Kennedy Jenks

14 August 2020

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

Subject: First Semiannual 2020 Groundwater Sampling Results
BNSF Railway Company, Parkwater Rail Yard
Spokane, Washington
KJ 2096110*00

Dear Ms. Treccani:

This letter summarizes the monitoring activities and presents the field and laboratory results for samples collected during the first semiannual 2020 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)[1]. 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 proposed sampling reduction in a letter dated 21 April 2020.

Field Activities

The first semiannual 2020 groundwater sampling event was conducted on 16 June 2020. Well MW-14 was resampled on 8 July 2020 due to a discrepancy between the arsenic concentrations detected in the

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

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primary and duplicate samples collected from this well on 16 June 2020. 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 was conducted in general conformance with the U.S. Environmental Protection Agency's (EPA) low-flow groundwater sampling procedures[2].

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 National Center for Testing & Innovation, of Mt. Juliet, Tennessee (Pace National), a Washington State-accredited environmental laboratory, under appropriate chain-of-custody. Samples were analyzed by Pace National for total and dissolved arsenic by 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 reports were reviewed for quality control/quality assurance purposes and the data were found to be generally acceptable for its intended purpose, though the total arsenic results for the sample-duplicate pair collected in June 2020 were qualified as estimated, J due to the relative percent difference (RPD) being outside the acceptable range (see below). Total and dissolved arsenic results for the samples from well MW-6 were qualified as estimated, J, due to the results being less than the laboratory reporting limit. Data validation reports are included in Attachment B.

Groundwater elevation measurements indicate a groundwater flow direction toward the west to west-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 June 2020 sampling event, concentrations of total arsenic ranged from 0.00117 J milligrams per liter (mg/L) in well MW-6 to 0.00820 J mg/L in well MW-14. Reported concentrations of dissolved arsenic ranged from 0.000979 J mg/L in well MW-6 to 0.00434 mg/L in well MW-19. Total and dissolved arsenic concentrations were reported below the site-specific cleanup level (CUL) of 0.005 mg/L, other than the total arsenic concentration reported in the sample from well MW-14.

The reported concentration of total arsenic in the primary sample from well MW-14 was above the cleanup level of 0.005 mg/L. However, total arsenic in the duplicate from well MW-14 was reported at 0.00352 J mg/L. The RPD between the two results is 79.9 percent, which is outside the acceptable range of up to 20 percent; therefore, these results were flagged as estimated ("J"). In contrast, the reported concentrations of dissolved arsenic in the primary and duplicate samples from well MW-14 were 0.00384 mg/L and 0.00393 mg/L, an RPD of 2.3 percent. Due to the high calculated RPD

[2] U.S. Environmental Protection Agency, Region 1. 1996. Low Stress (low-flow) Purging and Sampling Procedure for the Collection of Ground Water Samples from Monitoring Wells, EPA SOP No. GW 0001, Revision No. 2, July 30.

between the primary and duplicate total arsenic results, well MW-14 was resampled on 8 July 2020. The laboratory reported 0.00473 mg/L of total arsenic and 0.00420 mg/L of dissolved arsenic in the MW-14 sample collected on 8 July. The resample results are below the arsenic CUL and consistent with recent sampling events since 2017.

Since shutdown of the remediation system in March 2016, 11 groundwater monitoring events have occurred resulting in the collection of 45 samples (including 11 primary/duplicate sample pairs). Total arsenic concentrations in 38 samples (including eight primary/duplicate sample pairs) have been below the CUL. Total arsenic concentrations in seven samples have been reported above the CUL. In those seven samples, the results for one primary/duplicate pair were above the CUL, while only the primary sample result of two other primary/duplicate pairs was above the CUL. Five of the seven samples with concentrations reported above the CUL are associated with turbidity over 5 nephelometric turbidity units (NTU), indicating that elevated total arsenic concentrations are associated with suspended sediment or colloids, and not the result of reduced geochemical conditions associated with former DRO impacts. This is further supported by the positive ORP and elevated DO measured in the purge water, indicators of oxidized geochemical conditions, as well as the absence of DRO above the CUL in groundwater samples collected since November 2016.

Total arsenic concentrations in Site groundwater are consistent with background arsenic concentrations reported in area water supply wells. Arsenic concentrations reported in City of Spokane Water Department drinking water quality reports range from 0.0036 (in the Central Well located approximately 4 miles from the Site, City of Spokane 2019) to 0.0051 mg/L (in the Ray Street well located approximately 2.2 miles from the Site, City of Spokane 2016). Total arsenic concentrations in the Parkwater and Well Electric wells, both located within 1 mile of the Site, have ranged from 0.00318 to 0.00507 mg/L in the last 5 years (City of Spokane 2016, City of Spokane 2019). Based on Ecology's public well construction records, the Parkwater well is screened from approximately 1838.0 to 1891.5 feet above mean sea level (amsl); well construction details for the Well Electric well were not available. Samples of Site groundwater are collected from within the elevation range in which the Parkwater well is screened. These results indicate that arsenic concentrations in groundwater beneath the Site are representative of background (naturally occurring) conditions rather than residual geochemical changes from historical DRO impacts.

Summary and Conclusions

Total arsenic concentrations reported in three of the four wells sampled were below the CUL of 0.005 mg/L. The total arsenic concentrations reported in the primary and duplicate samples collected from well MW-14 varied significantly (an RPD of 79.9 percent); however, the dissolved arsenic concentrations in the two samples were similar (an RPD of 2.3 percent). Because of the discrepancy between the primary and duplicate samples collected in June 2020, well MW-14 was resampled in July 2020. The June 2020 results from wells MW-6, MW-7, MW-19, and the duplicate collected from MW-14, and July 2020 results from well MW-14 were below the CUL. Dissolved arsenic concentrations were reported below the CUL in the five (four primary and one duplicate) samples collected in June.

Total arsenic was last reported at concentrations above the Site-specific CUL in two monitoring wells during the December 2018 event (MW-6 and MW-14). Arsenic concentrations were below the Site specific CULs in the two semiannual 2019 events (total and dissolved arsenic in May 2019 and total

arsenic in November 2019) and the first semiannual 2020 event (total and dissolved arsenic in June/July 2020 samples). One more semiannual sampling event with results below the arsenic CUL is needed to meet the closure requirement of four consecutive monitoring events with results below the CUL. A second semiannual 2020 sampling event is planned for November 2020.

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

Very truly yours,

Kennedy/Jenks Consultants, Inc.

