Interim Remedial Action Measures Work Plan

Permapost Products, Inc., Hillsboro, Oregon, ECSI #148

Final

Prepared for:

Permapost Products, Inc.
Hillsboro, Oregon
July 1, 2024
Project No. M8012.01.001

Prepared by:

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

MAUL FOSTER ALONGI

Interim Remedial Action Measures Work Plan

Permapost Products, Inc., Hillsboro, Oregon, ECSI #148

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

Maul Foster & Alongi, Inc.

EXPIRES: 12/31/2025
This digital seal certifies the signatory and document content.

Josh Elliott, PE
Principal Engineer

Krysta Krippaehne-Stein, EIT
Project Engineer

Contents

Abbreviations

AOI	area of interest
BMP	best management practices
The City	City of Hillsboro
COC	chemical of concern
CRZ	critical root zone
CSM	conceptual site model
DEQ	Oregon Department of Environmental Quality
EPA	U.S. Environmental Protection Agency
IRAM	Interim Remedial Action Measures
LA	landscape architect
MFA	Maul Foster & Alongi, Inc.
ng/kg	nanograms per kilogram
OAR	Oregon Administrative Rule
Permapost	Permapost Products, Inc.
PRG	preliminary remediation goals
RAO	remedial action objective
RBC	risk-based concentration
RCRA	Resource Conservation and Recovery Act
SMP	Site Management Plan
TEQ	toxicity equivalent

1 Introduction

At the request of the Oregon Department of Environmental Quality (DEQ), Maul Foster & Alongi, Inc. (MFA) has prepared this Interim Remedial Action Measures (IRAM) Work Plan for Permapost Products, Inc. (Permapost) This work plan outlines the steps that will be taken by Permapost to remediate shallow soil contamination at a residential property (Property 1) adjacent to the Permapost property. Property 1 is located at 3975 SE Witch Hazel Road in Hillsboro, Oregon (see Figure 1-1). Property 1 is one of four residential parcels adjacent to Permapost's southern property line. Shallow soil on Property 1 has documented arsenic and dioxin/furan contamination that exceed preliminary remediation goals (PRGs) outlined in the feasibility study (FS) (MFA, 2024).

As described in the FS (MFA, 2024), Property 1 is part of area of interest 5 (AOI-5). AOI-5 is one of five AOIs that comprise the Permapost Site. In addition to AOI-5, the Permapost Site is comprised four other AOIs: the terrace (AOI-1), one of two parcels on the adjoining Aloha property (AOI-2), the Property (AOI-3), and the railroad ditch (AOI-4) (see Figure 1-2).

AOI-5 consists of four residential properties adjacent and to the south of the Permapost property (see Figure 1-2). Permapost has initiated discussions regarding remediation of AOI-5 with 3 of the 4 property owners, including possible purchase of properties 2 and 3. The owner of property 4 has not responded to Permapost and Permapost has not been provided access to property 4. The owner of Property 1 is the only property owner that has currently indicated they are prepared to proceed with an IRAM.

The proposed IRAM would remove soil with concentrations of arsenic and dioxin/furans above PRGs established for the Site in the FS (MFA, 2024), to the extent accessible. The proposed IRAM will include removal of contaminated soil, consolidation and capping of contaminated soil on the adjacent Permapost property, importing clean soil, and landscaping restoration.

2 Background

2.1 Previous Investigations

In October 2022 and May 2023, at the request of DEQ, Permapost conducted soil sampling on properties 1, 2, and 3 in AOI-5 (see Figure 2-1). Soil was sampled in the front and backyards of the residences and analyzed for chemicals of concern (COC) (dioxin/furans and arsenic) to assess contamination from potential historical stormwater runoff onto AOI-5. Analytical data were screened relative to the residential RBC for dioxins/furans and the natural background concentration for arsenic (MFA 2022). Based on analytical data collected to date, soil contamination is limited to three feet or less below ground surface.

On May 31, 2024, additional soil sampling was conducted within the front and middle yard of Property 1 for pre-design sampling. Depending on the results of these samples, anticipated remediation depths may be revised in coordination with DEQ.

2.2 Preliminary Remediation Goals

As described in OAR 340-122-0115, cleanup levels are the residual concentrations of hazardous substances in a medium that are determined to be protective under specified exposure conditions of public health, safety, and welfare, and of the environment. PRGs for shallow soil were developed for human receptors under a residential exposure scenario and are considered cleanup levels for shallow soil at AOI-5 (which includes Property 1) (MFA 2024):

- Arsenic, 0-3 feet bgs, PRG of 8.8 milligrams per kilogram.
- Dioxin toxicity equivalent (TEQ), 0-3 feet bgs, PRG of 11.8 nanograms per kilogram (ng/kg).

The PRGs identified will be protective of residential, occupational, construction, and excavation workers as applicable for Property 1. The PRGs account for cancer and noncancer effects and rely on DEQ background soil concentration for arsenic and a site-specific background concentration developed for dioxins based on a background study using topsoil data collected from regional topsoil providers (MFA 2023b). The dioxin PRG was approved by DEQ (DEQ, 2023).

