#### Lauridsen, Keld B - DNR

From:	Savale, Michael <michael.savale@tetratech.com></michael.savale@tetratech.com>
Sent:	Monday, July 22, 2024 12:46 PM
То:	Lauridsen, Keld B - DNR
Cc:	Beaulieu, Jacquelyn Marie; Schroedel, Justin Robert
Subject:	2024 PFAS Site Investigation Work Plan (BRRTS #: 02-05-586429)
Attachments:	2024_07_08_2024 Site Investigation Work Plan_GP Broadway Mill.pdf

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Keld,

Please see the attached PFAS Site Investigation Work Plan (SIWP) for the Georgia-Pacific Broadway LLC (GP) facility located at 1919 South Broadway, Green Bay WI. This is the fourth SIWP for the PFAS investigation (BRRTS #: 02-05-586429). The 2024 SIWP includes the completion of up to two soil borings and the installation of up to one monitoring well to further delineate PFAS impacts southwest of the Broadway facility and one round of groundwater PFAS sampling following drilling activities. GP is requesting WDNR concurrence that this SIWP is acceptable. Tetra Tech and GP have identified resources to complete the 2024 SIWP scope the week of August 12, 2024, however, in accordance with NR 716.09(3)(b), GP will not execute the 2024 SIWP scope until the work plan has been approved by the WDNR or 30 days after its receipt by the department.

Please let me know if there are any questions and if a paper copy of the SIWP is required.

Thank you, Mike

Mike Savale | Associate Geologist Direct 734.213.5040 | Mobile 810.923.8076 | michael.savale@tetratech.com

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# 2024 PFAS Site Investigation Work Plan Georgia-Pacific Broadway Facility Green Bay, Wisconsin

#117-031669-24033 July 8, 2024

#### **PRESENTED BY**

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Date 7/8/2024

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### **CERTIFICATION**

Hydrogeologist:

I hereby certify that I am a hydrogeologist as that term is defined in s. NR712.03(1), Wis. Adm. Code, and that, to the best of my knowledge, all information contained in this document is correct and the document was prepared in compliance with all applicable requirements in chs. NR700 to 726, Wis. Adm. Code.

Plank

Chris Bonniwell, Ph.D., LPG Tetra Tech, Inc. 13555 Bishops Court, Suite 201 Brookfield WI 53005

#### **1.0 INTRODUCTION**

On behalf of Georgia-Pacific Broadway LLC (Georgia-Pacific), Tetra Tech, Inc. (Tetra Tech), has prepared this Site Investigation Work Plan (2024 SIWP) to present follow-up activities associated with the investigation of perfluoroalkyl and polyfluoroalkyl substances (PFAS) at the Georgia-Pacific Broadway Facility located at 1919 South Broadway, in Green Bay, Wisconsin, Wisconsin Department of Natural Resources (WDNR) facility identification #405032870 (Site). A site location map is provided in **Figure 1**. This open PFAS case with the WDNR's Remediation and Redevelopment Program is tracked as Bureau for Remediation and Redevelopment Tracking System (BRRTS) # 02-05-586429.

In June 2020, Georgia-Pacific conducted an initial Site PFAS investigation as requested by the WDNR in their November 1, 2019, *PFAS Sampling Requirements, GP Broadway Mill Expansion, 1919 South Broadway, Green Bay, WI, BRRTS #:02-05-583452* letter. The initial investigation determined that PFAS was present in the groundwater, as documented in the *PFAS Investigation Summary Report,* dated August 12, 2020. The WDNR response on October 19, 2020, *Reported Contamination at GP Broadway Mill Expansion – PFAS* letter, requested that a work plan be submitted detailing the further investigation of the PFAS detections. As requested by the WDNR, Georgia-Pacific prepared the *PFAS Site Investigation Work Plan,* dated December 17, 2020 (2020 SIWP), to further investigate the source and extent of PFAS detected at the Site.

