

**Notice:** Use this form to request a **written response (on agency letterhead)** from the Department of Natural Resources (DNR) regarding technical assistance, a post-closure change to a site, a specialized agreement or liability clarification for Property with known or suspected environmental contamination. A fee will be required as is authorized by s. 292.55, Wis. Stats., and NR 749, Wis. Adm. Code., unless noted in the instructions below. Personal information collected will be used for administrative purposes and may be provided to requesters to the extent required by Wisconsin's Open Records law [ss. 19.31 - 19.39, Wis. Stats.].

## Definitions

**"Property"** refers to the subject Property that is perceived to have been or has been impacted by the discharge of hazardous substances.

**"Liability Clarification"** refers to a written determination by the Department provided in response to a request made on this form. The response clarifies whether a person is or may become liable for the environmental contamination of a Property, as provided in s. 292.55, Wis. Stats.

**"Technical Assistance"** refers to the Department's assistance or comments on the planning and implementation of an environmental investigation or environmental cleanup on a Property in response to a request made on this form as provided in s. 292.55, Wis. Stats.

**"Post-closure modification"** refers to changes to Property boundaries and/or continuing obligations for Properties or sites that received closure letters for which continuing obligations have been applied or where contamination remains. Many, but not all, of these sites are included on the GIS Registry layer of RR Sites Map to provide public notice of residual contamination and continuing obligations.

## Select the Correct Form

This form should be used to request the following from the DNR:

- Technical Assistance
- Liability Clarification
- Post-Closure Modifications
- Specialized Agreements (tax cancellation, negotiated agreements, etc.)

Do **not** use this form if one of the following applies:

- Request for an **off-site liability exemption or clarification** for Property that has been or is perceived to be contaminated by one or more hazardous substances that originated on another Property containing the source of the contamination. Use DNR's Off-Site Liability Exemption and Liability Clarification Application Form 4400-201.
- Submittal of an Environmental Assessment for the **Lender Liability Exemption**, s 292.21, Wis. Stats., **if no response or review by DNR is requested**. Use the Lender Liability Exemption Environmental Assessment Tracking Form 4400-196.
- Request for an **exemption to develop on a historic fill site** or licensed landfill. Use DNR's Form 4400-226 or 4400-226A.
- **Request for closure** for Property where the investigation and cleanup actions are completed. Use DNR's Case Closure - GIS Registry Form 4400-202.

All forms, publications and additional information are available on the internet at: [dnr.wi.gov/topic/Brownfields/Pubs.html](http://dnr.wi.gov/topic/Brownfields/Pubs.html).

## Instructions

1. Complete sections 1, 2, 6 and 7 for all requests. Be sure to provide adequate and complete information.
2. Select the type of assistance requested: Section 3 for technical assistance or post-closure modifications, Section 4 for a written determination or clarification of environmental liabilities; or Section 5 for a specialized agreement.
3. Include the fee payment that is listed in Section 3, 4, or 5, unless you are a "Voluntary Party" enrolled in the Voluntary Party Liability Exemption Program **and** the questions in Section 2 direct otherwise. Information on to whom and where to send the fee is found in Section 8 of this form.
4. Send the completed request, supporting materials and the fee to the appropriate DNR regional office where the Property is located.

See the map on the last page of this form. A paper copy of the signed form and all reports and supporting materials shall be sent with an electronic copy of the form and supporting materials on a compact disk. For electronic document submittal requirements see: <http://dnr.wi.gov/files/PDF/pubs/rr/RR690.pdf>

The time required for DNR's determination varies depending on the complexity of the site, and the clarity and completeness of the request and supporting documentation.

# Technical Assistance, Environmental Liability Clarification or Post-Closure Modification Request

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## Section 1. Contact and Recipient Information

### Requester Information

This is the person requesting technical assistance or a post-closure modification review, that his or her liability be clarified or a specialized agreement and is identified as the requester in Section 7. DNR will address its response letter to this person.

|  |                           |                   |  |
|--|---------------------------|-------------------|--|
| Last Name<br>Wahl                                | First<br>Scott            | MI                | Organization/ Business Name<br>Tyco Fire Products LP |
| Mailing Address<br>2700 Industrial Parkway South |                           | City<br>Marinette | State<br>WI  |
|  |                           | ZIP Code<br>54143 |  |
| Phone # (include area code)                      | Fax # (include area code) | Email             |  |
|  |                           |                   |  |

The requester listed above: (select all that apply)

- Is currently the owner
  Is considering selling the Property  
 Is renting or leasing the Property
  Is considering acquiring the Property  
 Is a lender with a mortgagee interest in the Property  
 Other. Explain the status of the Property with respect to the applicant:

### Contact Information (to be contacted with questions about this request)

Select if same as requester

|  |                           |                                  |  |
|--|---------------------------|----------------------------------|--|
| Contact Last Name<br>Verburg                         | First<br>Ben              | MI                               | Organization/ Business Name<br>Arcadis |
| Mailing Address<br>126 N Jefferson Street, Suite 400 |                           | City<br>Milwaukee                | State<br>WI                            |
|  |                           | ZIP Code<br>53202                |  |
| Phone # (include area code)<br>(414) 276-7742        | Fax # (include area code) | Email<br>Ben.Verburg@arcadis.com |  |

### Environmental Consultant (if applicable)

|  |                           |                                  |  |
|--|---------------------------|----------------------------------|--|
| Contact Last Name<br>Verburg                         | First<br>Ben              | MI                               | Organization/ Business Name<br>Arcadis |
| Mailing Address<br>126 N Jefferson Street, Suite 400 |                           | City<br>Milwaukee                | State<br>WI                            |
|  |                           | ZIP Code<br>53202                |  |
| Phone # (include area code)<br>(414) 276-7742        | Fax # (include area code) | Email<br>Ben.Verburg@arcadis.com |  |

## Section 2. Property Information

|   |  |
|---|--|
| Property Name<br>Tyco Fire Technology Center - PFCs | FID No. (if known)<br>438005590  |
| BRRTS No. (if known)<br>0238580694                  | Parcel Identification Number   |
| Street Address<br>2700 Industrial Parkway South     | City<br>Marinette  |
|   | State<br>WI  |
|   | ZIP Code<br>54143  |
| County<br>Marinette                                 | Municipality where the Property is located<br><input type="radio"/> City <input type="radio"/> Town <input type="radio"/> Village of Marinette |
|   | Property is composed of:<br><input type="radio"/> Single tax parcel <input type="radio"/> Multiple tax parcels                                 |
|   | Property Size Acres<br>380   |

# Technical Assistance, Environmental Liability Clarification or Post-Closure Modification Request

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1. Is a response needed by a specific date? (e.g., Property closing date) Note: Most requests are completed within 60 days. Please plan accordingly.

