Kennedy Jenks

8 February 2022

Ms. Sandra Treccani
Site Manager
Washington State Department of Ecology
4601 North Monroe Street
Spokane, Washington 99205

Subject: Second Semiannual 2021 Groundwater Sampling Results
BNSF Railway Company, Parkwater Rail Yard
Spokane, Washington
KJ 2196110*00

Dear Ms. Treccani:

This letter summarizes the monitoring activities and presents the field and laboratory results for samples collected during the second semiannual 2021 groundwater sampling event at the BNSF Railway Company (BNSF) Parkwater Rail Yard (Site) located in Spokane, Washington.

Background

Cleanup work at the Site is being implemented under Consent Decree No. 12202548-1 between BNSF and the Washington State Department of Ecology (Ecology). A soil and groundwater remediation system operated at the Site from March 2009 to May 2016. Ecology approved a request to shut down the remediation system and continue with a reduced groundwater monitoring schedule in a letter dated 26 January 2016.

Groundwater monitoring activities are conducted in accordance with the Compliance Monitoring Plan (CMP) included in the Engineering Design Report (EDR) (GeoEngineers 2013). As specified in the CMP, the reduced monitoring will be conducted on monitoring wells MW-6, MW-7, MW-14, and MW-19 (Fueling Area wells) for a minimum of four consecutive quarters. According to the CMP, groundwater monitoring "will be ceased in the Fueling Area wells after the remediation system has been shut down for one full year and laboratory data from four consecutive quarters of monitoring indicate diesel-range organics (DRO) and arsenic concentrations in groundwater samples are less than cleanup criteria." Four consecutive quarters of monitoring were conducted following the shutdown of the remediation system in 2016. In a letter dated 28 August 2017, BNSF requested that the frequency of groundwater monitoring and cap integrity inspections be reduced from quarterly to semiannual (second and fourth quarter each year). Ecology approved the proposed sampling reduction in a letter dated 25 September 2017. In a letter dated 16 April 2020, BNSF requested to discontinue analyzing DRO in groundwater. Ecology approved the request to remove DRO from the analytical suite in a letter dated 21 April 2020, leaving arsenic as the remaining constituent to be monitored.

The arsenic cleanup criterion included in the EDR, also referred to as the site-specific cleanup level (CUL), was 0.005 milligrams per liter (mg/L). That value was based on the background arsenic concentration at the time the remedial strategy for the Site was developed. In January 2022, Ecology published the Natural Background Groundwater Arsenic Concentrations in Washington State, which provides information on natural background groundwater arsenic ranges for major watershed basins in

the State of Washington (Ecology 2022). The study includes updated natural background arsenic concentrations based on a dataset of arsenic results from public water supply wells. According to Table 2 of the study, the arsenic concentration for the Spokane basin ranges from 0.0009 to 0.0213 mg/L, with a calculated natural background concentration [90th percentile upper tolerance limit (UTL)] of 0.0053 mg/L (Ecology 2022).

Field Activities

The second semiannual 2021 groundwater sampling event was conducted on 22 November 2021. Groundwater monitoring activities included measuring depth-to-water in monitoring wells, then purging groundwater from each well using a stainless-steel bladder pump and collecting groundwater samples. Purging and sampling were conducted using low-flow techniques (ASTM 2018).

Groundwater samples were collected in accordance with the requirements of the CMP and stored in a cooler containing crushed ice until being delivered to Pace Analytical Services, LLC of Minneapolis, Minnesota (Pace), a Washington State-accredited environmental laboratory, under appropriate chain-of-custody. Samples were analyzed by Pace for total and dissolved arsenic by U.S. Environmental Protection Agency (EPA) Method 6020.

Results

Depth-to-groundwater measurements and calculated groundwater elevations are summarized in Table 1 and presented on Figure 1. Water quality parameters measured during groundwater purging are summarized in Table 2, and monitoring well purge forms are included in Attachment A. Analytical results are summarized in Table 3 and are presented on Figure 2 (arsenic), and the laboratory reports are included in Attachment B. The laboratory report was reviewed for quality control/quality assurance purposes and the data were found to be acceptable for their intended purpose.

Groundwater elevation measurements indicate groundwater flows to the west to northwest with an average hydraulic gradient of 0.002 feet per foot. This is consistent with the groundwater flow direction observed during previous monitoring events at the Site.

During the November 2021 sampling event, reported concentrations of total arsenic ranged from 0.0023 mg/L in monitoring well MW-14 to 0.0052 mg/L in monitoring well MW-19. Reported concentrations of dissolved arsenic ranged from 0.0014 mg/L in monitoring well MW-14 to 0.0038 mg/L in monitoring well MW-19.

Summary and Conclusions

Total arsenic concentrations in groundwater were reported below the natural background UTL of 0.0053 mg/L for the last four sampling events. Arsenic in groundwater is representative of natural background conditions and results are within the natural distribution range for the region (Ecology, 2022). Therefore, Kennedy Jenks recommends that groundwater monitoring be discontinued, and monitoring wells decommissioned.

Please contact us at (503) 423-4018 if you have questions regarding the above information.

Very truly yours,

Kennedy/Jenks Consultants, Inc.

2/8/2022

Alice Robinson
Project Engineer

Ryan Hultgren, P.E.
Principal Engineer

cc: Shane DeGross, BNSF Railway Company

Attachments:

- Table 1 – Groundwater Elevation Summary 22 November 2021
- Table 2 – Water Quality Parameters Summary
- Table 3 – 2016-2021 Groundwater Analytical Results Summary
- Figure 1 – Groundwater Potentiometric Map, 22 November 2021
- Figure 2 – Groundwater Results Map, May 2016-November 2021
- Attachment A – Spokane Environmental Services Monitoring Well Sampling Field Log
- Attachment B – Laboratory Analytical Report and Chain-of-Custody Documentation

References:

ASTM International. 2018. D6771-18: Standard Practice for Low-Flow Purging and Sampling for Wells and Devices Used for Ground-Water Quality Investigations. September 2018.

GeoEngineers. 2013. Engineering Design Report, BNSF Parkwater Rail Yard Site, Spokane, Washington.

Washington State Department of Ecology. 2022. Natural Background Groundwater Arsenic Concentrations in Washington State, Study Results, January 2022, Publication No. 14-09-044

Tables

TABLE 1

GROUNDWATER ELEVATION SUMMARY
22 November 2021
BNSF Parkwater Rail Yard
Spokane, Washington

Well Number	Date	Top of Casing Elevation (feet)[(a)]	Depth to Groundwater (feet btoc)[(b)]	Groundwater Elevation (feet amsl)[(c)]
MW-4	11/22/2021	1,950.76	65.59	1,885.17
MW-6	11/22/2021	1,951.04	66.75	1,884.29
MW-7	11/22/2021	1,951.13	66.89	1,884.24
MW-11	11/22/2021	1,951.20	69.45	1,881.75
MW-14	11/22/2021	1,951.41	67.61	1,883.80
MW-16	11/22/2021	1,950.44	67.29	1,883.15
MW-19	11/22/2021	1,951.24	67.01	1,884.23

Notes:

(a) Elevations are referenced to the North American Vertical Datum of 1988 (NAVD 88).