3 Interim Remedial Action Alternatives

Remedial action alternatives for AOI-5 (which includes Property 1) were screened and evaluated in the FS (MFA, 2024) and are summarized in Table 3-1. The FS recommended alternative (Alternative 5.2B) and this proposed IRAM is consistent with the proposed final remedy for AOI-5.

Under Alternative 5.2B, the following elements are included:

- Soil exceeding PRGs would be excavated, transported, and disposed of at the consolidation area on the Permapost property.
- Excavation areas would extend up to 3 feet bgs as shown on Figure 3-1. Excavation depths may be refined based on forthcoming pre-design sampling results.
- Excavation areas would be backfilled using clean imported soil to grade.

Alternative 5.2A is approximately twice the cost of Alternative 5.2B because Alternative 5.2A relies on disposal of the soil at a RCRA Subtitle D landfill that accepts soil that contains dioxin/furan concentrations, as opposed to incorporating the soil into a cap on the Permapost property (see Table 3-1 and Appendix). The volume of soil estimated to be generated during cleanup is 1,514 cubic yards (loose volume of approximately 1,892 cubic yards). Therefore, this volume of soil will generate an estimated 95 truck trips assuming 20 cubic yards per trip (truck and pup).

Incorporation of excavated soil from Property 1 onto the Permapost property with a soil cap (requirement under any reasonable anticipated remedial alternative) provides an equally protective and effective remedy to offsite disposal (Alternative 5.2A) and much higher degree of cost

reasonableness and sustainability, and is financially achievable by Permapost. Implementation of this IRAM will be permanent because soil removal on Property 1 will meet PRGs in yard soil and the IRAM will not interfere with other final remedial actions at the Permapost Site. The owner of Property 1 and Permapost have agreed to cooperate to implement the Alternative 5.2B as an IRAM this year.

4 Description of Interim Remedy

4.1 Interim Remedial Action Areas

Excavation areas for Property 1 are shown on Figure 3-1. The cleanup areas and depths are based on the results of soil characterization described earlier in this work plan and in previously submitted reports (MFA 2022). The northern and central portion of Property 1 will be excavated to a depth of 3 feet bgs. The southern yard will be excavated to a depth of 2 feet bgs. Excavation depths may be refined based on forthcoming pre-design sampling results from samples collected in May 2024.

4.2 Interim Remedial Action Components

The primary interim remedial action components are:

- Soil exceeding PRGs will be excavated, transported, and capped on the Permapost property (temporary stockpiling in DU-G may take place before final remedy implementation on the Permapost property).
- Excavation areas will extend up to 3 feet bgs as shown on Figure 3-1. Excavation depths may be refined based on forthcoming pre-design sampling results.
- Excavation areas will be backfilled using clean imported soil to grade. Permapost has tested soil from a variety of available sources.
- Yard landscaping will be restored.

All accessible soil that exceeds the PRGs will be excavated on Property 1. Accessible soils are those not covered by permanent structures (such as homes and garages) or asphalt or concrete paving (such as sidewalks, driveways, patios, and parking areas).

Permapost will work with the owner of property to coordinate the cleanup, including:

- Verify and survey cleanup areas.
- Establish the restoration design.
- Provide information on pre-cleanup activities and owner responsibilities.
- Provide information about the cleanup and restoration timeline.
- Provide information regarding landscape care following yard restoration.

Permapost and the property owner will sign a cleanup contract before cleanup is implemented. The cleanup will be designed to constitute a final cleanup action and no institutional controls (e.g.,

environmental covenants or deed restrictions) will be placed on the property. The cleanup and restoration process is further described in the following subsections.

4.2.1 Interim Remedial Action Approach

Prior to remedial action, topographic, public and private utility, and vegetation surveys will be conducted. The property owner will be responsible for removing nonpermanent structures from the yard (e.g., piles of wood, debris, toys, piles of soil, lawn furniture, fire pits, vehicles). Existing fences in areas identified for cleanup will remain in place in areas where they do not impede interim remedial action activities. Fence panels that impede interim remedial action activities may be temporarily removed to facilitate cleanup and replaced following completion of the interim remedial action.

Structures constructed on permanent foundations (e.g., cement or concrete pads) will remain in place, including the garage located on the northwestern portion of the property. The garage foundation consists of a reinforced concrete slab that was constructed at a similar timeframe as the residence, therefore it is unlikely contamination above PRGs exists below the foundation.

Structures not constructed on permanent foundations (e.g., sheds without foundations/footings) and moveable site features (e.g., vehicles, boats, trailers, etc.) will be temporarily removed from the property prior to the start of interim remedial actions to facilitate excavation of contaminated soil beneath the structures and features. Assessment of existing above grade structures (e.g., sheds) would be required to determine whether a structure can be temporarily moved for soil removal access without impacting the structures usability/structural integrity. If a structure cannot be moved without damaging the usability/structural integrity, Permapost will coordinate with the homeowner to determine agreement for 1) retaining it in place or, 2) removing it without replacement.

