2021 ANNUAL REPORT FOR GROUNDWATER MONITORED NATURAL ATTENUATION

Pulp & Tissue Mill RAU, Georgia-Pacific West Site

Prepared for: Port of Bellingham

Project No. 140298-A-19 • February 15, 2022 • Final

Aspect CONSULTING

earth + water

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Aspect Consulting, LLC

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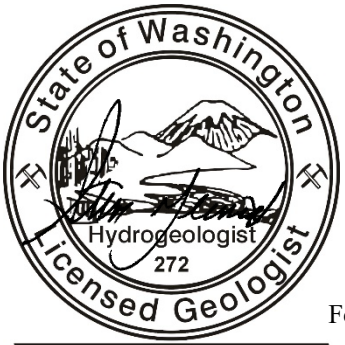
AARON ARTHUR FITTS



February 15, 2022

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1 Background for Groundwater Monitoring Program

This report presents results from the 2021 compliance monitoring for the groundwater monitored natural attenuation (MNA) cleanup action selected by the Washington State Department of Ecology (Ecology) for the Pulp and Tissue Mill (PTM) Remedial Action Unit (RAU) at the Georgia-Pacific West Site (Site). The Pulp/Tissue RAU is being cleaned up under the terms of Consent Decree No. 14207008 (Decree) between the Port of Bellingham (Port) and Ecology. Monitoring of the groundwater MNA cleanup action is being conducted by Aspect Consulting, LLC (Aspect) in accordance with the Compliance Monitoring Plan for Groundwater MNA (CMP; Aspect, 2015), which was reviewed and approved by Ecology prior to initiation of the monitoring program.

As described in the Cleanup Action Plan for the PTM RAU (CAP; Ecology, 2014), the highest beneficial use of Site groundwater is discharge to marine water, not potable use, and groundwater cleanup levels (CULs) for the PTM RAU were established accordingly. Groundwater CULs for individual contaminants are included in the data tables for this report (Tables 1 and 2).

At the time of the CAP preparation, the contaminants that exceeded cleanup levels in PTM RAU groundwater included (acidic) pH and selected metals in the Acid Plant Subarea, chlorinated solvent volatile organic compounds (VOCs) tetrachloroethene (PCE) and vinyl chloride (VC) in the LP-MW01 Subarea, and selected metals in the Miscellaneous Dissolved Metals Exceedances Area (termed here Miscellaneous Metals Area). The locations of these three areas are depicted on Figure 1. Chlorinated solvent concentrations in the LP-MW01 Subarea were demonstrated to meet groundwater cleanup levels by the end of the 2017 monitoring period and monitoring for the subarea was therefore terminated, as documented in the 2017 Annual Report (Aspect, 2018a). The LP-MW01 Subarea is not discussed further in this report.

As described in the 2017 Annual Report (Aspect, 2018a), wells AA-MW01 through AA-MW04, FH-MW01, and GF-MW01 were decommissioned in 2016 prior to construction of the RAU-wide environmental cap and, following cap construction, were replaced with wells that are essentially identical in construction and location. The replacement well numbers have ‘R’ at the end of their names (e.g., AA-MW01R). Wells AA-MW01R and FH-MW01R were subsequently decommissioned in early 2021 to accommodate construction of Harcourt Development’s (Harcourt) Granary Avenue Waterfront Residential project. Those wells will be re-established for monitoring following completion of that project. Figure 1 depicts locations of the monitoring wells that have been and are currently being monitored during the MNA program, including wells not accessible for monitoring during the 2021 monitoring.

This report documents the MNA groundwater compliance monitoring data collected to date and, based on the requirements of Section 2.2 of the CMP, presents the plan for the next year of monitoring.

Following this Background section, the structure of the report is as follows:

- Section 2 – Describes the groundwater sampling and analysis completed in 2021.

- Section 3 – Contains an evaluation of the groundwater analytical data with respect to the cleanup levels and long-term trends.
- Section 4 – Presents the plan for monitoring in 2022.

2 2021 Groundwater Sampling and Analysis

In accordance with the CMP (Aspect, 2015) and the findings from the 2020 Annual Report (Aspect, 2021), semiannual groundwater monitoring was performed in April and October of 2021. The wells sampled are depicted on Figure 1 and their chemical analyses[1] in 2021 were as follows:

Acid Plant Subarea

- Wells GF-MW01R and BC-MW05 were inaccessible for monitoring in 2021 because they are located within the construction footprint (fenced area) for Harcourt's Granary Avenue Waterfront Residential project. Wells FH-MW01R and AA-MW01R were within the excavation area for Harcourt's new construction and therefore were decommissioned prior to any sampling events in 2021. Each of those wells will be reestablished for monitoring following completion of that project.
- Within the Acid Plant Subarea, the groundwater samples from well AA-MW04R was analyzed for five dissolved metals: arsenic, cadmium, copper, nickel, and zinc.
- Because wells AA-MW04R and FH-MW01R did not yet meet cleanup levels at the end of 2020, the following wells positioned outside the Acid Plant Subarea were also monitored:
  - Cross-gradient from the Acid Plant Subarea, groundwater parameters, including pH, were measured in the field at wells AA-MW02R AA-MW03R[2]. If the field measurement of groundwater pH was less than pH 6.2 in a well, then that well was sampled for analysis of the same five dissolved metals as were analyzed at AA-MW04R. In 2021, well AA-MW03R had a measured pH less than 6.2 during the April monitoring event so that sample was analyzed for the five dissolved metals. During the October monitoring event, well AA-MW03R had a measured pH of greater than 6.2 and so was not sampled. Well AA-MW02R had a pH of greater than 6.2 during both monitoring events in 2021.

[1] Groundwater parameters (temperature, pH, electrical conductance, dissolved oxygen, and oxidation reduction potential [ORP]) were also measured in the field for each monitoring location and event.

[2] Well AA-MW03R has had pH exceeding the CUL, but no dissolved metals exceedances during the RI/FS, so is considered on the edge of the Acid Plant Subarea.

- Regardless of pH, well AA-MW02R was sampled for dissolved copper during each round to provide monitoring downgradient of the Miscellaneous Metals Area, as described below.

Miscellaneous Metals Area

- Within the Miscellaneous Metals Area, groundwater samples from wells LP-MW01 and SC-MW02R were analyzed for dissolved copper.
- Because wells LP-MW01 and SC-MW02R did not meet CULs at the end of 2020, downgradient wells LB-MW01R and AA-MW02R were sampled for dissolved copper in accordance with the CMP.

3 Data Evaluation

The following subsections describe the analytical results from the 2021 groundwater monitoring events for the Acid Plant Subarea and Miscellaneous Metals Area. The 2021 results are compared with CULs and with data from prior monitoring events to assess temporal trends in groundwater pH or metals concentrations. Tables 1 and 2 present the analytical results over the entire period of monitoring for the Acid Plant Subarea and Miscellaneous Metals Area, respectively.

Based on Aspect's independent quality assurance validation of the 2021 analytical data, no data were qualified, and the data are usable for their intended purpose. Appendix A provides Aspect's data validation report and the laboratory reports for the two rounds of 2021 analytical data.

3.1 Acid Plant Subarea

3.1.1 pH

The groundwater pH exceeded the CUL (pH 6.2)[3] in well AA-MW04R, located within the acidic source area,[4] and at cross-gradient well AA-MW03R,[5] during one of two 2021 monitoring events. The cross-gradient shoreline well GF-MW01R, located mill-west of the Acid Plant Subarea, could not be monitored in 2021 as described in Section 2. The measured pH met the CUL in the cross-gradient well, AA-MW02R, during the 2021 monitoring period.

Within the Acid Plant Subarea, measured pH levels remain low (acidic), but show an overall, gradual, longer-term improvement (increase in pH) relative to the earliest measurements in 2004. The pH reading of 5.53 at well AA-MW04R, from the October

[3] While the term "exceedance" typically refers to a measurement greater than a cleanup level, for acidic pH it refers to a measurement less than the pH 6.2 CUL.

[4] The 2004 data from the acidic source area are from well GF-MW02, which was located just mill-west of well AA-MW04/04R (Figure 1), but which could not be found at the start of the RI in 2009.

[5] This well has data from 2009 to 2021 only; there was not a monitoring well in the AA-MW03R location in 2004.

sampling event, was lower than recorded in 2020; however, the overall trend of pH at that well continues to improve over the long term. The cross-gradient well AA-MW03R continues to show a trend of increasing pH from 2018 through 2021, with the October 2021 reading being the first to comply with the CUL since the start of its monitoring in 2009 (Table 1). No readings from well FH-MW01R were made in 2021 because the well has been decommissioned, as described in Section 2. The average annual groundwater pH in these three pH-impacted wells over the past 4 years are tabulated below.

Well	Area represented by samples from well	Average Annual Groundwater pH (CUL = 6.2)			
		2018	2019	2020	2021
AA-MW04R	Acidic metals plume source	4.8	5.5	6.3	5.9
FH-MW01R	Downgradient from source	5.5	5.7	5.0	NA
AA-MW03R	Cross-gradient from source	4.5	5.6	5.8	6.2

NA: Not monitored

Figure 2 graphically illustrates the longer-term pH trends at these three well locations since their monitoring began (2004 for AA-MW04R and FH-MW01R; 2009 for AA-MW03R). On all figures in this report, the groundwater pH axis is plotted in reverse order so that points higher on the axis are farther from the CUL (pH 6.2), consistent with how metals concentrations are plotted. The collective data indicate an overall long-term improvement in groundwater pH but with considerable short-term variation.

3.1.2 Dissolved Metals

AA-MW04R

Metals concentrations at well AA-MW04R during the April 2021 sampling event were consistent with the 2020 concentrations with only nickel exceeding its CUL. The October 2021 sampling event saw lower pH than previous sampling and corresponding higher metals concentrations (exceeding respective CULs) for all metals except arsenic which remained non-detect. The concentrations for dissolved cadmium, copper, nickel, and zinc were on the order of those detected during the 2019 sampling events (Aspect, 2020) but were still significantly lower than concentrations dating back to 2016 events.

Plotting the groundwater pH and the summed concentrations of the five dissolved metals monitored (arsenic, cadmium, copper, nickel, zinc) over time illustrates a general improvement in groundwater quality since the October 2016 concentration spike created by formation disturbance during drilling of replacement well AA-MW04R as described in Aspect (2018b). A general correlation between lower pH and higher metals concentrations is also apparent over the past 4 years of data, although the correlation is not perfect (Figure 3[6]).

[6] Figure 3 does not extend back to 2004 because adjacent 2004 well GF-MW02 never had elevated metals concentrations in groundwater, despite having highly acidic groundwater, so it is not meaningful to combine those data for analysis of long-term metals trends back to 2004.

FH-MW01R

Well FH-MW01R was inaccessible and could not be sampled in October 2020, and the well was later decommissioned as described in Section 2. Accordingly, no analysis of metals trends beyond that presented in the 2020 Annual Report (Aspect, 2021) can be conducted.

AA-MW03R

At well AA-MW03R, located on the mill-east edge of the Acid Plant Subarea (Figure 1), the concentrations of dissolved metals did not exceed the CULs during the April 2021 sampling event when its pH was less than the pH 6.2 CUL. During the October 2021 sampling event, the pH at this well did not exceed the CUL and the well was therefore not sampled per the CMP. Metal concentrations at this well have only exceeded the CUL for nickel since the start of monitoring in 2009. The nickel concentrations show a consistent decline over time since the January 2019 monitoring event, when a dramatic nickel increase occurred as a result of GALS-related construction, as was observed at FH-MW01R and discussed in the prior monitoring reports. Concentrations of the other dissolved metals (arsenic, cadmium, copper, and zinc) remained below CULs in 2021, as they have been since 2009 (Table 1).