(b) btoc = below top of casing

(c) amsl = above mean sea level

TABLE 2

WATER QUALITY PARAMETERS SUMMARY
BNSF Parkwater Rail Yard, Spokane, Washington

Monitoring Well ID	Sample Collection Date	Water Quality Parameters					
		pH	Conductivity (mS/cm)	Turbidity (NTU)	Temperature (°C)	Dissolved Oxygen (mg/L)	ORP (mV)
MW-6	03/15/2016	7.37	0.278	0.72	11.17	1.34	76.4
	05/24/2016	7.41	0.254	1.63	12.59	1.03	83.9
	08/17/2016	7.40	0.255	5.78	14.37	6.56	14.8
	11/07/2016	6.79	0.412	1.21	12.66	0.60	-20.1
	03/08/2017	7.22	0.265	2.46	10.22	1.82	44.9
	11/06/2017	7.18	0.232	2.74	11.03	2.91	72.5
	06/28/2018	7.57	0.286	0.0	15.77	0.00	35.0
	12/05/2018	6.98	0.301	46.9	11.09	1.33	243.0
	05/14/2019	7.42	0.266	0.0	13.18	0.00	101.0
	01/08/2020	6.50	0.271	17.8	10.31	0.00	170.0
	06/16/2020	7.19	0.273	0.0	11.41	0.00	130.0
	11/19/2020	6.67	0.290	0.0	11.30	0.00	56.0
	11/22/2021	6.93	0.401	12.3	12.30	0.24	-17.0
MW-7	03/15/2016	7.70	0.252	2.82	11.37	5.32	101.8
	05/24/2016	7.69	0.250	2.45	12.95	7.69	-72.9
	08/17/2016	7.87	0.244	3.42	15.11	7.77	38.8
	11/07/2016	7.53	0.255	0.23	11.93	6.45	83.6
	03/08/2017	7.32	0.290	2.77	10.29	4.46	51.5
	11/06/2017	7.88	0.251	7.79	11.33	5.89	73.9
	06/28/2018	7.82	0.275	0.0	14.91	1.78	131.0
	12/05/2018	7.63	0.290	5.2	10.87	4.25	258.0
	05/14/2019	7.28	0.260	0.0	12.78	4.54	138.0
	11/25/2019	8.00	0.340	25.5	7.41	7.70	36.0
	06/16/2020	7.78	0.264	0.0	12.30	5.19	135.0
	11/19/2020	7.60	0.249	0.0	10.83	4.26	132.0
	11/22/2021	7.59	0.268	10.2	11.60	7.56	64.0
MW-14	03/15/2016	7.64	0.251	0.00	10.21	7.26	75.8
	05/24/2016	7.72	0.252	2.48	13.27	7.84	45.5
	08/17/2016	7.48	0.261	2.92	17.13	5.12	17.2
	11/07/2016	7.00	0.372	0.88	12.64	1.47	-24.3
	03/08/2017	7.14	0.265	11.71	9.35	7.11	65.3
	11/06/2017	7.52	0.289	13.59	8.96	3.58	33.3
	06/28/2018	8.02	0.261	0.0	17.12	5.15	173.0
	12/05/2018	7.21	0.339	7.8	10.58	1.98	155.0
	05/14/2019	7.64	0.253	0.0	12.93	5.64	55.0
	11/25/2019	7.63	0.451	31.4	7.20	11.90	0.0
	06/16/2020	7.91	0.252	0.0	12.44	6.69	128.0
	07/08/2020	7.97	0.245	0.0	15.80	7.21	100.0
	11/19/2020	7.10	0.338	0.0	10.87	0.40	-24.0
	11/22/2021	7.06	0.367	9.5	10.75	4.16	-3.0

WATER QUALITY PARAMETERS SUMMARY
BNSF Parkwater Rail Yard, Spokane, Washington

Monitoring Well ID	Sample Collection Date	Water Quality Parameters					
		pH	Conductivity (mS/cm)	Turbidity (NTU)	Temperature (°C)	Dissolved Oxygen (mg/L)	ORP (mV)
MW-19	03/15/2016	7.90	0.243	1.43	11.06	9.25	114.3
	05/24/2016	7.91	0.242	1.25	13.17	9.72	81.5
	08/17/2016	7.71	0.251	1.47	17.05	8.45	40.7
	11/07/2016	7.57	0.256	1.37	12.20	7.96	114.9
	03/08/2017	7.54	0.252	4.41	10.12	9.21	59.5
	11/06/2017	7.72	0.255	5.67	10.63	7.53	78.6
	06/28/2018	7.97	0.264	75.7	12.28	0.60	125.0
	12/05/2018	7.55	0.285	1.6	10.74	4.59	287.0
	05/14/2019	7.93	0.247	0.0	12.95	4.77	113.0
	11/25/2019	8.09	0.329	33.0	10.03	8.44	65.0
	06/16/2020	7.81	0.249	0.0	11.29	6.78	135.0
	11/19/2020	7.28	0.250	46.6	11.79	4.55	177.0
	11/22/2021	8.25	0.280	11.6	8.88	7.01	131.0

Notes:
mS/cm = milliSiemens per centimeter.
NTU = nephelometric turbidity units.
°C = degrees Celsius.
mg/L = milligrams per liter.
ORP = oxidation-reduction potential.
mV = millivolts.

TABLE 3

2016-2021 GROUNDWATER ANALYTICAL RESULTS SUMMARY
BNSF Parkwater Rail Yard, Spokane, Washington

Sample ID[a]	Monitoring Well ID[a]	Date	Total Arsenic[b] (mg/L)		Dissolved Arsenic[b] (mg/L)		Diesel-Range Organics[c] (mg/L)		Turbidity (NTU)
MW6-031516	MW-6	03/15/2016	0.002	U	0.002	U	0.488		0.72
MW6-052416		05/24/2016	0.002	U	--		0.201		1.63
MW6-081716		08/17/2016	0.00505		--		0.131	B	5.78
MW6-110716		11/07/2016	0.00450		--		**1.560**		1.21
MW6-030817		03/08/2017	0.00323		--		0.250	U	2.46
MW6-110617		11/06/2017	0.00139	J	--		0.095	J	2.74
PW-MW6-062818		06/28/2018	0.00334		--		0.200	U	0.0
		12/05/2018	**0.02090**		--		0.096	J	46.9
PW-MW6-051419		05/14/2019	0.00131	J	0.0014	J	0.200	U	0.0
		01/08/2020	0.00217		--		0.200	U	17.8
PW-MW6-061620		06/16/2020	0.00117	J	0.000979	J	--		0.0
MW-6-111920		11/19/2020	0.00391/0.00403		0.000942/0.000966	J/J	--		0.0
MW-6		05/11/2021	0.00096		0.00089		--		0.0
PW-MW6-112221		11/22/2021	0.00470		0.0035		--		12.3
MW7-031516	MW-7	03/15/2016	0.00336		0.0032		0.153		2.82
MW7-052416		05/24/2016	0.00485		--		0.138		2.45
MW7-081716		08/17/2016	**0.00548**		--		0.100	U	3.42
MW7-110716		11/07/2016	0.00342		--		0.250	U	0.23
MW7-030817		03/08/2017	0.00200	U	--		0.250	U	2.77
MW7-110617		11/06/2017	0.00370		--		0.200	U	7.79
PW-MW7-062818		06/28/2018	0.00388		--		0.200	U	0.0
		12/05/2018	0.00495		--		0.200	U	5.2
PW-MW7-051419		05/14/2019	0.00305		0.00334		0.200	U	0.0
MW-7-112519		11/25/2019	0.00332		--		0.200	U	25.5
PW-MW7-061620		06/16/2020	0.00334		0.00325		--		0.0
MW-7-111920		11/19/2020	0.00389		0.00388		--		0.0
MW-7		05/11/2021	0.00300		0.0028		--		0.0
PW-MW7-112221		11/22/2021	0.00410		0.0037		--		10.2
MW14-031516	MW-14	03/15/2016	0.00283/0.00289[d]		0.00272/0.00279		0.100/0.100	U	0.0
MW14-052416		05/24/2016	0.00423/0.00397		--/--		0.100/0.100	U	2.48
MW14-081716		08/17/2016	0.00445/0.00371		--/--		0.100/0.112	U/B	2.42
MW14-110716		11/07/2016	0.00223/0.00225		--/--		**0.647/0.648**		0.88
MW14-030817		03/08/2017	**0.0104/0.0107**		--/--		0.250/0.250	U/U	11.71
MW14-110617		11/06/2017	0.00286/0.00295		--/--		0.200/0.200	U	13.59
PW-MW14-062818		06/28/2018	0.00482/0.00474		--/--		0.200/0.200	U	0.0
		12/05/2018	**0.00548/**0.00331		--/--		0.200/0.200	U	7.8
PW-MW14-051419		05/14/2019	0.00323/0.00358		0.00321/0.00313		0.200/0.200	U	0.0
MW-14-112519		11/25/2019	0.00381/0.00390		--/--		0.106/0.107	J/J	31.4
PW-MW14-061620		06/16/2020	**0.00820**/0.00352	J	0.00384/0.00393		--		0.0
MW-14		07/08/2020	0.00473		0.0042		--		0.0
MW-14-111920		11/19/2020	0.00306		0.00297		--		0.0
MW-14		05/11/2021	0.0036/0.0036		0.0031/0.0029		--		0.0
PW-MW14-112221		11/22/2021	0.0023/0.0024		0.0014/0.0015		--		9.5
MW19-031516	MW-19	03/15/2016	0.00394		0.00455		0.100	U	1.43
MW19-052416		05/24/2016	0.00416		--		0.100	U	1.25
MW19-081716		08/17/2016	0.00367		--		0.100	U	1.47
MW19-110716		11/07/2016	0.00334		--		0.250	U	1.37
MW19-030817		03/08/2017	0.00387				0.250	U	4.41
MW-19-110617		11/06/2017	0.00302		--		0.200	U	5.67
PW-MW19-062818		06/28/2018	**0.00564**		--		0.200	U	75.7
		12/05/2018	0.00389		--		0.200	U	1.6
PW-MW19-051419		05/14/2019	0.00432		0.00467		0.200	U	0.0
MW-19-112519		11/25/2019	0.00496		--		0.200	U	33.0
PW-MW19-061620		06/16/2020	0.00429		0.00434		--		0.0
MW-19-111920		11/19/2020	0.00416		0.00389		--		46.6
MW-19		05/11/2021	0.00410		0.0042		--		0.0
PW-MW19-112221		11/22/2021	0.00520		0.0038		--		11.6

