



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

November 13, 2017

SUBJECT: Submittal of October 2017 Groundwater Data
Dinitrotoluene Breakdown Products Sampling
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) October 2017 Dinitrotoluene Breakdown Products Sampling Groundwater Data. This was a special sampling event conducted in accordance with the Dinitrotoluene Breakdown Products Sampling Plan dated June 22, 2017. On April 4, 2017, the Wisconsin Department of Health Services (WDHS) issued interim drinking water health advisory levels (HALs) for five (5) dinitrotoluene (DNT) breakdown products (see below).

Compound	Health Advisory Level
2-Nitroaniline	100 µg/l
3- and 4-Nitroaniline (combined)	2 µg/l
2,4-Diaminotoluene	0.01 µg/l
2,6-Diaminotoluene	300 µg/l

CT Laboratories, LLC (CT Lab) of Baraboo, Wisconsin conducted a method detection limit (MDL) study for the DNT breakdown products listed above. The MDL study was conducted in accordance with current WDNR lab certification guidance. CT Lab obtained standards of known concentrations for the DNT breakdown products. These standards were used to calibrate the analytical instrumentation. A gas chromatograph with a mass spectrometer detector (GC/MS) was utilized to run method SW8270DSIM. 2-Nitroaniline, 3-nitroaniline, and 4-nitroaniline could be extracted well and had a good GC/MS instrument response. CT Lab could get GC/MS peak separation for 3- and 4-nitroaniline; therefore, they did not need to report them as a co-eluting pair. Conversely, the 2,4-diaminotoluene and 2,6-diaminotoluene compounds did not extract well and had a poor GC/MS instrument response. CT Lab was required, because of these factors, to spike 2,4-diaminotoluene and 2,6-diaminotoluene at a higher concentration than the nitroanilines. This caused their detection limits to be higher. CT Lab was also not able to get GC/MS peak separation of 2,4-diaminotoluene and 2,6-diaminotoluene, thus requiring these compounds be reported as a co-eluting pair. The detection limit for 2,4 & 2,6-diaminotoluene (combined) was determined to be 1.1 µg/l (micrograms per liter). The results of the MDL study are shown below.

Compound	MDL (Detection Limit)
2-Nitroaniline	0.12 µg/l
3-Nitroaniline	0.10 µg/l
4-Nitroaniline	0.11 µg/l
2,4 & 2,6-Diaminotoluene (combined)	1.1 µg/l

SpecPro Professional Services, LLC (SPS) collected groundwater samples from 17 monitoring wells and three (3) residential wells associated with the Central Plume, Deterrent Burning Ground Plume, Nitrocellulose Production Area Plume, and Propellant Burning Ground Plume. The groundwater samples were collected on October 16 and 17, 2017. The enclosed files contain the signed Environmental Monitoring Data Certification Forms, a list of wells sampled, and a map showing the well locations.

The following five (5) DNT breakdown products were analyzed: 2-nitroaniline, 3-nitroaniline, 4-nitroaniline, and 2,4 & 2,6-diaminotoluene (combined).

No DNT breakdown products were detected above an interim drinking water HAL. 2-Nitroaniline was detected in seven monitoring wells (DBM-8201, DBM-8202, DBN-1001B, PBM-0002, PBM-0008, PBN-8202A, and PBN-8202C) with the detections ranging from 0.12 to 0.6 µg/l. The monitoring wells with detections were adjacent to the source areas, Deterrent Burning Ground or Propellant Burning Ground. No detections were found in monitoring wells or residential wells downgradient of the source areas.

