Contaminated Media Management Plan (CMMP)

Northwest Pipe Company
12005 North Burgard Road
Portland, Oregon 97203
ECSI No. 138

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Prepared by

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Acronyms and Abbreviations

bgs	below ground surface
CFR	*Code of Federal Regulations*
CMMP	Contaminated Media Management Plan
DEQ	Oregon Department of Environmental Quality
mg/kg	milligram(s) per kilogram
NOAA	National Oceanic and Atmospheric Administration
OAR	Oregon Administrative Rule
OSHA	Occupational Safety and Health Administration
PAH	polynuclear aromatic hydrocarbon
PBC	polychlorinated biphenyl
RBC	risk-based concentration
TPH	total petroleum hydrocarbons
VOC	volatile organic compound

1. Introduction

The property on which Northwest Pipe Company's Portland facility currently resides has a long history of industrial use. Industrial activities began in 1940 and continue today. Northwest Pipe Company began operations at the Portland facility in 1982, leasing the property, and ultimately purchased the property in 1997. Northwest Pipe Company has conducted a number of environmental investigations, testing surface soil, subsurface soil, and groundwater, with a number of removal actions for soil completed prior to and after property acquisition. Through these investigations, various constituents associated with past practices have been found in certain samples of the soil and groundwater at the site.

This Contaminated Media Management Plan (CMMP) summarizes the proper management of contaminated soil and groundwater in the event that they are encountered during future work at the site. This CMMP is intended to communicate methods and practices to employees, contractors, and potential future developers to protect human health and the environment.

The environmental media management procedures set forth in this CMMP do not prevent any party from seeking pre-approval of an alternative procedure allowed by law for managing environmental media on the site. Such pre-approval should be obtained from the appropriate governmental agency after consultation with the Oregon Department of Environmental Quality (DEQ).

1.1 Purpose and Objectives

The purpose of this CMMP is to provide guidance for managing contaminated media that may be encountered during subsurface work at the Portland facility, to achieve the objectives stated below.

- Minimize environmental liability by properly addressing contaminated media issues early in the planning phase of projects
- Manage excavated materials in a manner consistent with applicable regulations to minimize risk to human health and the environment
- Protect the construction workers and Northwest Pipe Company employees from adverse exposure to hazardous substances during construction by identifying, to the extent feasible, location, concentrations, and quantities of contaminated media likely to be encountered during potential future construction activities
- Prevent exacerbation of existing environmental conditions and hindrance of plant operational activities

This CMMP should be reviewed prior to subsurface work at the Portland facility and kept available as a reference for the duration of each project.

Tables and figures (located at the end of the text) present a summary of analytical data and show the site layout, as well as the locations of the areas of concern.

1.2 Limitations

This document is intended only to provide procedures for identifying and handling of contaminated media encountered during construction activities at the Portland facility. It is not intended to suggest or provide health and safety level information for the protection of construction workers. Individuals and parties who are tasked with conducting construction activities at this site should read this document and the documents referenced herein. They should also consult an Industrial Hygienist and/or Environmental Professional regarding performance of their own hazard assessments to determine appropriate health and safety measures.

Users of this document need to be aware that rules and regulations can change and the management practices stated herein are acceptable as of 2019; however, they may not be acceptable in the future. In

addition, it is important to note that future site conditions may differ from those presented in this document. Northwest Pipe Company will review, and revise if necessary, this CMMP every 3 to 5 years.

2. Site Overview

A summary of the Northwest Pipe Company's Portland facility setting is provided in this section.

2.1 Project Area Setting and History

The Portland facility is located approximately 1,500 feet inland from the east bank of the Willamette River approximately 4 miles upstream of the confluence of the Willamette and the Columbia Rivers in Portland, Oregon, 1 mile north of the St. Johns Bridge, and approximately 1 mile upstream of Sauvie Island. The property is bordered on three sides by Burgard Industrial Park, which is owned by various entities and on the south by an access road to Schnitzer Steel, which lies between the site and the Port of Portland's Terminal 4 (see Figure 1 for Site Location Map). The subject property is located in the southern half of Section 35 of Township 2 North, Range 1 West, on tax lots 2N1W35-00500, and has a street address of 12005 North Burgard Street. The approximate center of the facility is located at 45° 36' 32.4" latitude and -122° 46' 24.2" longitude.

The property, including the leased area to the south used as a lay-down area for steel coil for manufacturing purposes, has a general parallelogram shape and encompasses approximately 28.48 acres. It measures approximately 485 yards long and 295 yards wide, and was commissioned on June 18, 1942, as an assembly shop for the Oregon Shipbuilding Corporation. The property was used to produce Liberty Ships and Victory Ships during WWII, even though industrial activities began earlier, with construction of the shipyard in 1940 and the first keel laid in May 1941.

The site lies within the drainage basin designated as the Lower Willamette Basin with surface elevations ranging from 30 to 35 feet above mean sea level with elevations in the northern part of the site slightly lower than in the southern part (USGS, 1962). The site is generally flat. Precipitation occurs mainly as rain in October through May with an annual average of 36 inches per year (NOAA, 2019). Stormwater runoff is discharged through a stormwater system that feeds into an offsite, communal outfall that discharges to a constructed privately-owned slip of the Willamette River.

2.2 Geology

The site and its vicinity are located in the northern portion of the Willamette Valley physiographic province. The region is underlain with sand and silt deposited on the floodplain and includes areas of artificial fill, largely derived from dredge material (USGS, 1991).

The *Soil Survey of Multnomah County Area, Oregon*, compiled by the U.S. Soil Conservation Service (USCS) (1919), describes the soil at the subject property as Urban land, 0 to 3 percent slopes. No hydric soil components are listed for this soil series in the May 31, 1989, *Hydric Soils in Multnomah County Area*, Oregon, compiled by the USCS.

Based on soil borings advanced at various locations across the site, the general site geologic profile consists of well-graded fine to medium-grained sand with layers or lenses of silt, silty sand, and sandy silt (interpreted to be hydraulic fill placed during original site development) to approximately 26 feet below ground surface (bgs), underlain by a thick deposit of fine-grained silt with infrequent sandier silt intervals (interpreted to be native alluvium deposited in a low-energy environment), from approximately 26 feet to at least 120 feet below ground surface (bgs).

2.3 Groundwater

The shallow sand interval contains the uppermost water-bearing zone at the site, with an average depth to groundwater of approximately 14 feet bgs. The underlying silt horizon is a confining layer that separates the shallow water-bearing zone from a deeper coarse sand and gravel aquifer that is tapped by

an onsite production well at a depth of 198 to 203 feet bgs. Groundwater can be encountered at approximately 12 to 18 feet bgs throughout the site.

2.4 Environmental History

A number of environmental investigations have been performed at the Northwest Pipe Company property. Environmental investigation and sampling started in 1989 and environmental sampling continues. A list of these investigations is provided below:

- Dames & Moore (1989), Phase I & Phase II Property Transfer Assessment
- Crosby & Overton (1989), Remedial Activities Report
- Crosby & Overton (1989), Corrective Action Report
- OMNI (1990), Environmental Groundwater Monitoring Well Report
- URS Corporation (2000), Letter Report/Environmental Review
- CH2M HILL (2000), Preliminary Assessment
- CH2M HILL (2001), Preliminary Assessment Addendum
- CH2M HILL (2001), Site Investigation
- CH2M HILL (2002), Southeast Area Investigation
- CH2M HILL (2003), Southeast Area Groundwater Investigation
- CH2M HILL (2003), Stormwater System Sampling
- CH2M HILL (2004), Southeast Area Supplemental Site Investigation
- CH2M HILL (2005), Draft Remedial Investigation/Source Control Evaluation
- CH2M HILL (2006), Surface Soil sampling/Catch basin solids sampling
- CH2M HILL (2007), Surface, Subsurface Soil, & Groundwater Sampling
- CH2M HILL (2009), Surface Soil and Roof Runoff Sampling
- CH2M HILL (2012-2013), Stormwater Sampling
- CH2M HILL (2012-2013), Subsurface Soil Investigation and Groundwater Sampling
- CH2M (2016-2017), Groundwater Sampling
- Jacobs Engineering Group Inc. (Jacobs) (2018-2019), Groundwater Sampling

3. Contaminated Media Designation

This section presents the environmental media covered under this CMMP.

3.1 Surface Soil

For this document, surface soil is defined as soil from the ground surface to a depth of 0.5 foot. Table 1 presents a summary of sampling results compared to DEQ risk-based concentrations (RBCs) (updated in May 2018) for soil ingestion, dermal contact, and inhalation for the occupational, construction worker, and excavation worker receptor scenarios (DEQ, 2018). In this report, either the 2018 RBC for the construction worker or occupational worker exposure scenario is used for comparison, depending on which is lower, or more conservative. The 2018 RBC value for arsenic is 1.9 milligrams per kilogram (mg/kg), which is less than area background concentrations identified by DEQ to be 8.8 mg/kg.

Locations where sample analytical results exceed the 2018 DEQ RBCs are identified as contaminated media and will require proper management under this CMMP. Figure 2 indicates the location of surface soil samples and the locations that fit the definition of contaminated media in the surface soil.

3.2 Subsurface Soil

For this CMMP, subsurface soil is defined as the soil found deeper than 0.5 foot. Table 2 presents a summary of sample analytical results compared to the soil ingestion, dermal contact, and inhalation for the occupational, construction worker, and excavation worker receptor scenarios; and volatilization to outdoor air, vapor intrusion into buildings, and leaching to groundwater for the occupational receptor

scenarios. Figure 3 indicates the locations of subsurface soil samples identified as contaminated media in the subsurface soil.

3.3 Groundwater

Groundwater data collected from the site from 2001 to 2019 have been screened against the occupational scenario for ingestion and inhalation from tapwater; volatilization to outdoor air; and vapor intrusion into buildings; as well as the construction worker and excavation worker scenario for groundwater in an excavation. Data are presented in Table 3. Shallow groundwater in two localized areas of the Portland facility has been found to contain concentrations of volatile organic compounds (VOCs) at concentrations exceeding 2018 DEQ RBCs. One is in the southeast corner of the Portland facility and one is approximately midway along the western boundary. If groundwater in these areas are encountered in an excavation or brought to the surface by dewatering, it should be managed appropriately. Figure 4 indicates the location of these VOC exceedances of 2018 RBCs. Figure 4 also shows the area containing groundwater contamination at levels that may require management as a contaminated medium.

4. Contaminated Media Management

This section presents the procedures for managing contaminated media at the site.

4.1 Management of Contaminated Soil

Any activities conducted at the site that disturb soil could affect contaminated soil. Soil-disturbing activities at the site (for example, excavation for underground utilities, building footings, or foundations) should follow the management practices described in this section.

4.1.1 Contaminated Media Disposal Requirements

Contaminated media management and disposal options depend on the concentration of hazardous materials found in the media. Below is a discussion of the disposal options categorized by various concentrations of hazardous materials. Figure 6 presents a flow chart indicating these management options.

In general, soil that is excavated to conduct localized underground utility work can be used to backfill the excavation provided that obvious evidence of contamination is not observed (such as strong odors, staining, or other evidence of contamination). Excavations that remove large volumes and result in excess soil may require special material management as discussed in this section.

4.1.1.1 No Detectable Hazardous Materials

Soil and groundwater for which there is no evidence of contamination or environmental sampling indicates the absence of contaminants (that is, organic chemicals are not detected and/or the detected concentrations of inorganic constituents are similar to background levels) are considered clean fill consistent with the regulatory definition found in Oregon Administrative Rule (OAR) 340-93-030(18).

There are no regulatory restrictions concerning the use or disposal of material meeting this definition. Soil meeting these requirements can be used where needed onsite or shipped offsite as clean fill. Groundwater meeting these requirements can be used onsite for various operational needs and applications, such as dust control or hydrostatic-test water.

4.1.1.2 Hazardous Materials Concentrations Below Residential RBC

Media that contain reported levels of hazardous materials at concentrations less than DEQ's RBCs for the residential risk scenario also meets the regulatory definition of clean fill (OAR 340.93.03(18)).

Excavated clean fill may be used either onsite or at offsite locations, consistent with any offsite location criteria for clean fill.

Although formal manifests are not required for the transport and disposal of nonhazardous solid waste, bills of lading and weigh slips for each load of solid waste disposed of offsite should be obtained and maintained in the Portland facility's files.

4.1.1.3 Hazardous Materials Concentrations Below Occupational RBC

Soil and groundwater waste generated by site activities that contain concentrations of hazardous substances greater than DEQ's RBC levels for the residential scenario but less than DEQ's RBC levels for the occupational exposure scenario are solid wastes. As a solid waste, the contaminated material must be managed appropriately.

Contaminated media that meet this definition may be used as backfill onsite provided that there is no obvious evidence of contamination observed (such as strong odors, staining, or other evidence of contamination) and as long as it remains on contiguous tax lot(s) owned by Northwest Pipe Company. If this material cannot be managed onsite, it should be disposed of offsite at a facility that is authorized to accept this material or treated at a permitted solid waste facility. Solid waste liquids typically can be accepted by sanitary treatment facilities, such as the City of Portland municipal sewage system under a discharge permit.

4.1.1.4 Hazardous Materials Concentrations Below Hot Spot Levels

Soil and groundwater waste generated by site activities that contain concentrations of hazardous substances greater than DEQ's RBC levels for the industrial scenario but less than hot spot levels are also a solid waste and must be managed appropriately. Hot spot levels, defined in OAR 340-122-115(31), as relevant to the Portland facility, consist of contaminated media with concentrations exceeding DEQ's defined Hot Spot Concentrations (last updated May 2018).

Contaminated media that meets this definition may be used onsite provided that there is no obvious evidence of contamination observed (such as strong odors, staining, or other evidence of contamination) and as long as it remains on contiguous tax lot(s) owned by Northwest Pipe Company and is part of a DEQ approved remedial action (that is, capping). If this material cannot be managed onsite, it should be disposed of offsite at a facility that is authorized to accept this material or treated at a permitted solid waste facility.

4.1.1.5 Hazardous Materials Concentrations Above Hot Spot Levels

Contaminated media with concentrations of hazardous materials greater than hot spot levels will need DEQ authorization for onsite management. Offsite management will be restricted to permitted treatment, storage, and disposal facilities that are authorized to accept this material.

4.1.1.6 Contaminated Media with Obvious Evidence of Contamination

Excavated media with obvious signs of contamination such as strong odors, staining, or other evidence of contamination should be segregated and managed as discussed in Section 5 Procedures for Unanticipated Materials of this CMMP.

4.1.2 Soil Excavation and Groundwater Extraction Procedures

Contaminated soil should be excavated in a manner that prevents co-mingling of contaminated and uncontaminated soil. Movement of excavation equipment over or through contaminated soil should be minimized to prevent tracking the contaminated soil into areas of uncontaminated soil. Excavated contaminated soil should be properly covered to prevent exposure to work crews and plant staff. Proper soil management practices should be implemented to prevent exposed soil from eroding and washing offsite or into the stormwater system.

Excavation equipment should be maintained in good working order, and standard equipment maintenance procedures should be maintained to prevent spillage of oil or hazardous substances from the equipment. In particular, oil leaks from equipment and machinery should be repaired promptly and any contaminated soil created by the spill promptly cleaned up.

4.1.3 Staging Areas/Roll-off Boxes

As necessary to facilitate efficient management during soil-disturbing activities, contaminated soil generated by construction should be temporarily staged in an onsite location out of traffic pathways on a plastic sheet thick enough to withstand the activities that will occur. The plastic sheet should cover the area upon which the contaminated soil will be temporarily placed. Berms around the edges of this bottom sheet may be needed to prevent surface water run-on and runoff if work is occurring during wet weather. Staging areas should be covered during periods of strong winds, at night, and during weekends unless work is actively proceeding during those times. The cover should be weighted to reduce the potential for wind to remove it and expose the staged soil to the elements. If dust from the staging area is observed, the area should either be covered or lightly watered to reduce or eliminate the dust. If practical, staged soil will be located in the exclusion zone (described in Section 4.1.5).

Contaminated soil will be staged within the site boundaries, which is defined as property either owned or leased by Northwest Pipe Company. At the conclusion of a construction project generating soil, the area beneath soil staged on pavement will be cleaned of loose soil and debris; typically by sweeping, with collected soil managed as a solid waste. The area beneath contaminated soil staged on unpaved leased property, if any construction work is done on leased property, will be inspected after the plastic sheet is removed and any observed spilled soil will be collected and managed as a solid waste.

4.1.4 Loading and Hauling

Loading areas for contaminated soil will be located in the exclusion zone (discussed in Section 4.1.5).

Trucks equipped with bed-liners should be loaded in a manner that prevents the soil from spilling or being tracked into uncontaminated areas of the site. Loose material falling onto the exterior of the truck during loading should be removed before the truck leaves the loading area. Any material collected in the loading area should be placed either into the truck or held until the next truck is loaded. At the conclusion of the paving process, surface soil in unpaved areas should be inspected and any observed spilled soil collected and managed as solid waste. If loading areas are paved, any loose soil should be cleaned from the pavement and managed as a solid waste.

Specific truck haul routes should be established before offsite transport of waste begins. Onsite truck routes should be established to minimize or prevent interference with plant operations and to minimize truck traffic over contaminated areas. The contractor will be responsible for confirming that loaded truck weights are within acceptable limits. Trucks will be covered before they leave the loading area.

4.1.5 Exclusion Zone and Decontamination

The contractor should establish an exclusion zone around the soil excavation area where contaminated soil is anticipated. Specific entrance and exit locations to the exclusion zone will be established by the contractor as part of the health and safety plan.

Equipment will be allowed to move freely within the exclusion zone. Decontamination between specific excavation areas will consist of sweeping loose soil with brooms and removing significant quantities of adhered soil with hand tools. Thorough decontamination, such as washing, will not be required for movement of equipment within the exclusion zone.

If practicable, truck loading areas will be located at the boundary of the exclusion zone such that trucks will not fully enter the exclusion zone and will not require extensive decontamination. As discussed in Section 4.1.4, soil that has fallen onto trucks will be removed before the truck leaves the loading area.

Vehicles leaving the exclusion zone that have driven over unpaved surfaces that have, or are suspected of having, contaminated media will pass through a wheel wash before entering the public right-of-way.

Thorough decontamination of the excavation equipment will be required before the equipment exits the exclusion zone. This could include sweeping, pressure washing, or using compressed air to blow off loose soil.

Personnel exiting the exclusion zone will decontaminate according to the decontamination procedures to be specified in the contractor's health and safety plan.

4.2 Management of Contaminated Water

Water or groundwater that must be managed because of construction, redevelopment, or through future groundwater sampling activities within the areas indicated in Figure 4 should be collected, temporarily contained, and evaluated for proper management. It is expected that the temporary containerized water would likely be discharged under a future City of Portland Industrial Batch Discharge Permit or, if quantities are small, through an appropriately permitted commercial wastewater treatment provider.

5. Procedures for Unanticipated Materials

In the event material that appears to be contaminated is encountered in areas of the site where they were not anticipated, the practices identified below should be implemented:

- A representative sample of the material should be collected and analyzed for polynuclear aromatic hydrocarbons (PAHs) and polychlorinated biphenyls (PCBs). Other constituents may be added to the analysis list based on observation of the encountered material. Such additional constituents may include, but are not necessarily limited to, total petroleum hydrocarbons (TPH)and VOCs).

- Materials with concentrations less than DEQ's RBCs (developed under OAR 340-122-0244(2)(a) and available at https://www.oregon.gov/deq/FilterDocs/RBDMTable.pdf) for residential exposure may be managed and disposed of as clean fill onsite or offsite (note that these values originally were developed under DEQ's underground storage tank program but are applied by the Department generally to other types of sites).

- Materials with concentrations less than DEQ's RBCs for construction workers may be managed onsite.

- Materials with concentrations greater than DEQ's RBCs for construction workers should be managed onsite if the exposure pathway is effectively eliminated through site development, or if it can be demonstrated that future exposure to these materials will not exceed DEQ's RBCs for excavation workers. If these conditions cannot be met, the material should be disposed of in an appropriate offsite landfill or other approved disposal site.

5.1 Contingent Soil Management Procedures

Based on the results of the sampling and analysis performed at the Portland facility, hazardous waste-contaminated soil is not expected to exist at the site. If, however, contaminated soil appearing to be inconsistent with that presented in this CMMP (unanticipated contaminated soil) is encountered, or if soil associated with process knowledge suggesting hazardous waste could be present is identified, contingent soil management procedures may be required. The contingent soil management procedures are necessary to maintain potential Resource Conservation and Recovery Act (RCRA) hazardous waste compliance and provide a higher level of protectiveness than provided under the soil management procedures specified above.

In addition to the soil management procedures specified previously in this CMMP, contingent soil management procedures could include the following:

- Field screening of unanticipated contaminated soil before excavation will be performed if possible to assess the nature of the soil before it is excavated. Field screening may include the use of field test kits used by experienced personnel to rapidly assess the concentrations of various contaminants.
- The exact number of samples necessary to make a waste determination is situation-specific and a function of how evenly concentrations might be distributed. Typically, waste determinations will be performed for individual soil piles and containers (roll-off boxes).
- Unanticipated and unknown contaminated soil should not be transported on public roadways until it has been properly characterized.
- Different types of unanticipated contaminated soil should not be co-mingled.
- Contaminated media designated as hazardous waste will be removed offsite as soon as possible, but no later than 90 days after being generated as a waste.

If sampling and analysis indicate that the soil is not a hazardous waste, the soil management procedures for that soil no longer need to satisfy the contingent management requirements.

If the soil is designated a hazardous waste, the soil will be managed in accordance with applicable hazardous waste regulations as described in RCRA Subtitle C (40 *Code of Federal Regulations* [CFR] 260 through 273).

5.2 Health and Safety

The contractor performing work involving contaminated media should develop a health and safety plan for its employees. The contractor will be responsible for meeting all applicable Occupational Safety and Health Administration (OSHA) health and safety requirements, including, but not limited to, 29 CFR 1910.120. The contractor should review all information provided by Northwest Pipe Company regarding the nature and extent of contaminated media anticipated in the project area. The contractor will be responsible for determining what, if any, OSHA regulations are applicable to the contractor's contaminated media excavation, management, and hauling activities. The contractor should employ a certified industrial hygienist to make this determination.

6. References

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Tables

Table 1

Surface Soil Sample Summary

Northwest Pipe Company, Portland, Oregon

Sample ID		DEQ Risk-Based Concentrations for Soil Ingestion, Dermal Contact, and Inhalation (May 2018 Update)			SS1		SS2		GP5	SS101	SS102	SS103	SS104	SS-01		SS-02	SS-03	SS-04	SS-05		SS-06	SS-07	SS-08		SS-09		SS-10
Date Sampled					09/10/01		09/10/01		09/10/01	06/21/05	06/21/05	06/21/05	06/21/05	10/04/06		10/04/06	10/04/06	10/04/06	10/04/06		10/04/06	10/04/06	10/04/06		10/04/06		10/04/06
Sample Depth					0.5 - 0.75		0.5		0.5	0.5	0.5	0.5	0.5	0		0	0	0	0		0	0	0		0		0
Analyte	**Units**	**Occupational**	**Construction Worker**	**Excavation Worker**	*EF*		*EF*							*EF*					*EF*				*EF*		*EF*		
General Chemistry																											
% Solids	% by Weight	--	--	--																							
Percent Moisture	%	--	--	--																							
Percent Solids	%	--	--	--																							
Total Organic Carbon	mg/kg	--	--	--																							
Metals, Total																											
Aluminum	mg/kg	--	--	--																							
Antimony	mg/kg	--	--	--																							
Arsenic	mg/kg	1.9	15	420																							
Cadmium	mg/kg	1,100	350	9,700																							
Chromium	mg/kg	>Max	530,000	>Max																							
Copper	mg/kg	47,000	14,000	390,000																							
Lead	mg/kg	800	800	800																							
Mercury	mg/kg	350	110	2,900																							
Nickel	mg/kg	22,000	7,000	190,000																							
Selenium	mg/kg	--	--	--																							
Silver	mg/kg	5,800	1,800	49,000																							
Zinc	mg/kg	--	--	--										31		150	260	200	390		240	100	200		140		1,400
Polynuclear Aromatic Hydrocabons																											
Acenaphthene	µg/kg	70,000,000	21,000,000	590,000,000										2.3	U				93.0				97.0		350		
Acenaphthylene	µg/kg	--	--	--										6.1					86.0				320		49.0		
Anthracene	µg/kg	350,000,000	110,000,000	>Max										17.0					360				810		1,000		
Benzo (a) anthracene	µg/kg	21,000	170,000	4,800,000										40.0					3,700	D			8,600	D	5,100	D	
Benzo (a) pyrene	µg/kg	2,100	17,000	490,000										52.0					2,800	D	*<10*		5,000	D	*<10*	3,300	D	*<10*
Benzo (b) fluoranthene	µg/kg	21,000	170,000	4,900,000										73.0					4,400	D			7,400	D		5,100	D	
Benzo (g,h,i) perylene	µg/kg	--	--	--										37.0					1,600				3,700	D		2,800	D	
Benzo (k) fluoranthene	µg/kg	210,000	1,700,000	49,000,000										27.0					1,300				3,000	D		1,400		
Chrysene	µg/kg	2,100,000	17,000,000	490,000,000										61.0					4,600	D			9,700	D		5,200	D	
Dibenzo (a,h) anthracene	µg/kg	2,100	17,000	490,000										9.5					570				940			640		
Fluoranthene	µg/kg	30,000,000	10,000,000	280,000,000										65.0					4,900	D			14,000	D		9,500	D	
Fluorene	µg/kg	47,000,000	14,000,000	390,000,000										2.5					65.0				110			390		
Indeno (1,2,3-cd) pyrene	µg/kg	21,000	170,000	4,900,000										29.0					1,400				3,000	D		2,300	D	
Naphthalene	µg/kg	23,000	580,000	16,000,000										2.3	U				46.0				84.0			72.0		
Phenanthrene	µg/kg	--	--	--										23.0					1,100				2,300	D		5,000	D	
Pyrene	µg/kg	23,000,000	7,500,000	210,000,000										62.0					4,900	D			14,000	D		8,200	D	
Total PAHs	µg/kg	--	--	--										506.4					31,920				73,061			50,401		

Notes:

EF = Exceedance factor (calculated if consistuent exceeded indicated screening level)

D = Dilution

J = Estimated value below reporting limit.

U = Not detected at specified reporting limit.

mg/kg = milligrams per Kilogram

µg/kg = micrograms per Kilogram

-- = Screening level not established (Note: If ROD CUL was available, JSCS SLV is not shown.)

Shaded = detected result exceeded indicated screening value

Dup = Field Duplicate

Screening value taken from DEQ Risk-Based Concentrations for the soil ingestion, dermal contact and inhalation (May 2018 revision)

Table 1

Surface Soil Sample Summary

Northwest Pipe Company, Portland, Oregon

Sample ID		DEQ Risk-Based Concentrations for Soil Ingestion, Dermal Contact, and Inhalation (May 2018 Update)			SS-11		SS-12		SS-13			SS-14		SS-15			SS-16		SS-17		SS-19		SS301		SS302		SS303		SS304		SS305			SS305 (Dup)		
Date Sampled					10/04/06		10/04/06		10/04/06			10/04/06		10/04/06			10/04/06		10/04/06		10/04/06		09/25/07		09/25/07		09/25/07		09/25/07		09/25/07			09/25/07		
Sample Depth					0		0		0			0		0			0		0		0		0-0.5		0-0.5		0-0.5		0-0.5		0-0.5			0-0.5		
Analyte	**Units**	**Occupational**	**Construction Worker**	**Excavation Worker**							*EF*					*EF*														*EF*				*EF*	
General Chemistry																																			
% Solids	% by Weight	--	--	--																															
Percent Moisture	%	--	--	--																															
Percent Solids	%	--	--	--																															
Total Organic Carbon	mg/kg	--	--	--																															
Metals, Total																																			
Aluminum	mg/kg	--	--	--																															
Antimony	mg/kg	--	--	--																															
Arsenic	mg/kg	1.9	15	420																															
Cadmium	mg/kg	1,100	350	9,700																															
Chromium	mg/kg	>Max	530,000	>Max																															
Copper	mg/kg	47,000	14,000	390,000																															
Lead	mg/kg	800	800	800																															
Mercury	mg/kg	350	110	2,900																															
Nickel	mg/kg	22,000	7,000	190,000																															
Selenium	mg/kg	--	--	--																															
Silver	mg/kg	5,800	1,800	49,000																															
Zinc	mg/kg	--	--	--	150		240		520			75		130			80		71		300														
Polynuclear Aromatic Hydrocabons																																			
Acenaphthene	µg/kg	70,000,000	21,000,000	590,000,000					580					13.0									6.68	J	5.38				10.3		500			703		
Acenaphthylene	µg/kg	--	--	--					340					8.4									3.51	J	2.81				4.92		64.6	J		108	J	
Anthracene	µg/kg	350,000,000	110,000,000	>Max					1,800					100.0									27		13.8				20.2		1,420			2,710		
Benzo (a) anthracene	µg/kg	21,000	170,000	4,800,000					13,000	D				300	D								256		87.8				95.8		5,110			9,000		
Benzo (a) pyrene	µg/kg	2,100	17,000	490,000					8,900	D	*<10*			270	D								246		88.9				90.3		3,480		*<10*	6,660		*<10*
Benzo (b) fluoranthene	µg/kg	21,000	170,000	4,900,000					14,000	D				420	D								425		141				156		5,250			9,930		
Benzo (g,h,i) perylene	µg/kg	--	--	--					7,200	D				250	D								219		88.9				84.5		2,030			4,160		
Benzo (k) fluoranthene	µg/kg	210,000	1,700,000	49,000,000					5,100	D				170									153		46.1				51.2		2,110			3,350		
Chrysene	µg/kg	2,100,000	17,000,000	490,000,000					15,000	D				350	D								279		107				106		4,660			8,520		
Dibenzo (a,h) anthracene	µg/kg	2,100	17,000	490,000					1,300					79.0									39.9		14.9				15.5		438			910		
Fluoranthene	µg/kg	30,000,000	10,000,000	280,000,000					25,000	D				440	D								370		155				187		12,300			23,800		
Fluorene	µg/kg	47,000,000	14,000,000	390,000,000					510					8.7									6.02	J	3.86				13.3		521			978		
Indeno (1,2,3-cd) pyrene	µg/kg	21,000	170,000	4,900,000					6,200	D				190	D								155		64.5				59.8		1,510			3,190		
Naphthalene	µg/kg	23,000	580,000	16,000,000					140					4.4									3.63	J	2.84				43.4		127	J		156	J	
Phenanthrene	µg/kg	--	--	--					10,000	D				130									82.4		56.2				105		6,660			12,300		
Pyrene	µg/kg	23,000,000	7,500,000	210,000,000					22,000	D				440	D								404		157				171		9,870			19,300		
Total PAHs	µg/kg	--	--	--					131,070					3,174									2,676		1,036				1,214		56,051			105,775		

Notes:

EF = Exceedance factor (calculated if consistuent exceeded indicated screening level)

D = Dilution

J = Estimated value below reporting limit.

U = Not detected at specified reporting limit.

mg/kg = milligrams per Kilogram

µg/kg = micrograms per Kilogram

-- = Screening level not established (Note: If ROD CUL was available, JSCS SLV is not shown.)

Shaded = detected result exceeded indicated screening value

Dup = Field Duplicate

Screening value taken from DEQ Risk-Based Concentrations for the soil ingestion, dermal contact and inhalation (May 2018 revision)

Table 1
Surface Soil Sample Summary
Northwest Pipe Company, Portland, Oregon

Sample ID		DEQ Risk-Based Concentrations for Soil Ingestion, Dermal Contact, and Inhalation (May 2018 Update)			SS306		SS307		SS308		SS309		SS310		SS311		SS312		SS313		SS314		SS315		SS315 (Dup)		SS316		SS317		SS318	
Date Sampled					09/25/07		09/25/07		09/25/07		09/25/07		09/25/07		09/25/07		09/25/07		09/25/07		09/25/07		09/25/07		09/25/07		09/25/07		09/25/07		09/25/07	
Sample Depth					0-0.5		0-0.5		0-0.5		0-0.5		0-0.5		0-0.5		0-0.5		0-0.5		0-0.5		0-0.5		0-0.5		0-0.5		0-0.5		0-0.5	
Analyte	**Units**	**Occupational**	**Construction Worker**	**Excavation Worker**	*EF*		*EF*				*EF*				*EF*		*EF*															
General Chemistry																																
% Solids	% by Weight	--	--	--																												
Percent Moisture	%	--	--	--																												
Percent Solids	%	--	--	--																												
Total Organic Carbon	mg/kg	--	--	--																												
Metals, Total																																
Aluminum	mg/kg	--	--	--																												
Antimony	mg/kg	--	--	--																												
Arsenic	mg/kg	1.9	15	420																												
Cadmium	mg/kg	1,100	350	9,700																												
Chromium	mg/kg	>Max	530,000	>Max																												
Copper	mg/kg	47,000	14,000	390,000																												
Lead	mg/kg	800	800	800																												
Mercury	mg/kg	350	110	2,900																												
Nickel	mg/kg	22,000	7,000	190,000																												
Selenium	mg/kg	--	--	--																												
Silver	mg/kg	5,800	1,800	49,000																												
Zinc	mg/kg	--	--	--																												
Polynuclear Aromatic Hydrocabons																																
Acenaphthene	µg/kg	70,000,000	21,000,000	590,000,000				82.1	J				90		163				2,030		19.3	J			2.98	J	3.67	J	4.63			24.7	J
Acenaphthylene	µg/kg	--	--	--				179					33.1	J	46.6	J			47.4	J	21.2	J			7.68	J	12.9	J	3.2			90.9	
Anthracene	µg/kg	350,000,000	110,000,000	>Max				417					312		602				4,820		76.2	J			15.9	J	22.7		17.8			200	
Benzo (a) anthracene	µg/kg	21,000	170,000	4,800,000				2,500					1,670		2,200				9,380		330				74.6		84.1		84.3			1,570	
Benzo (a) pyrene	µg/kg	2,100	17,000	490,000				2,520		*<10*			1,660		1,960				7,830		*<10*		356				97.6		99.9		88.8		734	
Benzo (b) fluoranthene	µg/kg	21,000	170,000	4,900,000				4,310					2,460		2,630				9,810		663				246		275		137			2,180	
Benzo (g,h,i) perylene	µg/kg	--	--	--				2,140					1,280		1,370				4,540		325				151		116		62.8			922	
Benzo (k) fluoranthene	µg/kg	210,000	1,700,000	49,000,000				1,620					937		1,270				6,530		248				121		66.3		48.5			845	
Chrysene	µg/kg	2,100,000	17,000,000	490,000,000				2,750					1,730		2,290				9,670		382				129		113		82.8			2,820	
Dibenzo (a,h) anthracene	µg/kg	2,100	17,000	490,000				399					227		245				1,150		54.1	J			26	J	26.8		13.4			203	
Fluoranthene	µg/kg	30,000,000	10,000,000	280,000,000				3,860					3,520		5,120				33,900		649				135		142		167			1,880	
Fluorene	µg/kg	47,000,000	14,000,000	390,000,000				38.9	J				110		167				1,920		8.18	U			3.42	U	4.04	J	4.43			12.2	J
Indeno (1,2,3-cd) pyrene	µg/kg	21,000	170,000	4,900,000				1,570					885		983				3,250		241				95.8		86.4		49.2			598	
Naphthalene	µg/kg	23,000	580,000	16,000,000				67.9	J				103		50.1	J			308	J	14.4	J			5.39	J	5.49	J	1.95			10.4	J
Phenanthrene	µg/kg	--	--	--				936					1,340		2,320				24,800		257				37.5		43.3		68.3			232	
Pyrene	µg/kg	23,000,000	7,500,000	210,000,000				4,050					3,270		4,690				28,200		623				143		146		153			2,120	
Total PAHs	µg/kg	--	--	--				27,440					19,627		26,107				148,185		4,259				1,288		1,248		987			14,442	

Notes:
EF = Exceedance factor (calculated if consistuent exceeded indicated screening level)
D = Dilution
J = Estimated value below reporting limit.
U = Not detected at specified reporting limit.
mg/kg = milligrams per Kilogram
µg/kg = micrograms per Kilogram
-- = Screening level not established (Note: If ROD CUL was available, JSCS SLV is not shown.)
Shaded = detected result exceeded indicated screening value
Dup = Field Duplicate
Screening value taken from DEQ Risk-Based Concentrations for the soil
ingestion, dermal contact and inhalation (May 2018 revision)

Table 1
Surface Soil Sample Summary
Northwest Pipe Company, Portland, Oregon

Sample ID		DEQ Risk-Based Concentrations for Soil Ingestion, Dermal Contact, and Inhalation (May 2018 Update)			SS320		SS-401			SS-402			SS-403			SS-404			SS-405			SS-406			SS-407			SS-408			SS-409			SS-410		
Date Sampled					09/25/07		10/19/09			10/19/09			10/19/09			10/19/09			10/19/09			10/19/09			10/19/09			10/19/09			10/19/09			10/19/09		
Sample Depth					0-0.5		0-0.5			0-0.5			0-0.5			0-0.5			0-0.5			0-0.5			0-0.5			0-0.5			0-0.5			0-0.5		
Analyte	**Units**	**Occupational**	**Construction Worker**	**Excavation Worker**					*EF*			*EF*			*EF*					*EF*			*EF*			*EF*					*EF*			*EF*	
General Chemistry																																				
% Solids	% by Weight	--	--	--			90.8			93.7			92.8			85		87.3			89.7			87.5			92.9		81.6			86.9				
Percent Moisture	%	--	--	--			15			12			9.8			19		13			14			15			6		18			12				
Percent Solids	%	--	--	--			85			88			90			81		87			86			85			94		82			88				
Total Organic Carbon	mg/kg	--	--	--			4,300			6,000			5,300			74,000		62,000	J		18,000			70,000			9,300		28,000			16,000				
Metals, Total																																				
Aluminum	mg/kg	--	--	--			7,040			4,720			5,450			3,730		15,800			3,160			24,200			13,000		10,600			27,000				
Antimony	mg/kg	--	--	--			0.611	U		0.569	U		0.592	U		0.627	U	3.96			0.606	U		2.46			2.48		0.654	U		0.626	U			
Arsenic	mg/kg	1.9	15	420			2.65	J	*<10*	2.28	J	*<10*	2.92	J	*<10*	1.88	J	3.57	J	*<10*	7.80	J	*<10*	4.59	J	*<10*	1.57	J	7.21	J	*<10*	31.5		*<10*		
Cadmium	mg/kg	1,100	350	9,700			1.00	J		1.08	J		1.11	J		0.916	J	5.73			7.31			6.26			4.53		8.97			1.73	J			
Chromium	mg/kg	>Max	530,000	>Max			35.6			33.6			30.0			50.5		2,360			970			3,620			2,020		121			45.6				
Copper	mg/kg	47,000	14,000	390,000			46.9			40.5			27.6			31.5		114			240			137			75.4		152			34.7				
Lead	mg/kg	800	800	800			6.48	J		16.7			9.99	J		53.1		22.1			14.1			20.9			10.6		160			35.3				
Mercury	mg/kg	350	110	2,900			0.0140	J		0.0104	J		0.00633	J		0.00605	U	0.00647	J		0.00614	U		0.0105	J		0.00488	U	0.0897			0.0218	J			
Nickel	mg/kg	22,000	7,000	190,000			22.0			17.1			14.5			16.7		35.4			519			36.7			12.4		52.5			29.2				
Selenium	mg/kg	--	--	--			0.491	U		0.457	U		0.475	U		0.504	U	0.491	U		0.487	U		1.94	J		0.696	J	0.525	U		12.1	J			
Silver	mg/kg	5,800	1,800	49,000			0.132	J		0.182	J		0.185	J		0.117	J	2.54	J		0.665	J		3.55			2.05	J	0.922	J		4.01				
Zinc	mg/kg	--	--	--			91.9			152			98.8			87.0		126			144			97.8			74.6		753			163				
Polynuclear Aromatic Hydrocabons																																				
Acenaphthene	µg/kg	70,000,000	21,000,000	590,000,000	24	J	5.45	J					5.67	J		58.9		33.9	J		49.8	J		15.6			3.54	U								
Acenaphthylene	µg/kg	--	--	--	240		3.62	U					3.66	J		11.6	J	276			84.6	J		16.3			5.45	J								
Anthracene	µg/kg	350,000,000	110,000,000	>Max	603		10.4	J					25			272		413			156	J		41.1			11.2	J								
Benzo (a) anthracene	µg/kg	21,000	170,000	4,800,000	1,470		73.6						376			1,780		1,670	J		545			252			41.1									
Benzo (a) pyrene	µg/kg	2,100	17,000	490,000	917		78.6						430			1,490		1,550			274	J		257			51.5									
Benzo (b) fluoranthene	µg/kg	21,000	170,000	4,900,000	2,780		91						506			1670		2,180			2,160			375			96.5									
Benzo (g,h,i) perylene	µg/kg	--	--	--	584		72.6						371			1,050		1,180			1,800			218			62.8									
Benzo (k) fluoranthene	µg/kg	210,000	1,700,000	49,000,000	941		71.8						479			1310		1,710			1,790			223			68.7									
Chrysene	µg/kg	2,100,000	17,000,000	490,000,000	2,150		94.1						510			1,980		2,090	J		1,640			339			68.5									
Dibenzo (a,h) anthracene	µg/kg	2,100	17,000	490,000	136		18.1						105			367		451			290	J		63			16.3									
Fluoranthene	µg/kg	30,000,000	10,000,000	280,000,000	2,370		168						421			3,450		1,680			1,780			457			70.1									
Fluorene	µg/kg	47,000,000	14,000,000	390,000,000	47.2	J	6.23	J					4.6	J		63.1		38.7	J		58.2	J		9.44	J		3.54	U								
Indeno (1,2,3-cd) pyrene	µg/kg	21,000	170,000	4,900,000	481		61.4						326			959		1,160			1,140			199			51.8									
Naphthalene	µg/kg	23,000	580,000	16,000,000	22.8	J	12.3	J					4.46	J		17.1		17.8	J		139			7.5	J		3.54	U								
Phenanthrene	µg/kg	--	--	--	361		77.3						77.1			1,380		462			443			143			18.4									
Pyrene	µg/kg	23,000,000	7,500,000	210,000,000	2,480		150						439			3,070		1,700			1,900			283			63.3									
Total PAHs	µg/kg	--	--	--	15,607		991						4,083			18,929		16,612			14,250			2,899			626									