In April 2021, the 2020 SIWP was executed. The results were documented in the *Expanded PFAS Investigation Summary Report*, dated June 30, 2021. In this report, Georgia-Pacific proposed actions to further investigate the results of the April 2021 investigation. In an email dated August 19, 2021, the WDNR requested a follow-up round of groundwater sampling from the existing monitoring well network prior to the installation of additional monitoring wells proposed in the June 2021 report. On September 20 through 22, 2021, groundwater samples were collected from the Site monitoring well network in addition to the collection of two surface water samples. Following the September 2021 sampling, Georgia-Pacific prepared the *2022 Site Investigation Work Plan*, dated January 25, 2022 (2022 SIWP), which included the results of the follow-up groundwater sampling and detailed the next steps of the PFAS investigation.

The 2022 SIWP included the installation of additional monitoring wells and two rounds of groundwater PFAS sampling. On May 2 through 6, 2022, additional monitoring well installations and one round of groundwater sampling were completed per the 2022 SIWP. The May 2022 well installations and groundwater monitoring results were documented in the *2022 PFAS Site Investigation Summary Report,* dated August 25, 2022. The second round of groundwater monitoring included in the *2022 SIWP* was conducted on August 1 through 3, 2022. The August 2022 results were reported in the *Investigation Summary Report: August 2022 PFAS Groundwater Sampling and May-June 2022 Soil Sampling for Excavations,* dated November 9, 2022, which proposed follow-up groundwater PFAS sampling to be conducted in the third quarter of 2023. On

August 9 and 10, 2023, the 2023 third quarter groundwater PFAS sampling was conducted. The third quarter 2023 groundwater results were reported in the *2023 Third Quarter Groundwater PFAS Sampling* report, dated November 15, 2023, and are depicted in **Figure 2**.

This SIWP includes the proposed next steps associated with the Site PFAS investigation. All work proposed in this SIWP will be conducted following procedures provided in the 2020 SIWP that was prepared in accordance with the site investigation requirements prescribed in Chapter NR 716 Wisconsin Administrative Code (Wis. Admin. Code). Any planned deviations from the procedures provided in the December 2020 Work Plan will be addressed herein.

#### 2.0 PROPOSED 2024 SCOPE OF WORK

In an email dated November 22, 2023, the WDNR indicated that additional groundwater PFAS delineation may be needed within the southwestern portion of the site, west of monitoring well MW-22-14. This 2024 SIWP includes the completion of up to two soil borings and the installation of one monitoring well to further delineate the extent of PFAS impacts southwest of the Site. In addition, this 2024 SIWP includes third-quarter groundwater PFAS sampling, as proposed in the 2023 Third Quarter Groundwater PFAS Sampling report.

The installation of MW-22-14 was first attempted approximately 250 feet to the northwest at soil boring SB-22-03. At this location, a continuous interval of clay was encountered from 0 to 30 feet below the ground surface (bgs). The location of soil boring SB-22-03 is depicted in **Figure 2** and the SB-22-03 soil boring log is provided as **Appendix A**. The soil borings included in this 2024 SIWP will be completed on Georgia-Pacific property west of MW-22-14 to determine if groundwater is present or if the observed clay interval and absence of shallow groundwater continues in the southwestern portion of the Site. The first soil boring will be completed approximately 280 feet southwest of MW-22-14. If groundwater is encountered at this location within the upper 30 feet bgs, a monitoring well will be installed and a second soil boring location within the upper 30 feet bgs, a monitoring well will be installed. If no groundwater is encountered in the second boring location within the upper 30 feet bgs, a monitoring well will be installed. If no groundwater is encountered in the second soil boring, it can be reasonably concluded that shallow groundwater is not present west MW-22-14. Proposed soil boring locations are depicted in **Figure 3**. The following field activities included in this 2024 SIWP are described further in the following sections:

- Pre-drilling utility clearing
- Collection of continuous soil cores for geologic logging to depths up to 30 feet below ground surface (bgs) or until groundwater is encountered.
- Installation and development of up to one monitoring well.
- Collection of one round of groundwater samples using low-flow techniques for PFAS analysis from the Site monitoring well network including, if installed, the new monitoring well discussed above.

#### 2.1 PRE-DRILLING PREPARATIONS

Prior to advancing soil borings, Tetra Tech will coordinate property access with the property owner, Georgia-Pacific. Utility locating will be completed by utilizing the Wisconsin 811 Diggers Hotline. In addition, knowledgeable Georgia-Pacific personnel will assess each boring location to confirm the absence of underground utilities.

