PNG ENVIRONMENTAL, INC.

TECHNICAL MEMORANDUM

To:	Rob Hood, Oregon Department of Environmental Quality
From:	Samantha Biles, P.E. and Brad Berggren, R.G., P.E.
Date:	March 8, 2022
Subject:	Upland Groundwater and Soil Vapor Monitoring – Summer 2021 East Side Plating Portland, Oregon ECSI #644

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5/1/2022

PNG Environmental, Inc. (PNG) is providing recent monitoring results for groundwater and soil vapor at the East Side Plating Facility located at 8400 SE 26th Place, Portland, Oregon (Figure 1 and Figure 2). In October and November 2020, site characterization activities were completed to supplement previous site data and evaluate potentially contaminated media at the site as requested by the Oregon Department of Environmental Quality (DEQ) under a DEQ Voluntary Cleanup program (VCP) letter agreement. Site characterization activities included expansion of the groundwater monitoring well network, sampling of the expanded groundwater well network, and installation and sampling of a network of soil vapor monitoring points. A Site Characterization Report was submitted to DEQ on May 7, 2021 (PNG 2021). At the request of DEQ, PNG conducted another site-wide groundwater and soil vapor monitoring event in August 2021. The August monitoring event was consistent with the November 2020 event with the intent to evaluate seasonal variation in groundwater and soil vapor quality. This memorandum summarizes the results of the August 2021 upland sampling event for groundwater and soil vapor.

GROUNDWATER MONITORING

The entire monitoring well network (MW-1 through MW-12) was sampled on August 4, 2021. Monitoring activities were consistent with the November 2020 sampling efforts and the DEQ-approved work plan (PNG 2020). A total of 13 samples were collected, including one duplicate sample. Groundwater samples were analyzed for VOCs, total and dissolved Primary Pollutant metals, TPH-Gx, TPH-Dx, cyanide, and dissolved hexavalent chromium. Groundwater elevations are shown on Table 1. Field-measured parameters and laboratory analytical results for the August 2021 event and previous groundwater sampling since 2011 are shown on Tables 2 through 5. In general, the magnitude and frequency of analyte detections were similar between the November 2020 and August 2021 events.

Groundwater Elevation and Flow

Consistent with observations between 2011 and 2014, water level measurements collected during November 2020 and August 2021 indicate the shallow groundwater flow is generally to the west away from Johnson Creek. Wells MW-1 through MW-5 have previous groundwater elevation measurements going back to 2011 (Table 1). Shallow groundwater flow based on groundwater elevations observed in August 2021 is consistent with November 2020 and historic measurements. The predominant groundwater flow direction is to the west away from Johnson

Creek. The groundwater flow direction has been consistent over multiple years of monitoring and across all seasons.

One anomaly was observed in the groundwater elevations measured from the expanded well network in November 2020. A relatively high groundwater level measurement was collected from MW-7 that was not consistent with the groundwater elevations in surrounding wells. Additional depth-to-water measurements collected in December 2020 confirmed the observed anomaly at MW-7. Based on the relatively high groundwater elevations observed at MW-7, there is likely a source of recharge to shallow groundwater in the area of the well. The source of the recharge is currently uncertain. Depth-to-water measurements collected in August 2021 as part of the groundwater monitoring event continue to show the presence of elevated groundwater levels in the vicinity of MW-7 (Figure 3).

From December 2020 to August 2021, the groundwater elevations in monitoring wells at the perimeter of the facility (MW-1, MW-10, MW-11, MW-12) have declined by approximately 0.5 to two feet. These declining groundwater elevations are typical of expected seasonal variation. However, groundwater elevations at MW-7 and nearby MW-8 and MW-9 have increased over this same period. At MW-7 specifically, groundwater elevations in August 2021 are 2.5 feet higher than they were in December 2020, and an estimated seven feet higher than would be expected based on the groundwater elevations observed in perimeter wells.

Since these observed conditions of relatively high groundwater elevations in the vicinity of MW-7 have persisted following several months of negligible precipitation, the source of shallow groundwater recharge does not appear to be stormwater leakage from the roof drain downspout and conveyance line that runs west to east under Plant #2. Also, shallow groundwater recharge near MW-7 does not appear to be related to the concrete floor trench and pipe gallery in Plant #2 that contains piping with collected fluid overflow from the plating basins at the northern end of Plant #2. The piping conveys the collected fluid to the waste water treatment area within the southern half of Plant #2. The concrete floor trench containing the pipe gallery was examined recently (summer 2021) and was dry with no pipe leakage observed. Additional investigation is needed to determine the source of the persistent, elevated groundwater elevations at MW-7.

Metals and Cyanide

Monitoring wells MW-1 through MW-5 have groundwater quality data extending back to their installation in 2011. Consistent with historic data at these locations, during the August 2021 sampling event, most metals were not detected above laboratory reporting limits at these locations (Figure 4). Dissolved copper was detected at MW-4 at a concentration of 8.6 micrograms per liter (ug/L), similar to the historic range for this location (3.4 to 6.4 ug/L). Dissolved arsenic was detected at MW-2 at a concentration of 4.4 ug/L, but was not previously detected at this location. These five wells were installed for monitoring purposes following the nickel-plating solution release and cleanup in 2011 and 2012. The highest nickel concentrations observed in groundwater from these wells occurred in June 2012 at MW-4 (1,320 ug/L). Monitoring Well MW-4 is within the limits of the soil excavation completed in response to the nickel-plating fluid release reported in 2011. Nickel in groundwater appears to be generally decreasing in these wells following the 2012 cleanup activities. The dissolved nickel concentration at MW-4 during the August 2021 monitoring event was 339 ug/L. The dissolved zinc concentration trend in groundwater at MW-4 is similar to the nickel trend at this location, with the highest recorded zinc concentration in June 2012 (866 ug/L) and a generally reducing

trend into 2020 (89 ug/L) and 2021 (167 ug/L). All of the detected metal concentrations were well below the applicable RBCs for groundwater in an excavation.

MW-8 was installed in 2020 at an angle under the northern end of Plant #2 and directly within the footprint of the 2011 nickel-plating solution release. As expected, dissolved nickel was detected at this location with a concentration of 31 ug/L in November 2020 and 19 ug/L in August 2021. MW-8 also had a relatively low detection of arsenic during both sampling events. No metals in groundwater at MW-8 exceed applicable RBCs for groundwater in an excavation.

MW-7 and MW-9 were installed within the footprint of Plant #2 and adjacent to the plating lines. Groundwater samples from MW-7 and MW-9 had relatively low concentrations of several metals including beryllium, cadmium, chromium, and copper. In addition, these locations contained the highest detected concentrations in groundwater of both nickel and zinc across the facility for the 2020 sampling event. Zinc remained highest at these wells in the 2021 sampling event. Due to the relatively high concentrations of zinc, the laboratory dilution during analysis increased the reporting limits for other analytes. Nickel was not detected in either sample during the 2021 sampling event at the increased laboratory reporting limits (Table 3). Concentrations of dissolved zinc at MW-7 and MW-9 were 185,000 ug/L and 222,000 ug/L, respectively. Both wells also had correspondingly elevated field-measured conductivity (Table 2). Although groundwater at MW-7 and MW-9 had elevated concentrations of zinc and possibly nickel (based on 2020 results) relative to the rest of the ESP facility, no metals in groundwater at MW-7 or MW-9 exceed applicable RBCs for groundwater in an excavation.

MW-6 and MW-10 are located to the west of Plant #2, downgradient from most of the facility and adjacent to the western property boundary. Metals in groundwater at both of these wells were predominately nondetect at laboratory reporting limits in 2020 and 2021, with the exception of relatively low concentrations of arsenic, chromium, copper, nickel, and zinc. Metals at MW-11, downgradient from Plant #3, were also predominately nondetect with the exception of dissolved nickel at 8.6 ug/L and dissolved copper at 5.6 ug/L. No metals at MW-6, MW-10, or MW-11 exceed applicable RBCs for groundwater in an excavation.

MW-12 is on the northern portion of the ESP property, adjacent to and downgradient of Johnson Creek. Dissolved nickel and zinc concentrations in groundwater at this location were 9.9 and 56 ug/L, respectively, in 2020. Dissolved nickel was 6.8 ug/L in 2021. Dissolved zinc was nondetect in groundwater at the laboratory reporting limit in 2021 at this location. These nickel and zinc concentrations in groundwater at MW-12 are well below the RBC for groundwater in an excavation.

Dissolved hexavalent chromium was analyzed in groundwater for the first time at the site during the 2020 sampling event. Dissolved hexavalent chromium was detected in groundwater at seven of the 12 well locations in 2020 and at six of the 12 well locations in 2021. Most recently, dissolved hexavalent chromium was detected in groundwater samples at concentrations ranging from 0.035 to 5.3 ug/L. Consistent with the 2020 sampling event, the detected hexavalent chromium concentrations in 2021 were also sporadically distributed across the site and do not appear to indicate a localized source (Figure 4). All of these detected concentrations in groundwater were well below the applicable RBC for groundwater in an excavation.

Cyanide was also analyzed for the first time in groundwater at the site in 2020. Cyanide was only detected in one groundwater sample in 2020 (7.1 ug/L at MW-9) and not detected in 2021. The cyanide concentration in groundwater does not exceed the applicable RBC for groundwater in an excavation.

TPH and VOCs

Consistent with the November 2020 event, groundwater samples from all wells were analyzed for gasoline (GRO), diesel (DRO), and residual range organics (RRO) (Table 4). RRO was not detected during the 2020 sampling event, and was only detected in one sample during the 2021 sampling event (269 ug/L at MW-6). DRO was detected at six of the 12 wells in 2020, but only two of the 12 wells in 2021. DRO detected concentrations range from 107 to 371 ug/L. Most recently, similar levels of GRO (112 to 225 ug/L) were detected at three of the 12 wells. The highest detection of GRO in both the 2020 and 2021 sampling events was at MW-2. MW-2 is located immediately downgradient of the former gasoline underground storage tanks (USTS) abandoned in 1990. Low concentrations of benzene, ethylbenzene, and toluene – contaminants typically associated with petroleum fuel releases – were also detected exclusively at MW-2 during the 2020 sampling event, but nondetect at all wells in 2021. The extent of these petroleum-related compounds in groundwater continues to be limited to the area of the former gasoline USTs since none of these compounds are detected in groundwater samples from the downgradient wells MW-3, MW-4, MW-5, and MW-6.

The only PCE detection during the 2021 groundwater sampling event was in monitoring well MW-3 at a concentration of 1.1 ug/L. This concentration in groundwater is consistent with historic results since 2014 at this location.

None of the TPH or VOC concentrations detected in groundwater exceed applicable RBCs for groundwater in an excavation.

