2 Adsorptive Media Maintenance - Backwashing

Adsorptive media needs to be periodically backwashed. Backwashing will be completed for either of the following conditions.

- Partially spent media will be backwashed to remove sediment from the top of the bed and improve flow through the media (i.e., to reduce channeling).
- After soaking and prior to being placed in-service, fresh media will be backwashed to remove fines, remove entrapped air, and to fully stratify the media bed.

Due to the expected duration of the project, media change out is not anticipated. If change out of adsorptive media is required, it will include removal of the spent media, placement of fresh media into the vessel, soaking of the media, and backwashing. Water used for backwashing will be circulated through the treatment system. Spent media will be chemically profiled and disposed of at a landfill designated by the Port, contingent on approval by the receiving facility, or regenerated (as applicable based on results of chemical profiling).

5.3 Turbidity Treatment System Maintenance

The chitosan injection system will be monitored to determine the optimal dosing for sediment removal. Depending on the volume of solids that collect in the weir tank, the solids may need to be removed (via vacuum truck) prior to the completion of the project. Solids removed from the tanks will be profiled and disposed of off-site at a landfill designated by the Port.

If treatment includes sand, bag, or cartridge filtration, filters that have become fouled would be backwashed or replaced as needed. Sand filters typically have an automatic backwashing mode. Backwashing water will be routed to the tanks and recirculated through the treatment system.

6 Storm System Discharge and Monitoring

Dewatering will be conducted using a localized approach (e.g., a limited number of dewatering wells) to help minimize the volume of water. Due to restrictions governing aircraft safety, it is not practicable to discharge to the ground surface for infiltration on this project. The nearest unpaved area is over 500 feet to the south, across the aircraft apron and active taxiway. As a result, discharge will be to the storm sewer in the work area.

6.1 Influent Sampling

Influent sampling will be performed to assess the influent concentration of contaminants and to help estimate media consumption and system performance. Influent sampling will be conducted at start-up and when changes in the influent source occur. The system may be operated by batch or continuous discharge depending on flow rates. Sampling from the system influent will be completed when sufficient water has accumulated in the first holding tank. The samples will be analyzed for TPH, VOCs, and PFAS.

6.2 Performance Sampling

Sampling between the two Fluoro-Sorb 200 media vessels will be completed on a weekly basis to further assess media consumption and the potential for breakthrough. Samples will be analyzed for TPH, VOCs, and PFAS (EPA Method 1633). Samples will be submitted to the analytical laboratory on a rush turnaround time (e.g., 24 to 48 hours for TPH and VOCs and 15 to 20 business days for PFAS). If breakthrough occurs, the media in the vessels that experienced breakthrough will be replaced. For TPH, VOCs, PFOS, and PFOA breakthrough is considered to have occurred when concentrations are reported above the method reporting limit (MRL). The laboratory MRLs for TPH, VOCs, and PFAS are presented in Appendix E. None of the MRLs for TPH and VOCs applicable to the Site exceed the screening levels values for the following:

- DEQ, 2019. Oregon National Ambient Water Quality Criteria: OAR 340-041-8033, Table 30, Aquatic Life Water Quality Criteria for Toxic Pollutants.
- DEQ, 2011. Appendix D: Stormwater Data Reporting and Screening Table for Non-Portland Harbor Sites.

The Port is using the most stringent, EPA recognized technology available and will use the weekly performance data to monitor the performance of the treatment system, while the final media polishing vessel serves as a safeguard.

6.3 Pre-Discharge Requirements

Pre-discharge sampling is not feasible, as described above, due to PFAS laboratory turnaround times and operational constraints within the aircraft movement area. To address these limitations, the project will utilize best available treatment technologies recognized by the EPA for PFAS removal, including high-efficiency adsorption media. The system is configured in series so that the final adsorption vessels function as a polishing step, providing an additional safeguard against media breakthrough prior to discharge. This approach reflects the most practicable and protective method for managing dewatering discharges under the constraints of the project location. Prior to discharging water from the system, the operator must have completed the daily observation and maintenance, detailed in Section 5.1.

6.4 Discharge Monitoring and Reporting

Discharges will be monitored and recorded on discharge forms. These forms will include start and end times of discharge events, flow rates, volumes discharged, and other observations.

Limitations

The services undertaken in completing this report were performed consistent with generally accepted professional consulting principles and practices. No other warranty, express or implied, is made. These services were performed consistent with our agreement with our client. This report is solely for the use and information of our client unless otherwise noted. Any reliance on this report by a third party is at such party's sole risk.

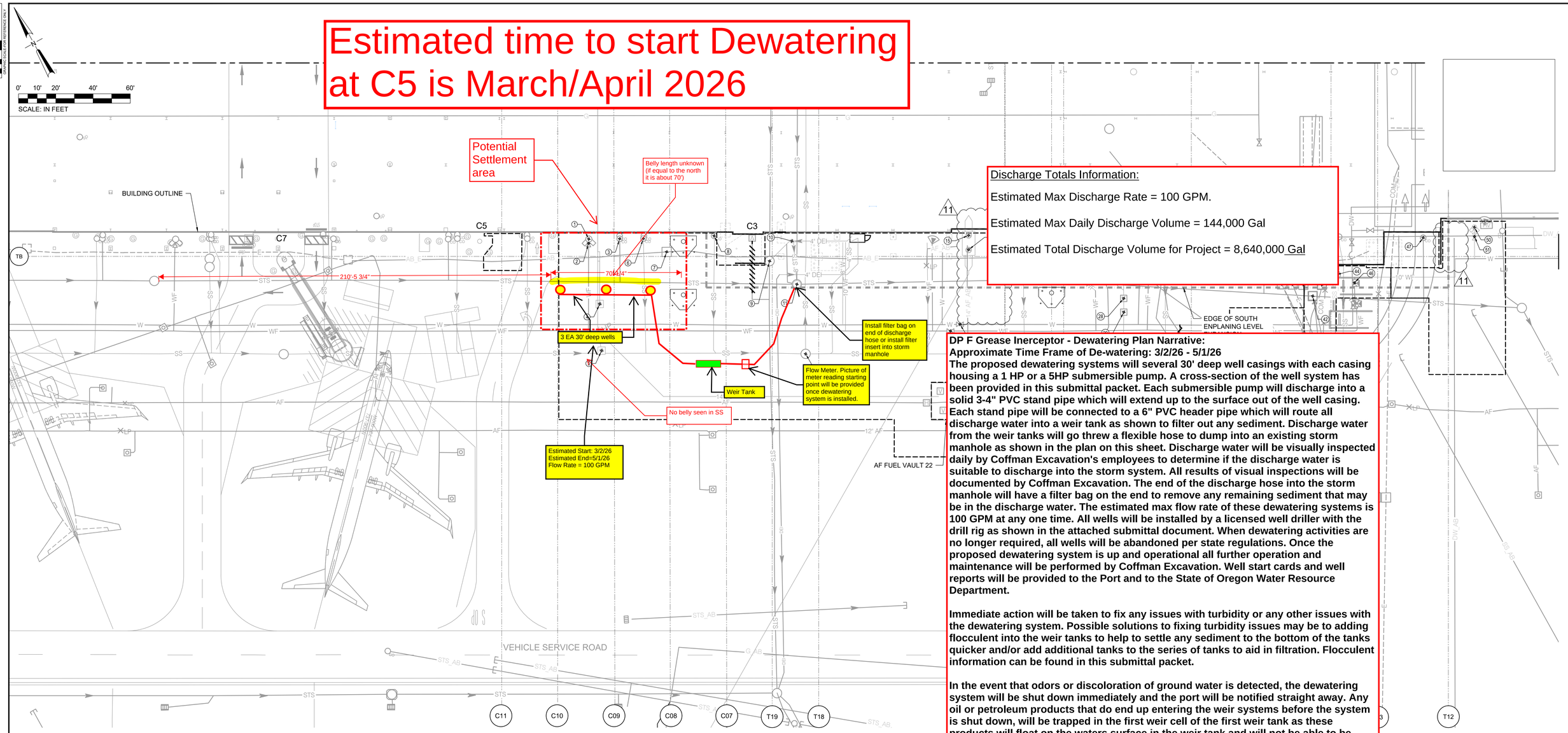
Opinions and recommendations contained in this report apply to conditions existing when services were performed and are intended only for the client, purposes, locations, time frames, and project parameters indicated. We are not responsible for the impacts of any changes in environmental standards, practices, or regulations subsequent to performance of services. We do not warrant the accuracy of information supplied by others, or the use of segregated portions of this report.

Appendix A

Coffman Excavation Inc. Dewatering Plan

MAUL FOSTER ALONGI

Estimated time to start Dewatering at C5 is March/April 2026



Discharge Totals Information:

Estimated Max Discharge Rate = 100 GPM.

Estimated Max Daily Discharge Volume = 144,000 Gal

Estimated Total Discharge Volume for Project = 8,640,000 Gal

DP F Grease Inerceptor - Dewatering Plan Narrative:
Approximate Time Frame of De-watering: 3/2/26 - 5/1/26
The proposed dewatering systems will several 30' deep well casings with each casing housing a 1 HP or a 5HP submersible pump. A cross-section of the well system has been provided in this submittal packet. Each submersible pump will discharge into a solid 3-4" PVC stand pipe which will extend up to the surface out of the well casing. Each stand pipe will be connected to a 6" PVC header pipe which will route all discharge water into a weir tank as shown to filter out any sediment. Discharge water from the weir tanks will go threw a flexible hose to dump into an existing storm manhole as shown in the plan on this sheet. Discharge water will be visually inspected daily by Coffman Excavation's employees to determine if the discharge water is suitable to discharge into the storm system. All results of visual inspections will be documented by Coffman Excavation. The end of the discharge hose into the storm manhole will have a filter bag on the end to remove any remaining sediment that may be in the discharge water. The estimated max flow rate of these dewatering systems is 100 GPM at any one time. All wells will be installed by a licensed well driller with the drill rig as shown in the attached submittal document. When dewatering activities are no longer required, all wells will be abandoned per state regulations. Once the proposed dewatering system is up and operational all further operation and maintenance will be performed by Coffman Excavation. Well start cards and well reports will be provided to the Port and to the State of Oregon Water Resource Department.

Immediate action will be taken to fix any issues with turbidity or any other issues with the dewatering system. Possible solutions to fixing turbidity issues may be to adding flocculent into the weir tanks to help to settle any sediment to the bottom of the tanks quicker and/or add additional tanks to the series of tanks to aid in filtration. Flocculent information can be found in this submittal packet.

In the event that odors or discoloration of ground water is detected, the dewatering system will be shut down immediately and the port will be notified straight away. Any oil or petroleum products that do end up entering the weir systems before the system is shut down, will be trapped in the first weir cell of the first weir tank as these products will float on the waters surface in the weir tank and will not be able to be discharged into the storm system. The oil or petroleum products can then be skimmed off the waters surface using a vacuum truck and then be disposed of offsite at Rivercity Environmental located off of NE 109th Street in Portland. Also, as a short term solution for managing any possibly contaminated ground water we can discharge water from the weir tank into water trucks and haul this water off to River City Environmental.

ADJUSTMENT SCHEDULE

#	ASSET ID#	DESCRIPTION	EX. ELEV.	FIN. ELEV.	REMARKS	ADJ. DETAIL
1	FH008	EX. W FH	27.17	27.13	NAR	N/A
2	WV075	EX. W VALVE	27.12'	27.11	NAR	
3	STSCO0004437	EX. STS CO	27.14'	27.13	NAR	
4	HP CASING 1	PKG B AF CASING VENT	N/A	26.77	NAR	N/A
5	HPD	PKG B AF HIGH POINT DRAIN	N/A	26.52	NAR	N/A
6	SSCO00004443	EX. SS CO	27.15'	27.13	NAR	
7	EVLT00002009	ABAND. ELEC VAULT	N/A		N/A	N/A
8	SSCO00004445	EX. SS CO	27.16'	27.10	ADJ	
9	STSMH1117	EX. STS MH	26.98'	26.97	NAR	
10	CO-DIO-1	PKG B STS CO	N/A	27.10	NAR	N/A
11	STSMH1098	EX. STS MH	26.81'	26.78	ADJ	4 C3.007-F
12	SSMH997	EX. SS MH	26.39'	26.36	ADJ	4 C3.007-F
13	WV370	EX. W VALVE	26.50'	26.44	ADJ	2 C4.025-F
14	WV369	EX. W VALVE	26.46'	26.41	ADJ	
15		KENNEDY FEEDER VAULT	N/A	27.07	NAR	N/A
16		KENNEDY FEEDER VAULT	N/A	26.93	NAR	N/A
17						
18						
19	STSMH8269	EX. STS MH	26.35'	26.49	ADJ	4 C3.007-F
20	CO Z-1	PKG B SS CO	N/A	26.71	NAR	N/A

ADJUSTMENT SCHEDULE

#	ASSET ID#	DESCRIPTION	EX. ELEV.	FIN. ELEV.	REMARKS	ADJ. DETAIL
21	FH-2	PKG B W FH	N/A	26.45	NAR	N/A
22	WF-VAL-1	PKG B WF GATE VALVE	N/A	26.42	NAR	N/A
23	FH010	EX. W FH	27.04'	27.04	NAR	
24	WV076	EX. W GATE VALVE	26.62'	26.62	NAR	
25	STSCO0003992	EX. STS CO	26.64'	26.64	NAR	
26	STSCO0003991	EX. STS CO	26.61'	26.61	NAR	
27	SSCO00004448	EX. SS CO	26.30'	26.41	ADJ	
28	SSVLT0001193	EX. SS VAULT	26.15'	26.29	ADJ	4 C4.024-F
29	SSVLT0001194	EX. SS VAULT	26.07'	26.22	ADJ	4 C4.024-F
30	SSMH00002389	EX. SS MH	25.84'	26.00	ADJ	4 C3.007-F
31	CVLT238	EX. COMM VAULT	26.35'	26.49	ADJ	8 C3.007-F
32	SSCO00003989	EX. SS CO	26.67'	26.67	NAR	
33	SSCO00003990	EX. SS CO	26.65'	26.65	NAR	
34	SSMH998A	EX. SS MH	25.87'	26.02	ADJ	4 C3.007-F
35	MHTP 06B	ABAND. COMM VAULT	N/A		N/A	
36	MHTP 06A	ABAND. COMM VAULT	N/A		N/A	
37	MHTD 06	ABAND. COMM VAULT	N/A		N/A	
38	EVLT102	EX. ELEC VAULT	26.53	26.53	NAR	
39	EVLT108	EX. ELEC VAULT	26.57	26.57	NAR	
40	EVLT00001186	EX. ELEC VAULT	26.56	26.56	NAR	