AA-MW01R

Shoreline well AA-MW01R was inaccessible so could not be sampled in October 2020, and the well was later decommissioned, as described in Section 2. Accordingly, no analysis of metals trends beyond that presented in the 2020 Annual Report (Aspect, 2021) can be conducted. Following a 2018 spike in dissolved nickel attributable to GALS construction (Aspect, 2020), metals were non-detect at this shoreline well during each of the five monitoring events from January 2019 through April 2020 (Table 1).

Other Cross-Gradient and Downgradient Wells

During both 2021 monitoring events, dissolved copper remained non-detect at well AA-MW02R, located mill-east of the Acid Plant Subarea (Figure 1). Wells GF-MW01R and BC-MW05 were inaccessible and could not be monitored in October 2021 as described in Section 2.

3.2 Miscellaneous Metals Area

The Miscellaneous Metals Area encompasses two wells, LP-MW01 and SC-MW02R, that had low-level exceedances of selected metals without pH impacts during the Site remedial investigation/feasibility study (RI/FS).

LP-MW01

Groundwater pH at well LP-MW01 complied with the CUL during both 2021 monitoring events (average pH 6.46) (Table 2). The dissolved copper concentration in the sample from the April event (2.1 µg/L) did not exceed the CUL and was the lowest measured copper concentration in that well since the start of monitoring in 2009. However, the October 2021 copper concentration (9.4 µg/L) exceeded the CUL again (Table 2). There appears to be some connection with higher copper concentrations and the drier season; however, no statistically significant correlation has been made. Despite the short-term variability, the average annual copper concentrations in this well indicate a slow but steady improvement over time, as indicated in the tabulation below.

Year	Average Annual Copper in µg/L
2017*	7.7
2018	7.5
2019	6.2
2020	6.0
2021	5.8

* 2017 average includes October 2016 data (see Table 2)

SC-MW02R

At well SC-MW02R, the dissolved copper concentration was slightly below the CUL during both the April and October sampling events (2.8 µg/L and 2.4 µg/L, respectively) (Table 2). The resulting 2021 average annual copper concentration (2.6 µg/L) is below the CUL for the first time since the initial sampling of this well in 2016, as noted in the tabulation below.

Year	Average Annual Copper in µg/L
2017*	3.9
2018	7.8
2019	7.8
2020	3.1
2021	2.6

* 2017 average includes October 2016 data (see Table 2)

Downgradient Wells AA-MW02R and LB-MW01R

At well AA-MW02R, downgradient of the Miscellaneous Metals Area, dissolved copper remained non-detect, consistent with laboratory results since 2015 (Table 2).

At downgradient well LB-MW01R, dissolved copper exceeded the CUL during the April sampling event (7.4 µg/L) but complied with the CUL during the October sampling event (1.7 µg/L) (Table 2). The higher result in April than October is the opposite of the pattern observed for metals concentrations in other wells as described above. The October 2021 sampling event was the first time that copper concentrations complied with the CUL since April of 2017. There is not a clear temporal trend in the dissolved copper data from LB-MW01R as indicated by average annual concentrations over the past 5 years in the tabulation below.

Year	Average Annual Copper in µg/L
2017*	5.2
2018	5.6
2019	5.0
2020	5.6
2021	4.6

* 2017 average includes October 2016 data (see Table 2)

4 Plan for 2022 MNA Monitoring

Following completion of the 2021 MNA monitoring, no wells or analytes qualify for exclusion from the monitoring program based on the decision framework of the CMP (Aspect, 2015). Consequently, the semiannual monitoring program conducted in 2021 will be repeated in 2022—i.e., the same analytes will be measured from the same wells in April and October 2022 as indicated in Table 3.

Following receipt of data from the 2022 monitoring events, an annual report will be prepared that analyzes the collective data and re-evaluates the scope of the monitoring program for the subsequent (2023) monitoring, in accordance with the CMP.

5 References

Aspect Consulting, LLC (Aspect), 2015, Compliance Monitoring Plan for Groundwater Monitored Natural Attenuation, Pulp & Tissue Mill RAU, Georgia-Pacific West Site, July 7, 2015.

Aspect Consulting, LLC (Aspect), 2018a, 2017 Annual Report for Groundwater Monitored Natural Attenuation, Pulp & Tissue Mill RAU, Georgia-Pacific West Site, January 3, 2018.

Aspect Consulting, LLC (Aspect), 2018b, 2018 Annual Report for Groundwater Monitored Natural Attenuation, Pulp & Tissue Mill RAU, Georgia-Pacific West Site, December 17, 2018.

Aspect Consulting, LLC (Aspect), 2020, 2019 Annual Report for Groundwater Monitored Natural Attenuation, Pulp & Tissue Mill RAU, Georgia-Pacific West Site, January 17, 2020.

Aspect Consulting, LLC (Aspect), 2021, 2020 Annual Report for Groundwater Monitored Natural Attenuation, Pulp & Tissue Mill RAU, Georgia-Pacific West Site, January 19, 2021.

Washington State Department of Ecology (Ecology), 2014, Cleanup Action Plan, Pulp/Tissue Mill Remedial Action Unit, Georgia-Pacific West Site, Bellingham, Washington, Exhibit B to Consent Decree No. 14207008, October 30, 2014.

6 Limitations

Work for this project was performed for the Port of Bellingham (Client), and this report was prepared in accordance with generally accepted professional practices for the nature and conditions of work completed in the same or similar localities, at the time the work was performed. This report does not represent a legal opinion. No other warranty, expressed or implied, is made.

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TABLES

Table 1. Groundwater Chemistry Data for Acid Plant Subarea

Project No. 140298, Georgia-Pacific West Site, Bellingham, Washington

Analyte	Units	Groundwater Cleanup Level	Wells Within Acidic Metals Plume												
			GF-MW02	AA-MW04			AA-MW04R								
			07/25/04	09/29/09	03/30/10	02/25/15	10/14/16	11/02/16	01/11/17	04/17/17	07/05/17	01/24/18	04/23/18	07/10/18	10/02/18
Field Parameters															
pH	pH units	6.2	**3.34**	**4.18**	**4.49**	**4.50**	**4.34**	**4.38**	**4.51**	**4.53**	**4.45**	**4.58**	**4.54**	**5.5**	**6.5**
Temperature	deg C		**18.87**	**15.35**	**11.12**	**11.0**	**15.49**	**15.48**	**8.81**	**11.1**	**15.95**	**10.9**	**12.8**	**15.1**	**15.7**
Specific Conductance	uS/cm		**2442**	**2345**	**1716**	**538.7**	**2900.6**	**2123.3**	**1527.3**	**1195**	**1095.6**	**835**	**981**	**1150**	**1088**
Dissolved Oxygen	mg/L		**1.55**	**1.23**	**0.38**	**0.51**	**0.12**	**0.14**	**0.15**	**0.26**	**0.13**	**0.4**	**0.3**	**0.1**	**0.11**
ORP	mV		**393.7**	**-164**	**277.9**	**74.7**	**204.2**	**167.4**	**136.1**	**158.3**	**135.4**	**83**	**62**	**44**	**-177**
Turbidity	NTU		**5.41**	**10**	**20**	**2.20**	**22.1**	**7.12**	**13.2**	--	**6.32**	--	**20**	**35**	**0.02**
Metals															
Arsenic (Dissolved)	ug/L	5	**38**	**4.73**	**48**	**5.3**	**83**	**17**	**6.4**	**7.1**	**25**	**14**	3.0 U	**8.1**	**17**
Cadmium (Dissolved)	ug/L	8.8	**81.1**	**1650**	**74.3**	**7.8**	**5000**	**920**	**120**	**49**	**20**	**14**	**9.4**	**47**	4.0 U
Copper (Dissolved)	ug/L	3.1	**795**	**2.78**	**179**	**1.4**	**15000**	**3900**	**1000**	**420**	**240**	**120**	**170**	**130**	**3.8**
Nickel (Dissolved)	ug/L	8.2	**626**	**1560**	**108**	**19**	**1400**	**320**	**65**	**39**	**42**	**24**	**13**	**83**	4.0 U
Zinc (Dissolved)	ug/L	81	**2440**	**7420**	**836**	**82**	**10000**	**1800**	**440**	**250**	**330**	**150**	**83**	**330**	25 U

Analyte	Units	Groundwater Cleanup Level	Wells Within Acidic Metals Plume							
			AA-MW04R (continued)							
			01/13/19	04/08/19	07/24/19	10/09/19	04/21/20	10/07/20	04/29/21	10/20/21
Field Parameters										
pH	pH units	6.2	**5.93**	**5.08**	**6.28**	**5.68**	**6.13**	**6.43**	**6.30**	**5.53**
Temperature	deg C		**12.66**	**10.6**	**16.8**	**15.9**	**11.4**	**16.3**	**12.1**	**16.1**
Specific Conductance	uS/cm		**1254**	**1478**	**1149**	**1126**	**770**	**838**	**748**	**823**
Dissolved Oxygen	mg/L		**0.14**	**0.22**	**0.61**	**0.19**	**0.93**	**0.28**	**0.23**	**0.11**
ORP	mV		**62.9**	**145.1**	**-8.6**	**67.8**	**-135**	**-39**	**-202**	**147**
Turbidity	NTU		**29**	**16.5**	**15**	**45.6**	**11.9**	**8.4**	**3.3**	**3.8**
Metals										
Arsenic (Dissolved)	ug/L	5	3.0 U	3.0 U	**4.3**	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U
Cadmium (Dissolved)	ug/L	8.8	**81**	**54**	4.0 U	**120**	4.0 U	4.0 U	4.0 U	**66**
Copper (Dissolved)	ug/L	3.1	**100**	**300**	**18**	**94**	**1.2**	1.0 U	**1.2**	**190**
Nickel (Dissolved)	ug/L	8.2	**93**	**60**	**18**	**130**	**38**	**21**	**24**	**44**
Zinc (Dissolved)	ug/L	81	**480**	**470**	**68**	**530**	**66**	**44**	**63**	**230**

Table 1. Groundwater Chemistry Data for Acid Plant Subarea

Project No. 140298, Georgia-Pacific West Site, Bellingham, Washington

Analyte	Units	Groundwater Cleanup Level	Wells Within Acidic Metals Plume											
			FH-MW01				FH-MW01R							
			07/25/04	09/29/09	03/30/10	02/25/15	10/15/16	01/11/17	04/18/17	07/05/17	01/24/18	04/23/18	07/10/18	10/02/18
Field Parameters														
pH	pH units	6.2	**4.11**	**4.36**	**4.64**	**5.27**	**4.92**	**5.16**	**5.41**	**5.08**	**5.46**	**5.52**	**5.35**	**5.7**
Temperature	deg C		**20.39**	**16.53**	**11.22**	**11.9**	**16.91**	**9.93**	**12.5**	**19.52**	**11.8**	**12.2**	**16.3**	**17.1**
Specific Conductance	uS/cm		**2305**	**2132**	**1613**	**1877**	**2085.4**	**1527.5**	**1348**	**1458.5**	**1152**	**1563**	**1899**	**2086**
Dissolved Oxygen	mg/L		**0.73**	**0.82**	**0.45**	**0.80**	**0.1**	**0.16**	**0.33**	**0.35**	**1.4**	**0.3**	**0.1**	**0.17**
ORP	mV		**261.3**	**-158.6**	**71.6**	**121.7**	**-154.6**	**43.9**	**83.1**	**-114.4**	**-22**	**-7**	**-57**	**-174.2**
Turbidity	NTU		**3.22**	**10**	**10**	**300**	**36.1**	**19.2**	--	**21.2**	--	**39**	**25**	**3.94**
Metals														
Arsenic (Dissolved)	ug/L	5	**2**	**2.72**	0.5 U	3 U	3.0 U	3.0 U	3.0 U	3.0 U	**5.3**	**15**	**88**	**20**
Cadmium (Dissolved)	ug/L	8.8	0.2 U	0.02 U	**0.443**	4 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	**5.9**	4.0 U	4.0 U
Copper (Dissolved)	ug/L	3.1	**0.8**	**1.55**	**1.55**	1 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Nickel (Dissolved)	ug/L	8.2	**405**	**209**	**459**	**190**	**140**	**69**	**59**	**77**	**54**	**6200**	**2700**	**1100**
Zinc (Dissolved)	ug/L	81	**760**	**616**	**1130**	**530**	**510**	**250**	**180**	**230**	**150**	**950**	**560**	**180**