TABLE 3

2016-2021 GROUNDWATER ANALYTICAL RESULTS SUMMARY
BNSF Parkwater Rail Yard, Spokane, Washington

Sample ID[a]	Monitoring Well ID[a]	Date	Total Arsenic[b] (mg/L)		Dissolved Arsenic[b] (mg/L)		Diesel-Range Organics[c] (mg/L)		Turbidity (NTU)
FB-031516	Field Blank	03/15/2016	0.002	U	0.002	U	0.100	U	--
FB-052416		05/24/2016	0.002	U	--		0.100	U	--
FB-081716		08/17/2016	0.002	U	--		0.100	U	--
FB-110716		11/07/2016	0.002	U	--		0.250	U	--
FB-030817		03/08/2017	0.002	U	--		0.250	U	--
RB-031516	Rinsate Blank	03/15/2016	0.002	U	0.002	U	0.100	U	--
RB-052416		05/24/2016	0.002	U	--		0.218		--
RB-081716		08/17/2016	0.002	U	--		0.100	U	--
RB-110716		11/07/2016	0.002	U	--		0.250	U	--
RB-030817		03/08/2017	0.002	U	--		0.250	U	--
PW-EB-051419		05/14/2019	0.002	U	--		0.200	U	--
PW-EB-061620		06/16/2020	0.002	U	--		--		--
EB-111920		11/19/2020	0.002	U	--		--		--
Rinsate		05/11/2021	0.00014	U	--		--		--
PW-EB 112221		11/22/2021	0.0005	U	--		--		--
Background Concentration reported in 2022 Ecology Report			0.0053		--		--		--
EDR Site-Specific Cleanup Levels			0.005		0.005		0.5		--

Notes:

(a) Samples analyzed by ESC Lab Sciences Inc., Mt. Juliet, Tennessee (now Pace National).

(b) Total and dissolved arsenic analyzed using U.S. Environmental Protection Agency Method 6020.

(c) Diesel-range petroleum hydrocarbons analyzed using Northwest Method NWTPH-Dx with silica-gel cleanup during 2016, November 2017, 2018, and 2019 sampling events. Diesel-range petroleum hydrocarbons analyzed using Northwest Method NWTPH-Dx without silica-gel cleanup during the March 2017 sampling event.

(d) Where two values are displayed for the same date, the second value is the analytical result for a duplicate sample.

Bold indicates detected concentration above the natural background concentration as reported in the 2022 Ecology Report (for arsenic) or the EDR Site-Specific Cleanup Levels (for DRO).

mg/L = milligrams per liter.

U = not detected at a concentration greater than or equal to the listed laboratory reporting limit.

B = The sample analyte is found in the associated blank.

J = Analyte concentration is an estimated value less than the laboratory reporting limit.

-- = not sampled

Rinsate blank was collected by pumping distilled water through the sampling pump after it was decontaminated.

NTU = nephelometric turbidity units.

Figures

N:\BNSF Washington\Parkwater\Events\2021 Events\2021 SA2 Event\Fig1_ParkwaterGWContours.mxd Date: 12/17/2021 Printed by: GloriaGonzalez

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

Legend

- Monitoring Well, Groundwater Elevation, Sample Collected
- Monitoring Well, Groundwater Elevation Only
- Monitoring Well, Groundwater Not Measured
- Interpreted Groundwater Gradient Direction
- Intepreted Groundwater Elevation Contours (feet AMSL, dashed where inferred)
- Fueling Area