#### 2.2 SOIL BORINGS

The first five feet of each soil boring will be completed using a hand auger. The remainder of each soil boring will be completed using direct push drilling methods. A core barrel assembly will be advanced into the subsurface to obtain continuous soil cores. The soil borings will be advanced down to a depth of 30 feet bgs, or until five feet below the water table, whichever comes first. The exact depth will be determined based on field observations. All non-disposable drilling equipment will be decontaminated following procedures detailed in **Section 2.8**.

As the soil cores are brought to the surface, they will be placed on plastic sheeting and logged by the onsite Tetra Tech geologist. Each soil core will be described including sample recovery and lithology description using the Unified Soil Classification System (USCS). Signs of contamination (staining and odor), moisture content, and other notable observations/information will be noted. Proposed soil boring locations are depicted in **Figure 2**.

WDNR Soil Boring Logs (WDNR Form 4400-122) will be completed for the soil borings. Copies of the forms will be submitted to the WDNR within 60 days after the monitoring wells have been installed per the requirements of s. NR 141.23 Wis. Admin. Code.

#### 2.3 MONITORING WELL INSTALLATION

If groundwater is encountered west of MW-22-14, a monitoring well will be installed in the soil boring location using a hollow stem auger to widen the existing borehole. The monitoring wells will be installed following the procedures and specifications described in Chapter NR 141 Wis. Admin. Code. The monitoring well will be constructed as follows:

- A 2-inch diameter Schedule 40 polyvinyl chloride (PVC) casing with 10 feet of 0.010-inch slot PVC screen will be installed approximately 5 feet below the water table.
- A locking well cap will be installed.
- A sand filter pack will be placed around the casing to a minimum of 2 feet above the well screen. If the depth to groundwater is less than 7 feet bgs, the filter pack height above the top of the well screen will be reduced to 6 inches to accommodate the placement of the annular space seal.
- Two feet of clean fine sand will be placed above the filter pack. If the depth to groundwater is less than 5 bgs, the fine sand thickness will be reduced to allow for a minimum 2-foot-thick bentonite annular space seal.
- A bentonite pellet seal (hydrated in-place) will be placed on top of the fine sand around the casing to the bottom of the flush-mount protective well casing. Per NR 141.13 Wis. Admin. Code, bentonite granules will be used as the annular space seal if the depth to groundwater is less than 7 feet bgs. The ground surface seal around the flush-mount protective well casing will be constructed of concrete.

Following the installation of the monitoring well, it will be developed per the well development requirements specified in s. NR 141.21 Wis. Admin. Code to remove fines from the sand filter pack, well screen, and casing. In addition, a professional survey will be performed to establish the horizontal and vertical location of each soil boring and well location, including the elevation of the top of each well casing. The potential monitoring well locations are depicted in **Figure 3**.

WDNR Monitoring Well Construction Forms (WDNR Form 4400-113A) and Monitoring Well Development Forms (WDNR Form 4400-113B) will be completed for the monitoring well. Copies of the forms will be submitted to the WDNR within 60 days after the monitoring wells have been installed per the requirements of s. NR 141.23 Wis. Admin. Code.

#### 2.4 WATER-LEVEL MEASUREMENT

Depth to water will be measured to 0.01-foot from the new and existing monitoring wells using an electronic water level meter prior to the collection of groundwater samples. The depth to water measurements will be relative to the top of the well casing (at north side) and will be used to determine the direction of groundwater flow across the Site. The depth to water will also be monitored during the purging of the monitoring wells to monitor drawdown during groundwater sampling.

#### 2.5 GROUNDWATER SAMPLING

Following drilling activities, groundwater samples will be collected from the new monitoring well (if installed) and the 14 existing monitoring wells, depicted in **Figure 3.** Groundwater sampling will be performed using a peristaltic pump with high-density polyethylene (HDPE) and silicone tubing. New or dedicated tubing will be used for each monitoring well to avoid cross-contamination between wells.