Existing small shrubs, groundcovers, and lawns that are in areas identified for cleanup will be removed or transplanted to facilitate soil excavation. Existing large woody vegetation (e.g., trees and large shrubs, herein referred to as trees) will be handled on a case-by-case basis. If preservation of the tree is desired, trees will be surveyed by a certified arborist; this survey effort will include delineation of the critical root zone (CRZ) and an evaluation of the health/viability of individual trees. Where practicable and if desired by the homeowner, existing, viable trees will be preserved during construction by the following practices:

- Delineation of the CRZ by construction fencing.
- Prohibition of construction equipment entry into and transit within the CRZ.
- Hand and/or vactor truck excavation of soil in the CRZ.
- Restoration of soil near roots (following excavation and survey of post-excavation grade).
- Informing the homeowner of any soil within the cleanup horizon that may have to remain to preserve the tree.
- Covering clean fill soil around the tree with mulch.
- Additional precautions as recommended by the project arborist.

Trees that are identified as unhealthy/inviable will be removed before soil excavation and may be replaced with a nursery-stock tree as part of the landscape restoration.

Contamination exceeding the PRGs will be removed. As mentioned in Section 4.1, up to three feet of soil will be excavated and will be replaced with clean soil (see Figure 3-1). Excavations adjacent to

existing hardscaping (e.g., roads, driveways) and structures will be constructed with side slopes to avoid undermining. Excavations on steeper slopes may be benched to allow compaction of clean fill during restoration. Very steep slopes and areas that are inaccessible to equipment (e.g., small areas confined by structures or hardscapes) will be further evaluated during predesign activities. The exact maximum slope allowed for various scenarios will be determined in consultation with a structural engineer. Means such as hand excavation may be used to remove soils to the maximum extent practicable.

It is Permapost's responsibility to ensure that best management practices (BMPs) are being followed. BMPs for soil and stormwater will be used to during excavation and removal eliminate or minimize any releases of contaminants. BMPs may include:

- Dampening soil to limit dust.
- Avoiding overwatering to prevent erosion or migration of contaminated soil.
- Covering disturbed soil, open excavations, and soil piles with plastic sheeting to reduce stormwater contact with potentially contaminated soil and soil runoff.
- Loading trucks in a careful, controlled manner to minimize spillage, and placing plastic sheeting beneath the swing path of the excavator to contain any soil that is spilled.
- Using rubber rumble strips immediately adjacent to loading areas to dislodge loose soil from truck tires before trucks leave the site.
- Covering soil loads before trucks leave the work site.
- Monitoring roadways to ensure that soil is not being tracked off site.
- Street sweeping (if required) to removed tracked soil from roadways.

Following excavation, the yard will be surveyed by the contractor. The topographic survey will be submitted to the engineer for approval. Alternative means, such as grade stakes, may also be used to verify excavation completion. The engineer will compare the elevations of the excavation to the preconstruction elevations to ensure that the full excavation extent has been achieved prior to placement of clean soil and restoration.

A structural engineer will be retained by Permapost to evaluate existing foundation conditions immediately prior to construction. This evaluation will document visible cracks or other indications of pre-existing damage. Following construction, the structural engineer will re-evaluate each foundation to ensure that there has been no foundation damage as a result of the construction activities. Permapost will keep these pre- and post-construction foundation inspection records on file; these records will be made available to the property owner upon request.

4.2.2 Restoration Approach

The property owner will be provided with two options for yard restoration:

1. Restore with lawn and mulched bed(s).
2. Restore with the same or in-kind landscaping that was removed.

The property owner will have the opportunity to meet with a landscape architect (LA) to develop the property landscape restoration design during the pre-cleanup planning visit(s). During this

consultation, the LA will present the restoration options to the property owner and the preferred option and configuration will be selected.

Permapost will provide information to the property owner regarding appropriate lawn and vegetation care to support successful establishment of landscaping.

4.3 Health and Safety Procedures

Interim remedial actions will be conducted in accordance with a site-specific health and safety plan. The site-specific health and safety plan will be prepared consistent with Oregon Occupational Safety and Health Administration regulations and Title 29 of the Code of Federal Regulations 1910.120 and 1926.65.

Permapost will retain an excavation contractor that will complete the work in compliance with Oregon Occupational Safety and Health Administration regulations. The contractor will be required to use a crew that has received Hazardous Waste Operations and Emergency Response training.

4.4 Schedule

Depending on review timelines, property owner cooperation, and contractor availability, execution of the interim remedial action is planned to begin in late summer 2024.

If interim remedial actions proceed, design drawings incorporating the property-specific cleanup plan will be submitted for DEQ review at least one week before the plan is submitted to the homeowner.

