From:	Moen, Trevor J - DNR
Sent:	Wednesday, December 23, 2020 3:09 PM
To:	Eric M Bretl
Cc:	Danko, Jeff; Ryan Suennen; Gerold, Laura A - DNR; Schmitt Marquez, Heidi S - DNR; Knutson, Jason R - DNR; Carey, Angela J - DNR; Peter_Fasbender@fws.gov
Subject:	Reissuance of WPDES Permit No. WI-0001040-08-0 - Tyco Fire Products LP
Attachments:	Permit Cover Letter.pdf; Tyco Fire Products LP_WPDES Permit No. WI-0001040-08-0.pdf; Tyco Fire Products LP_WPDES Permit No. WI-0001040-08-0_Fact Sheet.pdf; Notice of Final Determination.pdf; EPA Hg and As Approval with Descision.pdf
Follow Up Flag:	Follow up
Flag Status:	Flagged

Hello Mr. Bretl,

This is notification that the Wisconsin Department of Natural Resources (Department) has reissued Wisconsin Pollutant Discharge Elimination System (WPDES) Permit No. WI-0001040-08-0 to Tyco Fire Products LP. Coverage will become effective on January 1, 2021. Attached is the signed permit cover letter, signed WPDES permit, fact sheet, notice of final determination with response to comments, and EPA Arsenic and Mercury Variance Approval.

The Department will issue a press release of the reissuance of this permit next week. It will available here: https://dnr.wisconsin.gov/newsroom.

A hard copy of these documents will be mailed soon. In the meantime, this digital copy serves as your authorization under the permit.

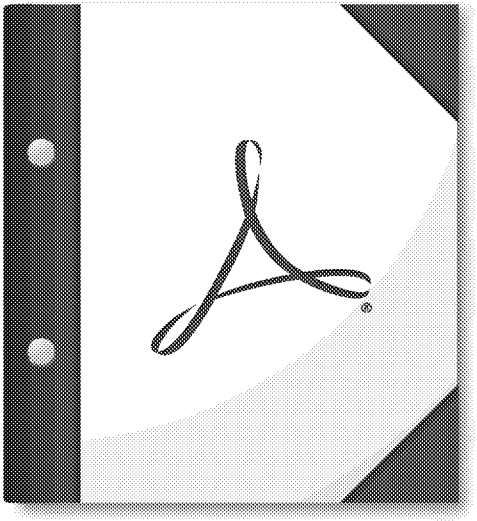
Please contact me if you have any questions.

Thank you for your time and cooperation,

We are committed to service excellence.
Visit our survey at http://dnr.wi.gov/customersurvey to evaluate how I did.

Trevor J. Moen
Wastewater Engineer – Bureau of Water Quality
Wisconsin Department of Natural Resources
625 E County Rd Y STE 700
Oshkosh WI 54901
Mobile Phone: (920) 410-5192
Trevor.Moen@Wisconsin.gov

dnr.wi.gov



For the best experience, open this PDF portfolio in Acrobat X or Adobe Reader X, or later.

Get Adobe Reader Now!

STATE OF WISCONSIN DEPARTMENT OF NATURAL RESOURCES

NOTICE OF FINAL DETERMINATION TO REISSUE A WISCONSIN POLLUTANT DISCHARGE ELIMINATION SYSTEM (WPDES) PERMIT NO. WI-0001040-08-0

Permittee: Tyco Fire Products LP, One Stanton Street, Marinette, WI, 54143

Facility Where Discharge Occurs: Tyco Fire Products LP, One Stanton Street, Marinette, WI 54143

Receiving Water and Location: Menominee River (Wausaukee and Lower Menominee River Watersheds, Menominee River Basin) in Marinette County

Brief Facility Description: Tyco Fire Products LP (Tyco) manufactures fire extinguishers and fire suppression products at its facility located at One Stanton Street, Marinette, WI 54143. The metal finishing process for manufacturing fire extinguishers and fire suppression products at site results in the generation of metal finishing process wastewater. There are four process areas (Building 29 (Cartridge, Udylite, Small part sprayer), Washroom 36, TTX Line Washroom, and Proceco Sprayer) that generate process wastewater from rinse streams. The process wastewater from these areas are combined and treated by the metal finishing wastewater treatment system (MFWWTS). Also, the facility generates concentrated waste solutions from the process areas (spent caustic, rust inhibitor, spent sulfuric acid, and spent zinc bond) that are collected and metered to the MFWWTS except the zinc bond. The spent zinc bond is first treated at zinc bond treatment system (ZBTS). The effluent from the MFWWTS is monitored at Sampling Point 101. The cake sludge from ZBTS and MFWWTS is hauled off-site to a solid waste landfill and will be tracked via Outfall 005 and Outfall 006. The treated effluent from MFWWTS is conveyed to the industrial sewer system and combined with noncontact cooling water (NCCW), boiler blowdown, contaminated groundwater infiltration, and roof drain runoff prior to discharging to the Menominee River through Outfall 001. The source water for metal finishing process water and NCCW comes from the City of Marinette municipal water supply. The source water for the boiler house comes from the Menominee River through an intake system and is monitored at influent Sampling Point 703. Sanitary waste generated at the Tyco facility site is discharged to the Marinette Wastewater Treatment Facility.

Tyco also has on-going contaminated groundwater remediation projects at the site through agreements between the U.S. Environmental Protection Agency (USEPA), the Wisconsin Department of Natural Resources (hereafter Department) and Tyco under Resource Conservation and Recovery Act (RCRA). Previous manufacturing of arsenic-containing herbicides by Ansul Corp. resulted in arsenic contamination of groundwater at the Tyco site. As part of the remediation, Tyco pumps contaminated groundwater from seven extraction wells to a groundwater collection and treatment system (GWCTS) that is discharged to the Menominee River through Outfall 003. The dewatered cake sludge from GWCTS is hauled off-site to a hazardous waste landfill and will be tracked via Outfall 008. The concentrated reject streams from the GWCTS are collected and hauled off-site for disposal and will be tracked via Outfall 007.

Tyco also runs a pump down program (PDP) that regularly pumps arsenic contaminated groundwater from the former Salt Vault and 8th Street Slip areas at the site to maintain a certain groundwater level based on the low river level datum to prevent offsite migration of contaminated groundwater. The pumped groundwater is stored at the site and hauled offsite for disposal.

Tyco plans to upgrade the GWCTS to enhance mercury and arsenic removal. The GWCTS upgrades include two new microfiltration systems, two new triple pass reverse osmosis systems, and new carbon bed and ion exchange process as final polishing step for per- and polyfluoroalkyl substance (PFAS) removal. Also, once upgrades to the GWCTS are complete, Tyco plans to convey some of water from the PDP to the GWCTS to be treated and discharged to the Menominee River.

Due to infiltration of groundwater into the industrial sewer discharging through Outfall 001 resulting in elevated arsenic concentrations in the effluent, Tyco plans to abandon Outfall 001 and combine the treated metal finishing wastewater (In-Plant Sampling Point 101) with treated groundwater at Outfall 003 to form Outfall 004. The NCCW and boiler blowdown previously discharged through Outfall 001 will be diverted to the sanitary sewer system. Stormwater from roof drains will be diverted to above-ground/surface conveyance to the Menominee River. This Outfall 001 abandonment project will reduce the arsenic and mercury loading to the Menominee River from groundwater infiltration into the industrial sewer system.

Permit Drafter's Name, Address and Phone: Trevor Moen, DNR, 625 E CTY Rd Y Suite 700, Oshkosh, WI, 54901, (920) 424-7883

Basin Engineer's Name, Address, and Phone: Laura Gerold, 2984 Shawano Avenue, Green Bay, WI 54313-6727, (920) 662-5426

Date Permit Signed/Issued: December 23, 2020

Date of Effectiveness: January 1, 2021

Date of Expiration: December 31, 2025

Public Informational Hearing Held On: September 24, 2020

Following the public informational hearing, the Department has made a final determination to reissue the WPDES permit for the above-named permittee for this existing discharge. The permit application information from the WPDES permit file, comments received on the proposed permit and applicable Wis. Adm. Codes were used as a basis for this final determination.

The Department has the authority to issue, modify, suspend, revoke and reissue or terminate WPDES permits and to establish effluent limitations and permit conditions under ch. 283, Stats.

Any minor corrections to typographical errors, updating page numbers and headers/footers, adding and updating the Table of Contents and titles, correcting formatting, renumbering headings, and web links are not included in this summary document. Following is a summary of significant comments and any significant changes which have been made in the terms and conditions set forth in the draft permit. A copy of the public comments received, and any document referenced by the Department in a response is available upon request.

Comments Received from the Applicant, Individuals or Groups and Any Permit Changes as Applicable (Note: comments of similar substance were combined/summarized below for the reader's efficiency)

General Public Comments #1: The Department received comments from the public requesting the permit prohibit discharge of PFAS to the environment or require a limit of zero for PFAS in the discharge to the Menominee River.

Department Response:

The Department shall prohibit a discharge of any pollutant to a water of state if it is determined to be one of the discharges specified in s. 283.31(2), Wis. Stats. The discharges from Tyco do not meet one of the discharges listed under s. 283.31(2), Wis. Stats. Additionally, the Department lacks the authority to calculate and impose water quality-based effluent limitations (WQBEL) of zero for PFAS because Wisconsin does not have promulgated numeric water quality standards for PFAS. However, pursuant to s. 283.31(3), Wis. Stats. and 40 CFR Part 122.4(d), the Department may only issue a WPDES permit if it includes water quality-based effluent limits in a WPDES permit that ensure compliance with the applicable water quality requirements of all affected states. Michigan has promulgated Human Non-Cancer Criteria (equivalent to Wisconsin's Human Threshold Criteria) of 0.42 µg/L for PFOA and 0.011 µg/L for PFOS for surface waters used for public drinking water supply. Both the Menominee River and Lake Michigan are interstate waters shared with Michigan, so the Department is including water quality-based limits in the WPDES permit that ensure that Michigan's water quality standards are met.

Chapter NR 106, Wis. Adm. Code includes procedures for calculating water quality-based effluent limits, and these procedures do not authorize the Department to include a zero limit for PFOA or PFOS in this instance. These procedures are based on mass balance calculations of effluent pollutants and ambient pollutants and only authorize limitations that are sufficiently stringent to ensure attainment of water quality standards. Michigan's criteria consider PFOS to be a bioaccumulating chemical of concern (BCC, bioaccumulation factor over 1000) but do not consider PFOA to be a BCC. Because of this, no dilution would be allowed within the receiving water for PFOS, and limits would be set equal to criteria in accordance with s. NR 106.06(2)(br), Wis. Adm. Code. However, dilution is considered in calculating WQBELs for PFOA since it is not considered a BCC. Because dilution is used to calculate limits for PFOA, the available well monitoring data does not show reasonable potential to exceed the calculated PFOA limits. Therefore, the lowest limit that could be calculated and imposed for the outfalls at Tyco are set equal to the applicable water quality standard for PFOS, but a limit for PFOA was not included. With this said, the Department understands that Tyco intends to install granular activated carbon treatment to meet PFOS limits, and this will also be effective for treating PFOA and other PFAS compounds.

General Public Comment #2:

"Given that both the State of Michigan and Wisconsin are in the process of evolving surface water standards for PFAS, I request that this five-year permit includes a provision to reopen the permit for revision prior to the its

expiration should surface water standards be issued or revised in either state below the draft proposal of PFOS at 11 ppt (with no other PFAS compounds listed in the draft)."

Department Response:

According to s. NR 203.135 (1), Wis. Adm. Code, the Department may modify a permit upon request of any interested person, including the permittee, or upon the Department's initiative. Permits may only be modified, for one of the causes listed in s. NR 203.136(1), Wis. Adm. Code. If cause exists, the Department may request an updated application if necessary. One of the causes for modification under s. NR 203.136(1)(c), Wis. Adm. Code is if the new standards or regulations have been developed or changed. However, for the Department to modify the permit under s. NR 203.136(1)(c), Wis. Adm. Code, the standards or regulations must have changed after permit issuance or reissuance and a permittee has requested a change in a timely manner, or a judicial decision stays or remands an applicable standard or regulation that requires a change to the permit. Nevertheless, the Department is required to reevaluate and recalculate water quality-based effluent limits every permit reissuance. If new PFAS water quality standards have been developed and promulgated for the next permit reissuance, the Department will then reevaluate whether the discharge from the facility has reasonable potential to exceed these water quality standards and may impose effluent limits for the discharge to the Menominee River.

General Public Comment #3:

"That the permit explicitly forbid offsite processing of wastewater at the 1 Stanton Street facility and/or the discharge of treated wastewater through the 1 Stanton Street outfall when it has been treated and transported from an offsite location."

Department Response:

Section 3.1 of the draft permit states that "The discharge(s) shall be limited to the waste type(s) designated for the listed sampling point(s)." The section continues on to specify the types and sources of wastewater that may be discharged through each outfall/sample point. None of the sample point descriptions in this section authorize the acceptance and discharge of wastewater sourced from outside sources.

General Public Comment #4:

A member of the public commented on liability for cleanup environmental contamination, the proposed Back Forty Mine in Michigan, and the coordination of local municipalities and the Department.

Department Response:

Section 6.2.7 of the permit requires that "the permittee shall notify the Department in accordance with ch. NR 706 (formerly NR 158), Wis. Adm. Code, in the event that a spill or accidental release of any material or substance results in the discharge of pollutants to the waters of the state at a rate or concentration greater than the effluent limitations established in this permit, or the spill or accidental release of the material is unregulated in this permit, unless the spill or release of pollutants has been reported to the Department in accordance with s. NR 205.07 (1)(s), Wis. Adm. Code."

Also, Section 292.11(2)(a), Wis. Stats., requires any person who possesses or controls a hazardous substance or who causes the discharge of a hazardous substance to notify the Department immediately of any discharge not authorized by the permit. Lastly, pursuant to s. 292.11(3), Wis. Stats., a person who possesses or controls a hazardous substance which is discharged or who causes the discharge of a hazardous substance shall take the actions necessary to restore the environment to the extent practicable and minimize the harmful effects from the discharge to the air, lands or waters of this state.

The Back Forty Mine is regulated by the State of Michigan rather than the State of Wisconsin. In settling water quality-based effluent limitations for Wisconsin facilities such as Tyco, the Department uses effluent data from the facility's discharge, background surface water quality, and effluent data from all nearby dischargers to a surface water to help determine which pollutants needed to be monitored and limited in the discharge pursuant to the permit requirements.

The Department works with all affected parties, including the City of Marinette, involved with clean-up of PFAS contamination in the Marinette and Peshtigo Area. There are no Wisconsin cities down river from the City of Marinette. The Department's Remediation and Redevelopment Program and Department's Drinking Water Program are working with Johnson Controls, Inc. - Tyco Fire Products to investigate and clean-up PFAS contamination in the

Marinette and Peshtigo Area, including private well owners. Please see the Department's webpage "PFAS Contamination in the Marinette and Peshtigo Area" (https://dnr.wisconsin.gov/topic/Contaminants/Marinette.html) for more information on PFAS contamination in the Marinette-Peshtigo Area.

General Public Comment #5:

"PFAS discharge should be ZERO and no transport of substances or water for discharge should be allowed. We do not need more PFAS being allowed to flow into the environment. Please protect our water."

Department Response:

Please see the Department response to General Public Comment #1 for the justification for the not prohibiting the discharge and not including a limit of zero for PFOA and PFOS.

Please see the Department response to General Public Comment #3 for the justification about the acceptance and discharge of wastewater sourced from outside sources in the permit.

The WPDES Program can only regulate and permit discharges of pollutants to a water of the state or land applying of sludges, by-product solids, or liquid wastes to approved land application sites pursuant to s. 283.31, Wis. Adm. Code. The WPDES Program does not have authority to prohibit the offsite disposal or transport of wastes from one permitted facility to another facility.

The Department received comments from the National Wildlife Federation (NWF).

NWF Comments:

"Whenever a facility's discharges of PFASs risk causing violations of state water quality standards, the DNR should consider the need to include both monitoring and effluent limit conditions in the draft permit – including but not limited to conditions governing PFOA and PFOS. While PFOA and PFOS are known to be highly prevalent and harmful, research shows that newer PFASs may be similarly unsafe, with some potentially requiring heavier use to achieve the same performance. To guard against reckless discharges of PFASs into Wisconsin's surface waters, the DNR should require at least monitoring of multiple PFASs at facilities whose effluent is known or suspected to contain PFASs. For reference, we note that the Michigan Department of Environment, Great Lakes, and Energy ("EGLE") has published guidance instructing the agency to test for a minimum of 28 different PFASs when analyzing wastewater effluent for PFASs. Furthermore, we would like to remind the DNR that irrespective of water quality standards, the Clean Water Act requires permit writers to exercise best professional judgment on a case-by-case basis to establish technology-based effluent limitations in WPDES permits for pollutants not addressed by applicable federal industrial effluent guidelines. Thus, although federal effluent guidelines do not yet exist for PFASs, DNR permit writers may develop technology-based effluent limitations for PFASs and apply them to permits pertaining to particular industry sectors which carry a significant risk of discharging PFASs into surface waters."

Department Response:

The Department included monitoring requirements for only PFOS and PFOA because there exist applicable numeric water quality standards only for these two PFAS compounds. Even more broadly, according to the ITRC's listing of state promulgated standards, no states currently have promulgated, enforceable surface water quality standards for compounds other than PFOS or PFOA, although some have action levels for other compounds in surface water. Based on this information, the Department only included monitoring for PFOA and PFOS in this WPDES permit. With this said, in the permittee's next application for permit reissuance, the Department may require monitoring for additional compounds if their presence is reasonably expected (s. NR 200.065(1)(g), Wis. Adm. Code) in order to evaluate the need for inclusion of limitations based on standards effective at that time. Furthermore, any treatment to remove PFOS to concentrations less than the effluent limitation included in the permit is expected to also significantly reduce concentrations of other PFAS compounds.

The Department received comments from the Midwest Environmental Advocates (MEA).

MEA Comment #1:

"Despite the recommendation to include an effluent limitation for PFOS at Outfalls [00]1 and [00]3, the permit fails to do so. Instead, the Department is content to include a compliance schedule and wait two years until after Tyco combines those outfalls to form Outfall [00]4. DNR does so purportedly to 'allow Tyco time to collect data to inform design of treatment technology since the Department does not have data for PFOS, time for Tyco to design

the treatment system, time for the Department to review the system, time for Tyco to bid/prepare for construction, and time for Tyco to install and initiate the treatment system.' However, DNR also recognizes the possibility that treatment upgrades may not be necessary.

An effluent limitation for PFOA is not recommended because Michigan does not consider PFOA to be a bioaccumulating chemical of concern, which makes dilution available. 'Due to dilution, there was no reasonable potential for PFOA standards to be exceeded.' DNR makes this recommendation while acknowledging that it does not have any effluent monitoring data for PFOA."

Department Response:

For imposition of new effluent limitations for existing dischargers, the Department may include a schedule for compliance with that limitation that leads to compliance as soon as possible but does not extend beyond five years from the date of permit reissuance (s. NR 106.117, Wis. Adm. Code). The schedule must also include interim milestones for compliance. The schedule included in the WPDES permit meets these requirements because it allows time for the permittee to collect data to inform the design of the treatment technology, evaluate and hire an engineering consultant, design a treatment system, solicit and evaluate bids for installation of the system, obtain Department review of the system under ch. NR 108, Wis. Adm. Code, construct/install the system, and perform any necessary startup monitoring and modifications to the system prior to the limitation becoming effective. The Department determined that two years is a reasonable amount of time for this to be achieved.

The Department determined that Outfall 001 and Outfall 003 has no reasonable potential to cause or contribute to an exceedance of PFOA water quality standards based on raw groundwater data, so a PFOA limit is not necessary at either outfall. The calculated limit for PFOA after consideration of dilution is 1.15×10^6 ng/L at both Outfall 001 and Outfall 003. At Outfall 003, the determination of no reasonable potential was based on the maximum measured PFOA concentration in that untreated groundwater at Outfall 003 of 9,100 ng/L, which is below 1.15×10^6 ng/L.

The Department similarly concluded that there is no reasonable potential for PFOA concentrations to exceed 1.15×10^6 ng/L at Outfall 001. This is because Outfall 001 consists of metal finishing wastewater, boiler blowdown, noncontact cooling water, roof drain runoff, and infiltrating groundwater from beneath the site, none of which are expected to exceed 1.15×10^6 ng/L. Firefighting foams are not manufactured in same location as the metal finishing process. An analysis of PFAS sources (https://www.michigan.gov/documents/egle/wrd-ipp-pfas-intiative-identified-sources_699494_7.pdf) and an analysis of metal finishers in Michigan (https://www.michigan.gov/documents/egle/wrd-ep-pfas-chrome-plating_693686_7.pdf) found that the primary source of PFAS in metal finishing process wastewater was fume suppressants, which are used most prevalently in chrome plating facilities and consist primarily of 6:2 FTS. 6:2 FTS has a chain length of 6 and therefore would not be expected to break down into an 8-chain PFAS compound such as PFOA, although there may be lower concentrations of PFOA or PFOS present at metal finishing facilities that historically used longer chain PFAS-based fume suppressants. Nonetheless, the Michigan EGLE analysis found that the majority of metal finishers studied had non-detectable concentrations of PFOA in their effluent, with two facilities containing 11 ng/L PFOA. Given that Tyco does not practice chrome plating, high levels of PFOA are not expected in the process wastewater. Water used for metal finishing processes and non-contact cooling water is sourced from the City of Marinette public water supply system, which contains PFOA concentrations of no higher than 2.10 ng/L based on the recent sampling conducted between November 20, 2017 and September 30, 2020 (https://www.marinette.wi.us/361/PFOA-and-PFOS-Investigation). Boiler water is sourced from the Menominee River, and 2019 sampling by Department staff observed PFOA concentrations in the Menominee River no greater than 0.82 ng/L (https://dnr.wisconsin.gov/topic/Contaminants/WaterQuality.html#study). Even though boiler blowdown may concentrate pollutants in boiler makeup water to a small extent, this boiler blowdown is not expected to contribute toward any exceedance of PFOA water quality standards given that a concentration by a factor $>10^6$ would be necessary for this to be the case. As mentioned in the previous paragraph, the groundwater beneath the site is known to contain PFOA concentrations as high as 9,100 ng/L, so infiltration into the industrial sewer leading to Outfall 001 is expected to be the main source of PFOA to Outfall 001. Given that the other sources are expected to be dilutionary, the Department concluded that there does not exist reasonable potential for the discharge from Outfall 001 to cause or contribute to an exceedance of applicable water quality standards for PFOA.

Based on the above information, a PFOA limit is not necessary at Outfall 001 or Outfall 003. Also, Outfall 001 will be abandoned at the end of the compliance schedule to eliminate any untreated groundwater from being discharged to the Menominee River. It should also be noted that any treatment technology which Tyco installs to remove PFOS is also expected to be effective at removing other PFAS compounds.

Raw groundwater data exceeds the proposed PFOS effluent limitation, so the Department believes PFOS removal will be necessary in order to comply with the limitation.

MEA Comment #2:

"DNR regulations allow reissued permits to include schedules for compliance with new or more stringent effluent limitations 'when appropriate.' As DNR is well aware, exposure to low concentrations of PFAS have been linked to an increased risk for all sorts of adverse health impacts such as cancer, reproductive and developmental problems, high cholesterol, ulcerative colitis, and more. DNR is also well aware that Tyco's operations in the Marinette and Peshtigo area have resulted in widespread PFAS contamination. Concentrations of PFAS detected in private drinking water wells in that area have been among the highest in the state. Granting Tyco a permit that authorizes it to discharge PFAS to the Menominee River and ultimately to Lake Michigan for an additional two years before effluent limitations go into effect is anything but 'appropriate.'

These effluent limitations are also not new and thus are no more stringent than they would have been had DNR not administratively extended Tyco's current permit for the last 12 years. That permit was issued in 2003 and expired in 2008.15 Although administrative extensions are sometimes necessary, WPDES permits are not intended to last longer than five years. And while permittees can continue to discharge after their permits expire if certain conditions are met, that extension can only be for an additional five years. This 12-year delay is therefore extremely concerning. Had Tyco's WPDES permit been reissued once since Michigan's human health surface water criteria for PFOA and PFOS were promulgated in 2014—6 years after the expiration of the original permit—the facility would already be required to comply with these effluent limitations.

Tyco has known about this problem for years and has already had plenty of time to conduct sampling and work with DNR to design and install adequate pollution controls. The effluent limitation of 11 ppt for PFOS should apply to Outfalls [00]1 and [00]3 at the beginning of the permit term."

Department Response:

See the response to MEA comment #1 regarding the duration of the compliance schedule.

The PFOS limitations are in fact new; this is the first time that these limitations have been imposed in this WPDES permit. Compliance schedules commence upon a limit being imposed in a WPDES permit, rather than the date on which the water quality standard that forms the basis for the rule is promulgated. This is because effluent limitations take into account reasonable potential determinations and limit calculation procedures, and these determinations/calculations are made during the permit process; the permittee cannot know with certainty whether a limit will be imposed and the value of that limit until a permit is effective.

There exists no cap on length of administrative continuation of a WPDES permit in state or federal law. The Department strives to reissue WPDES permits in a timely manner and has worked with the permittee over the past years to develop a pollutant minimization plans to ensure attainment of the highest attainable condition in the receiving water.

MEA Comment #3:

"DNR has not justified the absence of an effluent limitation for PFOA. The Department simply concludes, without the benefit of monitoring data and with no elaboration whatsoever on the availability of dilution, that there is no reasonable potential to exceed the applicable surface water criterion of 420 ppt for PFOA. In the absence of representative data, DNR should err on the side of caution and include an effluent limitation for PFOA. Without such an effluent limitation, DNR cannot ensure compliance with Michigan's water quality standards if monitoring data does not confirm the department's expectations. DNR will then only be able to bring the permittee in compliance once the permit is reissued or after going through the permit modification process. If monitoring data does confirm the department's expectations, the inclusion of the PFOA effluent limitation will have no adverse impact on the permittee."

Department Response:

The WQBEL memo includes PFOA data for raw groundwater and influent to the groundwater treatment system that will discharge through Outfall 001 and Outfall 003. The WQBEL memo concludes that there does not exist reasonable potential for the permittee to cause or contribute to an exceedance of water quality standards for PFOA because of available dilution in the receiving water. Please see the Department response to MEA comment #1 regarding the justification for the not including an effluent limit for PFOA.

MEA Comment #4:

"The permit includes monitoring requirements for both PFOA and PFOS at Outfalls [00]1, [00]3, and [00]4. However, available EPA testing methods for wastewater effluent such as SW-846 Method 8327 allow for the analysis of more than PFOA and PFOS in a single sample at no additional cost. Tyco should be required to provide DNR with all PFAS data it receives as a result of the monitoring requirements in the permit. This is necessary because DNR is likely to issue its own human health surface water criteria for not only PFOA and PFOS, but for additional PFAS too, in the near future. Having that data will enable DNR to work with the permittee to anticipate the potential need for additional pollution controls in the future, reduce costs, and expedite compliance."

Department Response:

The Department's experience has been that there is an increased cost for analysis of parameters in addition to PFOA and PFOS (roughly $50/sample, but this amount varies depending upon the laboratory). At the time of the next permit reissuance, the Department has authority to require sampling for additional PFAS compounds if their presence is reasonably expected (s. NR 200.065(1)(g), Wis. Adm. Code) in order to evaluate the need for inclusion of limitations based on standards effective at that time. Please also note that any treatment to remove PFOS is expected to also significantly reduce concentrations of other PFAS compounds. See the Department response to NWF's comment above for more detail.

MEA Comment #5:

"In order to grant a variance, DNR 'must demonstrate that attaining the designated use and criterion is not feasible throughout the term of the [water quality standard (WQS)] variance' based on factors set forth in 40 C.F.R. § 131.10(g). EPA regulations require that the DNR show the scientific basis supporting a proposed WQS variance. For example, DNR must perform a 'use attainability analysis' to justify that an attainable use is not feasible under one of the six factors in 40 C.F.R. § 131.10(g). A use attainability analysis is a "structured scientific assessment of the factors affecting the attainment of the use.' Further, DNR must adopt water quality criteria 'based on sound scientific rationale,' and EPA must review proposed revisions that exclude uses set forth in 33 U.S.C. § 1251(a)(2) to determine whether they are 'based upon appropriate technical and scientific data and analyses.'

To justify Tyco's mercury variance, DNR points to the sixth factor in 40 C.F.R. § 131.10(g), which provides that '[c]ontrols more stringent than those required by sections 301(b) and 306 of the Act would result in substantial and widespread economic and social impact.' In support of this determination, DNR cites Wis. Admin. Code NR § 106.145(1), which includes the Department's blanket finding that 'requiring all dischargers of mercury to remove mercury using wastewater treatment technology to achieve discharge concentrations necessary to meet water quality standards would result in substantial and widespread adverse social and economic impacts.' However, the only evidence DNR provides in support is a decades old study in which the Ohio EPA estimated the feasibility and costs of pollutant control technologies necessary to effectively treat mercury pollution.

By relying exclusively on Wis. Admin. Code NR § 106.145(1) and the 1997 Ohio EPA study, DNR failed to evaluate site-specific information related to Tyco's facility, steps Tyco would need to take in order to meet the water-quality based effluent limit, or '[a]ppropriate mercury source reduction activities' Tyco could install.

EPA regulations reiterate the need for DNR to thoroughly reevaluate WQS variances on a regular basis. As part of this reevaluation, DNR must consider whether conditions have changed, whether new or additional information has become available, and whether feasible progress is being made towards achieving water quality standards. These requirements are designed to ensure that water quality goals are being attained wherever feasible, or if attainment is not immediately feasible, that incremental progress towards those goals is being made. The purpose of the variance framework is undermined where decades-old information is relied upon to justify the need for a variance and there has been no attempt to analyze whether further progress has been or can be made.

Notably, DNR has repeatedly acknowledged that it relies on the 1997 Ohio EPA study for mercury variances and that an updated mercury variance process 'would include an updated justification for variances.' DNR has therefore admitted that its blanket finding that 'treating to produce effluent at concentrations to meet the limit [is] technically and economically infeasible' is outdated. It is unreasonable to continue to apply this blanket finding and to rely on the outdated 1997 Ohio EPA study without reviewing any advances in reducing mercury concentrations that may have occurred since then.

Given this recognition that the blanket justification for mercury variances is outdated, DNR should evaluate the cost-effectiveness and feasibility of pollution controls that have been developed or improved upon in the last two decades. And this evaluation should be done on a case by case basis to increase transparency, including for Tyco.

First, WQS variances are water body/waterbody segment specific to provide public transparency. Evaluating how cost-effective and feasible pollution controls are on a case-to-case basis therefore ensures water quality compliance to the public for each site.

Second, because each waterbody has unique factors, the only way to ensure the water quality criteria is 'based on *sound* scientific rationale' is to consider each waterbody's unique characteristics. Here, the Menominee River at the point of discharge is impaired for mercury, but DNR does not take into account how that may alter the cost-effective analysis.

Lastly, even if DNR still finds the 1997 Ohio EPA study and the findings in Wis. Admin Code NR § 106.145(1) to be valid, neither of these justifications support DNR's conclusion that "[c]ontrols more stringent than those required by sections 301(b) and 306 of the Act would result in substantial and widespread economic and social impact." DNR does not provide any evidence to support the conclusion that the substantial and widespread economic and social impact are preventing Tyco from meeting the wildlife criterion of 1.3 ng/L. Without a proper, site-specific evaluation, a mercury variance should not be granted."

Department Response:

The Department recognizes the study used to justify this mercury variance is an older study; however, the Department is still not aware of any known chemical treatment process to remove mercury from wastewater. Thus, the only end-of-pipe treatment technologies that are potentially feasible would be non-membrane filtration. In *Cost Compliance with Water Quality Criteria for Pollutants for Oregon Waters* (2008), EPA's assessment of the economic impact of complying with a more stringent mercury criteria in Oregon considered different types of treatment and did not consider enhanced solids removal in cost estimates for implementing more stringent mercury criteria, concluding: "[f]or metals such as mercury and arsenic, technologies that primary target the dissolved fraction of the pollutant are most likely to achieve low effluent levels because most of the particulate fraction would already have been removed with existing treatment controls designed to remove solids." The study noted that "due to the uncertainty of achievable effluent levels, we did not identify any end-of-pipe treatment technologies capable of producing the necessary effluent concentrations on a consistent and reliable basis." Moreover, EPA's *Economic Analysis for the Revision of Certain Federal Water Quality Criteria Applicable to Washington* (2015) repeated the same conclusion regarding the status of mercury treatment technologies. Therefore, at this time the Department still believes the Ohio EPA study is applicable. Source reduction measures are still preferable, as they have been shown to be effective in reducing the discharge of mercury and do not create a concentrated waste stream that must be disposed.

