



DEPARTMENT OF THE ARMY
BADGER ARMY AMMUNITION PLANT
S7273 BLUFF ROAD
MERRIMAC, WISCONSIN 53561

June 5, 2018

SUBJECT: Submittal of April 2018 Monitoring Well and Residential Well Groundwater Data
Badger Army Ammunition Plant

Mr. Jason Lowery
Wisconsin Department of Natural Resources
GEF2 Central Office
PO Box 7921
Madison, WI 53707-7921

Dear Mr. Lowery:

Enclosed is the Badger Army Ammunition Plant (BAAP) April 2018 Monitoring Well and Residential Well Groundwater Data. This was a semi-annual sampling event. SpecPro Professional Services, LLC (SPS) collected groundwater samples from 115 monitoring wells associated with the Deterrent Burning Ground (DBG) Plume, Nitrocellulose Production Area Plume, and Propellant Burning Ground (PBG) Plume. SPS collected groundwater samples from three residential wells, Lins-R, Purcell-D, and WE-UK124. Monitoring wells in the Central Plume are scheduled to be sampled during June 2018. The enclosed files contain the signed Environmental Monitoring Data Certification Forms, a list of wells sampled, a map showing the well locations, residential well lab results summary spreadsheet, and residential well lab results. Per previous discussions, the Army understands that the WDNR will be mailing the results to each residential well owner.

Deterrent Burning Ground Plume

Based on the WDNR *2014 Monitoring Well Optimization Plan* email approval dated May 27, 2014 and a subsequent modification dated July 15, 2016, 45 monitoring wells associated with the DBG Plume were sampled during April 2018. The groundwater results indicate that dinitrotoluene (DNT) concentrations in the DBG Plume have continued to decrease over the past year except in three monitoring wells, ELN-1003B, ELN-1003C, and ELN-1502A. To verify the DNT concentrations in ELN-1003B, ELN-1003C, and ELN-1502A, additional groundwater samples were collected from each monitoring well on May 14, 2018. The enclosed table compares the DNT results from the April 2018 sampling event to the May 2018 resampling event.

The total DNT concentration in ELN-1502A increased from 0.195 micrograms per liter ($\mu\text{g/l}$) during September 2016 to 0.442 $\mu\text{g/l}$ during April 2017 to 0.492 $\mu\text{g/l}$ during September 2017 to 0.594 $\mu\text{g/l}$ during April 2018 and to 0.69 $\mu\text{g/l}$ during May 2018. ELN-1502A is located at the eastern plant boundary and 0.7 miles southeast of the DBG source area. ELN-1502A will be sampled again during September 2018.

The total DNT concentration in ELN-1003B increased from 0.051 $\mu\text{g/l}$ during April 2017 to 0.068 $\mu\text{g/l}$ during September 2017 to 0.232 $\mu\text{g/l}$ during April 2018 and to 0.186 $\mu\text{g/l}$ during May 2018.

ELN-1003B is located 0.5 miles southeast of ELN-1502A. ELN-1003B will be sampled again during September 2018.

The total DNT concentration in ELN-1003C increased from no detect during September 2017 to 0.074 µg/l during April 2018 and to 0.108 µg/l during May 2018. ELN-1003C is located 0.5 miles southeast of ELN-1502A. ELN-1003C will be sampled again during September 2018.

Nitrocellulose Production Area Plume

Per the WDNR's October 3, 2014 request, we have included DNT groundwater data from four (4) monitoring wells located near the former DNT Screen House. These monitoring wells help define the extents of DNT in the Nitrocellulose Production Area Plume. The groundwater results indicate that DNT concentrations in this area have remained stable.

Propellant Burning Ground Plume

Based on the WDNR *Propellant Burning Ground Monitoring Requirements* dated January 5, 2015, 66 monitoring wells associated with the PBG Plume were sampled during April 2018. The groundwater results indicate that volatile organic compounds (VOCs) concentrations in the PBG Plume were relatively unchanged since September 2017. DNT concentrations downgradient of the PBG were relatively unchanged since September 2017.

The total DNT concentration in PBN-8202A increased from 1.469 µg/l during September 2017 to 94.65 µg/l during April 2018. This is an unexpected increase over recent sampling events. Prior to 2006, total DNT concentrations in PBN-8202A had been above 100 µg/l. PBN-8202A is located adjacent to and downgradient of the PBG Waste Pits (source area). To verify the DNT concentrations in PBN-8202A, an additional groundwater sample was collected on May 14, 2018. The enclosed table compares the DNT results from the April 2018 sampling event to the May 2018 resampling event. The total DNT concentration in PBN-8202A was 420.294 µg/l on May 14, 2018. The recent increase in DNT concentrations in PBN-8202A may be related to the recent rise in groundwater levels. Over the past 1½ years, the groundwater table near the PBG has risen six feet.

