TECHNICAL MEMORANDUM

To:	Rob Hood, Oregon Department of Environmental Quality
From:	Samantha Biles, P.E. and Brad Berggren, R.G., P.E.
Date:	February 24, 2023
Subject:	Hydrologic Monitoring and Johnson Creek Bed Survey East Side Plating Portland, Oregon ECSI #644

PNG Environmental, Inc. (PNG) is providing recent hydrologic monitoring results of groundwater and surface water (Johnson Creek) elevations at the East Side Plating Facility located at 8400 SE 26th Place, Portland, Oregon (Figure 1 and Figure 2). In 2020 and 2021, East Side Plating (ESP) performed site characterization activities including soil, soil gas, and groundwater investigations to supplement previous site data and evaluate potentially contaminated media at the site (PNG 2021, PNG 2021a). In addition, an investigation of Johnson Creek sediment and creek bank soil was conducted adjacent to the ESP facility. These recent characterization activities were completed at the request of 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, installation and sampling of a network of soil vapor monitoring points, sampling of lower bank soil, and sampling of Johnson Creek sediment in the vicinity of ESP. DEQ reviewed the Upland Groundwater and Soil Vapor Monitoring – Summer 2021 Technical Memorandum and the Johnson Creek Investigation Report and both documents were subsequently finalized on March 8, 2022. Based on their review, DEQ requested additional monitoring of facility-wide groundwater elevations and Johnson Creek surface water elevations along with a profile survey of the creek bed (a thread profile). The intent of DEQ's requested additional investigation was to further support previous investigation conclusions that shallow groundwater from the ESP facility, particularly from beneath Plant #2 and in the vicinity of monitoring well MW-7, does not discharge to Johnson Creek adjacent to the ESP facility. This memorandum summarizes the results of the hydrologic monitoring conducted between March and August 2022 in support of previous hydrologic monitoring at the facility since 2011.

PREVIOUS HYDROLOGIC INVESTIGATIONS

2011-2012 Post-Spill Hydrologic Monitoring

Several previous groundwater investigations were completed at the ESP facility in 2011, 2012 and 2014, as outlined in the Post-Spill Response Groundwater Investigation Report (Saga 2013) and the subsequent Ground Water Sampling Results Memorandum (PNG 2014).

Upon the discovery of a plating fluid release north of the Plant #2 building in September 2011, Saga Environmental and Engineering, Inc. (SE&E) assisted ESP with remediation activities which, in part, included groundwater investigation activities. To document the effectiveness of the cleanup actions and document the limited impact from the release, five groundwater

monitoring wells (MW-1 through MW-5) were installed to define the extent of contamination and to assess whether contaminated groundwater may flow into nearby surface water (Johnson Creek) in the future. These wells were monitored on a quarterly bases between December 2011 and December 2012. During this monitoring period, the water table was encountered between 6.7 and 13.3 feet below ground surface. Similar water table conditions were observed in February 2014. Groundwater elevation data indicated that groundwater north of the Plant #2 building flowed to the west-southwest away from Johnson Creek and across the facility. This groundwater flow direction was consistent throughout all seasons of the year. A series of groundwater elevation contour figures from these 2011, 2012 and 2014 investigations are included in Appendix A.

Subsurface utilities identified during the investigation in the study area near Plant #2 included storm sewer lines, sanitary sewer lines, and a combined storm and sanitary sewer line. Specifically, a sanitary sewer line located east of Plant #2 discharges into a below-ground City of Portland combined sewer line that crosses the northwest corner of the facility (Appendix B). This combined sewer line runs below Johnson Creek and is designed to carry sanitary and storm water from the northeast to the southwest. The outfall of the combined sewer line was not identified during this investigation, however, it does not outfall within 500 feet of the ESP facility. City of Portland construction data for the combined sewer pipe, where it crosses the northwest corner of the facility, indicates the utility line is below the water table year-round, and therefore could represent a potential preferential pathway for groundwater flow. However, according to the City of Portland, the backfill used to construct the line is sand and gravel of similar hydraulic conductivity to the surrounding material, and consequently, may not act as a potential pathway for groundwater flow contamination. The general colocation of the persistent groundwater level trough/depression in the vicinity of monitoring wells MW-3 and MW-5, and the submerged combined sewer line suggests there may be a relationship. This monitoring of groundwater and surface water levels during multiple seasons in 2022 confirm groundwater flow is not toward Johnson Creek adjacent to the ESP property.

2020-2021 Hydrologic Monitoring

In October and November 2020, PNG completed soil, soil gas, and groundwater investigations. The investigations included installation of seven monitoring wells (MW-6 through MW-12). In 2020 and 2021, investigation activities included water level measurements from all 12 groundwater monitoring wells (MW-1 thru MW-12) at the facility during November 2020, December 2020, August 2021, and December 2021. The following is a summary of the hydrologic monitoring results and evaluations from the additional monitoring.

Consistent with observations between 2011 and 2014, water level measurements collected during November 2020, December 2020, August 2021, and December 2021 indicate the shallow groundwater flow is generally to the west and away from Johnson Creek. The groundwater flow direction continued to be consistent over the multiple years of monitoring and across all seasons. Groundwater elevation measurements are summarized on Table 1.

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. Subsequent depth-to-water measurements collected in August 2021 continued to show the presence of elevated groundwater levels in the vicinity of MW-7 (Figure 3a). Also, consistent with the 2020 and August 2021 groundwater monitoring the

groundwater elevation measurements collected in December 2021 continued to confirm the anomalous groundwater elevation at MW-7. Contrary to expectations the August 2021 (summer dry season) groundwater elevation at MW-7 was higher than December 2020 and December 2021 (winter wet season) groundwater elevations at MW-7.

Since these observed conditions of relatively high groundwater elevations in the vicinity of MW-7 persisted in August 2021 following several months of negligible precipitation, the cause does not appear to be stormwater leakage from the roof drain downspout and conveyance line that runs west to east under Plant #2 near MW-7. 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 wastewater treatment area within the southern half of Plant #2. The concrete floor trench containing the pipe gallery was examined initially in summer 2021 and was dry with no pipe leakage observed. ESP staff followed up on this initial examination with a more detailed inspection in January 2023. The concrete floor trench functions as a gallery for piping that conveys collected fluids from the northern plating areas of the Plant #4 building to the wastewater treatment area within the southern half of the building. The concrete floor trench is approximately 160 feet in length, covered in steel plates, and the base of the trench ranges from 9 inches (north end) to 47 inches (southern end) in depth below the Plant #2 concrete floor surface. The concrete floor surface along the trench is relatively level (relative floor surface elevations measured with a laser level along the length of the trench varied by less than ½ inch). Consequently, the 38 inches of elevation fall (north to south) over the 160 foot trench length represents an approximately 2% trench base slope to the south away from the location of MW-7. The walls and floor of the concrete piping gallery trench are painted with a waterproof coating. In January 2023, ESP removed each of the 24 steel plates and visually inspected the entire length of the concrete trench (approximately 160 ft) and no pipe leakage or standing fluids were observed. Photos of typical sections of the floor trench near MW-7 (near north end of the trench) are attached as Appendix C. Other potential sources of water contribution to the subsurface, such as water supply lines, were also researched. ESP staff are not aware of any water supply lines or water discharge lines in the immediate vicinity of MW-7 that could be the cause of the relatively high groundwater elevations observed in this well.

2022 HYDROLOGIC EVALUATIONS

During 2022, groundwater and surface water elevation monitoring events were conducted monthly starting in March 2022. During each monitoring event, groundwater level measurements were collected from all wells at the facility (MW-1 through MW-12). In addition, Johnson Creek surface water measurements were collected during each 2022 monitoring event. Following each monitoring event, a map of groundwater elevation contours was produced (Figures 3b-g).

Johnson Creek Surface Water Levels and Profile Survey

Between March and August 2022, Johnson Creek surface water levels were measured monthly from the wet weather season through the dry weather season to support an evaluation of the relationship between surface water and groundwater at the ESP facility. The surface water levels were measured from an elevation benchmark established on the 26th Place bridge adjacent to the northwest corner of the ESP facility. This bridge benchmark location was

surveyed by Statewide Land Survey and tied to the same datum as other surveyed locations and monitoring wells on site for consistency.

Surface water elevations at this bridge location, measured between March and August 2022, ranged from 54.67 feet (July) to 56.19 feet (April). Johnson Creek surface water elevations measured in 2022 are shown on Table 1. The surface water measuring point established on the 26th Place bridge is approximately 40 feet downstream from monitoring well MW-1 and 200 feet downstream from monitoring well MW-12 (ESP facility monitoring wells located adjacent to Johnson Creek). Surface water elevations in Johnson Creek upstream from the bridge and adjacent to MW-1 and MW-12 were estimated using an average stream gradient reported for Johnson Creek (Johnson Creek Watershed Characterization, City of Portland, March 2005). Johnson Creek is a low gradient stream that drops approximately 700 feet over its 25-mile course. The average gradient along the mainstem is 0.5 percent (City of Portland 2005). The steeper upper section, with a gradient of 0.8 percent, begins in the headwaters and extends downstream about 5.5 miles to Regner Road in Gresham. The middle section is extremely flat and takes on a slough-like character with an average gradient of 0.4 percent. Beginning about at SE 82nd Avenue, Johnson Creek begins to cut its way down to the Willamette River with a correspondingly higher gradient than the middle section. The section of Johnson Creek adjacent to ESP is downstream of SE 82nd Avenue and is reported to have an average gradient of greater than 0.4 percent. To estimate Johnson Creek surface water elevations upstream of the 26th Place bridge and adjacent to the ESP groundwater monitoring wells MW-1 and MW-12, PNG assumed the lower average gradient of 0.4 percent reported for the middle section of the creek. The use of the lower average gradient of 0.4 percent provides a conservatively low surface water adjustment for the upstream location.

Monitoring Well MW-1 is the closest monitoring well to the established 26th Place Bridge benchmark and is located approximately 40 feet upstream. Using an average gradient along the creek of 0.4 percent, the surface water elevation in Johnson Creek adjacent to MW-1 would be 0.16 feet higher (0.004 ft/ft gradient x 40 ft = 0.16 ft elevation increase) than the surface water elevation measured at the bridge benchmark. Similarly, the projected surface water elevation in Johnson Creek further upstream adjacent to MW-12 (approximately 200 feet upstream) would be 0.8 feet (0.004 ft/ft gradient x 200 ft = 0.8 ft elevation increase) above the surface water elevation at the bridge. The reference for the Johnson Creek surface water gradient and the calculations used for the projection of upstream surface water elevations are shown in Appendix D.

Per DEQ's request, on July 29, 2022, Statewide Land Surveying completed a thread profile (a survey of the elevation of the deepest part – typically the center – of the channel) of Johnson Creek in the vicinity of ESP. The profile survey spanned approximately the same stretch of creek as sediment sampling covered during the September 2021 investigation. This profile survey for Johnson Creek is included in Appendix E. The creek bed elevation ranges from 51 to 58 feet with the highest elevations located upstream from ESP. The 7-foot difference in creek bed elevation over the 1000 feet of creek length surveyed equates to a creek bed gradient of 0.7 percent, slightly steeper than the average stream gradient assumed for estimating surface water elevations immediately upstream of the 26th Place bridge. Adjacent to the 26th Place bridge (i.e., where monthly Johnson Creek surface water measurements have been collected since March 2022), the creek bed elevation is approximately 52 feet. Johnson Creek bed elevations near the locations of MW-1 and MW-12 are 51 feet and 54 feet, respectively.

Groundwater Elevation and Flow

Recent groundwater level monitoring conducted between March (wet weather season) and August (dry weather season) 2022 are consistent with previous monitoring events since 2011 and confirm the shallow groundwater flow is generally to the west and away from Johnson Creek (Table 1) (Figures 3b-g).

Review of the groundwater elevation data collected since 2011 consistently identifies the area immediately north of Plant #2 (characterized by MW-3, MW-4, MW-5, and MW-8) as the area of lowest water table elevations on the ESP facility. Over the more than 10 years of water level monitoring completed throughout all seasons, these monitoring wells have consistently exhibited the lowest water table elevations on the facility. In addition, of these four monitoring wells, MW-3 has always exhibited the lowest water table elevation observed over the years of monitoring.

Depth-to-water measurements collected in 2022 continue to show the presence of greater groundwater elevations in the vicinity of MW-7 (Figures 3b-g). As mentioned previously, research was conducted to identify the source of this anomaly. Since these observed conditions of relatively high groundwater elevations in the vicinity of MW-7 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 has been inspected and observed to be dry. Additional research into other potential water sources beneath this portion of Plant #2 were unable to identify another source or operational cause of the persistent, higher groundwater elevations at MW-7. The atypical groundwater elevations at MW-7 may represent a localized subsurface condition that provides greater groundwater communication in the vicinity of MW-7 and MW-11. Other than the anomalously high groundwater elevation observed at MW-7 in August 2021, the groundwater elevations of observed in MW-7 and MW-11 since November 2020 are generally similar (Figure 4).

Review of the March through August 2022, as well as 2020 and 2021, groundwater elevation contour maps indicate that shallow groundwater on the ESP facility flows toward the water table depression associated with MW-3 and the surrounding wells (MW-4, MW-5 and MW-8). Shallow groundwater adjacent to Johnson Creek in the vicinity of MW-1 and MW-12 consistently flows to the south–southwest away from Johnson Creek during both wet and dry seasons. Similarly, shallow groundwater in the vicinity of MW-6, MW-7 and MW-2 (northern portions of Plant #2 and Plant #3) flows to the north-northwest toward the water table depression associated with MW-3. The shallow groundwater at the ESP facility consistently flows south-southwest from areas adjacent to Johnson Creek and north-northwest from areas beneath the northern portions of Plant #2 (including groundwater associated with MW-7) toward the water table depression around MW-3 on the western boundary of the facility. The relationship of these shallow groundwater flows from the north and south toward the water table low point in the vicinity of MW-3 during both wet and dry seasons is illustrated on Cross-Sections A – A' and B – B' (Figures 5a-c and Figures 6a-c).

JOHNSON CREEK SURFACE WATER AND GROUNDWATER RELATIONSHIP

As discussed above, the groundwater level monitoring conducted between March (wet weather season) and August (dry weather season) 2022 confirms that shallow groundwater flow is consistently to the west across the ESP facility and away from Johnson Creek during all seasons. The Johnson Creek surface water level monitoring completed over this same

timeframe further supports that shallow groundwater on the ESP facility, including groundwater in the vicinity of MW-7, does not discharge to Johnson Creek adjacent the facility.

Review of the groundwater and surface water elevations (Table 1 and 2, as well as, Figures 3a-g, and cross-section Figures 5a-c, 6a-c, and 7 a-c) indicates surface water elevations measured at the 26th Place Bridge location (downstream of MW-1) were always (throughout wet and dry seasons) on the order of one foot greater than groundwater elevations measured at MW-1 adjacent to the creek. In addition, if the surface water measurements at the bridge are increased 0.8 feet to account for the stream gradient influence on surface water elevations approximately 200 feet upstream from the bridge (and adjacent to MW-12), then estimated upstream Johnson creek surface water elevations are always greater than groundwater elevations observed in MW-12. Although the elevation of the Johnson Creek bed is below the groundwater table, the comparison of surface water and groundwater elevations (e.g., hydraulic head levels) measured during each of the 2022 monitoring events indicates the stretch of Johnson Creek adjacent to the ESP facility is a losing stream (i.e., Johnson Creek surface water hydraulic head is greater than the groundwater hydraulic head and thus surface water is recharging or discharging to groundwater over this stretch) during both wet and dry seasons of the year. This conclusion is consistent with the observed shallow groundwater flow away from Johnson Creek over multiple years and seasons.

SUMMARY AND CONCLUSIONS

- Per DEQ's request, on July 29, 2022, Statewide Land Surveying completed a thread profile of Johnson Creek in the vicinity of ESP. The profile survey spanned approximately the same stretch of creek as sediment sampling covered during the September 2021 investigation. The creek bed elevation ranges from 51 to 58 feet with the highest elevations located upstream from ESP. Adjacent to the 26th Place bridge, the creek bed elevation is approximately 52 feet. Johnson Creek bed elevations near the locations of MW-1 and MW-12 are 51 feet and 54 feet, respectively. Johnson Creek bed elevation at the 26th Place bridge and adjacent to MW-1 and MW-12 are shown on Table 1.
- Between March and August 2022, Johnson Creek surface water levels were measured monthly to support an evaluation of the relationship between surface water and groundwater at the ESP facility. The surface water levels were measured from an elevation benchmark established on the 26th Place bridge adjacent to the northwest corner of the ESP facility.
    - Review of the groundwater elevation data collected since 2011 consistently identifies the area immediately north of Plant #2 (characterized by MW-3, MW-4, MW-5, and MW-8) as the area of lowest water table elevations on the ESP facility.
    - Depth-to-water measurements collected in 2022 continue to show the presence of greater groundwater elevations in the vicinity of MW-7. Research was unable to identify a source or operational cause of the persistent, higher groundwater elevations at MW-7. The atypical groundwater elevations at MW-7 may represent a localized subsurface condition that provides greater groundwater communication in the vicinity of MW-7 and MW-11.
    - Review of the March through August 2022, as well as 2020 and 2021, groundwater elevation contour maps indicates that shallow groundwater at the

ESP facility consistently flows south-southwest from areas adjacent to Johnson Creek and north-northwest from areas beneath the northern portions of Plant #2 (including groundwater associated with MW-7) toward the water table depression around MW-3 on the western boundary of the facility.