Analyte	Units	Groundwater Cleanup Level	Wells Within Acidic Metals Plume					
			FH-MW01R (continued)					
			01/14/19	04/08/19	07/24/19	10/09/19	04/22/20	10/07/20	04/29/21	10/20/21
Field Parameters										
pH	pH units	6.2	**5.96**	**5.71**	**5.69**	**5.62**	**5.00**	**Not Monitored**		
Temperature	deg C		**10.82**	**11.9**	**16.8**	**16.7**	**11.7**			
Specific Conductance	uS/cm		**2291**	**2370**	**2110**	**1879**	**1005**			
Dissolved Oxygen	mg/L		**0.34**	**0.38**	**0.29**	**0.17**	**0.80**			
ORP	mV		**32**	**-9.9**	**-23.7**	**63.9**	**32**			
Turbidity	NTU		**37**	**40.5**	**34.1**	**11.8**	**17**			
Metals										
Arsenic (Dissolved)	ug/L	5	**29**	**35**	**25**	**27**	**46**	**Not Monitored**		
Cadmium (Dissolved)	ug/L	8.8	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U			
Copper (Dissolved)	ug/L	3.1	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U			
Nickel (Dissolved)	ug/L	8.2	**2400**	**2500**	**990**	**850**	**590**			
Zinc (Dissolved)	ug/L	81	**810**	**1300**	**940**	**840**	**750**			

Table 1. Groundwater Chemistry Data for Acid Plant Subarea

Project No. 140298, Georgia-Pacific West Site, Bellingham, Washington

Analyte	Units	Groundwater Cleanup Level	Wells Outside of Acidic Metals Plume										
			AA-MW01			AA-MW01R							
			09/29/09	03/30/10	02/25/15	10/15/16	01/11/17	04/17/17	07/06/17	01/24/18	04/23/18	07/10/18	10/02/18
Field Parameters													
pH	pH units	6.2	**7.56**	**6.92**	**6.99**	**6.99**	**6.91**	**6.99**	**6.74**	**6.75**	**6.98**	**6.82**	**6.79**
Temperature	deg C		**18.45**	**12.8**	**11.9**	**16.36**	**11.01**	**12.9**	**17.18**	**12.9**	**13.3**	**16.1**	**17.5**
Specific Conductance	uS/cm		**746**	**848**	**1526**	**1503.7**	**1341.3**	**1333**	**1361.2**	**1586**	**1437**	**2720**	**5075**
Dissolved Oxygen	mg/L		**1.2**	**0.47**	**0.55**	**0.11**	**0.16**	**1**	**0.13**	**0.3**	**0.5**	**0.2**	**0.13**
ORP	mV		**-353.7**	**-112.7**	**9.0**	**-194**	**-32.6**	**-107**	**-80.8**	**-85**	**-49**	**-108**	**-210.3**
Turbidity	NTU		**10**	**10**	**1.39**	**27.3**	**37.3**	**--**	**4.54**	**--**	**14**	**12**	**16.4**
Metals													
Arsenic (Dissolved)	ug/L	5	**0.11 J**	0.5 U	3 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	**4.5**	**3.8**	3.0 U
Cadmium (Dissolved)	ug/L	8.8	0.02 U	0.02 U	4 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U
Copper (Dissolved)	ug/L	3.1	**0.3**	**0.58**	1 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Nickel (Dissolved)	ug/L	8.2	**0.84**	**1.62**	4 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	**130**	**16**	**11**
Zinc (Dissolved)	ug/L	81	0.5 U	0.5 U	25 U	25 U	25 U	10 U	25 U	25 U	25.0 U	25 U	25 U

Analyte	Units	Groundwater Cleanup Level	Wells Outside of Acidic Metals Plume							
			AA-MW01R							
			01/13/19	04/08/19	07/24/19	10/10/19	04/21/20	10/07/20	04/29/21	10/20/21
Field Parameters										
pH	pH units	6.2	**7.38**	**7.03**	**6.88**	**6.88**	**7.05**	**Not Monitored**		
Temperature	deg C		**13.33**	**12.4**	**18.4**	**17.5**	**12.8**			
Specific Conductance	uS/cm		**2575.2**	**1313**	**5253**	**5139**	**1201**			
Dissolved Oxygen	mg/L		**0.12**	**0.21**	**0.32**	**4.37**	**0.60**			
ORP	mV		**-78.9**	**-104.9**	**-84.9**	**41.2**	**-77**			
Turbidity	NTU		**28.8**	**18.2**	**9.4**	**0.88**	**1.6**			
Metals										
Arsenic (Dissolved)	ug/L	5	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	**Not Monitored**		
Cadmium (Dissolved)	ug/L	8.8	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U			
Copper (Dissolved)	ug/L	3.1	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U			
Nickel (Dissolved)	ug/L	8.2	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U			
Zinc (Dissolved)	ug/L	81	25 U	25 U	25 U	25 U	25 U			

Table 1. Groundwater Chemistry Data for Acid Plant Subarea

Project No. 140298, Georgia-Pacific West Site, Bellingham, Washington

Analyte	Units	Groundwater Cleanup Level	Wells Outside of Acidic Metals Plume															
			AA-MW02			AA-MW02R												
			10/01/09	04/01/10	02/25/15	10/14/16	04/17/17	07/05/17	01/24/18	04/24/18	07/10/18	10/03/18	01/13/19	04/08/19	07/24/19	10/09/19	04/22/20	10/07/20
Field Parameters																		
pH	pH units	6.2	**7.23**	**7.24**	**7.32**	**7.35**	**7.41**	**7.19**	**7.18**	**7.33**	**7.1**	**7.2**	**7.56**	**7.24**	**7.21**	**7.25**	**7.25**	**7.27**
Temperature	deg C		**15.13**	**12.39**	**12.4**	**16.46**	**12.4**	**16.16**	**12.3**	**11.4**	**14.9**	**15.1**	**12.85**	**12**	**16.1**	**14.8**	**11.7**	**15.6**
Specific Conductance	uS/cm		**1337**	**984**	**1110**	**1204.2**	**1018**	**883.6**	**957**	**807**	**812**	**753**	**925.5**	**1041**	**1055**	**886**	**806**	**780**
Dissolved Oxygen	mg/L		**0.58**	**0.72**	**0.54**	**0.09**	**0.25**	**0.23**	**0.3**	**0.1**	**0.1**	**0.2**	**0.12**	**0.21**	**0.37**	**0.18**	**0.63**	**0.14**
ORP	mV		**-335.1**	**-239.1**	**0.3**	**-183.2**	**-41.5**	**-27.6**	**59**	**1**	**-11**	**-30.4**	**-133.1**	**-10**	**-42.9**	**26**	**13**	**-228**
Turbidity	NTU		**10**	**10**	**16.3**	**9.01**	--	**13.2**	--	**5**	**7**	**0.02**	**7.84**	**0.51**	**8.2**	**1.04**	**1.3**	**0.02**
Metals																		
Arsenic (Dissolved)	ug/L	5	**0.1 J**	0.5 U	3 U	--	3.0 U	3.0 U	--	--	--	--	--	--	--	--	--	--
Cadmium (Dissolved)	ug/L	8.8	0.02 U	0.02 U	4 U	--	4.0 U	4.0 U	--	--	--	--	--	--	--	--	--	--
Copper (Dissolved)	ug/L	3.1	**0.67**	**0.68**	1 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Nickel (Dissolved)	ug/L	8.2	**2.18**	**2.3**	4 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	--	--
Zinc (Dissolved)	ug/L	81	**0.4 J**	**0.6 J**	25 U	--	10 U	25 U	--	--	--	--	--	--	--	--	--	--

Analyte	Units	Groundwater Cleanup Level	Wells Outside of Acidic Metals Plume	
			AA-MW02R	
			04/28/21	10/20/21
Field Parameters				
pH	pH units	6.2	**7.50**	**7.24**
Temperature	deg C		**12.3**	**15.7**
Specific Conductance	uS/cm		**696**	**591.1**
Dissolved Oxygen	mg/L		**0.45**	**0.10**
ORP	mV		**68**	**90.6**
Turbidity	NTU		**2.8**	**0.02**
Metals				
Arsenic (Dissolved)	ug/L	5	--	--
Cadmium (Dissolved)	ug/L	8.8	--	--
Copper (Dissolved)	ug/L	3.1	1.0 U	1.0 U
Nickel (Dissolved)	ug/L	8.2	**--**	**--**
Zinc (Dissolved)	ug/L	81	**--**	**--**

Table 1. Groundwater Chemistry Data for Acid Plant Subarea

Project No. 140298, Georgia-Pacific West Site, Bellingham, Washington

Analyte	Units	Groundwater Cleanup Level	Wells Outside of Acidic Metals Plume																
			AA-MW03			AA-MW03R													
			09/29/09	03/30/10	02/25/15	10/15/16	01/11/17	04/17/17	07/05/17	01/24/18	04/24/18	07/10/18	10/03/18	01/13/19	04/08/19	07/24/19	10/10/19	04/21/20	10/07/20
Field Parameters																			
pH	pH units	6.2	**5.06**	**4.87**	**5.52**	**4.42**	**4.61**	**5.27**	**4.23**	**4.84**	**4.4**	**4.63**	**4.43**	**5.67**	**5.72**	**5.64**	**5.47**	**5.80**	**5.76**
Temperature	deg C		**15.94**	**11.26**	**12.2**	**16.55**	**10.54**	**11.9**	**16.95**	**11.2**	**11**	**16**	**16.9**	**12.9**	**11.5**	**17.4**	**17.5**	**12.2**	**18.1**
Specific Conductance	uS/cm		**1581**	**1661**	**1960**	**1820.5**	**1667.8**	**1820**	**1600.8**	**1431**	**1247**	**1288**	**1350**	**1153**	**901**	**976**	**706**	**813**	**805**
Dissolved Oxygen	mg/L		**0.86**	**0.92**	**0.99**	**0.1**	**0.51**	**1.55**	**0.11**	**0.9**	**0.2**	**0.1**	**0.12**	**0.08**	**0.2**	**0.35**	**0.14**	**0.75**	**0.45**
ORP	mV		**-268**	**69.9**	**119.3**	**-141.2**	**-10.5**	**-33.2**	**12**	**-25**	**-21**	**-49**	**39.4**	**-155**	**-77.2**	**-79.5**	**-4.4**	**-137**	**-30**
Turbidity	NTU		**10**	**10**	**2.55**	**7.12**	--	--	**9.34**	--	**4**	**4**	**0.02**	**8.54**	**11.8**	**11.2**	**2.41**	**1.9**	**0.02**
Metals																			
Arsenic (Dissolved)	ug/L	5	**0.87**	0.5 U	3 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U
Cadmium (Dissolved)	ug/L	8.8	0.02 U	**0.09**	4 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U
Copper (Dissolved)	ug/L	3.1	**0.99**	**1.09**	1 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Nickel (Dissolved)	ug/L	8.2	**3.01**	**7.37**	**8.0**	**4.3**	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	**65**	**33**	**27**	**45**	**12**	**6.4**
Zinc (Dissolved)	ug/L	81	**32.3**	**23.6**	25 U	25 U	25 U	10 U	25 U	25 U	25.0 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U