Notes:
EF = Exceedance factor (calculated if consistuent exceeded indicated screening level)
D = Dilution
J = Estimated value below reporting limit.
U = Not detected at specified reporting limit.
mg/kg = milligrams per Kilogram
µg/kg = micrograms per Kilogram
-- = Screening level not established (Note: If ROD CUL was available, JSCS SLV is not shown.)
Shaded = detected result exceeded indicated screening value
Dup = Field Duplicate
Screening value taken from DEQ Risk-Based Concentrations for the soil
ingestion, dermal contact and inhalation (May 2018 revision)

Table 1

Surface Soil Sample Summary

Northwest Pipe Company, Portland, Oregon

Sample ID		DEQ Risk-Based Concentrations for Soil Ingestion, Dermal Contact, and Inhalation (May 2018 Update)			SS1			SS2			GP5	SS101		SS102		SS103		SS104		SS-01		SS-02		SS-03		SS-04		SS-05			SS-06		SS-07	SS-08			SS-09			SS-10	
Date Sampled					09/10/01			09/10/01			09/10/01	06/21/05		06/21/05		06/21/05		06/21/06		10/04/06		10/04/06		10/04/06		10/04/06		10/04/06			10/04/06		10/04/06	10/04/06			10/04/06			10/04/06	
Sample Depth					0.5 - 0.75			0.5			0.5	0.5		0.5		0.5		0.5		0		0		0		0		0			0		0	0			0			0	
Analyte	**Units**	**Occupational**	**Construction Worker**	**Excavation Worker**	*EF*			*EF*																																	
Polychlorinated Biphenyls																																								
Aroclor-1016	µg/kg	590	4,900	140,000	8.4	U		8.1	U			34.2	U	34.8	U	34.5	U	33.1	U	22.0	U							400	U					200	U		43.0	U			
Aroclor-1221	µg/kg	590	4,900	140,000	8.4	U		8.1	U			34.2	U	34.8	U	34.5	U	33.1	U	22.0	U							400	U					200	U		43.0	U			
Aroclor-1232	µg/kg	590	4,900	140,000	8.4	U		8.1	U			34.2	U	34.8	U	34.5	U	33.1	U	22.0	U							400	U					200	U		43.0	U			
Aroclor-1242	µg/kg	590	4,900	140,000	8.4	U		8.1	U			34.2	U	34.8	U	34.5	U	33.1	U	22.0	U							400	U					200	U		43.0	U			
Aroclor-1248	µg/kg	590	4,900	140,000	8.4	U		8.1	U			34.2	U	34.8	U	34.5	U	33.1	U	22.0	U							400	U					200	U		43.0	U			
Aroclor-1254	µg/kg	590	4,900	140,000	2,700		*<10*	6,200		*<10*		65.7		53.5		607		*<10*	148		22.0	U						3,700		*<10*				2,200		*<10*	430				
Aroclor-1260	µg/kg	590	4,900	140,000	8.4	U		8.1	U			34.2	U	34.8	U	139			59.5		22.0	U						1,100		*<10*				410			100				
Aroclor-1262	µg/kg	590	4,900	140,000																22.0	U						400	U					200	U		43.0	U			
Aroclor-1268	µg/kg	590	4,900	140,000																22.0	U						400	U					200	U		43.0	U			
Total PCBs	µg/kg	590	4,900	140,000	2,700		*<10*	6,200		*<10*		66		54		746		*<10*	208									4,800		*<10*				2,610		*<10*	530				
Organochlorine Pesticides																																								
4,4´-DDD	µg/kg	12,000	9,700	270,000																																					
4,4´-DDE	µg/kg	8,200	66,000	1,800,000																																					
4,4´-DDT	µg/kg	8,500	66,000	1,800,000																																					
Aldrin	µg/kg	130	1,100	30,000																																					
alpha-BHC	µg/kg	360	3,000	83,000																																					
alpha-Chlordane	µg/kg	7,400	61,000	1,700,000																																					
beta-BHC	µg/kg	--	--	--																																					
Chlordane (tech)	µg/kg	7,400	61,000	1,700,000																																					
delta-BHC	µg/kg	--	--	--																																					
Dieldrin	µg/kg	140	1,200	33,000																																					
Endosulfan I	µg/kg	4,900,000	1,600,000	45,000,000																																					
Endosulfan II	µg/kg	4,900,000	1,600,000	45,000,000																																					
Endosulfan sulfate	µg/kg	--	--	--																																					
Endrin	µg/kg	250,000	80,000	2,200,000																																					
Endrin aldehyde	µg/kg	--	--	--																																					
Endrin ketone	µg/kg	--	--	--																																					
gamma-BHC (Lindane)	µg/kg	2,100	17,000	470,000																																					
gamma-Chlordane	µg/kg	7,400	61,000	1,700,000																																					
Heptachlor	µg/kg	450	4,000	110,000																																					
Heptachlor epoxide	µg/kg	240	2,000	56,000																																					
Methoxychlor	µg/kg	--	--	--																																					
Toxaphene	µg/kg	2,100	17,000	470,000																																					
Phthalates																																								
Bis(2-ethylhexyl)phthalate	µg/kg	160,000	130,000	37,000,000																																					
Butyl benzyl phthalate	µg/kg	--	--	--																																					
Diethyl phthalate	µg/kg	--	--	--																																					
Dimethyl phthalate	µg/kg	--	--	--																																					
Di-n-butyl phthalate	µg/kg	--	--	--																																					
Di-n-octyl phthalate	µg/kg	--	--	--																																					
Total Petroleum Hydrocarbons																																								
Gas-Range Organics (C7-C12)	mg/kg	20,000	9,700	>Max	0.25	U		0.25	U		0.25	U																													
Diesel-Range Organics (C12-C24)	mg/kg	14,000	4,600	>Max	46			603			20.0	U								4.7	U						100	U					360			120	U			
Oil-Range Organics (C24-C36)	mg/kg	36,000	11,000	>Max	85			2,100			50.0	U																													

Notes:

EF = Exceedance factor (calculated if consistuent exceeded indicated screening level)

D = Dilution

J = Estimated value below reporting limit.

U = Not detected at specified reporting limit.

mg/kg = milligrams per Kilogram

µg/kg = micrograms per Kilogram

-- = Screening level not established (Note: If ROD CUL was available, JSCS SLV is not shown.)

Shaded = detected result exceeded indicated screening value

Dup = Field Duplicate

Screening value taken from DEQ Risk-Based Concentrations for the soil ingestion, dermal contact and inhalation (May 2018 revision)

Table 1
Surface Soil Sample Summary
Northwest Pipe Company, Portland, Oregon

Sample ID		DEQ Risk-Based Concentrations for Soil Ingestion, Dermal Contact, and Inhalation (May 2018 Update)			SS-11		SS-12		SS-13			SS-14		SS-15			SS-16	SS-17	SS-19	SS301	SS302	SS303	SS304	SS305			SS305 (Dup)		
Date Sampled					10/04/06		10/04/06		10/04/06			10/04/06		10/04/06			10/04/06	10/04/06	10/04/06	09/25/07	09/25/07	09/25/07	09/25/07	09/25/07			09/25/07		
Sample Depth					0		0		0			0		0			0	0	0	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5			0-0.5		
Analyte	**Units**	**Occupational**	**Construction Worker**	**Excavation Worker**							*EF*					*EF*										*EF*			*EF*
Polychlorinated Biphenyls																													
Aroclor-1016	µg/kg	590	4,900	140,000					1,300	U				210	U								24.8	U	123	U		120	U	
Aroclor-1221	µg/kg	590	4,900	140,000					1,300	U				210	U								24.8	U	123	U		120	U	
Aroclor-1232	µg/kg	590	4,900	140,000					1,300	U				210	U								24.8	U	123	U		120	U	
Aroclor-1242	µg/kg	590	4,900	140,000					1,300	U				210	U								24.8	U	123	U		120	U	
Aroclor-1248	µg/kg	590	4,900	140,000					1,300	U				210	U								24.8	U	123	U		120	U	
Aroclor-1254	µg/kg	590	4,900	140,000					11,000		*<10*			630		*<10*							90.6		768		*<10*	778		*<10*
Aroclor-1260	µg/kg	590	4,900	140,000					1,500		*<10*			210	U								24.8	U	263			346		
Aroclor-1262	µg/kg	590	4,900	140,000					1,300	U				210	U															
Aroclor-1268	µg/kg	590	4,900	140,000					1,300	U				210	U															
Total PCBs	µg/kg	590	4,900	140,000					12,500		*<10*			630		*<10*							91		1,031		*<10*	1,124		*<10*
Organochlorine Pesticides																													
4,4´-DDD	µg/kg	12,000	9,700	270,000																									
4,4´-DDE	µg/kg	8,200	66,000	1,800,000																									
4,4´-DDT	µg/kg	8,500	66,000	1,800,000																									
Aldrin	µg/kg	130	1,100	30,000																									
alpha-BHC	µg/kg	360	3,000	83,000																									
alpha-Chlordane	µg/kg	7,400	61,000	1,700,000																									
beta-BHC	µg/kg	--	--	--																									
Chlordane (tech)	µg/kg	7,400	61,000	1,700,000																									
delta-BHC	µg/kg	--	--	--																									
Dieldrin	µg/kg	140	1,200	33,000																									
Endosulfan I	µg/kg	4,900,000	1,600,000	45,000,000																									
Endosulfan II	µg/kg	4,900,000	1,600,000	45,000,000																									
Endosulfan sulfate	µg/kg	--	--	--																									
Endrin	µg/kg	250,000	80,000	2,200,000																									
Endrin aldehyde	µg/kg	--	--	--																									
Endrin ketone	µg/kg	--	--	--																									
gamma-BHC (Lindane)	µg/kg	2,100	17,000	470,000																									
gamma-Chlordane	µg/kg	7,400	61,000	1,700,000																									
Heptachlor	µg/kg	450	4,000	110,000																									
Heptachlor epoxide	µg/kg	240	2,000	56,000																									
Methoxychlor	µg/kg	--	--	--																									
Toxaphene	µg/kg	2,100	17,000	470,000																									
Phthalates																													
Bis(2-ethylhexyl)phthalate	µg/kg	160,000	130,000	37,000,000																									
Butyl benzyl phthalate	µg/kg	--	--	--																									
Diethyl phthalate	µg/kg	--	--	--																									
Dimethyl phthalate	µg/kg	--	--	--																									
Di-n-butyl phthalate	µg/kg	--	--	--																									
Di-n-octyl phthalate	µg/kg	--	--	--																									
Total Petroleum Hydrocarbons																													
Gas-Range Organics (C7-C12)	mg/kg	20,000	9,700	>Max																									
Diesel-Range Organics (C12-C24)	mg/kg	14,000	4,600	>Max					270					42						12.3	J	11.1	J	7.6	J	11.3	J	224	J		169	J	
Oil-Range Organics (C24-C36)	mg/kg	36,000	11,000	>Max																									

Notes:
EF = Exceedance factor (calculated if consistuent exceeded indicated screening level)
D = Dilution
J = Estimated value below reporting limit.
U = Not detected at specified reporting limit.
mg/kg = milligrams per Kilogram
µg/kg = micrograms per Kilogram
-- = Screening level not established (Note: If ROD CUL was available, JSCS SLV is not shown.)
Shaded = detected result exceeded indicated screening value
Dup = Field Duplicate
Screening value taken from DEQ Risk-Based Concentrations for the soil
ingestion, dermal contact and inhalation (May 2018 revision)

Table 1
Surface Soil Sample Summary
Northwest Pipe Company, Portland, Oregon

Sample ID		DEQ Risk-Based Concentrations for Soil Ingestion, Dermal Contact, and Inhalation (May 2018 Update)			SS306			SS307			SS308	SS309			SS310			SS311	SS312			SS313			SS314	SS315	SS315 (Dup)	SS316	SS317	SS318
Date Sampled					09/25/07			09/25/07			09/25/07	09/25/07			09/25/07			09/25/07	09/25/07			09/25/07			09/25/07	09/25/07	09/25/07	09/25/07	09/25/07	09/25/07
Sample Depth					0-0.5			0-0.5			0-0.5	0-0.5			0-0.5			0-0.5	0-0.5			0-0.5			0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5
Analyte	**Units**	**Occupational**	**Construction Worker**	**Excavation Worker**	*EF*			*EF*					*EF*			*EF*			*EF*												
Polychlorinated Biphenyls																														
Aroclor-1016	µg/kg	590	4,900	140,000	2,340	U		490	U			476	U		489	U			490	U		25.2	U							
Aroclor-1221	µg/kg	590	4,900	140,000	2,340	U		490	U			476	U		489	U			490	U		25.2	U							
Aroclor-1232	µg/kg	590	4,900	140,000	2,340	U		490	U			476	U		489	U			490	U		25.2	U							
Aroclor-1242	µg/kg	590	4,900	140,000	2,340	U		490	U			476	U		489	U			490	U		25.2	U							
Aroclor-1248	µg/kg	590	4,900	140,000	2,340	U		490	U			476	U		489	U			490	U		25.2	U							
Aroclor-1254	µg/kg	590	4,900	140,000	8,930		*<10*	7,360		*<10*		2,900		*<10*	3,310		*<10*		2,730		*<10*	186								
Aroclor-1260	µg/kg	590	4,900	140,000	2,340	U		888		*<10*		1,360			489	U			490	U		36.3								
Aroclor-1262	µg/kg	590	4,900	140,000																										
Aroclor-1268	µg/kg	590	4,900	140,000																										
Total PCBs	µg/kg	590	4,900	140,000	8,930		*<10*	8,248		*<10*		4,260		*<10*	3,310		*<10*		2,730		*<10*	186								
Organochlorine Pesticides																														
4,4´-DDD	µg/kg	12,000	9,700	270,000																										
4,4´-DDE	µg/kg	8,200	66,000	1,800,000																										
4,4´-DDT	µg/kg	8,500	66,000	1,800,000																										
Aldrin	µg/kg	130	1,100	30,000																										
alpha-BHC	µg/kg	360	3,000	83,000																										
alpha-Chlordane	µg/kg	7,400	61,000	1,700,000																										
beta-BHC	µg/kg	--	--	--																										
Chlordane (tech)	µg/kg	7,400	61,000	1,700,000																										
delta-BHC	µg/kg	--	--	--																										
Dieldrin	µg/kg	140	1,200	33,000																										
Endosulfan I	µg/kg	4,900,000	1,600,000	45,000,000																										
Endosulfan II	µg/kg	4,900,000	1,600,000	45,000,000																										
Endosulfan sulfate	µg/kg	--	--	--																										
Endrin	µg/kg	250,000	80,000	2,200,000																										
Endrin aldehyde	µg/kg	--	--	--																										
Endrin ketone	µg/kg	--	--	--																										
gamma-BHC (Lindane)	µg/kg	2,100	17,000	470,000																										
gamma-Chlordane	µg/kg	7,400	61,000	1,700,000																										
Heptachlor	µg/kg	450	4,000	110,000																										
Heptachlor epoxide	µg/kg	240	2,000	56,000																										
Methoxychlor	µg/kg	--	--	--																										
Toxaphene	µg/kg	2,100	17,000	470,000																										
Phthalates																														
Bis(2-ethylhexyl)phthalate	µg/kg	160,000	130,000	37,000,000																										
Butyl benzyl phthalate	µg/kg	--	--	--																										
Diethyl phthalate	µg/kg	--	--	--																										
Dimethyl phthalate	µg/kg	--	--	--																										
Di-n-butyl phthalate	µg/kg	--	--	--																										
Di-n-octyl phthalate	µg/kg	--	--	--																										
Total Petroleum Hydrocarbons																														
Gas-Range Organics (C7-C12)	mg/kg	20,000	9,700	>Max																										
Diesel-Range Organics (C12-C24)	mg/kg	14,000	4,600	>Max	276	J		96.4	J		44.5	J	76.9	J		50.1	J		44.5	J	64.6	J		25.3	J	26.5	J	35	J	36.3	J	6.8	J	342	J	36.5	J
Oil-Range Organics (C24-C36)	mg/kg	36,000	11,000	>Max																										

Notes:
EF = Exceedance factor (calculated if consistuent exceeded indicated screening level)
D = Dilution
J = Estimated value below reporting limit.
U = Not detected at specified reporting limit.
mg/kg = milligrams per Kilogram
µg/kg = micrograms per Kilogram
-- = Screening level not established (Note: If ROD CUL was available, JSCS SLV is not shown.)
Shaded = detected result exceeded indicated screening value
Dup = Field Duplicate
Screening value taken from DEQ Risk-Based Concentrations for the soil
ingestion, dermal contact and inhalation (May 2018 revision)

Table 1
Surface Soil Sample Summary
Northwest Pipe Company, Portland, Oregon

Sample ID		DEQ Risk-Based Concentrations for Soil Ingestion, Dermal Contact, and Inhalation (May 2018 Update)			SS320		SS-401		SS-402		SS-403		SS-404		SS-405		SS-406		SS-407		SS-408		SS-409		SS-410	
Date Sampled					09/25/07		10/19/09		10/19/09		10/19/09		10/19/09		10/19/09		10/19/09		10/19/09		10/19/09		10/19/09		10/19/09	
Sample Depth					0-0.5		0-0.5		0-0.5		0-0.5		0-0.5		0-0.5		0-0.5		0-0.5		0-0.5		0-0.5		0-0.5	
Analyte	**Units**	**Occupational**	**Construction Worker**	**Excavation Worker**				*EF*		*EF*		*EF*				*EF*		*EF*		*EF*				*EF*		*EF*
Polychlorinated Biphenyls																										
Aroclor-1016	µg/kg	590	4,900	140,000			3.67	U	17.8	U	36	U	19.6	U	19.1	U	37.2	U	7.6	U	1.79	U	408	U		7.68	U
Aroclor-1221	µg/kg	590	4,900	140,000			7.32	U	35.5	U	71.7	U	39.1	U	38	U	74.2	U	15.2	U	3.57	U	814	U		15.3	U
Aroclor-1232	µg/kg	590	4,900	140,000			3.67	U	17.8	U	36	U	19.6	U	19.1	U	37.2	U	7.6	U	1.79	U	408	U		7.68	U
Aroclor-1242	µg/kg	590	4,900	140,000			3.67	U	17.8	U	36	U	19.6	U	19.1	U	37.2	U	7.6	U	1.79	U	408	U		7.68	U
Aroclor-1248	µg/kg	590	4,900	140,000			3.67	U	17.8	U	36	U	19.6	U	19.1	U	37.2	U	7.6	U	1.79	U	408	U		7.68	U
Aroclor-1254	µg/kg	590	4,900	140,000			65.8		368		540		302		399		460		120		25		8,740		*<10*	181	
Aroclor-1260	µg/kg	590	4,900	140,000			3.67	U	17.8	U	36	U	19.6	U	19.1	U	37.2	U	7.6	U	1.79	U	408	U		7.68	U
Aroclor-1262	µg/kg	590	4,900	140,000			3.67	U	17.8	U	36	U	19.6	U	19.1	U	37.2	U	7.6	U	1.79	U	408	U		7.68	U
Aroclor-1268	µg/kg	590	4,900	140,000			3.67	U	17.8	U	36	U	19.6	U	19.1	U	37.2	U	7.6	U	1.79	U	408	U		7.68	U
Total PCBs	µg/kg	590	4,900	140,000			66		368		540		302		399		460		120		25		8,740		*<10*	181	
Organochlorine Pesticides																										
4,4´-DDD	µg/kg	12,000	9,700	270,000			0.726	U	1.76	U	1.78	U	1.94	U	1.88	U	1.84	U	0.751	U	0.708	U	4.03	U		1.90	U
4,4´-DDE	µg/kg	8,200	66,000	1,800,000			1.47	U	5.32	U	7.22	U	5.87	U	7.64	U	5.57	U	1.52	U	0.708	U	81.9	U		3.85	U
4,4´-DDT	µg/kg	8,500	66,000	1,800,000			3.69	U	21.4	U	28.9	U	19.7	U	22.9	U	22.4	U	9.56	U	2.14	U	491	U		15.4	U
Aldrin	µg/kg	130	1,100	30,000			0.726	U	1.76	U	1.78	U	1.94	U	1.88	U	1.84	U	0.751	U	0.708	U	4.03	U		1.90	U
alpha-BHC	µg/kg	360	3,000	83,000			0.726	U	1.76	U	1.78	U	1.94	U	1.88	U	1.84	U	0.751	U	0.708	U	6.78	J		1.90	U
alpha-Chlordane	µg/kg	7,400	61,000	1,700,000			0.726	U	1.76	U	1.78	U	1.94	U	1.88	U	1.84	U	0.751	U	0.708	U	12.2	U		1.90	U
beta-BHC	µg/kg	--	--	--			0.726	U	1.76	U	1.78	U	1.94	U	1.88	U	1.84	U	0.751	U	0.708	U	4.03	U		1.90	U
Chlordane (tech)	µg/kg	7,400	61,000	1,700,000			16.5	U	39.9	U	40.4	U	44.0	U	42.8	U	41.8	U	17.1	U	16.1	U	91.7	U		43.1	U
delta-BHC	µg/kg	--	--	--			0.726	U	1.76	U	1.78	U	1.94	U	1.88	U	1.84	U	0.751	U	0.708	U	4.03	U		1.90	U
Dieldrin	µg/kg	140	1,200	33,000			1.47	U	3.57	U	7.22	U	5.87	U	9.58	U	3.73	U	2.28	U	0.708	U	57.3	U		5.75	U
Endosulfan I	µg/kg	4,900,000	1,600,000	45,000,000			0.726	U	1.76	U	1.78	U	1.94	U	1.88	U	1.84	U	0.751	U	0.708	U	20.5	U		1.90	U
Endosulfan II	µg/kg	4,900,000	1,600,000	45,000,000			0.726	U	1.76	U	3.61	U	1.94	U	3.82	U	1.84	U	0.751	U	0.708	U	40.9	U		1.90	U
Endosulfan sulfate	µg/kg	--	--	--			0.726	U	1.76	U	1.78	U	1.94	U	1.88	U	1.84	U	0.751	U	0.708	U	4.03	U		1.90	U
Endrin	µg/kg	250,000	80,000	2,200,000			0.726	U	1.76	U	3.61	U	1.94	U	3.82	U	1.84	U	0.751	U	0.708	U	40.9	U		1.90	U
Endrin aldehyde	µg/kg	--	--	--			0.726	U	1.76	U	3.61	U	3.93	U	3.82	U	1.84	U	0.751	U	0.708	U	32.8	U		1.90	U
Endrin ketone	µg/kg	--	--	--			0.726	U	1.76	U	1.78	U	3.93	U	13.4	U	1.84	U	0.751	U	0.708	U	32.8	U		1.90	U
gamma-BHC (Lindane)	µg/kg	2,100	17,000	470,000			0.726	U	1.76	U	1.78	U	1.94	U	1.88	U	1.84	U	0.751	U	0.708	U	4.03	U		1.90	U
gamma-Chlordane	µg/kg	7,400	61,000	1,700,000			0.726	U	5.32	U	1.78	U	1.94	U	1.88	U	5.57	U	0.751	U	0.708	U	81.9	U		1.90	U
Heptachlor	µg/kg	450	4,000	110,000			0.726	U	1.76	U	1.78	U	1.94	U	1.88	U	1.84	U	0.751	U	0.708	U	4.03	U		1.90	U
Heptachlor epoxide	µg/kg	240	2,000	56,000			0.726	U	3.57	U	3.61	U	3.93	U	3.82	U	3.73	U	1.52	U	0.708	U	49.1	U		1.90	U
Methoxychlor	µg/kg	--	--	--			1.47	U	1.76	U	14.4	U	3.93	U	11.5	U	9.35	U	4.57	U	0.708	U	205	U		3.85	U
Toxaphene	µg/kg	2,100	17,000	470,000			22.0	U	53.2	U	53.8	U	58.7	U	57.000	U	55.7	U	22.8	U	21.4	U	122	U		57.5	U
Phthalates																										
Bis(2-ethylhexyl)phthalate	µg/kg	160,000	130,000	37,000,000			66.8		389	J	191		325		139		335		467		60.3		667			178	
Butyl benzyl phthalate	µg/kg	--	--	--			382		84.6	J	28.3	J	75		37.3	J	148	U	31		14.5	J	163	U		49.2	
Diethyl phthalate	µg/kg	--	--	--			14.7	U	70.7	U	14.4	U	31.4	U	30.6	U	148	U	15.1	U	14.4	U	163	U		15.3	U
Dimethyl phthalate	µg/kg	--	--	--			14.7	U	70.7	U	14.4	U	31.4	U	30.6	U	148	U	15.1	U	14.4	U	163	U		15.3	U
Di-n-butyl phthalate	µg/kg	--	--	--			14.7	U	70.7	U	14.4	U	31.4	U	30.6	U	148	U	15.1	U	14.4	U	163	U		15.3	U
Di-n-octyl phthalate	µg/kg	--	--	--			14.7	U	141	U	289	U	157	U	383	U	296	U	151	U	144	U	816	U		305	U
Total Petroleum Hydrocarbons																										
Gas-Range Organics (C7-C12)	mg/kg	20,000	9,700	>Max																						
Diesel-Range Organics (C12-C24)	mg/kg	14,000	4,600	>Max	183	J																				
Oil-Range Organics (C24-C36)	mg/kg	36,000	11,000	>Max																						

Notes:
EF = Exceedance factor (calculated if consistuent exceeded indicated screening level)
D = Dilution
J = Estimated value below reporting limit.
U = Not detected at specified reporting limit.
mg/kg = milligrams per Kilogram
µg/kg = micrograms per Kilogram
-- = Screening level not established (Note: If ROD CUL was available, JSCS SLV is not shown.)
Shaded = detected result exceeded indicated screening value
Dup = Field Duplicate
Screening value taken from DEQ Risk-Based Concentrations for the soil
ingestion, dermal contact and inhalation (May 2018 revision)

Table 1
Surface Soil Sample Summary
Northwest Pipe Company, Portland, Oregon

Sample ID		DEQ Risk-Based Concentrations for Soil Ingestion, Dermal Contact, and Inhalation (May 2018 Update)			SS1		SS2		GP5		SS101		SS102		SS103		SS104		SS-01		SS-02		SS-03		SS-04		SS-05		SS-06		SS-07		SS-08		SS-09		SS-10	
Date Sampled					09/10/01		09/10/01		09/10/01		06/21/05		06/21/05		06/21/05		06/21/05		10/04/06		10/04/06		10/04/06		10/04/06		10/04/06		10/04/06		10/04/06		10/04/06		10/04/06		10/04/06	
Sample Depth					0.5 - 0.75		0.5		0.5		0.5		0.5		0.5		0.5		0		0		0		0		0		0		0		0		0		0	
Analyte	**Units**	**Occupational**	**Construction Worker**	**Excavation Worker**	*EF*		*EF*		*EF*																													
Volatile Organic Compounds																																						
1,1,1,2-Tetrachloroethane	µg/kg	--	--	--					1.1	U																												
1,1,1-Trichloroethane	µg/kg	870,000,000	470,000,000	>Max					1.1	U																												
1,1,2,2-Tetrachloroethane	µg/kg	--	--	--					1.1	U																												
1,1,2-Trichloroethane	µg/kg	26,000	54,000	1,500,000					1.1	U																												
1,1-Dichloroethane	µg/kg	260,000	3,200,000	89,000,000					1.1	U																												
1,1-Dichloroethene	µg/kg	29,000,000	13,000,000	370,000,000					1.1	U																												
1,1-Dichloropropene	µg/kg	--	--	--					1.1	U																												
1,2,3-Trichlorobenzene	µg/kg	--	--	--					1.1	U																												
1,2,3-Trichloropropane	µg/kg	--	--	--					1.1	U																												
1,2,4-Trichlorobenzene	µg/kg	--	--	--					1.1	U																												
1,2,4-Trimethylbenzene	µg/kg	6,900,000	2,900,000	81,000,000					1.1	U																												
1,2-Dibromo-3-Chloropropane	µg/kg	--	--	--					1.1	U																												
1,2-Dibromoethane	µg/kg	--	--	--					1.1	U																												
1,2-Dichlorobenzene	µg/kg	36,000,000	20,000,000	560,000,000					1.1	U																												
1,2-Dichloroethane	µg/kg	--	--	--					1.1	U																												
1,2-Dichloropropane	µg/kg	--	--	--					1.1	U																												
1,3,5-Trimethylbenzene	µg/kg	--	--	--					1.1	U																												
1,3-Dichlorobenzene	µg/kg	--	--	--					1.1	U																												
1,3-Dichloropropane	µg/kg	--	--	--					1.1	U																												
1,4-Dichlorobenzene	µg/kg	64,000	1,300,000	36,000,000					1.1	U																												
2,2-Dichloropropane	µg/kg	--	--	--					1.1	U																												
2-Chlorotoluene	µg/kg	--	--	--					1.1	U																												
4-Chlorotoluene	µg/kg	--	--	--					1.1	U																												
Benzene	µg/kg	37,000	380,000	11,000,000					1.1	U																												
Bromobenzene	µg/kg	--	--	--					1.1	U																												
Bromochloromethane	µg/kg	--	--	--					1.1	U																												
Bromodichloromethane	µg/kg	15,000	230,000	6,300,000					1.1	U																												
Bromoform	µg/kg	260,000	2,700,000	74,000,000					1.1	U																												
Bromomethane	µg/kg	750,000	370,000	10,000,000					1.1	U																												
Carbon Tetrachloride	µg/kg	34,000	320,000	8,900,000					1.1	U																												
Chlorobenzene	µg/kg	8,700,000	4,700,000	130,000,000					1.1	U																												
Chlorodibromomethane	µg/kg	17,000	210,000	5,800,000					1.1	U																												
Chloroethane	µg/kg	>Max	>Max	>Max					1.1	U																												
Chloroform	µg/kg	26,000	410,000	11,000,000					1.1	U																												
Chloromethane	µg/kg	25,000,000	25,000,000	700,000,000					1.1	U																												
Cis-1,2-Dichloroethene	µg/kg	2,300,000	710,000	20,000,000					1.1	U																												
Cis-1,3-Dichloropropene	µg/kg	--	--	--					1.1	U																												
Dibromomethane	µg/kg	--	--	--					1.1	U																												
Dichlorodifluoromethane	µg/kg	--	--	--					1.1	U																												
Ethylbenzene	µg/kg	150,000	1,700,000	49,000,000					1.1	U																												
Hexachlorobutadiene	µg/kg	--	--	--					1.1	U																												
Isopropylbenzene	µg/kg	57,000,000	27,000,000	750,000,000					1.1	U																												
m+p-Xylenes	µg/kg	--	--	--					2.2	U																												
Methylene Chloride	µg/kg	1,600,000	2,100,000	58,000,000					1.1	U																												
Naphthalene	µg/kg	23,000	580,000	16,000,000					1.1	U																												
n-Butylbenzene	µg/kg	--	--	--					1.1	U																												
n-Propylbenzene	µg/kg	--	--	--					1.1	U																												
o-Xylene	µg/kg	--	--	--					1.1	U																												
p-Isopropyltoluene	µg/kg	--	--	--					1.1	U																												
Sec-Butylbenzene	µg/kg	--	--	--					1.1	U																												
Styrene	µg/kg	130,000,000	56,000,000	>Max					1.1	U																												
Tert-Butylbenzene	µg/kg	--	--	--					1.1	U																												
Tetrachloroethene	µg/kg	1,000,000	1,800,000	50,000,000					1.1	U																												
Toluene	µg/kg	88,000,000	28,000,000	770,000,000					1.1	U																												
Trans-1,2-Dichloroethene	µg/kg	23,000,000	7,100,000	200,000,000					1.1	U																												
Trans-1,3-Dichloropropene	µg/kg	--	--	--					1.1	U																												
Trichloroethene	µg/kg	51,000	130,000	3,700,000					1.1	U																												
Trichlorofluoromethane	µg/kg	130,000,000	69,000,000	>Max					1.1	U																												
Vinyl Chloride	µg/kg	4,400	34,000	950,000					1.1	U																												

Notes:
EF = Exceedance factor (calculated if consistuent exceeded indicated screening level)
D = Dilution
J = Estimated value below reporting limit.
U = Not detected at specified reporting limit.
mg/kg = milligrams per Kilogram
µg/kg = micrograms per Kilogram
-- = Screening level not established (Note: If ROD CUL was available, JSCS SLV is not shown.)
Shaded = detected result exceeded indicated screening value
Dup = Field Duplicate
Screening value taken from DEQ Risk-Based Concentrations for the soil ingestion, dermal contact and inhalation (May 2018 revision)

Table 2
Subsurface Soil Sample Summary
Northwest Pipe Company, Portland, Oregon

Sample ID		DEQ Risk-Based Concentrations (May 2018 Update)						GP-1		GP-2		GP-5		GP-5		GW03		GW05		GW05		GP201		GP202		GP203		GP203 (Dup)		GP204		GP205		GP206		GP207		GP208	
Sample Date								09/07/01		09/10/01		09/10/01		09/10/01		08/29/02		08/30/02		08/30/02		09/26/07		09/26/07		09/26/07		09/26/07		09/26/07		09/26/07		09/26/07		09/26/07		09/27/07	
Sample Depth (ft)		Soil Ingestion, Dermal Contact, and Inhalation			Volatilization to Outdoor Air	Vapor Intrusion into Buildings	Leaching to Groundwater	6		18		3		6		9		2.5		13.5		9		8		8		8		9		9		9		9		9	
Analyte	**Units**	**Occupational**	**Construction Worker**	**Excavation Worker**	**Occupational**	**Occupational**	**Occupational**																			*EF*		*EF*									
General Chemistry																																					
Total Organic Carbon	mg/kg	--	--	--																																	
Metals, Total																																					
Arsenic	mg/kg	1.9	15	420	--	--	--																														
Cadmium	mg/kg	1,100	350	9,700	--	--	--																														
Chromium	mg/kg	>Max	530,000	>Max	--	--	--																														
Copper	mg/kg	47,000	14,000	390,000	--	--	--																														
Lead	mg/kg	800	800	800	--	--	30																														
Manganese	mg/kg	25,000	8,200	230,000	--	--	--																														
Mercury	mg/kg	350	110	2,900	--	--	--																														
Nickel	mg/kg	22,000	7,000	190,000	--	--	--																														
Zinc	mg/kg	--	--	--	--	--	--																			39.3		39.7		36.7				40.3		40.7			
Polynuclear Aromatic Hydrocabons																																					
1-Methylnaphthalene	µg/kg	--	--	--	--	--	--																														
2-Methylnaphthalene	µg/kg	--	--	--	--	--	--																														
Acenaphthene	µg/kg	70,000,000	21,000,000	590,000,000	>Max	>Max	>Csat	5.0	U	6.0	U															0.166	U	0.172	U	0.158	U			0.161	U	0.171	U		
Acenaphthylene	µg/kg	--	--	--	--	--	--	5.0	U	6.0	U															0.385	J	0.214	U	2.5				0.201	U	0.213	U		
Anthracene	µg/kg	350,000,000	110,000,000	>Max	>Max	>Max	>Csat	5.0	U	6.0	U															1.07	J	0.422	U	1.1	J			0.394	U	0.418	U		
Benzo (a) anthracene	µg/kg	21,000	170,000	4,800,000	>Csat	>Csat	>Csat	5.0	U	6.0	U															0.736	J	0.757	J	3.1				0.226	J	1.22	J		
Benzo (a) pyrene	µg/kg	2,100	17,000	490,000	--	--	>Csat	5.0	U	6.0	U															0.841	J	0.891	J	7.34				0.589	U	1.51	J		
Benzo (b) fluoranthene	µg/kg	21,000	170,000	4,900,000	--	--	>Csat	5.0	U	6.0	U															1.21	J	1.31	J	7.54				0.276	UJ	7.13			
Benzo (g,h,i) perylene	µg/kg	--	--	--	--	--	--	5.0	U	6.0	U															1.17	J	0.679	UJ	9.75				0.39	UJ	2.17			
Benzo (k) fluoranthene	µg/kg	210,000	1,700,000	49,000,000	--	--	>Csat	5.0	U	6.0	U															0.535	J	0.712	J	3.15				0.247	U	3.14			
Chrysene	µg/kg	2,100,000	17,000,000	490,000,000	--	--	>Csat	5.0	U	6.0	U															0.701	J	1.07	J	2.93				0.373	U	2.68			
Dibenzo (a,h) anthracene	µg/kg	2,100	17,000	490,000	--	--	>Csat	5.0	U	6.0	U															0.261	J	0.155	U	0.894	J			0.265	J	0.445	J		
Fluoranthene	µg/kg	30,000,000	10,000,000	280,000,000	--	--	>Csat	5.0	U	6.0	U															0.977	J	0.503	J	4.36				0.272	J	6.34			
Fluorene	µg/kg	47,000,000	14,000,000	390,000,000	>Max	>Max	>Csat	5.0	U	6.0	U															0.194	U	0.202	U	0.185	U			0.189	U	0.2	U		
Indeno (1,2,3-cd) pyrene	µg/kg	21,000	170,000	4,900,000	--	--	>Csat	5.0	U	6.0	U															0.883	J	0.475	UJ	5.8				0.327	UJ	1.36	J		
Naphthalene	µg/kg	23,000	580,000	16,000,000	83,000	83,000	340	5.0	U	6.0	U															0.209	U	0.349	J	0.359	J			0.205	J	0.26	J		
Phenanthrene	µg/kg	--	--	--	--	--	--	5.0	U	6.0	U															0.388	J	0.262	J	0.39	J			0.174	U	0.525	J		
Pyrene	µg/kg	23,000,000	7,500,000	210,000,000	>Max	>Max	>Csat	5.0	U	6.0	U															0.946	J	0.522	J	7.22				0.233	J	5.14			
Total PAHs	µg/kg	--	--	--	--	--	--																			10.1		6.4		56.4				1.2		31.9			
Polychlorinated Biphenyls																																					
Aroclor-1016	µg/kg	590	4,900	140,000	>Csat	>Csat	1,100																					28.0	U	29.8	U	25.8	U			27.9	U		
Aroclor-1221	µg/kg	590	4,900	140,000	>Csat	>Csat	1,100																					28.0	U	29.8	U	25.8	U			27.9	U		
Aroclor-1232	µg/kg	590	4,900	140,000	>Csat	>Csat	1,100																					28.0	U	29.8	U	25.8	U			27.9	U		
Aroclor-1242	µg/kg	590	4,900	140,000	>Csat	>Csat	1,100																					28.0	U	29.8	U	25.8	U			27.9	U		
Aroclor-1248	µg/kg	590	4,900	140,000	>Csat	>Csat	1,100																					28.0	U	29.8	U	25.8	U			27.9	U		
Aroclor-1254	µg/kg	590	4,900	140,000	>Csat	>Csat	1,100																					28.0	U	29.8	U	25.8	U			27.9	U		
Aroclor-1260	µg/kg	590	4,900	140,000	>Csat	>Csat	1,100																					28.0	U	29.8	U	25.8	U			27.9	U		
Total PCBs	µg/kg	590	4,900	140,000	>Csat	>Csat	1,100																																
Total Petroleum Hydrocarbons																																					
Gas-Range Organics (C7-C12)	mg/kg	20,000	9,700	>Max	69,000	>Max	130	2.77		2.18		0.25	U	0.25	U							0.05	J	0.042	J	0.093	J	0.45	UJ	0.044	J	0.081	J	0.094	J	0.5	UJ	0.24	UJ
Diesel-Range Organics (C12-C24)	mg/kg	14,000	4,600	>Max	>Max	>Max	>Max	20.0	U	20.0	U	20.0	U	20.0	U							2.6	J	1.6	J	1.7	J	2.1	J	1.5	J	2.0	J	1.6	J	12.7	J	6.7	J
Oil-Range Organics (C24-C36)	mg/kg	36,000	11,000	>Max	>Max	>Max	>Max	50.0	U	50.0	U	50.0	U	50.0	U																						
Volatile Petroleum Hydrocarbons																																					
C5-C6 Aliphatics	mg/kg	--	--	--	--	--	--																														
C6-C8 Aliphatics	mg/kg	--	--	--	--	--	--																														
C8-C10 Aliphatics	mg/kg	--	--	--	--	--	--																														
C10-C12 Aliphatics	mg/kg	--	--	--	--	--	--																														
C8-C10 Aromatics	mg/kg	--	--	--	--	--	--																														
C10-C12 Aromatics	mg/kg	--	--	--	--	--	--																														
C12-C13 Aromatics	mg/kg	--	--	--	--	--	--																														
Total VPH	mg/kg	--	--	--	--	--	--																														
Extractable Petroleum Hydrocarbons																																					
C10-C12 Aliphatics	mg/kg	--	--	--	--	--	--																														
C12-C16 Aliphatics	mg/kg	--	--	--	--	--	--																														
C16-C21 Aliphatics	mg/kg	--	--	--	--	--	--																														
C21-C34 Aliphatics	mg/kg	--	--	--	--	--	--																														
C10-C12 Aromatics	mg/kg	--	--	--	--	--	--																														
C12-C16 Aromatics	mg/kg	--	--	--	--	--	--																														
C16-C21 Aromatics	mg/kg	--	--	--	--	--	--																														
C21-C34 Aromatics	mg/kg	--	--	--	--	--	--																														