ADJUSTMENT SCHEDULE

#	ASSET ID#	DESCRIPTION	EX. ELEV.	FIN. ELEV.	REMARKS	ADJ. DETAIL
41	AFVL363	AF HPV	25.66	25.66	NAR	N/A
42	CVLT128	EX. COMM VAULT	26.45	26.44	NAR	N/A
43	CVLT280	EX. COMM VAULT	26.49	26.50	NAR	
44	SSMH00002120	ABAND. SS MH	26.52			2 C3.007-F
45	STSVLT527	ABAND. STS VAULT	26.57			2 C3.007-F
46	WV078	EX. W VALVE	26.40'	26.53	ADJ	2 C4.025-F
47	STSCO9178	EX. STS CO	26.66	26.65	NAR	N/A
48						
49						
50	FH-1	PKG B W FH	N/A	26.76	NAR	N/A
51	GV-F	PKG B WF GATE VALVE	N/A	26.74	NAR	N/A

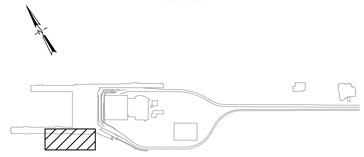
NAR = NO ADJUSTMENT REQUIRED

ADJ = ADJUST STRUCTURE TO NEW PROPOSED ELEVATION

LEGEND:

AF — EXISTING AVIATION FUEL
SS — EXISTING SANITARY SEWER
LIMITS OF PAVEMENT WORK
PRF — EXISTING PERFORATED PIPE
P_ABAND_STS — ABANDONED STORM SEWER
ELECTRICAL/COMM
DUCTBANK, PROPOSED OR EXISTING

...F.
...ED OF OFF AIRPORT PROPERTY BY THE CONTRACTOR ...Y THE PORT.
... CAN BE AT GROUND SURFACE.
...CTIVATION OF REPLACEMENT FACILITIES. ALL SYSTEMS ...EPTION OF LIMITED (USUALLY NIGHT-TIME) SHUTDOWNS FOR
...EMOVE FUEL AND FILL WITH CLSM. COLLECT AND DISPOSE OF ...EM OPERATOR WILL INSPECT EXISTING FUEL PIPING UPON ...HE FUEL SYSTEM OPERATORS INSPECTION. DO NOT REMOVE
...ND INSTALLING SPOOL PIECES MAY BE CONDUCTED AT THE CONTRACTOR'S OPTION. NO BURIED FLANGE CONNECTIONS OR VALVES WILL BE PERMITTED IN THE FINAL PIPE CONFIGURATION.
7. FOR PIPE ABANDONMENT SEE DETAIL 1, SHEET C3.007-F. FOR MH ABANDONMENT SEE DETAIL 2, SHEET C3.007-F.
8. CUT MAINLINE FUEL PIPE AND REMOVE LATERAL CONNECTION. REPAIR MAINLINE PIPE WITH SPOOL PIECE AND PLIDCO FITTINGS.
9. INSTALL RESTRAINED JOINT FITTINGS FOR CAPPING WATER LINES AND PLACE CONCRETE THRUST BLOCKS.
10. LIMITS OF CITY OF PORTLAND REVIEW: PURSUANT TO A CITY OF PORTLAND AND PORT OF PORTLAND AGREEMENT, WORK OUTSIDE OF THE BOUNDARY SHOWN ON THE DRAWINGS IS SHOWN FOR THE CITY'S INFORMATION ONLY AND IS NOT SUBJECT TO CITY CODE ADMINISTRATION.
11. EXISTING FIRE HYDRANTS SHALL BE MAINTAINED IN CONTINUOUS SERVICE THROUGHOUT THE CONSTRUCTION DURATION UNTIL NEW REPLACEMENT FIRE HYDRANTS HAVE BEEN INSTALLED AND ARE OPERATIONAL. WATER SHALL BE SUPPLIED EITHER FROM THE EXISTING MAINLINE OR FROM LATERAL EXTENSIONS FROM THE REPLACEMENT MAINLINE AS NECESSARY FOR CONSTRUCTION SEQUENCING.
12. REMOVE PIPE FROM MANHOLE WALL. PATCH WALL AS SHOWN IN DETAIL 5. SHEET C3.007-F.



KEY PLAN
SCALE: N.T.S.

CAN YOU SEE THE ARPA AREA? THE ADJACENT SAMPLES SHOW THREE DIFFERENT LEVELS OF SHADING. SETTINGS FOR VIEWING AND PRINTING DRAWING CONTENT ARE OPTIMIZED WHEN ALL THREE PLANES ARE VISIBLE. THIS GUIDANCE IS PROVIDED FOR REFERENCE ONLY.

NO.	DATE	BY	REVISIONS	APP'VD
11	7/18/22		Sheet REVISED by CC #29.5	
10	1/10/22		Sheet REVISED by CC #29.4	
2	N/A		REVISIONS NO. 2-9 NOT USED	
1	9/17/21		Sheet ADDED by CC #29.3	

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PORTLAND, OREGON

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2016D006 — DESIGN NUMBER
102191 — PROJECT NUMBER

REGISTERED PROFESSIONAL ENGINEER
60434PE
Digitally Signed
OREGON
MARCH 9, 1989
HANS N. CONRADT
EXPIRES: 12-31-23

DESIGNED BY	R. CARSON
DRAWN BY	N. HATCHER
CHECKED BY	H. CONRADT
DATE	FEBRUARY 2021
SCALE	1" = 20'

PORTLAND INTERNATIONAL AIRPORT

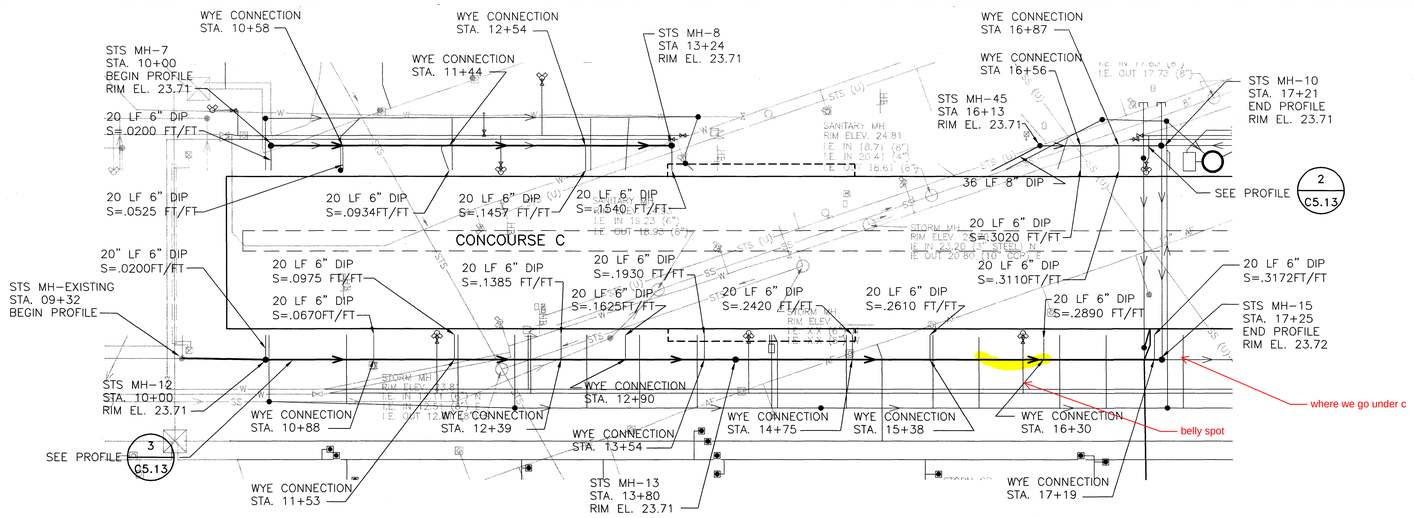
TCORE - BUILDING ENCLOSURE AND INTERIOR CONSTRUCTION
UTILITY REMOVAL AND ADJUSTMENT PLAN
AIRSIDE 1

SUBMITTED BY	TYPE	DRAWING NO.	SHEET NO.	DISC. SHT. NO.
STEVE JANNSEN, PORT ENGINEER	CD	PDX 2021-510		C3.002-F

PRINTED: 7/8/2022 10:52:39 AM
File Path: O:\63842\CADD\DS001\Drawings\PDX TCORE\PACKAGE F\2-CIVIL\3.001-F UTILITY REMOVAL AND ADJUSTMENT PLAN.dwg

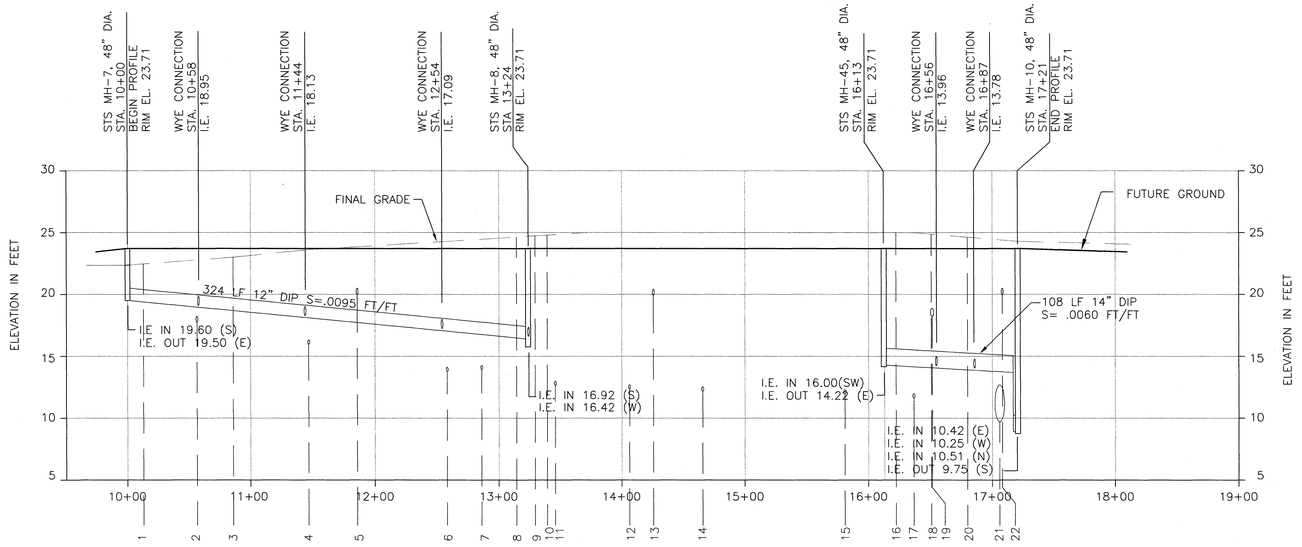
DIGITALLY SIGNED
ELECTRONIC DOCUMENT AVAILABLE UPON REQUEST

DRAWING SCALE IS REDUCED 50% WHEN SHEET SIZE IS 22" x 17".



STORM SEWER PLAN

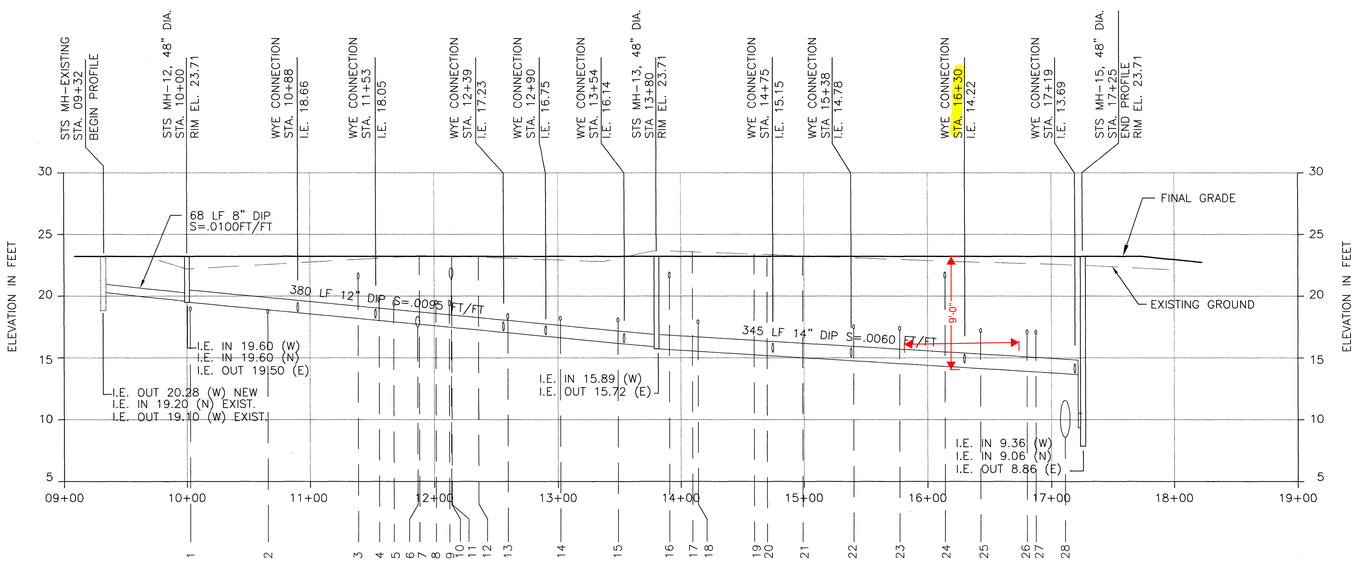
SCALE: 1" = 50' (1 / C5.13)



STORM SEWER PROFILE

SCALE: HORIZ. 1" = 50'
VERT. 1" = 5'
(2 / C5.13)

PIPE CONFLICT TABLE				
PIPE	STA.	TYPE	ELEV.	CONDITION
1	10+13	AVIATION FUEL	UNKNOWN	EXISTING
2	10+56	6" SANITARY SEWER	17.80	NEW
3	10+85	STORM SEWER	UNKNOWN	DEMO
4	11+47	4" SANITARY SEWER	15.90	NEW
5	11+86	6" FIRE WATER	20.00	NEW
6	12+58	4" SANITARY SEWER	13.78	NEW
7	12+86	4" SANITARY SEWER	13.51	NEW
8	13+14	WATER	UNKNOWN	DEMO
9	13+29	WATER	UNKNOWN	DEMO
10	13+40	8" STORM SEWER	UNKNOWN	DEMO
11	13+46	4" SANITARY SEWER	12.51	NEW
12	14+06	4" SANITARY SEWER	12.35	NEW
13	14+25	6" FIRE WATER	20.00	NEW
14	14+65	4" SANITARY SEWER	12.19	NEW
15	15+80	4" SANITARY SEWER	11.97	NEW
16	16+22	8" STORM SEWER	UNKNOWN	DEMO
17	16+36	4" SANITARY SEWER	11.65	NEW
18	16+51	SANITARY SEWER	UNKNOWN	DEMO
19	16+51	8" SANITARY SEWER	18.22	DEMO
20	16+80	WATER	UNKNOWN	DEMO
21	17+06	36" STORM SEWER	9.70	NEW
22	17+10	6" FIRE WATER	20.00	NEW