Prior to sampling, groundwater will be purged using low-flow purging techniques. During the purging of each well, water level drawdown, flow rate, and water quality readings will be recorded. Groundwater will be pumped through a flow-through cell and water quality parameters (pH, conductivity, temperature, dissolved oxygen, oxidation-reduction potential, and turbidity) will be measured with a YSI DSS Pro multi-parameter water quality meter or the equivalent. The instrument will be calibrated according to the manufacturer's specifications before sampling and equipment calibration will be documented in the field staff's field notes. The water quality parameters will be collected at 3-minute intervals until all parameters have stabilized for three consecutive readings and are within the following limits:

- Turbidity (10% if greater than 5 Nephelometric Turbidity Units)
- Dissolved oxygen (10% for values greater than 2 milligrams per Liter (mg/L); 0.5 mg/L for values less than 2 mg/L)

- Specific conductance (3%)
- Temperature (3%)
- pH (0.1 unit)
- Oxidation-reduction potential (10 millivolts)

Drawdown will be maintained at 0.3 feet or less during purging and sampling. If water quality parameters do not stabilize or meet the limits within one hour, three well volumes will be removed from the well and a groundwater sample will be collected.

Groundwater samples will be collected into clean, pre-labeled, laboratory-supplied bottles. The sample containers will be placed in a cooler for shipment to Enthalpy Analytical. Samples will be analyzed for the WDNR list of 33 PFAS presented on the *Wisconsin DNR PFAS Updates*, dated March 1, 2021, using EPA Method 1633.

### 2.6 QUALITY ASSURANCE/QUALITY CONTROL (QA/QC) SAMPLES

QA/QC samples will be collected to ensure PFAS contamination is not introduced to the samples from the drilling equipment or water used for equipment decontamination. QA/QC samples and collection methodology is provided below.

- Drilling Activities
  - One equipment blank sample will be collected from decontaminated drilling tooling. The equipment blank will be collected by pouring laboratory-provided reagent-free water over the decontaminated drilling tooling. The rinsate will be collected and poured into the laboratory-provided containers.
- Sample Collection Events
  - Laboratory blind field duplicate groundwater samples will be collected concurrently with groundwater sample collection at a frequency of one duplicate sample per every ten samples or less.
  - One equipment blank sample will be collected during groundwater sampling. Prior to sample collection, reusable sampling equipment will be decontaminated. Laboratoryprovided reagent-free water will be run through or over disposable sampling equipment (sample tubing and nitrile gloves) and over reusable sampling equipment (water level meter). The rinsate will be collected into laboratory-supplied containers.
  - Field blank samples will be prepared in the field, concurrent with equipment blank sample collection, using laboratory-supplied reagent-free water. The reagent-free water will be poured into laboratory-supplied sample containers. The field blanks will be marked for laboratory hold and will be analyzed if one of the equipment blank samples contains significant levels of PFAS.

The QA/QC samples will be analyzed Enthalpy Analytical for the WDNR list of 33 PFAS presented on the *Wisconsin DNR PFAS Updates*, dated March 1, 2021, using EPA Method 1633.

#### 2.7 SAMPLE HANDLING

Procedures for sample handling, including the field-related considerations concerning sample preservation, packaging, and shipping are described below. Due to the nature of PFAS and its prevalence in many consumer products, special precautions and procedures will be required for the handling, packaging, and shipment of samples analyzed for PFAS. Samples will be collected directly into clean, laboratory-provided containers. Sample container sets will be placed into sealed plastic bags and placed on ice for preservation from the time of collection through shipment to the analytical laboratory. Custody of the samples will be maintained and documented through chain-of-custody forms. Chain-of-custody begins with the collection of the samples in the field and ends at the analytical laboratory receiving department. The samples will be shipped to the analytical laboratory via overnight courier service.