Permapost will coordinate with the owner to identify a start date for the work. Upon completion of the interim remedial action, technical memoranda incorporating the following items will be submitted to DEQ:

- Descriptions of field activities and observations.
- Survey showing the final lateral and vertical extents of the excavations, finished grade, and landscape components.
- Documentation of the volume of soil removed from property 1 and placed on the Permapost property.
- Copies of laboratory analytical results from import fill.

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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.

Figures

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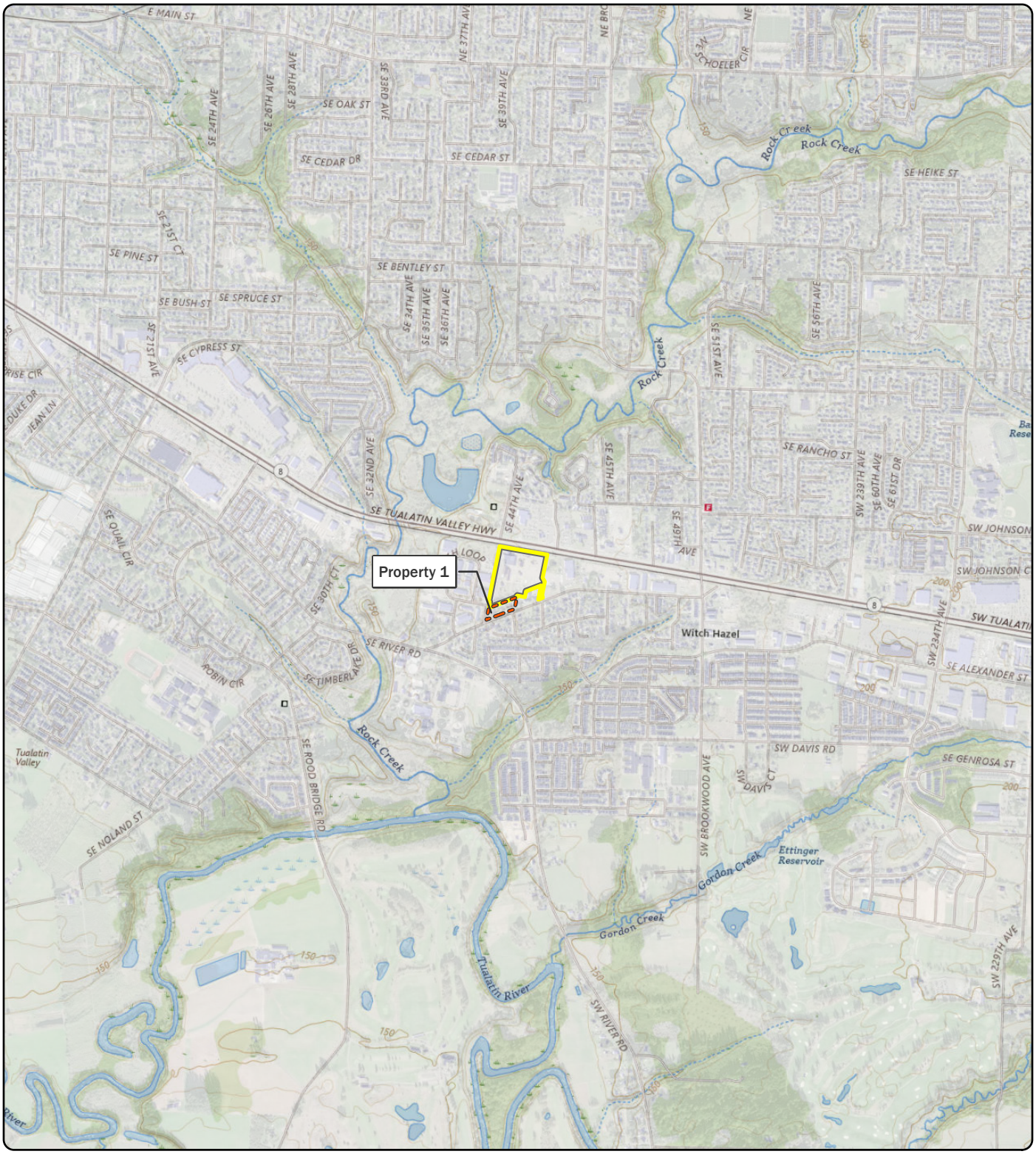

Notes
U.S. Geological Survey 7.5-minute topographic quadrangle (2020): Hillsboro and Scholls.
Township 1 south, range 2 west, section 9.
AOI = area of interest.

Data Source
Property boundary obtained from Oregon Metro.

Legend

- AOI-5 Boundary
- Permapost Property Boundary

Figure 1-1
Vicinity Map

Permapost Products, Inc.
Hillsboro, OR

0 1,000 2,000
Feet

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Print Date: 6/25/2024
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Figure 1-2
Areas of Interest

Permapost Products, Inc.
Hillsboro, OR

Legend

- AOI-1 Terrace
- AOI-2 Aloha Property
- AOI-3 Permapost Property
- AOI-4 Railroad Ditch
- AOI-5 Residential Properties
- RCRA Cap
- Permapost Property Boundary
- Stream
- Tax Lot

Notes
AOI = area of interest.
Permapost = Permapost Products, Inc.
RCRA = Resource Conservation and Recovery Act.