No  Yes

Date requested by: \_\_\_\_\_

Reason: \_\_\_\_\_

2. Is the "Requester" enrolled as a Voluntary Party in the Voluntary Party Liability Exemption (VPLE) program?

No. **Include the fee that is required for your request in Section 3, 4 or 5.**

Yes. **Do not include a separate fee.** This request will be billed separately through the VPLE Program.

**Fill out the information in Section 3, 4 or 5 which corresponds with the type of request:**

**Section 3. Technical Assistance or Post-Closure Modifications;**

**Section 4. Liability Clarification; or Section 5. Specialized Agreement.**

## Section 3. Request for Technical Assistance or Post-Closure Modification

Select the type of technical assistance requested: [Numbers in brackets are for WI DNR Use]

- No Further Action Letter (NFA) (Immediate Actions) - NR 708.09, [183] - **Include a fee of \$350.** Use for a written response to an immediate action after a discharge of a hazardous substance occurs. Generally, these are for a one-time spill event.
- Review of Site Investigation Work Plan - NR 716.09, [135] - **Include a fee of \$700.**
- Review of Site Investigation Report - NR 716.15, [137] - **Include a fee of \$1050.**
- Approval of a Site-Specific Soil Cleanup Standard - NR 720.10 or 12, [67] - **Include a fee of \$1050.**
- Review of a Remedial Action Options Report - NR 722.13, [143] - **Include a fee of \$1050.**
- Review of a Remedial Action Design Report - NR 724.09, [148] - **Include a fee of \$1050.**
- Review of a Remedial Action Documentation Report - NR 724.15, [152] - **Include a fee of \$350**
- Review of a Long-term Monitoring Plan - NR 724.17, [25] - **Include a fee of \$425.**
- Review of an Operation and Maintenance Plan - NR 724.13, [192] - **Include a fee of \$425.**

Other Technical Assistance - s. 292.55, Wis. Stats. [97] (For request to build on an abandoned landfill use Form 4400-226)

- Schedule a Technical Assistance Meeting - **Include a fee of \$700.**
- Hazardous Waste Determination - **Include a fee of \$700.**
- Other Technical Assistance - **Include a fee of \$700.** Explain your request in an attachment.

Post-Closure Modifications - NR 727, [181]

- Post-Closure Modifications: Modification to Property boundaries and/or continuing obligations of a closed site or Property; sites may be on the GIS Registry. This also includes removal of a site or Property from the GIS Registry. **Include a fee of \$1050, and:**
  - Include a fee of \$300 for sites with residual soil contamination; and
  - Include a fee of \$350 for sites with residual groundwater contamination, monitoring wells or for vapor intrusion continuing obligations.

Attach a description of the changes you are proposing, and documentation as to why the changes are needed (if the change to a Property, site or continuing obligation will result in revised maps, maintenance plans or photographs, those documents may be submitted later in the approval process, on a case-by-case basis).

## Skip Sections 4 and 5 if the technical assistance you are requesting is listed above and complete Sections 6 and 7 of this form Section 6. Other Information Submitted

Identify all materials that are included with this request.

**Send both a paper copy of the signed form and all reports and supporting materials, and an electronic copy of the form and all reports, including Environmental Site Assessment Reports, and supporting materials on a compact disk.**

**Include one copy of any document from any state agency files that you want the Department to review as part of this request. The person submitting this request is responsible for contacting other state agencies to obtain appropriate reports or information.**

Phase I Environmental Site Assessment Report - Date: \_\_\_\_\_

Phase II Environmental Site Assessment Report - Date: \_\_\_\_\_

# Technical Assistance, Environmental Liability Clarification or Post-Closure Modification Request

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Legal Description of Property (required for all liability requests and specialized agreements)

Map of the Property (required for all liability requests and specialized agreements)

Analytical results of the following sampled media: Select all that apply and include date of collection.

Groundwater     Soil     Sediment     Other medium - Describe: \_\_\_\_\_

Date of Collection: \_\_\_\_\_

A copy of the closure letter and submittal materials

Draft tax cancellation agreement

Draft agreement for assignment of tax foreclosure judgment

Other report(s) or information - Describe: \_\_\_\_\_

For Property with newly identified discharges of hazardous substances only: Has a notification of a discharge of a hazardous substance been sent to the DNR as required by s. NR 706.05(1)(b), Wis. Adm. Code?

Yes - Date (if known): \_\_\_\_\_

No

Note: The Notification for Hazardous Substance Discharge (non-emergency) form is available at:

[dnr.wi.gov/files/PDF/forms/4400/4400-225.pdf](http://dnr.wi.gov/files/PDF/forms/4400/4400-225.pdf).


## Section 7. Certification by the Person who completed this form

I am the person submitting this request (requester)

I prepared this request for: Scott Wahl

Requester Name

I certify that I am familiar with the information submitted on this request, and that the information on and included with this request is true, accurate and complete to the best of my knowledge. I also certify I have the legal authority and the applicant's permission to make this request.

  
Signature

May 1, 2020  
Date Signed

Project Environmental Scientist  
Title

(414) 276-7742  
Telephone Number (include area code)

# Technical Assistance, Environmental Liability Clarification or Post-Closure Modification Request

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## Section 8. DNR Contacts and Addresses for Request Submittals

Send or deliver one paper copy and one electronic copy on a compact disk of the completed request, supporting materials, and fee to the region where the property is located to the address below. Contact a [DNR regional brownfields specialist](#) with any questions about this form or a specific situation involving a contaminated property. For electronic document submittal requirements see: <http://dnr.wi.gov/files/PDF/pubs/rr/RR690.pdf>.