STORM SEWER PROFILE

SCALE: HORIZ. 1" = 50'
VERT. 1" = 5'
(3 / C5.13)

PIPE CONFLICT TABLE				
PIPE	STA.	TYPE	ELEV.	CONDITION
1	10+03	4" SANITARY SEWER	18.78	NEW
2	10+66	4" SANITARY SEWER	18.33	NEW
3	11+38	6" FIRE WATER	20.00	NEW
4	11+55	4" SANITARY SEWER	19.60	NEW
5	11+67	6" DOMESTIC WATER	19.20	DEMO
6	11+86	10" FIRE WATER	17.49	DEMO
7	11+86	STORM SEWER	UNKNOWN	DEMO
8	12+01	4" SANITARY SEWER	19.60	NEW
9	12+12	4" DOMESTIC WATER	19.20	NEW
10	12+14	6" FIRE WATER	20.00	NEW
11	12+14	8" STORM SEWER	UNKNOWN	DEMO
12	12+36	8" SANITARY SEWER	UNKNOWN	DEMO
13	12+60	6" SANITARY SEWER	19.60	NEW
14	13+02	4" SANITARY SEWER	18.35	NEW
15	13+49	4" SANITARY SEWER	18.31	NEW
16	13+91	6" FIRE WATER	20.00	NEW
17	14+10	4" GREASE WASTE	–	NEW
18	14+14	4" SANITARY SEWER	17.94	NEW
19	14+61	AVIATION FUEL	UNKNOWN	EXISTING
20	14+71	4" SANITARY SEWER	18.02	NEW
21	14+99	AVIATION FUEL	UNKNOWN	TEMP
22	15+40	4" SANITARY SEWER	17.88	NEW
23	15+79	4" SANITARY SEWER	17.66	NEW
24	16+14	6" FIRE WATER	20.00	NEW
25	16+43	4" SANITARY SEWER	17.62	NEW
26	16+81	4" SANITARY SEWER	17.55	NEW
27	16+88	4" SANITARY SEWER	17.52	NEW
28	17+12	36" STORM SEWER	8.67	NEW

THESE RECORD DRAWINGS WERE PREPARED AFTER THE COMPLETION OF CONSTRUCTION BASED ON THE ORIGINAL DRAWINGS. THE REVISIONS ARE BASED SOLELY ON INFORMATION PROVIDED BY THE CONTRACTOR. THE CONSULTANT HAS NOT INDEPENDENTLY VERIFIED THE INFORMATION PROVIDED BY THE CONTRACTOR AND IS NOT RESPONSIBLE FOR ANY VARIATIONS BETWEEN THE CONDITIONS SHOWN ON THE RECORD DRAWINGS AND THE ACTUAL CONDITIONS.

NO.	DATE	BY	REVISIONS	CK'D	APP'V'D
1	10/02		RECORD DRAWINGS		
2	3/29/99	BEB	MODIFICATION NO. 2	HNC	

PORT OF PORTLAND
PORTLAND, OREGON

ZIMMER·GUNSUL·FRASCA PARTNERSHIP
Architecture/Planning/Interior Design
Portland Seattle Los Angeles Washington D.C.

HNTB

97D049 DESIGN NUMBER | 23115 PROJECT NUMBER

REGISTERED PROFESSIONAL ENGINEER 60434PE OREGON MARCH 9, 1982 JAMES N. CONRADT 10/1/02
EXPIRES: 12-31-03

DESIGNED BY	S. LONG
DRAWN BY	N. HATCHER
CHECKED BY	H. CONRADT
DATE	MAR 1999
SCALE	1" = 50'

PORTLAND INTERNATIONAL AIRPORT
TERMINAL EXPANSION SOUTH – PHASE 2
STORM SEWER PLAN & PROFILE

SUBMITTED BY STEVE JANNSEN PROJECT ENGINEER

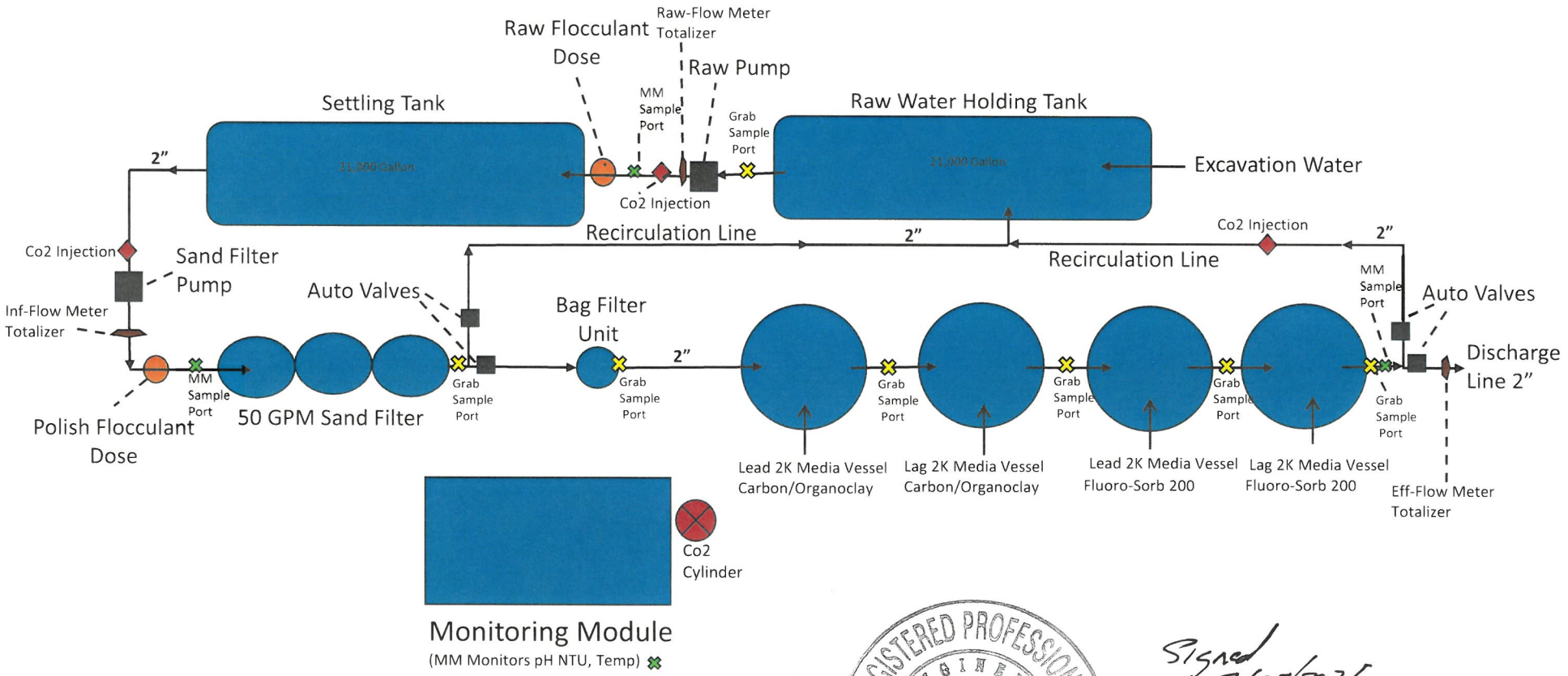
DRAWING NO. PDX 98-500 736/1223 (C5.13)

TCore C5 EMP

Appendix B

Process Flow Diagram

MAUL FOSTER ALONGI



REGISTERED PROFESSIONAL ENGINEER 65720PE OREGON JAN. 13, 2004 DANIEL A. SCARPINE

RENEWAL DATE: 6/30/ 2026

Signed 7/25/2025

Clear Creek Systems

Appendix C

Treatment System Cut Sheets

MAUL FOSTER ALONGI

Chitosan Enhanced Sand Filtration-ATS

WATER TREATMENT/MONITORING MODULE

• Turbidity Control • pH Control • Up to 1,200 GPM

WATER TREATMENT

- FloClear Chitosan Polymer injection for fine particle removal and turbidity control
- CO2 injection for pH control
- 24 Hrs per day – 7 days per week operational capability

MONITORING/DATA MANAGEMENT

- Programmable controller for influent and effluent flow control and data logging
- Monitors and controls turbidity, pH and water flow data
- Direct download to a computer for easy reporting
- Alerts the operator when a problem arises
- Lights, heater and work space for computer and jar testing
- Completely enclosed and lockable
- 8' Wide x 10' Long x 8' High
- Requires: 120v, 20 amp service
- Approximate Weight: 4,200 lbs.
- Complies with State of California storm water permit requirements for Active Treatment Systems (ATS)

CLEAR CREEK SYSTEMS, INC.

4101 Union Avenue
Bakersfield, CA 93305
877 324 9634 · 661 324 9634
661 322 4206 Fax
www.clearcreeksystems.com

WATER STORAGE
FRAC TANK

• Open Top • 21,000 Gallon

FEATURES

- Epoxy coated smooth wall interior
- Sloped bottom for easy clean out
- 20” curbside manway
- (4) 6” front ports (2) 6” rear ports
- Rear stairwell
- Full length observation walkway with OSHA hand rails
- Compact foot print
- No internal bracing

TECHNICAL

- Dimensions 39’ 9” L x 8’ 5” W x 11’ 4”H
- Safety Rail Height 44”
- Over the Road Height 12’ 10”
- Stairs Down Width 10’
- 25,000 lb. dry weight

CLEAR CREEK SYSTEMS, INC.

4101 Union Avenue
Bakersfield, CA 93305
877 324 9634 · 661 324 9634
661 322 4206 Fax
www.clearcreeksystems.com

B200
SEDIMENT FILTRATION

• Up to 200 GPM • 150 PSI

FEATURES

- Dual bag filtration
- Two (2) bag filters for high solids holding capacity
- Replaceable filter bags from 0.5 to 200 micron (Nominal)
- Manifold valving for easy isolation
- Capable of 100 GPM flow while changing one bag
- No moving parts
- Skid mounted
- Lifting lug

TECHNICAL

- Units fitted with bleed valves and pressure gauges
- Initial pressure drop is less than 5 psi at 200 gpm
- System can stand alone for sediment removal or can be used in combination with media vessels
- Utilizes industry standard type #2 bag filters

MATERIAL SPECIFICATIONS

- Chambers constructed with 304 stainless steel
- Piping construction: 3” Stainless Steel
- 3” Camlock inlet and outlet
- Each bag filter chamber holds one (1) 7” x 30”
- Type #2 filter bag
- Maximum operating pressure 150 psig
- Height 65” Width 56” Length 31”

CLEAR CREEK SYSTEMS, INC.

4101 Union Avenue
Bakersfield, CA 93305
877 324 9634 · 661 324 9634
661 322 4206 Fax
www.clearcreeksystems.com

SF-100
SEDIMENT FILTRATION

• Up to 1000 GPM • 150 PSI

FEATURES

- Skid mounted high rate automatic backwashing sand media filter designed for general-purpose water filtration of organic/inorganic solids.
- Ultra 116 automatic filter controller.
- Flush activation based on elapsed time and/or pressure differential.
- Back flush of 47 gpm, automatic (10 psi differential pressure over clean pressure drop, or manual mode)
- 13.5 sq ft of total filtration area

TECHNICAL

- Filtration- down to 20-30 microns
- Height: 5'-6"
- Width: 2'-4"
- Length: 6'-9" (skid length)
- Weight: 860 lbs (equipment only)
  1,850 lbs (media only)
  3,400 lbs operational
- Inlet/Outlet 3" flange, backwash line 2"

MATERIAL SPECIFICATIONS

- Design press – 100 psi max.
- Capacity- 95-142 gpm (normal flow range)
- Compressed air- 5 cfm minimum at 60 psi supplied by intergrally mounted compressor
- Requires 110 V AC

CLEAR CREEK SYSTEMS, INC.

4101 Union Avenue
Bakersfield, CA 93305
877 324 9634 · 661 324 9634
661 322 4206 Fax
www.clearcreeksystems.com

Appendix D

Safety Data Sheets

MAUL FOSTER ALONGI

SAFETY DATA SHEET

Carbon Dioxide

Airgas
an Air Liquide company

Section 1. Identification

GHS product identifier : Carbon Dioxide

Chemical name : Carbon dioxide, gas

Other means of identification : Carbonic, Carbon Dioxide, Carbonic Anhydride, R744, Carbon Dioxide USP

Product type : Gas.

Product use : Synthetic/Analytical chemistry and Medical use.

Synonym : Carbonic, Carbon Dioxide, Carbonic Anhydride, R744, Carbon Dioxide USP

SDS # : 001013

Supplier's details : Airgas USA, LLC and its affiliates
259 North Radnor-Chester Road
Suite 100
Radnor, PA 19087-5283
1-610-687-5253

24-hour telephone : 1-866-734-3438

Section 2. Hazards identification

OSHA/HCS status : This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Classification of the substance or mixture : GASES UNDER PRESSURE - Liquefied gas
Simple asphyxiant.

GHS label elements

Hazard pictograms :

Signal word : Warning

Hazard statements : Contains gas under pressure; may explode if heated.
May displace oxygen and cause rapid suffocation.
May increase respiration and heart rate.

Precautionary statements

General : Read and follow all Safety Data Sheets (SDS'S) before use. Read label before use. Keep out of reach of children. If medical advice is needed, have product container or label at hand. Close valve after each use and when empty. Use equipment rated for cylinder pressure. Do not open valve until connected to equipment prepared for use. Use a back flow preventative device in the piping. Use only equipment of compatible materials of construction. Always keep container in upright position.

Prevention : Use and store only outdoors or in a well ventilated place.

Response : Not applicable.

Storage : Protect from sunlight. Store in a well-ventilated place.

Disposal : Not applicable.

Hazards not otherwise classified : In addition to any other important health or physical hazards, this product may displace oxygen and cause rapid suffocation.
May cause frostbite.

Section 3. Composition/information on ingredients

Substance/mixture : Substance

Chemical name : Carbon dioxide, gas

Other means of identification : Carbonic, Carbon Dioxide, Carbonic Anhydride, R744, Carbon Dioxide USP

Product code : 001013

CAS number/other identifiers

CAS number : 124-38-9

Ingredient name	%	CAS number
Carbon Dioxide	100	124-38-9

Any concentration shown as a range is to protect confidentiality or is due to batch variation.

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

Section 4. First aid measures

Description of necessary first aid measures

Eye contact : Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Get medical attention if irritation occurs.

