State of Oregon
Department of Environmental Quality Memorandum

Date: July 24, 2023

To: FILE

Through: Bruce Scherzinger, Lead Worker
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From: Ellen Woods, Project Manager
Western Region

Subject: Rhine Property, LUST #22-22-0282; Staff Memorandum in support of a No Further Action determination

This document presents the basis for the Oregon Department of Environmental Quality's (DEQ's) recommended No Further Action (NFA) determination for the Rhine Property, in Albany. As discussed in this report, contaminant concentrations in soils and groundwater are below acceptable risk levels.

The proposed NFA determination meets the requirements of Oregon Administrative Rules Chapter 340, Division 122, Sections 0205 to 0360.

The proposal is based on information documented in the administrative record for this site. A copy of the administrative record index is presented at the end of this report.

1. BACKGROUND

Site location.
The site's location can be described as follows:

- Address: 37545 Century Drive, Albany, Linn County, Oregon.
- Latitude 44.6674 N, -123.0568 W
- Linn County map and tax lot 10S03W280001601, located in Township 10 South, Range 3 West, Section 28

Site setting.
The site is located in a rural area of Albany, just east of Interstate Highway 5 (Figure 1). The site is approximately 0.76 acres that includes three structures on the northern half of the property: a former gas station building, a former restroom building and a building associated with spray foam production that formerly housed pump islands. A water supply well located in the northwest corner of the site, adjacent to the former gas station building, provides water to the site. The current features of the site are depicted in Figure 2.

The site is in a rural development zone and is zoned by Linn County as Freeway Interchange Commercial (FIC). Land uses permitted under FIC zoning are intended to serve motorists from the interstate and rural community residents. Examples of use may include but are not limited to, service stations, restaurants, and convenience stores.

The property immediately north of the site is also zoned FIC and includes a cannabis shop and RV repair shop. The site is otherwise surrounded by I-5 to the east and agricultural fields (zoned Exclusive Farm Use [EFU]) to the south and west.

Physical setting.
The topography of the site is generally flat and the site lies within the Missoula Flood deposit area of the Willamette Valley. The well log for the onsite well indicates that subsurface geology consists of clay down to 70 feet below ground surface (bgs) which is underlain by a layer of soft sandstone from 70 feet bgs to 145 feet bgs and clay from 145 feet bgs to 185 feet bgs. Subsurface geology encountered during site investigation activities showed native soils consisting of beige and gray clay with some rounded gravels down to 9 feet bgs.

Shallow groundwater at the site is estimated to flow to the west-northwest towards the Willamette River. Groundwater was only encountered during the excavation of one of the former gasoline underground storage tanks (USTs) at 7 feet bgs. Groundwater was otherwise not encountered during soil excavation or sampling activities. Static water levels at the site and in the vicinity are likely 20 feet to more than 40 feet below ground surface.[1] The well log for the onsite well indicates that "most water" was encountered at 75 feet to 145 bgs and an estimated static water level of 40 feet bgs.

Site history.
The site is a former gasoline and service station that was constructed in 1960. The site had two 4,000-gallon gasoline USTs and one 500-gallon used oil UST. The site was utilized for a spray foam installation business in the 1980s. After this change in use, the perimeter of the covered fuel pump island was walled in with empty steel drums that were stacked and attached to each other with spray foam insulation. <u>This report does not address any contamination or risk from materials or chemicals used during historical spray foam operations at the site.</u> This report only addresses the petroleum release associated with the former gas station operation.

The site and building have not been in use since around 2008-2009, other than for storage purposes. A third party is interested in purchasing the property and the new owner has plans to continue occupational use of the site into the future.

2. BENEFICIAL LAND AND WATER USE DETERMINATIONS

Land use.
The site is in a rural area of Albany and is zoned by Linn County as Freeway Interchange Commercial (FIC). Land uses permitted under FIC zoning are intended to serve motorists from

[1] United States Geological Survey (USGS) National Water Information System (NWIS) website (https://maps.waterdata.usgs.gov)

the interstate and rural community residents. Examples of use may include but are not limited to, service stations, restaurants, and convenience stores. It is expected that land use at the site and surrounding properties will remain the same in the future.

Groundwater use.
Current and reasonably likely future beneficial uses of groundwater at the site and in the vicinity include drinking water wells for residential, commercial and irrigation purposes. There is no public water supply available for the site or the vicinity. A search of Oregon Water Resources Department well logs identified three water supply wells within 0.25 miles of the site, including the well on the subject site. The two offsite wells were completed to depth of 86 feet and 395 feet bgs and static water levels were recorded as 30 feet and 55 feet bgs, respectively.

The well log for the onsite well indicates the type of work for the well was "New Well" and "Abandon". This suggests that installation of the well was attempted but it was not developed, screened, or sealed and was abandoned. However, the dates and owner listed on the well log match with property records and this was the only log found that referenced the site. The well is located on the property near the former restroom building. The well was drilled down to a depth of 185 feet bgs, according to the well log.