### DNR NORTHERN REGION

Attn: RR Program Assistant  
Department of Natural Resources  
223 E Steinfest Rd Antigo, WI 54409

### DNR NORTHEAST REGION

Attn: RR Program Assistant  
Department of Natural Resources  
2984 Shawano Avenue  
Green Bay WI 54313

### DNR SOUTH CENTRAL REGION

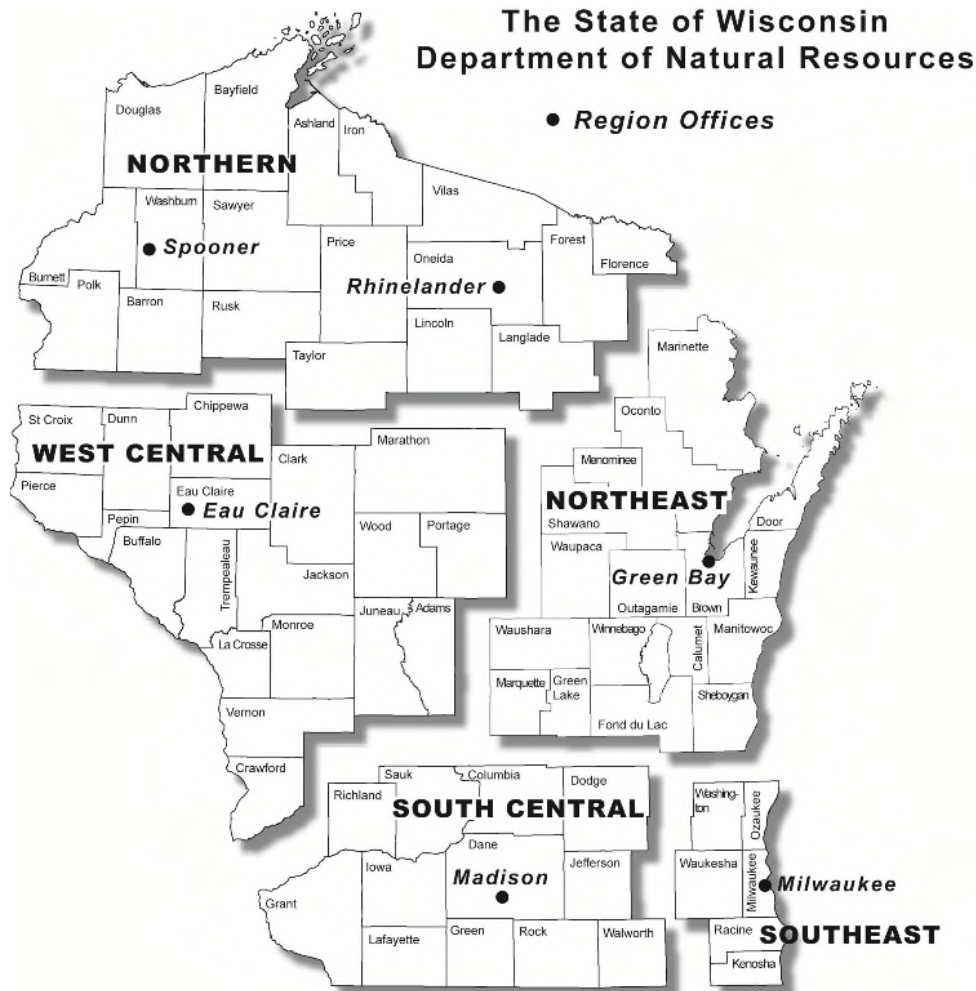
Attn: RR Program Assistant  
Department of Natural Resources  
3911 Fish Hatchery Road  
Fitchburg WI 53711

### DNR SOUTHEAST REGION

Attn: RR Program Assistant  
Department of Natural Resources  
2300 North Martin Luther King Drive  
Milwaukee WI 53212

### DNR WEST CENTRAL REGION

Attn: RR Program Assistant  
Department of Natural Resources  
1300 Clairemont Ave.  
Eau Claire WI 54702



Note: These are the Remediation and Redevelopment Program's designated regions. Other DNR program regional boundaries may be different.

| DNR Use Only  |                     |                                       |  |
|---|---------------------|---------------------------------------|--|
| Date Received   | Date Assigned       | BRRTS Activity Code                   | BRRTS No. (if used)                    |
| DNR Reviewer  |                     | Comments                              |  |
| Fee Enclosed?<br><input type="radio"/> Yes <input type="radio"/> No | Fee Amount<br>\$    | Date Additional Information Requested | Date Requested for DNR Response Letter |
| Date Approved   | Final Determination |                                       |  |

Mr. David Neste  
Remediation and Redevelopment Program  
Wisconsin Department of Natural Resources  
2984 Shawano Avenue  
Green Bay, Wisconsin 54313-6727

Arcadis U.S., Inc.  
126 North Jefferson Street  
Suite 400  
Milwaukee  
Wisconsin 53202  
Tel 414 276 7742  
Fax 414 276 7603  
www.arcadis.com

Subject:  
Near-Term Bedrock Groundwater Evaluation Work Plan  
Tyco Stanton Street Facility, Marinette, Wisconsin  
BRRTS No. 02-38-581955

ENVIRONMENT

Dear Mr. Neste:

Date:  
May 1, 2020

On behalf of Tyco Fire Products LP (Tyco), Arcadis U.S., Inc. (Arcadis) has prepared this Near-Term Bedrock Groundwater Evaluation Work Plan (work plan) to conduct an evaluation of bedrock groundwater conditions associated with the facility at 1 Stanton Street in Marinette, Wisconsin (Site). The activities proposed in this work plan are designed to develop a more complete understanding of bedrock groundwater flow and quality conditions as they pertain to per- and poly-fluoroalkyl substances (PFAS).

Contact:  
Ben Verburg

Phone:  
414.277.6231

Email:  
Ben.Verburg@arcadis.com

Our ref:  
30015294

## BACKGROUND

The Site comprises approximately 66 acres in the north-northeastern portion of the City of Marinette, directly south of the Menominee River (**Figure 1**). The surrounding area of the Site consists of industrial and residential properties within the City of Marinette. The land surface within the Site is generally flat, much of it paved or covered by industrial buildings.

The Site overlies approximately 35 to 45 feet of unconsolidated materials, comprising fill, fine alluvium or lakebed sediments, and till. The water table in the site vicinity is typically less than 5 feet below ground surface, generally occurring within the shallow fill materials. Bedrock beneath the Site and surrounding area consists of dolomite. In borings completed at the Site, the bedrock surface is blanketed by 5 feet or more of dense till, which provides hydraulic confinement between the bedrock and shallow groundwater. Some boreholes completed in uppermost bedrock (e.g., more than 10 to 15 feet below the rock surface) encountered fractured and weathered rock with moderate permeability (CH2M Hill 2016). Other locations attempted in shallow rock encountered no open fractures and could not be completed as wells. The frequency of fractures

decreases quickly with depth, such that the deeper portion of the dolomite (e.g., more than 10 to 15 feet below the rock surface) is interpreted to function as an aquitard, allowing no significant groundwater flow.

The Stanton Street facility was used to manufacture arsenic-based agricultural herbicide between 1957 and 1977. Investigations and remedial actions to address impacts of arsenic on soil and groundwater began in 1974 and were continued by Tyco after it acquired the Site in 1990. Tyco implemented a number of corrective measures through the Resource Conservation and Recovery Act (RCRA) program, including construction of a hydraulic barrier wall system that completely encloses the facility with a combination of slurry and sheet pile walls that extend across the thickness of the overburden. Under the RCRA program, Tyco has established an extensive monitoring well network that includes 18 shallow bedrock wells, 5 of which are located outside of the barrier wall. Existing well locations are shown on **Figure 2**.

