

**U.S. Geological Survey Summary and Review of “DRAFT FINAL  
Preliminary Assessment/Site Inspection of Per- and Polyfluoroalkyl  
Substances, Badger Army Ammunition Plant Sauk County, Wisconsin,  
November 2019”**

**May 22, 2020**

***Background***

Most of the information included in this Background section was taken directly from the “DRAFT Final Preliminary Assessment/Site Inspection of Per- and Polyfluoroalkyl Substances, Badger Army Ammunition Plant Sauk County, Wisconsin”, hereinafter referred to as the PA/SI.

PFAS is a class of compounds that has been used in a wide range of industrial applications and commercial products due to their unique surface tension/leveling properties. Some common compounds containing PFAS include Teflon® coated cookware, firefighting foams, paints, hydraulic fluids, electronics, textiles, and paper coatings. Due to industry and regulatory concerns about the potential health effects and adverse environmental impacts, there has been a reduction in the manufacture and use of PFAS worldwide. In the U.S., significant reductions in the production, importation, and use of perfluorooctanesulfonic acid (PFOS) and perfluorooctanoic acid (PFOA), two individual compounds in the PFAS class, occurred between 2001 and 2015.

The focus of this Preliminary Assessment (PA) is to identify the locations, or areas of potential interest (AOPIs), where PFAS, specifically PFOS and PFOA, were used and if a suspected release occurred.

The objective of the Site Inspection (SI) is to compile sufficient technically defensible and useful data to verify assumptions made during the PA and determine whether media (groundwater, soil, surface water, and/or sediment) associated with individual AOPIs contain detectable levels of the contaminant of interest. The SI is a limited investigation near suspected sources of contamination to determine if a release has occurred but is not a comprehensive extent-of-contamination survey.

Normally, a SI is performed following the PA. In this case, the PA and SI were done concurrently at Badger Army Ammunition Plant (BAAP) at the request of U.S. Army Environmental Command in August/September of 2018.

## ***Review and General Comments***

- The PA/SI did a very thorough review of available information such as interviews and administrative records and documents to help identify areas of potential PFAS use or storage and areas of potential release of PFAS to the environment at BAAP. The records review is well documented in table 1.
- The areas evaluated for possible PFAS use, storage, and/or potential release to the environment were categorized as either AOPIs or non-AOPIs. Eight non-AOPIs and three AOPIs were identified. Very good descriptions, including history of activities, were provided for each of the AOPIs and non-AOPIs.
- The AOPIs that were identified at BAAP were the Firefighter Training Area (FFTA), Landfill 3646, and the Propellant Burning Ground (PBG) area.
- As part of the SI, sampling was performed at selected areas (AOPIs) with potential to have had PFAS releases. Samples were analyzed for PFOS and PFOA.
  - Nineteen soil samples were collected from three borings at the FFTA. The sampling depths ranged from 5 to 84 feet.
  - Groundwater samples were collected from 17 wells at the PBG. Surface water and sediment samples were collected at three ponds in the PBG area.
  - No soil or groundwater sampling was performed at Landfill 3646.
- Most of the soil sample concentrations were below the limit of detection (LOD). Seven of 19 samples had concentrations above the LOD; the highest concentration in FFTA soil was of 5,000 parts per trillion (ppt). Generally, the samples with detectable concentrations were at the deeper sampling depths. There is no EPA Hazard Advisory Level (HAL) for PFAS soil concentrations.
- PFOS/PFOA concentrations in groundwater samples exceeded the LOD in 6 of the 17 wells sampled. The highest concentration in groundwater was 19.5 ppt near PBG area settling ponds, near the southern boundary of the BAAP. The EPA HAL for groundwater is 70 ppt.
- There were no detections of PFOS/PFOA in sediment or surface water above the LOD.

### *Specific Comments and Questions*

- Based on the type of work that was conducted at BAAP, there could have been fires in the past where PFAS-containing foams were used to put out fires. Is there history of any fires at the plant?
- Page 5 indicates that high volume purge methods were used to collect samples, but page 7, section 4.4.1, indicates low-flow purging was used for collection of field parameters. Perhaps clarify that samples were collected using a high-volume purge.
- Field notes and forms. Suggest that the field forms be filled out. For instance, the MP elevation isn't located on any of these forms so the groundwater elevation can't be easily determined.

### *Recommendations*

- The FFTA soil sample PFAS detections were generally at the deeper depths and from the field notes, it appears that those samples from deeper depths were in saturated conditions. So, PFAS is likely in the groundwater in that area. There are not any monitor wells very close to the FFTA. It is recommended that a groundwater sampling plan be implemented in the FFTA area.
- Landfill 3646 was designated as an AOPI, yet there were no soil or groundwater samples collected in that area. Given the proximity of the Landfill to the path of the Central Plume, the availability of monitor wells downgradient of the landfill, and the presence of numerous residential wells downgradient, it is recommended that some groundwater samples be collected in that area and analyzed for PFAS.
- Although PFAS was not detected in many of the groundwater samples that were collected in the PBG area, the highest concentrations in samples with detections were near the BAAP boundary. Because of the relatively high mobility of PFAS and highly transmissive aquifer system, PFAS compounds might have moved beyond the BAAP boundary and possibly under or beyond the Wisconsin River. It is recommended, as a precautionary measure, to sample for PFAS in selected residential wells and across the River, if possible.