- Review of the groundwater and surface water elevations indicates surface water elevations measured at the 26th Place Bridge location (downstream of MW-1) were always (throughout wet and dry seasons) on the order of one foot greater than groundwater elevations measured at MW-1 adjacent to the creek. The comparison of surface water and groundwater elevations measured during each of the 2022 monitoring events indicates the stretch of Johnson Creek adjacent to the ESP facility is a losing stream (i.e., Johnson Creek surface water is recharging or discharging to groundwater over this stretch) during both wet and dry seasons of the year.
- As discussed above, the groundwater level monitoring conducted between March (wet weather season) and August (dry weather season) 2022 confirms that shallow groundwater flow is consistently to the west across the ESP facility and away from Johnson Creek during all seasons. The Johnson Creek surface water level monitoring completed over this same timeframe further supports that shallow groundwater on the ESP facility, including groundwater in the vicinity of MW-7, does not discharge to Johnson Creek adjacent the facility.

ATTACHMENTS

Table 1 – Groundwater and Surface Water Elevations
Table 2 – 2022 Groundwater and Surface Water Elevations

Figure 1 – Site Location Map
Figure 2 – Site Features
Figure 3a – Groundwater Elevation Contours December 16, 2021
Figure 3b – Groundwater Elevation Contours March 21, 2022
Figure 3c – Groundwater Elevation Contours April 19, 2022
Figure 3d – Groundwater Elevation Contours May 18, 2022
Figure 3e – Groundwater Elevation Contours June 14, 2022
Figure 3f – Groundwater Elevation Contours July 19, 2022
Figure 3g – Groundwater Elevation Contours August 12, 2022
Figure 4 – Groundwater Elevation – MW-7 and MW-11
Figure 5a – Cross Section A-A' December 2021
Figure 5b – Cross Section A-A' April 2022
Figure 5c – Cross Section A-A' August 2022
Figure 6a – Cross Section B-B' December 2021
Figure 6b – Cross Section B-B' April 2022
Figure 6c – Cross Section B-B' August 2022
Figure 7a – Cross Section C-C' March 2022
Figure 7b – Cross Section C-C' June 2022
Figure 7c – Cross Section C-C'

Appendix A – 2011 through 2014 Groundwater Contour Maps
Appendix B – City of Portland Combined Sewer Information
Appendix C – Typical Floor Trench Photographs
Appendix D – Calculation of Upstream Surface Water Elevation Adjustments
Appendix E – Profile Survey for Johnson Creek

REFERENCES

City of Portland. 2005 (March). *Johnson Creek Watershed Characterization.* City of Portland Environmental Services.

PNG. 2014 (April 7). *February 2014 Ground Water Sampling Results.* PNG Environmental, Inc.

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

PNG. 2021a (November 29). *Upland Groundwater and Soil Vapor Monitoring – Summer 2021.* PNG Environmental, Inc.

Portland. 2005 (March). *Johnson Creek Watershed Characterization*. City of Portland Bureau of Environmental Services.

Saga. 2013 (May 8). *Post-Spill Response Groundwater Investigation Report,* Saga Environmental and Engineering, Inc.

TABLES

Table 1
Groundwater and Surface Water 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
		12/16/2021	8.73	54.98
		03/21/2022	9.37	54.34
		04/19/2022	8.86	54.85
		05/18/2022	9.22	54.49
		06/14/2022	8.83	54.88
		07/19/2022	9.86	53.85
		08/12/2022	9.90	53.81
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
		12/16/2021	10.19	54.29
		03/21/2022	9.57	54.91
		04/19/2022	9.07	55.41
		05/18/2022	8.85	55.63
		06/14/2022	8.65	55.83
		07/19/2022	9.22	55.26
		08/12/2022	10.48	54.00
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
		12/16/2021	12.22	51.68
		03/21/2022	12.48	51.42
		04/19/2022	12.03	51.87
		05/18/2022	12.24	51.66
		06/14/2022	12.08	51.82
		07/19/2022	12.77	51.13
		08/12/2022	13.04	50.86
MW-4	63.94	12/20/2011	12.28	51.66
		03/28/2012	11.09	52.85

Table 1
Groundwater and Surface Water 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-4 (cont'd)		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
		12/16/2021	11.51	52.43
		03/21/2022	11.80	52.14
		04/19/2022	11.22	52.72
		05/18/2022	11.44	52.50
		06/14/2022	11.19	52.75
		07/19/2022	12.13	51.81
		08/12/2022	12.53	51.41
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
		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
		12/16/2021	12.43	51.78
		03/21/2022	12.72	51.49
		04/19/2022	12.27	51.94
		05/18/2022	12.49	51.72
		06/14/2022	12.32	51.89
		07/19/2022	13.03	51.18
		08/12/2022	13.31	50.90
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
		12/16/2021	11.63	53.02
		03/21/2022	11.86	52.79
		04/19/2022	11.13	53.52
		05/18/2022	11.13	53.52
		06/14/2022	11.13	53.52
		07/19/2022	12.09	52.56
		08/12/2022	12.65	52.00
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
		12/16/2021	5.59	58.94
		03/21/2022	7.21	57.32
		04/19/2022	6.10	58.43
		05/18/2022	6.92	57.61
		06/14/2022	6.51	58.02
		07/19/2022	7.79	56.74
		08/12/2022	9.47	55.06

Table 1
Groundwater and Surface Water 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-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
		12/16/2021	7.40	51.98
		03/21/2022	7.84	51.58
		04/19/2022	7.10	52.25
		05/18/2022	7.30	52.07
		06/14/2022	7.08	52.27
		07/19/2022	8.26	51.20
		08/12/2022	9.25	50.29
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
		12/16/2021	9.79	54.85
		03/21/2022	11.47	53.17
		04/19/2022	11.08	53.56
		05/18/2022	10.98	53.66
		06/14/2022	10.49	54.15
		07/19/2022	11.72	52.92
		08/12/2022	12.27	52.37
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
		12/16/2021	5.39	59.80
		03/21/2022	7.26	57.93
		04/19/2022	5.47	59.72
		05/18/2022	6.49	58.70
		06/14/2022	5.82	59.37
		07/19/2022	10.78	54.41
		08/12/2022	12.24	52.95
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
		12/16/2021	5.59	58.68
		03/21/2022	6.58	57.69
		04/19/2022	5.89	58.38
		05/18/2022	5.55	58.72
		06/14/2022	4.95	59.32
		07/19/2022	7.52	56.75
		08/12/2022	8.79	55.48
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
		12/16/2021	6.87	56.87
		03/21/2022	8.02	55.72
		04/19/2022	7.23	56.51
		05/18/2022	7.82	55.92
		06/14/2022	7.33	56.41
		07/19/2022	8.90	54.84
		08/12/2022	8.79	54.95

Table 1
Groundwater and Surface Water 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)
Johnson Creek Surface Water @ 26th Pl Bridge* *Approximate Creek Bed Elevation is 52ft*	68.55	03/21/2022	12.74	55.81
		04/19/2022	12.36	56.19
		05/18/2022	12.91	55.64
		06/14/2022	12.68	55.87
		07/19/2022	13.88	54.67
		08/12/2022	13.62	54.93
Johnson Creek Surface Water Calculated @ MW-1** *Approximate Creek Bed Elevation is 51.5ft*		03/21/2022	-	55.97
		04/19/2022	-	56.35
		05/18/2022	-	55.80
		06/14/2022	-	56.03
		07/19/2022	-	54.83
		08/12/2022	-	55.09
Johnson Creek Surface Water Calculated @ MW-12*** *Approximate Creek Bed Elevation is 54ft*		03/21/2022	-	56.61
		04/19/2022	-	56.99
		05/18/2022	-	56.44
		06/14/2022	-	56.67
		07/19/2022	-	55.47
		08/12/2022	-	55.73

Notes:

[a] MW-8 is installed at a 24 degree angle.

MSL = Mean sea level

TOC = Top of well casing

* The March 21. 2022 measurement was collected from a point on the 26th Place bridge prior to the survey of the point used for subsequent measurement of Johnson Creek surface water elevation. The March 21, 2022 surface water elevation was calculated by manually measuring the elevation difference between the surveyed location and the adjacent point used on the bridge.

** Calculated surface water elevation adjacent to MW-1 is 0.16 feet greater than surface water elevation measured at the 26th Place Bridge. The 0.16 foot increase in surface water elevation 40 feet upstream of the bridge (MW-1 location) is based on assumed 0.4% (0.004 feet/ft) Johnson Creek surface water gradient. (40 ft x 0.004 ft/ft = 0.16 ft)

*** Calculated surface water elevation adjacent to MW-12 is 0.80 feet greater than surface water elevation measured at the 26th Place Bridge. The 0.80 foot increase in surface water elevation 200 feet upstream of the bridge (MW-12 location) is based on assumed 0.4% (0.004 feet/ft) Johnson Creek surface water gradient. (200 ft x 0.004 ft/ft = 0.80 ft)

Table 2
2022 Groundwater and Surface Water Elevations (feet MSL)
East Side Plating
Portland, Oregon

Date Measured	Johnson Creek Surface Water Elevation at 26th Place Bridge*	MW-1 Groundwater Elevation	Calculated Johnson Creek Surface Water Elevation at MW-1**	MW-12 Groundwater Elevation	Calculated Johnson Creek Surface Water Elevation at MW-12***
03/21/2022	55.81	54.34	55.97	55.72	56.61
04/19/2022	56.19	54.85	56.35	56.51	56.99
05/18/2022	55.64	54.49	55.80	55.92	56.44
06/14/2022	55.87	54.88	56.03	56.41	56.67
07/19/2022	54.67	53.85	54.83	54.84	55.47
08/12/2022	54.93	53.81	55.09	54.95	55.73

Notes:

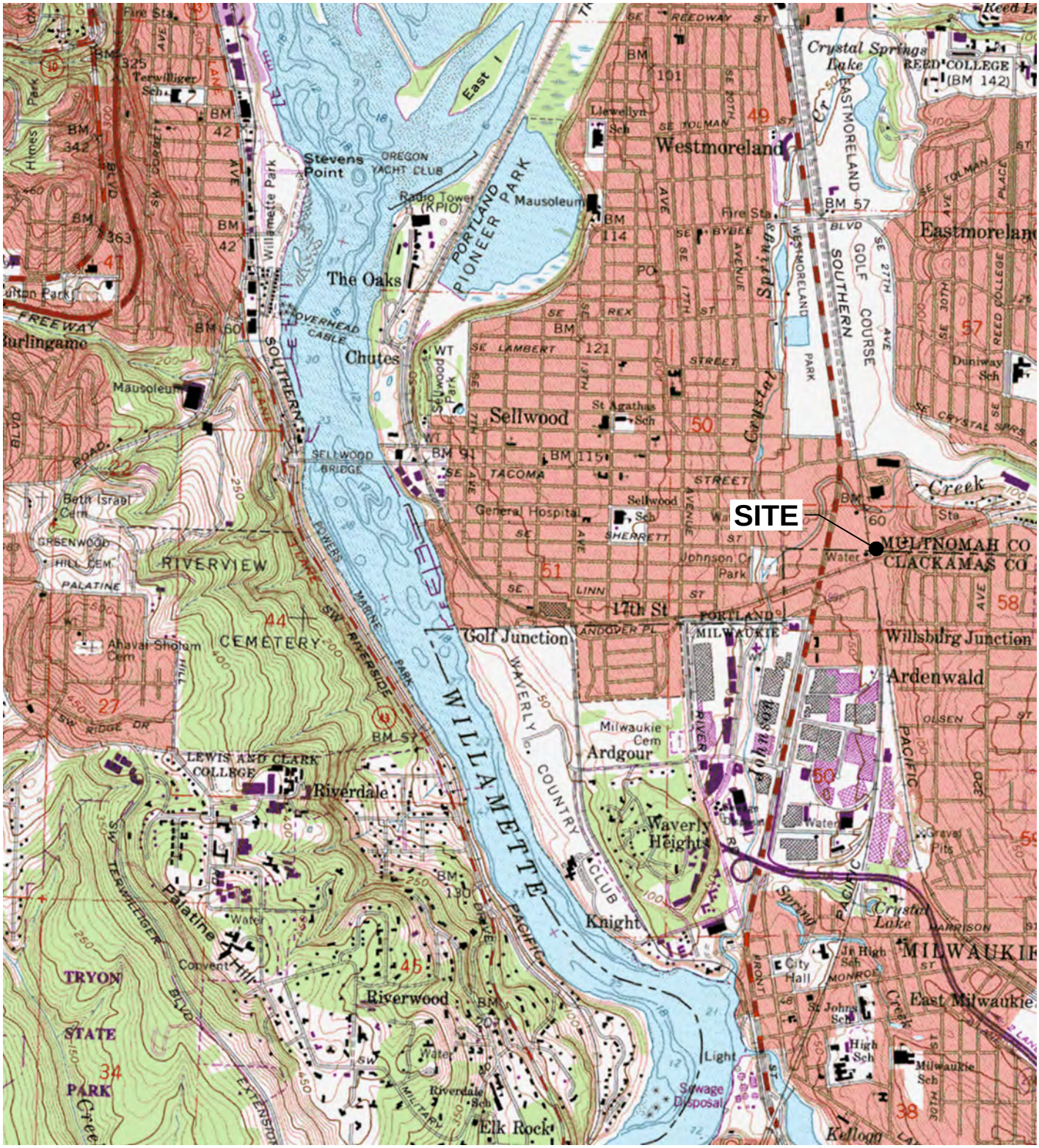
* The March 21, 2022 measurement was collected from a point on the 26th Place Bridge prior to the survey of the point used for subsequent measurement of Johnson Creek surface water elevations. The March 21, 2022 surface water elevation was calculated by manually meauring the elevation difference between the surveyed location and the adjacent point used on the bridge.

** Calculated surface water elevation adjacent to MW-1 is 0.16 feet greater than surface water elevation measured at the 26th Place Bridge. The 0.16 foot increase in surface water elevation 40 feet upstream of the bridge (MW-1 location) is based on assumed 0.4% (0.004 feet/ft) Johnson Creek surface water gradient. (40 ft x 0.004 ft/ft = 0.16 ft)

*** Calculated surface water elevation adjacent to MW-12 is 0.80 feet greater than surface water elevation measured at the 26th Place Bridge. The 0.80 foot increase in surface water elevation 200 feet upstream of the bridge (MW-12 location) is based on assumed 0.4% (0.004 feet/ft) Johnson Creek surface water gradient. (200 ft x 0.004 ft/ft = 0.80 ft)

MSL = Mean sea level

FIGURES



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

PNG ENVIRONMENTAL, INC.
6665 SW Hampton St., Ste. 101
Tigard, OR 97223
TEL (503) 620-2387
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
- A — A' — Cross Section Location

Combined Sewer Line
Outfall 1
Approx. Location of Former USTs
Johnson Creek
Approx. Location of 1985 Drum Spill Area
Approx. 2011 Nickel-Solution Release Area
Groundwater Flow Direction
East Side Plating Facility
Approx. Plating Area
Plant #3
Plant #2
Plant #1
Railroad
Approx. Location of Former House
Approx. Location of 1988 Drum Salvage Release
Springwater Corridor Trail
N

APPROXIMATE SCALE IN FEET

0 80 160

PNG ENVIRONMENTAL, INC.
6665 SW Hampton St., Ste. 101
Tigard, OR 97223
TEL (503) 620-2387
FAX (503) 620-2977

DATE:	2-13-23
FILE NAME:	1197-02
DRAWN BY:	JJT
APPROVED BY:	SV

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

SITE FEATURES
CROSS SECTION LOCATIONS

Project No. 1197-02
Figure No. 2

I:\Autocad Files\PNG-Autocad\1197-01 ESP-SE 26th Pl\2023\Feb 2023\1197-01_ BM-021323.dwg

LEGEND

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

Combined Sewer Line

Johnson Creek

MW-1 54.98

MW-12 56.87

MW-5 51.78

MW-4 52.43

MW-3 51.68

MW-8 51.98

East Side Plating Facility

MW-2 54.29

Approx. Plating Area

MW-6 53.02

MW-7 58.94

Plant #3

MW-11 58.68

Plant #2

MW-9 54.85

MW-10 59.80

52

53

54

55

56

57

58

59

Railroad

Plant #1

Approx. Location of Former House

Springwater Corridor Trail

N

APPROXIMATE SCALE IN FEET

0 80 160

I:\Autocad Files\PNG-Autocad\1197-01 ESP-SE 26th PI\2022\Oct 2022\1197-01_BM-100622.dwg