SUB-SLAB SOIL VAPOR

On August 3, 2021, sub-slab soil gas was collected from all nine vapor pin locations (VP-1 through VP-9). A total of 10 samples were collected, including one duplicate sample. All soil gas samples were analyzed for VOCs and TPH-G (Table 5).

In November 2020, gasoline or GRO was detected at all nine locations at concentrations ranging from 170 to 820 microgram per cubic meter [ug/m^3] (Figure 5). Similarly, in August 2021 gasoline was detected at eight of nine locations at concentrations ranging from 82 to 570 ug/m^3. Gasoline-related VOCs including benzene, toluene, ethylbenzene, and xylenes were also detected at a majority of soil vapor samples from locations across the site. However, all of these detected concentrations are well below the applicable occupational RBCs for vapor intrusion into buildings.

In both the November 2020 and August 2021 sampling events, PCE was detected in all soil gas samples at low concentrations ranging from 2.0 to 350 ug/m^3. During both events, the highest concentration was detected at VP-4 located in the northern half of Plant #2. TCE was detected at six locations (VP-4 through VP-9) at concentrations ranging from 0.55 to 3.6 ug/m^3 in November 2020 and 1.3 to 6.9 ug/m^3 in August 2021. Other VOCs including 1,1-Dichloroethene, and 1,1-Dichloroethane were also detected at relatively low levels in a majority of samples from VP-4 through VP-9 (Plants #2 and #3). Additional VOCs detected less frequently at the ESP site include chloroform, 1,1,1-Trichloroethane, freon 11, ethanol, and 1-Propanol. No VOC concentrations in the soil gas samples exceed related occupational RBCs for vapor intrusion into buildings.

SUMMARY AND CONCLUSIONS

- Groundwater and soil vapor were sampled at the East Side Plating facility in August 2021. The 2021 sampling locations, sampling methodology, and laboratory analyses were consistent with the November 2020 sampling event.
- One anomaly was observed in the groundwater levels measured from the expanded well network in November 2020. A relatively high groundwater level measurement was collected from MW-7 that was not consistent with the groundwater elevations in surrounding wells. Based on the relatively high groundwater elevation at MW-7 in November 2020, there was likely a source of recharge to shallow groundwater in the area of that well. Depth-to-water measurements collected in August 2021 as part of the subsequent groundwater monitoring event continued to demonstrate the presence of elevated groundwater levels in the vicinity of MW-7. Since these conditions of relatively high groundwater levels in the vicinity of MW-7 have persisted following several months of negligible precipitation, the source of shallow groundwater recharge does not appear to be stormwater leakage from the roof drain downspout and conveyance line that runs west to east under Plant #2. Also, shallow groundwater recharge near MW-7 does not appear to be related to the concrete floor trench and pipe gallery in Plant #2 that contains piping with collected fluid overflow from the plating basins at the northern end of Plant #2. The piping conveys the collected fluid to the waste water treatment area within the southern half of Plant #2. The concrete floor trench containing the pipe gallery was examined recently (summer 2021) and was dry with no pipe leakage observed. Additional investigation is needed to determine the source of the persistent, elevated groundwater elevations at MW-7.
- Groundwater quality results are generally positive, consistent with the 2020 site characterization activities, and no detections exceed applicable occupational, construction worker, or excavation worker RBCs.
    - Groundwater at MW-7 and MW-9 had elevated concentrations of zinc and possibly nickel (based on 2020 results) relative to the rest of the ESP facility. However, no metal concentrations in groundwater at ESP exceed applicable RBCs for groundwater in an excavation.
    - Dissolved hexavalent chromium was analyzed for the first time at the site during the 2020 sampling event. Despite sporadic detections of hexavalent detections across the site, all of these detected concentrations were well below the applicable RBC for groundwater in an excavation.
    - Cyanide was also analyzed for the first time at the site in 2020. Cyanide was only detected in one groundwater sample in 2020 (7.1 ug/L at MW-9) and not detected in 2021. The cyanide concentration detected in groundwater does not exceed the applicable RBC for groundwater in an excavation.
    - The TPH or VOC concentrations detected in groundwater during 2021 were generally consistent with the 2020 concentrations and none exceed applicable RBCs for groundwater in an excavation.
    - Monitoring wells MW-3, MW-5, MW-6, MW-9 and MW-10 are adjacent to the western property boundary and represent locations downgradient from Plant #2 and Plant #3 operations. No exceedances of applicable occupational,

construction worker, or occupational worker RBCs were observed in groundwater samples from these downgradient wells.

- In November 2020, gasoline or GRO was detected at all nine vapor monitoring point locations. Similarly, in August 2021 gasoline was detected at eight of nine locations. Gasoline-related VOCs including benzene, toluene, ethylbenzene, and xylenes were also detected at a majority of soil vapor samples across the site. However, all of these detected concentrations are well below the occupational RBCs for vapor intrusion into buildings. No VOC concentrations in the soil gas samples exceed applicable occupational RBCs for vapor intrusion into buildings.
- The characterization activities completed in 2020 focused on potential source areas involving former releases or portions of the ESP facility associated with plating operations and chemical storage (PNG 2021). The 2020 characterization activities did not identify source areas with substantially elevated concentrations in soil. In addition, the sub-slab soil gas and groundwater samples collected in November 2020 did not identify any substantial sources of soil and/or groundwater contamination at the ESP facility. The August 2021 soil gas and groundwater analytical results were generally consistent with the November 2020 results and support this conclusion.

ATTACHMENTS

Table 1 – Groundwater Elevations
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Figure 2 – Site Features
Figure 3 – Groundwater Elevation Contours – August 4, 2021
Figure 4 – Select Metals in Groundwater
Figure 5 – Gasoline and BTEX in Soil Vapor
Figure 6 – Chlorinated VOCs in Soil Vapor

REFERENCES

PNG. 2020 (September 11). *Site Characterization Work Plan.* PNG Environmental, Inc.

PNG. 2021 (May 7). *Site Characterization Report.* PNG Environmental, Inc.

TABLES

Table 1
Groundwater Elevations
East Side Plating
Portland, Oregon

Well Identification	TOC Elevation (feet MSL)	Monitoring Summary		
		Date Measured	Depth to Water (feet below TOC)	Groundwater Elevation (feet MSL)
MW-1	63.71	12/20/2011	9.68	54.03
		03/28/2012	8.95	54.76
		06/21/2012	9.31	54.40
		09/14/2012	10.13	53.58
		12/13/2012	9.01	54.70
		02/27/2014	9.25	54.46
		10/03/2018	10.18	53.53
		11/17/2020	9.23	54.48
		12/16/2020	9.33	54.38
		08/04/2021	10.14	53.57
MW-2	64.48	12/20/2011	10.41	54.07
		03/28/2012	9.06	55.42
		06/21/2012	6.69	57.79
		09/14/2012	11.33	53.15
		12/13/2012	9.98	54.50
		02/27/2014	9.77	54.71
		10/03/2018	10.98	53.50
		11/17/2020	10.88	53.60
		12/16/2020	10.66	53.82
		08/04/2021	10.02	54.46
MW-3	63.90	12/20/2011	12.67	51.23
		03/28/2012	11.71	52.19
		06/21/2012	12.12	51.78
		09/14/2012	13.00	50.90
		12/13/2012	11.99	51.91
		02/27/2014	12.31	51.59
		10/03/2018	13.44	50.46
		11/17/2020	12.83	51.07
		12/16/2020	12.89	51.01
		08/04/2021	12.98	50.92
MW-4	63.94	12/20/2011	12.28	51.66
		03/28/2012	11.09	52.85
		06/21/2012	11.65	52.29
		09/14/2012	12.64	51.30
		12/13/2012	11.37	52.57
		02/27/2014	11.76	52.18
		10/03/2018	12.93	51.01
		11/17/2020	12.29	51.65
		12/16/2020	12.39	51.55
		08/04/2021	12.36	51.58
MW-5	64.21	12/20/2011	12.94	51.27
		03/28/2012	11.99	52.22
		06/21/2012	12.43	51.78
		09/14/2012	13.31	50.90
		12/13/2012	12.26	51.95

Table 1
Groundwater Elevations
East Side Plating
Portland, Oregon

Well Identification	TOC Elevation (feet MSL)	Monitoring Summary		
		Date Measured	Depth to Water (feet below TOC)	Groundwater Elevation (feet MSL)
MW-5 (cont'd)		02/27/2014	12.57	51.64
		10/03/2018	13.70	50.51
		11/17/2020	13.08	51.13
		12/16/2020	13.15	51.06
		08/04/2021	13.30	50.91
MW-6	64.65	11/17/2020	12.36	52.29
		12/16/2020	12.63	52.02
		08/04/2021	12.52	52.13
MW-7	64.53	11/17/2020	6.54	57.99
		12/16/2020	6.52	58.01
		08/04/2021	3.96	60.57
MW-8[a]	64.30	11/17/2020	8.35	51.11
		12/16/2020	8.13	51.31
		08/04/2021	6.82	52.51
MW-9	64.64	11/17/2020	11.85	52.79
		12/16/2020	11.75	52.89
		08/04/2021	11.09	53.55
MW-10	65.19	11/17/2020	8.51	56.68
		12/16/2020	7.80	57.39
		08/04/2021	9.08	56.11
MW-11	64.27	11/17/2020	4.98	59.29
		12/16/2020	6.31	57.96
		08/04/2021	9.59	54.68
MW-12	63.74	11/17/2020	7.64	56.10
		12/16/2020	7.77	55.97
		08/04/2021	9.14	54.60

Notes:
[a] MW-8 is installed at a 24 degree angle.
MSL = Mean sea level
TOC = Top of well casing

Table 2
Field-Measured Water Quality Parameters
East Side Plating
Portland, Oregon