The Department received comments from Tyco Fire Products LP (Tyco).

Tyco Comment #1:

Comment 1A. "Where Wisconsin law is silent, the DNR may not apply Michigan law to fill the gap. The Permit's Fact Sheet reasons that because 'the Menominee River and Lake Michigan are interstate waters shared with the state of Michigan,' Tyco is regulated by *Michigan's* 'PFOA and PFOS limits.' Exhibit A, at 19-20, 23. But the United States Supreme Court has already held that when states share a common waterway, a state affected by another state's discharge may only *advise* the discharging state regarding pollution beyond its borders. *See Int'l Paper Co. v. Ouellette*, 479 U.S. 481, 490–91 (1987); *accord Milwaukee v. Illinois*, 451 U.S. 304, 327-329 (1980)."

Department Response:

The United States Supreme Court's decision in *Int'l Paper Co. v. Ouellette*, 479 U.S. 481 (1987) does not apply to the circumstances here. In *Int'l Paper Co.*, the Supreme Court stated that "an affected State only has an advisory role in regulating pollution that originates beyond its borders." By this statement, the Supreme Court meant that an affected state shall be given notice and the opportunity to object at a public hearing for a permit issued by either EPA or a source state. An affected state may not block the issuance of the permit nor establish a separate permit system to regulate an out-of-state source. An affected state can only apply to EPA to disapprove the permit if EPA determines that the discharge will have an undue impact on interstate waters. Here, Wisconsin is the source state and is the permitting authority for the point source. Pursuant to 40 CFR 122.4(d) and s. 283.31(3)(d), Wis. Stats., the Department is required to include terms and conditions in the permit that are necessary to meet federal or state water

quality standards and any applicable federal law or regulation. Under both federal and Wisconsin law, Wisconsin's permit must be protective of Michigan's WQC for PFOS and PFOA because the receiving water is a shared waterbody. In other words, Wisconsin's decision to include limits that are protective of Michigan's WQC is in compliance with both the federal regulation and its own state law, not Michigan law.

Comment 1B. "Although the United States Environmental Protection Agency may impose downstream water quality requirements on affected states, that power does not extend to the DNR. *See* 40 CFR § 122.4(d); *see also Arkansas v. Oklahoma*, 503 U.S. 91 (1992) (holding that the EPA may require a point source to comply with downstream water quality standards for an EPA-issued permit)."

Department Response:

The title of 40 CFR 122.4 clearly states that this whole section is "applicable to State NPDES programs, see § 123.25." Moreover, 40 CFR 123.25 requires that "[a]ll State programs must have legal authority to implement each of the following provisions," which includes 40 CFR 122.4 (Prohibitions). Section 283.13(5), Wis. Stats., provides that the Department "shall require compliance with . . . water quality based effluent limitations in any permit issued, reissued or modified if these limitations are necessary to meet applicable water quality standards, treatment standards, schedules of compliance or any other state or federal law, rule or regulation." In addition, ss. 283.31(3)(d)1. and 2., Wis. Stats., requires that the Department issue a WPDES permit with more stringent limitations if "[n]ecessary to meet federal or state water quality standards" or "[n]ecessary to comply with any applicable federal law or regulation." As such, Wisconsin is required and authorized to enforce the requirements under 40 CFR 122.4(d). In *Arkansas v. Oklahoma*, 503 U.S. 91 (1992), the disputed permit was issued by EPA rather than by the source state. As such, this case did not address nor deny a source state's authority to issue a permit that is in compliance with 40 CFR 122.4(d) in its delegated NPDES program.

Comment 1C. "Additionally, the Menominee River and Lake Michigan may be interstate waters, but there is an indisputable boundary separating Wisconsin's portion of these rivers from Michigan's. Wis. Const. art. II, Section 1; *Michigan v. Wisconsin*, 270 U.S. 295, 309-314 (1926). That boundary marks a limit on the DNR's regulatory authority. The Wisconsin Legislature has already considered this issue of jurisdiction over interstate waters when it defined 'waters of the state' as 'portions of Lake Michigan … ***within the boundaries of Wisconsin***' and 'all lakes, bays, rivers … and other surface water … ***within the state or under its jurisdiction***.' Wis. Stat. § 283.01 (emphasis added). The DNR may regulate pollutants only within Wisconsin's jurisdiction within the Menominee River and Lake Michigan. With no Wisconsin-adopted PFOA or PFOS water quality based effluent limits or categorical standards, the DNR will exceed the bounds of its authority by enforcing Michigan's water quality limits upon a discharge on the Wisconsin side of the river. Wis. Stat. § 227.11(2)(a)1.—3."

Department Response:

By issuing the Tyco permit, the Department is regulating pollutants discharged from Wisconsin into waters of the state. It is not regulating an out-of-state source discharging into out-of-state water. In order to comply with 40 CFR 122.4(d) and s. 283.31(3)(d), Wis. Stats, the conditions set in the permit must ensure compliance with the applicable water quality requirements of all affected States, which includes downstream water in Michigan. As such, the Department is issuing a permit with terms and conditions that are protective of Michigan's WQC for the downstream water to regulate in-state discharges within Wisconsin's jurisdiction in order to enforce the federal regulation and Wisconsin law, not Michigan law.

Comment 1D. "Even if Michigan's PFOA and PFOS limits did apply to the portion of the river located within the State of Wisconsin, Michigan law authorizes consideration of dilution to achieve that PFOS limit. Exhibit A, at 19-20, 23. The Fact Sheet adopts the Michigan water quality based effluent limit for PFOS at end-of-pipe, based on a rationale that "no dilution may be allowed for PFOS" in Wisconsin because Michigan 'consider[s] PFOS to be a bioaccumulating chemical of concern.' Exhibit A, at 19. True, Michigan categorizes PFOS as a BCC. But unlike Wisconsin, Michigan allows dilution of PFOS and other BCCs under certain circumstances. *See* Mich. Admin. Code R 323.1215 (providing for permitting of 'pollutant discharge [of] … BCCs expected to be present in the discharge as a result of operations at the facility'). The Permit incorrectly applies Michigan law as prohibiting dilution of PFOS.'

Since Michigan law allows for dilution of PFOS, Tyco's Marinette facility actually already abides by Michigan's PFOS effluent limit. Michigan law allows for dilution of a charge within a set distance from the discharge point source. *See* Mich. Admin. Code R. 323.1215 (permitting new mixing zones into surface waters under certain circumstances). Consistent with the Department's determination for PFOA, taking into account dilution, there is no

reasonable potential for PFOS from Tyco's Marinette facility to exceed the Michigan PFOS water quality standards."

Department Response:

The Department can only use Wisconsin statues and administrative codes when calculating effluent limits for WPDES permits, and not another state's law. Section NR 106.06(2)(br), Wis. Adm. Code, requires effluent limitations for existing discharges of BCCs into the Great Lakes system may not include a mixing zone or exceed the most stringent applicable water quality criteria or secondary values for BCCs. Therefore, the Department cannot consider dilution for PFOS since it is listed as a BCC.

Comment 1E. "Tyco asks the DNR to remove the water quality-based effluent limits for PFOS discharged from Outfall [00]4 in Condition 3.2.3, as well as the schedule of compliance to meet those limits in Condition 5.5 of the draft permit for Tyco's One Stanton Street plant. Tyco acknowledges that although Wisconsin does not currently have PFOA and PFOS limits established by regulations, such effluent limits are likely forthcoming in the next permit cycle. Tyco therefore is willing to voluntarily agree to monitor, on a quarterly basis, its discharge for PFOS and PFOA during the current permit cycle, recognizing that data will be used to reevaluate discharges from the facility in the next permit cycle, when Wisconsin will likely have established its own effluent limits for PFOS and PFOA. Tyco will treat the 11 ppt PFOS limit as a performance indicator and take steps to address any monitored exceedances of that limit."

Department Response:

Given the Department Responses to Comments 1A to 1D, the Department intends to keep the PFOS effluent limits and the compliance schedule in the proposed permit.

Tyco Comment #2:

"Section 3.2.3 Sampling Point Outfall 004 – Combined Process WW & GW indicates that the combined groundwater collection and treatment system (GWCTS) and wastewater treatment plant (WWTP) arsenic concentration in the effluent water meet a 194 μg/l criteria. It is understood that WDNR established this criteria based on historical discharge volumes and the proposed arsenic effluent criteria (170 μg/l for the WWTP Outfall 001, and 500 μg/l for the GWCTS) for the separate treatment processes. However, this approach, and the resulting combined effluent criteria proposed does not take into consideration that periodic shut downs of the separate treatment processes may occur. Therefore, without the contribution of the WWTP effluent mixing with the effluent from the GWCTS, it is likely that the proposed 194 μg/l will be exceeded during the periods of lower volume contribution or shut down of the WWTP. The permit should address this likelihood. Tyco recommends that the combined effluent criteria be based on the 0.22 lb/day monthly arsenic mass limit currently included in Section 3.2.3, and removed the 194 μg/l arsenic concentration. In the alternative, Tyco requests that the Department clarify that the 194 μg/l arsenic concentration limit only applies to Outfall 004 when the WWTP is in operation."

Department Response:

The combined discharge limit of 194 ug/L for the proposed Outfall 004 is a variance limit based on water quality criteria. The Department used mass balance considering the historic maximum annual average discharge flow rates from Outfall 003 and Sampling Point 101 and the expected maximum arsenic concentration from the upgraded GWCTS (500 ug/L) and the metal finishing WWTP (15 ug/L) to calculate the final arsenic variance limit at Outfall 004. While the Department understands that Tyco will have periodic shutdowns and days without flow from the metal finishing WWTP and/or the GWCTS, the Department believes the calculated arsenic limits of 194 ug/L and 0.22 lbs/day are representative of the highest attainable condition for the discharge at Outfall 004 and are effective regardless if the metal finishing WWTP or the GWCTS is in operation. The Department recommends that Tyco utilize operational flexibility to time the shutdowns of the WWTP and the GWCTS on the same day or implement temporary flow storage of GWCTS influent or effluent, if necessary, to avoid any possible exceedances during WWTP shutdown. If exceptional circumstances cause an exceedance of the arsenic variance concentration limit, the Department may consider enforcement discretion if the arsenic variance mass limit is met.

Comments Received from EPA or Other Government Agencies and Any Permit Changes as Applicable

The Department received comments from the United States Environmental Protection Agency (EPA).

EPA Comment #1:

"As discussed in sections 3.8 and 3.9 of Tyco's draft permit, the variances would require Tyco to install a 60 gallon per minute (gpm) treatment system that upgrades and improves the existing groundwater treatment system to enhance arsenic and mercury removal by December 1, 2022. As discussed in Attachment 1 to Tyco's September 3, 2019 *Response to April 17, 2019 Outfall 003 Components of Additional Information Request for Tyco Arsenic Variance Package*, the selection of a 60 gpm system was based on a feasibility and alternative analysis of treatment and minimization options, which determined that a 60 gpm system 'is the most capable of minimizing arsenic/mercury leaving the site,' and '[h]as the highest likelihood of achieving the lowest possible effluent concentration' "

However, Table 3A of Tyco's February 18, 2019 *Response to Additional Information Request for Tyco Arsenic Variance Package* indicates that Tyco also evaluated an option (Option 2) of installing a larger groundwater treatment system (90 or 120 gpm) and that such a system may have the capability of achieving a lower mass loading to the Menomonee River than the 60 gpm treatment option that was selected. Specifically, Table 3A estimates that a 90 or 120 gpm system would result in 35-85 pounds of arsenic being discharged into the Menomonee River per year, compared to 43-85 pounds of arsenic per year for a 60 gpm system. Additionally, Table 3A states that 'the likelihood of achieving a lower concentration with Option 2 [a 90 or 120 gpm system] is better than Option 1 [a 60 gpm system].'

40 CFR §131.14(b)(1)(ii) requires that variances include the requirements that 'represent the highest attainable condition of the water body or waterbody segment applicable throughout the term of the water quality standards (WQS) variance based on the documentation required in (b)(2) of this section.' If the 90 or 120 gpm system has the potential to achieve a greater reduction in mass loading of arsenic to the Menomonee River (and, thus, also Lake Michigan downstream) and is feasible for Tyco to install and implement, then the highest attainable condition for the Tyco facility would include implementation of that 90 or 120 gpm system.

Based on the 'Comments' column of Table 3A, it appears that Tyco's basis for not selecting a 90 or 120 gpm system is that the level of improvement over a 60 gpm system is uncertain and '90 or 120 gpm systems are overdesigned and overbuilt and would require an unnecessary expenditure of energy and resources that may result in impacts to the community, compared with Option 1 [60 gpm system].' If the reason that a 90 or 120 gpm was not selected is due to uncertainty in the achievable results, then Tyco should conduct additional evaluations to determine whether a 90 or 120 gpm system would achieve lower mass loading rates of arsenic than the 60 gpm system. Alternatively, if the achievable loading rates of a 90 or 120 gpm system are known, Wisconsin Department of Natural Resources (WDNR) should provide information demonstrating either: 1) that a 90 or 120 gpm system is technically or economically infeasible or 2) that a 90 or 120 gpm system would not achieve a greater reduction in the release of arsenic from the site than a 60 gpm system."

Department Response:

The Department has concluded that the proposed 60 gpm treatment system upgrades represent the highest attainable condition. Tyco is required to extract groundwater beneath certain areas of the site to maintain set target groundwater elevations to prevent flooding and migration of groundwater pollution offsite. Tyco estimates that the extraction rate necessary to achieve these target groundwater elevations is 12 to 30 gpm and is determined independently of the treatment system capacity. Consultants designing the system indicated that the effluent quality would not be expected to improve by running that 12-30 gpm flow rate through a 90 or 120 gpm capacity system rather than a 60 gpm system. In fact, if a larger (90 or 120 gpm) system were to be constructed, a higher extraction flow rate would likely be necessary for proper system operation, leading to unnecessary additional loading of mercury and arsenic as well as unnecessary expenditure of energy and resources. The 60 gpm capacity system will have a capacity of at least twice the projected groundwater extraction rate. This capacity will allow the system to be operated as two 30 gpm systems either in series or in parallel. Operational flexibility will allow for the permittee to alter the configuration based on effluent sampling results in order to ensure the highest attainable condition for arsenic and mercury loading is achieved. As required under the 2009 RCRA Administrative Order on Consent, Tyco will continue to evaluate technological advances as part of the 5-year review process to see if additional technologies could continue to improve the groundwater collection and treatment system (GWCTS).

EPA Comment #2:

"Based on effluent data submitted with Tyco's annual mercury pollutant minimization program (PMP) reports and discharge monitoring data provided by WDNR, mercury concentrations in Tyco's effluent averaged 4.97 ng/L at Outfall 001 and 3.14 ng/L at Outfall 003 between 2015 and 2019. While EPA is not aware of any other fire extinguisher and fire suppression product manufacturing plants in Wisconsin with mercury variances, documentation submitted to EPA in support of other mercury variances indicates that Tyco's effluent mercury concentrations are relatively high compared to other industrial wastewater treatment plants in Wisconsin (see Figure 1 below). Tyco's average effluent mercury concentrations at Outfall 001 between 2015 and 2019 were greater than the average levels at 77.3% of other industrial facilities and the average effluent mercury concentrations at Outfall 003 in the same time period were greater than the average levels at 52.0% of other industrial facilities. Most other industrial wastewater treatment plants in Wisconsin have achieved long-term average mercury concentrations less than 3 ng/L. Additionally, discharge monitoring report data provided by WDNR indicate frequent high peaks in the facility's effluent at Outfall 001, with 23.7% of samples exceeding 10 ng/L and 8.5% of samples exceeding 15 ng/L (see Figure 2 below). While Tyco's annual mercury PMP reports indicate that mercury in the facility's intake water is a significant source of mercury to the facility, the "net" mercury levels (calculated by Tyco by subtracting the influent mercury concentration from the effluent mercury concentration) indicate that other sources have been contributing to effluent mercury concentrations at Outfall 001 since 2016 (see Figure 3 below).

To ensure that the mercury variance includes all activities necessary to reduce mercury to the greatest extent practicable (i.e., achieve the highest attainable condition), Tyco should assess what factors contribute to its higher effluent mercury concentrations relative to its peers and what feasible steps (if any) Tyco could take to address those factors. Tyco's 2019 mercury PMP annual report indicates that the facility last did a detailed review of sources within the facility in 2007. Additionally, it is unclear based on Tyco's annual reports whether that 2007 review included analysis of process chemicals used at the facility. Given that the last detailed source inventory occurred 13 years ago, an updated review of potential sources of mercury within the facility, including all process chemicals, may be useful in identifying the factors contributing to the facility's high mercury concentrations. If Tyco has not collected samples within the facility to identify which processes are contributing mercury, such a mercury monitoring process may also be useful."

Department Response:

Tyco has revised its mercury pollutant minimization program (PMP) to include an updated source inventory and testing plan of potential mercury sources within the facility that will be performed during the first year of the permit term. This source inventory will include all process chemicals, known mercury containing devices, and process wastewater inputs. Section 3.8 of the permit was revised to include these actions.

EPA Comment #3:

"Attachment 1 to Tyco's September 3, 2019 *Response to April 17, 2019 Outfall 003 Components of Additional Information Request for Tyco Arsenic Variance Package* states that, '[b]ecause the selected treatment technologies for arsenic have also been shown to be effective for addressing mercury, and mercury concentrations are significantly lower than those of arsenic, this constituent will also be addressed as part of the proposed system upgrade.' However, based on Tyco's February 18, 2019 *Response to Additional Information Request for Tyco Arsenic Variance Package*, the selected treatment technologies appear to have been selected and designed primarily to address arsenic. Is WDNR aware of any additional treatment options or modifications to the proposed treatment system that would achieve the same level of arsenic removal but enhance removal of mercury from Tyco's effluent?"

Department Response:

The Department is not aware of any additional treatment options or modifications to the proposed treatment system that would achieve the same or enhanced level of arsenic removal but enhance removal of mercury from Tyco's effluent. Additionally, Tyco did evaluate other technologies to minimize mercury concentrations in effluent during the alternatives evaluation process, and Tyco did not identify any that would achieve equal or greater removal of mercury and arsenic. The Department has concluded that the proposed treatment system upgrades will be designed to treat mercury and arsenic that represent the highest attainable condition. The proposed treatment system components will treat mercury in the following ways, along with arsenic:

- Pretreatment – Coagulation using ferric sulfate and the coagulation/precipitation processes for this groundwater treatment system represent a proven means with which to remove mercury from groundwater. Ferric sulfate in conjunction with the other portions of the treatment process would aid in the co-precipitation as part of the enhanced arsenic and mercury removal process. This portion would be the first stage of treatment and allow for the precipitate to settle out in the clarifier prior to any filtration or use of RO.
- Microfiltration (MF) – Filtration through the MF membranes would also address mercury by removing any partially precipitated or suspended solids that would have mercury in them.
- RO – The RO is a robust treatment technology that is also optimal for soluble mercury removal. The triple pass RO membranes would be a final filter and would catch the very small amounts of soluble mercury that may remain in the influent flow of the treatment process.
- Vibratory Shear Enhancement Process (VSEP) – The VSEP membranes will also contribute to reductions of any soluble mercury that may remain in the RO reject influent flow of the treatment process.
- Polishing Step – The carbon bed also has the ability to remove additional mercury as part of this stage of treatment.

EPA Comment #4:

"As discussed in Section II.O of the Facility Specific Arsenic Variance Data Sheet, the basis for the proposed arsenic variance is provided in WDNR's August 2018 document entitled *Arsenic in Lake Michigan*. That document evaluates arsenic sources and estimated arsenic concentrations over time in Lake Michigan to demonstrate that 'anthropogenic sources have impacted the arsenic conditions in Lake Michigan, and the condition cannot be remedied during the proposed variance term of 5 years.' However, Section II.B of the Facility Specific Arsenic Variance Data Sheet states that Wisconsin's human cancer criterion (non-public water supply) and aquatic life criteria for arsenic, which apply to the Menomonee River, may also be affected. As discussed above, the analyses in WDNR's August 2018 *Arsenic in Lake Michigan* document are specific to Lake Michigan and would not apply to the Menomonee River. Does WDNR intend for the proposed arsenic variance to affect any of the arsenic criteria that apply to the Menomonee River? If the variance will affect any of the arsenic criteria that apply to the Menomonee River, WDNR should provide additional information on why it is infeasible to attain the arsenic criteria in the Menomonee River since the provided rationale is based on factors specific to Lake Michigan."

Department Response:

The Department does not expect the proposed arsenic variance limits to affect attainment of any of the arsenic surface water criteria that apply to the Menominee River. The proposed arsenic variance limits do not exceed the calculated arsenic limits based on the surface water quality criteria for the Menominee River as calculated in the WQBEL memo. The Department has removed from the Facility Specific Arsenic Variance Data Sheet and supporting documents all statements indicating that arsenic surface water quality criteria for the Menominee River will be affected by the proposed arsenic variance limits for Tyco.

Changes Initiated by the Department:

- The effective date has been changed from December 1, 2020 to January 1, 2021 to facilitate the review of the variance and permit by EPA. This effective date change also caused the compliance schedules dates in Section 5 of permit to be changed to one month later.

APPEAL RIGHTS

As provided by s. 283.63, Wis. Stats., and ch. 203, Wis. Adm. Code, persons desiring further adjudicative review of this final determination may request a public adjudicatory hearing. A request shall be made by filing a verified petition for review with the Secretary of the Department of Natural Resources within 60 days of the date the permit was signed (see permit signature date above). Further information regarding the conduct and nature of public adjudicatory hearings may be found by reviewing ch. NR 203, Wis. Adm. Code, s. 283.63, Wis. Stats., and other applicable law, including s. 227.42, Wis. Stats.

Information on file for this permit action is accessible via e-mail by contacting the above-named permit drafter's e-mail address or the above-named basin engineer's e-mail during normal business hours Monday through Friday (except holidays). Note that Department staff have limited access to permit hard copy files during this time as they

are working from home, but much of the permit file is available electronically by e-mail request. Reasonable costs (15 cents per page for copies and 7 cents per page for scanning) will be charged for copies of information in the file other than the public notice and fact sheet. Pursuant to the Americans with Disabilities Act, reasonable accommodation, including the provision of informational material in an alternative format, will be made to qualified individuals upon request.

State of Wisconsin
DEPARTMENT OF NATURAL RESOURCES
101 South Webster Street
P.O. Box 7921
Madison, WI 53707-7921

Tony Evers, Governor
Preston D. Cole, Secretary
Telephone (608) 266-2621
Toll Free 1-888-936-7463
TTY Access via relay - 711

WISCONSIN
DEPT. OF NATURAL RESOURCES

ERIC BRETL
TYCO FIRE PRODUCTS LP
ONE STANTON STREET
MARINETTE, WI 54143

SUBJECT: WPDES Permit Reissuance No. WI-0001040-08-0
Tyco Fire Products LP, One Stanton Street, Marinette, WI 54143

Dear Mr. Bretl:

Your Wisconsin Pollutant Discharge Elimination System (WPDES) Permit is enclosed. The conditions of the enclosed permit reissuance were determined using the permit application, information from your WPDES permit file, other information available to the Department, comments received during the public notice period, and applicable Wisconsin Administrative Codes. All discharges from this facility and actions or reports relating thereto shall be in accordance with the terms and conditions of the enclosed permit.

This enclosed permit requires you to submit monitoring results to the Department on a periodic basis. Monitoring forms, which must be submitted electronically, are available on the Department's web page. Go to the DNR Switchboard page at https://dnr.wisconsin.gov/topic/Switchboard to log in and access your monitoring forms. For your convenience, there is a 'Summary of Reports Due' at the end of the enclosed permit that shows a synopsis of the required reports and monitoring forms.

The WPDES permit program has been approved by the Administrator of the U.S. Environmental Protection Agency pursuant to Section 402(b) of the Federal Water Pollution Control Act Amendments of 1972 (33 U.S.C. Section 1342 (b)). The terms and conditions of the enclosed permit are accordingly subject to enforcement under ss. 283.89 and 283.91, Stats., and Section 309 of the Federal Act (33 U.S.C. Section 1319).

The Department has the authority under chs. 160 and 283, Wis. Stats., to establish effluent limitations, monitoring requirements, and other permit conditions for discharges to groundwater and surface waters of the State. The Department also has the authority to issue, reissue, modify, terminate, or revoke and reissue WPDES permits under ch. 283, Wis. Stats.

The enclosed permit contains water quality-based effluent limitations that are necessary to ensure the water quality standards for the Menominee River are met. You may apply for a variance from the water quality standard used to derive the limitations pursuant to s. 283.15, Stats., by submitting an application to the Director of the Bureau of Water Quality, P.O. Box 7921, Madison, Wisconsin 53707 within 60 days of the date the permit was issued (see "Date Permit Signed/Issued" after the signature on the front page of the enclosed permit). This statute also allows the permittee to apply for a variance to the water quality standard when applying for reissuance of the permit. Subchapter III of ch. NR 200, Wis. Adm. Code, specifies the procedures that must be followed and the information that must be included when submitting an application for a variance.

To challenge the reasonableness of or necessity for any term or condition of the enclosed permit, s. 283.63, Stats., and ch. NR 203, Wis. Adm. Code, require that you file a verified petition for review with the Secretary of the Department of Natural Resources within 60 days of the date the permit was issued (see "Date Permit Signed/Issued" after the signature on the front page of the enclosed permit). For permit-related decisions that are not reviewable pursuant to s. 283.63, Stats., it may be possible for permittees or other persons to obtain an

administrative review pursuant to s. 227.42, Stats., and s. NR 2.05(5), Wis. Adm. Code, or a judicial review pursuant to s. 227.52, Stats. If you choose to pursue one of these options, you should know that Wisconsin Statutes and Administrative Code establish time periods within which requests to review Department decisions must be filed.

Sincerely,

Trevor J Moen

Digitally signed by Trevor J Moen
Date: 2020.12.23 12:45:26 -06'00'

Trevor Moen
Wastewater Engineer
Bureau of Water Quality

Dated: 12/23/2020

EC: Laura Gerold – DNR Green Bay Service Center
Heidi Schmitt-Marquez – DNR Green Bay Service Center
Jason Knutson – DNR Central Office Madison
Angela Carey – DNR Central Office Madison
Jeff Danko – Tyco Fire Products LP
Ryan Suennen – Tyco Fire Products LP
EPA – Region V
U.S. Fish and Wildlife Service
Legal Permit File

ED_014293_00000430-00018

WPDES PERMIT

STATE OF WISCONSIN
DEPARTMENT OF NATURAL RESOURCES

PERMIT TO DISCHARGE UNDER THE WISCONSIN POLLUTANT DISCHARGE ELIMINATION SYSTEM

Tyco Fire Products LP

is permitted, under the authority of Chapter 283, Wisconsin Statutes, to discharge from a facility

located at

One Stanton Street, Marinette, Wisconsin

to the

Menominee River (Wausaukee and Lower Menominee River Watersheds, Menominee River Basin) in Marinette County

in accordance with the effluent limitations, monitoring requirements and other conditions set forth in this permit.

The permittee shall not discharge after the date of expiration. If the permittee wishes to continue to discharge after this expiration date an application shall be filed for reissuance of this permit, according to Chapter NR 200, Wis. Adm. Code, at least 180 days prior to the expiration date given below.

State of Wisconsin Department of Natural Resources
For the Secretary

By Trevor J Moen Digitally signed by Trevor J Moen Date: 2020.12.23 12:55:28 -06'00'

Trevor Moen
Wastewater Engineer
Bureau of Water Quality

12/23/2020
Date Permit Signed/Issued

PERMIT TERM: EFFECTIVE DATE – January 1, 2021 **EXPIRATION DATE – December 31, 2025**

TABLE OF CONTENTS

1 INFLUENT REQUIREMENTS **1**

1.1 SAMPLING POINT(S) 1
1.2 MONITORING REQUIREMENTS 1
1.2.1 Sampling Point 703 - Menominee River Intake *1*
1.2.2 Sampling Point 704 - GWCTS Influent *2*

2 IN-PLANT REQUIREMENTS **3**

2.1 SAMPLING POINT(S) 3
2.2 MONITORING REQUIREMENTS AND LIMITATIONS 3
2.2.1 Sampling Point 101 - Metal Finishing Effluent *3*
2.2.2 Sampling Point 107 - Mercury Field Blank Results *6*
2.2.3 Sampling Point 108 - GWCTS Effluent *6*

3 SURFACE WATER REQUIREMENTS **8**

3.1 SAMPLING POINT(S) 8
3.2 MONITORING REQUIREMENTS AND EFFLUENT LIMITATIONS 8
3.2.1 Sampling Point (Outfall) 001 - Combined WW to Menominee River *8*
3.2.2 Sampling Point (Outfall) 003 - GWCTS Effluent *10*
3.2.3 Sampling Point (Outfall) 004 - Combined Process WW & GW *11*
3.3 TOTAL HARDNESS SAMPLING 13
3.4 TOTAL METALS ANALYSES 13
3.5 EFFLUENT MAXIMUM TEMPERATURE MONITORING 13
3.6 WHOLE EFFLUENT TOXICITY (WET) TESTING 13
3.7 WATER TREATMENT ADDITIVES 15
3.8 MERCURY VARIANCE – IMPLEMENT POLLUTANT MINIMIZATION PLAN 15
3.9 ARSENIC VARIANCE – IMPLEMENT POLLUTANT MINIMIZATION PLAN 16

4 OFFSITE DISPOSAL REQUIREMENTS **18**

4.1 SAMPLING POINT(S) 18
4.2 MONITORING REQUIREMENTS AND LIMITATIONS 18
4.3 REPORTING AND RECORDKEEPING REQUIREMENTS 18
4.3.1 Annual Land Application Report *18*
4.3.2 Other Methods of Disposal or Distribution Report *18*
4.3.3 Daily Disposal Log *19*

5 SCHEDULES **20**

5.1 MERCURY POLLUTANT MINIMIZATION PROGRAM 20
5.2 ARSENIC POLLUTANT MINIMIZATION PROGRAM 20
5.3 ARSENIC INTERIM LIMITS AT SP 108 AND OUTFALL 004 21
5.4 TOTAL TOXIC ORGANICS MANAGEMENT PLAN 22
5.5 PFOS LIMITS 22
5.6 ARSENIC LIMIT AT OUTFALL 001 22
5.7 MERCURY LIMIT AT OUTFALL 001 22
5.8 PERMIT APPLICATION SUBMITTAL 23

6 STANDARD REQUIREMENTS **24**

6.1 REPORTING AND MONITORING REQUIREMENTS 24
6.1.1 Monitoring Results *24*
6.1.2 Sampling and Testing Procedures *24*
6.1.3 Recording of Results *24*
6.1.4 Reporting of Monitoring Results *25*
6.1.5 Records Retention *25*
6.1.6 Other Information *25*

6.1.7 Reporting Requirements – Alterations or Additions 25
6.1.8 Mercury Sampling and Monitoring 26
6.2 SYSTEM OPERATING REQUIREMENTS 26
6.2.1 Noncompliance Reporting 26
6.2.2 Bypass 26
6.2.3 Scheduled Bypass 27
6.2.4 Controlled Diversions 27
6.2.5 Proper Operation and Maintenance 27
6.2.6 Operator Certification 27
6.2.7 Spill Reporting 27
6.2.8 Planned Changes 28
6.2.9 Duty to Halt or Reduce Activity 28
6.3 SURFACE WATER REQUIREMENTS 28
6.3.1 Permittee-Determined Limit of Quantitation Incorporated into this Permit 28
6.3.2 Appropriate Formulas for Effluent Calculations 28
6.3.3 Effluent Temperature Requirements 29
6.3.4 Visible Foam or Floating Solids 29
6.3.5 Surface Water Uses and Criteria 29
6.3.6 Compliance with Phosphorus Limitation 29
6.3.7 Additives 30
6.3.8 Whole Effluent Toxicity (WET) Monitoring Requirements 30
6.3.9 Whole Effluent Toxicity (WET) Identification and Reduction 30
6.3.10 Reopener Clause 31

7 SUMMARY OF REPORTS DUE **32**

1 Influent Requirements

1.1 Sampling Point(s)

Sampling Point Designation	
Sampling Point Number	**Sampling Point Location, WasteType/Sample Contents and Treatment Description (as applicable)**
703	At Sampling Point 703, the permittee shall take representative samples of the Menominee River intake water prior to use at the facility. The Menominee River intake is located in Building B86 at 45° 5' 58.2828" N 87° 36' 56.0412" W.
704	At Sampling Point 704, the permittee shall take representative samples of the influent (contaminated groundwater) to the groundwater collection and treatment system (GWCTS).