Analyte	Units	Groundwater Cleanup Level	Wells Outside of Acidic Metals Plume	
			AA-MW03R	
			04/28/21	10/21/21
Field Parameters				
pH	pH units	6.2	**6.06**	**6.35**
Temperature	deg C		**12.6**	**17.7**
Specific Conductance	uS/cm		**1126**	**399.6**
Dissolved Oxygen	mg/L		**0.06**	**0.93**
ORP	mV		**-39**	**-149.5**
Turbidity	NTU		**2.9**	**0.02**
Metals				
Arsenic (Dissolved)	ug/L	5	3.0 U	--
Cadmium (Dissolved)	ug/L	8.8	4.0 U	--
Copper (Dissolved)	ug/L	3.1	1.0 U	--
Nickel (Dissolved)	ug/L	8.2	4.0 U	--
Zinc (Dissolved)	ug/L	81	25 U	--

Table 1. Groundwater Chemistry Data for Acid Plant Subarea

Project No. 140298, Georgia-Pacific West Site, Bellingham, Washington

Analyte	Units	Groundwater Cleanup Level	Wells Outside of Acidic Metals Plume														
			BC-MW05														
			12/19/10	10/15/16	04/17/17	07/06/17	01/24/18	04/25/18	07/10/18	10/02/18	01/13/19	04/08/19	07/23/19	10/09/19	04/21/20	10/07/20	04/28/21	10/20/21
Field Parameters																		
pH	pH units	6.2	**7.64**	**7.25**	**7.4**	**7.2**	**7.2**	**7.42**	**7.21**	**7.26**	**7.54**	**7.25**	**7.17**	**7.12**	**7.22**	**Not Monitored**		
Temperature	deg C		**10.82**	**15.04**	**12.2**	**16.78**	**11.5**	**12.4**	**15**	**16**	**11.37**	**11.2**	**17.2**	**14.9**	**11.4**			
Specific Conductance	uS/cm		**25250**	**9868.8**	**4674**	**11489.4**	**5766**	**10857**	**13952**	**31689**	**15228**	**10350**	**11949**	**13024**	**13070**			
Dissolved Oxygen	mg/L		**0.22**	**0.12**	**0.2**	**0.16**	**0.3**	**0.1**	**1.9**	**0.53**	**0.18**	**0.23**	**0.33**	**0.27**	**6.77**			
ORP	mV		**-313.1**	**-326.5**	**-297.7**	**-327.8**	**-325**	**-207**	**-161**	**-294**	**-305.09**	**-290**	**-266.9**	**-187.4**	**-309**			
Turbidity	NTU		**2.75**	**13.7**	--	**7.72**	--	--	--	**0.02**	**80**	**8.19**	**7.8**	**0.87**	**0.4**			
Metals																		
Arsenic (Dissolved)	ug/L	5	--	--	--	--	--	--	--	--	--	--	--	--	--	**Not Monitored**		
Cadmium (Dissolved)	ug/L	8.8	--	--	--	--	--	--	--	--	--	--	--	--	--			
Copper (Dissolved)	ug/L	3.1	--	--	--	--	--	--	--	--	--	--	--	--	--			
Nickel (Dissolved)	ug/L	8.2	--	--	--	--	--	--	--	--	--	--	--	--	--			
Zinc (Dissolved)	ug/L	81	--	--	--	--	--	--	--	--	--	--	--	--	--			

Analyte	Units	Groundwater Cleanup Level	Wells Outside of Acidic Metals Plume														
			GF-MW01R														
			10/15/16	01/11/17	04/19/17	07/06/17	01/24/18	04/25/18	07/10/18	10/02/18	01/13/19	04/08/19	07/23/19	10/09/19	04/22/20	10/07/20	04/28/21	10/20/21
Field Parameters																		
pH	pH units	6.2	**6.13**	**6.44**	**6.4**	**6.23**	**6.26**	**6.25**	**6.23**	**6.52**	**6.91**	**6.34**	**6.24**	**6.5**	**6.13**	**Not Monitored**		
Temperature	deg C		**16.95**	**10.73**	**12**	**16.42**	**12**	**13.4**	**15.8**	**17.6**	**12.99**	**11.3**	**17.2**	**17.1**	**11.9**			
Specific Conductance	uS/cm		**7059.1**	**7950.7**	**3687**	**1125.2**	**8380**	**1231**	**1764**	**19073**	**3445.7**	**4901**	**3204**	**2012**	**1464**			
Dissolved Oxygen	mg/L		**0.1**	**0.15**	**0.19**	**0.17**	**0.5**	**0.2**	**0.1**	**0.08**	**0.09**	**0.21**	**0.19**	**0.17**	**1.18**			
ORP	mV		**-219.6**	**-168.4**	**-127.7**	**-14.9**	**-90**	**-61**	**-95**	**-277.6**	**-254.3**	**-127**	**-61.3**	**-67.7**	**8.5**			
Turbidity	NTU		**6.47**	**9.7**	--	**7.72**	--	--	**5**	**0.02**	**3.17**	--	**8.1**	**3.99**	**1.9**			
Metals																		
Arsenic (Dissolved)	ug/L	5	3.0 U	--	--	--	--	--	--	--	--	--	--	--	3.0 U	**Not Monitored**		
Cadmium (Dissolved)	ug/L	8.8	4.0 U	--	--	--	--	--	--	--	--	--	--	--	4.0 U			
Copper (Dissolved)	ug/L	3.1	1.0 U	--	1.0 U	--	--	--	--	--	--	--	--	--	1.0 U			
Nickel (Dissolved)	ug/L	8.2	4.0 U	--	4.0 U	--	--	--	--	--	--	--	--	--	4.0 U			
Zinc (Dissolved)	ug/L	81	25 U	--	--	--	--	--	--	--	--	--	--	--	25 U			

Notes

Wells AA-MW01R, BC-MW05, FH-MW-01R, and GF-MW01R not monitored 10/7/2020 because they were within Harcourt construction zone.

U - Not detected at PQL. Yellow - exceeded cleanup level. "--" indicates analysis not conducted.

Table 2. Groundwater Chemistry Data for Miscellaneous Metals Area

Project No. 140298, Georgia-Pacific West Site, Bellingham, Washington

Analyte	Units	Groundwater Cleanup Level	Wells Within Miscellaneous Metals Area											
			LP-MW01											
			07/27/04	09/30/09	03/29/10	02/26/15	10/14/16	01/11/17	04/17/17	07/06/17	01/23/18	04/23/18	07/10/18	10/03/18
Field Parameters														
pH	pH units	6.2	**7.20**	**7.09**	**7.79**	**6.94**	**6.71**	**7.04**	**7.23**	**6.88**	**6.85**	**6.56**	**6.5**	**6.59**
Temperature	deg C		**19.14**	**19.1**	**11.39**	**10.8**	**16.11**	**7.6**	**11.2**	**18.79**	**9.1**	**11.7**	**18**	**16.9**
Specific Conductance	uS/cm		**863**	**712**	**222**	**193.3**	**277.5**	**237.2**	**509.8**	**430.2**	**317**	**164**	**590**	**670**
Dissolved Oxygen	mg/L		**0.73**	**0.99**	**3.14**	**0.60**	**7.46**	**1.79**	**0.21**	**0.16**	**0.4**	**1.2**	**0.1**	**3.21**
ORP	mV		**-27.4**	**-289.2**	**97.6**	**-178.6**	**76.6**	**30**	**-96.2**	**-193.4**	**121**	**-50**	**-111**	**76.7**
Turbidity	NTU		**17.4**	**10**	**10**	**3.59**	**3.26**	**1.35**	--	**5.38**	**10**	**9**	**7**	**0.02**
Metals														
Arsenic (Dissolved)	ug/L	5	**14.1**	**3.18**	**1.1 J**	--	--	--	--	--	--	--	--	--
Cadmium (Dissolved)	ug/L	8.8	**1.5**	**0.097**	**0.061**	--	--	--	--	--	--	--	--	--
Copper (Dissolved)	ug/L	3.1	**45**	**3.10**	**4.41**	**3.5**	**4.1**	**4.5**	**11**	**11**	**6.5**	**4.4**	**10**	**9.1**
Nickel (Dissolved)	ug/L	8.2	**7**	**1.61**	**1.2**	4 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	--	**4.1**	--
Zinc (Dissolved)	ug/L	81	**10**	**0.56**	0.5 U	--	--	--	--	--	--	--	--	--

Analyte	Units	Groundwater Cleanup Level	Wells Within Miscellaneous Metals Area							
			LP-MW01 (continued)							
			01/14/19	04/09/19	07/24/19	10/08/19	04/20/20	10/07/20	04/29/21	10/21/21
Field Parameters										
pH	pH units	6.2	**7.13**	**6.26**	**6.47**	**6.40**	**6.09**	**6.59**	**6.57**	**6.35**
Temperature	deg C		**10.39**	**11.1**	**17.6**	**14.9**	**12.3**	**16.7**	**12.8**	**14.9**
Specific Conductance	uS/cm		**166**	**265**	**563.6**	**273.4**	**190**	**385**	**243**	**284.5**
Dissolved Oxygen	mg/L		**2.5**	**0.92**	**0.22**	**0.23**	**0.64**	**0.38**	**0.13**	**1.01**
ORP	mV		**-2.8**	**83.6**	**86.4**	**14.9**	**-121**	**140**	**60**	**-47.7**
Turbidity	NTU		**5.44**	**0.1**	**6.7**	**2.19**	**1.4**	**1.1**	**5.5**	**0.02**
Metals										
Arsenic (Dissolved)	ug/L	5	--	--	--	--	--	--	--	--
Cadmium (Dissolved)	ug/L	8.8	--	--	--	--	--	--	--	--
Copper (Dissolved)	ug/L	3.1	**3.9**	**4.2**	**7.4**	**9.1**	**3.1**	**8.8**	**2.1**	**9.4**
Nickel (Dissolved)	ug/L	8.2	--	--	--	--	--	--	--	--
Zinc (Dissolved)	ug/L	81	--	--	--	--	--	--	--	--

Table 2. Groundwater Chemistry Data for Miscellaneous Metals Area

Project No. 140298, Georgia-Pacific West Site, Bellingham, Washington

Analyte	Units	Groundwater Cleanup Level	Wells Within Miscellaneous Metals Area										
			SC-MW02				SC-MW02R						
			07/27/04	09/30/09	04/01/10	02/26/15	10/14/16	04/17/17	07/05/17	01/23/18	04/23/18	07/10/18	10/02/18
Field Parameters													
pH	pH units	6.2	**6.05**	**6.41**	**6.56**	**6.78**	**6.89**	**6.94**	**6.34**	**6.7**	**6.69**	**6.51**	**6.71**
Temperature	deg C		**15.28**	**16.58**	**10.89**	**11.3**	**16.51**	**11.6**	**17.38**	**11.1**	**11.1**	**16.1**	**15.3**
Specific Conductance	uS/cm		**6685**	**4137**	**2920**	**3325**	**1765.5**	**1726**	**1855.5**	**1389**	**1024**	**2557**	**4233**
Dissolved Oxygen	mg/L		**0.68**	**0.65**	**4.58**	**0.58**	**0.12**	**0.1**	**0.1**	**0.6**	--	**0.1**	**0.06**
ORP	mV		**-385.2**	**-496.6**	**-272**	**-193.7**	**-303.3**	**-177.8**	**-269.4**	**-62**	**-92**	**-215**	**229.7**
Turbidity	NTU		**55.8**	**10**	**15**	**9.14**	**28**	--	--	--	**12**	**38**	**0.02**
Metals													
Arsenic (Dissolved)	ug/L	5	**12.2**	**2.94**	1.67 U	--	--	--	--	--	--	--	--
Cadmium (Dissolved)	ug/L	8.8	0.5 U	**0.043**	0.067 U	--	--	--	--	--	--	--	--
Copper (Dissolved)	ug/L	3.1	**17**	**4.78**	**0.412**	2 U	**4.4**	**3.1**	**4.1**	**3.7**	**4.1**	**16**	**7.3**
Nickel (Dissolved)	ug/L	8.2	**29**	**8.42**	1.67 U	**13**	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	**17**	**28**
Zinc (Dissolved)	ug/L	81	**20**	**4.13**	1.67 U	--	--	--	--	--	--	--	--