PNG ENVIRONMENTAL, INC.
6665 SW Hampton St., Ste. 101
Tigard, OR 97223
TEL (503) 620-2387
FAX (503) 620-2977

DATE:	10-6-22
FILE NAME:	1197-02
DRAWN BY:	JJT
APPROVED BY:	SV

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

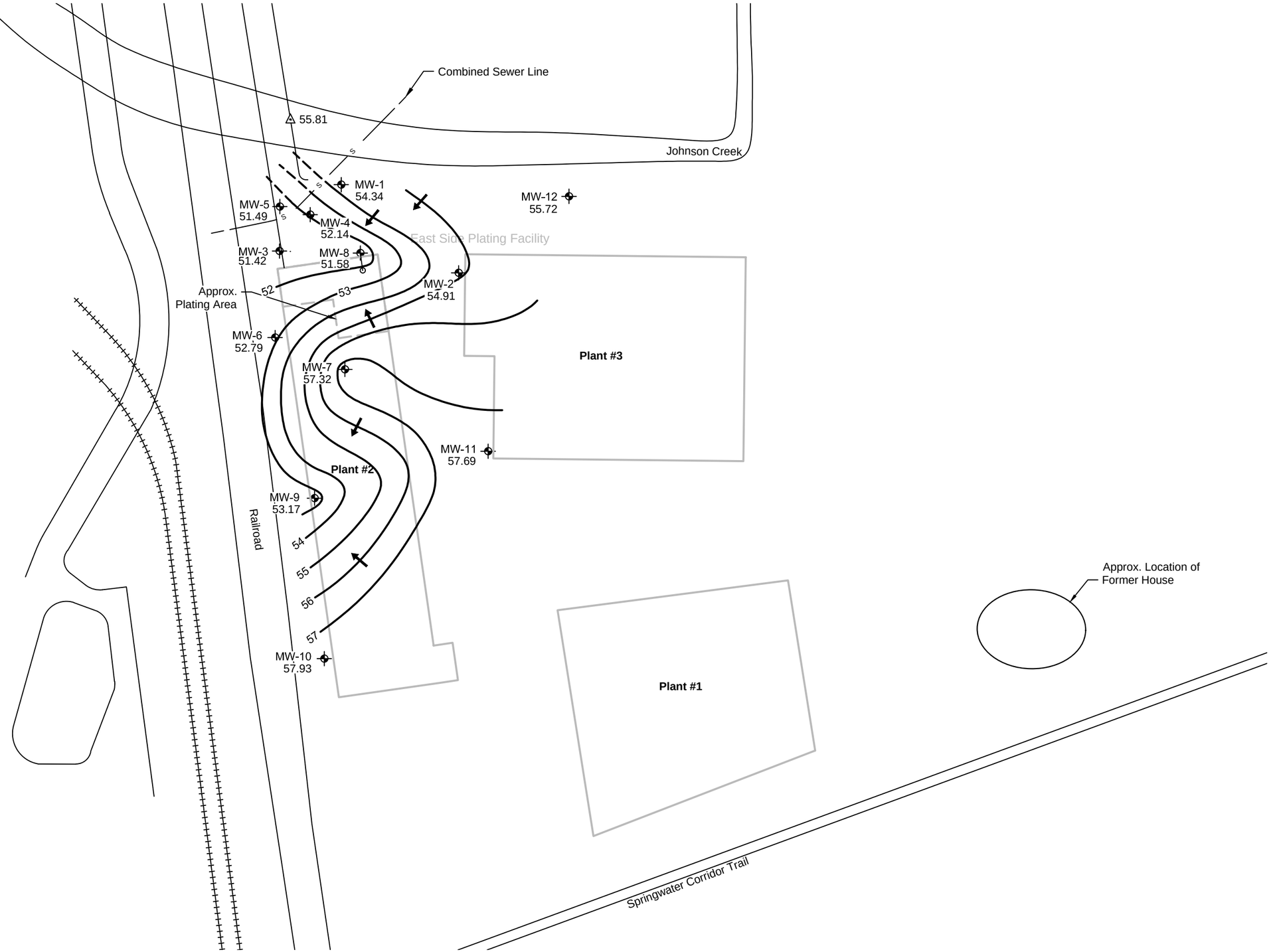
GROUNDWATER ELEVATION CONTOURS
DECEMBER 16, 2021

Project No. 1197-02

Figure No. 3a

LEGEND

- MW-1 — Monitoring Well
- 51.49 — Groundwater Elevation
- Groundwater Elevation Contour
- Approx. Groundwater Flow Direction
- Johnson Creek Surfacewater Elevation from Surveyed Elevation Point on Bridge



PNG ENVIRONMENTAL, INC.
6665 SW Hampton St., Ste. 101
Tigard, OR 97223
TEL (503) 620-2387
FAX (503) 620-2977

DATE:	10-6-22
FILE NAME:	1197-02
DRAWN BY:	JJT
APPROVED BY:	SV

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

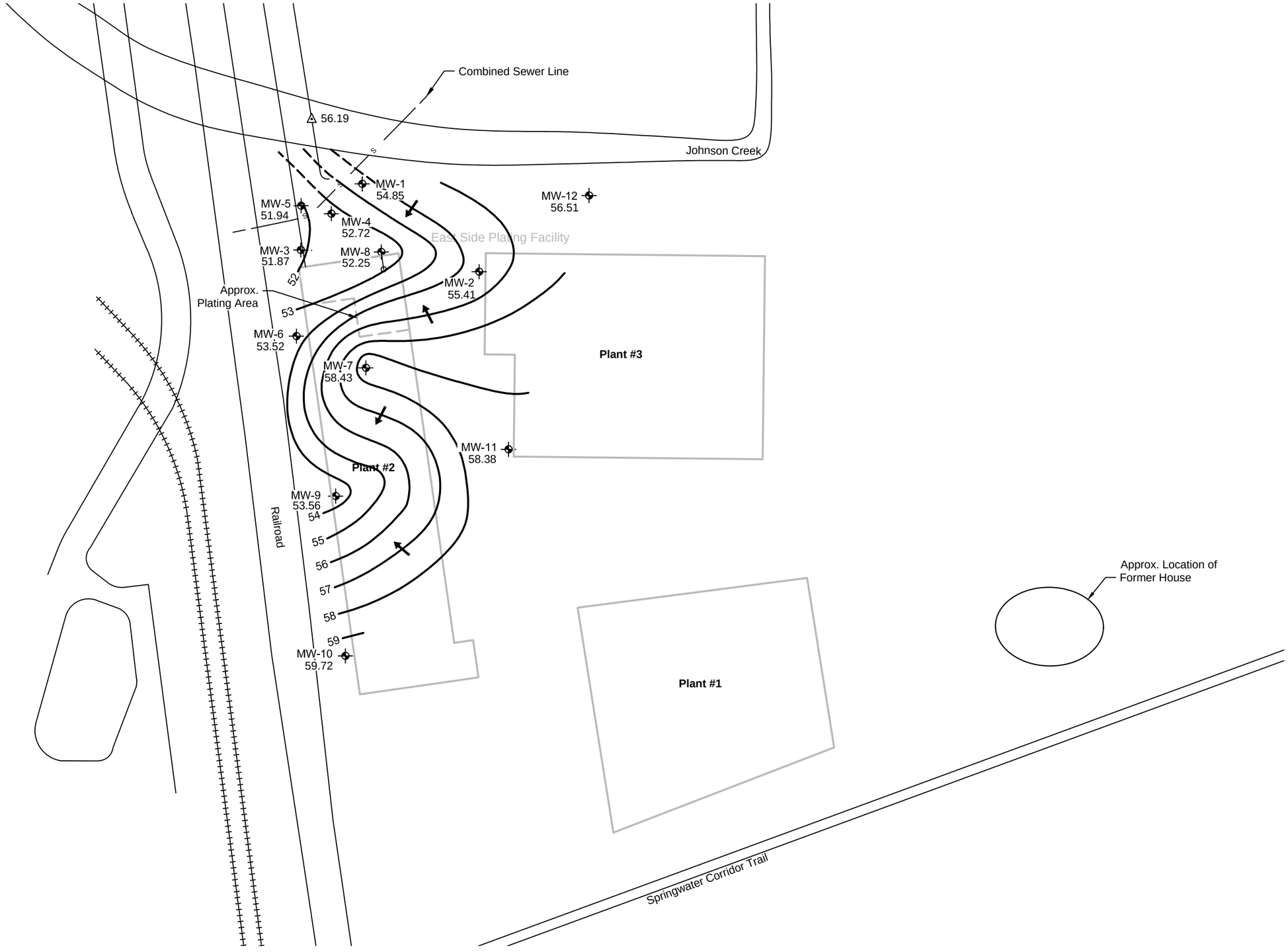
GROUNDWATER ELEVATION CONTOURS
MARCH 21, 2022

Project No. 1197-02

Figure No. 3b

LEGEND

- MW-1 ⊕ — Monitoring Well
- 51.87 — Groundwater Elevation
- ~ — Groundwater Elevation Contour
- ← — Approx. Groundwater Flow Direction
- △ — Johnson Creek Surfacewater Elevation from Surveyed Elevation Point on Bridge



APPROXIMATE SCALE IN FEET

0 80 160

PNG ENVIRONMENTAL, INC. 6665 SW Hampton St., Ste. 101 Tigard, OR 97223 TEL (503) 620-2387 FAX (503) 620-2977	DATE: 10-6-22 FILE NAME: 1197-02 DRAWN BY: JJT APPROVED BY: SV	EAST SIDE PLATING 8300, 5310, 8400 SE 26TH PLACE PORTLAND, OR	GROUNDWATER ELEVATION CONTOURS APRIL 19, 2022	Project No. 1197-02 Figure No. 3c

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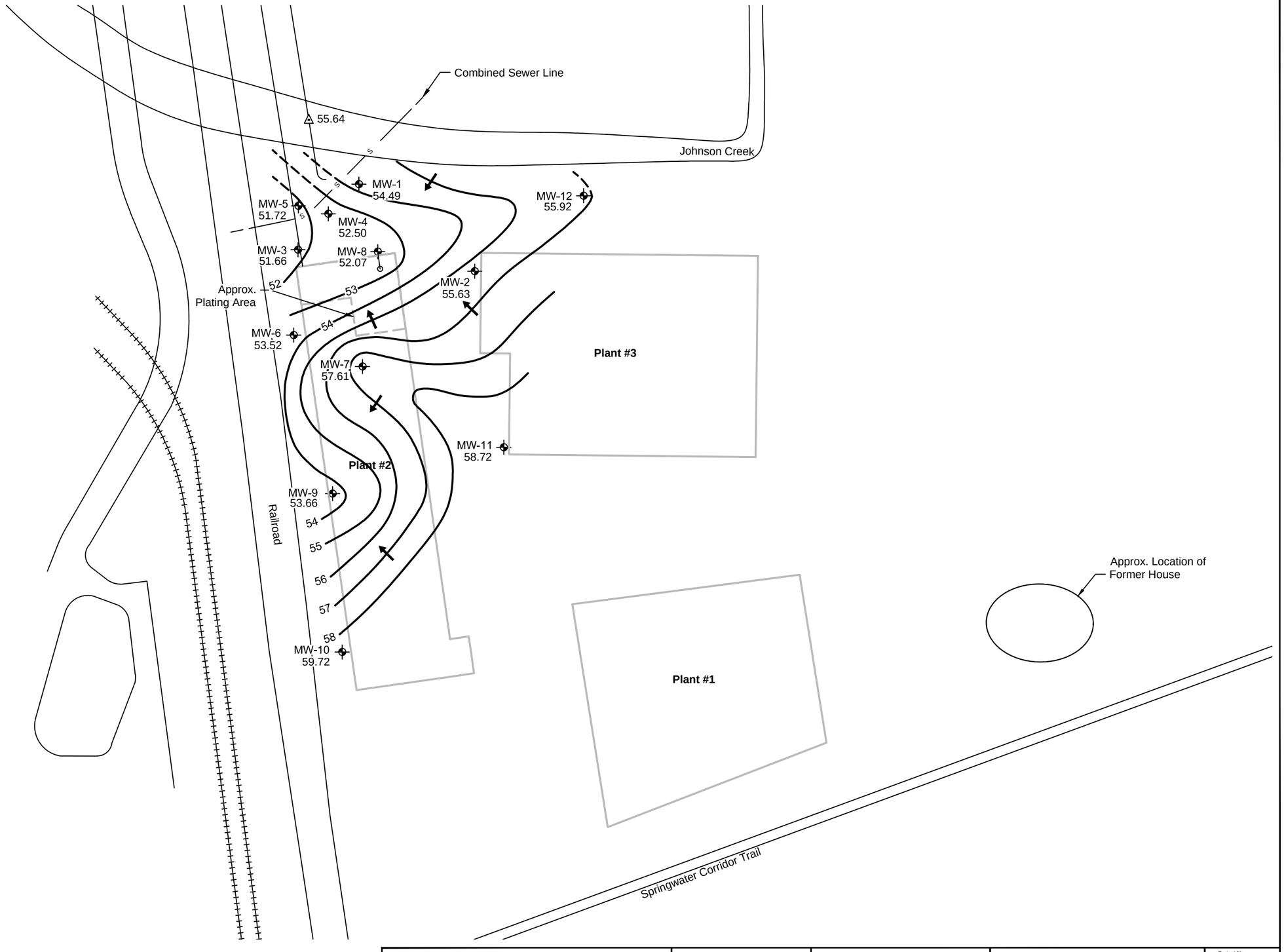
LEGEND

MW-1	Monitoring Well
51.72	Groundwater/Surfacewater Elevation (feet)
	Groundwater Elevation Contour
	Approx. Groundwater Flow Direction
△	Johnson Creek Surfacewater Elevation from Surveyed Elevation Point on Bridge



APPROXIMATE SCALE IN FEET

0 80 160

PNG ENVIRONMENTAL, INC. 6665 SW Hampton St., Ste. 101 Tigard, OR 97223 TEL (503) 620-2387 FAX (503) 620-2977	DATE: 5-20-22 FILE NAME: 1197-02 DRAWN BY: JJT APPROVED BY: SV	EAST SIDE PLATING 8300, 5310, 8400 SE 26TH PLACE PORTLAND, OR	GROUNDWATER ELEVATION CONTOURS MAY 18, 2022	Project No. 1197-02 Figure No. 3d

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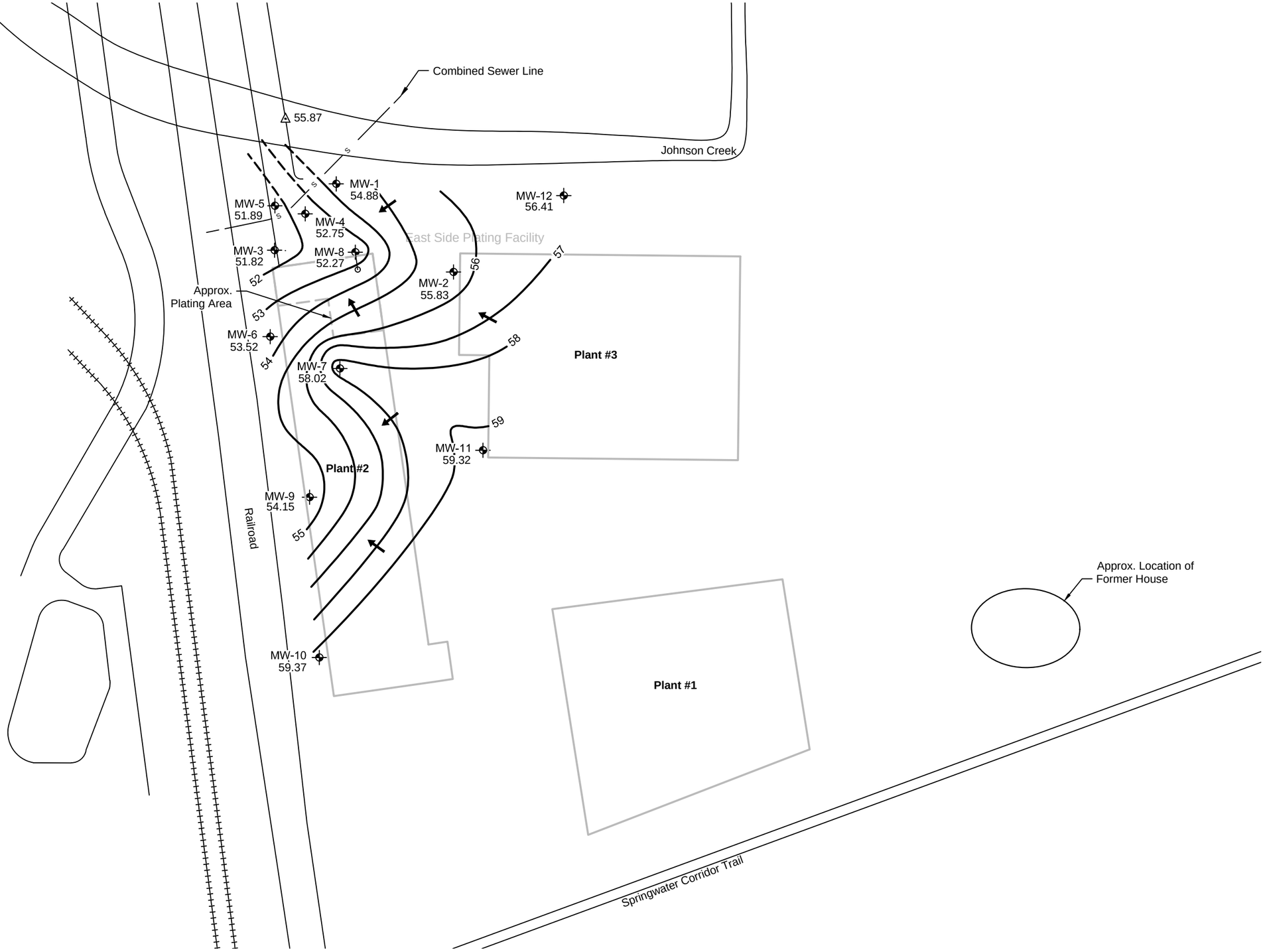
LEGEND