8/14/2020

Alice Robinson
Project Engineer

Ryan Hultgren, P.E.
Principal Engineer

cc: Shane DeGross, BNSF Railway Company

Attachments:
- Table 1 – Groundwater Elevation Summary 16 June 2020
- Table 2 – Water Quality Parameters Summary
- Table 3 – 2016-2020 Groundwater Analytical Results Summary
- Figure 1 – Groundwater Potentiometric Map, 16 June 2020
- Figure 2 – Groundwater Results Map, 2016-2020
- Attachment A – Spokane Environmental Services Monitoring Well Sampling Field Log
- Attachment B – Laboratory Analytical Report and Chain-of-Custody Documentation

References:
City of Spokane Water Department. 2016. 2016 Technical Drinking Water Report.
City of Spokane Water Department. 2019. 2019 Technical Drinking Water Report.

Tables

TABLE 1

GROUNDWATER ELEVATION SUMMARY
16 June 2020
BNSF Parkwater Rail Yard
Spokane, Washington

Well Number	Date	Top of Casing Elevation (feet)[(a)]	Depth to Groundwater (feet btoc)	Groundwater Elevation (feet amsl)[(a)]
MW-4	06/16/2020	1,950.76	61.93	1,888.83
MW-6	06/16/2020	1,951.04	63.15	1,887.89
MW-7	06/16/2020	1,951.13	63.34	1,887.79
MW-11	06/16/2020	1,951.20	66.09	1,885.11
MW-14	06/16/2020	1,951.41	64.09	1,887.32
MW-16	06/16/2020	1,950.44	63.81	1,886.63
MW-19	06/16/2020	1,951.24	63.40	1,887.84

Notes:

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

btoc = below top of casing

amsl = above mean sea level

NM = not measured

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
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
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	245.000	0.0	15.80	7.21	100.0
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

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

2016-2020 GROUNDWATER ANALYTICAL RESULTS SUMMARY
BNSF Parkwater Rail Yard, Spokane, Washington

Monitoring Well ID[a]	Date	Total Arsenic[b] (mg/L)		Dissolved Arsenic[b] (mg/L)		Diesel-Range Organics[c] (mg/L)		Turbidity (NTU)
MW-6	03/15/2016	0.002	U	0.002	U	0.488		0.72
	05/24/2016	0.002	U	--		0.201		1.63
	08/17/2016	**0.00505**		--		0.131	B	5.78
	11/07/2016	0.00450		--		**1.560**		1.21
	03/08/2017	0.00323		--		0.250	U	2.46
	11/06/2017	0.00139	J	--		0.095	J	2.74
	06/28/2018	0.00334		--		0.200	U	0.0
	12/05/2018	**0.02090**		--		0.096	J	46.9
	05/14/2019	0.00131	J	0.0014	J	0.200	U	0.0
	01/08/2020	0.00217		--		0.200	U	17.8
	06/16/2020	0.00117	J	0.000979	J	--		0.0
MW-7	03/15/2016	0.00336		0.0032		0.153		2.82
	05/24/2016	0.00485		--		0.138		2.45
	08/17/2016	**0.00548**		--		0.100	U	3.42
	11/07/2016	0.00342		--		0.250	U	0.23
	03/08/2017	0.00200	U	--		0.250	U	2.77
	11/06/2017	0.00370		--		0.200	U	7.79
	06/28/2018	0.00388		--		0.200	U	0.0
	12/05/2018	0.00495		--		0.200	U	5.2
	05/14/2019	0.00305		0.00334		0.200	U	0.0
	11/25/2019	0.00332		--		0.200	U	25.5
	06/16/2020	0.00334		0.00325		--		0.0
MW-14	03/15/2016	0.00283/0.00289[d]		0.00272/0.00279		0.100/0.100	U	0.0
	05/24/2016	0.00423/0.00397		--/--		0.100/0.100	U	2.48
	08/17/2016	0.00445/0.00371		--/--		0.100/0.112	U/B	2.42
	11/07/2016	0.00223/0.00225		--/--		**0.647/0.648**		0.88
	03/08/2017	**0.0104/0.0107**		--/--		0.250/0.250	U/U	11.71
	11/06/2017	0.00286/0.00295		--/--		0.200/0.200	U	13.59
	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
	05/14/2019	0.00323/0.00358		0.00321/0.00313		0.200/0.200	U	0.0
	11/25/2019	0.00381/0.00390		--/--		0.106/0.107	J/J	31.4
	06/16/2020	**0.00820**/0.00352	J	0.00384/0.00393		--		0.0
	07/08/2020	0.00473		0.0042		--		0.0
MW-19	03/15/2016	0.00394		0.00455		0.100	U	1.43
	05/24/2016	0.00416		--		0.100	U	1.25
	08/17/2016	0.00367		--		0.100	U	1.47
	11/07/2016	0.00334		--		0.250	U	1.37
	03/08/2017	0.00387				0.250	U	4.41
	11/06/2017	0.00302		--		0.200	U	5.67
	06/28/2018	**0.00564**		--		0.200	U	75.7
	12/05/2018	0.00389		--		0.200	U	1.6
	05/14/2019	0.00432		0.00467		0.200	U	0.0
	11/25/2019	0.00496		--		0.200	U	33.0
	06/16/2020	0.00429		0.00434		--		0.0
Field Blank	03/15/2016	0.002	U	0.002	U	0.100	U	--
	05/24/2016	0.002	U	--		0.100	U	--
	08/17/2016	0.002	U	--		0.100	U	--
	11/07/2016	0.002	U	--		0.250	U	--
	03/08/2017	0.002	U	--		0.250	U	--

2016-2020 GROUNDWATER ANALYTICAL RESULTS SUMMARY
BNSF Parkwater Rail Yard, Spokane, Washington

Monitoring Well ID[a]	Date	Total Arsenic[b] (mg/L)		Dissolved Arsenic[b] (mg/L)		Diesel-Range Organics[c] (mg/L)		Turbidity (NTU)
Rinsate Blank	03/15/2016	0.002	U	0.002	U	0.100	U	--
	05/24/2016	0.002	U	--		0.218		--
	08/17/2016	0.002	U	--		0.100	U	--
	11/07/2016	0.002	U	--		0.250	U	--
	03/08/2017	0.002	U	--		0.250	U	--
	05/14/2019	0.002	U	--		0.200	U	--
	06/16/2020	0.002	U	--		--		--
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 EDR Site-Specific cleanup level.

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 based on being either less than the laboratory reporting limit or data validation findings

-- = not sampled

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

NTU = nephelometric turbidity units.

