



February 12, 2025

Project No. 0228.05.002

Rob Hood
Oregon Department of Environmental Quality
700 NE Multnomah Street, Suite 600
Portland, Oregon 97232

Re: Work Plan for Site Investigation at Union MLK Cardlock, DEQ File No. 26-21-1204

Dear Rob:

This letter presents the revised work plan for the investigation of subsurface conditions associated with the underground storage tank (UST) system at the Union MLK Cardlock located at 8100 NE Martin Luther King Jr. Boulevard in Portland, Oregon (the site). The UST system is active and operated by PetroCard, Inc. (PetroCard). The work plan was originally prepared and submitted to the Department of Environmental Quality (DEQ) by Maul Foster & Alongi, Inc (MFA) in September 2023 as requested by Jim Orr, DEQ, in a July 18, 2023 letter to Ron Beach at PetroCard. The work plan had been revised to address your work plan review comments provided to MFA via email on November 7, 2024.

Background

On December 2 and 3, 2021, BB&A Environmental (BB&A) completed a focused Phase II environmental site assessment (ESA) at the site. BB&A collected soil and groundwater samples from soil borings and monitoring wells for laboratory analysis. MFA staff accompanied BB&A and collected collocated and additional soil samples for laboratory analysis from the borings advanced by BB&A. The laboratory results for the samples collected by MFA together with the BB&A ESA report were provided to the DEQ in MFA's January 21, 2022, Initial (Twenty Day) Report.

The results of the BB&A ESA, tank integrity testing, and exposure assessment indicated that a localized area of soil contamination is present at boring P3 along the east side of the southwest UST cluster and is not the result of an ongoing release. As human exposure to this contamination is unlikely or can be controlled with appropriate health and safety measures if future construction or utility work is planned, PetroCard did not intend to further assess the contamination nor enter into the DEQ's voluntary cleanup program.

Based on review of the BB&A and MFA investigation results, in a letter dated July 18, 2023, DEQ requested a workplan to address the following:

1. Locate all abandoned underground storage tanks and properly decommission them.
2. Sample indoor air and subslab vapors to screen the site for volatile contamination.
3. Evaluate the nature and extent of hydrocarbons in soil and groundwater.

This work plan addresses items 1 and 3 above. Item 2 (indoor air and subslab vapor sampling) is not proposed at this time. The single building on site is used for storage and electrical equipment. PetroCard employees typically occupy the building for less than 30 minutes once a week. As

described below, MFA will assess conditions at monitoring wells KMW-01 and KMW-03 located adjacent to the building. MFA may recommend additional on-site work if warranted based on the KMW-01 and KMW-03 data and current and likely future use of the building.

Regarding item 3, evaluation of the nature and extent of the localized hydrocarbons in soil associated with BB&A boring P3 is not proposed at this time. As described in the January 21, 2022, Initial (Twenty Day) Report, BB&A and MFA collected a soil sample from P3 at a depth of 18 to 19 feet below ground surface (bgs). Gasoline-range hydrocarbons were detected in the BB&A sample at a concentration of 42,400 milligrams per kilogram (mg/kg) and in the MFA sample at a concentration of 16,300 mg/kg (see the BB&A Table 1 and MFA table in the attachments). Benzene, toluene, ethylbenzene, and xylene were also detected in the BB&A and MFA samples, and diesel-range hydrocarbons were detected in the MFA sample.

To assess the vertical extent of contamination at P3, MFA collected a second soil sample at boring P3 at a depth of 32 to 33 feet bgs. Gasoline- and diesel range hydrocarbons, benzene, toluene, and ethylbenzene were not detected. Only xylene was detected in this sample at a concentration much lower than applicable risk-based concentrations (RBCs). In addition, photoionization detector (PID) readings in soil at the boring were elevated (1,624 parts per million) at the 18- to 19-foot depth, corresponding to the depth of the BB&A and MFA soil samples with the RBC exceedances (see the P3 boring log in the attachment). At greater depth, the PID readings quickly decreased by one- to three-orders of magnitude, and the PID reading was only 10 parts per million at the 32- to 33-foot depth of the MFA sample with no RBC exceedances. The PID data together with the MFA sample data delineate the vertical extent of contamination at boring P3 and confirm the contamination does not extend to the water table, precluding the need to sample groundwater at the P3 location.