- MW-1 ⊕ — Monitoring Well
- 51.89 — Groundwater/Surfacewater Elevation (feet)
- Groundwater Elevation Contour
- Approx. Groundwater Flow Direction
- △ — Johnson Creek Surfacewater Elevation from Surveyed Elevation Point on Bridge



N

APPROXIMATE SCALE IN FEET

0 80 160

PNG ENVIRONMENTAL, INC.
6665 SW Hampton St., Ste. 101
Tigard, OR 97223
TEL (503) 620-2387
FAX (503) 620-2977

DATE:	10-6-22
FILE NAME:	1197-02
DRAWN BY:	JJT
APPROVED BY:	SV

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

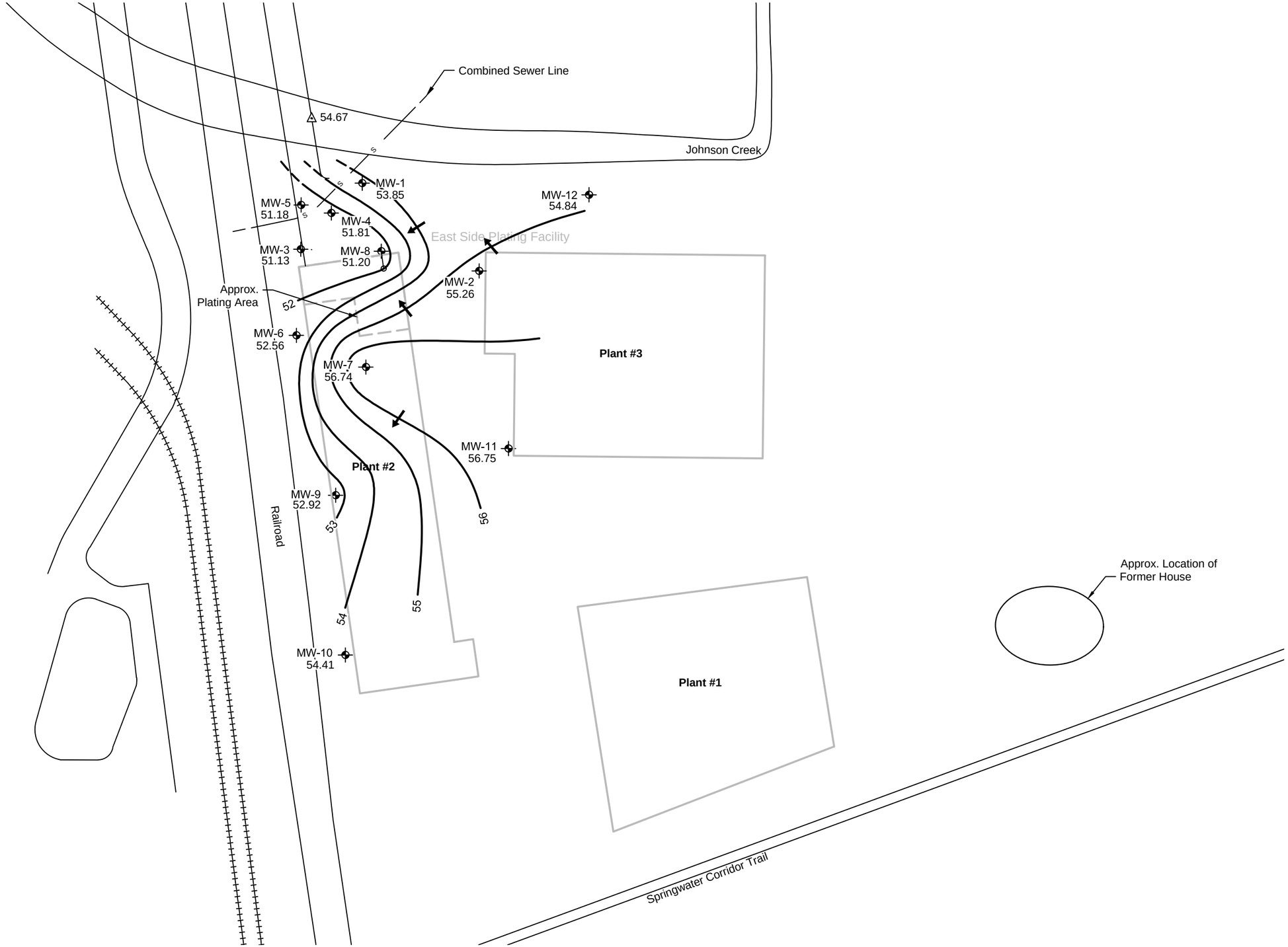
GROUNDWATER ELEVATION CONTOURS
JUNE 14, 2022

Project No. 1197-02

Figure No. 3e

LEGEND

- MW-1 ⊕ — Monitoring Well
- 51.13 — Groundwater/Surfacewater Elevation (feet)
- ~ — Groundwater Elevation Contour
- ← — Approx. Groundwater Flow Direction
- △ — Johnson Creek Surfacewater Elevation from Surveyed Elevation Point on Bridge



APPROXIMATE SCALE IN FEET

0 80 160

PNG ENVIRONMENTAL, INC.	DATE: 10-6-22	EAST SIDE PLATING	GROUNDWATER ELEVATION CONTOURS
6665 SW Hampton St., Ste. 101	FILE NAME: 1197-02	8300, 5310, 8400 SE 26TH PLACE	JULY 19, 2022
Tigard, OR 97223	DRAWN BY: JJT	PORTLAND, OR	Project No. 1197-02
TEL (503) 620-2387	APPROVED BY: SV		Figure No. 3f
FAX (503) 620-2977			

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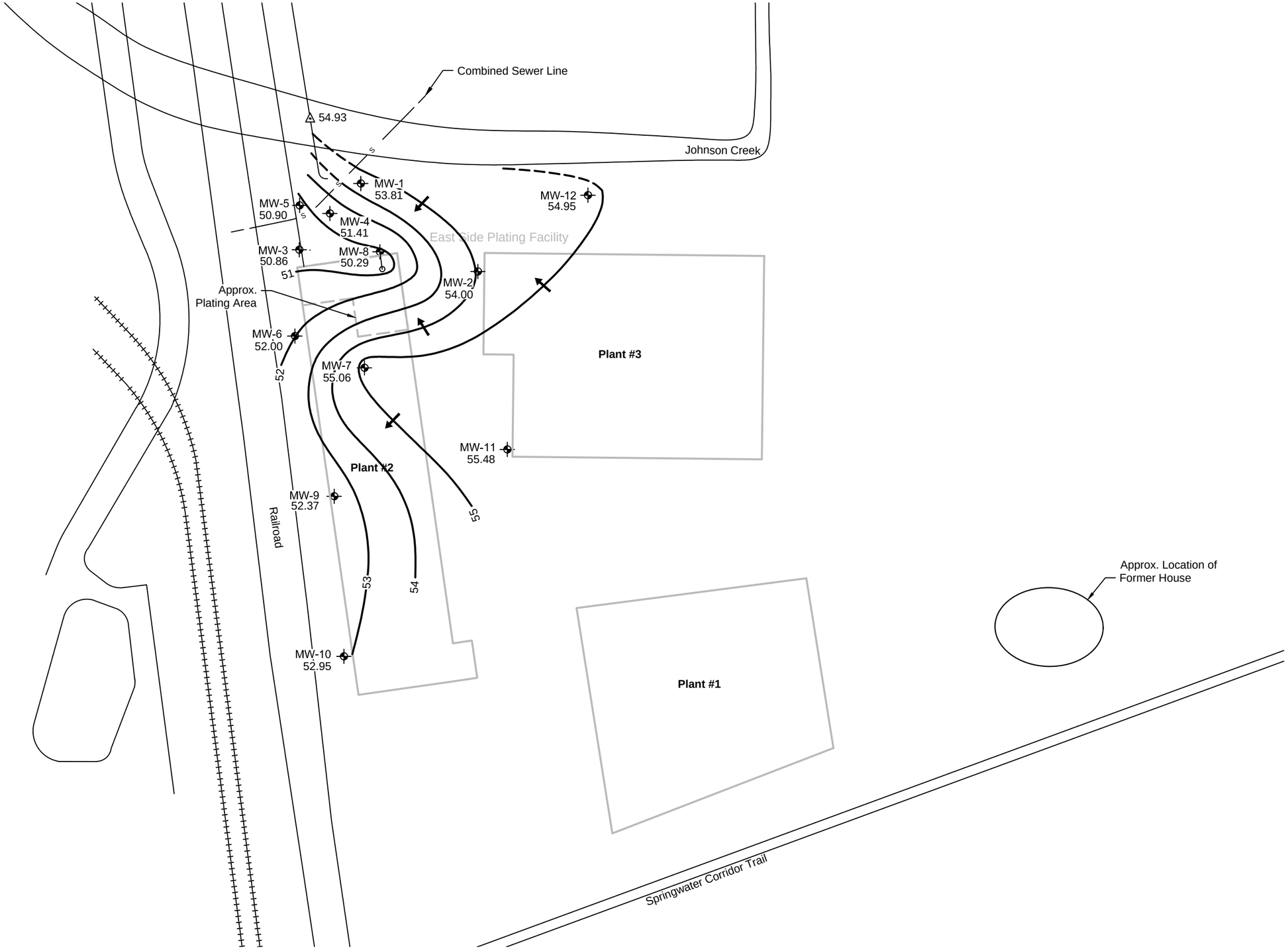
LEGEND

- MW-1 ⊕ — Monitoring Well
- 50.90 — Groundwater/Surfacewater Elevation (feet)
- Groundwater Elevation Contour
- Approx. Groundwater Flow Direction
- △ — Johnson Creek Surfacewater Elevation from Surveyed Elevation Point on Bridge



N

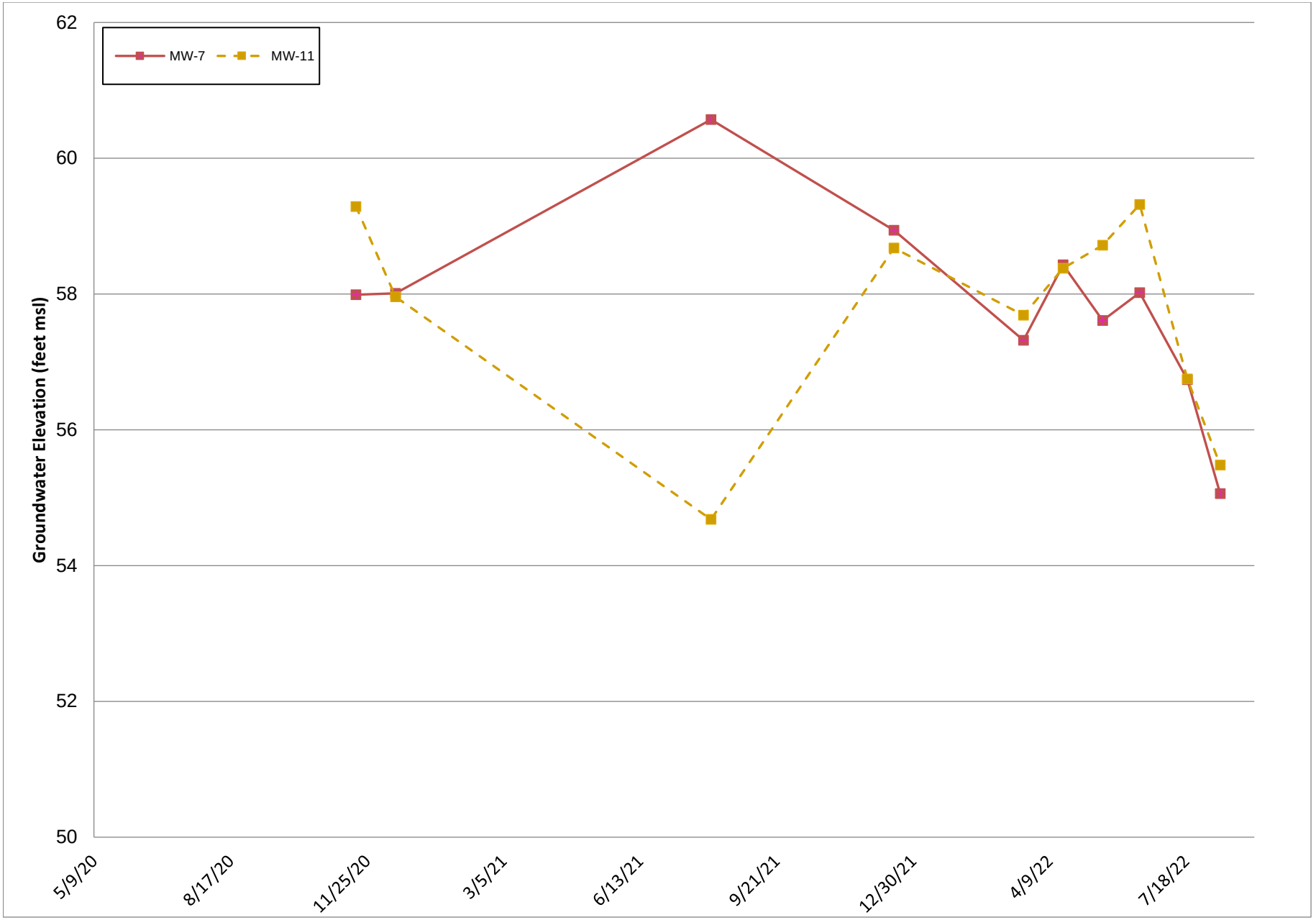
APPROXIMATE SCALE IN FEET

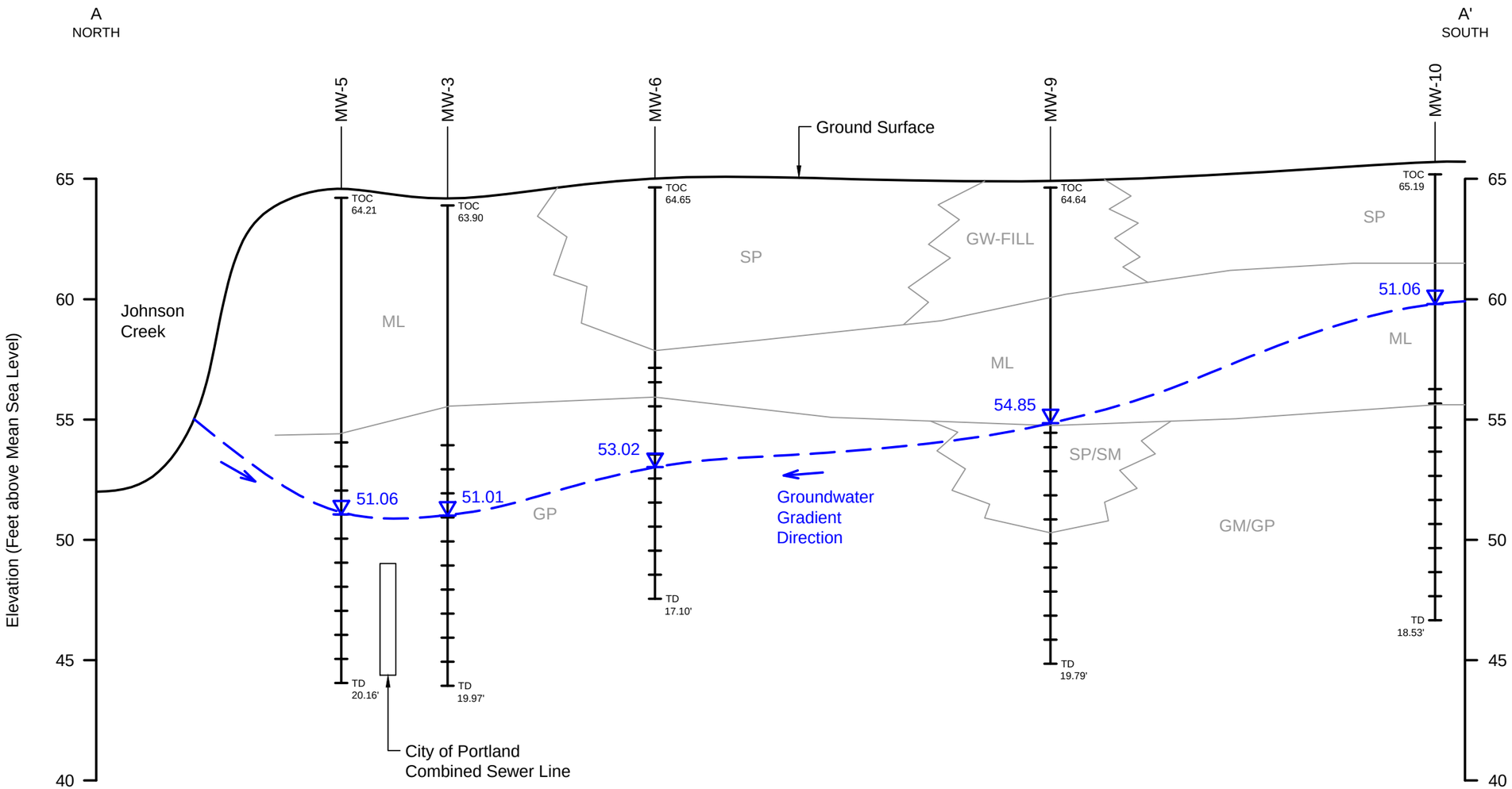
0 80 160

PNG ENVIRONMENTAL, INC. 6665 SW Hampton St., Ste. 101 Tigard, OR 97223 TEL (503) 620-2387 FAX (503) 620-2977	DATE: 10-6-22 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 12, 2022	Project No. 1197-02 Figure No. 3g

I:\Autocad Files\PNG-Autocad\1197-01 ESP-SE 26th Pl\2022\Oct 2022\1197-01_BM-100622.dwg

Figure 4
Groundwater Elevation - MW-7 and MW-11
East Side Plating, Inc.