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 Lab. 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,

SITTON.ROBERT
.MICHAEL.1092
435268

Digitally signed by
SITTON.ROBERT.MICHAEL
1092435268
Date: 2017.11.14 09:32:54
-06'00

Robert M. Sitton
Commander's Representative

Enclosures

Copy furn: Roger Walton, Contracting Officer's Representative

Notice: Personally identifiable information collected will be used for program administration and enforcement purposes. The Department may also provide this information to requesters as required under Wisconsin's Open Records law, ss. 19.31 to 19.39, Wis. Stats. When submitting monitoring data, the owner or operator of the facility, practice or activity is required to notify the Department in writing that a groundwater standard or an explosive gas level has been attained or exceeded, as specified in ss. NR 140.24(1)(a); NR 140.26(1)(a); NR 507.30NR 635.14(9)(a); NR 635.18(20) and NR 507.30, Wis. Adm. Code. Failure to report may result in fines, forfeitures or other penalties resulting from enforcement under ss. 289.97, 291.97 or 299.95, Wis. Stats.

Instructions:

- Prepare one form for each license or monitoring ID.
- Please type or print legibly.
- Attach a notification of any values that attain or exceed groundwater standards (that is, preventive action limits, enforcement standards or alternative concentration limits). The notification must include a preliminary analysis of the cause and significance of each value.
- Attach a notification of any gas values that attain or exceed explosive gas levels.
- Send the original signed form, any notification, and Electronic Data Deliverable [EDD] to: GEMS Data Submittal Contact - WA/5
Bureau of Waste Management
Wisconsin Department of Natural Resources
101 South Webster Street
Madison WI 53707-7921

Monitoring Data Submittal Information

Name of entity submitting data (laboratory, consultant, facility owner):

SpecPro Professional Services - Badger Army Ammunition Plant

Contact for questions about data formatting. Include data preparer's name, telephone number and E-mail address:

Name: Joel Janssen

Phone: (608) 438-1110

E-mail: Joel.Janssen@SpecProSvc.com

Facility name:	License # / Monitoring ID	Facility ID [FID]	Actual sampling dates (e.g., July 2-6, 2003)
BAAP - Landfill #5	02813	157005530	10/16/17

The enclosed results are for sampling required in the month(s) of: (e.g., June 2003)

October 2017

Type of Data Submitted (Check all that apply)

- | | |
|---|--|
| <input checked="" type="checkbox"/> Groundwater monitoring data from monitoring wells | <input type="checkbox"/> Gas monitoring data |
| <input type="checkbox"/> Groundwater monitoring data from private water supply wells | <input type="checkbox"/> Air monitoring data |
| <input type="checkbox"/> Leachate monitoring data | <input type="checkbox"/> Other (specify) _____ |

Notification attached?

- No. No groundwater standards or explosive gas limits were exceeded.
- Yes, a notification of values exceeding a groundwater standard is attached. It includes a list of monitoring points, dates, sample values, groundwater standard and preliminary analysis of the cause and significance of any concentration.
- Yes, a notification of values exceeding an explosive gas limit is attached. It includes the monitoring points, dates, sample values and explosive gas limits.

Certification

To the best of my knowledge, the information reported and statements made on this data submittal and attachments are true and correct. Furthermore, I have attached complete notification of any sampling values meeting or exceeding groundwater standards or explosive gas levels, and a preliminary analysis of the cause and significance of concentrations exceeding groundwater standards.

Joel Janssen

Project Manager

(608) 438-1110

Facility Representative Name (Print)

Title

(Area Code) Telephone No.

Signature

Date

FOR DNR USE ONLY. Check action taken, and record date and your initials. Describe on back side if necessary.

Found uploading problems on _____ Initials _____

Notified contact of problems on _____ Uploaded data successfully on _____

EDD format(s): Diskette CD (initial submittal and follow-up) E-mail (follow-up only) Other _____

Case Narrative
Groundwater Monitoring
License Number 2813
Landfill #5
October 2017
Badger Army Ammunition Plant

Groundwater is currently being monitored by the facility because of past production activities.

No compounds were detected in the three (3) monitoring wells sampled.

Dinitrotoluene (DNT) breakdown products were laboratory analyzed by CT Laboratories using method SW 8270D SIM. The following five (5) DNT breakdown products were reported: 2-nitroaniline, 3-nitroaniline, 4-nitroaniline, 2,4-diaminotoluene, and 2,6-diaminotoluene. These DNT breakdown products do not have a NR 140 groundwater standard.