Analyte	Units	Groundwater Cleanup Level	Wells Within Miscellaneous Metals Area							
			SC-MW02R (continued)							
			01/14/19	04/09/19	07/24/19	10/08/19	04/20/20	10/07/20	04/29/21	10/21/21
Field Parameters										
pH	pH units	6.2	**7.12**	**6.37**	**6.55**	**6.56**	**6.33**	**6.73**	**6.87**	**6.55**
Temperature	deg C		**9.53**	**10.3**	**15.7**	**14.6**	**12.1**	**16.0**	**12.2**	**15.9**
Specific Conductance	uS/cm		**1187**	**1587**	**2267**	**1053**	**1577**	**2799**	**2083**	**1067**
Dissolved Oxygen	mg/L		**0.15**	**0.79**	**0.11**	**0.47**	**0.47**	**0.16**	**0.16**	**0.11**
ORP	mV		**-216**	**-116.4**	**-340.7**	**-43.9**	**-154**	**-300**	**-286**	**-208.7**
Turbidity	NTU		**18.1**	**41.6**	**38.4**	**8.24**	**70**	**9**	**17**	**6.47**
Metals										
Arsenic (Dissolved)	ug/L	5	--	--	--	--	--	--	--	--
Cadmium (Dissolved)	ug/L	8.8	--	--	--	--	--	--	--	--
Copper (Dissolved)	ug/L	3.1	**14**	**4.8**	**7.4**	**5.1**	**2.9**	**3.3**	**2.8**	**2.4**
Nickel (Dissolved)	ug/L	8.2	4.0 U	4.0 U	**6.2**	4.0 U	--	--	--	--
Zinc (Dissolved)	ug/L	81	--	--	--	--	--	--	--	--

Table 2. Groundwater Chemistry Data for Miscellaneous Metals Area

Project No. 140298, Georgia-Pacific West Site, Bellingham, Washington

Analyte	Units	Groundwater Cleanup Level	Wells Downgradient of Miscellaneous Metals Area									
			AA-MW02			AA-MW02R						
			10/01/09	04/01/10	02/25/15	10/14/16	04/17/17	07/05/17	01/24/18	04/24/18	07/10/18	10/03/18
Field Parameters												
pH	pH units	6.2	**7.23**	**7.24**	**7.32**	**7.35**	**7.41**	**7.19**	**7.18**	**7.33**	**7.1**	**7.2**
Temperature	deg C		**15.13**	**12.39**	**12.4**	**16.46**	**12.4**	**16.16**	**12.3**	**11.4**	**14.9**	**15.1**
Specific Conductance	uS/cm		**1337**	**984**	**1110**	**1204.2**	**1018**	**883.6**	**957**	**807**	**812**	**753**
Dissolved Oxygen	mg/L		**0.58**	**0.72**	**0.54**	**0.09**	**0.25**	**0.23**	**0.3**	**0.1**	**0.1**	**0.2**
ORP	mV		**-335.1**	**-239.1**	**0.3**	**-183.2**	**-41.5**	**-27.6**	**59**	**1**	**-11**	**-30.4**
Turbidity	NTU		**10**	**10**	**16.3**	**9.01**	--	**13.2**	--	**5**	**7**	**0.02**
Metals												
Arsenic (Dissolved)	ug/L	5	**0.1 J**	0.5 U	3 U	--	3.0 U	3.0 U	--	--	--	--
Cadmium (Dissolved)	ug/L	8.8	0.02 U	0.02 U	4 U	--	4.0 U	4.0 U	--	--	--	--
Copper (Dissolved)	ug/L	3.1	**0.67**	**0.68**	1 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Nickel (Dissolved)	ug/L	8.2	**2.18**	**2.3**	4 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U
Zinc (Dissolved)	ug/L	81	**0.4 J**	**0.6 J**	25 U	--	10 U	25 U	--	--	--	--

Analyte	Units	Groundwater Cleanup Level	Wells Downgradient of Miscellaneous Metals Area							
			AA-MW02R (continued)							
			01/13/19	04/08/19	07/24/19	10/09/19	04/22/20	10/07/20	04/28/21	10/20/21
Field Parameters										
pH	pH units	6.2	**7.56**	**7.24**	**7.21**	**7.25**	**7.25**	**7.27**	**7.50**	**7.24**
Temperature	deg C		**12.85**	**12**	**16.1**	**14.8**	**11.7**	**15.6**	**12.3**	**15.7**
Specific Conductance	uS/cm		**925.5**	**1041**	**1055**	**886**	**806**	**780**	**696**	**591.1**
Dissolved Oxygen	mg/L		**0.12**	**0.21**	**0.37**	**0.18**	**0.63**	**0.14**	**0.45**	**0.10**
ORP	mV		**-133.1**	**-10**	**-42.9**	**26**	**13**	**-228**	**68**	**90.6**
Turbidity	NTU		**7.84**	**0.51**	**8.2**	**1.04**	**1.3**	**0.02**	**2.8**	**0.02**
Metals										
Arsenic (Dissolved)	ug/L	5	--	--	--	--	--	--	--	--
Cadmium (Dissolved)	ug/L	8.8	--	--	--	--	--	--	--	--
Copper (Dissolved)	ug/L	3.1	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Nickel (Dissolved)	ug/L	8.2	4.0 U	4.0 U	4.0 U	4.0 U	--	--	**--**	**--**
Zinc (Dissolved)	ug/L	81	--	--	--	--	--	--	**--**	**--**

Table 2. Groundwater Chemistry Data for Miscellaneous Metals Area

Project No. 140298, Georgia-Pacific West Site, Bellingham, Washington

Analyte	Units	Groundwater Cleanup Level	Wells Downgradient of Miscellaneous Metals Area											
			LB-MW01				LB-MW01R							
			07/27/04	10/01/09	04/01/10	02/26/15	10/14/16	01/11/17	04/19/17	07/05/17	01/24/18	04/23/18	07/10/18	10/02/18
Field Parameters														
pH	pH units	6.2	**6.60**	**6.79**	**6.84**	**6.70**	**6.93**	**7**	**7.23**	**7.04**	**6.95**	**7.19**	**7.39**	**7.74**
Temperature	deg C		**20.00**	**18.3**	**11.38**	**11.3**	**16.09**	**10.93**	**11**	**16.33**	**10.7**	**12.3**	**15.1**	**15.3**
Specific Conductance	uS/cm		**858**	**1001**	**702**	**607**	**1008**	**723.3**	**540.1**	**478.9**	**589**	**376**	**1001**	**1489**
Dissolved Oxygen	mg/L		**0.86**	**0.61**	**0.95**	**0.53**	**0.15**	**0.22**	**0.15**	**0.06**	**0.3**	**0.1**	**0.1**	**0.01**
ORP	mV		**-294.8**	**-379.1**	**-250.6**	**57.0**	**-207.4**	**-43.5**	**-17.6**	**-51.2**	**47**	**-43**	**-33**	**-298.8**
Turbidity	NTU		**6.44**	**10**	**10**	**4.45**	**18.6**	**10.8**	--	**2**	--	**5**	**8**	--
Metals														
Arsenic (Dissolved)	ug/L	5	0.5 U	0.5 U	0.5 U	3 U	--	--	--	--	--	--	--	--
Cadmium (Dissolved)	ug/L	8.8	0.5 U	0.02 U	0.02 U	4 U	--	--	--	--	--	--	--	--
Copper (Dissolved)	ug/L	3.1	1 U	**1.4**	**0.79**	**8.7**	**5.9**	**2.0**	**2.0**	**11.0**	**6.7**	**6.0**	**5.4**	**4.1**
Nickel (Dissolved)	ug/L	8.2	1 U	**0.86**	**2**	4 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4 U	4.0 U	4.0 U
Zinc (Dissolved)	ug/L	81	10 U	**0.72**	**0.6 J**	25 U	--	--	--	--	--	--	--	--

Analyte	Units	Groundwater Cleanup Level	Wells Downgradient of Miscellaneous Metals Area							
			LB-MW01R (continued)							
			01/13/19	04/09/19	07/24/19	10/09/19	04/21/20	10/07/20	04/28/21	10/20/21
Field Parameters										
pH	pH units	6.2	**7.45**	**7.64**	**7.62**	**7.45**	**7.44**	**7.66**	**8.24**	**7.10**
Temperature	deg C		**11.1**	**10.8**	**15**	**14.7**	**11.4**	**15.5**	**12.3**	**15.4**
Specific Conductance	uS/cm		**634.9**	**1364**	**1361**	**1197**	**626**	**1122**	**995**	**760**
Dissolved Oxygen	mg/L		**0.13**	**0.22**	**0.08**	**0.12**	**1.17**	**0.18**	**0.11**	**1.96**
ORP	mV		**-170.2**	**-145.5**	**-65.7**	**-17.7**	**-188**	**-95**	**-273**	**-145.6**
Turbidity	NTU		**2.38**	**0.1**	**8.9**	**2.03**	**2.7**	**1.8**	**2.5**	**0.02**
Metals										
Arsenic (Dissolved)	ug/L	5	--	--	--	--	--	--	--	--
Cadmium (Dissolved)	ug/L	8.8	--	--	--	--	--	--	--	--
Copper (Dissolved)	ug/L	3.1	**3.4**	**5.7**	**7.1**	**3.7**	**5.5**	**5.6**	**7.4**	**1.7**
Nickel (Dissolved)	ug/L	8.2	4.0 U	4.0 U	4.0 U	4.0 U	--	--	--	--
Zinc (Dissolved)	ug/L	81	--	--	--	--	--	--	--	--

Notes

Wells AA-MW02R and SC-MW02R not monitored 1/11/17 due to iced-in monuments.

U - Not detected at PQL. Yellow - exceeded cleanup level. "--" indicates analysis not conducted.

Table 3. Wells and Analytes for 2022 Groundwater Monitoring

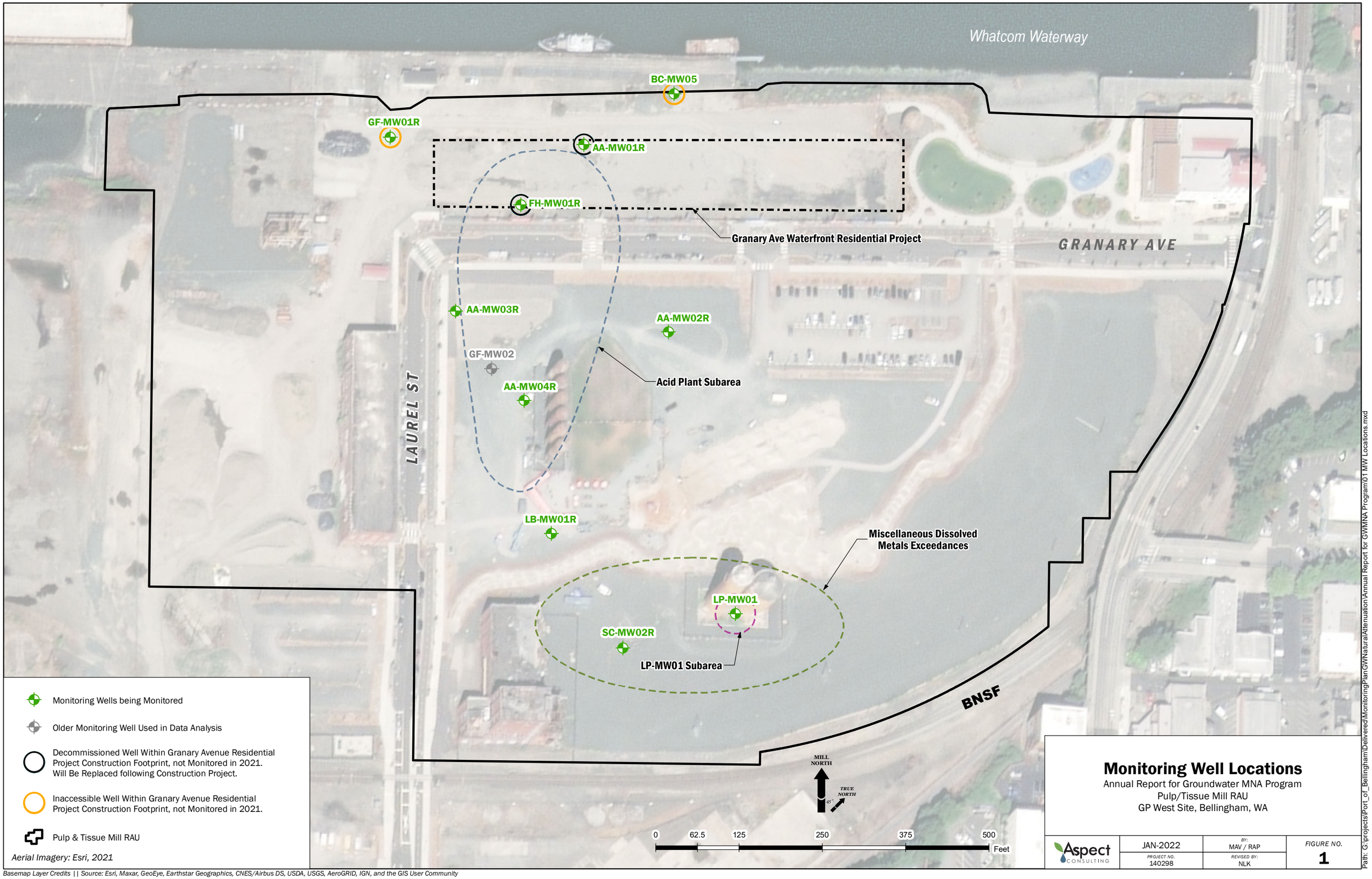
Project No. 140298, Georgia-Pacific West Site, Bellingham, Washington

