

State of Oregon
Department of Environmental Quality

Memorandum

Date: February 11, 2025

To: FILE

Through: Brad Shultz, WR Cleanup Manager and Bruce Scherzinger, WR Lead Worker

From: Nancy Sawka
WR Site Project Manager

Subject: Younger Oil Keizer Texaco, LUST 24-03-0558; UST Facility I.D. #9197, 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 Younger Oil Keizer Texaco Leaking Underground Storage Tank (LUST) site (now known as Keizer Shell Food Mart, LLC) in Keizer. As discussed in this report, contaminant concentrations in soil 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 and ORS 465.200 through 465.455.

The proposal is based on information documented in the administrative record for this site. The administrative record is located at Your DEQ Online (YDO) at ordeq.org/4eX6IkS (under "Key Words" enter 24-03-0558).

1. BACKGROUND

Site location.

The site's location (Figure 1) can be described as follows:

- Address: 3401 River Road North, Keizer, Marion County Oregon.
- Latitude 44.975597419° North, longitude -123.027521054999° West
- Map and Tax Lot 073W11CB04200

Site setting.

- Site size in acres, 0.36 acres
- Main structures on the site include the service station/food mart building, the fuel dispenser islands with canopy and an aboveground storage tank (AST) and dispenser for propane. Remaining areas are covered in asphalt and concrete with a small area of landscaping on the north boundary. (Figure 2)
- Adjacent properties include an automotive repair shop to the west followed by residential housing, Abby's pizza restaurant to the north followed by Garden Way, River Rd North to the

east followed by commercial businesses and Apple Blossom Ave to the south followed by commercial businesses.

- Land use zoning for the site and surrounding area is Mixed Use (MU).

Physical setting.

- Topography is generally flat at an elevation at about 140 feet above MSL
- Depth to groundwater ranges between 10 and 16 feet bgs
- Subsurface soils beneath the site, based on boring and monitor well logs, includes fine sandy silt from 1 foot to 4-10 feet bgs, followed by a course sandy gravel to 18 feet bgs.
- Groundwater flow direction at the site has been generally to the northeast during environmental investigations.
- Distance to surface water. Unknown reservoir about 1,600 feet southeast and Willamette River about 2,250 feet west.

Site history.

Based on tax records a service station and food mart was built on the property in 1963. Historical operations included three gasoline underground storage tanks (USTs) including one 10,000-gallon, one 8,000-gallon and one 6,000-gallon tank and three canopy-covered dispensers. The USTs are located under concrete on the north side of the food mart and the dispensers are located on the east side of the food mart and were installed in 1978. All original tanks remain under the current service station operations, except the 10,000-gallon UST which was replaced in 1990. The other tanks were upgraded to current UST standards in 1990 and 2015. In March 2003, a release was reported to DEQ when petroleum hydrocarbons were found in groundwater during environmental investigations conducted by Aspen Environmental. DEQ logged the release, and the site was assigned LUST #24-03-0558.

The site was purchased by NS Holdings One LLC from Younger Oil in December 2023 and is now operated as Keizer Shell Food Mart. Younger Oil owned and operated the service station since September 1997. Prior to 1997 the property was owned by M&M Rentals Co.

2. BENEFICIAL LAND AND WATER USE DETERMINATIONS

Land use.

The site and surrounding properties are zoned for Mixed-Use, which allows commercial and residential uses within a single building or complex. The site is currently operating as service station and food mart. Due to the site location along a busy commercial four lane road, River Road North, the use of the site and surrounding properties are expected to remain as commercial use, and residential development is not reasonably likely.

Further from the site to the east and west, the zoning changes to Medium Density and Single Family Residential. The nearest residential building is an apartment complex located to the west and approximately 120 feet from the groundwater contamination.

Groundwater use.

The City of Keizer provides drinking water to the site and surrounding area. The City gets its water from 15 deep water supply wells ranging in depth from 100 to 450 feet bgs. None of the municipal water wells are located within a 0.25-mile radius of the site. The nearest water well, MARI 55036, is located approximately 2,650 feet northwest of the site. Based on the depths, construction, and distances, it is very unlikely that contamination from the site would reach the municipal wells.

Based on a review of the OWRD database and a door-to-door survey completed by MSBA, there are no known private drinking water wells within the area of contamination from the site.

Surface water.

The nearest surface water bodies to the site are an unknown reservoir about 1,600 feet southeast and the Willamette River about 2,250 feet west. Neither are within the area of contamination nor expected to be impacted by the site.

Surface runoff appears to spread laterally from the site to the east towards River Rd North and to the south towards Apple Blossom Ave. No underground stormwater utilities, catch basins, or oil-water separators were identified at the site. The nearest catch basin is located east of site, adjacent to the sidewalk on the west side of River Rd.

3. INVESTIGATION AND CLEANUP WORK

Soil and groundwater investigations were conducted at the site at various times between 2003 and 2024 by Aspen Environmental, Wohlers Environmental, and Martin S. Burck Associates for Younger Oil. During that time four soil borings (3041-N, 3041-C, 3041-S and DP-1) and six monitoring wells (MW-1 through MW-6) were installed. Figure 2 shows the locations of borings and wells. Soil borings 3041-N, C and S were angled borings installed under the three dispensers and DP-1 was installed adjacent to a propane AST and dispenser. MW-1 through MW-4 were installed around the concrete UST pad, MW-5 and 7 were installed upgradient of the tanks and dispensers and MW-6 is an upgradient well installed southwest of the food mart. Soil samples were collected from all borings and wells during installations in March 2003 or July 2004. Little to no contamination was found in soil except for in MW-6 at 3 feet bgs with detections of gasoline at 2,460 milligrams per kilogram (mg/Kg), toluene at 0.2 mg/Kg, ethylbenzene at 1.6 mg/Kg, xylenes at 14.5 mg/Kg, naphthalene at 3.6 mg/Kg, isopropylbenzene at 1.7 mg/Kg, n-propylbenzene at 3.9 mg/Kg, 1,2,4-TMB¹ at 30.9 mg/Kg, and 1,3,5-TMB at 11.5 mg/Kg. It is unclear what the source of contamination was from at MW-6. There is no record of tanks or dispensers in that area. No additional soil sampling was conducted. Soil sample results are summarized in Table 1.

Quarterly to semi-annual groundwater monitoring was completed at the wells between March 2003 and September 2019. Sampling results are summarized in Tables 2 and 3. The highest concentrations of petroleum contamination was found in MW-2 adjacent to the north side of the

¹ TMB: trimethylbenzene

USTs during the 2003 and 2004 sampling events with concentrations of gasoline up to 70,600 microgram per liter (ug/L), diesel up to 820 ug/L, and BTEX+N² up to 4,880 ug/L, 4,400 ug/L, 1,064 ug/L, 6,520 ug/L and 557 ug/L, respectively. Little to no PAHs³ were detected in the groundwater. Over time, the concentrations in MW-2 significantly decreased with gasoline reduced to 208 ug/L and BTEX+N to 2.4 ug/L, non-detect, 3.07 ug/L, 8.2 ug/L and 7.58 ug/L, respectively, during the last sampling event in September 2019. No petroleum contamination was detected in groundwater from MW-1 or MW-3 through MW-6 from the last sampling event.

Chlorinated solvents including tetrachloroethylene (PCE) and trichloroethylene (TCE) were detected in groundwater from several wells on the site. Chlorinated solvents have been attributed to offsite sources and are being investigated under ECSI # 4280, Salem area Mass Transit District and ECSI # 4281, Cherry City Metals.

Nature and extent of contamination.

Contaminants of interest include gasoline, diesel, VOCs⁴ and PAHs primarily in groundwater. Little to no contamination was found in the soil. Depth to groundwater occurred between 10 and 16 feet bgs during investigations and monitoring. The extent of remaining contamination in groundwater is shown in Figure 3.

4. RISK EVALUATION

Conceptual site model.

The source of petroleum contamination is likely related to historical operations of the UST system. The contamination is primarily confined to the site and extending a short distance beneath the sidewalk to the east along River Rd North and the boundary of the site and the Abby's pizza parking lot to the north. The site and effected properties are currently commercially developed. This use is expected to remain the same into the future. The potential current and future human receptors under this use scenario includes occupational, construction and excavation workers. Table 3 below shows potential exposure pathways and receptors for this site.

[CONCEPTUAL SITE MODEL TABLE – ONE EXAMPLE]

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

Pathway	Receptor	Applicable Pathway?	Basis for selection/exclusion
SOIL			
Ingestion, dermal contact, and inhalation	Residential	No	See Note 1.
	Urban residential	No	
	Occupational	Yes	
	Construction worker	Yes	

² BTEX+N: benzene, toluene, ethylbenzene, xylene and naphthalene

³ PAHs: polynuclear aromatic hydrocarbons

⁴ VOCs: volatile organic hydrocarbons (included BTEX+N)

Pathway	Receptor	Applicable Pathway?	Basis for selection/exclusion
	Excavation worker	Yes	
Volatilization to outdoor air	Residential	No	See Note 1.
	Urban residential	No	
	Occupational	Yes	
Vapor intrusion into buildings	Residential	No	See Note 1.
	Urban residential	No	
	Occupational	Yes	
Leaching to groundwater	Residential	No	See Note 2.
	Urban residential	No	
	Occupational	No	
GROUNDWATER			
Ingestion and inhalation from tap water	Residential	No	See Note 2.
	Urban residential	No	
	Occupational	No	
Volatilization to outdoor air	Residential	No	See Note 1.
	Urban residential	No	
	Occupational	Yes	
Vapor intrusion into buildings	Residential	No	See Note 1.
	Urban residential	No	
	Occupational	Yes	
Groundwater in excavation	Construction and excavation worker	Yes	

Notes:

1. The site and affected properties are used for commercial purposes. This use is not expected to change in the foreseeable future. There are no residential uses within or near the contaminated area.
2. There are no private groundwater or water supply wells within the contamination area. City water is provided to the site and surrounding properties.

Contaminant concentrations and human health risk evaluation.

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. If RBCs are exceeded, then this indicates there is a potential risk to the receptor from the contamination. Table 4 compares the highest concentrations of detected contaminants in soil and recent groundwater samples (from the last three years) to the RBCs for the applicable receptors and exposure pathways from Table 3. Since the project was completed in 2019, the RBCs from 2018 are used in the table. Based on the table, no RBCs are exceeded for the applicable human health receptors and applicable soil and groundwater pathways.