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Bureau of Waste Management
Wisconsin Department of Natural Resources
101 South Webster Street
Madison WI 53707-7921

Monitoring Data Submittal Information

Name of entity submitting data (laboratory, consultant, facility owner):

SpecPro Professional Services - Badger Army Ammunition Plant

Contact for questions about data formatting. Include data preparer's name, telephone number and E-mail address:

Name: Joel Janssen

Phone: (608) 438-1110

E-mail: Joel.Janssen@SpecProSvc.com

Facility name:	License # / Monitoring ID	Facility ID [FID]	Actual sampling dates (e.g., July 2-6, 2003)
BAAP - Propellant Burning Grounds	02814	157005420	10/16 - 10/17/17

The enclosed results are for sampling required in the month(s) of: (e.g., June 2003)

October 2017

Type of Data Submitted (Check all that apply)

- | | |
|---|--|
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Joel Janssen

Project Manager

(608) 438-1110

Facility Representative Name (Print)

Title

(Area Code) Telephone No.

Signature

Date

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EDD format(s): Diskette CD (initial submittal and follow-up) E-mail (follow-up only) Other _____

Case Narrative
Groundwater Monitoring
License Number 2814
Propellant Burning Grounds
October 2017
Badger Army Ammunition Plant

Groundwater is currently being monitored by the facility because of past production activities.

Seven (7) monitoring wells were sampled during this round. 2-Nitroaniline was detected in PBM-0002, PBM-0008, PBN-8202A, and PBN-8202C. There were no exceedances as there is not a NR 140 groundwater standard for 2-nitroaniline.

Dinitrotoluene (DNT) breakdown products were laboratory analyzed by CT Laboratories using method SW 8270D SIM. The following five (5) DNT breakdown products were reported: 2-nitroaniline, 3-nitroaniline, 4-nitroaniline, 2,4-diaminotoluene, and 2,6-diaminotoluene. These DNT breakdown products do not have a NR 140 groundwater standard.

SpecPro Professional Services, LLC

Badger Army Ammunition Plant

October 2017

GROUNDWATER MONITORING ALL HITS REPORT

License No: 2814

Report Date: 11/7/2017

Parameter Name	Well	Well Name	Date	Dup	Result	LOD	LOQ	Units	PAL	ES
2-Nitroaniline	368	PBM-0002	10/17/2017	1	0.48	0.13	0.53	ug/l		
2-Nitroaniline	374	PBM-0008	10/17/2017	1	0.6	0.13	0.53	ug/l		
2-Nitroaniline	613	PBN-8202A	10/17/2017	1	0.25	0.12	0.51	ug/l		
2-Nitroaniline	615	PBN-8202C	10/17/2017	1	0.13	0.12	0.5	ug/l		

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Contact for questions about data formatting. Include data preparer's name, telephone number and E-mail address:

Name: Joel Janssen

Phone: (608) 438-1110

E-mail: Joel.Janssen@SpecProSvcS.com

Facility name:	License # / Monitoring ID	Facility ID [FID]	Actual sampling dates (e.g., July 2-6, 2003)
BAAP - Deterrent Burning Grounds	03037	157065260	10/16/17

The enclosed results are for sampling required in the month(s) of: (e.g., June 2003)

October 2017

Type of Data Submitted (Check all that apply)

- | | |
|---|--|
| <input checked="" type="checkbox"/> Groundwater monitoring data from monitoring wells | <input type="checkbox"/> Gas monitoring data |
| <input type="checkbox"/> Groundwater monitoring data from private water supply wells | <input type="checkbox"/> Air monitoring data |
| <input type="checkbox"/> Leachate monitoring data | <input type="checkbox"/> Other (specify) _____ |

Notification attached?

- No. No groundwater standards or explosive gas limits were exceeded.
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Joel Janssen

Project Manager

(608) 438-1110

Facility Representative Name (Print)

Title

(Area Code) Telephone No.