Note:
1. Locations are approximate.
2. AMSL = Above Mean Sea Level

N

0 75 150
Scale: Feet

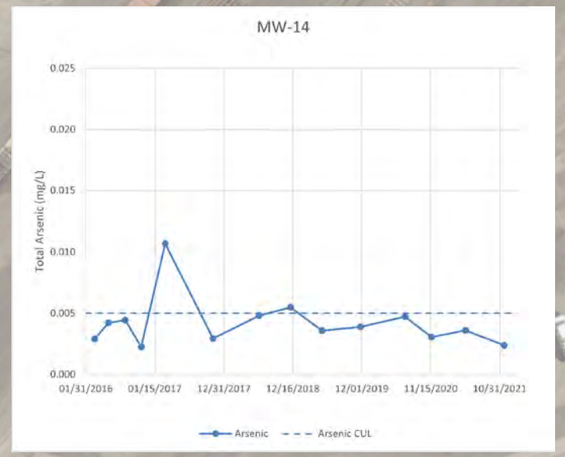
Kennedy Jenks

BNSF Railway Company
Parkwater Railyard
Spokane, Washington

Interpreted November 2021 Groundwater Elevation Contour Map

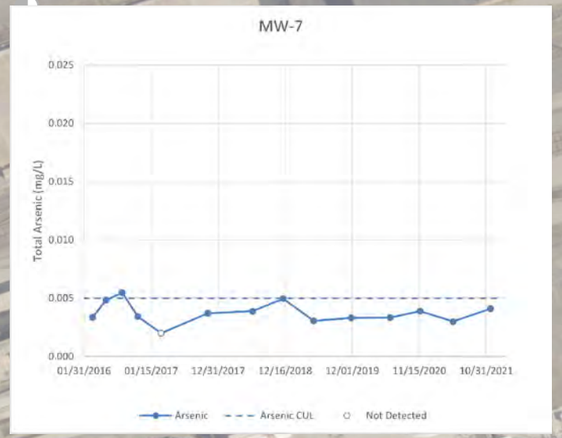
2196110*00

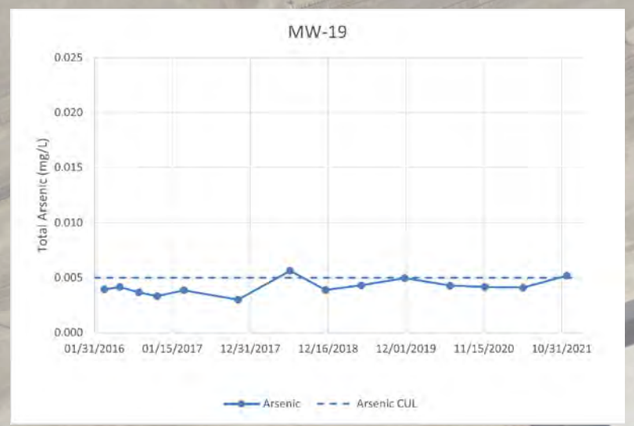
Figure 1



MW-14	
Date	Total As
5/24/16	0.00423/0.00397
8/17/16	0.00445/0.00371
11/7/16	0.00223/0.00225
3/8/17	**0.0104/0.0107**
11/6/17	0.00286/0.00295
6/28/18	0.00482/0.00474
12/5/18	**0.00548**/0.00331
5/14/19	0.00323/0.00358
11/25/19	0.00381/0.00390
7/8/20	0.00473
11/19/20	0.00306
05/10/21	0.0036/0.0036
11/22/21	0.0023/0.0024

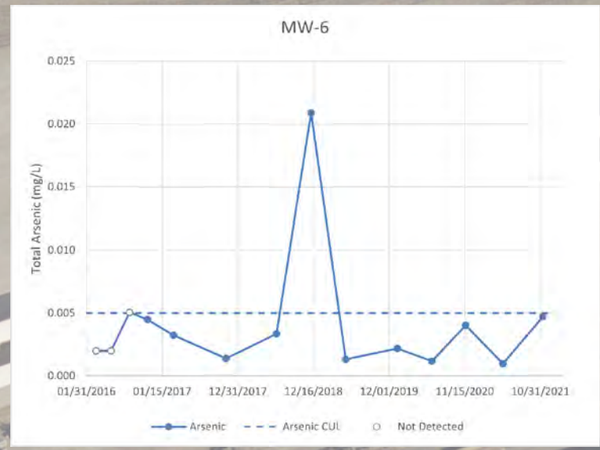
MW-7	
Date	Total As
5/24/16	0.00485
8/17/16	**0.00548**
11/7/16	0.00342
3/8/17	0.002 U
11/6/17	0.00370
6/28/18	0.00388
12/5/18	0.00495
5/14/19	0.00305
11/25/19	0.00332
6/16/20	0.00334
11/19/20	0.00389
05/10/21	0.0030
11/22/21	0.0041





MW-19	
Date	Total As
5/24/16	0.0042
8/17/16	0.0037
11/7/16	0.0033
3/8/17	0.0039
11/6/17	0.00302
6/28/18	**0.00564**
12/5/18	0.00389
5/14/19	0.00432
11/25/19	0.00496
6/16/20	0.0043
11/19/20	0.00416
05/10/21	0.0041
11/22/21	**0.0052**

MW-6	
Date	Total As
5/24/16	0.002 U
8/17/16	**0.00505**
11/7/16	0.00450
3/8/17	0.00323
11/6/17	0.00139 J
6/28/18	0.00334
12/5/18	**0.02090**
5/14/19	0.00131 J
1/8/20	0.00217
6/16/20	0.00117 J
11/19/20	0.00391/0.00403
05/10/21	0.00096
11/22/21	0.0047



N:\BNSF Washington\Parkwater\Events\2021 Events\2021 SA2 Event\Fig2_GWResultsMap.mxd Date: 12/20/2021 Printed by: GloriaGonzalez

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

Legend

- Monitoring Well, Groundwater Elevation, Sample Collected
- Monitoring Well, Groundwater Elevation Only
- Monitoring Well, Groundwater Not Measured
- Interpeted Groundwater Gradient Direction

Note:
1. Locations are approximate.
2. Groundwater results are in milligrams per liter (mg/L).
3. Total As = Total Arsenic.
   CUL = Cleanup Level.
   U = Below the laboratory reporting limit.
   J = Concentration is estimated value above the laboratory detection limit and less than the laboratory reporting limit.
4. Duplicate samples collected from MW-14.

N

0 40 80

Scale: Feet

Kennedy Jenks

BNSF Railway Company
Parkwater Railyard
Spokane, Washington

Groundwater Results Map
May 2016-November 2021

2196110*00
Figure 2

Attachment A

Spokane Environmental Services
Monitoring Well Sampling Field Log

Monitoring Well Sampling Field Log

SPOKANE ENVIRONMENTAL SOLUTIONS

Well Number: MW-19

Date: 11/22

Project Information	
Project Name:	PARK WATER BWSP
Project Number:	

Sampling Information	
Field Team:	Flair
Purge Method:	Low Flow
Sampling Method:	Low Flow
Water Quality Meter:	Model: U-52
	Serial Number:
Purge Water Disposition:	

Comments

Well Construction Information

Stick-up or Flush	Well Diameter (in)	Total Depth (ft btoc)	Screen Interval (ft bgs or btoc)
F	2		

Monitoring Information

Initial DTW (ft btoc)	Saturated Screen Interval (ft bgs or btoc)	Pump Intake Depth (ft btoc): (Mid Sat. Screen Interval)
67.01		

Sample Containers

Number	Type	Preservative	Analytical Parameters	Filtered?
1		HNO_3	As Total	
1		HNO_3	As Diss.	✓

Well Purge Data

Time	Volume Purged (L)	Purge Rate (L/min) (<0.5 L/min)	DTW (ft btoc)	Temp. (°C)	Conductivity (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTUs)	Clarity/Color/ Remarks
	Pump On		Initial	-	±3%	±10%	±0.1	±10mv	±10%	<= Stabilization Criteria
10:00	2.0	0.250		10.76	0.293	8.17	10.46	20	61.1	
10:05				10.69	0.165	8.05	9.75	53	17.4	
10:10				9.22	0.287	6.03	9.37	78	18.6	
10:15				8.81	0.285	7.04	9.13	92	13.0	
10:20				8.61	0.276	8.25	8.91	100	13.2	
10:25				8.83	0.280	6.98	8.66	111	13.5	
10:30				8.74	0.282	6.99	8.48	119	12.4	
10:35				8.68	0.280	7.01	8.25	131	11.6	

	Start Sampling	Sample ID:	Sample Time:
	End Sampling	QA/QC Sample ID:	QA/QC Sample Time:

Note: bgs= below ground surface btoc=below top of casing DTW=depth to water
Clarity: VC=very cloudy Cl=cloudy SC=slightly cloudy AC=almost clear C=clear CC=crystal clear

PW-MW19-112221 @ 10:40

Monitoring Well Sampling Field Log

SPOKANE ENVIRONMENTAL SOLUTIONS

Well Number: MW-14

Date:

Project Information	
Project Name:	PARK Water BNSF
Project Number:	

Sampling Information	
Field Team:	Fabio
Purge Method:	Low Flow
Sampling Method:	Low Flow
Water Quality Meter:	Model: U-52
	Serial Number:
Purge Water Disposition:	

Comments

MW14 - TURBID
orange color

Well Construction Information

Stick-up or Flush	Well Diameter (in)	Total Depth (ft btoc)	Screen Interval (ft bgs or btoc)
F	2		

Monitoring Information

Initial DTW (ft btoc)	Saturated Screen Interval (ft bgs or btoc)	Pump Intake Depth (ft btoc): (Mid Sat. Screen Interval)
67.61		

Sample Containers

Number	Type	Preservative	Analytical Parameters	Filtered?
1		HNO_3	As Total	
1		HNO_3	As diss.	