Surface water use.
There are no surface water bodies at the site. The nearest surface water body is Murder Creek, located approximately 800 feet south of the site. The next nearest surface water is a pond located at Willamette Memorial Park Cemetery, approximately 0.35 miles southwest of the site. The Willamette River is approximately 1 mile away from the site to the southwest.

3. INVESTIGATION AND CLEANUP WORK

Two gasoline USTs and one waste oil UST were decommissioned by removal at the site in 1989. It is suspected that the tanks were removed at the same time additional tanks were removed from the property immediately north of the site (37575 Century Drive); it is known that the site and the adjacent property to the north had the same owner at the time the tanks were decommissioned and both properties were used as gas station at one point in time. A UST decommissioning report and associated data for the subject site were not submitted to DEQ at the time of decommissioning, however, eyewitness reports of the tank removal at both properties support that the tanks at the subject site were removed in 1989.

A ground penetrating radar survey was conducted in February 2022 to identify the locations of the former tanks and associated infrastructure. No USTs were located on site; however, the survey indicated the presence of three former tank locations. Two former tank areas (UST1 and UST2) were located next to the former pump island and are likely associated with the former gasoline USTs. The third former tank area is likely associated with the former waste oil tank and was located next to the former station building. The former UST fuel piping was located along the south side of the former pump island structure through a utility locate.

In July 2022, a site investigation was conducted to assess subsurface impacts from the former USTs. The former tank areas were excavated to the presumed depth of each tank and six soil samples (two samples for each tank) were collected from native soils below the disturbed excavation surfaces. Soil along the former UST piping was excavated down to native soils at approximately 3 feet bgs and two soil samples were collected. Two soil samples were collected inside the former pump island structure with a hand auger due to spatial constraints inside the structure.

Lab results showed that soils in the area of UST1 were contaminated, with a concentration of gasoline observed at approximately 8 feet bgs. Gasoline was also detected along the former piping, in addition to naphthalene and 1,2,4-trimethylbenzene. Total petroleum hydrocarbons (TPH) and associated constituents were not detected in any soil samples from the former waste oil tank excavation at 6 feet bgs. Arsenic, barium, chromium and lead were detected in this area but at concentrations below unacceptable risk levels and naturally occurring background levels.

Groundwater was only encountered at the site when groundwater entered the excavation area of UST1 and pooled at the 7 feet bgs level in the excavation. Due to the subsurface geology of the site and the angular gabion rock used to previously backfill the excavation, the groundwater that entered the excavation was likely perched and does not represent a viable aquifer for beneficial uses. The groundwater that entered the excavation did not have a detectable sheen or odor. A groundwater sample was collected from the excavation and had detections of gasoline (1,340 micrograms per liter [µg/L]) and several volatile organic compounds (VOCs) at various concentrations: benzene at 1.65 µg/L, toluene at 1.40 µg/L, ethylbenzene at 15.1 µg/L, total xylenes at 17.6 µg/L, naphthalene at 3.59 µg/L, isopropylbenzene at 3.18 µg/L, 1,2,4-trimethylbenzene at 30.4 µg/L and 1,3,5-trimethylbenzene at 10.0 µg/L.

The onsite well was sampled on February 17, 2023, to assess potential impacts from contamination at the site. The well has not seen recent consistent use and was purged for approximately 15 minutes before the sample was collected. Groundwater from the well was sampled prior to any treatment connections. Gasoline was detected as present in the sample via the Northwest TPH Identification method; however, a quantifiable concentration of gasoline was not detected via subsequent analysis. Concentrations of VOCs and polycyclic aromatic hydrocarbons (PAHs) were also not detected. Relatively low concentrations of arsenic, barium and lead were detected in groundwater from the well.

Nature and extent of contamination.
The contaminants of interest in soil and groundwater include:

- TPH as gasoline, diesel and heavy oil
- VOCs
- PAHs
- Metals

Residual soil contamination at the site was observed at depths ranging from 3 feet bgs to 8 feet bgs and is horizontally limited to the area of former UST1 and product lines. Shallow groundwater was only encountered at 7 feet bgs in the excavation area of UST1, located along

the southwest wall of the building with the former pump island. This groundwater was likely perched, due to the former excavation fill material and subsurface geology at the site. Groundwater was otherwise not encountered at the site. Residual soil contamination does not appear to have impacted the onsite well, due to the lack of detections for TPH and associated constituents and relatively low detections of metals.

4. RISK EVALUATION

Conceptual site model.
Evaluating human exposure to residual chemical contamination requires an assessment of the type and extent of that exposure. This is based on current and reasonably likely future site use. DEQ publishes risk-based concentrations (RBCs) for contaminants commonly encountered, for different types of exposure scenarios. These RBCs are conservative estimates of protective levels of contaminants in soil, groundwater and air. Table 1 shows potential exposure pathways and receptors for this site. Based on this, applicable RBCs are identified and used for risk screening.