1.2 Monitoring Requirements

The permittee shall comply with the following monitoring requirements.

1.2.1 Sampling Point 703 - Menominee River Intake

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow Rate		gpd	Daily	Total Daily	
Arsenic, Total Recoverable		µg/L	Monthly	Grab	See permit sections 3.9 and 5.2 for more information.
Mercury, Total Recoverable		ng/L	Quarterly	Grab	See permit sections 3.8 and 5.1 for more information.

1.2.1.1 CWIS - Authority to Operate and Description

The permittee shall at all times properly operate and maintain the Menominee River intake system. The permittee shall give advance notice to the Department of any planned changes in the location, design, operation, or capacity of the intake structure. The permittee is authorized to use the Menominee River water intake system as described in the fact sheet.

1.2.1.2 Water Intake BTA (Best Technology Available) Determination

The Department believes that the Menominee River water intake, as described above in subsection 1.2.1.1, represents BTA for minimizing adverse environmental impact in accordance with the requirements in s. 283.31(6), Wis. Stats. and section 316(b) of the Clean Water Act.

1.2.1.3 Future BTA for Water Intake Structure

BTA determinations for entrainment and impingement mortality at water intake structures will be made in each permit reissuance, in accordance with s. 283.31(6), Wis. Stats. However, if the design intake flow (DIF) exceeds 2 MGD and

the permittee uses greater than 25% of intake water exclusively for cooling, BTA determinations for entrainment mortality and impingement mortality will be made in accordance with ss. NR 111.12-13, Wis. Adm. Code and the permittee will be required to submit all the required information in s. NR 111.40(2)(b), Wis. Adm. Code with the permit application.

1.2.1.4 Intake Screen Discharges and Removed Substances

Floating debris and accumulated trash collected on the water intake trash rack shall be removed and disposed of in a manner to prevent any pollutant from the material from entering the waters of the State pursuant to s. NR 205.07(3)(a), Wis. Adm. Code, except that backwashes may contain fine materials that originated from the intake water source such as sand, silt, small vegetation or aquatic life.

1.2.1.5 Endangered Species Act

Nothing in this permit authorizes take for the purpose of a facility's compliance with the Endangered Species Act.

1.2.2 Sampling Point 704 - GWCTS Influent

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow Rate		gpd	Daily	Continuous	
Arsenic, Total Recoverable		µg/L	Weekly	24-Hr Flow Prop Comp	See permit sections 3.9 and 5.2 for more information.
Suspended Solids, Total		mg/L	Weekly	24-Hr Flow Prop Comp	
Mercury, Total Recoverable		ng/L	Monthly	Grab	See permit sections 3.8 and 5.1 for more information.

2 In-Plant Requirements

2.1 Sampling Point(s)

Sampling Point Designation	
Sampling Point Number	**Sampling Point Location, WasteType/Sample Contents and Treatment Description (as applicable)**
101	At Sampling Point 101, the permittee shall take representative samples of the treated metal finishing process wastewater after the physical chemical process wastewater treatment system prior to mixing with other wastewater streams and discharging through Outfall 001. On January 1, 2023, treated metal finishing process wastewater will be diverted to Outfall 004.
107	At Sampling Point 107, the permittee shall collect a field blank for each day a mercury is sample is collected.
108	At Sampling Point 108, the permittee shall take representative samples of the final treated effluent from the groundwater collection and treatment system (GWCTS) prior to mixing with the treated metal finishing effluent and discharging through Outfall 004 to the Menominee River. Sampling is required when there is a discharge through this Sampling Point during any month.

2.2 Monitoring Requirements and Limitations

The permittee shall comply with the following monitoring requirements and limitations.

2.2.1 Sampling Point 101 - Metal Finishing Effluent

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow Rate		MGD	Daily	Continuous	
Suspended Solids, Total	Daily Max	60 mg/L	3/Week	24-Hr Flow Prop Comp	
Suspended Solids, Total	Monthly Avg	31 mg/L	3/Week	24-Hr Flow Prop Comp	
Oil & Grease (Hexane)	Daily Max	52 mg/L	Monthly	Grab	
Oil & Grease (Hexane)	Monthly Avg	26 mg/L	Monthly	Grab	
Cadmium, Total Recoverable	Daily Max	690 µg/L	Monthly	24-Hr Flow Prop Comp	
Cadmium, Total Recoverable	Monthly Avg	260 µg/L	Monthly	24-Hr Flow Prop Comp	
Copper, Total Recoverable	Daily Max	3,380 µg/L	Monthly	24-Hr Flow Prop Comp	
Copper, Total Recoverable	Monthly Avg	2,070 µg/L	Monthly	24-Hr Flow Prop Comp	
Nickel, Total Recoverable	Daily Max	3,980 µg/L	Monthly	24-Hr Flow Prop Comp	
Nickel, Total	Monthly Avg	2,380 µg/L	Monthly	24-Hr Flow	

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Recoverable				Prop Comp	
Zinc, Total Recoverable	Daily Max	2,610 µg/L	Monthly	24-Hr Flow Prop Comp	
Zinc, Total Recoverable	Monthly Avg	1,480 µg/L	Monthly	24-Hr Flow Prop Comp	
Total Toxic Organics	Daily Max	2,130 µg/L	Monthly	24-Hr Flow Prop Comp	See permit section 2.2.1.4 for more information.
Chromium, Total Recoverable	Daily Max	2,770 µg/L	1/ 6 Months	24-Hr Flow Prop Comp	
Chromium, Total Recoverable	Monthly Avg	1,710 µg/L	1/ 6 Months	24-Hr Flow Prop Comp	
Lead, Total Recoverable	Daily Max	690 µg/L	1/ 6 Months	24-Hr Flow Prop Comp	
Lead, Total Recoverable	Monthly Avg	430 µg/L	1/ 6 Months	24-Hr Flow Prop Comp	
Silver, Total Recoverable	Daily Max	430 µg/L	1/ 6 Months	24-Hr Flow Prop Comp	
Silver, Total Recoverable	Monthly Avg	240 µg/L	1/ 6 Months	24-Hr Flow Prop Comp	
Cyanide, Total	Daily Max	1,200 µg/L	1/ 6 Months	Grab	
Cyanide, Total	Monthly Avg	650 µg/L	1/ 6 Months	Grab	
Mercury, Total Recoverable		ng/L	Monthly	Grab	Monitoring Only. See permit sections 3.8 and 5.1 for more information.
Mercury, Total Recoverable		mg/day	Monthly	Calculated	
Arsenic, Total Recoverable		µg/L	Monthly	24-Hr Flow Prop Comp	Monitoring Only. See permit sections 3.9 and 5.2 for more information.
Arsenic, Total Recoverable		lbs/day	Monthly	Calculated	
pH (Continuous)			Daily	Continuous	See permit section 2.2.1.2 for more information.

2.2.1.1 Total Metals Analyses

Measurements of total metals and total recoverable metals shall be considered as equivalent.

2.2.1.2 Continuous pH Monitoring

The permittee shall maintain the pH of the discharge within the range of 6.0 to 9.0 standard units (s.u.) except excursions are permitted subject to the following conditions:

- The pH is monitored continuously;
- The total time during which the pH is outside the range of 6.0 to 9.0 s.u. shall not exceed 446 minutes in any calendar month;
- No individual pH excursion outside the range of 6.0 to 9.0 s.u. shall exceed 60 minutes in duration;

- No individual pH excursion shall be outside the range of 4.0 to 11.0 s.u.; and
- On a daily basis, the permittee shall report the minimum and maximum pH, the total time that the pH is outside the range of 6.0 to 9.0 s.u., and the number of pH excursions outside the range of 6.0 to 9.0 s.u. that exceed 60 minutes in duration.

2.2.1.3 Flow Augmentation

The permittee may not augment the use of process wastewater or otherwise dilute the wastewater as a partial or total substitute for adequate treatment to achieve compliance with the above effluent limitations in Section 2.2.1 for Sampling Point 101.

2.2.1.4 Toxic Organics Requirements

2.2.1.4.1 TTO Summation

Total Toxic Organics (TTO) means the sum of all quantifiable effluent concentrations greater than 10 ug/L of the toxic organic pollutants listed in ss. NR 215.03(1)-(5), Wis. Adm. Code.

2.2.1.4.2 Identified Toxic Organics

If monitoring is necessary to measure compliance with the TTO standard, the permittee need only analyze for those pollutants which would reasonably be expected to be present in the discharge.

2.2.1.4.3 Process Modification/Planned Changes

Use of a toxic organic that is listed in ss. NR 215.03(1)-(5), Wis. Adm. Code, and that has the potential for entering wastewaters discharged, is classified by the Department as a process modification. The permittee shall report such process modifications in accordance with the Standard Requirements section herein (see "Planned Changes" in the "System Operating Requirements" subsection of Standard Requirements) and include the toxic organic when monitoring TTO.

2.2.1.4.4 Certification in Lieu of Monitoring for Total Toxic Organics

The permittee may demonstrate compliance with the total toxic organics (TTO) monitoring and limitations in Section 2.2.1 if the permittee meets the requirements of this section. The permittee is not required to monitor for TTO and other TTO parameters at Sampling Points 101 if the permittee continues to comply with the following conditions:

1. The permittee continues to implement their toxic organic management plan; and
2. The permittee makes a TTO certification statement monthly on the Discharge Monitoring Report form, in accordance with s. 261.13(1)(a), Wis. Adm. Code, that states the following:

   Based on my inquiry of the person or persons directly responsible for managing compliance with the permit limitation for total toxic organics (TTO), I certify that to the best of my knowledge and belief, no dumping of concentrated toxic organics into the wastewaters has occurred since filing of the last discharge monitoring report. I further certify that this facility is implementing the toxic organic management plan submitted to the Department of Natural Resources.

If the permittee elects to not follow the TTO certification requirements or does not meet the TTO certification requirements stated in this section, the permittee shall comply with the TTO monitoring listed in Section 2.2.1.

2.2.1.4.5 Toxic Organic Management Plan

The permittee shall prepare and implement a toxic organic management plan to remain eligible for the certification option in Section 2.2.1.4.4 for TTO monitoring as specified in s. NR 261.13(b), Wis. Adm. Code. The toxic organics management plan shall specify procedures and practices to meet the requirements of this section.

2.2.1.4.5.1 Toxic Organic Management Plan Content

The toxic organic management plan shall include at least the following information:

1. The toxic organic compounds used;

2. The method of disposal used instead of dumping (i.e. reclamation, contract hauling, or incineration); and
3. Procedures for ensuring that toxic organics do not routinely spill or leak into the wastewater.

2.2.1.4.5.2 Operate Consistent to an Approved Toxic Organic Management Plan

The permittee shall submit the toxic organic management plan to the department for approval. The permittee shall operate consistent with the department approved toxic organic management plan.

2.2.1.4.5.3 Amendment of the Toxic Organic Management Plan

The permittee shall amend its toxic organic management plan whenever there is a change in the use of toxic organic pollutants or operational changes that affects the potential for leaks or spills of toxic organic compounds into wastewaters. The amended management plan shall be submitted by written request to the department for approval.

2.2.1.4.5.4 Review and Certification of the Toxic Organic Management Plan

The toxic organic management plan, and any amendments thereto, shall be reviewed by the senior technical manager at the facility and approved and signed by the facility authorized representative. Any person signing the management plan, or its amendments shall certify to the department that the management plan or its amendments have been prepared in accordance with good engineering practices.

2.2.1.4.5.5 Record Keeping Requirements

The permittee shall maintain on the facility premises an official copy of the current management plan and allow employee access to the plan. The permittee shall make the plan available to the department for inspection or review upon request.

2.2.1.4.5.6 Employee Training

The permittee shall provide training to new employees and refresher training to existing employees on the toxic organic management plan.

2.2.2 Sampling Point 107 - Mercury Field Blank Results

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Mercury, Total Recoverable		ng/L	Monthly	Blank	See permit section 2.2.2.1 for more information.

2.2.2.1 Field Blank Sampling and Monitoring

If more than one mercury sample is collected in a day, the permittee shall collect at least one field blank for each 10 mercury samples collected on that day. The permittee shall report, but may not subtract, field blank concentrations when reporting mercury sample results.

2.2.3 Sampling Point 108 - GWCTS Effluent

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow Rate		MGD	Daily	Continuous	
Suspended Solids, Total		mg/L	Weekly	24-Hr Flow Prop Comp	Monitoring Only.
Arsenic, Total Recoverable	Daily Max	500 µg/L	Weekly	24-Hr Flow Prop Comp	This is an interim variance limit. See permit sections 3.9 and 5.2 for more information.

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Arsenic, Total Recoverable	Daily Max	0.17 lbs/day	Weekly	Calculated	This is an interim variance limit. See permit sections 3.9 and 5.2 for more information.
Mercury, Total Recoverable	Daily Max	24 ng/L	Monthly	24-Hr Flow Prop Comp	This is an interim variance limit. See permit sections 3.8 and 5.1 for more information.
Mercury, Total Recoverable		mg/day	Monthly	Calculated	
PFOA		ng/L	Monthly	24-Hr Flow Prop Comp	Monitoring Only.
PFOS		ng/L	Monthly	24-Hr Flow Prop Comp	Monitoring Only.

.

2.2.3.1 Activation Date

Sampling Point 108 will become active on January 1, 2023 unless the permittee completes the diversion and combination of process wastewater from Sampling Point 101 with Outfall 003 to form Outfall 004 and Sampling Point 108 at an earlier date. In this case, the permittee shall comply with the monitoring requirements and effluent limitations listed Section 2.2.3 immediately when discharge through Sampling Point 108 commences.

ED_014293_00000430-00028

3 Surface Water Requirements

3.1 Sampling Point(s)

The discharge(s) shall be limited to the waste type(s) designated for the listed sampling point(s).

Sampling Point Designation	
Sampling Point Number	**Sampling Point Location, WasteType/Sample Contents and Treatment Description (as applicable)**
001	At Sampling Point 001, the permittee shall take representative samples of the combined discharge of treated metal finishing process wastewater from Sampling Point 101, noncontact cooling water (NCCW), boiler blowdown, groundwater infiltration, and stormwater from roof drains prior to discharge to the Menominee River via Outfall 001. Outfall 001 is located along the south bank of the Menominee River near the boiler house at 45° 5' 54.42" N 87° 36' 44.4024" W. On January 1, 2023, the treated metal finishing process wastewater from Sampling Point 101 will be diverted to Outfall 004 and noncontact cooling water (NCCW) and boiler blowdown will be diverted to the City of Marinette sanitary sewer system. Stormwater from roof drains will conveyed over the land surface to the Menominee River. Outfall 001 will be deactivated on January 1, 2023.
003	At Sampling Point 003, the permittee shall take representative samples of the final treated effluent from the groundwater collection and treatment system (GWCTS) prior to discharge to the Menominee River via Outfall 003. Outfall 003 is located along the southern bank of the Menominee River near Building 14 on the northwest side of the property at 45° 5' 58.4088" N 87° 36' 54.522" W. On January 1, 2023, the treated metal finishing process wastewater from Sampling Point 101 will be combined with the GWCTS effluent from Sampling Point 108 and diverted to Outfall 004. Outfall 003 will be deactivated on January 1, 2023.
004	At Sampling Point 004, the permittee shall take representative samples of the combined discharge of treated metal finishing wastewater (Sampling Point 101) and treated groundwater (Sampling Point 108) prior to discharge to the Menominee River via Outfall 004. Sampling is required when there is a discharge from this outfall during any month.

3.2 Monitoring Requirements and Effluent Limitations

The permittee shall comply with the following monitoring requirements and limitations.

3.2.1 Sampling Point (Outfall) 001 - Combined WW to Menominee River

Monitoring Requirements and Effluent Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow Rate		MGD	Daily	Continuous	
pH Field	Daily Max	9.0 su	Daily	Continuous	
pH Field	Daily Min	6.0 su	Daily	Continuous	
Temperature Maximum		deg F	Weekly	Measure	Monitoring Only. See permit section 3.5 for more information.
Hardness, Total as $CaCO_3$		mg/L	Monthly	24-Hr Flow Prop Comp	Monitoring Only. See permit section 3.3 for more information.

Monitoring Requirements and Effluent Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Arsenic, Total Recoverable	Daily Max	170 µg/L	Monthly	24-Hr Flow Prop Comp	This is an interim compliance schedule limit effective until December 31, 2022. See permit sections 3.9 and 5.6 for more information.
Arsenic, Total Recoverable	Daily Max	0.81 lbs/day	Monthly	Calculated	This is an interim compliance schedule limit effective until December 31, 2022. See permit sections 3.9 and 5.6 for more information.
Cadmium, Total Recoverable	Daily Max	57 µg/L	Monthly	24-Hr Flow Prop Comp	
Cadmium, Total Recoverable	Monthly Avg	57 µg/L	Monthly	24-Hr Flow Prop Comp	
Cadmium, Total Recoverable	Daily Max	0.27 lbs/day	Monthly	Calculated	
Copper, Total Recoverable	Daily Max	69 µg/L	Monthly	24-Hr Flow Prop Comp	
Copper, Total Recoverable	Monthly Avg	69 µg/L	Monthly	24-Hr Flow Prop Comp	
Copper, Total Recoverable	Daily Max	0.98 lbs/day	Monthly	Calculated	
Cyanide, Amenable	Daily Max	92 µg/L	Monthly	24-Hr Flow Prop Comp	
Cyanide, Amenable	Monthly Avg	92 µg/L	Monthly	24-Hr Flow Prop Comp	
Cyanide, Amenable	Daily Max	0.44 lbs/day	Monthly	Calculated	
Chlorine, Total Residual	Daily Max	38 µg/L	Monthly	Grab	Must be analyzed within 15 minutes of sample collection.
Chlorine, Total Residual	Monthly Avg	38 µg/L	Monthly	Grab	Must be analyzed within 15 minutes of sample collection.
Mercury, Total Recoverable	Daily Max	29 ng/L	Monthly	Grab	This is an interim compliance schedule limit effective until December 31, 2022. See permit sections 3.8 and 5.7 for more information.
Phosphorus, Total	Rolling 12 Month Avg	1.0 mg/L	1/ 2 Months	24-Hr Flow Prop Comp	
PFOA		ng/L	Monthly	24-Hr Flow Prop Comp	Monitoring Only.
PFOS		ng/L	Monthly	24-Hr Flow Prop Comp	See permit section 5.5 for more information.

Monitoring Requirements and Effluent Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
PFOS		mg/day	Monthly	Calculated	See permit section 5.5 for more information.
Acute WET	Daily Max	1.0 TU_a	See Listed Qtr(s)	24-Hr Flow Prop Comp	See permit section 3.6 for more information.

3.2.1.1 Deactivation Date

Outfall 001 will be deactivated on January 1, 2023.

3.2.2 Sampling Point (Outfall) 003 - GWCTS Effluent

Monitoring Requirements and Effluent Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow Rate		MGD	Daily	Continuous	
pH Field	Daily Max	9.0 su	Daily	Continuous	
pH Field	Daily Min	6.0 su	Daily	Continuous	
Arsenic, Total Recoverable	Daily Max	680 µg/L	Weekly	24-Hr Flow Prop Comp	This is an initial effluent limitation effective until December 31, 2022. See permit sections 3.9, 5.2, and 5.3 for more information.
Arsenic, Total Recoverable	Daily Max	0.23 lbs/day	Weekly	Calculated	This is an initial effluent limitation effective until December 31, 2022. See permit sections 3.9, 5.2, and 5.3 for more information.
Suspended Solids, Total		mg/L	Monthly	24-Hr Flow Prop Comp	Monitoring Only.
Mercury, Total Recoverable	Daily Max	24 ng/L	Monthly	24-Hr Flow Prop Comp	This is an interim variance limit effective until December 31, 2022. See permit sections 3.8 and 5.1 for more information.
Hardness, Total as $CaCO_3$		mg/L	Monthly	24-Hr Flow Prop Comp	Monitoring Only.
Chlorine, Total Residual	Daily Max	38 µg/L	Monthly	Grab	Must be analyzed within 15 minutes of sample collection.
Chlorine, Total Residual	Monthly Avg	38 µg/L	Monthly	Grab	Must be analyzed within 15 minutes of sample collection.
PFOA		ng/L	Weekly	24-Hr Flow Prop Comp	Monitoring Only.
PFOS		ng/L	Weekly	24-Hr Flow Prop Comp	See permit section 5.5 for more information.

Monitoring Requirements and Effluent Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
PFOS		mg/day	Weekly	Calculated	See permit section 5.5 for more information.
Acute WET	Daily Max	1.0 TU_a	See Listed Qtr(s)	24-Hr Flow Prop Comp	See permit section 3.6 for more information.

3.2.2.1 Deactivation Date

Outfall 003 will be deactivated on January 1, 2023.

3.2.3 Sampling Point (Outfall) 004 - Combined Process WW & GW

Monitoring Requirements and Effluent Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow Rate		MGD	Daily	Continuous	
pH Field	Daily Max	9.0 su	Daily	Continuous	
pH Field	Daily Min	6.0 su	Daily	Continuous	
Chlorine, Total Residual	Daily Max	38 µg/L	Monthly	Grab	Must be analyzed within 15 minutes of sample collection.
Chlorine, Total Residual	Monthly Avg	38 µg/L	Monthly	Grab	Must be analyzed within 15 minutes of sample collection.
Phosphorus, Total	Rolling 12 Month Avg	1.0 mg/L	1/ 2 Months	24-Hr Flow Prop Comp	
Arsenic, Total Recoverable	Daily Max	194 µg/L	Monthly	24-Hr Flow Prop Comp	This is an interim variance limit. See permit sections 3.9 and 5.2 for more information.
Arsenic, Total Recoverable	Daily Max	0.22 lbs/day	Monthly	Calculated	This is an interim variance limit. See permit sections 3.9 and 5.2 for more information.
Mercury, Total Recoverable	Daily Max	18 ng/L	Monthly	Grab	This is an interim variance limit. See permit sections 3.9 and 5.1 for more information.
Mercury, Total Recoverable		mg/day	Monthly	Calculated	
Cadmium, Total Recoverable	Daily Max	57 µg/L	Monthly	24-Hr Flow Prop Comp	
Cadmium, Total Recoverable	Monthly Avg	57 µg/L	Monthly	24-Hr Flow Prop Comp	
Cadmium, Total Recoverable	Daily Max	0.23 lbs/day	Monthly	Calculated	

Monitoring Requirements and Effluent Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Copper, Total Recoverable	Daily Max	69 µg/L	Monthly	24-Hr Flow Prop Comp	
Copper, Total Recoverable	Monthly Avg	69 µg/L	Monthly	24-Hr Flow Prop Comp	
Copper, Total Recoverable	Daily Max	0.28 lbs/day	Monthly	Calculated	
Nickel, Total Recoverable	Daily Max	2,000 µg/L	Monthly	24-Hr Flow Prop Comp	
Nickel, Total Recoverable	Monthly Avg	2,000 µg/L	Monthly	24-Hr Flow Prop Comp	
Nickel, Total Recoverable	Daily Max	8.1 lbs/day	Monthly	Calculated	
Zinc, Total Recoverable	Daily Max	520 µg/L	Monthly	24-Hr Flow Prop Comp	
Zinc, Total Recoverable	Monthly Avg	520 µg/L	Monthly	24-Hr Flow Prop Comp	
Zinc, Total Recoverable	Daily Max	2.1 lbs/day	Monthly	Calculated	
Cyanide, Amenable	Daily Max	92 µg/L	Monthly	24-Hr Flow Prop Comp	
Cyanide, Amenable	Monthly Avg	92 µg/L	Monthly	24-Hr Flow Prop Comp	
Cyanide, Amenable	Daily Max	0.37 lbs/day	Monthly	Calculated	
Hardness, Total as $CaCO_3$		mg/L	Monthly	24-Hr Flow Prop Comp	Monitoring Only. See permit section 3.3 for more information.
Temperature Maximum		deg F	Weekly	Measure	Monitoring Only. See permit section 3.5 for more information.
PFOA		ng/L	Monthly	24-Hr Flow Prop Comp	Monitoring Only.
PFOS	Daily Max	11 ng/L	Monthly	24-Hr Flow Prop Comp	
PFOS	Monthly Avg	11 ng/L	Monthly	24-Hr Flow Prop Comp	
PFOS	Monthly Avg	2.1 mg/day	Monthly	Calculated	
Acute WET	Daily Max	1.0 TU_a	See Listed Qtr(s)	24-Hr Flow Prop Comp	See permit section 3.6 for more information.

3.2.3.1 Activation Date

Outfall 004 will become active on January 1, 2023 unless the permittee completes the diversion and combination of process wastewater from Sampling Point 101 with Outfall 003 to form Outfall 004 at an earlier date. In this case, the permittee shall comply with the monitoring requirements and effluent limitations listed Section 3.2.3 immediately when discharge through Outfall 004 commences.

3.3 Total Hardness Sampling

Total hardness analysis shall be performed on the same sample as total recoverable cadmium, total recoverable copper, total recoverable nickel, and total recoverable zinc.

3.4 Total Metals Analyses

Measurements of total metals and total recoverable metals shall be considered as equivalent.

3.5 Effluent Maximum Temperature Monitoring

For manually measuring effluent temperature, grab samples should be collected at 6 evenly spaced intervals during the 24-hour period. Alternative sampling intervals may be approved if the permittee can show that the maximum effluent temperature is captured during the sampling interval. Report the maximum temperature measured during the day on the eDMR. For more information see the Standard Requirements section in this permit.

3.6 Whole Effluent Toxicity (WET) Testing

Primary Control Water: Menominee River

Dilution series: At least five effluent concentrations and dual controls must be included in each test.

- **Acute:** 100, 50, 25, 12.5, 6.25% and any additional selected by the permittee.

WET Testing Frequency:

Outfall 001:

- **Acute** tests shall be conducted twice each year in rotating quarters in order to collect seasonal information about the discharge. Tests are required during the following quarters:

Quarters	Year
2nd (April – June)	2021
4th (October – December)	2021
1st (January – March)	2022
3rd (July – September)	2022

Outfall 003:

- **Acute** tests shall be conducted once each year in rotating quarters in order to collect seasonal information about the discharge. Tests are required during the following quarters:

Quarters	Year
2nd (April – June)	2021
3rd (July – September)	2022

Outfall 004:

- **Acute** tests shall be conducted twice each year in rotating quarters in order to collect seasonal information about the discharge. Tests are required during the following quarters:

Quarters	Year
1st (January – March)	2023
3rd (July – September)	2023
2nd (April – June)	2024
4th (October – December)	2024
1st (January – March)	2025
3rd (July – September)	2025

- **WET Testing After Permit Expiration:** Acute WET testing shall continue after the permit expiration date (until the permit is reissued) in accordance with the WET requirements specified for the last full calendar year of this permit. For example, the next test would be required in the following quarters:

Quarters	Year
1st (January – March)	2026
3rd (July – September)	2026

Testing: WET testing shall be performed during normal operating conditions. Permittees are not allowed to turn off or otherwise modify treatment systems, production processes, or change other operating or treatment conditions during WET tests.

Reporting: The permittee shall report test results on the Discharge Monitoring Report form, and also complete the "Whole Effluent Toxicity Test Report Form" (Section 6, "*State of Wisconsin Aquatic Life Toxicity Testing Methods Manual, 2nd Edition*"), for each test. The original, complete, signed version of the Whole Effluent Toxicity Test Report Form shall be sent to the Biomonitoring Coordinator, Bureau of Water Quality, 101 S. Webster St., P.O. Box 7921, Madison, WI 53707-7921, within 45 days of test completion. The Discharge Monitoring Report (DMR) form shall be submitted electronically by the required deadline.

Determination of Positive Results: An acute toxicity test shall be considered positive if the Toxic Unit - Acute (TU_a) is greater than 1.0 for either species. The TU_a shall be calculated as follows: $TU_a = 100 \div LC_{50}$.

Additional Testing Requirements: Within 90 days of a test which showed positive results, the permittee shall submit the results of at least 2 retests to the Biomonitoring Coordinator on "Whole Effluent Toxicity Test Report Forms". The 90-day reporting period shall begin the day after the test which showed a positive result. The retests shall be completed using the same species and test methods specified for the original test (see the Standard Requirements section herein).

ED_014293_00000430-00035

3.7 Water Treatment Additives

The permittee shall maintain a record of the dosage rate of all water treatment additives used on a monthly basis. The additives may be changed during the term of the permit following procedures in the 'Additives' subsection of the Standard Requirements.

3.8 Mercury Variance – Implement Pollutant Minimization Plan

This permit contains variances to the water quality-based effluent limit (WQBEL) for mercury granted in accordance with s. 283.15, Wis. Stats. As conditions of these variances the permittee shall (a) maintain effluent quality at or below the interim effluent limitation specified in the table above, (b) implement the mercury pollutant minimization measures specified below, (c) follow the Pollutant Minimization Plan and (d) perform the actions listed in the compliance schedule. (See the Schedules section herein):

1. Continue to monitor intake water from the Menominee River **quarterly** for low-level mercury at Sampling Point 703.
2. Continue to monitor influent to the groundwater treatment system at least **monthly** for low-level mercury at Sampling Point 704.
3. Continue implementation of mercury equipment evaluation program including:
    a. Collection and recycling of light bulbs (fluorescent tubes, metal halide lamps, mercury vapor lights, and high-pressure sodium lights)
    b. Collection of certain types of batteries (lead/acid, nickel/cadmium, and lithium halide).
    c. Maintain an inventory of all known mercury containing devices.
    d. Continue the training program for Tyco employees on the proper handling and disposal of mercury containing devices.
    e. Replacement of mercury containing devices with mercury free or low-level mercury alternatives when practicable (e.g. replacement of facility lighting systems with LED light bulbs and sulfuric acid with food grade sulfuric acid).
    f. Update inventory of process chemicals and known mercury containing devices.
    g. Sample the wastewater process inputs to assess mercury contribution.
4. Continue implementation of chemical screening program including:
    a. All new chemicals are screened by the Environmental Department prior to their purchase and use in the metal finishing facility. Screening includes a review of safety data sheet information, to determine the presence of unwanted chemical constituents, such as mercury. Based on this review, any chemicals containing reportable quantities of mercury are not allowed to be introduced into the facility for use.
    b. Test new chemicals proposed for metal finishing process to ensure they do not contain mercury or include certification from the manufacturer that the chemical does not contain mercury.
5. Continue Barrier Wall Groundwater Monitoring Plan (BWGMP) consistent with the RCRA consent order to prevent the migration of impacted groundwater to the outside watershed.
6. Continue maintenance and monitoring of site Phyto-transpiration system.
7. Continue recycling of treated process wastewater for facility water usage when practicable.
8. Continue maintenance and monitoring of designated cover areas over impacted soils and groundwater.

