ARCADIS Design & Consultancy for natural and built assets

BADGER ARMY AMMUNITION PLANT

PFAS Public Meeting Presentation

5 December 2019

2018 Badger PFAS PA/SI Overview

ARCADIS Design & Consultancy for natural and built assets

Preliminary Assessment (PA) Activities

- Historical Records Research
  - 24 historical documents reviewed of former activities conducted at Badger
  - 11 areas investigated
- Interviews Conducted
  - Joel Janssen, Program Manager with SpecPro Professional Services, LLC
  - Verlyn Mueller, Archivist/Curator at Museum of Badger Army Ammunition and former employee
- Site Reconnaissance during SI Activities in 2018
  - Majority of BAAP is open fields with minimal infrastructure

Areas of Potential Interest Identified

- **Firefighter Training Area (FFTA)**
  - Two fire training areas in the northwestern portion of Badger
  - Operational during the AFFF usage timeframe
- **Landfill 3646**
  - Received potential PFAS-containing soil excavated from the FFTA in 2011
- **Propellant Burning Ground (PBG)**
  - Located in the southwestern portion of Badger

Groundwater Sampling Methods

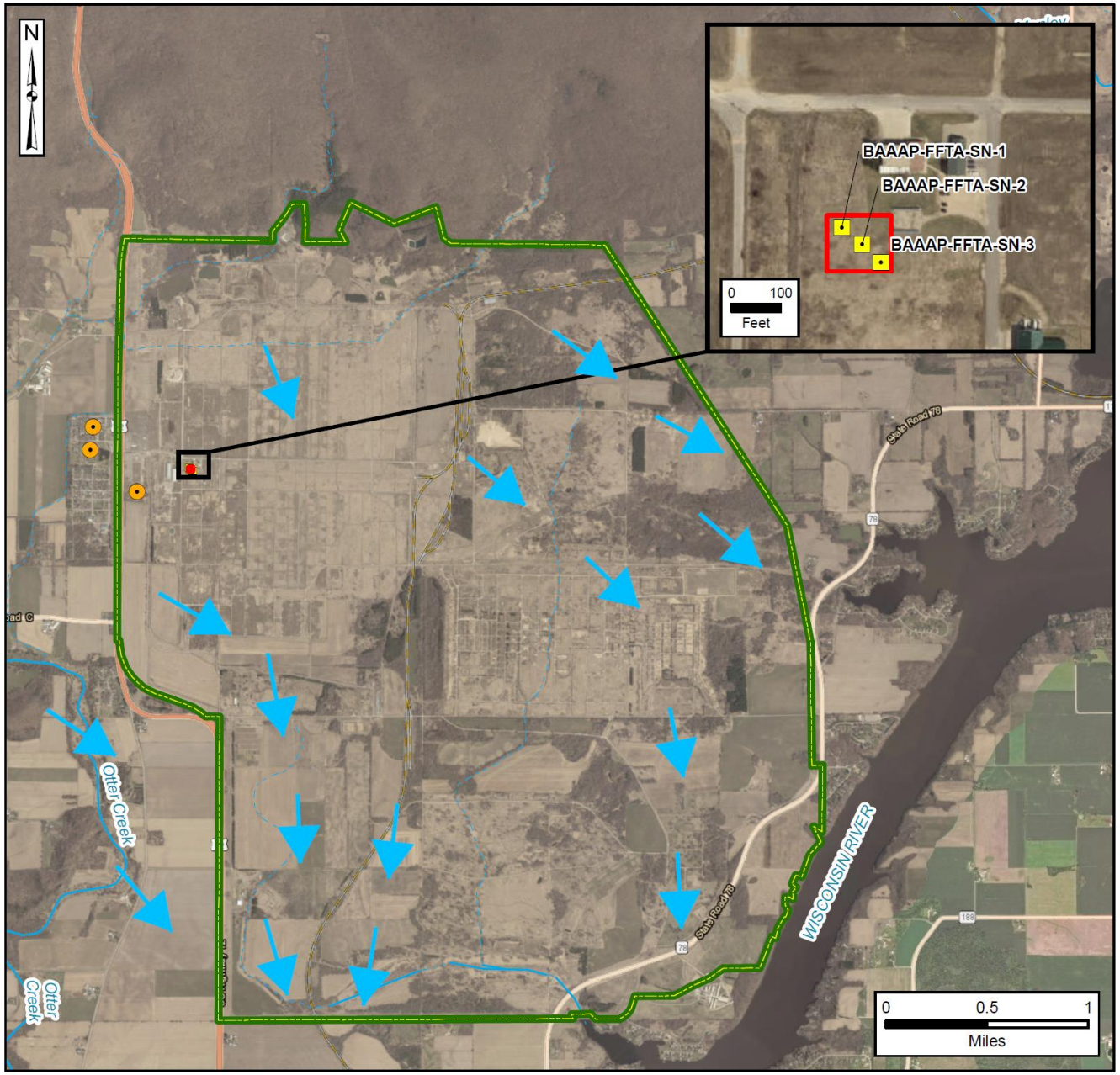
- Each monitoring well is equipped with a dedicated pump and tubing. These pumps are utilized during the various groundwater monitoring events at Badger.
- The dedicated tubing in each well is lined with teflon, which is known to contain PFAS.
- This teflon lined tubing could result in a false positive in the groundwater samples. To ensure representative samples, the pumps and tubing were removed from the wells prior to PFAS sampling activities.
- In addition, 10 well volumes of water were removed to ensure a representative groundwater sample not affected by the dedicated pumps or tubing.