Pathways by which soil contamination at the site could reach human receptors include:

- Soil ingestion, dermal contact, and inhalation for occupational receptors
- Soil ingestion, dermal contact, and inhalation for future construction and excavation worker receptors
- Volatilization to outdoor air for occupational receptors
- Vapor intrusion into buildings for occupational receptors
- Leaching to groundwater for occupational receptors

Pathways by which groundwater contamination at the site could reach human receptors include:

- Ingestion and inhalation from tap water for occupational receptors
- Volatilization to outdoor air for occupational receptors
- Vapor intrusion into buildings for occupational receptors
- Groundwater in excavations for future construction and excavation workers

Contaminant concentrations.
Analytical results for soil and groundwater are presented in Table 2. The highest concentration of contamination remaining in shallow soils onsite is 89.2 milligrams per kilogram (mg/Kg) gasoline at 3 feet bgs along the former product lines. This concentration is below the RBC for soil ingestion, dermal contact, and inhalation for occupational receptors (20,000 mg/Kg). Naphthalene was detected at a concentration of 0.486 mg/Kg in the same area. This concentration exceeds the RBC for contamination leaching from soil to groundwater for occupational receptors (0.34 mg/Kg). Deeper soil contamination was observed in excavation of UST1 at 8 feet bgs, where gasoline was detected at 14.8 mg/Kg. This concentration is below RBCs for soil ingestion, dermal contact, and inhalation for construction and excavation workers (9,700 mg/Kg and >Max[2], respectively), in addition to other applicable RBCs.

[2] The constituent RBC for this pathway is calculated as great than 1,000,000 mg/Kg. Therefore, this substance is deemed not to pose risks in this scenario.

TPH and associated constituents were not detected in any soil samples from the former waste oil tank excavation; however, detections of arsenic (3.9 mg/Kg), barium (258.0 mg/Kg), chromium (33.9 mg/Kg) and lead (11.9 mg/Kg were observed at approximately 6 feet bgs. All observed concentrations of metals in soil are below background levels expected in the South Willamette Valley and are below applicable RBCs.

Shallow groundwater was not encountered at the site, except for water that entered the UST1 excavation area at 7 feet bgs. A groundwater sample collected from this water was noted to be very turbid. Gasoline was detected in the same sample at 1,340 µg/L, which exceeds the RBC for ingestion and inhalation from tap water for occupational receptors (450 µg/L). Ethylbenzene and naphthalene were detected at concentrations 15.1 µg/L and 3.59 µg/L, respectively, and exceeded the ingestion and inhalation from tap water RBCs for occupational receptors (0.38 µg/L and 0.72 µg/L, respectively). Other various VOCs were detected in this sample but at concentrations that were below applicable RBCs.

The onsite well was sampled due to the contaminant concentrations that exceeded RBCs in soil and groundwater. Contaminant concentrations in a sample from the well were all below occupational ingestion and inhalation from tap water RBCs and indicate acceptable risk to occupational receptors at the site.

Metals detected in the well sample were also below ingestion and inhalation from tap water RBCs, with the exception of arsenic. A slightly elevated concentration of arsenic was detected in the onsite water well at 11.8 µg/L, which is above the occupational RBC for ingestion an inhalation from tap water (0.31 µg/L) and EPA's Maximum Contaminant Level (10 ug/L). Arsenic naturally occurs in the environment, and it is not considered a contaminant of concern for the petroleum release at the site. Arsenic has been identified above the Maximum Contaminant Level of 10 ug/L in Linn County wells and much of the Willamette Basin, which is related to naturally occurring arsenic in local bedrock of the Cascade volcanic province (Hinkle and Pollette, 1999). The groundwater sample was collected before the water passed through any treatment system at the well, and a more accurate representation of arsenic present in drinking water could be obtained by collecting a sample after the water passes through a treatment system.

Human health risk.
The highest concentrations of contaminants observed in shallow and deeper soils onsite are below RBCs for soil ingestion, dermal contact, and inhalation for occupational, construction and excavation worker receptors, and therefore, there is no unacceptable risk to current and future workers at the site. Additionally, no applicable RBCs were exceeded for construction or excavation workers who may come into contact with contaminated soil and groundwater in the future.

Laboratory results for soil and groundwater samples suggested potential unacceptable risk to users of the onsite water well. The February 2023 sampling event showed no impacts and there is acceptable risk to occupational receptors that currently use the well or are likely to in the future. DEQ suggests that the onsite well be sampled at least once within the first 3 months of regular use, since well has not been active in some time.

DEQ contacted Oregon Health Authority (OHA) and Linn County Department of Health Services (DHS) regarding the elevated concentration of arsenic in the onsite well that exceeds EPA's arsenic MCL. OHA stated that the agency does not have the authority to require a treatment system for the well since it is not currently considered a public water supply (i.e., there are less than three service connections from the well and less than 10 people using the well) (Email communication with OHA, June 16, 2023). If the well were to be classified as a public water supply in the future, OHA stated that EPA's arsenic MCL does not apply to Oregon Very Small Water Systems[3] or Transient Non-Community Water Systems[4] due to the anticipated short exposure times to the water (Email communication with OHA, July 5, 2023). Linn County DHS stated that any future uses or improvements of the well that would classify it as a public water supply would be assessed via a water system survey at the time the future use is proposed (Email and phone communication with Linn County DHS, July 5, 2023). Regardless, DEQ recommends that a treatment system for arsenic reduction be installed to minimize human ingestion of arsenic in groundwater now and in the future.