Tyco's operations at the Site include fire extinguisher and fire suppression system manufacturing. These processes involve the handling of PFAS-containing materials. Groundwater sampling for PFAS was first performed in 2018. The sampling results, reported in the June 21, 2018 Summary of Groundwater Sampling (Arcadis 2018), showed detections of PFAS in shallow groundwater. An expanded groundwater sampling event was performed in December 2019, including wells located outside of the barrier. This second sampling program, reported in the February 4, 2020 Summary of Soil and Groundwater Sampling (Arcadis 2020a), included three bedrock wells (MW003D, MW013D, and MW102D). The sampling results showed that PFAS is present in shallow bedrock groundwater. As described below, the tasks proposed in this work plan are designed to further evaluate the nature and extent of PFAS detected in bedrock.

## SCOPE AND OBJECTIVES

Activities described in this work plan were developed to refine the conceptual model of PFAS potentially affecting shallow bedrock, develop further understanding of groundwater flow pathways in shallow bedrock, identify potential receptors, and expand or complete the delineation of PFAS in shallow bedrock.

The work described herein consists of: 1) an initial review of available historical land use information, site-specific water-level data, PFAS groundwater analytical data, and groundwater use survey information; 2) collection of groundwater elevation and pressure transducer data from select monitoring wells; 3) inspection and redevelopment, as needed, of existing monitoring wells proposed to be sampled; 4) installation and development of proposed shallow bedrock monitoring wells; and 5) groundwater sample collection for PFAS analyses from select existing monitoring wells (on-site wells and upgradient, off-site wells and piezometers) and proposed new monitoring wells.

## INITIAL DATA REVIEW AND ANALYSIS

### Research Land Use Near Stanton Street Site

Land use of properties near the Stanton Street Site will be reviewed to assess potential PFAS sources in addition to the Site. The information from the review of land use in the surrounding area will be evaluated in conjunction with geographic and topographic features to evaluate possible transport pathways that may affect groundwater in shallow bedrock.

### Review Historical Water-Level Elevation Data

As part of the RCRA Corrective Action, water-level measurements in monitoring wells and the Menominee River have been recorded nearly continuously over the past several years. Arcadis will review these available data to assess current and historical gradients that may affect groundwater transport in bedrock.

### Evaluate Existing Groundwater PFAS Analytical Results

The PFAS analytical data for the groundwater sampling conducted in 2018 and 2019 will be reviewed to understand the specific PFAS substances that were detected and at what relative concentrations. The findings of the review of PFAS mixtures will be used to identify similarities and differences among the data to assess possible source(s) of the PFAS.

### Refine Groundwater Use Survey

An updated groundwater use survey will be requested from sources within the appropriate state and county departments, including the Wisconsin Department of Health Services and the Wisconsin Geological and Natural History Survey. Although it is highly unlikely that groundwater in bedrock would flow under the Menominee River, a regional flow divide, the water use survey will include adjacent portions of Menominee, Michigan, to verify that no major groundwater withdrawals exist across the river. The information from the updated survey will be reviewed to determine the presence/absence of groundwater use areas and potential receptors.

## BEDROCK MONITORING WELL INSTALLATION AND SAMPLING ACTIVITIES

Four shallow bedrock monitoring wells will be installed to further assess groundwater flow and quality conditions in shallow bedrock upgradient of the Site. Wells will be constructed similarly to existing shallow bedrock monitoring wells, with screens completed in approximately the upper 15 feet of bedrock. Proposed shallow bedrock monitoring well locations are shown on **Figure 2**. Proposed locations are approximate and may need to be adjusted based on access limitations. Groundwater elevations and sampling at these locations will be used to determine the extent of shallow bedrock impacts, flow direction, and horizontal and vertical gradients.

### Access and Utility Clearance

Shallow bedrock monitoring wells are planned to be installed within public rights-of-way (ROW) of the City of Marinette. Prior to completing work in a ROW, permission for access will be obtained from the City. If planned locations of well locations cannot be completed within the ROW of the City, a private access agreement will be signed prior to conducting work.

Prior to beginning the bedrock monitoring well installations, Wisconsin One Call (i.e., Diggers Hotline) will be contacted. In accordance with Arcadis standard policies, at minimum, three lines of evidence will be utilized for locating subsurface utilities. The anticipated lines of evidence include the public utility locate, contracting a private utility locating service, conducting an inspection of each location, and reviewing available utility drawings. An air knife or hand auger may also be used to clear boring areas, if needed.



### Shallow Bedrock Monitoring Well Installation and Development

Shallow bedrock wells will be installed via sonic drilling techniques. During drilling activities, a temporary steel casing will be advanced to the top of bedrock and seated approximately 2 feet (ft) into the rock surface to provide a temporary surface seal. Bedrock drilling will continue by telescoping a 6-inch-diameter borehole approximately 16 ft below the rock surface.

Continuous soil cores will be collected and logged by an Arcadis field geologist. Soil descriptions will include soil type, grain size, moisture content, and color. Fine-grained soil descriptions will also include plasticity and consistency. Coarse-grained soil descriptions will include angularity and sorting. Bedrock cores and cuttings will be logged for general lithology. Note that sonic drilling does not preserve intact rock cores; therefore, detailed logging will not be feasible.

The screened interval of each shallow bedrock monitoring well will be set within the first 15 ft of competent bedrock. Prior to construction of the well, the borehole will be cleared of cuttings and then tested to determine if the borehole intersected fractures with sufficient permeability for collection of water quality and elevation data. Tests will be completed as falling head tests using an inflatable packer to isolate the upper bedrock. A borehole recharge rate of approximately 0.25 gallon per minute will be deemed sufficient to complete a well. If the borehole does not meet this criterion, up to one additional borehole will be completed at an alternate location.

Shallow bedrock wells will be constructed with 10-ft-long by 2-inch-diameter schedule 40 polyvinyl chloride (PVC) 0.010-inch slotted screen and a 2-inch-diameter schedule 40 PVC riser to the surface. Filter pack sand will be placed to 2 ft above the screen, with a filter pack seal (clean fine sand and bentonite or bentonite only based on the depth of the screened interval) to at least 2 ft above the filter pack sand. Once the bentonite has set (approximately one hour), the well will be grouted to surface.

