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SUBJECT: Response to Site Investigation Work Plan, Interim Site Investigation Report, Conceptual Site Model and Aerial Deposition Evaluation Report
JCI/Tyco Stanton (PFAS), 1 Stanton Street, Marinette, WI
BRRTS #02-38-581955

Dear Mr. Danko and Mr. Wahl:

On March 22, 2021 the Wisconsin Department of Natural Resources (DNR) received the *Site Investigation Work Plan* ("SI Work Plan") for the above-referenced site and submitted by Arcadis U.S., Inc. (Arcadis), on behalf of Johnson Controls, Inc. and Tyco Fire Products LP (JCI/Tyco). JCI/Tyco developed the SI Work Plan following its submittal of the following reports to DNR:

- *Interim Site Investigation Report* ("Interim SI Report") – July 6, 2020
- *Conceptual Site Model* ("CSM") – August 11, 2020
- *Aerial Deposition Evaluation Report* ("Aerial Evaluation Report") – August 11, 2020

The SI Work Plan, Interim SI Report, CSM and Aerial Evaluation Report were each accompanied by the appropriate fee required under Wisconsin Administrative Code (Wis. Adm. Code) § NR 749.04(1), for formal DNR review and response.

The DNR reviewed each of these reports and appreciates JCI/Tyco's patience in awaiting a response. Because JCI/Tyco's March 2021 SI Work Plan builds upon the content and conclusions presented in its prior reports, the DNR's response in this letter includes collective comments on the SI Work Plan, Interim SI Report, CSM and Aerial Evaluation Report.

JCI/Tyco's submittals are for the site investigation to define the degree and extent of per- and polyfluoroalkyl substances (PFAS) contamination at its facility located at 1 Stanton Street, Marinette, Wisconsin ("Site"). The DNR agrees with JCI/Tyco's plans to expand the groundwater investigation at the Site; however, the scope of work presented in the SI Work Plan will not result in a complete site investigation per Wis. Adm. Code § 716.11. Additional sampling and/or documentation will be required to define the vertical and horizontal extent (Wis. Adm. Code § NR 716.11(3)(a)) of PFAS contamination in affected media and to evaluate the need for interim or remedial actions (Wis. Adm. Code § NR 716.11(3)(b)). The current data gaps that the DNR identified in its review of the reports are summarized in this letter.

Background

On July 23, 2018, JCI/Tyco reported a discharge of PFAS compounds at its 1 Stanton Street facility. The discharge was discovered during United States Environmental Protection Agency (U.S. EPA) monitoring of the JCI/Tyco (Ansul) BRRTS case #02-38-000011, which is related to arsenic contamination that was discovered and investigated starting in 1974 and for which JCI/Tyco has implemented corrective measures through the Resource Conservation and Recovery Act (RCRA) program. On August 16, 2018 the DNR issued a letter with BRRTS case #02-38-581955, notifying JCI/Tyco of its responsibility to investigate and restore the environment for the discharge of PFAS at the Site.¹

The discharge of PFAS at the Site is associated with JCI/Tyco's operations including blending and packaging PFAS-containing aqueous film forming foams (AFFF). Currently, JCI/Tyco blends firefighting foam concentrate products and manufactures fire extinguishers and other fire suppression system hardware at the Site. It is the DNR's understanding that JCI/Tyco began distributing firefighting foam in 1964. Up until approximately 1975, it repackaged some foams manufactured by other companies including 3M and starting around 1975 JCI/Tyco began blending and packaging its own firefighting foam at the Site. JCI/Tyco's blending operations occur in Building 18, quality control testing occurs in Building 71, and storage of off-spec material occurs in Building 59. The locations of these building are shown on Arcadis' Figure 2 in **Attachment A**.

Summary of Previous Investigations and RCRA Corrective Action Measures

The 66-acre property was investigated and underwent RCRA corrective action measures for the arsenic contamination under BRRTS case #02-38-000011 ("Arsenic RCRA Site"). The conceptual layout and overviews based on the prior investigation and corrective actions are shown on CH2MHill's Figure 1-4 and Jacobs' Figure 3 in **Attachment A**.

Relevant information from the prior investigations for the Arsenic RCRA Site include the following:

- The Menominee River abuts the property to the northeast and under natural conditions (i.e., without the barrier wall and extraction system discussed below), the groundwater flow in the unconsolidated aquifer is toward the river.
- Depth to groundwater is less than 5 feet below ground surface (ft bgs). In recent years the groundwater elevations have increased, and currently the depth to groundwater is less than 1 ft bgs in some areas.
- In recent years flooding has occurred and caused mixing of surface water and groundwater that then discharged directly to the Menominee River from the property.
- Depth to bedrock on the property is approximately 35 to 50 ft bgs, and it is separated from the unconsolidated aquifer by a low permeability glacial till that limits the downward migration of groundwater from the upper unconsolidated units into the bedrock.
- NR 141 monitoring wells are in place on the property to monitor groundwater in different depth zones: shallow (S) ~5 to 20 ft bgs; intermediate (M) ~20 to 35 ft bgs; and bedrock (D) ~35 to 50 ft bgs.

¹ On July 2, 2019, the DNR issued a letter with new BRRTS case #02-38-583852 notifying ChemDesign Products, Inc. (ChemDesign) of its responsibility to investigate and restore the environment for the discharge of PFAS related to its operations at the Site. ChemDesign is a chemical toll service provider and has leased portions of the Site from JCI/Tyco since 1983. Starting in 2005, ChemDesign has processed PFAS for JCI/Tyco from raw materials. The DNR received a SI Work Plan from ChemDesign on June 17, 2021.

Relevant information from the completed corrective actions for the Arsenic RCRA Site include the following:

- Groundwater in the unconsolidated zone on the property is contained, to the extent possible, within a barrier wall that was installed around the perimeter of the property by 2010. The barrier wall is keyed into the low-permeability glacial till and includes a slurry wall along the upland perimeter and a sheet pile wall along the Menominee River (see CH2MHill's Figure 1-4 and Jacobs' Figure 3 in **Attachment A**).
- Groundwater levels inside the containment barrier are controlled by plant (tree) uptake and a series of groundwater extractions wells throughout the Site. Improvements to the groundwater pump-down program, a separate extraction system that was established to manage groundwater elevations in the areas with the highest arsenic concentrations (Salt Vault and Former 8th Street Slip), have been required to control water levels and try to achieve and maintain inward hydraulic gradients in these areas; future improvements are planned.
- Approximately 259,000 cubic yards of sediment in the Menominee River near to the property were dredged from 2012 to 2013, and additional sediment was dredged in 2014 (quantity not specified). The extent of the dredging was based on arsenic concentrations detected in the sediment. Dredging removed the sediment down to bedrock or dense glacial till.
- Soils were excavated or capped based on arsenic concentrations (locations not specified).
- Institutional controls were established to prohibit residential activities, restrict groundwater use and well installation, limit site access and restrict anchoring in certain areas of the Menominee River.
- Extracted groundwater is treated on-site using reverse osmosis and the treated effluent is discharged to the Menominee River under a Wisconsin Pollutant Discharge Elimination System (WPDES) individual permit. The permit was reissued to JCI/Tyco in December 2020 (WI-0001040-08-0).
- Some stormwater and process water are discharged to the Menominee River at a separate outfall covered under the WPDES Permit. Leakage of groundwater into stormwater pipes is believed to be causing elevated contaminant levels at the outfall to the Menominee River, and thus, JCI/Tyco is updating the management of stormwater on the property to be above ground to eliminate groundwater leakage.

Summary of PFAS Monitoring under the WPDES Permit

Monitoring for perfluorooctanoic acid (PFOA) and perfluorooctanesulfonic acid (PFOS) at two outfalls to the Menominee River began upon reissuance of the facility's WPDES permit WI-0001040-08-0 in January 2021. The PFOA and PFOS results reported by JCI/Tyco for the two outfalls through July 26, 2021 are as follows:

- The effluent from the groundwater treatment system had concentrations ranging from 0.73 – 55 parts per trillion (ppt) for PFOA and 0.46 – 2.9 ppt for PFOS. (In May 2018, the influent to the groundwater treatment system was tested for PFAS and had PFOA = 1,800 ppt and PFOS = 67 ppt.)
- The outfall containing the process water and stormwater has concentrations ranging from 75 – 190 ppt for PFOA and 11 – 34 ppt for PFOS.

JCI/Tyco's PFAS monitoring follows the compliance schedule set in the permit to meet the PFOS effluent limit of 11 ppt. A compliance schedule was included in the permit because this was new limit pursuant to Wis. Adm. Code. § NR 106.117, and allows time for the updates to stormwater handling to be completed at the Site.

Wis. Adm. Code ch. NR 716 for PFAS vs. the RCRA Corrective Actions for Arsenic

JCI/Tyco suggested that the RCRA corrective action measures that have occurred or that are in place for the Arsenic RCRA Site will also control and address risk associated with PFAS for BRRTS case # 02-38-581955. However, the sources and transport pathways resulting in PFAS contamination differ from those that caused the arsenic contamination, and thus the degree and extent of the PFAS contamination may differ.

Response to Site Investigation Work Plan Interim Site Investigation Report,
 Conceptual Site Model and Aerial Deposition Evaluation Report
 BRRTS #02-38-581955

A site investigation for PFAS completed in accordance with Wis. Adm. Code ch. NR 716 is required. JCI/Tyco may be required to take additional response actions for PFAS based on the findings and conclusions of the site investigation. The DNR's responses that follow for the Interim SI Report, CSM, Aerial Deposition Report, and SI Work Plan are provided based on this requirement that the degree and extent of PFAS contamination must be defined (Wis. Adm. Code § NR 716.11(3)(a)) before the effectiveness/protectiveness of the current corrective action measures can be assessed (Wis. Adm. Code § NR 716.11(3)(b)).

Summary and Review of Interim SI Report (July 2020)

In its Interim SI Report, JCI/Tyco summarized the PFAS investigation activities and data collected at the Site through December 2019. These initial activities were conducted to evaluate the presence of PFAS and help scope future investigation activities. JCI/Tyco has not submitted additional site investigation data for the Site since the Interim SI Report.

JCI/Tyco collected soil samples from seven locations and groundwater samples from 18 existing on-site monitoring wells. The sample locations are shown on Arcadis' Figures 5 and 8 in **Attachment A**. These samples were analyzed for 14 PFAS compounds. The results for PFOA and PFOS are summarized in the tables below; other PFAS were also detected.