Figures

Path: N:\BNSF Washington\Parkwater\Events\2020 Events\2020 SA1 Report\ParkwaterGWContours.mxd

Source: Esri, DigitalGlobe, 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

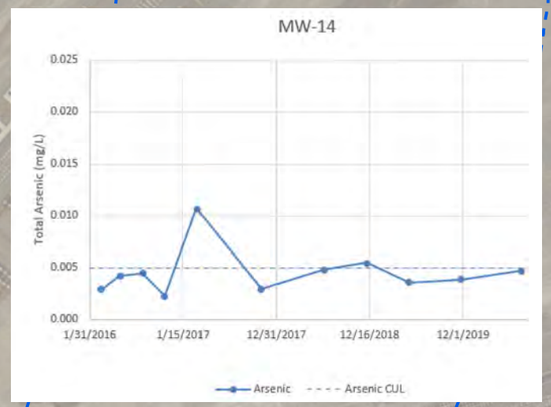
Kennedy/Jenks Consultants

BNSF Railway Company
Parkwater Railyard
Spokane, Washington

Interpreted June 2020
Groundwater Elevation Contour Map

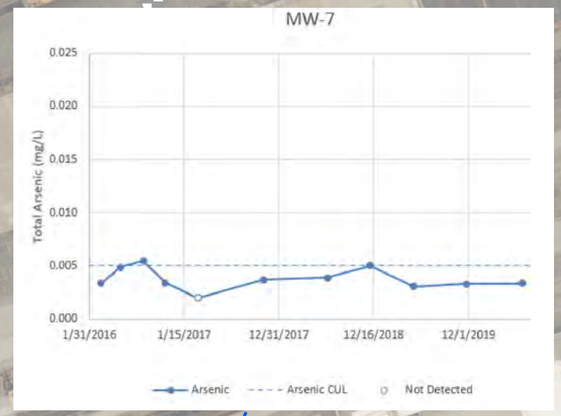
2096110*00
August 2020

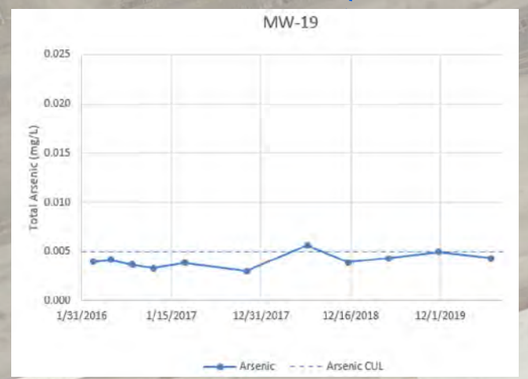
Figure 1



MW-14	
Date	Total As
3/15/16	0.00283/0.00289
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

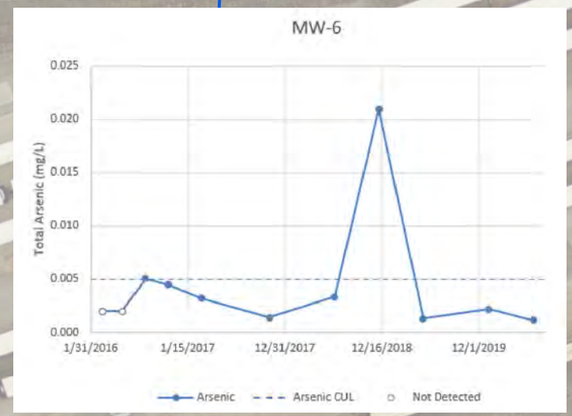
MW-7	
Date	Total As
3/15/16	0.00336
5/24/16	0.00485
8/17/16	**0.00548**
11/7/16	0.00342
3/8/17	0.002 U
11/6/17	0.00370
6/28/18	0.00388
12/5/18	0.00495
5/14/19	0.00305
11/25/19	0.00332
6/16/20	0.00334





MW-19	
Date	Total As
3/15/16	0.0039
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

MW-6	
Date	Total As
3/15/16	0.002 U
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



Path: N:\BNSF Washington\Parkwater\Events\2020 Events\2020 SA1 Report\Fig2_GWResultsMap.mxd

Source: Esri, DigitalGlobe, 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
- Intepreted Groundwater Elevation Contours (feet AMSL, dashed where inferred)

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 Consultants

BNSF Railway Company
Parkwater Railyard
Spokane, Washington

Groundwater Results Map 2016-2020

2096110*00
August 2020

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: 6-16-20

Project Information	
Project Name:	PARK WATER BNSF
Project Number:	

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

Comments

purge WATER VISUALLY clean

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)
63.40		

Sample Containers

Number	Type	Preservative	Analytical Parameters	Filtered?

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
11:30	3	0.250		11.32	0.259	6.61	7.76	124	0.0	
11:35	4.25			11.20	0.257	6.96	7.80	128	0.0	
11:40	5.5			11.28	0.255	6.66	7.81	130	0.0	
11:45	6.75			11.27	0.254	6.85	7.81	132	0.0	
11:50	8			11.31	0.253	6.98	7.80	133	0.0	
11:55	9.25			11.27	0.250	6.89	7.81	134	0.0	
12:00	10.5			11.29	0.249	6.78	7.81	135	0.0	

	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-MW19-061620 @ 12:05

Monitoring Well Sampling Field Log

SPOKANE ENVIRONMENTAL SOLUTIONS

Well Number: MW-6

Date: 6-16-20

Project Information	
Project Name:	PARKWATER BNSF
Project Number:	

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

Comments

purge waters visually clean

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)
63.15		

Sample Containers

Number	Type	Preservative	Analytical Parameters	Filtered?

Well Purge Data

Time	Volume Purged (L)	Purge Rate (L/min) (<0.5 L/min)	DTW (ft btoc)	Temp. (°C)	Conductivity (µS/cm) mS	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTUs)	Clarity/Color/ Remarks
	Pump On		Initial	-	±3%	±10%	±0.1	±10mv	±10%	<= Stabilization Criteria
10:15	3.0	0.250		12.88	0.283	0.03	7.22	143	0.0	
10:20	4.25			12.07	0.276	0.00	7.30	134	0.0	
10:25	5.5			11.78	0.275	0.00	7.29	133	0.0	
10:30	6.75			11.61	0.274	0.00	7.26	132	0.0	
10:35	8			11.42	0.273	0.00	7.20	131	0.0	
10:40	9.25			11.41	0.273	0.00	7.19	130	0.0	
		PW-MW6-061620 @					10:45			
	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

Monitoring Well Sampling Field Log

SPOKANE ENVIRONMENTAL SOLUTIONS

Well Number: MW-14

Date: 6-16-20

Project Information	
Project Name:	Park Water BNSF
Project Number:	

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

Comments

purge water clear

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)
64.09		

Sample Containers

Number	Type	Preservative	Analytical Parameters	Filtered?
1		HCl		
1				

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
13:40	2.5	0.250		13.20	0.253	7.08	7.91	114	0.0	
13:45	3.75			12.63	0.252	6.78	7.90	120	0.0	
13:50	5.0			12.52	0.252	6.60	7.89	123	0.0	
13:55	6.25			12.54	0.252	6.59	7.90	125	0.0	
14:00	7.5			12.47	0.252	6.63	7.90	126	0.0	
14:05	8.75			12.44	0.252	6.69	7.91	128	0.0	

	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 SG=slightly cloudy AC=almost clear C=clear CC=crystal clear

PW-MW14-061620 @ 14:10
PW-DUP-061620 @ 13:00
PW-EB-061620 @ 14:20

Monitoring Well Sampling Field Log

SPOKANE ENVIRONMENTAL SOLUTIONS

Well Number: MW-7

Date: 6/16/20

Project Information	
Project Name:	PARK WATER BNSF
Project Number:	

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

Comments

purge water visually clear

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

Monitoring Information		
Initial DTW (ft btoc)	Saturated Screen Interval (ft bgs or btoc)	Pump Intake Depth (ft btoc): (Mid Sat. Screen Interval)
63.34		

Sample Containers				
Number	Type	Preservative	Analytical Parameters	Filtered?