Notes:
EF = Exceedance factor (calculated if consistuent exceeded indicated screening level)
D = Dilution
J = Estimated value below reporting limit.
U = Not detected at specified reporting limit.
mg/kg = milligrams per Kilogram
µg/kg = micrograms per Kilogram
-- = Screening level not established (Note: If ROD CUL was available, JSCS SLV is not shown.)
Shaded = detected result exceeded indicated screening value
Dup = Field Duplicate
Screening value taken from DEQ Risk-Based Concentrations for the soil ingestion, dermal contact and inhalation; vapor intrusion to outdoor air; vapor intrusion into buildings; leaching to groundwater (May 2018 revision)

Table 2
Subsurface Soil Sample Summary
Northwest Pipe Company, Portland, Oregon

Sample ID		DEQ Risk-Based Concentrations (May 2018 Update)						GP209		GP210		GP211		GP211 (Dup)		GP212		GP213		GP214		TP-101-3		TP-102-1		TP-102-3		TP-103-1		TP-103-3		HSCS-1			HSCS-2		
Sample Date					Volatilization to Outdoor Air	Vapor Intrusion into Buildings	Leaching to Groundwater	09/27/07		09/28/07		09/27/07		09/27/07		09/27/07		09/27/07		09/27/07		01/11/08		01/11/08		01/11/08		01/11/08		01/11/08		09/09/11			09/09/11		
Sample Depth (ft)		Soil Ingestion, Dermal Contact, and Inhalation						9		9		9		9		9		10		10		3		1		3		1		3		5.5			5.5		
Analyte	**Units**	**Occupational**	**Construction Worker**	**Excavation Worker**	**Occupational**	**Occupational**	**Occupational**									*EF*		*EF*														*EF*			*EF*
General Chemistry																																			
Total Organic Carbon	mg/kg	--	--	--																															
Metals, Total																																			
Arsenic	mg/kg	1.9	15	420	--	--	--																												
Cadmium	mg/kg	1,100	350	9,700	--	--	--																												
Chromium	mg/kg	>Max	530,000	>Max	--	--	--																												
Copper	mg/kg	47,000	14,000	390,000	--	--	--																												
Lead	mg/kg	800	800	800	--	--	30																												
Manganese	mg/kg	25,000	8,200	230,000	--	--	--																												
Mercury	mg/kg	350	110	2,900	--	--	--																												
Nickel	mg/kg	22,000	7,000	190,000	--	--	--																												
Zinc	mg/kg	--	--	--	--	--	--			37.0						43.9				38.0		50.8		33.1		46.6		39.4		40.5							
Polynuclear Aromatic Hydrocabons																																			
1-Methylnaphthalene	µg/kg	--	--	--	--	--	--																									261	U		269	U	
2-Methylnaphthalene	µg/kg	--	--	--	--	--	--																									261	U		269	U	
Acenaphthene	µg/kg	70,000,000	21,000,000	590,000,000	>Max	>Max	>Csat	0.178	U	0.153	U	0.153	U	0.155	U	201				0.169	U	2.3	J	5.1		2.8	U	0.52	J	2.8	U	261	U		269	U	
Acenaphthylene	µg/kg	--	--	--	--	--	--	0.221	U	0.338	J	0.19	U	0.192	U	78.3				0.21	U	27	U	3.6		28	U	12.7		28	U	993			2,960		
Anthracene	µg/kg	350,000,000	110,000,000	>Max	>Max	>Max	>Csat	0.434	U	0.38	J	0.374	U	0.378	U	66.8				0.411	U	12.2		16.7		28	U	11		28	U	548			1,600		
Benzo (a) anthracene	µg/kg	21,000	170,000	4,800,000	>Csat	>Csat	>Csat	0.618	J	3.51		0.123	U	0.125	U	26.3	J			0.135	U	22.1		133		28	U	16.1		28	U	608			873		
Benzo (a) pyrene	µg/kg	2,100	17,000	490,000	--	--	>Csat	0.649	U	3.6		0.559	U	0.566	U	100				0.614	U	16.4		105		3.8		30.1		28	U	5,550		*<10*	8,920		*<10*
Benzo (b) fluoranthene	µg/kg	21,000	170,000	4,900,000	--	--	>Csat	0.608	UJ	4.1		0.123	U	0.125	U	120				0.135	U	24		159		4.7		30.6		3.3		10,400			13,200		
Benzo (g,h,i) perylene	µg/kg	--	--	--	--	--	--	0.452	UJ	2.86		0.156	U	0.158	U	48.9				2.02		9.7		64.3		3.6		42.6		28	U	5,780			11,200		
Benzo (k) fluoranthene	µg/kg	210,000	1,700,000	49,000,000	--	--	>Csat	0.294	J	2.52		0.234	U	0.238	U	107				0.258	U	8.6		58.5		28	U	13.1		28	U	1,270			2,370		
Chrysene	µg/kg	2,100,000	17,000,000	490,000,000	--	--	>Csat	0.713	J	3.23		0.354	U	0.358	U	31.4	J			0.389	U	24.3		136		28	U	19.3		28	U	3,470			6,430		
Dibenzo (a,h) anthracene	µg/kg	2,100	17,000	490,000	--	--	>Csat	0.16	U	0.422	J	0.138	U	0.139	U	3.1	U			0.152	U	27	U	17.5		2.8	U	4.6		2.8	U	1,240			1,990		
Fluoranthene	µg/kg	30,000,000	10,000,000	280,000,000	--	--	>Csat	1.47	J	6.02		0.19	U	0.192	U	65.9				0.301	J	41.7		180		3.1		15.1		28	U	1,710			1,730		
Fluorene	µg/kg	47,000,000	14,000,000	390,000,000	>Max	>Max	>Csat	0.209	U	0.178	U	0.18	U	0.182	U	440				0.198	U	2.8		2.7		2.8	U	1.2	J	2.8	U	261	U		269	U	
Indeno (1,2,3-cd) pyrene	µg/kg	21,000	170,000	4,900,000	--	--	>Csat	0.259	UJ	1.76	J	0.146	U	0.147	U	55.5				0.16	U	7.7		51.7		28	U	21.5		28	U	5,560			9,630		
Naphthalene	µg/kg	23,000	580,000	16,000,000	83,000	83,000	340	0.399	J	0.268	J	0.192	U	0.196	U	421				0.648	J	1	J	2.4	J	0.34	J	2.3	J	0.38	J	261	U		269	U	
Phenanthrene	µg/kg	--	--	--	--	--	--	0.491	J	1.24	J	0.166	U	0.168	U	279				0.428	J	22.2		41.1		28	U	4.7		28	U	261	U		269	U	
Pyrene	µg/kg	23,000,000	7,500,000	210,000,000	>Max	>Max	>Csat	1.36	J	6.28		0.212	U	0.215	U	69.7				0.31	J	40.1		187		4.4		23		7.5		1,560			2,670		
Total PAHs	µg/kg	--	--	--	--	--	--	5.3		36.5						2,111				3.71		235		1,164		19.9		248		11.2		38,689			63,573		
Polychlorinated Biphenyls																																			
Aroclor-1016	µg/kg	590	4,900	140,000	>Csat	>Csat	1,100					26.0	U							28.0	U			23.6	U	23.6	U	23.1	U	23.8	U	23.3	U	246	U		538	U	
Aroclor-1221	µg/kg	590	4,900	140,000	>Csat	>Csat	1,100					26.0	U							28.0	U			23.6	U	23.6	U	23.1	U	23.8	U	23.3	U	246	U		538	U	
Aroclor-1232	µg/kg	590	4,900	140,000	>Csat	>Csat	1,100					26.0	U							28.0	U			23.6	U	23.6	U	23.1	U	23.8	U	23.3	U	246	U		538	U	
Aroclor-1242	µg/kg	590	4,900	140,000	>Csat	>Csat	1,100					26.0	U							28.0	U			23.6	U	23.6	U	23.1	U	23.8	U	23.3	U	246	U		538	U	
Aroclor-1248	µg/kg	590	4,900	140,000	>Csat	>Csat	1,100					26.0	U							28.0	U			23.6	U	23.6	U	23.1	U	23.8	U	23.3	U	246	U		538	U	
Aroclor-1254	µg/kg	590	4,900	140,000	>Csat	>Csat	1,100					26.0	U							186				23.6	U	23.6	U	23.1	U	23.8	U	23.3	U	1,390		*<10*	4,280		*<10*
Aroclor-1260	µg/kg	590	4,900	140,000	>Csat	>Csat	1,100					26.0	U							28.0	U			23.6	U	119		23.1	U	23.8	U	23.3	U	246	U		538	U	
Total PCBs	µg/kg	590	4,900	140,000	>Csat	>Csat	1,100													186													1,390		*<10*	4,280		*<10*
Total Petroleum Hydrocarbons																																			
Gas-Range Organics (C7-C12)	mg/kg	20,000	9,700	>Max	69,000	>Max	130	0.31	UJ	0.28	UJ	0.16	UJ	0.52	UJ	0.35	UJ			0.16	UJ			0.12	UJ												
Diesel-Range Organics (C12-C24)	mg/kg	14,000	4,600	>Max	>Max	>Max	>Max	2.0	J	1.7	J	1.7	J	1.5	J	3,470				2.0	J			2.1	J												
Oil-Range Organics (C24-C36)	mg/kg	36,000	11,000	>Max	>Max	>Max	>Max																												
Volatile Petroleum Hydrocarbons																																			
C5-C6 Aliphatics	mg/kg	--	--	--	--	--	--																												
C6-C8 Aliphatics	mg/kg	--	--	--	--	--	--																												
C8-C10 Aliphatics	mg/kg	--	--	--	--	--	--																												
C10-C12 Aliphatics	mg/kg	--	--	--	--	--	--																												
C8-C10 Aromatics	mg/kg	--	--	--	--	--	--																												
C10-C12 Aromatics	mg/kg	--	--	--	--	--	--																												
C12-C13 Aromatics	mg/kg	--	--	--	--	--	--																												
Total VPH	mg/kg	--	--	--	--	--	--																												
Extractable Petroleum Hydrocarbons																																			
C10-C12 Aliphatics	mg/kg	--	--	--	--	--	--																												
C12-C16 Aliphatics	mg/kg	--	--	--	--	--	--																												
C16-C21 Aliphatics	mg/kg	--	--	--	--	--	--																												
C21-C34 Aliphatics	mg/kg	--	--	--	--	--	--																												
C10-C12 Aromatics	mg/kg	--	--	--	--	--	--																												
C12-C16 Aromatics	mg/kg	--	--	--	--	--	--																												
C16-C21 Aromatics	mg/kg	--	--	--	--	--	--																												
C21-C34 Aromatics	mg/kg	--	--	--	--	--	--																												

Notes:
EF = Exceedance factor (calculated if consistuent exceeded indicated screening level)
D = Dilution
J = Estimated value below reporting limit.
U = Not detected at specified reporting limit.
mg/kg = milligrams per Kilogram
µg/kg = micrograms per Kilogram
-- = Screening level not established (Note: If ROD CUL was available, JSCS SLV is not shown.)
Shaded = detected result exceeded indicated screening value
Dup = Field Duplicate
Screening value taken from DEQ Risk-Based Concentrations for the soil ingestion, dermal contact and inhalation;
vapor intrusion to outdoor air; vapor intrusion into buildings; leaching to groundwater (May 2018 revision)

Table 2
Subsurface Soil Sample Summary
Northwest Pipe Company, Portland, Oregon

Sample ID		DEQ Risk-Based Concentrations (May 2018 Update)						HSCS-3			HSCS-4			HSCS-5		HSCS-6		HSCS-7		HSCS-8		HSCS-9		HSCS-10		GP301		GP302		GP303		GP304		GP305		GP306		GP307	
Sample Date								09/09/11			09/09/11			09/16/11		09/16/11		09/16/11		09/16/11		09/16/11		09/16/11		05/31/12		05/31/12		05/31/12		05/31/12		05/31/12		05/31/12	
Sample Depth (ft)		Soil Ingestion, Dermal Contact, and Inhalation			Volatilization to Outdoor Air	Vapor Intrusion into Buildings	Leaching to Groundwater	5.5			5.5			1.5		1.5		1.5		1.5		2		2		10-11		7-8		9.5-10.5		9.5-10.5		9.5-10.5		10.5-11.5		13-14	
Analyte	**Units**	**Occupational**	**Construction Worker**	**Excavation Worker**	**Occupational**	**Occupational**	**Occupational**		*EF*			*EF*															*EF*										
General Chemistry																																					
Total Organic Carbon	mg/kg	--	--	--																						13,400								269		277	
Metals, Total																																					
Arsenic	mg/kg	1.9	15	420	--	--	--																			2.52		*<10*									
Cadmium	mg/kg	1,100	350	9,700	--	--	--																			0.15	J										
Chromium	mg/kg	>Max	530,000	>Max	--	--	--																			7.23											
Copper	mg/kg	47,000	14,000	390,000	--	--	--																			8.23											
Lead	mg/kg	800	800	800	--	--	30																			1.76											
Manganese	mg/kg	25,000	8,200	230,000	--	--	--																			149											
Mercury	mg/kg	350	110	2,900	--	--	--																			0.017											
Nickel	mg/kg	22,000	7,000	190,000	--	--	--																			11.7											
Zinc	mg/kg	--	--	--	--	--	--																			26.8											
Polynuclear Aromatic Hydrocabons																																					
1-Methylnaphthalene	µg/kg	--	--	--	--	--	--	72,000			57,700			2.4	U	2.27	U	2.49	J	2.29	U	2.34	U	2.27	U	4.17	UJ	13,300	J	0.19	U	0.2	U	0.21	U				
2-Methylnaphthalene	µg/kg	--	--	--	--	--	--	119,000			94,300			1.71	U	3.23	J	4.36	J	1.63	U	1.66	U	1.62	U	4.46	UJ	11,200	J	0.21	U	0.21	U	0.22	U				
Acenaphthene	µg/kg	70,000,000	21,000,000	590,000,000	>Max	>Max	>Csat	1,180,000			924,000			4.95	J	6.61	J	2.11	U	2.16	U	2.21	U	2.15	U	817	J	904,000	J	3.38		6.5		0.3	J				
Acenaphthylene	µg/kg	--	--	--	--	--	--	25,900	U		27,100	U		2.78	J	15.9	J	53.2		2	U	2.04	U	1.99	U	42.2	J	14,100	J	1.91		0.39	J	0.22	U				
Anthracene	µg/kg	350,000,000	110,000,000	>Max	>Max	>Max	>Csat	144,000			128,000			11	J	54.2		20.8	J	2.34	U	2.39	U	7.2	J	179	J	209,000	J	5.89		2.19		0.31	U				
Benzo (a) anthracene	µg/kg	21,000	170,000	4,800,000	>Csat	>Csat	>Csat	209,000		*<10*	160,000		*<10*	71.2		174		62.3		2.06	U	2.11	U	9.31	J	598	J	164,000	J	*<10*		7.07		3.56		0.71	J		
Benzo (a) pyrene	µg/kg	2,100	17,000	490,000	--	--	>Csat	35,600		*<10*	27,100	U		50.7		169		143		2.03	J	1.44	U	10.8	J	917	J	17,500	J	*<10*		5		1.98		0.62	J		
Benzo (b) fluoranthene	µg/kg	21,000	170,000	4,900,000	--	--	>Csat	70,800		*<10*	52,000		*<10*	73		266		159		2.75	J	1.74	U	15.5	J	1,470	J	32,400	J	*<10*		7.48		2.58		0.83	J		
Benzo (g,h,i) perylene	µg/kg	--	--	--	--	--	--	25,900	U		27,100	U		42.5		310		261		4.38	U	4.48	U	18.8	J	184	J	4,170	UJ			8.47		1.2		0.8	J		
Benzo (k) fluoranthene	µg/kg	210,000	1,700,000	49,000,000	--	--	>Csat	29,500			27,100	U		28.1		94.2		58		3.33	U	3.4	U	7.79	J	483	J	15,000	J			2.56		0.8	J	0.57	U		
Chrysene	µg/kg	2,100,000	17,000,000	490,000,000	--	--	>Csat	150,000			118,000			76.8		228		97.8		3.37	U	3.44	U	7.99	J	938	J	115,000	J			4.78		2.12		0.59	J		
Dibenzo (a,h) anthracene	µg/kg	2,100	17,000	490,000	--	--	>Csat	25,900	U		27,100	U		23	J	28.6		52.1		3.09	U	3.16	U	3.07	U	8.27	UJ	3,830	UJ			0.38	U	0.39	U	0.41	U		
Fluoranthene	µg/kg	30,000,000	10,000,000	280,000,000	--	--	>Csat	1,890,000			1,470,000			141		208		47.1		3.18	J	2.23	U	11.9	J	4,300	J	1,490,000	J			23.2		16		2.23			
Fluorene	µg/kg	47,000,000	14,000,000	390,000,000	>Max	>Max	>Csat	580,000			442,000			3.01	J	5.39	J	3.16	J	2.21	U	2.26	U	2.2	U	324	J	324,000	J			1.47		1.18		0.21	U		
Indeno (1,2,3-cd) pyrene	µg/kg	21,000	170,000	4,900,000	--	--	>Csat	25,900	U		27,100	U		46.1		176		161		16.3	J	16.6	J	25.6		207	J	4,170	UJ			5.57		1.16		0.51	J		
Naphthalene	µg/kg	23,000	580,000	16,000,000	83,000	83,000	340	392,000		*17*	299,000		*13*	2.27	U	4.62	J	6.18	J	2.16	U	2.21	U	2.15	U	8.07	J	7,410	J	22		0.48	J	0.57	J	0.21	U		
Phenanthrene	µg/kg	--	--	--	--	--	--	1,860,000			1,440,000			28.3		57		14.3	J	3.19	J	2.3	U	4.91	J	119	J	1,160,000	J			8.1		5.42		1.25			
Pyrene	µg/kg	23,000,000	7,500,000	210,000,000	>Max	>Max	>Csat	1,330,000			952,000			134		265		71.3		3.46	J	2.31	U	13.4	J	1,260	J	1,210,000	J			21.5		26.1		2.62			
Total PAHs	µg/kg	--	--	--	--	--	--	8,061,900			6,137,000			736		2,066		1,217		30.9		16.6		133		10,808		4,535,310				95.7		62.7		10.16			
Polychlorinated Biphenyls																																					
Aroclor-1016	µg/kg	590	4,900	140,000	>Csat	>Csat	1,100	255	U		252	U														5.19	U	100	U			5.07	U	5.24	U	5.4	U		
Aroclor-1221	µg/kg	590	4,900	140,000	>Csat	>Csat	1,100	255	U		252	U														10.8	U	209	U			10.6	U	10.9	U	11.3	U		
Aroclor-1232	µg/kg	590	4,900	140,000	>Csat	>Csat	1,100	255	U		252	U														0.52	U	10.1	U			0.51	U	0.53	U	0.54	U		
Aroclor-1242	µg/kg	590	4,900	140,000	>Csat	>Csat	1,100	255	U		252	U														1.82	U	35.2	U			1.78	U	1.83	U	1.89	U		
Aroclor-1248	µg/kg	590	4,900	140,000	>Csat	>Csat	1,100	255	U		252	U														1.4	U	27.2	U			1.37	U	1.42	U	1.46	U		
Aroclor-1254	µg/kg	590	4,900	140,000	>Csat	>Csat	1,100	644		*<10*	785		*<10*													86.2		507	J			1.76	U	1.82	U	1.88	U		
Aroclor-1260	µg/kg	590	4,900	140,000	>Csat	>Csat	1,100	255	U		252	U														1.56	U	30.3	U			8.02	J	1.58	U	1.63	U		
Total PCBs	µg/kg	590	4,900	140,000	>Csat	>Csat	1,100	644		*<10*	785		*<10*													86.2		507				8.0							
Total Petroleum Hydrocarbons																																					
Gas-Range Organics (C7-C12)	mg/kg	20,000	9,700	>Max	69,000	>Max	130																														
Diesel-Range Organics (C12-C24)	mg/kg	14,000	4,600	>Max	>Max	>Max	>Max																			84.5		13,900	J	*<10*		2.6	J	20.0	J	2.24	J		
Oil-Range Organics (C24-C36)	mg/kg	36,000	11,000	>Max	>Max	>Max	>Max																			92.2	J	2,650	J			7.52	J	40.7	J	6.53	J		
Volatile Petroleum Hydrocarbons																																					
C5-C6 Aliphatics	mg/kg	--	--	--	--	--	--																			2.5	U	3.6	U										
C6-C8 Aliphatics	mg/kg	--	--	--	--	--	--																			2.5	U	3.9	JD										
C8-C10 Aliphatics	mg/kg	--	--	--	--	--	--																			0.37	U	1.2	JD										
C10-C12 Aliphatics	mg/kg	--	--	--	--	--	--																			0.37	U	2.3	JD										
C8-C10 Aromatics	mg/kg	--	--	--	--	--	--																			2.5	U	3.7	JD										
C10-C12 Aromatics	mg/kg	--	--	--	--	--	--																			2.5	U	5.8	JD										
C12-C13 Aromatics	mg/kg	--	--	--	--	--	--																			2.5	U	50.0	D										
Total VPH	mg/kg	--	--	--	--	--	--																			2.5	U	68.0	JD										
Extractable Petroleum Hydrocarbons																																					
C10-C12 Aliphatics	mg/kg	--	--	--	--	--	--																			0.24	U	1.0	J										
C12-C16 Aliphatics	mg/kg	--	--	--	--	--	--																			1.2	J	74.0	J										
C16-C21 Aliphatics	mg/kg	--	--	--	--	--	--																			15.0		290	J										
C21-C34 Aliphatics	mg/kg	--	--	--	--	--	--																			23.0		420	J										
C10-C12 Aromatics	mg/kg	--	--	--	--	--	--																			6.1	U	10.0	J										
C12-C16 Aromatics	mg/kg	--	--	--	--	--	--																			1.3	J	510	J										
C16-C21 Aromatics	mg/kg	--	--	--	--	--	--																			30.0		8,900	D										
C21-C34 Aromatics	mg/kg	--	--	--	--	--	--																			84.0		3,400	D										

Notes:
EF = Exceedance factor (calculated if consistuent exceeded indicated screening level)
D = Dilution
J = Estimated value below reporting limit.
U = Not detected at specified reporting limit.
mg/kg = milligrams per Kilogram
µg/kg = micrograms per Kilogram
-- = Screening level not established (Note: If ROD CUL was available, JSCS SLV is not shown.)
Shaded = detected result exceeded indicated screening value
Dup = Field Duplicate
Screening value taken from DEQ Risk-Based Concentrations for the soil ingestion, dermal contact and inhalation;
vapor intrusion to outdoor air; vapor intrusion into buildings; leaching to groundwater (May 2018 revision)

Table 2
Subsurface Soil Sample Summary
Northwest Pipe Company, Portland, Oregon

Sample ID		DEQ Risk-Based Concentrations (May 2018 Update)						GP-1	GP-2	GP-5	GP-5	GW03	GW05	GW05	GP201	GP202	GP203	GP203 (Dup)	GP204	GP205	GP206	GP207	GP208
Sample Date								09/07/01	09/10/01	09/10/01	09/10/01	08/29/02	08/30/02	08/30/02	09/26/07	09/26/07	09/26/07	09/26/07	09/26/07	09/26/07	09/26/07	09/26/07	09/27/07
Sample Depth (ft)		Soil Ingestion, Dermal Contact, and Inhalation			Volatilization to Outdoor Air	Vapor Intrusion into Buildings	Leaching to Groundwater	6	18	3	6	9	2.5	13.5	9	8	8	8	9	9	9	9	9
Analyte	**Units**	**Occupational**	**Construction Worker**	**Excavation Worker**	**Occupational**	**Occupational**	**Occupational**																
																			EF		*EF*		
Volatile Organic Compounds																							
1,1,1,2-Tetrachloroethane	µg/kg	--	--	--	--	--	--	1.1 U	1.2 U	1.0 U	1.1 U	1.1 U	1.1 U	1.2 U			9.6 U	6.8 U			6.1 U		6.0 U	6.1 U	
1,1,1-Trichloroethane	µg/kg	870,000,000	470,000,000	>Max	>Csat	>Csat	880,000	1.1 U	1.2 U	1.0 U	1.1 U	1.1 U	1.1 U	1.2 U			9.6 U	6.8 U			6.1 U		6.0 U	6.1 U	
1,1,2,2-Tetrachloroethane	µg/kg	--	--	--	--	--	--	1.1 U	1.2 U	1.0 U	1.1 U	1.1 U	1.1 U	1.2 U			9.6 U	6.8 U			6.1 U		6.0 U	6.1 U	
1,1,2-Trichloroethane	µg/kg	26,000	54,000	1,500,000	24,000	4,200	29	1.1 U	1.2 U	1.0 U	1.1 U	1.1 U	1.1 U	1.2 U			9.6 U	6.8 U			6.1 U		6.0 U	6.1 U	
1,1-Dichloroethane	µg/kg	260,000	3,200,000	89,000,000	240,000	5,900	200	1.1 U	1.2 U	1.0 U	1.1 U	1.1 U	1.1 U	1.2 U			9.6 U	6.8 U			6.1 U		6.0 U	6.1 U	
1,1-Dichloroethene	µg/kg	29,000,000	13,000,000	370,000,000	>Csat	680,000	32,000	1.1 U	1.2 U	1.0 U	1.1 U	1.1 U	1.1 U	1.2 U			9.6 U	6.8 U			6.1 U		6.0 U	6.1 U	
1,1-Dichloropropene	µg/kg	--	--	--	--	--	--	1.1 U	1.2 U	1.0 U	1.1 U	1.1 U	1.1 U	1.2 U			9.6 U	6.8 U			6.1 U		6.0 U	6.1 U	
1,2,3-Trichlorobenzene	µg/kg	--	--	--	--	--	--	1.1 U	1.2 U	1.0 U	1.1 U	1.1 U	1.1 U	1.2 U			9.6 U	6.8 U			6.1 U		6.0 U	6.1 U	
1,2,3-Trichloropropane	µg/kg	--	--	--	--	--	--	1.1 U	1.2 U	1.0 U	1.1 U	1.1 U	1.1 U	1.2 U			9.6 U	6.8 U			6.1 U		6.0 U	6.1 U	
1,2,4-Trichlorobenzene	µg/kg	--	--	--	--	--	--	1.1 U	1.2 U	1.0 U	1.1 U	1.1 U	1.1 U	1.2 U			9.6 U	6.8 U			6.1 U		6.0 U	6.1 U	
1,2,4-Trimethylbenzene	µg/kg	6,900,000	2,900,000	81,000,000	>Csat	>Csat	48,000	1.1 U	1.2 U	1.0 U	1.1 U	1.1 U	1.1 U	1.2 U			9.6 U	6.8 U			6.1 U		6.0 U	6.1 U	
1,2-Dibromo-3-Chloropropane	µg/kg	--	--	--	--	--	--	1.1 U	1.2 U	1.0 U	1.1 U	1.1 U	1.1 U	1.2 U			9.6 U	6.8 U			6.1 U		6.0 U	6.1 U	
1,2-Dibromoethane	µg/kg	--	--	--	--	--	--	1.1 U	1.2 U	1.0 U	1.1 U	1.1 U	1.1 U	1.2 U			9.6 U	6.8 U			6.1 U		6.0 U	6.1 U	
1,2-Dichlorobenzene	µg/kg	36,000,000	20,000,000	560,000,000	>Csat	>Csat	160,000	1.1 U	1.2 U	1.0 U	1.1 U	1.1 U	1.1 U	1.2 U			9.6 U	6.8 U			6.1 U		6.0 U	6.1 U	
1,2-Dichloroethane	µg/kg	--	--	--	--	--	--	1.1 U	1.2 U	1.0 U	1.1 U	1.1 U	1.1 U	1.2 U			9.6 U	6.8 U			6.1 U		6.0 U	6.1 U	
1,2-Dichloropropane	µg/kg	--	--	--	--	--	--	1.1 U	1.2 U	1.0 U	1.1 U	1.1 U	1.1 U	1.2 U			9.6 U	6.8 U			6.1 U		6.0 U	6.1 U	
1,3,5-Trimethylbenzene	µg/kg	--	--	--	--	--	--	1.1 U	1.2 U	1.0 U	1.1 U	1.1 U	1.1 U	1.2 U			9.6 U	6.8 U			6.1 U		6.0 U	6.1 U	
1,3-Dichlorobenzene	µg/kg	--	--	--	--	--	--	1.1 U	1.2 U	1.0 U	1.1 U	1.1 U	1.1 U	1.2 U			9.6 U	6.8 U			6.1 U		6.0 U	6.1 U	
1,3-Dichloropropane	µg/kg	--	--	--	--	--	--	1.1 U	1.2 U	1.0 U	1.1 U	1.1 U	1.1 U	1.2 U			9.6 U	6.8 U			6.1 U		6.0 U	6.1 U	
1,4-Dichlorobenzene	µg/kg	64,000	1,300,000	36,000,000	36,000	13,000	250	1.1 U	1.2 U	1.0 U	1.1 U	1.1 U	1.1 U	1.2 U			9.6 U	6.8 U			6.1 U		6.0 U	6.1 U	
2,2-Dichloropropane	µg/kg	--	--	--	--	--	--	1.1 U	1.2 U	1.0 U	1.1 U	1.1 U	1.1 U	1.2 U			9.6 U	6.8 U			6.1 U		6.0 U	6.1 U	
2-Butanone	µg/kg	--	--	--	--	--	--										9.6 U	6.8 U			6.1 U		6.0 U	6.1 U	
2-Chlorotoluene	µg/kg	--	--	--	--	--	--	1.1 U	1.2 U	1.0 U	1.1 U	1.1 U	1.1 U	1.2 U			9.6 U	6.8 U			6.1 U		6.0 U	6.1 U	
4-Chlorotoluene	µg/kg	--	--	--	--	--	--	1.1 U	1.2 U	1.0 U	1.1 U	1.1 U	1.1 U	1.2 U			9.6 U	6.8 U			6.1 U		6.0 U	6.1 U	
4-Methyl-2-Pentanone	µg/kg	--	--	--	--	--	--										9.6 U	6.8 U			6.1 U		6.0 U	6.1 U	
Acetone	µg/kg	--	--	--	--	--	--										9.6 U	6.8 U			6.1 U		6.0 U	6.1 U	
Benzene	µg/kg	37,000	380,000	11,000,000	50,000	2,100	100	1.1 U	1.2 U	1.0 U	1.1 U	1.1 U	1.1 U	1.2 U			9.6 U	6.8 U			6.1 U		6.0 U	6.1 U	
Bromobenzene	µg/kg	--	--	--	--	--	--	1.1 U	1.2 U	1.0 U	1.1 U	1.1 U	1.1 U	1.2 U			9.6 U	6.8 U			6.1 U		6.0 U	6.1 U	
Bromochloromethane	µg/kg	--	--	--	--	--	--	1.1 U	1.2 U	1.0 U	1.1 U	1.1 U	1.1 U	1.2 U			9.6 U	6.8 U			6.1 U		6.0 U	6.1 U	
Bromodichloromethane	µg/kg	15,000	230,000	6,300,000	11,000	530	8.8	1.1 U	1.2 U	1.0 U	1.1 U	1.1 U	1.1 U	1.2 U			9.6 U	6.8 U			6.1 U		6.0 U	6.1 U	
Bromoform	µg/kg	260,000	2,700,000	74,000,000	360,000	110,000	220	1.1 U	1.2 U	1.0 U	1.1 U	1.1 U	1.1 U	1.2 U			9.6 U	6.8 U			6.1 U		6.0 U	6.1 U	
Bromomethane	µg/kg	750,000	370,000	10,000,000	700,000	17,000	400	1.1 U	1.2 U	1.0 U	1.1 U	1.1 U	1.1 U	1.2 U			9.6 U	6.8 U			6.1 U		6.0 U	6.1 U	
Carbon Tetrachloride	µg/kg	34,000	320,000	8,900,000	65,000	1,600	58	1.1 U	1.2 U	1.0 U	1.1 U	1.1 U	1.1 U	1.2 U			9.6 U	6.8 U			6.1 U		6.0 U	6.1 U	
Chlorobenzene	µg/kg	8,700,000	4,700,000	130,000,000	>Csat	>Csat	27,000	1.1 U	1.2 U	1.0 U	1.1 U	1.1 U	1.1 U	1.2 U			9.6 U	6.8 U			6.1 U		6.0 U	0.31 J	
Chlorodibromomethane	µg/kg	17,000	210,000	5,800,000	14,000	2,900	11	1.1 U	1.2 U	1.0 U	1.1 U	1.1 U	1.1 U	1.2 U			9.6 U	6.8 U			6.1 U		6.0 U	6.1 U	
Chloroethane	µg/kg	>Max	>Max	>Max	>Csat	>Csat	1,300,000	1.1 U	1.2 U	1.0 U	1.1 U	1.1 U	1.1 U	1.2 U			9.6 U	6.8 U			6.1 U		6.0 U	6.1 U	
Chloroform	µg/kg	26,000	410,000	11,000,000	17,000	410	15	1.1 U	1.2 U	1.0 U	1.1 U	1.1 U	1.1 U	1.2 U			9.6 U	6.8 U			6.1 U		6.0 U	6.1 U	
Chlorohexane	µg/kg	--	--	--	--	--	--										9.6 U	6.8 U			6.1 U		6.0 U	6.1 U	
Chloromethane	µg/kg	25,000,000	25,000,000	700,000,000	>Csat	300,000	9,100	1.1 U	1.2 U	1.0 U	1.1 U	1.1 U	1.1 U	1.2 U			9.6 U	6.8 U			6.1 U		6.0 U	6.1 U	
Cis-1,2-Dichloroethene	µg/kg	2,300,000	710,000	20,000,000	>Max	>Max	4,500	1.1 U	15.2	1.0 U	1.1 U	1.1 U	1.1 U	1.2 U			1.2 J	4.2 J			6.1 U		6.0 U	6.1 U	
Cis-1,3-Dichloropropene	µg/kg	--	--	--	--	--	--	1.1 U	1.2 U	1.0 U	1.1 U	1.1 U	1.1 U	1.2 U			9.6 U	6.8 U			6.1 U		6.0 U	6.1 U	
Dibromomethane	µg/kg	--	--	--	--	--	--	1.1 U	1.2 U	1.0 U	1.1 U	1.1 U	1.1 U	1.2 U			9.6 U	6.8 U			6.1 U		6.0 U	6.1 U	
Dichlorodifluoromethane	µg/kg	--	--	--	--	--	--	1.1 U	1.2 U	1.0 U	1.1 U	1.1 U	1.1 U	1.2 U			9.6 U	6.8 U			6.1 U		6.0 U	6.1 U	
Ethylbenzene	µg/kg	150,000	1,700,000	49,000,000	160,000	17,000	900	1.1 U	1.2 U	1.0 U	1.1 U	1.1 U	1.1 U	1.2 U			9.6 U	6.8 U			6.1 U		6.0 U	6.1 U	
Hexachlorobutadiene	µg/kg	--	--	--	--	--	--	1.1 U	1.2 U	1.0 U	1.1 U	1.1 U	1.1 U	1.2 U			9.6 U	6.8 U			6.1 U		6.0 U	6.1 U	
Isopropylbenzene	µg/kg	57,000,000	27,000,000	750,000,000	>Csat	>Csat	>Csat	1.1 U	1.2 U	1.0 U	1.1 U	1.1 U	1.1 U	1.2 U			9.6 U	6.8 U			6.1 U		6.0 U	6.1 U	
m+p-Xylenes	µg/kg	--	--	--	--	--	--	2.2 U	2.4 U	2.1 U	2.2 U	2.2 U	2.1 U	2.4 U			9.6 U	6.8 U			6.1 U		6.0 U	6.1 U	
Methylene Chloride	µg/kg	1,600,000	2,100,000	58,000,000	>Csat	950,000	2,400	1.1 U	1.2 U	1.2	1.3	1.1 U	1.1 U	1.2 U			9.6 U	6.8 U			6.1 U		6.0 U	6.1 U	
Methyl-tert-butyl Ether	µg/kg	1,100,000	12,000,000	320,000,000	1,500,000	110,000	540										9.6 U	6.8 U			6.1 U		6.0 U	6.1 U	
Naphthalene	µg/kg	23,000	580,000	16,000,000	83,000	83,000	340	1.1 U	1.2 U	1.0 U	1.1 U	1.1 U	1.1 U	1.2 U			9.6 U	6.8 U			6.1 U		6.0 U	6.1 U	
n-Butylbenzene	µg/kg	--	--	--	--	--	--	1.1 U	1.2 U	1.0 U	1.1 U	1.1 U	1.1 U	1.2 U			9.6 U	6.8 U			6.1 U		6.0 U	6.1 U	
n-Propylbenzene	µg/kg	--	--	--	--	--	--	1.1 U	1.2 U	1.0 U	1.1 U	1.1 U	1.1 U	1.2 U			9.6 U	6.8 U			6.1 U		6.0 U	6.1 U	
o-Xylene	µg/kg	--	--	--	--	--	--	1.1 U	1.2 U	1.0 U	1.1 U	1.1 U	1.1 U	1.2 U			9.6 U	6.8 U			6.1 U		6.0 U	6.1 U	
p-Isopropyltoluene	µg/kg	--	--	--	--	--	--	1.1 U	1.2 U	1.0 U	1.1 U	1.1 U	1.1 U	1.2 U			9.6 U	6.8 U			6.1 U		6.0 U	6.1 U	
Sec-Butylbenzene	µg/kg	--	--	--	--	--	--	1.1 U	1.2 U	1.0 U	1.1 U	1.1 U	1.1 U	1.2 U			9.6 U	6.8 U			6.1 U		6.0 U	6.1 U	
Styrene	µg/kg	130,000,000	56,000,000	>Max	>Csat	>Csat	800,000	1.1 U	1.2 U	1.0 U	1.1 U	1.1 U	1.1 U	1.2 U			9.6 U	6.8 U			6.1 U		6.0 U	6.1 U	
Tert-Butylbenzene	µg/kg	--	--	--	--	--	--	1.1 U	1.2 U	1.0 U	1.1 U	1.1 U	1.1 U	1.2 U			9.6 U	6.8 U			6.1 U		6.0 U	6.1 U	
Tetrachloroethene	µg/kg	1,000,000	1,800,000	50,000,000	>Csat	36,000	1,900	1.1 U	726 D	1.0 U	1.1 U	37.6	14.8	2.4			53.7	65.5			6.1 U		6.0 U	6.1 U	
Toluene	µg/kg	88,000,000	28,000,000	770,000,000	>Csat	>Csat	490,000	1.1 U	1.2 U	1.0 U	1.1 U	1.1 U	1.1 U	1.2 U			9.6 U	6.8 U			6.1 U		6.0 U	6.1 U	
Trans-1,2-Dichloroethene	µg/kg	23,000,000	7,100,000	200,000,000	>Max	>Max	51,000	1.1 U	1.2 U	1.0 U	1.1 U	1.1 U	1.1 U	1.2 U			9.6 U	6.8 U			6.1 U		6.0 U	6.1 U	
Trans-1,3-Dichloropropene	µg/kg	--	--	--	--	--	--	1.1 U	1.2 U	1.0 U	1.1 U	1.1 U	1.1 U	1.2 U			9.6 U	6.8 U			6.1 U		6.0 U	6.1 U	
Trichloroethene	µg/kg	51,000	130,000	3,700,000	96,000	2,300	87	1.1 U	17.1	1.0 U	1.1 U	1.1 U	1.4	1.2 U			0.54 J	0.87 J			6.1 U		6.0 U	6.1 U	
Trichlorofluoromethane	µg/kg	130,000,000	69,000,000	>Max	>Csat	>Csat	280,000	1.1 U	1.2 U	1.0 U	1.1 U	1.1 U	1.1 U	1.2 U			9.6 U	6.8 U			6.1 U		6.0 U	6.1 U	
Vinyl Chloride	µg/kg	4,400	34,000	950,000	89,000	2,200	10	1.1 U	1.2 U	1.0 U	1.1 U	1.1 U	1.1 U	1.2 U			9.6 U	6.8 U			6.1 U		6.0 U	6.1 U	

Notes:
EF = Exceedance factor (calculated if consistuent exceeded indicated screening level)
D = Dilution
J = Estimated value below reporting limit.
U = Not detected at specified reporting limit.
mg/kg = milligrams per Kilogram
µg/kg = micrograms per Kilogram
-- = Screening level not established (Note: If ROD CUL was available, JSCS SLV is not shown.)
Shaded = detected result exceeded indicated screening value
Dup = Field Duplicate
Screening value taken from DEQ Risk-Based Concentrations for the soil ingestion, dermal contact and inhalation;
vapor intrusion to outdoor air; vapor intrusion into buildings; leaching to groundwater (May 2018 revision)