Location	Depth Zone	# of Wells	Groundwater Sample IDs	Concentration Range (ppt)	
				PFOA	PFOS
Inside Containment Wall	Shallow	5	MW032S, 041S, 044S, 054S, 108S	520 – 9,100	140 – 650
	Intermediate	1	MW008M	3,700	350
	Shallow Bedrock	0	--	--	--
Outside Containment Wall	Shallow	5	MW003S, 013S, 021S-R, 102S, 104S	41 – 1,200	1.6 – 220
	Intermediate	4	MW003M, 013M, 040M, 102M	9 – 290	ND – 32
	Shallow Bedrock	3	MW003D, 013D, 102D	1,100 – 1,300	ND – 2.1

Location	# of Borings	Soil Sample IDs	Concentration Range (ppb)	
			PFOA	PFOS
Inside Containment Wall	7	SS-18-01 to SS-18-07	1.3 – 15	ND – 4.7
Outside Containment Wall	0	--	--	--

ND = not detected

-- no samples

JCI/Tyco has not collected PFAS surface water samples for this Site but did present the results of surface water samples collected by the DNR and Michigan's Department of Environment, Great Lakes and Energy (EGLE) in 2019 in the Menominee River and mouth of Green Bay. The locations of these samples are shown on Arcadis' Figure 9 in **Attachment A**. The maximum concentrations detected in these surface water samples were 0.82 ppt for PFOA and 0.71 ppt for PFOS.

Additional work is required at the Site to define the degree and extent of PFAS contamination, and future testing must include the 36 PFAS compounds that JCI/Tyco is required to report. The DNR understands that JCI/Tyco did not prepare the Interim SI Report with the intent of meeting the requirements of Wis. Adm. Code § NR 716.15; therefore, the DNR did not review it for completeness. The DNR factored the data presented in the Interim SI Report into its review of the CSM and SI Work Plan.

Summary and Review of CSM (August 2020)

In the CSM, JCI/Tyco presented its current interpretation of the initial site investigation results and stated that it plans to update the CSM as new data become available. JCI/Tyco stated that it intends to use the CSM to identify data gaps and to develop SI Work Plans to define the degree and extent of PFAS contamination.

JCI/Tyco did not identify data gaps in the CSM; however, in its review, the DNR did identify data gaps that JCI/Tyco must address during this or future investigation activities in order to define the vertical and horizontal extent (Wis. Adm. Code § NR 716.11(3)(a)) of PFAS contamination and to evaluate need for interim or remedial actions (Wis. Adm. Code § NR 716.11(3)(b)). The data gaps identified by DNR are summarized below; this is not an exhaustive list and other data gaps may be found as the site investigation continues and the CSM is updated.

Sources:

JCI/Tyco's testing during the initial site investigation activities found that PFAS are present in soil and groundwater at the Site. In the CSM, JCI/Tyco stated that the PFAS contamination is likely from incidental releases that occurred when PFAS-containing materials migrated into soil and/or groundwater through cracks in the floor, structural defects in process pipes or structural defects in the sanitary sewer system. (Up until 2012, JCI/Tyco discharged foam-containing wastewater to the sanitary sewer. Wastewater is now containerized and disposed of off-site, and structural defects to the sanitary sewer system were corrected in 2019.)

JCI/Tyco is also investigating discharges of PFAS to the environment at its Fire Technology Center (FTC), located at 2700 Industrial Parkway South in Marinette, Wisconsin (BRRTS #02-38-580694), which is approximately 1.5 miles from the Site. The site investigation for PFAS at FTC is on-going; however, data collected to date points to the FTC as a primary source of PFAS contamination in the shallow bedrock and a potential contributing source to PFAS in the unconsolidated aquifer in and around the Stanton property.

The DNR finds that JCI/Tyco needs to identify the locations of the potential PFAS releases at the Site and use these locations to scope future site investigation activities.

Data Gap #1a: Information and chronology of activities related to potential PFAS sources and types of PFAS containing materials that have been used/blended/stored at the Site over time. Include list of PFAS foams JCI/Tyco repackaged for other manufacturers.

Data Gap #1b: Historical aerial imagery that shows development at the Site over time.

Data Gap #1c: Locations where PFAS-containing materials are or were received and stored at the Site, and locations and summary for how PFAS-containing materials are or were historically moved between buildings or areas of the Site (e.g., above-grade process pipes, underground process pipes).

Data Gap #1d: Locations of the current and historical sanitary sewer system (on the property and the pathway to the wastewater treatment plant), and locations where structure defects in the sanitary sewer system were found. (A utility map from the 2007 pre-design report to U.S. EPA for the RCRA corrective action for arsenic includes some of this information – see Earth Tech Figure 3-1 in **Attachment A.**)

Soil:

JCI/Tyco's soil samples from the initial site investigation appear to have been collected in areas where soils are accessible and could present a direct contact risk to human health if high enough concentrations of PFAS are present. To evaluate risk from contaminants detected in soil, the soil concentrations are compared to Wis. Adm.

Code ch. NR 720 residual contaminant levels (RCLs) that are protective of human health from direct contact with the soil (e.g., incidental ingestion or dermal absorption) and RCLs that are protective of groundwater (i.e., soil concentrations that will not leach and cause an exceedance of groundwater standards). The Wis. Adm. Code ch. NR 720 direct contact residual contaminant levels (RCLs) for PFOA and PFOS² are 1,260 ppb (non-industrial) and 16,400 ppb (industrial) for each compound. The concentrations of PFOA and PFOS detected in the seven soil samples collected to date were all below these direct contact RCLs. JCI/Tyco has not presented the Wis. Adm. Code § NR 720.10 groundwater pathway RCLs per for the PFAS detected in soil at the Stanton Site.³

The soil samples collected during the initial investigation were not necessarily collected from potential source areas. The DNR finds that additional soil sampling is needed in and around the 66-acre property to characterize PFAS in soil near potential source areas and to define the degree and extent of the PFAS contamination.

Data Gap #2a: PFAS concentrations in soil at locations where releases from operations and handling may have occurred at the Site; near process pipeline and sanitary sewers and drains on the property and along the sanitary sewer corridor to the wastewater treatment plant – especially where structural defects in the sewer system were found; in the wetlands area on the Site; and in soils outside the perimeter of the property – especially in areas where stormwater runoff or other migration pathways may have deposited material.

Data Gap #2b: Map showing location and depth where arsenic-contaminated soil was excavated and the location and type of cover in place over the residual arsenic contamination for BRRTS 02-38-000011.

Data Gap #2c: Groundwater pathway RCLs (Wis. Adm. Code § NR 720.10) for PFAS detected at the Site that have a recommended groundwater enforcement standard.

Groundwater:

JCI/Tyco's groundwater sampling from 15 monitoring wells screened in the unconsolidated aquifer at the Site found that PFAS contamination is present inside and outside the barrier wall at concentrations that are greater than the Wisconsin Department of Health Services' (DHS's) Cycle 11 recommended groundwater standards.⁴ JCI/Tyco is utilizing these recommended groundwater standards under Wis. Adm. Code § NR 722.09(2)(b)2. The highest concentration of PFAS was detected in a well screened in the shallow depth interval inside the barrier wall (PFOA = 9,100 ppt in MW108S). PFAS concentrations were generally lower in samples collected outside the barrier wall and in samples collected from the intermediate depth interval of the unconsolidated aquifer. The extent of groundwater with concentrations of PFAS greater than the DHS's Cycle 11 recommended groundwater standards has not been defined at the Site.

The distribution of PFAS in groundwater suggests that the PFAS came from surface or shallow releases primarily on the property, and the barrier wall that was constructed in 2010 will likely limit, but may not prevent, further migration of the PFAS in groundwater from the property. The PFAS currently outside the barrier wall may have migrated prior to the construction of the containment system, from leaks in the barrier wall, from leaks in the sanitary sewer, and/or from stormwater runoff or other migration pathways. The PFAS in groundwater migrating

² Perfluorobutane sulfonic acid (PFBS) also has Wis. Adm. Code ch. NR 720 direct contact RCLs of 1,260,000 ppb (non-industrial) and 16,400,000 ppb (industrial). PFBS is not a contaminant of concern at the Site.

³ In its June 2020 CSM for the FTC site, JCI/Tyco calculated a groundwater RCL of PFOA = 5 ppb and PFOS = 0.9 ppb; however, a comparable evaluation or recommendation to use these calculated RCLs was not included for the Stanton site.

⁴ On November 6, 2020, the DHS recommended groundwater standards for PFAS, which brought the total number of PFAS compounds with recommended standards to 18 PFAS ("Cycle 11"). <https://www.dhs.wisconsin.gov/water/gws-cycle11.htm>

from the FTC is a potential contributing source to PFAS in the unconsolidated aquifer in and around the Stanton property. The migration of PFAS in groundwater outside the perimeter of the property is not controlled or contained by the barrier wall.

The DNR finds that additional groundwater sampling is needed to define the degree and extent of the PFAS contamination in the unconsolidated aquifer and to assess the migration of the PFAS at the Site.

Data Gap #3a: Additional groundwater sampling to characterize the extent and stability of PFAS contamination in groundwater inside the barrier wall based on analysis for 36 PFAS.

Data Gap #3b: Additional groundwater sampling to define the degree, extent and stability of PFAS contamination in groundwater at various depths in the unconsolidated aquifer outside the perimeter of the property based on analysis for 36 PFAS – with focused attention to potential sources like historical structural defects in the sanitary sewer and areas where stormwater runoff or other transport mechanisms may have deposited material containing PFAS.

Data Gap #3c: Information to document the effectiveness of the barrier wall in containing groundwater flow from the property, including the identification of locations of historical or current leaks.

Bedrock:

JCI/Tyco's sampling of three shallow bedrock wells during the initial site investigation found that PFAS is present in the groundwater in the shallow bedrock outside the barrier wall on the Stanton property at concentrations greater than 1,000 ppt for PFOA. On May 11, 2020, the DNR received JCI/Tyco's *Near-term Bedrock Groundwater Evaluation Work Plan* (Bedrock SI Work Plan) to expand the investigation of PFAS along the shallow bedrock migration pathway. Based on review of the available site investigation data, the DNR finds that the PFAS detected in bedrock on the Stanton property may be associated with JCI/Tyco's FTC site (BRRTS #02-38-580694).