Well ID	Field Parameters	Dissolved Metals				
		Arsenic	Cadmium	Copper	Nickel	Zinc
AA-MW01R	X	X	X	X	X	X
AA-MW04R	X	X	X	X	X	X
FH-MW01R	X	X	X	X	X	X
LB-MW01R	X			X		
LP-MW01	X			X		
SC-MW02R	X			X		
AA-MW02R	X	X if pH <6.2	X if pH <6.2	X	X if pH <6.2	X if pH<6.2
AA-MW03R	X	X for As, Cd, Cu, Ni, Zn if pH <6.2				
BC-MW05	X					
GF-MW01R	X					

Notes

If pH < 6.2 in AA-MW02R, AA-MW03R, BC-MW05R, or GF-MW01R, analyze that well for full suite of dissolved metals (As, Cd, Cu, Ni, Zn). However, AA-MW02R is analyzed for Cu and Ni each event (refer to text).

FIGURES



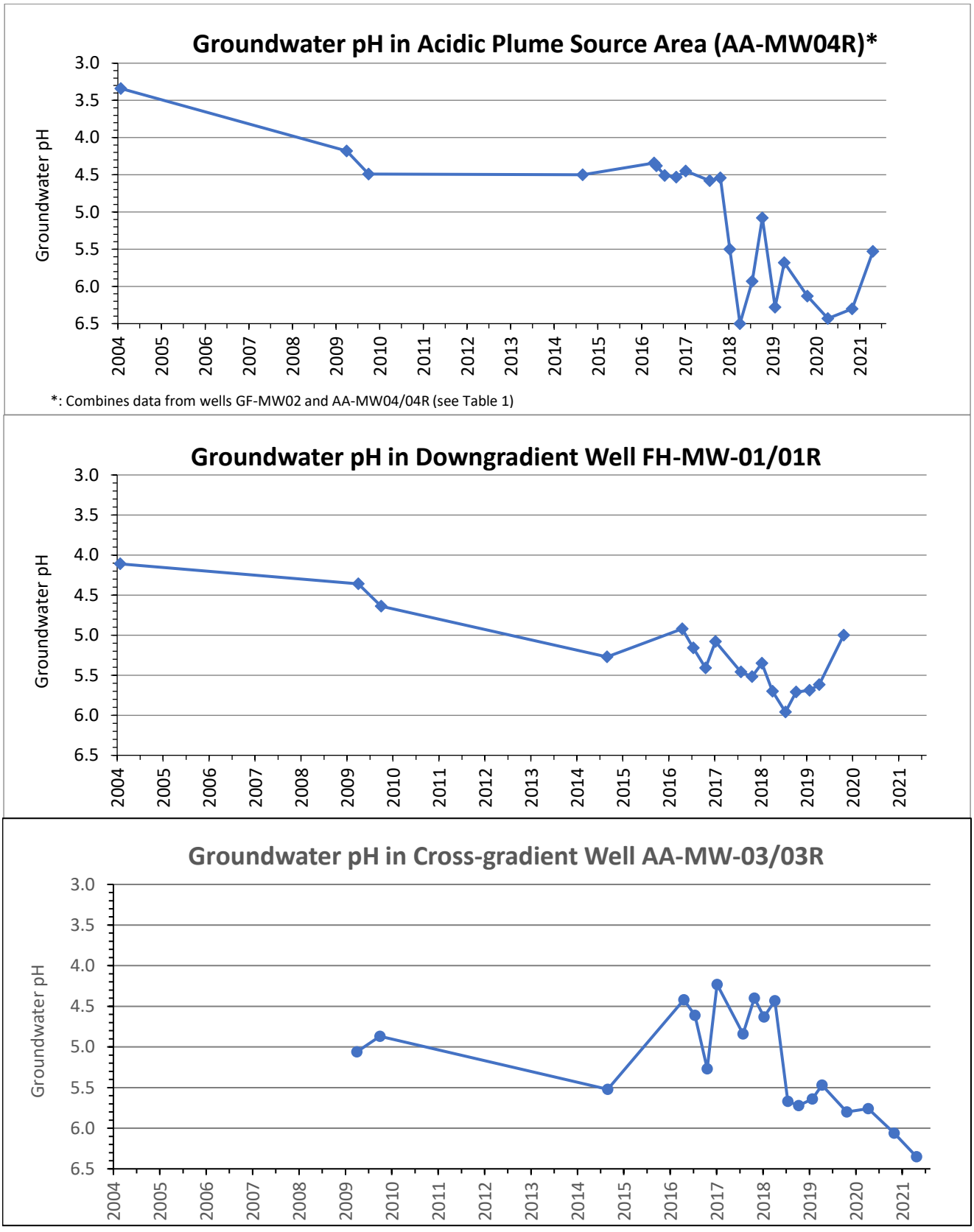
Monitoring Well Locations

Annual Report for Groundwater MNA Program
Pulp/Tissue Mill RAU
GP West Site, Bellingham, WA

Aspect Consulting	JAN-2022	BY: MAV / RAP	FIGURE NO. 1
	PROJECT NO. 140298	REVISED BY: NLK	

Basemap Layer Credits || Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

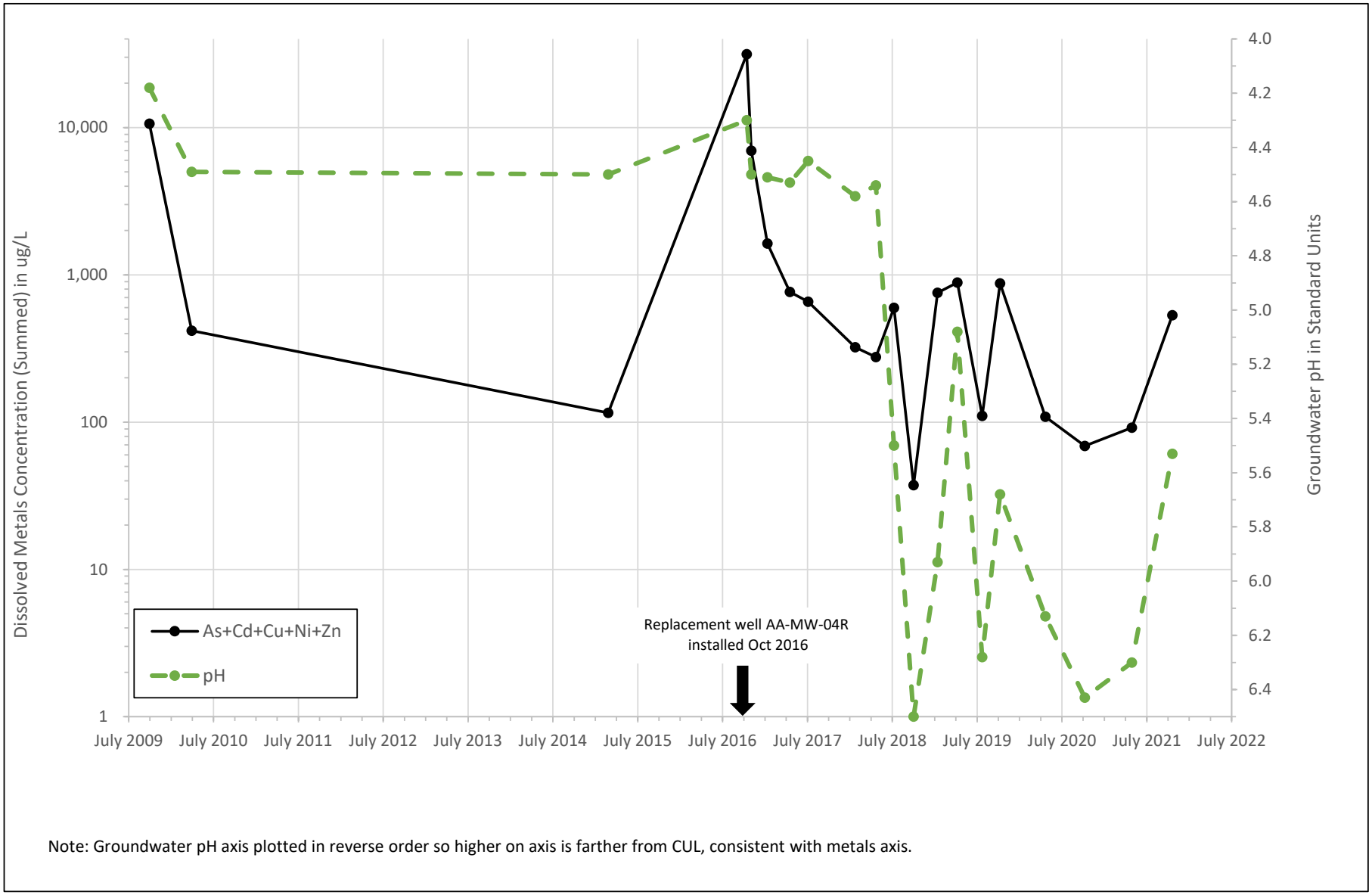
Path: G:\projects\Port_of_Bellingham\Delivered\MonitoringPlanGWNaturalAttenuation\Annual Report for GWMNA Program\01 MW Locations.mxd



Note: Groundwater pH axis is plotted in reverse order so higher on axis is farther from pH 6.2 CUL.

Figure 2

Acidic Plume Groundwater pH Trends Over Time, 2004-2021



Note: Groundwater pH axis plotted in reverse order so higher on axis is farther from CUL, consistent with metals axis.

Figure 3
Metals Concentration and pH Trends Over Time for Well AA-MW04/04R
2021 Groundwater MNA Annual Report
Project No. 140298

APPENDIX A

Data Validation Report and Laboratory Reports from OnSite Environmental

DATA VALIDATION REPORT

Georgia-Pacific Pulp and Tissue Mill
Remedial Action Unit Monitored Natural Attenuation
Groundwater Sampling 2021
Sample Delivery Groups 2104-304 and 2110-200

Prepared by:
Aspect Consulting, LLC
710 Second Ave, Suite 550
Seattle, WA 98104

Project No. 140298-A-19 • December 2021

1 Introduction

This report summarizes the findings of the United States Environmental Protection Agency (USEPA) Stage 2A data validation performed on analytical data for groundwater samples collected in April and October of 2021 at the Georgia-Pacific West Pulp and Tissue Mill Remedial Action Unit. This data quality review is divided into sections by sample delivery group (SDG). A complete list of samples and analyses for each SDG is provided in the Sample Index at the beginning of each section.