Table 2
Subsurface Soil Sample Summary
Northwest Pipe Company, Portland, Oregon

Sample ID			DEQ Risk-Based Concentrations (May 2018 Update)						GP209		GP210		GP211		GP211 (Dup)		GP212		GP213		GP214		TP-101-3		TP-102-1		TP-102-3		TP-103-1		TP-103-3		HSCS-1		HSCS-2	
Sample Date						Volatilization to Outdoor Air	Vapor Intrusion into Buildings	Leaching to Groundwater	09/27/07		09/28/07		09/27/07		09/27/07		09/27/07		09/27/07		09/27/07		01/11/08		01/11/08		01/11/08		01/11/08		01/11/08		09/09/11		09/09/11	
Sample Depth (ft)			Soil Ingestion, Dermal Contact, and Inhalation						9		9		9		9		9		10		10		3		1		3		1		3		5.5		5.5	
Analyte	**Units**	**Occupational**	**Construction Worker**	**Excavation Worker**	**Occupational**	**Occupational**	**Occupational**																													
Volatile Organic Compounds																																				
1,1,1,2-Tetrachloroethane	µg/kg	--	--	--	--	--	--		6.0	U	6.8	U					6.2	U																		
1,1,1-Trichloroethane	µg/kg	870,000,000	470,000,000	>Max	>Csat	>Csat	880,000		6.0	U	6.8	U					6.2	U																		
1,1,2,2-Tetrachloroethane	µg/kg	--	--	--	--	--	--		6.0	U	6.8	U					6.2	U																		
1,1,2-Trichloroethane	µg/kg	26,000	54,000	1,500,000	24,000	4,200	29		6.0	U	6.8	U					6.2	U																		
1,1-Dichloroethane	µg/kg	260,000	3,200,000	89,000,000	240,000	5,900	200		6.0	U	6.8	U					6.2	U																		
1,1-Dichloroethene	µg/kg	29,000,000	13,000,000	370,000,000	>Csat	680,000	32,000		6.0	U	6.8	U					6.2	U																		
1,1-Dichloropropene	µg/kg	--	--	--	--	--	--		6.0	U	6.8	U					6.2	U																		
1,2,3-Trichlorobenzene	µg/kg	--	--	--	--	--	--		6.0	U	6.8	U					6.2	U																		
1,2,3-Trichloropropane	µg/kg	--	--	--	--	--	--		6.0	U	6.8	U					6.2	U																		
1,2,4-Trichlorobenzene	µg/kg	--	--	--	--	--	--		6.0	U	6.8	U					6.2	U																		
1,2,4-Trimethylbenzene	µg/kg	6,900,000	2,900,000	81,000,000	>Csat	>Csat	48,000		6.0	U	6.8	U					6.2	U																		
1,2-Dibromo-3-Chloropropane	µg/kg	--	--	--	--	--	--		6.0	U	6.8	U					6.2	U																		
1,2-Dibromoethane	µg/kg	--	--	--	--	--	--		6.0	U	6.8	U					6.2	U																		
1,2-Dichlorobenzene	µg/kg	36,000,000	20,000,000	560,000,000	>Csat	>Csat	160,000		6.0	U	6.8	U					6.2	U																		
1,2-Dichloroethane	µg/kg	--	--	--	--	--	--		6.0	U	6.8	U					6.2	U																		
1,2-Dichloropropane	µg/kg	--	--	--	--	--	--		6.0	U	6.8	U					6.2	U																		
1,3,5-Trimethylbenzene	µg/kg	--	--	--	--	--	--		6.0	U	6.8	U					6.2	U																		
1,3-Dichlorobenzene	µg/kg	--	--	--	--	--	--		6.0	U	6.8	U					6.2	U																		
1,3-Dichloropropane	µg/kg	--	--	--	--	--	--		6.0	U	6.8	U					6.2	U																		
1,4-Dichlorobenzene	µg/kg	64,000	1,300,000	36,000,000	36,000	13,000	250		6.0	U	6.8	U					6.2	U																		
2,2-Dichloropropane	µg/kg	--	--	--	--	--	--		6.0	U	6.8	U					6.2	U																		
2-Butanone	µg/kg	--	--	--	--	--	--		6.0	U	6.8	U					6.2	U																		
2-Chlorotoluene	µg/kg	--	--	--	--	--	--		6.0	U	6.8	U					6.2	U																		
4-Chlorotoluene	µg/kg	--	--	--	--	--	--		6.0	U	6.8	U					6.2	U																		
4-Methyl-2-Pentanone	µg/kg	--	--	--	--	--	--		6.0	U	6.8	U					6.2	U																		
Acetone	µg/kg	--	--	--	--	--	--		6.0	U	6.8	U					6.2	U																		
Benzene	µg/kg	37,000	380,000	11,000,000	50,000	2,100	100		6.0	U	6.8	U					6.2	U																		
Bromobenzene	µg/kg	--	--	--	--	--	--		6.0	U	6.8	U					6.2	U																		
Bromochloromethane	µg/kg	--	--	--	--	--	--		6.0	U	6.8	U					6.2	U																		
Bromodichloromethane	µg/kg	15,000	230,000	6,300,000	11,000	530	8.8		6.0	U	6.8	U					6.2	U																		
Bromoform	µg/kg	260,000	2,700,000	74,000,000	360,000	110,000	220		6.0	U	6.8	U					6.2	U																		
Bromomethane	µg/kg	750,000	370,000	10,000,000	700,000	17,000	400		6.0	U	6.8	U					6.2	U																		
Carbon Tetrachloride	µg/kg	34,000	320,000	8,900,000	65,000	1,600	58		6.0	U	6.8	U					6.2	U																		
Chlorobenzene	µg/kg	8,700,000	4,700,000	130,000,000	>Csat	>Csat	27,000		6.0	U	6.8	U					6.2	U																		
Chlorodibromomethane	µg/kg	17,000	210,000	5,800,000	14,000	2,900	11		6.0	U	6.8	U					6.2	U																		
Chloroethane	µg/kg	>Max	>Max	>Max	>Csat	>Csat	1,300,000		6.0	U	6.8	U					6.2	U																		
Chloroform	µg/kg	26,000	410,000	11,000,000	17,000	410	15		6.0	U	6.8	U					6.2	U																		
Chlorohexane	µg/kg	--	--	--	--	--	--		6.0	U	6.8	U					6.2	U																		
Chloromethane	µg/kg	25,000,000	25,000,000	700,000,000	>Csat	300,000	9,100		6.0	U	6.8	U					6.2	U																		
Cis-1,2-Dichloroethene	µg/kg	2,300,000	710,000	20,000,000	>Max	>Max	4,500		6.0	U	6.8	U					6.2	U																		
Cis-1,3-Dichloropropene	µg/kg	--	--	--	--	--	--		6.0	U	6.8	U					6.2	U																		
Dibromomethane	µg/kg	--	--	--	--	--	--		6.0	U	6.8	U					6.2	U																		
Dichlorodifluoromethane	µg/kg	--	--	--	--	--	--		6.0	U	6.8	U					6.2	U																		
Ethylbenzene	µg/kg	150,000	1,700,000	49,000,000	160,000	17,000	900		6.0	U	6.8	U					6.2	U																		
Hexachlorobutadiene	µg/kg	--	--	--	--	--	--		6.0	U	6.8	U					6.2	U																		
Isopropylbenzene	µg/kg	57,000,000	27,000,000	750,000,000	>Csat	>Csat	>Csat		6.0	U	6.8	U					6.2	U																		
m+p-Xylenes	µg/kg	--	--	--	--	--	--		6.0	U	6.8	U					6.2	U																		
Methylene Chloride	µg/kg	1,600,000	2,100,000	58,000,000	>Csat	950,000	2,400		6.0	U	6.8	U					6.2	U																		
Methyl-tert-butyl Ether	µg/kg	1,100,000	12,000,000	320,000,000	1,500,000	110,000	540		6.0	U	6.8	U					6.2	U																		
Naphthalene	µg/kg	23,000	580,000	16,000,000	83,000	83,000	340		6.0	U	6.8	U					6.2	U																		
n-Butylbenzene	µg/kg	--	--	--	--	--	--		6.0	U	6.8	U					6.2	U																		
n-Propylbenzene	µg/kg	--	--	--	--	--	--		6.0	U	6.8	U					6.2	U																		
o-Xylene	µg/kg	--	--	--	--	--	--		6.0	U	6.8	U					6.2	U																		
p-Isopropyltoluene	µg/kg	--	--	--	--	--	--		6.0	U	6.8	U					6.2	U																		
Sec-Butylbenzene	µg/kg	--	--	--	--	--	--		6.0	U	6.8	U					6.2	U																		
Styrene	µg/kg	130,000,000	56,000,000	>Max	>Csat	>Csat	800,000		6.0	U	6.8	U					6.2	U																		
Tert-Butylbenzene	µg/kg	--	--	--	--	--	--		6.0	U	6.8	U					6.2	U																		
Tetrachloroethene	µg/kg	1,000,000	1,800,000	50,000,000	>Csat	36,000	1,900		6.0	U	6.8	U					1.0	J	*<10*																	
Toluene	µg/kg	88,000,000	28,000,000	770,000,000	>Csat	>Csat	490,000		6.0	U	6.8	U					6.2	U																		
Trans-1,2-Dichloroethene	µg/kg	23,000,000	7,100,000	200,000,000	>Max	>Max	51,000		6.0	U	6.8	U					6.2	U																		
Trans-1,3-Dichloropropene	µg/kg	--	--	--	--	--	--		6.0	U	6.8	U					6.2	U																		
Trichloroethene	µg/kg	51,000	130,000	3,700,000	96,000	2,300	87		6.0	U	6.8	U					6.2	U																		
Trichlorofluoromethane	µg/kg	130,000,000	69,000,000	>Max	>Csat	>Csat	280,000		6.0	U	6.8	U					6.2	U																		
Vinyl Chloride	µg/kg	4,400	34,000	950,000	89,000	2,200	10		6.0	U	6.8	U					6.2	U																		

Notes:
EF = Exceedance factor (calculated if consistuent exceeded indicated screening level)
D = Dilution
J = Estimated value below reporting limit.
U = Not detected at specified reporting limit.
mg/kg = milligrams per Kilogram
µg/kg = micrograms per Kilogram
-- = Screening level not established (Note: If ROD CUL was available, JSCS SLV is not shown.)
Shaded = detected result exceeded indicated screening value
Dup = Field Duplicate
Screening value taken from DEQ Risk-Based Concentrations for the soil ingestion, dermal contact and inhalation;
vapor intrusion to outdoor air; vapor intrusion into buildings; leaching to groundwater (May 2018 revision)

Table 3
Analytical Groundwater Sampling Results
Northwest Pipe Company, Portland, Oregon

Location ID		DEQ Risk-Based Concentrations (May 2018 Update)				PW1W	GP-1	GP-2	GP-3	GP-4	GP-5	GP-6	GP-7	GW01	GW02	GW03	GW04	GW05
Sample ID						PW1W	GP1W	GP2W	GP3W	GP4W	GP5W	GP6W	GP7W	GW01-15-	GW02-15-	GW03-15-	GW04-15-	GW05-16-
Sample Date						09/07/01	09/07/01	09/07/01	09/07/01	09/07/01	09/07/01	09/07/01	09/07/01	08/29/02	08/29/02	08/29/02	08/29/02	08/30/02
Sample Type		Ingestion & Inhalation from Tapwater	Volatilization to Outdoor Air	Vapor Intrusion into Buildings	GW in Excavation	N1	N1	N1	N1	N1	N1	N1	N1	N1	N1	N1	N1	N1
Analyte	**Units**	**Occupational**	**Occupational**	**Occupational**	**Construction & Excavation Worker**	*EF*	*EF*	*EF*	*EF*	*EF*	*EF*	*EF*	*EF*	*EF*	*EF*	*EF*	*EF*	*EF*
Field Parameters																		
Temperature	(°C)	--	--	--	--													
pH		--	--	--	--													
Conductivity	(µS/cm)	--	--	--	--													
Dissolved Oxygen	mg/L	--	--	--	--													
Oxidation Reduction Potential	mV	--	--	--	--													
Turbidity	NTU	--	--	--	--													
Conventional Parameters																		
Alkalinity, Total as CaCO3	mg/L	--	--	--	--													
Chloride	mg/L	--	--	--	--													
Nitrate ion	mg/L	--	--	--	--													
Nitrate-N	mg/L	--	--	--	--													
Sulfate	mg/L	--	--	--	--													
Total Organic Carbon	mg/L	--	--	--	--													
Total Suspended Solids (TSS)	mg/L	--	--	--	--													
Metals, Total																		
Arsenic	mg/L	0.00031	--	--	--													
Cadmium	mg/L	0.16	--	--	--													
Chromium	mg/L	250	--	--	--													
Copper	mg/L	6.5	--	--	--													
Iron	mg/L	--	--	--	--													
Lead	mg/L	0.015	--	--	>S													
Manganese	mg/L	3.9	--	--	3,200													
Mercury	mg/L	0.049	--	--	>S													
Nickel	mg/L	3.3	--	--	>S													
Zinc	mg/L	--	--	--	--													
Metals, Dissolved																		
Arsenic	mg/L	0.00031	--	--	--													
Cadmium	mg/L	0.16	--	--	--													
Chromium	mg/L	250	--	--	--													
Copper	mg/L	6.5	--	--	--													
Iron	mg/L	--	--	--	--													
Ferrous Iron[1]	mg/L	--	--	--	--													
Lead	mg/L	0.015	--	--	>S													
Manganese	mg/L	3.9	--	--	3200													
Mercury	mg/L	0.049	--	--	>S													
Nickel	mg/L	3.3	--	--	>S													
Zinc	mg/L	--	--	--	--													
Polynuclear Aromatic Hydrocabons																		
1-Methylnaphthalene	µg/L	--	--	--	--													
2-Methylnaphthalene	µg/L	--	--	--	--													
Acenaphthene	µg/L	2,500	>S	>S	>S													
Acenaphthylene	µg/L	--	--	--	--													
Anthracene	µg/L	>S	>S	>S	>S													
Benzo(a)anthracene	µg/L	0.38	>S	>S	>S													
Benzo(a)pyrene	µg/L	0.47	--	--	>S													
Benzo(b)fluoroanthene	µg/L	>S	--	--	>S													
Benzo(g,h,i)perylene	µg/L	--	--	--	--													
Benzo(k)fluoranthene	µg/L	>S	--	--	>S													
Chrysene	µg/L	>S	--	--	>S													
Dibenzo(a,h)anthracene	µg/L	0.47	--	--	>S													
Fluoranthene	µg/L	>S	--	--	>S													
Fluorene	µg/L	1,300	>S	>S	>S													
Indeno(1,2,3-c,d)pyrene	µg/L	>S	--	--	>S													
Naphthalene	µg/L	0.72	16,000	11,000	500													
Phenanthrene	µg/L	--	--	--	--													
Pyrene	µg/L	>S	>S	>S	>S													
Total PAH[2]	µg/L	--	--	--	--													
Polychlorinated Biphenyls																		
Aroclor-1260	µg/L	0.028	>S	>S	30													
Aroclor-1254	µg/L	0.028	>S	>S	30													
Aroclor-1221	µg/L	0.028	>S	>S	30													
Aroclor-1232	µg/L	0.028	>S	>S	30													
Aroclor-1248	µg/L	0.028	>S	>S	30													
Aroclor-1016	µg/L	0.028	>S	>S	30													
Aroclor-1242	µg/L	0.028	>S	>S	30													
Total PCBs[2]	µg/L	0.028	>S	>S	30													
Total Petroleum Hydrocarbons																		
Gasoline (TPH-Gx)	mg/L	0.45	>S	>S	>S													
Diesel (TPH-Dx)	mg/L	0.43	>S	>S	14													
Motor Oil (TPH-Oil)	mg/L	1.3	>S	>S	>S													
VOCs																		
1,1,1,2-Tetrachloroethane	µg/L	--	--	--	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,1-Trichloroethane	µg/L	37,000	--	--	1,100,000	1.0 U	1.1	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U

Table 3
Analytical Groundwater Sampling Results
Northwest Pipe Company, Portland, Oregon

Location ID		DEQ Risk-Based Concentrations (May 2018 Update)				PW1W		GP-1		GP-2		GP-3		GP-4		GP-5		GP-6		GP-7		GW01		GW02		GW03		GW04		GW05	
Sample ID						PW1W		GP1W		GP2W		GP3W		GP4W		GP5W		GP6W		GP7W		GW01-15-		GW02-15-		GW03-15-		GW04-15-		GW05-16-	
Sample Date						09/07/01		09/07/01		09/07/01		09/07/01		09/07/01		09/07/01		09/07/01		09/07/01		08/29/02		08/29/02		08/29/02		08/29/02		08/30/02	
Sample Type		Ingestion & Inhalation from Tapwater	Volatilization to Outdoor Air	Vapor Intrusion into Buildings	GW in Excavation	N1		N1		N1		N1		N1		N1		N1		N1		N1		N1		N1		N1		N1	
Analyte	**Units**	**Occupational**	**Occupational**	**Occupational**	**Construction & Excavation Worker**		*EF*		*EF*		*EF*		*EF*		*EF*		*EF*		*EF*		*EF*		*EF*		*EF*		*EF*		*EF*		*EF*
VOCs																															
1,1,2,2-Tetrachloroethane	µg/L	--	--	--	--	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U		
1,1,2-Trichloroethane	µg/L	1.3	21,000	11,000	49	1.0	U	1.1		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	0.5	J		
1,1-Dichloroethane	µg/L	13	68,000	14,000	10,000	1.7		1.0	U	1.0	U	1.0	U	1.7		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	3.7		1.0	U	1.0	U		
1,1-Dichloroethene	µg/L	1,400	2,400,000	360,000	44,000	1.0	U	3.3		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	6.6		1.0	U	22.0			
1,1-Dichloropropene	µg/L	--	--	--	--	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U		
1,2,3-Trichlorobenzene	µg/L	--	--	--	--	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U		
1,2,3-Trichloropropane	µg/L	--	--	--	--	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U		
1,2,4-Trichlorobenzene	µg/L	--	--	--	--	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U		
1,2,4-Trimethylbenzene	µg/L	250	>S	>S	6,300	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U		
1,2-Dibromo-3-Chloropropane	µg/L	--	--	--	--	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U		
1,2-Dibromoethane	µg/L	--	--	--	--	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U		
1,2-Dichlorobenzene	µg/L	1,400	>S	>S	37,000	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U		
1,2-Dichloroethane	µg/L	--	--	--	--	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U		
1,2-Dichloroethene	µg/L	--	--	--	--																										
1,2-Dichloropropane	µg/L	--	--	--	--	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U		
1,3,5-Trimethylbenzene	µg/L	280	>S	>S	7,500	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U		
1,3-Dichlorobenzene	µg/L	--	--	--	--	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U		
1,3-Dichloropropane	µg/L	--	--	--	--	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U		
1,4-Dichlorobenzene	µg/L	2.1	21,000	7,100	1,500	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U		
2,2-Dichloropropane	µg/L	--	--	--	--	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U		
2-Butanone	µg/L	--	--	--	--																										
2-Chloroethyl Vinyl Ether	µg/L	--	--	--	--																										
2-Chlorotoluene	µg/L	--	--	--	--	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U		
2-Hexanone	µg/L	--	--	--	--																										
4-Chlorotoluene	µg/L	--	--	--	--	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U		
4-Methyl-2-Pentanone	µg/L	--	--	--	--																										
Acetone	µg/L	--	--	--	--																										
Benzene	µg/L	2.1	14,000	2,800	1,800	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	0.5	J	1.0	U	0.8	J		
Bromobenzene	µg/L	--	--	--	--	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U		
Bromochloromethane	µg/L	--	--	--	--	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U		
Bromodichloromethane	µg/L	0.6	6,000	2,300	450	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U		
Bromoform	µg/L	16	550,000	470,000	14,000	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U		
Bromomethane	µg/L	36	130,000	27,000	1,200	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U		
Carbon Dioxide	µg/L	--	--	--	--																										
Carbon Disulfide	µg/L	--	--	--	--																										
Carbon Tetrachloride	µg/L	2.1	7,700	1,200	1,800	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U		
Chlorobenzene	µg/L	350	>S	>S	10,000	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U		
Chlorodibromomethane	µg/L	0.77	17,000	13,000	610	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U		
Chloroethane	µg/L	88,000	>S	>S	2,400,000	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U		
Chloroform	µg/L	0.98	6,300	1,600	720	1.0	U	1.8		*<10*	1.1		*<10*	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0		*<10*	1.0	U			
Chlorohexane	µg/L	--	--	--	--																										
Chloromethane	µg/L	790	1,800,000	330,000	22,000	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U		
Cis-1,2-Dichloroethene	µg/L	260	>S	>S	18,000	10.8		960	D	*<10*	230	D		4.1		56.0		1.3		1.0	U	1.0	U	8.4		1,800	D	*<10*	0.7	J	4,200	D	*16*
Cis-1,3-Dichloropropene	µg/L	--	--	--	--	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U		
Dibromomethane	µg/L	--	--	--	--	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U		
Dichlorodifluoromethane	µg/L	--	--	--	--	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U		
Ethylbenzene	µg/L	6.4	43,000	8,200	4,500	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U		
Hexachlorobutadiene	µg/L	--	--	--	--	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U		
Isopropylbenzene	µg/L	--	--	--	--	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U		
m+p-Xylenes	µg/L	--	--	--	--	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U		
Methane	µg/L	--	--	--	--																										
Methylene Chloride	µg/L	200	13,000,000	3,300,000	79,000	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U		
Methyl-tert-butyl Ether	µg/L	68	1,500,000	870,000	63,000																										
Naphthalene	µg/L	0.72	16,000	11,000	500	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U		
n-Butylbenzene	µg/L	--	--	--	--	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U		
n-Propylbenzene	µg/L	--	--	--	--	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U		
o-Xylene	µg/L	--	--	--	--	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U		
p-Isopropyltoluene	µg/L	--	--	--	--	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U		
Sec-Butylbenzene	µg/L	--	--	--	--	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U		
Styrene	µg/L	5,700	>S	>S	170,000	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U		
Tert-Butylbenzene	µg/L	--	--	--	--	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U		
Tetrachloroethene	µg/L	48	>S	48,000	5,600	3.8		9,800	D	*<10*	4,300	D	*90*	2.1		4.6		2.8		3.3		3.1		3.5		700	D	*15*	4,900	D	*102*	260	D	*<10*	1,200	D	*25*
Toluene	µg/L	6,300	>S	>S	220,000	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U		
Trans-1,2-Dichloroethene	µg/L	--	--	--	--	1.0	U	8.4		3.7		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	4.9		1.0	U	13.0			
Trans-1,3-Dichloropropene	µg/L	--	--	--	--	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U		
Trichloroethene	µg/L	3.3	20,000	3,700	430	1.0	U	1,200	D	*<10*	260	D	*79*	1.1		11.0		*<10*	1.0	U	1.0	U	1.0	U	53.0		*16*	850	D	*<10*	13.0		*<10*	860	D	*<10*
Trichlorofluoromethane	µg/L	5,200	>S	460,000	160,000	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U		
Vinyl Chloride	µg/L	0.49	5,900	880	960	1.0	U	1.0	U	1.0	U	1.0	U	7.4		*15*	1.0	U	1.5		*<10*	1.0	U	1.0	U	2.8		*<10*	1.0	U	48.0		*98*
Xylenes, Total	µg/L	830	>S	>S	23,000																										

Notes:

D = Dilution
J = Estimated value.
U = The analyte was analyzed for, but not detected.
-- = Not Established

EF = Exceedance factor (calculated if consistuent exceeded indicated screening level)
Shaded = detected result exceeded indicated DEQ RBCs
Sample Type: N = Normal Sample, FD - Field Duplicate

°C = degrees Celsius
mg/L = milligrams per Liter
mV = millivolts
µg/L = micrograms per Liter

µS/cm = microsiemens per centimeter
NTU = Nephelometric Turbidity Units
Screening levels from DEQ Risk-Based Concentrations (May 2018 Update)

Table 3
Analytical Groundwater Sampling Results
Northwest Pipe Company, Portland, Oregon

Location ID		DEQ Risk-Based Concentrations (May 2018 Update)				GW06		GW07		GW08		GW09		GW09		GW10		GW11		GW12		MW-01		MW-02		MW-03		GP-101		GP-102	
Sample ID						GW06-16-08/29/02		GW07-16-08/29/02		GW08-16-08/29/02		GW09-16-08/29/02		GW09-16-08/29/02		GW10-16-08/29/02		GW11-16-08/30/02		GW12-16-08/30/02		MW01-08/29/03		MW02-08/29/03		MW03-08/29/03		GP-101-07/21/04		GP-102-07/21/04	
Sample Date						08/29/02		08/29/02		08/29/02		08/29/02		08/29/02		08/29/02		08/30/02		08/30/02		08/29/03		08/29/03		08/29/03		07/21/04		07/21/04	
Sample Type		Ingestion & Inhalation from Tapwater	Volatilization to Outdoor Air	Vapor Intrusion into Buildings	GW in Excavation	N1		N1		N1		N1		FD1		N1		N1		N1		N1		N1		N1		N1		N1	
Analyte	**Units**	**Occupational**	**Occupational**	**Occupational**	**Construction & Excavation Worker**		***EF***		***EF***		***EF***		***EF***		***EF***		***EF***		***EF***		***EF***		***EF***		***EF***		***EF***		***EF***
Field Parameters																													
Temperature	(°C)	--	--	--	--																								
pH		--	--	--	--																								
Conductivity	(µS/cm)	--	--	--	--																								
Dissolved Oxygen	mg/L	--	--	--	--																								
Oxidation Reduction Potential	mV	--	--	--	--																								
Turbidity	NTU	--	--	--	--																								
Conventional Parameters																													
Alkalinity, Total as CaCO3	mg/L	--	--	--	--																								
Chloride	mg/L	--	--	--	--																								
Nitrate ion	mg/L	--	--	--	--																								
Nitrate-N	mg/L	--	--	--	--																								
Sulfate	mg/L	--	--	--	--																								
Total Organic Carbon	mg/L	--	--	--	--																								
Total Suspended Solids (TSS)	mg/L	--	--	--	--																								
Metals, Total																													
Arsenic	mg/L	0.00031	--	--	--																								
Cadmium	mg/L	0.16	--	--	--																								
Chromium	mg/L	250	--	--	--																								
Copper	mg/L	6.5	--	--	--																								
Iron	mg/L	--	--	--	--																								
Lead	mg/L	0.015	--	--	>S																								
Manganese	mg/L	3.9	--	--	3,200																								
Mercury	mg/L	0.049	--	--	>S																								
Nickel	mg/L	3.3	--	--	>S																								
Zinc	mg/L	--	--	--	--																								
Metals, Dissolved																													
Arsenic	mg/L	0.00031	--	--	--																								
Cadmium	mg/L	0.16	--	--	--																								
Chromium	mg/L	250	--	--	--																								
Copper	mg/L	6.5	--	--	--																								
Iron	mg/L	--	--	--	--																								
Ferrous Iron[1]	mg/L	--	--	--	--																								
Lead	mg/L	0.015	--	--	>S																								
Manganese	mg/L	3.9	--	--	3200																								
Mercury	mg/L	0.049	--	--	>S																								
Nickel	mg/L	3.3	--	--	>S																								
Zinc	mg/L	--	--	--	--																								
Polynuclear Aromatic Hydrocabons																													
1-Methylnaphthalene	µg/L	--	--	--	--																								
2-Methylnaphthalene	µg/L	--	--	--	--																								
Acenaphthene	µg/L	2,500	>S	>S	>S																								
Acenaphthylene	µg/L	--	--	--	--																								
Anthracene	µg/L	>S	>S	>S	>S																								
Benzo(a)anthracene	µg/L	0.38	>S	>S	>S																								
Benzo(a)pyrene	µg/L	0.47	--	--	>S																								
Benzo(b)fluoroanthene	µg/L	>S	--	--	>S																								
Benzo(g,h,i)perylene	µg/L	--	--	--	--																								
Benzo(k)fluoranthene	µg/L	>S	--	--	>S																								
Chrysene	µg/L	>S	--	--	>S																								
Dibenzo(a,h)anthracene	µg/L	0.47	--	--	>S																								
Fluoranthene	µg/L	>S	--	--	>S																								
Fluorene	µg/L	1,300	>S	>S	>S																								
Indeno(1,2,3-c,d)pyrene	µg/L	>S	--	--	>S																								
Naphthalene	µg/L	0.72	16,000	11,000	500																								
Phenanthrene	µg/L	--	--	--	--																								
Pyrene	µg/L	>S	>S	>S	>S																								
Total PAH[2]	µg/L	--	--	--	--																								
Polychlorinated Biphenyls																													
Aroclor-1260	µg/L	0.028	>S	>S	30																								
Aroclor-1254	µg/L	0.028	>S	>S	30																								
Aroclor-1221	µg/L	0.028	>S	>S	30																								
Aroclor-1232	µg/L	0.028	>S	>S	30																								
Aroclor-1248	µg/L	0.028	>S	>S	30																								
Aroclor-1016	µg/L	0.028	>S	>S	30																								
Aroclor-1242	µg/L	0.028	>S	>S	30																								
Total PCBs[2]	µg/L	0.028	>S	>S	30																								
Total Petroleum Hydrocarbons																													
Gasoline (TPH-Gx)	mg/L	0.45	>S	>S	>S																								
Diesel (TPH-Dx)	mg/L	0.43	>S	>S	14																								
Motor Oil (TPH-Oil)	mg/L	1.3	>S	>S	>S																								
VOCs																													
1,1,1,2-Tetrachloroethane	µg/L	--	--	--	--	1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U	
1,1,1-Trichloroethane	µg/L	37,000	--	--	1,100,000	1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		0.34 J	

Table 3
Analytical Groundwater Sampling Results
Northwest Pipe Company, Portland, Oregon

Location ID		DEQ Risk-Based Concentrations (May 2018 Update)				GW06		GW07		GW08		GW09		GW09		GW10		GW11		GW12		MW-01		MW-02		MW-03		GP-101		GP-102	
Sample ID						GW06-16-08/29/02		GW07-16-08/29/02		GW08-16-08/29/02		GW09-16-08/29/02		GW09-16-08/29/02		GW10-16-08/29/02		GW11-16-08/30/02		GW12-16-08/30/02		MW01-08/29/03		MW02-08/29/03		MW03-08/29/03		GP-101-07/21/04		GP-102-07/21/04			
Sample Date						08/29/02		08/29/02		08/29/02		08/29/02		08/29/02		08/29/02		08/30/02		08/30/02		08/29/03		08/29/03		08/29/03		07/21/04		07/21/04			
Sample Type		Ingestion & Inhalation from Tapwater	Volatilization to Outdoor Air	Vapor Intrusion into Buildings	GW in Excavation	N1		N1		N1		N1		FD1		N1		N1		N1		N1		N1		N1		N1		N1			
Analyte	**Units**	**Occupational**	**Occupational**	**Occupational**	**Construction & Excavation Worker**		***EF***		***EF***		***EF***		***EF***		***EF***		***EF***		***EF***		***EF***		***EF***		***EF***		***EF***		***EF***		***EF***
VOCs																															
1,1,2,2-Tetrachloroethane	µg/L	--	--	--	--	1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U			
1,1,2-Trichloroethane	µg/L	1.3	21,000	11,000	49	1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U			
1,1-Dichloroethane	µg/L	13	68,000	14,000	10,000	1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		0.19 J		0.24 J			
1,1-Dichloroethene	µg/L	1,400	2,400,000	360,000	44,000	1.0 U		1.0 U		1.0 U		0.6 J		0.5 J		1.0 U		1.0 U		1.0 U		2.7		1.0 U		1.0 U		1.0 U		1.0 U			
1,1-Dichloropropene	µg/L	--	--	--	--	1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U			
1,2,3-Trichlorobenzene	µg/L	--	--	--	--	1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U			
1,2,3-Trichloropropane	µg/L	--	--	--	--	1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U			
1,2,4-Trichlorobenzene	µg/L	--	--	--	--	1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U			
1,2,4-Trimethylbenzene	µg/L	250	>S	>S	6,300	1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U			
1,2-Dibromo-3-Chloropropane	µg/L	--	--	--	--	1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		5.0 U		5.0 U			
1,2-Dibromoethane	µg/L	--	--	--	--	1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U			
1,2-Dichlorobenzene	µg/L	1,400	>S	>S	37,000	1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U			
1,2-Dichloroethane	µg/L	--	--	--	--	1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U			
1,2-Dichloroethene	µg/L	--	--	--	--																										
1,2-Dichloropropane	µg/L	--	--	--	--	1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U			
1,3,5-Trimethylbenzene	µg/L	280	>S	>S	7,500	1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U			
1,3-Dichlorobenzene	µg/L	--	--	--	--	1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U			
1,3-Dichloropropane	µg/L	--	--	--	--	1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U			
1,4-Dichlorobenzene	µg/L	2.1	21,000	7,100	1,500	1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U			
2,2-Dichloropropane	µg/L	--	--	--	--	1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U			
2-Butanone	µg/L	--	--	--	--																										
2-Chloroethyl Vinyl Ether	µg/L	--	--	--	--																										
2-Chlorotoluene	µg/L	--	--	--	--	1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U			
2-Hexanone	µg/L	--	--	--	--																										
4-Chlorotoluene	µg/L	--	--	--	--	1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U			
4-Methyl-2-Pentanone	µg/L	--	--	--	--																										
Acetone	µg/L	--	--	--	--																										
Benzene	µg/L	2.1	14,000	2,800	1,800	1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U			
Bromobenzene	µg/L	--	--	--	--	1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U			
Bromochloromethane	µg/L	--	--	--	--	1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U			
Bromodichloromethane	µg/L	0.6	6,000	2,300	450	1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U			
Bromoform	µg/L	16	550,000	470,000	14,000	1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U			
Bromomethane	µg/L	36	130,000	27,000	1,200	1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U			
Carbon Dioxide	µg/L	--	--	--	--																										
Carbon Disulfide	µg/L	--	--	--	--																										
Carbon Tetrachloride	µg/L	2.1	7,700	1,200	1,800	1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U			
Chlorobenzene	µg/L	350	>S	>S	10,000	1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U			
Chlorodibromomethane	µg/L	0.77	17,000	13,000	610	1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U			
Chloroethane	µg/L	88,000	>S	>S	2,400,000	1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U			
Chloroform	µg/L	0.98	6,300	1,600	720	1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		2.6	*<10*	1.0 U		1.0 U		1.0 U		1.0 U		1.0 U			
Chlorohexane	µg/L	--	--	--	--																										
Chloromethane	µg/L	790	1,800,000	330,000	22,000	1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U			
Cis-1,2-Dichloroethene	µg/L	260	>S	>S	18,000	39.0	*<10*	34.0	*<10*	11.0		61.0		57.0		50.0		1.0 U		16.0		800 D	*<10*	1.0 U		1.0 U		1.0 U		0.4 J			
Cis-1,3-Dichloropropene	µg/L	--	--	--	--	1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U									
Dibromomethane	µg/L	--	--	--	--	1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U			
Dichlorodifluoromethane	µg/L	--	--	--	--	1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U			
Ethylbenzene	µg/L	6.4	43,000	8,200	4,500	1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U			
Hexachlorobutadiene	µg/L	--	--	--	--	1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U			
Isopropylbenzene	µg/L	--	--	--	--	1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U			
m+p-Xylenes	µg/L	--	--	--	--	1.0 U		2.0 U		2.0 U		2.0 U		2.0 U		2.0 U		2.0 U		2.0 U		2.0 U		1.0 U		2.0 U		1.0 U		1.0 U			
Methane	µg/L	--	--	--	--																										
Methylene Chloride	µg/L	200	13,000,000	3,300,000	79,000	1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		2.0 U		2.0 U			
Methyl-tert-butyl Ether	µg/L	68	1,500,000	870,000	63,000																										
Naphthalene	µg/L	0.72	16,000	11,000	500	1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U			
n-Butylbenzene	µg/L	--	--	--	--	1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U			
n-Propylbenzene	µg/L	--	--	--	--	1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U			
o-Xylene	µg/L	--	--	--	--	2.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		2.0 U		1.0 U		1.0 U		1.0 U			
p-Isopropyltoluene	µg/L	--	--	--	--	1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U			
Sec-Butylbenzene	µg/L	--	--	--	--	1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U			
Styrene	µg/L	5,700	>S	>S	170,000	1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U			
Tert-Butylbenzene	µg/L	--	--	--	--	1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U			
Tetrachloroethene	µg/L	48	>S	48,000	5,600	310 D	*<10*	210 D	*<10*	110 D	*<10*	120 D	*<10*	120 D	*<10*	260 D	*<10*	27.0		3,300 D	*69*	240 D	*<10*	1.0 U		19.0		1.0 U		59.0 D	*<10*		
Toluene	µg/L	6,300	>S	>S	220,000	1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U			
Trans-1,2-Dichloroethene	µg/L	--	--	--	--	1.0 U		1.0 U		1.0 U		0.6 J		0.5 J		1.0 J		1.0 U		1.0 U		5.8		1.0 U		1.0 U		1.0 U		1.0 U			
Trans-1,3-Dichloropropene	µg/L	--	--	--	--	1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U							
Trichloroethene	µg/L	3.3	20,000	3,700	430	59.0	*18*	12.0	*<10*	20.0	*<10*	100 D	*30*	98.0 D	*30*	110 D	*33*	1.3		65.0	*20*	34.0	*10*	1.0 U		1.0		1.0 U		10.0	*<10*		
Trichlorofluoromethane	µg/L	5,200	>S	460,000	160,000	1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U			
Vinyl Chloride	µg/L	0.49	5,900	880	960	1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.7	*<10*	1.0 U		1.0 U		10.0	*20*	1.0 U		1.0 U		0.27 J	*<10*	1.0 U			
Xylenes, Total	µg/L	830	>S	>S	23,000																										

Notes:

D = Dilution
J = Estimated value.
U = The analyte was analyzed for, but not detected.
-- = Not Established

EF = Exceedance factor (calculated if consistuent exceeded indicated screening level)
Shaded = detected result exceeded indicated DEQ RBCs
Sample Type: N = Normal Sample, FD - Field Duplicate

°C = degrees Celsius
mg/L = milligrams per Liter
mV = millivolts
µg/L = micrograms per Liter

µS/cm = microsiemens per centimeter
NTU = Nephelometric Turbidity Units
Screening levels from DEQ Risk-Based Concentrations (May 2018 Update)

Table 3
Analytical Groundwater Sampling Results
Northwest Pipe Company, Portland, Oregon

Location ID		DEQ Risk-Based Concentrations (May 2018 Update)				GP-103		GP-104		GP-106		GP-107		GP-108		GP-109		GP-110		GP-111		GP-112		GP-112		MW-01		MW-02		MW-03		MW-03	
Sample ID						GP-103-07/21/04		GP-104-07/21/04		GP-106-07/21/04		GP-107-07/21/04		GP-108-07/21/04		GP-109-07/21/04		GP-110-07/21/04		GP-111-07/21/04		GP-112-07/22/04		GP-112-07/22/04		MW01-08/16/04		MW02-08/16/04		MW03-08/16/04		MW03-08/16/04	
Sample Date																															
Sample Type		Ingestion & Inhalation from Tapwater	Volatilization to Outdoor Air	Vapor Intrusion into Buildings	GW in Excavation	N1		N1		N1		N1		N1		N1		N1		N1		N1		N1		N1		N1		FD1	
Analyte	**Units**	**Occupational**	**Occupational**	**Occupational**	**Construction & Excavation Worker**	*EF*		*EF*		*EF*		*EF*		*EF*												*EF*						
Field Parameters																															
Temperature	(°C)	--	--	--	--																					15.1		16.5		16.3		
pH		--	--	--	--																					6.8		7.0		6.8		
Conductivity	(µS/cm)	--	--	--	--																					366		343		304		
Dissolved Oxygen	mg/L	--	--	--	--																					0.15		0.16		0.26		
Oxidation Reduction Potential	mV	--	--	--	--																					-130		-151		-93		
Turbidity	NTU	--	--	--	--																					4.6		3.2		3.7		
Conventional Parameters																															
Alkalinity, Total as CaCO3	mg/L	--	--	--	--																											
Chloride	mg/L	--	--	--	--																											
Nitrate ion	mg/L	--	--	--	--																											
Nitrate-N	mg/L	--	--	--	--																											
Sulfate	mg/L	--	--	--	--																											
Total Organic Carbon	mg/L	--	--	--	--																											
Total Suspended Solids (TSS)	mg/L	--	--	--	--																											
Metals, Total																															
Arsenic	mg/L	0.00031	--	--	--																											
Cadmium	mg/L	0.16	--	--	--																											
Chromium	mg/L	250	--	--	--																											
Copper	mg/L	6.5	--	--	--																											
Iron	mg/L	--	--	--	--																											
Lead	mg/L	0.015	--	--	>S																											
Manganese	mg/L	3.9	--	--	3,200																											
Mercury	mg/L	0.049	--	--	>S																											
Nickel	mg/L	3.3	--	--	>S																											
Zinc	mg/L	--	--	--	--																											
Metals, Dissolved																															
Arsenic	mg/L	0.00031	--	--	--																											
Cadmium	mg/L	0.16	--	--	--																											
Chromium	mg/L	250	--	--	--																											
Copper	mg/L	6.5	--	--	--																											
Iron	mg/L	--	--	--	--																											
Ferrous Iron[1]	mg/L	--	--	--	--																											
Lead	mg/L	0.015	--	--	>S																											
Manganese	mg/L	3.9	--	--	3200																											
Mercury	mg/L	0.049	--	--	>S																											
Nickel	mg/L	3.3	--	--	>S																											
Zinc	mg/L	--	--	--	--																											
Polynuclear Aromatic Hydrocabons																															
1-Methylnaphthalene	µg/L	--	--	--	--																											
2-Methylnaphthalene	µg/L	--	--	--	--																											
Acenaphthene	µg/L	2,500	>S	>S	>S																											
Acenaphthylene	µg/L	--	--	--	--																											
Anthracene	µg/L	>S	>S	>S	>S																											
Benzo(a)anthracene	µg/L	0.38	>S	>S	>S																											
Benzo(a)pyrene	µg/L	0.47	--	--	>S																											
Benzo(b)fluoroanthene	µg/L	>S	--	--	>S																											
Benzo(g,h,i)perylene	µg/L	--	--	--	--																											
Benzo(k)fluoranthene	µg/L	>S	--	--	>S																											
Chrysene	µg/L	>S	--	--	>S																											
Dibenzo(a,h)anthracene	µg/L	0.47	--	--	>S																											
Fluoranthene	µg/L	>S	--	--	>S																											
Fluorene	µg/L	1,300	>S	>S	>S																											
Indeno(1,2,3-c,d)pyrene	µg/L	>S	--	--	>S																											
Naphthalene	µg/L	0.72	16,000	11,000	500																											
Phenanthrene	µg/L	--	--	--	--																											
Pyrene	µg/L	>S	>S	>S	>S																											
Total PAH[2]	µg/L	--	--	--	--																											
Polychlorinated Biphenyls																															
Aroclor-1260	µg/L	0.028	>S	>S	30																											
Aroclor-1254	µg/L	0.028	>S	>S	30																											
Aroclor-1221	µg/L	0.028	>S	>S	30																											
Aroclor-1232	µg/L	0.028	>S	>S	30																											
Aroclor-1248	µg/L	0.028	>S	>S	30																											
Aroclor-1016	µg/L	0.028	>S	>S	30																											
Aroclor-1242	µg/L	0.028	>S	>S	30																											
Total PCBs[2]	µg/L	0.028	>S	>S	30																											
Total Petroleum Hydrocarbons																															
Gasoline (TPH-Gx)	mg/L	0.45	>S	>S	>S																											
Diesel (TPH-Dx)	mg/L	0.43	>S	>S	14																											
Motor Oil (TPH-Oil)	mg/L	1.3	>S	>S	>S																											
VOCs																															
1,1,1,2-Tetrachloroethane	µg/L	--	--	--	--	1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		
1,1,1-Trichloroethane	µg/L	37,000	--	--	1,100,000	1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		