Well Purge Data

Time	Volume Purged (L)	Purge Rate (L/min) (<0.5 L/min)	DTW (ft btoc)	Temp. (°C)	Conductivity (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTUs)	Clarity/Color/ Remarks
	Pump On		Initial	-	±3%	±10%	±0.1	±10mv	±10%	<= Stabilization Criteria
13:35				10.16	0.370	3.57	7.45	14	183	
13:40				10.07	0.374	2.31	7.25	7	130	
13:45				10.51	0.373	1.39	7.19	12	~~57.5~~	57.5
13:50				10.54	0.374	11.31	7.13	3	36.6	
13:55				10.29	0.375	3.20	7.11	0	14.0	
14:00				10.75	0.369	3.50	7.07	-3	10.6	
14:05				10.75	0.367	4.16	7.06	-3	9.5	

	Start Sampling	Sample ID:	Sample Time:
	End Sampling	QA/QC Sample ID:	QA/QC Sample Time:

Note: bgs= below ground surface btoc=below top of casing DTW=depth to water
Clarity: VC=very cloudy Cl=cloudy SC=slightly cloudy AC=almost clear C=clear CC=crystal clear

PW-MW-14-112221 @ 14:10
PW DUP - 112221
PW EB - 112221

Monitoring Well Sampling Field Log

SPOKANE ENVIRONMENTAL SOLUTIONS

Well Number: MW-7

Date: 11-22

Project Information	
Project Name:	PARK water BNSF
Project Number:	

Sampling Information	
Field Team:	Flavio
Purge Method:	Low Flow
Sampling Method:	Low Flow
Water Quality Meter:	Model: U-52
	Serial Number:
Purge Water Disposition:	

Comments

Well Construction Information

Stick-up or Flush	Well Diameter (in)	Total Depth (ft btoc)	Screen Interval (ft bgs or btoc)
F	2		

Monitoring Information

Initial DTW (ft btoc)	Saturated Screen Interval (ft bgs or btoc)	Pump Intake Depth (ft btoc): (Mid Sat. Screen Interval)
66.89		

Sample Containers

Number	Type	Preservative	Analytical Parameters	Filtered?
1		HNO_3	As Total	
1		HNO_3	As Diss	

Well Purge Data

Time	Volume Purged (L)	Purge Rate (L/min) (<0.5 L/min)	DTW (ft btoc)	Temp. (°C)	Conductivity (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTUs)	Clarity/Color/ Remarks
	Pump On	0.250	Initial	-	±3%	±10%	±0.1	±10mv	±10%	<= Stabilization Criteria
12:40	2			10.57	0.278	6.05	7.37	-25	12.0	
12:45				11.08	0.274	6.01	7.45	19	14.2	
12:50				11.36	0.264	7.07	7.51	33	15.4	
12:55				11.59	0.269	7.64	7.55	49	14.5	
13:00				11.57	0.268	7.55	7.57	57	16.1	
13:05				11.60	0.268	7.56	7.59	64	10.2	

	Start Sampling	Sample ID:	Sample Time:
	End Sampling	QA/QC Sample ID:	QA/QC Sample Time:

Note: bgs= below ground surface btoc=below top of casing DTW=depth to water
Clarity: VC=very cloudy Cl=cloudy SC=slightly cloudy AC=almost clear C=clear CC=crystal clear

PW-MW7-112221 @ 13:10

Monitoring Well Sampling Field Log

SPOKANE ENVIRONMENTAL SOLUTIONS

Well Number: MW-6

Date: 11-22

Project Information	
Project Name:	PARK WATER BASE
Project Number:	

Sampling Information	
Field Team:	Flavio
Purge Method:	Low Flow
Sampling Method:	Low Flow
Water Quality Meter:	Model: U-52
	Serial Number:
Purge Water Disposition:	

Comments

Well Construction Information			
Stick-up or Flush	Well Diameter (in)	Total Depth (ft btoc)	Screen Interval (ft bgs or btoc)
F	2		

Monitoring Information		
Initial DTW (ft btoc)	Saturated Screen Interval (ft bgs or btoc)	Pump Intake Depth (ft btoc): (Mid Sat. Screen Interval)
66.75		

Sample Containers

Number	Type	Preservative	Analytical Parameters	Filtered?
1	~~AS~~	HNO_3	As Total	
1	~~AS~~	HNO_3	As Dissolved	

Well Purge Data

Time	Volume Purged (L)	Purge Rate (L/min) (<0.5 L/min)	DTW (ft btoc)	Temp. (°C)	Conductivity (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTUs)	Clarity/Color/ Remarks
	Pump On	0.25 L/min	Initial	-	±3%	±10%	±0.1	±10mv	±10%	<= Stabilization Criteria
11:30				6.26	0.012	12.33	7.34	153	41.2	ORange
11:35				8.19	0.402	2.84	7.77	2	35.1	
11:40				8.50	0.405	2.32	7.46	-7	37.7	
11:45				7.33	0.395	5.12	7.09	-31	24.1	
11:50				8.93	0.389	1.01	7.19	-14	19.8	
11:55				8.61	0.379	1.08	7.19	-6	16.3	
12:00				9.70	0.398	0.74	7.03	-11	14.4	
12:05				9.81	0.401	0.24	6.93	-17	12.3	

	Start Sampling	Sample ID:	Sample Time:
	End Sampling	QA/QC Sample ID:	QA/QC Sample Time:

Note: bgs= below ground surface btoc=below top of casing DTW=depth to water
Clarity: VC=very cloudy Cl=cloudy SC=slightly cloudy AC=almost clear C=clear CC=crystal clear

PW-MW6-112221 @ 12:10

Pace Analytical
www.pacelabs.com

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: of

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company:	Kennedy Jenks_BNSF	Report To:	Alice Robinson	Attention:	Alice Robinson
Address:	275 Battery Street, Suite 550	Copy To:	Ryan Hultgren, Janice Sloan	Company Name:	Kennedy Jenks
	San Francisco, CA 94111		Todd Miller	Address:	ap@kennedyjenks.com
Email To:	Alice Robinson	Purchase Order No.:		Pace Quote Reference:	
Phone:	503-423-4018 Fax:	Project Name:		Pace Project Manager:	Jennifer Anderson
Requested Due Date/TAT:	Standard	Project Number:	BNSF Parkwater	Pace Profile #:	42766, Line 1

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER

Site Location STATE: WA

Requested Analysis Filtered (Y/N)

ITEM #	Section D Required Client Information: SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE	Valid Matrix Codes: MATRIX / CODE — DRINKING WATER DW; WATER WT; WASTE WATER WW; PRODUCT P; SOIL/SOLID SL; OIL OL; WIPE WP; AIR AR; OTHER OT; TISSUE TS	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED: COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	6020 Total Arsenic	6020 Dissolved Arsenic	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	PW - EB 112221				11/22/21					3										X	X		
2	PW - DUP 112221									3										X	X		
3	PW - MW14 112221					14:10				5										X	X		
4	PW - MW7 - 112221					13:10				5										X	X		
5	PW - MW6 112221					12:10				2										X	X		
6	PW - MW19 - 112221					0:40				2										X	X		
7																							
8																							
9																							
10																							
11																							
12																							