0 200
Feet

Data Sources
Aerial photograph obtained from City of Portland (2022); tax lot data obtained from Oregon Metro (2023).

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Figure 2-1
AOI-5 Sample Locations

Permapost Products, Inc.
Hillsboro, OR

Legend

- 3-Point Composite Sample
- Hand Auger
- Decision Unit A
- Decision Unit B
- Discrete Composite Sampling Area
- Previous Decision Unit
- Historical Encroachment Until 1990
- Existing Berm
- Former Retail Yard Driving Lane
- Study Area
- Permapost Property
- Tax Lot

Notes
AOI = area of interest.
Permapost = Permapost Products, Inc.

0 40
Feet

Data Sources
Aerial photograph obtained from the City of Portland (2022); tax lot data obtained from Oregon Metro (2024).

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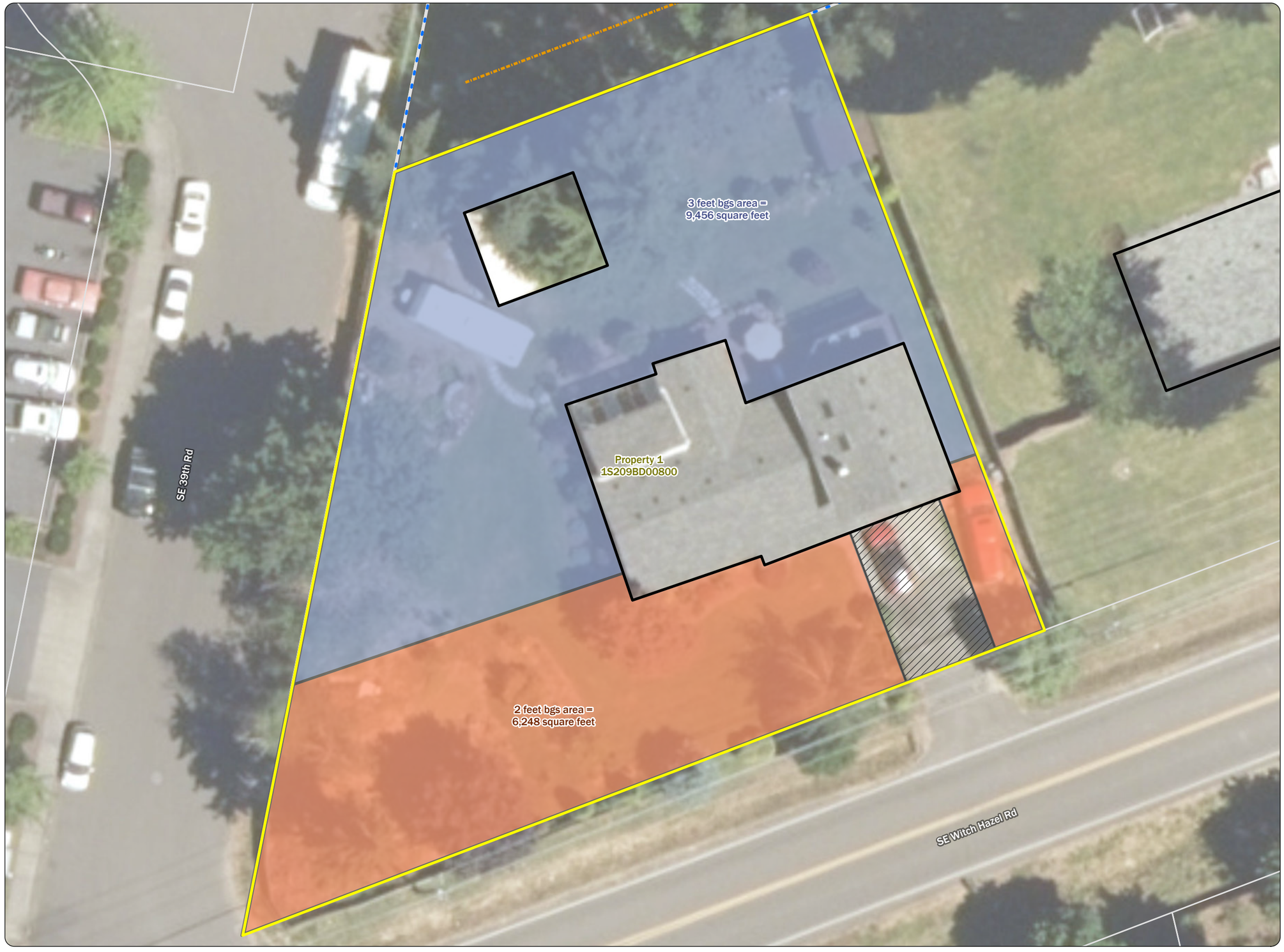

Figure 3-1
Property 1
Remediation Areas

Permapost Products, Inc.
Hillsboro, OR

Legend

Remediation Area

- Remediate to 2 foot bgs
- Remediate to 3 feet bgs
- Existing Berm
- Former Retail Yard Driving Lane
- Building
- Hardscape / Pavement
- Property 1 Tax Lot
- Permapost Property
- Tax Lot

Notes

Square footage inclusive of all areas on the property of a given remediation depth.
bgs = below ground surface.
Permapost = Permapost Products, Inc.