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
12:40	2	0.250		12.25	0.259	5.83	7.77	129	0.0	
12:45	3.25			12.17	0.261	5.49	7.77	130	0.0	
12:50	4.5			12.19	0.263	5.40	7.77	132	0.0	
12:55	5.75			12.24	0.263	5.30	7.77	133	0.0	
13:00	7			12.29	0.263	5.29	7.77	134	0.0	
13:05	8.25			12.30	0.264	5.19	7.78	135	0.0	

	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-MW7-061620 @ 13:10

Attachment B

Laboratory Analytical Report and
Chain-of-Custody Documentation

Pace Analytical®
National Center for Testing & Innovation

ANALYTICAL REPORT

June 25, 2020

Kennedy/Jenks Con-BNSF Region 1

Sample Delivery Group:	L1230223
Samples Received:	06/17/2020
Project Number:	
Description:	BNSF - Parkwater, WA

Report To: Alice Robinson
275 Battery Street, Ste 550
San Francisco, CA 94111

Entire Report Reviewed By:

Mark W. Beasley
Project Manager

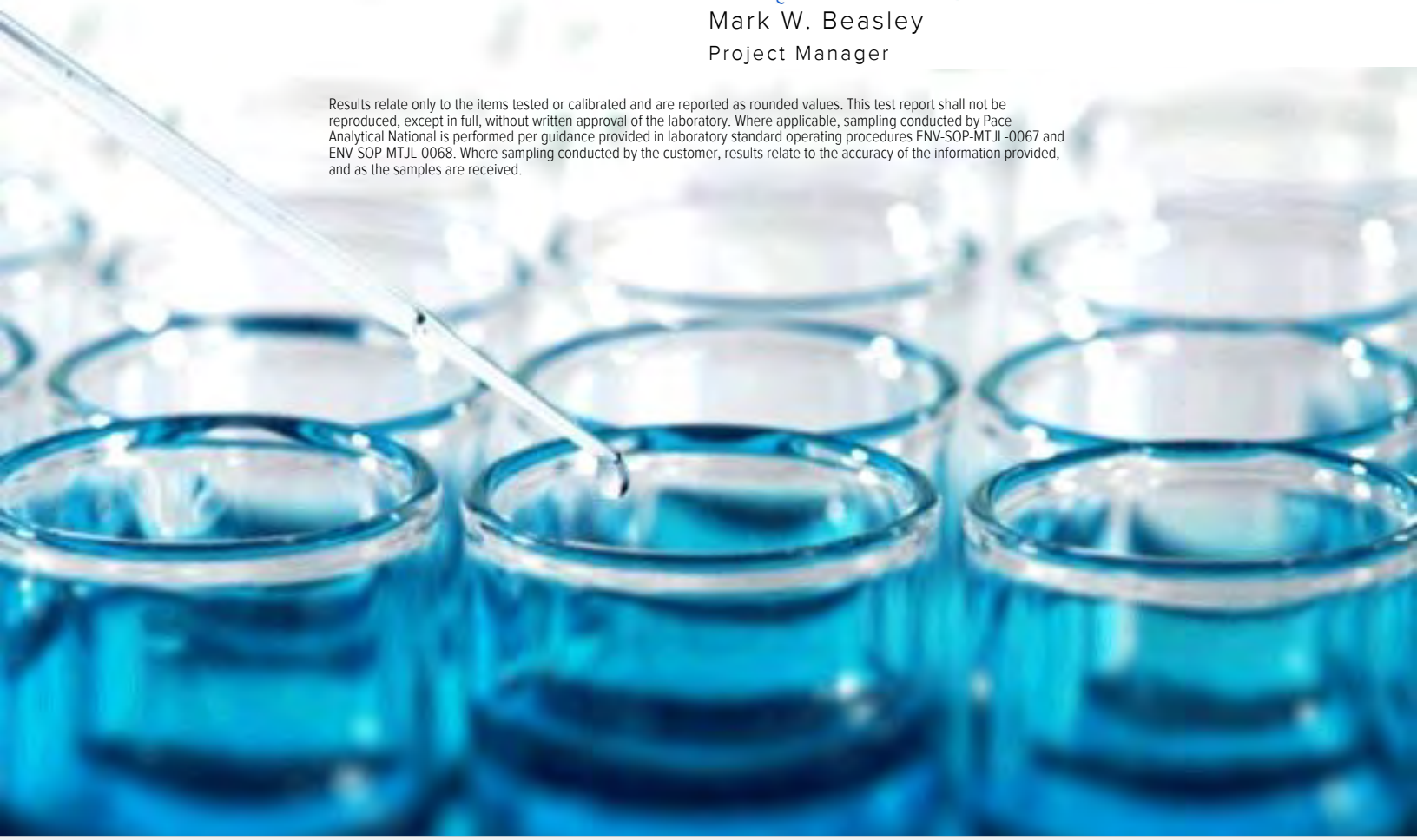


TABLE OF CONTENTS

PW-MW6-061620 L1230223-01 GW

Collected by: Flavio | Collected date/time: 06/16/20 10:45 | Received date/time: 06/17/20 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Metals (ICPMS) by Method 6020B	WG1495346	1	06/23/20 11:55	06/23/20 15:29	LAT	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG1495375	1	06/23/20 20:40	06/24/20 01:17	LD	Mt. Juliet, TN

PW-MW19-061620 L1230223-02 GW

Collected by: Flavio | Collected date/time: 06/16/20 12:05 | Received date/time: 06/17/20 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Metals (ICPMS) by Method 6020B	WG1495346	1	06/23/20 11:55	06/23/20 16:37	LAT	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG1495375	1	06/23/20 20:40	06/24/20 01:31	LD	Mt. Juliet, TN

PW-MW7-061620 L1230223-03 GW

Collected by: Flavio | Collected date/time: 06/16/20 13:10 | Received date/time: 06/17/20 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Metals (ICPMS) by Method 6020B	WG1495346	1	06/23/20 11:55	06/23/20 16:40	LAT	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG1495375	1	06/23/20 20:40	06/24/20 01:34	LD	Mt. Juliet, TN