Note: Water levels 12/16/21 (Table 1)

VERTICAL SCALE IN FEET
0 10

HORIZONTAL SCALE IN FEET
0 40 80

PNG ENVIRONMENTAL, INC.
6665 SW Hampton St., Ste. 101
Tigard, OR 97223
TEL (503) 620-2387
FAX (503) 620-2977

DATE:	2-13-23
FILE NAME:	1197-02
DRAWN BY:	JJT
APPROVED BY:	SV

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

SITE FEATURES
CROSS SECTION A-A'
DECEMBER 2021

Project No. 1197-02

Figure No. 5A

A
NORTH

A'
SOUTH

MW-5 MW-3 MW-6 MW-9 MW-10

Ground Surface

TOC 64.21
TOC 63.90
TOC 64.65
TOC 64.64
TOC 65.19

Elevation (Feet above Mean Sea Level)

65
60
55
50
45
40

Johnson Creek

56.19

ML
SP
GW-FILL
SP
ML
ML
SP/SM
GP
GM/GP

51.94
51.87
53.52
53.56
59.72

Groundwater Gradient Direction

TD 20.16'
TD 19.97'
TD 17.10'
TD 19.79'
TD 18.53'

City of Portland Combined Sewer Line

Note: Water levels 4/19/22 (Table 1)

VERTICAL SCALE IN FEET
0 10

HORIZONTAL SCALE IN FEET
0 40 80

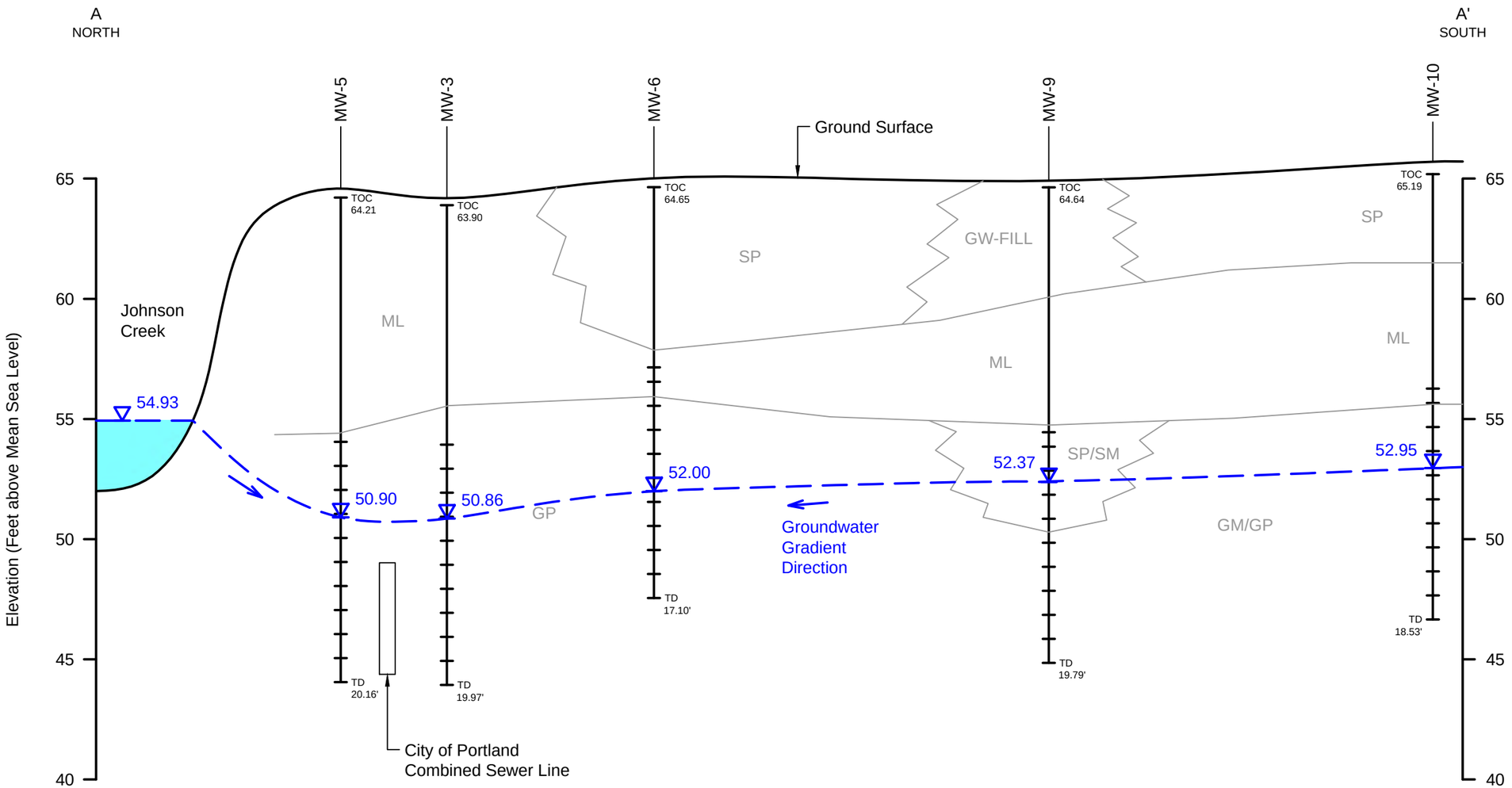
PNG ENVIRONMENTAL, INC.
6665 SW Hampton St., Ste. 101
Tigard, OR 97223
TEL (503) 620-2387
FAX (503) 620-2977

DATE:	2-13-23
FILE NAME:	1197-02
DRAWN BY:	JJT
APPROVED BY:	SV

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

SITE FEATURES
CROSS SECTION A-A'
APRIL 2022

Project No. 1197-02
Figure No. 5B



Note: Water levels 8/12/22 (Table 1)

VERTICAL SCALE IN FEET
0 10

HORIZONTAL SCALE IN FEET
0 40 80

PNG ENVIRONMENTAL, INC.
6665 SW Hampton St., Ste. 101
Tigard, OR 97223
TEL (503) 620-2387
FAX (503) 620-2977

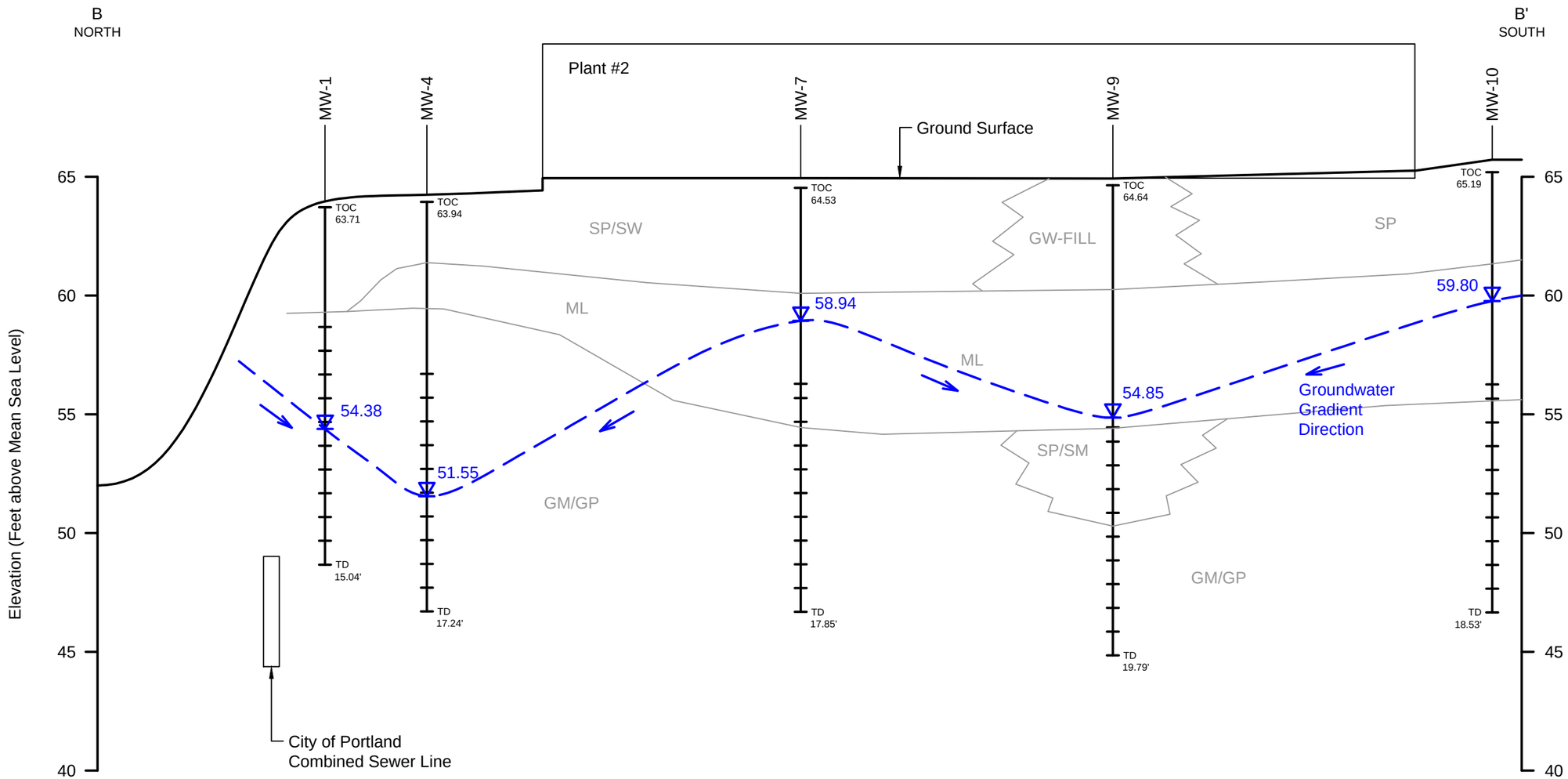
DATE:	2-13-23
FILE NAME:	1197-02
DRAWN BY:	JJT
APPROVED BY:	SV

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

SITE FEATURES
CROSS SECTION A-A'
AUGUST 2022

Project No. 1197-02

Figure No. 5C



Note: Water levels 12/16/21 (Table 1)

VERTICAL SCALE IN FEET
0 10

HORIZONTAL SCALE IN FEET
0 40 80

PNG ENVIRONMENTAL, INC.
6665 SW Hampton St., Ste. 101
Tigard, OR 97223
TEL (503) 620-2387
FAX (503) 620-2977

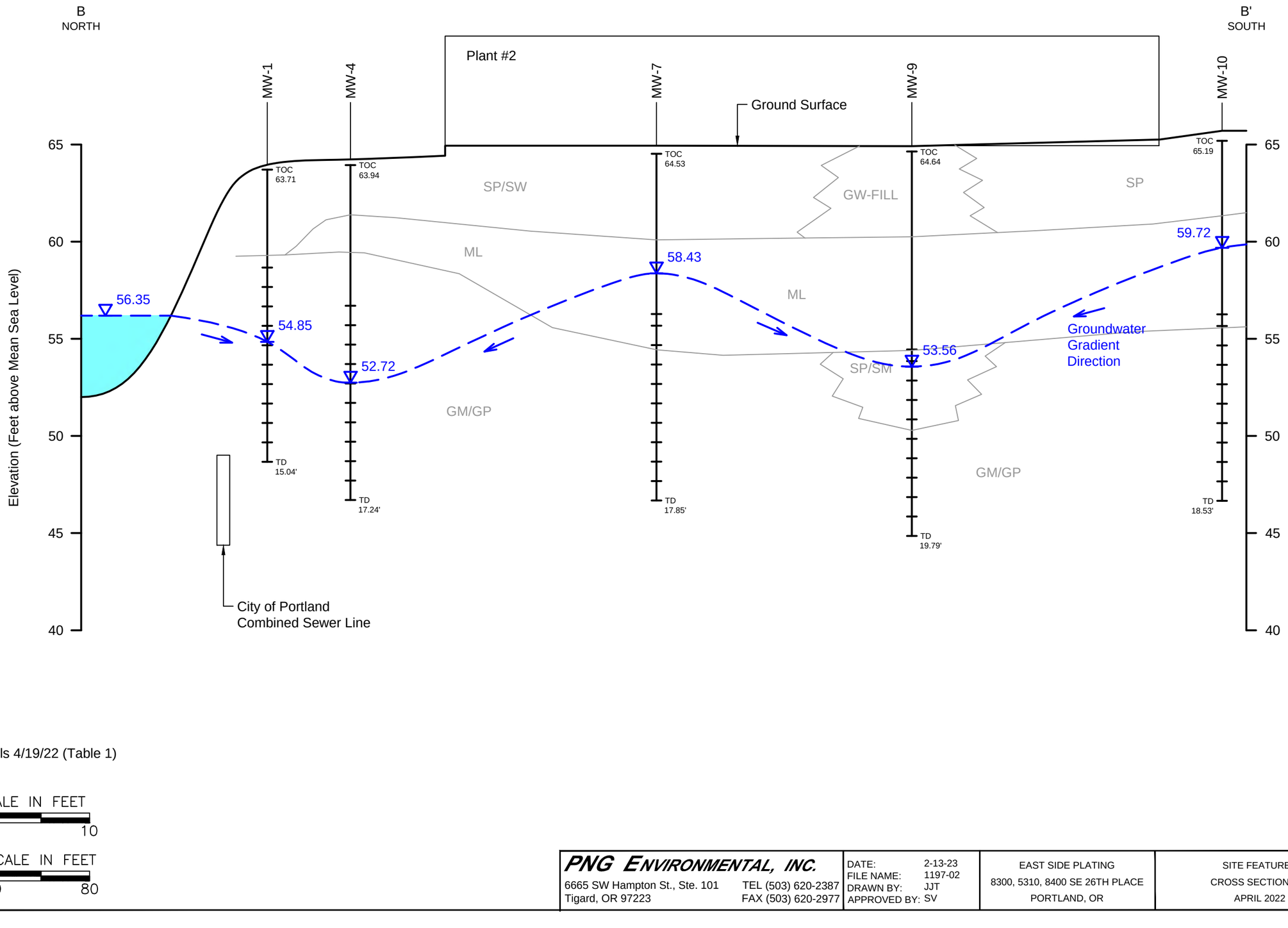
DATE:	2-13-23
FILE NAME:	1197-02
DRAWN BY:	JJT
APPROVED BY:	SV

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

SITE FEATURES
CROSS SECTION B-B'
DECEMBER 2021

Project No. 1197-02

Figure No. 6A



Note: Water levels 4/19/22 (Table 1)

VERTICAL SCALE IN FEET
0 10

HORIZONTAL SCALE IN FEET
0 40 80

PNG ENVIRONMENTAL, INC.
6665 SW Hampton St., Ste. 101
Tigard, OR 97223
TEL (503) 620-2387
FAX (503) 620-2977