0 20
Feet

Data Sources

Aerial photograph obtained from the City of Portland (2022); tax lot data obtained from Oregon Metro (2024).

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Tables

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Table 3-1
Soil Alternatives Ranking
Permapost Products, Inc.
Hillsboro, Oregon

Alternative	Protectiveness	Effectiveness	Long-Term Reliability	Implementability	Implementation Risk	Total	Meets Treatment Preference for Hot Spots	Cost	
								Total Estimated Cost	Reasonableness of Cost
AOI-5: Residential Properties - Property 1									
Alternative 5.1: No Action	N	0	0	5	5	10	N	$0	0
Alternative 5.2A: Soil Removal, Landfill Disposal, and Backfill to Grade	Y	5	5	5	3.5	18.5	Y	$589,000	3
Alternative 5.2B: Soil Removal, Consolidation on the Permapost Property, and Backfill to Grade	Y	5	4	5	3	17	Y	$268,000	4
Alternative 5.3A: Capping and Landfill Disposal	Y	4	3.5	2	4.5	14	Y	$394,000	2
Alternative 5.3B: Capping and Consolidation on the Permapost Property	Y	4	3	2	4	13	Y	$271,000	3

NOTES:

Recommended Alternative.

Criteria Scoring:

1—Does not satisfy the criterion.

2—Marginally satisfies the criterion.

3—Partially satisfies the criterion.

4—Mostly satisfies the criterion.

5—Completely satisfies the criterion.

N = no.

NA = not applicable.

Y = yes.

Appendix

Cost Estimates

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ENGINEER'S PRELIMINARY OPINION OF PROBABLE COST

Title:	**AOI-5 - Property 1 Alternatives 5.2A/B Costs**	
Project:	Feasibility Study	
Client:	Permapost Products, Inc.	
Project No./Task:	M8012.01.001	Initial
Prepared By:	K. Krippaehne-Stein	KKS
Checked By:		
Date:	6/24/2024	
Revision No.:	0	

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Cost Estimate Summary—AOI-5 Alternative 5.2A

Schedule A—	Mobilization and Site Preparation	$	19,000
Schedule B—	Excavation, Landfill Disposal, and Restoration	$	402,000
Schedule C—	Design and Permitting	$	33,000
Schedule D—	Administrative Costs	$	37,000
Schedule E—	Contingency	$	98,000
	Total:	**$**	**589,000**

Cost Estimate Summary—AOI-5 Alternative 5.2B

Schedule A—	Mobilization and Site Preparation	$	21,000
Schedule B—	Excavation, Consolidation on Permapost Property, and Restoration	$	132,000
Schedule C—	Design and Permitting	$	33,000
Schedule D—	Administrative Costs	$	37,000
Schedule E—	Contingency	$	45,000
	Total:	**$**	**268,000**

Assumptions:

1. Mobilization is 8% of the remediation total minus transportation and disposal at landfill costs.
2. Soil can be disposed of at a Subtitle D landfill.
3. The excavation area is backfilled with topsoil to current grade.
4. Contingency is 20%.

ENGINEER'S PRELIMINARY OPINION OF PROBABLE COST
AOI-5 - Property 1 Alternatives 5.2A Costs
Maul Foster Alongi, Inc.

Schedule A							
Mobilization and Site Preparation		*Quantity*	*Unit*	*Unit Cost*		*Total Cost*	
A.1	Mobilization	1	LS	$	9,370	$	9,370
A.2	Stabilized Construction Entrance	1	LS	$	5,000	$	5,000
A.3	Erosion and Sediment Control	1	LS	$	5,000	$	5,000
				Subtotal Schedule A:		**$**	**19,370**
Schedule B							
Excavation, Landfill Disposal, and Restoration		*Quantity*	*Unit*	*Unit Cost*		*Total Cost*	
B.1	On-Site Excavation and Handling	1,514	BCY	$	12	$	18,170
B.2	Transportation and Disposal at Landfill (Non-Hazardous)	2,271	TON	$	130	$	295,190
B.3	Purchase and Import of Soil Fill	2,271	TON	$	35	$	79,480
B.4	Placement and Compaction of Fill	1,892	LCY	$	5	$	9,470
				Subtotal Schedule B:		**$**	**402,310**
Schedule C							
Design and Permitting		*Quantity*	*Unit*	*Unit Cost*		*Total Cost*	
C.1	Remedial Design	1	LS	$	25,000	$	25,000
C.2	Permitting	1	LS	$	8,000	$	8,000
				Subtotal Schedule C:		**$**	**33,000**
Schedule D							
Administrative Costs		*Quantity*	*Unit*	*Unit Cost*		*Total Cost*	
D.1	Project Management	1	LS	$	12,000	$	12,000
D.2	Construction Management	1	LS	$	25,000	$	25,000
				Subtotal Schedule D:		**$**	**37,000**
Schedule E							
Contingency		*Quantity*	*Unit*	*Unit Cost*		*Total Cost*	
E.1	Contingency	1	LS	$	98,400	$	98,400
				Subtotal Schedule E:		**$**	**98,400**