Inhalation : Remove victim to fresh air and keep at rest in a position comfortable for breathing. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention if adverse health effects persist or are severe. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

Skin contact : Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur. Wash clothing before reuse. Clean shoes thoroughly before reuse.

Ingestion : As this product is a gas, refer to the inhalation section.

Most important symptoms/effects, acute and delayed

Potential acute health effects

Eye contact : No known significant effects or critical hazards.

Inhalation : No known significant effects or critical hazards.

Skin contact : No known significant effects or critical hazards.

Frostbite : Try to warm up the frozen tissues and seek medical attention.

Ingestion : As this product is a gas, refer to the inhalation section.

Over-exposure signs/symptoms

Eye contact : No specific data.

Inhalation : No specific data.

Skin contact : No specific data.

Ingestion : No specific data.

Indication of immediate medical attention and special treatment needed, if necessary

Notes to physician : Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

Specific treatments : No specific treatment.

Section 4. First aid measures

Protection of first-aiders : No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

See toxicological information (Section 11)

Section 5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media : Use an extinguishing agent suitable for the surrounding fire.

Unsuitable extinguishing media : None known.

Specific hazards arising from the chemical : Contains gas under pressure. In a fire or if heated, a pressure increase will occur and the container may burst or explode.

Hazardous thermal decomposition products : Decomposition products may include the following materials:
carbon dioxide
carbon monoxide

Special protective actions for fire-fighters : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Contact supplier immediately for specialist advice. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool.

Special protective equipment for fire-fighters : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Avoid breathing gas. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

For emergency responders : If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

Environmental precautions : Ensure emergency procedures to deal with accidental gas releases are in place to avoid contamination of the environment. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Methods and materials for containment and cleaning up

Small spill : Immediately contact emergency personnel. Stop leak if without risk.

Large spill : Immediately contact emergency personnel. Stop leak if without risk. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

Section 7. Handling and storage

Precautions for safe handling

Protective measures : Put on appropriate personal protective equipment (see Section 8). Contains gas under pressure. Avoid breathing gas. Do not puncture or incinerate container. Use equipment rated for cylinder pressure. Close valve after each use and when empty. Protect cylinders from physical damage; do not drag, roll, slide, or drop. Use a suitable hand truck for cylinder movement.
Avoid contact with eyes, skin and clothing. Empty containers retain product residue and can be hazardous.

Section 7. Handling and storage

Advice on general occupational hygiene : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

Conditions for safe storage, including any incompatibilities : Store in accordance with local regulations. Store in a segregated and approved area. Store away from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10). Cylinders should be stored upright, with valve protection cap in place, and firmly secured to prevent falling or being knocked over. Cylinder temperatures should not exceed 52 °C (125 °F). Keep container tightly closed and sealed until ready for use. See Section 10 for incompatible materials before handling or use.

Section 8. Exposure controls/personal protection

Control parameters

Occupational exposure limits

Ingredient name	Exposure limits
Carbon Dioxide	**ACGIH TLV (United States, 3/2017). Oxygen Depletion [Asphyxiant].** STEL: 54000 mg/m³ 15 minutes. STEL: 30000 ppm 15 minutes. TWA: 9000 mg/m³ 8 hours. TWA: 5000 ppm 8 hours. **NIOSH REL (United States, 10/2016).** STEL: 54000 mg/m³ 15 minutes. STEL: 30000 ppm 15 minutes. TWA: 9000 mg/m³ 10 hours. TWA: 5000 ppm 10 hours. **OSHA PEL (United States, 6/2016).** TWA: 9000 mg/m³ 8 hours. TWA: 5000 ppm 8 hours. **OSHA PEL 1989 (United States, 3/1989).** STEL: 54000 mg/m³ 15 minutes. STEL: 30000 ppm 15 minutes. TWA: 18000 mg/m³ 8 hours. TWA: 10000 ppm 8 hours.

Appropriate engineering controls : Good general ventilation should be sufficient to control worker exposure to airborne contaminants.

Environmental exposure controls : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

Individual protection measures

Hygiene measures : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/face protection : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: safety glasses with side-shields.

Skin protection

Section 8. Exposure controls/personal protection

Hand protection : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.

Body protection : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Other skin protection : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Respiratory protection : Based on the hazard and potential for exposure, select a respirator that meets the appropriate standard or certification. Respirators must be used according to a respiratory protection program to ensure proper fitting, training, and other important aspects of use. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Section 9. Physical and chemical properties

Appearance

Physical state : Gas. [Compressed gas.]

Color : Colorless.

Odor : Odorless.

Odor threshold : Not available.

pH : Not available.

Melting point : Sublimation temperature: -79°C (-110.2 to °F)

Boiling point : Not available.

Critical temperature : 30.85°C (87.5°F)

Flash point : [Product does not sustain combustion.]

Evaporation rate : Not available.

Flammability (solid, gas) : Not available.

Lower and upper explosive (flammable) limits : Not available.

Vapor pressure : 830 (psig)

Vapor density : 1.53 (Air = 1) Liquid Density@BP: Solid density = 97.5 lb/ft3 (1562 kg/m3)

Specific Volume (ft^3/lb) : 8.7719

Gas Density (lb/ft^3) : 0.114

Relative density : Not applicable.

Solubility : Not available.

Solubility in water : Not available.

Partition coefficient: n-octanol/water : 0.83

Auto-ignition temperature : Not available.

Decomposition temperature : Not available.

Viscosity : Not applicable.

Flow time (ISO 2431) : Not available.

Molecular weight : 44.01 g/mole

Section 10. Stability and reactivity

Reactivity : No specific test data related to reactivity available for this product or its ingredients.

Chemical stability : The product is stable.

Possibility of hazardous reactions : Under normal conditions of storage and use, hazardous reactions will not occur.

Conditions to avoid : No specific data.

Incompatible materials : No specific data.

Hazardous decomposition products : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Hazardous polymerization : Under normal conditions of storage and use, hazardous polymerization will not occur.

Section 11. Toxicological information

Information on toxicological effects

Acute toxicity

Not available.

Irritation/Corrosion

Not available.

Sensitization

Not available.

Mutagenicity

Not available.

Carcinogenicity

Not available.

Reproductive toxicity

Not available.

Teratogenicity

Not available.

Specific target organ toxicity (single exposure)

Not available.

Specific target organ toxicity (repeated exposure)

Not available.

Aspiration hazard

Not available.

Information on the likely routes of exposure : Not available.

Potential acute health effects

Eye contact : No known significant effects or critical hazards.

Inhalation : No known significant effects or critical hazards.

Skin contact : No known significant effects or critical hazards.

Section 11. Toxicological information

Ingestion : As this product is a gas, refer to the inhalation section.

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact : No specific data.

Inhalation : No specific data.

Skin contact : No specific data.

Ingestion : No specific data.

Delayed and immediate effects and also chronic effects from short and long term exposure

Short term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Long term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Potential chronic health effects

Not available.

General : No known significant effects or critical hazards.

Carcinogenicity : No known significant effects or critical hazards.

Mutagenicity : No known significant effects or critical hazards.

Teratogenicity : No known significant effects or critical hazards.

Developmental effects : No known significant effects or critical hazards.

Fertility effects : No known significant effects or critical hazards.

Numerical measures of toxicity

Acute toxicity estimates

Not available.

Section 12. Ecological information

Toxicity

Not available.

Persistence and degradability

Not available.

Bioaccumulative potential

Product/ingredient name	$LogP_{ow}$	BCF	Potential
Carbon Dioxide	0.83	-	low

Mobility in soil

Soil/water partition coefficient (K_{OC}) : Not available.

Other adverse effects : No known significant effects or critical hazards.

Section 13. Disposal considerations

Disposal methods : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Empty Airgas-owned pressure vessels should be returned to Airgas. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Empty containers or liners may retain some product residues. Do not puncture or incinerate container.

Section 14. Transport information

	DOT	TDG	Mexico	IMDG	IATA
UN number	UN1013	UN1013	UN1013	UN1013	UN1013
UN proper shipping name	CARBON DIOXIDE	CARBON DIOXIDE	CARBON DIOXIDE	CARBON DIOXIDE	CARBON DIOXIDE
Transport hazard class(es)	2.2 	2.2 	2.2 	2.2 	2.2 
Packing group	-	-	-	-	-
Environmental hazards	No.	No.	No.	No.	No.

"Refer to CFR 49 (or authority having jurisdiction) to determine the information required for shipment of the product."

Additional information

DOT Classification : **Limited quantity** Yes.
Quantity limitation Passenger aircraft/rail: 75 kg. Cargo aircraft: 150 kg.

TDG Classification : Product classified as per the following sections of the Transportation of Dangerous Goods Regulations: 2.13-2.17 (Class 2).
Explosive Limit and Limited Quantity Index 0.125
Passenger Carrying Road or Rail Index 75

IATA : **Quantity limitation** Passenger and Cargo Aircraft: 75 kg. Cargo Aircraft Only: 150 kg.

Special precautions for user : **Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

Transport in bulk according to Annex II of MARPOL and the IBC Code : Not available.

Section 15. Regulatory information

U.S. Federal regulations : **TSCA 8(a) CDR Exempt/Partial exemption**: This material is listed or exempted.

Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs) : Not listed

Section 15. Regulatory information

Clean Air Act Section 602 Class I Substances : Not listed

Clean Air Act Section 602 Class II Substances : Not listed

DEA List I Chemicals (Precursor Chemicals) : Not listed

DEA List II Chemicals (Essential Chemicals) : Not listed

SARA 302/304

Composition/information on ingredients

No products were found.

SARA 304 RQ : Not applicable.

SARA 311/312

Classification : Refer to Section 2: Hazards Identification of this SDS for classification of substance.

State regulations

Massachusetts : This material is listed.

New York : This material is not listed.

New Jersey : This material is listed.

Pennsylvania : This material is listed.

International regulations

Chemical Weapon Convention List Schedules I, II & III Chemicals

Not listed.

Montreal Protocol (Annexes A, B, C, E)

Not listed.

Stockholm Convention on Persistent Organic Pollutants

Not listed.

Rotterdam Convention on Prior Informed Consent (PIC)

Not listed.

UNECE Aarhus Protocol on POPs and Heavy Metals

Not listed.

Inventory list

Australia : This material is listed or exempted.

Canada : This material is listed or exempted.

China : This material is listed or exempted.

Europe : This material is listed or exempted.

Japan : **Japan inventory (ENCS)**: This material is listed or exempted.
Japan inventory (ISHL): This material is listed or exempted.

Malaysia : Not determined.

New Zealand : This material is listed or exempted.

Philippines : This material is listed or exempted.

Republic of Korea : This material is listed or exempted.

Taiwan : This material is listed or exempted.

Thailand : Not determined.

Turkey : This material is listed or exempted.

United States : This material is listed or exempted.

Viet Nam : Not determined.

Section 16. Other information

Hazardous Material Information System (U.S.A.)

Health	/	1
Flammability		0
Physical hazards		3

Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. Although HMIS® ratings and the associated label are not required on SDSs or products leaving a facility under 29 CFR 1910.1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered trademark and service mark of the American Coatings Association, Inc.

The customer is responsible for determining the PPE code for this material. For more information on HMIS® Personal Protective Equipment (PPE) codes, consult the HMIS® Implementation Manual.

National Fire Protection Association (U.S.A.)

Reprinted with permission from NFPA 704-2001, Identification of the Hazards of Materials for Emergency Response Copyright ©1997, National Fire Protection Association, Quincy, MA 02269. This reprinted material is not the complete and official position of the National Fire Protection Association, on the referenced subject which is represented only by the standard in its entirety.

Copyright ©2001, National Fire Protection Association, Quincy, MA 02269. This warning system is intended to be interpreted and applied only by properly trained individuals to identify fire, health and reactivity hazards of chemicals. The user is referred to certain limited number of chemicals with recommended classifications in NFPA 49 and NFPA 325, which would be used as a guideline only. Whether the chemicals are classified by NFPA or not, anyone using the 704 systems to classify chemicals does so at their own risk.

Procedure used to derive the classification

Classification	Justification
GASES UNDER PRESSURE - Liquefied gas	Expert judgment

History

Date of printing : 2/12/2018

Date of issue/Date of revision : 2/12/2018

Date of previous issue : 4/25/2017

Version : 0.03

Key to abbreviations : ATE = Acute Toxicity Estimate
BCF = Bioconcentration Factor
GHS = Globally Harmonized System of Classification and Labelling of Chemicals
IATA = International Air Transport Association
IBC = Intermediate Bulk Container
IMDG = International Maritime Dangerous Goods
LogPow = logarithm of the octanol/water partition coefficient
MARPOL = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution)
UN = United Nations

References : Not available.

Notice to reader

Section 16. Other information

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.
Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

FloClear 2%

Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

Date of issue: 01/09/2017 Version: 1.0

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Product form : Mixture

Product name : FloClear 2%

Product code : 001401

1.2. Relevant identified uses of the substance or mixture and uses advised against

Use of the substance/mixture : Stormwater Flocculant

1.3. Details of the supplier of the safety data sheet

Rocklin Products
4101 Union Avenue
Bakersfield, CA 93305 - USA

1.4. Emergency telephone number

Emergency number : Not Required

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

GHS-US classification

Not classified

2.2. Label elements

GHS-US labelling

No labelling applicable

2.3. Other hazards

No additional information available

2.4. Unknown acute toxicity (GHS-US)

Not applicable

SECTION 3: Composition/information on ingredients

3.1. Substance

Not applicable

3.2. Mixture

Full text of H-statements: see section 16

SECTION 4: First aid measures

4.1. Description of first aid measures

First-aid measures general : Never give anything by mouth to an unconscious person. If you feel unwell, seek medical advice (show the label where possible).

First-aid measures after inhalation : Allow breathing of fresh air. Allow the victim to rest.

First-aid measures after skin contact : Remove affected clothing and wash all exposed skin area with mild soap and water, followed by warm water rinse.

First-aid measures after eye contact : Rinse immediately with plenty of water. Obtain medical attention if pain, blinking or redness persist.

First-aid measures after ingestion : Rinse mouth. Do NOT induce vomiting. Obtain emergency medical attention.

4.2. Most important symptoms and effects, both acute and delayed

Symptoms/injuries : Not expected to present a significant hazard under anticipated conditions of normal use.

4.3. Indication of any immediate medical attention and special treatment needed

No additional information available

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media : Foam. Dry powder. Carbon dioxide. Water spray. Sand.

Unsuitable extinguishing media : Do not use a heavy water stream.

5.2. Special hazards arising from the substance or mixture

Fire hazard : Not flammable.

Reactivity : The product is non-reactive under normal conditions of use, storage and transport.

5.3. Advice for firefighters

Firefighting instructions : Use water spray or fog for cooling exposed containers. Exercise caution when fighting any chemical fire. Prevent fire-fighting water from entering environment.