ED_014293_00000430-00036

9. Continue maintenance and monitoring of underground piping to reduce impacted groundwater from leaving the site.
10. Complete upgrades and improvements to the existing groundwater treatment system to a 60 gpm system to enhance mercury removal by January 1, 2023. The upgrades will include:
    a. Improvements to the oxidation/coagulation/precipitation processes
    b. Two new Pall membrane microfiltration (MF) systems
    c. Two new 30 gpm Pall triple pass reverse osmosis (RO) systems
    d. Reconfiguration of vibratory shear enhanced processing (VSEP) system
    e. Granular activated carbon and ion exchange process as final polishing step
    f. Upgrades to the control system to manage flow rates at the site
11. Abandon Outfall 001 to eliminate infiltration and discharge of untreated groundwater from the underground industrial sewer system by January 1, 2023.
12. Continue to manage water levels in Salt Vault and 8th St. Slip areas of site to maintain an inward gradient and prevent potential exfiltration of groundwater from the site.
13. Complete the diversion of process wastewater and treated groundwater to Outfall 004, boiler blowdown and NCCW to the City of Marinette sanitary sewer system and divert roof drain runoff to surface conveyance to eliminate or reduce mercury contribution to the Menominee River as practicable, all by January 1, 2023.
14. Complete updates to boiler system to reduce intake of Menominee River water by January 1, 2022.
15. Implement tracking of the total annual volume and final disposal location of liquid wastes and sludges generated at the site that may contain mercury.
16. Evaluate new and existing water treatment technologies at least every 5 years, consistent with the RCRA consent order. If any are found to have improved on existing technology of treatment systems currently implemented, then conduct pilot testing and/or bench scale testing of treatment systems to determine if current treatment removal or efficiency can be enhanced in the fourth year of the permit.
17. Review operation of groundwater treatment system for flow total and removal efficiency quarterly and implement operational changes as needed to achieve remedial goals.
18. Implement and track the annual mass balance of mercury entering and leaving the site.

3.9 Arsenic Variance – Implement Pollutant Minimization Plan

This permit contains variances to the water quality-based effluent limit (WQBEL) for arsenic granted in accordance with s. 283.15, Wis. Stats. As conditions of these variances the permittee shall (a) maintain effluent quality at or below the interim effluent limitation specified in the table above, (b) implement the arsenic pollutant minimization measures specified below, (c) follow the Pollutant Minimization Plan and (d) perform the actions listed in the compliance schedule. (See the Schedules section herein):

1. Implement monitoring of intake water from the Menominee River **monthly** for arsenic.
2. Continue to monitor influent to the groundwater treatment system at least **weekly** for arsenic.
3. Continue Barrier Wall Groundwater Monitoring Plan (BWGMP) to prevent the migration of impacted groundwater to the outside watershed.
4. Continue maintenance and monitoring of site Phyto-transpiration system.
5. Continue maintenance and monitoring of designated cover areas over impacted soils and groundwater.

6. Continue maintenance and monitoring of underground piping associated with outfall discharges to reduce impacted groundwater from leaving the site.
7. Complete upgrades and improvements to the existing groundwater treatment system to a 60 gpm system to enhance arsenic removal by January 1, 2023. The upgrades will include:
    a. Improvements to the oxidation/coagulation/precipitation processes
    b. Two new Pall membrane microfiltration (MF) systems
    c. Two new 30 gpm Pall triple pass reverse osmosis (RO) systems
    d. Reconfiguration of vibratory shear enhanced processing (VSEP) system
    e. Granular activated carbon and ion exchange process as final polishing step
    f. Upgrades to the control system to manage flow rates at the site
8. Abandon Outfall 001 to eliminate infiltration and discharge of untreated groundwater from the underground industrial sewer system by January 1, 2023.
9. Continue to manage water levels in Salt Vault and 8th St. Slip areas of site to maintain an inward gradient and prevent exfiltration of groundwater from the site.
10. Complete the diversion of process wastewater and treated groundwater to Outfall 004, boiler blowdown and NCCW to the City of Marinette sanitary sewer system and divert roof drain runoff to surface conveyance to eliminate or reduce arsenic contribution to the Menominee River as practicable, all by January 1, 2023.
11. Complete updates to boiler system to reduce or eliminate intake of Menominee River water by January 1, 2022.
12. Implement tracking of the total annual volume and final disposal location of liquid wastes and sludges generated at the site that may contain arsenic.
13. Evaluate new and existing water treatment technologies at least every 5 years, consistent with EPA/RCRA consent order. If any are found to have improved on existing technology of treatment systems currently implemented, then conduct pilot testing and/or bench scale testing of treatment systems to determine if treatment removal or efficiency can be enhanced in the fourth year of the permit.
14. Review operation of groundwater treatment system for flow totals and removal efficiency quarterly and implement operational changes as needed to achieve remedial goals.
15. Implement and track the annual mass balance of arsenic entering and leaving the site.

ED_014293_00000430-00038

4 Offsite Disposal Requirements

4.1 Sampling Point(s)

This section shall be limited to the waste type(s) designated in the listed sampling point(s) for offsite disposal.

Sampling Point Designation	
Sampling Point Number	**Sampling Point Location, WasteType/Sample Contents and Treatment Description (as applicable)**
005	At Sampling Point 005, the permittee shall track the final disposal of cake sludge associated with the metal finishing process wastewater treatment system.
006	At Sampling Point 006, the permittee shall track the final disposal of cake sludge associated with the zinc bond treatment system.
007	At Sampling Point 007, the permittee shall track the final disposal of VSEP and/or RO reject water associated with the groundwater collection and treatment system (GWCTS).
008	At Sampling Point 008, the permittee shall track the final disposal of cake sludge associated with the groundwater collection and treatment system (GWCTS).

4.2 Monitoring Requirements and Limitations

The permittee shall comply with the following monitoring requirements and limitations

4.2.1 Sampling Point (Outfall) 005 – Metal Finishing Cake Sludge; 006 – Zinc Bond Sludge; 007 – VSEP/RO Reject; and 008 – GWCTS Sludge

4.2.1.1 Landspreading or Discharge to Manure Pit(s) Approval

The permittee is not authorized under this permit to landspread any of the wastes associated with Outfalls 005, 006, 007, or 008 and is not authorized to store these wastes in manure storage structure(s).

4.3 Reporting and Recordkeeping Requirements

The permittee shall comply with the following reporting and recordkeeping requirements.

4.3.1 Annual Land Application Report

The annual totals for the land application loadings of liquid wastes, by-product solids and sludges to field spreading sites shall be submitted electronically on the Annual Land Application Report Form 3400-55 by January 31, each year whether or not waste is land applied. Following submittal of the electronic Annual Land Application Report Form 3400-55, this form shall be certified electronically via the 'eReport Certify' page by a responsible executive officer, manager, partner or proprietor as specified in s. 283.37(3), Wis. Stats., or a duly authorized representative of the officer, manager, partner or proprietor that has been delegated signature authority pursuant to s. NR 205.07(1)(g)2, Wis. Adm. Code. The 'eReport Certify' page certifies that the electronic report form is true, accurate and complete.

4.3.2 Other Methods of Disposal or Distribution Report

The permittee shall submit electronically the Other Methods of Disposal or Distribution Report Form 3400-52 by January 31, each year whether or not waste is hauled to another facility, landfilled, or incinerated. Following submittal

of the electronic Report Form 3400-52, this form shall be certified electronically via the 'eReport Certify' page by a responsible executive officer, manager, partner or proprietor as specified in s. 283.37(3), Wis. Stats., or a duly authorized representative of the officer, manager, partner or proprietor that has been delegated signature authority pursuant to s. NR 205.07(1)(g)2, Wis. Adm. Code. The 'eReport Certify' page certifies that the electronic report form is true, accurate and complete.

4.3.3 Daily Disposal Log

The permittee shall maintain a daily disposal log of all waste(s) hauled to another facility, landfill, or incinerator for disposal.

ED_014293_00000430-00040

5 Schedules

5.1 Mercury Pollutant Minimization Program

As a condition of the variance to the water quality-based effluent limitation(s) for mercury granted in accordance with s. NR 106.145(6), Wis. Adm. Code, the permittee shall perform the following actions.

Required Action	Due Date
Annual Mercury Progress Reports: Submit an annual mercury progress report. The annual mercury progress report shall: Indicate which mercury pollutant minimization activities or activities outlined in the approved Pollutant Minimization Plan have been implemented; Include an analysis of trends in monthly and annual total effluent mercury concentrations based on mercury sampling; and Include an analysis of how influent and effluent mercury varies with time. The first annual mercury progress report is to be submitted by the Due Date.	01/31/2022
Annual Mercury Progress Report #2: Submit a mercury progress report as defined above.	01/31/2023
Annual Mercury Progress Report #3: Submit a mercury progress report as defined above.	01/31/2024
Final Mercury Progress Report and Updated PMP Plan: Submit a final report documenting the success in reducing mercury concentrations in the effluent, as well as the anticipated future reduction in mercury sources and mercury effluent concentrations. The report shall summarize mercury pollutant minimization activities that have been implemented during the current permit term and state which, if any, pollutant minimization activities from the approved pollutant minimization plan were not pursued and why. The report shall include an analysis of trends in monthly and annual total effluent mercury concentrations based on mercury sampling during the current permit term. The report shall also include an analysis of how influent and effluent mercury varies with time and with significant loading of mercury such as loads from industries into the collection system. If the permittee intends to reapply for a mercury variance per s. NR 106.145, Wis. Adm. Code, for the reissued permit, a detailed updated PMP plan outlining the pollutant minimization activities proposed for the upcoming permit term shall be submitted along with the final report.	01/31/2025
Annual Mercury Reports After Permit Expiration: In the event that this permit is not reissued on time, the permittee shall continue to submit annual mercury reports each year covering pollutant minimization activities implemented and mercury concentration trends.	

5.2 Arsenic Pollutant Minimization Program

As a condition of the variance to the water quality-based effluent limitation(s) for arsenic granted in accordance with s. 283.15, Wis. Stats., the permittee shall perform the following actions.

Required Action	Due Date
Implementation of Arsenic Pollutant Minimization Program: The permittee shall implement the arsenic pollutant minimization program as submitted or as amended by agreement of the permittee and the Department.	01/31/2021
Annual Arsenic Progress Report #1: The permittee shall submit to the Department an annual progress report that shall discuss which arsenic pollutant minimization measures have been	01/31/2022

ED_014293_00000430-00041

Required Action	Due Date
implemented during the period from the permit effective date to the due date of the report. The report shall include an analysis of trends in monthly, quarterly, and annual total intake and effluent arsenic concentrations and mass discharge of arsenic based on sampling and flow data. The report shall also provide an update on the permittee's progress in implementing pollutant minimization measures, operational improvements, and facility modifications to optimize reductions in arsenic discharges. Submittal of the first annual process report is required by the Due Date.	
Annual Arsenic Progress Report #2: Submit an arsenic progress report as defined above.	01/31/2023
Annual Arsenic Progress Report #3: Submit an arsenic progress report as defined above.	01/31/2024
Final Arsenic Progress Report and Updated PMP Plan: Submit a final report documenting the success in reducing arsenic concentrations in the effluent, as well as the anticipated future reduction in arsenic sources and arsenic effluent concentrations. The report shall summarize arsenic pollutant minimization activities that have been implemented during the current permit term and state which, if any, pollutant minimization activities from the approved pollutant minimization plan were not pursued and why. The report shall include an analysis of trends in monthly and annual total effluent arsenic concentrations based on arsenic sampling during the current permit term. The report shall also include an analysis of how influent and effluent arsenic varies with time. If the permittee intends to reapply for an arsenic variance per s. 283.15, Wis. Stats., for the reissued permit, a detailed updated PMP plan outlining the pollutant minimization activities proposed for the upcoming permit term shall be submitted along with the final report.	01/31/2025
Annual Arsenic Reports After Permit Expiration: In the event that this permit is not reissued on time, the permittee shall continue to submit annual arsenic reports each year covering pollutant minimization activities implemented and arsenic concentration trends.	

5.3 Arsenic Interim Limits at SP 108 and Outfall 004

This compliance schedule requires the permittee to achieve compliance by the specified date.

Required Action	Due Date
Report on Effluent Discharges: Submit a report on arsenic concentrations and mass for Outfall 003 and Sampling Point 101 with conclusions regarding compliance at future In-Plant Sampling Point 108 and Outfall 004.	06/30/2021
Action Plan: Submit an action plan for complying with the interim arsenic variance limits. If construction is required, include plans and specifications with the submittal.	12/31/2021
Initiate Actions: Initiate actions identified in the plan.	06/30/2022
Complete Actions: Complete actions identified in the plan and achieve compliance with the interim arsenic variance limits at Sampling Point 108 and Outfall 004	12/31/2022

5.4 Total Toxic Organics Management Plan

The permittee shall submit an updated Total Organics (TTO) management plan as required by s. NR 216.13(1), Wis. Adm. Code.

Required Action	Due Date
Submit Updated TTO Plan: Submit an update to the TTO management plan to demonstrate compliance with requirements in this permit and ch. NR 261, Wis. Adm. Code.	03/31/2021

5.5 PFOS Limits

This compliance schedule requires the permittee to achieve compliance by the specified date.

Required Action	Due Date
Report on Effluent Discharges: Submit a report on effluent PFOS concentrations at Outfall 001, Outfall 003, and Sampling Point 101 with conclusions regarding compliance at future Outfall 004.	06/30/2021
Action Plan: Submit an action plan for complying with all effluent PFOS limits. If the action plan calls for treatment upgrades or installation, submit final construction plans and specifications to the Department for plan review.	12/31/2021
Initiate Actions: Initiate actions identified in the plan.	06/30/2022
Complete Actions: Complete actions necessary to achieve compliance with final PFOS limits.	12/31/2022

5.6 Arsenic Limit at Outfall 001

This compliance schedule requires the permittee to achieve compliance by the specified date

Required Action	Due Date
Report on Effluent Discharges: Submit a report on arsenic concentration with conclusions regarding compliance at Outfall 001.	06/30/2021
Action Plan: Submit an action plan for complying with the final arsenic limit if determined necessary by the Department. If the action plan calls for treatment upgrades or installation, submit final construction plans and specifications to the Department for plan review.	12/31/2021
Initiate Actions: Initiate actions identified in the plan.	06/30/2022
Complete Actions: Complete actions necessary to achieve compliance with the final arsenic limit.	12/31/2022

5.7 Mercury Limit at Outfall 001

This compliance schedule requires the permittee to achieve compliance by the specified date

Required Action	Due Date
Report on Effluent Discharges: Submit a report on mercury concentration with conclusions regarding compliance at Outfall 001.	06/30/2021
Action Plan: Submit an action plan for complying with the final mercury limit if determined necessary by the Department. If the action plan calls for treatment upgrades or installation, submit final construction plans and specifications to the Department for plan review.	12/31/2021
Initiate Actions: Initiate actions identified in the plan.	06/30/2022

ED_014293_00000430-00043

Required Action	Due Date
Complete Actions: Complete actions necessary to achieve compliance with the final mercury limit.	12/31/2022

5.8 Permit Application Submittal

The permittee shall file an application for permit reissuance in accordance with NR 200, Wis. Adm. Code.

Required Action	Due Date
Permit Application Submittal: Submit a complete permit application to the Department no later than 180 days prior to permit expiration.	06/30/2025

6 Standard Requirements

NR 205, Wisconsin Administrative Code (Conditions for Industrial Dischargers): The conditions in ss. NR 205.07(1) and NR 205.07(3), Wis. Adm. Code, are included by reference in this permit. The permittee shall comply with all of these requirements. Some of these requirements are outlined in the Standard Requirements section of this permit. Requirements not specifically outlined in the Standard Requirement section of this permit can be found in ss. NR 205.07(1) and NR 205.07(3).

6.1 Reporting and Monitoring Requirements

6.1.1 Monitoring Results

Monitoring results obtained during the previous month shall be summarized and reported on a Department Wastewater Discharge Monitoring Report. The report may require reporting of any or all of the information specified below under 'Recording of Results'. This report is to be returned to the Department no later than the date indicated on the form. A copy of the Wastewater Discharge Monitoring Report Form or an electronic file of the report shall be retained by the permittee.

Monitoring results shall be reported on an electronic discharge monitoring report (eDMR). The eDMR shall be certified electronically by a responsible executive or officer, manager, partner or proprietor as specified in s. 283.37(3), Wis. Stats., or a duly authorized representative of the officer, manager, partner or proprietor that has been delegated signature authority pursuant to s. NR 205.07(1)(g)2, Wis. Adm. Code. The 'eReport Certify' page certifies that the electronic report form is true, accurate and complete.

If the permittee monitors any pollutant more frequently than required by this permit, the results of such monitoring shall be included on the Wastewater Discharge Monitoring Report.

The permittee shall comply with all limits for each parameter regardless of monitoring frequency. For example, monthly, weekly, and/or daily limits shall be met even with monthly monitoring. The permittee may monitor more frequently than required for any parameter.

6.1.2 Sampling and Testing Procedures

Sampling and laboratory testing procedures shall be performed in accordance with Chapters NR 218 and NR 219, Wis. Adm. Code and shall be performed by a laboratory certified or registered in accordance with the requirements of ch. NR 149, Wis. Adm. Code. Groundwater sample collection and analysis shall be performed in accordance with ch. NR 140, Wis. Adm. Code. The analytical methodologies used shall enable the laboratory to quantitate all substances for which monitoring is required at levels below the effluent limitation. If the required level cannot be met by any of the methods available in NR 219, Wis. Adm. Code, then the method with the lowest limit of detection shall be selected. Additional test procedures may be specified in this permit.

6.1.3 Recording of Results

The permittee shall maintain records which provide the following information for each effluent measurement or sample taken:

- the date, exact place, method and time of sampling or measurements;
- the individual who performed the sampling or measurements;
- the date the analysis was performed;
- the individual who performed the analysis;
- the analytical techniques or methods used; and
- the results of the analysis.

6.1.4 Reporting of Monitoring Results

The permittee shall use the following conventions when reporting effluent monitoring results:

- Pollutant concentrations less than the limit of detection shall be reported as < (less than) the value of the limit of detection. For example, if a substance is not detected at a detection limit of 0.1 mg/L, report the pollutant concentration as < 0.1 mg/L.

- Pollutant concentrations equal to or greater than the limit of detection, but less than the limit of quantitation, shall be reported and the limit of quantitation shall be specified.

- For purposes of calculating NR 101 fees, the 2 mg/l lower reporting limits for BOD_5 and Total Suspended Solids shall be considered to be limits of quantitation

- For the purposes of reporting a calculated result, average or a mass discharge value, the permittee may substitute a 0 (zero) for any pollutant concentration that is less than the limit of detection. However, if the effluent limitation is less than the limit of detection, the department may substitute a value other than zero for results less than the limit of detection, after considering the number of monitoring results that are greater than the limit of detection and if warranted when applying appropriate statistical techniques.

6.1.5 Records Retention

The permittee shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings or electronic data records for continuous monitoring instrumentation, copies of all reports required by the permit, and records of all data used to complete the application for the permit for a period of at least 3 years from the date of the sample, measurement, report or application, except for sludge management forms and records, which shall be kept for a period of at least 5 years.

6.1.6 Other Information

Where the permittee becomes aware that it failed to submit any relevant facts in a permit application or submitted incorrect information in a permit application or in any report to the Department, it shall promptly submit such facts or correct information to the Department.

6.1.7 Reporting Requirements – Alterations or Additions

The permittee shall give notice to the Department as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is only required when:

- The alteration or addition to the permitted facility may meet one of the criteria for determining whether a facility is a new source.
- The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification requirement applies to pollutants which are not subject to effluent limitations in the existing permit.
- The alteration or addition results in a significant change in the permittee's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use of disposal sites not reported during the permit application process nor reported pursuant to an approved land application plan. Additional sites may not be used for the land application of sludge until department approval is received.

6.1.8 Mercury Sampling and Monitoring

The permittee shall collect and analyze all mercury samples according to the sampling and laboratory analysis requirements of ss. NR 106.145(9) and (10), Wis. Adm. Code. The permittee shall use an analytical method sensitive enough to have a limit of quantitation (LOQ) of less than 1.3 ng/L for the effluent and field blank samples, unless the samples are quantified at levels above 1.3 ng/L. The permittee shall report results of samples and field blanks to the Department on Discharge Monitoring Reports

6.2 System Operating Requirements

6.2.1 Noncompliance Reporting

The permittee shall report the following types of noncompliance by a telephone call to the Department's regional office within 24 hours after becoming aware of the noncompliance:

- any noncompliance which may endanger health or the environment;
- any violation of an effluent limitation resulting from a bypass;
- any violation of an effluent limitation resulting from an upset; and
- any violation of a maximum discharge limitation for any of the pollutants listed by the Department in the permit, either for effluent or sludge.

A written report describing the noncompliance shall also be submitted to the Department as directed at the end of this permit within 5 days after the permittee becomes aware of the noncompliance. On a case-by-case basis, the Department may waive the requirement for submittal of a written report within 5 days and instruct the permittee to submit the written report with the next regularly scheduled monitoring report. In either case, the written report shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times; the steps taken or planned to reduce, eliminate and prevent reoccurrence of the noncompliance; and if the noncompliance has not been corrected, the length of time it is expected to continue.

A scheduled bypass approved by the Department under the 'Scheduled Bypass' section of this permit shall not be subject to the reporting required under this section.

NOTE: Section 292.11(2)(a), Wisconsin Statutes, requires any person who possesses or controls a hazardous substance or who causes the discharge of a hazardous substance to notify the Department of Natural Resources **immediately** of any discharge not authorized by the permit. **The discharge of a hazardous substance that is not authorized by this permit or that violates this permit may be a hazardous substance spill. To report a hazardous substance spill, call DNR's 24-hour HOTLINE at 1-800-943-0003**.

6.2.2 Bypass

Except for a controlled diversion as provided in the 'Controlled Diversions' section of this permit, any bypass is prohibited and the Department may take enforcement action against a permittee for such occurrences under s. 283.89, Wis. Stats. The Department may approve a bypass if the permittee demonstrates all the following conditions apply:

- The bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;
- There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities or adequate back-up equipment, retention of untreated wastes, reduction of inflow and infiltration, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventative maintenance. When evaluating feasibility of alternatives, the department may consider factors such as technical achievability, costs and affordability of implementation and risks to public health, the environment and, where the permittee is a municipality, the welfare of the community served; and
- The bypass was reported in accordance with the 'Noncompliance Reporting' section of this permit.

6.2.3 Scheduled Bypass

Whenever the permittee anticipates the need to bypass for purposes of efficient operations and maintenance and the permittee may not meet the conditions for controlled diversions in the 'Controlled Diversions' section of this permit, the permittee shall obtain prior written approval from the Department for the scheduled bypass. A permittee's written request for Department approval of a scheduled bypass shall demonstrate that the conditions for unscheduled bypassing are met and include the proposed date and reason for the bypass, estimated volume and duration of the bypass, alternatives to bypassing and measures to mitigate environmental harm caused by the bypass. The department may require the permittee to provide public notification for a scheduled bypass if it is determined there is significant public interest in the proposed action and may recommend mitigation measures to minimize the impact of such bypass.

6.2.4 Controlled Diversions

Controlled diversions are allowed only when necessary for essential maintenance to assure efficient operation provided the following requirements are met:

- Effluent from the wastewater treatment facility shall meet the effluent limitations established in the permit. Wastewater that is diverted around a treatment unit or treatment process during a controlled diversion shall be recombined with wastewater that is not diverted prior to the effluent sampling location and prior to effluent discharge;
- A controlled diversion may not occur during periods of excessive flow or other abnormal wastewater characteristics;
- A controlled diversion may not result in a wastewater treatment facility overflow; and
- All instances of controlled diversions shall be documented in wastewater treatment facility records and such records shall be available to the department on request.

6.2.5 Proper Operation and Maintenance

The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control which are installed or used by the permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance includes effective performance, adequate funding, adequate operator staffing and training as required in ch. NR 114, Wis. Adm. Code, and adequate laboratory and process controls, including appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems only when necessary to achieve compliance with the conditions of the permit.

6.2.6 Operator Certification

The wastewater treatment facility shall be under the direct supervision of a state certified operator. In accordance with s. NR 114.53, Wis. Adm. Code, every WPDES permitted treatment plant shall have a designated operator-in-charge holding a current and valid certificate. The designated operator-in-charge shall be certified at the level and in all subclasses of the treatment plant, except laboratory. Treatment plant owners shall notify the department of any changes in the operator-in-charge within 30 days. Note that s. NR 114.52(22), Wis. Adm. Code, lists types of facilities that are excluded from operator certification requirements (i.e. private sewage systems, pretreatment facilities discharging to public sewers, industrial wastewater treatment that consists solely of land disposal, agricultural digesters and concentrated aquatic production facilities with no biological treatment).

6.2.7 Spill Reporting

The permittee shall notify the Department in accordance with ch. NR 706 (formerly NR 158), Wis. Adm. Code, in the event that a spill or accidental release of any material or substance results in the discharge of pollutants to the waters of the state at a rate or concentration greater than the effluent limitations established in this permit, or the spill or accidental release of the material is unregulated in this permit, unless the spill or release of pollutants has been reported to the Department in accordance with s. NR 205.07 (1)(s), Wis. Adm. Code.

ED_014293_00000430-00048

6.2.8 Planned Changes

In accordance with ss. 283.31(4)(b) and 283.59, Stats., the permittee shall report to the Department any facility expansion, production increase or process modifications which will result in new, different or increased discharges of pollutants. The report shall either be a new permit application, or if the new discharge will not violate the effluent limitations of this permit, a written notice of the new, different or increased discharge. The notice shall contain a description of the new activities, an estimate of the new, different or increased discharge of pollutants and a description of the effect of the new or increased discharge on existing waste treatment facilities. Following receipt of this report, the Department may modify this permit to specify and limit any pollutants not previously regulated in the permit.

6.2.9 Duty to Halt or Reduce Activity

Upon failure or impairment of treatment facility operation, the permittee shall, to the extent necessary to maintain compliance with its permit, curtail production or wastewater discharges or both until the treatment facility operations are restored or an alternative method of treatment is provided.

6.3 Surface Water Requirements

6.3.1 Permittee-Determined Limit of Quantitation Incorporated into this Permit

For pollutants with water quality-based effluent limits below the Limit of Quantitation (LOQ) in this permit, the LOQ calculated by the permittee and reported on the Discharge Monitoring Reports (DMRs) is incorporated by reference into this permit. The LOQ shall be reported on the DMRs, shall be the lowest quantifiable level practicable, and shall be no greater than the minimum level (ML) specified in or approved under 40 CFR Part 136 for the pollutant at the time this permit was issued, unless this permit specifies a higher LOQ.

6.3.2 Appropriate Formulas for Effluent Calculations

The permittee shall use the following formulas for calculating effluent results to determine compliance with average concentration limits and mass limits and total load limits:

Weekly/Monthly/Six-Month/Annual Average Concentration = the sum of all daily results for that week/month/six-month/year, divided by the number of results during that time period. [Note: When a six-month average effluent limit is specified for Total Phosphorus the applicable periods are May through October and November through April.]

Weekly Average Mass Discharge (lbs/day): Daily mass = daily concentration (mg/L) x daily flow (MGD) x 8.34, then average the daily mass values for the week.

Monthly Average Mass Discharge (lbs/day): Daily mass = daily concentration (mg/L) x daily flow (MGD) x 8.34, then average the daily mass values for the month.

Six-Month Average Mass Discharge (lbs/day): Daily mass = daily concentration (mg/L) x daily flow (MGD) x 8.34, then average the daily mass values for the six-month period. [Note: When a six-month average effluent limit is specified for Total Phosphorus the applicable periods are May through October and November through April.]

Annual Average Mass Discharge (lbs/day): Daily mass = daily concentration (mg/L) x daily flow (MGD) x 8.34, then average the daily mass values for the entire year.

Total Monthly Discharge: = monthly average concentration (mg/L) x total flow for the month (MG/month) x 8.34.

Total Annual Discharge: = sum of total monthly discharges for the calendar year.

12-Month Rolling Sum of Total Monthly Discharge: = the sum of the most recent 12 consecutive months of Total Monthly Discharges.

ED_014293_00000430-00049

6.3.3 Effluent Temperature Requirements

Weekly Average Temperature – The permittee shall use the following formula for calculating effluent results to determine compliance with the weekly average temperature limit (as applicable): Weekly Average Temperature = the sum of all daily maximum results for that week divided by the number of daily maximum results during that time period.

Cold Shock Standard – Water temperatures of the discharge shall be controlled in a manner as to protect fish and aquatic life uses from the deleterious effects of cold shock. 'Cold Shock' means exposure of aquatic organisms to a rapid decrease in temperature and a sustained exposure to low temperature that induces abnormal behavior or physiological performance and may lead to death.

Rate of Temperature Change Standard – Temperature of a water of the state or discharge to a water of the state may not be artificially raised or lowered at such a rate that it causes detrimental health or reproductive effects to fish or aquatic life of the water of the state.

6.3.4 Visible Foam or Floating Solids

There shall be no discharge of floating solids or visible foam in other than trace amounts.

6.3.5 Surface Water Uses and Criteria

In accordance with NR 102.04, Wis. Adm. Code, surface water uses and criteria are established to govern water management decisions. Practices attributable to municipal, industrial, commercial, domestic, agricultural, land development or other activities shall be controlled so that all surface waters including the mixing zone meet the following conditions at all times and under all flow and water level conditions:

a) Substances that will cause objectionable deposits on the shore or in the bed of a body of water, shall not be present in such amounts as to interfere with public rights in waters of the state.

b) Floating or submerged debris, oil, scum or other material shall not be present in such amounts as to interfere with public rights in waters of the state.

c) Materials producing color, odor, taste or unsightliness shall not be present in such amounts as to interfere with public rights in waters of the state.

d) Substances in concentrations or in combinations which are toxic or harmful to humans shall not be present in amounts found to be of public health significance, nor shall substances be present in amounts which are acutely harmful to animal, plant or aquatic life.

6.3.6 Compliance with Phosphorus Limitation

Compliance with the concentration limitation for phosphorus shall be determined as a rolling twelve-month average and shall be calculated as follows:

First, determine the pounds of phosphorus for an individual month by multiplying the average of all the concentration values for phosphorus (in mg/L) for that month by the total flow for the month in Million Gallons times the conversion factor of 8.34.

Then, the monthly pounds of phosphorus determined in this manner shall be summed for the most recent 12 months and inserted into the numerator of the following equation.

$$\text{Average concentration of P in mg/L} = \frac{\text{Total lbs of P discharged (most recent 12 months)}}{\text{Total flow in MG (most recent 12 months) X 8.34}}$$

The compliance calculation shall be performed each month with a reported discharge volume after substituting data from the most recent month(s) for the oldest month(s). A calculated value in excess of the concentration limitation will be considered equivalent to a violation of a monthly average.

6.3.7 Additives

In the event that the permittee wishes to commence use of a water treatment additive, or increase the usage of the additives greater than indicated in the permit application, the permittee must get a written approval from the Department prior to initiating such changes. This written approval shall provide authority to utilize the additives at the specific rates until the permit can be either reissued or modified in accordance with s. 283.53, Stats. Restrictions on the use of the additives may be included in the authorization letter.

6.3.8 Whole Effluent Toxicity (WET) Monitoring Requirements

In order to determine the potential impact of the discharge on aquatic organisms, static-renewal toxicity tests shall be performed on the effluent in accordance with the procedures specified in the *"State of Wisconsin Aquatic Life Toxicity Testing Methods Manual, 2nd Edition" (PUB-WT-797*, November 2004) as required by NR 219.04, Table A, Wis. Adm. Code). All of the WET tests required in this permit, including any required retests, shall be conducted on the *Ceriodaphnia dubia* and fathead minnow species. Receiving water samples shall not be collected from any point in contact with the permittee's mixing zone and every attempt shall be made to avoid contact with any other discharge's mixing zone.

6.3.9 Whole Effluent Toxicity (WET) Identification and Reduction

Within 60 days of a retest which showed positive results, the permittee shall submit a written report to the Biomonitoring Coordinator, Bureau of Water Quality, 101 S. Webster St., PO Box 7921, Madison, WI 53707-7921, which details the following:

- A description of actions the permittee has taken or will take to remove toxicity and to prevent the recurrence of toxicity;

- A description of toxicity reduction evaluation (TRE) investigations that have been or will be done to identify potential sources of toxicity, including some or all of the following actions:

  (a) Evaluate the performance of the treatment system to identify deficiencies contributing to effluent toxicity (e.g., operational problems, chemical additives, incomplete treatment)
  (b) Identify the compound(s) causing toxicity
  (c) Trace the compound(s) causing toxicity to their sources (e.g., industrial, commercial, domestic)
  (d) Evaluate, select, and implement methods or technologies to control effluent toxicity (e.g., in-plant or pretreatment controls, source reduction or removal)

- Where corrective actions including a TRE have not been completed, an expeditious schedule under which corrective actions will be implemented;

- If no actions have been taken, the reason for not taking action.