Ecological risk.

The site is primarily covered by structures, asphalt and concrete leaving little exposure to contaminated soils for any ecological receptors. Additionally, given the concrete/asphalt cover

and the location along a busy commercial road, the site is not suitable for significant ecological habitat. There are no surface water bodies within the site or contaminated area. The nearest surface water bodies are at least 1,600 feet away and should not be impacted by site contamination.

5. RECOMMENDATION

Groundwater monitoring from 2003 through 2019 shows that petroleum contamination in groundwater has significantly decreased over the years. Based on more recent groundwater results and historical soil sample results, contamination remaining in soil and groundwater does not exceed acceptable risk levels. Based on this, a No Further Action determination is recommended for this site. The No Further Action determination should be recorded in YDO.

The site is still an active service station. This NFA only applies to the release discussed in this memo that was reported in 2003. It does not include other new/separate releases from the service station.

6. ATTACHMENTS

Figures:

Figure 1: Site Location Map

Figure 2: Soil Data Map with Sample Locations

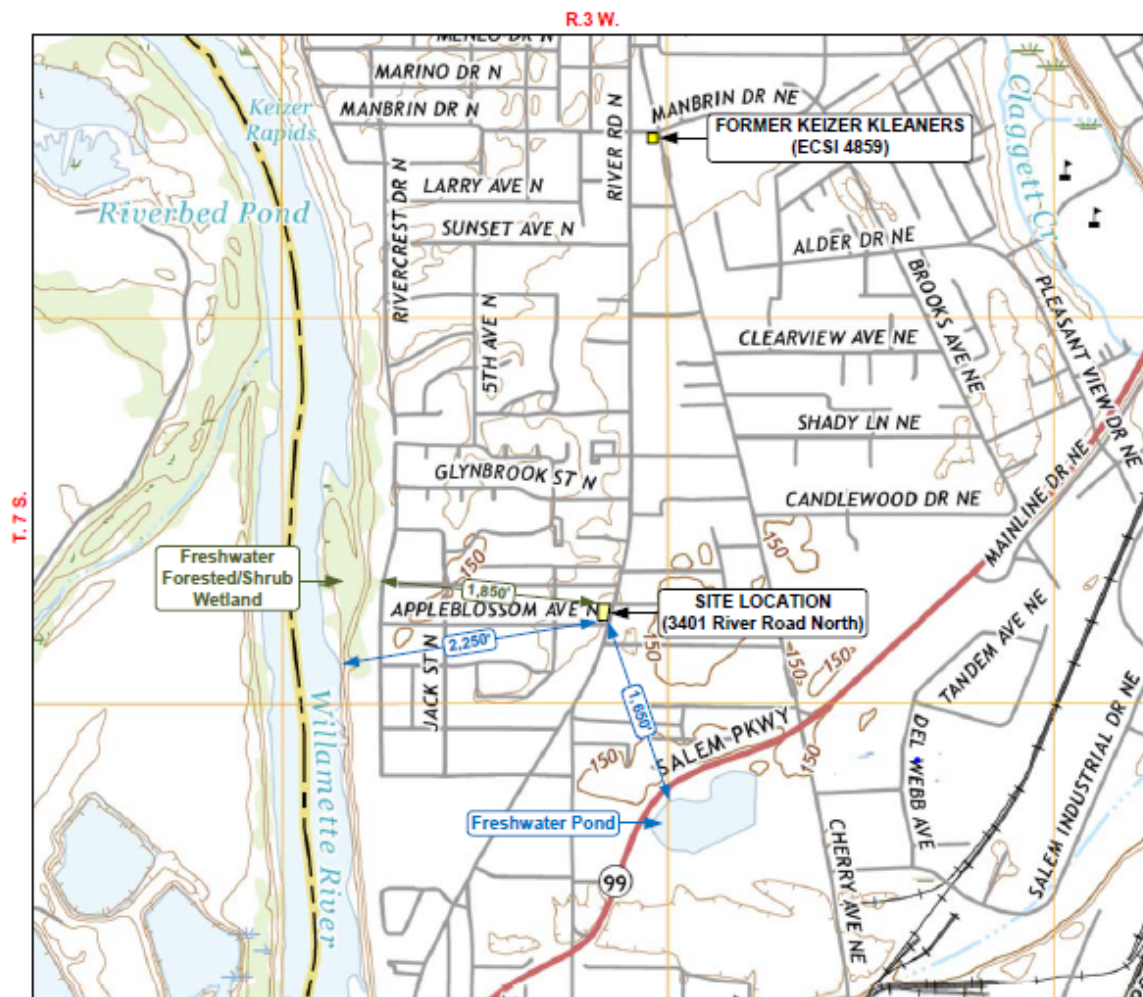
Figure 3: Estimated Extent of Current Groundwater Contamination

Tables:

Table 1: Soil Sample Analytical Data

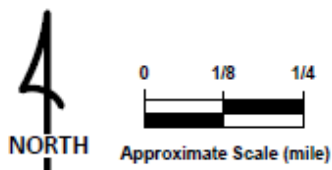
Table 2: Groundwater Sample Analytical Data, PHCs, VOCs and HDBs

Table 3: Groundwater Sample Analytical Data, PAHs



Adapted from: SALEM WEST QUADRANGLE, Oregon, 7.5 Minute Series,
USGS Topographic Map, 2020, Contour Interval: 10 Feet;
North American Vertical Datum of 1988

Revised: 7/9/2024 1:24 PM



MSBA
Martin S. Burck Associates, Inc.
Geologic and Environmental Consulting Services

FIGURE 1

SITE LOCATION MAP

Younger Oil Company
3401 River Road North
Keizer, Oregon
DEQ File No. 24-03-0558

LEGEND

- MW-1 Soil Boring Location and ID
- MW-1 Monitoring Well Location and ID
- MW6-3' G 2,460 nd B 1.6 E 1.6 N 3.6 Sample ID Gasoline (NWTPH-Gx) (ppm) Benzene (8021B) (ppm) Ethylbenzene (8021B) (ppm) Naphthalene (8021B) (ppm)
- < / nd Not detected above the reporting limit, as listed
- Bold Text** Indicates Analyte Was Detected Above the Reporting Limit
- UST Underground Storage Tank

Revised: 7/9/2024 2:41 PM

Soil Data Results:

- MW6-3'**
G 2,460
nd
B 1.6
E 1.6
N 3.6
- MW6-7'**
G nd
nd
B 1.6
E 1.6
N 3.6
- MW6-11'**
G 56
nd
B 1.6
E 1.6
N 3.6
- MW6-13'**
G nd
nd
B 1.6
E 1.6
N 3.6
- MW6-15'**
G nd
nd
B 1.6
E 1.6
N 3.6
- MW6-17'**
G 55
- MW4-11'**
G nd
nd
B 1.6
E 1.6
N 3.6
- MW4-15'**
G nd
nd
B 1.6
E 1.6
N 3.6
- MW5-11'**
G nd
nd
B 1.6
E 1.6
N 3.6
- MW5-15'**
G nd
nd
B 1.6
E 1.6
N 3.6
- MW5-19'**
G nd
nd
B 1.6
E 1.6
N 3.6
- DP-1-13'**
G nd
nd
B 1.6
E 1.6
N 3.6
- DP-1-11'**
G nd
nd
B 1.6
E 1.6
N 3.6
- DP-1-15'**
G nd
nd
B 1.6
E 1.6
N 3.6
- 3401-N-06.0**
G < 20
- 3401-C-06.0**
G < 20
- 3401-S-06.0**
G < 20

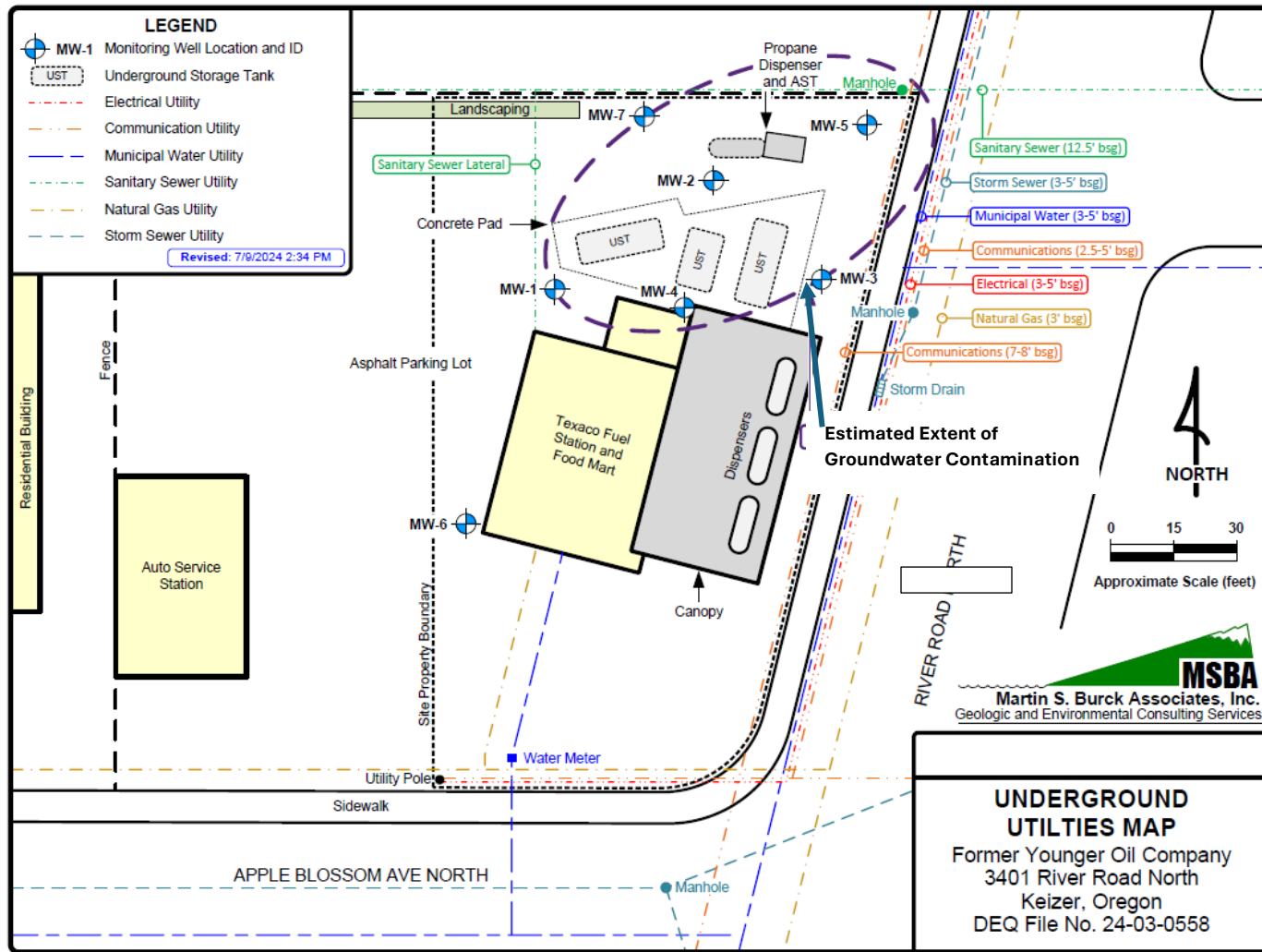
FIGURE 3

SOIL DATA MAP

Younger Oil Company
3401 River Road North
Keizer, Oregon
DEQ File No. 24-03-0558

S:\Project Files\Younger Oil\Kelzer Texaco\Figures & Aerial Photos\Closure Report\F 3 Soil Data Map.vsd