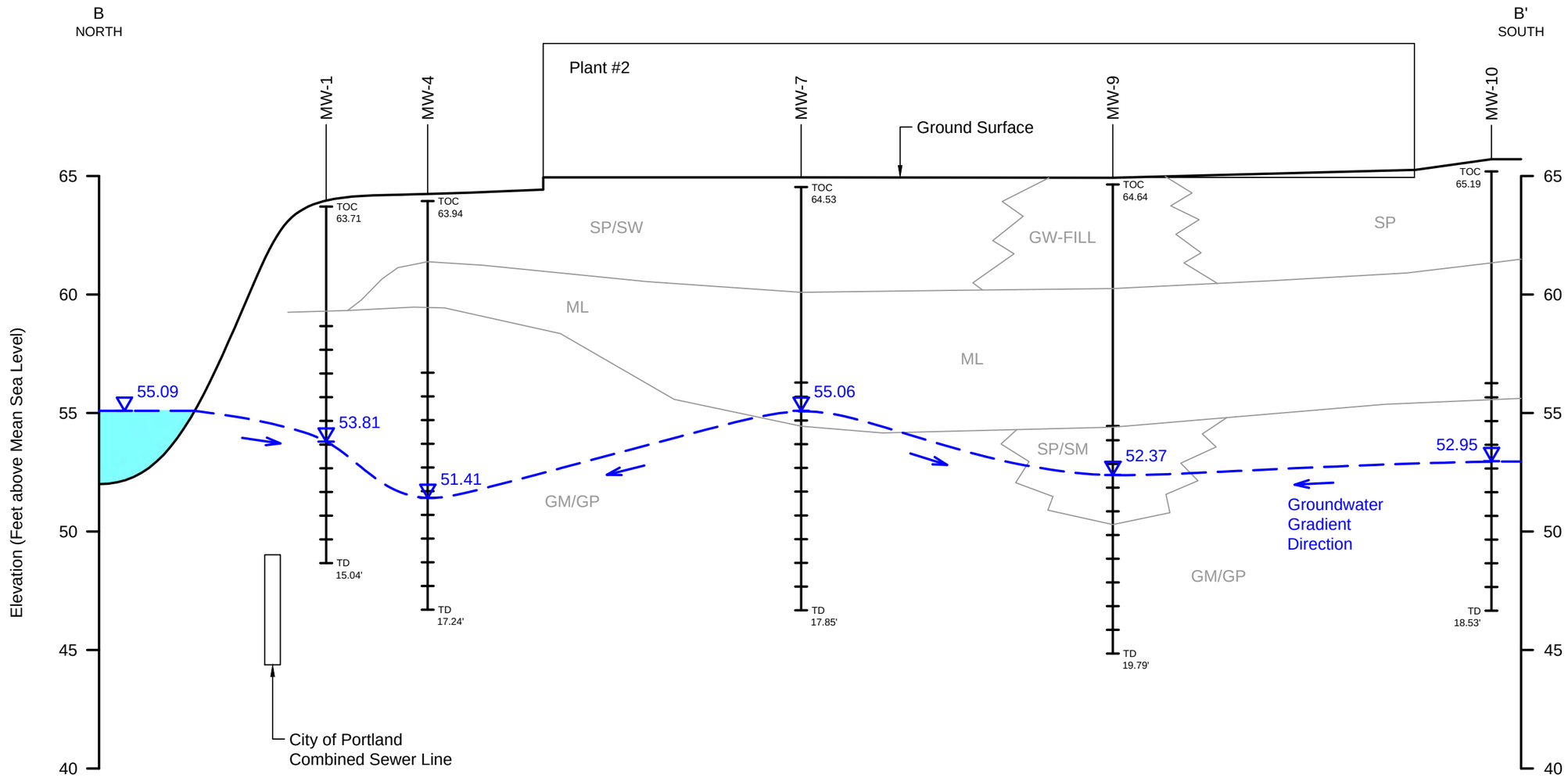
DATE:	2-13-23
FILE NAME:	1197-02
DRAWN BY:	JJT
APPROVED BY:	SV

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

SITE FEATURES
CROSS SECTION B-B'
APRIL 2022

Project No. 1197-02

Figure No. 6B



Note: Water levels 8/12/22 (Table 1)

VERTICAL SCALE IN FEET
0 10

HORIZONTAL SCALE IN FEET
0 40 80

PNG ENVIRONMENTAL, INC.
6665 SW Hampton St., Ste. 101
Tigard, OR 97223
TEL (503) 620-2387
FAX (503) 620-2977

DATE:	2-13-23
FILE NAME:	1197-02
DRAWN BY:	JJT
APPROVED BY:	SV

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

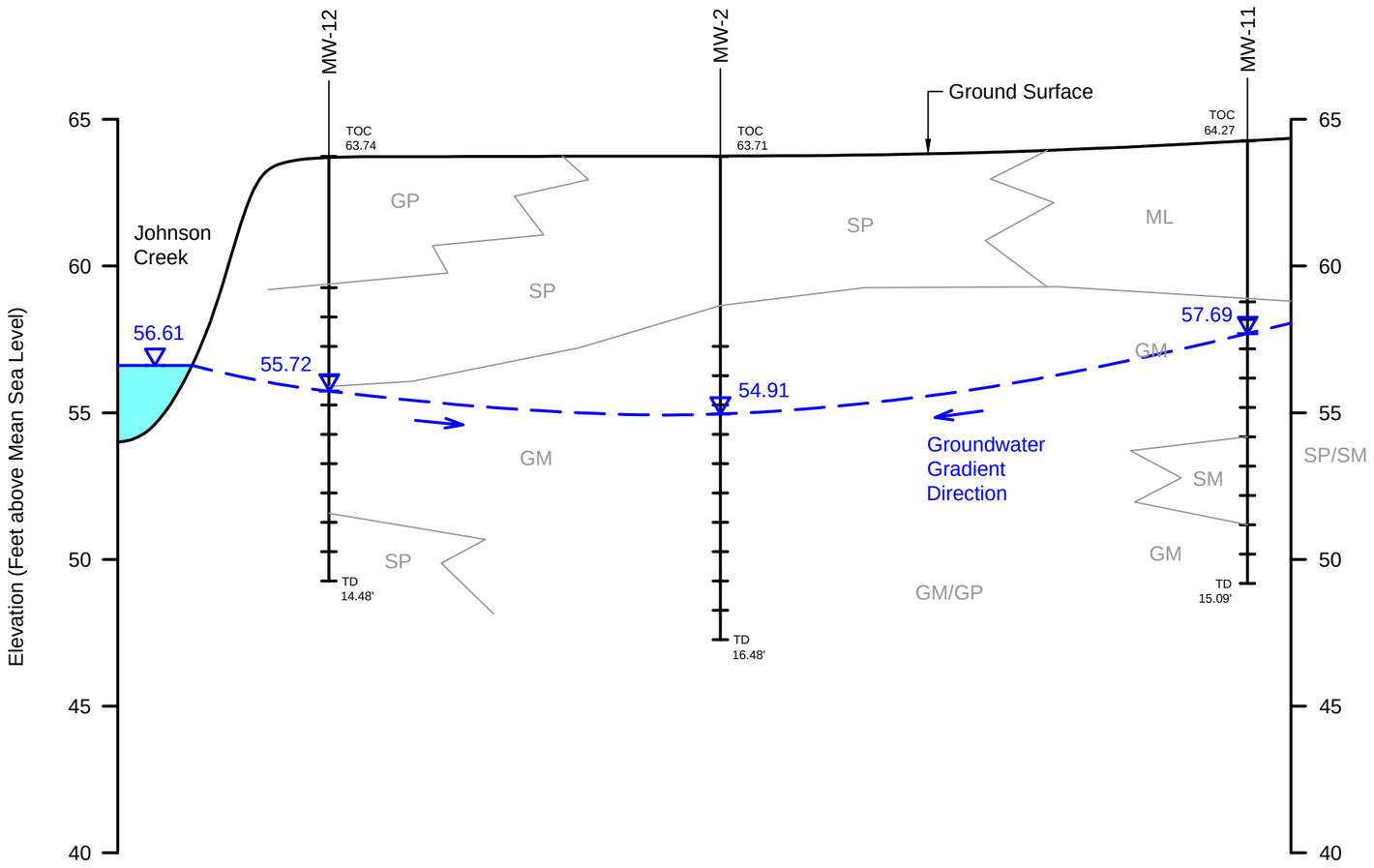
SITE FEATURES
CROSS SECTION B-B'
AUGUST 2022

Project No. 1197-02

Figure No. 6C

C
NORTH

C'
SOUTH



Note: Water levels 3/21/22 (Table 1)

VERTICAL SCALE IN FEET
0 10

HORIZONTAL SCALE IN FEET
0 40 80

PNG ENVIRONMENTAL, INC.
6665 SW Hampton St., Ste. 101
Tigard, OR 97223
TEL (503) 620-2387
FAX (503) 620-2977

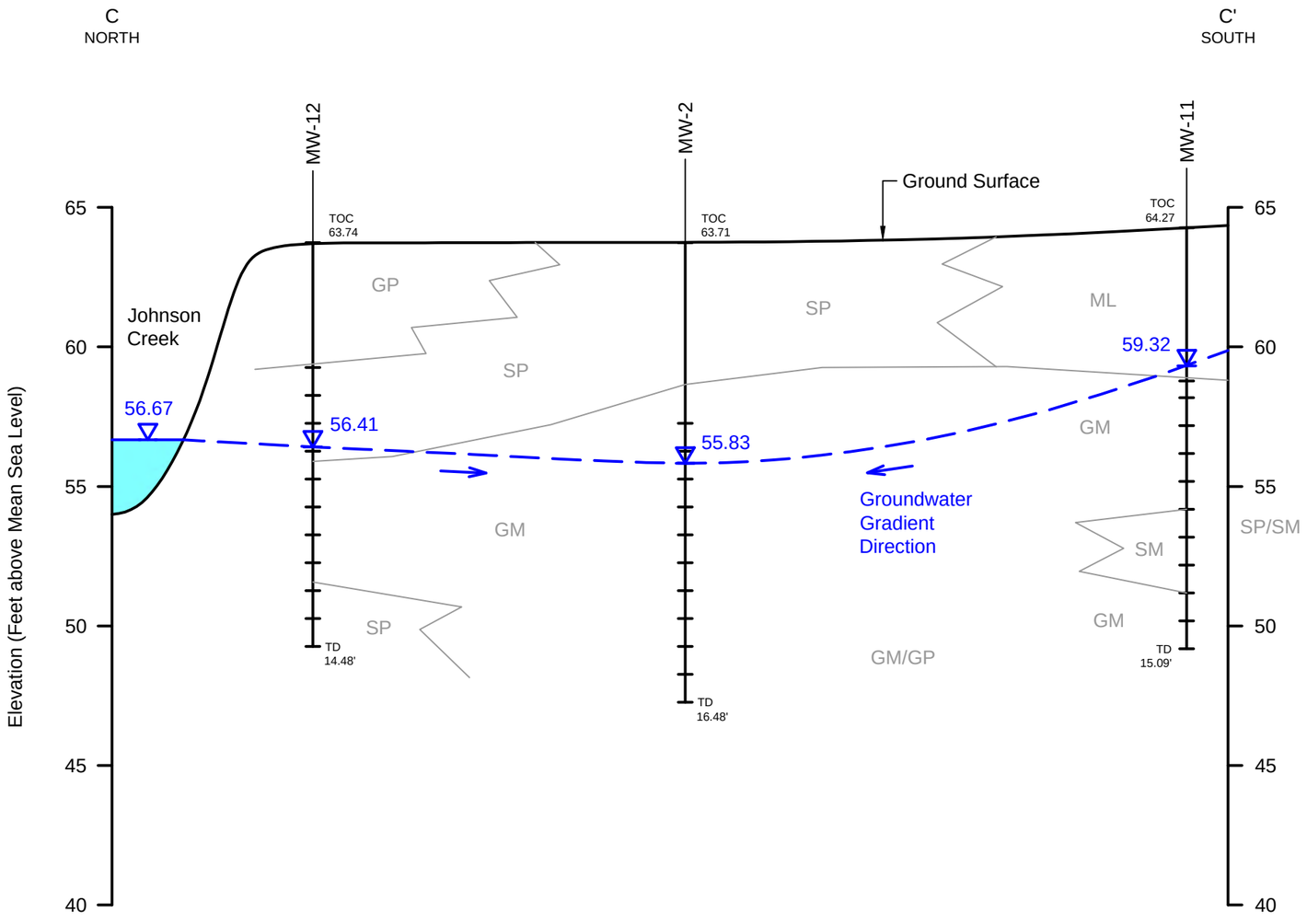
DATE:	2-13-23
FILE NAME:	1197-02
DRAWN BY:	JJT
APPROVED BY:	SV

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

SITE FEATURES
CROSS SECTION C-C'
MARCH 2022

Project No. 1197-02

Figure No. 7A



Note: Water levels 6/14/22 (Table 1)

VERTICAL SCALE IN FEET

0 10

HORIZONTAL SCALE IN FEET

0 40 80

PNG ENVIRONMENTAL, INC.
6665 SW Hampton St., Ste. 101
Tigard, OR 97223
TEL (503) 620-2387
FAX (503) 620-2977

DATE:	2-13-23
FILE NAME:	1197-02
DRAWN BY:	JJT
APPROVED BY:	SV

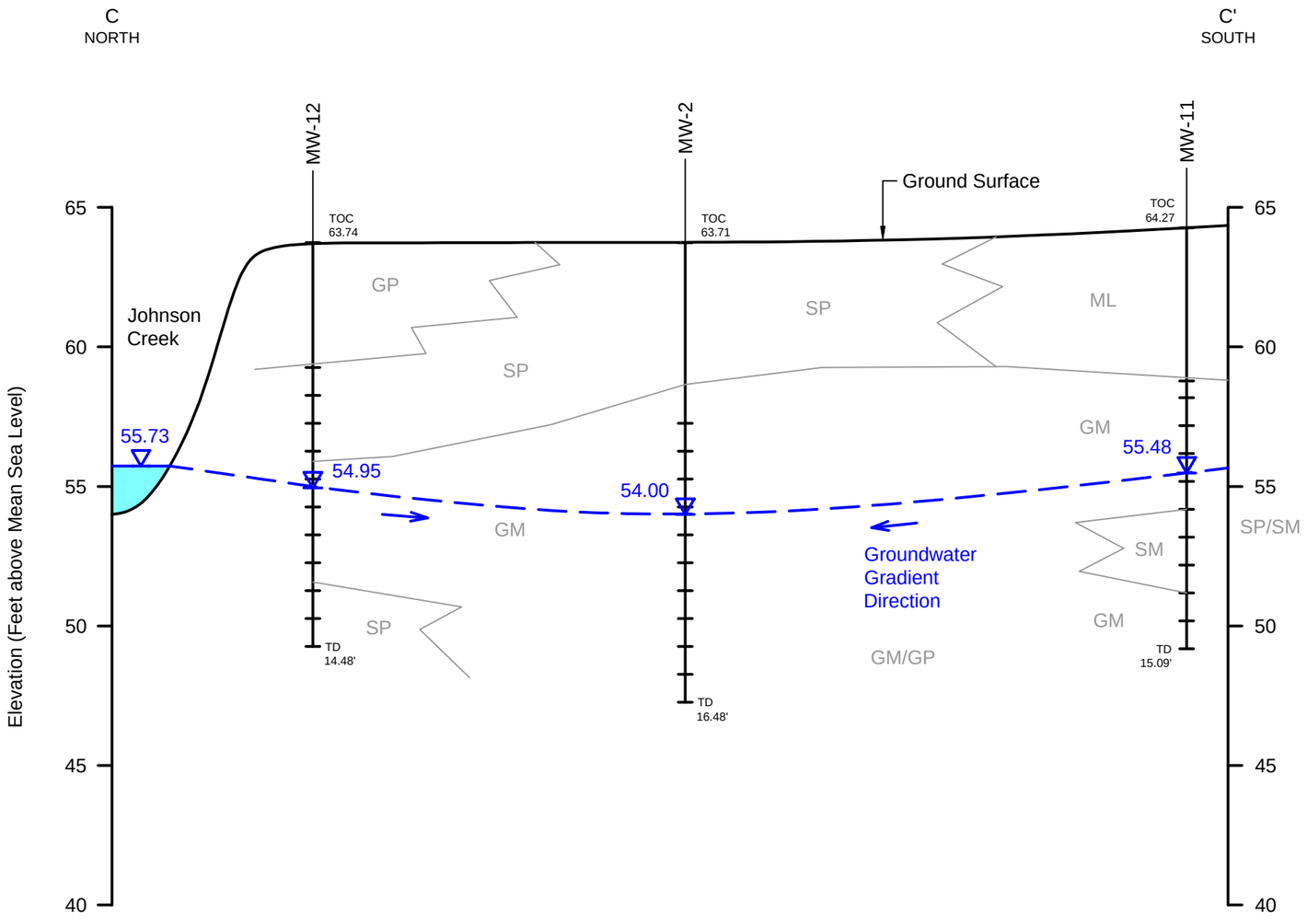
EAST SIDE PLATING
8300, 5310, 8400 SE 26TH PLACE
PORTLAND, OR