Table 3
Analytical Groundwater Sampling Results
Northwest Pipe Company, Portland, Oregon

Location ID		DEQ Risk-Based Concentrations (May 2018 Update)				GP-103		GP-104		GP-106		GP-107		GP-108		GP-109		GP-110		GP-111		GP-112		GP-112		MW-01		MW-02		MW-03		MW-03	
Sample ID						GP-103-		GP-104-		GP-106-		GP-107-		GP-108-		GP-109-		GP-110-		GP-111-		GP-112-		GP-112-		MW01-		MW02-		MW03-		MW03-	
Sample Date						07/21/04		07/21/04		07/21/04		07/21/04		07/21/04		07/21/04		07/21/04		07/21/04		07/22/04		07/22/04		08/16/04		08/16/04		08/16/04		08/16/04	
Sample Type		Ingestion & Inhalation from Tapwater	Volatilization to Outdoor Air	Vapor Intrusion into Buildings	GW in Excavation	N1		N1		N1		N1		N1		N1		N1		N1		N1		N1		N1		N1		N1		FD1	
Analyte	**Units**	**Occupational**	**Occupational**	**Occupational**	**Construction & Excavation Worker**	*EF*		*EF*		*EF*		*EF*		*EF*												*EF*							
VOCs																															
1,1,2,2-Tetrachloroethane	µg/L	--	--	--	--	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
1,1,2-Trichloroethane	µg/L	1.3	21,000	11,000	49	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
1,1-Dichloroethane	µg/L	13	68,000	14,000	10,000	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	0.25	J	1.0	U	1.0	U	1.0	U	1.0	U	0.48	J	0.39	J	0.21	J	0.23	J
1,1-Dichloroethene	µg/L	1,400	2,400,000	360,000	44,000	1.0		0.92	J	1.0	U	0.54	J	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	4.8		1.0	U	1.0	U	1.0	U
1,1-Dichloropropene	µg/L	--	--	--	--	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
1,2,3-Trichlorobenzene	µg/L	--	--	--	--	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
1,2,3-Trichloropropane	µg/L	--	--	--	--	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
1,2,4-Trichlorobenzene	µg/L	--	--	--	--	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
1,2,4-Trimethylbenzene	µg/L	250	>S	>S	6,300	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
1,2-Dibromo-3-Chloropropane	µg/L	--	--	--	--	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
1,2-Dibromoethane	µg/L	--	--	--	--	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
1,2-Dichlorobenzene	µg/L	1,400	>S	>S	37,000	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
1,2-Dichloroethane	µg/L	--	--	--	--	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
1,2-Dichloroethene	µg/L	--	--	--	--																										
1,2-Dichloropropane	µg/L	--	--	--	--	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
1,3,5-Trimethylbenzene	µg/L	280	>S	>S	7,500	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
1,3-Dichlorobenzene	µg/L	--	--	--	--	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
1,3-Dichloropropane	µg/L	--	--	--	--	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
1,4-Dichlorobenzene	µg/L	2.1	21,000	7,100	1,500	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
2,2-Dichloropropane	µg/L	--	--	--	--	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
2-Butanone	µg/L	--	--	--	--																										
2-Chloroethyl Vinyl Ether	µg/L	--	--	--	--																										
2-Chlorotoluene	µg/L	--	--	--	--	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
2-Hexanone	µg/L	--	--	--	--																										
4-Chlorotoluene	µg/L	--	--	--	--	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
4-Methyl-2-Pentanone	µg/L	--	--	--	--																										
Acetone	µg/L	--	--	--	--																										
Benzene	µg/L	2.1	14,000	2,800	1,800	1.0	U	0.18	J	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	0.23	J	1.0	U	1.0	U	1.0	U
Bromobenzene	µg/L	--	--	--	--	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
Bromochloromethane	µg/L	--	--	--	--	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
Bromodichloromethane	µg/L	0.6	6,000	2,300	450	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
Bromoform	µg/L	16	550,000	470,000	14,000	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
Bromomethane	µg/L	36	130,000	27,000	1,200	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
Carbon Dioxide	µg/L	--	--	--	--																										
Carbon Disulfide	µg/L	--	--	--	--																										
Carbon Tetrachloride	µg/L	2.1	7,700	1,200	1,800	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
Chlorobenzene	µg/L	350	>S	>S	10,000	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
Chlorodibromomethane	µg/L	0.77	17,000	13,000	610	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
Chloroethane	µg/L	88,000	>S	>S	2,400,000	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
Chloroform	µg/L	0.98	6,300	1,600	720	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
Chlorohexane	µg/L	--	--	--	--																										
Chloromethane	µg/L	790	1,800,000	330,000	22,000	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
Cis-1,2-Dichloroethene	µg/L	260	>S	>S	18,000	200	D	120	D	15.0		170	D	7.6		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1,200	D	*<10*		0.17	D	1.0	U	1.0	U
Cis-1,3-Dichloropropene	µg/L	--	--	--	--																									1.0	U	1.0	U
Dibromomethane	µg/L	--	--	--	--	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
Dichlorodifluoromethane	µg/L	--	--	--	--	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
Ethylbenzene	µg/L	6.4	43,000	8,200	4,500	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
Hexachlorobutadiene	µg/L	--	--	--	--	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
Isopropylbenzene	µg/L	--	--	--	--	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
m+p-Xylenes	µg/L	--	--	--	--	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
Methane	µg/L	--	--	--	--																										
Methylene Chloride	µg/L	200	13,000,000	3,300,000	79,000	2.0	U	2.0	U	0.11	J	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U
Methyl-tert-butyl Ether	µg/L	68	1,500,000	870,000	63,000																									1.0	U	1.0	U
Naphthalene	µg/L	0.72	16,000	11,000	500	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
n-Butylbenzene	µg/L	--	--	--	--	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
n-Propylbenzene	µg/L	--	--	--	--	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
o-Xylene	µg/L	--	--	--	--	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
p-Isopropyltoluene	µg/L	--	--	--	--	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
Sec-Butylbenzene	µg/L	--	--	--	--	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
Styrene	µg/L	5,700	>S	>S	170,000	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
Tert-Butylbenzene	µg/L	--	--	--	--	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
Tetrachloroethene	µg/L	48	>S	48,000	5,600	66.0	D	*<10*	260	D	*<10*	1.3		66.0	D	*<10*	21.0		0.75	J	3.3		0.66	J	1.0	U	1.0	U	1,000	D	*21*	0.47	J	21.0		11.0	
Toluene	µg/L	6,300	>S	>S	220,000	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	0.12	J	1.0	U	1.0	U
Trans-1,2-Dichloroethene	µg/L	--	--	--	--	1.5		2.8		1.0	U	0.87	J	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	16.0		1.0	U	1.0	U	1.0	U
Trans-1,3-Dichloropropene	µg/L	--	--	--	--																									1.0	U	1.0	U
Trichloroethene	µg/L	3.3	20,000	3,700	430	38.0	D	*12*	170	D	*52*	3.8	*<10*	40.0		*12*	5.6	*<10*	0.22	J	1.0	U	0.6	J	1.0	U	1.0	U	80.0	D	*24*	1.0	U	2.0		1.9	
Trichlorofluoromethane	µg/L	5,200	>S	460,000	160,000	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
Vinyl Chloride	µg/L	0.49	5,900	880	960	0.88	J	*<10*	0.78	J	*<10*	4.0	*<10*	5.0		*10*	0.18	J	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	8.5		*17*	1.0	U	1.0	U	1.0	U
Xylenes, Total	µg/L	830	>S	>S	23,000																										

Notes:
D = Dilution
J = Estimated value.
U = The analyte was analyzed for, but not detected.
-- = Not Established

EF = Exceedance factor (calculated if consistuent exceeded indicated screening level)
Shaded = detected result exceeded indicated DEQ RBCs
Sample Type: N = Normal Sample, FD - Field Duplicate

°C = degrees Celsius
mg/L = milligrams per Liter
mV = millivolts
µg/L = micrograms per Liter

µS/cm = microsiemens per centimeter
NTU = Nephelometric Turbidity Units
Screening levels from DEQ Risk-Based Concentrations (May 2018 Update)

Table 3
Analytical Groundwater Sampling Results
Northwest Pipe Company, Portland, Oregon

Location ID		DEQ Risk-Based Concentrations (May 2018 Update)				MW-04		MW-04		MW-05		MW-01		MW-02		MW-03		MW-04		MW-05		MW-06		MW-06		MW-01		MW-02		MW-03	
Sample ID						MW04-08/16/04		MW04-08/16/04		MW05-08/16/04		MW01-01/11/05		MW02-01/11/05		MW03-01/11/05		MW04-01/11/05		MW05-01/11/05		MW06-01/11/05		MW06-01/11/05		MW01-06/21/05		MW02-06/21/05		MW03-06/21/05	
Sample Date						08/16/04		08/16/04		08/16/04		01/11/05		01/11/05		01/11/05		01/11/05		01/11/05		01/11/05		01/11/05		06/21/05		06/21/05		06/21/05	
Sample Type		Ingestion & Inhalation from Tapwater	Volatilization to Outdoor Air	Vapor Intrusion into Buildings	GW in Excavation	N1		FD1		N1		N1		N1		N1		N1		N1		N1		FD1		N1		N1		N1	
Analyte	**Units**	**Occupational**	**Occupational**	**Occupational**	**Construction & Excavation Worker**	*EF*		*EF*		*EF*		*EF*		*EF*				*EF*		*EF*		*EF*		*EF*		*EF*					
Field Parameters																															
Temperature	(°C)	--	--	--	--	15.3				15.1																					
pH		--	--	--	--	6.5				6.8																					
Conductivity	(µS/cm)	--	--	--	--	429				284																					
Dissolved Oxygen	mg/L	--	--	--	--	0.14				0.13																					
Oxidation Reduction Potential	mV	--	--	--	--	-103				-130																					
Turbidity	NTU	--	--	--	--	1.0				0.8																					
Conventional Parameters																															
Alkalinity, Total as CaCO3	mg/L	--	--	--	--																					155		170		140	
Chloride	mg/L	--	--	--	--																					2.4		1.7		4.4	
Nitrate ion	mg/L	--	--	--	--																										
Nitrate-N	mg/L	--	--	--	--																					0.1	U	0.1	U	0.17	
Sulfate	mg/L	--	--	--	--																					2.0		0.15		15	
Total Organic Carbon	mg/L	--	--	--	--																					1.4		2.3		1.6	
Total Suspended Solids (TSS)	mg/L	--	--	--	--																										
Metals, Total																															
Arsenic	mg/L	0.00031	--	--	--																										
Cadmium	mg/L	0.16	--	--	--																										
Chromium	mg/L	250	--	--	--																										
Copper	mg/L	6.5	--	--	--																										
Iron	mg/L	--	--	--	--																										
Lead	mg/L	0.015	--	--	>S																										
Manganese	mg/L	3.9	--	--	3,200																					2.6		2.7		1.2	
Mercury	mg/L	0.049	--	--	>S																										
Nickel	mg/L	3.3	--	--	>S																										
Zinc	mg/L	--	--	--	--																										
Metals, Dissolved																															
Arsenic	mg/L	0.00031	--	--	--																										
Cadmium	mg/L	0.16	--	--	--																										
Chromium	mg/L	250	--	--	--																										
Copper	mg/L	6.5	--	--	--																										
Iron	mg/L	--	--	--	--																										
Ferrous Iron[1]	mg/L	--	--	--	--																					16		15		6.5	
Lead	mg/L	0.015	--	--	>S																										
Manganese	mg/L	3.9	--	--	3200																										
Mercury	mg/L	0.049	--	--	>S																										
Nickel	mg/L	3.3	--	--	>S																										
Zinc	mg/L	--	--	--	--																										
Polynuclear Aromatic Hydrocabons																															
1-Methylnaphthalene	µg/L	--	--	--	--																										
2-Methylnaphthalene	µg/L	--	--	--	--																										
Acenaphthene	µg/L	2,500	>S	>S	>S																										
Acenaphthylene	µg/L	--	--	--	--																										
Anthracene	µg/L	>S	>S	>S	>S																										
Benzo(a)anthracene	µg/L	0.38	>S	>S	>S																										
Benzo(a)pyrene	µg/L	0.47	--	--	>S																										
Benzo(b)fluoroanthene	µg/L	>S	--	--	>S																										
Benzo(g,h,i)perylene	µg/L	--	--	--	--																										
Benzo(k)fluoranthene	µg/L	>S	--	--	>S																										
Chrysene	µg/L	>S	--	--	>S																										
Dibenzo(a,h)anthracene	µg/L	0.47	--	--	>S																										
Fluoranthene	µg/L	>S	--	--	>S																										
Fluorene	µg/L	1,300	>S	>S	>S																										
Indeno(1,2,3-c,d)pyrene	µg/L	>S	--	--	>S																										
Naphthalene	µg/L	0.72	16,000	11,000	500																										
Phenanthrene	µg/L	--	--	--	--																										
Pyrene	µg/L	>S	>S	>S	>S																										
Total PAH[2]	µg/L	--	--	--	--																										
Polychlorinated Biphenyls																															
Aroclor-1260	µg/L	0.028	>S	>S	30																										
Aroclor-1254	µg/L	0.028	>S	>S	30																										
Aroclor-1221	µg/L	0.028	>S	>S	30																										
Aroclor-1232	µg/L	0.028	>S	>S	30																										
Aroclor-1248	µg/L	0.028	>S	>S	30																										
Aroclor-1016	µg/L	0.028	>S	>S	30																										
Aroclor-1242	µg/L	0.028	>S	>S	30																										
Total PCBs[2]	µg/L	0.028	>S	>S	30																										
Total Petroleum Hydrocarbons																															
Gasoline (TPH-Gx)	mg/L	0.45	>S	>S	>S																										
Diesel (TPH-Dx)	mg/L	0.43	>S	>S	14																										
Motor Oil (TPH-Oil)	mg/L	1.3	>S	>S	>S																										
VOCs																															
1,1,1,2-Tetrachloroethane	µg/L	--	--	--	--	1.0	U		1.0	U		1.0	U				0.5	U	0.5	U	0.5	U	0.5	U		0.5	U		0.5	U		1.1	U		0.5	U	0.5	U
1,1,1-Trichloroethane	µg/L	37,000	--	--	1,100,000	1.0	U		1.0	U		1.0	U				0.5	U	0.5	U	0.5	U	0.5	U		0.5	U		0.5	U		1.1	U		0.5	U	0.5	U

Table 3
Analytical Groundwater Sampling Results
Northwest Pipe Company, Portland, Oregon

Location ID		DEQ Risk-Based Concentrations (May 2018 Update)				MW-04		MW-04		MW-05		MW-01		MW-02		MW-03		MW-04		MW-05		MW-06		MW-06		MW-01		MW-02		MW-03	
Sample ID						MW04-		MW04-		MW05-		MW01-		MW02-		MW03-		MW04-		MW05-		MW06-		MW06-		MW01-		MW02-		MW03-	
Sample Date						08/16/04		08/16/04		08/16/04		01/11/05		01/11/05		01/11/05		01/11/05		01/11/05		01/11/05		01/11/05		06/21/05		06/21/05		06/21/05	
Sample Type		Ingestion & Inhalation from Tapwater	Volatilization to Outdoor Air	Vapor Intrusion into Buildings	GW in Excavation	N1		FD1		N1		N1		N1		N1		N1		N1		N1		FD1		N1		N1		N1	
Analyte	**Units**	**Occupational**	**Occupational**	**Occupational**	**Construction & Excavation Worker**		*EF*		*EF*		*EF*		*EF*						*EF*		*EF*		*EF*		*EF*					
VOCs																															
1,1,2,2-Tetrachloroethane	µg/L	--	--	--	--	1.0 U		1.0 U		1.0 U		0.5 U		0.5 U		0.5 U		0.5 U		0.5 U		0.5 U		0.5 U		1.1 U		0.5 U		0.5 U	
1,1,2-Trichloroethane	µg/L	1.3	21,000	11,000	49	1.0 U		1.0 U		1.0 U		0.5 U		0.5 U		0.5 U		0.5 U		0.5 U		0.5 U		0.5 U		1.1 U		0.5 U		0.5 U	
1,1-Dichloroethane	µg/L	13	68,000	14,000	10,000	0.26 J		0.21 J		0.22 J		0.5 U		0.5 U		0.5 U		0.5 U		0.5 U		0.5 U		0.5 U		1.1 U		0.5 U		0.5 U	
1,1-Dichloroethene	µg/L	1,400	2,400,000	360,000	44,000	0.91 J		0.75 J		0.58 J		4.0		0.5 U		0.5 U		0.56		0.5 U		2.5		2.7		2.4		0.5 U		0.5 U	
1,1-Dichloropropene	µg/L	--	--	--	--	1.0 U		1.0 U		1.0 U																					
1,2,3-Trichlorobenzene	µg/L	--	--	--	--	1.0 U		1.0 U		1.0 U																					
1,2,3-Trichloropropane	µg/L	--	--	--	--	1.0 U		1.0 U		1.0 U																					
1,2,4-Trichlorobenzene	µg/L	--	--	--	--	1.0 U		1.0 U		1.0 U																					
1,2,4-Trimethylbenzene	µg/L	250	>S	>S	6,300	1.0 U		1.0 U		1.0 U																					
1,2-Dibromo-3-Chloropropane	µg/L	--	--	--	--	5.0 U		5.0 U		5.0 U																					
1,2-Dibromoethane	µg/L	--	--	--	--	1.0 U		1.0 U		1.0 U																					
1,2-Dichlorobenzene	µg/L	1,400	>S	>S	37,000	1.0 U		1.0 U		1.0 U																					
1,2-Dichloroethane	µg/L	--	--	--	--	1.0 U		1.0 U		1.0 U		0.5 U		0.5 U		0.5 U		0.5 U		0.5 U		0.5 U		0.5 U		1.1 U		0.5 U		0.5 U	
1,2-Dichloroethene	µg/L	--	--	--	--							1,100		0.5 U		0.68		200		27.0		690		710		630		0.5 U		1.0	
1,2-Dichloropropane	µg/L	--	--	--	--	1.0 U		1.0 U		1.0 U		0.5 U		0.5 U		0.5 U		0.5 U		0.5 U		0.5 U		0.5 U		1.1 U		0.5 U		0.5 U	
1,3,5-Trimethylbenzene	µg/L	280	>S	>S	7,500	1.0 U		1.0 U		1.0 U																					
1,3-Dichlorobenzene	µg/L	--	--	--	--	1.0 U		1.0 U		1.0 U																					
1,3-Dichloropropane	µg/L	--	--	--	--	1.0 U		1.0 U		1.0 U																					
1,4-Dichlorobenzene	µg/L	2.1	21,000	7,100	1,500	1.0 U		1.0 U		1.0 U																					
2,2-Dichloropropane	µg/L	--	--	--	--	1.0 U		1.0 U		1.0 U																					
2-Butanone	µg/L	--	--	--	--							1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		11.0 U		5.0 U		5.0 U	
2-Chloroethyl Vinyl Ether	µg/L	--	--	--	--																										
2-Chlorotoluene	µg/L	--	--	--	--	1.0 U		1.0 U		1.0 U																					
2-Hexanone	µg/L	--	--	--	--							1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		11.0 U		5.0 U		5.0 U	
4-Chlorotoluene	µg/L	--	--	--	--	1.0 U		1.0 U		1.0 U																					
4-Methyl-2-Pentanone	µg/L	--	--	--	--							1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		2.2 U		1.0 U		1.0 U	
Acetone	µg/L	--	--	--	--							1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.8		1.6		2.2 U		1.0 U		1.0 U	
Benzene	µg/L	2.1	14,000	2,800	1,800	0.13 J		1.0 U		1.0 U		0.5 U		0.5 U		0.5 U		0.5 U		0.5 U		0.5 U		0.5 U		1.1 U		0.5 U		0.5 U	
Bromobenzene	µg/L	--	--	--	--	1.0 U		1.0 U		1.0 U																					
Bromochloromethane	µg/L	--	--	--	--	1.0 U		1.0 U		1.0 U																					
Bromodichloromethane	µg/L	0.6	6,000	2,300	450	1.0 U		1.0 U		1.0 U		0.5 U		0.5 U		0.5 U		0.5 U		0.5 U		0.5 U		0.5 U		1.1 U		0.5 U		0.5 U	
Bromoform	µg/L	16	550,000	470,000	14,000	1.0 U		1.0 U		1.0 U		0.5 U		0.5 U		0.5 U		0.5 U		0.5 U		0.5 U		0.5 U		1.1 U		0.5 U		0.5 U	
Bromomethane	µg/L	36	130,000	27,000	1,200	1.0 U		1.0 U		1.0 U		0.5 U		0.5 U		0.5 U		0.5 U		0.5 U		0.5 U		0.5 U		1.1 U		0.5 U		0.5 U	
Carbon Dioxide	µg/L	--	--	--	--																					72,000		42,000		49,000	
Carbon Disulfide	µg/L	--	--	--	--							1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		2.2 U		1.0 U		1.0 U	
Carbon Tetrachloride	µg/L	2.1	7,700	1,200	1,800	1.0 U		1.0 U		1.0 U		0.5 U		0.5 U		0.5 U		0.5 U		0.5 U		0.5 U		0.5 U		1.1 U		0.5 U		0.5 U	
Chlorobenzene	µg/L	350	>S	>S	10,000	1.0 U		1.0 U		1.0 U		0.5 U		0.5 U		0.5 U		0.5 U		0.5 U		0.5 U		0.5 U		1.1 U		0.5 U		0.5 U	
Chlorodibromomethane	µg/L	0.77	17,000	13,000	610	1.0 U		1.0 U		1.0 U		0.5 U		0.5 U		0.5 U		0.5 U		0.5 U		0.5 U		0.5 U		1.1 U		0.5 U		0.5 U	
Chloroethane	µg/L	88,000	>S	>S	2,400,000	1.0 U		1.0 U		1.0 U		0.5 U		0.5 U		0.5 U		0.5 U		0.5 U		0.5 U		0.5 U		1.1 U		0.5 U		0.5 U	
Chloroform	µg/L	0.98	6,300	1,600	720	1.0 U		1.0 U		1.0 U		0.5 U		0.5 U		0.5 U		0.5 U		0.5 U		1.7	*<10*	1.6	*<10*	1.1 U		0.5 U		0.5 U	
Chlorohexane	µg/L	--	--	--	--																										
Chloromethane	µg/L	790	1,800,000	330,000	22,000	0.36 J		1.0 U		1.0 U		0.5 U		0.5 U		0.5 U		0.5 U		0.5 U		0.5 U		0.5 U		1.1 U		0.5 U		0.5 U	
Cis-1,2-Dichloroethene	µg/L	260	>S	>S	18,000	500 D	*<10*	310 D	*<10*	160 D	*<10*	1,200 D	*<10*	0.5 U		0.68		210 D		27.0		740 D	*<10*	720 D	*<10*	840 D	*<10*	0.5 U		1.0	
Cis-1,3-Dichloropropene	µg/L	--	--	--	--							0.5 U		0.5 U		0.5 U		0.5 U		0.5 U		0.5 U		0.5 U		1.1 U		0.5 U		0.5 U	
Dibromomethane	µg/L	--	--	--	--	1.0 U		1.0 U		1.0 U																					
Dichlorodifluoromethane	µg/L	--	--	--	--	1.0 U		1.0 U		1.0 U																					
Ethylbenzene	µg/L	6.4	43,000	8,200	4,500	1.0 U		1.0 U		1.0 U		0.5 U		0.5 U		0.5 U		0.5 U		0.5 U		0.5 U		0.5 U		1.1 U		0.5 U		0.5 U	
Hexachlorobutadiene	µg/L	--	--	--	--	1.0 U		1.0 U		1.0 U																					
Isopropylbenzene	µg/L	--	--	--	--	1.0 U		1.0 U		1.0 U																					
m+p-Xylenes	µg/L	--	--	--	--	1.0 U		1.0 U		1.0 U		2.0 U		2.0 U		2.0 U		2.0 U		2.0 U		2.0 U		2.0 U		4.4 U		2.0 U		2.0 U	
Methane	µg/L	--	--	--	--																					5,200		9,800		1,200	
Methylene Chloride	µg/L	200	13,000,000	3,300,000	79,000	2.0 U		2.0 U		2.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.1 U		0.5 U		0.5 U	
Methyl-tert-butyl Ether	µg/L	68	1,500,000	870,000	63,000																										
Naphthalene	µg/L	0.72	16,000	11,000	500	1.0 U		1.0 U		1.0 U																					
n-Butylbenzene	µg/L	--	--	--	--	1.0 U		1.0 U		1.0 U																					
n-Propylbenzene	µg/L	--	--	--	--	1.0 U		1.0 U		1.0 U																					
o-Xylene	µg/L	--	--	--	--	1.0 U		1.0 U		1.0 U		0.5 U		0.5 U		0.5 U		0.5 U		0.5 U		0.5 U		0.5 U		1.1 U		0.5 U		0.5 U	
p-Isopropyltoluene	µg/L	--	--	--	--	1.0 U		1.0 U		1.0 U																					
Sec-Butylbenzene	µg/L	--	--	--	--	1.0 U		1.0 U		1.0 U																					
Styrene	µg/L	5,700	>S	>S	170,000	1.0 U		1.0 U		1.0 U		0.5 U		0.5 U		0.5 U		0.5 U		0.5 U		0.5 U		0.5 U		1.1 U		0.5 U		0.5 U	
Tert-Butylbenzene	µg/L	--	--	--	--	1.0 U		1.0 U		1.0 U																					
Tetrachloroethene	µg/L	48	>S	48,000	5,600	150 D	*<10*	74.0 D	*<10*	52.0 D	*<10*	790 D	*16*	0.5 U		20.0		190 D	*<10*	110 D	*<10*	2,000 D	*42*	1,900 D	*40*	470 D	*<10*	0.5 U		5.0	
Toluene	µg/L	6,300	>S	>S	220,000	0.18 J		0.14 J		1.0 U		0.5 U		0.5 U		0.5 U		0.5 U		0.5 U		0.5 U		0.5 U		1.1 U		0.5 U		0.5 U	
Trans-1,2-Dichloroethene	µg/L	--	--	--	--	4.5		3.7		1.5		6.7		0.5 U		0.5 U		1.9		0.5 U		4.3		4.4		5.2		0.5 U		0.5 U	
Trans-1,3-Dichloropropene	µg/L	--	--	--	--							0.5 U		0.5 U		0.5 U		0.5 U		0.5 U		0.5 U		0.5 U		1.1 U		0.5 U		0.5 U	
Trichloroethene	µg/L	3.3	20,000	3,700	430	31.0	*<10*	25.0	*<10*	5.6	*<10*	49.0	*15*	0.5 U		1.9		38.0	*12*	8.5	*<10*	1,000 D	*<10*	960 D	*<10*	45.0	*14*	0.5 U		1.8	
Trichlorofluoromethane	µg/L	5,200	>S	460,000	160,000	1.0 U		1.0 U		1.0 U																					
Vinyl Chloride	µg/L	0.49	5,900	880	960	180 D	*367*	120 D	*245*	0.54 J	*<10*	5.8	*12*	0.5 U		0.5 U		72.0	*147*	0.5 U		0.93	*<10*	0.95	*<10*	4.3	*<10*	0.5 U		0.5 U	
Xylenes, Total	µg/L	830	>S	>S	23,000							0.6 U		0.6 U		0.6 U		0.6 U		0.6 U		0.6 U		0.6 U		1.3 U		0.6 U		0.6 U	

Notes:
D = Dilution
J = Estimated value.
U = The analyte was analyzed for, but not detected.
-- = Not Established

EF = Exceedance factor (calculated if consistuent exceeded indicated screening level)
Shaded = detected result exceeded indicated DEQ RBCs
Sample Type: N = Normal Sample, FD - Field Duplicate

°C = degrees Celsius
mg/L = milligrams per Liter
mV = millivolts
µg/L = micrograms per Liter

µS/cm = microsiemens per centimeter
NTU = Nephelometric Turbidity Units
Screening levels from DEQ Risk-Based Concentrations (May 2018 Update)

Table 3
Analytical Groundwater Sampling Results
Northwest Pipe Company, Portland, Oregon

Location ID		DEQ Risk-Based Concentrations (May 2018 Update)				MW-03	MW-04	MW-05	MW-06	MW-01	MW-02	MW-03	MW-03	MW-04	MW-05	MW-06	MW-01	MW-02
Sample ID						MW03-06/21/05 FD1	MW04-06/21/05 N1	MW05-06/21/05 N1	MW06-06/21/05 N1	MW1-09/21/05 N1	MW2-09/21/05 N1	MW3-09/21/05 N1	MW3-09/21/05 FD1	MW4-09/21/05 N1	MW5-09/21/05 N1	MW6-09/21/05 N1	MW-1-092407 09/24/07 N1	MW-2-092407 09/24/07 N1
Sample Date																		
Sample Type																		
		Ingestion & Inhalation from Tapwater	Volatilization to Outdoor Air	Vapor Intrusion into Buildings	GW in Excavation													
Analyte	**Units**	**Occupational**	**Occupational**	**Occupational**	**Construction & Excavation Worker**	*EF*	*EF*	*EF*	*EF*									
Field Parameters																		
Temperature	(°C)	--	--	--	--				14.7									
pH		--	--	--	--				6.1									
Conductivity	(µS/cm)	--	--	--	--				376.9									
Dissolved Oxygen	mg/L	--	--	--	--				0.2									
Oxidation Reduction Potential	mV	--	--	--	--				-33.7									
Turbidity	NTU	--	--	--	--				4.0									
Conventional Parameters																		
Alkalinity, Total as CaCO3	mg/L	--	--	--	--	150	190	120	150	160	160	150	130	180	120	150		
Chloride	mg/L	--	--	--	--	4.3	3.4	1.6	5.8	2.9	2.0	4.3	4.2	3.5	2.9	6.5		
Nitrate ion	mg/L	--	--	--	--					0.1 U	0.1 U	0.23	0.3	0.2	1.0	0.1 U		
Nitrate-N	mg/L	--	--	--	--	0.14	0.12	0.1 U	0.1 U									
Sulfate	mg/L	--	--	--	--	13	10	6.6	22	4.4	0.11	15	17	13	17	25		
Total Organic Carbon	mg/L	--	--	--	--	1.6	1.9	1.9	2.7	1.2	2.1	1.5	1.5	1.5	2.4	1.8		
Total Suspended Solids (TSS)	mg/L	--	--	--	--													
Metals, Total																		
Arsenic	mg/L	0.00031	--	--	--													
Cadmium	mg/L	0.16	--	--	--													
Chromium	mg/L	250	--	--	--													
Copper	mg/L	6.5	--	--	--													
Iron	mg/L	--	--	--	--													
Lead	mg/L	0.015	--	--	>S													
Manganese	mg/L	3.9	--	--	3,200	0.98	1.8	1.6	2.6	2.5	2.5	0.93	1.7	1.5	1.7	2.1		
Mercury	mg/L	0.049	--	--	>S													
Nickel	mg/L	3.3	--	--	>S													
Zinc	mg/L	--	--	--	--													
Metals, Dissolved																		
Arsenic	mg/L	0.00031	--	--	--													
Cadmium	mg/L	0.16	--	--	--													
Chromium	mg/L	250	--	--	--													
Copper	mg/L	6.5	--	--	--													
Iron	mg/L	--	--	--	--													
Ferrous Iron[1]	mg/L	--	--	--	--	4.2	11	7.7	13	16	15	3.0	12	7.6	4.3	12		
Lead	mg/L	0.015	--	--	>S													
Manganese	mg/L	3.9	--	--	3200													
Mercury	mg/L	0.049	--	--	>S													
Nickel	mg/L	3.3	--	--	>S													
Zinc	mg/L	--	--	--	--												0.0050 U	0.0078
Polynuclear Aromatic Hydrocabons																		
1-Methylnaphthalene	µg/L	--	--	--	--													
2-Methylnaphthalene	µg/L	--	--	--	--													
Acenaphthene	µg/L	2,500	>S	>S	>S												0.00133 U	0.0016 J
Acenaphthylene	µg/L	--	--	--	--													
Anthracene	µg/L	>S	>S	>S	>S												0.003 J	0.0037 J
Benzo(a)anthracene	µg/L	0.38	>S	>S	>S												0.0017 J	0.0014 J
Benzo(a)pyrene	µg/L	0.47	--	--	>S													
Benzo(b)fluoroanthene	µg/L	>S	--	--	>S													
Benzo(g,h,i)perylene	µg/L	--	--	--	--													
Benzo(k)fluoranthene	µg/L	>S	--	--	>S													
Chrysene	µg/L	>S	--	--	>S												0.0018 J	0.00131 U
Dibenzo(a,h)anthracene	µg/L	0.47	--	--	>S													
Fluoranthene	µg/L	>S	--	--	>S													
Fluorene	µg/L	1,300	>S	>S	>S												0.00135 U	0.0013 J
Indeno(1,2,3-c,d)pyrene	µg/L	>S	--	--	>S													
Naphthalene	µg/L	0.72	16,000	11,000	500												0.0045 J	0.0048 J
Phenanthrene	µg/L	--	--	--	--												0.002 J	0.0037 J
Pyrene	µg/L	>S	>S	>S	>S												0.0058 J	0.00395 U
Total PAH[2]	µg/L	--	--	--	--													
Polychlorinated Biphenyls																		
Aroclor-1260	µg/L	0.028	>S	>S	30													
Aroclor-1254	µg/L	0.028	>S	>S	30													
Aroclor-1221	µg/L	0.028	>S	>S	30													
Aroclor-1232	µg/L	0.028	>S	>S	30													
Aroclor-1248	µg/L	0.028	>S	>S	30													
Aroclor-1016	µg/L	0.028	>S	>S	30													
Aroclor-1242	µg/L	0.028	>S	>S	30													
Total PCBs[2]	µg/L	0.028	>S	>S	30													
Total Petroleum Hydrocarbons																		
Gasoline (TPH-Gx)	mg/L	0.45	>S	>S	>S												0.060 J	0.032 J
Diesel (TPH-Dx)	mg/L	0.43	>S	>S	14												0.0404 U	0.0547 U
Motor Oil (TPH-Oil)	mg/L	1.3	>S	>S	>S													
VOCs																		
1,1,1,2-Tetrachloroethane	µg/L	--	--	--	--												1.0 U	1.0 U
1,1,1-Trichloroethane	µg/L	37,000	--	--	1,100,000	0.5 U	0.5 U	0.5 U	5.0 U	1.1 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5.0 U	1.0 U	1.0 U

Table 3
Analytical Groundwater Sampling Results
Northwest Pipe Company, Portland, Oregon