Well Name	Date	Temperature (°F)	Dissolved Oxygen (mg/L)	Oxidation Reduction Potential (mV)	pH	Specific Conductance (mS/cm)
MW-1	02/27/2014	51.3	1.97	-202	7.3	0.35
	10/25/2018	64.8	1.55	-67	7.6	0.31
	11/17/2020	61.5	0.49	-43	7.2	0.36
	08/04/2021	66.8	0.41	3.7	8.0	0.93
MW-2	02/27/2014	54.7	1.56	-176	7.0	0.64
	11/17/2020	61.2	0.40	-8.3	7.0	0.40
	08/04/2021	68.4	1.11	-54	7.3	0.43
MW-3	02/27/2014	51.7	5.40	6.0	6.6	0.29
	10/25/2018	59.0	3.28	-26	7.5	0.25
	11/17/2020	58.6	0.72	53	6.7	0.28
	08/04/2021	60.4	2.20	47	7.4	0.35
MW-4	11/17/2020	61.3	0.37	56	6.7	0.50
	08/04/2021	67.8	1.16	-11	7.1	0.37
MW-5	02/27/2014	49.7	4.90	27	7.0	0.24
	11/17/2020	59.0	0.56	56	7.0	0.21
	08/04/2021	64.8	1.64	31	7.3	0.23
MW-6	11/17/2020	54.8	0.60	256	8.5	0.43
	08/04/2021	56.4	0.68	159	9.4	0.33
MW-7	11/17/2020	61.4	0.47	340	6.3	4.16
	08/04/2021	63.4	0.52	274	7.3	4.18
MW-8	11/17/2020	60.6	0.35	32	7.1	0.90
	08/04/2021	64.2	1.23	-15	7.2	0.89
MW-9	11/17/2020	58.7	1.47	306	5.7	4.74
	08/04/2021	64.6	0.76	316	5.3	5.11
MW-10	11/17/2020	54.8	6.15	308	7.5	0.16
	08/04/2021	57.5	3.44	292	7.2	0.27
MW-11	11/17/2020	57.7	0.92	300	7.1	0.29
	08/04/2021	71.3	1.00	0.8	7.2	0.28
MW-12	11/17/2020	54.8	3.37	320	7.0	0.22
	08/04/2021	67.6	1.16	-30	7.5	0.29

Notes:
mS/cm = Millisiemens per centimeter
F = degrees Fahrenheit
mg/L = Milligrams per liter
mV = Millivolts

Table 3
Groundwater Analytical Results - Total and Dissolved Metals and Cyanide (ug/L)
East Side Plating
Portland, Oregon

Sample ID	Sample Date	Total Antimony	Dissolved Antimony	Total Arsenic	Dissolved Arsenic	Total Beryllium	Dissolved Beryllium	Total Cadmium	Dissolved Cadmium	Dissolved Hexavalent Chromium	Total Chromium	Dissolved Chromium	Total Copper	Dissolved Copper	Total Lead	Dissolved Lead	Total Mercury	Dissolved Mercury	Total Nickel	Dissolved Nickel
B-1	10/25/2018	2.0 U	2.0 U	190	2.0 U	20	2.0 U	7.8	2.0 U	-	297	10 U	972	10 U	960	2.0 U	0.20 U	0.20 U	839	12
B-2	10/25/2018	2.0 U	2.0 U	280	2.0 U	45	2.0 U	40	2.0 U	-	2,750	10 U	3,550	10 U	1,160	2.0 U	0.20 U	0.20 U	2,330	10 U
B-3	10/25/2018	2.0 U	2.0 U	86	6.5	16	100 U	237	237	-	2,910	1,500	4,610	3,660	215	2.0 U	0.20 U	0.20 U	6,790	6,140
B-4	10/25/2018	2.0 U	2.0 U	19	2.6	2.0 U	2.0 U	2.0 U	2.0 U	-	35	10 U	89	10 U	22	2.0 U	0.20 U	0.20 U	52	10 U
B-5	10/25/2018	2.0 U	2.0 U	29	2.1	5.4	2.0 U	3.7	2.0 U	-	110	10 U	444	10 U	259	2.0 U	0.20 U	0.20 U	119	10 U
B-6	10/25/2018	2.0 U	2.0 U	23	2.0 U	3.3	2.0 U	2.0 U	2.0 U	-	162	10 U	252	10 U	93	2.0 U	0.20 U	0.20 U	144	10 U
MW-1	12/20/2011	-	-	-	-	-	-	-	-	-	-	2.0 U	-	4.0 U	-	1.0 U	-	-	-	2.0 U
	03/28/2012	-	-	-	-	-	-	-	-	-	-	2.0 U	-	4.0 U	-	1.0 U	-	-	-	2.1
	06/21/2012	-	-	-	-	-	-	-	-	-	-	2.0 U	-	2.0 U	-	1.0 U	-	-	-	2.0 U
	09/14/2012	-	-	-	-	-	-	-	-	-	-	2.0 U	-	2.0 U	-	1.0 U	-	-	-	2.0 U
	12/13/2012	-	-	-	-	-	-	-	-	-	-	2.0 U	-	2.0 U	-	1.0 U	-	-	-	2.0 U
	10/25/2018	2.0 U	2.0 U	2.3	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	-	10 U	10 U	10 U	10 U	2.0 U	2.0 U	0.20 U	0.20 U	10 U	10 U
	11/17/2020	4.0 U	4.0 U	2.0 U	2.0 U	2.0 U	2.0 U	1.0 U	1.0 U	0.020 U	2.0 U	2.0 U	5.0 U	5.0 U	5.0 U	5.0 U	0.20 U	0.20 U	2.0 U	2.0 U
	08/04/2021	4.0 U	4.0 U	2.0 U	2.0 U	2.0 U	2.0 U	1.0 U	1.0 U	0.020 UJ	2.0 U	3.0	5.0 U	5.0 U	2.0 U	2.0 U	0.20 U	0.20 U	6.5	7.8
MW-2	12/20/2011	-	-	-	-	-	-	-	-	-	-	2.0 U	-	4.0 U	-	1.0 U	-	-	-	8.4
	03/28/2012	-	-	-	-	-	-	-	-	-	-	2.0 U	-	4.0 U	-	1.0 U	-	-	-	3.5
	06/21/2012	-	-	-	-	-	-	-	-	-	-	2.0 U	-	2.0 U	-	1.0 U	-	-	-	6.3
	09/14/2012	-	-	-	-	-	-	-	-	-	-	2.0 U	-	2.0 U	-	1.0 U	-	-	-	6.0
	12/13/2012	-	-	-	-	-	-	-	-	-	-	2.0 U	-	2.0 U	-	1.0 U	-	-	-	14
	11/17/2020	4.0 U	4.0 U	2.6	2.0 U	2.0 U	2.0 U	1.0 U	1.0 U	0.020 U	2.0 U	2.0 U	5.0 U	5.0 U	5.0 U	5.0 U	0.20 U	0.20 U	2.0 U	2.0 U
	08/04/2021	4.0 U	4.0 U	4.5	4.4	2.0 U	2.0 U	1.0 U	1.0 U	0.020 UJ	2.0 U	2.0 U	5.0 U	5.0 U	2.0 U	2.0 U	0.20 U	0.20 U	2.0 U	2.4
MW-3	12/20/2011	-	-	-	-	-	-	-	-	-	-	2.0 U	-	88	-	1.0 U	-	-	-	5.1
	03/28/2012	-	-	-	-	-	-	-	-	-	-	2.0 U	-	4.0 U	-	1.0 U	-	-	-	17
	06/21/2012	-	-	-	-	-	-	-	-	-	-	2.0 U	-	2.0 U	-	1.0 U	-	-	-	7.0
	09/14/2012	-	-	-	-	-	-	-	-	-	-	2.0 U	-	2.0 U	-	1.0 U	-	-	-	5.1
	12/13/2012	-	-	-	-	-	-	-	-	-	-	2.0 U	-	2.0 U	-	1.0 U	-	-	-	5.7
	10/25/2018	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	-	10 U	10 U	10 U	10 U	2.0 U	2.0 U	0.20 U	0.20 U	30	10 U
	11/17/2020	4.0 U	4.0 U	2.0 U	2.0 U	2.0 U	2.0 U	1.0 U	1.0 U	0.41	2.3	2.0 U	5.0 U	5.0 U	5.0 U	5.0 U	0.20 U	0.20 U	4.1	2.0 U
MW-99 (duplicate)	11/17/2020	4.0 U	4.0 U	2.0 U	2.0 U	2.0 U	2.0 U	1.0 U	1.0 U	0.45	2.9	2.0 U	9.6 J	5.0 U	5.0 U	5.0 U	0.20 U	0.20 U	4.7	2.0 U
	08/04/2021	4.0 U	4.0 U	2.0 U	2.0 U	2.0 U	2.0 U	1.0 U	1.0 U	0.48 J	2.2	2.0 U	5.0 U	5.0 U	2.0 U	2.0 U	0.20 U	0.20 U	11	8.2
MW-99 (duplicate)	08/04/2021	4.0 U	4.0 U	2.0 U	2.0 U	2.0 U	2.0 U	1.0 U	1.0 U	0.46 J	2.2	2.0 U	6.4 J	5.0 U	2.0 U	2.0 U	0.20 U	0.20 U	11	8.1
MW-4	12/20/2011	-	-	-	-	-	-	-	-	-	-	2.2	-	4.0 U	-	1.0 U	-	-	-	6.7
	03/28/2012	-	-	-	-	-	-	-	-	-	-	2.0 U	-	5.0	-	1.0 U	-	-	-	996
	06/21/2012	-	-	-	-	-	-	-	-	-	-	2.0 U	-	6.2	-	1.0 U	-	-	-	1,320
	09/14/2012	-	-	-	-	-	-	-	-	-	-	2.0 U	-	3.4	-	1.0 U	-	-	-	128
	12/13/2012	-	-	-	-	-	-	-	-	-	-	2.0 U	-	6.4	-	1.0 U	-	-	-	595
	11/17/2020	4.0 U	4.0 U	2.0 U	2.0 U	2.0 U	2.0 U	1.0 U	1.0 U	0.025	2.0 U	2.0 U	5.0 U	5.1	5.0 U	5.0 U	0.20 U	0.20 U	287	231
	08/04/2021	4.0 U	4.0 U	2.0 U	2.0 U	2.0 U	2.0 U	1.0 U	1.0 U	0.057 J	2.0 U	2.0 U	8.0 J	8.6	2.0 U	2.0 U	0.20 U	0.20 U	316	339
MW-5	12/20/2011	-	-	-	-	-	-	-	-	-	-	2.5	-	4.0 U	-	1.0 U	-	-	-	6.5
	03/28/2012	-	-	-	-	-	-	-	-	-	-	2.0 U	-	4.0 U	-	1.0 U	-	-	-	2.5
	06/21/2012	-	-	-	-	-	-	-	-	-	-	2.0 U	-	2.0 U	-	1.0 U	-	-	-	3.4
	09/14/2012	-	-	-	-	-	-	-	-	-	-	2.0 U	-	2.8	-	1.0 U	-	-	-	2.1
	12/13/2012	-	-	-	-	-	-	-	-	-	-	2.0 U	-	2.0 U	-	1.0 U	-	-	-	2.2
	11/17/2020	4.0 U	4.0 U	2.0 U	2.0 U	2.0 U	2.0 U	1.0 U	1.0 U	0.48	2.0 U	2.0 U	5.0 U	5.0 U	5.0 U	5.0 U	0.20 U	0.20 U	4.9	4.5
	08/04/2021	4.0 U	4.0 U	2.0 U	2.0 U	2.0 U	2.0 U	1.0 U	1.0 U	0.28 J	2.0 U	2.0 U	5.0 U	5.0 U	2.0 U	2.0 U	0.20 U	0.20 U	12	10
MW-6	11/17/2020	4.0 U	4.0 U	2.2	2.0 U	2.0 U	2.0 U	1.0 U	1.0 U	0.041	4.9	2.0 U	6.8 J	5.0 U	5.0 U	5.0 U	0.20 U	0.20 U	5.9	2.0 U
	08/04/2021	4.0 U	4.0 U	5.6	2.0 U	2.0 U	2.0 U	1.0 U	1.0 U	0.035 J	12	2.0 U	21	5.0 U	3.7	2.0 U	0.20 U	0.20 U	9.9	2.0 U
MW-7	11/17/2020	4.0 U	4.0 U	2.0 U	2.0 U	4.7	4.2	19	18	0.020 U	2.0 U	2.0 U	75	67	5.0 U	5.0 U	0.20 U	0.20 U	867	877
	08/04/2021	4.0 U	4.0 U	2.0 U	2.0 U	5.6	5.6	16	17	0.020 UJ	2.0 U	3.9	139	136	2.0 U	2.0 U	0.20 U	0.20 U	2,000 U	2,000 U
MW-8	11/17/2020	4.0 U	4.0 U	3.1	2.0 U	2.0 U	2.0 U	1.0 U	1.0 U	0.020 U	2.0 U	2.0 U	5.0 U	5.0 U	5.0 U	5.0 U	0.20 U	0.20 U	32	31
	08/04/2021	4.0 U	4.0 U	2.1	3.2	2.0 U	2.0 U	1.0 U	1.0 U	0.020 UJ	2.0 U	2.0 U	5.0 U	5.0 U	2.0 U	2.0 U	0.20 U	0.20 U	16	19
MW-9	11/17/2020	20 U	4.0 U	10 U	2.0 U	10 U	6.3	55	45	0.020 U	18	6.3	110	85	25 U	5.0 U	0.20 U	0.20 U	1,400	1,130
	08/04/2021	4.0 U	4.0 U	2.0 U	2.0 U	8.3	8.7	50	51	0.020 UJ	10,000 U	10,000 U	25,000 U	25,000 U	14	17	0.20 U	0.20 U	10,000 U	10,000 U
MW-10	11/17/2020	20 U	4.0 U	10 U	2.0 U	10 U	2.0 U	5.0 U	1.0 U	6.5	12	7.4	25 U	5.0 U	25 U	5.0 U	0.20 U	0.20 U	10 U	2.1
	08/04/2021	4.0 U	4.0 U	2.0 U	2.0 U	2.0 U	2.0 U	1.0 U	1.0 U	5.3 J	7.8	5.5	5.0 U	5.0 U	2.0 U	2.0 U	0.20 U	0.20 U	3.1	2.2