FIGURE 3: Estimated Extent of Current Groundwater Contamination



S:\Project Files\Younger Oil\Keizer Texaco\Figures & Aerial Photos\Closure Report\F 11 Underground Utilities.vsd

TABLE 1

SOIL SAMPLE ANALYTICAL DATA

Former Younger Oil Company
3401 River Road North
Keizer, Oregon
DEQ File No. 24-03-0558

Sample ID	Sample Date	Sample Depth (feet bsg) ^a	PHCs ^b (ppm) ^c			RBDM VOCs ^d (ppm)												TCLP Lead ^e (ppm)
			Gasoline	Diesel	Heavy Oil	Benzene	Toluene	Ethylbenzene	Xylenes	Naphthalene	1,2-Dibromoethane	1,2-Dichloroethane	Methyl Tert Butyl Ether	Isopropylbenzene	n-Propylbenzene	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	
Aspen Environmental Services, Inc., Samples																		
3401-N@6.0	03/18/03	6	< 20 ^f	- ^g	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3401-C@6.0	03/18/03	6	< 20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3401-S@6.0	03/18/03	6	< 20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Wohlers Environmental Services, Inc., Samples																		
MW-4-11'	07/07/04	11	nd ^h	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW-4-15'	07/07/04	15	nd	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW-5-11'	07/07/04	11	nd	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW-5-15'	07/07/04	15	nd	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW-5-19'	07/07/04	19	nd	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW-6-3'	07/07/04	3	2,460 ^{i,j}	-	-	nd	0.2	1.6	14.5	3.6	-	-	-	1.7	3.9	30.9	11.5	nd
MW-6-7'	07/07/04	7	nd	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW-6-11'	07/07/04	11	56	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW-6-13'	07/07/04	13	nd	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW-6-15'	07/07/04	15	nd	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW-6-17'	07/07/04	17	55	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DP-1-3' (MW-7)	07/07/04	3	nd	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DP-1-11' (MW-7)	07/07/04	11	nd	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DP-1-15' (MW-7)	07/07/04	15	nd	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

TABLE 1 (continued)

TABLE 1
SOIL SAMPLE ANALYTICAL DATA

Former Younger Oil Company
DEQ File No. 24-03-0558

Sample ID	Sample Date	Sample Depth (feet bsg) ^a	PHCs ^b (ppm) ^c			RBDM VOCs ^d (ppm)											TCLP Lead ^e (ppm)	
			Gasoline	Diesel	Heavy Oil	Benzene	Toluene	Ethylbenzene	Xylenes	Naphthalene	1,2-Dibromoethane	1,2-Dichloroethane	Methyl Tert Butyl Ether	Isopropylbenzene	n-Propylbenzene	1,2,4-Trimethylbenzene		1,3,5-Trimethylbenzene
DEQ Soil Risk-Based Concentrations (RBC) - Updated May 2018																		
LGW ^k	Residential	31	9,500	9,500	0.023	84	0.22	23	0.077	0.0001	0.0028	0.11	96	-- ^l	10	11	30	
	Occupational Worker	130	> Max ^m	> Max	0.10	490	0.90	100	0.34	0.0006	0.013	0.54	> Csat ⁿ	--	48	53	30	
SIDCI ^o	Residential	1,200	1,100	1,100	8.2	5,800	34	1,400	5.3	0.16	3.6	250	3,500	--	430	430	400	
	Occupational Worker	20,000	14,000	14,000	37	88,000	150	25,000	23	0.73	16	1,100	57,000	--	6,900	6,900	800	
	Construction Worker	9,700	4,600	4,600	380	28,000	1,700	20,000	580	9.0	200	12,000	27,000	--	2,900	2,900	800	
	Excavation Worker	> Max	> Max	> Max	11,000	770,000	49,000	560,000	16,000	250	5,600	320,000	750,000	--	81,000	81,000	800	
VIB ^p	Residential	94	> Max	> Max	0.16	> Csat	1.3	160	6.4	0.012	0.077	8.5	> Csat	--	140	98	NV ^q	
	Occupational Worker	> Max	> Max	> Max	2.1	> Csat	17	> Csat	83	0.16	1.0	110	> Csat	--	> Csat	> Csat	NV	
VOA ^r	Residential	5,900	> Max	> Max	11	> Csat	36	> Csat	6.4	0.15	3.4	340	> Csat	--	> Csat	> Csat	NV	
	Occupational Worker	69,000	> Max	> Max	50	> Csat	160	> Csat	83	0.65	15	1,500	> Csat	--	> Csat	> Csat	NV	

a Depth of sample in feet below surface grade (bsg)

b Petroleum hydrocarbons (PHCs) were analyzed using NWTPH method Gx (gasoline) and Dx (diesel and oil)

c Numerical analytical data reported in parts per million (ppm)

d Volatile organic compounds (VOCs) were analyzed using EPA method 8260B

e Lead analyzed using toxicity characteristic leaching procedure (TCLP)

f (<) Analyte concentration not detected above the laboratory reporting limit, as listed

g (-) Not analyzed/not available

h (nd) Not Detected above the laboratory reporting limit as noted in tables provided by Wohler's Environmental Services, Inc. Laboratory reports not available

i Bold value indicates analyte concentration exceeds laboratory reporting limit

j Yellow shading indicates the analyte concentration (or one-half the laboratory reporting limit) exceeds an RBC. The exceeded RBC is also shaded

k Leaching to Groundwater (LGW) RBCs for the residential and occupational receptors

l (--) Not available (Oregon DEQ has not established an RBC value for the respective analyte)

m (> MAX) "The constituent RBC for this pathway is calculated as greater than 1,000,000 mg/kg or 1,000,000 mg/L. Therefore, these substances are not expected to pose risks in the scenario shown" (Appendix A, RBDM, 2018)

n (> Csat) "This soil RBC exceeds the limit of three-phase equilibrium partitioning" (Appendix A, RBDM, 2018)

o Soil Ingestion, Dermal Contact, and Inhalation (SIDCI) RBCs for the residential and occupational, construction, and excavation worker receptors

p Vapor Intrusion into Buildings (VIB) RBCs for the residential and occupational receptors

q (NV) "This chemical is considered "nonvolatile" for the purposes of the exposure calculations" (Appendix A, RBDM, 2018)

r Volatilization to Outdoor Air (VOA) RBCs for the residential and occupational receptors

S:\Project Files\Younger Oil\Keizer Texaco\Tables\0) CURRENT TABLES\T 1 Soil Data.xls\T 5

TABLE 2
GROUNDWATER SAMPLE ANALYTICAL DATA -
PHCs, VOCs, AND HYDROCARBON DEGRADING BACTERIA
Former Younger Oil Company
3401 River Road North
Keizer, Oregon
DEQ File No. 24-03-0558