Following shallow bedrock well installation and passage of a minimum of 24 hours, each shallow bedrock monitoring well will be developed via over-pumping and surging methods using a submersible pump to remove sediments from the well and surrounding filter pack. Groundwater parameters (pH, specific conductance, temperature, and turbidity) will be measured periodically, and well development activities will continue until up to 10 well volumes have been purged or turbidity has stabilized below 50 Nephelometric Turbidity Units (NTUs).

### Sample Collection

Groundwater sampling is planned at seven existing bedrock monitoring wells located inside, adjacent to and upgradient of the slurry wall, two piezometers located farther upgradient near the Ansul Fire Technology Center (FTC), one upgradient off-site piezometer (PZ) cluster (with two PZs), and the four proposed new bedrock monitoring wells to determine and confirm the extent of shallow bedrock impacts. The monitoring wells (existing and new) proposed to be sampled are shown on **Figure 3**. The seven existing bedrock monitoring wells to be sampled include MW003D, MW013D, MW040D, MW100D, MW102D, MW108D, and MW109D; the two upgradient piezometers near the FTC to be sampled are PZ-01D and PZ-04D; and the one upgradient off-site piezometer cluster to be sampled is PZ-28 (where groundwater samples will be collected from the two overburden piezometers).

Prior to collecting groundwater samples from the select existing monitoring wells, the wells will be inspected and redeveloped as needed. Additional care and development will be conducted as appropriate

in existing wells that contain sample tubing and/or pressure transducers. Groundwater sampling will be conducted after a minimum of two weeks following redevelopment, if required.

Low-flow sampling procedures will be used for groundwater sampling, using a peristaltic pump and dedicated down-well disposable tubing. Analytical samples will be collected after groundwater parameters that are measured with a field probe, including dissolved oxygen, pH, specific conductivity, and oxidation-reduction potential, are shown to have stabilized at each well. All monitoring wells will be gauged for depth to water and depth to the bottom of the well.

Samples will be collected for PFAS analysis following the sample handling procedures described in the Quality Assurance and Quality Control (QA/QC) section of this work plan.

### Groundwater Elevation Data Collection

During this planned work, one round of groundwater elevations will be manually measured using a water-level meter at the newly installed shallow bedrock monitoring wells and select existing monitoring wells and piezometers. These data will be used to assess groundwater flow direction as well as horizontal and vertical gradients within the surficial aquifer.

Pressure transducers will also be installed at five monitoring wells and will collect continuous data for a three-month time frame. The five monitoring wells where transducers will be deployed include three shallow bedrock monitoring wells (MW003D, MW013D, and MW102D) and two shallow overburden monitoring wells (MW013S and MW040S). The locations of these wells are shown on **Figure 4**. The data will be used, in combination with data from existing transducers deployed at site monitoring wells, to assess potential hydraulic gradient anomalies of groundwater flow to the Menominee River as a result of potential backflow and influence from the containment wall.

### Investigation-Derived Waste

Purge water, soil, and drilling fluid generated while completing the proposed activities will be containerized (e.g., 55-gallon steel drums) and staged in a centralized and secured location on Tyco property, pending characterization. Waste disposal options for soil will be assessed following waste characterization. Waste disposal of purge water and drilling fluid will be through the on-site water treatment system following proper permitting through the Wisconsin Department of Natural Resources (WDNR).

### Survey

The new shallow bedrock monitoring wells will be surveyed following installation activities. The ground surface elevation of each location will be referenced to the North American Vertical Datum of 1988 (NAVD 88) system and the horizontal coordinates will be reported in the Wisconsin State Plane North American Datum 1983 (NAD 83) – Wisconsin Central 4802 Zone system as part of the survey work.

## QUALITY ASSURANCE AND QUALITY CONTROL

### Special Considerations for PFAS Sampling

The detection of PFAS compounds at very low concentrations can be influenced by common PFAS-containing materials that may be present at the Site or introduced by sampling equipment or personnel. Therefore, specific PFAS sampling protocols will be followed by sampling personnel. To minimize the potential for cross-contamination, attention will be given to handling and decontamination procedures for sampling equipment as well as clothing and personal care products used by sampling personnel.

Sampling for PFAS compounds will include the submission of one laboratory-supplied reagent field blank per day to analyze for the presence of ambient PFAS in the sampling area. PFAS-free water used for the reagent field blank sample will be brought to the Site in laboratory-supplied bottles. Field staff will transfer the laboratory-supplied PFAS-free water into an empty sample bottle. This reagent field blank will be placed in the same cooler as other samples intended for PFAS analyses.

All sampling equipment will be decontaminated with an Alconox®, Liquinox®, or methanol solution between use at each sampling location and then rinsed with laboratory-supplied PFAS-free water. To assess the adequacy of the decontamination process, a rinse blank will be collected every 20 samples or once per day, whichever is more frequent. To prepare a rinse blank, a sample of PFAS-free water will be poured over or through decontaminated field equipment prior to collection of environmental samples.

### Laboratory Methods and Analysis

Samples will be placed in laboratory-supplied containers, stored and shipped on ice, and handled with chain-of-custody documentation. Samples will be sent to TestAmerica or an equivalent laboratory that is accredited for PFAS analysis. Samples will be analyzed for all 14 PFAS compounds that are reportable using a modified version of United States Environmental Protection Agency (USEPA) Method 537.

As part of the field QA/QC, one matrix spike (MS) sample and one matrix spike duplicate (MSD) sample will be collected for every 20 field samples and one field duplicate will be collected for every 10 field samples. Specific to this work plan, one MS, one MSD, and two field duplicates will be collected.

Internal laboratory QA/QC will consist of one laboratory blank and one laboratory control sample (or blank spike) per batch of samples, and additional QA/QC as indicated by the laboratory QA/QC procedures and the Draft Quality Assurance Project Plan (Arcadis 2020b).

## REPORTING

After the investigation is completed and laboratory data are received, Arcadis will prepare a letter report summarizing the results of the near-term bedrock groundwater evaluation work. The letter report will include well construction details for the four proposed bedrock monitoring wells, potentiometric groundwater elevation contour maps, and figures showing groundwater PFAS analytical data and hydrographs of the continuous water-level data from the pressure transducers. In addition, the report will include WDNR Forms required per NR 716.15(4)(g), analytical results, and chain-of-custody forms.

Mr. David Neste  
Wisconsin Department of Natural Resources  
May 1, 2020

## REFERENCES

Arcadis. 2018. Summary Groundwater Sampling, Ansul Inc. Stanton Street Facility, Marinette, Wisconsin, EPA ID: WID006125215. June.

Arcadis. 2019. Groundwater Sampling Work Plan, Tyco Fire Products LP, 1 Stanton Street, Marinette, Wisconsin. March.