Table 3
Groundwater Analytical Results - Total and Dissolved Metals and Cyanide (ug/L)
East Side Plating
Portland, Oregon

Sample ID	Sample Date	Total Antimony	Dissolved Antimony	Total Arsenic	Dissolved Arsenic	Total Beryllium	Dissolved Beryllium	Total Cadmium	Dissolved Cadmium	Dissolved Hexavalent Chromium	Total Chromium	Dissolved Chromium	Total Copper	Dissolved Copper	Total Lead	Dissolved Lead	Total Mercury	Dissolved Mercury	Total Nickel	Dissolved Nickel
MW-11	11/17/2020	4.0 U	4.0 U	2.0 U	2.0 U	2.0 U	2.0 U	1.0 U	1.0 U	0.028	2.0 U	2.0 U	5.0 U	5.0 U	5.0 U	5.0 U	0.20 U	0.20 U	9.3	10
	08/04/2021	4.0 U	4.0 U	2.0 U	2.0 U	2.0 U	2.0 U	1.0 U	1.0 U	0.046 J	2.0 U	2.0 U	5.5 J	5.6	2.0 U	2.0 U	0.20 U	0.20 U	7.4	8.6
MW-12	11/17/2020	4.0 U	4.0 U	2.0 U	2.0 U	2.0 U	2.0 U	1.0 U	1.0 U	0.026	2.0 U	2.0 U	5.4 J	5.0 U	5.0 U	5.0 U	0.20 U	0.20 U	9.6	9.9
	08/04/2021	4.0 U	4.0 U	2.0 U	2.0 U	2.0 U	2.0 U	1.0 U	1.0 U	0.020 UJ	2.0 U	2.0 U	5.0 U	5.0 U	2.0 U	2.0 U	0.20 U	0.20 U	6.1	6.8
DEQ RBC Screening Level Criteria for Groundwater[a]																				
Ingestion/Inhalation from Tapwater																				
Occupational		NA	NA	0.31	0.31	330	330	160	160	0.90	250,000	250,000	6,500	6,500	15	15	49	49	3,300	3,300
Volatilization to Outdoor Air																				
Occupational		NA	NA	NA	NA	NA	NA	NA	NA	NV	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vapor Intrusion into Buildings																				
Occupational		NA	NA	NA	NA	NA	NA	NA	NA	NV	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
GW in an Excavation																				
Construction/Excavation		NA	NA	6,300	6,300	270,000	270,000	130,000	130,000	9,400	>S / 9,400	>S / 9,400	5,400,000	5,400,000	>S	>S	>S	>S	>S	>S

Table 3
Groundwater Analytical Results - Total and Dissolved Metals and Cyanide (ug/L)
East Side Plating
Portland, Oregon

Sample ID	Sample Date	Total Selenium	Dissolved Selenium	Total Silver	Dissolved Silver	Total Thallium	Dissolved Thallium	Total Zinc	Dissolved Zinc	Total Cyanide
B-1	10/25/2018	10 U	10 U	5.0 U	5.0 U	7.1	2.0 U	2,700	50 U	-
B-2	10/25/2018	50 U	10 U	25 U	5.0 U	9.7	2.0 U	15,100	50 U	-
B-3	10/25/2018	10 U	500 U	5.0 U	250 U	3.7	2.0 U	1,390,000	1,350,000	-
B-4	10/25/2018	10 U	10 U	5.0 U	5.0 U	2.0 U	2.0 U	178	50 U	-
B-5	10/25/2018	10 U	10 U	5.0 U	5.0 U	2.0 U	2.0 U	358	50 U	-
B-6	10/25/2018	10 U	10 U	5.0 U	5.0 U	2.0 U	2.0 U	351	50 U	-
MW-1	12/20/2011	-	-	-	1.0 U	-	-	-	4.0 U	-
	03/28/2012	-	-	-	-	-	-	-	4.0 U	-
	06/21/2012	-	-	-	-	-	-	-	4.0 U	-
	09/14/2012	-	-	-	-	-	-	-	4.0 U	-
	12/13/2012	-	-	-	-	-	-	-	4.0 U	-
	10/25/2018	10 U	10 U	5.0 U	5.0 U	2.0 U	2.0 U	50 U	50 U	-
	11/17/2020	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	25 U	25 U	5.0 U
	08/04/2021	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	25 U	25 U	5.0 UJ
MW-2	12/20/2011	-	-	-	1.0 U	-	-	-	5.2	-
	03/28/2012	-	-	-	-	-	-	-	4.0 U	-
	06/21/2012	-	-	-	-	-	-	-	4.0 U	-
	09/14/2012	-	-	-	-	-	-	-	4.0 U	-
	12/13/2012	-	-	-	-	-	-	-	4.0 U	-
	11/17/2020	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	25 U	25 U	5.0 UJ
	08/04/2021	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	25 U	25 U	5.0 UJ
MW-3	12/20/2011	-	-	-	1.0 U	-	-	-	4.0 U	-
	03/28/2012	-	-	-	-	-	-	-	4.0 U	-
	06/21/2012	-	-	-	-	-	-	-	4.0 U	-
	09/14/2012	-	-	-	-	-	-	-	4.0 U	-
	12/13/2012	-	-	-	-	-	-	-	4.0 U	-
	10/25/2018	10 U	10 U	5.0 U	5.0 U	2.0 U	2.0 U	50 U	50 U	-
	11/17/2020	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	25 U	25 U	5.0 UJ
MW-99 (duplicate)	11/17/2020	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	25 U	25 U	5.0 UJ
	08/04/2021	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	25 U	25 U	5.0 UJ
MW-99 (duplicate)	08/04/2021	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	25 U	25 U	5.0 UJ
MW-4	12/20/2011	-	-	-	1.0 U	-	-	-	4.0 U	-
	03/28/2012	-	-	-	-	-	-	-	621	-
	06/21/2012	-	-	-	-	-	-	-	866	-
	09/14/2012	-	-	-	-	-	-	-	87	-
	12/13/2012	-	-	-	-	-	-	-	322	-
	11/17/2020	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	131	89	5.0 UJ
	08/04/2021	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	148	167	5.0 UJ
MW-5	12/20/2011	-	-	-	1.0 U	-	-	-	5.2	-
	03/28/2012	-	-	-	-	-	-	-	4.0 U	-
	06/21/2012	-	-	-	-	-	-	-	4.0 U	-
	09/14/2012	-	-	-	-	-	-	-	4.0 U	-
	12/13/2012	-	-	-	-	-	-	-	4.0 U	-
	11/17/2020	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	25 U	25 U	5.0 UJ
	08/04/2021	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	25 U	25 U	5.0 UJ
MW-6	11/17/2020	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	25 U	25 U	5.0 UJ
	08/04/2021	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	30	25 U	5.0 UJ
MW-7	11/17/2020	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	175,000	158,000	5.0 UJ
	08/04/2021	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	179,000	185,000	5.0 UJ
MW-8	11/17/2020	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	25 U	25 U	5.0 UJ
	08/04/2021	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	25 U	25 U	5.0 UJ
MW-9	11/17/2020	10 U	4.2	10 U	2.0 U	10 U	2.0 U	341,000	273,000	7.1 J
	08/04/2021	3.1	3.8	11	12	10 U	2.0 U	337,000	222,000	5.0 UJ
MW-10	11/17/2020	10 U	2.0 U	10 U	2.0 U	10 U	2.0 U	125 U	58	5.0 UJ
	08/04/2021	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	71	73	5.0 UJ

Table 3
Groundwater Analytical Results - Total and Dissolved Metals and Cyanide (ug/L)
East Side Plating
Portland, Oregon

Sample ID	Sample Date	Total Selenium	Dissolved Selenium	Total Silver	Dissolved Silver	Total Thallium	Dissolved Thallium	Total Zinc	Dissolved Zinc	Total Cyanide
MW-11	11/17/2020	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	25 U	25 J	5.0 UJ
	08/04/2021	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	25 U	25 U	5.0 UJ
MW-12	11/17/2020	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	55	56	5.0 UJ
	08/04/2021	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	25 U	25 U	5.0 UJ
DEQ RBC Screening Level Criteria for Groundwater[a]										
Ingestion/Inhalation from Tapwater										
Occupational		NA	NA	820	820	NA	NA	NA	NA	98
Volatilization to Outdoor Air										
Occupational		NA	NA	NA	NA	NA	NA	NA	NA	NV
Vapor Intrusion into Buildings										
Occupational		NA	NA	NA	NA	NA	NA	NA	NA	NV
GW in an Excavation										
Construction/Excavation		NA	NA	1,100,000	1,100,000	NA	NA	NA	NA	81,000

Table 3
Groundwater Analytical Results - Total and Dissolved Metals and Cyanide (ug/L)
East Side Plating
Portland, Oregon

Note:
[a] Oregon Department of Environmental Quality (DEQ) Generic Risk-Based Concentrations (revised May 2018)
Metals by EPA Method 6010/6020
Mercury by EPA Method 7470A
Cyanide by Method SM 4500CN E-2011
ug/L = Micrograms per Liter
U = Undetected at method reporting limit shown
J = Data Validation Qualifier. The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample. See data validation report for additional information.
- = Not analyzed for this parameter
NA = Not applicable
NV = This chemical is considered "nonvolatile" for purposes of the exposure calculations.
>S = This groundwater RBC exceeds the solubility limit. Refer to Appendix D of the RBDM for the corresponding value of S. Groundwater concentrations in excess of S indicate that free product may be present. See Section B.2.1.4 for additional information.