The permittee may also request approval from the Department to postpone additional retests in order to investigate the source(s) of toxicity. Postponed retests must be completed after toxicity is believed to have been removed.

6.3.10 Reopener Clause

Pursuant to s. 283.15(11), Wis. Stat. and 40 CFR 131.20, the Department may modify or revoke and reissue this permit if, through the triennial standard review process, the Department determines that the terms and conditions of this permit need to be updated to reflect the highest attainable condition of the receiving water.

ED_014293_00000430-00052

7 Summary of Reports Due

FOR INFORMATIONAL PURPOSES ONLY

Description	Date	Page
Mercury Pollutant Minimization Program -Annual Mercury Progress Reports	January 31, 2022	20
Mercury Pollutant Minimization Program -Annual Mercury Progress Report #2	January 31, 2023	20
Mercury Pollutant Minimization Program -Annual Mercury Progress Report #3	January 31, 2024	20
Mercury Pollutant Minimization Program -Final Mercury Progress Report and Updated PMP Plan	January 31, 2025	20
Mercury Pollutant Minimization Program -Annual Mercury Reports After Permit Expiration	See Permit	20
Arsenic Pollutant Minimization Program -Implementation of Arsenic Pollutant Minimization Program	January 31, 2021	20
Arsenic Pollutant Minimization Program -Annual Arsenic Progress Report #1	January 31, 2022	21
Arsenic Pollutant Minimization Program -Annual Arsenic Progress Report #2	January 31, 2023	21
Arsenic Pollutant Minimization Program -Annual Arsenic Progress Report #3	January 31, 2024	21
Arsenic Pollutant Minimization Program -Final Arsenic Progress Report and Updated PMP Plan	January 31, 2025	21
Arsenic Pollutant Minimization Program -Annual Arsenic Reports After Permit Expiration	See Permit	21
Arsenic Interim Limits at SP 108 and Outfall 004 -Report on Effluent Discharges	June 30, 2021	21
Arsenic Interim Limits at SP 108 and Outfall 004 -Action Plan	December 31, 2021	21
Arsenic Interim Limits at SP 108 and Outfall 004 -Initiate Actions	June 30, 2022	21
Arsenic Interim Limits at SP 108 and Outfall 004 -Complete Actions	December 31, 2022	21
Total Toxic Organics Management Plan -Submit Updated TTO Plan	March 31, 2021	22
PFOS Limits -Report on Effluent Discharges	June 30, 2021	22
PFOS Limits -Action Plan	December 31, 2021	22
PFOS Limits -Initiate Actions	June 30, 2022	22
PFOS Limits -Complete Actions	December 31, 2022	22
Arsenic Limit at Outfall 001 -Report on Effluent Discharges	June 30, 2021	22
Arsenic Limit at Outfall 001 -Action Plan	December 31, 2021	22

ED_014293_00000430-00053

Description	Date	Page
Arsenic Limit at Outfall 001 -Initiate Actions	June 30, 2022	22
Arsenic Limit at Outfall 001 -Complete Actions	December 31, 2022	22
Mercury Limit at Outfall 001 -Report on Effluent Discharges	June 30, 2021	22
Mercury Limit at Outfall 001 -Action Plan	December 31, 2021	22
Mercury Limit at Outfall 001 -Initiate Actions	June 30, 2022	22
Mercury Limit at Outfall 001 -Complete Actions	December 31, 2022	23
Permit Application Submittal -Permit Application Submittal	June 30, 2025	23
Wastewater Discharge Monitoring Report	no later than the date indicated on the form	24

Report forms shall be submitted electronically in accordance with the reporting requirements herein. Any facility plans or plans and specifications for municipal, industrial, industrial pretreatment and non-industrial wastewater systems shall be submitted to the Bureau of Water Quality, P.O. Box 7921, Madison, WI 53707-7921. All other submittals required by this permit shall be submitted to:
Northeast Region, 2984 Shawano Avenue, Green Bay, WI 54313-6727

ED_014293_00000430-00054

Permit Fact Sheet

General Information

Permit Number:	WI-0001040-08-0
Permittee Name:	Tyco Fire Products LP
Facility Address:	One Stanton Street, Marinette WI 54143
Discharge Location:	Outfall 001: Along the south bank of the Menominee River near the boiler house at 45° 5' 54.42" N 87° 36' 44.4024" W. Outfall 003: Along the southern bank of the Menominee River near Building 14 on the northwest side of the property at 45° 5' 58.4088" N 87° 36' 54.522" W. Outfall 004: Along the southern bank of the Menominee River near Building 14 on the northwest side of the property at 45° 5' 58.4088" N 87° 36' 54.522" W.
Receiving Water:	Menominee River
StreamFlow ($Q_{7,10}$):	1240 cfs
Stream Classification:	Menominee River is classified as a warmwater sport fish community and non-public water supply at the discharge from Outfall 001 and Outfall 003. One mile downstream of Outfall 001 and Outfall 003 is Lake Michigan which is classified as a cold-water and public water supply.

Facility Description

Tyco Fire Products LP (Tyco) manufactures fire extinguishers and fire suppression products at its facility located at One Stanton Street, Marinette, WI 54143. The metal finishing process for manufacturing fire extinguishers and fire suppression products at site results in the generation of metal finishing process wastewater. There are four process areas (Building 29 (Cartridge, Udylite, Small part sprayer), Washroom 36, TTX Line Washroom, and Proceco Sprayer) that generate process wastewater from rinse streams. The process wastewater from these areas are combined and treated by the metal finishing wastewater treatment system (MFWWTS). Also, the facility generates concentrated waste solutions from the process areas (spent caustic, rust inhibitor, spent sulfuric acid, and spent zinc bond) that are collected and metered to the MFWWTS except the zinc bond. The spent zinc bond is first treated at zinc bond treatment system (ZBTS). At the ZBTS, the zinc bond is collected in an equalization tank. The zinc bond is then sent to a batch treatment system. The zinc bond from the batch treatment system is then sent to a filter press to dewater the solids. The zinc bond cake sludge is then hauled off-site to a solid waste landfill and will be tracked via Outfall 006. The filter press filtrate is then metered to the MFWWTS. The effluent from the MFWWTS is monitored at Sampling Point 101. At the MFWWTS, the process wastewater is conveyed to two equalization tanks to equalize the flow. Following the equalization tanks, the process wastewater is mixed with treated zinc bond solution and spent sulfuric acid and sent to a set of two reaction tanks. In the first reaction tank the water is dosed with ferric sulfate. In the second reaction tank, the water is mixed with spent caustic and rust inhibitor and dosed with sodium hydroxide and lime slurry. The water then is sent to a concentration tank. The two-stage reaction system will precipitate metal oxides and phosphates from the water. The solids and water are then separated using a microfiltration (MF) system. The separated solids from the MF system are then sent to a sludge thickener. After thickening, the sludge is dewatered using a filter press. The cake sludge is then hauled off-site to a solid waste landfill and will be tracked via Outfall 005. The MF filtrate is then sent to a reverse osmosis (RO) pretreatment system. The RO pretreatment system includes the dosing of acid, antiscalant, and sodium metabisulfite. The pH of the water is adjusted using the acid to lower the pH of the filtrate to optimize RO performance and mitigate scaling of the RO

ED_014293_00000430-00055

membranes. The preconditioning step also may include adding an antiscalant to inhibit the precipitation of solids on the membrane elements. The sodium metabisulfite is added to remove any oxidizers like free chlorine. The water is then sent to the RO system or sent to the pH neutralization system depending up the total dissolved solids being fed to the RO system. If sent to the RO system, the RO permeate is sent to the RO product water collection tank to be reused in the facility. The RO system will recover approximately 60-85% of the water for reuse. The RO reject water is sent to the pH neutralization system. If the water is does not meet the effluent limits, the water is diverted back to the equalization tanks. After the pH neutralization system, the treated effluent is conveyed to the industrial sewer system and combined with noncontact cooling water (NCCW), boiler blowdown, contaminated groundwater infiltration, and roof drain runoff prior to discharging to the Menominee River through Outfall 001. Beginning by January 1, 2023, Tyco will abandon its underground sewer system to eliminate infiltration of contaminated groundwater and redirect certain waste streams to the sanitary sewer. See the next section "Facility Changes for Compliance with Mercury and Arsenic Variances" below for more details. The source water for metal finishing process water and NCCW comes from the City of Marinette municipal water supply. The source water for the boiler house comes from the Menominee River through an intake system and is monitored at influent Sampling Point 703. Sanitary waste generated at the Tyco facility site is discharged to the Marinette Wastewater Treatment Facility. A water flow diagram for the facility and a treatment system flow diagram of the metal finishing wastewater treatment system are attached to this fact sheet.

Tyco also has on-going contaminated groundwater remediation projects at the site through agreements between the U.S. Environmental Protection Agency (USEPA), the Wisconsin Department of Natural Resources (department) and Tyco under Resource Conservation and Recovery Act (RCRA). Previous manufacturing of arsenic-containing herbicides by Ansul Corp. resulted in arsenic contamination of groundwater at the Tyco site with groundwater arsenic concentrations ranging from 10 µg/L arsenic to as high as 1,000,000 µg/L depending upon the groundwater depth and location at the site (the groundwater enforcement standard for arsenic is 10 µg/L and the groundwater preventive action limit is 1 µg/L. The surface water quality standard is 0.2 µg/L). This area with contaminated groundwater is contained by an underground sheet pile and slurry wall that is intended to prevent the contaminated groundwater from freely migrating offsite and into the Menominee River. As part of the remediation, Tyco pumps contaminated groundwater from seven extraction wells to a groundwater collection and treatment system (GWCTS) that is discharged to the Menominee River through Outfall 003. This is done to maintain groundwater levels within the groundwater containment area, thereby preventing the contaminated groundwater from leaving the area without treatment. However, because arsenic treatment to the surface water standard of 0.2 µg/L is technically infeasible, Tyco has applied for an arsenic variance for this discharge. Under this variance, Tyco will be required to take action to ensure the highest attainable condition of arsenic concentrations in the receiving water, including upgrading its GWCTS to use the best available treatment and other actions (see "Facility Changes for Compliance with Mercury and Arsenic Variances" section below and permit section 5.2). At the GWCTS, extracted groundwater is mixed with a 12.5% bleach solution in a collection tank. After the collection tank, the water is sent to the first set of two reaction tanks in series. A 50% caustic soda solution is added to these tanks to raise the pH. Following the reaction tanks, the water is conveyed to an inclined plate clarifier. The clarifier will promote settling of precipitated solids from the water and reduce the concentration of solids prior to microfiltration. Ferric sulfate will be dosed into the flash mixer of the inclined plate clarifier to reduce long-term hardness scaling. The solids will collect at the bottom of the clarifier and be pumped to a filter press for dewatering. The supernatant (clarified water) from the clarifier will overflow into another reaction tank. Sulfuric acid and ferric sulfate are added to this tank to the lower the pH. The water will then flow into another reaction tank, where a lime slurry is added to raise the pH prior to being directed to a microfiltration (MF) system. The two-stage reaction system will precipitate out insoluble forms of arsenic that can be removed by filtration. The MF system is the preliminary treatment step for removing particulate arsenic and other suspended materials that could foul the reverse osmosis (RO) membranes. The solids removed from the MF system are backwashed and sent to the filter press for dewatering as well. The dewatered cake sludge from the filter press is hauled off-site to a hazardous waste landfill and will be tracked via Outfall 008. The water removed from the filter press is sent back to the first set of reaction tanks. Once the groundwater is filtered through the MF system, the filtrate will be pumped to the RO pretreatment system where the pH of the water is adjusted using sulfuric acid to lower the pH of the filtrate to optimize RO performance and mitigate scaling of the RO membranes. The preconditioning step also may include adding an antiscalant to inhibit the precipitation of solids on the membrane elements. The water from the RO pretreatment system then is processed through primary RO membranes. The dissolved solids in the feed stream, including the arsenic, are

ED_014293_00000430-00056

concentrated in the RO reject. The primary RO permeate is then collected in the RO permeate water collection tank and routed to Outfall 003. The primary RO reject is sent to the vibratory shear enhanced processing (VSEP) membrane filtration system to enhance the treatment of the primary RO reject water. The VSEP system will further concentrate the primary RO reject water. The VSEP system permeate is sent back to the RO permeate water collection tank. The concentration VSEP or reject stream is collected in the reject storage tank for off-site disposal and will be tracked via Outfall 007. A treatment system flow diagram of the GWCTS is attached to this fact sheet.

Tyco also runs a pump down program (PDP) that regularly pumps arsenic contaminated groundwater from the former Salt Vault and 8th Street Slip areas at the site to maintain a certain groundwater level based on the low river level datum to prevent offsite migration of contaminated groundwater. The pumped groundwater is stored at the site and hauled offsite for disposal. A site map showing these areas is attached to this fact sheet.

Facility Changes for Compliance with Mercury and Arsenic Variances

Tyco plans to upgrade the GWCTS to enhance mercury and arsenic removal. The GWCTS upgrades include two new MF systems, two new triple pass RO systems, and new carbon bed and ion exchange process as final polishing step for per- and polyfluoroalkyl (PFAS) removal. Also, once upgrades to the GWCTS are complete, Tyco plans to convey some of water from the PDP to the GWCTS to be treated and discharged to the Menominee River. Currently, PDP water is hauled off-site for deep well injection out-of-state.

Due to infiltration of groundwater into the industrial sewer discharging through Outfall 001 resulting in periodic elevated arsenic concentrations in the effluent, Tyco plans to abandon Outfall 001 and combine the treated metal finishing wastewater (In-Plant Sampling Point 101) with treated groundwater at Outfall 003 to form Outfall 004. The NCCW and boiler blowdown previously discharged through Outfall 001 will be diverted to the sanitary sewer system. Stormwater from roof drains will be diverted to above-ground/surface conveyance to the Menominee River. This Outfall 001 abandonment project will reduce the arsenic and mercury loading to the Menominee River from groundwater infiltration into the industrial sewer system.

Fact Sheet Organization

This fact sheet explains the rationale and assumptions used in deriving the conditions and requirements set forth in the general permit. Additionally, this fact sheet highlights changes in permit conditions that the department proposes to make when reissuing the WPDES permit. This fact sheet compares conditions in the previous permit to those in the reissued permit. The previous permit remains in effect until the permit is reissued. The tables that follow were taken from the permit and are numbered in this fact sheet as they are numbered in the permit. Bolded and highlighted text and cells within tables indicate permit conditions that are new or different from those found in the previous permit.

ED_014293_00000430-00057

1 Influent Requirements

1.1 Sampling Point(s)

Sampling Point Designation	
Sampling Point Number	**Sampling Point Location, WasteType/Sample Contents and Treatment Description (as applicable)**
703	**At Sampling Point 703, the permittee shall take representative samples of the Menominee River intake water prior to use at the facility. The Menominee River intake is located in Building B86 at 45° 5' 58.2828" N 87° 36' 56.0412" W.**
704	**At Sampling Point 704, the permittee shall take representative samples of the influent (contaminated groundwater) to the groundwater collection and treatment system (GWCTS).**

1.2 Monitoring Requirements

1.2.1 Sampling Point 703 - Menominee River Intake

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow Rate		**gpd**	**Daily**	**Total Daily**	
Arsenic, Total Recoverable		**µg/L**	**Monthly**	**Grab**	
Mercury, Total Recoverable		ng/L	**Quarterly**	Grab	

Changes from Previous Permit:

- The sampling point description has been updated to include the location of intake and where to sample the water under Section 1.1.
- The permit includes daily intake flow monitoring.
- The permit includes total recoverable arsenic intake monitoring.

Explanation of Limits and Monitoring Requirements

Arsenic: Arsenic sampling will help the permittee determine the intake arsenic contribution to the effluent discharge and measure the effectiveness of their reductions through the pollutant minimization program. Additionally, this data will assist the department in establishing an initial arsenic effluent limitation in future permit reissuances

Mercury: Mercury sampling will help the permittee determine the intake mercury contribution to the effluent discharge and measure the effectiveness of their reductions through the pollutant minimization program. Additionally, this data will assist the department in establishing an alternative mercury effluent limitation in future permit reissuances.

ED_014293_00000430-00058

Cooling Water Intake Structure (CWIS): This influent section includes the CWIS description, authorization for use, and BTA (Best Technology Available) determination. The permittee is authorized to use the cooling water intake structure which consists of the following:

- **Location:** The Menominee River intake (B86 feed) is located at the north corner of the property in Building B86 along the property line of Marinette Marine at 45° 5' 58.2828" N 87° 36' 56.0412" W.
- **General Description:** The Menominee River intake consists of a 2-foot diameter conduit pipe that sits 3 feet above the bottom of the river. The conduit pipe then extends 25.5 feet to Building B86 from the river where the water is then conveyed into a reservoir. From the reservoir, water is the pumped through a pump with a 9-inch inlet pipe with a screen that has with 1/2" squares and 1/16" wire and outlet pipe with a screen that has 3/32" circles and a 1/8" gap between circles. The river water is then conveyed to the boiler house for steam generation and to the sprinkler system for testing.
- **Maximum Design Intake Flow (DIF):** The maximum design intake flow (DIF) is 144,000 gpd (0.268 cfs).
- **Maximum Through-Screen Design Intake Velocity:** The maximum through-screen design intake velocity at the 2-foot conduit pipe is 0.0853 feet/second (0.268 cfs / [π (1 foot)^2) * 100% open area proportion]). The maximum through-screen design intake velocity at the pump inlet screen is 0.788 feet/second (0.268 cfs / [π (0.375 feet)^2) * 77% open area proportion])
- **Actual Intake Flow (AIF):** The actual intake flow is 8,945 gpd (0.0166 cfs).
- **Actual Through-Screen Intake Velocity:** The actual through-screen intake velocity at the 2-foot conduit pipe is 0.00528 feet/second (0.0166 cfs / [π (1 foot)^2) * 100% open area proportion]). The actual through-screen intake velocity at the pump inlet screen is 0.0488 feet/second (0.0166 cfs / [π (0.375 feet)^2) * 77% open area proportion]).
- **Intake Water Used Exclusively for Cooling:** 0%
- **Nearby Intakes:** Kimberly Clark Corporation – Marinette: DIF = 11.5 MGD and AIF = 1.0 MGD

BTA (Best Technology Available) Determination: BTA determination using best professional judgement for entrainment and impingement mortality at the Menominee River intake structure was made in accordance with s. 283.31(6), Wis. Stats. Best professional judgment BTA determinations are made using the department's 2020 Guidance for Evaluating Intake Structures Using Best Professional Judgment. For existing intake structures, the guidance advises that intakes deemed BTA should fulfill at least one or more of the following six criteria:

1. Each water intake structure has a maximum design intake velocity of 0.5 fps OR a maximum actual intake velocity of 0.5 fps.

   At the 2-foot conduit pipe, the maximum actual through screen intake velocity is 0.00528 fps. At the pump inlet screen, the maximum actual through-screen intake velocity is 0.0488 fps. Because the requirements of this impingement mortality BTA option are satisfied, no other BTA options were evaluated.

2. The facility operates a closed-cycle recirculating system that only requires make-up water with > 3 cycles of concentration on at least a daily basis.
3. The facility operates an intake structure that minimizes impingement rates by nature of its location (e.g. offshore velocity cap).
4. The facility employs a system of technologies (e.g. wedge-wire screens, barrier nets; acoustic, light, or pH deterrent systems; variable speed pumps, etc.) that minimize impingement mortality rates.
5. The facility operates a modified traveling screen in an optimal manner that does not promote reimpingement or predation of returned organisms.
6. The facility's intake withdraws water at > 0.25 fps less than or equal to 16% of the time.

7. There is data indicating that the impingement mortality rate has been/will be reduced 80-95% compared to a once-through cooling system with 3/8" traveling screens.
8. There is biological data that affirmatively demonstrates that: 1) the source water body does not include threatened or endangered species in the vicinity of the intake, and 2) there are no aquatic life and water quality problems partly or solely due to the presence or operation of the intake structure.

AND one or more of the following five criteria:

1. The total water withdrawn (actual intake flow) is ≤ 5% of the mean annual flow of the river on which the intake is located (if on a river or stream) OR the total quantity of the water withdrawn is restricted to a level necessary to maintain the natural thermal stratification or turnover patterns (where present) except in cases where the disruption is beneficial (if on a lake or reservoir).

   The actual intake flow is 0.0013% of the $Q_{7,10}$ of the Menominee River. Because the requirements of this entrainment BTA option are satisfied, no other BTA options were evaluated.

2. The facility operates at < 8% capacity utilization rate (with pumps turned off or, if variable frequency drives exist, down substantially during periods of non-operation) or at full capacity only for portions of days during a few months or less on an annual basis. If located in a spawning area, the period of water intake operation should not correspond with times when spawning, peak egg/larval abundance, or larval recruitment is occurring (depending on species present, usually between April – October).
3. The facility operates a closed-cycle recirculating system that only requires make-up water with > 3 cycles of concentration on at least a daily basis.
4. The facility utilizes other means such as variable speed pumps, unit retirements, etc. to decrease entrainment rates by greater than or equal to 60% compared to a once-through cooling system with 3/8" traveling screens.
5. There is biological data that affirmatively demonstrates that: 1) the source water body does not include threatened or endangered species in the vicinity of the intake, 2) there are no aquatic life and water quality problems partly or solely due to the presence or operation of the intake structure, and 3) the department biologist concurs that operation of the intake during periods of spawning, peak egg/larval abundance, and larval recruitment will not substantially impact populations or prey bases for the fishery.

The facility meets two of the above criteria. The department, therefore, believes that the Menominee River intake structure does represent BTA for minimizing adverse environmental impact in accordance with the requirements in section 283.31(6), Wis. Stats. and section 316 (b) of the Clean Water Act.

Future BTA: Future BTA determinations will continue to be made in each permit reissuance pursuant to s. 283.31(6), Wis. Stats., based on best professional judgment. However, if the design intake flow exceeds 2 MGD and if 25% or more of the intake water, based on actual intake flow, is used exclusively for cooling, BTA determinations for entrainment and impingement mortality will be made in accordance with ss. NR 111.12-13, Wis. Adm. Code and the permittee will be required to submit all the required information in s. NR 111.40(2)(b), Wis. Adm. Code with the permit application.

Intake Screen Discharges and Removed Substances: Floating debris and accumulated trash collected on the cooling water intake trash rack shall be removed and disposed of in a manner to prevent any pollutant from the material from entering the waters of the State pursuant to s. NR 205.07 (3) (a), Wis. Adm. Code.

Endangered Species Act: This permit does not authorize take of threatened or endangered species under s. 29.604, Wis. Stats., and ch. NR 27, Wis. Adm. Code. Contact the state Natural Heritage Inventory (NHI) staff with inquiries regarding incidental take of state-listed threatened and endangered species and the US Fish and Wildlife Service with inquiries regarding incidental take of federally listed threatened and endangered species.

ED_014293_00000430-00060

1.2.2 Sampling Point 704 – GWCTS Influent

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow Rate		**gpd**	**Daily**	**Continuous**	
Arsenic, Total Recoverable		**ug/L**	**Weekly**	**24-Hr Flow Prop Comp**	
Suspended Solids, Total		**mg/L**	**Weekly**	**24-Hr Flow Prop Comp**	
Mercury, Total Recoverable		**ng/L**	**Monthly**	**Grab**	

Explanation of Limits and Monitoring Requirements

Influent Characterization and Monitoring: The permittee shall characterize the wastewater influent to the GWCTS. This influent characterization will allow for proper wastewater treatment process control.

ED_014293_00000430-00061

2 In-Plant Requirements

2.1 Sampling Point(s)

Sampling Point Designation	
Sampling Point Number	**Sampling Point Location, WasteType/Sample Contents and Treatment Description (as applicable)**
101	**At Sampling Point 101, the permittee shall take representative samples of the treated metal finishing process wastewater after the physical chemical process wastewater treatment system prior to mixing with other wastewater streams and discharging through Outfall 001. On January 1, 2023, treated metal finishing process wastewater will be diverted to Outfall 004.**
107	**At Sampling Point 107, the permittee shall collect a field blank for each day a mercury is sample is collected.**
108	**At Sampling Point 108, the permittee shall take representative samples of the final treated effluent from the groundwater collection and treatment system (GWCTS) prior to mixing with the treated metal finishing effluent and discharging through Outfall 004 to the Menominee River. Sampling is required when there is a discharge through this Sampling Point during any month.**

2.2 Monitoring Requirements and Limitations

The permittee shall comply with the following monitoring requirements and limitations.

2.2.1 Sampling Point 101- Metal Finishing Effluent

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow Rate		MGD	Daily	Continuous	
Suspended Solids, Total	Daily Max	60 mg/L	**3/Week**	**24-Hr Flow Prop Comp**	
Suspended Solids, Total	Monthly Avg	31 mg/L	**3/Week**	**24-Hr Flow Prop Comp**	
Oil & Grease (Hexane)	Daily Max	52 mg/L	**Monthly**	Grab	
Oil & Grease (Hexane)	Monthly Avg	26 mg/L	**Monthly**	Grab	
Cadmium, Total Recoverable	Daily Max	690 ug/L	**Monthly**	**24-Hr Flow Prop Comp**	

ED_014293_00000430-00062

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Cadmium, Total Recoverable	Monthly Avg	260 ug/L	**Monthly**	**24-Hr Flow Prop Comp**	
Copper, Total Recoverable	Daily Max	3,380 ug/L	**Monthly**	**24-Hr Flow Prop Comp**	
Copper, Total Recoverable	Monthly Avg	2,070 ug/L	**Monthly**	**24-Hr Flow Prop Comp**	
Nickel, Total Recoverable	Daily Max	3,980 ug/L	**Monthly**	**24-Hr Flow Prop Comp**	
Nickel, Total Recoverable	Monthly Avg	2,380 ug/L	**Monthly**	**24-Hr Flow Prop Comp**	
Zinc, Total Recoverable	Daily Max	2,610 ug/L	**Monthly**	**24-Hr Flow Prop Comp**	
Zinc, Total Recoverable	Monthly Avg	1,480 ug/L	**Monthly**	**24-Hr Flow Prop Comp**	
Total Toxic Organics	Daily Max	2,130 ug/L	Monthly	**24-Hr Flow Prop Comp**	
Chromium, Total Recoverable	Daily Max	2,770 ug/L	**1/ 6 Months**	**24-Hr Flow Prop Comp**	
Chromium, Total Recoverable	Monthly Avg	1,710 ug/L	**1/ 6 Months**	**24-Hr Flow Prop Comp**	
Lead, Total Recoverable	Daily Max	690 ug/L	**1/ 6 Months**	**24-Hr Flow Prop Comp**	
Lead, Total Recoverable	Monthly Avg	430 ug/L	**1/ 6 Months**	**24-Hr Flow Prop Comp**	
Silver, Total Recoverable	Daily Max	430 ug/L	**1/ 6 Months**	**24-Hr Flow Prop Comp**	
Silver, Total Recoverable	Monthly Avg	240 ug/L	**1/ 6 Months**	**24-Hr Flow Prop Comp**	
Cyanide, Total	Daily Max	1,200 ug/L	**1/ 6 Months**	Grab	
Cyanide, Total	Monthly Avg	650 ug/L	**1/ 6 Months**	Grab	

ED_014293_00000430-00063

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Mercury, Total Recoverable		**ng/L**	**Monthly**	**Grab**	
Mercury, Total Recoverable		**mg/day**	**Monthly**	**Calculated**	
Arsenic, Total Recoverable		**ug/L**	**Monthly**	**24-Hr Flow Prop Comp**	
Arsenic, Total Recoverable		**lbs/day**	**Monthly**	**Calculated**	
pH (Continuous)			**Daily**	**Continuous**	

Changes from Previous Permit:

The sampling point description has been updated under Section 2.1.

The sample frequencies for oil and grease, total recoverable cadmium, copper, nickel, and zinc have been changed from "2/week" to "Monthly".

The sample frequencies for total cyanide, total recoverable chromium, lead, and silver have been changed from "Monthly" to "1/6 Months".

The sample frequency for total suspended solids have been changed from "Daily" to "3/week".

Monitoring has been added for total recoverable mercury and arsenic.

Monitoring for specific toxic organic compounds have been removed from the permit.

The sample type for most parameters have been changed from "24-Hr Comp" to "24-Hr Flow Prop Comp" to show the current effluent sampling type.

pH continuous monitoring requirements have been changed from the previous permit.

Chapter NR 219, Wis. Adm. Code, specifies that the Freon Oil & Grease test method is no longer approved and shall not be used. Permittees shall either use the hexane extractable material (HEM) or silica gel treated HEM test methods as provided in ch. NR 219, Wis. Adm. Code.

Explanation of Limits and Monitoring Requirements

Categorical Treatment Based Limitations: Categorical treatment-based limitations remain unchanged from the previous permit. These limits are based ch. NR 261, Wis. Adm. Code. Chapter NR 261, Wis. Adm. Code, specifies effluent guidelines for discharges from metal finishing categories of point sources and subcategories. These guidelines are based on federal guidelines at 40 CFR Part 433. Section NR 220.13, Wis. Adm. Code, includes provisions that address cases where federal and state rule differ. Wisconsin statutes at s. 283.11, Wis. Stats., address compliance with federal standards. In this case, the state rules are consistent with federal rules with a few exceptions. In such cases, the permit will in all cases be based on the state rule notwithstanding the federal regulations. The omissions are described below.

ED_014293_00000430-00064

With regard to new source performance standards (NSPS), the state rules do not specify a date for the definition for a new source. Therefore, it is necessary to review the available federal guidance and rules. The Boornazian memo (September 28, 2006) specifies a new source date for direct discharges of July 15, 1983. The department relies on the Boornazian memo to establish date of applicability for NSPS.

All production process and production equipment that cause the discharge of pollutants were installed prior to the date promulgation of federal standards (July 15, 1983) for Tyco. Therefore, the BPT and BAT standards for the "Metal Finishing Subcategory" are applicable in accordance with ss. NR 261.12(1) and (2), Wis. Adm. Code and 40 CFR Part 433 Subparts A. As noted above, the department has included effluent guidelines from federal regulations where these guidelines are not consistent with department standards.

The federal standard rule lists pH standards of 6.0 to 9.0 for best available technology (BAT) and NSPS standard requirements under 40 CFR Parts 433.13 and 433.16. State rules in ch. NR 261, Wis. Adm. Code, lists the pH range of 6.0 to 9.5 for BAT and NSPS. State rules cannot be less restrictive than federal rules, so the federal rule's limits of 6.0-9.0 were used.

The permit reduces the sample frequencies for total suspended solids, total cyanide, oil and grease, total recoverable cadmium, chromium, copper, lead, nickel, silver, and zinc. As explained in "Monitoring Frequency Reduction Evaluation" attachment of this fact sheet, reduced monitoring frequency is consistent with EPA guidance to minimize unnecessary monitoring when discharge levels are below effluents limits. Consistent with guidance, the department is allowed to increase the frequency of this parameter during the permit term through a permit modification should effluent exceedances occur.

Removal of TTO Parameters: The department has removed the TTO parameters from the permit as monitoring for these parameters are not necessary if Tyco continues to submit monthly TTO monitoring certification on their discharge monitoring reports.

Mercury: Mercury sampling will help the permittee determine metal finishing process mercury contribution to the effluent discharge and measure the effectiveness of their reductions through the pollutant minimization program.

Arsenic: Arsenic sampling will help the permittee determine metal finishing process arsenic contribution to the effluent discharge and measure the effectiveness of their reductions through the pollutant minimization program.

Continuous pH Monitoring and Limits: Technology-based effluent limits for pH have been changed from the previous permit. The proposed permit specifies pH limits of 6.0 minimum and 9.0 maximum pursuant to 40 CFR 433.13 as state rules differ from federal rules, and the permit must include limits based upon the more stringent of the two. The pH excursions of the permitted pH range are allowed only when pH is monitored continuously pursuant to s. NR 205.06, Wis. Adm. Code. The metal finishing discharge at Sampling Point 101 may fall outside of the permitted pH range for a total of 446 minutes in one month. However, any individual excursion outside of the pH range of 6.0 to 9.0 s.u. may not exceed 60 minutes and may not exceed any length outside the range of 4.0 to 11.0 s.u. The absolute pH limits of 4.0 s.u. minimum and 11.0 s.u. maximum are based on water quality based pH limits as specified by s. NR 102.05(3)(h), Wis. Adm. Code.