The FTC property is approximately 1.5 miles from the Stanton property and is hydraulically upgradient from the Stanton property. The PFAS concentrations in soil and groundwater in the unconsolidated aquifer on and near the FTC property are significantly greater than on the Stanton property. In addition, the Stanton CSM says that discharges of PFAS at the Stanton Site were likely incidental releases of PFAS-containing materials at the surface or from structural defects to sewers or other subgrade pipes, and that downward migration of PFAS into shallow bedrock is limited by a low-permeability glacial till that sits on top of the bedrock on the Stanton property. Based on the current CSM and the distribution of PFAS detected in the groundwater, it is unlikely that releases of PFAS on or near the surface on the Stanton property are the primary source of PFAS detected in the shallow bedrock wells on this property.

Because the PFAS impacts migrating in the shallow bedrock are not exclusive to the Stanton Site, the DNR has assigned the Bedrock SI Work Plan to both the FTC and Stanton Sites and provided a response under separate cover to address both of these BRRTS cases. The data gaps in the investigation of the bedrock migration pathway are summarized in DNR's companion letter to JCI/Tyco dated August 31, 2021.

Stormwater:

JCI/Tyco included a map of seven stormwater outfalls at the bulkhead along the Menominee River (see CH2M Hill Figure 2 in **Attachment A**). JCI/Tyco indicated that this was a partial map for the stormwater management and that JCI/Tyco will update the stormwater management on the Site to be above ground by January 1, 2023.

At the time of the CSM, JCI/Tyco had not sampled stormwater for PFAS. In January 2021, JCI/Tyco began testing Outfall 001 for PFOA and PFOS as required in its newly reissued WPDES permit. Outfall 001 is a combined effluent from wastewater, noncontact cooling water, groundwater infiltration, and stormwater. PFOA and PFOS were detected in Outfall 001 at concentrations of 75 – 190 ppt for PFOA and 11 – 30 ppt for PFOS.

Data Gap #4a: Maps identifying all historical and current stormwater flow and discharge locations, and the plans for the above-ground stormwater management when the plans become available.

Data Gap #4b: Samples of stormwater currently flowing from the Site at locations other than Outfall 001 and samples of stormwater at discharge locations from the Site once the stormwater management is moved above ground.

Surface Water:

JCI/Tyco did not collect surface water during the initial site investigation. JCI/Tyco reported that the concentrations of PFOA and PFOS in public surface water samples collected from the Menominee River and Bay of Green Bay River in 2019 were below the DNR's surface water guidelines of 420 ppt for PFOA and 11 ppt for PFOS. These samples were collected at locations that were upstream and downstream of the Site. In addition, in recent years the water levels in the Menominee River have increased and caused flooding at the Site, which may at times cause mixing of groundwater and surface water and alter hydraulic gradients and flow paths.

Data Gap #5a: Evaluation on the effect flooding and varying water levels in the Menominee River have on PFAS concentrations measured in groundwater at the Site and potential PFAS migration from the Site in discharge to Menominee River over the barrier wall, through weirs and/or other outlets. (Location of weirs are shown on Jacob's Figure 3 in **Attachment A**.)

Data Gap #5b: Surface water sampling for PFAS from the Menominee River directly adjacent the Site at locations where groundwater, surface water and/or stormwater discharge to the river.

Sediment:

JCI/Tyco suggested that previous dredging of sediment to remove arsenic contamination from the Menominee River and the current containment of groundwater at the Site make it a low possibility that PFAS will be present in the residual sediment at levels of concern. JCI/Tyco has not sampled sediment for PFAS in the Menominee River and has not specified concentrations in the sediment that would constitute levels of concern to receptors.

Data Gap #6a: Summary of sediment dredging completed for BRRTS 02-38-00001 (figures identifying the areas and depths of dredging, summary of location and methods for sediment stabilization, and statement regarding the facility and/or other locations where the stabilized sediment was disposed).

Data Gap #6b: Identification of receptors and determination of concentrations in sediment that would be levels of concern to those receptors.

Data Gap #6c: Sampling of sediment and porewater for PFAS in the Menominee River at locations outside the limits of the prior dredging, inside the dredged area near potential outfall/discharge locations from the Site and upstream and downstream of the Site.

Biota:

JCI/Tyco did not collect samples of fish or biota during the initial site investigation. JCI/Tyco reported that nine fish samples collected by the DNR in 2012 in the Menominee River had concentrations of PFOS ranging from 5.4

to 26 nanograms per gram (ng/g), which are below the do not eat threshold of 200 ng/g established in 2019 by the Great Lakes Consortium for Fish Consumption Advisories.

Data Gap #7: Evaluation of risk to other receptors such as invertebrates and higher trophic organisms.

Groundwater Treatment:

JCI/Tyco's reverse osmosis groundwater treatment system was designed to treat the groundwater extracted from the Site for arsenic. JCI/Tyco suggested that the reverse osmosis membranes will also remove PFAS; however, at the time of the CSM, JCI/Tyco had not tested the effluent for PFAS. In January 2021, JCI/Tyco began testing the effluent for PFOA and PFOS as required in its newly reissued WPDES permit. The effluent had concentrations ranging from 0.73 – 45 ppt for PFOA and 0.46 – 2.9 ppt for PFOS, which indicates concentrations of PFOA and PFOS are reduced by the reverse osmosis groundwater treatment system. Continued testing under the requirements of the WPDES Permit can be used to confirm these findings and evaluate variability over time.

Data Gap #8a: Reporting the results from the PFAS testing completed for the WPDES Permit in the site investigation report to document the findings and conclusions within the context of the Wis. Adm. Code § NR 716 site investigation.

Note, the reject water from the reverse osmosis treatment was reported to be transported off-site for disposal and the filter cake disposed off-site at the Menominee City Landfill. Because reverse osmosis is also removing PFAS during treatment of the contaminated water, JCI/Tyco is reminded to confirm the reject water and filter cake are appropriately characterized for disposal.

Summary and Review of Aerial Deposition Report (August 2020)

In its Aerial Deposition Report, JCI/Tyco applied the CSM to evaluate the potential for aerial deposition of PFAS and concluded that its operations at the Site could not serve as aerial emission source for PFAS because there are no stack emissions and no outdoor testing or fire training of AFFF. JCI/Tyco also concluded that ChemDesign, who leases a portion of the Site, is not a source of aerial emissions of PFAS. ChemDesign converts raw PFAS ingredients in sealed reactors into specific types of PFAS for use by JCI/Tyco in AFFF; when ChemDesign vents the reactors, the vapors are collected and returned to the reactor or disposed as a waste.⁵

On February 23, 2021, the DNR provided JCI/Tyco with a response identifying technical data gaps in the Aerial Deposition Evaluation for the FTC (BRRTS #02-38-580694). The operations at the Stanton Street facility differ from those at the FTC, and additional information is needed on the Stanton Street operations to further develop the CSM and evaluate the potential for aerial deposition of PFAS from this Site. Additional data gaps may be identified in the future as the site investigation continues, the CSM is refined, and/or the science for aerial deposition of PFAS advances. Current data gaps in the understanding of JCI/Tyco's operations at the Site include:

Data Gap #9b: Clarification if AFFF is the only PFAS-containing material at the Site, or if there are other processes or materials containing PFAS (e.g., coating operations or other secondary manufacturing).

Data Gap #9b: Process flow diagrams and physical locations of the various manufacturing and quality control operations. Identify the locations of any vents used in any processes containing PFAS and

⁵ The potential migration of PFAS in air from ChemDesign's operations will be evaluated in the site investigation for BRRTS case #02-38-583852

discussion if heat is used in any processes containing PFAS. If heat is used, specify locations, temperatures and duration.

Data Gap #9c: Discussion of the activities with air permits for the Site, if there are PFAS containing materials used within these activities, and the potential for PFAS air emissions from these activities.

Summary and Review of SI Work Plan (March 2021)

JCI/Tyco’s stated objective in the SI Work Plan was to delineate the extent of PFAS contamination in the overburden groundwater that meets or exceeds the DHS’s Cycle 11 recommended groundwater standards.

JCI/Tyco’s proposed scope of work included:

- Installation of three new monitoring wells (MW125S-20, MW125M-35, and MW126S-20) in the unconsolidated zone off the property. (JCI/Tyco installed the wells in November and December 2020.)
- Groundwater monitoring in 23 monitoring wells listed below and shown on Figure 4 in **Attachment A**. (These include 15 monitoring wells previously sampled for PFAS during the initial site investigation.)
 - One round of water level measurements, and
 - One round of groundwater samples analyzed for 36 PFAS in accordance with the draft QAPP.⁶

Location	Depth Zone	Previously Sampled for PFAS		Not Previously Sampled for PFAS	
		# of Wells	Monitoring Well IDs	# of Wells	Monitoring Well IDs
Inside Containment Wall	Shallow	5	MW032S, 041S, 44S, 054S, 108S	0	--
	Intermediate	1	MW008M	0	--
Outside Containment Wall	Shallow	5	MW003S, 013S, 021S-R, 102S, 104S	4	MW022S*, 125S-20, 126S-20, PZ-28-14
	Intermediate	4	MW003M, 013S, 040M, 102M	4	MW021M, 022M*, 125M-35, PZ-28-54

* If MW022S and MW022M are not accessible, then JCI/Tyco proposes to sample MW049S and MW049M in their place.

JCI/Tyco stated that media, other than groundwater, had been sufficiently characterized; thus, JCI/Tyco proposed no additional sampling of soil, surface water, stormwater, air or sediment in the SI Work Plan. The DNR disagrees with this conclusion, as noted in the data gaps that the DNR identified above and in its response to JCI/Tyco’s Bedrock SI Work Plan.

JCI/Tyco stated that the SI Work Plan was developed based on identification of data gaps; however, JCI/Tyco did not list data gaps in the Interim SI Report, CSM, Aerial Deposition Report or SI Work Plan. The DNR identified gaps identified in the Wis. Adm. Code ch. NR 716 site investigation for PFAS at the Site, which JCI/Tyco’s must address during the site investigation process.