Table 4
Groundwater Analytical Results - Volatile Organic Compounds (ug/L)
East Side Plating
Portland, Oregon

Location	Sample Date	GRO	DRO	RRO	Tetrachloroethene	Trichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	1,1-Dichloroethene	Vinyl Chloride	1,1,1-Trichloroethane	1,1,2-Trichloroethane	1,1-Dichloroethane	Benzene	Ethylbenzene	Toluene	Total Xylenes	Naphthalene
B-1	10/25/2018	100 U	249	250 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	2.7	1.4	14	2.5 U
B-2	10/25/2018	100 U	375	676	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	2.3	2.5 U
B-3	10/25/2018	100 U	2,780	250 U	0.79	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	1.3	1.2	6.9	2.5 U
B-4	10/25/2018	100 U	100 U	250 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	1.5 U	2.5 U
B-5	10/25/2018	116 J	105 U	263 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	1.5 U	2.5 U
B-6	10/25/2018	100 U	177	250 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	2.1	2.5 U
MW-1	02/27/2014	-	-	-	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.25 U	0.50 U	1.0 U	1.5 U	2.0 U
	10/25/2018	100 U	114	250 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	1.5 U	2.5 U
	11/17/2020	100 U	198	250 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 UJ	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	1.5 U	2.5 UJ
	08/04/2021	120 J	371	250 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	1.5 U	2.5 UJ
MW-2	02/27/2014	-	-	-	5.0 U	5.0 U	27	5.0 U	5.0 U	24	5.0 U	5.0 U	5.0 U	2.5 U	0.5 U	1.0 U	10,970	20 U
	11/17/2020	518	250	250 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 UJ	0.50 U	0.50 U	0.50 U	1.6	2.8	0.74	1.5 U	2.5 UJ
	08/04/2021	225 J	100 U	250 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	1.5 U	2.5 UJ
MW-3	02/27/2014	-	-	-	1.1	0.50 UJ	0.50 UJ	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.25 U	0.50 U	1.0 U	1.5 U	2.0 U
MW-99 (duplicate)	02/27/2014	-	-	-	1.1	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.25 U	0.50 U	1.0 U	1.5 U	2.0 U
	10/25/2018	100 U	100 U	250 U	1.1	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	1.5 U	2.5 U
	11/17/2020	100 U	100 U	250 U	0.88	0.50 U	0.50 U	0.50 U	0.50 U	0.50 UJ	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	1.5 U	2.5 UJ
MW-99 (duplicate)	11/17/2020	100 U	100 U	250 U	0.63	0.50 U	0.50 U	0.50 U	0.50 U	0.50 UJ	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	1.5 U	2.5 UJ
	08/04/2021	100 U	100 U	250 U	1.1	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	1.5 U	2.5 UJ
MW-99 (duplicate)	08/04/2021	100 U	100 U	250 U	0.86	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	1.5 U	2.5 UJ
MW-4	11/17/2020	100 U	100 U	250 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 UJ	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	1.5 U	2.5 UJ
	08/04/2021	100 U	100 U	250 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	1.5 U	2.5 U
MW-5	02/27/2014	-	-	-	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.25 U	0.50 U	1.0 U	1.5 U	2.0 U
	11/17/2020	100 U	100 U	250 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 UJ	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	1.5 U	2.5 UJ
	08/04/2021	100 U	100 U	250 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	1.5 U	2.5 UJ
MW-6	11/17/2020	100 U	100 U	250 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 UJ	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	1.5 U	2.5 UJ
	08/04/2021	100 U	100 U	269	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	1.5 U	2.5 UJ
MW-7	11/17/2020	100 U	107	250 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 UJ	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	1.5 U	2.5 UJ
	08/04/2021	100 U	100 U	250 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	1.5 U	2.5 U
MW-8	11/17/2020	100 U	159	250 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 UJ	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	1.5 U	2.5 UJ
	08/04/2021	112 J	100 U	250 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	1.5 U	2.5 UJ
MW-9	11/17/2020	100 U	100 U	250 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 UJ	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	1.5 U	2.5 UJ
	08/04/2021	100 U	297	250 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	1.5 U	2.5 U
MW-10	11/17/2020	100 U	100 U	250 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 UJ	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	1.5 U	2.5 UJ
	08/04/2021	100 U	100 U	250 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	1.5 U	2.5 UJ
MW-11	11/17/2020	100 U	111	250 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 UJ	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	1.5 U	2.5 UJ
	08/04/2021	100 U	100 U	250 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	1.5 U	2.5 UJ
MW-12	11/17/2020	100 U	182	250 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 UJ	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	1.5 U	2.5 UJ
	08/04/2021	100 U	100 U	250 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	1.5 U	2.5 UJ
DEQ RBC Screening Level Criteria for Groundwater[a]																		
Ingestion/Inhalation from Tapwater																		
Occupational		450	430	430	48	3.3	260	2,600	1,400	0.49	37,000	1.3	13	2.1	6.4	6,300	830	0.72
Volatilization to Outdoor Air																		
Occupational		>S	>S	>S	>S	20,000	>S	>S	2,400,000	5,900	>S	21,000	68,000	14,000	43,000	>S	>S	16,000
Vapor Intrusion into Buildings																		
Occupational		>S	>S	>S	48,000	3,700	>S	>S	360,000	880	>S	11,000	14,000	2,800	8,200	>S	>S	11,000
GW in an Excavation																		
Construction/Excavation		14,000	>S	>S	5,600	430	18,000	180,000	44,000	960	1,100,000	49	10,000	1,800	4,500	220,000	23,000	500

Table 4
Groundwater Analytical Results - Volatile Organic Compounds (ug/L)
East Side Plating
Portland, Oregon

Notes:
[a]Oregon Department of Environmental Quality (DEQ) Generic Risk-Based Concentrations (RBCs) (revised May 2018)
Volatile organic compounds (VOCs) analyzed by EPA Method 8260
Gasoline range organics (GRO) analyzed by Method NWTPH-Gx
Diesel and residual range organics (DRO and RRO) analyzed by Method NWTPH-Dx
ug/L = Micrograms per Liter
U = Undetected at method reporting limit shown
J = Data Validation Qualifier. The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample. See data validation report for additional information.
- = Not analyzed for this parameter
NA = Not applicable
>S = This groundwater RBC exceeds the solubility limit. Refer to Appendix D of the RBDM for the corresponding value of S. Groundwater concentrations in excess of S indicate that free product may be present. See Section B.2.1.4 for additional information.

Table 5

Soil Vapor Analytical Results - Volatile Organic Compounds (ug/m^3)

East Side Plating

Portland, Oregon

Location	Date	Gasoline	Benzene	Toluene	Ethylbenzene	Total Xylenes	PCE	TCE	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	1,1-Dichloroethene	1,1-Dichloroethane	Vinyl Chloride	Freon 12	Chloromethane
Plant #1															
VP-1	11/16/2020	220	0.26 U	0.69	3.1	6.9	13	0.17 U	0.13 U	0.63 U	0.063 U	0.13 U	0.041 U	2.5	1.6 U
	08/03/2021	140	0.28 U	0.94	2.9	7.3	170	0.19 U	0.14 U	0.69 U	0.069 U	0.14 U	0.044 U	2.4	1.8 U
VP-2	11/16/2020	400	0.45	2.1	3.0	16	10	0.17 U	0.12 U	0.63 U	0.063 U	0.13 U	0.040 U	2.5	1.6 U
	08/03/2021	490	0.24 U	5.0	8.1	46	14	0.16 U	0.12 U	0.59 U	0.059 U	0.12 U	0.038 U	2.2	1.5 U
Plant #2															
VP-3	11/16/2020	260	0.27 U	1.7	4.7	16	2.0	0.18 U	0.14 U	0.68 U	0.068 U	0.14 U	0.044 U	2.8	1.8 U
	08/03/2021	220	0.21 U	0.52	2.3	5.7	2.2	0.14 U	0.11 U	0.53 U	0.053 U	0.11 U	0.034 U	2.2	1.4 U
VP-4	11/16/2020	170	0.47 U	1.0	1.5	7.6	180	1.3	0.23 U	1.2 U	0.54	11	0.11	2.4	4.8
Duplicate (VP-10)	11/16/2020	180	0.67 U	1.0	1.5	8.0	180	1.3	0.33 U	1.7 U	0.54	10	0.13	2.3	4.3 U
	08/03/2021	190 U	0.76 U	0.89 U	0.57	2.4	320	2.3	0.38 U	1.9 U	0.39	12	0.12 U	2.2	4.9 U
Duplicate (VP-10)	08/03/2021	190 U	0.76 U	1.0	0.65	2.9	350	2.8	0.38 U	1.9 U	0.43	13	0.12 U	1.8	4.9 U
Plant #3															
VP-5	11/16/2020	280	0.34 U	4.5	4.5	25	160	1.0	0.17 U	0.85 U	0.085 U	0.52	0.055 U	2.2	2.2 U
	08/03/2021	570	0.45 U	2.0	7.8	24	250	1.9	0.22 U	1.1 U	0.11 U	0.53	0.072 U	2.2	2.9 U
VP-6	11/16/2020	570	0.40	6.4	12	54	51	0.55	0.13 U	0.63 U	0.53	15	0.17	2.2	1.6 U
	08/03/2021	82	0.23 U	0.51	0.67	3.0	160	1.3	0.26	0.56 U	0.59	18	0.036 U	2.4	1.5 U
VP-7	11/16/2020	200	0.25 U	3.1	3.9	23	120	1.4	0.12 U	0.61 U	0.061 U	1.7	0.040 U	2.5	1.6 U
	08/03/2021	260	0.30 U	0.87	2.6	9.6	240	4.1	0.15 U	0.74 U	0.082	2.6	0.048 U	2.4	1.9 U
VP-8	11/16/2020	220	0.24 U	4.4	5.1	30	100	2.2	0.12 U	0.60 U	0.076	0.12 U	0.039 U	2.5	1.6 U
	08/03/2021	130	0.43 U	0.99	0.90	4.1	190	6.0	0.22 U	1.1 U	0.11 U	0.22 U	0.070 U	2.5	2.8 U
VP-9	11/16/2020	820	0.26	3.4	7.2	27	48	3.6	0.12 U	0.62 U	0.10	0.13 U	0.040 U	2.2	1.6 U
	08/03/2021	160	0.24 U	0.28 U	1.1	2.4	95	6.9	0.12 U	0.59 U	0.059 U	0.14	0.038 U	2.5	1.5 U
DEQ RBC Screening Level Criteria for Soil Gas[a]															
Vapor Intrusion Into Buildings															
Occupational		1,700,000	1,600	21,900,000	4,900	440,000	47,000	2,900	>Pv	>Pv	880,000	7,700	2,800	NA	390,000
DEQ RBC Screening Level Criteria for Air[a]															
Inhalation															
Occupational		1,700	1.6	22,000	4.9	440	47	2.9	>Pv	>Pv	880	7.7	2.8	NA	390