PW-MW14-061620 L1230223-04 GW

Collected by: Flavio | Collected date/time: 06/16/20 14:10 | Received date/time: 06/17/20 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Metals (ICPMS) by Method 6020B	WG1495346	1	06/23/20 11:55	06/23/20 17:03	LAT	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG1495375	1	06/23/20 20:40	06/24/20 01:37	LD	Mt. Juliet, TN

PW-EB-061620 L1230223-05 GW

Collected by: Flavio | Collected date/time: 06/16/20 14:20 | Received date/time: 06/17/20 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Metals (ICPMS) by Method 6020B	WG1495375	1	06/23/20 20:40	06/24/20 01:40	LD	Mt. Juliet, TN

PW-DUP-061620 L1230223-06 GW

Collected by: Flavio | Collected date/time: 06/16/20 13:00 | Received date/time: 06/17/20 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Metals (ICPMS) by Method 6020B	WG1495346	1	06/23/20 11:55	06/23/20 17:07	LAT	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG1495375	1	06/23/20 20:40	06/24/20 01:50	LD	Mt. Juliet, TN

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Mark W. Beasley
Project Manager

Metals (ICPMS) by Method 6020B

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Arsenic	1.17	J	0.735	2.00	1	06/24/2020 01:17	WG1495375
Arsenic,Dissolved	0.979	J	0.735	2.00	1	06/23/2020 15:29	WG1495346

Metals (ICPMS) by Method 6020B

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Arsenic	4.29		0.735	2.00	1	06/24/2020 01:31	WG1495375
Arsenic,Dissolved	4.34		0.735	2.00	1	06/23/2020 16:37	WG1495346

Metals (ICPMS) by Method 6020B

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Arsenic	3.34		0.735	2.00	1	06/24/2020 01:34	WG1495375
Arsenic,Dissolved	3.25		0.735	2.00	1	06/23/2020 16:40	WG1495346

Metals (ICPMS) by Method 6020B

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Arsenic	8.20		0.735	2.00	1	06/24/2020 01:37	WG1495375
Arsenic,Dissolved	3.84		0.735	2.00	1	06/23/2020 17:03	WG1495346

Metals (ICPMS) by Method 6020B

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Arsenic	U		0.735	2.00	1	06/24/2020 01:40	WG1495375

Metals (ICPMS) by Method 6020B

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Arsenic	3.52		0.735	2.00	1	06/24/2020 01:50	WG1495375
Arsenic,Dissolved	3.93		0.735	2.00	1	06/23/2020 17:07	WG1495346

Method Blank (MB)

(MB) R3542046-1 06/23/20 15:22

Analyte	MB Result ug/l	MB Qualifier	MB MDL ug/l	MB RDL ug/l
Arsenic,Dissolved	U		0.735	2.00

Laboratory Control Sample (LCS)

(LCS) R3542046-2 06/23/20 15:25

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Arsenic,Dissolved	50.0	49.3	98.7	80.0-120	

L1230223-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1230223-01 06/23/20 15:29 • (MS) R3542046-4 06/23/20 15:36 • (MSD) R3542046-5 06/23/20 15:39

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Arsenic,Dissolved	50.0	0.979	52.6	50.1	103	98.1	1	75.0-125			4.99	20

Method Blank (MB)

(MB) R3542140-1 06/24/20 01:11

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	ug/l		ug/l	ug/l
Arsenic	U		0.735	2.00

Laboratory Control Sample (LCS)

(LCS) R3542140-2 06/24/20 01:14

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
	ug/l	ug/l	%	%	
Arsenic	50.0	47.5	95.1	80.0-120	

L1230223-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1230223-01 06/24/20 01:17 • (MS) R3542140-4 06/24/20 01:24 • (MSD) R3542140-5 06/24/20 01:27

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	ug/l	%	%		%			%	%
Arsenic	50.0	1.17	50.0	49.4	97.6	96.5	1	75.0-125			1.13	20

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

MDL	Method Detection Limit.
RDL	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
J	The identification of the analyte is acceptable; the reported value is an estimate.

Pace National is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.
* Not all certifications held by the laboratory are applicable to the results reported in the attached report.
* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace National.

State Accreditations

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN-03-2002-34
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	n/a
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO00356
Kentucky [1 6]	90010	South Carolina	84004
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana [1]	LA180010	Texas	T104704245-18-15
Maine	TN0002	Texas [5]	LAB0152
Maryland	324	Utah	TN00003
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	460132
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA

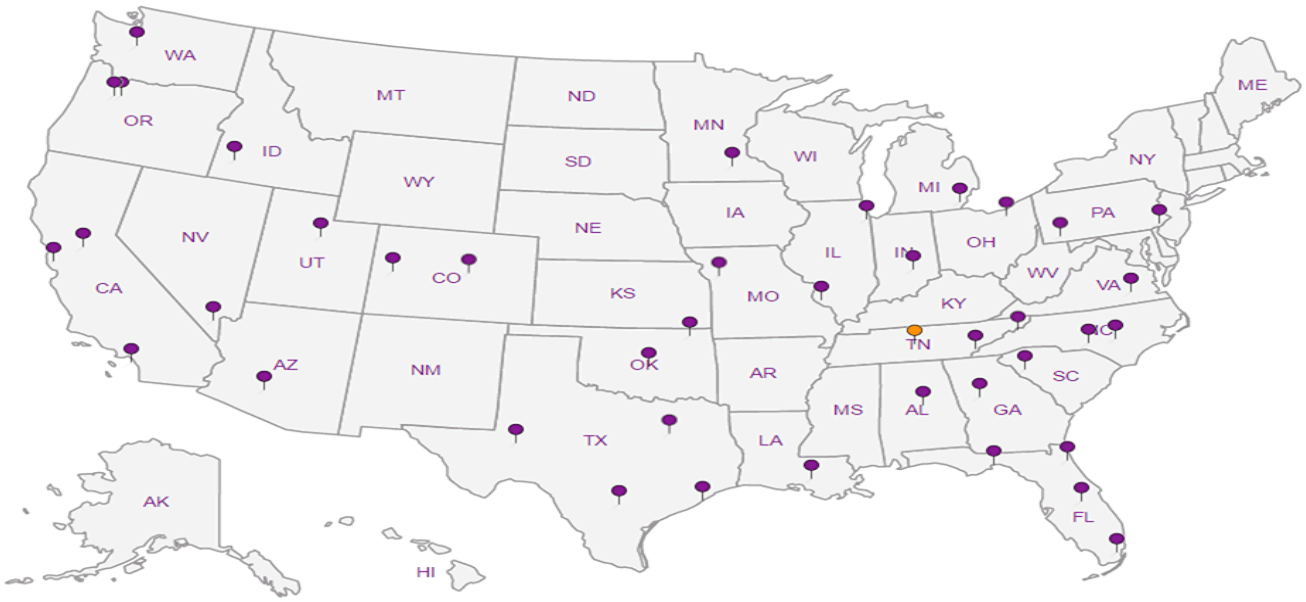
Third Party Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

Our Locations

Pace National has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. Pace National performs all testing at our central laboratory.