The BB&A and MFA soil sample results have also delineated the horizontal extent of soil contamination associated with BB&A boring P3. The BB&A site plan in the attachment includes the BB&A sample locations for borings P1 through P13. The corresponding soil sample data from these borings is included on BB&A Table 1 in the attachment. On the site plan, I have highlighted the P3 boring location in yellow, corresponding to the elevated gasoline-range hydrocarbon, benzene, and ethylbenzene concentrations that exceeded one or more RBCs at this location. All remaining BB&A boring locations are highlighted green on the site plan, corresponding to non-detections of hydrocarbons in soil, or detections that are much less than the concentrations at P3 and less than the RBCs, indicating the horizontal extent of contamination is delineated.

Work Plan

The following activities are proposed to locate abandoned underground storage tanks and evaluate the nature and extent of indoor air vapor intrusion RBC exceedances in groundwater.

Abandoned UST Assessment

BB&A identified three possible abandoned USTs at the site. These are shown on the BB&A site plan in the attachment, and include the following:

- One abandoned and presumed diesel or heating oil UST was identified adjacent to the south side of the building on site.
- One likely abandoned former 1,000-gallon gasoline UST was identified south of the presumed diesel or heating oil UST.
- BB&A discovered a 2-inch-diameter metal cap connected to a metal pipe south of the southwest UST cavity. BB&A was able to open the cap and did not notice a petroleum odor. The bottom of

the metal pipe was measured at 10 feet bgs and was empty. BB&A suspected that the metal cap and pipe are associated with an additional former UST.

To confirm the presence of these suspected abandoned USTs, MFA will conduct a ground penetrating radar and magnetometer survey of the suspect UST locations. MFA will also examine any fill ports or other access points to the USTs, if present, including measuring the bottom of the metal pipe and checking for the presence of petroleum hydrocarbons using an oil-water interface probe. If recoverable petroleum product is encountered in the USTs, it will be removed.

Nature and Extent Assessment

The BB&A focused Phase II ESA included groundwater sample collection from two existing monitoring wells (KMW-01 and KMW-02), one temporary monitoring well (TMW-P9), and one soil boring (P8). The locations of these wells and boring are shown on the site plan, and the groundwater data are provided on BB&A Table 2 in the attachment.

- At KMW-01, the diesel concentration exceeded the RBC for groundwater volatilization to indoor air of 1,700 micrograms per liter for commercial buildings.
- At KMW-02, there were no exceedances of the RBCs.
- At TMW-P9, the benzene concentration slightly exceeded the RBC for groundwater volatilization to indoor air of 12 micrograms per liter for commercial buildings.
- At P8, there were no exceedances of the RBCs.

These RBC exceedance locations are highlighted in yellow on the site plan and Table 2 in the attachment. There are no commercial buildings downgradient of KMW-01¹, but the building on site is near KMW-01 and TMW-P9.

To confirm whether diesel and benzene concentrations in groundwater exceed the indoor air RBC near the building, MFA will collect a groundwater sample from KMW-01 and KMW-03. MFA will measure the water level at KMW-01 through KMW-05 monthly beginning in January 2024, and sample KMW-01 and KMW-03 if and when sufficient groundwater is present for sample collection.

During sample collection, groundwater will be purged with a peristaltic pump and new, disposable tubing, using low-flow purging procedures. Periodically, a water quality meter will be used to measure the following groundwater parameters during purging: temperature, pH, specific conductance, dissolved oxygen, oxidation-reduction potential, and turbidity. These parameters will be recorded on the field sampling datasheet. The groundwater samples will be collected after three consecutive groundwater parameter readings indicate that the parameters have stabilized. The samples will be collected directly into laboratory-supplied containers, placed in an iced cooler, and submitted to the laboratory under standard chain-of-custody procedures. The groundwater samples will be analyzed for the following:

- Gasoline-, diesel-, and oil-range petroleum hydrocarbons by methods NWTPH-Gx and NWTPH-Dx.
- Benzene, toluene, ethylbenzene, xylene, and naphthalene by EPA Method 8260D.

¹ The BB&A site plan in the attachment includes a label "Office & Shops" to the north and downgradient of KMW-01. This is an error. There are no buildings at this location, and none are proposed.