#### 2.8 DECONTAMINATION PROCEDURES

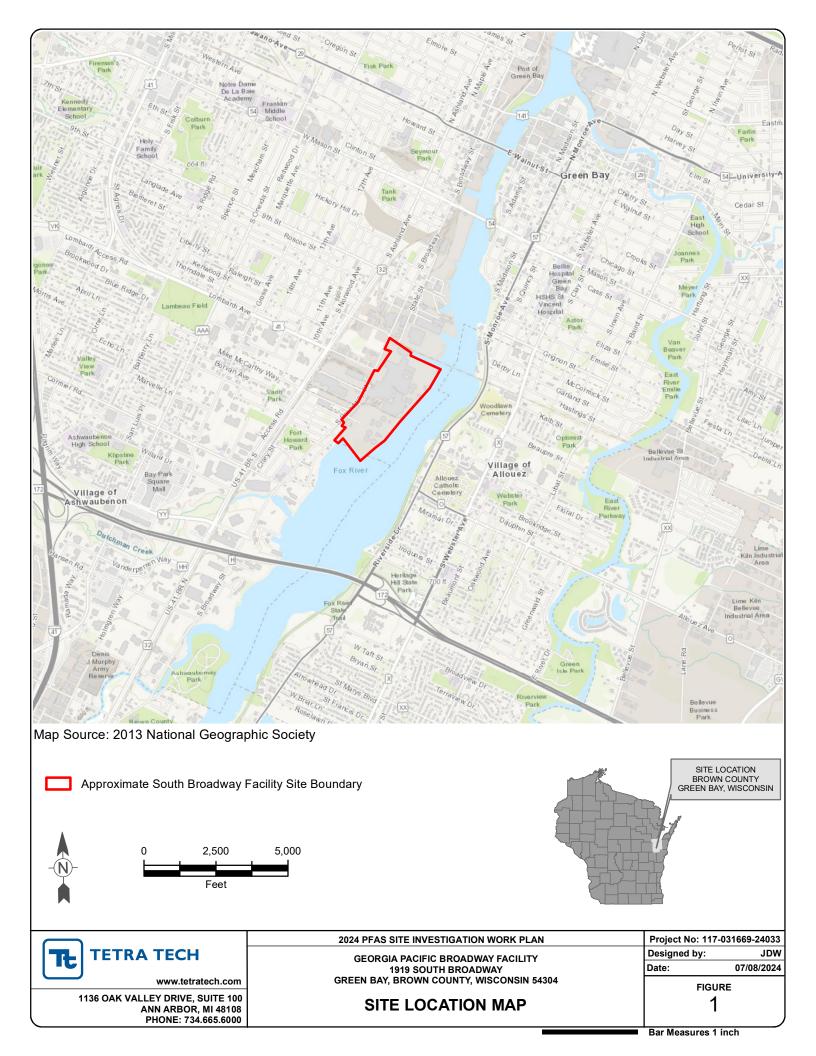
All drilling equipment will be decontaminated before being brought to the work site and between each boring location. All decontamination water will be containerized for offsite disposal. Alconox detergent and a pressure washer will be used with clean water to decontaminate drilling equipment.