Protection during firefighting : Do not enter fire area without proper protective equipment, including respiratory protection.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

6.1.1. For non-emergency personnel

Emergency procedures : Evacuate unnecessary personnel.

6.1.2. For emergency responders

Protective equipment : Equip cleanup crew with proper protection.

Emergency procedures : Ventilate area.

6.2. Environmental precautions

Prevent entry to sewers and public waters. Notify authorities if liquid enters sewers or public waters.

6.3. Methods and material for containment and cleaning up

Methods for cleaning up : Soak up spills with inert solids, such as clay or diatomaceous earth as soon as possible. Collect spillage. Store away from other materials.

6.4. Reference to other sections

See Heading 8. Exposure controls and personal protection.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling : Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work. Provide good ventilation in process area to prevent formation of vapour. No smoking.

7.2. Conditions for safe storage, including any incompatibilities

Storage conditions : Keep only in the original container in a cool, well-ventilated place. Keep container closed when not in use.

Incompatible products : Strong bases. Strong acids.

Incompatible materials : Sources of ignition. Direct sunlight.

Storage temperature : 10 - 50 °C will freeze at 3C.

7.3. Specific end use(s)

No additional information available

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

FloClear 2%	
ACGIH	Not applicable
OSHA	Not applicable

8.2. Exposure controls

Personal protective equipment : Avoid all unnecessary exposure.

Hand protection : Wear protective gloves/protective clothing/eye protection/face protection protective gloves.

Eye protection : Chemical goggles or safety glasses.

Respiratory protection	:	Use a properly fitted, particulate filter respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.
Other information	:	Do not eat, drink or smoke during use.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	:	Liquid
Colour	:	Colorless to Pale Yellow
Odour	:	vinegar
Odour threshold	:	No data available
pH	:	3 - 4.5
Relative evaporation rate (butylacetate=1)	:	No data available
Melting point	:	No data available
Freezing point	:	No data available
Boiling point	:	99.4 °C
Flash point	:	No data available
Auto-ignition temperature	:	No data available
Decomposition temperature	:	No data available
Flammability (solid, gas)	:	No data available
Vapour pressure	:	No data available
Relative vapour density at 20 °C	:	No data available
Relative density	:	No data available
Density	:	1 - 1.1 g/ml
Solubility	:	Soluble.
Log Pow	:	No data available
Log Kow	:	No data available
Viscosity, kinematic	:	No data available
Viscosity, dynamic	:	No data available
Explosive properties	:	No data available
Oxidising properties	:	No data available
Explosive limits	:	No data available

9.2. Other information

No additional information available

SECTION 10: Stability and reactivity

10.1. Reactivity

The product is non-reactive under normal conditions of use, storage and transport.

10.2. Chemical stability

Stable under normal conditions.

10.3. Possibility of hazardous reactions

No dangerous reactions known under normal conditions of use.

10.4. Conditions to avoid

Direct sunlight. Extremely high or low temperatures.

10.5. Incompatible materials

Strong acids. Strong bases.

10.6. Hazardous decomposition products

Under normal conditions of storage and use, hazardous decomposition products should not be produced.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity	:	Not classified
Skin corrosion/irritation	:	Not classified pH: 3 - 4.5
Serious eye damage/irritation	:	Not classified pH: 3 - 4.5
Respiratory or skin sensitisation	:	Not classified
Germ cell mutagenicity	:	Not classified
Carcinogenicity	:	Not classified
Reproductive toxicity	:	Not classified
Specific target organ toxicity (single exposure)	:	Not classified
Specific target organ toxicity (repeated exposure)	:	Not classified
Aspiration hazard	:	Not classified
Potential adverse human health effects and symptoms	:	Based on available data, the classification criteria are not met.

SECTION 12: Ecological information

12.1. Toxicity

No additional information available

12.2. Persistence and degradability

FloClear 2%	
Persistence and degradability	Not established.

12.3. Bioaccumulative potential

FloClear 2%	
Bioaccumulative potential	Not established.

12.4. Mobility in soil

No additional information available

12.5. Other adverse effects

Effect on the global warming	:	No known ecological damage caused by this product.
Other information	:	None known.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Ecology - waste materials : None known.

SECTION 14: Transport information

UN-No.(DOT)	:	Non Regulated
UN-No. (IMDG)	:	Non Regulated
UN-No. (IATA)	:	Non Regulated

14.2. UN proper shipping name

Proper Shipping Name (DOT)	:	Not applicable
Proper Shipping Name (IMDG)	:	Not applicable
Proper Shipping Name (IATA)	:	Not applicable

14.3. Transport hazard class(es)

Transport hazard class(es) (DOT) : Not applicable

:

Transport hazard class(es) (IMDG) : Not applicable

Transport hazard class(es) (IATA) : Not applicable

14.4. Packing group

Packing group (DOT) : Not applicable

Packing group (IMDG) : Not applicable

Packing group (IATA) : Not applicable

14.5. Environmental hazards

Marine pollutant(IMDG) : No

Marine pollutant(IATA) : No

SECTION 15: Regulatory information

15.1. US Federal regulations

All components of this product are listed, or excluded from listing, on the United States Environmental Protection Agency Toxic Substances Control Act (TSCA) inventory

This product or mixture does not contain a toxic chemical or chemicals in excess of the applicable de minimis concentration as specified in 40 CFR §372.38(a) subject to the reporting requirements of section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372.

15.2. International regulations

CANADA

No additional information available

15.3. US State regulations

California Proposition 65 - This product does not contain any substances known to the state of California to cause cancer, developmental and/or reproductive harm

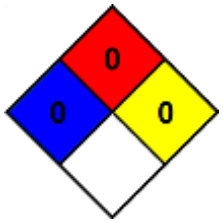
SECTION 16: Other information

Other information : None.

NFPA health hazard : 0 - Exposure under fire conditions would offer no hazard beyond that of ordinary combustible materials.

NFPA fire hazard : 0 - Materials that will not burn.

NFPA reactivity : 0 - Normally stable, even under fire exposure conditions, and are not reactive with water.



HMIS III Rating

Health : 0 - No significant risk to health

Flammability : 0

Physical : 0

Personal Protection : B

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

SAFETY DATA SHEET

1. Identification

Product identifier **FLUORO-SORB® 200 absorbent**

Other means of identification

CAS number 68953-58-2

Recommended use adsorbent or absorbent technical function of substance

Recommended restrictions None known.

Manufacturer/Importer/Supplier/Distributor information

Manufacturer

Company name CETCO, a Minerals Technologies Company

Address 2870 Forbs Avenue
Hoffman Estates, IL 60192
United States

Telephone General Information 800.527.9948

Website http://www.cetco.com

E-mail safetydata@mineralstech.com

Emergency phone number 1.866.519.4752 (US, CA, MX) 1 760.476.3962

Americas 1.866.519.4752 (US, Canada, Mexico) 1 760 476 3962

2. Hazard(s) identification

Physical hazards Not classified.

Health hazards

Carcinogenicity	Category 1A
Specific target organ toxicity, repeated exposure	Category 1

Environmental hazards Not classified.

OSHA defined hazards Not classified.

Label elements

Signal word Danger

Hazard statement May cause cancer. Causes damage to organs through prolonged or repeated exposure.

Precautionary statement

Prevention Do not handle until all safety precautions have been read and understood. Do not breathe dust. Wash thoroughly after handling. Do not eat, drink or smoke when using this product. Wear protective gloves/protective clothing/eye protection/face protection. Observe good industrial hygiene practices.

Response If exposed or concerned: Get medical advice/attention.

Storage Store in accordance with local/regional/national regulations.

Disposal Dispose of contents/container in accordance with local/regional/national/international regulations.

Hazard(s) not otherwise classified (HNOC) None known.

Supplemental information 100% of the substance consists of component(s) of unknown acute oral toxicity. 100% of the substance consists of component(s) of unknown acute dermal toxicity. 100% of the substance consists of component(s) of unknown acute inhalation toxicity. 100% of the substance consists of component(s) of unknown acute hazards to the aquatic environment. 100% of the substance consists of component(s) of unknown long-term hazards to the aquatic environment.

3. Composition/information on ingredients

Substances

Chemical name	Common name and synonyms	CAS number	%
Quaternary ammonium compounds, bis (hydrogenated tallow alkyl)dimethyl, salts with bentonite		68953-58-2	100

Constituents

Chemical name	Common name and synonyms	CAS number	%
QUARTZ (SIO2)		14808-60-7	<= 6
CRISTOBALITE		14464-46-1	<= 2

Composition comments Occupational Exposure Limits for constituents are listed in Section 8.

4. First-aid measures

Inhalation Move to fresh air. Call a physician if symptoms develop or persist.

Skin contact Wash off with soap and water. Get medical attention if irritation develops and persists.

Eye contact Do not rub eyes.

Ingestion Rinse mouth. Get medical attention if symptoms occur.

Most important symptoms/effects, acute and delayed Dusts may irritate the respiratory tract, skin and eyes. Prolonged exposure may cause chronic effects.

Indication of immediate medical attention and special treatment needed Provide general supportive measures and treat symptomatically. Keep victim under observation. Symptoms may be delayed.

General information If you feel unwell, seek medical advice (show the label where possible). Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves.

5. Fire-fighting measures

Suitable extinguishing media Water fog. Foam. Dry chemical powder. Carbon dioxide (CO2).

Unsuitable extinguishing media Do not use water jet as an extinguisher, as this will spread the fire.

Specific hazards arising from the chemical During fire, gases hazardous to health may be formed.

Special protective equipment and precautions for firefighters Self-contained breathing apparatus and full protective clothing must be worn in case of fire.

Fire fighting equipment/instructions Move containers from fire area if you can do so without risk.

Specific methods Use standard firefighting procedures and consider the hazards of other involved materials.

General fire hazards No unusual fire or explosion hazards noted.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures Keep unnecessary personnel away. Keep people away from and upwind of spill/leak. Wear appropriate protective equipment and clothing during clean-up. Do not breathe dust. Use a NIOSH/MSHA approved respirator if there is a risk of exposure to dust/fume at levels exceeding the exposure limits. Ensure adequate ventilation. Local authorities should be advised if significant spillages cannot be contained. For personal protection, see section 8 of the SDS.

Methods and materials for containment and cleaning up Avoid dispersal of dust in the air (i.e., clearing dust surfaces with compressed air). Collect dust using a vacuum cleaner equipped with HEPA filter. Stop the flow of material, if this is without risk.

Large Spills: Wet down with water and dike for later disposal. Shovel the material into waste container. Following product recovery, flush area with water.

Small Spills: Sweep up or vacuum up spillage and collect in suitable container for disposal.

Never return spills to original containers for re-use. Put material in suitable, covered, labeled containers. For waste disposal, see section 13 of the SDS.

Environmental precautions Avoid discharge into drains, water courses or onto the ground.

7. Handling and storage

Precautions for safe handling

Do not handle until all safety precautions have been read and understood. Minimize dust generation and accumulation. Provide appropriate exhaust ventilation at places where dust is formed. Do not breathe dust. When using, do not eat, drink or smoke. Should be handled in closed systems, if possible. Wear appropriate personal protective equipment. Wash hands thoroughly after handling. Observe good industrial hygiene practices.

Conditions for safe storage, including any incompatibilities

Store in tightly closed container. Store in a well-ventilated place. Keep out of the reach of children. Store away from incompatible materials (see Section 10 of the SDS).

8. Exposure controls/personal protection

Occupational exposure limits

US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)

Constituents	Type	Value	Form
CRISTOBALITE (CAS 14464-46-1)	PEL	0.05 mg/m3	Respirable dust.
QUARTZ (SIO2) (CAS 14808-60-7)	PEL	0.05 mg/m3	Respirable dust.

US. OSHA Table Z-3 (29 CFR 1910.1000)

Additional components	Type	Value	Form
INERT OR NUISANCE DUSTS	TWA	5 mg/m3	Respirable fraction.
		15 mg/m3	Total dust.
		50 mppcf	Total dust.
		15 mppcf	Respirable fraction.

Constituents	Type	Value	Form
CRISTOBALITE (CAS 14464-46-1)	TWA	0.05 mg/m3	Respirable.
		1.2 mppcf	Respirable.
QUARTZ (SIO2) (CAS 14808-60-7)	TWA	0.1 mg/m3	Respirable.
		2.4 mppcf	Respirable.

US. ACGIH Threshold Limit Values

Constituents	Type	Value	Form
CRISTOBALITE (CAS 14464-46-1)	TWA	0.025 mg/m3	Respirable fraction.
QUARTZ (SIO2) (CAS 14808-60-7)	TWA	0.025 mg/m3	Respirable fraction.

US. NIOSH: Pocket Guide to Chemical Hazards

Constituents	Type	Value	Form
CRISTOBALITE (CAS 14464-46-1)	TWA	0.05 mg/m3	Respirable dust.
QUARTZ (SIO2) (CAS 14808-60-7)	TWA	0.05 mg/m3	Respirable dust.

Biological limit values

No biological exposure limits noted for the ingredient(s).

Appropriate engineering controls

Good general ventilation should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level. If material is ground, cut, or used in any operation which may generate dusts, use appropriate local exhaust ventilation to keep exposures below the recommended exposure limits.

Individual protection measures, such as personal protective equipment

Eye/face protection

Applicable for industrial settings only. Chemical respirator with organic vapor cartridge, full facepiece, dust and mist filter.

Skin protection

Hand protection

Applicable for industrial settings only. Wear appropriate chemical resistant gloves.

Other	Applicable for industrial settings only. Use of an impervious apron is recommended.
Respiratory protection	Applicable for industrial settings only. Use a NIOSH/MSHA approved respirator if there is a risk of exposure to dust/fume at levels exceeding the exposure limits. Chemical respirator with organic vapor cartridge, full facepiece, dust and mist filter.
Thermal hazards	Wear appropriate thermal protective clothing, when necessary.
General hygiene considerations	Observe any medical surveillance requirements. Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants.

9. Physical and chemical properties

Appearance	
Physical state	Solid.
Form	Micropowder. Powder. or Granular.
Color	Grey.
Odor	Slight. fatty odor
Odor threshold	Not available.
pH	6 - 9
Melting point/freezing point	Not available.
Initial boiling point and boiling range	Not available.
Flash point	Not available.
Evaporation rate	Not available.
Flammability (solid, gas)	Not available.
Upper/lower flammability or explosive limits	
Flammability limit - lower (%)	Not available.
Flammability limit - upper (%)	Not available.
Explosive limit - lower (%)	Not available.
Explosive limit - upper (%)	Not available.
Vapor pressure	Not available.
Vapor density	Not available.
Relative density	Not available.
Solubility(ies)	
Solubility (water)	Not available.
Partition coefficient (n-octanol/water)	Not available.
Auto-ignition temperature	Not available.
Decomposition temperature	275 °F (135 °C)
Viscosity	Not available.
Other information	
Explosive properties	Not explosive.
Flammability	>= 950 °F (>= 510 °C)
Oxidizing properties	Not oxidizing.