Arcadis. 2020a. Summary of Soil and Groundwater Sampling, Tyco Stanton Street Facility, Marinette, Wisconsin, BRRTS No. 02-38-581955. February.

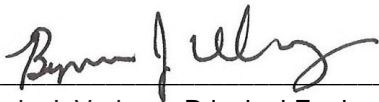
Arcadis. 2020b. Draft Quality Assurance Project Plan, Tyco Fire Projects LP. April.

CH2M Hill. 2015. Revised Barrier Wall Groundwater Monitoring Plan Update, Tyco Fire Products LP. September.

CH2M Hill. 2016. Technical Memorandum: Attachment 1 - Tyco Site Information, Tyco Fire Products LP. January.

## NR 712.09 CERTIFICATION

I, Benjamin Verburg, hereby certify that I am a registered professional engineer in the State of Wisconsin, registered in accordance with the requirements of ch. A-E 4, Wis. Adm. Code; that this document has been prepared in accordance with the Rules of Professional Conduct in ch. A-E 8, 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. NR 700 to 726, Wis. Adm. Code.

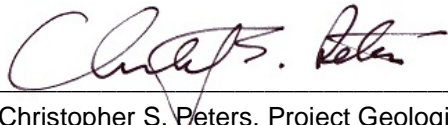


Benjamin J. Verburg, Principal Engineer



P.E. Stamp

I, Christopher Peters, hereby certify that I am a hydrogeologist as that term is defined in s. NR 712.03 (1), Wis. Adm. Code, am registered in accordance with the requirements of ch. GHSS 2, Wis. Adm. Code, or licensed in accordance with the requirements of ch. GHSS 3, Wis. Adm. Code, and that, to the best of my knowledge, all of the information contained in this document is correct and the document was prepared in compliance with all applicable requirements in chs. NR 700 to 726, Wis. Adm. Code.



Christopher S. Peters, Project Geologist



Date

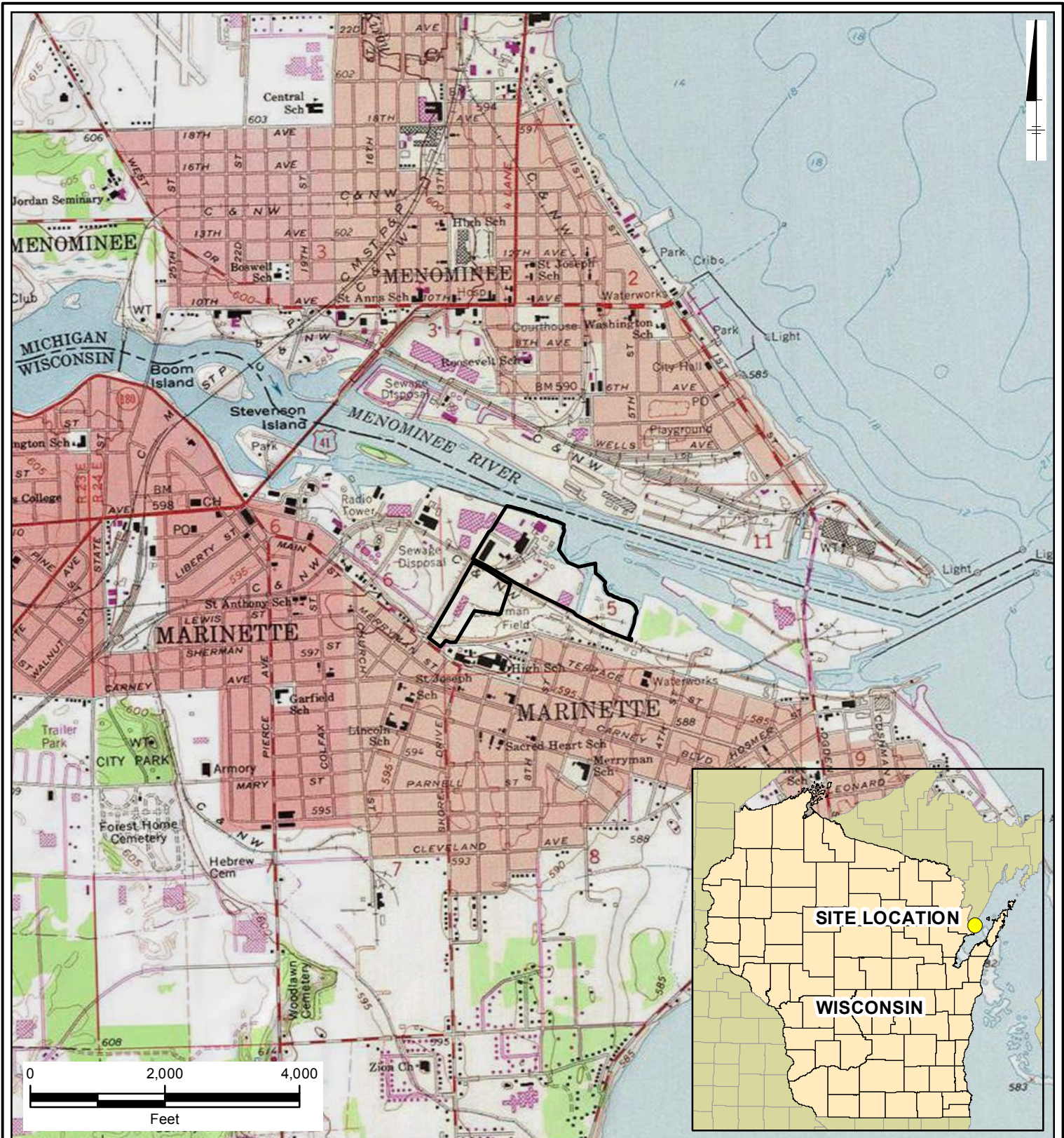
Enclosures:

### Figures

- 1 Site Location
- 2 Proposed Shallow Bedrock Monitoring Well Locations
- 3 Proposed Groundwater Sampling Locations
- 4 Proposed Transducer Deployment Locations