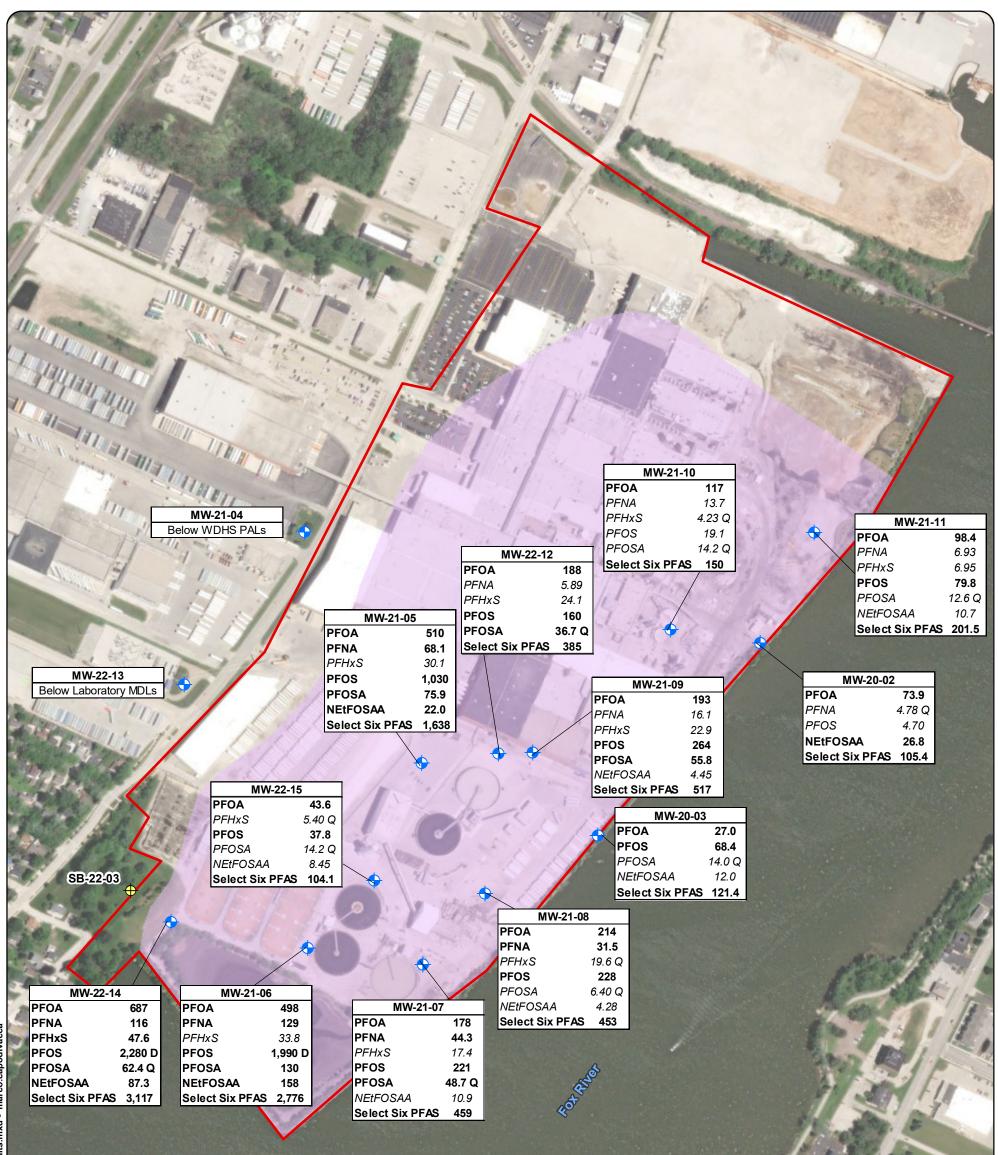
All non-disposable sampling equipment will be decontaminated before use and after each use. Nondisposable sampling equipment will be decontaminated using Alconox detergent and distilled water. All decontamination water will be containerized for off-site disposal.