Signature

Joel Janssen

Date

11/13/17

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EDD format(s): Diskette CD (initial submittal and follow-up) E-mail (follow-up only) Other

Case Narrative
Groundwater Monitoring
License Number 3037
Deterrent Burning Grounds
October 2017
Badger Army Ammunition Plant

Groundwater is currently being monitored by the facility because of past production activities.

Three (3) monitoring wells were sampled during this round. 2-Nitroaniline was detected in DBM-8201, DBM-8202, and DBN-1001B. There were no exceedances as there is not a NR 140 groundwater standard for 2-nitroaniline.

Dinitrotoluene (DNT) breakdown products were laboratory analyzed by CT Laboratories using method SW 8270D SIM. The following five (5) DNT breakdown products were reported: 2-nitroaniline, 3-nitroaniline, 4-nitroaniline, 2,4-diaminotoluene, and 2,6-diaminotoluene. These DNT breakdown products do not have a NR 140 groundwater standard.

SpecPro Professional Services, LLC

Badger Army Ammunition Plant

October 2017

GROUNDWATER MONITORING ALL HITS REPORT

License No: 3037

Report Date: 11/7/2017

Parameter Name	Well	Well Name	Date	Dup	Result	LOD	LOQ	Units	PAL	ES
2-Nitroaniline	301	DBM-8201	10/16/2017	1	0.34	0.12	0.5	ug/l		
2-Nitroaniline	302	DBM-8202	10/16/2017	1	0.12	0.12	0.51	ug/l		
2-Nitroaniline	472	DBN-1001B	10/16/2017	1	0.24	0.12	0.5	ug/l		

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Name: Joel Janssen

Phone: (608) 438-1110

E-mail: Joel.Janssen@SpecProSvcS.com

Facility name:	License # / Monitoring ID	Facility ID [FID]	Actual sampling dates (e.g., July 2-6, 2003)
BAAP - Nitroglycerine Pond/Rocket Paste Area	03487	157005530	10/16/17

The enclosed results are for sampling required in the month(s) of: (e.g., June 2003)

October 2017

Type of Data Submitted (Check all that apply)

- | | |
|---|--|
| <input checked="" type="checkbox"/> Groundwater monitoring data from monitoring wells | <input type="checkbox"/> Gas monitoring data |
| <input type="checkbox"/> Groundwater monitoring data from private water supply wells | <input type="checkbox"/> Air monitoring data |
| <input type="checkbox"/> Leachate monitoring data | <input type="checkbox"/> Other (specify) _____ |

Notification attached?

- No. No groundwater standards or explosive gas limits were exceeded.
- Yes, a notification of values exceeding a groundwater standard is attached. It includes a list of monitoring points, dates, sample values, groundwater standard and preliminary analysis of the cause and significance of any concentration.
- Yes, a notification of values exceeding an explosive gas limit is attached. It includes the monitoring points, dates, sample values and explosive gas limits.

Certification

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Joel Janssen

Project Manager

(608) 438-1110

Facility Representative Name (Print)

Title

(Area Code) Telephone No.

Signature

Date

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EDD format(s): Diskette CD (initial submittal and follow-up) E-mail (follow-up only) Other _____

Case Narrative
Groundwater Monitoring
License Number 3487
Nitroglycerine Pond/Rocket Paste Area
October 2017
Badger Army Ammunition Plant

Groundwater is currently being monitored by the facility because of past production activities.

No compounds were detected in the two (2) monitoring wells sampled.

Dinitrotoluene (DNT) breakdown products were laboratory analyzed by CT Laboratories using method SW 8270D SIM. The following five (5) DNT breakdown products were reported: 2-nitroaniline, 3-nitroaniline, 4-nitroaniline, 2,4-diaminotoluene, and 2,6-diaminotoluene. These DNT breakdown products do not have a NR 140 groundwater standard.

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E-mail: Joel.Janssen@SpecProSvc.com

Facility name:	License # / Monitoring ID	Facility ID [FID]	Actual sampling dates (e.g., July 2-6, 2003)
BAAP - Off-Site Plume Wells	03493	157005530	10/16/17

The enclosed results are for sampling required in the month(s) of: (e.g., June 2003)

October 2017

Type of Data Submitted (Check all that apply)

- | | |
|---|--|
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Joel Janssen

Project Manager

(608) 438-1110

Facility Representative Name (Print)

Title

(Area Code) Telephone No.