10. Stability and reactivity

Reactivity	The product is stable and non-reactive under normal conditions of use, storage and transport.
Chemical stability	Material is stable under normal conditions.
Possibility of hazardous reactions	No dangerous reaction known under conditions of normal use.
Conditions to avoid	Contact with incompatible materials.
Incompatible materials	Strong oxidizing agents.

Hazardous decomposition products No hazardous decomposition products are known.

11. Toxicological information

Information on likely routes of exposure

Inhalation Dust may irritate respiratory system.

Skin contact Dust or powder may irritate the skin.

Eye contact Dust may irritate the eyes.

Ingestion Knowledge about health hazard is incomplete.

Symptoms related to the physical, chemical and toxicological characteristics Dusts may irritate the respiratory tract, skin and eyes.

Information on toxicological effects

Acute toxicity Not known.

Toxicological data

Constituents	Species	Test Results
CRISTOBALITE (CAS 14464-46-1)		
Acute		
Oral		
LD50	Rat	> 22500 mg/kg

Skin corrosion/irritation Due to partial or complete lack of data the classification is not possible.

Serious eye damage/eye irritation Due to partial or complete lack of data the classification is not possible.

Respiratory or skin sensitization

Respiratory sensitization Due to partial or complete lack of data the classification is not possible.

Skin sensitization Due to partial or complete lack of data the classification is not possible.

Germ cell mutagenicity Due to partial or complete lack of data the classification is not possible.

Carcinogenicity May cause cancer.

IARC Monographs. Overall Evaluation of Carcinogenicity

CRISTOBALITE (CAS 14464-46-1)	1 Carcinogenic to humans.
QUARTZ (SIO2) (CAS 14808-60-7)	1 Carcinogenic to humans.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1053)

CRISTOBALITE (CAS 14464-46-1)	Cancer
QUARTZ (SIO2) (CAS 14808-60-7)	Cancer

US. National Toxicology Program (NTP) Report on Carcinogens

CRISTOBALITE (CAS 14464-46-1)	Known To Be Human Carcinogen. Reasonably Anticipated to be a Human Carcinogen.
QUARTZ (SIO2) (CAS 14808-60-7)	Known To Be Human Carcinogen.

Reproductive toxicity Due to partial or complete lack of data the classification is not possible.

Specific target organ toxicity - single exposure Due to partial or complete lack of data the classification is not possible.

Specific target organ toxicity - repeated exposure Causes damage to organs through prolonged or repeated exposure.

Aspiration hazard Due to partial or complete lack of data the classification is not possible.

Chronic effects Causes damage to organs through prolonged or repeated exposure.

12. Ecological information

Ecotoxicity The product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

Persistence and degradability No data is available on the degradability of this product.

Bioaccumulative potential No data available.

Mobility in soil No data available.

Other adverse effects No other adverse environmental effects (e.g. ozone depletion, photochemical ozone creation potential, endocrine disruption, global warming potential) are expected from this component.

13. Disposal considerations

Disposal instructions	Collect and reclaim or dispose in sealed containers at licensed waste disposal site. Dispose of contents/container in accordance with local/regional/national/international regulations.
Local disposal regulations	Dispose in accordance with all applicable regulations.
Hazardous waste code	The waste code should be assigned in discussion between the user, the producer and the waste disposal company.
Waste from residues / unused products	Dispose of in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions).
Contaminated packaging	Since emptied containers may retain product residue, follow label warnings even after container is emptied. Empty containers should be taken to an approved waste handling site for recycling or disposal.

14. Transport information

DOT

Not regulated as dangerous goods.

IATA

Not regulated as dangerous goods.

IMDG

Not regulated as dangerous goods.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code	Not applicable.

15. Regulatory information

US federal regulations This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

Toxic Substances Control Act (TSCA)

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)

Not regulated.

CERCLA Hazardous Substance List (40 CFR 302.4)

Not listed.

SARA 304 Emergency release notification

Not regulated.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1053)

CRISTOBALITE (CAS 14464-46-1)	Cancer
QUARTZ (SIO2) (CAS 14808-60-7)	Cancer
CRISTOBALITE (CAS 14464-46-1)	lung effects
QUARTZ (SIO2) (CAS 14808-60-7)	lung effects
CRISTOBALITE (CAS 14464-46-1)	immune system effects
QUARTZ (SIO2) (CAS 14808-60-7)	immune system effects
CRISTOBALITE (CAS 14464-46-1)	kidney effects
QUARTZ (SIO2) (CAS 14808-60-7)	kidney effects

Superfund Amendments and Reauthorization Act of 1986 (SARA)

SARA 302 Extremely hazardous substance

Not listed.

SARA 311/312 Hazardous chemical	No (Exempt)

SARA 313 (TRI reporting)

Not regulated.

Other federal regulations

Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List

Not regulated.

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)

Not regulated.

Safe Drinking Water Act (SDWA)	Not regulated.

US state regulations

California Proposition 65

WARNING: This product can expose you to QUARTZ (SIO2), which is known to the State of California to cause cancer. For more information go to www.P65Warnings.ca.gov.

California Proposition 65 - CRT: Listed date/Carcinogenic substance

QUARTZ (SIO2) (CAS 14808-60-7) Listed: October 1, 1988

US. California. Candidate Chemicals List. Safer Consumer Products Regulations (Cal. Code Regs, tit. 22, 69502.3, subd. (a))

CRISTOBALITE (CAS 14464-46-1)
QUARTZ (SIO2) (CAS 14808-60-7)

International Inventories

Country(s) or region	Inventory name	On inventory (yes/no)*
Australia	Australian Inventory of Chemical Substances (AICS)	Yes
Canada	Domestic Substances List (DSL)	Yes
Canada	Non-Domestic Substances List (NDSL)	No
China	Inventory of Existing Chemical Substances in China (IECSC)	Yes
Europe	European Inventory of Existing Commercial Chemical Substances (EINECS)	Yes
Europe	European List of Notified Chemical Substances (ELINCS)	No
Japan	Inventory of Existing and New Chemical Substances (ENCS)	Yes
Korea	Existing Chemicals List (ECL)	Yes
New Zealand	New Zealand Inventory	Yes
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	Yes
Taiwan	Taiwan Chemical Substance Inventory (TCSI)	Yes
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

*A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s)
A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

16. Other information, including date of preparation or last revision

Issue date 12-July-2019

Revision date 12-December-2019

Version # 15

HMIS® ratings Health: 3*
Flammability: 0
Physical hazard: 0

NFPA ratings Health: 2
Flammability: 0
Instability: 0

Disclaimer CETCO, a Minerals Technologies Company cannot anticipate all conditions under which this information and its product, or the products of other manufacturers in combination with its product, may be used. It is the user's responsibility to ensure safe conditions for handling, storage and disposal of the product, and to assume liability for loss, injury, damage or expense due to improper use. The information in the sheet was written based on the best knowledge and experience currently available. The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The manufacturer expressly does not make any representations, warranties, or guarantees as to its accuracy, reliability or completeness nor assumes any liability, for its use. It is the user's responsibility to verify the suitability and completeness of such information for each particular use.

The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

Revision information This document has undergone significant changes and should be reviewed in its entirety.

Hydrosil International LTD.
125 Prairie Lake Road - East Dundee, IL 60118
Phone: 847-844-0680
Emergency Phone: 847-844-0680
Fax: 847-844-0799

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HS-250-AC

50/50 Blend by Volume of HS-200 and 6 x 12 Mesh Coconut Shell Activated Carbon Safety Data Sheet

Revision date : 2017

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 - Product Identifier

Product Name: HS-250AC

1.2 - Relevant identified uses of the substance or mixture and uses advised against

Use of the substance/mixture : Filtration

1.3 - Details of the supplier of the safety data sheet

Hydrosil International Ltd.
125 Prairie Lake Rd
East Dundee, IL 60118
(P) 847-844-0680
(F) 847-844-0799
www.hydrosilintl.com

1.4 - Emergency telephone number

Emergency number : 1-847-844-0680

Section 2: Hazards Identification

2.1 - Classification of the substance or mixture

GHS-US classification
Eye Dam. 1 H318
STOT SE 3 H335

2.2 - Label Elements

GHS-US labelling

Hazard pictograms (GHS-US) :

Signal word (GHS-US) : Danger
Hazard statements (GHS-US) :

H318 - Causes serious eye damage
H335 - May cause respiratory irritation

Precautionary statements (GHS-US) :

P261 - Avoid breathing dust/fume/gas/mist/vapours/spray
P271 - Use only outdoors or in a well-ventilated area
P280 - Wear protective gloves/protective clothing/eye protection/face protection
P304+P340 - IF INHALED: Remove person to fresh air and keep comfortable for breathing
P305+P351+P338 - If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
P310 - Immediately call a POISON CENTER/doctor/…
P312 - Call a POISON CENTER/doctor/…/if you feel unwell
P403+P233 - Store in a well-ventilated place. Keep container tightly closed
P405 - Store locked up
P501 - Dispose of contents/container to ...

2.3 - Other Hazards

No additional information available

2.4 - Unknown acute toxicity (GHS US)

No data available

SECTION 3: Composition/information on ingredients

3.1 - Substances

Not applicable

3.2 - Mixture

Name	Product Identifier	%	GHS-US Classification
Zeolite	(CAS No.) 1318-02-1	55.85 - 57.85	STOT SE 3, H335
Carbon	(CAS No.) 7732-18-5	33.09 - 35.09	Not classified
Water	(CAS No.) 7732-18-5	2.84 - 8.84	Not classified
N,N,N-Trimethyl-1-hexadecanaminium chloride	(CAS No.) 112-02-7	2.22 - 4.22	Skin Irrit. 2, H315 Eye Dam. 1, H318 Aquatic Acute 1, H400

SECTION 4: First aid measures

4.1 - Description of first aid measures

First-aid measures after inhalation : Remove person to fresh air. If not breathing, administer CPR or artificial respiration. Get immediate medical attention.
First-aid measures after skin contact : If skin reddening or irritation develops, seek medical attention.
First-aid measures after eye contact : Immediately flush eyes with plenty of water for at least 15 minutes. If irritation persists get medical attention.
First-aid measures after ingestion : If the material is swallowed, get immediate medical attention or advice. DO NOT induce vomiting unless directed to do so by medical personnel.

4.2 - Most important symptoms and effects, both acute and delayed

Symptoms/injuries after inhalation : May cause respiratory irritation.
Symptoms/injuries after skin contact : Causes skin irritation.
Symptoms/injuries after eye contact : Causes serious eye irritation.
Symptoms/injuries after ingestion : May be harmful if swallowed.

4.3 - Indication of any immediate medical attention and special treatment needed

No additional information available

SECTION 5: Firefighting measures

5.1 - Extinguishing media

Suitable extinguishing media : If involved with fire, flood with plenty of water.
Unsuitable extinguishing media : None.

5.2 - Special hazards arising from the substance or mixture

Fire hazard : None known.
Explosion hazard : None known.

5.3 - Advice for firefighters

Protection during firefighting : Firefighters should wear full protective gear.

SECTION 6: Accidental release measures

6.1 - Personal precautions, protective equipment and emergency procedures

General measures : Avoid contact with the skin and the eyes.
For non-emergency personnel : No additional information available
For emergency responders : No additional information available

6.2 - Environmental precautions

None.

6.3 - Methods and material for containment and cleaning up

For containment : If possible, stop flow of product.
Methods for cleaning up : Shovel or sweep up and put in a closed container for disposal.

6.4 - Reference to other sections

No additional information available

SECTION 7: Handling and storage

7.1 - Precautions for safe handling

Precautions for safe handling : Avoid contact with eyes.

7.2 - Conditions for safe storage, including any incompatibilities

Storage conditions : Protect containers from physical damage. Store in dry, cool, well-ventilated area.

7.3 - Specific end use(s)

No additional information available

SECTION 8: Exposure controls/personal protection

8.1 - Control parameters

No additional information available

8.2 - Exposure controls

Appropriate engineering controls : Local exhaust and general ventilation must be adequate to meet exposure standards.
Hand protection : Use impervious gloves.
Eye protection : Safety glasses.
Skin and body protection : Wear suitable working clothes.
Respiratory protection : If airborne concentrations are above the applicable exposure limits, use NIOSH approved respiratory protection.

SECTION 9: Physical and chemical properties

9.1 - Information on basic physical and chemical properties

Physical state : Solid
Appearance : Irregular shaped
Colour : White/black
Odour : No data available
Odour threshold : No data available
pH : No data available
Relative evaporation rate (butylacetate=1) : No data available
Melting point : No data available
Freezing point : No data available
Boiling point : No data available
Flash point : No data available
Self ignition temperature : No data available
Decomposition temperature : No data available
Flammability (solid, gas) : No data available
Vapour pressure : No data available
Relative vapour density at 20 °C : No data available
Relative density : 54-56 lb/ft3
Solubility : No data available
Log Pow : No data available
Log Kow : No data available
Viscosity, kinematic : No data available
Viscosity, dynamic : No data available
Explosive properties : No data available
Oxidising properties : No data available
Explosive limits : No data available

9.1 - Other information

No additional information available

SECTION 10: Stability and reactivity

10.1 - Reactivity

No additional information available

10.2 - Chemical stability

Stable under normal conditions.

10.3 - Possibility of hazardous reactions

Will not occur

10.4 - Conditions to avoid

None

10.5 - Incompatible materials

Strong oxidizing and reducing agents.

10.6 - Hazardous decomposition products

Carbon monoxide may be generated in the event of a fire. Organic chlorides, amines, hydrogen chloride may be produced.

SECTION 11: Toxicological information

11.1 - Information on toxicological effects

Acute toxicity : Not classified

Zeolite (1318-02-1)	
LD50 oral rat	5000 mg/kg
LD50 dermal rabbit	> 2000 mg/kg
LC50 inhalation rat (mg/l)	2.4 mg/l (Exposure time: 1 h)
ATE (oral)	5000 mg/kg

Carbon (7440-44-0)	
LD50 oral rat	> 10000 mg/kg

Potassium permanganate (7722-64-7)	
LD50 dermal rabbit	4300 uL/kg/24H;

Skin corrosion/irritation : Not classified
Serious eye damage/irritation : Causes serious eye damage.
Respiratory or skin sensitisation : Not classified
Germ cell mutagenicity : Not classified
Carcinogenicity : Not classified

Zeolite (1318-02-1)	
IARC group	3

Reproductive toxicity : Not classified
Specific target organ toxicity (single exposure) : May cause respiratory irritation.
Specific target organ toxicity (repeated exposure) : Not classified
Aspiration hazard : Not classified

SECTION 12: Ecological information

12.1 - Toxicity

Zeolite (1318-02-1)	
LC50 fishes 1	1800 mg/l (Exposure time: 96 h - Species: Brachydanio rerio [semi-static])
EC50 Daphnia 1	1000 - 1800 mg/l (Exposure time: 48 h - Species: Daphnia magna)
EC50 other aquatic organisms 1	18 mg/l (Exposure time: 96 h - Species: Desmodesmus subspicatus)
LC50 fish 2	3200 - 5600 mg/l (Exposure time: 96 h - Species: Oryzias latipes [semi-static])

12.2 - Persistence and degradability

No additional information available

12.3 - Bioaccumulative potential

No additional information available

12.4 - Mobility in soil

No additional information available

12.5 - Other adverse effects

No additional information available

SECTION 13: Disposal considerations

13.1 - Waste treatment methods

Waste disposal recommendations : Dispose of contents/container in accordance with local/regional/national/international regulations.