Table 5

Soil Vapor Analytical Results - Volatile Organic Compounds (ug/m^3)

East Side Plating

Portland, Oregon

Location	Date	Chloroform	1,1,1-Trichloroethane	Carbon Tetrachloride	1,3-Butadiene	Freon 11	Ethanol	Acetone	2-Propanol	Carbon Disulfide	Methylene Chloride	Hexane	2-Butanone	Cyclohexane	1,4-Dioxane
Plant #1															
VP-1	11/16/2020	0.16 U	0.92	0.20 U	0.35 U	2.0	3.0	6.4 J	83	10	1.1 U	2.8 U	2.4 U	2.8 U	0.58 U
	08/03/2021	0.17 U	0.71	0.22 U	0.38 U	1.6	1.6 U	8.8	4.6 J	2.7 U	1.2 U	3.1 U	2.6 U	3.0 U	0.60 J
VP-2	11/16/2020	0.15 U	0.23	0.20 U	0.52	1.4	7.1	13 J	19	2.5 U	1.1 U	3.2	2.6	2.7 U	0.57 U
	08/03/2021	0.14 U	0.25	0.19 U	0.33 U	0.87	2.3	19	13	2.3 U	1.1	2.6 U	8.4	2.5 U	0.99
Plant #2															
VP-3	11/16/2020	1.1	0.57	0.26	0.38 U	1.6	5.1	30 J	400 J	2.7 U	1.2 U	3.0 U	2.5 U	2.9 U	0.62 U
	08/03/2021	1.6	0.85	0.28	0.30 U	1.2	1.3 U	7.4	6.0	3.3	0.93 U	2.4 U	2.0 U	2.3 U	0.48 U
VP-4	11/16/2020	0.45	270	0.37 U	0.64 U	1.6 U	7.0	25 J	150	4.5 U	2.0 U	5.1 U	4.3 U	5.6	1.0 U
Duplicate (VP-10)	11/16/2020	0.46	260	0.53 U	0.93 U	2.4 U	7.2	11 J	170	6.5 U	2.9 U	7.4 U	6.2 U	7.2 U	1.5 U
	08/03/2021	0.70	380	0.60 U	1.0 U	2.6 U	4.4 U	15	5.8 U	7.4 U	3.3 U	8.3 U	7.0 U	8.1 U	1.7 U
Duplicate (VP-10)	08/03/2021	0.73	390	0.60 U	1.0 U	2.7 U	4.5 U	15	5.8 U	7.4 U	3.3 U	8.4 U	7.0 U	8.2 U	1.7 U
Plant #3															
VP-5	11/16/2020	4.9	21	0.27 U	0.47 U	1.3	3.6	44 J	340 J	3.3 U	1.5 U	3.8 U	3.2 U	3.7 U	0.77 U
	08/03/2021	2.4	32	0.36 U	0.63 U	1.6 U	2.7 U	17	7.9	4.4 U	2.0 U	5.0 U	4.2 U	4.9 U	1.0 U
VP-6	11/16/2020	2.1	19	0.20 U	0.35 U	1.7	7.5	26 J	680 J	2.5 U	3.5	2.8 U	4.3	2.7 U	0.57 U
	08/03/2021	4.9	45	0.18 U	0.31 U	3.9	1.3 U	12	3.7 J	2.2 U	3.9	2.5 U	2.1 U	2.4 U	1.3
VP-7	11/16/2020	0.38	9.7	0.20 U	0.34 U	1.8	4.0	16 J	390 J	2.4 U	1.1 U	2.7 U	2.3 U	2.7 U	0.72
	08/03/2021	0.69	18	0.23 U	0.41 U	1.5	1.8 U	13	4.8	2.9 U	1.3 U	3.3 U	2.7 U	3.2 U	0.83
VP-8	11/16/2020	1.9	0.76	0.19 U	0.34 U	4.4	35	33 J	560 J	2.4 U	1.0 U	2.7 U	3.1	2.6 U	0.55 U
	08/03/2021	1.2	1.1	0.34 U	0.60 U	2.7	2.6 U	9.2	4.2	4.2 U	1.9 U	4.8 U	4.0 U	4.7 U	0.98 U
VP-9	11/16/2020	0.52	83	0.20 U	0.35 U	1.6	41	30 J	520 J	2.4 U	1.1 U	2.8 U	3.5	2.7 U	0.56 U
	08/03/2021	0.50	140	0.19 U	0.33 U	2.1	1.6	13	5.3	2.3 U	1.0 U	2.6 U	2.2 U	2.5 U	0.53 U
DEQ RBC Screening Level Criteria for Soil Gas[a]															
Vapor Intrusion Into Buildings															
Occupational		530	21,900,000	2,000	NA	3,100,000	NA	NA	NA	NA	NA	NA	NA	NA	2,500
DEQ RBC Screening Level Criteria for Air[a]															
Inhalation															
Occupational		0.53	22,000	2.0	NA	3,100	NA	NA	NA	NA	NA	NA	NA	NA	2.5

Table 5

Soil Vapor Analytical Results - Volatile Organic Compounds (ug/m^3)

East Side Plating

Portland, Oregon

Location	Date	Tetrahydrofuran	4-Methyl-2-pentanone	Cumeme	Propylbenzene	4-Ethyltoluene	1,3,5-TMB	1,2,4-TMB	1,3-Dichlorobenzene
Plant #1									
VP-1	11/16/2020	28	0.66 U	0.79 U	2.2	2.9 J	1.6	8.6	0.96 U
	08/03/2021	2.6 U	0.72	0.86 U	2.4	2.5	1.5	6.5	1.0 U
VP-2	11/16/2020	2.3 U	1.5	0.78 U	0.78 U	3.0 J	1.2	4.5	0.95 U
	08/03/2021	2.2 U	4.7	0.73 U	0.73 U	2.3 J	1.1	5.2	0.89 U
Plant #2									
VP-3	11/16/2020	2.5 U	1.3	0.84 U	2.7	3.9 J	2.7	12	1.2
	08/03/2021	2.0 U	0.54 J	0.66 U	1.6	1.9	1.3	6.3	0.80 U
VP-4	11/16/2020	4.3 U	1.2 U	1.4 U	1.4 U	1.4 U	1.4 U	1.7	1.8 U
Duplicate (VP-10)	11/16/2020	6.2 U	1.7 U	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	2.5 U
	08/03/2021	7.0 U	1.9 U	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U	2.8 U
Duplicate (VP-10)	08/03/2021	7.0 U	1.9 U	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U	2.9 U
Plant #3									
VP-5	11/16/2020	3.2 U	1.1	1.0 U	1.0 U	3.1 J	1.3	4.9	2.2
	08/03/2021	4.2 U	2.9	1.4 U	3.8	5.3	3.0	14	1.7 U
VP-6	11/16/2020	2.3 U	2.6	2.0	5.2	8.8 J	4.6	22	3.6
	08/03/2021	2.1 U	0.84	0.70 U	0.70 U	0.70 U	0.70 U	0.76	0.85 U
VP-7	11/16/2020	2.3 U	1.2	0.76 U	0.76 U	2.0 J	0.76 J	3.0	1.9
	08/03/2021	2.7 U	1.8	0.91 U	1.2	1.7	0.92	4.4	1.1 U
VP-8	11/16/2020	2.2 U	1.7	0.75 U	0.75 U	2.3 J	0.92	3.2	2.1
	08/03/2021	4.0 U	1.2	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.6 U
VP-9	11/16/2020	2.3 U	1.5	0.93	3.5	5.4 J	3.0	15	1.7
	08/03/2021	2.2 U	0.61 U	0.73 U	0.98	1.3	0.81	3.9	0.89 U
DEQ RBC Screening Level Criteria for Soil Gas[a]									
Vapor Intrusion Into Buildings									
Occupational		NA	NA	1,800,000	NA	NA	260,000	260,000	NA
DEQ RBC Screening Level Criteria for Air[a]									
Inhalation									
Occupational		NA	NA	1,800	NA	NA	260	260	NA

Table 5

Soil Vapor Analytical Results - Volatile Organic Compounds (ug/m^3)

East Side Plating

Portland, Oregon

Notes:

[a] Oregon Department of Environmental Quality (DEQ) Generic Risk-based concentrations (revised May 2018)