Sample ID	Sample Date	Collected By	PHCs ^a (ppb) ^b			VOCs ^c (ppb)																		Hydrocarbon Degrading Bacteria ^d (CFU/ml) ^e	
						RBDM VOCs												Detected Additional VOCs							
			Gasoline	Diesel	Oil	Benzene	Toluene	Ethylbenzene	Xylenes	Naphthalene	1,2-Dibromoethane	1,2-Dichloroethane	Methyl Tert Butyl Ether	Isopropylbenzene	n-Propylbenzene	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	n-Butylbenzene	sec-Butylbenzene	1,2,3-Trimethylbenzene	cis-1,2-Dichloroethene	Trichloroethene (TCE)	Tetrachloroethene (PCE)		Chloroform
Monitoring Well Samples																									
MW-1	3/18/03	Aspen	- ^f	-		38 ^{g,h}	< 2 ⁱ	< 2	< 2	4	< 2	< 2	< 2	< 2	< 2	< 2	< 2	-	-	-	-	-	-	-	-
	6/17/03	Wohlers	-	380	< 500	31	23	4	31	2	< 2	< 2	< 5	< 2	< 2	4	2	-	-	-	-	-	-	-	-
	9/5/03	Wohlers	-	460	< 500	1.17	< 1	< 2	< 2	< 2	< 2	< 2	< 5	< 2	< 2	< 2	< 2	-	-	-	-	-	-	-	-
	12/22/03	Wohlers	-	550	< 500	2	< 2	< 2	< 2	< 2	< 2	< 2	< 5	< 2	< 2	< 2	< 2	-	-	-	-	-	-	-	-
	3/30/04	Wohlers	-	950	< 500	1	< 2	< 2	2	4	< 2	< 2	< 5	< 2	< 2	< 2	< 2	-	-	-	-	-	-	-	-
	6/23/04	Wohlers	< 250	4,470	< 500	1	< 2	< 2	2	< 2	< 2	< 2	< 5	< 2	< 2	< 2	< 2	-	-	-	-	-	-	-	-
	9/13/04	Wohlers	< 250	< 250	< 500	< 0.50	< 2	< 2	< 2	< 2	< 2	< 2	< 3	< 2	< 2	< 2	< 2	-	-	-	-	-	-	-	-
	12/7/04	Wohlers	< 250	910	< 500	< 0.50	< 2	< 2	< 2	< 2	< 2	< 2	< 5	< 2	< 2	< 2	< 2	-	-	-	-	-	-	-	-
	12/28/05	Wohlers	< 250	-		< 0.50	< 2	< 2	< 2	4	< 2	< 2	< 5	< 2	< 2	< 2	< 2	-	-	-	-	-	-	-	-
	3/29/06	Wohlers	< 2	1,400	< 380	3.5	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	-	-	-	-	-	-	-	-
	6/28/06	Wohlers	< 250	< 250	< 500	1.4	< 2	< 2	3	< 2	< 2	< 2	< 5	4	< 2	< 2	< 2	-	-	-	-	-	-	-	-
	9/26/06	Wohlers	< 250	< 250	< 500	< 0.30	< 2	< 2	< 2	< 2	< 2	< 2	< 5	< 2	< 2	< 2	< 2	-	-	-	-	-	-	-	-
	12/28/06	Wohlers	< 250	< 250	< 500	< 0.30	< 2	< 2	< 2	< 2	< 2	< 2	< 5	< 2	< 2	< 2	< 2	-	-	-	-	-	-	-	-
	3/15/07	Wohlers	< 250	< 250	< 500	1.0	< 2	< 2	< 2	2	< 2	< 2	< 5	< 2	< 2	< 2	< 2	-	-	-	-	-	-	-	-
	6/25/07	Wohlers	725	< 250	< 500	14	7	11	49	3	< 2	< 2	< 5	< 2	< 2	14	4	-	-	-	-	-	-	-	-
	9/15/07	Wohlers	125	-	-	< 0.30	< 2	< 2	< 2	< 2	< 2	< 2	< 5	< 2	< 2	< 2	< 2	-	-	-	-	-	-	-	-
	12/16/07	Wohlers	151	-	-	2.36	< 2	< 2	< 2	4	< 2	< 2	< 5	< 2	< 2	< 2	< 2	-	-	-	-	-	-	-	-
	3/12/08	Wohlers	< 100	-	-	< 0.30	< 2	< 2	< 2	< 2	< 2	< 2	< 5	< 2	< 2	< 2	< 2	-	-	-	-	-	-	-	-
	6/12/08	Wohlers	< 100	-	-	0.44	< 2	< 2	< 2	< 2	< 2	< 2	< 5	< 2	< 2	< 2	< 2	-	-	-	-	-	-	-	-
	8/20/08	Wohlers	< 100	-	-	< 0.3	< 2	< 2	< 2	< 2	< 2	< 2	< 4	< 2	< 2	< 2	< 2	-	-	-	-	-	-	-	-
12/29/08	Wohlers	< 100	-	-	< 0.3	< 2	< 2	< 2	< 2	< 2	< 2	< 4	< 2	< 2	< 2	< 2	-	-	-	-	-	-	-	-	
3/17/09	Wohlers	< 100	-	-	< 0.35	< 1	< 1	< 2	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	-	-	-	-	-	-	-	-	
9/16/09	Wohlers	< 100	-	-	< 0.30	< 1	< 1	< 2	< 0.25	< 2	1	< 2	< 2	< 2	< 2	< 2	-	-	-	1	4.3	-	-	-	
3/23/10	Wohlers	< 100	-	-	< 0.30	< 1	< 1	< 2	0.30	< 0.10	< 0.10	< 2	< 2	< 2	< 2	< 2	-	-	-	1.4 ^j	7	-	-	-	
5/30/14	MSBA	< 100	-	-	< 0.250	< 1.00	< 0.500	< 1.50	< 2.00	< 0.500	< 0.500	< 1.00	< 1.00	< 0.500	< 1.00	< 1.00	-	-	-	-	-	-	-	-	
2/22/17	MSBA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
6/27/19	MSBA	< 100	-	-	< 1.00	< 1.00	< 1.00	< 3.00	< 5.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	3.78	< 1.00	< 5.00	-	
9/16/19	MSBA	< 100	-	-	< 1.00	< 1.00	< 1.00	< 3.00	< 5.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	3.14	< 1.00	< 5.00	-	

TABLE 2 (continued)

TABLE 2 (continued)																											
GROUNDWATER SAMPLE ANALYTICAL DATA -																											
PHCs, VOCs, AND HYDROCARBON DEGRADING BACTERIA																											
Former Younger Oil Company																											
DEQ File No. 24-03-0558																											
Sample ID	Sample Date	Collected By	PHCs ^a (ppb) ^b			VOCs ^c (ppb)																				Hydrocarbon Degrading Bacteria ^d (CFU/ml) ^e	
						RBDM VOCs												Detected Additional VOCs									
			Gasoline	Diesel	Oil	Benzene	Toluene	Ethylbenzene	Xylenes	Naphthalene	1,2-Dibromoethane	1,2-Dichloroethane	Methyl Tert Butyl Ether	Isopropylbenzene	n-Propylbenzene	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	n-Butylbenzene	sec-Butylbenzene	1,2,3-Trimethylbenzene	cis-1,2-Dichloroethene	Trichloroethene (TCE)	Tetrachloroethene (PCE)	Chloroform			
MW-2	3/18/03	Aspen	-	-	-	2,986	712	354	1,940	246	< 2	< 2	< 2	55	110	660	155	-	-	-	-	-	-	-	-	-	
	6/17/03	Wohlers	-	< 250	< 500	3,980	3,423	758	4,696	422	< 2	< 2	< 2	< 2	< 2	1,347	386	-	-	-	-	-	-	-	-	-	
	9/5/03	Wohlers	-	< 250	< 500	2,750	2,190	620	3,710	394	< 2	46	< 5	75	147	1,014	336	-	-	-	-	-	-	-	-	-	
	12/22/03	Wohlers	-	< 250	< 500	3,840	4,400	418	6,520	557	< 2	< 2	< 5	28	24	1,352	411	-	-	-	-	-	-	-	-	-	
	3/30/04	Wohlers	-	< 250	< 500	1,500	1,350	563	2,940	310	< 2	< 2	< 5	69	133	996	290	-	-	-	-	-	-	-	-	-	
	6/23/04	Wohlers	70,600	< 250	< 500	4,880	4,000	1,064	6,520	313	< 2	< 2	7	110	204	2,630	481	-	-	-	-	-	-	-	-	-	
	9/13/04	Wohlers	1,170	< 250	< 500	< 0.50	< 2	< 2	< 2	< 2	< 2	< 2	6	< 2	< 2	< 2	26	-	-	-	-	-	-	-	-		
	12/7/04	Wohlers	7,360	< 250	< 500	751	167	73	1,040	149	< 2	< 2	< 5	17	12	389	136	-	-	-	-	-	-	-	-	-	
	12/28/05	Wohlers	< 250	-	-	20	4	< 2	130	6	< 2	< 2	< 5	< 2	< 2	< 2	73	-	-	-	-	-	-	-	-	-	
	3/29/06	Wohlers	2,600	820	< 440	380	61	37	520	49	< 0.50	< 0.50	< 0.50	17	4.8	84	120	-	-	-	-	-	-	-	-	-	
	6/28/06	Wohlers	18,700	< 250	< 500	1,200	669	347	1,970	231	< 2	< 2	< 5	246	126	957	230	-	-	-	-	-	-	-	-	-	
	9/26/06	Wohlers	1,800	< 250	< 500	129.5	4	56	35	29	< 2	< 2	< 5	43	34	58	5	-	-	-	-	-	-	-	-	-	
	12/28/06	Wohlers	3,770	< 250	< 500	223	66	35	518	98	< 2	< 2	< 5	< 2	17	183	37	-	-	-	-	-	-	-	-	-	
	3/15/07	Wohlers	4,420	< 250	< 500	299	72	50	615	147	< 2	< 2	< 5	16	22	175	41	-	-	-	-	-	-	-	-	-	
	6/25/07	Wohlers	15,200	< 250	< 500	860	260	290	1,260	158	< 2	< 2	< 5	48	61	502	120	-	-	-	-	-	-	-	-	-	
	9/15/07	Wohlers	1,980	-	-	123	28	55	131	51	< 2	< 2	< 5	33	35	96	13	-	-	-	-	-	-	-	-	-	
	12/16/07	Wohlers	520	-	-	21.78	2	< 2	45	12	< 2	< 2	< 5	< 2	< 2	19	4	-	-	-	-	-	-	-	-	-	
	3/12/08	Wohlers	11,800	-	-	932	186	120	1,055	246	< 2	< 2	< 5	34	45	317	62	-	-	-	-	-	-	-	-	-	
	6/12/08	Wohlers	1,080	-	-	96.4	4	16	65	64	< 2	< 2	< 5	4	6	45	8	-	-	-	-	-	-	-	-	-	
	8/20/08	Wohlers	14,600	-	-	478	231	192	822	214	< 2	< 2	< 4	61	75	457	108	-	-	-	-	-	-	-	-	-	
	12/29/08	Wohlers	1,180	-	-	37.2	4	5	119	26	< 2	< 2	< 4	2	4	54	11	-	-	-	-	-	-	-	-	-	
	3/17/09	Wohlers	1,200	-	-	60	14	17	260	76	< 1	< 1	< 1	7	11	140	28	-	2.5	-	-	-	-	-	-	-	
	9/16/09	Wohlers	141	-	-	0.4	< 1	< 1	< 2	< 0.25	< 2	4	< 2	< 2	< 2	< 2	< 2	-	-	-	4	27	-	-	-	-	
	3/23/10	Wohlers	1,280	-	-	20.3	4	7	84	25.30	< 0.10	< 0.10	< 2	5	6	65	8	-	-	-	0.6 ^j	5	-	-	-	-	
5/30/14	MSBA	1,810	-	-	44.0	6.45	27.9	173	61.8	< 0.500	< 0.500	< 1.00	7.45	13.2	122	19.3	-	-	-	-	-	-	-	-	-		
2/22/17	MSBA	105	-	-	1.14	< 1.00	1.16	6.54	< 2.00	< 0.500	< 0.500	< 1.00	< 1.00	-	5.16	< 1.00	-	-	-	-	-	-	-	-	100		
6/27/19	MSBA	1,500	-	-	45.8	5.45	42.0	87.5	57.7	< 1.00	< 1.00	< 1.00	20.6	26.3	149	13.4	3.61	7.05	50.0	< 1.00	< 1.00	< 1.00	< 5.00	-	-		
9/16/19	MSBA	208	-	-	2.40	< 1.00	3.07	8.72	7.58	< 1.00	< 1.00	< 1.00	2.47	2.60	20.6	< 1.00	< 1.00	1.18	10.2	< 1.00	1.12	< 1.00	< 5.00	-	-		
TABLE 2 (continued)																											