ENGINEER'S PRELIMINARY OPINION OF PROBABLE COST
AOI-5 - Property 1 Alternatives 5.2B Costs
Maul Foster Alongi, Inc.

Schedule A					
Mobilization and Site Preparation		*Quantity*	*Unit*	*Unit Cost*	*Total Cost*
A.1	Mobilization	1	LS	$ 11,370	$ 11,370
A.2	Stabilized Construction Entrance	1	LS	$ 5,000	$ 5,000
A.3	Erosion and Sediment Control	1	LS	$ 5,000	$ 5,000
				Subtotal Schedule A:	**$ 21,370**

Schedule B					
Excavation, Consolidation on Permapost Prope		*Quantity*	*Unit*	*Unit Cost*	*Total Cost*
B.1	On-Site Excavation and Handling	1,514	BCY	$ 12	$ 18,170
B.2	Transportation to Permapost Property	2,271	TON	$ 3	$ 6,820
B.3	Soil Handling/Consolidation on Permapost Property	1,514	BCY	$ 12	$ 18,170
B.4	Purchase and Import of Soil Fill	2,271	TON	$ 35	$ 79,480
B.5	Placement and Compaction of Fill	1,892	LCY	$ 5	$ 9,470
				Subtotal Schedule B:	**$ 132,110**

Schedule C					
Design and Permitting		*Quantity*	*Unit*	*Unit Cost*	*Total Cost*
C.1	Remedial Design	1	LS	$ 25,000	$ 25,000
C.2	Permitting	1	LS	$ 8,000	$ 8,000
				Subtotal Schedule C:	**$ 33,000**

Schedule D					
Administrative Costs		*Quantity*	*Unit*	*Unit Cost*	*Total Cost*
D.1	Project Management	1	LS	$ 12,000	$ 12,000
D.2	Construction Management	1	LS	$ 25,000	$ 25,000
				Subtotal Schedule D:	**$ 37,000**

Schedule E					
Contingency		*Quantity*	*Unit*	*Unit Cost*	*Total Cost*
E.1	Contingency	1	LS	$ 44,700	$ 44,700
				Subtotal Schedule E:	**$ 44,700**

ENGINEER'S PRELIMINARY OPINION OF PROBABLE COST

Title:	**AOI-5 - Property 1 Alternatives 5.3A/B Costs**	
Project:	Feasibility Study	
Client:	Permapost Products, Inc.	
Project No./Task:	M8012.01.001	Initial
Prepared By:	K. Krippaehne-Stein	KKS
Checked By:		
Date:	6/24/2024	
Revision No.:	0	

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Cost Estimate Summary—AOI-5 Alternative 5.3A

Schedule A—	Mobilization and Site Preparation	$	15,000
Schedule B—	Excavation, Landfill Disposal, and Capping	$	170,000
Schedule C—	Design and Permitting	$	33,000
Schedule D—	Administrative Costs	$	62,000
Schedule E—	Monitoring and Maintenance	$	48,000
Schedule F—	Contingency	$	66,000
	Total:	**$**	**394,000**

Cost Estimate Summary—AOI-5 Alternative 5.3B

Schedule A—	Mobilization and Site Preparation	$	16,000
Schedule B—	Excavation, Consolidation on Permapost Property, and Capping	$	67,000
Schedule C—	Design and Permitting	$	33,000
Schedule D—	Administrative Costs	$	62,000
Schedule E—	Monitoring and Maintenance	$	48,000
Schedule F—	Contingency	$	45,000
	Total:	**$**	**271,000**

Assumptions:

1. Mobilization is 8% of the remediation total minus transportation and disposal at landfill costs.
2. The excavation area is exacavated to 1 foot below ground surface and backfilled to current grade with topsoil.
3. Soil can be disposed of at a Subtitle D landfill.
4. Contingency is 20%.

ENGINEER'S PRELIMINARY OPINION OF PROBABLE COST
AOI-5 - Property 1 Alternatives 5.3A Costs
Maul Foster Alongi, Inc.