Volatile organic compounds (VOCs) analyzed by Modified TO-15/TO-15 SIM

PCE = Tetrachloroethene

TCE = Trichloroethene

TMB = Trimethylbenzene

ug/m^3 = Micrograms per cubic meter

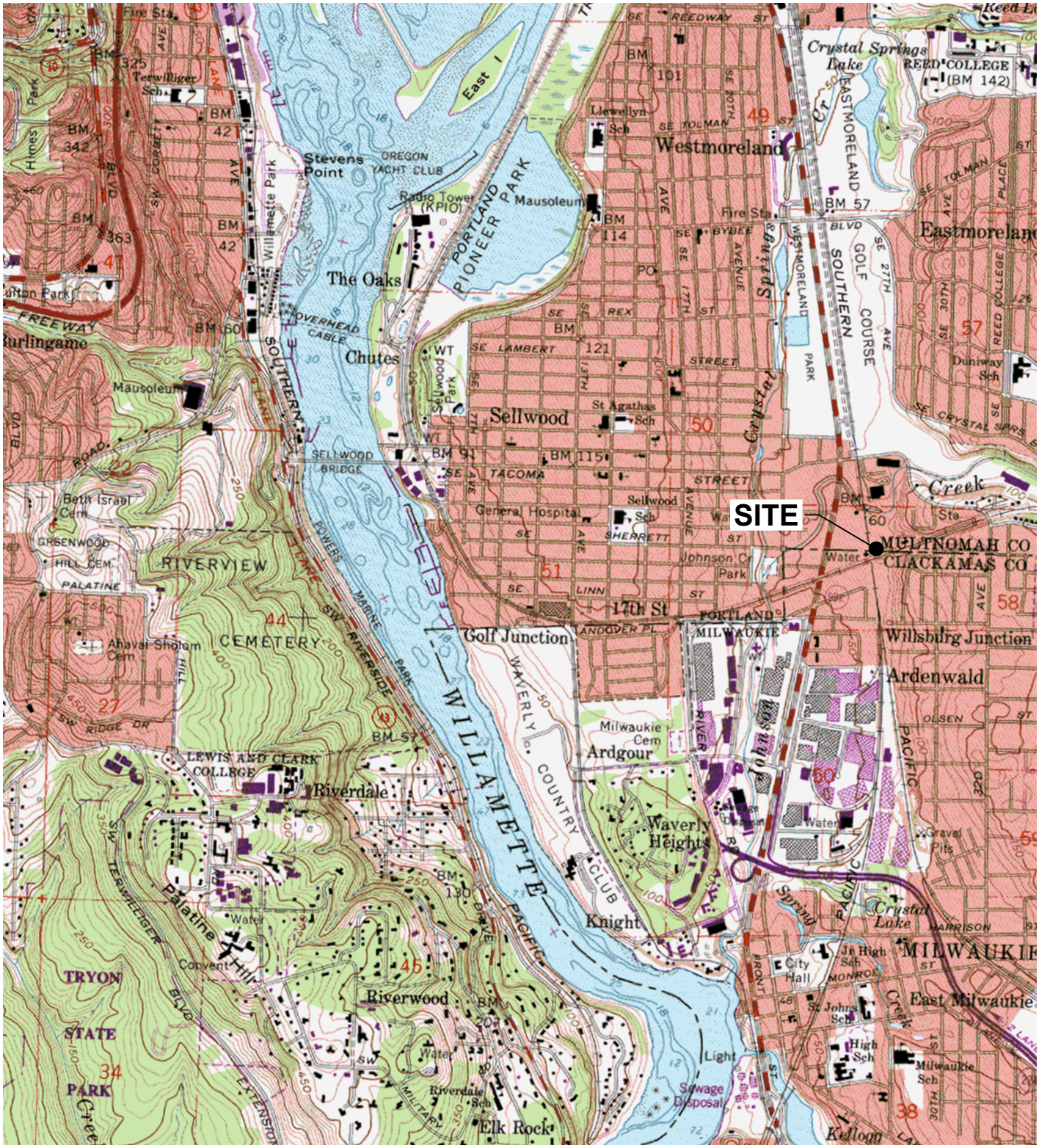
U = Undetected at method reporting limit shown

J = Estimated Value.

- = Not applicable or not analyzed for this parameter

>Pv = The air concentration reported for the RBC exceeds the vapor pressure of the pure chemical. It can be assumed that this constituent cannot create an unacceptable risk by this pathway.

FIGURES



APPROXIMATE SCALE IN FEET

0 1000 2000 4000

NOTE: USGS, LAKE OSWEGO QUADRANGLE
OREGON
7.5 MINUTE SERIES (TOPOGRAPHIC)

PNG ENVIRONMENTAL, INC. 6665 SW Hampton St., Ste. 101 TEL (503) 620-2387 Tigard, OR 97223 FAX (503) 620-2977	DATE: 3-13-17 FILE NAME: 1197-01 DRAWN BY: JJT APPROVED BY: SV	EAST SIDE PLATING 8300, 8310, 8400 SE 26TH PLACE PORTLAND, OR	SITE LOCATION MAP	Project No. 1197-01 Figure No. 1

LEGEND

- MW-1 — Monitoring Well
- B-1 — Boring Location
- MW-8 — Angled Monitoring Well
- VP-1 — Vapor Monitoring Point
- Former Outfall

Approx. Location of Former USTs
Outfall 1
Johnson Creek
MW-12
Approx. Location of 1985 Drum Spill Area
Approx. 2011 Nickel-Solution Release Area
MW-1
MW-5
MW-4
MW-3
MW-8
B-5
B-6
MW-2
VP-5
VP-6
VP-7
MW-6
B-4
Plant #3
Approx. Plating Area
MW-7
VP-4
MW-11
VP-9
VP-8
B-3
Plant #2
MW-9
Railroad
B-7
VP-1
Approx. Location of Former House
B-2
VP-3
MW-10
Plant #1
Approx. Location of 1988 Drum Salvage Release
B-1
VP-2
Springwater Corridor Trail

N

APPROXIMATE SCALE IN FEET

0 80 160

PNG ENVIRONMENTAL, INC.
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Tigard, OR 97223
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DATE:	8-11-21
FILE NAME:	1197-02
DRAWN BY:	JJT
APPROVED BY:	SV

EAST SIDE PLATING
8300, 5310, 8400 SE 26TH PLACE
PORTLAND, OR

SITE FEATURES

Project No. 1197-02
Figure No. 2

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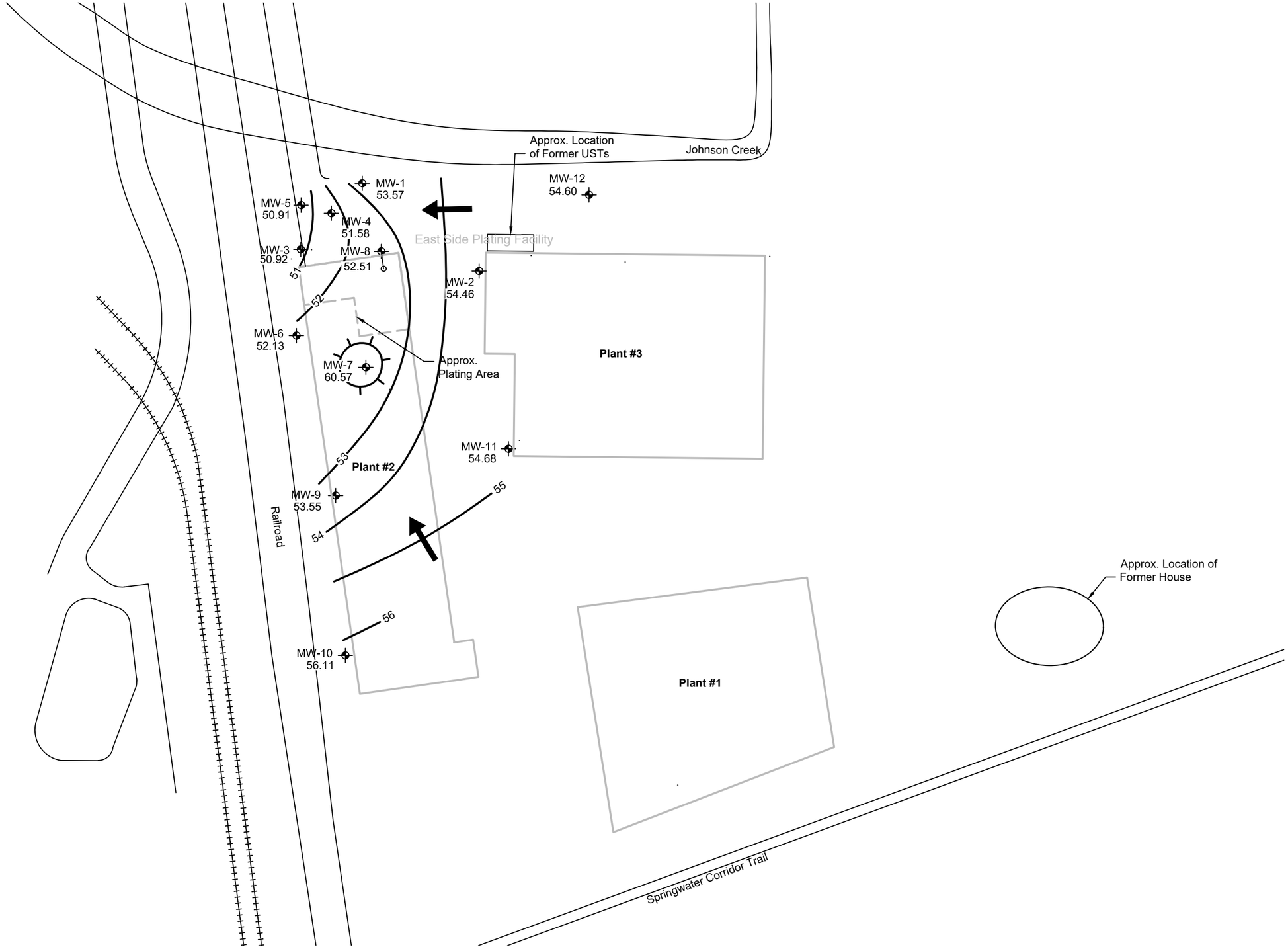
LEGEND

- MW-1 — Monitoring Well
- 52.89 — Groundwater Elevation
- Groundwater Elevation Contour
- Approx. Groundwater Flow Direction
- ⊠ Former Outfall



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APPROXIMATE SCALE IN FEET

0 80 160

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PNG ENVIRONMENTAL, INC. 6665 SW Hampton St., Ste. 101 Tigard, OR 97223 TEL (503) 620-2387 FAX (503) 620-2977	DATE: 3-8-22 FILE NAME: 1197-02 DRAWN BY: JJT APPROVED BY: SV	EAST SIDE PLATING 8300, 5310, 8400 SE 26TH PLACE PORTLAND, OR	GROUNDWATER ELEVATION CONTOURS AUGUST 4, 2021	Project No. 1197-02 Figure No. 3

APPROXIMATE SCALE IN FEET

0 80 160

N

MW-1					
Date	D. Cr6	T. Ni	D. Ni	T. Zn	D. Zn
11/17/20	0.020U	2.0U	2.0U	25U	25U
8/4/21	0.020UJ	6.5	7.8	25U	25U

MW-2					
Date	D. Cr6	T. Ni	D. Ni	T. Zn	D. Zn
11/17/20	0.020U	2.0U	2.0U	25U	25U
8/4/21	0.020UJ	2.0U	2.4	25U	25U

MW-12					
Date	D. Cr6	T. Ni	D. Ni	T. Zn	D. Zn
11/17/20	0.026	9.6	9.9	55	56
8/4/21	0.020UJ	6.1	6.8	25U	25U