TABLE 2 (continued)

TABLE 2 (continued)
GROUNDWATER SAMPLE ANALYTICAL DATA -
PHCs, VOCs, AND HYDROCARBON DEGRADING BACTERIA
Former Younger Oil Company
DEQ File No. 24-03-0558

Sample ID	Sample Date	Collected By	PHCs ^a (ppb) ^b			VOCs ^c (ppb)																		Hydrocarbon Degrading Bacteria ^d (CFU/ml) ^e	
						RBDM VOCs												Detected Additional VOCs							
			Gasoline	Diesel	Oil	Benzene	Toluene	Ethylbenzene	Xylenes	Naphthalene	1,2-Dibromoethane	1,2-Dichloroethane	Methyl Tert Butyl Ether	Isopropylbenzene	n-Propylbenzene	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	n-Butylbenzene	sec-Butylbenzene	1,2,3-Trimethylbenzene	cis-1,2-Dichloroethene	Trichloroethene (TCE)	Tetrachloroethene (PCE)		Chloroform
MW-3	3/18/03	Aspen	-	-	-	704	10	15	88	153	< 2	< 2	< 5	16	15	135	4	-	-	-	-	-	-	-	-
	6/17/03	Wohlers	-	< 250	< 500	465	18	44	19	23	< 2	< 2	< 5	8	13	8	< 2	-	-	-	-	-	-	-	-
	9/5/03	Wohlers	-	< 250	< 500	78	< 2	2	4	< 2	< 2	< 3	< 5	2	< 2	< 2	< 2	-	-	-	-	-	-	-	-
	12/22/03	Wohlers	-	< 250	< 500	859	91	25	131	67	< 2	< 2	< 5	12	15	30	8	-	-	-	-	-	-	-	-
	3/30/04	Wohlers	-	< 250	< 500	148	22	78	200	85	< 2	< 2	< 5	10	13	112	6	-	-	-	-	-	-	-	-
	6/23/04	Wohlers	1,450	< 250	< 500	177	16	27	30	36	< 2	< 2	< 5	18	30	21	< 2	-	-	-	-	-	-	-	-
	9/13/04	Wohlers	< 250	< 250	< 500	< 0.50	< 2	< 2	< 2	< 2	< 2	< 2	6	< 2	< 2	< 2	< 2	-	-	-	-	-	-	-	-
	12/7/04	Wohlers	622	< 250	< 500	74	< 2	4	12	8	< 2	< 2	< 5	< 2	< 2	2	< 2	-	-	-	-	-	-	-	-
	12/28/05	Wohlers	< 250	-	-	< 0.50	< 2	< 2	< 2	2	< 2	< 2	< 5	< 2	< 2	< 2	< 2	-	-	-	-	-	-	-	-
	3/29/06	Wohlers	43	< 170	< 430	11	< 0.50	< 0.50	2.9	6.7	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	-	-	-	-	-	-	-	-
	6/28/06	Wohlers	< 250	< 250	< 500	< 0.30	< 2	< 2	< 2	< 2	< 2	< 2	< 5	< 2	< 2	< 2	< 2	-	-	-	-	-	-	-	-
	9/26/06	Wohlers	< 250	< 250	< 500	< 0.30	< 2	< 2	< 2	< 2	< 2	< 2	< 5	< 2	< 2	< 2	< 2	-	-	-	-	-	-	-	-
	12/28/06	Wohlers	1,480	< 250	< 500	167	21	29	99	7	< 2	< 2	< 5	7	8	22	5	-	-	-	-	-	-	-	-
	3/15/07	Wohlers	< 250	< 250	< 500	1.5	< 2	< 2	3	16	< 2	< 2	< 5	< 2	< 2	3	< 2	-	-	-	-	-	-	-	-
	6/25/07	Wohlers	388	< 250	< 500	9.2	3	5	22	3	< 2	< 2	< 5	< 2	< 2	8	< 2	-	-	-	-	-	-	-	-
	9/15/07	Wohlers	< 100	-	-	< 0.30	< 2	< 2	< 2	< 2	< 2	< 2	< 5	< 2	< 2	< 2	< 2	-	-	-	-	-	-	-	-
	12/16/07	Wohlers	485	-	-	24.87	< 2	< 2	3	4	< 2	< 2	< 5	< 2	< 2	< 2	< 2	-	-	-	-	-	-	-	-
	3/12/08	Wohlers	103	-	-	4.71	< 2	< 2	< 2	< 2	< 2	< 2	< 5	< 2	< 2	< 2	< 2	-	-	-	-	-	-	-	-
	6/12/08	Wohlers	157	-	-	3.39	< 2	< 2	< 2	< 2	< 2	< 2	< 5	< 2	< 2	< 2	< 2	-	-	-	-	-	-	-	-
	8/20/08	Wohlers	171	-	-	0.46	< 2	< 2	< 2	< 2	< 2	< 2	< 4	< 2	< 2	< 2	< 2	-	-	-	-	-	-	-	-
	12/29/08	Wohlers	421	-	-	12.7	< 2	< 2	< 2	< 2	< 2	< 2	< 4	< 2	< 2	< 2	< 2	-	-	-	-	-	-	-	-
	3/17/09	Wohlers	< 100	-	-	2.6	< 1	< 1	< 2	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	-	-	-	-	-	-	-	-
	9/16/09	Wohlers	< 100	-	-	< 0.30	< 1	< 1	< 2	< 0.25	< 2	< 2	< 2	< 2	< 2	< 2	< 2	-	-	-	-	-	-	-	-
	3/23/10	Wohlers	< 100	-	-	2.0	< 1	< 1	< 2	0.40	< 0.10	< 0.10	< 2	< 2	< 2	< 2	< 2	-	-	-	-	-	-	-	-
	5/30/14	MSBA	< 100	-	-	< 0.250	< 1.00	< 0.500	< 1.50	< 2.00	< 0.500	< 0.500	< 1.00	< 1.00	< 0.500	< 1.00	< 1.00	-	-	-	-	-	-	-	-
	2/22/17	MSBA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	6/27/19	MSBA	< 100	-	-	< 1.00	< 1.00	< 1.00	< 3.00	< 5.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 5.00	-	
	9/16/19	MSBA	< 100	-	-	< 1.00	< 1.00	< 1.00	< 3.00	< 5.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	3.69	< 1.00	< 5.00	-	

TABLE 2 (continued)

TABLE 2 (continued)
GROUNDWATER SAMPLE ANALYTICAL DATA -
PHCs, VOCs, AND HYDROCARBON DEGRADING BACTERIA
Former Younger Oil Company
DEQ File No. 24-03-0558