Schedule A							
Mobilization and Site Preparation		*Quantity*	*Unit*		*Unit Cost*		*Total Cost*
A.1	Mobilization	1	LS	$	5,360	$	5,360
A.2	Stabilized Construction Entrance	1	LS	$	5,000	$	5,000
A.3	Erosion and Sediment Control	1	LS	$	5,000	$	5,000
				Subtotal Schedule A:		**$**	**15,360**
Schedule B							
Excavation, Landfill Disposal, and Capping		*Quantity*	*Unit*		*Unit Cost*		*Total Cost*
B.1	On-Site Excavation and Handling	582	BCY	$	12	$	6,990
B.2	Transportation and Disposal at Landfill (Non-Hazardous)	873	TON	$	130	$	113,450
B.3	Purchase and Placement of Demarcation Fabric	15,708	SF	$	1	$	15,710
B.4	Purchase and Import of Soil Fill	873	TON	$	35	$	30,550
B.5	Placement and Compaction of Fill	727	LCY	$	5	$	3,640
				Subtotal Schedule B:		**$**	**170,340**
Schedule C							
Design and Permitting		*Quantity*	*Unit*		*Unit Cost*		*Total Cost*
C.1	Remedial Design	1	LS	$	25,000	$	25,000
C.2	Permitting	1	LS	$	8,000	$	8,000
				Subtotal Schedule C:		**$**	**33,000**
Schedule D							
Administrative Costs		*Quantity*	*Unit*		*Unit Cost*		*Total Cost*
D.1	Project Management	1	LS	$	12,000	$	12,000
D.2	Construction Management	1	LS	$	25,000	$	25,000
D.3	Preparation of Environmental Covenant	1	LS	$	10,000	$	10,000
D.4	Preparation of Site Management Plan	1	LS	$	15,000	$	15,000
				Subtotal Schedule D:		**$**	**62,000**
Schedule E							
Monitoring and Maintenance		*Quantity*	*Unit*		*Unit Cost*		*Net Present Value*
E.1	Annual Cap Monitoring	30	YR	$	2,000	$	31,870
E.2	Annual Cap Maintenance	30	YR	$	1,000	$	15,940
				Subtotal Schedule E:		**$**	**47,810**
Schedule F							
Contingency		*Quantity*	*Unit*		*Unit Cost*		*Total Cost*
F.1	Contingency	1	LS	$	65,800	$	65,800
				Subtotal Schedule F:		**$**	**65,800**

ENGINEER'S PRELIMINARY OPINION OF PROBABLE COST
AOI-5 - Property 1 Alternatives 5.3B Costs
Maul Foster Alongi, Inc.

Schedule A							
Mobilization and Site Preparation		*Quantity*	*Unit*		*Unit Cost*		*Total Cost*
A.1	Mobilization	1	LS	$	6,120	$	6,120
A.2	Stabilized Construction Entrance	1	LS	$	5,000	$	5,000
A.3	Erosion and Sediment Control	1	LS	$	5,000	$	5,000
					Subtotal Schedule A:	**$**	**16,120**

Schedule B							
Excavation, Consolidation on Permapost Property		*Quantity*	*Unit*		*Unit Cost*		*Total Cost*
B.1	On-Site Excavation and Handling	582	BCY	$	12	$	6,990
B.2	Transportation to Permapost Property	873	TON	$	3	$	2,620
B.3	Soil Handling/Consolidation on Permapost Property	582	BCY	$	12	$	6,990
B.4	Purchase and Placement of Demarcation Fabric	15,708	SF	$	1	$	15,710
B.5	Purchase and Import of Soil Fill	873	TON	$	35	$	30,550
B.6	Placement and Compaction of Fill	727	LCY	$	5	$	3,640
					Subtotal Schedule B:	**$**	**66,500**

Schedule C							
Design and Permitting		*Quantity*	*Unit*		*Unit Cost*		*Total Cost*
C.1	Remedial Design	1	LS	$	25,000	$	25,000
C.2	Permitting	1	LS	$	8,000	$	8,000
					Subtotal Schedule C:	**$**	**33,000**

Schedule D							
Administrative Costs		*Quantity*	*Unit*		*Unit Cost*		*Total Cost*
D.1	Project Management	1	LS	$	12,000	$	12,000
D.2	Construction Management	1	LS	$	25,000	$	25,000
D.3	Preparation of Environmental Covenant	1	LS	$	10,000	$	10,000
D.4	Preparation of Site Management Plan	1	LS	$	15,000	$	15,000
					Subtotal Schedule D:	**$**	**62,000**

Schedule E							
Monitoring and Maintenance		*Quantity*	*Unit*		*Unit Cost*		*Net Present Value*
E.1	Annual Cap Monitoring	30	YR	$	2,000	$	31,870
E.2	Annual Cap Maintenance	30	YR	$	1,000	$	15,940
					Subtotal Schedule E:	**$**	**47,810**

Schedule F							
Contingency		*Quantity*	*Unit*		*Unit Cost*		*Total Cost*
F.1	Contingency	1	LS	$	45,100	$	45,100
					Subtotal Schedule F:	**$**	**45,100**