Reporting

Following completion of the abandoned tank assessment and nature and extent assessment, MFA will prepare a brief letter report summarizing the results of the site investigation. The report will include the following:

- Description of activities completed.
- Results of the abandoned tank assessment, including confirmation of tank presence/absence, presence/absence of petroleum product, and volume of product removed, if any.
- KMW-01 and KMW-03 groundwater sampling results and comparison of the results to the RBCs for groundwater volatilization to indoor air for commercial buildings.
- Photo log.
- Laboratory report.
- Recommendations for additional work at the site, if warranted, based on the results of site investigation.

Summary

In summary, the site investigation will include the following elements:

- Assessment of the suspected abandoned USTs using ground penetrating radar, a magnetometer survey, and observation of conditions inside the pipe and USTs if present and accessible. Recoverable petroleum product will be removed from the tanks, if encountered.
- Groundwater level monitoring at KMW-01 through KMW-05.
- Groundwater sample collection from KMW-01 and KMW-03.
- Reporting the results to DEQ.

Sincerely,

Maul Foster & Alongi, Inc.

David Weatherby, RG
Principal Geologist

Attachment

BB&A Site Plan, Tables, and Boring Log; MFA Table

cc: Ron Beach, PetroCard.

Attachment

BB&A Site Plan, Tables, and Boring Log; MFA Table

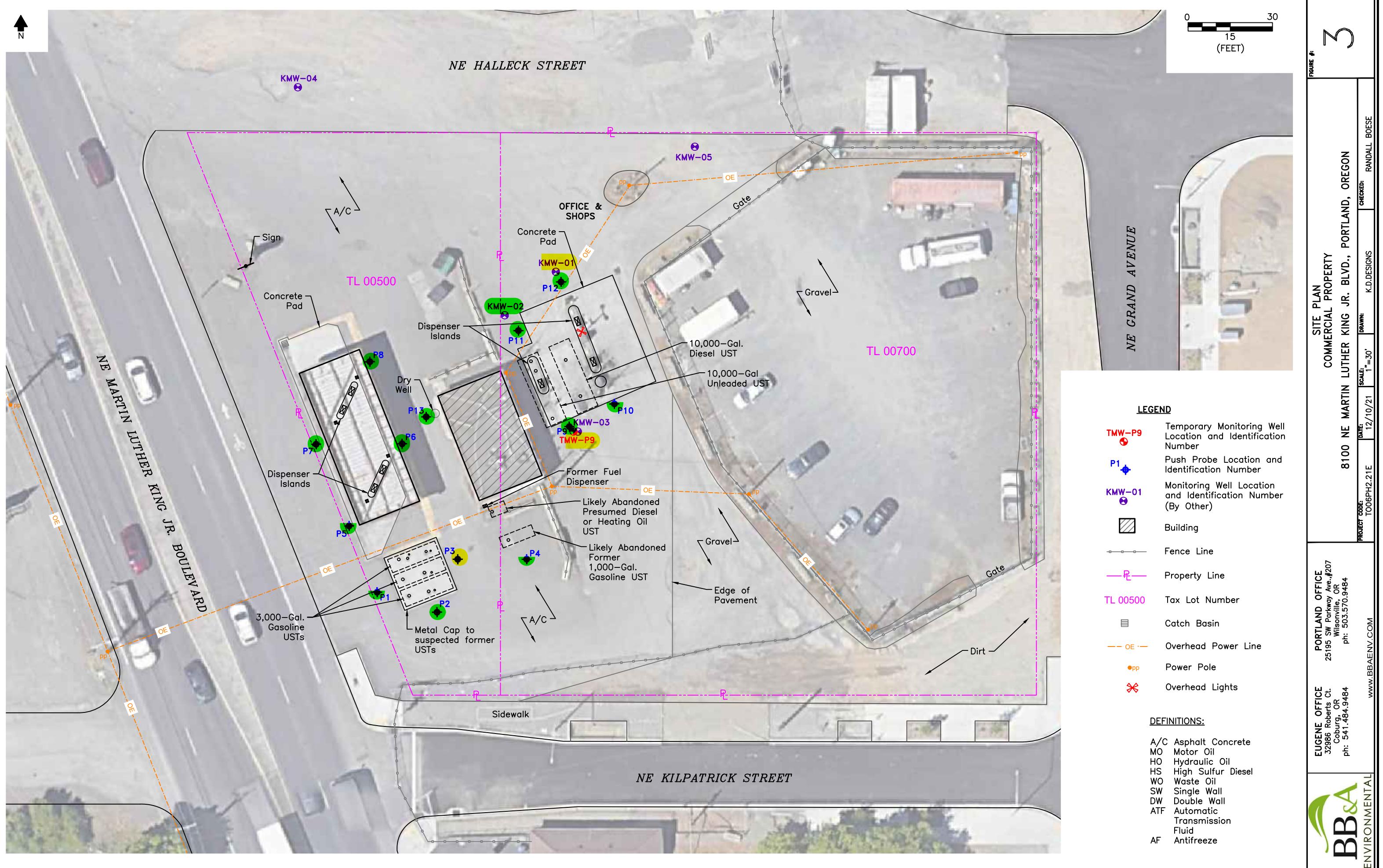


Table 1. Soil Analytical Results

8100 NE MLK Blvd. Portland, OR

UNITS: TPH and BTEX concentrations in milligrams per kilogram (mg/kg), or parts per million (ppm).

>Max: The constituent RBC for this pathway is greater than 100,000 mg/Kg.

>Csat: Soil RBC exceeds three-phase equilibrium partitioning.

NS: No standard

ND: no hydrocarbons detected.

DET: hydrocarbons detected

<0.05 Indicates contaminant was not detected above method-reporting limit.

Shaded where not analyzed