Location ID		DEQ Risk-Based Concentrations (May 2018 Update)				MW-03	MW-04	MW-05	MW-06	MW-01	MW-02	MW-03	MW-03	MW-04	MW-05	MW-06	MW-01	MW-02
Sample ID						MW03-06/21/05-FD1	MW04-06/21/05-N1	MW05-06/21/05-N1	MW06-06/21/05-N1	MW1-09/21/05-N1	MW2-09/21/05-N1	MW3-09/21/05-N1	MW3-09/21/05-FD1	MW4-09/21/05-N1	MW5-09/21/05-N1	MW6-09/21/05-N1	MW-1-092407-09/24/07-N1	MW-2-092407-09/24/07-N1
Sample Date																		
Sample Type																		
		Ingestion & Inhalation from Tapwater	Volatilization to Outdoor Air	Vapor Intrusion into Buildings	GW in Excavation													
Analyte	**Units**	**Occupational**	**Occupational**	**Occupational**	**Construction & Excavation Worker**	*EF*	*EF*	*EF*	*EF*					*EF*	*EF*	*EF*	*EF*	
VOCs																		
1,1,2,2-Tetrachloroethane	µg/L	--	--	--	--	0.5 U	0.5 U	0.5 U	5.0 U	1.1 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5.0 U	1.0 U	1.0 U
1,1,2-Trichloroethane	µg/L	1.3	21,000	11,000	49	0.5 U	0.5 U	0.5 U	5.0 U	1.1 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5.0 U	1.0 U	1.0 U
1,1-Dichloroethane	µg/L	13	68,000	14,000	10,000	0.5 U	0.5 U	0.5 U	5.0 U	1.1 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5.0 U	1.0 U	1.0 U
1,1-Dichloroethene	µg/L	1,400	2,400,000	360,000	44,000	0.5 U	0.5 U	0.5 U	5.0 U	2.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	6.2	1.3	1.0 U
1,1-Dichloropropene	µg/L	--	--	--	--												1.0 U	1.0 U
1,2,3-Trichlorobenzene	µg/L	--	--	--	--												1.0 U	1.0 U
1,2,3-Trichloropropane	µg/L	--	--	--	--												1.0 U	1.0 U
1,2,4-Trichlorobenzene	µg/L	--	--	--	--												1.0 U	1.0 U
1,2,4-Trimethylbenzene	µg/L	250	>S	>S	6,300												1.0 U	1.0 U
1,2-Dibromo-3-Chloropropane	µg/L	--	--	--	--												1.0 U	1.0 U
1,2-Dibromoethane	µg/L	--	--	--	--												1.0 U	1.0 U
1,2-Dichlorobenzene	µg/L	1,400	>S	>S	37,000												1.0 U	1.0 U
1,2-Dichloroethane	µg/L	--	--	--	--	0.5 U	0.5 U	0.5 U	5.0 U	1.1 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5.0 U	1.0 U	1.0 U
1,2-Dichloroethene	µg/L	--	--	--	--	0.5 U	150	53.0	1,300	690	0.5 U	0.79	0.79	140	150	1,600		
1,2-Dichloropropane	µg/L	--	--	--	--	0.5 U	0.5 U	0.5 U	5.0 U	1.1 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5.0 U	1.0 U	1.0 U
1,3,5-Trimethylbenzene	µg/L	280	>S	>S	7,500												1.0 U	1.0 U
1,3-Dichlorobenzene	µg/L	--	--	--	--												1.0 U	1.0 U
1,3-Dichloropropane	µg/L	--	--	--	--												1.0 U	1.0 U
1,4-Dichlorobenzene	µg/L	2.1	21,000	7,100	1,500												1.0 U	1.0 U
2,2-Dichloropropane	µg/L	--	--	--	--												1.0 U	1.0 U
2-Butanone	µg/L	--	--	--	--	5.0 U	5.0 U	5.0 U	50.0 U	11.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	50.0 U	1.0 U	1.0 U
2-Chloroethyl Vinyl Ether	µg/L	--	--	--	--													
2-Chlorotoluene	µg/L	--	--	--	--												1.0 U	1.0 U
2-Hexanone	µg/L	--	--	--	--	5.0 U	5.0 U	5.0 U	50.0 U	11.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	50.0 U		
4-Chlorotoluene	µg/L	--	--	--	--												1.0 U	1.0 U
4-Methyl-2-Pentanone	µg/L	--	--	--	--	1.0 U	1.0 U	1.0 U	10.0 U	2.2 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	10.0 U	1.0 U	1.0 U
Acetone	µg/L	--	--	--	--	1.0 U	1.0 U	1.0 U	10.0 U	2.2 U	8.6	11.0	4.8	1.0 U	3.7	10.0 U	1.0 U	1.0 U
Benzene	µg/L	2.1	14,000	2,800	1,800	0.5 U	0.5 U	0.5 U	5.0 U	1.1 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5.0 U	0.11 J	1.0 U
Bromobenzene	µg/L	--	--	--	--												1.0 U	1.0 U
Bromochloromethane	µg/L	--	--	--	--												1.0 U	1.0 U
Bromodichloromethane	µg/L	0.6	6,000	2,300	450	0.5 U	0.5 U	0.5 U	5.0 U	1.1 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5.0 U	1.0 U	1.0 U
Bromoform	µg/L	16	550,000	470,000	14,000	0.5 U	0.5 U	0.5 U	5.0 U	1.1 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5.0 U	1.0 U	1.0 U
Bromomethane	µg/L	36	130,000	27,000	1,200	0.5 U	0.5 U	0.5 U	5.0 U	1.1 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5.0 U	1.0 U	1.0 U
Carbon Dioxide	µg/L	--	--	--	--	49,000	110,000	42,000	110,000	57,000	43,000	63,000	31,000	110,000	40,000	98,000		
Carbon Disulfide	µg/L	--	--	--	--	1.0 U	1.0 U	1.0 U	10.0 U	2.2 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	10.0 U		
Carbon Tetrachloride	µg/L	2.1	7,700	1,200	1,800	0.5 U	0.5 U	0.5 U	5.0 U	1.1 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5.0 U	1.0 U	1.0 U
Chlorobenzene	µg/L	350	>S	>S	10,000	0.5 U	0.5 U	0.5 U	5.0 U	1.1 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5.0 U	1.0 U	1.0 U
Chlorodibromomethane	µg/L	0.77	17,000	13,000	610	0.5 U	0.5 U	0.5 U	5.0 U	1.1 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5.0 U	1.0 U	1.0 U
Chloroethane	µg/L	88,000	>S	>S	2,400,000	0.5 U	0.5 U	0.5 U	5.0 U	1.1 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5.0 U	1.0 U	1.0 U
Chloroform	µg/L	0.98	6,300	1,600	720	0.5 U	0.5 U	0.5 U	5.0 U	1.1 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5.0 U	1.0 U	1.0 U
Chlorohexane	µg/L	--	--	--	--												1.0 U	1.0 U
Chloromethane	µg/L	790	1,800,000	330,000	22,000	0.5 U	0.5 U	0.5 U	5.0 U	1.1 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5.0 U	1.0 U	1.0 U
Cis-1,2-Dichloroethene	µg/L	260	>S	>S	18,000	0.5 U	150 D	53.0	1,300 D	*<10* 730 D	*<10* 0.5 U	0.79	0.79	160	160	*<10* 1,700	*<10* 386 D	*<10* 0.37 J
Cis-1,3-Dichloropropene	µg/L	--	--	--	--	0.5 U	0.5 U	0.5 U	5.0 U	1.1 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5.0 U	1.0 U	1.0 U
Dibromomethane	µg/L	--	--	--	--												1.0 U	1.0 U
Dichlorodifluoromethane	µg/L	--	--	--	--												1.0 U	1.0 U
Ethylbenzene	µg/L	6.4	43,000	8,200	4,500	0.5 U	0.5 U	0.5 U	5.0 U	1.1 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5.0 U	1.0 U	1.0 U
Hexachlorobutadiene	µg/L	--	--	--	--												1.0 U	1.0 U
Isopropylbenzene	µg/L	--	--	--	--												1.0 U	1.0 U
m+p-Xylenes	µg/L	--	--	--	--	2.0 U	2.0 U	2.0 U	20.0 U	1.1 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5.0 U	1.0 U	1.0 U
Methane	µg/L	--	--	--	--	940	8,600	3,000	1,800	3,900	13,000	7,700	720	6,100	2,600	3,000		
Methylene Chloride	µg/L	200	13,000,000	3,300,000	79,000	0.5 U	0.5 U	0.5 U	5.0 U	1.1 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5.0 U	1.0 U	1.0 U
Methyl-tert-butyl Ether	µg/L	68	1,500,000	870,000	63,000												1.0 U	1.0 U
Naphthalene	µg/L	0.72	16,000	11,000	500												1.0 U	1.0 U
n-Butylbenzene	µg/L	--	--	--	--												1.0 U	1.0 U
n-Propylbenzene	µg/L	--	--	--	--												1.0 U	1.0 U
o-Xylene	µg/L	--	--	--	--	0.5 U	0.5 U	0.5 U	5.0 U	1.1 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5.0 U	1.0 U	1.0 U
p-Isopropyltoluene	µg/L	--	--	--	--												1.0 U	1.0 U
Sec-Butylbenzene	µg/L	--	--	--	--												1.0 U	1.0 U
Styrene	µg/L	5,700	>S	>S	170,000	0.5 U	0.5 U	0.5 U	5.0 U	1.1 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5.0 U	1.0 U	1.0 U
Tert-Butylbenzene	µg/L	--	--	--	--												1.0 U	1.0 U
Tetrachloroethene	µg/L	48	>S	48,000	5,600	12.0	130 D	*<10* 110 D	*<10* 2,100 D	*44* 460 D	*<10* 0.5 U	9.0	9.7	140 D	*<10* 1,200 D	*25* 2,800 D	*58* 146 D	*<10* 0.34 J
Toluene	µg/L	6,300	>S	>S	220,000	0.5 U	0.5 U	0.5 U	5.0 U	1.1 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5.0 U	1.0 U	1.0 U
Trans-1,2-Dichloroethene	µg/L	--	--	--	--	0.5 U	1.9	0.5 U	9.9	5.0	0.5 U	0.5 U	0.5 U	1.9	0.93	12.0	3.1	1.0 U
Trans-1,3-Dichloropropene	µg/L	--	--	--	--	0.5 U	0.5 U	0.5 U	5.0 U	1.1 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5.0 U	1.0 U	1.0 U
Trichloroethene	µg/L	3.3	20,000	3,700	430	2.1	28.0 *<10*	18.0 *<10*	1,500 D	*<10* 38.0 *12*	0.5 U	1.7	1.8	24.0 D	*<10* 72.0 D	*22* 1,900 D	*<10* 14.7	*<10* 1.0 U
Trichlorofluoromethane	µg/L	5,200	>S	460,000	160,000												1.0 U	1.0 U
Vinyl Chloride	µg/L	0.49	5,900	880	960	0.5 U	59.0 *120*	0.5 U	5.7 *12*	2.9 *<10*	0.5 U	0.5 U	0.5 U	55.0 *112*	0.5 U	6.7 *14*	6.6 *13*	1.0 U
Xylenes, Total	µg/L	830	>S	>S	23,000	0.6 U	0.6 U	0.6 U	6.0 U	1.3 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	6.0 U		

Notes:

D = Dilution
J = Estimated value.
U = The analyte was analyzed for, but not detected.
-- = Not Established

EF = Exceedance factor (calculated if consistuent exceeded indicated screening level)
Shaded = detected result exceeded indicated DEQ RBCs
Sample Type: N = Normal Sample, FD - Field Duplicate

°C = degrees Celsius
mg/L = milligrams per Liter
mV = millivolts
µg/L = micrograms per Liter

µS/cm = microsiemens per centimeter
NTU = Nephelometric Turbidity Units
Screening levels from DEQ Risk-Based Concentrations (May 2018 Update)

Table 3
Analytical Groundwater Sampling Results
Northwest Pipe Company, Portland, Oregon

Location ID		DEQ Risk-Based Concentrations (May 2018 Update)				MW-03		MW-04		MW-05		MW-06		GP-201		GP-202		GP-203		GP-203		GP-204		GP-205		GP-206		GP-207		GP-208		GP-209	
Sample ID						MW-3-092407		MW-4-092407		MW-5-092407		MW-6-092407		GP201-W-0		GP202-W-0		GP203-W-0		GP203-W-1		GP204-W-0		GP205-W-0		GP206-W-0		GP207-W-0		GP208-W-0		GP209-W-0	
Sample Date						09/24/07		09/24/07		09/24/07		09/24/07		09/26/07		09/26/07		09/26/07		09/26/07		09/26/07		09/26/07		09/26/07		09/26/07		09/27/07		09/27/07	
Sample Type						N1		N1		N1		N1		N1		N1		N1		FD1		N1		N1		N1		N1		N1		N1	
Analyte	**Units**	**Ingestion & Inhalation from Tapwater**	**Volatilization to Outdoor Air**	**Vapor Intrusion into Buildings**	**GW in Excavation**																												
		Occupational	**Occupational**	**Occupational**	**Construction & Excavation Worker**	*EF*		*EF*		*EF*		*EF*		*EF*		*EF*		*EF*		*EF*		*EF*		*EF*		*EF*		*EF*		*EF*		*EF*	
Field Parameters																																	
Temperature	(°C)	--	--	--	--																												
pH		--	--	--	--																												
Conductivity	(µS/cm)	--	--	--	--																												
Dissolved Oxygen	mg/L	--	--	--	--																												
Oxidation Reduction Potential	mV	--	--	--	--																												
Turbidity	NTU	--	--	--	--																												
Conventional Parameters																																	
Alkalinity, Total as CaCO3	mg/L	--	--	--	--																												
Chloride	mg/L	--	--	--	--																												
Nitrate ion	mg/L	--	--	--	--																												
Nitrate-N	mg/L	--	--	--	--																												
Sulfate	mg/L	--	--	--	--																												
Total Organic Carbon	mg/L	--	--	--	--																												
Total Suspended Solids (TSS)	mg/L	--	--	--	--																												
Metals, Total																																	
Arsenic	mg/L	0.00031	--	--	--																												
Cadmium	mg/L	0.16	--	--	--																												
Chromium	mg/L	250	--	--	--																												
Copper	mg/L	6.5	--	--	--																												
Iron	mg/L	--	--	--	--																												
Lead	mg/L	0.015	--	--	>S																												
Manganese	mg/L	3.9	--	--	3,200																												
Mercury	mg/L	0.049	--	--	>S																												
Nickel	mg/L	3.3	--	--	>S																												
Zinc	mg/L	--	--	--	--	0.0050	U	0.0064		0.0050	U	0.0050	U	0.0064		0.0066		0.0051		0.0061		0.011		0.0073		0.0050	U	0.0096		0.0059		0.0072	
Metals, Dissolved																																	
Arsenic	mg/L	0.00031	--	--	--																												
Cadmium	mg/L	0.16	--	--	--																												
Chromium	mg/L	250	--	--	--																												
Copper	mg/L	6.5	--	--	--																												
Iron	mg/L	--	--	--	--																												
Ferrous Iron[1]	mg/L	--	--	--	--																												
Lead	mg/L	0.015	--	--	>S																												
Manganese	mg/L	3.9	--	--	3200																												
Mercury	mg/L	0.049	--	--	>S																												
Nickel	mg/L	3.3	--	--	>S																												
Zinc	mg/L	--	--	--	--	0.0050	U	0.0064		0.0050	U	0.0050	U	0.0064		0.0066		0.0051		0.0061		0.011		0.0073		0.0050	U	0.0096		0.0059		0.0072	
Polynuclear Aromatic Hydrocabons																																	
1-Methylnaphthalene	µg/L	--	--	--	--																												
2-Methylnaphthalene	µg/L	--	--	--	--																												
Acenaphthene	µg/L	2,500	>S	>S	>S	0.00127	U	0.00127	U	0.00135	U	0.00134	U																				
Acenaphthylene	µg/L	--	--	--	--																												
Anthracene	µg/L	>S	>S	>S	>S	0.0035	J	0.0042	J	0.0039	J	0.006	J																				
Benzo(a)anthracene	µg/L	0.38	>S	>S	>S	0.00126	U	0.00125	U	0.00134	U	0.00133	U																				
Benzo(a)pyrene	µg/L	0.47	--	--	>S																												
Benzo(b)fluoroanthene	µg/L	>S	--	--	>S																												
Benzo(g,h,i)perylene	µg/L	--	--	--	--																												
Benzo(k)fluoranthene	µg/L	>S	--	--	>S																												
Chrysene	µg/L	>S	--	--	>S	0.00131	U	0.00131	U	0.0014	U	0.00138	U																				
Dibenzo(a,h)anthracene	µg/L	0.47	--	--	>S																												
Fluoranthene	µg/L	>S	--	--	>S																												
Fluorene	µg/L	1,300	>S	>S	>S	0.00129	U	0.00129	U	0.00138	U	0.00137	U																				
Indeno(1,2,3-c,d)pyrene	µg/L	>S	--	--	>S																												
Naphthalene	µg/L	0.72	16,000	11,000	500	0.0038	J	0.0045	J	0.0072	J	0.0057	J																				
Phenanthrene	µg/L	--	--	--	--	0.00154	U	0.0017	J	0.00165	U	0.00164	U																				
Pyrene	µg/L	>S	>S	>S	>S	0.00395	U	0.00395	U	0.00421	U	0.00418	U																				
Total PAH[2]	µg/L	--	--	--	--																												
Polychlorinated Biphenyls																																	
Aroclor-1260	µg/L	0.028	>S	>S	30																												
Aroclor-1254	µg/L	0.028	>S	>S	30																												
Aroclor-1221	µg/L	0.028	>S	>S	30																												
Aroclor-1232	µg/L	0.028	>S	>S	30																												
Aroclor-1248	µg/L	0.028	>S	>S	30																												
Aroclor-1016	µg/L	0.028	>S	>S	30																												
Aroclor-1242	µg/L	0.028	>S	>S	30																												
Total PCBs[2]	µg/L	0.028	>S	>S	30																												
Total Petroleum Hydrocarbons																																	
Gasoline (TPH-Gx)	mg/L	0.45	>S	>S	>S	0.034	J	0.069	J	0.30		0.44		0.031	J	0.027	J	0.77		*<10*		0.66		*<10*		0.040	J	0.028	J	0.032	J	0.11		0.10	U	0.10	U	
Diesel (TPH-Dx)	mg/L	0.43	>S	>S	14	0.0435	U	0.044	U	0.0447	U	0.0496	U	0.0665		0.0996		1.05		*<10*		0.982		*<10*		0.0908		0.112		0.0188	J	5.67		*13*		0.0383	U	0.0412	U	
Motor Oil (TPH-Oil)	mg/L	1.3	>S	>S	>S																																		
VOCs																																	
1,1,1,2-Tetrachloroethane	µg/L	--	--	--	--	1.0	U	1.0	U	1.0	U	5.0	U	1.0	U	1.0	U	1.0	U			1.0	U			1.0	U	1.0	U	1.0	U			1.0	U	1.0	U	
1,1,1-Trichloroethane	µg/L	37,000	--	--	1,100,000	1.0	U	1.0	U	0.15	J	5.0	U	1.0	U	1.0	U	1.0	U			1.0	U			1.0	U	1.0	U	1.0	U			1.0	U	1.0	U	

Table 3
Analytical Groundwater Sampling Results
Northwest Pipe Company, Portland, Oregon

Location ID		DEQ Risk-Based Concentrations (May 2018 Update)				MW-03	MW-04	MW-05	MW-06	GP-201	GP-202	GP-203	GP-203	GP-204	GP-205	GP-206	GP-207	GP-208	GP-209
Sample ID						MW-3-092407	MW-4-092407	MW-5-092407	MW-6-092407	GP201-W-0	GP202-W-0	GP203-W-0	GP203-W-1	GP204-W-0	GP205-W-0	GP206-W-0	GP207-W-0	GP208-W-0	GP209-W-0
Sample Date						09/24/07	09/24/07	09/24/07	09/24/07	09/26/07	09/26/07	09/26/07	09/26/07	09/26/07	09/26/07	09/26/07	09/26/07	09/27/07	09/27/07
Sample Type		Ingestion & Inhalation from Tapwater	Volatilization to Outdoor Air	Vapor Intrusion into Buildings	GW in Excavation	N1	N1	N1	N1	N1	N1	N1	FD1	N1	N1	N1	N1	N1	N1
Analyte	**Units**	**Occupational**	**Occupational**	**Occupational**	**Construction & Excavation Worker**														
VOCs																			
1,1,2,2-Tetrachloroethane	µg/L	--	--	--	--	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloroethane	µg/L	1.3	21,000	11,000	49	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	µg/L	13	68,000	14,000	10,000	0.12 J	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	0.20 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.6	0.15 J
1,1-Dichloroethene	µg/L	1,400	2,400,000	360,000	44,000	1.0 U	0.32 J	0.98 J	2.4 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloropropene	µg/L	--	--	--	--	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2,3-Trichlorobenzene	µg/L	--	--	--	--	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2,3-Trichloropropane	µg/L	--	--	--	--	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2,4-Trichlorobenzene	µg/L	--	--	--	--	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2,4-Trimethylbenzene	µg/L	250	>S	>S	6,300	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	0.37 J	0.38 J	1.0 U	1.0 U	1.0 U	2.2	1.0 U	1.0 U
1,2-Dibromo-3-Chloropropane	µg/L	--	--	--	--	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dibromoethane	µg/L	--	--	--	--	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	µg/L	1,400	>S	>S	37,000	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	µg/L	--	--	--	--	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethene	µg/L	--	--	--	--														
1,2-Dichloropropane	µg/L	--	--	--	--	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,3,5-Trimethylbenzene	µg/L	280	>S	>S	7,500	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	2.9	2.8	1.0 U	1.0 U	1.0 U	0.72 J	1.0 U	1.0 U
1,3-Dichlorobenzene	µg/L	--	--	--	--	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.07 J	1.0 U	1.0 U	0.42 J
1,3-Dichloropropane	µg/L	--	--	--	--	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	µg/L	2.1	21,000	7,100	1,500	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.27 J	0.78 J	1.0 U	4.8 *<10*
2,2-Dichloropropane	µg/L	--	--	--	--	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
2-Butanone	µg/L	--	--	--	--	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
2-Chloroethyl Vinyl Ether	µg/L	--	--	--	--														
2-Chlorotoluene	µg/L	--	--	--	--	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
2-Hexanone	µg/L	--	--	--	--														
4-Chlorotoluene	µg/L	--	--	--	--	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
4-Methyl-2-Pentanone	µg/L	--	--	--	--	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Acetone	µg/L	--	--	--	--	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Benzene	µg/L	2.1	14,000	2,800	1,800	1.0 U	0.10 J	0.20 J	5.0 U	1.0 U	1.0 U	0.55 J	0.57 J	1.0 U	1.0 U	1.0 U	0.10 J	1.0 U	1.0 U
Bromobenzene	µg/L	--	--	--	--	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromochloromethane	µg/L	--	--	--	--	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromodichloromethane	µg/L	0.6	6,000	2,300	450	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	µg/L	16	550,000	470,000	14,000	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromomethane	µg/L	36	130,000	27,000	1,200	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Carbon Dioxide	µg/L	--	--	--	--														
Carbon Disulfide	µg/L	--	--	--	--														
Carbon Tetrachloride	µg/L	2.1	7,700	1,200	1,800	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	µg/L	350	>S	>S	10,000	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	3.2
Chlorodibromomethane	µg/L	0.77	17,000	13,000	610	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroethane	µg/L	88,000	>S	>S	2,400,000	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroform	µg/L	0.98	6,300	1,600	720	1.0 U	1.0 U	0.33 J	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chlorohexane	µg/L	--	--	--	--	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloromethane	µg/L	790	1,800,000	330,000	22,000	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.19 J	0.35 J	1.0 U
Cis-1,2-Dichloroethene	µg/L	260	>S	>S	18,000	1.7	49.8	337 D *<10*	638 D *<10*	1.0 U	0.31 J	1.0 U	1.0 U	0.56 J	0.14 J	0.34 J	0.71 J	0.50 J	0.24 J
Cis-1,3-Dichloropropene	µg/L	--	--	--	--	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Dibromomethane	µg/L	--	--	--	--	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane	µg/L	--	--	--	--	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Ethylbenzene	µg/L	6.4	43,000	8,200	4,500	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	0.64 J	0.55 J	1.0 U	1.0 U	1.0 U	0.17 J	1.0 U	1.0 U
Hexachlorobutadiene	µg/L	--	--	--	--	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Isopropylbenzene	µg/L	--	--	--	--	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	23.9	24.1	1.0 U	1.0 U	1.0 U	0.48 J	1.0 U	1.0 U
m+p-Xylenes	µg/L	--	--	--	--	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.4	1.4	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Methane	µg/L	--	--	--	--														
Methylene Chloride	µg/L	200	13,000,000	3,300,000	79,000	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Methyl-tert-butyl Ether	µg/L	68	1,500,000	870,000	63,000	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Naphthalene	µg/L	0.72	16,000	11,000	500	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	0.12 J	1.0 U	1.0 U	1.0 U	1.0 U	11.9 *17*	1.0 U	1.0 U
n-Butylbenzene	µg/L	--	--	--	--	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	15.7	15.5	1.0 U	1.0 U	1.0 U	0.19 J	1.0 U	1.0 U
n-Propylbenzene	µg/L	--	--	--	--	1.0 U	1.0 U	1.0 U	5.0 U	0.08 J	1.0 U	35.7	35.8	0.08 J	1.0 U	1.0 U	0.96 J	1.0 U	1.0 U
o-Xylene	µg/L	--	--	--	--	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	0.11 J	0.11 J	1.0 U	1.0 U	1.0 U	0.09 J	1.0 U	0.10 J
p-Isopropyltoluene	µg/L	--	--	--	--	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Sec-Butylbenzene	µg/L	--	--	--	--	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	3.4	3.5	1.0 U	1.0 U	1.0 U	0.12 J	1.0 U	1.0 U
Styrene	µg/L	5,700	>S	>S	170,000	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Tert-Butylbenzene	µg/L	--	--	--	--	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene	µg/L	48	>S	48,000	5,600	15.6	147 D *<10*	1,420 D *30*	1,210 D *25*	0.32 J	0.37 J	0.35 J	0.17 J	0.24 J	0.17 J	0.14 J	0.30 J	1.0 U	1.0 U
Toluene	µg/L	6,300	>S	>S	220,000	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	0.39 J	0.38 J	1.0 U	1.0 U	1.0 U	0.22 J	1.0 U	0.13 J
Trans-1,2-Dichloroethene	µg/L	--	--	--	--	1.0 U	0.97 J	2.3	4.2 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trans-1,3-Dichloropropene	µg/L	--	--	--	--	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trichloroethene	µg/L	3.3	20,000	3,700	430	3.0	43.8 *13*	78.2 *24*	466 *<10*	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.22 J	1.0 U	1.0 U
Trichlorofluoromethane	µg/L	5,200	>S	460,000	160,000	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Vinyl Chloride	µg/L	0.49	5,900	880	960	1.0 U	20.9 *43*	0.28 J	3.1 J *<10*	1.0 U	0.16 J	1.0 U	1.0 U	1.5 *<10*	0.38 J	0.68 J *<10*	0.31 J	0.19 J	0.58 J *<10*
Xylenes, Total	µg/L	830	>S	>S	23,000														

Notes:

D = Dilution
J = Estimated value.
U = The analyte was analyzed for, but not detected.
-- = Not Established

EF = Exceedance factor (calculated if consistuent exceeded indicated screening level)
Shaded = detected result exceeded indicated DEQ RBCs
Sample Type: N = Normal Sample, FD - Field Duplicate

°C = degrees Celsius
mg/L = milligrams per Liter
mV = millivolts
µg/L = micrograms per Liter

µS/cm = microsiemens per centimeter
NTU = Nephelometric Turbidity Units
Screening levels from DEQ Risk-Based Concentrations (May 2018 Update)

Table 3
Analytical Groundwater Sampling Results
Northwest Pipe Company, Portland, Oregon

Location ID		DEQ Risk-Based Concentrations (May 2018 Update)				GP-210		GP-211		GP-211		GP-212		GP-213		GP-214		MW-7		MW-7		MW-8		MW-8		MW-9		MW-9		MW-01	
Sample ID						GP210-W-0		GP211-W-0		GP211-W-1		GP212-W-0		GP213-W-0		GP214-W-0		MW-7-61512		MW-7-53113		MW-8-61512		MW-8-53113		MW-9-61512		MW-9-53113		MW-01-102616	
Sample Date						09/27/07		09/27/07		09/27/07		09/27/07		09/27/07		09/27/07		06/15/12		05/31/13		06/15/12		05/31/13		06/15/12		05/31/13		10/26/16	
Sample Type		Ingestion & Inhalation from Tapwater	Volatilization to Outdoor Air	Vapor Intrusion into Buildings	GW in Excavation	N1		N1		FD1		N1		N1		N1		N		N		N		N		N		N		N	
Analyte	**Units**	**Occupational**	**Occupational**	**Occupational**	**Construction & Excavation Worker**	*EF*												*EF*													
Field Parameters																															
Temperature	(°C)	--	--	--	--													14.4		13.2		15.3		14.2		15.9		15.2		15.9	
pH		--	--	--	--													6.69		6.80		6.95		6.60		6.83		6.60		6.42	
Conductivity	(µS/cm)	--	--	--	--													353		130		312		250		360		242		352	
Dissolved Oxygen	mg/L	--	--	--	--																									0.26	
Oxidation Reduction Potential	mV	--	--	--	--													-100		-93		-134		-34		-128		-31		6	
Turbidity	NTU	--	--	--	--													11.4		8.81		10.3		0.52		2.8		3.0		6.8	
Conventional Parameters																															
Alkalinity, Total as CaCO3	mg/L	--	--	--	--																										
Chloride	mg/L	--	--	--	--																									2.46	
Nitrate ion	mg/L	--	--	--	--																										
Nitrate-N	mg/L	--	--	--	--																									0.37	J
Sulfate	mg/L	--	--	--	--																									10.1	
Total Organic Carbon	mg/L	--	--	--	--																									1.00	
Total Suspended Solids (TSS)	mg/L	--	--	--	--													11.3				18.7				27					
Metals, Total																															
Arsenic	mg/L	0.00031	--	--	--													0.00531		0.0033		0.00154	<10	0.00179	<10	0.00312	10	0.00631	20		
Cadmium	mg/L	0.16	--	--	--													0.000076	J	0.00003	U	0.000044	J	0.00003	U	0.000042	J	0.00003	U		
Chromium	mg/L	250	--	--	--													0.00073	U	0.00073	U	0.00073	U	0.00073	U	0.00073	U	0.00073	U		
Copper	mg/L	6.5	--	--	--													0.0033	J	0.00249	J	0.00158	U	0.00158	U	0.00158	U	0.00158	U		
Iron	mg/L	--	--	--	--																										
Lead	mg/L	0.015	--	--	>S													0.00341	J	0.00146	U	0.00146	U	0.00146	U	0.00146	U	0.00146	U		
Manganese	mg/L	3.9	--	--	3,200													2.2		0.919		1.2		0.713		2.11		1.9			
Mercury	mg/L	0.049	--	--	>S													0.000031	J	0.000015	U	0.000029	J	0.000015	U	0.000045	J	0.000015	U		
Nickel	mg/L	3.3	--	--	>S													0.00948	J	0.0038	U	0.0038	U	0.0038	U	0.0038	U	0.0038	U		
Zinc	mg/L	--	--	--	--													0.00704	J	0.00178	U	0.00317	J	0.00297	J	0.00264	J	0.00225	J		
Metals, Dissolved																															
Arsenic	mg/L	0.00031	--	--	--													0.00533		0.00312		0.00144	<10	0.00154		0.00309	<10	0.00704			
Cadmium	mg/L	0.16	--	--	--													0.000073	J	0.00003	U	0.000059	J	0.00003	U	0.000062	J	0.00003	U		
Chromium	mg/L	250	--	--	--													0.00075	J	0.00073	U	0.00073	U	0.00073	U	0.00073	U	0.00073	U		
Copper	mg/L	6.5	--	--	--													0.00158	U	0.00158	U	0.00158	U	0.00158	U	0.00158	U	0.00158	U		
Iron	mg/L	--	--	--	--																									1.59	
Ferrous Iron[1]	mg/L	--	--	--	--																										
Lead	mg/L	0.015	--	--	>S													0.00419	J	0.00161	J	0.00248	J	0.00188	J	0.00302	J	0.00146	U		
Manganese	mg/L	3.9	--	--	3200													2.2		0.879		1.26		0.828		2.13		1.96			
Mercury	mg/L	0.049	--	--	>S													0.000028	U	0.000015	U	0.000098	J	0.000015	U	0.000061	J	0.000015	U		
Nickel	mg/L	3.3	--	--	>S													0.0101	J	0.004	U	0.0038	U	0.004	U	0.0038	U	0.0038	U		
Zinc	mg/L	--	--	--	--	0.0050	U	0.0061		0.0053		0.0053		0.0058		0.0058		0.00581	J	0.00178	U	0.00363	J	0.00273	J	0.00396	J	0.00178	U		
Polynuclear Aromatic Hydrocabons																															
1-Methylnaphthalene	µg/L	--	--	--	--													39.2		89.9		14		17		0.051	J	0.035	J		
2-Methylnaphthalene	µg/L	--	--	--	--													22.5		4.68	U	0.25	U	1.03	J	0.027	U	0.012	U		
Acenaphthene	µg/L	2,500	>S	>S	>S													701		2,000		200		231		6.65		2.91			
Acenaphthylene	µg/L	--	--	--	--													19.4		53.4		3.06		6.44		0.084	J	0.086			
Anthracene	µg/L	>S	>S	>S	>S													45.2		188		2.57		1.93		0.19		0.26			
Benzo(a)anthracene	µg/L	0.38	>S	>S	>S													8.96	J	197		0.2	U	0.37	U	0.021	U	0.012	J		
Benzo(a)pyrene	µg/L	0.47	--	--	>S													2.83	U	100		0.27	U	0.49	U	0.028	U	0.012	U		
Benzo(b)fluoroanthene	µg/L	>S	--	--	>S													3.34	U	48		0.31	U	0.58	U	0.033	U	0.014	U		
Benzo(g,h,i)perylene	µg/L	--	--	--	--													2.61	U	6.6	J	0.24	U	0.45	U	0.028	J	0.011	U		
Benzo(k)fluoranthene	µg/L	>S	--	--	>S													3.78	U	71.9		0.36	U	0.65	U	0.037	U	0.016	U		
Chrysene	µg/L	>S	--	--	>S													5.39	J	159		0.25	U	0.46	U	0.026	U	0.011	U		
Dibenzo(a,h)anthracene	µg/L	0.47	--	--	>S													3.74	U	87.1		0.35	U	0.65	U	0.037	U	0.016	U		
Fluoranthene	µg/L	>S	--	--	>S													97.5		2,010		1.31		0.62	U	0.17		0.024	J		
Fluorene	µg/L	1,300	>S	>S	>S													171		701		37.9		35.7		0.16		0.025	J		
Indeno(1,2,3-c,d)pyrene	µg/L	>S	--	--	>S													2.12	U	83.7		0.2	U	0.37	U	0.021	U	0.0092	U		
Naphthalene	µg/L	0.72	16,000	11,000	500													61.9		27.3		0.42	U	0.78	U	0.047	J	0.029	J		
Phenanthrene	µg/L	--	--	--	--													259		2,650	B	17.6		21.5	B	0.48		0.16	B		
Pyrene	µg/L	>S	>S	>S	>S													73.6		1,670		0.79	J	0.72	U	0.18		0.11			
Total PAH[2]	µg/L	--	--	--	--													1,505		10,143		277		314.6		8.04		3.651			
Polychlorinated Biphenyls																															
Aroclor-1260	µg/L	0.028	>S	>S	30													0.0062	U			0.0062	U			0.006	U				
Aroclor-1254	µg/L	0.028	>S	>S	30													0.0075	U			0.0075	U			0.0073	U				
Aroclor-1221	µg/L	0.028	>S	>S	30													0.017	U			0.017	U			0.017	U				
Aroclor-1232	µg/L	0.028	>S	>S	30													0.017	U			0.017	U			0.016	U				
Aroclor-1248	µg/L	0.028	>S	>S	30													0.0083	U			0.0083	U			0.008	U				
Aroclor-1016	µg/L	0.028	>S	>S	30													0.015	U			0.015	U			0.015	U				
Aroclor-1242	µg/L	0.028	>S	>S	30													0.02	U			0.02	U			0.019	U				
Total PCBs[2]	µg/L	0.028	>S	>S	30																										
Total Petroleum Hydrocarbons																															
Gasoline (TPH-Gx)	mg/L	0.45	>S	>S	>S	0.10	U	0.10	U	0.10	U	0.96	*<10*	0.10	U	0.10	U														
Diesel (TPH-Dx)	mg/L	0.43	>S	>S	14	0.0933		0.0209	UJ	0.0185	UJ	2.81	*<10*	0.0782	U	0.0768	U	8.32		3.06		0.99	<10	1.2	<10	0.78	<10	0.48	<10		
Motor Oil (TPH-Oil)	mg/L	1.3	>S	>S	>S													1.21		15.3		0.22	J	0.41	J	0.55		0.54			
VOCs																															
1,1,1,2-Tetrachloroethane	µg/L	--	--	--	--	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U														
1,1,1-Trichloroethane	µg/L	37,000	--	--	1,100,000	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U														

Table 3
Analytical Groundwater Sampling Results
Northwest Pipe Company, Portland, Oregon

Location ID		DEQ Risk-Based Concentrations (May 2018 Update)				GP-210		GP-211	GP-211	GP-212	GP-213	GP-214	MW-7	MW-7	MW-8	MW-8	MW-9	MW-9	MW-01
Sample ID						GP210-W-0		GP211-W-0	GP211-W-1	GP212-W-0	GP213-W-0	GP214-W-0	MW-7-61512	MW-7-53113	MW-8-61512	MW-8-53113	MW-9-61512	MW-9-53113	MW-01-102616
Sample Date						09/27/07		09/27/07	09/27/07	09/27/07	09/27/07	09/27/07	06/15/12	05/31/13	06/15/12	05/31/13	06/15/12	05/31/13	10/26/16
Sample Type		Ingestion & Inhalation from Tapwater	Volatilization to Outdoor Air	Vapor Intrusion into Buildings	GW in Excavation	N1		N1	FD1	N1	N1	N1	N	N	N	N	N	N	N
Analyte	**Units**	**Occupational**	**Occupational**	**Occupational**	**Construction & Excavation Worker**	*EF*							*EF*	*EF*	*EF*	*EF*	*EF*	*EF*	*EF*
VOCs																			
1,1,2,2-Tetrachloroethane	µg/L	--	--	--	--	1.0 U		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U							
1,1,2-Trichloroethane	µg/L	1.3	21,000	11,000	49	1.0 U		1.0 U	1.0 U	0.15 J	1.0 U	1.0 U							
1,1-Dichloroethane	µg/L	13	68,000	14,000	10,000	0.63 J		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U							
1,1-Dichloroethene	µg/L	1,400	2,400,000	360,000	44,000	1.0 U		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U							
1,1-Dichloropropene	µg/L	--	--	--	--	1.0 U		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U							
1,2,3-Trichlorobenzene	µg/L	--	--	--	--	1.0 U		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U							
1,2,3-Trichloropropane	µg/L	--	--	--	--	1.0 U		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U							
1,2,4-Trichlorobenzene	µg/L	--	--	--	--	1.0 U		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U							
1,2,4-Trimethylbenzene	µg/L	250	>S	>S	6,300	1.0 U		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U							
1,2-Dibromo-3-Chloropropane	µg/L	--	--	--	--	1.0 U		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U							
1,2-Dibromoethane	µg/L	--	--	--	--	1.0 U		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U							
1,2-Dichlorobenzene	µg/L	1,400	>S	>S	37,000	1.0 U		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U							
1,2-Dichloroethane	µg/L	--	--	--	--	1.0 U		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U							
1,2-Dichloroethene	µg/L	--	--	--	--														
1,2-Dichloropropane	µg/L	--	--	--	--	1.0 U		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U							
1,3,5-Trimethylbenzene	µg/L	280	>S	>S	7,500	1.0 U		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U							
1,3-Dichlorobenzene	µg/L	--	--	--	--	1.0 U		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U							
1,3-Dichloropropane	µg/L	--	--	--	--	1.0 U		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U							
1,4-Dichlorobenzene	µg/L	2.1	21,000	7,100	1,500	1.0 U		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U							
2,2-Dichloropropane	µg/L	--	--	--	--	1.0 U		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U							
2-Butanone	µg/L	--	--	--	--	1.0 U		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U							
2-Chloroethyl Vinyl Ether	µg/L	--	--	--	--														
2-Chlorotoluene	µg/L	--	--	--	--	1.0 U		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U							
2-Hexanone	µg/L	--	--	--	--														
4-Chlorotoluene	µg/L	--	--	--	--	1.0 U		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U							
4-Methyl-2-Pentanone	µg/L	--	--	--	--	1.0 U		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U							
Acetone	µg/L	--	--	--	--	1.0 U		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U							
Benzene	µg/L	2.1	14,000	2,800	1,800	1.0 U		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U							
Bromobenzene	µg/L	--	--	--	--	1.0 U		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U							
Bromochloromethane	µg/L	--	--	--	--	1.0 U		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U							
Bromodichloromethane	µg/L	0.6	6,000	2,300	450	1.0 U		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U							
Bromoform	µg/L	16	550,000	470,000	14,000	1.0 U		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U							
Bromomethane	µg/L	36	130,000	27,000	1,200	1.0 U		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U							
Carbon Dioxide	µg/L	--	--	--	--														81,000
Carbon Disulfide	µg/L	--	--	--	--														
Carbon Tetrachloride	µg/L	2.1	7,700	1,200	1,800	1.0 U		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U							
Chlorobenzene	µg/L	350	>S	>S	10,000	1.0 U		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U							
Chlorodibromomethane	µg/L	0.77	17,000	13,000	610	1.0 U		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U							
Chloroethane	µg/L	88,000	>S	>S	2,400,000	1.0 U		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U							
Chloroform	µg/L	0.98	6,300	1,600	720	1.0 U		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U							
Chlorohexane	µg/L	--	--	--	--	1.0 U		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U							
Chloromethane	µg/L	790	1,800,000	330,000	22,000	0.47 J		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U							
Cis-1,2-Dichloroethene	µg/L	260	>S	>S	18,000	0.62 J		1.0 U	1.0 U	6.6	4.8	0.41 J							113
Cis-1,3-Dichloropropene	µg/L	--	--	--	--	1.0 U		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U							
Dibromomethane	µg/L	--	--	--	--	1.0 U		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U							
Dichlorodifluoromethane	µg/L	--	--	--	--	1.0 U		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U							
Ethylbenzene	µg/L	6.4	43,000	8,200	4,500	1.0 U		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U							
Hexachlorobutadiene	µg/L	--	--	--	--	1.0 U		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U							
Isopropylbenzene	µg/L	--	--	--	--	1.0 U		1.0 U	1.0 U	5.8	1.0 U	1.0 U							
m+p-Xylenes	µg/L	--	--	--	--	1.0 U		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U							
Methane	µg/L	--	--	--	--														1,250
Methylene Chloride	µg/L	200	13,000,000	3,300,000	79,000	1.0 U		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U							
Methyl-tert-butyl Ether	µg/L	68	1,500,000	870,000	63,000	1.0 U		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U							
Naphthalene	µg/L	0.72	16,000	11,000	500	1.0 U		1.0 U	1.0 U	0.81 J	1.0 U	1.0 U							
n-Butylbenzene	µg/L	--	--	--	--	1.0 U		1.0 U	1.0 U	7.9	1.0 U	1.0 U							
n-Propylbenzene	µg/L	--	--	--	--	1.0 U		1.0 U	1.0 U	13.1	1.0 U	1.0 U							
o-Xylene	µg/L	--	--	--	--	1.0 U		1.0 U	1.0 U	0.15 J	1.0 U	1.0 U							
p-Isopropyltoluene	µg/L	--	--	--	--	1.0 U		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U							
Sec-Butylbenzene	µg/L	--	--	--	--	1.0 U		1.0 U	1.0 U	10.2	1.0 U	1.0 U							
Styrene	µg/L	5,700	>S	>S	170,000	1.0 U		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U							
Tert-Butylbenzene	µg/L	--	--	--	--	1.0 U		1.0 U	1.0 U	0.85 J	1.0 U	1.0 U							
Tetrachloroethene	µg/L	48	>S	48,000	5,600	0.11 J		1.0 U	1.0 U	0.34 J	1.4	0.60 J							158 *<10*
Toluene	µg/L	6,300	>S	>S	220,000	1.0 U		1.0 U	1.0 U	0.14 J	1.0 U	1.0 U							
Trans-1,2-Dichloroethene	µg/L	--	--	--	--	1.0 U		1.0 U	1.0 U	0.36 J	1.0 U	1.0 U							
Trans-1,3-Dichloropropene	µg/L	--	--	--	--	1.0 U		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U							
Trichloroethene	µg/L	3.3	20,000	3,700	430	0.14 J		1.0 U	1.0 U	1.0 U	0.94 J	0.72 J							22.8 *<10*
Trichlorofluoromethane	µg/L	5,200	>S	460,000	160,000	1.0 U		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U							
Vinyl Chloride	µg/L	0.49	5,900	880	960	0.67 J	*<10*	1.0 U	1.0 U	3.4 *<10*	1.0 U	1.0 U							16.7 *34*
Xylenes, Total	µg/L	830	>S	>S	23,000														

Notes:

D = Dilution
J = Estimated value.
U = The analyte was analyzed for, but not detected.
-- = Not Established

EF = Exceedance factor (calculated if consistuent exceeded indicated screening level)
Shaded = detected result exceeded indicated DEQ RBCs
Sample Type: N = Normal Sample, FD - Field Duplicate

°C = degrees Celsius
mg/L = milligrams per Liter
mV = millivolts
µg/L = micrograms per Liter