Residential Wells

2,6-DNT and total DNT were detected above the NR 140 Preventive Action Limit (PAL) in residential well WE-UK124 (432). 2,6-DNT and total DNT have routinely been detected above the PAL in WE-UK124. WE-UK124 is located in the southern portion of the Central Plume.

No exceedances of a NR 140 Groundwater Standard were found in Purcell-D (163). Purcell-D is located just outside the southern portion of the DBG Plume.

The Army instructed SPS to collect a groundwater sample from the Lins-R (879) residential well and analyze it for DNT and VOCs. The Lins-R residential well is located west of the PBG Plume. No compounds were detected above the analytical detection limits.

Per the WDNR Plan Modification of the Groundwater Monitoring Program dated September 4, 2013, 53 residential wells are scheduled to be sampled during August 2018.

Quality Review

SPS conducted an internal quality control review of the groundwater data. The internal review did not find any issues with the groundwater data. All groundwater samples were analyzed by CT Laboratories, LLC (CT Lab) in Baraboo, Wisconsin. CT Lab is a WDNR Chapter NR 149 certified laboratory and accredited by the Department of Defense Environmental Laboratory Accreditation Program (DoD ELAP).

Please do not hesitate to contact me at 608-434-5374 if you have any questions.

Sincerely,

A handwritten signature in black ink, appearing to read 'R. Sitton', written over a horizontal line.

Robert M. Sitton
Commander's Representative

Enclosure

Copy furn: Bryan Lynch, Contracting Officer's Representative

Table 1
April - May 2018 (Resampling)
Dinitrotoluene Groundwater Results
Badger Army Ammunition Plant

Well Name	Well ID	License	Sample Level	Date	Dinitrotoluenes						Dinitrotoluene, Total
					2,3-Dinitrotoluene	2,4-Dinitrotoluene	2,5-Dinitrotoluene	2,6-Dinitrotoluene	3,4-Dinitrotoluene	3,5-Dinitrotoluene	
PBN-8202A	613	2814	A	4/23/18	45	<u>2.1</u>	0.14	<u>27</u>	17	2.1	<u>93.34</u>
				4/23/18 (D)	48	<u>2.2</u>	0.15	<u>24</u>	18	2.3	<u>94.65</u>
				5/14/18	78	<u>33</u>	0.094	<u>270</u>	35	4.2	<u>420.294</u>
ELN-1003B	468	2813	B	4/26/18	0.029 (J)	0.026 (J)	0.028 (J)	0.024 (J)	0.1	0.025 (J)	<u>0.232</u>
				4/26/18 (D)	0.029 (J)	0.024 (J)	0.027 (J)	0.023 (J)	0.097	0.025 (J)	<u>0.225</u>
				5/14/18	0.03	<0.008	<0.003	0.036	0.12	<0.004	<u>0.186</u>
ELN-1003C	469	2813	C	4/26/18	0.025 (J)	0.026 (J)	<0.003	0.023 (J)	<0.004	<0.004	<u>0.074</u>
				5/14/18	<0.0061	<0.0081	<0.003	0.029 (J)	0.079	<0.004	<u>0.108</u>
ELN-1502A	533	2813	A	4/24/18	0.14	<0.0083	<0.0031	0.03 (J)	0.39	0.034	<u>0.594</u>
				4/24/18 (D)	0.13	<0.008	<0.003	0.027 (J)	0.38	<0.004	<u>0.537</u>
				5/14/18	0.17	<0.008	<0.003	0.08	0.44	<0.004	<u>0.69</u>
Chapter NR 140 PAL					NE	0.005	NE	0.005	NE	NE	0.005
Chapter NR 140 ES					NE	0.05	NE	0.05	NE	NE	0.05

Notes:

The Sample Level references the typical well depth configuration
All results are expressed in micrograms per liter (µg/l)
DNT analysis was performed by CT Laboratories
D = Duplicate sample
J = Analytical result is between the Limit of Detection (LOD) and Limit of Quantitation (LOQ)
NE = Not Established
Chapter NR 140 PAL - Chapter NR 140, Wisconsin Administrative Code, Preventive Action Limit (bold values)
Chapter NR 140 ES - Chapter NR 140, Wisconsin Administrative Code, Enforcement Standard (bold & underline values)