Ecological risk.
There are no surface water bodies at the site and shallow groundwater was not encountered at the site except for perched groundwater that entered the UST1 excavation. Significant groundwater contamination was not observed at the site and the potential for contaminated groundwater to impact offsite surface water bodies is low. Additionally, there is no terrestrial habitat at the site and there is not expected to be in the future. Contaminated soils have been delineated to be limited to the site. Thus, there is acceptable ecological risk at the site.

5. RECOMMENDATION

Following the removal of contamination and based on sample results for soil and groundwater, unacceptable risk levels are not exceeded, and a No Further Action determination is recommended for this site. The No Further Action determination should be recorded in DEQ's leaking underground storage tank database (LUST No. 22-22-0282). This recommendation does not address any contamination or risk from materials or chemicals used during historical spray foam operations at the site. This report only addresses the petroleum release associated with the former gas station operation.

6. ADMINISTRATIVE RECORD

Underground Storage Tank Site Investigation – 37545 Century Drive, Albany, OR, NWFF Environmental, September 18, 2022.

[3] Water systems serving 4 to 14 service connections and commercial or public premises used by 10 to 24 people at least 60 days per year. From: https://www.oregon.gov/oha/PH/HEALTHYENVIRONMENTS/DRINKINGWATER/RULES/Documents/sys-type.pdf (OHA Drinking Water Services, November 2022).
[4] A public water system that provides water in a place such as a gas station or campground where people do not remain for long periods of time. From: https://www.epa.gov/dwreginfo/information-about-public-water-systems (EPA, November 2022).

Well Water Sampling Summary Report (V1) - 37545 Century Drive, Albany, OR, NWFF Environmental, May 4, 2023.

7. OTHER REFERENCES

Arsenic in Ground Water of the Willamette Basin, Oregon, Stephen R. Hinkle and Danial J. Polette, U.S. Geological Survey, 1999. Accessed from https://ir.library.oregonstate.edu/downloads/0r967787s

Email communication with OHA, June 16, 2023. Available at https://www.deq.state.or.us/WebDocs/Controls/Output/PdfHandler.ashx?p=3f9014c6-dc32-4e37-a703-d76575beaee4pdf&s=2023-06-16_EmailCommunicationOHA.pdf

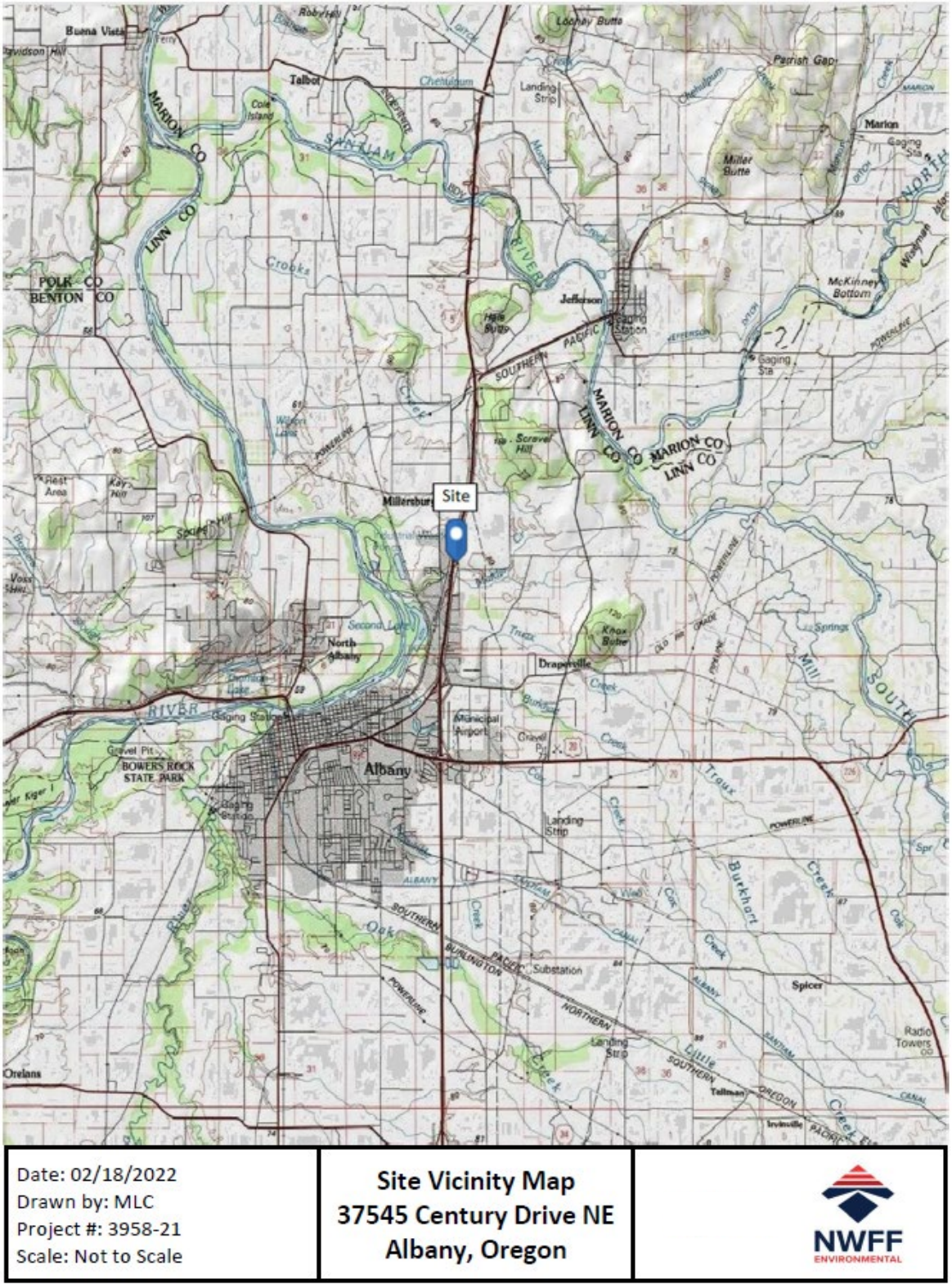
Email communication with OHA, July 5, 2023. Available at https://www.deq.state.or.us/WebDocs/Controls/Output/PdfHandler.ashx?p=0cf7dfe4-910e-4802-bd67-30942b1ebc65pdf&s=2023-07-05_EmailCommunicationOHA.pdf