µS/cm = microsiemens per centimeter
NTU = Nephelometric Turbidity Units
Screening levels from DEQ Risk-Based Concentrations (May 2018 Update)

Table 3
Analytical Groundwater Sampling Results
Northwest Pipe Company, Portland, Oregon

Location ID		DEQ Risk-Based Concentrations (May 2018 Update)				MW-01		MW-01		MW-01		MW-01		MW-01		MW-01		MW-02		MW-02		MW-02		MW-02		MW-02	
Sample ID						MW-01-020217		MW-01-050117		MW-01-072617		MW-01-120618		MW-01-050919		MW-01-100919		MW-02-102616		MW-02-020117		MW-02-042717		MW-02-072517		MW-02-120518		MW-02-050819	
Sample Date						02/02/17		05/01/17		07/26/17		12/06/18		05/09/19		10/09/19		10/26/16		02/01/17		04/27/17		07/25/17		12/05/18		05/08/19	
Sample Type						N		N		N		N		N		N		N		N		N		N		N	
Analyte	**Units**	**Ingestion & Inhalation from Tapwater** Occupational	**Volatilization to Outdoor Air** Occupational	**Vapor Intrusion into Buildings** Occupational	**GW in Excavation** Construction & Excavation Worker		*EF*		*EF*		*EF*		*EF*		*EF*		*EF*								*EF*		*EF*
Field Parameters																											
Temperature	(°C)	--	--	--	--	16.0		15.5		17.2		15.0		16.4		11.7		16.8		15.4		15.0		20.1		15.8		17.1	
pH		--	--	--	--	6.64		6.56		6.46		6.61		6.48		6.46		6.90		6.97		7.11		6.74		7.10		7.03	
Conductivity	(µS/cm)	--	--	--	--	385		423		513		460		889		458		197		202		240		244		265		501	
Dissolved Oxygen	mg/L	--	--	--	--	0.01		0.12		0.08		0.47		0.92		0.32		0.24		0.09		0.20		0.07		0.36		0.52	
Oxidation Reduction Potential	mV	--	--	--	--	-36		36		66		-32		93		-16		-138		-136		-142		-141		-167		-136	
Turbidity	NTU	--	--	--	--	3.1		3.0		1.0		1.0		1.7		1.9		0.7		8.2		8.1		1.0		1.6		4.6	
Conventional Parameters																											
Alkalinity, Total as CaCO3	mg/L	--	--	--	--																						
Chloride	mg/L	--	--	--	--	3.69		4		5.29		2.50		2.7		2.5		1.98		2.50		2.47		3.14		2.9		2.9	U
Nitrate ion	mg/L	--	--	--	--																						
Nitrate-N	mg/L	--	--	--	--	0.061		0.029		4.22		0.20		0.5	U	0.6		0.023	J	0.39		0.31		0.27		0.02	U	0.044	J
Sulfate	mg/L	--	--	--	--	4.71		3.57		29.3		8.50		12		11		4.15		8.09		5.37		5.88		2.5		0.92	J
Total Organic Carbon	mg/L	--	--	--	--	0.84		1.34		1.28		1.20		12		1.3		1.48		1.23		1.6		1.52		1.6		1.3	
Total Suspended Solids (TSS)	mg/L	--	--	--	--																						
Metals, Total																											
Arsenic	mg/L	0.00031	--	--	--																						
Cadmium	mg/L	0.16	--	--	--																						
Chromium	mg/L	250	--	--	--																						
Copper	mg/L	6.5	--	--	--																						
Iron	mg/L	--	--	--	--																						
Lead	mg/L	0.015	--	--	>S																						
Manganese	mg/L	3.9	--	--	3,200																						
Mercury	mg/L	0.049	--	--	>S																						
Nickel	mg/L	3.3	--	--	>S																						
Zinc	mg/L	--	--	--	--																						
Metals, Dissolved																											
Arsenic	mg/L	0.00031	--	--	--																						
Cadmium	mg/L	0.16	--	--	--																						
Chromium	mg/L	250	--	--	--																						
Copper	mg/L	6.5	--	--	--																						
Iron	mg/L	--	--	--	--	3.01		1.53		0.01								5.45		5.39		1.34		5.91					
Ferrous Iron[1]	mg/L	--	--	--	--							4.72		0.08		2.69										4.94		3.64	
Lead	mg/L	0.015	--	--	>S																						
Manganese	mg/L	3.9	--	--	3200																						
Mercury	mg/L	0.049	--	--	>S																						
Nickel	mg/L	3.3	--	--	>S																						
Zinc	mg/L	--	--	--	--																						
Polynuclear Aromatic Hydrocabons																											
1-Methylnaphthalene	µg/L	--	--	--	--																						
2-Methylnaphthalene	µg/L	--	--	--	--																						
Acenaphthene	µg/L	2,500	>S	>S	>S																						
Acenaphthylene	µg/L	--	--	--	--																						
Anthracene	µg/L	>S	>S	>S	>S																						
Benzo(a)anthracene	µg/L	0.38	>S	>S	>S																						
Benzo(a)pyrene	µg/L	0.47	--	--	>S																						
Benzo(b)fluoroanthene	µg/L	>S	--	--	>S																						
Benzo(g,h,i)perylene	µg/L	--	--	--	--																						
Benzo(k)fluoranthene	µg/L	>S	--	--	>S																						
Chrysene	µg/L	>S	--	--	>S																						
Dibenzo(a,h)anthracene	µg/L	0.47	--	--	>S																						
Fluoranthene	µg/L	>S	--	--	>S																						
Fluorene	µg/L	1,300	>S	>S	>S																						
Indeno(1,2,3-c,d)pyrene	µg/L	>S	--	--	>S																						
Naphthalene	µg/L	0.72	16,000	11,000	500																						
Phenanthrene	µg/L	--	--	--	--																						
Pyrene	µg/L	>S	>S	>S	>S																						
Total PAH[2]	µg/L	--	--	--	--																						
Polychlorinated Biphenyls																											
Aroclor-1260	µg/L	0.028	>S	>S	30																						
Aroclor-1254	µg/L	0.028	>S	>S	30																						
Aroclor-1221	µg/L	0.028	>S	>S	30																						
Aroclor-1232	µg/L	0.028	>S	>S	30																						
Aroclor-1248	µg/L	0.028	>S	>S	30																						
Aroclor-1016	µg/L	0.028	>S	>S	30																						
Aroclor-1242	µg/L	0.028	>S	>S	30																						
Total PCBs[2]	µg/L	0.028	>S	>S	30																						
Total Petroleum Hydrocarbons																											
Gasoline (TPH-Gx)	mg/L	0.45	>S	>S	>S																						
Diesel (TPH-Dx)	mg/L	0.43	>S	>S	14																						
Motor Oil (TPH-Oil)	mg/L	1.3	>S	>S	>S																						
VOCs																											
1,1,1,2-Tetrachloroethane	µg/L	--	--	--	--																						
1,1,1-Trichloroethane	µg/L	37,000	--	--	1,100,000																						

Table 3
Analytical Groundwater Sampling Results
Northwest Pipe Company, Portland, Oregon

Location ID		DEQ Risk-Based Concentrations (May 2018 Update)				MW-01		MW-01		MW-01		MW-01		MW-01		MW-01		MW-02		MW-02		MW-02		MW-02		MW-02	
Sample ID						MW-01-020217		MW-01-050117		MW-01-072617		MW-01-120618		MW-01-050919		MW-01-100919		MW-02-102616		MW-02-020117		MW-02-042717		MW-02-072517		MW-02-120518		MW-02-050819	
Sample Date						02/02/17		05/01/17		07/26/17		12/06/18		05/09/19		10/09/19		10/26/16		02/01/17		04/27/17		07/25/17		12/05/18		05/08/19	
Sample Type						N		N		N		N		N		N		N		N		N		N		N	
		Ingestion & Inhalation from Tapwater	Volatilization to Outdoor Air	Vapor Intrusion into Buildings	GW in Excavation																						
Analyte	**Units**	**Occupational**	**Occupational**	**Occupational**	**Construction & Excavation Worker**		*EF*		*EF*		*EF*		*EF*		*EF*		*EF*										*EF*
VOCs																											
1,1,2,2-Tetrachloroethane	µg/L	--	--	--	--																						
1,1,2-Trichloroethane	µg/L	1.3	21,000	11,000	49																						
1,1-Dichloroethane	µg/L	13	68,000	14,000	10,000																						
1,1-Dichloroethene	µg/L	1,400	2,400,000	360,000	44,000																						
1,1-Dichloropropene	µg/L	--	--	--	--																						
1,2,3-Trichlorobenzene	µg/L	--	--	--	--																						
1,2,3-Trichloropropane	µg/L	--	--	--	--																						
1,2,4-Trichlorobenzene	µg/L	--	--	--	--																						
1,2,4-Trimethylbenzene	µg/L	250	>S	>S	6,300																						
1,2-Dibromo-3-Chloropropane	µg/L	--	--	--	--																						
1,2-Dibromoethane	µg/L	--	--	--	--																						
1,2-Dichlorobenzene	µg/L	1,400	>S	>S	37,000																						
1,2-Dichloroethane	µg/L	--	--	--	--																						
1,2-Dichloroethene	µg/L	--	--	--	--																						
1,2-Dichloropropane	µg/L	--	--	--	--																						
1,3,5-Trimethylbenzene	µg/L	280	>S	>S	7,500																						
1,3-Dichlorobenzene	µg/L	--	--	--	--																						
1,3-Dichloropropane	µg/L	--	--	--	--																						
1,4-Dichlorobenzene	µg/L	2.1	21,000	7,100	1,500																						
2,2-Dichloropropane	µg/L	--	--	--	--																						
2-Butanone	µg/L	--	--	--	--																						
2-Chloroethyl Vinyl Ether	µg/L	--	--	--	--																						
2-Chlorotoluene	µg/L	--	--	--	--																						
2-Hexanone	µg/L	--	--	--	--																						
4-Chlorotoluene	µg/L	--	--	--	--																						
4-Methyl-2-Pentanone	µg/L	--	--	--	--																						
Acetone	µg/L	--	--	--	--																						
Benzene	µg/L	2.1	14,000	2,800	1,800																						
Bromobenzene	µg/L	--	--	--	--																						
Bromochloromethane	µg/L	--	--	--	--																						
Bromodichloromethane	µg/L	0.6	6,000	2,300	450																						
Bromoform	µg/L	16	550,000	470,000	14,000																						
Bromomethane	µg/L	36	130,000	27,000	1,200																						
Carbon Dioxide	µg/L	--	--	--	--	68,200		82,600		10,300		50,000		95,000		80,000		29,600		17,600		15,600		19,300		34,000		40,000	
Carbon Disulfide	µg/L	--	--	--	--																						
Carbon Tetrachloride	µg/L	2.1	7,700	1,200	1,800																						
Chlorobenzene	µg/L	350	>S	>S	10,000																						
Chlorodibromomethane	µg/L	0.77	17,000	13,000	610																						
Chloroethane	µg/L	88,000	>S	>S	2,400,000																						
Chloroform	µg/L	0.98	6,300	1,600	720																						
Chlorohexane	µg/L	--	--	--	--																						
Chloromethane	µg/L	790	1,800,000	330,000	22,000																						
Cis-1,2-Dichloroethene	µg/L	260	>S	>S	18,000	107		220		174		160		100		140		0.15	U	0.20	J	0.21	J	0.41	J	1.4		0.36	
Cis-1,3-Dichloropropene	µg/L	--	--	--	--																						
Dibromomethane	µg/L	--	--	--	--																						
Dichlorodifluoromethane	µg/L	--	--	--	--																						
Ethylbenzene	µg/L	6.4	43,000	8,200	4,500																						
Hexachlorobutadiene	µg/L	--	--	--	--																						
Isopropylbenzene	µg/L	--	--	--	--																						
m+p-Xylenes	µg/L	--	--	--	--																						
Methane	µg/L	--	--	--	--	1,740		3,120		177		620		310		990		3,680		3,300		3,420		5,330		7,300		7,200	
Methylene Chloride	µg/L	200	13,000,000	3,300,000	79,000																						
Methyl-tert-butyl Ether	µg/L	68	1,500,000	870,000	63,000																						
Naphthalene	µg/L	0.72	16,000	11,000	500																						
n-Butylbenzene	µg/L	--	--	--	--																						
n-Propylbenzene	µg/L	--	--	--	--																						
o-Xylene	µg/L	--	--	--	--																						
p-Isopropyltoluene	µg/L	--	--	--	--																						
Sec-Butylbenzene	µg/L	--	--	--	--																						
Styrene	µg/L	5,700	>S	>S	170,000																						
Tert-Butylbenzene	µg/L	--	--	--	--																						
Tetrachloroethene	µg/L	48	>S	48,000	5,600	71.1	*<10*	61.7	*<10*	197	*<10*	98	*<10*	220	*<10*	150	*<10*	0.0598		0.169		0.224		0.451		0.1	U	0.1	U	
Toluene	µg/L	6,300	>S	>S	220,000																						
Trans-1,2-Dichloroethene	µg/L	--	--	--	--																						
Trans-1,3-Dichloropropene	µg/L	--	--	--	--																						
Trichloroethene	µg/L	3.3	20,000	3,700	430	14.9	*<10*	13	*<10*	26.7	*<10*	13	*<10*	28	*<10*	18	*<10*	0.15	U	0.15	U	0.15	U	0.15	U	0.1	U	0.1	U	
Trichlorofluoromethane	µg/L	5,200	>S	460,000	160,000																						
Vinyl Chloride	µg/L	0.49	5,900	880	960	29.9	*61*	51.6	*105*	8.51	*17*	19	*39*	4	*<10*	17	*35*	0.0652		0.0370		0.0115	J	0.0190	J	2.6	*<10*	1.2	*<10*
Xylenes, Total	µg/L	830	>S	>S	23,000																						

Notes:
D = Dilution
J = Estimated value.
U = The analyte was analyzed for, but not detected.
-- = Not Established

EF = Exceedance factor (calculated if consistuent exceeded indicated screening level)
Shaded = detected result exceeded indicated DEQ RBCs
Sample Type: N = Normal Sample, FD - Field Duplicate

°C = degrees Celsius
mg/L = milligrams per Liter
mV = millivolts
µg/L = micrograms per Liter

µS/cm = microsiemens per centimeter
NTU = Nephelometric Turbidity Units
Screening levels from DEQ Risk-Based Concentrations (May 2018 Update)

Table 3
Analytical Groundwater Sampling Results
Northwest Pipe Company, Portland, Oregon

Location ID		DEQ Risk-Based Concentrations (May 2018 Update)				MW-02			MW-03			MW-03			MW-03			MW-03			MW-03			MW-03			MW-04			MW-04			MW-04		
Sample ID						MW-02-100819			MW-03-102616			MW-03-020217			MW-03-050117			MW-03-072717			MW-03-120718			MW-03-050919			MW-03-100919			MW-04-102616			MW-04-020117			MW-04-042717		
Sample Date						10/08/19			10/26/16			02/02/17			05/01/17			07/27/17			12/07/18			05/09/19			10/09/19			10/26/16			02/01/17			04/27/17		
Sample Type		Ingestion & Inhalation from Tapwater	Volatilization to Outdoor Air	Vapor Intrusion into Buildings	GW in Excavation	N			N			N			N			N			N			N			N			N			N			N		
Analyte	**Units**	**Occupational**	**Occupational**	**Occupational**	**Construction & Excavation Worker**		*EF*			*EF*			*EF*			*EF*			*EF*			*EF*			*EF*			*EF*			*EF*			*EF*		
Field Parameters																																				
Temperature	(°C)	--	--	--	--	13.7			16.4			15.9			15.5			17.0			14.6			15.8			12.2			14.8			14.3			13.0		
pH		--	--	--	--	6.87			6.61			6.76			6.56			6.55			6.74			6.67			6.49			6.34			6.39			6.60		
Conductivity	(µS/cm)	--	--	--	--	246			281			321			334			360			372			691			342			323			440			337		
Dissolved Oxygen	mg/L	--	--	--	--	0.26			0.32			0.26			0.07			0.08			1.02			0.44			0.80			0.28			0.32			0.22		
Oxidation Reduction Potential	mV	--	--	--	--	-106			-88			-68			-43			-69			-43			-37			-33			-59			-45			-59		
Turbidity	NTU	--	--	--	--	0.9			2.6			3.2			3.5			2.6			5.8			6.3			4.6			4.1			1.3			5.0		
Conventional Parameters																																				
Alkalinity, Total as CaCO3	mg/L	--	--	--	--																															
Chloride	mg/L	--	--	--	--	2.9	J		3.61			3.92			5.47			5.19			3.8			4.3			4.2			3.0			4.9			4.52		
Nitrate ion	mg/L	--	--	--	--																															
Nitrate-N	mg/L	--	--	--	--	0.02	U		0.018	J		0.018			0.0028	U		0.011			0.02	U		0.2	U		0.031	J		0.043	J		0.0028	U		0.011		
Sulfate	mg/L	--	--	--	--	1.5	J		10.2			10.4			12.1			9.48			10			9.4			10			5.7			4.42			2.35		
Total Organic Carbon	mg/L	--	--	--	--	1.4			1.27			0.93			1.27			1.33			1.5			1.3			1.6			1.21			1.09			1.40		
Total Suspended Solids (TSS)	mg/L	--	--	--	--																															
Metals, Total																																				
Arsenic	mg/L	0.00031	--	--	--																															
Cadmium	mg/L	0.16	--	--	--																															
Chromium	mg/L	250	--	--	--																															
Copper	mg/L	6.5	--	--	--																															
Iron	mg/L	--	--	--	--																															
Lead	mg/L	0.015	--	--	>S																															
Manganese	mg/L	3.9	--	--	3,200																															
Mercury	mg/L	0.049	--	--	>S																															
Nickel	mg/L	3.3	--	--	>S																															
Zinc	mg/L	--	--	--	--																															
Metals, Dissolved																																				
Arsenic	mg/L	0.00031	--	--	--																															
Cadmium	mg/L	0.16	--	--	--																															
Chromium	mg/L	250	--	--	--																															
Copper	mg/L	6.5	--	--	--																															
Iron	mg/L	--	--	--	--				6.14			4.46			3.32			6.31												12.9			9.75			9.83		
Ferrous Iron[1]	mg/L	--	--	--	--	2.52															2.96			2.72			3.12										
Lead	mg/L	0.015	--	--	>S																															
Manganese	mg/L	3.9	--	--	3200																															
Mercury	mg/L	0.049	--	--	>S																															
Nickel	mg/L	3.3	--	--	>S																															
Zinc	mg/L	--	--	--	--																															
Polynuclear Aromatic Hydrocabons																																				
1-Methylnaphthalene	µg/L	--	--	--	--																															
2-Methylnaphthalene	µg/L	--	--	--	--																															
Acenaphthene	µg/L	2,500	>S	>S	>S																															
Acenaphthylene	µg/L	--	--	--	--																															
Anthracene	µg/L	>S	>S	>S	>S																															
Benzo(a)anthracene	µg/L	0.38	>S	>S	>S																															
Benzo(a)pyrene	µg/L	0.47	--	--	>S																															
Benzo(b)fluoroanthene	µg/L	>S	--	--	>S																															
Benzo(g,h,i)perylene	µg/L	--	--	--	--																															
Benzo(k)fluoranthene	µg/L	>S	--	--	>S																															
Chrysene	µg/L	>S	--	--	>S																															
Dibenzo(a,h)anthracene	µg/L	0.47	--	--	>S																															
Fluoranthene	µg/L	>S	--	--	>S																															
Fluorene	µg/L	1,300	>S	>S	>S																															
Indeno(1,2,3-c,d)pyrene	µg/L	>S	--	--	>S																															
Naphthalene	µg/L	0.72	16,000	11,000	500																															
Phenanthrene	µg/L	--	--	--	--																															
Pyrene	µg/L	>S	>S	>S	>S																															
Total PAH[2]	µg/L	--	--	--	--																															
Polychlorinated Biphenyls																																				
Aroclor-1260	µg/L	0.028	>S	>S	30																															
Aroclor-1254	µg/L	0.028	>S	>S	30																															
Aroclor-1221	µg/L	0.028	>S	>S	30																															
Aroclor-1232	µg/L	0.028	>S	>S	30																															
Aroclor-1248	µg/L	0.028	>S	>S	30																															
Aroclor-1016	µg/L	0.028	>S	>S	30																															
Aroclor-1242	µg/L	0.028	>S	>S	30																															
Total PCBs[2]	µg/L	0.028	>S	>S	30																															
Total Petroleum Hydrocarbons																																				
Gasoline (TPH-Gx)	mg/L	0.45	>S	>S	>S																															
Diesel (TPH-Dx)	mg/L	0.43	>S	>S	14																															
Motor Oil (TPH-Oil)	mg/L	1.3	>S	>S	>S																															
VOCs																																				
1,1,1,2-Tetrachloroethane	µg/L	--	--	--	--																															
1,1,1-Trichloroethane	µg/L	37,000	--	--	1,100,000																															

Table 3
Analytical Groundwater Sampling Results
Northwest Pipe Company, Portland, Oregon

Location ID		DEQ Risk-Based Concentrations (May 2018 Update)				MW-02			MW-03			MW-03			MW-03			MW-03			MW-03			MW-03			MW-04			MW-04			MW-04		
Sample ID						MW-02-100819			MW-03-102616			MW-03-020217			MW-03-050117			MW-03-072717			MW-03-120718			MW-03-050919			MW-03-100919			MW-04-102616			MW-04-020117			MW-04-042717		
Sample Date						10/08/19			10/26/16			02/02/17			05/01/17			07/27/17			12/07/18			05/09/19			10/09/19			10/26/16			02/01/17			04/27/17		
Sample Type						N			N			N			N			N			N			N			N			N			N			N		
Analyte	**Units**	**Ingestion & Inhalation from Tapwater**	**Volatilization to Outdoor Air**	**Vapor Intrusion into Buildings**	**GW in Excavation**			***EF***			***EF***			***EF***			***EF***			***EF***			***EF***			***EF***			***EF***			***EF***			***EF***		
		Occupational	**Occupational**	**Occupational**	**Construction & Excavation Worker**																																	
VOCs																																				
1,1,2,2-Tetrachloroethane	µg/L	--	--	--	--																															
1,1,2-Trichloroethane	µg/L	1.3	21,000	11,000	49																															
1,1-Dichloroethane	µg/L	13	68,000	14,000	10,000																															
1,1-Dichloroethene	µg/L	1,400	2,400,000	360,000	44,000																															
1,1-Dichloropropene	µg/L	--	--	--	--																															
1,2,3-Trichlorobenzene	µg/L	--	--	--	--																															
1,2,3-Trichloropropane	µg/L	--	--	--	--																															
1,2,4-Trichlorobenzene	µg/L	--	--	--	--																															
1,2,4-Trimethylbenzene	µg/L	250	>S	>S	6,300																															
1,2-Dibromo-3-Chloropropane	µg/L	--	--	--	--																															
1,2-Dibromoethane	µg/L	--	--	--	--																															
1,2-Dichlorobenzene	µg/L	1,400	>S	>S	37,000																															
1,2-Dichloroethane	µg/L	--	--	--	--																															
1,2-Dichloroethene	µg/L	--	--	--	--																															
1,2-Dichloropropane	µg/L	--	--	--	--																															
1,3,5-Trimethylbenzene	µg/L	280	>S	>S	7,500																															
1,3-Dichlorobenzene	µg/L	--	--	--	--																															
1,3-Dichloropropane	µg/L	--	--	--	--																															
1,4-Dichlorobenzene	µg/L	2.1	21,000	7,100	1,500																															
2,2-Dichloropropane	µg/L	--	--	--	--																															
2-Butanone	µg/L	--	--	--	--																															
2-Chloroethyl Vinyl Ether	µg/L	--	--	--	--																															
2-Chlorotoluene	µg/L	--	--	--	--																															
2-Hexanone	µg/L	--	--	--	--																															
4-Chlorotoluene	µg/L	--	--	--	--																															
4-Methyl-2-Pentanone	µg/L	--	--	--	--																															
Acetone	µg/L	--	--	--	--																															
Benzene	µg/L	2.1	14,000	2,800	1,800																															
Bromobenzene	µg/L	--	--	--	--																															
Bromochloromethane	µg/L	--	--	--	--																															
Bromodichloromethane	µg/L	0.6	6,000	2,300	450																															
Bromoform	µg/L	16	550,000	470,000	14,000																															
Bromomethane	µg/L	36	130,000	27,000	1,200																															
Carbon Dioxide	µg/L	--	--	--	--	30,000			53,600			44,100			53,900			57,600			45,000			60,000			60,000			104,000			98,400			82,000		
Carbon Disulfide	µg/L	--	--	--	--																															
Carbon Tetrachloride	µg/L	2.1	7,700	1,200	1,800																															
Chlorobenzene	µg/L	350	>S	>S	10,000																															
Chlorodibromomethane	µg/L	0.77	17,000	13,000	610																															
Chloroethane	µg/L	88,000	>S	>S	2,400,000																															
Chloroform	µg/L	0.98	6,300	1,600	720																															
Chlorohexane	µg/L	--	--	--	--																															
Chloromethane	µg/L	790	1,800,000	330,000	22,000																															
Cis-1,2-Dichloroethene	µg/L	260	>S	>S	18,000	0.76			428		*<10*	502		*<10*	847		*<10*	670		*<10*	850		*<10*	860		*<10*	990		*<10*	111			119			116		
Cis-1,3-Dichloropropene	µg/L	--	--	--	--																															
Dibromomethane	µg/L	--	--	--	--																															
Dichlorodifluoromethane	µg/L	--	--	--	--																															
Ethylbenzene	µg/L	6.4	43,000	8,200	4,500																															
Hexachlorobutadiene	µg/L	--	--	--	--																															
Isopropylbenzene	µg/L	--	--	--	--																															
m+p-Xylenes	µg/L	--	--	--	--																															
Methane	µg/L	--	--	--	--	7,700			1,480			734			748			2,670			2,200			2,300			2,600			1,460			1,860			1,210		
Methylene Chloride	µg/L	200	13,000,000	3,300,000	79,000																															
Methyl-tert-butyl Ether	µg/L	68	1,500,000	870,000	63,000																															
Naphthalene	µg/L	0.72	16,000	11,000	500																															
n-Butylbenzene	µg/L	--	--	--	--																															
n-Propylbenzene	µg/L	--	--	--	--																															
o-Xylene	µg/L	--	--	--	--																															
p-Isopropyltoluene	µg/L	--	--	--	--																															
Sec-Butylbenzene	µg/L	--	--	--	--																															
Styrene	µg/L	5,700	>S	>S	170,000																															
Tert-Butylbenzene	µg/L	--	--	--	--																															
Tetrachloroethene	µg/L	48	>S	48,000	5,600	0.1	U		630		*13*	483		*10*	657		*14*	550		*11*	490		*10*	370		*<10*	530		*11*	28.2			12.4			14.4		
Toluene	µg/L	6,300	>S	>S	220,000																															
Trans-1,2-Dichloroethene	µg/L	--	--	--	--																															
Trans-1,3-Dichloropropene	µg/L	--	--	--	--																															
Trichloroethene	µg/L	3.3	20,000	3,700	430	0.1	U		221		*67*	178		*54*	283		*86*	209		*63*	160		*48*	100		*30*	160		*48*	38.4		*12*	20.3		*<10*	29.7		*<10*
Trichlorofluoromethane	µg/L	5,200	>S	460,000	160,000																															
Vinyl Chloride	µg/L	0.49	5,900	880	960	2.9		*<10*	22.8		*47*	20.8		*42*	26.1		*53*	29.9		*61*	46		*94*	46		*94*	62		*127*	4.45		*<10*	9.73		*20*	16.6		*34*
Xylenes, Total	µg/L	830	>S	>S	23,000																															

Notes:
D = Dilution
J = Estimated value.
U = The analyte was analyzed for, but not detected.
-- = Not Established

EF = Exceedance factor (calculated if consistuent exceeded indicated screening level)
Shaded = detected result exceeded indicated DEQ RBCs
Sample Type: N = Normal Sample, FD - Field Duplicate

°C = degrees Celsius
mg/L = milligrams per Liter
mV = millivolts
µg/L = micrograms per Liter

µS/cm = microsiemens per centimeter
NTU = Nephelometric Turbidity Units
Screening levels from DEQ Risk-Based Concentrations (May 2018 Update)

Table 3
Analytical Groundwater Sampling Results
Northwest Pipe Company, Portland, Oregon

Location ID		DEQ Risk-Based Concentrations (May 2018 Update)				MW-04		MW-04		MW-04		MW-04		MW-05		MW-05		MW-05		MW-05		MW-05		MW-05		MW-05	
Sample ID						MW-04-072617		MW-04-120618		MW-04-050819		MW-04-100819		MW-05-102616		MW-05-020217		MW-05-050117		MW-05-072717		MW-05-120718		MW-05-050919		MW-05-100919	
Sample Date						07/26/17		12/06/18		05/08/19		10/08/19		10/26/16		02/02/17		05/01/17		07/27/17		12/07/18		05/09/19		10/09/19	
Sample Type		Ingestion & Inhalation from Tapwater	Volatilization to Outdoor Air	Vapor Intrusion into Buildings	GW in Excavation	N		N		N		N		N		N		N		N		N		N		N	
Analyte	**Units**	**Occupational**	**Occupational**	**Occupational**	**Construction & Excavation Worker**	*EF*		*EF*		*EF*		*EF*		*EF*		*EF*		*EF*		*EF*		*EF*		*EF*		*EF*	
Field Parameters																											
Temperature	(°C)	--	--	--	--	15.1		14.3		14.5		11.7		15.5		15.7		15.4		18.0		13.5		16.7		12.7	
pH		--	--	--	--	6.42		6.53		6.47		6.19		6.50		6.59		6.60		6.46		6.71		6.39		6.42	
Conductivity	(µS/cm)	--	--	--	--	374		403		777		418		375		426		360		390		386		748		394	
Dissolved Oxygen	mg/L	--	--	--	--	0.13		0.53		0.92		0.24		0.17		0.33		0.11		0.11		0.62		0.79		0.31	
Oxidation Reduction Potential	mV	--	--	--	--	-66		-48		-30		-26		-52		77		-40		19		-7		97		-19	
Turbidity	NTU	--	--	--	--	8.1		1.3		1.4		0.5		1.2		1.8		0.5		2.2		1.0		1.2		0.3	
Conventional Parameters																											
Alkalinity, Total as CaCO3	mg/L	--	--	--	--																						
Chloride	mg/L	--	--	--	--	4.1		3.3		3.4	U	3.2		5.36		7.03		4.87		6.53		3.5		4.8		5.2	
Nitrate ion	mg/L	--	--	--	--																						
Nitrate-N	mg/L	--	--	--	--	0.023		0.046	J	0.058	J	0.053	J	0.34	J	0.57		0.0028	U	1.05		0.02	U	1.00		0.15	J
Sulfate	mg/L	--	--	--	--	2.55		4.1		3.7		3.9		20.5		29.7		11.9		20.9		7.1		17		12	
Total Organic Carbon	mg/L	--	--	--	--	0.72		1.7		1.3		1.5		1.67		1.5		1.33		1.28		1.6		1.5		1.9	
Total Suspended Solids (TSS)	mg/L	--	--	--	--																						
Metals, Total																											
Arsenic	mg/L	0.00031	--	--	--																						
Cadmium	mg/L	0.16	--	--	--																						
Chromium	mg/L	250	--	--	--																						
Copper	mg/L	6.5	--	--	--																						
Iron	mg/L	--	--	--	--																						
Lead	mg/L	0.015	--	--	>S																						
Manganese	mg/L	3.9	--	--	3,200																						
Mercury	mg/L	0.049	--	--	>S																						
Nickel	mg/L	3.3	--	--	>S																						
Zinc	mg/L	--	--	--	--																						
Metals, Dissolved																											
Arsenic	mg/L	0.00031	--	--	--																						
Cadmium	mg/L	0.16	--	--	--																						
Chromium	mg/L	250	--	--	--																						
Copper	mg/L	6.5	--	--	--																						
Iron	mg/L	--	--	--	--	10.0								4.46		0.0137	U	4.17		2.14							
Ferrous Iron[1]	mg/L	--	--	--	--			2.96		10.08		2.95										1.85		0.05		3.78	
Lead	mg/L	0.015	--	--	>S																						
Manganese	mg/L	3.9	--	--	3200																						
Mercury	mg/L	0.049	--	--	>S																						
Nickel	mg/L	3.3	--	--	>S																						
Zinc	mg/L	--	--	--	--																						
Polynuclear Aromatic Hydrocabons																											
1-Methylnaphthalene	µg/L	--	--	--	--																						
2-Methylnaphthalene	µg/L	--	--	--	--																						
Acenaphthene	µg/L	2,500	>S	>S	>S																						
Acenaphthylene	µg/L	--	--	--	--																						
Anthracene	µg/L	>S	>S	>S	>S																						
Benzo(a)anthracene	µg/L	0.38	>S	>S	>S																						
Benzo(a)pyrene	µg/L	0.47	--	--	>S																						
Benzo(b)fluoroanthene	µg/L	>S	--	--	>S																						
Benzo(g,h,i)perylene	µg/L	--	--	--	--																						
Benzo(k)fluoranthene	µg/L	>S	--	--	>S																						
Chrysene	µg/L	>S	--	--	>S																						
Dibenzo(a,h)anthracene	µg/L	0.47	--	--	>S																						
Fluoranthene	µg/L	>S	--	--	>S																						
Fluorene	µg/L	1,300	>S	>S	>S																						
Indeno(1,2,3-c,d)pyrene	µg/L	>S	--	--	>S																						
Naphthalene	µg/L	0.72	16,000	11,000	500																						
Phenanthrene	µg/L	--	--	--	--																						
Pyrene	µg/L	>S	>S	>S	>S																						
Total PAH[2]	µg/L	--	--	--	--																						
Polychlorinated Biphenyls																											
Aroclor-1260	µg/L	0.028	>S	>S	30																						
Aroclor-1254	µg/L	0.028	>S	>S	30																						
Aroclor-1221	µg/L	0.028	>S	>S	30																						
Aroclor-1232	µg/L	0.028	>S	>S	30																						
Aroclor-1248	µg/L	0.028	>S	>S	30																						
Aroclor-1016	µg/L	0.028	>S	>S	30																						
Aroclor-1242	µg/L	0.028	>S	>S	30																						
Total PCBs[2]	µg/L	0.028	>S	>S	30																						
Total Petroleum Hydrocarbons																											
Gasoline (TPH-Gx)	mg/L	0.45	>S	>S	>S																						
Diesel (TPH-Dx)	mg/L	0.43	>S	>S	14																						
Motor Oil (TPH-Oil)	mg/L	1.3	>S	>S	>S																						
VOCs																											
1,1,1,2-Tetrachloroethane	µg/L	--	--	--	--																						
1,1,1-Trichloroethane	µg/L	37,000	--	--	1,100,000																						

Table 3
Analytical Groundwater Sampling Results
Northwest Pipe Company, Portland, Oregon

Location ID		DEQ Risk-Based Concentrations (May 2018 Update)				MW-04		MW-04		MW-04		MW-04		MW-05		MW-05		MW-05		MW-05		MW-05		MW-05		MW-05	
Sample ID						MW-04-072617		MW-04-120618		MW-04-050819		MW-04-100819		MW-05-102616		MW-05-020217		MW-05-050117		MW-05-072717		MW-05-120718		MW-05-050919		MW-05-100919	
Sample Date						07/26/17		12/06/18		05/08/19		10/08/19		10/26/16		02/02/17		05/01/17		07/27/17		12/07/18		05/09/19		10/09/19	
Sample Type		Ingestion & Inhalation from Tapwater	Volatilization to Outdoor Air	Vapor Intrusion into Buildings	GW in Excavation	N		N		N		N		N		N		N		N		N		N		N	
Analyte	**Units**	**Occupational**	**Occupational**	**Occupational**	**Construction & Excavation Worker**		*EF*		*EF*		*EF*		*EF*		*EF*		*EF*		*EF*		*EF*		*EF*		*EF*		*EF*
VOCs																											
1,1,2,2-Tetrachloroethane	µg/L	--	--	--	--																						
1,1,2-Trichloroethane	µg/L	1.3	21,000	11,000	49																						
1,1-Dichloroethane	µg/L	13	68,000	14,000	10,000																						
1,1-Dichloroethene	µg/L	1,400	2,400,000	360,000	44,000																						
1,1-Dichloropropene	µg/L	--	--	--	--																						
1,2,3-Trichlorobenzene	µg/L	--	--	--	--																						
1,2,3-Trichloropropane	µg/L	--	--	--	--																						
1,2,4-Trichlorobenzene	µg/L	--	--	--	--																						
1,2,4-Trimethylbenzene	µg/L	250	>S	>S	6,300																						
1,2-Dibromo-3-Chloropropane	µg/L	--	--	--	--																						
1,2-Dibromoethane	µg/L	--	--	--	--																						
1,2-Dichlorobenzene	µg/L	1,400	>S	>S	37,000																						
1,2-Dichloroethane	µg/L	--	--	--	--																						
1,2-Dichloroethene	µg/L	--	--	--	--																						
1,2-Dichloropropane	µg/L	--	--	--	--																						
1,3,5-Trimethylbenzene	µg/L	280	>S	>S	7,500																						
1,3-Dichlorobenzene	µg/L	--	--	--	--																						
1,3-Dichloropropane	µg/L	--	--	--	--																						
1,4-Dichlorobenzene	µg/L	2.1	21,000	7,100	1,500																						
2,2-Dichloropropane	µg/L	--	--	--	--																						
2-Butanone	µg/L	--	--	--	--																						
2-Chloroethyl Vinyl Ether	µg/L	--	--	--	--																						
2-Chlorotoluene	µg/L	--	--	--	--																						
2-Hexanone	µg/L	--	--	--	--																						
4-Chlorotoluene	µg/L	--	--	--	--																						
4-Methyl-2-Pentanone	µg/L	--	--	--	--																						
Acetone	µg/L	--	--	--	--																						
Benzene	µg/L	2.1	14,000	2,800	1,800																						
Bromobenzene	µg/L	--	--	--	--																						
Bromochloromethane	µg/L	--	--	--	--																						
Bromodichloromethane	µg/L	0.6	6,000	2,300	450																						
Bromoform	µg/L	16	550,000	470,000	14,000																						
Bromomethane	µg/L	36	130,000	27,000	1,200																						
Carbon Dioxide	µg/L	--	--	--	--	82,900		80,000		85,000		150,000		75,100		74,900		50,500		63,800		40,000		60,000		65,000	
Carbon Disulfide	µg/L	--	--	--	--																						
Carbon Tetrachloride	µg/L	2.1	7,700	1,200	1,800																						
Chlorobenzene	µg/L	350	>S	>S	10,000																						
Chlorodibromomethane	µg/L	0.77	17,000	13,000	610																						
Chloroethane	µg/L	88,000	>S	>S	2,400,000																						
Chloroform	µg/L	0.98	6,300	1,600	720																						
Chlorohexane	µg/L	--	--	--	--																						
Chloromethane	µg/L	790	1,800,000	330,000	22,000																						
Cis-1,2-Dichloroethene	µg/L	260	>S	>S	18,000	137		190		150		120		1,160	*<10*	1,240	*<10*	634	*<10*	1,730	*<10*	1,600	*<10*	1,700	*<10*	2,200	*<10*
Cis-1,3-Dichloropropene	µg/L	--	--	--	--																						
Dibromomethane	µg/L	--	--	--	--																						
Dichlorodifluoromethane	µg/L	--	--	--	--																						
Ethylbenzene	µg/L	6.4	43,000	8,200	4,500																						
Hexachlorobutadiene	µg/L	--	--	--	--																						
Isopropylbenzene	µg/L	--	--	--	--																						
m+p-Xylenes	µg/L	--	--	--	--																						
Methane	µg/L	--	--	--	--	1,780		2,900		1,400		2,700		1,160		887		2,310		1,190		1,700		170		3,000	
Methylene Chloride	µg/L	200	13,000,000	3,300,000	79,000																						
Methyl-tert-butyl Ether	µg/L	68	1,500,000	870,000	63,000																						
Naphthalene	µg/L	0.72	16,000	11,000	500																						
n-Butylbenzene	µg/L	--	--	--	--																						
n-Propylbenzene	µg/L	--	--	--	--																						
o-Xylene	µg/L	--	--	--	--																						
p-Isopropyltoluene	µg/L	--	--	--	--																						
Sec-Butylbenzene	µg/L	--	--	--	--																						
Styrene	µg/L	5,700	>S	>S	170,000																						
Tert-Butylbenzene	µg/L	--	--	--	--																						
Tetrachloroethene	µg/L	48	>S	48,000	5,600	18.5		16		5.4		10.0		3,510	*73*	4,150	*86*	949	*20*	3,640	*76*	1,200	*25*	4,400	*92*	2,300	*4.80E+01*
Toluene	µg/L	6,300	>S	>S	220,000																						
Trans-1,2-Dichloroethene	µg/L	--	--	--	--																						
Trans-1,3-Dichloropropene	µg/L	--	--	--	--																						
Trichloroethene	µg/L	3.3	20,000	3,700	430	35.4	*11*	19	*<10*	8.4	*<10*	16	*<10*	195	*59*	208	*63*	92	*28*	170	*52*	85	*26*	240	*73*	140	*42*
Trichlorofluoromethane	µg/L	5,200	>S	460,000	160,000																						
Vinyl Chloride	µg/L	0.49	5,900	880	960	9.43	*19*	4.6	*<10*	6.1	*12*	5.6	*11*	40.4	*82*	39.5	*81*	70.7	*144*	7.58 J	*15*	77	*157*	14	*29*	120	*245*
Xylenes, Total	µg/L	830	>S	>S	23,000																						