Flow Augmentation: The flow augmentation requirements are in accordance with BPT and BAT standards for the "Metal Finishing Subcategory" from ss. NR 261.12(1)(c) and (2)(c), Wis. Adm. Code and 40 CFR Parts 433.13(c) and 433.14(c).

Toxic Organic Requirements:

TTO Summation: As defined in s. NR 261.03(8), Wis. Adm. Code, TTO means total toxic organics, which is the sum of all quantifiable values greater than 10 μg/L of the toxic organics listed in ss. NR 215.03(1)-(5), Wis. Adm. Code.

Identified Toxic Organics: In accordance with s. NR 261.13(c), Wis. Adm. Code, if monitoring is necessary to measure compliance with the TTO standard, the permittee need analyze only for those pollutants reasonably expected to be present. The department may require a full TTO pollutant scan.

ED_014293_00000430-00065

Process Modification/Planned Changes: In accordance with ss. 283.31(4) (b) and 283.59 (1), Wis. Stats., the permittee shall report to the department any facility expansion, production increase or process modifications which will result in new, different or increased discharges of pollutants. Therefore, any use of a toxic organic that is listed in ss. NR 215.03(1)-(5), Wis. Adm. Code, and that has the potential for entering wastewaters discharged, is classified by the Department as a process modification and must be reported to the department and included when monitoring for TTO.

Certification in Lieu of Monitoring for Total Toxic Organics: The proposed permit retains the current option for the permittee to substitute a certification statement s in lieu of total toxic organic monitoring for Sampling Points 101. These certification requirements are based on s. NR 261.13(1)(a) and (b), Wis. Adm. Code.

Certification Process: Pursuant to s NR 261.13(1)(a) and (b), to qualify for the certification option a permittee must:

1. The permittee continues to implement their toxic organic management plan; and
2. The permittee makes a TTO certification statement monthly on the Discharge Monitoring Report form, in accordance with s. NR 261.13(1)(a), Wis. Adm. Code.

Tyco will continue to qualify for the certification option as long as Tyco continues to make a TTO certification statement on the monthly DMRs and implement their toxic organic management plan. If the permittee elects to not follow the TTO certification requirements or does not meet the TTO certification requirements stated in this section, the permittee shall comply with the TTO monitoring listed in Section 2.2.1.

Toxic Organic Management Plan: The department shall incorporate the toxic organic management plan as a provision of the permit pursuant to s. NR 261.13(b), Wis. Adm. Code. The permittee shall prepare and implement a toxic organic management plan to remain eligible for the certification option for TTO monitoring as specified in s. NR 261.13(b), Wis. Adm. Code. The toxic organics management plan content is specified in s. NR 261.13(b), Wis. Adm. Code, as well. The remaining procedures and requirements for the management plan are based on similar activities specified in best management practice plans for spent pulping liquor, soap and turpentine management, spill prevention and control at paper mills pursuant to 40 CFR 430.03.

2.2.2 Sampling Point 107- Mercury Field Blank Results

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Mercury, Total Recoverable		ng/L	Monthly	Blank	

Changes from Previous Permit:

- None

Explanation of Limits and Monitoring Requirements

Mercury Field Blank: While the proposed permit continues monitoring requirements for mercury, it also imposes data quality requirements as specified in ss. NR 106.145(9) and (10), Wis. Adm. Code. Consequently, a field blank result is required each day a mercury is sample is collected. If more than one sample is collected in a day, at least one field blank shall be collected by the permittee for each 10 mercury samples collected on that day. The proposed permit establishes Sampling Point 107 to allow Tyco to report field blank results on discharge monitoring report forms.

ED_014293_00000430-00066

2.2.3 Sampling Point 108 – GWCTS Effluent

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow Rate		**MGD**	**Daily**	**Continuous**	
Suspended Solids, Total		**mg/L**	**Weekly**	**24-Hr Flow Prop Comp**	
Arsenic, Total Recoverable	**Daily Max**	**500 ug/L**	**Weekly**	**24-Hr Flow Prop Comp**	
Arsenic, Total Recoverable	**Daily Max**	**0.17 lbs/day**	**Weekly**	**Calculated**	
Mercury, Total Recoverable	**Daily Max**	**24 ng/L**	**Monthly**	**24-Hr Flow Prop Comp**	
Mercury, Total Recoverable		**mg/day**	**Monthly**	**Calculated**	

Changes from Previous Permit

This is a new in-plant sampling point, so all limits are new in this permit reissuance.

Explanation of Limits and Monitoring Requirements

Due to infiltration of groundwater into the industrial sewer discharging through Outfall 001 resulting in periodic elevated arsenic and mercury concentrations in the effluent, Tyco plans to abandon Outfall 001 and combine the treated metal finishing wastewater (In-Plant Sampling Point 101) with treated groundwater at Outfall 003 (In-Plant Sampling Point 108) to form Outfall 004.

In-Plant Sampling Point 108 becomes active on January 1, 2023 unless the permittee completes the diversion and combination of process wastewater from Sampling Point 101 with Outfall 003 to form Outfall 004 and Sampling Point 108 at an earlier date. In this case, the permittee shall comply with the monitoring requirements and effluent limitations listed Section 2.2.3 immediately when discharge through Sampling Point 108 commences. This schedule will allow Tyco time to properly abandon Outfall 001 and improve the groundwater collection and treatment system (GWCTS) to enhance arsenic and PFOS removal. The limits included for Sampling Point 108 are included to ensure proper operation and maintenance of the GWCTS and so that variance limits at Outfall 004 will be met.

Total Suspended Solids: Most total suspended solids (TSS) consists of inorganic material (such as sediment, silt and clays). Arsenic has known to be found in sediments and soils. Therefore, the permit retains monitoring for TSS to track the removal of these forms of arsenic. Additionally, monitoring for TSS will assist in the optimization and process control at the treatment facility.

Total Recoverable Arsenic: Tyco has indicated in their variance application that a level achievable during the term of the variance would be 500 µg/L. This level was included as the interim variance limit in accordance with s. 283.15(5)(c), Wis. Stats. However, Outfall 003 will be combined with the process wastewater at Sampling Point 101 to form Outfall 004. So, the interim variance limit of 500 µg/L will be applied to Sampling Point 108. This limit is necessary at this in-plant sample point to ensure the highest attainable condition (HAC) is achieved, as required under federal code provisions

ED_014293_00000430-00067

related to water quality standard variances. Application of a concentration-based limitation representing HAC only at Outfall 004 (after dilution with process wastewater) would not fully protect the HAC because it would allow the permittee to not operate the GWCTS in an optimal manner during periods of high flows of process waste streams, which would dilute the flow from the GWCTS. The department has included a compliance schedule in the permit to meet the interim variance limit of 500 µg/L. This schedule will allow time for optimization and/or upgrades to the GWCTS and the process wastewater at Sampling Point 101 to be combined with Outfall 003 to form Outfall 004.

The Department has included an initial arsenic mass limit of 0.17 lbs/day based on the daily maximum flow (0.0405 MGD) and interim concentration limit (500 ug/L) for Sampling Point 108.

Total Recoverable Mercury: See the explanation of total recoverable mercury limits at Outfall 003. Once Outfall 003 is deactivated, the final mercury alternative effluent limit (AEL) will be effective at Outfall 004, and the interim AEL of 24 ng/L will be applied to Sampling Point 108, which will take the place of Sampling Point 003. This limitation at Sampling Point 108 will ensure effective operation of the treatment system to ensure attainment of the HAC. It will prevent the permittee from using dilution during periods of high flow rates of process wastewater from Sampling Point 101 to meet the final AEL at Outfall 004.

ED_014293_00000430-00068

3 Surface Water Requirements

3.1 Sampling Point(s)

The discharge(s) shall be limited to the waste type(s) designated for the listed sampling point(s).

Sampling Point Designation	
Sampling Point Number	**Sampling Point Location, WasteType/Sample Contents and Treatment Description (as applicable)**
001	**At Sampling Point 001, the permittee shall take representative samples of the combined discharge of treated metal finishing process wastewater from Sampling Point 101, noncontact cooling water (NCCW), boiler blowdown, groundwater infiltration, and stormwater from roof drains prior to discharge to the Menominee River via Outfall 001. Outfall 001 is located along the south bank of the Menominee River near the boiler house at 45° 5' 54.42'' N 87° 36' 44.4024'' W. On January 1, 2023, the treated metal finishing process wastewater from Sampling Point 101 will be diverted to Outfall 004 and noncontact cooling water (NCCW) and boiler blowdown will be diverted to the City of Marinette sanitary sewer system. Stormwater from roof drains will conveyed over the land surface to the Menominee River. Outfall 001 will be deactivated on January 1, 2023.**
003	**At Sampling Point 003, the permittee shall take representative samples of the final treated effluent from the groundwater collection and treatment system (GWCTS) prior to discharge to the Menominee River via Outfall 003. Outfall 003 is located along the southern bank of the Menominee River near Building 14 on the northwest side of the property at 45° 5' 58.4088'' N 87° 36' 54.522'' W. On January 1, 2023, the treated metal finishing process wastewater from Sampling Point 101 will be combined with the GWCTS effluent from Sampling Point 108 and diverted to Outfall 004. Outfall 003 will be deactivated on January 1, 2023.**
004	**At Sampling Point 004, the permittee shall take representative samples of the combined discharge of treated metal finishing wastewater (Sampling Point 101) and treated groundwater (Sampling Point 108) prior to discharge to the Menominee River via Outfall 004. Sampling is required when there is a discharge from this outfall during any month.**

3.2 Monitoring Requirements and Effluent Limitations

The permittee shall comply with the following monitoring requirements and limitations.

3.2.1 Sampling Point (Outfall) 001 - Combined WW to Menominee River

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow Rate		MGD	Daily	Continuous	
pH Field	**Daily Max**	**9.0 s.u.**	**Daily**	**Continuous**	

ED_014293_00000430-00069

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
pH Field	**Daily Min**	**6.0 s.u.**	**Daily**	**Continuous**	
Temperature Maximum		deg F	**Weekly**	**Measure**	
Hardness, Total as CaCO3		mg/L	Monthly	**24-Hr Flow Prop Comp**	
Arsenic, Total Recoverable	Daily Max	**170 ug/L**	Monthly	**24-Hr Flow Prop Comp**	**This is an interim compliance schedule limit effective until November 30, 2022.**
Arsenic, Total Recoverable	**Daily Max**	**0.81 lbs/day**	**Monthly**	**Calculated**	**This is an interim compliance schedule limit effective until November 30, 2022.**
Cadmium, Total Recoverable	**Daily Max**	**57 ug/L**	**Monthly**	**24-Hr Flow Prop Comp**	
Cadmium, Total Recoverable	**Monthly Avg**	**57 ug/L**	**Monthly**	**24-Hr Flow Prop Comp**	
Cadmium, Total Recoverable	**Daily Max**	**0.27 lbs/day**	**Monthly**	**Calculated**	
Copper, Total Recoverable	Daily Max	69 ug/L	Monthly	**24-Hr Flow Prop Comp**	
Copper, Total Recoverable	**Monthly Avg**	**69 ug/L**	**Monthly**	**24-Hr Flow Prop Comp**	
Copper, Total Recoverable	Daily Max	0.98 lbs/day	Monthly	Calculated	
Cyanide, Amenable	**Daily Max**	**92 ug/L**	**Monthly**	**24-Hr Flow Prop Comp**	
Cyanide, Amenable	**Monthly Avg**	**92 ug/L**	**Monthly**	**24-Hr Flow Prop Comp**	
Cyanide, Amenable	**Daily Max**	**0.44 lbs/day**	**Monthly**	**Calculated**	
Chlorine, Total	**Daily Max**	**38 ug/L**	**Monthly**	**Grab**	

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Residual					
Chlorine, Total Residual	**Monthly Avg**	**38 ug/L**	**Monthly**	**Grab**	
Mercury, Total Recoverable	**Daily Max**	**29 ng/L**	**Monthly**	**Grab**	**This is an interim compliance schedule limit effective until November 30, 2022.**
Phosphorus, Total	Rolling 12 Month Avg	1.0 mg/L	**1/ 2 Months**	**24-Hr Flow Prop Comp**	
PFOA		**ng/L**	**Monthly**	**24-Hr Flow Prop Comp**	
PFOS		**ng/L**	**Monthly**	**24-Hr Flow Prop Comp**	**Final effluent limit is effective on December 1, 2022.**
PFOS		**mg/day**	**Monthly**	**Calculated**	**Final effluent limit is effective on December 1, 2022.**
Acute WET	**Daily Max**	**1.0 TUa**	**See Listed Qtr(s)**	**24-Hr Flow Prop Comp**	

Changes from Previous Permit

The sampling point description has been updated to include the location of the outfall and where to sample the water under Section 3.1.

The pH continuous monitoring requirements have been removed from the previous permit and pH limits of 6.0 to 9.0 s.u. have been added.

Maximum Temperature monitoring has been added to the permit.

The monitoring frequency for total phosphorus has been reduced from “Weekly” to “1/ 2 Months”.

The sample type for most parameters have been changed from “24-Hr Comp” to “24-Hr Flow Prop Comp” to show the current effluent sampling type.

The daily maximum total recoverable arsenic loading limit of 12 lbs/day has been changed from the previous permit.

The daily maximum limit for total recoverable arsenic has been changed to 170 ug/L.

Daily maximum and monthly average limits have been modified or added to the permit for total recoverable cadmium, total recoverable copper and amendable cyanide.

ED_014293_00000430-00071

Daily maximum and monthly average limits for total residual chlorine have been added to the permit.

A daily maximum limit for total recoverable mercury of 29 ng/L has been added to the permit.

Monitoring has been added to Outfall 001 for PFOA and PFOS.

A daily maximum acute WET limit of 1.0 TU_a has been added to the permit.

WET Testing sample frequency has been changed to "See Listed Qtr(s)" to be consistent with the quarters listed in the WET Testing subsection of the permit.

Explanation of Limits and Monitoring Requirements

Temperature Maximum: The Department has concluded that there is no reasonable potential to exceed a calculated temperature limit and therefore, only monitoring is required.

Parameter name has changed from "Temperature" to "Maximum Temperature," which represents the highest temperature recorded during the day rather than the average of all temperature readings collected during the day. This change reflects the water quality-based thermal rules, subch. V, NR 106, Wis. Adm. Code.

pH Limits: The pH is limited to the range of 6.0 to 9.0 standard units, with no change greater than 0.5 units outside the estimated natural seasonal maximum and minimum. This is consistent with the water quality standards pH range for waters classified for fish and aquatic life as defined in ch. NR 102.04(4)(c), Wis. Adm. Code.

The department has removed the pH continuous language (i.e. pH excursions and limits of 4 s.u. and 11 s.u.) as these requirements are only applicable to sampling points where categorical pH limits are established pursuant to s. NR 205.06, Wis. Adm. Code. Categorical pH limits are established at Sampling Point 101 not Outfall 001. Therefore, water quality standard pH limits shall apply at Outfall 001.

Total $CaCO_3$ Hardness: Since effluent hardness affects the toxicity of total recoverable cadmium, copper, and zinc in the effluent, total hardness (as CaCO3) will be monitored at the same frequency as total recoverable metals and analyzed in the same sample on the same day in the permit.

Total Recoverable Arsenic: This permit includes interim compliance limits for arsenic of 170 µg/L and 0.81 lbs/day and compliance schedule to allow a reasonable opportunity for the permittee to attain compliance with the final effluent limit of 0.2 µg/L associated mass limit for Outfall 001 in accordance with s. NR 106.117, Wis. Adm. Code, by the due dates specified in the permit. This schedule will allow time for Outfall 001 to be abandoned and the process wastewater at Sampling Point 101 to be combined at Outfall 004. The concentration limit of 170 µg/L was set equal to the 1-day P_{99}. Sewer relining has resulted in some lower arsenic levels at Outfall 001. Only arsenic data at Outfall 001 from December 2017 to May 2020 is used. The mass limit is based on the daily maximum flow (0.570 MGD) and the concentration limit (170 µg/L) for Outfall 001.

Total Recoverable Cadmium, Total Recoverable Copper and Amenable Cyanide: The need for limits for toxic substances at Outfall 001 also needs to be assessed based on the categorical limits that apply to the treated metal finishing effluent wastewater from Sampling Point 101. Section NR 106.04(1), Wis. Adm. Code, states that water quality–based effluent limitations (WQBELs) shall be required in the permit whenever the categorical effluent limits required are less stringent than necessary to achieve applicable water quality standards specified in chs. NR 102 to NR 105, Wis. Adm. Code.

To evaluate this, the applicable categorical limits for Sampling Point 101 are multiplied by the percentage of Outfall 001 flow which is made up of Sampling Point 101 flow to determine the highest effluent concentration that the categorical limit would allow at Outfall 001. This maximum allowed concentration is compared to the calculated WQBELs to determine the need for a limit at Outfall 001. Based on this comparison, daily maximum limits are needed at Outfall 001 for cadmium, copper, and cyanide with respective daily maximum mass limits.

Total Residual Chlorine: The source water at Tyco is mainly from Marinette Waterworks, which adds chlorine to the water supply. Therefore, the need for WQBELs for chlorine must be evaluated. Available data/information indicates the

ED_014293_00000430-00072

discharge contains concentrations of chlorine or halogen above the applicable WQBELs. Therefore, a daily maximum effluent limit of 38 µg/L is needed at Outfall 001 for permit reissuance. Due to revisions to s. NR 106.07(2), Wis. Adm. Code, mass limitations are no longer required. Weekly average limitations are not needed, as the daily maximum limitations will provide adequate protection of the receiving water.

Total Recoverable Mercury: This permit includes an interim compliance limit for mercury of 29 ng/L and compliance schedule to allow a reasonable opportunity for the permittee to attain compliance with the final effluent limit of 1.3 ng/L for Outfall 001 in accordance with s. NR 106.117, Wis. Adm. Code, by the due dates specified in the permit. This schedule will allow time for Outfall 001 to be abandoned and the process wastewater at Sampling Point 101 to be combined at Outfall 004.

Total Phosphorus: The permit contains a technology-based effluent limitation (TBEL) of 1.0 mg/L rolling 12-month average for total phosphorus that is unchanged from the previous permit. Chapter NR 217, Wis. Adm. Code, addresses point source dischargers of phosphorus to surface waters. The code categorically limits industrial dischargers to 1.0 mg/L as a rolling 12-month average if the discharge from all outfalls contains a cumulative total of more than 60 pounds of total phosphorus per month unless an alternative limit is approved. Tyco had an average total monthly discharge of 9.2 lbs per month at Outfall 001 from January 2013 to January 2018. Tyco had an average total monthly discharge of 0.009 lbs per month at Outfall 003 for a sample in February 2018. Since Tyco discharges a cumulative total less than 60 lbs per month through all outfalls, a limit of 1.0 mg/L is not needed. However, effluent limitations must be at least as stringent as the final effluent limitations in the previous permit unless the permittee requests removal of the limit and meets the anti-backsliding provisions of 40 CFR §122.44(I) Therefore, the TBEL of 1.0 mg/L as a 12-month rolling average for total phosphorus remains unchanged from the previous permit.

The permit reduces the sample frequency for total phosphorus. As explained in "Monitoring Frequency Reduction Evaluation" attachment of this fact sheet, reduced monitoring frequency is consistent with EPA guidance to minimize unnecessary monitoring when discharge levels are below effluents limits. Consistent with guidance, the department is allowed to increase the frequency of this parameter during the permit term via permit modification should effluent exceedances occur.

Chapters NR 102 and NR 217, Wis. Adm. Code, include phosphorus criteria and related procedures for calculating WQBELs for discharges of phosphorus to surface waters of the state from publicly and privately-owned wastewater facilities. WQBELs for phosphorus are needed whenever the discharge contains phosphorus at concentrations or loadings that will cause or contribute to an exceedance of the water quality standards. The Department has determined that TBEL is more restrictive than the WQBEL for Tyco at Outfall 001; therefore, a WQBEL is not necessary at this time and the TBEL is retained for the permit.

PFOA and PFOS: The Michigan Department of Environment, Great Lakes, and Energy (EGLE) has promulgated Human Non-Cancer Criteria (equivalent to Wisconsin's Human Threshold Criteria) of 0.42 µg/L for Perfluorooctanoic acid (PFOA) and 0.011 µg/L for perfluorooctane sulfonate (PFOS) for surface waters used for public drinking water supply. The department does not currently have any PFAS data from the process wastewater discharged via outfall 001. However, PFAS-containing substances are manufactured on site by ChemDesign and Tyco and present in the groundwater. Pursuant to s. 283.31(3)(d), Wis. Stats. and 40 CFR 122.4(d), the Department may only issue a WPDES permit if it includes water quality-based effluent limits in a WPDES permit that ensure compliance with the applicable water quality requirements of all affected states. Both the Menominee River and Lake Michigan are interstate waters shared with the state of Michigan. Therefore, PFOA and PFOS limits were evaluated for Outfall 001 to compliance with both the federal regulation and Wisconsin state law.

Michigan's criteria consider PFOS to be a bioaccumulating chemical of concern (BCC, bioaccumulation factor over 1000) but do not consider PFOA to be a BCC. Because of this, no dilution would be allowed for PFOS and limits would be set equal to criteria in accordance with s. NR 106.06(2)(br), Wis. Adm. Code. However, dilution may be allowed for PFOA since this pollutant is not considered a BCC.

No effluent monitoring data is available to estimate the possible concentrations of these pollutants at Outfall 001 but groundwater monitoring data for PFAS has shown that these pollutants are present in the influent to Outfall 003 and may

also be present at Outfall 001 due to groundwater infiltration into the sewer system. Due to the lack of effluent data, known concentrations of PFOS in the groundwater and no dilution with the receiving water, **a PFOS limit of 0.011 µg/L is recommended at Outfall 001 expressed as a monthly average limit.** There was no reasonable potential for PFOA standards to be exceeded due to dilution with the receiving water and known concentrations of PFOA in the groundwater, so limits were not included. Monitoring data from Outfall 001 an Outfall 003 can be used to determine whether a granular activated carbon treatment system will be needed to treat both GWCTS effluent and process wastewater, or just GWCTS effluent. The PFOS limits would be most limiting in driving treatment, so the PFOA limits would not be expected to have any effect on treatment design or effluent quality, if implemented.

The department has included a compliance schedule in the permit to meet the PFOS effluent limit as this is new limit pursuant to s. NR 106.117, Wis. Adm. Code. This schedule will allow time for Outfall 001 to be abandoned and the process wastewater at Sampling Point 101 to be combined at Outfall 004.

Acute Wet Limit: Regulatory changes relating to the acute and chronic WET limit reasonable potential procedures in s. NR 106.08(6)(b), Wis. Adm. Code, became effective on September 1, 2016 in order to more closely reflect federal regulation requirements. The department has determined that due to the available acute WET testing data and requirements specified in s. NR 106.08, Wis. Adm. Code, an acute WET limit is required in the permit and shall be 1.0 TU_a expressed as a daily maximum.

Daily Maximum and Monthly Average Limits: Recent regulatory changes to s. NR 205.065, Wis. Adm. Code, became effective September 1, 2016 that require limits in this permit to be expressed as daily maximum and monthly average limits whenever practicable. These changes are based on 40 CFR Part 122.45(d).

Water quality-based effluent limitations (WQBELs): For more information and explanation about the calculated WQBELs, please see the "Water Quality Based Effluent Limitations Memo" attachments of this fact sheet.

3.2.2 Sampling Point (Outfall) 003 - GWCT System Effluent

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow Rate		MGD	Daily	Continuous	
pH Field	**Daily Max**	**9.0 su**	**Daily**	**Continuous**	
pH Field	**Daily Min**	**6.0 su**	**Daily**	**Continuous**	
Arsenic, Total Recoverable	Daily Max	680 ug/L	Weekly	**24-Hr Flow Prop Comp**	**This is an initial effluent limitation effective until December 31, 2022.**
Arsenic, Total Recoverable	**Daily Max**	**0.23 lbs/day**	**Weekly**	**Calculated**	**This is an initial effluent limitation effective until December 31, 2022.**
Suspended Solids, Total		mg/L	Monthly	**24-Hr Flow Prop Comp**	
Mercury, Total Recoverable	**Daily Max**	**24 ng/L**	Monthly	**24-Hr Flow Prop Comp**	**This is an interim variance limit effective**

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
					until December 31, 2022.
Hardness, Total as CaCO3		**mg/L**	**Monthly**	**24-Hr Flow Prop Comp**	
Chlorine, Total Residual	**Daily Max**	**38 ug/L**	**Monthly**	**Grab**	
Chlorine, Total Residual	**Monthly Avg**	**38 ug/L**	**Monthly**	**Grab**	
PFOA		**ng/L**	**Weekly**	**24-Hr Flow Prop Comp**	
PFOS		**ng/L**	**Weekly**	**24-Hr Flow Prop Comp**	**Final effluent limit is effective on January 1, 2023.**
PFOS		**mg/day**	**Weekly**	**Calculated**	**Final effluent limit is effective on January 1, 2023.**
Acute WET	**Daily Max**	**1.0 TUa**	**See Listed Qtr(s)**	**24-Hr Flow Prop Comp**	

Changes from Previous Permit

The sampling point description has been updated to include the location of the outfall and where to sample the water under Section 3.1.

The pH continuous monitoring requirements have been removed from the previous permit and pH limits of 6.0 to 9.0 s.u. have been added.

The sample type for most parameters have been changed from "24-Hr Comp" to "24-Hr Flow Prop Comp" to show the current effluent sampling type.

The daily maximum total recoverable arsenic loading limit of 12 lbs/day has been changed from the previous permit.

A daily maximum limit for total recoverable mercury of 24 ng/L has been added to the permit.

Daily maximum and monthly average limits for total residual chlorine have been added to the permit.

Monitoring for total hardness has been added to the permit.

Monitoring for PFOA and PFOS has been added to the permit.

A daily maximum acute WET limit of 1.0 TU_a has been added to the permit.

WET Testing sample frequency has been changed to "See Listed Qtr(s)" to be consistent with the quarters listed in the WET Testing subsection of the permit.

ED_014293_00000430-00075

Explanation of Limits and Monitoring Requirements

pH Limits: The pH is limited to the range of 6.0 to 9.0 standard units, with no change greater than 0.5 units outside the estimated natural seasonal maximum and minimum. This is consistent with the water quality standards pH range for waters classified for fish and aquatic life as defined in ch. NR 102.04(4)(c), Wis. Adm. Code.

The department has removed the pH continuous language (i.e. pH excursions and limits of 4 s.u. and 11 s.u.) as these requirements are only applicable to sampling points where categorical pH limits are established pursuant to s. NR 205.06, Wis. Adm. Code. Categorical pH limits are established at Sampling Point 101 not Outfall 003. Therefore, water quality standard pH limits shall apply at Outfall 003.

Total Recoverable Arsenic: Since the discharge from Outfall 003 to the Menominee River is about a mile from Lake Michigan, downstream protection of designated uses and criteria of Lake Michigan must be considered in the calculation of WQBELs. The arsenic criterion in Lake Michigan is 0.2 µg/L and the background arsenic concentrations in the Menominee River (which is arsenic impaired) as well as Lake Michigan exceed this level. The 30-day P_{99} of effluent arsenic data is 852 µg/L at Outfall 003. Because this level exceeds the calculated limit of 0.2 µg/L and there is no assimilative capacity available for arsenic, arsenic limits are required in the reissued permit.

Tyco has applied for an arsenic variance for its discharges. If a variance is approved, initial and interim limits shall be included in the reissued permit pursuant to s. 283.15(5), Wis. Stats. The initial limit shall be set equal to the 1-day P_{99} value and expressed as a daily maximum. Based on arsenic monitoring, an initial limit of 3238 µg/L was calculated at Outfall 003. However, the previous permit included an arsenic limit of 680 µg/L at Outfall 003. Effluent limitations must be at least as stringent as the final effluent limitations in the previous permit pursuant to s. NR 207.12(4), Wis. Adm. Code. Therefore, the initial arsenic limit was set at 680 µg/L as a daily maximum at Outfall 003. This initial variance limit represents the level currently achievable by the permittee at the time of the variance approval in accordance with s. 283.15(5)(c), Wis. Stats. Tyco has indicated in their variance application that a level achievable during the term of the variance would be 500 µg/L. This level was included as the interim variance limit in accordance with s. 283.15(5)(c), Wis. Stats. However, Outfall 003 will be combined with the process wastewater at Sampling Point 101 to form Outfall 004. So, the interim variance limit of 500 µg/L will be applied to Sampling Point 108 to ensure optimal treatment by the GWCTS and thereby ensure achievement of the highest attainable condition as required by federal regulations pertaining to water quality standard variances. The department has included a compliance schedule in the permit to meet the interim variance limit of 500 µg/L. This schedule will allow time for optimization and/or upgrades to the GWCTS and the process wastewater at Sampling Point 101 to be combined with Outfall 003 to form Outfall 004.

The Department has added an initial arsenic mass limit of 0.23 lbs/day based on the daily maximum flow (0.0405 MGD) and concentration limit (680 ug/L) for Outfall 003.

Total Suspended Solids: Most total suspended solids (TSS) consists of inorganic material (such as sediment, silt and clays). Arsenic has known to be found in sediments and soils. Therefore, the permit retains monitoring for TSS to track the removal of these forms of arsenic. Additionally, monitoring for TSS will assist in the optimization and process control at the treatment facility.

Total Recoverable Mercury: During the previous permit term the department requested voluntary total recoverable mercury monitoring only at Outfall 003. A review of the mercury data collected by Tyco indicates the upper 99th percentile of the 30-day average (30-day P_{99}) discharge concentration is 6.0 ng/L for Outfall 003, procedure specified in s. NR 106.05(5)(a), Wis. Adm. Code. This discharge concentration exceeds the Wildlife Criterion of 1.3 ng/L as specified in s. NR 105.07(b), Wis. Adm. Code. Therefore, a mercury alternative effluent limit (AEL) is needed at Outfall 003.

Section NR 106.145(5), Wis. Adm. Code, specifies that a mercury AEL shall equal the 1-day P99 of the effluent data, and shall be expressed as a daily maximum concentration. Therefore, after a review of the mercury data collected by Tyco, the AEL is 24 ng/L as a daily maximum at Outfall 003. However, Outfall 003 will be combined with the process wastewater at Sampling Point 101 to form Outfall 004. Therefore, the AEL of 24 ng/L will serve as an interim AEL in accordance with s. 283.15(5)(c), Wis. Stats. until the mercury AEL is effective for Outfall 004. Once, the mercury AEL is effective at Outfall 004, the interim AEL of 24 ng/L will be applied at Sampling Point 108 to ensure optimal treatment by the

ED_014293_00000430-00076

GWCTS and thereby ensure achievement of the highest attainable condition as required by federal regulations pertaining to water quality standard variances.

Total $CaCO_3$ Hardness: Since effluent hardness affects the toxicity of total recoverable metals, the permit requires total hardness (as CaCO3) monitoring.

Total Residual Chlorine: Tyco adds sodium hypochlorite to oxidize arsenic prior to treatment to reduce fouling through GWCTS. Therefore, the need for WQBELs for chlorine must be evaluated. The facility has the ability to alter or suspend the treatment or pollutant control measures to the degree that there may be continued reasonable potential to exceed the applicable chlorine WQBELs. Therefore, a daily maximum effluent limit of 38 µg/L is needed at Outfall 003 for permit reissuance. Due to revisions to s. NR 106.07(2), Wis. Adm. Code, mass limitations are no longer required. Weekly average limitations are not needed, as the daily maximum limitations will provide adequate protection of the receiving water.

PFOA and PFOS: The Michigan Department of Environment, Great Lakes, and Energy (EGLE) has promulgated Human Non-Cancer Criteria (equivalent to Wisconsin's Human Threshold Criteria) of 0.42 µg/L for Perfluorooctanoic acid (PFOA) and 0.011 µg/L for perfluorooctane sulfonate (PFOS) for surface waters used for public drinking water supply. PFOA and PFOS were detected in the groundwater at monitoring wells located at the Tyco facility site. Pursuant to Wis. Stat s. 283.31(3)(d) and 40 CFR 122.4(d), the Department may only issue a WPDES permit if it includes water quality-based effluent limits in a WPDES permit that ensure compliance with the applicable water quality requirements of all affected states. The Menominee River is an interstate water shared with the state of Michigan. Therefore, PFOA and PFOS limits were evaluated for Outfall 003 to assess compliance with both the federal regulation and Wisconsin state law.