Sample ID	Sample Date	Collected By	PHCs ^a (ppb) ^b			VOCs ^c (ppb)																			Hydrocarbon Degrading Bacteria ^d (CFU/ml) ^e
						RBDM VOCs												Detected Additional VOCs							
			Gasoline	Diesel	Oil	Benzene	Toluene	Ethylbenzene	Xylenes	Naphthalene	1,2-Dibromoethane	1,2-Dichloroethane	Methyl Tert Butyl Ether	Isopropylbenzene	n-Propylbenzene	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	n-Butylbenzene	sec-Butylbenzene	1,2,3-Trimethylbenzene	cis-1,2-Dichloroethene	Trichloroethene (TCE)	Tetrachloroethene (PCE)	Chloroform	
MW-4	9/13/04	Wohlers	< 250	< 250	< 500	< 0.50	< 2	< 2	< 2	< 2	< 2	< 2	8	< 2	< 2	< 2	< 2	-	-	-	-	-	-	-	-
	12/7/04	Wohlers	1,380	< 250	< 500	211	2	2	4	< 2	< 2	< 2	< 5	8	9	< 2	3	-	-	-	-	-	-	-	-
	12/28/05	Wohlers	< 250	-	-	<0.50	< 2	< 2	< 2	< 2	< 2	< 2	< 5	< 2	< 2	< 2	< 2	-	-	-	-	-	-	-	-
	3/29/06	Wohlers	51	< 170	< 440	24	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	0.98	< 0.50	< 0.50	-	-	-	-	-	-	-	-
	6/28/06	Wohlers	487	< 250	< 500	50.5	< 2	3	< 2	< 2	< 2	< 2	< 5	< 2	7	< 2	< 2	-	-	-	-	-	-	-	-
	9/26/06	Wohlers	717	< 250	< 500	80.2	< 2	< 2	< 2	< 2	< 2	< 2	< 5	4	4	< 2	< 2	-	-	-	-	-	-	-	-
	12/28/06	Wohlers	< 250	< 250	< 500	0.6	< 2	< 2	< 1	< 2	< 2	< 2	< 5	< 2	< 2	< 2	< 2	-	-	-	-	-	-	-	-
	3/15/07	Wohlers	< 250	< 250	< 500	15	< 2	< 2	< 2	4	< 2	< 2	< 5	< 2	< 2	< 2	< 2	-	-	-	-	-	-	-	-
	6/25/07	Wohlers	484	< 250	< 500	40.1	< 2	< 2	< 2	< 2	< 2	< 2	< 5	4	< 2	< 2	< 2	-	-	-	-	-	-	-	-
	9/15/07	Wohlers	744	-	-	43	< 2	< 2	< 2	< 2	< 2	< 2	< 5	5	3	< 2	< 2	-	-	-	-	-	-	-	-
	12/16/07	Wohlers	< 100	-	-	0.3	< 2	< 2	< 2	< 2	< 2	< 2	< 5	< 2	< 2	< 2	< 2	-	-	-	-	-	-	-	-
	3/12/08	Wohlers	107	-	-	1.92	< 2	< 2	< 2	< 2	< 2	< 2	< 5	< 2	< 2	< 2	< 2	-	-	-	-	-	-	-	-
	6/12/08	Wohlers	174	-	-	3.40	< 2	< 2	< 2	< 2	< 2	< 2	< 5	< 2	< 2	< 2	< 2	-	-	-	-	-	-	-	-
	8/20/08	Wohlers	593	-	-	8.38	< 2	< 2	< 2	< 2	< 2	< 2	< 4	< 2	< 2	< 2	< 2	-	-	-	-	-	-	-	-
	12/29/08	Wohlers	194	-	-	0.73	< 2	< 2	< 2	< 2	< 2	< 2	< 4	< 2	< 2	< 2	< 2	-	-	-	-	-	-	-	-
	3/17/09	Wohlers	170	-	-	6.4	< 1	< 1	< 2	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	-	-	-	-	5.3	-	-	-
	9/16/09	Wohlers	453	-	-	1.1	< 1	< 1	< 2	< 0.25	< 2	< 2	< 2	< 2	< 2	< 2	< 2	-	-	-	-	6	-	-	-
	3/23/10	Wohlers	123	-	-	2.3	< 1	< 1	< 2	0.40	< 0.10	< 0.10	< 2	< 2	< 2	< 2	< 2	-	-	-	0.31 ^j	3	0.1 ^j	1 ^{j,k}	-
	5/30/14	MSBA	142	-	-	1.68	< 1.00	< 0.500	< 1.50	< 2.00	< 0.500	< 0.500	< 1.00	< 1.00	0.510	< 1.00	< 1.00	-	-	-	-	-	-	-	-
	2/22/17	MSBA	< 100	-	-	< 0.200	< 1.00	< 0.500	< 1.50	< 2.00	< 0.500	< 0.500	< 1.00	< 1.00	-	< 1.00	< 1.00	-	-	-	-	-	-	-	300
	6/27/19	MSBA	154	-	-	< 1.00	< 1.00	< 1.00	< 3.00	< 5.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 5.00	-
	9/16/19	MSBA	< 100	-	-	< 1.00	< 1.00	< 1.00	< 3.00	< 5.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 5.00	-
MW-5	9/13/04	Wohlers	< 250	< 250	< 500	< 0.50	< 2	< 2	< 2	< 2	< 2	< 2	< 3	< 2	< 2	< 2	< 2	-	-	-	-	-	-	-	-
	12/7/04	Wohlers	1,320	< 250	< 500	349	< 2	< 2	< 2	< 2	< 2	< 2	< 5	< 2	< 2	< 2	< 2	-	-	-	-	-	-	-	-
	12/28/05	Wohlers	< 250	-	-	24	< 2	< 2	< 2	< 2	< 2	< 2	< 5	< 2	< 2	< 2	< 2	-	-	-	-	-	-	-	-
	3/29/06	Wohlers	7	< 190	< 480	3.5	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	-	-	-	-	-	-	-	-
	6/28/06	Wohlers	3,400	< 250	< 500	1,170	16	32	69	34	< 2	< 2	< 5	7	9	45	6	-	-	-	-	-	-	-	-
	9/26/06	Wohlers	1,730	< 250	< 500	627.0	< 2	7	2	3	< 2	< 2	< 5	3	3	4	< 2	-	-	-	-	-	-	-	-
	12/28/06	Wohlers	729	< 250	< 500	205	< 2	3	3	< 2	< 2	< 2	< 5	< 2	< 2	3	< 2	-	-	-	-	-	-	-	-
	3/15/07	Wohlers	518	< 250	< 500	125	3	7	19	6	< 2	< 2	< 5	< 2	< 2	7	< 2	-	-	-	-	-	-	-	-
	6/25/07	Wohlers	5,010	< 250	< 500	1,100	8	110	206	26	< 2	< 2	< 5	10	14	75	20	-	-	-	-	-	-	-	-
	9/15/07	Wohlers	3,270	-	-	1,470	2	97	50	58	< 2	< 2	< 5	16	33	74	9	-	-	-	-	-	-	-	-
	12/16/07	Wohlers	129	-	-	1.7	< 2	< 2	< 2	4**	< 2	< 2	< 5	< 2	< 2	< 2	< 2	-	-	-	-	-	-	-	-
	3/12/08	Wohlers	107	-	-	4.07	< 2	< 2	< 2	< 2	< 2	< 2	< 5	< 2	< 2	< 2	< 2	-	-	-	-	-	-	-	-
	6/12/08	Wohlers	< 100	-	-	0.33	< 2	< 2	< 2	< 2	< 2	< 2	< 5	< 2	< 2	< 2	< 2	-	-	-	-	-	-	-	-
	8/20/08	Wohlers	2,400	-	-	883	< 2	5	4	24	< 2	< 2	< 4	3	3	2	4	-	-	-	-	-	-	-	-
	12/29/08	Wohlers	861	-	-	472	< 2	< 2	< 2	2	< 2	< 2	< 4	< 2	< 2	< 2	< 2	-	-	-	-	-	-	-	-
	3/17/09	Wohlers	470	-	-	190	1.4	< 1	< 2	1.7	< 1	< 1	< 1	1.9	3.5	< 1	< 1	-	-	-	1.3	5.7	-	-	-
	9/16/09	Wohlers	234	-	-	152	< 1	< 2	< 2	0.3	< 2	1	< 2	2	3	< 2	< 2	-	-	-	1	5	-	-	-
	3/23/10	Wohlers	1,690	-	-	469	4	13	43	19.20	< 0.10	< 0.10	< 2	6	10	8	< 2	-	-	-	0.9 ^j	-	-	-	-
	5/30/14	MSBA	109	-	-	12.2	< 1.00	< 0.500	< 1.50	15.6	< 0.500	< 0.500	< 1.00	< 1.00	< 0.500	< 1.00	< 1.00	-	-	-	-	-	-	-	-
	2/22/17	MSBA	< 100	-	-	1.59	< 1.00	< 0.500	< 1.50	< 2.00	< 0.500	< 0.500	< 1.00	< 1.00	-	< 1.00	< 1.00	-	-	-	-	-	-	-	100
	6/27/19	MSBA	< 100	-	-	< 1.00	< 1.00	< 1.00	< 3.00	< 5.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	10.1	< 1.00	< 5.00	-
	9/16/19	MSBA	< 100	-	-	< 1.00	< 1.00	< 1.00	< 3.00	< 5.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	1.78	17.1	< 1.00	< 5.00	-

TABLE 2 (continued)

TABLE 2 (continued)

TABLE 2 (continued)
GROUNDWATER SAMPLE ANALYTICAL DATA -
PHCs, VOCs, AND HYDROCARBON DEGRADING BACTERIA
Former Younger Oil Company
DEQ File No. 24-03-0558