SECTION 14: Transport information

In accordance with DOT / ADR / RID / ADNR / IMDG / ICAO / IATA

14.1 - UN number

Not applicable

14.2 - UN proper shipping name

Not applicable

SECTION 15: Regulatory information

15.1 - US Federal regulations

N,N,N-Trimethyl-1-hexadecanaminium chloride (112-02-7)
Listed on the United States TSCA (Toxic Substances Control Act) inventory
Carbon (7440-44-0)
Listed on the United States TSCA (Toxic Substances Control Act) inventory

15.2 - US State regulations

No additional information available

SECTION 16: Other information

Full text of H-phrases:

Aquatic Acute 1	Hazardous to the aquatic environment - Acute Hazard Category 1
Eye Dam. 1	Serious eye damage/eye irritation Category 1
Skin Irrit. 2	skin corrosion/irritation Category 2
STOT SE 3	Specific target organ toxicity (single exposure) Category 3
H315	Causes skin irritation
H318	Causes serious eye damage
H335	May cause respiratory irritation
H400	Very toxic to aquatic life

NFPA health hazard : 2 - Intense or continued exposure could cause temporary incapacitation or possible residual injury unless prompt
medical attention is given.
NFPA fire hazard : 0 - Materials that will not burn.
NFPA reactivity : 0 - Normally stable, even under fire exposure conditions, and are not reactive with water

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Appendix E

Laboratory MRLs

MAUL FOSTER ALONGI

Analytical Method Details - Apex Laboratories

Method	Analyte	MDL	MRL	Units	Surr. %R	DUP RPD	Matrix Spike %R	Matrix Spike RPD	Blank Spike %R	Blank Spike RPD	CAS #	OAR 340-041-8033, Table 30 RBC Chronic	OAR 340-041-8033, Table 30 RBC Acute	Appendix D Columbia Slough SLV
Diesel and/or Oil Hydrocarbons by NWTPH-Dx with Silica Gel Column Cleanup in Water														
NWTPH-Dx/SGC	Diesel	0.0400	0.0800	mg/L	-	30	36-132	30	36-132	30	68334-30-5	0.64	--	--
NWTPH-Dx/SGC	Oil	0.0800	0.160	mg/L	-	30	-	-	-	-	Oil	0.64	--	--
Volatile Organic Compounds by EPA 8260D in Water														
EPA 8260D	Acetone	10.0	20.0	ug/L	-	30	39-160	30	80-120	30	67-64-1	1,700	15,000	1,500
EPA 8260D	Acrylonitrile	1.00	2.00	ug/L	-	30	63-135	30	80-120	30	107-13-1	12,000	100,000	0.25
EPA 8260D	Benzene	0.100	0.200	ug/L	-	30	79-120	30	80-120	30	71-43-2	160	700	51
EPA 8260D	Bromobenzene	0.250	0.500	ug/L	-	30	80-120	30	80-120	30	108-86-1	--	--	--
EPA 8260D	Bromochloromethane	0.500	1.00	ug/L	-	30	78-123	30	80-120	30	74-97-5	--	--	--
EPA 8260D	Bromodichloromethane	0.500	1.00	ug/L	-	30	79-125	30	80-120	30	75-27-4	320	2,900	--
EPA 8260D	Bromoform	0.500	1.00	ug/L	-	30	66-130	30	80-120	30	75-25-2	230	1,100	140
EPA 8260D	Bromomethane	5.00	5.00	ug/L	-	30	53-141	30	80-120	30	74-83-9	16	38	--
EPA 8260D	2-Butanone (MEK)	5.00	10.0	ug/L	-	30	56-143	30	80-120	30	78-93-3	22,000	200,000	--
EPA 8260D	n-Butylbenzene	0.500	1.00	ug/L	-	30	75-128	30	80-120	30	104-51-8	--	--	--
EPA 8260D	sec-Butylbenzene	0.500	1.00	ug/L	-	30	77-126	30	80-120	30	135-98-8	--	--	--
EPA 8260D	tert-Butylbenzene	0.500	1.00	ug/L	-	30	78-124	30	80-120	30	98-06-6	--	--	--
EPA 8260D	Carbon disulfide	5.00	10.0	ug/L	-	30	64-133	30	80-120	30	75-15-0	15	130	0.92
EPA 8260D	Carbon tetrachloride	0.500	1.00	ug/L	-	30	72-136	30	80-120	30	56-23-5	77	690	1.6
EPA 8260D	Chlorobenzene	0.250	0.500	ug/L	-	30	80-120	30	80-120	30	108-90-7	25	220	50
EPA 8260D	Chloroethane	5.00	5.00	ug/L	-	30	60-138	30	80-120	30	75-00-3	--	--	--
EPA 8260D	Chloroform	0.500	1.00	ug/L	-	30	79-124	30	80-120	30	67-66-3	140	1,300	470
EPA 8260D	Chloromethane	2.50	5.00	ug/L	-	30	50-139	30	80-120	30	74-87-3	--	--	--
EPA 8260D	2-Chlorotoluene	0.500	1.00	ug/L	-	30	79-122	30	80-120	30	95-49-8	--	--	--
EPA 8260D	4-Chlorotoluene	0.500	1.00	ug/L	-	30	78-122	30	80-120	30	106-43-4	--	--	--
EPA 8260D	Dibromochloromethane	0.500	1.00	ug/L	-	30	74-126	30	80-120	30	124-48-1	320	2,900	13
EPA 8260D	1,2-Dibromo-3-chloropropane	2.50	5.00	ug/L	-	30	62-128	30	80-120	30	96-12-8	--	--	--
EPA 8260D	1,2-Dibromoethane (EDB)	0.250	0.500	ug/L	-	30	77-121	30	80-120	30	106-93-4	--	--	--
EPA 8260D	Dibromomethane	0.500	1.00	ug/L	-	30	79-123	30	80-120	30	74-95-3	--	--	--
EPA 8260D	1,2-Dichlorobenzene	0.250	0.500	ug/L	-	30	80-120	30	80-120	30	95-50-1	23	130	--
EPA 8260D	1,3-Dichlorobenzene	0.250	0.500	ug/L	-	30	80-120	30	80-120	30	541-73-1	22	79	--
EPA 8260D	1,4-Dichlorobenzene	0.250	0.500	ug/L	-	30	79-120	30	80-120	30	106-46-7	9.4	57	--
EPA 8260D	Dichlorodifluoromethane	0.500	1.00	ug/L	-	30	32-152	30	80-120	30	75-71-8	340	3,100	--
EPA 8260D	1,1-Dichloroethane	0.200	0.400	ug/L	-	30	77-125	30	80-120	30	75-34-3	410	3,700	47
EPA 8260D	1,2-Dichloroethane (EDC)	0.200	0.400	ug/L	-	30	73-128	30	80-120	30	107-06-2	2,000	8,200	37
EPA 8260D	1,1-Dichloroethene	0.200	0.400	ug/L	-	30	71-131	30	80-120	30	75-35-4	410	3,700	--
EPA 8260D	cis-1,2-Dichloroethene	0.200	0.400	ug/L	-	30	78-123	30	80-120	30	156-59-2	620	5,500	590
EPA 8260D	trans-1,2-Dichloroethene	0.200	0.400	ug/L	-	30	75-124	30	80-120	30	156-60-5	560	10,000	590
EPA 8260D	1,2-Dichloropropane	0.250	0.500	ug/L	-	30	78-122	30	80-120	30	78-87-5	520	3,300	15
EPA 8260D	1,3-Dichloropropane	0.500	1.00	ug/L	-	30	80-120	30	80-120	30	142-28-9	--	--	--
EPA 8260D	2,2-Dichloropropane	0.500	1.00	ug/L	-	30	60-139	30	80-120	30	594-20-7	--	--	--
EPA 8260D	1,1-Dichloropropene	0.500	1.00	ug/L	-	30	79-125	30	80-120	30	563-58-6	--	--	--
EPA 8260D	cis-1,3-Dichloropropene	0.500	1.00	ug/L	-	30	75-124	30	80-120	30	10061-01-5	--	--	0.055
EPA 8260D	trans-1,3-Dichloropropene	0.500	1.00	ug/L	-	30	73-127	30	80-120	30	10061-02-6	--	--	0.055
EPA 8260D	Ethylbenzene	0.250	0.500	ug/L	-	30	79-121	30	80-120	30	100-41-4	61	550	7.3
EPA 8260D	Hexachlorobutadiene	2.50	5.00	ug/L	-	30	66-134	30	80-120	30	87-68-3	1	10	--
EPA 8260D	2-Hexanone	5.00	10.0	ug/L	-	30	57-139	30	80-120	30	591-78-6	--	--	99
EPA 8260D	Isopropylbenzene	0.500	1.00	ug/L	-	30	72-131	30	80-120	30	98-82-8	4.8	43	--
EPA 8260D	4-Isopropyltoluene	0.500	1.00	ug/L	-	30	77-127	30	80-120	30	99-87-6	16	150	--
EPA 8260D	Methylene chloride	5.00	10.0	ug/L	-	30	74-124	30	80-120	30	75-09-2	1,500	8,500	590
EPA 8260D	4-Methyl-2-pentanone (MiBK)	5.00	10.0	ug/L	-	30	67-130	30	80-120	30	108-10-1	170	2,200	170
EPA 8260D	Methyl tert-butyl ether (MTBE)	0.500	1.00	ug/L	-	30	71-124	30	80-120	30	1634-04-4	730	6,500	--
EPA 8260D	Naphthalene	2.50	5.00	ug/L	-	30	61-128	30	80-120	30	91-20-3	21	170	--
EPA 8260D	n-Propylbenzene	0.250	0.500	ug/L	-	30	76-126	30	80-120	30	103-65-1	--	--	--
EPA 8260D	Styrene	0.500	1.00	ug/L	-	30	78-123	30	80-120	30	100-42-5	32	290	--
EPA 8260D	1,1,1,2-Tetrachloroethane	0.200	0.400	ug/L	-	30	78-124	30	80-120	30	630-20-6	85	770	11
EPA 8260D	1,1,2,2-Tetrachloroethane	0.250	0.500	ug/L	-	30	71-121	30	80-120	30	79-34-5	200	910	4
EPA 8260D	Tetrachloroethene (PCE)	0.200	0.400	ug/L	-	30	74-129	30	80-120	30	127-18-4	53	430	3.3
EPA 8260D	Toluene	0.500	1.00	ug/L	-	30	80-121	30	80-120	30	108-88-3	62	560	9.8
EPA 8260D	1,2,3-Trichlorobenzene	1.00	2.00	ug/L	-	30	69-129	30	80-120	30	87-61-6	8	130	--
EPA 8260D	1,2,4-Trichlorobenzene	1.00	2.00	ug/L	-	30	69-130	30	80-120	30	120-82-1	130	420	--
EPA 8260D	1,1,1-Trichloroethane	0.200	0.400	ug/L	-	30	74-131	30	80-120	30	71-55-6	76	690	--
EPA 8260D	1,1,2-Trichloroethane	0.250	0.500	ug/L	-	30	80-120	30	80-120	30	79-00-5	730	3,200	16
EPA 8260D	Trichloroethene (TCE)	0.200	0.400	ug/L	-	30	79-123	30	80-120	30	79-01-6	220	2,000	30
EPA 8260D	Trichlorofluoromethane	1.00	2.00	ug/L	-	30	65-141	30	80-120	30	75-69-4	--	--	--
EPA 8260D	1,2,3-Trichloropropane	0.500	1.00	ug/L	-	30	73-122	30	80-120	30	96-18-4	--	--	--
EPA 8260D	1,2,4-Trimethylbenzene	0.500	1.00	ug/L	-	30	76-124	30	80-120	30	95-63-6	15	140	--
EPA 8260D	1,3,5-Trimethylbenzene	0.500	1.00	ug/L	-	30	75-124	30	80-120	30	108-67-8	26	230	--
EPA 8260D	Vinyl chloride	0.100	0.200	ug/L	-	30	58-137	30	80-120	30	75-01-4	930	8,400	2.4
EPA 8260D	m,p-Xylene	0.500	1.00	ug/L	-	30	80-121	30	80-120	30	179601-23-1	--	--	1.8
EPA 8260D	o-Xylene	0.250	0.500	ug/L	-	30	78-122	30	80-120	30	95-47-6	--	--	13
EPA 8260D	Xylenes, total	0.750	1.50	ug/L	-	30	79-121	30	80-120	30	1330-20-7	27	240	--

Notes:

DEQ, 2019. Oregon National Ambient Water Quality Criteria: OAR 340-041-8033, Table 30, Aquatic Life Water Quality Criteria for Toxic Pollutants.

DEQ, 2011. Appendix D: Stormwater Data Reporting and Screening Table for Non-Portland Harbor Sites.