Michigan's criteria consider PFOS to be a bioaccumulating chemical of concern (BCC, bioaccumulation factor over 1000) but do not consider PFOA to be a BCC. Because of this, no dilution with receiving water would be allowed for PFOS and limits would be set equal to criteria in accordance with s. NR 106.06(2)(br), Wis. Adm. Code. However, dilution may be allowed for PFOA since this pollutant is not considered a BCC.

Comparing the detected influent levels of PFOS to the calculated limit shows that there is reasonable potential to exceed this limit, lacking effluent data. Due to the lack of effluent data and due to the fact that the influent data indicates that the discharge poses reasonable potential to cause or contribute to an exceedance of water quality standards, a PFOS limit of 0.011 µg/L is recommended at Outfall 003 expressed as a monthly average limit. There was no reasonable potential for PFOA standards to be exceeded due to dilution with receiving water, so limits were not included. Monitoring data from Outfall 001 and Outfall 003 can be used to determine whether a granular activated carbon treatment system will be needed to treat both GWCTS effluent and process wastewater, or just GWCTS effluent. The PFOS limits would be most limiting in driving treatment, so the PFOA limits would not be expected to have any effect on treatment design or effluent quality, if implemented.

The department has included a compliance schedule in the permit to meet the PFOS effluent limit as this is new limit pursuant to s. NR 106.117, Wis. Adm. Code. This schedule will allow time for Outfall 001 to be abandoned for flow from Sampling Point 101 to be directed to Outfall 004.

Acute Wet Limit: Regulatory changes reflect the acute and chronic WET limit reasonable potential procedures in s. NR 106.08(6)(b), Wis. Adm. Code, which became effective on September 1, 2016 in order to more closely reflect federal regulation requirements. The department has determined that due to the available acute WET testing data and requirements specified in s. NR 106.08, Wis. Adm. Code, an acute WET limit is required in the permit and shall be 1.0 TU_a expressed as a daily maximum.

Daily Maximum and Monthly Average Limits: Recent regulatory changes to s. NR 205.065, Wis. Adm. Code, became effective September 1, 2016 that require limits in this permit to be expressed as daily maximum and monthly average limits whenever practicable. These changes are based on 40 CFR Part 122.45(d).

Water quality-based effluent limitations (WQBELs): For more information and explanation about the calculated WQBELs, please see the "Water Quality Based Effluent Limitations Memo" attachments of this fact sheet.

ED_014293_00000430-00077

3.2.3 Sampling Point (Outfall) 004 – Combined Process WW & GW

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Flow Rate		MGD	Daily	Continuous	
pH Field	Daily Max	9.0 su	Daily	Continuous	
pH Field	Daily Min	6.0 su	Daily	Continuous	
Chlorine, Total Residual	Daily Max	38 ug/L	Monthly	Grab	
Chlorine, Total Residual	Monthly Avg	38 ug/L	Monthly	Grab	
Phosphorus, Total	Rolling 12 Month Avg	1.0 mg/L	1/ 2 Months	24-Hr Flow Prop Comp	
Arsenic, Total Recoverable	Daily Max	194 ug/L	Monthly	24-Hr Flow Prop Comp	This is an interim variance limit.
Arsenic, Total Recoverable	Daily Max	0.22 lbs/day	Monthly	Calculated	This is an interim variance limit.
Mercury, Total Recoverable	Daily Max	18 ng/L	Monthly	Grab	This is an interim variance limit.
Mercury, Total Recoverable		mg/day	Monthly	Calculated	
Cadmium, Total Recoverable	Daily Max	57 ug/L	Monthly	24-Hr Flow Prop Comp	
Cadmium, Total Recoverable	Monthly Avg	57 ug/L	Monthly	24-Hr Flow Prop Comp	
Cadmium, Total Recoverable	Daily Max	0.23 lbs/day	Monthly	Calculated	
Copper, Total Recoverable	Daily Max	69 ug/L	Monthly	24-Hr Flow Prop Comp	
Copper, Total Recoverable	Monthly Avg	69 ug/L	Monthly	24-Hr Flow Prop Comp	

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Copper, Total Recoverable	Daily Max	0.29 lbs/day	Monthly	Calculated	
Nickel, Total Recoverable	Daily Max	2,000 ug/L	Monthly	24-Hr Flow Prop Comp	
Nickel, Total Recoverable	Monthly Avg	2,000 ug/L	Monthly	24-Hr Flow Prop Comp	
Nickel, Total Recoverable	Daily Max	8.1 lbs/day	Monthly	Calculated	
Zinc, Total Recoverable	Daily Max	520 ug/L	Monthly	24-Hr Flow Prop Comp	
Zinc, Total Recoverable	Monthly Avg	520 ug/L	Monthly	24-Hr Flow Prop Comp	
Zinc, Total Recoverable	Daily Max	2.1 lbs/day	Monthly	Calculated	
Cyanide, Amenable	Daily Max	92 ug/L	Monthly	24-Hr Flow Prop Comp	
Cyanide, Amenable	Monthly Avg	92 ug/L	Monthly	24-Hr Flow Prop Comp	
Cyanide, Amenable	Daily Max	0.37 lbs/day	Monthly	Calculated	
Hardness, Total as CaCO3		mg/L	Monthly	24-Hr Flow Prop Comp	
Temperature Maximum		deg F	Weekly	Measure	
PFOA		ng/L	Monthly	24-Hr Flow Prop Comp	
PFOS	Daily Max	11 ng/L	Monthly	24-Hr Flow Prop Comp	
PFOS	Monthly Avg	11 ng/L	Monthly	24-Hr Flow Prop Comp	
PFOS	Monthly Avg	2.1 mg/day	Monthly	Calculated	

ED_014293_00000430-00079

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Acute WET	**Daily Max**	**1.0 TUa**	**See Listed Qtr(s)**	**24-Hr Flow Prop Comp**	

Changes from Previous Permit

This is a new outfall, so all limits are new in this permit reissuance.

Explanation of Limits and Monitoring Requirements

pH Limits: The pH is limited to the range of 6.0 to 9.0 standard units, with no change greater than 0.5 units outside the estimated natural seasonal maximum and minimum. This is consistent with the water quality standards pH range for waters classified for fish and aquatic life as defined in ch. NR 102.04(4)(c), Wis. Adm. Code.

Total Residual Chlorine: The source water at Tyco is mainly from Marinette Waterworks, which adds chlorine to the water supply. Also, Tyco adds sodium hypochlorite to oxidize arsenic prior to treatment to reduce fouling through GWCTS. Therefore, the need for WQBELs for chlorine must be evaluated. Available data/information indicates the discharge contains concentrations of chlorine above the applicable WQBELs. Therefore, a daily maximum effluent limit of 38 µg/L is needed at Outfall 004. Weekly average limitations are not needed, as the daily maximum limitations will provide adequate protection of the resource.

Total Phosphorus: Chapters NR 102 and NR 217, Wis. Adm. Code, include phosphorus criteria and related procedures for calculating WQBELs for discharges of phosphorus to surface waters of the state from publicly and privately-owned wastewater facilities. WQBELs for phosphorus are needed whenever the discharge contains phosphorus at concentrations or loadings that will cause or contribute to an exceedance of the water quality standards. The Department has determined that a WQBEL is not necessary at this time.

Chapter NR 217, Wis. Adm. Code, addresses point source dischargers of phosphorus to surface waters. The code categorically limits industrial dischargers to 1.0 mg/L as a rolling 12-month average if the discharge from all outfalls contains a cumulative total of more than 60 pounds of total phosphorus per month unless an alternative limit is approved. Since Tyco had an existing TBEL of 1.0 mg/L at Outfall 001, this limit is included at Outfall 004.

Total Recoverable Arsenic: Since the discharge from Outfall 004 to the Menominee River is about a mile from Lake Michigan, downstream protection of designated uses and criteria of Lake Michigan must be considered in the calculation of WQBELs. The arsenic criteria in Lake Michigan is 0.2 µg/L and the background arsenic concentrations in the Menominee River (which is arsenic impaired) as well as Lake Michigan exceeds this level. The 30-day P_{99} of effluent arsenic data is 852 µg/L at Outfall 003 (Sampling Point 108) and average concentration of 3 µg/L at Sampling Point 101 (based on 14 samples). Because these levels exceed the calculated limit of 0.2 µg/L and there is no assimilative capacity available for arsenic, arsenic limits are required in the reissued permit.

Tyco has applied for an arsenic variance for these discharges. If a variance is approved, interim limit will be included in the reissued permit pursuant to s. 283.15(5), Wis. Stats. The interim limit shall be set equal to the 1-day P_{99} value and expressed as a daily maximum. However, since there is no arsenic data available for Outfall 004, a predicted daily maximum value for Outfall 004 was calculated using a mass balance with maximum annual average flows and maximum expected discharge concentrations from Outfall 003 (Sampling Point 108) and Sampling Point 101 to calculate an appropriate interim limit. The mass balance resulted in an interim limit of 194 µg/L for arsenic at Outfall 004.

ED_014293_00000430-00080

In the absence of a variance, the final arsenic limit of 0.2 µg/L as a monthly average would apply. This limit would be accompanied by a corresponding arsenic mass limit and a daily maximum limit in order to meet expression of limits requirements.

The Department has added an interim arsenic mass limit based of 0.22 lbs/day based on the combined loading from Sampling Points 101 and 108. For Sampling Point 101, the department used the daily maximum flow (0.448 MGD) and estimated maximum concentration (15 ug/L). For Sampling Point 108, the department, the daily maximum flow (0.0405 MGD) and interim concentration limit (500 ug/L).

Total Recoverable Mercury: A review of the mercury data collected by Tyco indicates the upper 99th percentile of the 30-day average (30-day P_{99}) discharge concentration is 6.0 ng/L for Outfall 003 (Sampling Point 108) and 1.7 ng/L for Sampling Point 101, procedure specified in s. NR 106.05(5)(a), Wis. Adm. Code. This discharge concentration exceeds the Wildlife Criterion of 1.3 ng/L as specified in s. NR 105.07(b), Wis. Adm. Code. Therefore, a mercury AEL is needed at Outfall 004.

Section NR 106.145(5), Wis. Adm. Code, specifies that a mercury AEL shall equal the 1-day average (1-day P99) of the effluent data, and shall be expressed as a daily maximum concentration. However, since there is no mercury data available for Outfall 004, a predicted daily maximum value for Outfall 004 was calculated using a mass balance with maximum annual average flows and maximum expected discharge concentrations from Outfall 003 (Sampling Point 108) and Sampling Point 101 to calculate an appropriate AEL. The mass balance resulted in an AEL of 18 µg/L for mercury at Outfall 004.

In the absence of a variance, the final mercury limit of 1.3 ng/L as a monthly average would apply. This limit would be accompanied by a corresponding mercury mass limit and a daily maximum limit in order to meet expression of limits requirements.

Other Total Recoverable Metals and Amenable Cyanide: The need for limits for toxic substances at Outfall 004 also needs to be assessed based on the categorical limits that apply to the treated metal finishing effluent wastewater from Sampling Point 101. Section NR 106.04(1), Wis. Adm. Code, states that water quality–based effluent limitations (WQBELs) shall be required in the permit whenever the categorical effluent limits required are less stringent than necessary to achieve applicable water quality standards specified in chs. NR 102 to NR 105, Wis. Adm. Code.

To evaluate this, the applicable categorical limits for Sampling Point 101 are multiplied by the percentage of Outfall 004 flow which is made up of Sampling Point 101 flow to determine the highest effluent concentration that the categorical limit would allow at Outfall 004. This maximum allowed concentration is compared to the calculated WQBELs to determine the need for a limit at Outfall 004. Based on this comparison, daily maximum limits are needed at Outfall 004 for cadmium, copper, nickel, zinc, and cyanide with respective daily maximum mass limits.

Total $CaCO_3$ Hardness: Since effluent hardness affects the toxicity of total recoverable cadmium, copper, and zinc in the effluent, total hardness (as CaCO3) will be monitored at the same frequency as total recoverable metals and analyzed in the same sample on the same day in the permit.

Temperature Maximum: The Department has added temperature maximum monitoring to evaluate if water quality-based effluent temperature limits are needed with the next reissuance.

Acute Wet Limit: Regulatory changes reflect the acute and chronic WET limit reasonable potential procedures in s. NR 106.08(6)(b), Wis. Adm. Code, which became effective on September 1, 2016 in order to more closely reflect federal regulation requirements. The department has determined that due to the available acute WET testing data and requirements specified in s. NR 106.08, Wis. Adm. Code, an acute WET limit is required in the permit and shall be 1.0 TU_a expressed as a daily maximum.

Daily Maximum and Monthly Average Limits: Recent regulatory changes to s. NR 205.065, Wis. Adm. Code, became effective September 1, 2016 that require limits in this permit to be expressed as daily maximum and monthly average limits whenever practicable. These changes are based on 40 CFR Part 122.45(d).

Water quality-based effluent limitations (WQBELs): For more information and explanation about the calculated WQBELs, please see the "Water Quality Based Effluent Limitations Memo" attachments of this fact sheet.

3.3 Total Hardness Sampling

Total hardness analysis shall be performed on the same sample as total recoverable cadmium, total recoverable copper, total recoverable nickel, and total recoverable zinc. Since effluent hardness affects the toxicity of total recoverable cadmium, copper, and zinc in the effluent, total hardness (as CaCO3) will be monitored at the same frequency as total recoverable metals and analyzed in the same sample on the same day in the permit.

3.4 Total Metals Analyses

Measurements of total metals and total recoverable metals shall be considered as equivalent.

3.5 Effluent Maximum Temperature Monitoring

For manually measuring effluent temperature, grab samples should be collected at 6 evenly spaced intervals during the 24-hour period. Alternative sampling intervals may be approved if the permittee can show that the maximum effluent temperature is captured during the sampling interval. Report the maximum temperature measured during the day on the eDMR. For more information see the Standard Requirements section in this permit.

3.6 Whole Effluent Toxicity (WET) Testing

Recent regulatory changes have required the department to align their WET testing procedures with federal regulations. Therefore, the WET testing language has been modified to reflect these changes in the permit. The modification includes a requirement for continued WET testing after permit expiration (until the permit is reissued), the TUa and TU_c calculations have been revised, and requirements on when WET testing shall be performed.

3.7 Water Treatment Additives

Permittees shall not add any substance or water treatment additive to the discharge unless the use of the water treatment additive is reviewed and approved, in writing, by the department. Examples of water treatment additives are biocides (e.g. algaecides, microbicides, fungicides, and molluscicides), water quality conditioners (e.g. scale and corrosion inhibitors, pH adjustment chemicals, oxygen scavengers, conditioning agents, and water softening compounds), erosion control products, and clarifying agents.

On October 1, 2019, the department revised guidance entitled "Water Quality Review Procedures for Additives" (3400-3800-201-01), which is available at http://dnr.wi.gov/topic/wastewater/Guidance.html. This guidance supports the authority of s. 283.31(3)(d)1. and ss. 105.02(3), NR 105.05, and NR 106.05(1)(b), Wis. Adm. Code, to protect Wisconsin's surface water resources from such products. This guidance document establishes procedures to calculate secondary acute and chronic values for water-applied or land-applied additives pursuant to ss. NR 105.05 and 105.06, Wis. Adm. Code. Secondary acute values are the concentrations of a pollutant in surface water that protect aquatic life from adverse short-term effects. Therefore, facilities shall submit information regarding the toxicity of any added substances or additives to the discharge as specified in the permit, so the department can determine if they are allowable and will not negatively impact aquatic life or human health. The department shall also be informed of significant changes in additive usage or new additives that would raise the potential for negative impacts on aquatic life or human health.

For each water treatment additive used, the permittee shall submit a copy of the Additive Review Worksheet (Form 3400-213) to the department. Upon approval, the permittee shall comply with the conditions specified in the approval. An additive review is not required for additives with active ingredients consisting of chlorine, hypochlorite, sulfuric acid, hydrochloric acid or sodium hydroxide. Also, chemicals used in an industrial process generating wastewater that eventually receives treatment or chemicals added as part of wastewater treatment process (such as ferric chloride, alum or pickle liquor) are not considered water treatment additives and do not require an additive review.

Facilities are required to maintain records of additive use for department inspection. Recording additive use will provide documentation for the facility and the department to verify that the additive is being used and discharged in accordance with the permit requirements. For more information on the water treatment additive review process, see the additives webpage found here: https://dnr.wi.gov/topic/wastewater/additives.html.

ED_014293_00000430-00082

3.8 Mercury Variance – Implement Pollutant Minimization Program Plan

In accordance with s. NR 106.145(7), Wis. Adm. Code, the permittee is required to implement a pollutant minimization program as defined in s. NR 106.04(5), Wis. Adm. Code if the department grants an alternative mercury effluent limitation under s. 283.15, Wis. Stats.

3.9 Arsenic Variance – Implement Pollutant Minimization Program Plan

In accordance with s. 283.15(5)(c)2., Wis. Stats., the permittee is required to implement a pollutant minimization program as defined in s. NR 106.04(5), Wis. Adm. Code if the department grants initial and interim arsenic effluent limitations under s. 283.15, Wis. Stats.

ED_014293_00000430-00083

4 Land Application Requirements

4.1 Sampling Point(s)

The discharge(s) shall be limited to land application of the waste type(s) designated for the listed sampling point(s) on Department approved land spreading sites or by hauling to another facility.

Sampling Point Designation	
Sampling Point Number	**Sampling Point Location, WasteType/Sample Contents and Treatment Description (as applicable)**
005	**At Sampling Point 005, the permittee shall track the final disposal of cake sludge associated with the metal finishing process wastewater treatment system.**
006	**At Sampling Point 006, the permittee shall track the final disposal of cake sludge associated with the zinc bond treatment system.**
007	**At Sampling Point 007, the permittee shall track the final disposal of VSEP and/or RO reject water associated with the groundwater collection and treatment system (GWCTS).**
008	**At Sampling Point 008, the permittee shall track the final disposal of cake sludge associated with the groundwater collection and treatment system (GWCTS).**

4.2 Monitoring Requirements and Limitations

The permittee shall comply with the following monitoring requirements and limitations.

4.2.1 Sampling Point (Outfall) 005 – Metal Finishing Cake Sludge; 006 – Zinc Bond Sludge; 007 – VSEP/RO Reject; and 008 – GWCTS Sludge

Changes from Previous Permit

These are new outfalls, so all requirements are new in this permit reissuance.

Explanation of Limits and Monitoring Requirements

Landspreading or Discharge to Manure Pit(s) Approval: In order to obtain permit authorization for storage in manure storage structure(s) or landspreading any of the wastes associated with Outfalls 005, 006, 007, or 008, the permittee would need to demonstrate that these wastes have no detrimental effects on the soils, vegetation, or groundwater of a landspreading system and has beneficial properties as a soil condition or fertilizer. To date, this demonstration has not been made. To obtain this authorization, the permittee would also need to request a permit modification to include landspreading limits and monitoring requirements based on ch. NR 214, Wis. Adm. Code.

ED_014293_00000430-00084

4.3 Reporting and Recordkeeping Requirements

4.3.1 Annual Land Application Report

Permittees are required to submit electronically an Annual Land Application Report Form 3400-55 by January 31st, each year whether or not waste is land applied in accordance with s. NR 214.18(5)(c), Wis. Adm. Code.

4.3.2 Other Methods of Disposal or Distribution Report

Permittees are required to submit electronically the Other Methods of Disposal or Distribution Report Form 3400-52 by January 31, each year whether or not waste is hauled to another facility, landfilled, or incinerated in accordance with ch. NR 214, Wis. Adm. Code.

4.3.3 Daily Disposal Log

The permittee shall maintain a daily disposal log of all waste(s) hauled to another facility, landfill, or incinerator for disposal. This daily disposal log will ensure that the permittee is accurately reporting the total annual amounts on the Form 3400-052 (Other Methods of Disposal or Distribution Report).

ED_014293_00000430-00085

5 Compliance Schedules

5.1 Mercury Pollutant Minimization Program

Explanation of Compliance Schedule

The permit contains mercury variance limits at Outfall 003 and Outfall 004. To receive and retain variance limits for mercury, the permittee must implement a pollutant minimization program (PMP) plan and make annual reports on the progress of implementing the plan pursuant to s. NR 106.145(7)(g), Wis. Adm. Code. The Schedules section of the permit specifies the due dates for the annual PMP progress reports and the submittal of the new PMP for the next reissuance.

5.2 Arsenic Pollutant Minimization Program

Explanation of Compliance Schedule

The permit contains arsenic variance limits at Outfall 003 and Outfall 004. To receive and retain variance limits for arsenic, the permittee must implement a pollutant minimization program (PMP) plan and make annual reports on the progress of implementing the plan pursuant to s. 283.15(5), Wis. Stats. The Schedules section of the permit specifies the due dates for the annual PMP progress reports and the submittal of the new PMP for the next reissuance.

5.3 Arsenic Interim Limits at SP 108 and Outfall 004

Explanation of Compliance Schedule

This permit includes a compliance schedule to allow a reasonable opportunity for the permittee to attain compliance with the specified arsenic interim variance limits for future in-plant sampling point 108 (previously Outfall 003) and Outfall 004 in accordance with s. NR 106.117, Wis. Adm. Code, by the due dates specified in the permit.

5.4 Total Toxic Organics Management Plan

Explanation of Schedule

A toxic organics management plan is required in accordance with s. NR 261.13(1), Wis. Adm. Code. For each permit reissuance, the permittee is required to update their toxic organic management plan to demonstrate compliance with the conditions in the reissued permit and ch. NR 261, Wis. Adm. Code. The amended management plan shall be submitted to the department for approval by the due date in the permit.

5.5 PFOS Limits

Explanation of Compliance Schedule

This permit includes a compliance schedule to allow a reasonable opportunity for the permittee to attain compliance with the specified PFOS effluent limits for proposed Outfall 004 in accordance with s. NR 106.117, Wis. Adm. Code, by the due dates specified in the permit. This schedule will allow Tyco time to collect data to inform design of treatment technology since the department does not have data for PFOS, time for Tyco to design the treatment system, time for the department to review the system, time for Tyco to bid/prepare for construction, and time for Tyco to install and initiate the treatment system.

ED_014293_00000430-00086

5.6 Arsenic Limit at Outfall 001

Explanation of Compliance Schedule

This permit includes a compliance schedule to allow a reasonable opportunity for the permittee to attain compliance with the specified arsenic effluent limits for Outfall 001 in accordance with s. NR 106.117, Wis. Adm. Code, by the due dates specified in the permit.

5.7 Mercury Limit at Outfall 001

Explanation of Compliance Schedule

This permit includes a compliance schedule to allow a reasonable opportunity for the permittee to attain compliance with the specified mercury effluent limits for Outfall 001 in accordance with s. NR 106.117, Wis. Adm. Code, by the due dates specified in the permit.

5.8 Permit Application Submittal

Explanation of Schedule

The permittee shall file an application for permit reissuance in accordance with NR 200, Wis. Adm. Code. This Section serves as a reminder of the reissuance permit application due date.

ED_014293_00000430-00087

6 Standard Requirements

Changes from Previous Permit

Both the current permit and permit provide a Standard Requirements (SR) section that contains conditions and requirements that are, for the most part, applicable to all industrial permittees. Changes to the standard requirements section include:

- SR 6.1.1: The reporting requirement for monitoring results now requires the submittal of electronic discharge monitoring reports and report certifications. Paper forms are no longer required or accepted pursuant to s. NR 205.07 (1)(r), Wis. Adm. Code.
- SR 6.1.7: In an effort to align state rules with federal regulations, reporting requirements for alterations and additions pursuant to s. NR 205.07(1)(q), Wis. Adm. Code, are included in the permit.
- SR 6.1.8: Mercury sampling and monitoring requirements are based on mercury data quality requirements as specified in ss. NR 106.145(9) and (10), Wis. Adm. Code.
- SR 6.2.1: Approved scheduled bypasses are excluded from the noncompliance reporting requirement. A note on contact information for hazardous spills has been added.
- SR 6.2.2, 6.2.3 and 6.2.4: Bypass, schedule bypass and controlled diversions requirements have been rewritten to make them consistent with recent changes to ss. NR 205.07(1)(u) and (v), Wis. Adm. Code.
- SR 6.2.6: Operator certification requirements have been added to the permit. All wastewater treatment plants are required to be under the direct supervision of a state certified operator in accordance with ss. NR 108.06(2) and 205.07(1)(j), Wis. Adm. Code.
- Section on Flow Augmentation Prohibited has been removed as it is included under Section 2 for Sampling Point 101.
- SR 6.3.2: Methods for calculating 6-month average and annual average, total monthly and total annual discharge mass loadings are provided.
- SR 6.3.3: Standard requirements are added for temperature monitoring including weekly average maximum temperature calculation method, cold shock and rate of temperature change conditions pursuant to ss. NR 106.54(2) and NR 106.56(10) and (11), Wis. Adm. Code.
- SR 6.3.5: In response to EPA direction, general surface water narrative criteria pursuant to s. NR 102.04(1), Wis. Adm. Code, are included in the permit. These criteria address objectionable deposits, floating or submerged debris, oil and scum, materials producing color, odor or unsightliness, and substances in amounts found to be of public health significance or acutely harmful to animal plant or aquatic life. These criteria are applicable to all surface waters including mixing zones.
- SR 6.3.8 and 6.3.9: WET language has been altered due to recent Department rule changes that became effective on September 1, 2016.
- SR 6.3.10: Since Tyco will have variances to water quality standards, a reopener clause has been added to the permit pursuant to s. 283.11(15), Wis. Stats. and 40 CFR 131.20.

7 Summary of Reports Due

A summary of reports due has been added for informational purposes for the permittee to keep track of the due dates of reports and schedule items.

ED_014293_00000430-00088

Attachments:

Monitoring Frequency Reduction Evaluation

Water Quality Based Effluent Limitations Memo

Substantial Compliance Determination and Wastewater Facility Inspection Report Dated 12/04/2019

Water Flow Diagram(s)

Wastewater Treatment System Flow Diagram(s)

Prepared By:

Trevor Moen
Wastewater Engineer
Bureau of Water Quality

Date: 11/11/2020

ED_014293_00000430-00089

Monitoring Frequency Reduction Evaluation

The department shall determine on a case–by–case basis the monitoring frequency to be required for each effluent limitation in a permit pursuant s. NR 205.066(1), Wis. Adm. Code. To support s. NR 205.066(1), Wis. Adm. Code, the department used criteria for this monitoring frequency reduction evaluation from EPA's April 1996 guidance, "Interim Guidance for Performance-based Reduction of NPDES Permit Monitoring Frequencies".

Timing of Decision:

Monitoring reductions may be considered when a permit is reissued. A permit reissuance is currently being drafted, and any change in monitoring requirements can be accommodated with the permit reissuance.

EPA Guidance

EPA's guidance is applicable only to those parameters with monthly average effluent limits. For the purpose of applying EPA guidance, categorical based effluent limitations at Sampling Point 101 and total phosphorus at Outfall 001 are considered to be a monthly average limit. However, the EPA guidance does say that the use of daily maximum values could be considered on a case-by-case basis until specific methodology is developed for daily maximum permit values. Therefore, a similar process was applied to the daily maximum limits. The most current discharge data available to the department at the time of this analysis was used in the review. It consists of monthly discharge monitoring reports (DMRs) submitted by Tyco for the period of January 2013 through January 2018.

Facility Enforcement History:

Criminal Actions (all environmental statutes):

- Tyco was not criminally convicted under Federal or State environmental statutes of falsifying monitoring data or committing violations that presented an imminent and substantial endangerment of public health or welfare.
- Tyco was not convicted of any other criminal violation under any Federal or State environmental statute.
- No individual, while employed by Tyco, was convicted of a criminal violation under any Federal or State environmental law.

Civil Judicial Actions (Clean Water Act/WPDES related):

- No civil judicial action with respect to the Clean Water Act and Tyco's current WPDES permit occurred in the last year.

Administrative Actions (Clean Water Act/WPDES related):

- No Administrative Penalty Order (APO) or Administrative Order (AO) is currently in effect or will be in effect when the Tyco's permit is reissued.

Parameter-by-Parameter Compliance History:

Significant Noncompliance for parameters under Consideration

- Tyco has not had any Significant Noncompliance (SNC) for the parameter for which monitoring/reporting reductions are being considered during the last two years.

Any Effluent Violations of Selected Parameters

- Tyco has not had any effluent violations of selected (critical) parameters during the last year. These selected parameters include pollutants which pose heightened risks to human or environmental health, such as mercury and ammonia.

Residency Criteria for Continued Participation:

EPA's guidance specifies that to remain eligible for monitoring frequency reductions, the permittee:

- Must not have any significant noncompliance violations of effluent limitations for the parameters for which reductions have been granted;
- Must not fail to submit discharge monitoring reports; and
- Must not be subject to a new, formal enforcement action.

Relative Monitoring Frequencies:

The department's guidance suggests that parameters with shorter-term permit limits (i.e. weekly) should be monitored more frequently than those parameters with longer permit limits (i.e. monthly). In no case shall monitoring be reduced below once per week where there are weekly permit limits.

Ease of Performing the Test:

There is no reason to believe that the wastewater treatment system at Tyco will be inadequately staffed or improperly operated and maintained should the monitoring frequencies be reduced.

- **Special Considerations:** Only those special considerations from EPA's guidance that are applicable to Tyco's discharge are listed below.
- **Discontinuous Data:** Tyco continuously reported its effluent data during the period of January 2013 through March 2018. Tyco's wastewater discharge is neither intermittent nor short-term.
- **Independent/Dependent Control Parameters:** The department has determined that all effluent parameters considered are independently controlled by Tyco.
- **Exceptions:** Tyco's discharge does not appear to be particularly dangerous from the standpoint of protecting human health, endangered species or a sensitive aquatic environment.
- **Use of Daily Maximum Values:** Tyco has not violated daily maximum permit limitations of any considered effluent parameters in the past two years. Therefore, the department has considered the use of daily maximum values when considering monitoring/reporting reductions for the permit.

Parameter-by-Parameter Performance History:

Table 1. Reduced Monitoring for Applicable Monthly Average Parameters Following EPA Guidance

Parameter	**Maximum Monthly Average** (mg/L)	**Discharge Long-Term Monthly Average*** (mg/L)	**Monthly Average Effluent Limit** (mg/L)	**Ratio of Long-Term Average to Monthly Average Limit** (%)	**EPA Guidance Table 1 Recommended Monitoring Frequency**
Oil and Grease	4.4	<1.7	26	6.5	Once per Month
Total Recoverable Cadmium	0.0011	<0.00037	0.26	0.14	Once per Month
Total Recoverable Chromium	0.017	<0.0021	1.71	0.12	Once per Six Months
Total Recoverable Copper	0.046	<0.018	2.07	0.89	Once per Month

Parameter	Maximum Monthly Average (mg/L)	Discharge Long-Term Monthly Average* (mg/L)	Monthly Average Effluent Limit (mg/L)	Ratio of Long-Term Average to Monthly Average Limit (%)	EPA Guidance Table 1 Recommended Monitoring Frequency
Total Recoverable Lead	0.015	<0.0024	0.43	0.56	Once per Six Months
Total Recoverable Nickel	0.125	<0.036	2.38	1.51	Once per Month
Total Recoverable Silver	0.012	<0.0010	0.24	0.44	Once per Six Months
Total Recoverable Zinc	1.2	<0.148	1.48	10	Once per Month
Total Cyanide	0.22	<0.025	0.65	3.8	Once per Six Months
Total Suspended Solids	23	9.6	31	31	Thrice per Week
Total Phosphorus	0.65	0.26	1.72**	15	Once per two Months

*Results reported less than the limit of detection were used to calculate the discharge long-term monthly average and are denoted with a "<" symbol.

**This is a monthly average equivalent limit determined from the using the 12-month rolling average limit and procedures in Department's February 8, 2017 guidance entitled "Guidance for Implementing Wisconsin's Phosphorus Water Quality Standards for Point Source Discharges".