Sample ID	Sample Date	Collected By	PHCs ^a (ppb) ^b			VOCs ^c (ppb)																			Hydrocarbon Degrading Bacteria ^d (CFU/ml) ^e
						RBDM VOCs												Detected Additional VOCs							
			Gasoline	Diesel	Oil	Benzene	Toluene	Ethylbenzene	Xylenes	Naphthalene	1,2-Dibromoethane	1,2-Dichloroethane	Methyl Tert Butyl Ether	Isopropylbenzene	n-Propylbenzene	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	n-Butylbenzene	sec-Butylbenzene	1,2,3-Trimethylbenzene	cis-1,2-Dichloroethene	Trichloroethene (TCE)	Tetrachloroethene (PCE)	Chloroform	
MW-6	9/13/04	Wohlers	< 250	< 250	< 500	< 0.50	< 2	< 2	< 2	< 2	< 2	< 2	< 3	< 2	< 2	< 2	< 2	-	-	-	-	-	-	-	-
	12/7/04	Wohlers	< 250	< 250	< 500	< 0.50	< 2	< 2	< 2	< 2	< 2	< 2	< 5	< 2	< 2	< 2	< 2	-	-	-	-	-	-	-	-
	12/28/05	Wohlers	< 250	-	-	< 0.50	< 2	< 2	< 2	< 2	< 2	< 2	< 5	< 2	< 2	< 2	< 2	-	-	-	-	-	-	-	-
	3/29/06	Wohlers	< 2	< 160	< 400	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	-	-	-	-	-	-	-	-
	6/28/06	Wohlers	< 250	< 250	< 500	< 0.30	< 2	< 2	< 2	< 2	< 2	< 2	< 5	< 2	< 2	< 2	< 2	-	-	-	-	-	-	-	-
	9/26/06	Wohlers	< 250	< 250	< 500	< 0.30	< 2	< 2	< 2	< 2	< 2	< 2	< 5	< 2	< 2	< 2	< 2	-	-	-	-	-	-	-	-
	12/28/06	Wohlers	254	< 250	< 500	< 0.30	< 2	< 2	< 2	< 1	< 2	< 2	< 2	< 5	< 2	< 2	< 2	< 2	-	-	-	-	-	-	-
	3/15/07	Wohlers	< 250	< 250	< 500	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	6/25/07	Wohlers	< 100	< 250	< 500	1.0	< 2	< 2	< 2	< 2	< 2	< 2	< 5	< 2	< 2	< 2	< 2	-	-	-	-	-	-	-	-
	9/15/07	Wohlers	< 100	-	-	0.57	< 2	< 2	< 2	< 2	< 2	< 2	< 5	< 2	< 2	< 2	< 2	-	-	-	-	-	-	-	-
	12/16/07	Wohlers	< 100	-	-	< 0.30	< 2	< 2	< 2	< 2	< 2	< 2	< 5	< 2	< 2	< 2	< 2	-	-	-	-	-	-	-	-
	3/12/08	Wohlers	< 100	-	-	< 0.30	< 2	< 2	< 2	< 2	< 2	< 2	< 5	< 2	< 2	< 2	< 2	-	-	-	-	-	-	-	-
	6/12/08	Wohlers	< 100	-	-	0.35	< 2	< 2	< 2	< 2	< 2	< 2	< 5	< 2	< 2	< 2	< 2	-	-	-	-	-	-	-	-
	8/20/08	Wohlers	127	-	-	2	< 2	< 2	< 2	< 2	< 2	< 2	< 4	< 2	< 2	< 2	< 2	-	-	-	-	-	-	-	-
	12/29/08	Wohlers	146	-	-	< 0.3	< 2	< 2	< 2	< 2	< 2	< 2	< 4	< 2	< 2	< 2	< 2	-	-	-	-	-	-	-	-
	3/17/09	Wohlers	< 100	-	-	< 0.35	< 1	< 1	< 2	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	-	-	-	-	-	-	-	-
	9/16/09	Wohlers	128	-	-	0.5	< 1	< 1	< 2	< 0.25	< 2	7	< 2	< 2	< 2	< 2	< 2	-	-	-	7	44	-	-	-
	3/23/10	Wohlers	115	-	-	0.3	< 1	< 1	< 2	0.30	< 0.10	< 0.10	< 2	< 2	< 2	< 2	< 2	-	-	-	5	27	0.2 ^l	-	-
	5/30/14	MSBA	< 100	-	-	< 0.250	< 1.00	< 0.500	< 1.50	< 2.00	< 0.500	< 0.500	< 1.00	< 1.00	< 0.500	< 1.00	< 1.00	-	-	-	-	-	-	-	-
2/22/17	MSBA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
6/27/19	MSBA	< 100	-	-	-	< 1.00	< 1.00	< 1.00	< 3.00	< 5.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	3.62	24.6	< 1.00	< 5.00	-	
9/16/19	MSBA	< 100	-	-	-	< 1.00	< 1.00	< 1.00	< 3.00	< 5.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	2.77	22.2	< 1.00	< 5.00	-	
MW-7	9/13/04	Wohlers	< 250	< 250	< 500	< 0.50	< 2	< 2	< 2	< 2	< 2	< 2	< 3	< 2	< 2	< 2	< 2	-	-	-	-	-	-	-	-
	12/7/04	Wohlers	< 250	1,330	< 500	< 0.50	< 2	< 2	< 2	< 2	< 2	< 2	< 5	< 2	< 2	< 2	< 2	-	-	-	-	-	-	-	-
	12/28/05	Wohlers	< 250	-	-	< 0.50	< 2	< 2	< 2	< 2	< 2	< 2	< 5	< 2	< 2	< 2	< 2	-	-	-	-	-	-	-	-
	3/29/06	Wohlers	< 2	< 110	< 290	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	-	-	-	-	-	-	-	-
	6/28/06	Wohlers	< 250	< 250	< 500	< 0.30	< 2	< 2	< 2	< 2	< 2	< 2	< 5	< 2	< 2	< 2	< 2	-	-	-	-	-	-	-	-
	9/26/06	Wohlers	< 250	< 250	< 500	< 0.30	< 2	< 2	< 2	< 2	< 2	< 0.10	< 0.10	< 5	< 2	< 2	< 2	< 2	-	-	-	-	-	-	-
	12/28/06	Wohlers	< 250	< 250	< 500	< 0.30	< 2	< 2	< 2	< 1	< 2	< 2	< 5	< 2	< 2	< 2	< 2	-	-	-	-	-	-	-	-
	3/15/07	Wohlers	< 250	< 250	< 500	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	6/25/07	Wohlers	< 100	< 250	< 500	0.8	< 2	< 2	< 2	< 2	< 2	< 2	< 5	< 2	< 2	< 2	< 2	-	-	-	-	-	-	-	-
	9/15/07	Wohlers	100	-	-	< 0.30	< 2	< 2	< 2	< 2	< 2	< 2	< 5	< 2	< 2	< 2	< 2	-	-	-	-	-	-	-	-
	12/16/07	Wohlers	110	-	-	< 0.30	< 2	< 2	< 2	< 2	< 2	< 2	< 5	< 2	< 2	< 2	< 2	-	-	-	-	-	-	-	-
	3/12/08	Wohlers	< 100	-	-	< 0.30	< 2	< 2	< 2	< 2	< 2	< 2	< 5	< 2	< 2	< 2	< 2	-	-	-	-	-	-	-	-
	6/12/08	Wohlers	< 100	-	-	0.53	< 2	< 2	< 2	< 2	< 2	< 2	< 5	< 2	< 2	< 2	< 2	-	-	-	-	-	-	-	-
	8/20/08	Wohlers	115	-	-	0.32	< 2	< 2	< 2	< 2	< 2	< 2	< 4	< 2	< 2	< 2	< 2	-	-	-	-	-	-	-	-
	12/29/08	Wohlers	147	-	-	< 0.3	< 2	< 2	< 2	< 2	< 2	< 2	< 4	< 2	< 2	< 2	< 2	-	-	-	-	-	-	-	-
	3/17/09	Wohlers	< 100	-	-	< 0.35	< 1	< 1	< 2	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	-	-	-	-	-	-	-	-
	9/16/09	Wohlers	121	-	-	< 0.30	< 1	< 1	< 2	< 0.25	< 2	< 6	< 2	< 2	< 2	< 2	< 2	-	-	-	6	42	-	-	-
	3/23/10	Wohlers	< 100	< 250	-	< 0.30	< 1	< 1	< 2	< 0.25	< 0.10	< 0.10	< 2	< 2	< 2	< 2	< 2	-	-	-	3.5	18.6	0.1 ^l	-	-
	5/30/14	MSBA	< 100	-	-	< 0.250	< 1.00	< 0.500	< 1.50	< 2.00	< 0.500	< 0.500	< 1.00	< 1.00	< 0.500	< 1.00	< 1.00	-	-	-	-	-	-	-	-
2/22/17	MSBA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
6/27/19	MSBA	< 100	-	-	< 1.00	< 1.00	< 1.00	< 3.00	< 5.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	2.99	22.6	< 1.00	< 5.00	-	
9/16/19	MSBA	< 100	-	-	< 1.00	< 1.00	< 1.00	< 3.00	< 5.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	2.15	14.8	< 1.00	< 5.00	-	

TABLE 2 (continued)

TABLE 2 (continued)

TABLE 2 (continued)
GROUNDWATER SAMPLE ANALYTICAL DATA -
PHCs, VOCs, AND HYDROCARBON DEGRADING BACTERIA
Former Younger Oil Company
DEQ File No. 24-03-0558

Sample ID	Sample Date	Collected By	PHCs ^a (ppb) ^b			VOCs ^c (ppb)																		Hydrocarbon Degrading Bacteria ^d (CFU/ml) ^e	
						RBDM VOCs												Detected Additional VOCs							
			Gasoline	Diesel	Oil	Benzene	Toluene	Ethylbenzene	Xylenes	Naphthalene	1,2-Dibromoethane	1,2-Dichloroethane	Methyl Tert Butyl Ether	Isopropylbenzene	n-Propylbenzene	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	n-Butylbenzene	sec-Butylbenzene	1,2,3-Trimethylbenzene	cis-1,2-Dichloroethene	Trichloroethene (TCE)	Tetrachloroethene (PCE)		Chloroform
UST Cavity Observation Well Grab Sample																									
OW-1	3/18/03	Aspen	-	-	-	4,747	245	< 100	134	351	< 100	< 100	< 100	< 100	< 100	< 100	< 100	-	-	-	-	-	-	-	-
DEQ Groundwater Risk-Based Concentrations (RBCs) Updated May 2018																									
IIT ⁱ	Residential	110	100	100	0.46	1,100	1.5	190	0.17	0.0075	0.17	14	440	-- ^m	54	59	--	--	--	36	0.49	12	0.22	--	
	Occupational Worker	450	430	430	2.1	6,300	6.4	830	0.72	0.034	0.78	68	2,000	--	250	280	--	--	--	260	3.3	48	0.98	--	
VIB ⁿ	Residential	22,000	> S ^o	> S	210	> S	620	86,000	840	45	300	67,000	> S	--	50,000	36,000	--	--	--	> S	200	3,700	120	--	
	Occupational Worker	> S	> S	> S	2,800	> S	8200	> S	11,000	590	3,900	870,000	> S	--	> S	> S	--	--	--	> S	3,700	48,000	1,600	--	
VOA ^p	Residential	> S	> S	> S	3,100	> S	9,900	> S	3,600	180	2,100	350,000	> S	--	> S	> S	--	--	--	> S	3,300	64,000	1,400	--	
	Occupational Worker	> S	> S	> S	14,000	> S	43,000	> S	16,000	790	9,000	1,500,000	> S	--	> S	> S	--	--	--	> S	20,000	> S	6,300	--	
GWE ^q	Construction Worker	14,000	> S	> S	1,800	220,000	4,500	23,000	500	27	630	63,000	51,000	--	6,300	7,500	--	--	--	18,000	430	5,600	720	--	
	Excavation Worker																								

a Petroleum hydrocarbons (PHCs) were analyzed using NWTPH methods Gx (gasoline) and Dx (diesel and oil)
b Analytical results for PHCs and VOCs reported in parts per billion (ppb)
c Volatile organic compounds (VOCs) analyzed using EPA method 8260B or C
d Hydrocarbon degrading bacteria analyzed using method referenced in *Manual of Environmental Microbiology (2nd Edition, 2002: Chapter 84: Hydrocarbon Degrading Bacteria)*
e Analytical results for hydrocarbon degrading bacteria reported in colony-forming units per milliliter (CFU/ml)
f (-) Not analyzed/Not Available
g Bold value indicates analyte concentration exceeds the laboratory reporting limit
h Yellow Shading indicates the analyte concentration (or one-half the laboratory reporting limit) exceeds an RBC. The exceeded RBC is also shaded
i (<) Analyte concentration not detected above the laboratory reporting limit, as listed
j According to the laboratory, the result represents a "tentative identification" or "estimate"
k Likely laboratory contaminant
l Ingestion and Inhalation from Tapwater (IIT) RBCs for the residential and occupational receptors
m (--) Oregon Department of Environmental Quality has not established an RBC value for respective analyte
n Vapor Intrusion into Buildings (VIB) RBCs for the residential and occupational receptors
o (> S) "This groundwater RBC exceeds the solubility limit" (Appendix A, RBDM, 2018)
p Volatilization to Outdoor Air (VOA) RBCs for the residential and occupational receptors
q Groundwater in Excavation (GWE) RBCs for the construction and excavation worker receptors

TABLE 3

GROUNDWATER SAMPLE ANALYTICAL DATA - PAHS

Younger Oil Company
3401 River Road North
Keizer, Oregon
DEQ File No. 24-03-0558

Sample ID	Sample Date	Collected By	PAHs ^a (ppb) ^b															
			Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Naphthalene	Phenanthrene	Pyrene
MW-1	3/18/03	Aspen	0.2 ^c	< 0.1 ^d	-	< 0.1 ^e	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.7	< 0.1	0.2	0.2	0.1
	3/30/04	Wohlers	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.3	< 0.1	0.2	< 0.1	< 0.1
	6/23/04	Wohlers	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	0.4	< 0.2	0.3	< 0.2	0.4
	3/29/06	Wohlers	< 0.04	< 0.04	< 0.04	0.09	0.05	0.05	0.05	0.05	0.05	0.05	< 0.04	0.05	0.05	0.9	0.05	0.05
MW-2	6/23/04	Wohlers	0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	0.3	< 0.2	372	0.2	< 0.2
	3/29/06	Wohlers	< 0.05	0.05	0.05	0.5	0.05	0.05	< 0.05	0.05	0.05	< 0.05	< 0.05	0.1	< 0.05	41.2	0.05	0.1
MW-3	6/23/04	Wohlers	0.2	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.1	0.2	< 0.1	56	< 0.1	< 0.1
	12/7/04	Wohlers	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	4.7	< 0.1	< 0.1
MW-4	12/7/04	Wohlers	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.6	< 0.1	< 0.1