JCI/Tyco’s proposed scope of work partially addresses **Data Gap #3a** and **Data Gap #3b**; however, additional work may also be needed. The groundwater monitoring proposed in the SI Work Plan includes 36 PFAS, which will allow the results to be compared to DHS’s Cycle 11 recommended groundwater standards. JCI/Tyco can

⁶ JCI/Tyco’s final Quality Assurance Project Plan (QAPP) for the Site dated March 16, 2021 has been approved by the DNR.

proceed with the proposed scope of work with the understanding that additional sampling will likely be required to define the degree and extent of the PFAS contamination in the overburden groundwater. The DNR recommends that additional (existing) monitoring wells be added to the upcoming sampling event, which are listed below.

- **Data Gap #3a:** The sampling of wells that were previously sampled can be used to assess the reproducibility of the PFAS concentrations inside the containment wall. Additional wells not previously sampled for PFAS should be added to delineate the extent of PFAS contamination along the interior upland, boundary of the barrier wall, in the southeastern portion of the property and in the intermediate depth zone throughout the property. Suggested additions to the proposed sampling program include MW004S/004M, MW011S/011M, MW044M, MW106S/106M, and MW109S/109M.
- **Data Gap #3b:** The sampling of wells that were previously sampled can be used to assess the reproducibility of the PFAS concentrations outside the containment wall. The wells not previously sampled for PFAS that were added to the sampling program are a good next step in delineating the degree and extent of PFAS in groundwater. Suggested additions to the proposed sampling program include MW040S and MW104M. In the future, additional monitoring wells may be needed to characterize the overburden groundwater to the west of the site, to the south of the site in the area between PZ-28 and MW022 and in areas near historical structural defects in the sanitary sewer or where stormwater runoff or other transport mechanisms may have deposited material containing PFAS.
- **Data Gap #3c:** Evaluation of water levels and PFAS results from wells paired on the interior and exterior of the barrier wall can help to address this data gap. The wells suggested above may be used to assist in this evaluation. There is some mention of pressure transducer monitoring for some wells, and further analyses of these data, in combination with local precipitation and surface water level data from the nearby Menominee, MI USGS gage, may enhance the understanding of potential groundwater migration pathways for PFAS. (These data may also be used in the evaluation for Data Gap #5a).

Conclusions and Next Steps

Based on review of the Site Interim SI Report, CSM, Aerial Deposition Evaluation and SI Work Plan, the DNR agrees with JCI/Tyco's plans to expand the investigation of PFAS contamination at the Site; however, the scope of work presented in the SI Work Plan will not result in a complete site investigation per Wis. Adm. Code § 716.11. Additional sampling and/or documentation will be required in order to define the vertical and horizontal extent (Wis. Adm. Code § NR 716.11(3)(a)) of PFAS contamination and to evaluate need for interim or remedial actions (Wis. Adm. Code § NR 716.11(3)(b)).

JCI/Tyco is reminded that data from related BRRTS cases can be incorporated into this site investigation where warranted and applicable (e.g., BRRTS #02-38-00011, 02-38-50694, and 02-38-583852).

Given the size and complexity of this and related projects in the area, **the DNR directs JCI/Tyco to submit site investigation status reports within 60 days after completion of a scope of work defined in a work plan⁷ or as otherwise directed by DNR in its review and response of future work plans per Wis. Adm. Code § NR 716.17(1).** The DNR recognizes that site investigation for large and complex sites are iterative, and a final site investigation report per Wis. Adm. Code § NR 716.15 may not be possible while work is ongoing to define the degree and extent of contamination. However, certain elements required in Wis. Adm. Code § NR 716.15 will be needed to evaluate the data and to make decisions on appropriate next steps in the site investigation process for

⁷ When laboratory sampling is included in a scope of work, completion date is date when the laboratory report is received.

Response to Site Investigation Work Plan Interim Site Investigation Report,
Conceptual Site Model and Aerial Deposition Evaluation Report
BRRTS #02-38-581955

this Site. The site investigation status reports must include the required elements under Wis. Adm. Code § NR 716.14 (2) and additional items from Wis. Adm. Code § NR 716.15 as needed to evaluate completeness of the site investigation.

The next steps required by JCI/Tyco for the Site are summarized below. Additional written response to this letter is not needed.

- Within 60 days of receipt of this letter, implement the proposed groundwater sampling (Wis. Adm. Code § NR 716.11(2r)). The DNR recommends JCI/Tyco include the additional monitoring wells noted above in this sampling. Complete the work in accordance with the final QAPP dated March 2021; this includes analysis for the 36 PFAS compounds that JCI/Tyco is required to report.
- Within 60 days of receipt of the laboratory data from the groundwater sampling, submit a site investigation status report.⁸ The site investigation status report for work completed under this SI Work Plan shall include, at minimum, the following elements from Wis Adm. Code § NR 716.15.
 - Laboratory reports and summary of the groundwater monitoring results compared to Cycle 11 recommended groundwater standards.
 - Isoconcentration maps prepared for the shallow and intermediate depth intervals and at least two isoconcentration cross-sections through the Site (parallel and perpendicular to the Menominee River) that extend down into bedrock. Prepare the figures for PFOA and PFOS, with the understanding that other parameters may require mapping in the future. Include the well IDs and groundwater concentrations for sample points used to develop the isoconcentration contours. (Do not include points that were not sampled, or data for depth intervals that are not represented on the figure.) Dash the contours where inferred, and incorporate data from other BRRTS sites and the bedrock investigation, as applicable.
 - Assessment on the horizontal and vertical extent of PFAS impacts to groundwater.
 - Response to each of the site investigation data gaps identified in this letter.
 - Documentation of disposal of investigative derived waste (Wis. Adm. Code § NR 716.11(6)).
 - Conclusions and recommendations for next steps.

To support the findings and conclusions, the DNR recommends that JCI/Tyco include a CSM framework in the status report to evaluate completeness of the site investigation (e.g., flow chart identifying the release mechanisms, potential migration pathways, contaminated media and potential receptors).

- Within 60 days of submittal of the site investigation status report, submit a work plan to address the data gaps remaining in the site investigation per Wis. Adm. Code § NR 716.09. If JCI/Tyco chooses, it may include the work plan as an element of the site investigation status report, rather than a later separate submittal. (Alternatively, if JCI/Tyco concludes the site investigation is complete, then submit a site investigation report that complies with the requirements under Wis. Adm. Code § 716.15).

⁸ The 10-day data notification to the DNR per Wis. Adm. Code § NR 716.14 (2) is not required if JCI/Tyco continues to provide the biweekly updates to the database when the results becomes available and provides the status report within 60-days of receipt of the data per Wis. Adm. Code § 716.14(3). The requirement of 10-day data notification of results to landowners (with copy to DNR) remains in effect for samples of water supply wells and other media collected on properties that are not owned by JCI/Tyco.

August 31, 2021

Page 13 of 13

Response to Site Investigation Work Plan Interim Site Investigation Report,
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The DNR appreciates your efforts to investigate and remediate this Site. If you have any questions about this letter, please contact me, the DNR Project Manager, at (608) 622-8606 or Alyssa.Sellwood@wisconsin.gov.

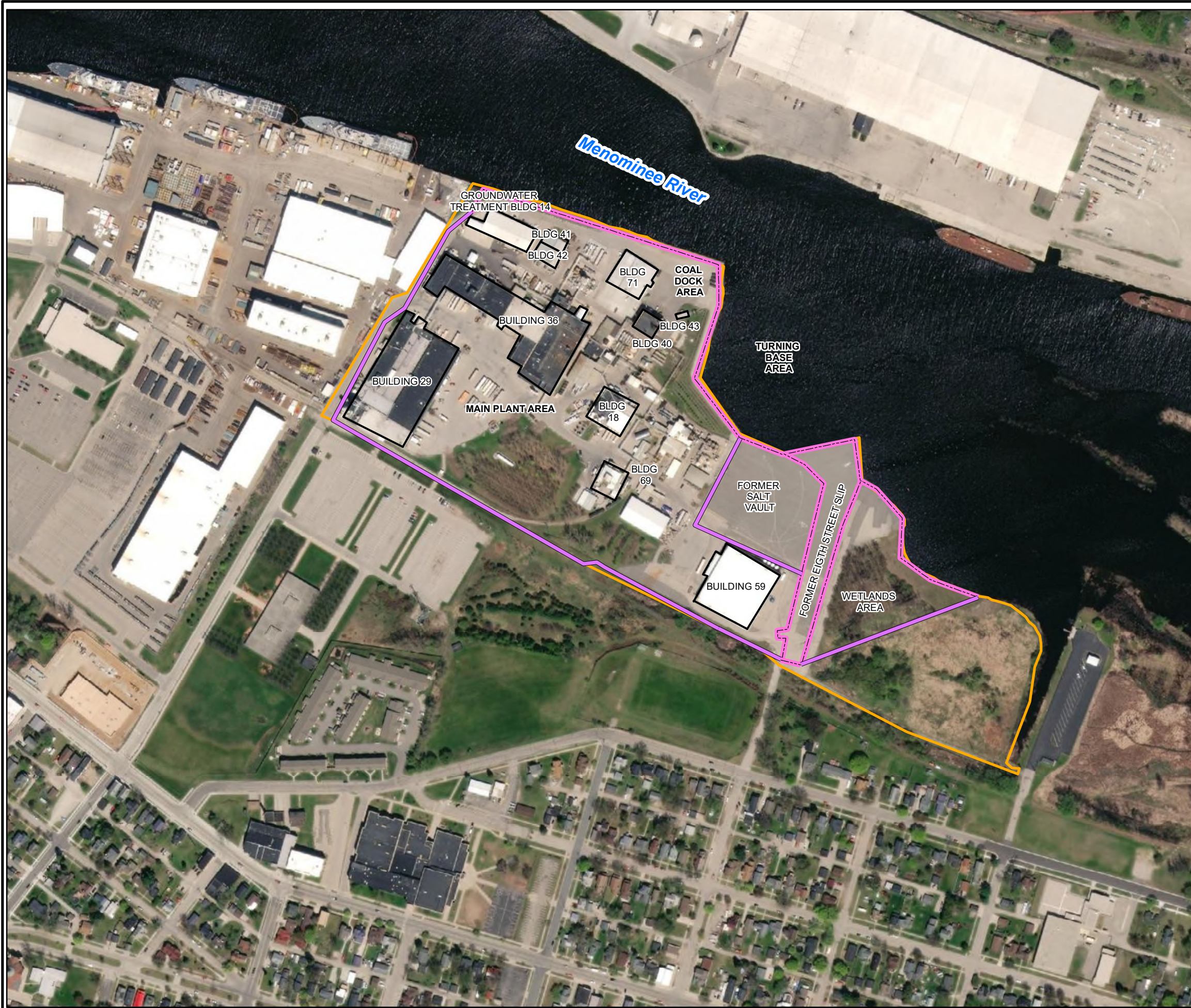
Sincerely,



Alyssa Sellwood, PE
Complex Sites Project Manager
Remediation & Redevelopment Program