Method: **EPA 1633**
Matrix: **Aqueous**
Units: **ng/L**

			non-DoD		DoD		
LIMS Order	CAS #	Analyte	MDL (ng/L)	MRL (ng/L)	DL (ng/L)	LOD (ng/L)	LOQ (ng/L)
1	375-22-4	PFBA	1.60	6.40	2.40	4.80	6.40
2	377-73-1	PFMPA	0.683	3.20	1.20	2.40	3.20
3	356-02-5	3:3FTCA	1.58	8.00	3.00	6.00	8.00
4	2706-90-3	PFPeA	0.419	3.20	1.20	2.40	3.20
5	863090-89-5	PFMBA	0.451	3.20	1.20	2.40	3.20
6	757124-72-4	4:2FTS	1.27	6.00	2.24	4.48	6.00
7	151772-58-6	NFDHA	1.55	3.20	1.20	2.40	3.20
8	375-73-5	PFBS	0.675	1.42	0.503	1.06	1.42
9	307-24-4	PFHxA	0.273	1.60	0.600	1.20	1.60
10	13252-13-6	HFPO-DA	1.70	6.68	2.40	4.80	6.68
11	914637-49-3	5:3FTCA	6.77	40.0	15.0	30.0	40.0
12	113507-82-7	PFEESA	0.372	2.85	1.07	2.14	2.85
13	375-85-9	PFHpA	0.271	1.60	0.600	1.20	1.60
14	2706-91-4	PFPeS	0.484	1.50	0.565	1.13	1.50
15	919005-14-4	ADONA	1.59	6.32	2.26	4.52	6.32
16	27619-97-2	6:2FTS	1.22	6.07	2.28	4.56	6.07
17	335-67-1	PFOA	1.78	2.00	0.600	1.20	1.60
18	355-46-4	PFHxS	0.504	1.60	0.550	1.10	1.60
19	812-70-4	7:3FTCA	3.59	40.0	15.0	30.0	40.0
20	375-95-1	PFNA	0.242	1.60	0.600	1.20	1.60
21	375-92-8	PFHpS	0.377	1.52	0.570	1.14	1.52
22	39108-34-4	8:2FTS	1.87	6.14	2.32	4.64	6.14
23	335-76-2	PFDA	0.425	1.60	0.600	1.20	1.60
24	2355-31-9	MeFOSAA	0.691	1.60	0.600	1.20	1.60
25	1763-23-1	PFOS	1.17	1.49	0.555	1.11	1.49
26	2991-50-6	EtFOSAA	0.689	1.60	0.600	1.20	1.60
27	2058-94-8	PFUnA	0.413	1.60	0.600	1.20	1.60
28	756426-58-1	9Cl-PF3ONS	1.92	6.24	2.24	4.48	6.24
29	68259-12-1	PFNS	0.604	1.54	0.580	1.16	1.54
30	754-91-6	PFOSA	0.398	1.60	0.600	1.20	1.60
31	307-55-1	PFDoA	0.223	1.60	0.600	1.20	1.60
32	335-77-3	PFDS	0.564	1.54	0.580	1.16	1.54
33	72629-94-8	PFTrDA	0.256	1.60	0.600	1.20	1.60
34	763051-92-9	11Cl-PF3OUdS	1.93	6.00	2.26	4.52	6.00
35	376-06-7	PFTeDA	0.239	1.60	0.600	1.20	1.60
36	79780-39-5	PFDoS	0.497	1.55	0.580	1.16	1.55
37	24448-09-7	MeFOSE	2.60	16.0	6.00	12.00	16.00
38	31506-32-8	MeFOSA	1.01	1.60	0.600	1.20	1.60

39	1691-99-2	EtFOSE	2.55	16.0	6.00	12.00	16.00
40	4151-50-2	EtFOSA	0.972	1.60	0.600	1.20	1.60

MDL last verified 2/02/24.

*Based on 500mL initial and 5mL final

List of 40 analytes.

Limits are updated periodically

For instruments M/V

Attachment D

EMP Review Application

MAUL
FOSTER
ALONGI

Contaminated Media Environmental Management Plan Review Application

Under Section 6 of the 1200-CA NPDES Construction Stormwater General Discharge Permit, if "treatment chemicals" are to be added to stormwater and/or authorized non-stormwater prior to discharge, the following EMP application must be submitted to DEQ prior to the initiation of construction activities. Submit this form to describe the proposed use of treatment chemicals.

I. Permit Registrant Information

Permit Registrant Name: Port of Portland			
Mailing Address: 7200 NE Airport Way			
City:	State:	Zip:	County:
Portland	OR	97218	Multnomah
Phone: (503) 415-6566	Email:	Blake.Hamalainen@portofportland.com	

II. Project/Site Information

Project/Site Name: Portland International Airport - TCORE Project			
Project/Site Address: 7000 NE Airport Way			
City:	State:	Zip:	County:
Portland	OR	97218	Multnomah
Site contact name (if different from permit registrant):			
Name:	Phone:	Email:	
Name:	Phone:	Email:	
Names of receiving waterbodies:			
Not applicable/none			

III. Map

Attach a map that illustrates the entire site including all of the below items. Include this map in your Erosion and Sediment Control Plan (ESCP):

- DEQ Environmental Cleanup Site Information (ECSI) site number (if applicable)
- A list or table of all known contaminants with lab tests results showing concentration and depth
- A list of all disposal locations
- Notice of approval from local jurisdiction if discharge is to public storm system
- A map with sample locations
- Temporary Erosion and Sediment Control Plans specific to contaminated soils
- Plans for offsite disposal of contaminated soils
- Any relevant (related) portions of ESCP that address the management of contaminated and potentially contaminated construction stormwater and dewatering program (if applicable)
- The dewatering plan (if applicable)
- All proposed point(s) of discharge to receiving waterbodies
- All soil types within areas to be disturbed
- All area of earth disturbance
- Sufficient indication of topography to indicate where stormwater flows

Attach a schematic drawing of the proposed treatment system(s). Include all components of the treatment train, sample points, and pipe configurations. In addition to sufficient holding capacity upstream of treatment, the system must have the capacity to hold water for testing and to re-treat water that does not meet water quality standards.

IV. Responsible Personnel

Treatment System Operator	Subcontractor (if applicable)
Clear Creek Systems	

Street/Location:	City:	State	Zip	County
6457 NE Columbia Street	Portland	OR	97218	Multnomah

Responsible personnel. List personnel who will be responsible for operating the chemical treatment systems and application of the chemicals. Cite the training that the personnel have received in operation and maintenance of the treatment system(s) and use of the specific chemical(s) proposed.

Lists of operators with training and certifications is attached. Clear Creek Systems is a dedicated water treatment firm specializing in the requirements of the project.

V. Proposed Treatment

- Check proposed treatment system.
- Chitosan enhanced sand filtration with discharge to infiltration (ground water)
- Chitosan enhanced sand filtration with discharge to temporary holding ponds (batch).
- Chitosan enhanced sand filtration with discharge to surface waters (flow-through).
- Other (describe below and submit documentation that the proposed system and chemical(s) demonstrate the ability to remove turbidity and produce non-toxic effluent/ discharge)

Check proposed cationic chemical(s) to be used:			
FlocClear™ (2% chitosan acetate solution)	X	LiquiFloc™ (1% chitosan acetate solution).	
ChitoVan™ (1% chitosan acetate solution)		StormKlear™	
LiquiFloc™ (3% Chitosan acetate solution)		StormKlearTM LiquiFlocTM (1% chitosan acetate solution)	
Other"			
Estimated Treatment Period Start Date:		Estimated Treatment Period End Date:	

Describe sampling and recordkeeping schedule. Attach additional sheets as needed:

This information is presented in the Groundwater Discharge, Treatment, and Monitoring Plan.

VI. Certification Information

I have documented and hereby certify that the following information is correct and has been documented in the ESCP for this project:

- The ESCP includes a complete site-specific description of the chemical treatment system herein proposed for use, including specifications, design, and Material Safety Data Sheets for all chemicals to be used.
- The controls to be used on the site are compatible with the safe and effective use of cationic chemical treatment.
- I verified through jar tests that the site soil is conducive to chemical treatment.
- I verified that the chemical treatment system operators for this project received training.
- I read, understand, and will follow all conditions and design criteria in the applicable use designation(s).
- If the discharge is to tribal waters, I notified the appropriate tribal government of the intent to use chemical treatment on a site located within that jurisdiction.
- I will keep the use level designation, operation and maintenance manual, and training certificate on site prior to and during use of chemical treatment.
- A licensed engineer designed the system for this project including system sizing, pond sizing, and flow requirements.
- I verify that the discharge will not adversely affect downstream conveyance systems or stream channels (e.g., cause erosion).

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 the 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.

Authorized Official First Name, Middle Initial, Last Name:

Title:
Manager, Environmental Land & Water

Signature: Date:

2-23-26

Email: Blake.Hamalainen@portofportland.com

Active Chemical Treatment Systems

This Section of Appendix A provides the Environmental Management Plan review application for projects with an active chemical treatment system (e.g., electro-coagulation, flocculants, filtration, polymers, hydrochloric or sulfuric acid) for sediment, pH neutralization, or other pollutant removal is planned or implemented. When "treatment chemicals" are proposed to treat stormwater and/or authorized non-stormwater prior to discharge, Section 6 of the 1200-CA permit requires the permit registrant to submit the following EMP review application to DEQ prior to the commencement of construction activities. DEQ may assign coverage under this permit after the permit registrant has included appropriate controls and implementation procedures designed to ensure that the above activities will not lead to discharges that cause an exceedance of water quality standards. In the absence of authorization, the permit registrant must apply for and receive coverage under an individual permit prior to discharging from the site.

Active Chemical Treatment System Environmental Management Plan Review Application

Under Section 6 of the 1200-CA NPDES Construction Stormwater General Discharge Permit, if "treatment chemicals" are to be added to stormwater and/or authorized non-stormwater prior to discharge, the following EMP application must be submitted to DEQ before the initiation of construction activities. Submit this form to describe the proposed use of treatment chemicals.

I. Permit Registrant Information

Permit Registrant Name: Port of Portland			
Mailing Address: 7200 NE Airport Way			
City:	State:	Zip:	County:
Portland	OR	97218	Multnomah
Phone: (503) 415-6566	Email:	Blake.Hamalainen@portofportland.com	

II. Project/Site Information

Project/Site Name: Portland International Airport - TCORE Project			
Project/Site Address: 7000 NE Airport Way			
City:	State:	Zip:	County:
Portland	OR	97218	Multnomah
Site contact name (if different from permit registrant):			
Name:	Phone:	Email:	
Name:	Phone:	Email:	
Names of receiving waterbodies:			
Columbia Slough			

III. Map

Attach a map that illustrates the entire site including all of the below items. Include this map in your Erosion and Sediment Control Plan (ESCP):

- DEQ Environmental Cleanup Site Information (ECSI) site number (if applicable)
- A list or table of all known contaminants with lab tests results showing concentration and depth
- A list of all disposal locations
- Notice of approval from local jurisdiction if discharge is to public storm system
- A map with sample locations
- Temporary Erosion and Sediment Control Plans specific to contaminated soils
- Plans for offsite disposal of contaminated soils
- Any relevant (related) portions of ESCP that address the management of contaminated and potentially contaminated construction stormwater and dewatering program (if applicable)
- The dewatering plan (if applicable)
- All proposed point(s) of discharge to receiving waterbodies
- All soil types within areas to be disturbed
- All area of earth disturbance
- Sufficient indication of topography to indicate where stormwater flows

Attach a schematic drawing of the proposed treatment system(s). Include all components of the treatment train, sample points, and pipe configurations. In addition to sufficient holding capacity upstream of treatment, the system must have the capacity to hold water for testing and to re-treat water that does not meet water quality standards.

IV. Responsible Personnel

Treatment System Operator		Subcontractor (if applicable)		
Clear Creek Systems				
Street/Location:	City:	State	Zip	County
6457 NE Columbia Street	Portland	OR	97218	Multnomah

Responsible personnel. List personnel who will be responsible for operating the chemical treatment systems and application of the chemicals. Cite the training that the personnel have received in operation and maintenance of the treatment system(s) and use of the specific chemical(s) proposed.

Lists of operators with training and certifications is attached. Clear Creek Systems is a dedicated water treatment firm specializing in the requirements of the project.

V. Proposed Treatment

- Check proposed treatment system.
- Chitosan enhanced sand filtration with discharge to infiltration (ground water)
- Chitosan enhanced sand filtration with discharge to temporary holding ponds (batch).
- Chitosan enhanced sand filtration with discharge to surface waters (flow-through).
- Other (describe below and submit documentation that the proposed system and chemical(s) demonstrate the ability to remove turbidity and produce non-toxic effluent/ discharge)

Check proposed cationic chemical(s) to be used:			
FlocClear™ (2% chitosan acetate solution)	X	LiquiFloc™ (1% chitosan acetate solution).	
ChitoVan™ (1% chitosan acetate solution)		StormKlear™	
LiquiFloc™ (3% Chitosan acetate solution)		StormKlearTM LiquiFlocTM (1% chitosan acetate solution)	
Other"			
Estimated Treatment Period Start Date:		Estimated Treatment Period End Date:	

Describe sampling and recordkeeping schedule. Attach additional sheets as needed:

This information is presented in the Groundwater Discharge, Treatment, and Monitoring Plan.

VI. Certification Information

I have documented and hereby certify that the following information is correct and has been documented in the ESCP for this project:

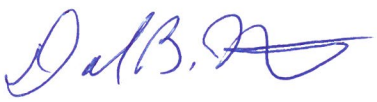
- The ESCP includes a complete site-specific description of the chemical treatment system herein proposed for use, including specifications, design, and Material Safety Data Sheets for all chemicals to be used.
- The controls to be used on the site are compatible with the safe and effective use of cationic chemical treatment.
- I verified through jar tests that the site soil is conducive to chemical treatment.
- I verified that the chemical treatment system operators for this project received training.
- I read, understand, and will follow all conditions and design criteria in the applicable use designation(s).
- If the discharge is to tribal waters, I notified the appropriate tribal government of the intent to use chemical treatment on a site located within that jurisdiction.
- I will keep the use level designation, operation and maintenance manual, and training certificate on site prior to and during use of chemical treatment.
- A licensed engineer designed the system for this project including system sizing, pond sizing, and flow requirements.
- I verify that the discharge will not adversely affect downstream conveyance systems or stream channels (e.g., cause erosion).

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 the 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.

Authorized Official First Name, Middle Initial, Last Name:

Title:
Manager, Environmental Land & Water

Signature:



Date:
2-23-26

Email: Blake.Hamalainen@portofportland.com

First Name	Last Name	Certification Expiration	Trained By	Current CCSI Employee
Marcus	Bohler	8/18/2026	Clear Creek Systems	Yes
Zoe	Wickline	8/18/2026	Clear Creek Systems	Yes
Sam	Pepper	12/15/2026	Clear Creek Systems	Yes
Jeremy	Gubner	8/18/2026	Clear Creek Systems	Yes
Matthew	Ross	8/18/2026	Clear Creek Systems	Yes
Brian	Anderson	12/15/2026	Clear Creek Systems	Yes
Vasiliy	Betev	12/15/2026	Clear Creek Systems	Yes
Sam	Petrie	6/21/2027	Clear Creek Systems	Yes
Jason	Martino	6/21/2027	Clear Creek Systems	Yes
Tyson	West	12/15/2026	Clear Creek Systems	Yes
Xavior	Terlaje	12/15/2026	Clear Creek Systems	Yes
Jorge	Farias	8/18/2026	Clear Creek Systems	Yes
Taylor	Johnson	6/21/2027	Clear Creek Systems	Yes
Jame	Westran	6/21/2027	Clear Creek Systems	Yes
Chase	Cannon	12/15/2026	Clear Creek Systems	Yes