BOLD: Indicates the contaminant was detected above the method-reporting limit**Highlight:** Indicates the contaminant was detected above one or more RBCs.RBCs: Risk-Based Concentration (RBC) for applicable exposure pathways including Soil ingestion, Dermal contact, and Inhalation (RBC_{ss}), Volatilization to Outdoor Air (RBC_{so}) and Vapor Intrusion into Buildings (RBC_{si})

Occ : Occupational receptor scenario CW: Construction Worker receptor scenario EW: Excavation Worker receptor scenario

Note: If gasoline-, diesel-, or oil-range TPH were detected in the HCID analysis, TPH concentrations were quantified with the respective analytical method.

Sample ID Push Probe - Depth Interval	Contaminant							
	HCID	Gasoline- range TPH	Diesel- range TPH	Oil-range TPH	Benzene	Toluene	Ethylbenzene	Xylenes
P1-11'	ND							
P2-8'-9'		27.7	<25.0	141	1.250	0.127	1.130	4.410
P2-12'-13'		16.9	<25.0	<50.0	0.305	<0.0593	0.260	2.330
P3-18'-19'		42,400	<25.0	<50.0	96.4	2,090	730	4,610
P4-7'-8'	DET		<25.0	154				
P5-11'-12'	ND							
P6-11'-12'	ND							
P7-11'-12'	ND							
P8-8'-9'	ND							
P9-14'-15'	DET		<25.0	131				
P10-11-12'	DET		<25.0	205				
P11-14'-15'	DET		<25.0	675				
P12-7'-8'	DET		<25.0	205				
P13-17-18'	ND							
RBC _{ss} - Occ	NS	20,000	14,000	NS	37	88,000 >Csat	150	25,000 >Csat
RBC _{ss} - CW	NS	9,700	4,600	NS	380	28,000 >Csat	1,700 >Csat	20,000 >Csat
RBC _{ss} - EW	NS	>Max	>Max	NS	11,000	770,000 >Csat	49,000 >Csat	560,000 >Csat
RBC _{so}	NS	69,000	>Max	NS	50	>Csat	160	>Csat
RBC _{si}	NS	>Max	>Max	NS	2.1	>Csat	17	>Csat

Table 2. Groundwater Analytical Results

8100 NE MLK Blvd. Portland, OR

All concentrations in parts per billion (ppb) or micrograms per Liter (ug/L).

NS: No standard

>S: This RBC exceeds the solubility limit.

<0.2 : Indicates not detected above method-reporting limit identified.

BOLD: Indicates the contaminant was detected above the method-reporting limit**Highlight:** Indicates the contaminant was detected above one or more RBCs.

Shaded where not analyzed.

RBCs = Occupational Risk-Based Concentration (RBC) for applicable exposure pathways including the volatilization to out door air in an occupational scenario (RBCwo), vapor intrusion into buildings in an occupational scenario (RBCwi),and groundwater in excavation (RBCwe).