Email communication with Linn County DHS, July 5, 2023. Available at https://www.deq.state.or.us/WebDocs/Controls/Output/PdfHandler.ashx?p=2be523ec-3b0e-4353-8e0f-18b809dc3794pdf&s=2023-07-05_EmailCommunicationLinnCountyDHS.pdf

8. ATTACHMENTS

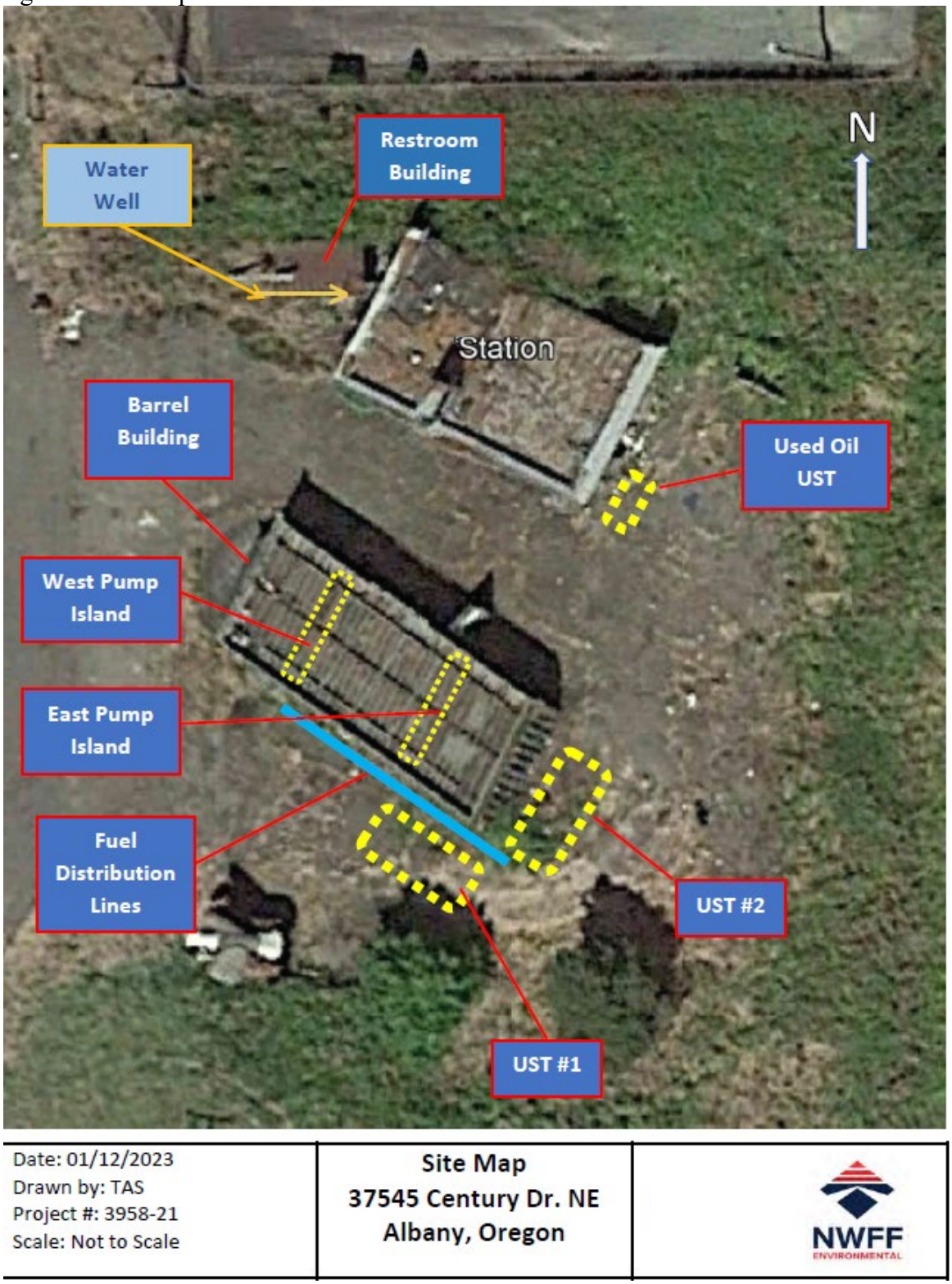
Figure 1. Vicinity map
Figure 2. Site map
Table 1. Identification of applicable RBCs, based on pertinent pathways and receptors
Table 2. UST investigation soil and groundwater analytical results
Table 3. Groundwater analytical results from onsite well