# FIGURES





**LEGEND:**

 APPROXIMATE SITE PROPERTY BOUNDARY

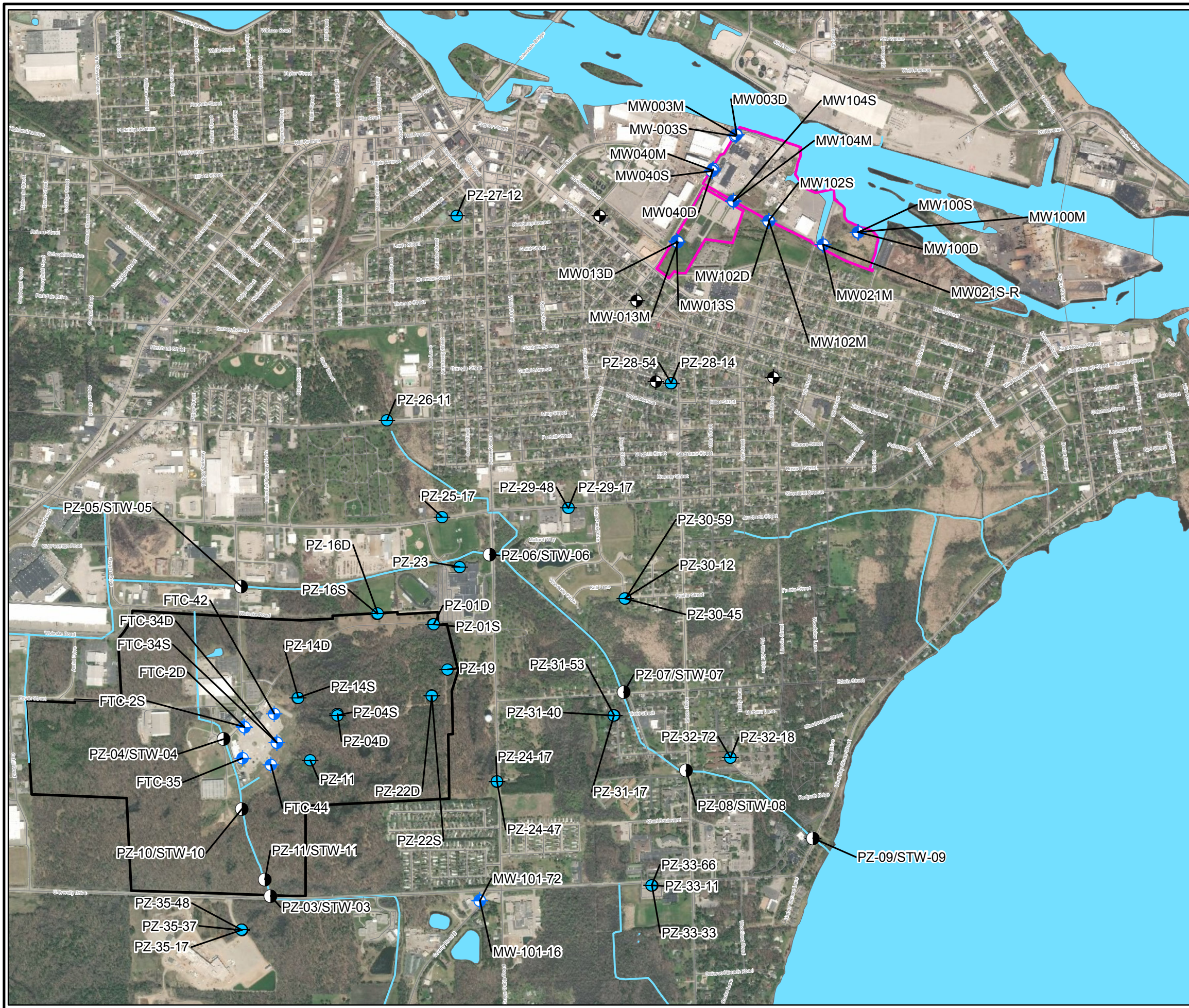
**NOTES:**

1. TOPOGRAPHIC MAP SOURCE: COPYRIGHT: © 2013 NATIONAL GEOGRAPHIC SOCIETY, I-CUBED, ACCESSED APRIL, 2020.

TYCO FIRE PRODUCTS, LP  
 MARINETTE, WISCONSIN  
 NEAR-TERM BEDROCK GROUNDWATER EVALUATION  
 WORK PLAN

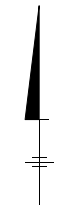
**SITE LOCATION**

 | **FIGURE 1**



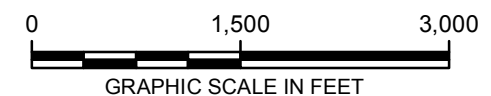
**LEGEND:**

- PROPOSED SHALLOW BEDROCK MONITORING WELLS (APPROXIMATE)
- MONITORING WELL
- PIEZOMETER
- IN-STREAM PIEZOMETER AND STILLING WELL PAIR
- APPROXIMATE STANTON ST PROPERTY BOUNDARY
- APPROXIMATE FTC SITE PROPERTY BOUNDARY
- ROAD
- DITCH/STREAM
- WATERBODY



**NOTES:**

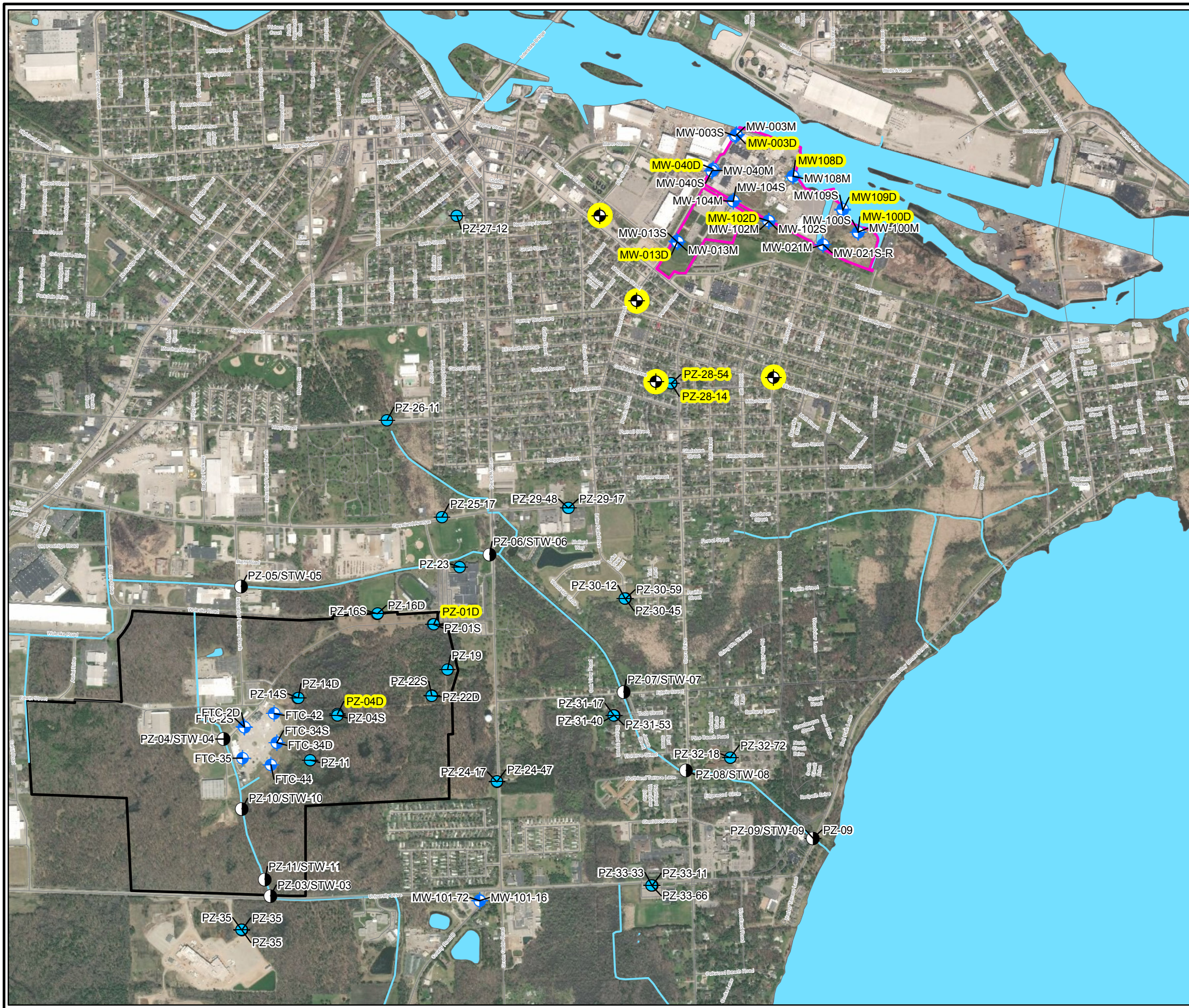
1. DITCH/STREAM DATA SOURCE: U.S. GEOLOGICAL SURVEY NATIONAL HYDROGRAPHY DATASET, ACCESSED FALL 2017.
2. ROAD DATA SOURCE: OPEN STREET MAP, ACCESSED FALL 2017.
3. AERIAL IMAGERY: 4/27/2016 DIGITALGLOBE, VIVID-USA