Attachment A: Referenced Figures

cc: Scott Potter, Arcadis (via email: scott.potter@arcadis.com)
Ben Verburg, Arcadis (via email: ben.verburg@arcadis.com)
Christopher Peters, Arcadis (via email: Christopher.peters@arcadis.com)
Bridget Kelly, DNR (via email: bridgetb.kelly@wisconsin.gov)
Jodie Peotter, DNR (via email: Jodie.peotter@wisconsin.gov)



LEGEND:

- APPROXIMATE SITE PROPERTY BOUNDARY
- SHEET PILE WALL
- SLURRY WALL

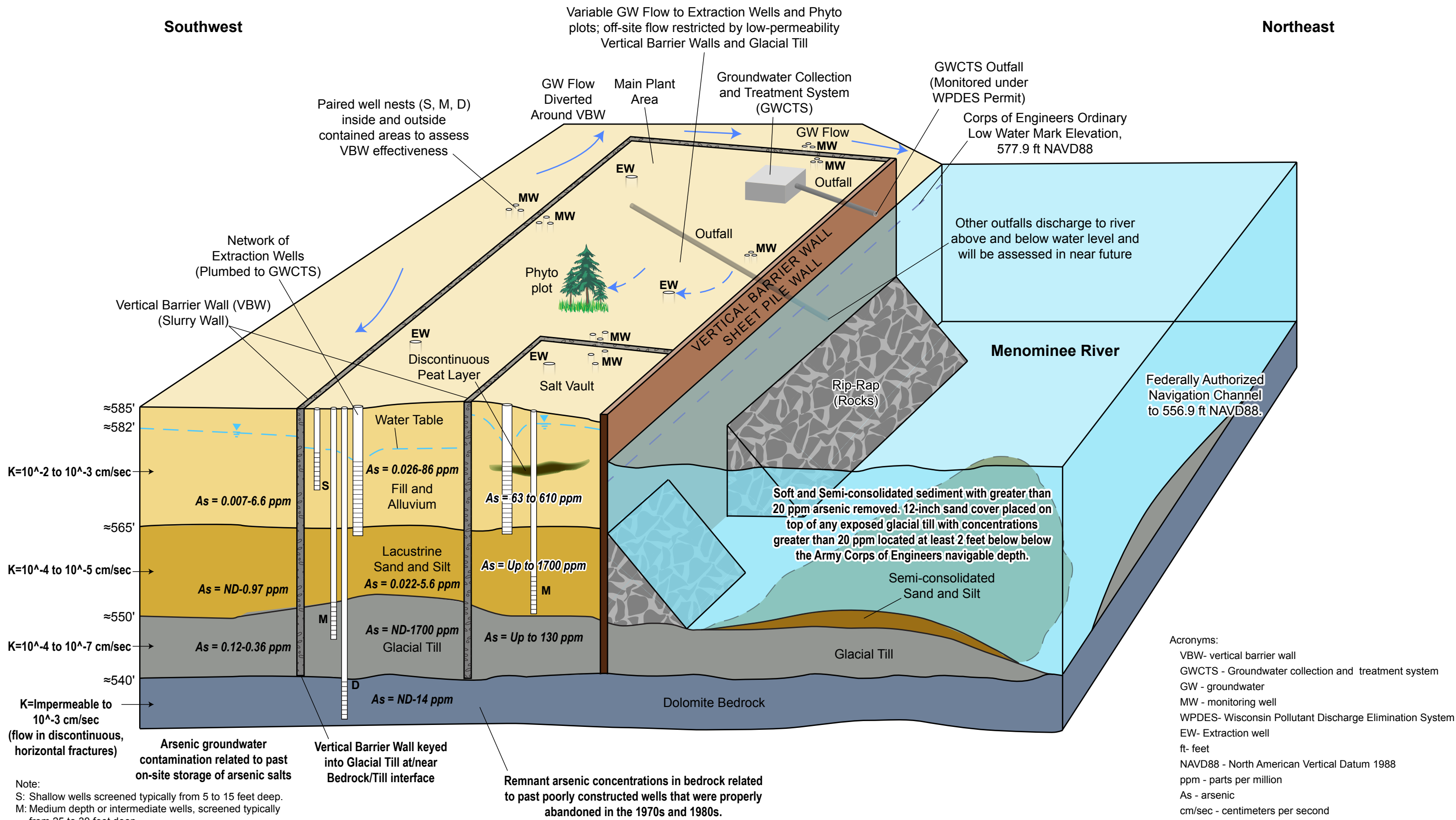
NOTES:

1. ROAD DATA SOURCE: OPEN STREET MAP, ACCESSED FALL 2017.
2. SERVICE LAYER CREDITS: SOURCE: ESRI, MAXAR, GEOEYE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, USDA, USGS, AEROGRIID, IGN, AND THE GIS USER COMMUNITY.



TYCO STANTON STREET FACILITY
MARINETTE, WISCONSIN
SITE INVESTIGATION WORK PLAN

SITE LAYOUT



Note:
 S: Shallow wells screened typically from 5 to 15 feet deep.
 M: Medium depth or intermediate wells, screened typically from 25 to 30 feet deep.
 D: Deep wells installed and sealed within the uppermost portion of bedrock using a 5-foot long screen.

Arsenic results are from 2013-2014 and represent highest and lowest arsenic concentrations detected in each area.
 Bedrock concentrations are the range for the entire site since bedrock is located below the barrier wall system.

Recent arsenic concentrations in Wetlands and 8th St Slip areas		
Unit	Wetlands	8th St Slip
Alluvium	0.014 to 1.5 ppm	65 to 120 ppm
Lacustrine sand and silt	ND to 1800 ppm	No data
Till	Up to 2.6 ppm	No data

NOT TO SCALE

- Acronyms:
 VBW- vertical barrier wall
 GWCTS - Groundwater collection and treatment system
 GW - groundwater
 MW - monitoring well
 WPDES- Wisconsin Pollutant Discharge Elimination System
 EW- Extraction well
 ft- feet
 NAVD88 - North American Vertical Datum 1988
 ppm - parts per million
 As - arsenic
 cm/sec - centimeters per second

FIGURE 1-4
 Conceptual Site Model Post-barrier Wall
 Tyco Fire Products LP
 Marinette, Wisconsin