Samples were sent to OnSite Environmental in Redmond, Washington for dissolved metals analysis, as summarized below:

SDG	Analysis	Method	Lab	Validation Level
2104-304	Metals	EPA 200.8	OnSite Environmental	2A
2110-200	Metals	EPA 200.8	OnSite Environmental	2A

Data assigned a J/UJ qualifier (estimated) may be used for site evaluation purposes but the reasons for qualification should be considered when interpreting sample concentrations. Values without qualification meet all data measurement quality objectives and are suitable for use.

Data qualifier definitions and a summary table of the qualified data are included in the Qualified Data Summary at the end of this report. Data qualifiers have been incorporated into the project chemistry database to reflect the validation in this report.

2 Data Validation Findings for SDG 2104-304

Groundwater samples in this SDG, and the chemical analyses performed on them, are tabulated below. The sections below describe the results of the data quality review for this SDG by analyte group (analysis).

Sample Name	Sample Date	EPA200.8
AAMW02R-20210428	4/28/21	X
AAMW03R-20210428	4/28/21	X
AAMW04R-20210428	4/29/21	X
LBMW01R-20210428	4/29/21	X
LPMW01-20210429	4/29/21	X
SCMW02R-20210429	4/29/21	X

2.1 Sample Receipt and Preservation

All samples were received in good condition and in the correct containers. Temperature upon receipt was within standard acceptable range.

2.2 Metals (EPA 200.8)

2.2.1 Holding Times

Samples were analyzed within the requisite holding time. No qualification or action was needed.

2.2.2 Method Blanks

Target analytes were not detected at or above the reporting levels in the method blanks. No qualification or action was needed.

2.2.3 Laboratory Duplicates (LD)

All LD RPD were within the laboratory specified control limits. No qualification or action was needed.

2.2.4 Matrix Spikes/Matrix Spike Duplicates (MS/MSD)

All MS/MSD %R and RPD were within the laboratory specified control limits. No qualification or action was needed.

2.2.5 Laboratory Control Samples (LCS)

All LCS %R were within the laboratory specified control limits. No qualification or action was needed.

2.2.6 Overall Assessment

Accuracy was acceptable based on the LCS and MS/MSD %R. Precision was acceptable based on the LD and MS/MSD RPD. The data are of known quality and are acceptable for use and no qualifiers are assigned.

3 Data Validation Findings for SDG 2110-200

Groundwater samples in this SDG, and the chemical analyses performed on them, are tabulated below. The sections below describe the results of the data quality review for this SDG by analyte group (analysis).

Sample Name	Sample Date	EPA200.8
AA-MW02R-20211019	10/19/21	X
AA-MW04R-20211019	10/19/21	X
LB-MW01R-20211021	10/21/21	X
LP-MW01-20211021	10/21/21	X
SC-MW02R-20211019	10/19/21	X

3.1 Sample Receipt and Preservation

All samples were received in good condition and in the correct containers. Temperature upon receipt was within standard acceptable range.

3.2 Metals (EPA 200.8)

3.2.1 Holding Times

Samples were analyzed within the requisite holding time. No qualification or action was needed.

3.2.2 Method Blanks

Target analytes were not detected at or above the reporting levels in the method blanks. No qualification or action was needed.

3.2.3 Laboratory Duplicates (LD)

All LD RPD were within the laboratory specified control limits. No qualification or action was needed.

3.2.4 Matrix Spikes/Matrix Spike Duplicates (MS/MSD)

All MS/MSD %R and RPD were within the laboratory specified control limits. No qualification or action was needed.

3.2.5 Overall Assessment

Accuracy was acceptable based on the LCS and MS/MSD %R. Precision was acceptable based on the LD and MS/MSD RPD. The data are of known quality and are acceptable for use and no qualifiers are assigned.

4 Qualified Data Summary

Qualified sample results from both monitoring events are listed below. Results flagged non-detect (U) by the laboratory with no further qualification necessary are not listed.

Sample ID	Method	Analyte	Qualifier	Reason
n/a	--	--	--	No qualifiers applied

Data Qualifier Definitions

Data Qualifier	Definition
J	The analyte was detected above the reported quantitation limit, and the reported concentration was an estimated value.
U	The analyte was analyzed for but was considered not detected at the reporting limit or reported value.
UJ	The analyte was analyzed for, and the associated quantitation limit was an estimated value.

OnSite Environmental Inc.
14648 NE 95th Street, Redmond, WA 98052 • (425) 883-3881

May 10, 2021

Steve Germiat
Aspect Consulting
Dexter Horton Building
710 2nd Avenue, Suite 550
Seattle, WA 98104

Re: Analytical Data for Project 140298
Laboratory Reference No. 2104-304

Dear Steve:

Enclosed are the analytical results and associated quality control data for samples submitted on April 30, 2021.

The standard policy of OnSite Environmental, Inc. is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,

David Baumeister
Project Manager

Enclosures

Date of Report: May 10, 2021
Samples Submitted: April 30, 2021
Laboratory Reference: 2104-304
Project: 140298

Case Narrative

Samples were collected on April 28 and 29, 2021 and received by the laboratory on April 30, 2021. They were maintained at the laboratory at a temperature of 2°C to 6°C.

Please note that any and all soil sample results are reported on a dry-weight basis, unless otherwise noted below.

General QA/QC issues associated with the analytical data enclosed in this laboratory report will be indicated with a reference to a comment or explanation on the Data Qualifier page. More complex and involved QA/QC issues will be discussed in detail below.

Date of Report: May 10, 2021
Samples Submitted: April 30, 2021
Laboratory Reference: 2104-304
Project: 140298

DISSOLVED METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**AA-MW02R-20210428**					
Laboratory ID:	04-304-01					
Copper	**ND**	1.0	EPA 200.8		5-5-21	
Client ID:	**AA-MW03R-20210428**					
Laboratory ID:	04-304-02					
Arsenic	**ND**	3.0	EPA 200.8		5-5-21	
Cadmium	**ND**	4.0	EPA 200.8		5-5-21	
Copper	**ND**	1.0	EPA 200.8		5-5-21	
Nickel	**ND**	4.0	EPA 200.8		5-5-21	
Zinc	**ND**	25	EPA 200.8		5-5-21	
Client ID:	**LP-MW01-20210429**					
Laboratory ID:	04-304-03					
Copper	**2.1**	1.0	EPA 200.8		5-5-21	
Client ID:	**SC-MW02R-20210429**					
Laboratory ID:	04-304-04					
Copper	**2.8**	1.0	EPA 200.8		5-5-21	
Client ID:	**AA-MW04R-20210429**					
Laboratory ID:	04-304-05					
Arsenic	**ND**	3.0	EPA 200.8		5-5-21	
Cadmium	**ND**	4.0	EPA 200.8		5-5-21	
Copper	**1.2**	1.0	EPA 200.8		5-5-21	
Nickel	**24**	4.0	EPA 200.8		5-5-21	
Zinc	**63**	25	EPA 200.8		5-5-21	
Client ID:	**LB-MW01R-20210429**					
Laboratory ID:	04-304-06					
Copper	**7.4**	1.0	EPA 200.8		5-5-21	

Date of Report: May 10, 2021
Samples Submitted: April 30, 2021
Laboratory Reference: 2104-304
Project: 140298

DISSOLVED METALS
EPA 200.8
QUALITY CONTROL

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0505D1					
Arsenic	**ND**	3.0	EPA 200.8		5-5-21	
Cadmium	**ND**	4.0	EPA 200.8		5-5-21	
Copper	**ND**	1.0	EPA 200.8		5-5-21	
Nickel	**ND**	4.0	EPA 200.8		5-5-21	
Zinc	**ND**	25	EPA 200.8		5-5-21	

Analyte	Result		Spike Level		Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE										
Laboratory ID:	04-304-05									
	ORIG	DUP								
Arsenic	**ND**	**ND**	NA	NA		NA	NA	NA	20	
Cadmium	**ND**	**ND**	NA	NA		NA	NA	NA	20	
Copper	**1.21**	**1.40**	NA	NA		NA	NA	14	20	
Nickel	**24.2**	**25.4**	NA	NA		NA	NA	5	20	
Zinc	**63.2**	**70.4**	NA	NA		NA	NA	11	20	
MATRIX SPIKES										
Laboratory ID:	04-304-05									
	MS	MSD	MS	MSD		MS	MSD			
Arsenic	**83.8**	**82.2**	80.0	80.0	ND	**105**	**103**	75-125	2	20
Cadmium	**78.4**	**76.8**	80.0	80.0	ND	**98**	**96**	75-125	2	20
Copper	**69.4**	**68.6**	80.0	80.0	ND	**87**	**86**	75-125	1	20
Nickel	**95.0**	**94.6**	80.0	80.0	24.2	**89**	**88**	75-125	0	20
Zinc	**145**	**143**	80.0	80.0	63.2	**102**	**100**	75-125	1	20

Analyte	Result	Spike Level	Source Result	Percent Recovery	Recovery Limits	Flags
SPIKE BLANK						
Laboratory ID:	SB0505D1					
Arsenic	**80.4**	80.0	N/A	**101**	85-115	
Cadmium	**79.2**	80.0	N/A	**99**	85-115	
Copper	**78.0**	80.0	N/A	**98**	85-115	
Nickel	**78.0**	80.0	N/A	**98**	85-115	
Zinc	**79.6**	80.0	N/A	**100**	85-115	

OnSite Environmental Inc.

Data Qualifiers and Abbreviations

A - Due to a high sample concentration, the amount spiked is insufficient for meaningful MS/MSD recovery data.

B - The analyte indicated was also found in the blank sample.

C - The duplicate RPD is outside control limits due to high result variability when analyte concentrations are within five times the quantitation limit.

E - The value reported exceeds the quantitation range and is an estimate.

F - Surrogate recovery data is not available due to the high concentration of coeluting target compounds.

H - The analyte indicated is a common laboratory solvent and may have been introduced during sample preparation, and be impacting the sample result.

I - Compound recovery is outside of the control limits.

J - The value reported was below the practical quantitation limit. The value is an estimate.

K - Sample duplicate RPD is outside control limits due to sample inhomogeneity. The sample was re-extracted and re-analyzed with similar results.

L - The RPD is outside of the control limits.

M - Hydrocarbons in the gasoline range are impacting the diesel range result.

M1 - Hydrocarbons in the gasoline range (toluene-naphthalene) are present in the sample.

N - Hydrocarbons in the lube oil range are impacting the diesel range result.

N1 - Hydrocarbons in diesel range are impacting lube oil range results.

O - Hydrocarbons indicative of heavier fuels are present in the sample and are impacting the gasoline result.

P - The RPD of the detected concentrations between the two columns is greater than 40.

Q - Surrogate recovery is outside of the control limits.

S - Surrogate recovery data is not available due to the necessary dilution of the sample.

T - The sample chromatogram is not similar to a typical _____.

U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

U1 - The practical quantitation limit is elevated due to interferences present in the sample.

V - Matrix Spike/Matrix Spike Duplicate recoveries are outside control limits due to matrix effects.

W - Matrix Spike/Matrix Spike Duplicate RPD are outside control limits due to matrix effects.

X - Sample extract treated with a mercury cleanup procedure.

X1- Sample extract treated with a sulfuric acid/silica gel cleanup procedure.

Y - The calibration verification for this analyte exceeded the 20% drift specified in methods 8260 & 8270, and therefore the reported result should be considered an estimate. The overall performance of the calibration verification standard met the acceptance criteria of the method.