Kennedy/Jenks Con-BNSF Region 1

275 Battery Street, Ste 550
San Francisco, CA 94111

Billing Information:
Accounts Payable
32001 32nd Ave. S.,Ste. 100
Federal Way, WA 98001

Pres Chk

Report to: Alice Robinson

Email To: RyanHultgren@kennedyjenks.com;AliceRobinso

Project Description: BNSF - Parkwater, WA

City/State Collected:

Please Circle: PT MT CT ET

Phone: 503-423-4000

Client Project #

Lab Project # BNSF1KEN-PARKWATER

Collected by (print): Flavio

Site/Facility ID #

P.O. #

Collected by (signature): Immediately Packed on Ice N ___ Y ✓

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day

Quote #

Date Results Needed: STANDARD

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	Dissolved As (FF) 250mlHDPE-HNO3	Total As 250mlHDPE-HNO3	Remarks	Sample # (lab only)
PW-MW6-061620		GW		6-16-20	10:45	2	X	X		-01
PW-MW19-061620		GW		6-16-20	12:05	2	X	X		02
PW-MW7-061620		GW		6-16-20	13:10	2	X	X		03
PW-MW14-061620		GW		6-16-20	14:10	2	X	X		04
PW-EB-061620		GW		6-16-20	14:20	2	X	X		05
PW-DUP-061620		GW		6-16-20	13:00	2	X	X		06
		GW				2	X	X		
		GW				2	X	X		
		GW				2	X	X		

Chain of Custody Page ___ of ___

Pace Analytical® National Center for Testing & Innovation

12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

SDG # L1230223
1041

Acctnum: BNSF1KEN
Template: T110283
Prelogin: P780209
PM: 134 - Mark W. Beasley
PB:
Shipped Via: FedEX Ground

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks:

pH _____ Temp _____
Flow _____ Other _____

Samples returned via: __ UPS __ FedEx __ Courier _____

Tracking # 184643242720

Sample Receipt Checklist

COC Seal Present/Intact:	NP	Y N
COC Signed/Accurate:		Y N
Bottles arrive intact:		Y N
Correct bottles used:		Y N
Sufficient volume sent:		Y N
If Applicable		
VOA Zero Headspace:		Y N
Preservation Correct/Checked:		Y N
RAD Screen <0.5 mR/hr:		Y N

	Date:	Time:		
Relinquished by: (Signature)	6/16/20	14:40	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Temp: 1.1+.2=1.3 °C Bottles Received: 11 — If preservation required by Login: Date/Time
Relinquished by: (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 6/17/20 Time: 0845 — Hold: — Condition: NCF / OK

Jeremy W. Watkins

Pace Analytical®
National Center for Testing & Innovation

Login #: L1230223	Client: BNSF1KEN	Date: 6/17/20	Evaluated by: Jeremy

Non-Conformance (check applicable items)

	Sample Integrity		Chain of Custody Clarification		
	Parameter(s) past holding time	x	Login Clarification Needed		**If Broken Container:**
	Temperature not in range		Chain of custody is incomplete		Insufficient packing material around container
	Improper container type		Please specify Metals requested.		Insufficient packing material inside cooler
	pH not in range.		Please specify TCLP requested.		Improper handling by carrier (FedEx / UPS / Couri
	Insufficient sample volume.		Received additional samples not listed on coc.		Sample was frozen
	Sample is biphasic.		Sample ids on containers do not match ids on coc		Container lid not intact
	Vials received with headspace.		Trip Blank not received.		**If no Chain of Custody:**
	Broken container		Client did not "X" analysis.		Received by:
	Broken container:		Chain of Custody is missing		Date/Time:
	Sufficient sample remains				Temp./Cont. Rec./pH:
					Carrier:
					Tracking#

Login Comments: Did not receive ASDG container for PW-EB-061620.

Client informed by:		Call		Email		Voice Mail		Date: 6/18/20	Time: 0945
TSR Initials: MB	Client Contact: Flavio I.								

Client notified we will only run total metals on this sample.

Pace Analytical®
National Center for Testing & Innovation

ANALYTICAL REPORT

July 10, 2020

Kennedy/Jenks Con-BNSF Region 1

Sample Delivery Group:	L1238042
Samples Received:	07/09/2020
Project Number:	2096111.02
Description:	BNSF - Parkwater, WA
Site:	PARKWATER RAILYARD
Report To:	Alice Robinson 275 Battery Street, Ste 550 San Francisco, CA 94111

Entire Report Reviewed By:

Mark W. Beasley
Project Manager

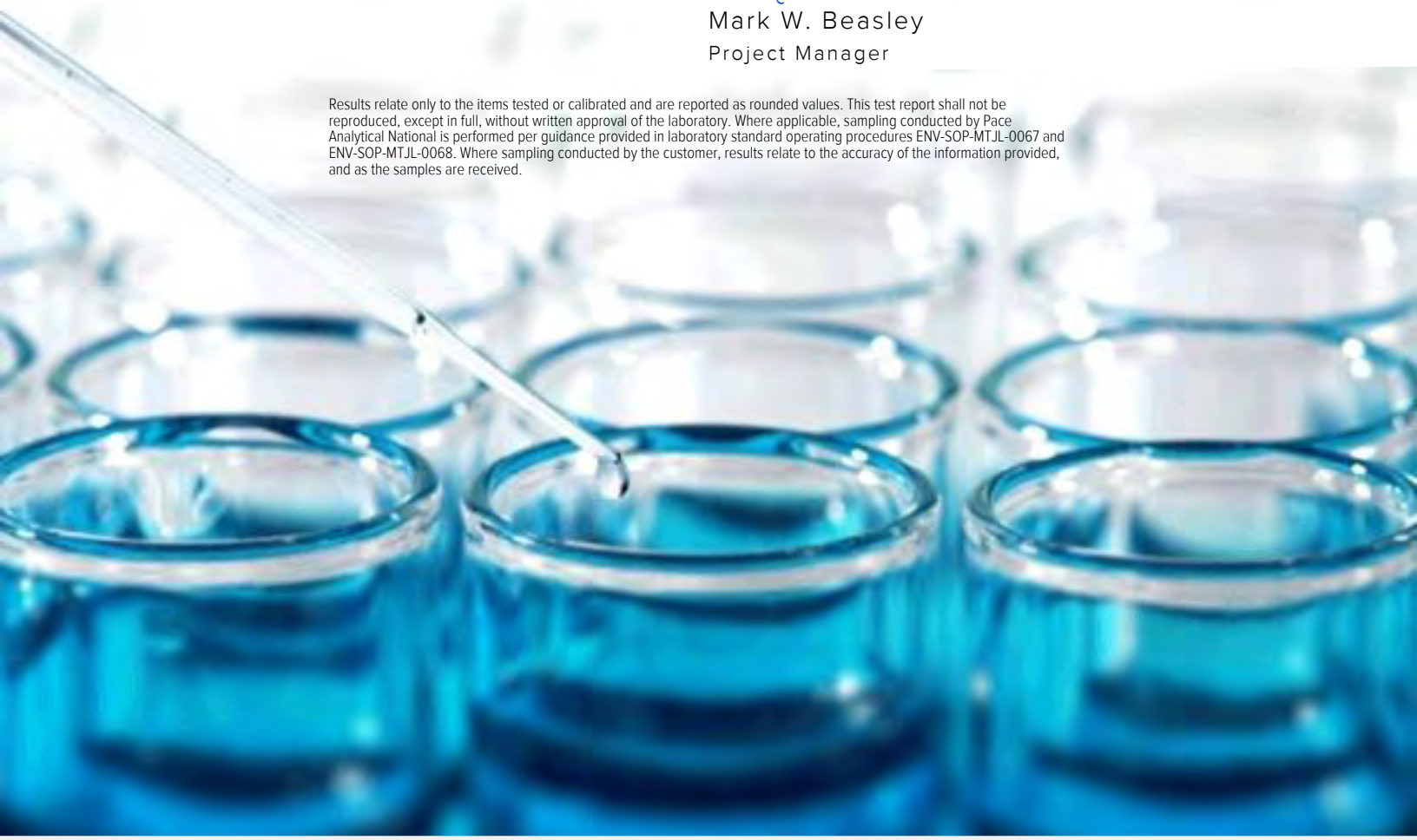


TABLE OF CONTENTS

MW-14 L1238042-01 GW

Collected by: Gary Panther
Collected date/time: 07/08/20 12:10
Received date/time: 07/09/20 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Metals (ICPMS) by Method 6020B	WG1506421	1	07/10/20 08:47	07/10/20 11:31	JPD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG1506823	1	07/10/20 08:11	07/10/20 12:01	JPD	Mt. Juliet, TN

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Mark W. Beasley
Project Manager

Metals (ICPMS) by Method 6020B

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Arsenic	4.73		0.735	2.00	1	07/10/2020 12:01	WG1506823
Arsenic,Dissolved	4.20		0.735	2.00	1	07/10/2020 11:31	WG1506421

Method Blank (MB)

(MB) R3548177-1 07/10/20 11:12

Analyte	MB Result ug/l	MB Qualifier	MB MDL ug/l	MB RDL ug/l
Arsenic,Dissolved	U		0.735	2.00

Laboratory Control Sample (LCS)

(LCS) R3548177-2 07/10/20 11:15

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Arsenic,Dissolved	50.0	49.6	99.2	80.0-120	

L1237727-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1237727-01 07/10/20 11:18 • (MS) R3548177-4 07/10/20 11:25 • (MSD) R3548177-5 07/10/20 11:28

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Arsenic,Dissolved	50.0	1.19	49.8	51.4	97.3	100	1	75.0-125			2.99	20

Method Blank (MB)

(MB) R3548179-1 07/10/20 11:30

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	ug/l		ug/l	ug/l
Arsenic	U		0.735	2.00

Laboratory Control Sample (LCS)

(LCS) R3548179-2 07/10/20 11:33

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
	ug/l	ug/l	%	%	
Arsenic	50.0	50.2	100	80.0-120	

L1238017-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1238017-02 07/10/20 11:37 • (MS) R3548179-4 07/10/20 11:44 • (MSD) R3548179-5 07/10/20 11:47

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	ug/l	%	%		%			%	%
Arsenic	50.0	18.9	68.5	67.3	99.2	96.9	1	75.0-125			1.72	20

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

MDL	Method Detection Limit.
RDL	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description

The remainder of this page intentionally left blank, there are no qualifiers applied to this SDG.

Pace National is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.
* Not all certifications held by the laboratory are applicable to the results reported in the attached report.
* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace National.

State Accreditations

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN-03-2002-34
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	n/a
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO00356
Kentucky [1 6]	90010	South Carolina	84004
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana [1]	LA180010	Texas	T104704245-18-15
Maine	TN0002	Texas [5]	LAB0152
Maryland	324	Utah	TN00003
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	460132
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA

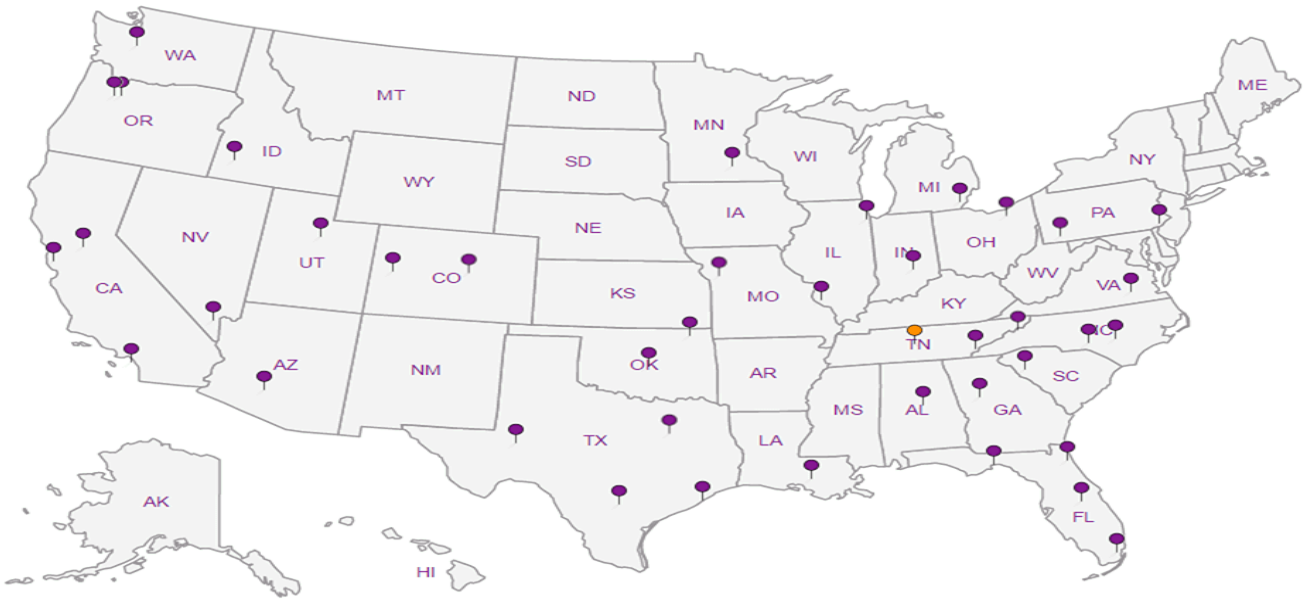
Third Party Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

Our Locations

Pace National has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. Pace National performs all testing at our central laboratory.