SITE FEATURES
CROSS SECTION C-C'
JUNE 2022

Project No. 1197-02

Figure No. 7B

I:\Autocad Files\PNG-Autocad\1197-01 ESP-SE 26th PI\2023\Feb 2023\1197-01_BM-021323.dwg



Note: Water levels 8/12/22 (Table 1)

VERTICAL SCALE IN FEET

0 10

HORIZONTAL SCALE IN FEET

0 40 80

PNG ENVIRONMENTAL, INC.
6665 SW Hampton St., Ste. 101
Tigard, OR 97223
TEL (503) 620-2387
FAX (503) 620-2977

DATE:	2-13-23
FILE NAME:	1197-02
DRAWN BY:	JJT
APPROVED BY:	SV

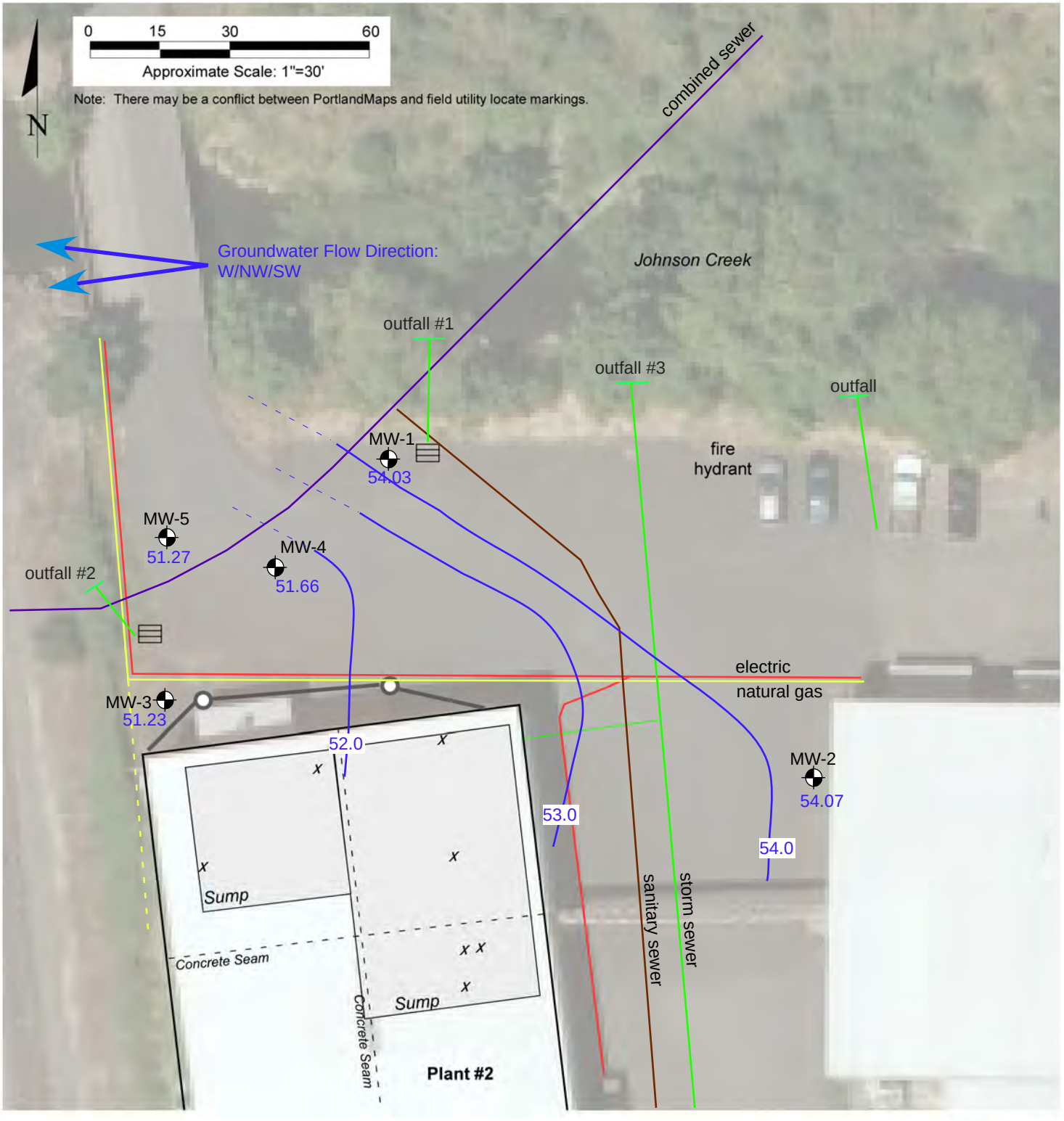
EAST SIDE PLATING
8300, 5310, 8400 SE 26TH PLACE
PORTLAND, OR

SITE FEATURES
CROSS SECTION C-C'
AUGUST 2022

Project No. 1197-02

Figure No. 7C

APPENDIX A
2011-2014 GROUNDWATER CONTOUR MAPS



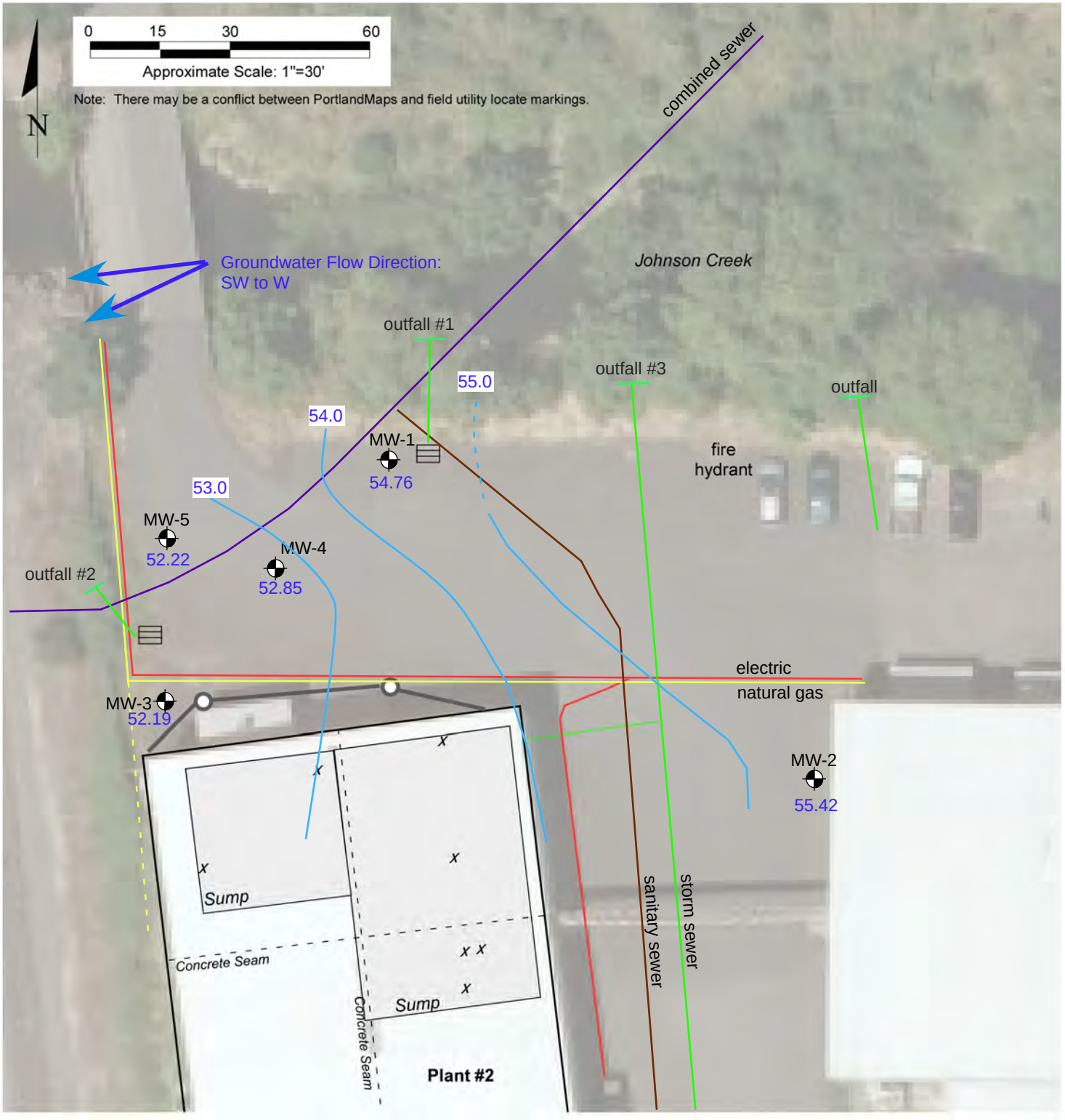
LEGEND

- Catch Basin
- CLSM Wall with Sump
- x Repaired tear in sump liner or wall failure
- MW-1 Groundwater Monitoring Well Location and Number
- 53.15 Groundwater Elevation
- Groundwater Elevation Contour

Figure 6
Groundwater Elevation Map 12/20/11

East Side Plating
8400 SE 26th Avenue
Portland, Oregon

Project No. 11035.00 February 2013



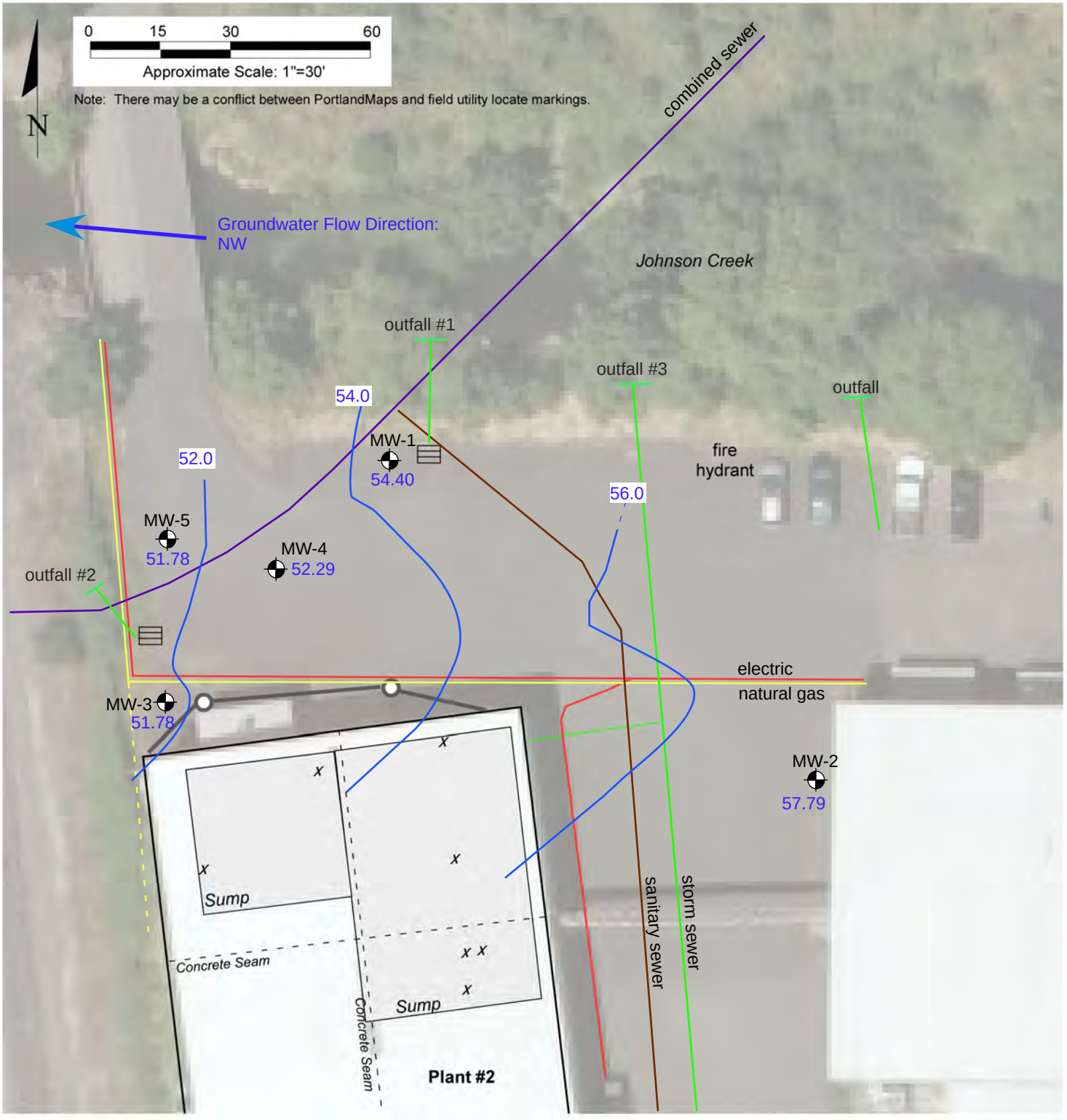
LEGEND

- Catch Basin
- CLSM Wall with Sump
- x Repaired tear in sump liner or wall failure
- MW-1 Groundwater Monitoring Well Location and Number
- 53.15 Groundwater Elevation
- Groundwater Elevation Contour

Figure 7
Groundwater Elevation Map 3/12/12

East Side Plating
8400 SE 26th Avenue
Portland, Oregon

Project No. 11035.00 February 2013



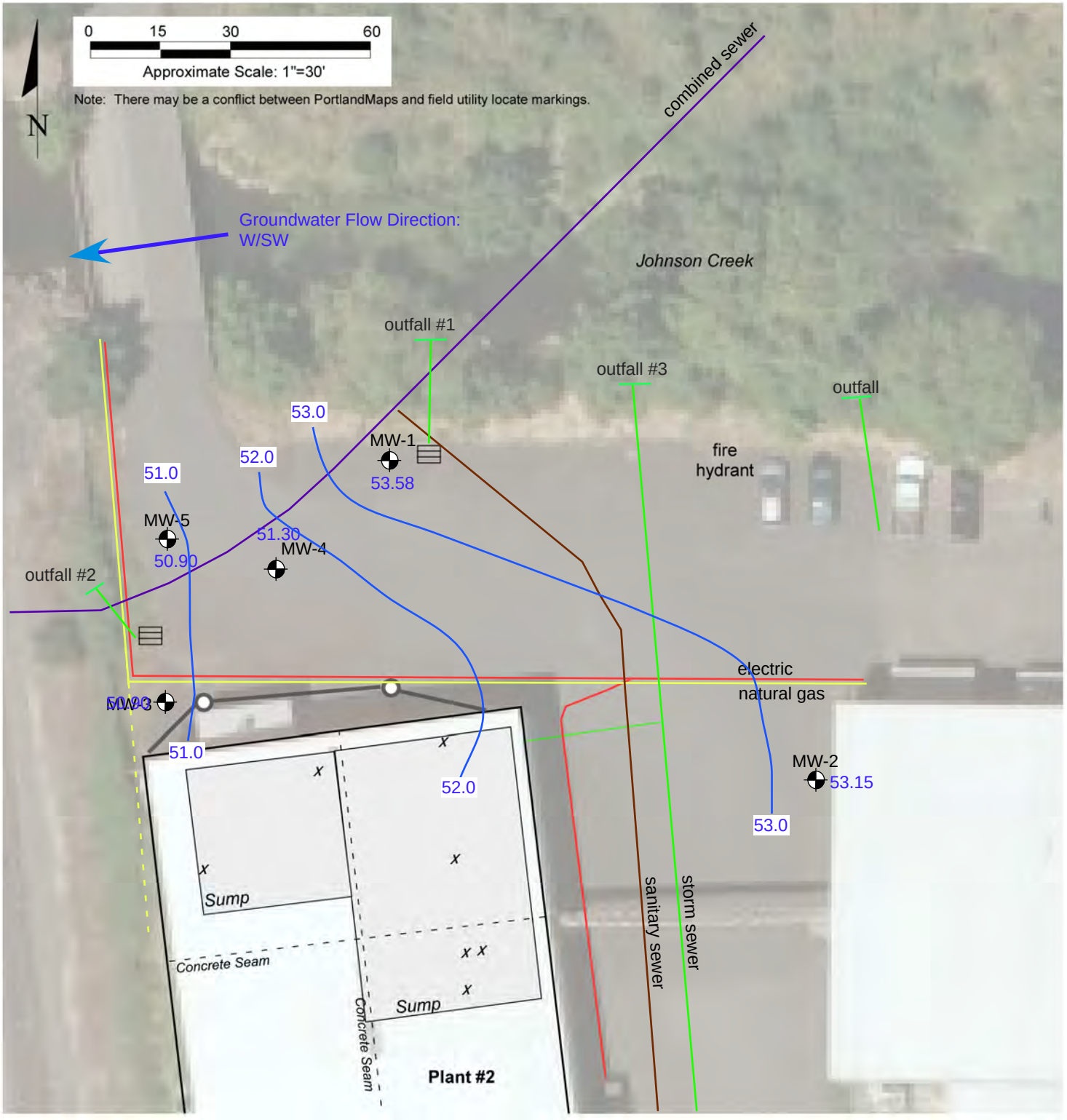
LEGEND

- Catch Basin
- CLSM Wall with Sump
- ✗ Repaired tear in sump liner or wall failure
- MW-1 Groundwater Monitoring Well Location and Number
- 53.15 Groundwater Elevation
- Groundwater Elevation Contour