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
BNSF Tech Specs							

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Flavia Talavera

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 11/22/21

Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

FI

11-22-2021
OVERCAST 31°F

08:20	MW-11	-	69.45
08:38	MW-16	-	67.29
	MW-04	-	65.59
	MW-19		67.01
	MW-6		66.75
	MW7		66.89
	MW-14		67.61

FIELD ENVIRONMENTAL INSTRUMENTS, INC.
www.fieldenvironmental.com

301 Brushton Ave
Suite A
Pittsburgh, PA 15221
Toll Free (800) 393-4009
Local (412) 436-2600
Fax (412) 436-2616

	Lot #	Expiration
Horiba Auto-Cal Solution	J364-14	1/6/2022

		Reading	Acceptable Range
Cal Standard PH 4 @ 25°		4.00	(3.96 - 4.04)
Cal Standard Conductivity		Reading ms/cm: 4.49	(4.31 - 4.58)
Cal Standard Turbidity	0 NTU	Reading NTU: 0.0	(-2 - +2)
	100 NTU	9.6	(95 - 105)
Dissolved Oxygen		Reading mg/L	
100% Saturation		9.81	
0% Saturation		0.00	

	Lot #	Expiration	Reading	Acceptable Range
Cal Standard PH 7 @ 25°	8101544.00	2/11/2023	7.00	(6.93 - 7.07)
Cal Standard PH 10 @ 25°	8102225.00	2/17/2023	10.00	(9.9 - 10.1)

	Temp °	Relative Reading	Acceptable Range
Check Standard ORP	20.6	220.0	(+/- 15mV)

☑ ORP pin in place

*Solutions provided by LabChem (412-826-5230)

Model	U-52-2
S/N	
Sonde	94776
Barcode	U70237X
Order #	471710

Calibrated By: Roderick Keels

Date of Calibration: 11/18/2021

All calibrations performed by FEI conform to manufacturer's specifications. Please report any issues within 24 hours of receiving equipment.

All calibration solutions used are traceable to NIST. Additional documentation is available upon request.

Attachment B

Laboratory Analytical Report and
Chain-of-Custody Documentation

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

December 08, 2021

Alice Robinson
Kennedy/Jenks Consultants
275 Battery Street
Suite 550
San Francisco, CA 94111

RE: Project: BNSF Parkwater
Pace Project No.: 10588909

Dear Alice Robinson:

Enclosed are the analytical results for sample(s) received by the laboratory on November 23, 2021. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

- Pace Analytical Services - Minneapolis

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Beverly Faraday
beverly.faraday@pacelabs.com
406-384-0559
Project Manager

Enclosures

cc: Ryan Hultgren, Kennedy Jenks
Kennedy Jenks Lab Data, Kennedy Jenks
Todd Miller, Kennedy/Jenks Consultants
Janice Sloan, Kennedy/Jenks

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

CERTIFICATIONS

Project: BNSF Parkwater
Pace Project No.: 10588909

Pace Analytical Services, LLC - Minneapolis MN

1700 Elm Street SE, Minneapolis, MN 55414
1800 Elm Street SE, Minneapolis, MN 55414--Satellite Air Lab
A2LA Certification #: 2926.01*
Alabama Certification #: 40770
Alaska Contaminated Sites Certification #: 17-009*
Alaska DW Certification #: MN00064
Arizona Certification #: AZ0014*
Arkansas DW Certification #: MN00064
Arkansas WW Certification #: 88-0680
California Certification #: 2929
Colorado Certification #: MN00064
Connecticut Certification #: PH-0256
EPA Region 8 Tribal Water Systems+Wyoming DW Certification #: via MN 027-053-137
Florida Certification #: E87605*
Georgia Certification #: 959
Hawaii Certification #: MN00064
Idaho Certification #: MN00064
Illinois Certification #: 200011
Indiana Certification #: C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky DW Certification #: 90062
Kentucky WW Certification #: 90062
Louisiana DEQ Certification #: AI-03086*
Louisiana DW Certification #: MN00064
Maine Certification #: MN00064*
Maryland Certification #: 322
Michigan Certification #: 9909
Minnesota Certification #: 027-053-137*
Minnesota Dept of Ag Approval: via MN 027-053-137
Minnesota Petrofund Registration #: 1240*
Mississippi Certification #: MN00064
Missouri Certification #: 10100
Montana Certification #: CERT0092
Nebraska Certification #: NE-OS-18-06
Nevada Certification #: MN00064
New Hampshire Certification #: 2081*
New Jersey Certification #: MN002
New York Certification #: 11647*
North Carolina DW Certification #: 27700
North Carolina WW Certification #: 530
North Dakota Certification #: R-036
Ohio DW Certification #: 41244
Ohio VAP Certification (1700) #: CL101
Ohio VAP Certification (1800) #: CL110*
Oklahoma Certification #: 9507*
Oregon Primary Certification #: MN300001
Oregon Secondary Certification #: MN200001*
Pennsylvania Certification #: 68-00563*
Puerto Rico Certification #: MN00064
South Carolina Certification #:74003001
Tennessee Certification #: TN02818
Texas Certification #: T104704192*
Utah Certification #: MN00064*
Vermont Certification #: VT-027053137
Virginia Certification #: 460163*
Washington Certification #: C486*
West Virginia DEP Certification #: 382
West Virginia DW Certification #: 9952 C
Wisconsin Certification #: 999407970
Wyoming UST Certification #: via A2LA 2926.01
USDA Permit #: P330-19-00208
*Please Note: Applicable air certifications are denoted with an asterisk (*).

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

SAMPLE SUMMARY

Project: BNSF Parkwater
Pace Project No.: 10588909

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10588909001	**PW-EB 112221**	Water	11/22/21 00:00	11/23/21 11:00
10588909002	**PW-DUP 112221**	Water	11/22/21 00:00	11/23/21 11:00
10588909003	**PW-MW14-112221**	Water	11/22/21 14:10	11/23/21 11:00
10588909004	**PW-MW7-112221**	Water	11/22/21 13:10	11/23/21 11:00
10588909005	**PW-MW6-112221**	Water	11/22/21 12:10	11/23/21 11:00
10588909006	**PW-MW19-112221**	Water	11/22/21 10:40	11/23/21 11:00

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

SAMPLE ANALYTE COUNT

Project: BNSF Parkwater
Pace Project No.: 10588909

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10588909001	**PW-EB 112221**	EPA 6020B	WBS	1	PASI-M
10588909002	**PW-DUP 112221**	EPA 6020B	WBS	1	PASI-M
		EPA 6020B	WBS	1	PASI-M
10588909003	**PW-MW14-112221**	EPA 6020B	WBS	1	PASI-M
		EPA 6020B	WBS	1	PASI-M
10588909004	**PW-MW7-112221**	EPA 6020B	WBS	1	PASI-M
		EPA 6020B	WBS	1	PASI-M
10588909005	**PW-MW6-112221**	EPA 6020B	WBS	1	PASI-M
		EPA 6020B	WBS	1	PASI-M
10588909006	**PW-MW19-112221**	EPA 6020B	WBS	1	PASI-M
		EPA 6020B	WBS	1	PASI-M

PASI-M = Pace Analytical Services - Minneapolis

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

PROJECT NARRATIVE

Project: BNSF Parkwater
Pace Project No.: 10588909

Method: **EPA 6020B**
Description: 6020B MET ICPMS
Client: KENNEDY JENKS_BNSF
Date: December 08, 2021