Notes:
D = Dilution
J = Estimated value.
U = The analyte was analyzed for, but not detected.
-- = Not Established

EF = Exceedance factor (calculated if consistuent exceeded indicated screening level)
Shaded = detected result exceeded indicated DEQ RBCs
Sample Type: N = Normal Sample, FD - Field Duplicate

°C = degrees Celsius
mg/L = milligrams per Liter
mV = millivolts
µg/L = micrograms per Liter

µS/cm = microsiemens per centimeter
NTU = Nephelometric Turbidity Units
Screening levels from DEQ Risk-Based Concentrations (May 2018 Update)

Table 3
Analytical Groundwater Sampling Results
Northwest Pipe Company, Portland, Oregon

Location ID		DEQ Risk-Based Concentrations (May 2018 Update)				MW-06		MW-06		MW-06		MW-06		MW-06		MW-06		MW-06		MW-06		MW-06		MW-06		MW-06	
Sample ID						MW-06-102616		MW-06-020217		MW-06-050117		MW-06-072717		MW-06-120718		MW-06-5/9/19		MW-06-10/09/19		MW-06-102616		MW-06-020117		MW-06-050117		MW-06-072717	
Sample Date						10/26/16		02/02/17		05/01/17		07/27/17		12/07/18		05/09/19		10/09/19		10/26/16		02/01/17		05/01/17		07/27/17	
Sample Type						N		N		N		N		N		N		N		FD		FD		FD		FD	
Analyte	**Units**	**Ingestion & Inhalation from Tapwater**	**Volatilization to Outdoor Air**	**Vapor Intrusion into Buildings**	**GW in Excavation**		*EF*		*EF*		*EF*		*EF*		*EF*		*EF*		*EF*		*EF*		*EF*		*EF*		*EF*
		Occupational	**Occupational**	**Occupational**	**Construction & Excavation Worker**																						
Field Parameters																											
Temperature	(°C)	--	--	--	--	15.9		15.5		15.7		16.6		14.3		17.8		12.0									
pH		--	--	--	--	6.47		6.54		6.35		6.27		6.61		6.42		6.38									
Conductivity	(µS/cm)	--	--	--	--	266		299		310		322		395		712		339									
Dissolved Oxygen	mg/L	--	--	--	--	0.15		0.20		0.13		0.07		0.66		0.70		0.14									
Oxidation Reduction Potential	mV	--	--	--	--	-76		-47		20		-9		-49		31		-36									
Turbidity	NTU	--	--	--	--	2.7		2.8		4.4		10.7		13.4		36.1		2.1									
Conventional Parameters																											
Alkalinity, Total as CaCO3	mg/L	--	--	--	--																						
Chloride	mg/L	--	--	--	--	5.07		6.12		6.2		5.18		5.2		5.8		5.5		5.05		5.95		6.21		5.21	
Nitrate ion	mg/L	--	--	--	--																						
Nitrate-N	mg/L	--	--	--	--	0.016	J	0.0028	U	0.0028	U	0.0084	J	0.02	U	0.13	U	0.039	J	0.017	J	0.003	J	0.0028	U	0.01	
Sulfate	mg/L	--	--	--	--	5.17		9.27		13.9		13.7		8.7		17		9.4		5.36		9.09		14		13.6	
Total Organic Carbon	mg/L	--	--	--	--	1.25		1.15		1.27		1.05		1.5		1.5		1.8		1.15		1.12		1.4		1.16	
Total Suspended Solids (TSS)	mg/L	--	--	--	--																						
Metals, Total																											
Arsenic	mg/L	0.00031	--	--	--																						
Cadmium	mg/L	0.16	--	--	--																						
Chromium	mg/L	250	--	--	--																						
Copper	mg/L	6.5	--	--	--																						
Iron	mg/L	--	--	--	--																						
Lead	mg/L	0.015	--	--	>S																						
Manganese	mg/L	3.9	--	--	3,200																						
Mercury	mg/L	0.049	--	--	>S																						
Nickel	mg/L	3.3	--	--	>S																						
Zinc	mg/L	--	--	--	--																						
Metals, Dissolved																											
Arsenic	mg/L	0.00031	--	--	--																						
Cadmium	mg/L	0.16	--	--	--																						
Chromium	mg/L	250	--	--	--																						
Copper	mg/L	6.5	--	--	--																						
Iron	mg/L	--	--	--	--	7.29		6.10		3.53		3.24								7.4		6.09		3.6		3.22	
Ferrous Iron[1]	mg/L	--	--	--	--									1.87		1.41		4.4									
Lead	mg/L	0.015	--	--	>S																						
Manganese	mg/L	3.9	--	--	3200																						
Mercury	mg/L	0.049	--	--	>S																						
Nickel	mg/L	3.3	--	--	>S																						
Zinc	mg/L	--	--	--	--																						
Polynuclear Aromatic Hydrocabons																											
1-Methylnaphthalene	µg/L	--	--	--	--																						
2-Methylnaphthalene	µg/L	--	--	--	--																						
Acenaphthene	µg/L	2,500	>S	>S	>S																						
Acenaphthylene	µg/L	--	--	--	--																						
Anthracene	µg/L	>S	>S	>S	>S																						
Benzo(a)anthracene	µg/L	0.38	>S	>S	>S																						
Benzo(a)pyrene	µg/L	0.47	--	--	>S																						
Benzo(b)fluoroanthene	µg/L	>S	--	--	>S																						
Benzo(g,h,i)perylene	µg/L	--	--	--	--																						
Benzo(k)fluoranthene	µg/L	>S	--	--	>S																						
Chrysene	µg/L	>S	--	--	>S																						
Dibenzo(a,h)anthracene	µg/L	0.47	--	--	>S																						
Fluoranthene	µg/L	>S	--	--	>S																						
Fluorene	µg/L	1,300	>S	>S	>S																						
Indeno(1,2,3-c,d)pyrene	µg/L	>S	--	--	>S																						
Naphthalene	µg/L	0.72	16,000	11,000	500																						
Phenanthrene	µg/L	--	--	--	--																						
Pyrene	µg/L	>S	>S	>S	>S																						
Total PAH[2]	µg/L	--	--	--	--																						
Polychlorinated Biphenyls																											
Aroclor-1260	µg/L	0.028	>S	>S	30																						
Aroclor-1254	µg/L	0.028	>S	>S	30																						
Aroclor-1221	µg/L	0.028	>S	>S	30																						
Aroclor-1232	µg/L	0.028	>S	>S	30																						
Aroclor-1248	µg/L	0.028	>S	>S	30																						
Aroclor-1016	µg/L	0.028	>S	>S	30																						
Aroclor-1242	µg/L	0.028	>S	>S	30																						
Total PCBs[2]	µg/L	0.028	>S	>S	30																						
Total Petroleum Hydrocarbons																											
Gasoline (TPH-Gx)	mg/L	0.45	>S	>S	>S																						
Diesel (TPH-Dx)	mg/L	0.43	>S	>S	14																						
Motor Oil (TPH-Oil)	mg/L	1.3	>S	>S	>S																						
VOCs																											
1,1,1,2-Tetrachloroethane	µg/L	--	--	--	--																						
1,1,1-Trichloroethane	µg/L	37,000	--	--	1,100,000																						

Table 3
Analytical Groundwater Sampling Results
Northwest Pipe Company, Portland, Oregon

Location ID		DEQ Risk-Based Concentrations (May 2018 Update)				MW-06		MW-06		MW-06		MW-06		MW-06		MW-06		MW-06		MW-06		MW-06		MW-06		MW-06	
Sample ID						MW-06-102616		MW-06-020217		MW-06-050117		MW-06-072717		MW-06-120718		MW-06-5/9/19		MW-06-10/09/19		MW-06-102616		MW-06-020117		MW-06-050117		MW-06-072717	
Sample Date						10/26/16		02/02/17		05/01/17		07/27/17		12/07/18		05/09/19		10/09/19		10/26/16		02/01/17		05/01/17		07/27/17	
Sample Type		Ingestion & Inhalation from Tapwater	Volatilization to Outdoor Air	Vapor Intrusion into Buildings	GW in Excavation	N		N		N		N		N		N		N		FD		FD		FD		FD	
Analyte	**Units**	**Occupational**	**Occupational**	**Occupational**	**Construction & Excavation Worker**		*EF*		*EF*		*EF*		*EF*		*EF*		*EF*		*EF*		*EF*		*EF*		*EF*		*EF*
VOCs																											
1,1,2,2-Tetrachloroethane	µg/L	--	--	--	--																						
1,1,2-Trichloroethane	µg/L	1.3	21,000	11,000	49																						
1,1-Dichloroethane	µg/L	13	68,000	14,000	10,000																						
1,1-Dichloroethene	µg/L	1,400	2,400,000	360,000	44,000																						
1,1-Dichloropropene	µg/L	--	--	--	--																						
1,2,3-Trichlorobenzene	µg/L	--	--	--	--																						
1,2,3-Trichloropropane	µg/L	--	--	--	--																						
1,2,4-Trichlorobenzene	µg/L	--	--	--	--																						
1,2,4-Trimethylbenzene	µg/L	250	>S	>S	6,300																						
1,2-Dibromo-3-Chloropropane	µg/L	--	--	--	--																						
1,2-Dibromoethane	µg/L	--	--	--	--																						
1,2-Dichlorobenzene	µg/L	1,400	>S	>S	37,000																						
1,2-Dichloroethane	µg/L	--	--	--	--																						
1,2-Dichloroethene	µg/L	--	--	--	--																						
1,2-Dichloropropane	µg/L	--	--	--	--																						
1,3,5-Trimethylbenzene	µg/L	280	>S	>S	7,500																						
1,3-Dichlorobenzene	µg/L	--	--	--	--																						
1,3-Dichloropropane	µg/L	--	--	--	--																						
1,4-Dichlorobenzene	µg/L	2.1	21,000	7,100	1,500																						
2,2-Dichloropropane	µg/L	--	--	--	--																						
2-Butanone	µg/L	--	--	--	--																						
2-Chloroethyl Vinyl Ether	µg/L	--	--	--	--																						
2-Chlorotoluene	µg/L	--	--	--	--																						
2-Hexanone	µg/L	--	--	--	--																						
4-Chlorotoluene	µg/L	--	--	--	--																						
4-Methyl-2-Pentanone	µg/L	--	--	--	--																						
Acetone	µg/L	--	--	--	--																						
Benzene	µg/L	2.1	14,000	2,800	1,800																						
Bromobenzene	µg/L	--	--	--	--																						
Bromochloromethane	µg/L	--	--	--	--																						
Bromodichloromethane	µg/L	0.6	6,000	2,300	450																						
Bromoform	µg/L	16	550,000	470,000	14,000																						
Bromomethane	µg/L	36	130,000	27,000	1,200																						
Carbon Dioxide	µg/L	--	--	--	--	57,100		60,500		81,800		78,600		55,000		90,000		80,000		59,500		62,300		82,300		80,000	
Carbon Disulfide	µg/L	--	--	--	--																						
Carbon Tetrachloride	µg/L	2.1	7,700	1,200	1,800																						
Chlorobenzene	µg/L	350	>S	>S	10,000																						
Chlorodibromomethane	µg/L	0.77	17,000	13,000	610																						
Chloroethane	µg/L	88,000	>S	>S	2,400,000																						
Chloroform	µg/L	0.98	6,300	1,600	720																						
Chlorohexane	µg/L	--	--	--	--																						
Chloromethane	µg/L	790	1,800,000	330,000	22,000																						
Cis-1,2-Dichloroethene	µg/L	260	>S	>S	18,000	1,160	*<10*	1,590	*<10*	1,530	*<10*	1,080	*<10*	1,300	*<10*	1,900	*<10*	1,700	*<10*	1,130	*<10*	1,600	*<10*	1,550	*<10*	1,080	*<10*
Cis-1,3-Dichloropropene	µg/L	--	--	--	--																						
Dibromomethane	µg/L	--	--	--	--																						
Dichlorodifluoromethane	µg/L	--	--	--	--																						
Ethylbenzene	µg/L	6.4	43,000	8,200	4,500																						
Hexachlorobutadiene	µg/L	--	--	--	--																						
Isopropylbenzene	µg/L	--	--	--	--																						
m+p-Xylenes	µg/L	--	--	--	--																						
Methane	µg/L	--	--	--	--	2,280		623		206		214	J	3,500		370		3100		2,040		666		265		382	J
Methylene Chloride	µg/L	200	13,000,000	3,300,000	79,000																						
Methyl-tert-butyl Ether	µg/L	68	1,500,000	870,000	63,000																						
Naphthalene	µg/L	0.72	16,000	11,000	500																						
n-Butylbenzene	µg/L	--	--	--	--																						
n-Propylbenzene	µg/L	--	--	--	--																						
o-Xylene	µg/L	--	--	--	--																						
p-Isopropyltoluene	µg/L	--	--	--	--																						
Sec-Butylbenzene	µg/L	--	--	--	--																						
Styrene	µg/L	5,700	>S	>S	170,000																						
Tert-Butylbenzene	µg/L	--	--	--	--																						
Tetrachloroethene	µg/L	48	>S	48,000	5,600	287	*<10*	805	*17*	1,280	*27*	810	*17*	430	*<10*	980	*20*	520	*1.10E+01*	299	*<10*	760	*16*	1,280	*27*	728	*15*
Toluene	µg/L	6,300	>S	>S	220,000																						
Trans-1,2-Dichloroethene	µg/L	--	--	--	--																						
Trans-1,3-Dichloropropene	µg/L	--	--	--	--																						
Trichloroethene	µg/L	3.3	20,000	3,700	430	60.4	*18*	147	*45*	225	*68*	128	*39*	110	*33*	210	*64*	110	*33*	70.9	*21*	145	*44*	228	*69*	123	*37*
Trichlorofluoromethane	µg/L	5,200	>S	460,000	160,000																						
Vinyl Chloride	µg/L	0.49	5,900	880	960	170	*347*	51	*104*	21.9	*45*	18.3	*37*	130	*265*	40	*82*	110	J *2.24E+02*	177	*361*	53.9	*110*	20.7	*42*	22.5	*46*
Xylenes, Total	µg/L	830	>S	>S	23,000																						

Notes:
D = Dilution
J = Estimated value.
U = The analyte was analyzed for, but not detected.
-- = Not Established

EF = Exceedance factor (calculated if consistuent exceeded indicated screening level)
Shaded = detected result exceeded indicated DEQ RBCs
Sample Type: N = Normal Sample, FD - Field Duplicate

°C = degrees Celsius
mg/L = milligrams per Liter
mV = millivolts
µg/L = micrograms per Liter

µS/cm = microsiemens per centimeter
NTU = Nephelometric Turbidity Units
Screening levels from DEQ Risk-Based Concentrations (May 2018 Update)

Table 3
Analytical Groundwater Sampling Results
Northwest Pipe Company, Portland, Oregon

Location ID		DEQ Risk-Based Concentrations (May 2018 Update)				MW-06			MW-06			MW-06		
Sample ID						MW-06-120718			MW-06-050919			MW-06-10/09/19		
Sample Date						12/07/18			05/09/19					
Sample Type		Ingestion & Inhalation from Tapwater	Volatilization to Outdoor Air	Vapor Intrusion into Buildings	GW in Excavation	FD			FD			FD		
Analyte	**Units**	**Occupational**	**Occupational**	**Occupational**	**Construction & Excavation Worker**	*EF*			*EF*			*EF*		
Field Parameters														
Temperature	(°C)	--	--	--	--							12.04		
pH		--	--	--	--							6.38		
Conductivity	(µS/cm)	--	--	--	--							339		
Dissolved Oxygen	mg/L	--	--	--	--							0.14		
Oxidation Reduction Potential	mV	--	--	--	--							-36.3		
Turbidity	NTU	--	--	--	--							2.14		
Conventional Parameters														
Alkalinity, Total as CaCO3	mg/L	--	--	--	--									
Chloride	mg/L	--	--	--	--	5.2			5.7			5.5		
Nitrate ion	mg/L	--	--	--	--									
Nitrate-N	mg/L	--	--	--	--	0.02	U		0.14	U		0.035	J	
Sulfate	mg/L	--	--	--	--	8.8			17			9.7		
Total Organic Carbon	mg/L	--	--	--	--	1.5			1.6			2.1		
Total Suspended Solids (TSS)	mg/L	--	--	--	--									
Metals, Total														
Arsenic	mg/L	0.00031	--	--	--									
Cadmium	mg/L	0.16	--	--	--									
Chromium	mg/L	250	--	--	--									
Copper	mg/L	6.5	--	--	--									
Iron	mg/L	--	--	--	--									
Lead	mg/L	0.015	--	--	>S									
Manganese	mg/L	3.9	--	--	3,200									
Mercury	mg/L	0.049	--	--	>S									
Nickel	mg/L	3.3	--	--	>S									
Zinc	mg/L	--	--	--	--									
Metals, Dissolved														
Arsenic	mg/L	0.00031	--	--	--									
Cadmium	mg/L	0.16	--	--	--									
Chromium	mg/L	250	--	--	--									
Copper	mg/L	6.5	--	--	--									
Iron	mg/L	--	--	--	--									
Ferrous Iron[1]	mg/L	--	--	--	--	1.87			1.41			4.4		
Lead	mg/L	0.015	--	--	>S									
Manganese	mg/L	3.9	--	--	3200									
Mercury	mg/L	0.049	--	--	>S									
Nickel	mg/L	3.3	--	--	>S									
Zinc	mg/L	--	--	--	--									
Polynuclear Aromatic Hydrocabons														
1-Methylnaphthalene	µg/L	--	--	--	--									
2-Methylnaphthalene	µg/L	--	--	--	--									
Acenaphthene	µg/L	2,500	>S	>S	>S									
Acenaphthylene	µg/L	--	--	--	--									
Anthracene	µg/L	>S	>S	>S	>S									
Benzo(a)anthracene	µg/L	0.38	>S	>S	>S									
Benzo(a)pyrene	µg/L	0.47	--	--	>S									
Benzo(b)fluoroanthene	µg/L	>S	--	--	>S									
Benzo(g,h,i)perylene	µg/L	--	--	--	--									
Benzo(k)fluoranthene	µg/L	>S	--	--	>S									
Chrysene	µg/L	>S	--	--	>S									
Dibenzo(a,h)anthracene	µg/L	0.47	--	--	>S									
Fluoranthene	µg/L	>S	--	--	>S									
Fluorene	µg/L	1,300	>S	>S	>S									
Indeno(1,2,3-c,d)pyrene	µg/L	>S	--	--	>S									
Naphthalene	µg/L	0.72	16,000	11,000	500									
Phenanthrene	µg/L	--	--	--	--									
Pyrene	µg/L	>S	>S	>S	>S									
Total PAH[2]	µg/L	--	--	--	--									
Polychlorinated Biphenyls														
Aroclor-1260	µg/L	0.028	>S	>S	30									
Aroclor-1254	µg/L	0.028	>S	>S	30									
Aroclor-1221	µg/L	0.028	>S	>S	30									
Aroclor-1232	µg/L	0.028	>S	>S	30									
Aroclor-1248	µg/L	0.028	>S	>S	30									
Aroclor-1016	µg/L	0.028	>S	>S	30									
Aroclor-1242	µg/L	0.028	>S	>S	30									
Total PCBs[2]	µg/L	0.028	>S	>S	30									
Total Petroleum Hydrocarbons														
Gasoline (TPH-Gx)	mg/L	0.45	>S	>S	>S									
Diesel (TPH-Dx)	mg/L	0.43	>S	>S	14									
Motor Oil (TPH-Oil)	mg/L	1.3	>S	>S	>S									
VOCs														
1,1,1,2-Tetrachloroethane	µg/L	--	--	--	--									
1,1,1-Trichloroethane	µg/L	37,000	--	--	1,100,000									

Table 3
Analytical Groundwater Sampling Results
Northwest Pipe Company, Portland, Oregon

Location ID		DEQ Risk-Based Concentrations (May 2018 Update)				MW-06			MW-06			MW-06		
Sample ID						MW-06-120718			MW-06-050919			MW-06-10/09/19		
Sample Date						12/07/18			05/09/19					
Sample Type		Ingestion & Inhalation from Tapwater	Volatilization to Outdoor Air	Vapor Intrusion into Buildings	GW in Excavation	FD			FD			FD		
Analyte	**Units**	**Occupational**	**Occupational**	**Occupational**	**Construction & Excavation Worker**		*EF*			*EF*			*EF*	
VOCs														
1,1,2,2-Tetrachloroethane	µg/L	--	--	--	--									
1,1,2-Trichloroethane	µg/L	1.3	21,000	11,000	49									
1,1-Dichloroethane	µg/L	13	68,000	14,000	10,000									
1,1-Dichloroethene	µg/L	1,400	2,400,000	360,000	44,000									
1,1-Dichloropropene	µg/L	--	--	--	--									
1,2,3-Trichlorobenzene	µg/L	--	--	--	--									
1,2,3-Trichloropropane	µg/L	--	--	--	--									
1,2,4-Trichlorobenzene	µg/L	--	--	--	--									
1,2,4-Trimethylbenzene	µg/L	250	>S	>S	6,300									
1,2-Dibromo-3-Chloropropane	µg/L	--	--	--	--									
1,2-Dibromoethane	µg/L	--	--	--	--									
1,2-Dichlorobenzene	µg/L	1,400	>S	>S	37,000									
1,2-Dichloroethane	µg/L	--	--	--	--									
1,2-Dichloroethene	µg/L	--	--	--	--									
1,2-Dichloropropane	µg/L	--	--	--	--									
1,3,5-Trimethylbenzene	µg/L	280	>S	>S	7,500									
1,3-Dichlorobenzene	µg/L	--	--	--	--									
1,3-Dichloropropane	µg/L	--	--	--	--									
1,4-Dichlorobenzene	µg/L	2.1	21,000	7,100	1,500									
2,2-Dichloropropane	µg/L	--	--	--	--									
2-Butanone	µg/L	--	--	--	--									
2-Chloroethyl Vinyl Ether	µg/L	--	--	--	--									
2-Chlorotoluene	µg/L	--	--	--	--									
2-Hexanone	µg/L	--	--	--	--									
4-Chlorotoluene	µg/L	--	--	--	--									
4-Methyl-2-Pentanone	µg/L	--	--	--	--									
Acetone	µg/L	--	--	--	--									
Benzene	µg/L	2.1	14,000	2,800	1,800									
Bromobenzene	µg/L	--	--	--	--									
Bromochloromethane	µg/L	--	--	--	--									
Bromodichloromethane	µg/L	0.6	6,000	2,300	450									
Bromoform	µg/L	16	550,000	470,000	14,000									
Bromomethane	µg/L	36	130,000	27,000	1,200									
Carbon Dioxide	µg/L	--	--	--	--	55,000			90,000			80,000		
Carbon Disulfide	µg/L	--	--	--	--									
Carbon Tetrachloride	µg/L	2.1	7,700	1,200	1,800									
Chlorobenzene	µg/L	350	>S	>S	10,000									
Chlorodibromomethane	µg/L	0.77	17,000	13,000	610									
Chloroethane	µg/L	88,000	>S	>S	2,400,000									
Chloroform	µg/L	0.98	6,300	1,600	720									
Chlorohexane	µg/L	--	--	--	--									
Chloromethane	µg/L	790	1,800,000	330,000	22,000									
Cis-1,2-Dichloroethene	µg/L	260	>S	>S	18,000	1,400		*<10*	1,900		*<10*	1,800		*<10*
Cis-1,3-Dichloropropene	µg/L	--	--	--	--									
Dibromomethane	µg/L	--	--	--	--									
Dichlorodifluoromethane	µg/L	--	--	--	--									
Ethylbenzene	µg/L	6.4	43,000	8,200	4,500									
Hexachlorobutadiene	µg/L	--	--	--	--									
Isopropylbenzene	µg/L	--	--	--	--									
m+p-Xylenes	µg/L	--	--	--	--									
Methane	µg/L	--	--	--	--	4,100			350			2,900		
Methylene Chloride	µg/L	200	13,000,000	3,300,000	79,000									
Methyl-tert-butyl Ether	µg/L	68	1,500,000	870,000	63,000									
Naphthalene	µg/L	0.72	16,000	11,000	500									
n-Butylbenzene	µg/L	--	--	--	--									
n-Propylbenzene	µg/L	--	--	--	--									
o-Xylene	µg/L	--	--	--	--									
p-Isopropyltoluene	µg/L	--	--	--	--									
Sec-Butylbenzene	µg/L	--	--	--	--									
Styrene	µg/L	5,700	>S	>S	170,000									
Tert-Butylbenzene	µg/L	--	--	--	--									
Tetrachloroethene	µg/L	48	>S	48,000	5,600	400		*<10*	1,000		*21*	600		*1.30E+01*
Toluene	µg/L	6,300	>S	>S	220,000									
Trans-1,2-Dichloroethene	µg/L	--	--	--	--									
Trans-1,3-Dichloropropene	µg/L	--	--	--	--									
Trichloroethene	µg/L	3.3	20,000	3,700	430	110		*33*	220		*67*	130		*39*
Trichlorofluoromethane	µg/L	5,200	>S	460,000	160,000									
Vinyl Chloride	µg/L	0.49	5,900	880	960	130		*265*	44		*90*	150	J	*3.06E+02*
Xylenes, Total	µg/L	830	>S	>S	23,000									

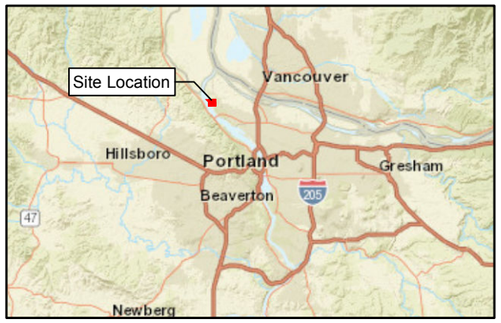
Notes:
D = Dilution
J = Estimated value.
U = The analyte was analyzed for, but not detected.
-- = Not Established

EF = Exceedance factor (calculated if consistuent exceeded indicated screening level)
Shaded = detected result exceeded indicated DEQ RBCs
Sample Type: N = Normal Sample, FD - Field Duplicate

°C = degrees Celsius
mg/L = milligrams per Liter
mV = millivolts
µg/L = micrograms per Liter

µS/cm = microsiemens per centimeter
NTU = Nephelometric Turbidity Units
Screening levels from DEQ Risk-Based Concentrations (May 2018 Update)

Figures



LEGEND

- Northwest Pipe Site Boundary
- Burgard Industrial Park
- Felton Property

N

0 300 600 1,200

Feet

Figure 1. Vicinity Map
Northwest Pipe Company
Portland, Oregon

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\\PDXFPP01\PROJ\NORTHWESTPIPECOMPANY\485880PORTHARBSUP\GIS\MAPFILES\2019\FIGURE2-1_VICINITYMAP.MXD GGEE 10/1/2019 1:51:45 PM

LEGEND

Metals
- Arsenic Exceeds Occupational Worker Scenario RBC

Polycyclic Aromatic Hydrocarbon (PAHs)
- No Exceedance of RBCs
- BaP Exeeds Occupational Worker Scenario RBC

Polychlorinated Biphenyls (PCBs)
- No Exceedance of RBCs
- Exceeds Occupational Worker Scenario RBC*
- Exceeds Construction Worker Scenario RBC*

- Railroad Line
- Northwest Pipe Site Boundary

0 25 50 100
Feet

N

Notes:
BaP = Benzo(a)pyrene
Sample locations represent soil between 0 and 0.5 feet below ground surface.
*See Table 1 for specific PCB Aroclors exceeding RBCs.
Screening values from DEQ Risk-Based Concentrations for soil Ingestion, dermal contact and inhalation. (May 2018 revision)

Figure 2. Exceedances of 2018 DEQ Risk-Based Concentrations (RBCs) in Surface Soil
Northwest Pipe Company
Portland, Oregon

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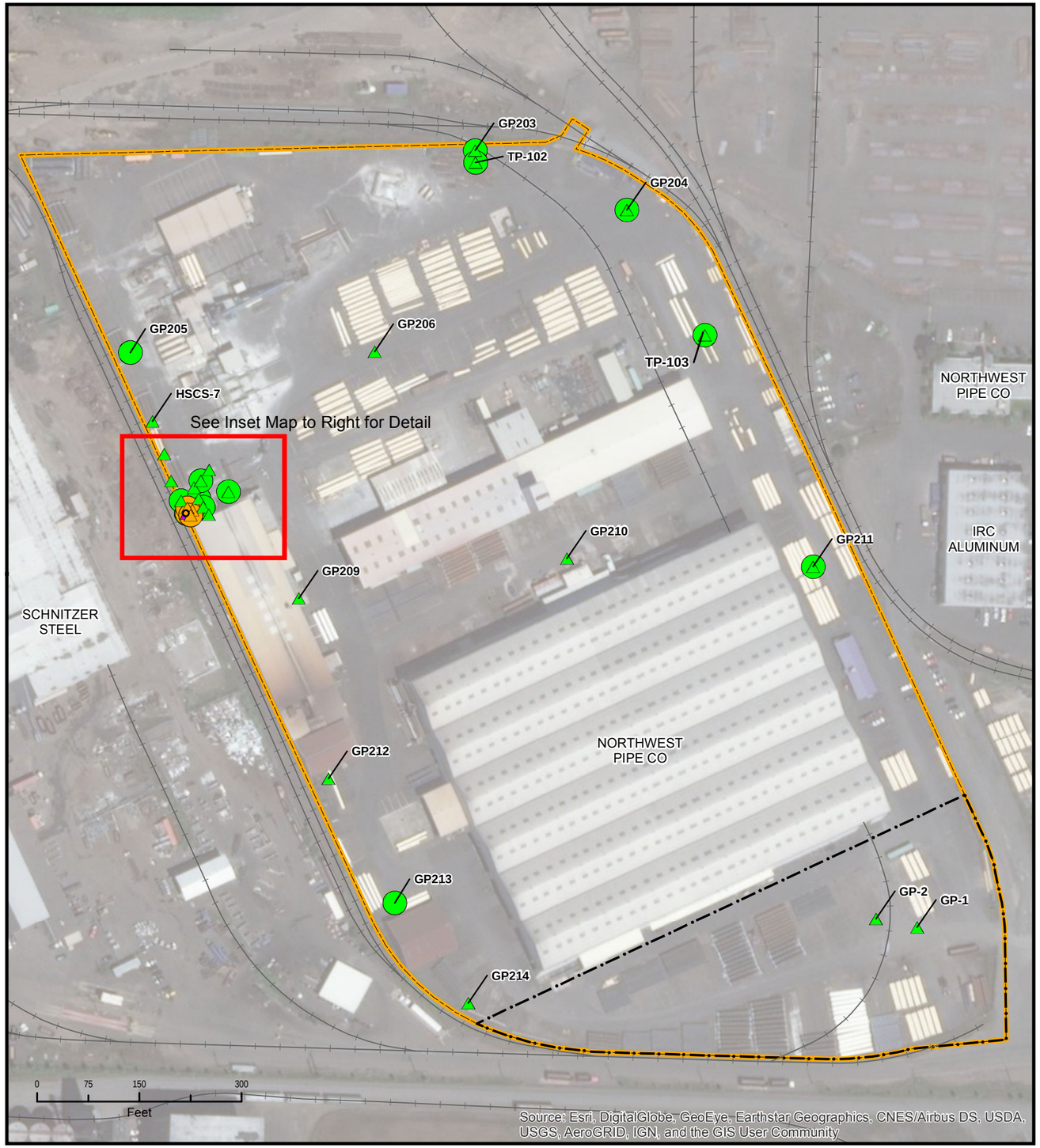

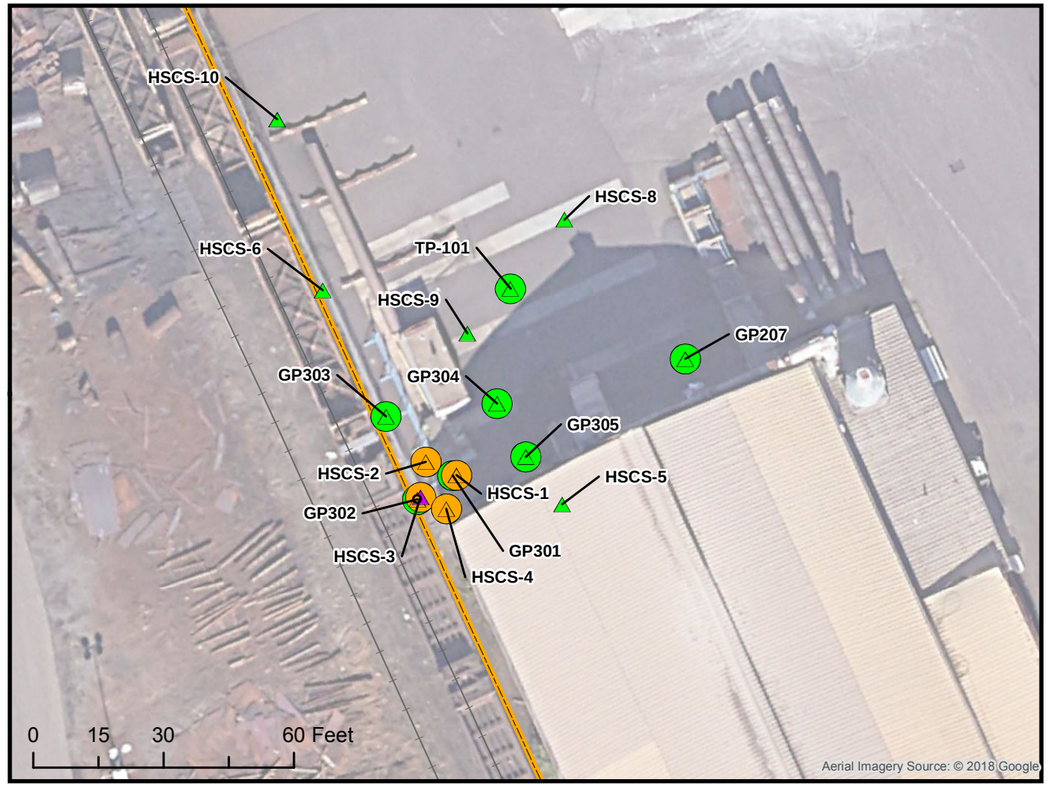

LEGEND

- Arsenic and TPH-Diesel Exceed Occupational Worker Scenario RBC

Polycyclic Aromatic Hydrocarbon (PAHs)

- No Exceedance of RBCs
- Selected PAHs Exceeds Occupational Worker Scenario RBC*
- BaP Exceeds Construction Worker Scenario RBC, Other PAHs Exceed Occupational Worker Scenario RBC*

Polychlorinated Biphenyls (PCBs)

- No Exceedance of RBCs
- Aroclor-1260 and Total PCBs Exceed Occupational Worker Scenario RBC
- Railroad Line
- Leased Property Boundary
- Northwest Pipe Site Boundary

N

Notes:
BaP = Benzo(a)pyrene
Sample locations represent soil 0.5 feet or greater below ground surface.
*See Table 2 for specific PAHs exceeding RBCs.
Screening values from DEQ Risk-Based Concentrations for soil
Ingestion, dermal contact and inhalation. (May 2018 revision)

Figure 3. Exceedances of 2018 DEQ Risk-Based Concentrations (RBCs) in Subsurface Soil
Northwest Pipe Company
Portland, Oregon

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\\COBRA\GIS\PROJECTS\UNIONPACIFICRAILROAD\LARAMIETIEPLANT\MAPFILES\CMMP\FIGURE3_SUBSURFACESOILSAMPLESUMMARYV2.MXD GGEE 11/26/2019 11:31:38 AM

LEGEND

Groundwater Sample

- September, 2001 Production Well
- August, 2002 Geoprobe Sample
- 2003 - Present Monitoring Well Location
- July, 2004 Geoprobe Sample
- September, 2007 Geoprobe Sample
- 2012 - 2013 Monitoring Well Location
- September, 2001 Geoprobe Sample
- Railroad Line
- Leased Property Boundary
- Northwest Pipe Site Boundary

Exceedances of 2018 DEQ Risk-Based Concentrations in Groundwater

- Arsenic
- PAHs
- VOCs
- TPH

Note: Arsenic was detected in groundwater at the small Stained Soil Area in the west-central part of the Site. Arsenic is not a component of Northwest Pipe's operations, nor is it known to have been associated with prior site activities by others. This arsenic likely originated from naturally-occurring minerals that compose the aquifer matrix. While arsenic solubility in groundwater normally is strongly controlled by co-precipitation onto low-solubility iron oxides within the aquifer matrix (Hem 1985), arsenic commonly occurs in western Oregon groundwater where aromatic hydrocarbons are present, because natural biodegradation of hydrocarbons can locally shift groundwater geochemistry, lowering redox conditions and causing precipitated iron and arsenic to enter solution. This effect is highly localized and dissolved arsenic tends to re-precipitate out of solution back onto the aquifer matrix within a short distance away from the affected area.

N

0 75 150 300

Feet

Figure 4. Exceedances of 2018 DEQ Risk-Based Concentrations (RBCs) in Groundwater
Northwest Pipe Company
Portland, Oregon

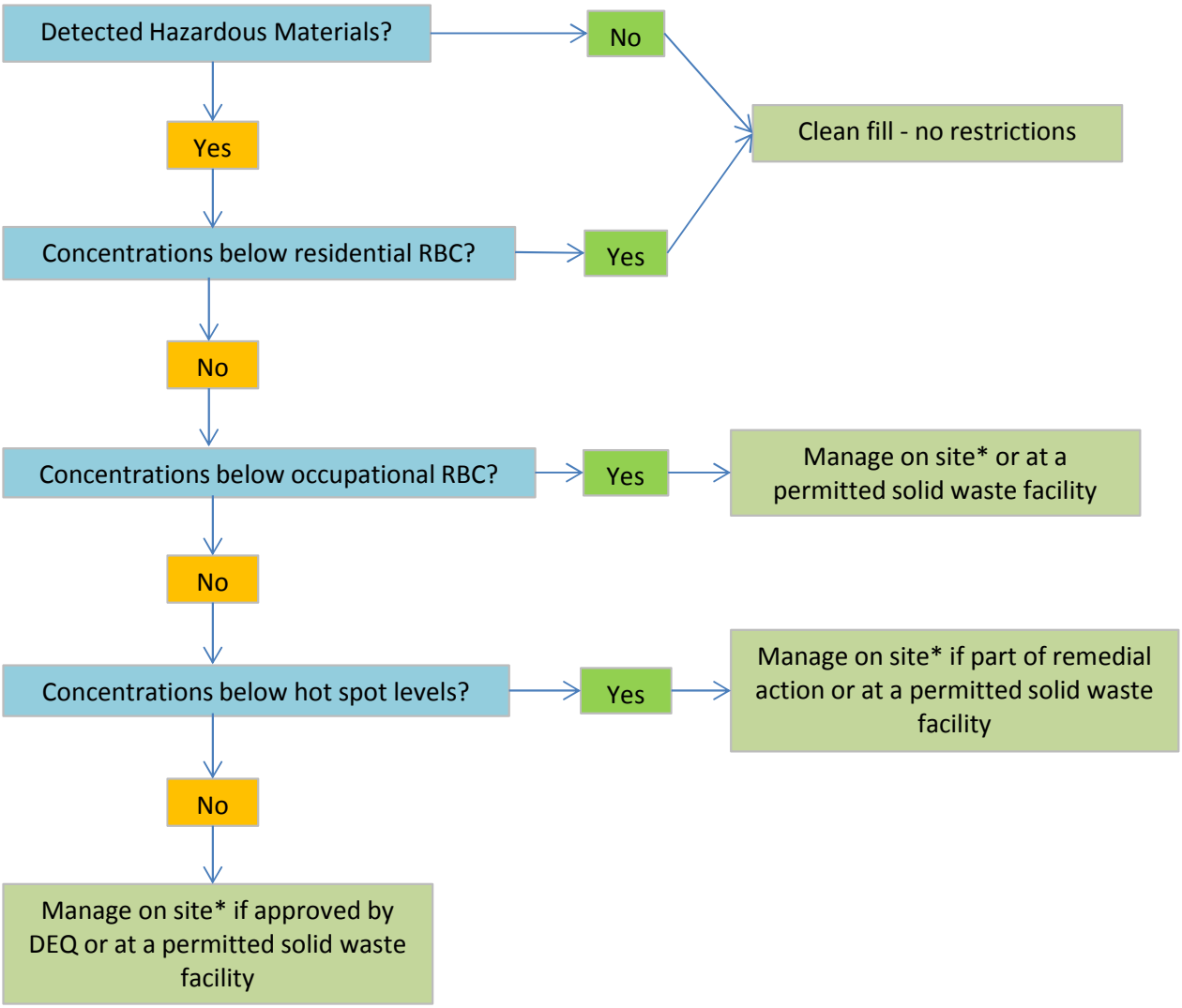
JACOBS

\\PDXFPP01\PROJ\NORTHWESTPIPECOMPANY\485880PORTHARBSUP\GIS\MAPFILES\2019\CMMP\FIGURE4_GROUNDWATERSAMPLESUMMARY.MXD GGEE 10/4/2019 2:56:01 PM

Figure 5

Contaminated Media Management Flow Chart

Northwest Pipe Company CMMP



RBC - DEQ risk based concentration levels

Hot spot - as defined in by DEQ Hot Spot Concentrations (updated May 2018)

*No odors, stains, or evidence of contamination. Media must remain on a contiguous tax lot owned by Northwest Pipe Company.