DEQ Soil Risk-Based Concentrations (RBCs) - Revised May 2018

IIT ^f	Residential	510	-- ^g	> S ^h	0.030	0.025	0.25	--	> S	> S	0.025	> S	280	> S	0.17	--	110
	Occupational Worker	2,500	--	> S	0.38	0.47	> S	--	> S	> S	0.47	> S	1,300	> S	0.72	--	> S
VIB ⁱ	Residential	> S	--	> S	> S	NV ^j	NV	--	NV	NV	NV	NV	> S	NV	840	--	> S
	Occupational Worker	> S	--	> S	> S	NV	NV	--	NV	NV	NV	NV	> S	NV	11,000	--	> S
VOA ^k	Residential	> S	--	> S	> S	NV	NV	--	NV	NV	NV	NV	> S	NV	3,600	--	> S
	Occupational Worker	> S	--	> S	> S	NV	NV	--	NV	NV	NV	NV	> S	NV	16,000	--	> S
GWE ^l	Construction Worker	> S	--	> S	> S	> S	> S	--	> S	> S	> S	> S	> S	> S	500	--	> S
	Excavation Worker	> S	--	> S	> S	> S	> S	--	> S	> S	> S	> S	> S	> S	500	--	> S

^a Polycyclic aromatic hydrocarbons (PAHs) analyzed using EPA method 8270D SIM

^b Analytical results reported in parts per billion (ppb)

^c Bold value indicates analyte concentration exceeds the laboratory reporting limit

^d (<) Analyte concentration not detected above the laboratory reporting limit, as listed

^e Yellow shading indicates the analyte concentration (or one-half the laboratory reporting limit) exceeds an RBC. The exceeded RBC is also shaded

^f Ingestion and Inhalation from Tapwater (IIT) RBCs for the residential and occupational receptors

^g (--) Not applicable (Oregon Department of Environmental Quality (DEQ) has not established a cleanup level for the respective analyte)

^h (> S) "This groundwater RBC exceeds the solubility limit" (Appendix A, RBDM, 2018)

ⁱ Vapor Intrusion into Buildings (VIB) RBCs for the residential and occupational receptors

^j (NV) "This chemical is considered "nonvolatile" for the purposes of the exposure calculations" (Appendix A, RBDM, 2018)

^k Volatilization to Outdoor Air (VOA) RBCs for the residential and occupational receptors

^l Groundwater in Excavation (GWE) RBCs for the construction and excavation worker receptors

Table 4: RBC Risk Evaluation

Applicable RBCs Maximum Concentrations					Contaminated Medium			SOIL	SOIL	SOIL	SOIL	SOIL
								mg/Kg (ppm)	mg/Kg (ppm)	mg/Kg (ppm)	mg/Kg (ppm)	mg/Kg (ppm)
								Soil Ingestion, Dermal Contact, and Inhalation	Soil Ingestion, Dermal Contact, and Inhalation	Soil Ingestion, Dermal Contact, and Inhalation	Volatilization to Outdoor Air	Vapor Intrusion into Buildings
								RBC _{so}	RBC _{so}	RBC _{so}	RBC _{so}	RBC _{vi}
					Receptor Scenario			Occupational	Construction Worker	Excavation Worker	Occupational	Occupational
					Direct or Indirect Pathway			DCS	DCS	DCS	IVS	IVS
Soil		Groundwater	Soil Gas	Air	CAS#	Chemical	Note	Note	Note	Note	Note	Note
Surface	SubSurface											
2,460	56	1,500			--	Generic Gasoline	nc, v	20000		9700		>Max
0		45.8			71-43-2	Benzene	c, v	37		380		>Csat
0.2		5.45			108-88-3	Toluene	nc, v	88000	>Csat	28000	>Csat	>Csat
1.6		42			100-41-4	Ethylbenzene	c, v	150		1700	>Csat	49000
14.5		87.5			1330-20-7	Xylenes	nc, v	25000	>Csat	20000	>Csat	560000
0		0			1634-04-4	MTBE (methyl t-butyl ether)	c, v	1100		12000	>Csat	320000
3.6		57.7			91-20-3	Naphthalene	c, v	23		580	>Csat	16000
30.9		149			95-63-6	1,2,4-Trimethylbenzene	nc, v	6900	>Csat	2900	>Csat	81000
11.5		13.4			108-67-8	1,3,5-Trimethylbenzene	nc, v	6900	>Csat	2900	>Csat	81000
1.7		20.6			98-82-8	iso-Propylbenzene (cumene)	nc, v	57000	>Csat	27000	>Csat	750000
		0			106-93-4	EDB (1,2-dibromoethane)	c, v	0.73		9		250
		0			107-06-2	EDC (1,2-dichloroethane)	c, v	16		200		5600
0					7439-92-1	Lead	NA, nv	800	L	800	L	800

Notes:

- 1 A zero (0) for the maximum concentration means the constituent was tested for but was not detected in any sample.
- 2 If the maximum concentration is blank, no samples were analyzed for that constituent in its respective media.
- 3 RBCs Updated May 2018
- 4 Direct or Indirect Pathway Codes have the following meanings: DC means it is a direct contact pathway with a limiting value of Csat. IVS means it is an indirect pathway with a limiting value of Csat. DS means it is a direct contact pathway with a limiting value equal to the solubility. S, IVW means it is an indirect pathway with a limiting value equal to the solubility. S, DCA means it is a direct contact pathway with a limiting value equal to the vapor concentration.
- c This chemical is a known or suspected carcinogen. The RBCs in this row were calculated using equations for carcinogens.
- c* The RBCs in this row were calculated using equations for both carcinogens and noncarcinogens (where lower). For some scenarios the RBCs based on non-carcinogenic effects are lower than RBCs based on cancer effects for these chemicals. You should use the lower of the calculated RBCs for each.
- >Csat This soil RBC exceeds the limit of three-phase equilibrium partitioning. Refer to "ChemData" page for the corresponding value of Csat. Soil concentrations in excess of Csat indicate that free product might be present. See Section B.2.1.4 for additional information.
- L The values for lead reported in this table are not calculated. See Section B.3.4 for the source of the lead numbers and information on applying them.
- >Max The constituent RBC for this pathway is calculated as greater than 1,000,000 mg/kg or 1,000,000 mg/L. Therefore, this substance is deemed not to pose risks in this scenario.
- BG The standard RBC value has been replaced with the background value from the physiographic region of the site.

Table 4: continued

Applicable RBCs Maximum Concentrations					Contaminated Medium				GROUNDWATER	GROUNDWATER	GROUNDWATER	SOIL GAS	AIR		
					Exposure Pathway				µg/L (ppb)	µg/L (ppb)	µg/L (ppb)	µg/m³	µg/m³		
									Volatilization to Outdoor Air	Vapor Intrusion into Buildings	GW in Excavation	Vapor Intrusion into Buildings	Inhalation		
					Receptor Scenario				RBC _{soil}	RBC _{soil}	RBC _{soil}	RBC _{soil}	RBC _{air}		
Occupational	Occupational	Construction & Excavation Worker	Occupational	Occupational											
Soil		Groundwater	Soil Gas	Air	Direct or Indirect Pathway				IVW	IVW	DCW	DCA			
Surface	SubSurface				CAS#	Chemical	T	Note	Note	Note	Note	1	Note	Note	Note
2,460	56	1,500	--	Generic Gasoline	no, v	>S		>S	14000		1700000		1700		
0		45.8		71-43-2 Benzene	c, v	14000		2800	1800		1600		16		
0.2		5.45		108-88-3 Toluene	no, v	-	>S	-	>S	220000	21900000		22000		
1.6		42		100-41-4 Ethylbenzene	c, v	43000		8200	4500		4900		4.9		
14.5		87.5		1330-20-7 Xylenes	no, v	-	>S	-	>S	23000	440000		440		
0		0		1634-04-4 MTBE (methyl t-butyl ether)	c, v	1500000		870000	63000		47000		47		
3.6		57.7		91-20-3 Naphthalene	c, v	16000		11000	500		360		0.36		
30.9		149		95-63-6 1,2,4-Trimethylbenzene	no, v	-	>S	-	>S	6300	260000		260		
11.5		13.4		108-67-8 1,3,5-Trimethylbenzene	no, v	-	>S	-	>S	7500	260000		260		
1.7		20.6		98-82-8 iso-Propylbenzene (cumene)	no, v	-	>S	-	>S	51000	1800000		1800		
		0		106-93-4 EDB (1,2-dibromoethane)	c, v	790		590	27		20		0.02		
		0		107-06-2 EDC (1,2-dichloroethane)	c, v	9000		3900	630		470		0.47		
0				7439-92-1 Lead	NA, nv	-	NV	-	NV	-	>S	-	NV	-	>Pv

Notes:

- 1 A zero (0) for the maximum concentration means the constituent was tested for but was not detected in any sample.
- 2 If the maximum concentration is blank, no samples were analyzed for that constituent in its respective media.
- 3 RBCs Updated May 2018
- 4 Direct or Indirect Pathway Codes have the following meanings: DC means it is a direct contact pathway with a limiting value of Csat. IVS means it is an indirect pathway with a limiting value of Csat. DS means it is a direct contact pathway with a limiting value equal to the solubility, S. IVW means it is an indirect pathway with a limiting value equal to the solubility. S. DCA means it is a direct contact pathway with a limiting value equal to the vapor pressure.
- c* This chemical is a known or suspected carcinogen. The RBCs in this row were calculated using equations for carcinogens.
- c* The RBCs in this row were calculated using equations for both carcinogens and noncarcinogens (where lower). For some scenarios the RBCs based on non-carcinogenic effects are lower than RBCs based on cancer effects for these chemicals. You should use the lower of the calculated RBCs for each chemical.
- >Csat This soil RBC exceeds the limit of three-phase equilibrium partitioning. Refer to "ChemData" page for the corresponding value of Csat. Soil concentrations in excess of Csat indicate that free product might be present. See Section B.2.1.4 for additional information.
- L The values for lead reported in this table are not calculated. See Section B.3.4 for the source of the lead numbers and information on applying them.
- >Max The constituent RBC for this pathway is calculated as greater than 1,000,000 mg/kg or 1,000,000 mg/L. Therefore, this substance is deemed not to pose risks in this scenario.
- BG The standard RBC value has been replaced with the background value from the physiographic region of the site.