2018 PFAS Sampling Activities

- Occurred in August/September of 2018.
- Groundwater samples were collected from several existing monitoring wells downgradient from the former fire training area.
- Soil samples were collected from the former fire training area.
- Sediment and surface water samples collected from small pond downgradient of former sludge drying beds.

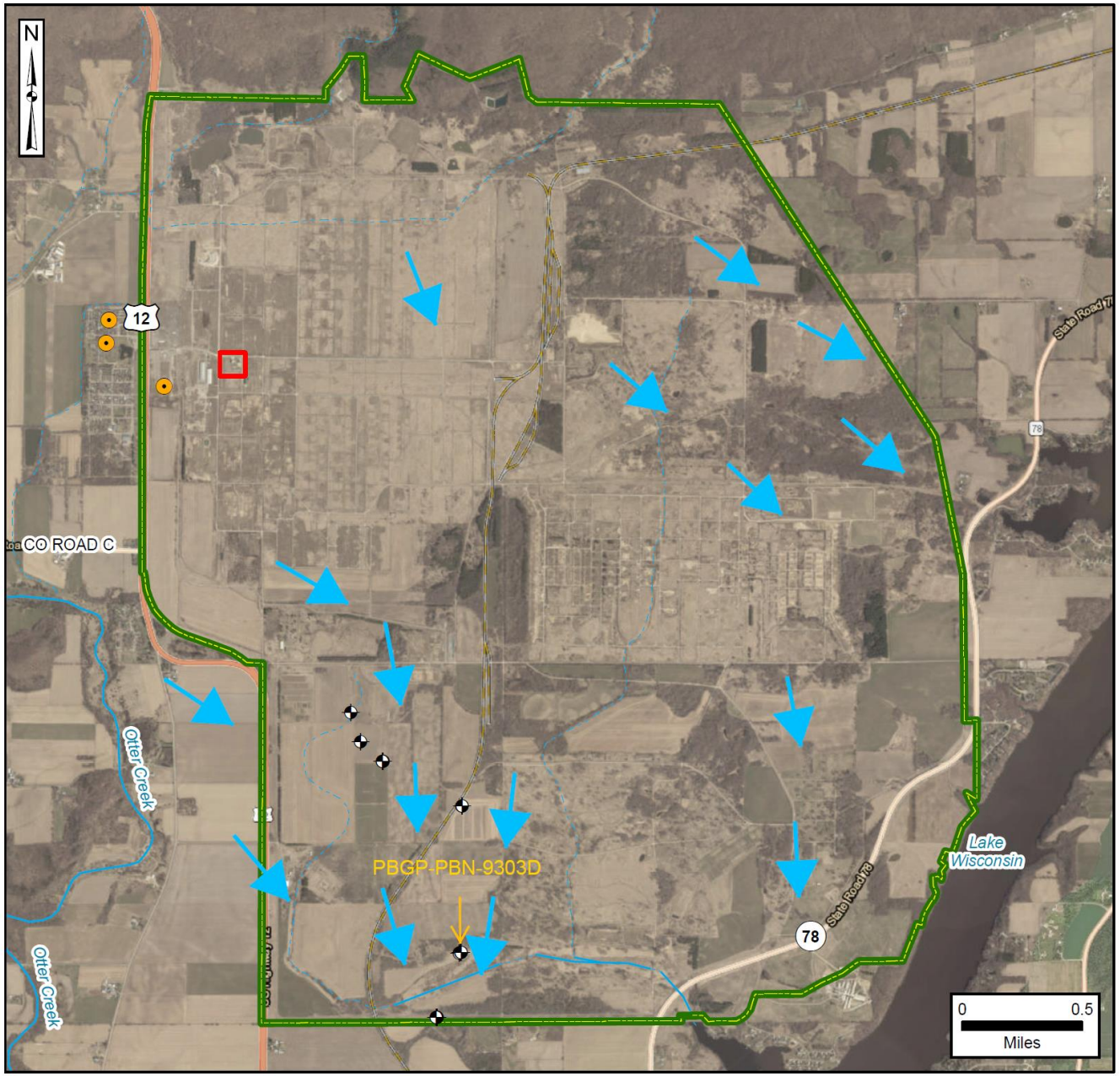
Soil Sampling

- 19 soil samples were collected from 3 locations at the former fire training area.
- 5 sampling intervals had detected PFOS/PFOA concentrations.
- The highest PFOS/PFOA concentration was 5 ppb at the 84 ft interval at SN-1.
- Soil cleanup standards are not promulgated for PFOS/PFOA with the EPA or WDNR at this time.