Figure 1. Vicinity map



From *Underground Storage Tank Site Investigation – 37545 Century Drive, Albany, OR*, NWFF Environmental, September 18, 2022.

Figure 2. Site map



Modified from *Site Map*, NWFF Environmental, January 12, 2023.

Table 1. Identification of applicable RBCs, based on pertinent pathways and receptors

	Pathway	Receptor	Is Pathway Complete?	Is RBC Exceeded?	Comments
Soil	Ingestion, Dermal Contact and Inhalation	Residential	No	N/A	See note 1.
		Urban Residential	No	N/A	
		Occupational	**Yes**	No	
		Construction Worker	**Yes**	No	
		Excavation Worker	**Yes**	No	
	Volatilization to Outdoor Air	Residential	No	N/A	
		Urban Residential	No	N/A	
		Occupational	**Yes**	No	
	Vapor Intrusion Into Buildings	Residential	No	N/A	
		Urban Residential	No	N/A	
		Occupational	**Yes**	No	
	Leaching to Groundwater	Residential	No	N/A	
		Urban Residential	No	N/A	
		Occupational	**Yes**	**Yes**	See note 2.
Groundwater	Ingestion & Inhalation From Tap Water	Residential	No	N/A	
		Urban Residential	No	N/A	
		Occupational	**Yes**	No	See note 3.
	Volatilization to Outdoor Air	Residential	No	N/A	
		Urban Residential	No	N/A	
		Occupational	**Yes**	No	
	Vapor Intrusion Into Buildings	Residential	No	N/A	
		Urban Residential	No	N/A	
		Occupational	**Yes**	No	
	Groundwater in Excavation	Construction/Excavation Worker	**Yes**	No	

Notes:

1. Use of the site is currently occupational. Occupational use of the site is expected into the foreseeable future.
2. Groundwater at the site was sampled and analyzed to assess potential impacts.
3. Although soil-leaching to groundwater and groundwater-ingestion and inhalation from tap water RBCs were exceeded in soil near the former product lines and groundwater in the UST1 excavation, results from sampling the onsite well were below groundwater ingestion and inhalation from tap water RBCs.
4. Complete exposure pathways with an exceedance of an RBC are highlighted.

Table 2. UST investigation soil and groundwater analytical results

Sample ID	UO-E6	UO-W6	UST1-W8	UST1-E8	PI-W	PI-E	DEQ Limit Migration to Ground Water
Description	soil	soil	soil	soil	soil	soil	
PID Reading (ppm)	*0.0*	*0.0*	*5.9*	*0.0*	*0.2*	*0.1*	
ANALYTE	**Hydrocarbon Indentification (HCID)**						*mg/kg*
GRO	ND	ND	ND	ND	ND	ND	--
DRO	ND	ND	ND	ND	ND	ND	--
RRO	ND	ND	ND	ND	ND	ND	--
ANALYTE	**Petroleum Fractions (AK 101, 102, & 103)**						*mg/kg*
GRO	6.98U	7.01U	14.8	7.93U	6.43U	5.63U	*130*
DRO	27.0U	25.7U	nt	nt	nt	nt	--
RRO	54.0U	51.4U	nt	nt	nt	nt	--
ANALYTE	**Volatile Fuels Method SW8021B**						*mg/kg*
Benzene	0.0140U	0.0140U	0.0139U	0.0159U	0.029U	0.0113U	*0.1*
Toluene	0.0698U	0.0701U	0.0696U	0.0793U	0.0643U	0.0563U	*490*
Ethylbenzene	0.0349U	0.0351U	0.0348U	0.0396U	0.0322U	0.0281U	*0.9*
Total Xylenes	0.0349U	0.0701U	0.104U	0.119U	0.0965U	0.0844U	*100*
Methyl tert-butyl ether (MTBE)	0.0698U	0.0701U	0.0696U	0.0793U	0.0643U	0.0563U	*0.54*
Naphthalene	0.140U	0.140U	0.139U	0.159U	0.129U	0.113U	*0.34*
1,2-Dibromromethane (EDB)	0.0698U	0.0701U	0.0696U	0.0793U	0.0643U	0.0563U	*0.00056*
1,2-Dichloroethane (EDC)	0.0349U	0.0351U	0.0348U	0.0396U	0.0322U	0.0281U	*0.013*
Isopropylbenzene	0.0698U	0.0701U	0.0696U	0.0793U	0.0643U	0.0563U	--
1,2,4-Trimethylbenzene	0.349U	0.0701U	0.0696U	0.0793U	0.0643U	0.0563U	*48*
1,3,5-Trimethylbenzene	0.0698U	0.0701U	0.0696U	0.0793U	0.0643U	0.0563U	*53*
ANALYTE	**Polynuclear Aromatics (PAHs)**						*mg/kg*
All SVOC analytes	ND						
ANALYTE	**RCRA Metals**						*mg/L*
Arsenic (As)	2.86	3.9	nt	nt	nt	nt	*5.0*
Barium (Ba)	258.0	198	nt	nt	nt	nt	*100.0*
Cadmium (Cd)	0.283U	0.270U	nt	nt	nt	nt	*1.0*
Chromium (Cr)	21.3	33.9	nt	nt	nt	nt	*5.0*
Lead (Pb)	11.9/ND	10.3/ND	nt	nt	nt	nt	*5.0*
Mercuiry (Hg)	0.113U	0.108U	nt	nt	nt	nt	*0.2*
Selenium (Se)	1.42U	1.35U	nt	nt	nt	nt	*1.0*
Silver (Ag)	0.283U	0.270U	nt	nt	nt	nt	*5.0*