MW-5					
Date	D. Cr6	T. Ni	D. Ni	T. Zn	D. Zn
11/17/20	0.48	4.9	4.5	25U	25U
8/4/21	0.28J	12	10	25U	25U

MW-4					
Date	D. Cr6	T. Ni	D. Ni	T. Zn	D. Zn
11/17/20	0.025	287	231	131	89
8/4/21	0.057J	316	339	148	167

MW-3					
Date	D. Cr6	T. Ni	D. Ni	T. Zn	D. Zn
11/17/20	0.45	4.7	2.0U	25U	25U
8/4/21	0.48J	11	8.2	25U	25U

MW-8					
Date	D. Cr6	T. Ni	D. Ni	T. Zn	D. Zn
11/17/20	0.020U	32	31	25U	25U
8/4/21	0.020UJ	16	19	25U	25U

MW-6					
Date	D. Cr6	T. Ni	D. Ni	T. Zn	D. Zn
11/17/20	0.041	5.9	2.0U	25U	25U
8/4/21	0.035J	9.9	2.0U	30	25U

MW-7					
Date	D. Cr6	T. Ni	D. Ni	T. Zn	D. Zn
11/17/20	0.020U	867	877	175,000	158,000
8/4/21	0.020UJ	2,000U	2,000U	179,000	185,000

MW-9					
Date	D. Cr6	T. Ni	D. Ni	T. Zn	D. Zn
11/17/20	0.020U	1,400	1,130	341,000	273,000
8/4/21	0.020UJ	10,000U	10,000U	337,000	222,000

MW-10					
Date	D. Cr6	T. Ni	D. Ni	T. Zn	D. Zn
11/17/20	6.5	10U	2.1	125U	58
8/4/21	5.3J	3.1	2.2	71	73

MW-11					
Date	D. Cr6	T. Ni	D. Ni	T. Zn	D. Zn
11/17/20	0.028	9.3	10	25U	25J
8/4/21	0.046J	7.4	8.6	25U	25U

Approx. Location of Former USTs

Johnson Creek

Approx. Location of 1985 Drum Spill Area

Approx. 2011 Nickel-Solution Release Area

MW-1 MW-5 MW-4 MW-3 MW-8 MW-12 MW-2 VP-5 VP-6 VP-7 B-5 B-6

Groundwater Flow Direction

MW-6 B-4 MW-7 VP-4 Approx. Plating Area

Plant #3

MW-11 VP-9 VP-8

B-3 Plant #2 MW-9

Railroad

B-2 VP-3 MW-10

Approx. Location of 1988 Drum Salvage Release

B-1

VP-1 B-7

Plant #1

VP-2

Approx. Location of Former House

Springwater Corridor Trail

LEGEND

MW-1	Monitoring Well
B-1	Boring Location
MW-8	Angled Monitoring Well
VP-1	Vapor Monitoring Point
T =	Total
D =	Dissolved
Cr6 =	Hexavalent Chromium (ug/L)
Ni =	Nickel (ug/L)
Zn =	Zinc (ug/L)
U =	Not Detected
J =	Estimated Value

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FILE NAME: 1197-02
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APPROVED BY: SV

EAST SIDE PLATING
8300, 5310, 8400 SE 26TH PLACE
PORTLAND, OR

SELECT METALS
IN GROUNDWATER

Project No. 1197-02

Figure No. 4

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APPROXIMATE SCALE IN FEET

0 80 160

N

Groundwater Flow Direction

VP-5					
Date	G	B	T	E	X
11/16/20	280	0.34U	4.5	4.5	25
8/3/21	570	0.45U	2.0	7.8	24

VP-6					
Date	G	B	T	E	X
11/16/20	570	0.40	6.4	12	54
8/3/21	82	0.23U	0.51	0.67	3.0

VP-7					
Date	G	B	T	E	X
11/16/20	200	0.25U	3.1	3.9	23
8/3/21	260	0.30U	0.87	2.6	9.6

VP-8					
Date	G	B	T	E	X
11/16/20	220	0.24U	4.4	5.1	30
8/3/21	130	0.43U	0.99	0.90	4.1

VP-9					
Date	G	B	T	E	X
11/16/20	820	0.26	3.4	7.2	27
8/3/21	160	0.24U	0.28U	1.1	2.4

VP-4					
Date	G	B	T	E	X
11/16/20	180	0.67U	1.0	1.5	8.0
8/3/21	190U	0.76U	1.0	0.65	2.9

VP-3					
Date	G	B	T	E	X
11/16/20	260	0.27U	1.7	4.7	16
8/3/21	220	0.21U	0.52	2.3	5.7

VP-1					
Date	G	B	T	E	X
11/16/20	220	0.26U	0.69	3.1	6.9
8/3/21	140	0.28U	0.94	2.9	7.3

VP-2					
Date	G	B	T	E	X
11/16/20	400	0.45	2.1	3.0	16
8/3/21	490	0.24U	5.0	8.1	46

Johnson Creek

Approx. Location of Former USTs

Approx. Location of 1985 Drum Spill Area

Approx. 2011 Nickel-Solution Release Area

Approx. Plating Area

Approx. Location of 1988 Drum Salvage Release

Approx. Location of Former House

Railroad

Springwater Corridor Trail

Plant #1

Plant #2

Plant #3

MW-1 MW-2 MW-3 MW-4 MW-5 MW-6 MW-7 MW-8 MW-9 MW-10 MW-11 MW-12

VP-1 VP-2 VP-3 VP-4 VP-5 VP-6 VP-7 VP-8 VP-9

B-1 B-2 B-3 B-4 B-5 B-6 B-7

LEGEND

- MW-1 — Monitoring Well
- B-1 — Boring Location
- MW-8 — Angled Monitoring Well
- VP-1 — Vapor Monitoring Point
- G = Gasoline (ug/m³)
- B = Benzene (ug/m³)
- T = Toluene (ug/m³)
- E = Ethylbenzene (ug/m³)
- X = Total Xylenes (ug/m³)

PNG ENVIRONMENTAL, INC.
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FILE NAME: 1197-02
DRAWN BY: JJT
APPROVED BY: SV

EAST SIDE PLATING
8300, 5310, 8400 SE 26TH PLACE
PORTLAND, OR

GASOLINE AND BTEX
IN SOIL VAPOR

Project No. 1197-02

Figure No. 5

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APPROXIMATE SCALE IN FEET

0 80 160

N

Groundwater Flow Direction

Johnson Creek

Approx. Location of Former USTs

Approx. Location of 1985 Drum Spill Area

Approx. 2011 Nickel-Solution Release Area

Approx. Plating Area

Approx. Location of 1988 Drum Salvage Release

Approx. Location of Former House

Railroad

Springwater Corridor Trail

Plant #1

Plant #2

Plant #3

MW-1 MW-2 MW-3 MW-4 MW-5 MW-6 MW-7 MW-8 MW-9 MW-10 MW-11 MW-12

VP-1 VP-2 VP-3 VP-4 VP-5 VP-6 VP-7 VP-8 VP-9

B-1 B-2 B-3 B-4 B-5 B-6 B-7

VP-5								
Date	PCE	TCE	cis	trans	1,1-DCE	1,1-DCA	VC	1,1,1-TCA
11/16/20	160	1.0	0.17U	0.85U	0.085U	0.52	0.055U	21
8/3/21	250	1.9	0.22U	1.1U	0.11U	0.53	0.072U	32

VP-6								
Date	PCE	TCE	cis	trans	1,1-DCE	1,1-DCA	VC	1,1,1-TCA
11/16/20	51	0.55	0.13U	0.63U	0.53	15	0.17	19
8/3/21	160	1.3	0.26	0.56U	0.59	18	0.036U	45

VP-7								
Date	PCE	TCE	cis	trans	1,1-DCE	1,1-DCA	VC	1,1,1-TCA
11/16/20	120	1.4	0.12U	0.61U	0.061U	1.7	0.040U	9.7
8/3/21	240	4.1	0.15U	0.74U	0.082	2.6	0.048U	18

VP-8								
Date	PCE	TCE	cis	trans	1,1-DCE	1,1-DCA	VC	1,1,1-TCA
11/16/20	100	2.2	0.12U	0.60U	0.076	0.12U	0.039U	0.76
8/3/21	190	6.0	0.22U	1.1U	0.11U	0.22U	0.070U	1.1

VP-9								
Date	PCE	TCE	cis	trans	1,1-DCE	1,1-DCA	VC	1,1,1-TCA
11/16/20	48	3.6	0.12U	0.62U	0.10	0.13U	0.040U	83
8/3/21	95	6.9	0.12U	0.59U	0.059U	0.14	0.038U	140

VP-4								
Date	PCE	TCE	cis	trans	1,1-DCE	1,1-DCA	VC	1,1,1-TCA
11/16/20	180	1.3	0.33U	1.7U	0.54	11	0.13	270
8/3/21	350	2.8	0.38U	1.9U	0.43	13	0.12U	390

VP-3								
Date	PCE	TCE	cis	trans	1,1-DCE	1,1-DCA	VC	1,1,1-TCA
11/16/20	2.0	0.18U	0.14U	0.68U	0.068U	0.14U	0.044U	0.57
8/3/21	2.2	0.14U	0.11U	0.53U	0.053U	0.11U	0.034U	0.85

VP-1								
Date	PCE	TCE	cis	trans	1,1-DCE	1,1-DCA	VC	1,1,1-TCA
11/16/20	13	0.17U	0.13U	0.63U	0.063U	0.13U	0.041U	0.92
8/3/21	170	0.19U	0.14U	0.69U	0.069U	0.14U	0.044U	0.71

VP-2								
Date	PCE	TCE	cis	trans	1,1-DCE	1,1-DCA	VC	1,1,1-TCA
11/16/20	10	0.17U	0.12U	0.63U	0.063U	0.13U	0.040U	0.23
8/3/21	14	0.16U	0.12U	0.59U	0.059U	0.12U	0.038U	0.25

LEGEND

MW-1	Monitoring Well
B-1	Boring Location
MW-8	Angled Monitoring Well
VP-1	Vapor Monitoring Point
PCE =	Tetrachloroethene (ug/m³)
TCE =	Trichloroethene (ug/m³)
U =	Not Detected
cis =	cis-1,2-Dichloroethene (ug/m³)
trans =	trans-1,2-Dichloroethene (ug/m³)
1,1-DCE =	1,1-Dichloroethene (ug/m³)
1,1-DCA =	1,1-Dichloroethane (ug/m³)
VC =	Vinyl Chloride (ug/m³)
1,1,1-TCA =	1,1,1-Trichloroethane (ug/m³)

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EAST SIDE PLATING
8300, 5310, 8400 SE 26TH PLACE
PORTLAND, OR

CHLORINATED VOCs
IN SOIL VAPOR

Project No. 1197-02

Figure No. 6