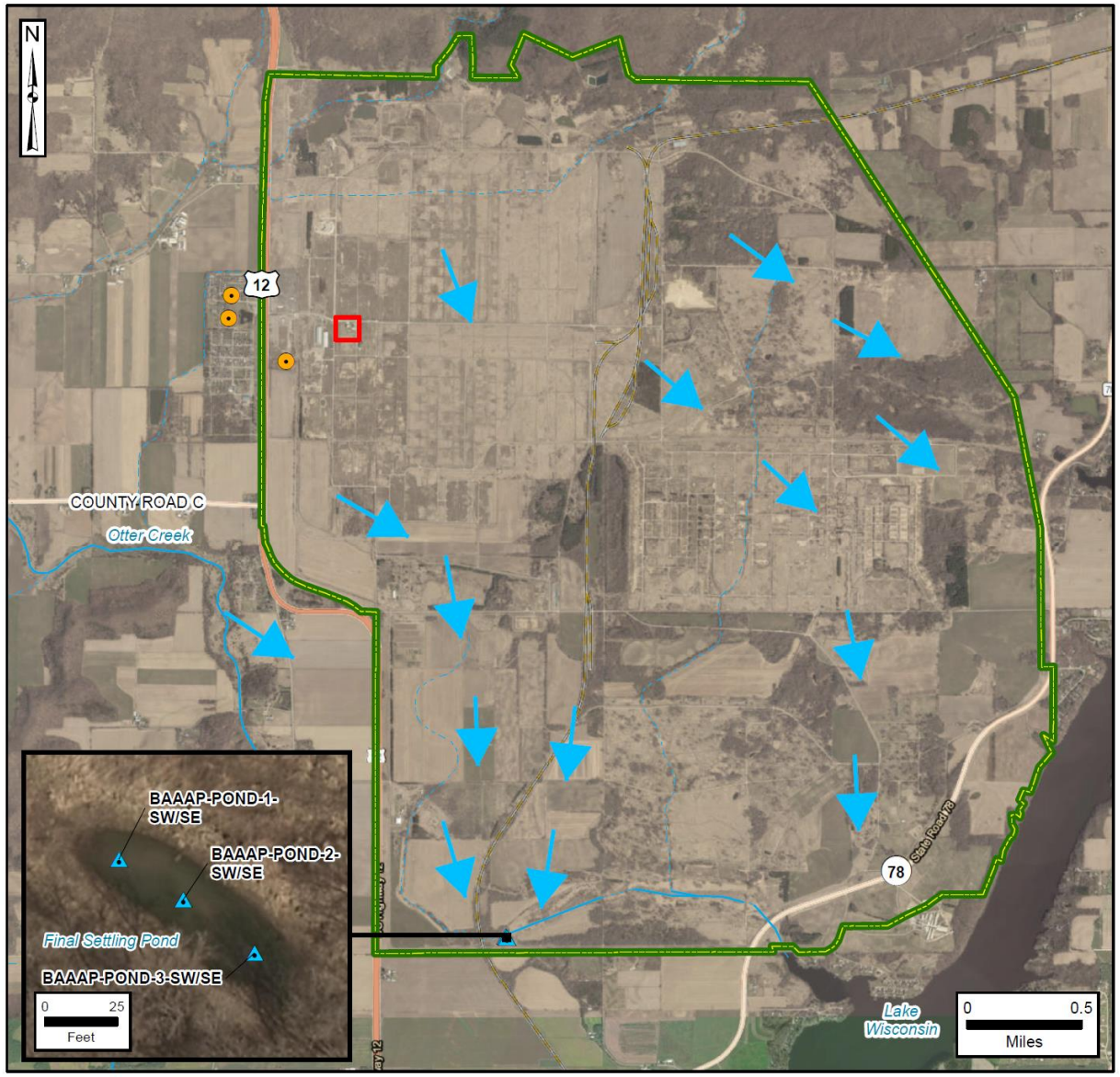
Groundwater Sampling

- Groundwater samples were collected from 17 locations downgradient of the former fire training area.
- PFOS/PFOA was detected at 9 locations above 2 ppt.
- The highest PFOS/PFOA concentration was 19.5 ppt at PBGP-PBN-9303D.
- All samples below USEPA's lifetime Health Advisory Level of PFOS + PFOA = 70 ppt



Sediment and Surface Water Sampling

- 3 surface water and 3 sediment samples were collected from a small pond downgradient of the former sludge drying beds.
- There were no PFOS/PFOA detections in any surface water or sediment samples.