Notes:	
xx.xU	*Analyte not detected at the listed Laboratory Limit of Quantitation (LOQ)*
xx.xJ	*Analyte value is estimated*
*xx.xU**	Analyte ND @ LOQ, dilution factor caused Detection Limit @ > cleanup level
xx.x	*Analyte detected in concentraion below* ***DEQ risk-based concentrations***
BOLD	*Analyte detected in concentraion exceeding* ***DEQ risk-based concentrations***
D	*Duplicated sample*
nt	*not tested*
xx.x/ND	*RCRA Total Metals / RCRA Toxic Characteristic Leaching Potential result*
ADEC Limit	*Cleanup levels from 18AAC75 (10/27/2018), Soils-Table B2, Over 40 Inch Zone or Migration to Groundwater. Water cleanup levels are from Table C.*

Modified from *Underground Storage Tank Site Investigation – 37545 Century Drive, Albany, OR*, NWFF Environmental, September 18, 2022.

Table 2 (continued). UST investigation soil and groundwater analytical results

Sample ID	PL-W3	PL-E3	UST2-S8	UST2-N8	DUP-1	UST1-H20	DEQ Limit Soil *Migration to Ground Water*
Description	soil	soil	soil	soil	soil	water	
PID Reading (ppm)	*1.2*	*0.0*	*2.1*	*5.0*	*2.1*	nt	
ANALYTE	**Hydrocarbon Identification (HCID)**						*mg/kg*
GRO	>24.2	ND	ND	ND	ND	ND	--
DRO	ND	ND	ND	ND	ND	ND	--
RRO	ND	ND	ND	ND	ND	ND	--
ANALYTE	**Petroleum Fractions (AK 101, 102, & 103)**						*mg/kg*
GRO	89.2	7.45U	7.01U	11.5U	7.21U	1.34	*130*
DRO	nt	nt	nt	nt	nt	ND	--
RRO	nt	nt	nt	nt	nt	ND	--
ANALYTE	**Volatile Fuels Method SW8021B**						*mg/kg*
Benzene	0.0117U	0.0149U	0.0140U	0.0231U	0.144U	1.65	*0.1*
Toluene	0.0587U	0.0745U	0.0701U	0.115U	0.0721U	1.40	*490*
Ethylbenzene	0.0294U	0.0372U	0.0351U	0.0577U	0.0361U	15.1	*0.9*
Total Xylenes	0.0881U	0.112U	0.105U	0.173U	0.108U	17.6	*100*
Methyl tert-butyl ether (MTBE)	0.0587U	0.0745U	0.0701U	0.115U	0.0721U	0.00100U	*0.54*
Naphthalene	0.486	0.149U	0.140U	0.231U	0.144U	3.59	*0.34*
1,2-Dibromromethane (EDB)	0.0587U	0.0745U	0.0701U	0.115U	0.0721U	0.000500U	*0.00056*
1,2-Dichloroethane (EDC)	0.0294U	0.0372U	0.0351U	0.0577U	0.0361U	0.000500U	*0.013*
Isopropylbenzene	0.0587U	0.0745U	0.0701U	0.115U	0.0721U	3.18	--
1,2,4-Trimethylbenzene	0.163	0.0745U	0.0701U	0.115U	0.0721U	30.4	*48*
1,3,5-Trimethylbenzene	0.0587U	0.0745U	0.0701U	0.115U	0.0721U	10.0	*53*
ANALYTE	**Polynuclear Aromatics (PAHs)**						*mg/kg*
All SVOC analytes	ND						
ANALYTE	**RCRA TCLP Metals**						*mg/L*
Arsenic (As)	nt	nt	nt	nt	nt	nt	*15.0*
Barium (Ba)	nt	nt	nt	nt	nt	nt	*69000.0*
Cadmium (Cd)	nt	nt	nt	nt	nt	nt	*350.0*
Chromium (Cr)	nt	nt	nt	nt	nt	nt	*49.0*
Lead (Pb)	nt	nt	nt	nt	nt	nt	*800.0*
Mercuiry (Hg)	nt	nt	nt	nt	nt	nt	*110.0*
Selenium (Se)	nt	nt	nt	nt	nt	nt	--
Silver (Ag)	nt	nt	nt	nt	nt	nt	*5.0*