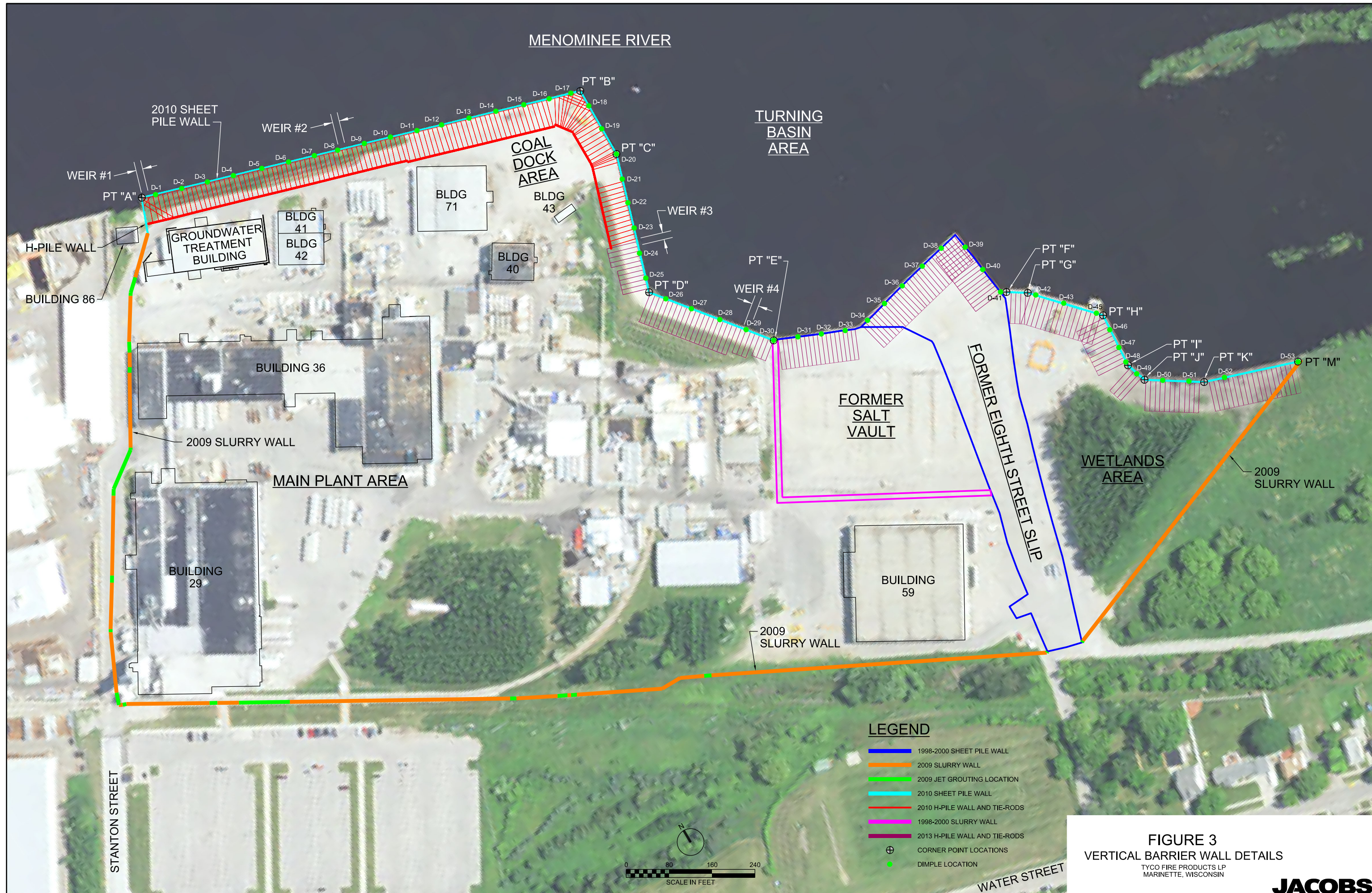
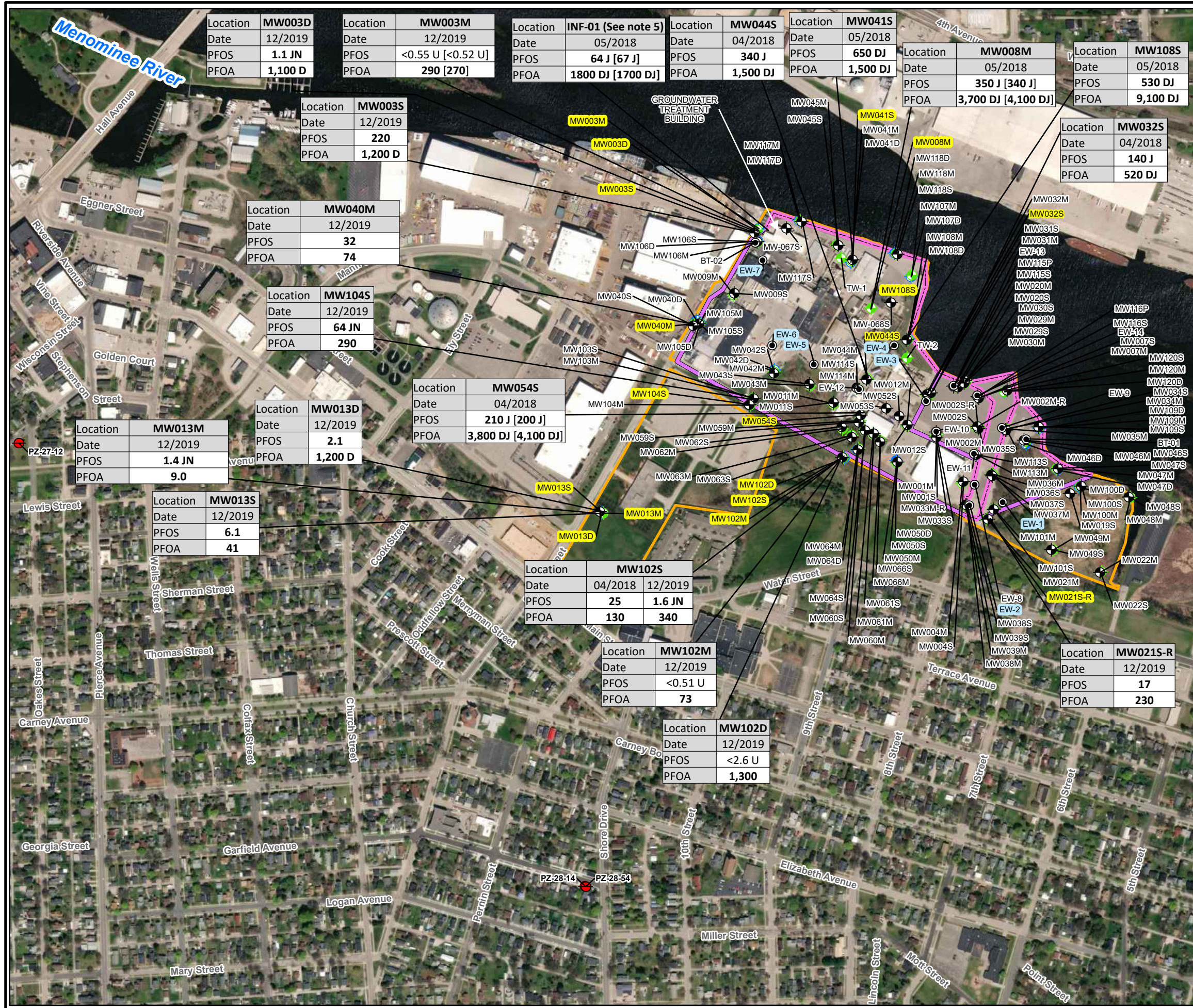


FIGURE 3
VERTICAL BARRIER WALL DETAILS
 TYCO FIRE PRODUCTS LP
 MARINETTE, WISCONSIN





Location	MW003D	Location	MW003M	Location	INF-01 (See note 5)	Location	MW044S	Location	MW041S
Date	12/2019	Date	12/2019	Date	05/2018	Date	04/2018	Date	05/2018
PFOS	1.1 JN	PFOS	<0.55 U [<u><0.52 U</u>]	PFOS	64 J [67 J]	PFOS	340 J	PFOS	650 DJ
PFOA	1,100 D	PFOA	290 [270]	PFOA	1800 DJ [1700 DJ]	PFOA	1,500 DJ	PFOA	1,500 DJ

Location	MW003S	Location	MW008M	Location	MW108S
Date	12/2019	Date	05/2018	Date	05/2018
PFOS	220	PFOS	350 J [340 J]	PFOS	530 DJ
PFOA	1,200 D	PFOA	3,700 DJ [4,100 DJ]	PFOA	9,100 DJ

Location	MW040M	Location	MW032S
Date	12/2019	Date	04/2018
PFOS	32	PFOS	140 J
PFOA	74	PFOA	520 DJ

Location	MW104S	Location	MW054S
Date	12/2019	Date	04/2018
PFOS	64 JN	PFOS	210 J [200 J]
PFOA	290	PFOA	3,800 DJ [4,100 DJ]

Location	MW013D	Location	MW013M
Date	12/2019	Date	12/2019
PFOS	2.1	PFOS	1.4 JN
PFOA	1,200 D	PFOA	9.0

Location	MW013S	Location	MW102S
Date	12/2019	Date	04/2018 12/2019
PFOS	6.1	PFOS	25 1.6 JN
PFOA	41	PFOA	130 340

Location	MW102M	Location	MW102D
Date	12/2019	Date	12/2019
PFOS	<0.51 U	PFOS	<2.6 U
PFOA	73	PFOA	1,300

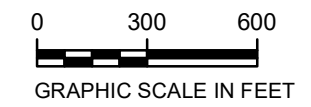
Location	MW021S-R
Date	12/2019
PFOS	17
PFOA	230

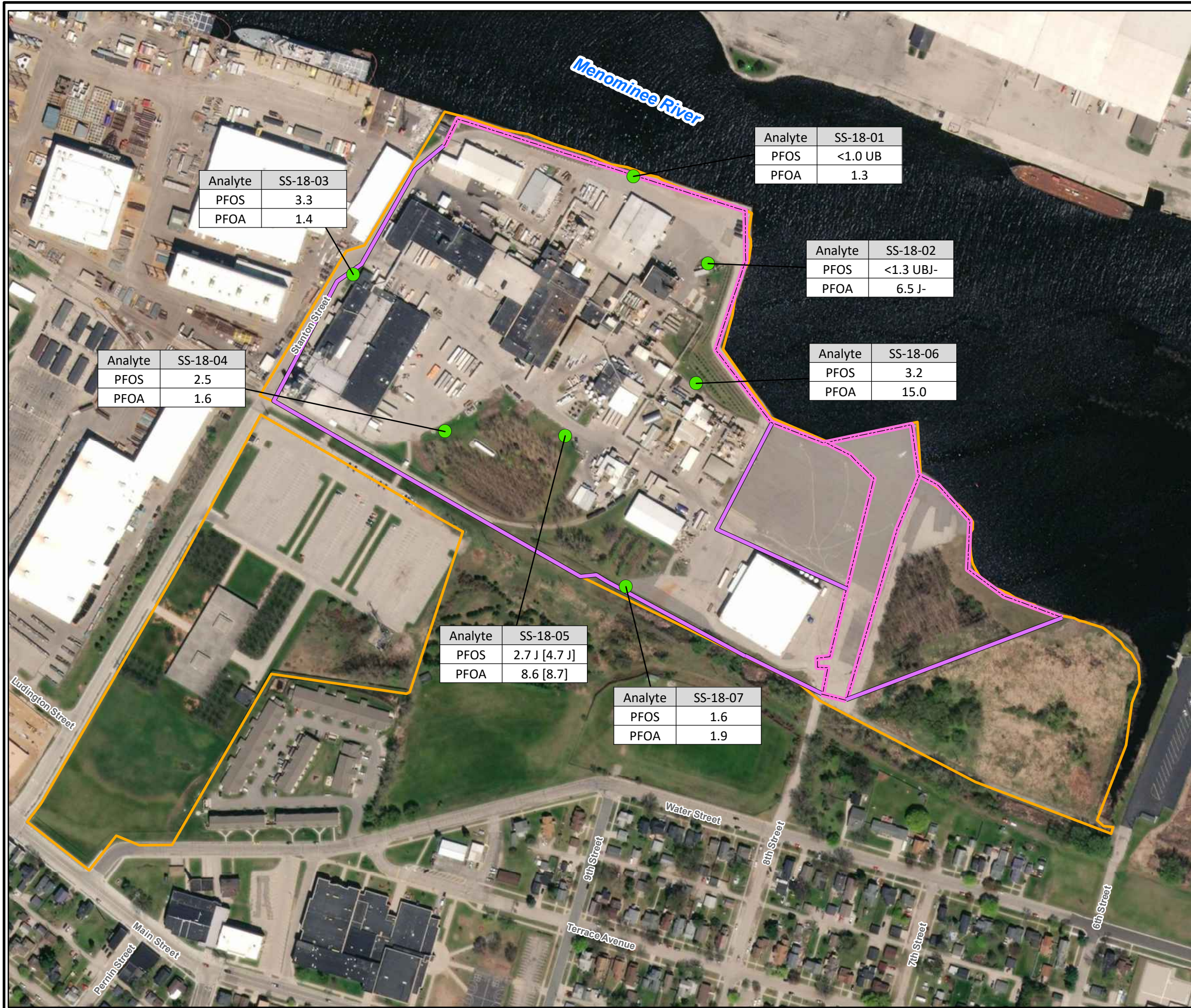
LEGEND:

- EXTRACTION WELL OR TEST WELL
- ⊕ MONITORING WELL - SHALLOW OR PEAT
- ⊕ MONITORING WELL - MEDIUM
- ⊕ MONITORING WELL - DEEP (BEDROCK)
- PIEZOMETER
- APPROXIMATE SITE PROPERTY BOUNDARY
- SHEET PILE WALL
- SLURRY WALL
- WELL ID** GROUNDWATER SAMPLING LOCATION
- EX-1** EXTRACTION WELL PUMPED TO GROUNDWATER COLLECTION AND TREATMENT SYSTEM