Figure 8
Groundwater Elevation Map 6/12/12

East Side Plating
8400 SE 26th Avenue
Portland, Oregon

Project No. 11035.00 February 2013



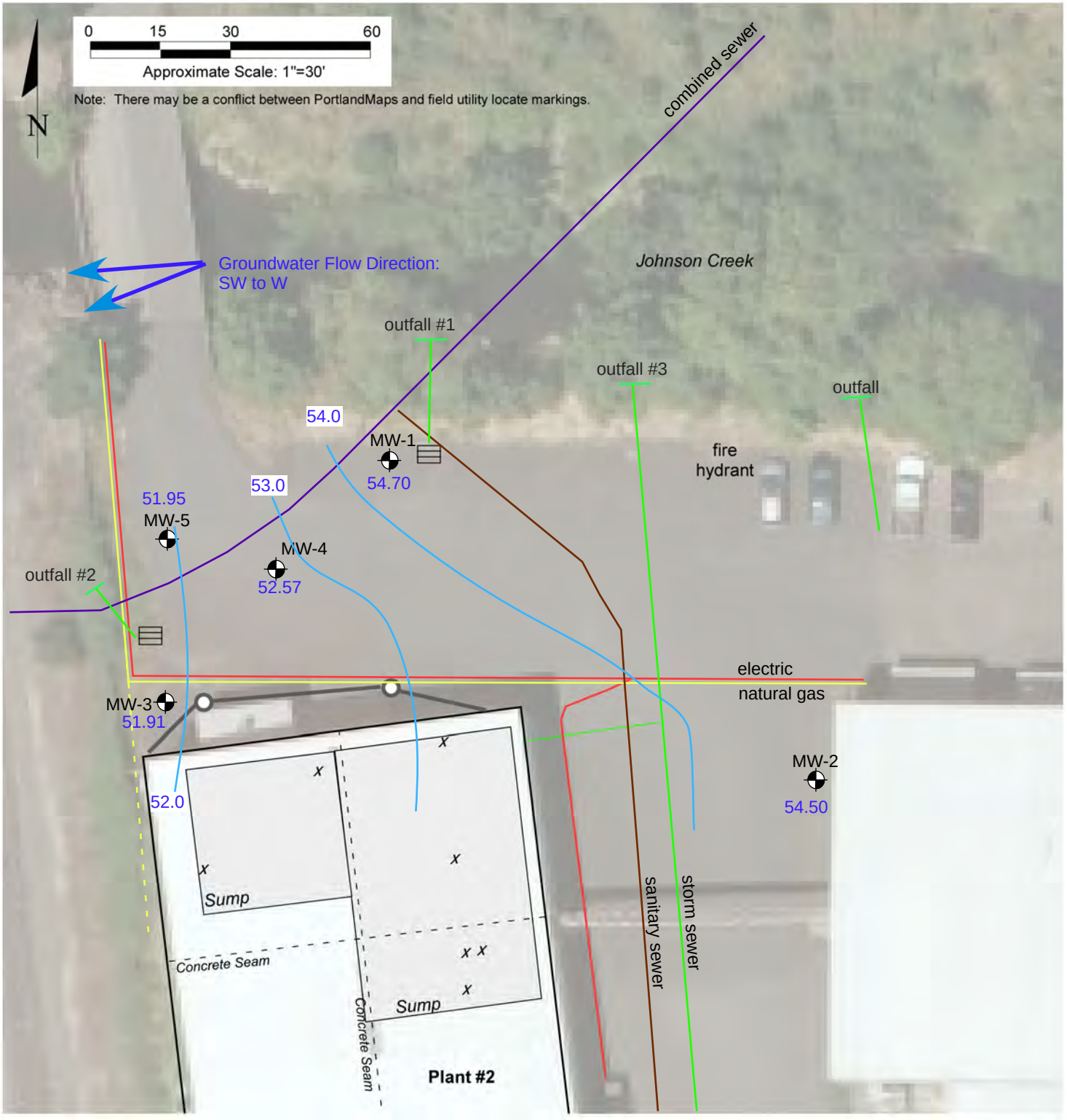
LEGEND

- Catch Basin
- CLSM Wall with Sump
- x Repaired tear in sump liner or wall failure
- MW-1 Groundwater Monitoring Well Location and Number
- 53.15 Groundwater Elevation
- Groundwater Elevation Contour

Figure 9
Groundwater Elevation Map 9/12/12

East Side Plating
8400 SE 26th Avenue
Portland, Oregon

Project No. 11035.00 February 2013



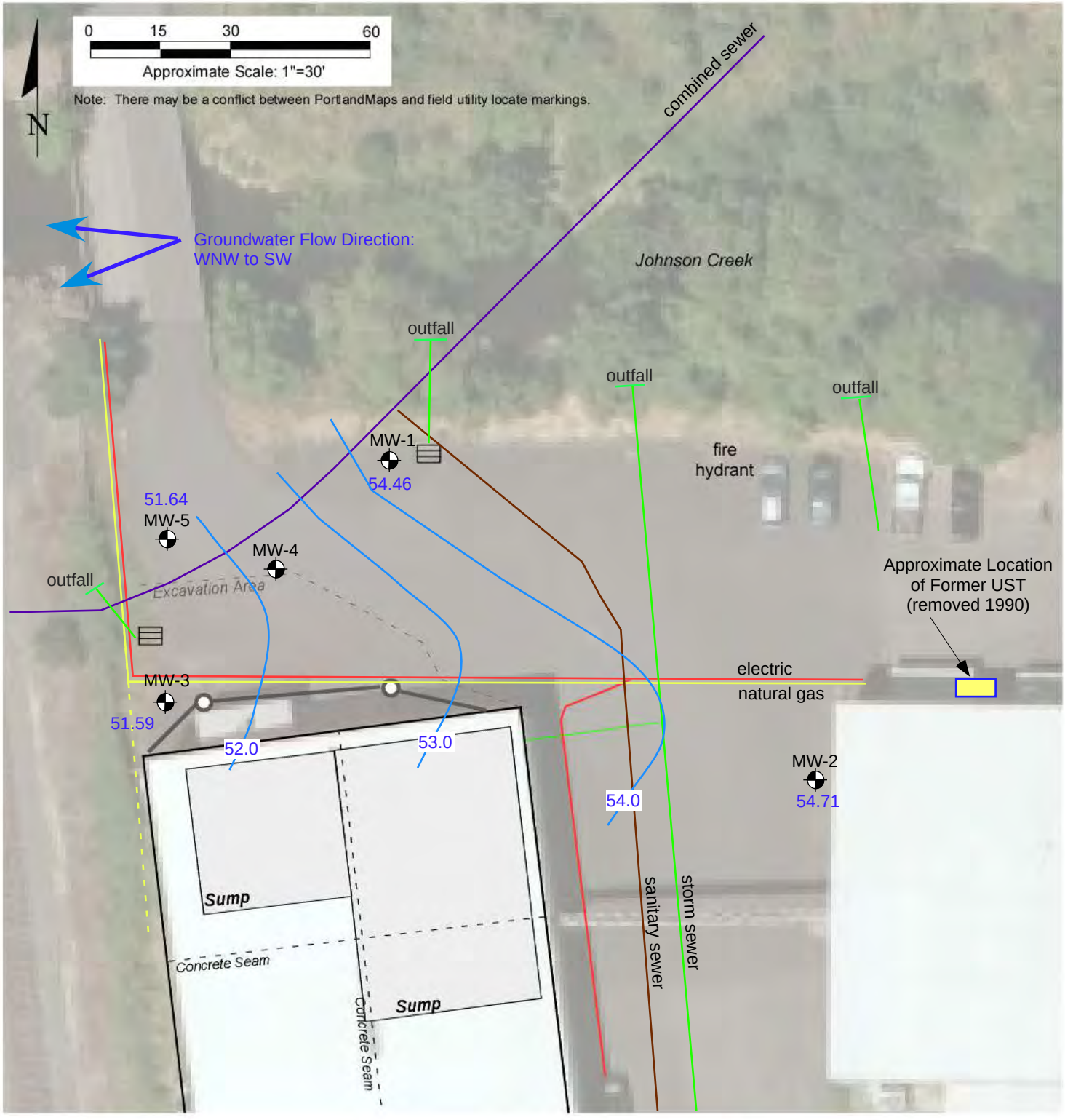
LEGEND

- Catch Basin
- CLSM Wall with Sump
- x Repaired tear in sump liner or wall failure
- MW-1 Groundwater Monitoring Well Location and Number
- 53.15 Groundwater Elevation
- Groundwater Elevation Contour

Figure 10
Groundwater Elevation Map 12/13/12

East Side Plating
8400 SE 26th Avenue
Portland, Oregon

Project No. 11035.00 February 2013



LEGEND

- Catch Basin
- Cutoff Wall with Sump
- MW-1 Groundwater Monitoring Well Location and Number
- 53.15 Groundwater Elevation
- Groundwater Elevation Contour

Figure 1
Groundwater Elevation Map 2/27/14

East Side Plating
8400 SE 26th Avenue
Portland, Oregon

Project No. 1197-01 April 2014

APPENDIX B
CITY OF PORTLAND COMBINED SEWER INFORMATION

8400 SE 26TH PL

PORTLAND, OR 97202

SMN ACY885 TO ACY924

SEWER MAIN/CHANNEL

Address	8300 SE 26TH PL
Area	LENTS 2
Subarea	SEW341
Location	EGA
District	SOUT
Map Number	
As Built	0652
Install Date	05/18/1922 12:00AM
Service Status	IN
Owner	BES
Main Type	CSOML COMBINED SEWER OVERFLOW MAIN
Pipe Shape	RCTP RECTANGULAR BOX (PIPE)
Pipe Length	12
Ups Depth	0
Elevation	44.1
Comments	
Pipe Type	UNSPEC UNSPECIFIED - UPDATE AT INSPEC
Pipe Size	61 X 63
Slope	3.675
Dwn Depth	0
Dwn Elevation	0

Associated Manholes

Asset ID	Service Status	Address	Flow
SMH ACY885	IN	8300 SE 26TH PL	IN
SMH ACY924	IN	8300 SE 26TH PL	OUT

Work Order History

Work Order Number	Completed Date	Asset ID	Activity
629125	08/09/2022	SMN ACY885 TO ACY924	INVMS - 15967322 Detail Main Invest
455120	06/30/2019	SMN ACY885 TO ACY924	TVSEWS - 15967310 Inspect Sewers TV
4914	11/05/1991	SMN ACY885 TO ACY924	RAISMH - DNU RAISE MANHOLES

TV Inspection History

Inspection Number	Completed Date	Asset ID	Summary
362343	08/09/2022	SMN ACY885 TO ACY924	Main sewer in fair condition with no major defects

APPENDIX C
TYPICAL FLOOR TRENCH PHOTOGRAPHS


TRUPER

APPENDIX D

CALCULATION OF UPSTREAM SURFACE WATER ELEVATION ADJUSTMENTS

Projected Johnson Creek Surface Water Elevation Calculations

Projected Surface Water Elevation Adjacent to MW-1

- Assumed Average Surface Water Gradient of 0.4 ft/100 ft (0.4%)
  - 0.4% is the minimum average gradient reported for Johnson Creek in the vicinity of East Side Plating (City of Portland March 2005)

- Monitoring Well MW-1 is approximately 40 ft upstream from the 26th Place Bridge survey point.

- Surface water elevation upstream of bridge and adjacent to MW-1 is

26th Place Bridge measured surface water elevation + 0.004 ft/ft x 40 ft

=

26th Place Bridge measured surface water elevation + 0.16 ft

Projected Surface Water Elevation Adjustment to MW-12

- Assumed Average Surface Water Gradient of 0.4 ft/100 ft (0.4%)
  - 0.4% is the minimum average gradient reported for Johnson Creek in the vicinity of East Side Plating (City of Portland March 2005)

- Monitoring Well MW-12 is approximately 200 ft upstream from the 26th Place Bridge survey point.

- Surface water elevation upstream of bridge and adjacent to MW-12 is

26th Place Bridge measured surface water elevation + 0.004 ft/ft x 200 ft

=

26th Place Bridge measured surface water elevation + 0.8 ft

APPENDIX E
PROFILE SURVEY FOR JOHNSON CREEK

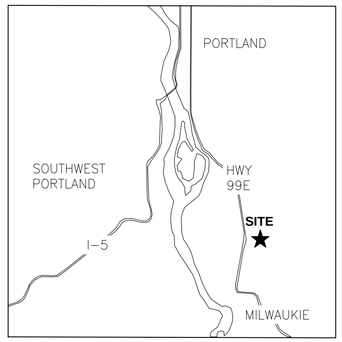
CONDITIONS SURVEY

JOHNSON CREEK THALWEG PROFILE

SITUATED IN THE SOUTHWEST QUARTER OF SECTION 24, TOWNSHIP 1 SOUTH, RANGE 1 EAST OF THE WILLAMETTE MERIDIAN, CITY OF PORTLAND, COUNTY OF MULTNOMAH, STATE OF OREGON

PNG ENVIRONMENTAL, INC.

VICINITY MAP



APPROXIMATE LOCATION OF SITE
45°27'46.46"N 122°38'08.70"W
NOT TO SCALE

HORIZONTAL DATUM

NAD 83/CORS 96, NORTH ZONE 3601, OREGON STATE PLANE COORDINATE SYSTEM INTERNATIONAL FEET

VERTICAL DATUM

NAVD 88 (GEOID2009)

SITE BENCHMARK

SWLS INC SITE CONTROL POINT ID GPS_4 LOCATION AS SHOWN. ELEVATION OF MARK IS 64.20 FEET

N

LEGEND

= SITE BENCHMARK

SHEET INDEX

NOTES

AERIAL PHOTO SHOWN FOR VISUALIZATION PURPOSE ONLY. LOCATION IS APPROXIMATE. IMAGE FROM GOOGLE EARTH.

SCALE: 1" = 40'

0' 40' 80' 120'

11" X 17" 1" = 80'
22" X 34" 1" = 40'

811 Know what's below. Call before you dig.

REGISTERED PROFESSIONAL LAND SURVEYOR
OREGON
JULY 29, 1988
GREGORY D. SPURLOCK
2370
EXPIRES: 06/30/24

JOB NUMBER: 2020-271
DRAWN: WB
REVIEWED: GDS
SV: 1 OF 2

SCALE: AS NOTED
DRAWN DATE: 7/29/22
REVIEW DATE: 7/29/22
SURVEY DATE: 7/21/22

REV: REV: REV: REV:

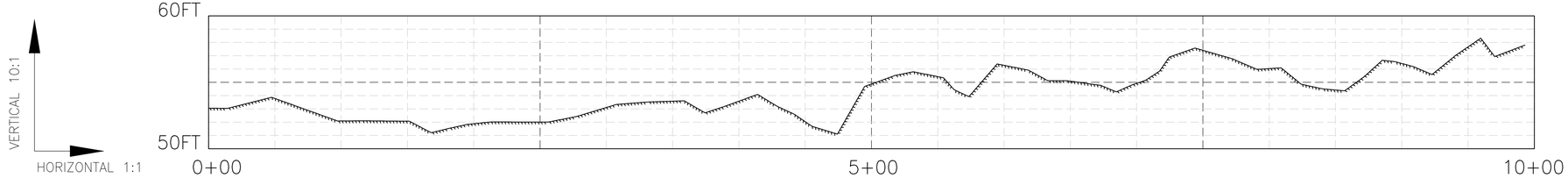
CLIENT: PNG ENVIRONMENTAL, INC.

STATEWIDE LAND SURVEYING INC.
43 NW AVA AVE. GRESHAM, OR 97030
O: 503-665-7777 F: 503-665-7988
EMAIL: SURVEY@STATEWIDESURVEYING.COM
WEB: WWW.STATEWIDESURVEYING.COM

SV1

CONDITIONS SURVEY

JOHNSON CREEK THALWEG PROFILE



SCALE: 1" = 50'

0' 50' 100' 150'

11" X 17" 1" = 100'
22" X 34" 1" = 50'

REGISTERED
PROFESSIONAL
LAND SURVEYOR

OREGON
JULY 29, 1988
GREGORY D. SPURLOCK
2370
EXPIRES: 06/30/24

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43 NW AVA AVE. GRESHAM, OR 97030
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REVIEWED: GDS
SV: 2 OF 2

CLIENT: PNG ENVIRONMENTAL, INC

REV:	SCALE: AS NOTED
REV:	DRAWN DATE: 7/29/22
REV:	REVIEW DATE: 7/29/22
REV:	SURVEY DATE: 7/21/22

SV2