#### 2.9 INVESTIGATION-DERIVED WASTE MANAGEMENT

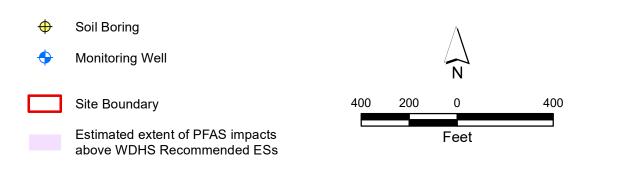
Purge water, decontamination water, and well development water generated during monitoring well installation and groundwater sampling will be containerized and stored in 55-gallon drums. Soil cutting investigation-derived waste (IDW) generated during soil boring advancement and monitoring well installation will be containerized in 55-gallon drums. IDW containers will be properly labeled identifying the contents. While awaiting disposal, IDW will be staged at a location that is agreeable to/and approved by, Georgia-Pacific. IDW will be disposed of in accordance with local, state, and federal regulations.

**FIGURES** 





results.mxd - marco.capodivacca



#### Notes:

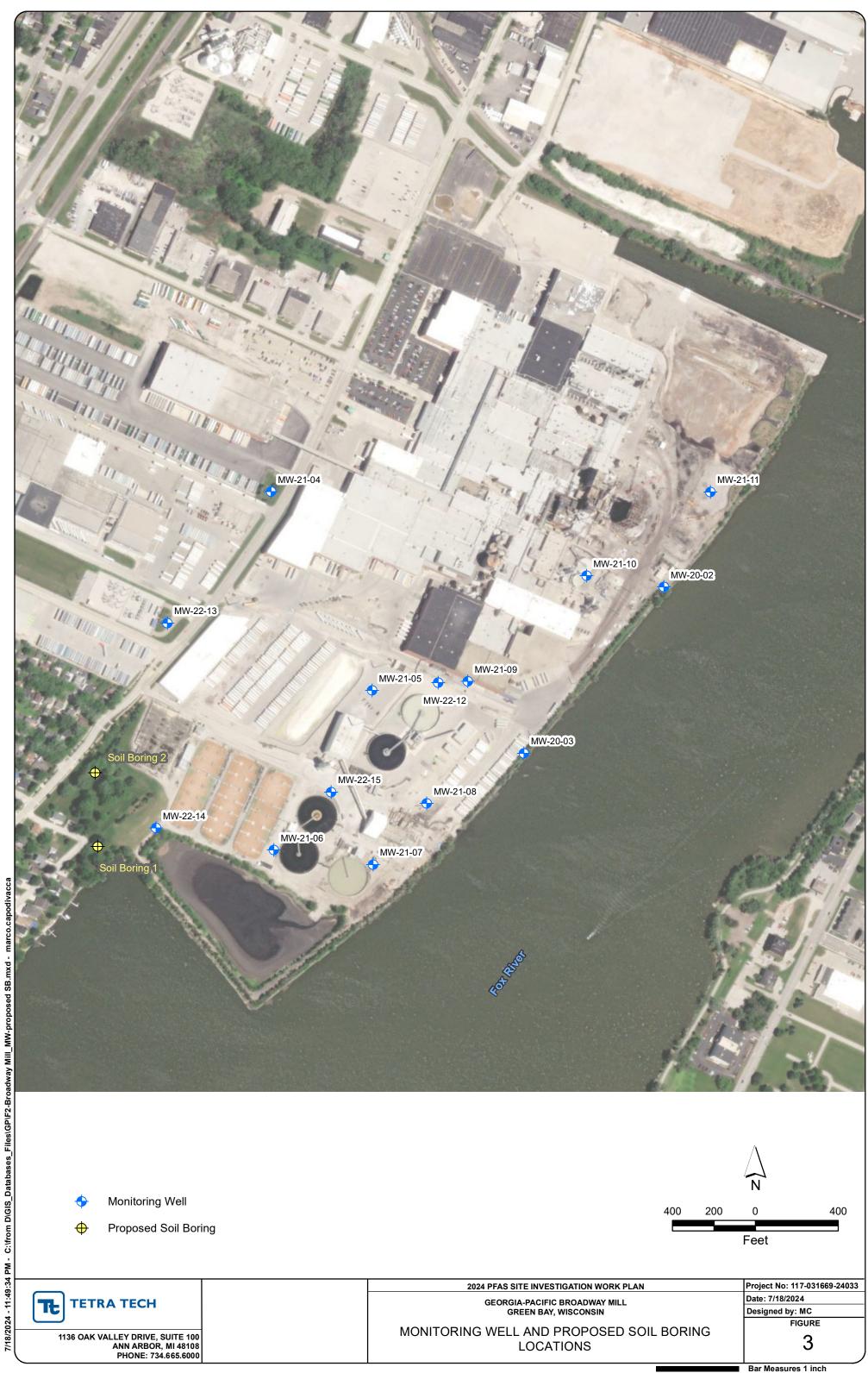
 Posted detections only include PFAS that exceed the Wisconsin Department of Health Services (WDHS) Recommended Preventive Action Limts (PALs) or Recommended Enforcement Standards (ESs) for Groundwater, Updated March 1, 2021.
 Bold font = Results exceed both the WDHS Recommended PAL and the WDHS Recommended ES for Groundwater.
 *Italicized font* = Results exceed the WDHS Recommended PAL for Groundwater.

4. Results are in nanograms per liter (ng/L).

5. MDLs = Method Detection Limits

	2024 PFAS SITE INVESTIGATION WORK PLAN	Project No: 117-031669-24033		
	GEORGIA-PACIFIC BROADWAY MILL	Date: 7/8/2024		
	GREEN BAY, WISCONSIN	Designed by: MC		
		FIGURE		
1136 OAK VALLEY DRIVE, SUITE 100 ANN ARBOR, MI 48108 PHONE: 734.665.6000	AUGUST 2023 GROUNDWATER ANALYTICAL RESULTS	2		

Bar Measures 1 inch



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APPENDIX A SB-22-03 SOIL BORING LOG State of Wisconsin Department of Natural Resources

SOIL BORING LOG INFORMATION	Ν
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Form	4400-1	22
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Rev. 7-98

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Remediation/Redevelopment

Waste Management 
Other

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I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm Tetra Tech	Tel:
		Fax:

This form is authorized by Chapters 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats. Completion of this form is mandatory. Failure to file this form may result in forfeiture of between \$10 and \$25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on this form is not intended to be be used for any other purpose. NOTE: See instructions for more information, including where the completed form should be sent.