NOTES:

- ALL WELLS DEPICTED WERE INSTALLED AND SURVEYED BY ANOTHER CONSULTANT EXCEPT THE PIEZOMETERS, WHICH WERE SURVEYED BY ARCADIS.
- ROAD DATA SOURCE: OPEN STREET MAP, ACCESSED FALL 2017.
- PFOS = PERFLUOROCTANESULFONIC ACID.
- PFOA = PERFLUOROCTANOIC ACID.
- INFO-01 SAMPLE IS REPRESENTATIVE OF GROUNDWATER COLLECTED FROM EXTRACTION WELLS EX-1 TO EX-7 PRIOR TO TREATMENT.
- UNITS ARE IN ng/L (NANOGRAM PER LITER) UNLESS OTHERWISE STATED.
- QUALIFIERS ARE DEFINED AS:
 < = COMPOUND NOT DETECTED AT METHOD DETECTION LIMIT.
 D = DILUTION REQUIRED FOR SAMPLE ANALYSIS.
 J = THE COMPOUND WAS POSITIVELY IDENTIFIED; HOWEVER, THE ASSOCIATED NUMERICAL VALUE IS AN ESTIMATED CONCENTRATION ONLY.
 N = THE ANALYSIS INDICATES THE PRESENCE OF A COMPOUND FOR WHICH THERE IS PRESUMPTIVE EVIDENCE TO MAKE A TENTATIVE IDENTIFICATION.
 U = LABORATORY FLAG INDICATING THE RESULT IS NON-DETECT.
 8. FIELD DUPLICATES ARE SHOWN IN BRACKETS [].
 9. BOLD = DETECTION.





Analyte	SS-18-03
PFOS	3.3
PFOA	1.4

Analyte	SS-18-04
PFOS	2.5
PFOA	1.6

Analyte	SS-18-05
PFOS	2.7 J [4.7 J]
PFOA	8.6 [8.7]

Analyte	SS-18-07
PFOS	1.6
PFOA	1.9

Analyte	SS-18-01
PFOS	<1.0 UB
PFOA	1.3

Analyte	SS-18-02
PFOS	<1.3 UBJ-
PFOA	6.5 J-

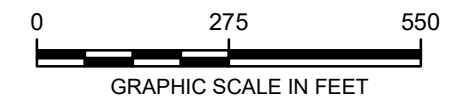
Analyte	SS-18-06
PFOS	3.2
PFOA	15.0

LEGEND:

- SOIL SAMPLE LOCATION
- APPROXIMATE SITE PROPERTY BOUNDARY
- SHEET PILE WALL
- SLURRY WALL

NOTES:

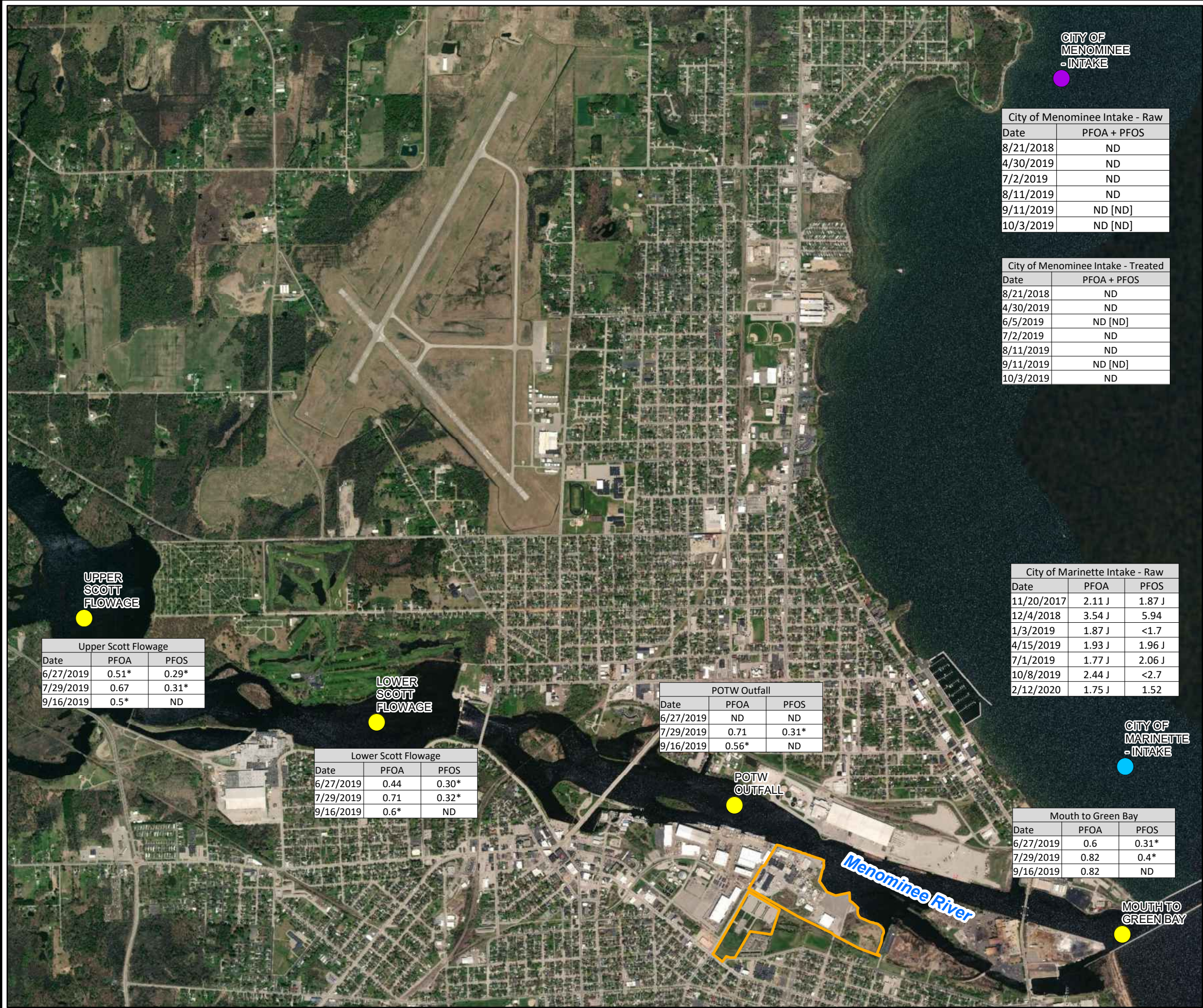
1. ALL BORING LOCATIONS DEPICTED ARE APPROXIMATE.
2. ROAD DATA SOURCE: OPEN STREET MAP, ACCESSED FALL 2017.
3. PFOS = PERFLUOROOCTANESULFONIC ACID.
4. PFOA = PERFLUOROOCTANOIC ACID.
5. UNITS ARE IN µg/kg (MICROGRAMS PER KILOGRAM).
6. QUALIFIERS ARE DEFINED AS:
 < = COMPOUND NOT DETECTED AT METHOD DETECTION LIMIT.
 J = COMPOUND WAS POSITIVELY IDENTIFIED; HOWEVER, THE ASSOCIATED NUMERICAL VALUE IS AN ESTIMATED CONCENTRATION ONLY.
 J- = RESULT IS AN ESTIMATED QUANTITY. THE ASSOCIATED NUMERICAL VALUE IS EXPECTED TO HAVE A NEGATIVE OR LOW BIAS.
 UB = COMPOUND CONSIDERED NON-DETECT AT THE LISTED VALUE DUE TO ASSOCIATED BLANK CONTAMINATION.
7. FIELD DUPLICATES ARE SHOWN IN BRACKETS [].



TYCO STANTON STREET FACILITY
MARINETTE, WISCONSIN
INTERIM SITE INVESTIGATION REPORT

SOIL ANALYTICAL RESULTS

FIGURE 8



CITY OF MENOMINEE - INTAKE

City of Menominee Intake - Raw	
Date	PFOA + PFOS
8/21/2018	ND
4/30/2019	ND
7/2/2019	ND
8/11/2019	ND
9/11/2019	ND [ND]
10/3/2019	ND [ND]

City of Menominee Intake - Treated	
Date	PFOA + PFOS
8/21/2018	ND
4/30/2019	ND
6/5/2019	ND [ND]
7/2/2019	ND
8/11/2019	ND
9/11/2019	ND [ND]
10/3/2019	ND

City of Marinette Intake - Raw		
Date	PFOA	PFOS
11/20/2017	2.11 J	1.87 J
12/4/2018	3.54 J	5.94
1/3/2019	1.87 J	<1.7
4/15/2019	1.93 J	1.96 J
7/1/2019	1.77 J	2.06 J
10/8/2019	2.44 J	<2.7
2/12/2020	1.75 J	1.52

POTW Outfall		
Date	PFOA	PFOS
6/27/2019	ND	ND
7/29/2019	0.71	0.31*
9/16/2019	0.56*	ND

Mouth to Green Bay		
Date	PFOA	PFOS
6/27/2019	0.6	0.31*
7/29/2019	0.82	0.4*
9/16/2019	0.82	ND

Upper Scott Flowage		
Date	PFOA	PFOS
6/27/2019	0.51*	0.29*
7/29/2019	0.67	0.31*
9/16/2019	0.5*	ND

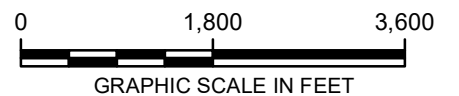
Lower Scott Flowage		
Date	PFOA	PFOS
6/27/2019	0.44	0.30*
7/29/2019	0.71	0.32*
9/16/2019	0.6*	ND

LEGEND:

- SURFACE WATER SAMPLE LOCATIONS**
- SAMPLED BY WDNR
 - SAMPLED BY CITY OF MARINETTE
 - SAMPLED BY EGLE
 - APPROXIMATE SITE PROPERTY BOUNDARY

NOTES:

1. ALL SURFACE WATER LOCATIONS DEPICTED ARE APPROXIMATE BASED ON PUBLICLY AVAILABLE DATA.
2. ROAD DATA SOURCE: OPEN STREET MAP, ACCESSED FALL 2017.
3. * = BETWEEN LOD AND LOQ.
4. EGLE = MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES, & ENERGY.
5. LOD = LIMIT OF DETECTION.
6. LOQ = LIMIT OF QUANTIFICATION.
7. PFOA = PERFLUOROOCTANOIC ACID.
8. PFOS = PERFLUOROOCTANE SULFONIC ACID.
9. POTW = PUBLICLY OWNED TREATMENT WORKS.
10. WDNR = WISCONSIN DEPARTMENT OF NATURAL RESOURCES.
11. UNITS ARE IN ng/L (NANOGRAM PER LITER) UNLESS OTHERWISE STATED.
12. QUALIFIERS ARE DEFINED AS:
 <= SUBSTANCE WAS NOT FOUND ABOVE THE LABORATORY LIMIT OF DETECTION.
 J = RESULT IS BETWEEN LOD AND LOQ, A REGION OF LESS CERTAIN QUANTIFICATION.
 ND = NON-DETECTABLE, SUBSTANCE WAS NOT FOUND ABOVE LABORATORY LIMIT OF DETECTION.
13. FIELD DUPLICATES ARE SHOWN IN BRACKETS [].