General Information:
6 samples were analyzed for EPA 6020B by Pace Analytical Services Minneapolis. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 3020A with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

PROJECT NARRATIVE

Project: BNSF Parkwater
Pace Project No.: 10588909

Method: **EPA 6020B**
Description: 6020B MET ICPMS, Dissolved
Client: KENNEDY JENKS_BNSF
Date: December 08, 2021

General Information:
5 samples were analyzed for EPA 6020B by Pace Analytical Services Minneapolis. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 3020A with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: BNSF Parkwater
Pace Project No.: 10588909

Sample: PW-EB 112221 **Lab ID: 10588909001** Collected: 11/22/21 00:00 Received: 11/23/21 11:00 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020A Pace Analytical Services - Minneapolis								
Arsenic	ND	ug/L	0.50	0.083	1	11/26/21 10:15	12/07/21 18:20	7440-38-2	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: BNSF Parkwater
Pace Project No.: 10588909

Sample: PW-DUP 112221 **Lab ID: 10588909002** Collected: 11/22/21 00:00 Received: 11/23/21 11:00 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020A Pace Analytical Services - Minneapolis								
Arsenic	**2.4**	ug/L	0.50	0.083	1	11/26/21 10:15	12/07/21 18:34	7440-38-2	
6020B MET ICPMS, Dissolved	Analytical Method: EPA 6020B Preparation Method: EPA 3020A Pace Analytical Services - Minneapolis								
Arsenic, Dissolved	**1.5**	ug/L	0.50	0.083	1	11/26/21 10:15	12/07/21 21:22	7440-38-2	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: BNSF Parkwater
Pace Project No.: 10588909

Sample: PW-MW14-112221 **Lab ID: 10588909003** Collected: 11/22/21 14:10 Received: 11/23/21 11:00 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020A Pace Analytical Services - Minneapolis								
Arsenic	**2.3**	ug/L	0.50	0.083	1	11/26/21 10:15	12/07/21 18:37	7440-38-2	
6020B MET ICPMS, Dissolved	Analytical Method: EPA 6020B Preparation Method: EPA 3020A Pace Analytical Services - Minneapolis								
Arsenic, Dissolved	**1.4**	ug/L	0.50	0.083	1	11/26/21 10:15	12/07/21 21:25	7440-38-2	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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Minneapolis, MN 55414
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ANALYTICAL RESULTS

Project: BNSF Parkwater
Pace Project No.: 10588909

Sample: PW-MW7-112221 **Lab ID: 10588909004** Collected: 11/22/21 13:10 Received: 11/23/21 11:00 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020A Pace Analytical Services - Minneapolis								
Arsenic	**4.1**	ug/L	0.50	0.083	1	11/26/21 10:15	12/07/21 18:40	7440-38-2	
6020B MET ICPMS, Dissolved	Analytical Method: EPA 6020B Preparation Method: EPA 3020A Pace Analytical Services - Minneapolis								
Arsenic, Dissolved	**3.7**	ug/L	0.50	0.083	1	11/26/21 10:15	12/07/21 21:54	7440-38-2	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: BNSF Parkwater
Pace Project No.: 10588909

Sample: PW-MW6-112221 **Lab ID: 10588909005** Collected: 11/22/21 12:10 Received: 11/23/21 11:00 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020A Pace Analytical Services - Minneapolis								
Arsenic	**4.7**	ug/L	0.50	0.083	1	11/26/21 10:15	12/07/21 18:55	7440-38-2	
6020B MET ICPMS, Dissolved	Analytical Method: EPA 6020B Preparation Method: EPA 3020A Pace Analytical Services - Minneapolis								
Arsenic, Dissolved	**3.5**	ug/L	0.50	0.083	1	11/26/21 10:15	12/07/21 21:57	7440-38-2	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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Minneapolis, MN 55414
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ANALYTICAL RESULTS

Project: BNSF Parkwater
Pace Project No.: 10588909

Sample: PW-MW19-112221 **Lab ID: 10588909006** Collected: 11/22/21 10:40 Received: 11/23/21 11:00 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020A Pace Analytical Services - Minneapolis								
Arsenic	**5.2**	ug/L	0.50	0.083	1	11/26/21 10:15	12/07/21 18:58	7440-38-2	
6020B MET ICPMS, Dissolved	Analytical Method: EPA 6020B Preparation Method: EPA 3020A Pace Analytical Services - Minneapolis								
Arsenic, Dissolved	**3.8**	ug/L	0.50	0.083	1	11/26/21 10:15	12/07/21 22:00	7440-38-2	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: BNSF Parkwater
Pace Project No.: 10588909

QC Batch: 785778
QC Batch Method: EPA 3020A
Analysis Method: EPA 6020B
Analysis Description: 6020B Water UPD5
Laboratory: Pace Analytical Services - Minneapolis
Associated Lab Samples: 10588909001, 10588909002, 10588909003, 10588909004, 10588909005, 10588909006

METHOD BLANK: 4183601 Matrix: Water
Associated Lab Samples: 10588909001, 10588909002, 10588909003, 10588909004, 10588909005, 10588909006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Arsenic	ug/L	ND	0.50	0.083	12/07/21 18:17	

LABORATORY CONTROL SAMPLE: 4183602

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Arsenic	ug/L	100	101	101	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 4183603 4183604

Parameter	Units	10588909001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Arsenic	ug/L	ND	100	100	97.6	97.3	98	97	75-125	0	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: BNSF Parkwater
Pace Project No.: 10588909

QC Batch: 785775
QC Batch Method: EPA 3020A
Analysis Method: EPA 6020B
Analysis Description: 6020B Water Dissolved UPD5
Laboratory: Pace Analytical Services - Minneapolis
Associated Lab Samples: 10588909002, 10588909003, 10588909004, 10588909005, 10588909006

METHOD BLANK: 4183589 Matrix: Water
Associated Lab Samples: 10588909002, 10588909003, 10588909004, 10588909005, 10588909006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Arsenic, Dissolved	ug/L	ND	0.50	0.083	12/07/21 21:13	

LABORATORY CONTROL SAMPLE: 4183590

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Arsenic, Dissolved	ug/L	100	100	100	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 4183591 4183592

Parameter	Units	10588909003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Arsenic, Dissolved	ug/L	1.4	100	100	99.1	98.9	98	97	75-125	0	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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Minneapolis, MN 55414
(612)607-1700

QUALIFIERS

Project: BNSF Parkwater
Pace Project No.: 10588909

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Reported results are not rounded until the final step prior to reporting. Therefore, calculated parameters that are typically reported as "Total" may vary slightly from the sum of the reported component parameters.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: BNSF Parkwater
Pace Project No.: 10588909

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10588909001	**PW-EB 112221**	EPA 3020A	785778	EPA 6020B	786175
10588909002	**PW-DUP 112221**	EPA 3020A	785778	EPA 6020B	786175
10588909003	**PW-MW14-112221**	EPA 3020A	785778	EPA 6020B	786175
10588909004	**PW-MW7-112221**	EPA 3020A	785778	EPA 6020B	786175
10588909005	**PW-MW6-112221**	EPA 3020A	785778	EPA 6020B	786175
10588909006	**PW-MW19-112221**	EPA 3020A	785778	EPA 6020B	786175
10588909002	**PW-DUP 112221**	EPA 3020A	785775	EPA 6020B	786142
10588909003	**PW-MW14-112221**	EPA 3020A	785775	EPA 6020B	786142
10588909004	**PW-MW7-112221**	EPA 3020A	785775	EPA 6020B	786142
10588909005	**PW-MW6-112221**	EPA 3020A	785775	EPA 6020B	786142
10588909006	**PW-MW19-112221**	EPA 3020A	785775	EPA 6020B	786142