Signature

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EDD format(s): Diskette CD (initial submittal and follow-up) E-mail (follow-up only) Other

Case Narrative
Groundwater Monitoring
License Number 3493
Off-Site Plume Wells
October 2017
Badger Army Ammunition Plant

Groundwater is currently being monitored by the facility because of past production activities.

No compounds were detected in the one (1) monitoring well sampled.

Dinitrotoluene (DNT) breakdown products were laboratory analyzed by CT Laboratories using method SW 8270D SIM. The following five (5) DNT breakdown products were reported: 2-nitroaniline, 3-nitroaniline, 4-nitroaniline, 2,4-diaminotoluene, and 2,6-diaminotoluene. These DNT breakdown products do not have a NR 140 groundwater standard.

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E-mail: Joel.Janssen@SpecProSvc.com

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BAAP - Off-Site Residential Wells	03497	157005530	10/16 - 10/17/17

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To the best of my knowledge, the information reported and statements made on this data submittal and attachments are true and correct. Furthermore, I have attached complete notification of any sampling values meeting or exceeding groundwater standards or explosive gas levels, and a preliminary analysis of the cause and significance of concentrations exceeding groundwater standards.

Joel Janssen

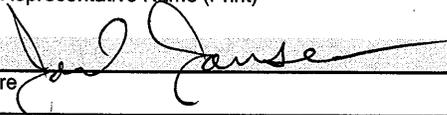
Project Manager

(608) 438-1110

Facility Representative Name (Print)

Title

(Area Code) Telephone No.

Signature 

Date 11/13/17

FOR DNR USE ONLY. Check action taken, and record date and your initials. Describe on back side if necessary.

Found uploading problems on _____ Initials _____

Notified contact of problems on _____ Uploaded data successfully on _____

EDD format(s): Diskette CD (initial submittal and follow-up) E-mail (follow-up only) Other

Case Narrative
Groundwater Monitoring
License Number 3497
Off-Site Residential Wells
October 2017
Badger Army Ammunition Plant

Groundwater is currently being monitored by the facility because of past production activities.

No compounds were detected in the three (3) residential wells sampled.

Dinitrotoluene (DNT) breakdown products were laboratory analyzed by CT Laboratories using method SW 8270D SIM. The following five (5) DNT breakdown products were reported: 2-nitroaniline, 3-nitroaniline, 4-nitroaniline, 2,4-diaminotoluene, and 2,6-diaminotoluene. These DNT breakdown products do not have a NR 140 groundwater standard.

Notice: Personally identifiable information collected will be used for program administration and enforcement purposes. The Department may also provide this information to requesters as required under Wisconsin's Open Records law, ss. 19.31 to 19.39, Wis. Stats. When submitting monitoring data, the owner or operator of the facility, practice or activity is required to notify the Department in writing that a groundwater standard or an explosive gas level has been attained or exceeded, as specified in ss. NR 140.24(1)(a); NR 140.26(1)(a); NR 507.30NR 635.14(9)(a); NR 635.18(20) and NR 507.30, Wis. Adm. Code. Failure to report may result in fines, forfeitures or other penalties resulting from enforcement under ss. 289.97, 291.97 or 299.95, Wis. Stats.

Instructions:

- Prepare one form for each license or monitoring ID.
- Please type or print legibly.
- Attach a notification of any values that attain or exceed groundwater standards (that is, preventive action limits, enforcement standards or alternative concentration limits). The notification must include a preliminary analysis of the cause and significance of each value.
- Attach a notification of any gas values that attain or exceed explosive gas levels.
- Send the original signed form, any notification, and Electronic Data Deliverable [EDD] to: GEMS Data Submittal Contact - WA/5

Bureau of Waste Management
Wisconsin Department of Natural Resources
101 South Webster Street
Madison WI 53707-7921