GROUNDWATER SAMPLE IDENTIFICATION (Location)	Total Petroleum Hydrocarbons (TPH)			Gasoline-Related Volatile Organic Compounds (VOCs)			
	Gasoline-Range TPH	Diesel-Range TPH	Oil-Range TPH	Benzene	Toluene	Ethylbenzene	Xylenes
P8-H2O	<100	550	331	<0.200	<1.00	<0.500	<1.50
KMW-01-H2O	452	2,810	<162	<0.200	1.12	0.620	2.92
KMW-02-H2O	<100	130	<178	<0.200	<1.00	<0.500	<1.50
TMWP9-H2O	291			18.7	3.00	<0.500	1.53
Risk-Based Concentrations (RBCs) from Appendix A of Oregon DEQ's <i>Risk-Based Decision Making for the Remediation of</i>							
RBCwo	>S	>S	NS	14,000	>S	43,000	>S
RBCwi	>S	>S	NS	280	>S	8,200	>S
RBCwe	14,000	>S	NS	1,800	220,000	4,500	23,000

PROBE LOG

PAGE 1 OF 2

PROBE NO.: P3
 PROJECT CODE: T006PH2.21E
 CADD FILE: T006PH2.21E
 PROJECT: COMMERCIAL PROPERTY
 LOCATION: 8100 NE MARTIN LUTHER KING JR. BLVD.
PORTLAND, OREGON

TOTAL DEPTH: 40'
 SURFACE ELEVATION: _____
 PROBING METHOD: MACRO CORE
 PROBED BY: BB&A ENVIRONMENTAL
 LOGGED BY: MATTHEW LUCZAK
 DATE COMPLETED: 12/02/21

DEPTH (feet)	SAMPLE IDENTIFICATION AND LAB RESULTS	MC RECOVERY	PID	H ₂ O LEVEL	LITHOLOGIC DESCRIPTION	LITHOLOGY	DEPTH (feet)	PROBE ABANDONMENT
0				0.0	- ASPHALT - GRAVEL (GM): fill		0	
		30%		0.0	- LSAND (SM): brown, coarse-fine grained, gravel cobbles at bottom			
				0.0				
				0.0				
5				0.0	- SAND (SM): brown, coarse-fine grained, trace gravel pebbles		5	
		20%		0.0				
				0.0				
				0.0				
10				0.9	- SAND & SILT (SM/ML): brown-gray, fine grained sand		10	
		90%		6.2	- SAND & SILT (SM/ML): brown, fine grained sand			
				57.2	- SAND & SILT (SM/ML): brown-gray, fine grained sand			
				137.6				
				110.4				
15				76.5	- SILT (ML): brown, moist		15	
		80%		896.1	- SAND & SILT (SM/ML): brown-gray, fine grained sand			
				1624	- SAND (SM): brown, medium-fine grained			
				106.2	- SLOUGH			
20				100	- SAND & SILT (SM/ML): brown-gray, fine grained sand		20	
		90%			- SAND (SM): brown-gray, medium-fine grained			
				20	- SAND & SILT (SM/ML): brown-gray, fine grained			
25							25	

LEGEND

BLS Below Land Surface

NOTES: _____

PID Photo Ionization Detector, Units in parts per million (ppm)

EUGENE OFFICE
 32986 Roberts Court Coburg, Oregon 97408
 ph. 541.484.9484 fax. 541.484.4188
PORTLAND OFFICE
 25195 SW Parkway Ave., Suite 207
 Wilsonville, Oregon 97070
 ph. 503.570.9484 fax. 503.570.0384