TYCO STANTON STREET FACILITY
MARINETTE, WISCONSIN
INTERIM SITE INVESTIGATION REPORT

**SURFACE WATER
ANALYTICAL RESULTS**

ARCADIS | **FIGURE 9**

SPC Utilities Legend

SPC Utility Points

- GAS PIPE JOINT
- GAS VALVE
- UNDERGROUND GAS VALVE
- UNDERGROUND GAS JOINT
- HYDRANT
- CITY HYDRANT
- CATCH BASIN
- LIFT STATION
- MANHOLE
- MANHOLE (ASSUMED)
- ELECTRIC MANHOLE (ASSUMED)
- PLUG
- SUMP
- TELECOMM CLOSET
- UNKNOWN
- UTILITY BOX
- UTILITY POLE
- WATER PIPE JOINT
- WATER VALVE
- WELL

SPC Utility Lines

- ABANDONED WATER LINE
- CITY WATER LINE
- GAS LINE
- PIPE GROUP
- RAW WATER LINE
- RIVER WATER LINE
- SEWER LINE
- SPRINKLER WATER LINE
- STEAM LINE
- UNDERGROUND ELECTRIC
- UNDERGROUND FIBER ROUTE
- UNDERGROUND GAS LINE
- UNKNOWN UTILITY
- WASTE WATER
- WATER LINE
- WELL WATER LINE

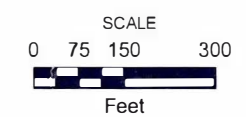
Facility Utilities Legend

Facility Utility Points

- City Water Manhole
- Hydrant
- Industrial Waste Manhole
- Raw Water Manhole
- Sanitary Sewer Manhole
- Storm Water Manhole
- Support Wire Pole?
- Toe Light
- Well

Facility Utility Lines

- Buried Electric
- Unknown
- Overhead Electric
- Overhead Steam Line
- Gas
- Industrial Waste
- Industrial Waste?
- Raw Water
- Raw Water Abandoned
- Reuse Water
- Rinse Water
- Water
- Sanitary Sewer
- Storm Water
- Storm Water?
- Fiber Optic
- Fiber and Telephone
- Telephone Wire
- Overhead Wire
- Support Wire
- Inlet Pipe



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SPC Utilities Note: Spatial errors due to variable scales and drawing qualities are present. Dimensions present in drawings were not captured in these datasets. Some attribution was irretrievable due to illegible portions of the drawings.

Base Utilities Note: Utilities were created for the pre-design remedial work plan.

Data Sources:
 SPC Utility data digitized from pdf files scanned from SPC drawings, 1967 through 2000, by John Bryson.
 Data is projected in Wisconsin SPCS, Central Zone, NAD83 feet.

Base Utilities:
 Survey by Robert Johnson, 2004
 CAD Drawing L-18910, 3/04/2003;
 CAD Drawing ansul ENV-utility, received 07/06
 Data verified and edited by Earth Tech, 08/2005



**FIGURE 3-1
 UTILITY MAP**
 TYCO SAFETY PRODUCTS - ANSUL FACILITY
 MARINETTE, WISCONSIN

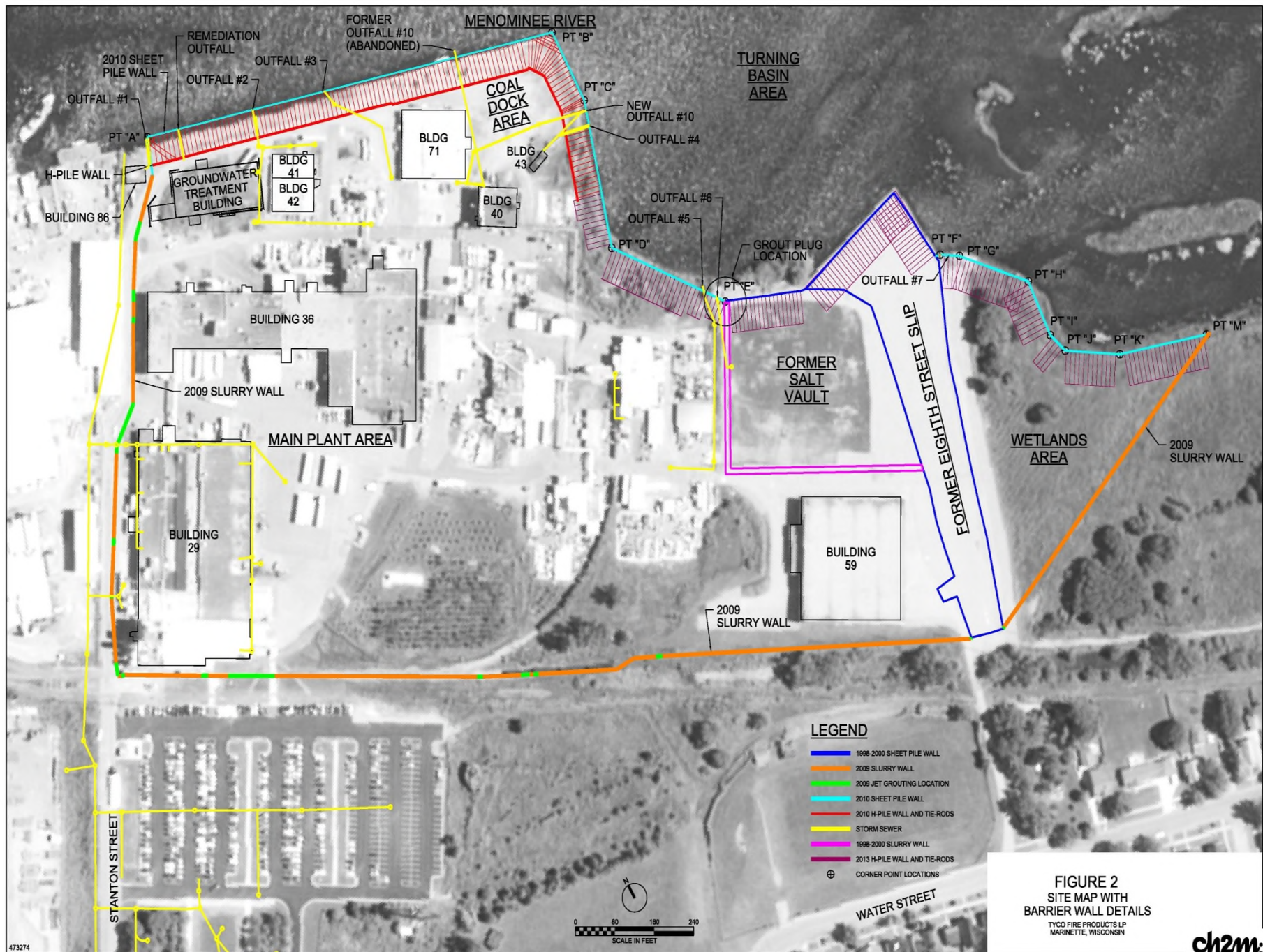


FIGURE 2
SITE MAP WITH
BARRIER WALL DETAILS
 TYCO FIRE PRODUCTS LP
 MARINETTE, WISCONSIN



City: Minneapolis/Citrix Div/Group: IMDVC Created By: Last Saved By: MSMiller
 TYCO Stanton St, Marinette, WI
 D:\Tyco_Stanton\2021-01\Figure 5 PROPOSED MONITORING WELL LOCATIONS Stanton_01202021.mxd 1/28/2021 2:19:21 PM



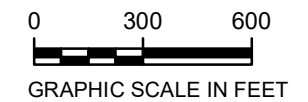
LEGEND:

- MONITORING WELL OR WELL CLUSTER
- PIEZOMETER
- APPROXIMATE SITE PROPERTY BOUNDARY
- SHEET PILE WALL
- SLURRY WALL

NOTES:

1. RIVER 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.
4. WELL LETTER SUFFIXES ARE DEFINED AS:
 S = SHALLOW MONITORING WELL.
 M = INTERMEDIATE MONITORING WELL.
 D = DEEP MONITORING WELL.
 R = REPLACEMENT WELL.
5. TRANSDUCERS ARE PROPOSED TO BE DEPLOYED IN THE FOLLOWING WELLS: MW003D, MW003S, MW013D, MW013S, AND MW102D IN ACCORDANCE WITH THE MAY 2020 NEAR-TERM BEDROCK GROUNDWATER EVALUATION WORK PLAN.
6. NOT INCLUDED IN THIS FIGURE ARE SHALLOW BEDROCK WELLS PZ-01D AND PZ-04D, WHICH ARE LOCATED ON THE TYCO FIRE TECHNOLOGY CENTER (FTC) SITE. THESE WELLS ARE PROPOSED TO BE SAMPLED AS PART OF THIS WORK PLAN.
7. WELLS PZ-28-75, MW127D-85, MW125 CLUSTER, AND MW126 PAIR WERE INSTALLED IN NOVEMBER/DECEMBER 2020.

- Shallow Monitoring Well
- Intermediate Monitoring Well
- Dashed - Contingency Well



TYCO STANTON STREET FACILITY
 MARINETTE, WISCONSIN
 SITE INVESTIGATION WORK PLAN

PROPOSED GROUNDWATER
 MONITORING LOCATIONS