Monitoring Data Submittal Information

Name of entity submitting data (laboratory, consultant, facility owner):

SpecPro Professional Services - Badger Army Ammunition Plant

Contact for questions about data formatting. Include data preparer's name, telephone number and E-mail address:

Name: Joel Janssen

Phone: (608) 438-1110

E-mail: Joel.Janssen@SpecProSvc.com

Facility name:	License # / Monitoring ID	Facility ID [FID]	Actual sampling dates (e.g., July 2-6, 2003)
BAAP - Southeast Area	04330	157005530	10/16/17

The enclosed results are for sampling required in the month(s) of: (e.g., June 2003)

October 2017

Type of Data Submitted (Check all that apply)

- | | |
|---|--|
| <input checked="" type="checkbox"/> Groundwater monitoring data from monitoring wells | <input type="checkbox"/> Gas monitoring data |
| <input type="checkbox"/> Groundwater monitoring data from private water supply wells | <input type="checkbox"/> Air monitoring data |
| <input type="checkbox"/> Leachate monitoring data | <input type="checkbox"/> Other (specify) _____ |

Notification attached?

- No. No groundwater standards or explosive gas limits were exceeded.
- Yes, a notification of values exceeding a groundwater standard is attached. It includes a list of monitoring points, dates, sample values, groundwater standard and preliminary analysis of the cause and significance of any concentration.
- Yes, a notification of values exceeding an explosive gas limit is attached. It includes the monitoring points, dates, sample values and explosive gas limits.

Certification

To the best of my knowledge, the information reported and statements made on this data submittal and attachments are true and correct. Furthermore, I have attached complete notification of any sampling values meeting or exceeding groundwater standards or explosive gas levels, and a preliminary analysis of the cause and significance of concentrations exceeding groundwater standards.

Joel Janssen

Project Manager

(608) 438-1110

Facility Representative Name (Print)

Title

(Area Code) Telephone No.

Signature

Date

FOR DNR USE ONLY. Check action taken, and record date and your initials. Describe on back side if necessary.

- Found uploading problems on _____ Initials _____
- Notified contact of problems on _____ Uploaded data successfully on _____

EDD format(s): Diskette CD (initial submittal and follow-up) E-mail (follow-up only) Other

Case Narrative
Groundwater Monitoring
License Number 4330
Southeast Area
October 2017
Badger Army Ammunition Plant