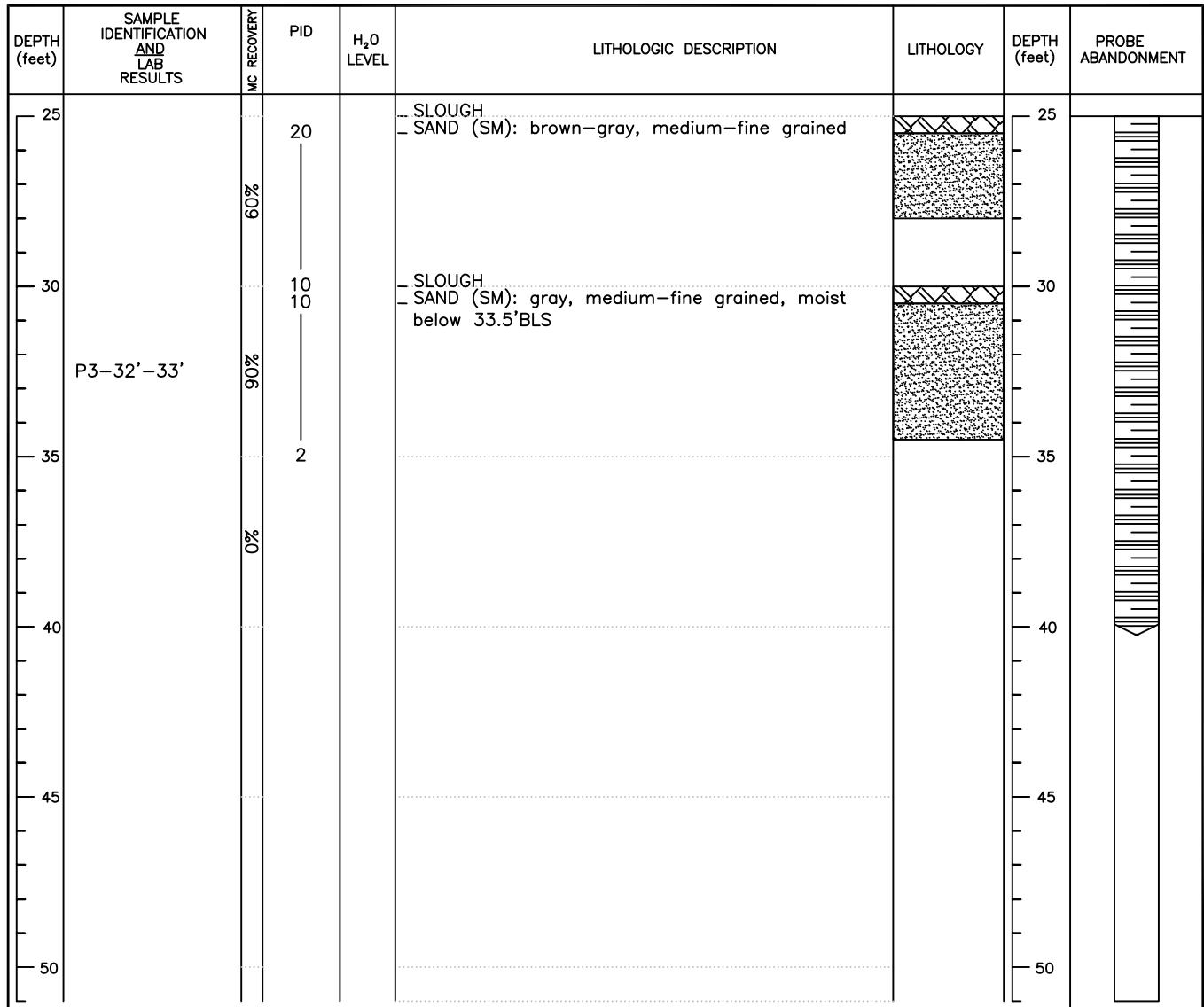


PROBE LOG

PAGE 2 OF 2

PROBE NO.: P3
 PROJECT CODE: T006PH2.21E
 CADD FILE: T006PH2.21E
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 LOCATION: 8100 NE MARTIN LUTHER KING JR. BLVD.
PORTLAND, OREGON

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LEGEND

BLS Below Land Surface

NOTES: _____

PID Photo Ionization Detector, Units in parts per million (ppm)

EUGENE OFFICE
 32986 Roberts Court Coburg, Oregon 97408
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PORTLAND OFFICE
 25195 SW Parkway Ave., Suite 207
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 ph. 503.570.9484 fax. 503.570.0384



Table
Summary of Soil Analytical Results—8100 NE Martin Luther King Jr. Blvd.
PetroCard, Inc.