Pace Analytical
www.pacelabs.com

CHAIN-OF-CUSTODY / Analytical Request Do

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed

WO# : 10588909

10588909

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company:	Kennedy Jenks_BNSF	Report To:	Alice Robinson	Attention:	Alice Robinson
Address:	275 Battery Street, Suite 550	Copy To:	Ryan Hultgren, Janice Sloan	Company Name:	Kennedy Jenks
	San Francisco, CA 94111		Todd Miller	Address:	ap@kennedyjenks.com
Email To:	Alice Robinson	Purchase Order No.:		Pace Quote Reference:	
Phone:	503-423-4018 Fax:	Project Name:		Pace Project Manager:	Jennifer Anderson
Requested Due Date/TAT:	Standard	Project Number:	BNSF Parkwater	Pace Profile #:	42766, Line 1

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER

Site Location STATE: WA

Section D Required Client Information

SAMPLE ID
(A-Z, 0-9 / ,-)
Sample IDs MUST BE UNIQUE

Valid Matrix Codes

MATRIX	CODE
DRINKING WATER	DW
WATER	WT
WASTE WATER	WW
PRODUCT	P
SOIL/SOLID	SL
OIL	OL
WIPE	WP
AIR	AR
OTHER	OT
TISSUE	TS

ITEM #	Section D Required Client Information / SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED: COMPOSITE START DATE	COLLECTED: COMPOSITE START TIME	COLLECTED: COMPOSITE END/GRAB DATE	COLLECTED: COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	6020 Total Arsenic	6020 Dissolved Arsenic	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	PW - EB 112221			11/22/21					2									X	X			001
2	PW - DUP 112221								2									X	X	X		002
3	PW - MW14 - 112221				14:10				2									X	X	X		003
4	PW - MW7 - 112221				13:10				2									X	X	X		004
5	PW - MW6 - 112221				12:10				2									X	X	X		005
6	PW - MW19 - 112221				10:40				2									X	X	X		006
7																						
8																						
9																						
10																						
11																						
12																						

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS: Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
BNSF Tech Specs				AC/PAGR	11-23-21	11:00	3.8	Y	Y	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Flavio Ishihara

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 11/22/21

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

Pace Analytical®	Document Name: **Sample Condition Upon Receipt (SCUR) - ESI**	Document Revised: 12Aug2020 **Page 1 of 1**
	Document No.: **ENV-FRM-MIN4-0149 Rev.01**	Pace Analytical Services - **Minneapolis**

Sample Condition Upon Receipt – ESI Tech Specs

Client Name: KENNEDY BNSF – BNFS

Project #: **WO#: 10588909**

PM: BEF Due Date: 12/09/21

CLIENT: KENNEDY_BNSF

Courier: ☐ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Pace ☐ SpeeDee ☐ Commercial

Tracking Number: _____ See Exceptions ☐ ENV-FRM-MIN4-0142

Custody Seal on Cooler/Box Present? ☒ Yes ☐ No **Seals Intact?** ☒ Yes ☐ No **Biological Tissue Frozen?** ☐ Yes ☐ No ☒ N/A

Packing Material: ☒ Bubble Wrap ☐ Bubble Bags ☐ None ☐ Other: _____ **Temp Blank?** ☒ Yes ☐ No

Thermometer: ☐ T1(0461) ☐ T2(1336) ☒ T3(0459) ☐ T4(0254) ☐ T5(0489) **Type of Ice:** ☒ Wet ☐ Blue ☐ None ☐ Dry ☐ Melted

Temp should be above freezing to 6°C **Cooler Temp Read w/temp blank:** 3.9 °C

Correction Factor: -0.1 **Cooler Temp Corrected w/temp blank:** 3.8 °C

Average Corrected Temp (no temp blank only): _____ °C ☐ See Exceptions ENV-FRM-MIN4-0142 ☐ 1 Container

USDA Regulated Soil: (☒ N/A, water sample/Other: _____)

Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA. MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? ☐ Yes ☐ No

Date/Initials of Person Examining Contents: AC 11-23-21

Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? ☐ Yes ☐ No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

				COMMENTS:
Chain of Custody Present and Filled Out?	☒ Yes	☐ No		1.
Chain of Custody Relinquished?	☐ Yes	☒ No		2.
Sampler Name and/or Signature on COC?	☒ Yes	☐ No	☐ N/A	3.
Samples Arrived within Hold Time?	☒ Yes	☐ No		4.
Short Hold Time Analysis (<72 hr)?	☐ Yes	☒ No		5. ☐ Fecal Coliform ☐ HPC ☐ Total Coliform/E coli ☐ BOD/cBOD ☐ Hex Chrome ☐ Turbidity ☐ Nitrate ☐ Nitrite ☐ Orthophos ☐
Rush Turn Around Time Requested?	☐ Yes	☒ No		6.
Sufficient Sample Volume?	☒ Yes	☐ No		AC 11-23-21
Triple Volume Provided for MS/MSD (if more than 10 samples)?	☒ Yes	☐ No	☒ N/A	7.
Correct Containers Used?	☒ Yes	☐ No		8.
-Pace Containers Used?	☒ Yes	☐ No		
Containers Intact?	☒ Yes	☐ No		9.
Field Filtered Volume Received for Dissolved Tests?	☐ Yes	☐ No	☒ N/A	10. Is sediment visible in the dissolved container? ☐ Yes ☐ No
Is sufficient information available to reconcile the samples to the COC	☒ Yes	☐ No		11. **If no, write ID/ Date/Time on Container Below:** **See Exception** ☐ **ENV-FRM-MIN4-0142**
Matrix: ☒ Water ☐ Soil ☐ Oil ☐ Other _____				
All containers needing acid/base preservation have been checked?	☒ Yes	☐ No	☐ N/A	12. Sample # 001 1/1 002-006 2/2 ☐ NaOH ☒ HNO_3 ☐ H_2SO_4 ☐ Zinc Acetate
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO_3, H_2SO_4, <2pH, NaOH >9 Sulfide, NaOH>10 Cyanide)	☒ Yes	☐ No	☐ N/A	
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin/PFAS *If adding preservative to a container it must be added to associated field and equipment blanks (verify with PM first)	☐ Yes	☐ No	☒ N/A	Positive for Res. Chlorine? ☐ Yes ☐ No **pH Paper Lot#** **See Exception** ☐ **ENV-FRM-MIN4-0142** Res. Chlorine: 0-6 Roll 239320 / 0-6 Strip / 0-14 Strip
Extra labels present on soil VOA or WIDRO contaners?	☐ Yes	☐ No	☒ N/A	13. **See Exception** ☐ **ENV-FRM-MIN4-0140**
Headspace in VOA Vials (greater than 6mm)?	☐ Yes	☐ No	☒ N/A	
3 Trip Blanks Present?	☐ Yes	☐ No	☒ N/A	14.
Trip Blank Custody Seals Present?	☐ Yes	☐ No	☒ N/A	Pace Trip Blank Lot # (if purchased): _____

Temp Log: Temp must be maintained at <6°C during login, record temp every 20 mins		
Opened Time: 12:00	Temp: 3.8	Corrected Temp:
Time:	put in cooler	
Time:	Temp:	Corrected Temp:

CLIENT NOTIFICATION/RESOLUTION **Field Data Required?** ☐ Yes ☐ No

Person Contacted: Date/Time:

Comments/Resolution:

Project Manager Review: _____ **Date:** 11/23/21

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

Labeled by: AC