PFOS/PFOA Data

Location	Sample ID	Sample Date	Sample Type	PFOS (ng/L)		PFOA (ng/L)	
				Result	Qualifier	Result	Qualifier
PBGP-PBM-8201	BAAP-PBGP-PBM-8201	09/05/2018	N	0.99	U	0.99	U
PBGP-PBN-1302A	BAAP-PBGP-PBN-1302A	08/31/2018	N	1.5	U	1.5	U
PBGP-PBN-1302B	BAAP-PBGP-PBN-1302B	08/31/2018	N	**3.4**		**1.2**	**J**
PBGP-PBN-1302C	BAAP-PBGP-PBN-1302C	09/04/2018	N	1.1	U	**3.5**	
PBGP-PBN-1302D	BAAP-PBGP-PBN-1302D	08/31/2018	N	1.5	U	1.5	U
PBGP-PBN-8201A	BAAP-PBGP-PBN-8201A	08/29/2018	N	**1.3**	**J**	1.0	U
PBGP-PBN-8201B	BAAP-PBGP-PBN-8201B	08/29/2018	N	1.1	U	**1.6**	**J**
PBGP-PBN-8201C	BAAP-PBGP-PBN-8201C	08/28/2018	N	1.1	U	1.1	U
PBGP-PBN-8205B	BAAP-PBGP-PBN-8205B	08/29/2018	N	1.0	U	1.0	U
PBGP-PBN-9301B	BAAP-PBGP-PBN-9301B	09/04/2018	N	1.0	U	1.0	U
PBGP-PBN-9301C	BAAP-PBGP-PBN-9301C	09/04/2018	N	**1.6**	**J**	**2.0**	
PBGP-PBN-9303B	BAAP-PBGP-PBN-9303B	09/05/2018	N	1.1	U	**1.2**	**J**
PBGP-PBN-9303C	BAAP-PBGP-PBN-9303C	09/05/2018	N	**7.8**		**3.8**	
PBGP-PBN-9303D	BAAP-PBGP-PBN-9303D	09/05/2018	N	**14**		**5.5**	
PBGP-PBM-8203	BAAP-PBGP-PBM-8203	08/30/2018	N	1.0	U	1.0	U
	BAAP-FD-GW-083018FD	08/30/2018	FD	**1.5**	**J**	1.1	U
PBGP-PBN-8205A	BAAP-PBGP-PBN-8205A	08/30/2018	N	1.1	U	1.1	U
PBGP-PBN-8205C	BAAP-PBGP-PBN-8205C	08/30/2018	N	**2.2**		**2.8**	

Other PFAS Data

	Max GW (ng/L)
6:2 Fluorotelomer Sulfonic Acid (6:2 FTSA)	1.7 J
8:2 Fluorotelomer Sulfonic Acid (8:2 FTSA)	ND
N-Ethyl Perfluorooctane Sulfonamidoacetic Acid (EtFOSAA)	4.3
N-Methylperfluoroocatane Sulfonamidoacetic Acid (MeFOSAA)	ND
Perfluorobutane sulfonic acid (PFBS)	ND
Perfluorobutanoic acid (PFBA)	30
Perfluorodecanoic acid (PFDA)	1.1 J
Perfluorododecanoic acid (PFDoA)	ND
Perfluoroheptanoic acid (PFHpA)	2.9
Perfluorohexane sulfonic acid (PFHxS)	1.7 J
Perfluorohexanoic acid (PFHxA)	5.6
Perfluorononanoic acid (PFNA)	1.1 J
Perfluoropentanoic acid (PFPeA)	24
Perfluorotetradecanoic acid (PFTeA)	ND
Perfluorotridecanoic acid (PFTrDA)	ND
Perfluoroundecanoic acid (PFUnA)	ND

No safe drinking water maximum contaminant level or health advisory level exists for these compounds. If properly promulgated state or federal standards are published, the Army has the data necessary to compare to those standards and take appropriate action. Currently there is nothing to compare the results to for other than PFOS, PFOA, or PFBS, so no further action is planned.

Summary

- All groundwater samples collected on-post were below the USEPA health advisory level for PFOS and PFOA.
- Draft PA/SI Report to WDNR by end of December 2019.
- Final PA/SI Report expected in Spring of 2020.

Thank you!

Questions?

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