Kennedy/Jenks Con-BNSF Region 1

275 Battery Street, Ste 550
San Francisco, CA 94111

Billing Information:
Accounts Payable
32001 32nd Ave. S.,Ste. 100
Federal Way, WA 98001

Pres Chk

Report to: Alice Robinson

Email To: RyanHultgren@kennedyjenks.com;AliceRobinso

Project Description: BNSF - Parkwater, WA

City/State Collected: Spokane, WA

Please Circle: PT MT CT ET

Phone: 503-423-4000

Client Project # 20961111.02

Lab Project # BNSF1KEN-PARKWATER

Collected by (print): Gary Pantuck

Site/Facility ID # Parkwater Railyard

P.O. #

Collected by (signature):

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day

Quote #

Date Results Needed

Immediately Packed on Ice N___ Y___

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	Dissolved As (FF) 250mlHDPE-HNO3	Total As 250mlHDPE-HNO3								Remarks	Sample # (lab only)
							<2	<2									
MW-14	G	GW	72'	7-8-20	1210	2	X	X									-01
MW-DUP	G	GW	72'	7-8-20	—	2	X	X								HOLD	
		GW				2	X	X									

Analysis / Container / Preservative

Chain of Custody Page ___ of ___

Pace Analytical®
National Center for Testing & Innovation

12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

SDG # L1238042

T F160

Acctnum: BNSF1KEN

Template: T110283

Prelogin: P784268

PM: 134 - Mark W. Beasley

PB:

Shipped Via: FedEX Ground

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other _____

Remarks:

pH _____ Temp _____

Flow _____ Other _____

Samples returned via:
__ UPS X FedEx __ Courier _____

Tracking # 1275 8605 8839

Sample Receipt Checklist
COC Seal Present/Intact: __NP Y N
COC Signed/Accurate: Y N
Bottles arrive intact: Y N
Correct bottles used: Y N
Sufficient volume sent: Y N
If Applicable
VOA Zero Headspace: Y N
Preservation Correct/Checked: Y N
RAD Screen <0.5 mR/hr: Y N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR	If preservation required by Login: Date/Time
Gary Pantuck	7-8-20	1315		0	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: 3.4, 3.3 °C Bottles Received: 4	
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 07/09/2020 Time: 8:45	07-061 Condition: NCF (OK)

DATA VALIDATION SUMMARY
BNSF Parkwater, WA

Laboratory Reports included in Data Validation	Dates	Sample IDs
Laboratory: Pace Analytical Services, Mt.Juliet, TN SDG: L1230223 Analyses: Metals	**Report Date:** 6/25/2020 **Sample Dates:** 6/16/2020-6/16/2020 **Validation Date:** 7/21/2020	Aqueous Samples: PW-MW6-061620, PW-MW7-061620, PW-MW14-061620, PW-MW19-061620 Field Duplicates: PW-DUP-061620 (duplicate of PW-MW14-061620) Equipment Blank: PW-EB-061620 Trip Blank: Not Collected

Criteria	(Yes or No)	Comment
Chain-of-Custody (COC) – Chain-of-custody protocol followed?	Yes	See Note
Temperature Blank – Sample temperature criteria met?	Yes	
Holding times – Samples analyzed within specified holding time?	Yes	
Laboratory method blank samples – Analytes present in method blank samples?	No	
Field/Equipment blank samples – Analytes present in field/equipment blank samples?	No	
Trip blank samples – Analytes present in trip blank samples?	No	See Note
Matrix Spikes (MS)/Matrix Spike Duplicate (MSD) samples – Control limits met?	Yes	
Surrogate percent recoveries – Control limits met?	Yes	See Note
Laboratory Control Sample (LCS) – Control limits met?	Yes	
Laboratory duplicate samples (if applicable) – Control limits met?	Yes	See Note
Field duplicate samples (if submitted) – Relative percent differences within control limits?	No	See Note
Other Issues?	No	

COC Note: Lab noted: "Did not receive ASDG container for PW-EB-061620. Client notified we will only run total metals on this sample." No action taken.
Trip Blank Note: Not Collected
Surrogate Recovery Note: Not applicable
Lab Duplicate Note: Not applicable
Field Duplicate Note: The RPD for the duplicate pair PW-MW14-061620 and PW-DUP-061620 ranged from 0-80%. Arsenic, Total was above the acceptance criteria at 79.9%. The parent sample and duplicate were qualified as estimated, J.

SUMMARY
Overall, the findings with respect to the quality assurance/quality control (QA/QC) data do not adversely affect the use of the analytical results.

DATA VALIDATION SUMMARY
BNSF Parkwater, WA

Laboratory Reports included in Data Validation	Dates	Sample IDs
Laboratory: Pace Analytical Services, Mt.Juliet, TN SDG: L1238042 Analyses: Metals	**Report Date:** 7/10/2020 **Sample Dates:** 7/8/2020-7/8/2020 **Validation Date:** 7/24/2020	Aqueous Samples: MW-14-070820 Field Duplicates: Not Collected Equipment Blank: Not Collected Trip Blank: Not Collected

Criteria	(Yes or No)	Comment
Chain-of-Custody (COC) – Chain-of-custody protocol followed?	Yes	
Temperature Blank – Sample temperature criteria met?	Yes	
Holding times – Samples analyzed within specified holding time?	Yes	
Laboratory method blank samples – Analytes present in method blank samples?	No	
Field/Equipment blank samples – Analytes present in field/equipment blank samples?	No	See Note
Trip blank samples – Analytes present in trip blank samples?	No	See Note
Matrix Spikes (MS)/Matrix Spike Duplicate (MSD) samples – Control limits met?	Yes	See Note
Surrogate percent recoveries – Control limits met?	Yes	See Note
Laboratory Control Sample (LCS) – Control limits met?	Yes	
Laboratory duplicate samples (if applicable) – Control limits met?	Yes	See Note
Field duplicate samples (if submitted) – Relative percent differences within control limits?	Yes	See Note
Other Issues?	No	See Note

Field Blank Note: Not Collected
Trip Blank Note: Not Collected
MS/MSD Note: Not applicable
Surrogate Recovery Note: Not applicable
Lab Duplicate Note: Not applicable
Field Duplicate Note: Not applicable
Other Note: The date was added to the sample ID to create a unique sample ID. No action taken.

SUMMARY
Overall, the findings with respect to the quality assurance/quality control (QA/QC) data do not adversely affect the use of the analytical results.