Z -

ND - Not Detected at PQL
PQL - Practical Quantitation Limit
RPD - Relative Percent Difference

Chain of Custody

Page 1 of 1

OnSite Environmental Inc.
Analytical Laboratory Testing Services
14648 NE 95th Street • Redmond, WA 98052
Phone: (425) 883-3881 • www.onsite-env.com

Company: ASPECT
Project Number: 140298
Project Name: GP PTM RAU
Project Manager: S. GERMIAT
Sampled by: A. FITTS

Turnaround Request (in working days)
(Check One)
☐ Same Day ☐ 1 Day
☐ 2 Days ☐ 3 Days
☒ Standard (7 Days)
☐ _____ (other)

Laboratory Number: 04-304

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	Number of Containers	NWTPH-HCID	NWTPH-Gx/BTEX	NWTPH-Gx	NWTPH-Dx (☐ Acid / SG Clean-up)	Volatiles 8260D	Halogenated Volatiles 8260D	EDB EPA 8011 (Waters Only)	Semivolatiles 8270E/SIM (with low-level PAHs)	PAHs 8270E/SIM (low-level)	PCBs 8082A	Organochlorine Pesticides 8081B	Organophosphorus Pesticides 8270E/SIM	Chlorinated Acid Herbicides 8151A	Total RCRA Metals	Total MTCA Metals	TCLP Metals	HEM (oil and grease) 1664A	Cu	As, Cd, Ni, Zn			% Moisture
1	AA-MW02R-20210428	04/28/21	15:04	GW	1																		X				
2	AA-MW03R-20210428	04/28/21	15:50	GW	1																		X	X			
3	LP-MW01-20210429	04/29/21	9:36	GW	1																		X				
4	SC-MW02R-20210429	04/29/21	11:20	GW	1																		X				
5	AA-MW04R-20210429	04/29/21	13:44	GW	1																		X	X			
6	LB-MW01R-20210429	04/29/21	15:10	GW	1																		X				

	Signature	Company	Date	Time
Relinquished		ASPECT	4/29/21	3:52 PM
Received		OSE	4/30/21	1200
Relinquished				
Received				
Relinquished				
Received				
Reviewed/Date		Reviewed/Date		

Comments/Special Instructions

- ALL SAMPLES FIELD FILTERED 0.45 µ

E.C. > 1,000 : AA-MW03R, SC-MW02R

E.C. < 1,000 : AA-MW02R, LP-MW01, AA-MW04R, LB-MW01R

Data Package: Standard ☐ Level III ☐ Level IV ☐

Chromatograms with final report ☐ Electronic Data Deliverables (EDDs) ☐

OnSite Environmental Inc.
14648 NE 95th Street, Redmond, WA 98052 • (425) 883-3881

November 3, 2021

Steve Germiat
Aspect Consulting
Dexter Horton Building
710 2nd Avenue, Suite 550
Seattle, WA 98104

Re: Analytical Data for Project 140298
Laboratory Reference No. 2110-200

Dear Steve:

Enclosed are the analytical results and associated quality control data for samples submitted on October 22, 2021.

The standard policy of OnSite Environmental, Inc. is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,

David Baumeister
Project Manager

Enclosures

Date of Report: November 3, 2021
Samples Submitted: October 22, 2021
Laboratory Reference: 2110-200
Project: 140298

Case Narrative

Samples were collected on October 19 and 21, 2021 and received by the laboratory on October 22, 2021. They were maintained at the laboratory at a temperature of 2°C to 6°C.

Please note that any and all soil sample results are reported on a dry-weight basis, unless otherwise noted below.

General QA/QC issues associated with the analytical data enclosed in this laboratory report will be indicated with a reference to a comment or explanation on the Data Qualifier page. More complex and involved QA/QC issues will be discussed in detail below.

Date of Report: November 3, 2021
Samples Submitted: October 22, 2021
Laboratory Reference: 2110-200
Project: 140298

DISSOLVED METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**AAMW04R-20211019**					
Laboratory ID:	10-200-01					
Arsenic	**ND**	3.0	EPA 200.8		10-27-21	
Cadmium	**66**	10	EPA 200.8		10-27-21	
Copper	**190**	2.5	EPA 200.8		10-27-21	
Nickel	**44**	10	EPA 200.8		10-27-21	
Zinc	**230**	63	EPA 200.8		10-27-21	
Client ID:	**AAMW02R-20211019**					
Laboratory ID:	10-200-02					
Copper	**ND**	1.0	EPA 200.8		10-27-21	
Client ID:	**SCMW02R-20211019**					
Laboratory ID:	10-200-03					
Copper	**2.4**	1.0	EPA 200.8		10-27-21	
Client ID:	**LBMW01R-20211021**					
Laboratory ID:	10-200-04					
Copper	**1.7**	1.0	EPA 200.8		10-27-21	
Client ID:	**LPMW01-20211021**					
Laboratory ID:	10-200-05					
Copper	**9.4**	1.0	EPA 200.8		10-27-21	

Date of Report: November 3, 2021
Samples Submitted: October 22, 2021
Laboratory Reference: 2110-200
Project: 140298

DISSOLVED METALS
EPA 200.8
QUALITY CONTROL

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB1027D1					
Arsenic	**ND**	3.0	EPA 200.8		10-27-21	
Cadmium	**ND**	4.0	EPA 200.8		10-27-21	
Copper	**ND**	1.0	EPA 200.8		10-27-21	
Nickel	**ND**	4.0	EPA 200.8		10-27-21	
Zinc	**ND**	25	EPA 200.8		10-27-21	

Analyte	Result		Spike Level		Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE										
Laboratory ID:	10-200-02									
	ORIG	DUP								
Arsenic	**ND**	**ND**	NA	NA		NA	NA	NA	20	
Cadmium	**ND**	**ND**	NA	NA		NA	NA	NA	20	
Copper	**ND**	**ND**	NA	NA		NA	NA	NA	20	
Nickel	**ND**	**ND**	NA	NA		NA	NA	NA	20	
Zinc	**ND**	**ND**	NA	NA		NA	NA	NA	20	
MATRIX SPIKES										
Laboratory ID:	10-200-02									
	MS	MSD	MS	MSD		MS	MSD			
Arsenic	**86.6**	**88.4**	80.0	80.0	ND	**108**	**111**	75-125	2	20
Cadmium	**78.6**	**78.8**	80.0	80.0	ND	**98**	**99**	75-125	0	20
Copper	**68.2**	**68.8**	80.0	80.0	ND	**85**	**86**	75-125	1	20
Nickel	**71.8**	**72.0**	80.0	80.0	ND	**90**	**90**	75-125	0	20
Zinc	**76.8**	**77.0**	80.0	80.0	ND	**96**	**96**	75-125	0	20
SPIKE BLANK										
Laboratory ID:	SB1027D1									
Arsenic	**82.8**		80.0		N/A	**104**	85-115			
Cadmium	**81.6**		80.0		N/A	**102**	85-115			
Copper	**76.0**		80.0		N/A	**95**	85-115			
Nickel	**77.4**		80.0		N/A	**97**	85-115			
Zinc	**79.4**		80.0		N/A	**99**	85-115			

OnSite Environmental Inc.

Data Qualifiers and Abbreviations

A - Due to a high sample concentration, the amount spiked is insufficient for meaningful MS/MSD recovery data.

B - The analyte indicated was also found in the blank sample.

C - The duplicate RPD is outside control limits due to high result variability when analyte concentrations are within five times the quantitation limit.

E - The value reported exceeds the quantitation range and is an estimate.

F - Surrogate recovery data is not available due to the high concentration of coeluting target compounds.

H - The analyte indicated is a common laboratory solvent and may have been introduced during sample preparation, and be impacting the sample result.

I - Compound recovery is outside of the control limits.

J - The value reported was below the practical quantitation limit. The value is an estimate.

K - Sample duplicate RPD is outside control limits due to sample inhomogeneity. The sample was re-extracted and re-analyzed with similar results.

L - The RPD is outside of the control limits.

M - Hydrocarbons in the gasoline range are impacting the diesel range result.

M1 - Hydrocarbons in the gasoline range (toluene-naphthalene) are present in the sample.

N - Hydrocarbons in the lube oil range are impacting the diesel range result.

N1 - Hydrocarbons in diesel range are impacting lube oil range results.

O - Hydrocarbons indicative of heavier fuels are present in the sample and are impacting the gasoline result.

P - The RPD of the detected concentrations between the two columns is greater than 40.

Q - Surrogate recovery is outside of the control limits.

S - Surrogate recovery data is not available due to the necessary dilution of the sample.

T - The sample chromatogram is not similar to a typical _____.

U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

U1 - The practical quantitation limit is elevated due to interferences present in the sample.

V - Matrix Spike/Matrix Spike Duplicate recoveries are outside control limits due to matrix effects.

W - Matrix Spike/Matrix Spike Duplicate RPD are outside control limits due to matrix effects.

X - Sample extract treated with a mercury cleanup procedure.

X1- Sample extract treated with a sulfuric acid/silica gel cleanup procedure.

Y - The calibration verification for this analyte exceeded the 20% drift specified in methods 8260 & 8270, and therefore the reported result should be considered an estimate. The overall performance of the calibration verification standard met the acceptance criteria of the method.

Y1 - Negative effects of the matrix from this sample on the instrument caused values for this analyte in the bracketing continuing calibration verification standard (CCVs) to be outside of 20% acceptance criteria. Because of this, quantitation limits and sample concentrations should be considered estimates.

Z -

ND - Not Detected at PQL
PQL - Practical Quantitation Limit
RPD - Relative Percent Difference

Chain of Custody

Page 1 of 1

OnSite Environmental Inc.
Analytical Laboratory Testing Services
14648 NE 95th Street • Redmond, WA 98052
Phone: (425) 883-3881 • www.onsite-env.com

Company: ASPECT
Project Number: 140298
Project Name: GP PTM RAU
Project Manager: S. GERMIAT
Sampled by: A. FITTS

Turnaround Request (in working days)
(Check One)
☐ Same Day ☐ 1 Day
☐ 2 Days ☐ 3 Days
☒ Standard (7 Days)
☐ _____ (other)

Laboratory Number: 10-200

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	Number of Containers	NWTPH-HCID	NWTPH-Gx/BTEX	NWTPH-Gx	NWTPH-Dx (☐ Acid / SG Clean-up)	Volatiles 8260D	Halogenated Volatiles 8260D	EDB EPA 8011 (Waters Only)	Semivolatiles 8270E/SIM (with low-level PAHs)	PAHs 8270E/SIM (low-level)	PCBs 8082A	Organochlorine Pesticides 8081B	Organophosphorus Pesticides 8270E/SIM	Chlorinated Acid Herbicides 8151A	Total RCRA Metals	Total MTCA Metals	TCLP Metals	HEM (oil and grease) 1664A	Cu	As, Cd, Ni, Zn			% Moisture
1	AAMW04R-20211019	10/19	12:40	GW	1																		X	X			
2	AAMW02R-20211019	10/19	14:19	GW	1																		X				
3	SCMW02R-20211019	10/19	15:35	GW	1																		X				
~~—~~	~~AAMW03R-20211021~~	~~10/21~~	~~11:40~~	~~GW~~											HOLD												
4	LBMW01R-20211021	10/21	10:09	GW	1																		X				
5	LPMW01-20211021	10/21	13:37	GW	1																		X				

	Signature	Company	Date	Time
Relinquished		ASPECT	10/21/21	3:07
Received			10/21/21	1200
Relinquished				
Received				
Relinquished				
Received				
Reviewed/Date		Reviewed/Date		

Comments/Special Instructions
- ALL SAMPLES FIELD FILTERED 0.45µ

E.C. >1,000: SCMW02R
E.C. <1,000: ALL OTHERS

Data Package: Standard ☐ Level III ☐ Level IV ☐

Chromatograms with final report ☐ Electronic Data Deliverables (EDDs) ☐