Notes:	
xx.xU	*Analyte not detected at the listed Laboratory Limit of Quantitation (LOQ)*
xx.xJ	*Analyte value is estimated*
*xx.xU**	Analyte ND @ LOQ, dilution factor caused Detection Limit @ > cleanup level
xx.x	*Analyte detected in concentraion below **DEQ risk-based concentrations***
BOLD	*Analyte detected in concentraion exceeding **DEQ risk-based concentrations***
D	*Duplicated sample*
nt	*not tested*
xx.x/ND	*RCRA Total Metals / RCRA Toxic Characteristic Leaching Potential result*
ADEC Limit	*Cleanup levels from 18AAC75 (10/27/2018), Soils-Table B2, Over 40 Inch Zone or Migration to Groundwater. Water cleanup levels are from Table C.*

Modified from *Underground Storage Tank Site Investigation – 37545 Century Drive, Albany, OR*, NWFF Environmental, September 18, 2022.

Table 3. Groundwater analytical results from onsite well

Onsite Water Well Sample (Sample ID: WS-01)					
	Result	Reporting Limit		RBCtw	
HCID					
Gasoline Range Organics	DET	101	ug/L		
Diesel Range Organics	ND	253	ug/L		
Oil Range Organics	ND	253	ug/L		
TPH					
Gasoline	ND	100	ug/L	450	ug/L
Diesel	ND	189	ug/L	430	ug/L
Oil	ND	377	ug/L	430	ug/L
VOCs					
Benzene	ND	0.2	ug/L	2.1	ug/L
Toluene	ND	1	ug/L	6300	ug/L
Ethylbenzene	ND	0.5	ug/L	6.4	ug/L
Xylenes, total	ND	1.5	ug/L	830	ug/L
Methyl tert-butyl ether (MTBE)	ND	1	ug/L	68	ug/L
Naphthalene	ND	2	ug/L	0.72	ug/L
1,2-Dibromoethane (EDB)	ND	0.5	ug/L	0.034	ug/L
1,2-Dichloroethane (EDC)	ND	0.5	ug/L	0.78	ug/L
Isopropylbenzene	ND	1	ug/L	2000	ug/L
1,2,4-Trimethylbenzene	ND	1	ug/L	250	ug/L
1,3,5-Trimethylbenzene	ND	1	ug/L	280	ug/L
PAHs					
Acenaphthene	ND	0.0322	ug/L	2500	ug/L
Acenaphthylene	ND	0.0322	ug/L	NV	
Anthracene	ND	0.0322	ug/L	>S	
Benz(a)anthracene	ND	0.0161	ug/L	0.38	ug/L
Benzo(a)pyrene	ND	0.0161	ug/L	0.47	ug/L
Benzo(b)fluoranthene	ND	0.0161	ug/L	>S	
Benzo(k)fluoranthene	ND	0.0161	ug/L	>S	
Benzo(g,h,i)perylene	ND	0.0322	ug/L	NV	
Chrysene	ND	0.0161	ug/L	>S	
Dibenz(a,h)anthracene	ND	0.0161	ug/L	0.47	ug/L
Fluoranthene	ND	0.0322	ug/L	>S	
Fluorene	ND	0.0322	ug/L	1300	ug/L
Indeno(1,2,3-cd)pyrene	ND	0.0161	ug/L	>S	
1-Methylnaphthalene	ND	0.0644	ug/L	NV	
2-Methylnaphthalene	ND	0.0644	ug/L	NV	
Naphthalene	ND	0.0644	ug/L	0.72	ug/L
Phenanthrene	ND	0.0644	ug/L	NV	
Pyrene	ND	0.0322	ug/L	>S	
Carbazole	ND	0.0322	ug/L	NV	
Dibenzofuran	ND	0.0322	ug/L	NV	
Metals					
Arsenic	11.8 ug/L	1.00	ug/L	0.31	ug/L
Barium	95.2 ug/L	2.00	ug/L	33000	ug/L
Cadmium	ND	0.200	ug/L	160	ug/L
Chromium	ND	2.00	ug/L	250000	ug/L
Lead	6.9 ug/L	0.200	ug/L	15	ug/L
Mercury	ND	0.0800	ug/L	49	ug/L
Selenium	ND	1.00	ug/L	NV	
Silver	ND	0.200	ug/L	820	ug/L

RBCtw = Occupational ingestion & inhalation from tap water risk-based concentration
DET = Detected
ND = Not detected
ug/L = micrograms per liter
NV = No value
>S =RBC exceeds the solubility limit
Based on laboratory data from *Well Water Sampling Summary Report (V1)- 37545 Century Drive, Albany, OR,* NWFF Environmental, May 4, 2023.