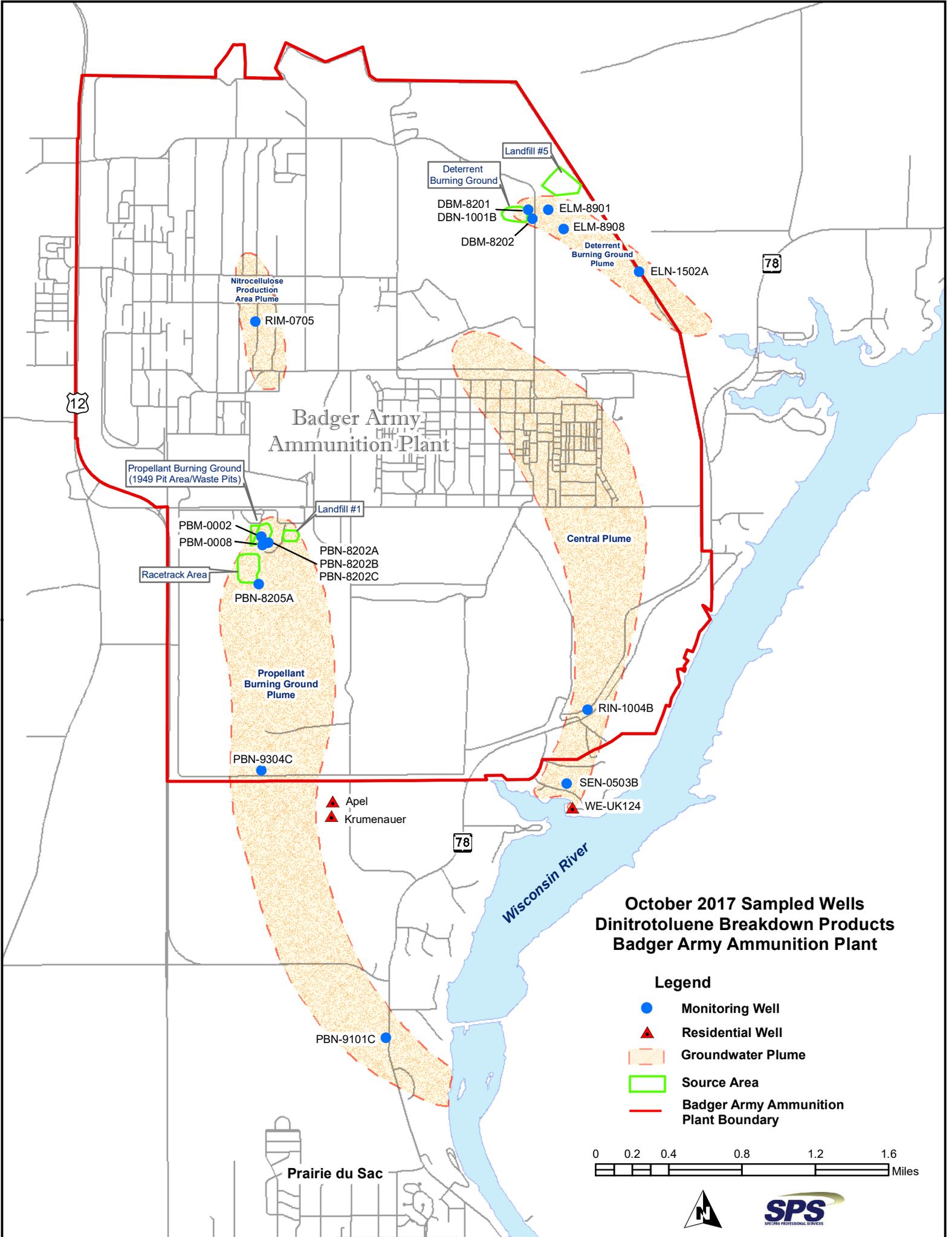
Groundwater is currently being monitored by the facility because of past production activities.

No compounds were detected in the one (1) monitoring well sampled.

Dinitrotoluene (DNT) breakdown products were laboratory analyzed by CT Laboratories using method SW 8270D SIM. The following five (5) DNT breakdown products were reported: 2-nitroaniline, 3-nitroaniline, 4-nitroaniline, 2,4-diaminotoluene, and 2,6-diaminotoluene. These DNT breakdown products do not have a NR 140 groundwater standard.

October 2017
Badger Army Ammunition Plant
Sampled Wells List

<u>License Area</u>	<u>Well ID</u>	<u>Reporting Name</u>	<u>Date</u>
2813	216	ELM-8901	10/16/17
2813	221	ELM-8908	10/16/17
2813	533	ELN-1502A	10/16/17
2814	368	PBM-0002	10/17/17
2814	374	PBM-0008	10/17/17
2814	613	PBN-8202A	10/17/17
2814	614	PBN-8202B	10/17/17
2814	615	PBN-8202C	10/17/17
2814	622	PBN-8205A	10/16/17
2814	686	PBN-9304C	10/16/17
3037	301	DBM-8201	10/16/17
3037	302	DBM-8202	10/16/17
3037	472	DBN-1001B	10/16/17
3487	442	RIM-0705	10/16/17
3487	498	RIN-1004B	10/16/17
3493	561	PBN-9101C	10/16/17
3497	432	WE-UK124	10/16/17
3497	875	Krumenauer	10/17/17
3497	998	Apel	10/17/17
4330	586	SEN-0503B	10/16/17



**October 2017 Sampled Wells
Dinitrotoluene Breakdown Products
Badger Army Ammunition Plant**

Legend

- Monitoring Well
- ▲ Residential Well
- Groundwater Plume
- Source Area
- Badger Army Ammunition Plant Boundary