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 NEAR-TERM BEDROCK GROUNDWATER EVALUATION  
 WORK PLAN

**PROPOSED SHALLOW BEDROCK  
 MONITORING WELL LOCATIONS**



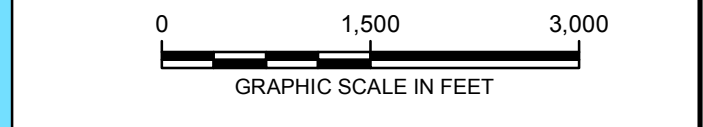


**LEGEND:**

- PROPOSED SHALLOW BEDROCK MONITORING WELLS (APPROXIMATE)
- MONITORING WELL
- PIEZOMETER
- IN-STREAM PIEZOMETER AND STILLING WELL PAIR
- APPROXIMATE STANTON ST. SITE PROPERTY BOUNDARY
- APPROXIMATE FTC SITE PROPERTY BOUNDARY
- ROAD
- DITCH/STREAM
- WATERBODY

**WELL ID**  
OR  
 PROPOSED GROUNDWATER SAMPLING (SEE NOTE 1 FOR COMPLETE LIST OF PROPOSED WELLS)

- NOTES:**
1. WELLS AND PIEZOMETERS PROPOSED FOR SAMPLING INCLUDE: MW003D, MW013D, MW040D, MW100D, MW102D, MW108D, MW109D, PZ-01D, PZ-04D, PZ-28-14, PZ-28-54, AND FOUR PROPOSED NEW SHALLOW BEDROCK WELLS
  2. DITCH/STREAM DATA SOURCE: U.S. GEOLOGICAL SURVEY NATIONAL HYDROGRAPHY DATASET, ACCESSED FALL 2017.
  3. ROAD DATA SOURCE: OPEN STREET MAP, ACCESSED FALL 2017.
  4. AERIAL IMAGERY: 4/27/2016 DIGITALGLOBE, VIVID-USA



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NEAR-TERM BEDROCK GROUNDWATER EVALUATION  
WORK PLAN

**PROPOSED GROUNDWATER  
SAMPLING LOCATIONS**



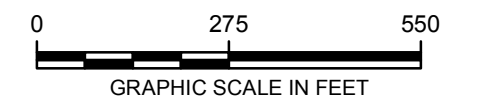
**LEGEND:**

- EXTRACTION WELL OR TEST WELL
- ⊕ MONITORING WELL - SHALLOW OR PEAT
- ⊕ MONITORING WELL - MEDIUM
- ⊕ MONITORING WELL - DEEP (BEDROCK)
- ▭ APPROXIMATE SITE PROPERTY BOUNDARY
- SHEET PILE WALL
- SLURRY WALL

**WELL ID** PROPOSED TRANSDUCER DEPLOYMENT LOCATION  
 (SEE NOTE 1 FOR A COMPLETE LIST OF PROPOSED WELL LOCATIONS)

**NOTES:**

1. THE MONITORING WELLS PROPOSED FOR TRANSDUCER DEPLOYMENT ARE: MW003D, MW013S, MW013D, MW040S, MW102D
2. ALL WELL LOCATIONS DEPICTED ARE APPROXIMATE.
3. ROAD DATA SOURCE: OPEN STREET MAP, ACCESSED FALL 2017.
4. THE PARCEL REPRESENTATIONS ON THIS MAP OR PRODUCT, OTHER THAN GRAPHIC ALTERATIONS THAT MAY BE INDICATED, ARE DERIVED FROM PUBLIC DOMAIN INFORMATION FROM VARIOUS SOURCES ROUTINELY PROVIDED TO AND MAINTAINED BY MARINETTE COUNTY. ALTHOUGH THE SOURCES ARE BELIEVED TO BE REASONABLY RELIABLE, THERE MAY BE ERRORS OR INCONSISTENCIES IN SAID REPRESENTATIONS. MARINETTE COUNTY DOES NOT MAKE ANY WARRANTY WHATSOEVER, EXPRESSED OR IMPLIED, THAT SAID REPRESENTATIONS ARE ACCURATE. IF THERE ARE DOUBTS AS TO THE ACCURACY OF ANY SUCH REPRESENTATIONS ON THIS MAP OR PRODUCT, AN INDEPENDENT INVESTIGATION IS RECOMMENDED.



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 MARINETTE, WISCONSIN  
 NEAR-TERM BEDROCK GROUNDWATER EVALUATION  
 WORK PLAN

**PROPOSED TRANSDUCER  
 DEPLOYMENT LOCATIONS**