Location:	RBC, Soil Ingestion, Dermal Contact, and Inhalation ⁽¹⁾			RBC, Soil, Vapor Intrusion into Building ⁽¹⁾	T006-P2		T006-P3		T006-P4	T006-P5	T006-P6	T006-P7	T006-P8	T006-P9	T006-P10
Sample Name:					T006-P2-8-9	T006-P2-12-13	T006-P3-18-19	T006-P3-32-33	T006-P4-7-8	T006-P5-11-12	T006-P6-11-12	T006-P7-11-12	T006-P8-8-9	T006-P9-14-15	T006-P10-11-12
Collection Date:	Occupational	Construction Worker	Excavation Worker	Occupational	12/02/2021	12/02/2021	12/02/2021	12/02/2021	12/02/2021	12/02/2021	12/02/2021	12/02/2021	12/02/2021	12/02/2021	12/02/2021
Collection Depth (ft bgs):		8-9	12-13		18-19	32-33	7-8	11-12	11-12	11-12	8-9	14-15	11-12		
VOCs (mg/kg)															
Benzene	37	380	11,000	2.1	0.368 J	1.41 J	23.1	0.0129 U	0.0131 U	0.0131 U	0.0616	0.0129 U	0.0116 U	0.0114 U	0.012 U
Ethylbenzene	150	1,700	49,000	17	0.0592 U	0.262	620	0.0645 U	0.0657 U	0.0656 U	0.059 U	0.0645 U	0.058 U	0.0569 U	0.0599 U
Toluene	88,000	28,000	770,000	NV	0.20 J	3.32	254	0.0323 U	0.0329 U	0.0328 U	0.0295 U	0.0323 U	0.029 U	0.0285 U	0.030 U
Xylenes, total ^(a)	25,000	20,000	560,000	NV	0.738 J	31.8	1,620	0.129	0.0986 U	0.0983 U	0.0885 U	0.0968 U	0.0871 U	0.0854 U	0.0899 U
TPH (mg/kg)															
Gasoline-Range Hydrocarbons	20,000	9,700	NV	NV	5.92 U	228	16,300	6.45 U	6.57 U	6.56 U	5.9 U	6.45 U	5.8 U	5.69 U	5.99 U
Diesel-Range Hydrocarbons	14,000	4,600	NV	NV	25 U	25 U	116	25 U	25 U	25 U	25 U	25 U	25 U	117 U	25 U
Oil-Range Hydrocarbons	14,000 ^(b)	4,600 ^(b)	NV	NV	114	50 U	50 U	50 U	50 U	118	125	50 U	93.9	538	221

Table
Summary of Soil Analytical Results—8100 NE Martin Luther King Jr. Blvd.
PetroCard, Inc.

Location:	RBC, Soil Ingestion, Dermal Contact, and Inhalation ⁽¹⁾			RBC, Soil, Vapor Intrusion into Building ⁽¹⁾	T006-P11	T006-P12	T006-P13
Sample Name:				T006-P11-14-15	T006-P12-7-8	T006-P13-17-18	
Collection Date:	Occupational	Construction Worker	Excavation Worker	Occupational	12/02/2021	12/02/2021	12/02/2021
Collection Depth (ft bgs):					14-15	7-8	17-18
VOCs (mg/kg)							
Benzene	37	380	11,000	2.1	0.0111 U	0.0115 U	0.0113 U
Ethylbenzene	150	1,700	49,000	17	0.0555 U	0.0577 U	0.0565 U
Toluene	88,000	28,000	770,000	NV	0.0278 U	0.0289 U	0.0283 U
Xylenes, total ^(a)	25,000	20,000	560,000	NV	0.0833 U	0.134	0.0848 U
TPH (mg/kg)							
Gasoline-Range Hydrocarbons	20,000	9,700	NV	NV	5.55 U	5.77 U	5.65 U
Diesel-Range Hydrocarbons	14,000	4,600	NV	NV	47.8 U	25 U	25 U
Oil-Range Hydrocarbons	14,000 ^(b)	4,600 ^(b)	NV	NV	313	162	50 U

Table
**Summary of Soil Analytical Results—8100 NE Martin Luther King Jr. Blvd.
PetroCard, Inc.**

NOTES:

Shading (color key below) indicates values that exceed screening criteria; non-detects ("U") were not compared with screening criteria.

RBC, soil ingestion, dermal contact, and inhalation, occupational

RBC, soil ingestion, dermal contact, and inhalation, construction worker

RBC, soil, vapor intrusion into building, occupational

ft bgs = feet below ground surface.

J = result is estimated.

mg/kg = milligrams per kilogram.

NV = no value.

RBC = risk-based concentration.

TPH = total petroleum hydrocarbons.

U = result is non-detect to method reporting limit.

VOC = volatile organic compounds.

^(a)Total xylenes are reported by the laboratory.

^(b)Value is for generic diesel/heating oil, since generic residual-range hydrocarbon values are not available.

REFERENCE:

⁽¹⁾Oregon Department of Environmental Quality. Table of risk-based concentrations for individual chemicals. May 2018.