Variability of the Treatment Process:

The variability of the treatment process was not considered as the ratios of long-term effluent average to monthly average limit for all parameters were 75% or less. EPA guidance suggests that the variability of the data should be considered when the ratio the ratio of long-term effluent average to monthly average limit is 76% or greater. Then the parameter must demonstrate a coefficient of variation (ration of standard deviation to average) of 20% or less.

Conclusion:

The monitoring frequency reductions using EPA guidance are stated in Table 1. These monitoring frequencies will allow the permittee flexibility in sampling, but also continue to assure the department that effluent limitation exceedances will not occur. Daily maximum monitoring will have the same monitoring frequency as the monthly average.

Continued Eligibility for Reduced Monitoring Frequencies:

Tyco is expected to maintain the performance levels that were used as the basis for granting monitoring reductions. To remain eligible for these reductions, Tyco may not have any SNC violations for effluent limitations of the parameters for which reductions have been granted or failure to submit DMRs or may not be subject to a new formal enforcement action. The department may modify this permit without public notice to increase the monitoring frequency up to daily for any reduced parameter.

CORRESPONDENCE/MEMORANDUM

State of Wisconsin

DATE: July 17, 2020

TO: Trevor Moen – WY/3

FROM: Wade Strickland – WY/3

SUBJECT: Updated Water Quality-Based Effluent Limitations for Tyco Fire Protection Products LP WPDES Permit No. WI-0001040-08-0

This is in response to your request for an evaluation of the need for water quality-based effluent limitations using Chapters NR 102, 104, 105, 106, 207, 210 and 217 of the Wisconsin Administrative Code (where applicable), for the discharges from the Tyco Fire Protection Products LP facility located at One Stanton Street, Marinette, Wisconsin in Marinette County. This industrial facility discharges to the Menominee River, located in the Wausaukee and Lower Menominee Rivers Watershed in the Menominee River Basin.

Water quality-based effluent limits for the 8th reissuance of the WPDES permit for Tyco have previously been calculated in several memos. The evaluations and conclusions in this memo supersede those outlined in the:

- May 3, 2018 Memo: *Updated Water Quality-Based Effluent Limitations for Tyco Fire Protection Products LP WPDES Permit No. WI-0001040-08-0*
- July 30, 2018 Memo: *Updated Arsenic, PFASs, and Chlorine Recommendations for Tyco Fire Protection Products LP, WPDES Permit No. WI-0001040-08-0*
- March 18, 2019 Memo: *Addendum to the Arsenic, PFASs, and Mercury Recommendations for Tyco Fire Protection Products LP, WPDES Permit No. WI-0001040-08-0*
- April 17, 2020: *Updated Water Quality-Based Effluent Limitations for Tyco Fire Protection Products LP WPDES Permit No. WI-0001040-08-0*

The evaluation of the permit recommendations is discussed in more detail in the attached report. Based on our review, the following recommendations are made on a chemical-specific basis:

Outfall 001

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	12-Month Rolling Avg.	Footnotes
Phosphorus					1.0 mg/L	
pH	9.0 s.u.	6.0 s.u.				1
Arsenic Interim Final	170 µg/L			 0.2 µg/L		2
Chlorine	38 µg/L			**38 µg/L**		3
Cadmium	57 µg/L 0.27 lbs/day			**57 µg/L**		3, 4
Copper	69 µg/L 0.98 lbs/day			**72 µg/L**		3, 4
Cyanide	92 µg/L 0.44 lbs/day			**92 µg/L**		3, 4

Printed on Recycled Paper

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	12-Month Rolling Avg.	Footnotes
Mercury Interim Final	29 ng/L			1.3 ng/L		2
Hardness						5
PFOA						5
PFOS	**11 ng/L**			11 ng/L 6.9 mg/day		3
Temperature						5
Acute WET	1.0 TU_a					

Outfall 003

Parameter	Daily Maximum	Daily Minimum	Monthly Average	12-Month Rolling Avg.	Footnotes
pH	9.0 s.u.	6.0 s.u.			1
Arsenic Initial Interim Final	680 µg/L 500 ug/L		0.2 µg/L		6
Mercury Initial Final	24 ng/L		1.3 ng/L		7
Total Suspended Solids					5
Hardness					5
Chlorine	38 µg/L		**38 µg/L**		3
PFOA					5
PFOS	**11 ng/L**		11 ng/L 0.00079 g/day		2
Acute WET	1.0 TU_a				

Footnotes:

1. Effluent pH may exceed this range within 4.0 to 11 s.u. following the conditions in the current permit. No changes are recommended to these limits or permit conditions.
2. The permit will include a compliance schedule for abandoning Outfall 001. The listed interim limits apply until Outfall 001 is abandoned.
3. Additional limits to comply with s. NR 106.07 are included in bold.
4. Effluent data does not show reasonable potential to exceed these limits. These limits are required because the categorical limits for these substances at SP 101 would allow water quality criteria to be exceeded.
5. Monitoring only.
6. Tyco has applied for an arsenic variance. The listed daily maximum limits may be included in the permit in place of the final water quality-based effluent limit if the arsenic variance application that was submitted is approved by EPA.

7. The alternative effluent limitation of 24 ng/L at Outfall 003 may only be included in the reissued permit in place of the water quality-based effluent limit if the mercury variance application that was submitted is approved by EPA.

Along with the chemical-specific recommendations mentioned above, the need for acute and chronic whole effluent toxicity (WET) monitoring and limits has also been evaluated for the discharge from Tyco. Following the guidance provided in the Department's November 1, 2016 *Whole Effluent Toxicity Program Guidance Document - Revision #12*, **2x annual acute WET testing is recommended at Outfall 001 and annual acute WET testing is recommended at Outfall 003** in the reissued permit. Tests should be done in rotating quarters, in order to collect seasonal information about this discharge.

According to the requirements specified in s. NR 106.08, Wis. Adm. Code, an acute WET limit is required at both Outfalls 001 and 003. The acute WET limit should be expressed as **1.0 TUa as a daily maximum** in the effluent limits table of the permit.

Sampling WET concurrently with any chemical-specific toxic substances is recommended. The primary control and dilution water used in WET tests conducted on Outfalls 001 and 003 should be a synthetic (standard) laboratory water. The primary control water must be specified in the WPDES permit.

Planned Facility Changes:
The treated metal finishing process wastewater at Sampling Point 101 (SP 101) will be combined with Outfall 003 prior to discharge. The combined discharge will be referred to as Outfall 004 in the reissued permit. Outfall 001 will be decommissioned and the waste streams other than SP 101 will be rerouted. The stormwater from Outfall 001 will be transferred overland and covered under the facility's stormwater permit. The noncontact cooling water and boiler blowdown from the site will be discharged to the sanitary sewer.

The following set of limits are recommended following facility changes and combination of SP 101 and Outfall 003 (Future Sampling Point 108) into Outfall 004. See the attached report for more detail.

Outfall 004

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	12-Month Rolling Avg.	Footnotes
Phosphorus					1.0 mg/L	
pH	9.0 s.u.	6.0 s.u.				
Arsenic Initial Final	194 µg/L			0.2 µg/L		2
Chlorine	38 µg/L			**38 µg/L**		3
Cadmium	57 µg/L 0.23 lbs/day			**57 µg/L**		3, 4
Copper	69 µg/L 0.28 lbs/day			**72 µg/L**		3, 4
Nickel	2000 ug/L 8.1 lbs/day			**2000 ug/L**		3, 4
Zinc	520 ug/L 2.1 lbs/day			**520 ug/L**		3, 4
Cyanide	92 µg/L			**92 µg/L**		3, 4

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	12-Month Rolling Avg.	Footnotes
	0.37 lbs/day					
Mercury AEL Final	18 ng/L			1.3 ng/L		5
Hardness						6
PFOA						6
PFOS	**11 ng/L**			11 ng/L 0.0021 g/day		2
Temperature						6
Acute WET	1.0 TU_a					

Internal Sampling Point 108 (former Outfall 003 discharge)

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	12-Month Rolling Avg.	Footnotes
Arsenic Interim Final	500 µg/L			0.2 µg/L		2
Mercury Interim Final	24 ng/L			1.3 ng/L		5
Total Suspended Solids						6

1. Effluent pH may exceed this range within 4.0 to 11 s.u. following the conditions in the current permit. No changes are recommended to these limits or permit conditions.
2. Interim limits may be included in the permit in place of the final water quality-based effluent limit if the arsenic variance application that was submitted is approved by EPA.
3. Additional limits to comply with s. NR 106.07 are included in bold.
4. Effluent data does not show reasonable potential to exceed these limits. These limits are required because the categorical limits for these substances at SP 101 would allow water quality criteria to be exceeded.
5. The alternative effluent limitations of 18 ng/L at Outfall 004 and 24 ng/L at an internal sample point for Outfall 003 may only be included in the reissued permit in place of the water quality-based effluent limit if the mercury variance application that was submitted is approved by EPA.
6. Monitoring only.

For Outfall 004, 2x annual acute WET testing (continued from the Outfall 001 recommendations) is recommended.

Please consult the attached report for details regarding the above recommendations. If there are any questions or comments, please contact Rachel Fritz at (608) 267-7657 (Rachel.Fritz@wisconsin.gov) or Diane Figiel at (608) 264-6274 (Diane.Figiel@wisconsin.gov).

Attachments (2): Narrative and Site Map

PREPARED BY:

Rachel Fritz Date: 07/17/2020

Rachel Fritz, Water Resources Engineer

E-cc: Laura Gerold, Wastewater Engineer – NER/Green Bay
Jason Knutson, Wastewater Section Chief – WY/3
Kari Fleming, Environmental Toxicologist – WY/3

Attachment #1

Water Quality-Based Effluent Limitations for Tyco Fire Products LP

WPDES Permit No. WI-0001040-08-0

Prepared by: Rachel Fritz

PART 1 – BACKGROUND INFORMATION

Facility Description:
Tyco Fire Products LP (formerly known as Ansul Fire Protection, Tyco Fire Suppression & BP-Ansul, LLC, and Tyco Fire Protection Products LP) manufactures fire extinguishers and fire-fighting agents. Metal finishing process wastewater is treated by chemical precipitation system (a new treatment system as of June 2013). The treated wastewater is monitored at internal Sampling Point 101 (SP 101) before combining with noncontact cooling water, boiler blowdown, roof drain runoff, and groundwater that has infiltrated into the industrial sewer. These combined waste streams are discharged to the Menominee River through Outfall 001.

Tyco is also conducting an arsenic groundwater remediation project on-site. The current permit includes Outfall 003 for the discharge of remedial action wastewater from this operation. This outfall began discharge in 2010, and prior to this permit reissuance, no effluent data was available for the characterization of this discharge.

The facility has planned several changes for the upcoming permit term:

- A new treatment system will be installed for the groundwater remediation discharge at Outfall 003 including granular activated carbon treatment.
- The treated metal finishing process wastewater (SP 101) will be combined with Outfall 003 prior to discharge. The combined discharge will be referred to as Outfall 004 in the reissued permit.
- Outfall 001 will be decommissioned and the waste streams other than SP 101 will be rerouted. The stormwater from Outfall 001 will be transferred overland and covered under the facility's stormwater permit. The noncontact cooling water and boiler blowdown from the site will be discharged to the sanitary sewer.

Attachment #2 is a site map showing the approximate locations of Outfalls 001 and 003.

Existing Permit Limitations: The current permit, which expired on June 30, 2008, includes the following effluent limitations.

ED_014293_00000430-00099

Outfall 001

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	12-Month Rolling Avg.	Footnotes
Flow Rate						1
Temperature						1
Phosphorus					1.0 mg/L	
Hardness						1
Arsenic	680 µg/L					2
Copper	69 µg/L 0.98 lbs/day					
Cadmium						1
Cyanide						1
Chlorine						1
Mercury						1
pH	11.0 s.u.	4.0 s.u.				3
Acute WET						1

Outfall 003

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	12-Month Rolling Avg.	Footnotes
Flow Rate						1
Total Suspended Solids						1
Arsenic	680 µg/L					
pH	11.0 s.u.	4.0 s.u.				3
Acute WET						1

Footnotes:

1. Monitoring only
2. A daily maximum limit of 12 lbs/day applies to the total pounds of arsenic discharged through outfalls 001 and 003
3. Whenever continuous pH monitoring is specified, the permittee shall maintain the pH of this wastewater within the range of 6.0 to 9.0 s.u. except, pursuant to ss. NR 205.06 and NR 102.05(3)(h), Wis. Adm. Code, excursions from the limits are permitted subject to the following conditions.
   - The total time during which the pH values are outside the required range shall not exceed 446 minutes in any calendar month.
   - No individual excursion from the range shall exceed 60 minutes.
   - No individual excursions shall be outside the range of 4.0 to 11.0 s.u., inclusive.
   - On a daily basis, the permittee is required to report the total time the pH limits are exceeded and the number of times any individual excursion exceeds 60 minutes in duration or is outside the range of 4.0 to 11.0 s.u., inclusive.

ED_014293_00000430-00100

Receiving Water Information:

- Name: Menominee River, about 1 mile from the mouth at Lake Michigan.
- Classification: Warmwater sport fish community, non-public water supply. Lake Michigan is Coldwater, public water supply (Coldwater and Public Water Supply criteria would be used at the point of discharge as well for bioaccumulating compounds of concern, because the discharge is within the Great Lakes basin.)
- Low Flow: The following 7-Q_{10} and 7-Q_2 values are from USGS for the Menominee River at Marinette where Outfall 001 is located. The Harmonic Mean has been estimated as recommended in *State of Wisconsin Water Quality Rules Implementation Plan* (Publ. WT-511-98)

  7-Q_{10} = 1240 cfs (cubic feet per second)
  7-Q_2 = 1740 cfs
  90-Q_{10} = 1479 cfs
  Harmonic Mean Flow = 3146 cfs

- Hardness = 138 mg/L as $CaCO_3$. This value represents the geometric mean of data from WET testing from April 2008 to July 2013
- % of low flow used to calculate limits: 25%
- Source of background concentration data: Chloride, mercury, and copper data from the Menominee River at CTH JJ is used for this evaluation. All other metals background data is from the Popple River. Instream PFOA and PFOS data comes from Department monitoring efforts in the Menominee River in 2019. The numerical values are shown in the tables below. If no data is available, the background concentration is assumed to be negligible and a value of zero is used in the computations.
- Multiple dischargers: Marinette Wastewater Utility discharges about 0.6 mi upstream of Tyco and Waupaca Foundry discharges about 0.6 mi downstream from Tyco. Due to the high level of dilution (IWC is less than 1%) overlapping mixing zones from these discharges are not considered in this assessment.
- Impaired water status: The Menominee River is impaired for PCBs and Mercury at the point of discharge.

Effluent Information:

The following table summarizes flow data from January 2015 to December 2019.

Flow Rates (in MGD):	001	003	101
Maximum Annual Average	0.167	0.0190	0.0325
Peak Daily	0.570	0.0405	0.448
Peak 7-Day Average	0.269	0.0329	0.118
Peak 30-Day Average	0.233	0.0233	0.0513
Overall Average	0.124	0.0137	0.0238

Since mixing zones for the Outfall 001 and 003 discharges are close together and may overlap, limits are calculated for a combined discharge volume of 0.186 MGD (0.167 MGD + 0.0190 MGD).

- Hardness = 244 mg/L as $CaCO_3$ at Outfall 001 based on DMR data from October 2014 to November 2019 and 25.7 mg/L as $CaCO_3$ at Outfall 003 based on WET testing data from January 2015 to December 2019.
- Acute dilution factor used: Not applicable – this facility does not have an approved Zone of Initial Dilution (ZID).

ED_014293_00000430-00101

- Water Source: About 5% of the source water comes from an intake on the Menominee River. The rest of the water comes from the City of Marinette.
- Additives: Seven water quality conditioners are used in the boiler house. These are evaluated in Part 5.
- Effluent characterization: This facility is categorized as a primary industry, so the permit application required effluent sample analyses for all the "priority pollutants" except for the pesticides category, dioxins and furans at Outfall 001. At Outfall 003, the permit only required monitoring for common pollutants and metals. The permit-required monitoring for As, Cd, Cu, Cn, and Hg from June 2015 to May 2020 is used in this evaluation, along with voluntary monitoring of mercury at Outfall 003 from June 2015 to April 2020.

  Sewer relining has resulted in some lower arsenic levels at Outfall 001. Only arsenic data at Outfall 001 from December 2017 to May 2020 is used.

	Outfall 001					**Outfall 003**	
	As - µg/L	Cu - µg/L	Cn - µg/L	Hg - ng/L*	Cd -µg/L	As - µg/L	Hg - ng/L
1-day P_{99}	170	48.7	-	29	3.4	3238	24
4-day P_{99}	100	30.1	-	16	1.8	2047	13
30-day P_{99}	68	18.0	-	8.5	0.82	852	6.0
Mean	52	12.7	0.85	5.5	0.39	294	2.9
Std	33	9.88	5	5.9	0.94	930	5.4
Sample size	121	263	58 (5 detects)	57	240	195	48
Range	<1 - 160	<1.3 - 51	<3 - 15	0.3 - 27	<0.14 - 5.7	<2.1 - 6700	0.2 - 36

*Mercury result at Outfall 001 from 04/13/2020 is excluded from P_{99} calculations. See explanation on page 9.
"<" means that the pollutant was not detected at the indicated level of detection. The mean concentration was calculated using zero in place of the non-detected results.

Effluent data for substances for which a single sample was analyzed is shown in the tables in Part 2 below, in the column titled "MEAN EFFL. CONC.".

The following table presents the average concentrations and measurements at Outfalls 001 and 003 from June 2015 to May 2020 for all parameters with limits in the current permit:

	Outfall 001	Outfall 003
TSS		0.50 mg/L
pH field	7.30 s.u.	7.34 s.u.
Phosphorus	0.29 mg/L	
Arsenic	123 µg/L* 0.19 lbs/day	294 µg/L
Copper	13.0 µg/L 0.017 lbs/day	

*Results below the method detection limit (also known as the level of detection, or LOD) were included as zeroes in calculation of average.

ED_014293_00000430-00102

PART 2 – WATER QUALITY-BASED EFFLUENT LIMITATIONS FOR TOXIC SUBSTANCES – EXCEPT AMMONIA NITROGEN

In general, permit limits for toxic substances are recommended whenever any of the following occur:

1. The maximum effluent concentration exceeds the calculated limit (s. NR 106.05(3), Wis. Adm. Code)
2. If 11 or more detected results are available in the effluent, the upper 99th percentile (or P_{99}) value exceeds the comparable calculated limit (s. NR 106.05(4), Wis. Adm. Code)
3. If fewer than 11 detected results are available, the mean effluent concentration exceeds 1/5 of the calculated limit (s. NR 106.05(6), Wis. Adm. Code)

The following tables list the water quality-based effluent limitations for this discharge along with the results of effluent sampling for all the detected substances. All concentrations are expressed in term of micrograms per Liter (µg/L), except for hardness and chloride (mg/L) and mercury (ng/L). Limits are calculated assuming a combined effluent flow rate of 0.186 MGD for Outfall 001 and 003 (0.167 MGD + 0.0190 MGD).

Daily Maximum Limits based on Acute Toxicity Criteria (ATC)
RECEIVING WATER FLOW = 992 cfs, (1-Q_{10} (estimated as 80% of 7-Q_{10})).

Effluent limitations based on acute criteria are different for Outfalls 001 and 003 because the effluent hardness levels vary significantly between outfalls.

Outfall 001							
SUBSTANCE	REF. HARD. mg/L	ATC	MAX. EFFL. LIMIT**	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	1-day P_{99}	1-day MAX. CONC.
Chlorine		19.0	38.1			**60**	**50**
Arsenic		340	680			170	160
Cadmium	243	28.5	56.9			3.4	5.7
Chromium	243	3725	7450	1490	<2.3		
Copper	243	35.8	71.6			48.7	51
Lead	243	252	503	101	0.17		
Mercury (ng/L)		830	830			29	27
Nickel	243	993	1985	397	2.7		
Zinc	243	261	522	104	23		
Cyanide		45.8	91.6	18.3	0.85		
Chloride - mg/L		757	1510	301	37		

ED_014293_00000430-00103

Outfall 003							
SUBSTANCE	REF. HARD. mg/L	ATC	MAX. EFFL. LIMIT**	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	1-day P_{99}	1-day MAX. CONC.
Arsenic		340	680			**3238**	**6700**
Chromium	26	592	1184	237	<2.3		
Copper	26	4.30	8.60	1.72	1.40		
Lead	26	28.7	57.5	11.5	<0.16		
Mercury (ng/L)		830	830			24	36
Nickel	26	148	297	59.4	<0.92		
Zinc	26	36.6	73.3	14.7	<8.1		

* * The 2 x ATC method of limit calculation yields a more restrictive limit than consideration of ambient concentrations and 1-Q_{10} flow rates per the changes to s. NR 106.07(3), Wis. Adm. Code, effective 09/01/2016.

Weekly Average Limits based on Chronic Toxicity Criteria (CTC)

RECEIVING WATER FLOW = 310 cfs (¼ of the 7-Q_{10})

						Outfall 001		Outfall 003	
SUBSTANCE	REF. HARD. mg/L	CTC	MEAN BACK-GRD.	WEEKLY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	4-day P_{99}	MEAN EFFL. CONC.	4-day P_{99}
Chlorine		7.28		7680			40		
Arsenic		152		163000			100		2047
Cadmium	138	3.17	0.021	3390			1.8		
Chromium	138	172	0.462	185000	36300	<2.3		<2.3	
Copper	138	13.7	0.629	14000			30.1	1.40	
Lead	138	38.3	0.404	40800	8000	0.17		<0.16	
Mercury (ng/L)		440	2.82	440			16		13
Nickel	138	68.7		73900	14500	2.7		<0.92	
Zinc	138	160	3.003	169000	33000	23		<8.1	
Cyanide		11.5		12300	2500	0.85			
Chloride - mg/L		395	7.3	417000	81800	37			

Monthly Average Limits based on Wildlife Criteria (WC)

RECEIVING WATER FLOW = 370 cfs (¼ of the 90-Q_{10})

SUBSTANCE	WC	MEAN BACK-GRD.	MO'LY AVE. LIMIT	1/5 OF EFFL. LIMIT	Outfall 001 30-day P_{99}	Outfall 003 30-day P_{99}
Mercury (ng/L)	1.3	2.82	**1.30**		**8.5**	**6.0**

ED_014293_00000430-00104

Monthly Average Limits based on Human Threshold Criteria (HTC)

RECEIVING WATER FLOW = 787 cfs (¼ of the Harmonic Mean)

					Outfall 001		Outfall 003	
SUBSTANCE	HTC	MEAN BACK-GRD.	MO'LY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	30-day P_{99}	MEAN EFFL. CONC.	30-day P_{99}
Cadmium	370	0.021	1.01E+06			0.82		
Chromium (+3)	3818000	0.462	1.04E+10	2.08E+09	<2.3			
Lead	140	0.404	3.81E+05	7.62E+04	0.17		<0.16	
Mercury (ng/L)	1.5	2.82	1.5			**8.5**		**6.0**
Nickel	43000		1.17E+08	2.35E+07	2.70		<0.92	
Cyanide, Total	9300		2.54E+07	5.14E+06	0.85			
Chlorobenzene	1210		3.30E+06	6.61E+05	2.1			
1,2-Dichlorobenzene	1509		4.12E+06	8.24E+05	0.52			

Monthly Average Limits based on Human Cancer Criteria (HCC)

RECEIVING WATER FLOW = 787 cfs (¼ of the Harmonic Mean)

					Outfall 001		Outfall 003	
SUBSTANCE	HCC	MEAN BACK-GRD.	MO'LY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	30-day P_{99}	MEAN EFFL. CONC.	30-day P_{99}
Arsenic	13.3	0.89	33900			68		852
Chloroform	1960		5.35 E06	1.07 E06	3.8			
Dichlorobromomethane	1960		5.35 E06	1.07 E06	2.4			
Chlorodibromomethane*	94.1		257000	50400	1.0			

*The calculated limit is based on secondary criteria

Conclusions and Recommendations: Based on a comparison of the effluent data and calculated effluent limitations, effluent limitations are apparently needed for arsenic, chlorine, and mercury.

Copper – The previous WQBEL Memo recommended a daily maximum limit of 3.8 ug/L at Outfall 003. Additional effluent hardness data is available that shows significantly higher hardness levels, which results in a higher copper limit. The recalculated daily max copper limit for Outfall 003 is 8.6 ug/L, and the available effluent data does not show reasonable potential to exceed this limit. **Therefore, no copper limit is recommended at Outfall 003.**

Arsenic – Because the Menominee River reaches Lake Michigan about a mile from Outfall 001, protection of downstream uses must be considered. The arsenic criteria in Lake Michigan is 0.2 µg/L and the background arsenic concentrations in the Menominee River as well as Lake Michigan exceed this level. The 30-day P_{99} of effluent arsenic data is 68 µg/L at Outfall 001 and 852 µg/L at Outfall 003. Because these levels exceed the calculated limit of 0.2 µg/L and there is no dilution available, arsenic limits are required in the reissued permit.

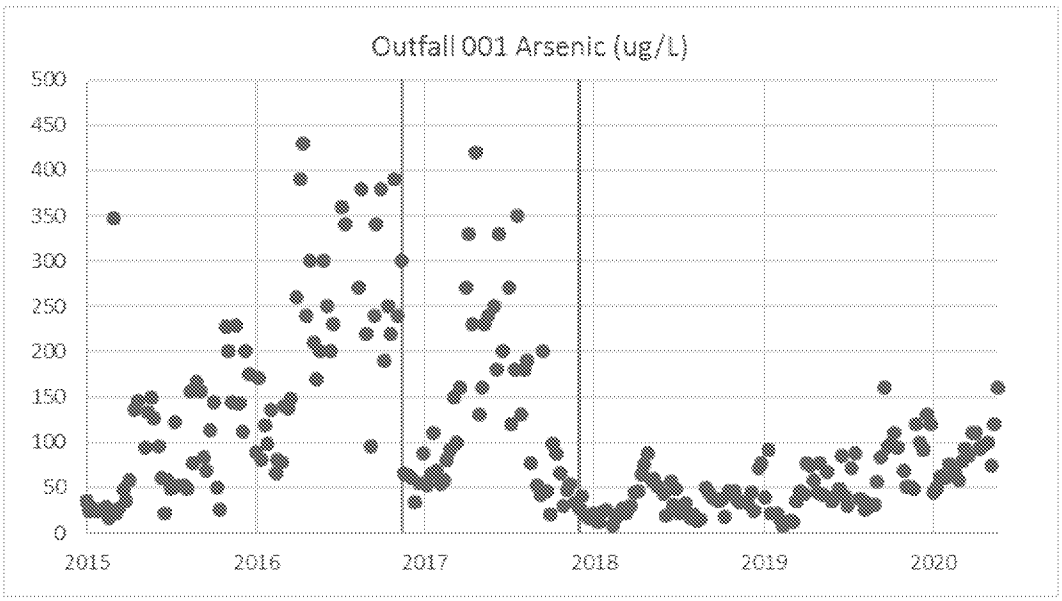
Tyco has applied for an arsenic variance for these discharges. If a variance is approved, an initial limit should be included in the reissued permit. **An initial limit of 170 ug/L, equal to the 1-day P_{99} is**

ED_014293_00000430-00105

recommended at Outfall 001. An initial limit of 680 ug/L followed by an interim limit of 500 ug/L for after new treatment is installed is recommended at Outfall 003.

Typically, this limit is set equal to the 1-day P_{99} value and expressed as a daily maximum. However, the 1-day P_{99} value of 3238 µg/L at Outfall 003 is higher than the arsenic limit of 680 ug/L currently in effect. In order to raise this limit, the facility would need to demonstrate the need for a higher limit in accordance with antidegradation procedures in s. NR 207.04 and a change in circumstances which warrants a higher limit in accordance with antibacksliding procedures in s. NR 207.12(4). Therefore, an initial limit of 680 µg/L is recommended at 003, expressed as a daily maximum.

The initial limit for Outfall 001 is based on arsenic monitoring data since 12/04/2017 (marked with the green line). The discharge from Outfall 001 does not contain the treated groundwater remediation water that is discharged at Outfall 003, and sampling of the process water has indicated arsenic concentrations below the standard, so the majority of the arsenic in this discharge is either from groundwater infiltration or legacy contamination.



Effluent arsenic data at Outfall 001 has been lower since sewer relining was finished on 11/16/2016 (marked with the orange line). There was a subsequent increase in arsenic concentration from March to September 2017, which is believed to be the result of upsets from catch basin work that occurred during this time, releasing legacy arsenic trapped in the system. All 120 arsenic sample results from after 12/04/2017 have been below 170 ug/L. The facility plans to discontinue discharge from Outfall 001 and combine the remaining discharge from SP 101 with the discharge from Outfall 003.

The final arsenic WQBEL of 0.2 ug/L remains unchanged. In the absence of a variance, the final limit of 0.2 µg/L as a monthly average would apply. This limit would be accompanied by a corresponding mass limit and a daily maximum concentration limit to meet expression of limits requirements.

ED_014293_00000430-00106

Chlorine - The discharge source water for Outfall 001 is from Marinette Waterworks, which adds chlorine to the water supply. Previously an exemption in s. NR 106.10(1), Wis. Adm. Code allowed dischargers of pass-through additives if they were added in quantities similar to a water supply. However, a March 2, 2012 court ruling declared a portion of s. NR 106.10(1), Wis. Adm. Code, invalid because it does not comply with certain provisions of the federal Clean Water Act and s. NR 106.10 has been updated to be consistent with federal regulations Therefore, the need for WQBELs for chlorine must be evaluated. Available data/information indicates the discharge contains concentrations of chlorine or halogen above the applicable WQBELs.

Tyco plans to utilize chlorine in the new wastewater treatment process for Outfall 003 to oxidize arsenic prior to the treatment system. The chlorine is expected to either dissipate or be removed by the treatment processes prior to discharge. However, limits are recommended based on s. NR 205.067(5)(a)2., Wis. Adm. Code, because the facility has the ability to alter or suspend the treatment or pollutant control measures to the degree that there may be continued reasonable potential to exceed the applicable chlorine WQBELs.

Therefore, **a daily maximum effluent limit of 38 µg/L is needed at Outfalls 001 and 003** for permit reissuance. Due to revisions to s. NR 106.07(2) Wis. Adm. Code, mass limitations are no longer required. Weekly average limitations are not needed, as the daily maximum limitations will provide adequate protection of the resource.

Mercury – The water quality-based effluent limit for total recoverable mercury is set equal to the most stringent criterion of 1.3 ng/L because the background concentration in the receiving water and similar inland streams is known to exceed 1.3 ng/L. The 30-day P_{99} of representative data is 8.5 ng/L at Outfall 001 and 6.0 ng/L at Outfall 003. These values are both greater than the most stringent limit (wildlife criterion of 1.3 ng/L); therefore, **a limit is recommended for mercury at Outfall 001 and 003.**

Tyco has applied for a mercury variance for both discharges. If a variance is granted and approved by EPA, in accordance with s. NR 106.145(5), Wis. Adm. Code, an alternative limit for mercury would be set equal to the 1-day P_{99} and would be expressed as a daily maximum. Accordingly, if a variance is granted, the alternative mercury limit would be **29 ng/L at Outfall 001 and 24 ng/L at Outfall 003** based on effluent data from January 2015 to December 2019. The alternate limits should be expressed as a daily maximum. In conjunction with an alternative limit, the proposed permit shall also include a pollutant minimization program in accordance with s. NR 106.145(6), Wis. Adm. Code.

Based on mercury effluent data at Outfall 001, before and after sewer relining on 11/16/2016, mercury concentrations do not appear to be reduced by the sewer relining. Therefore the 1-day P_{99} of all available effluent mercury data is recommended as the interim limit for Outfall 001.

Outfall 001 – Mercury (ng/L)		
	Prior to Sewer Relining (01/28/2015-10/20/2016)	Since Sewer Relining (11/28/2016 – 05/06/2020)
1-day P_{99}	23	27
4-day P_{99}	13	15
30-day P_{99}	5.8	9.1
Mean	2.5	6.5

ED_014293_00000430-00107

Std	5.7	5.5
Sample size	23	40
Range	<0.2 - 27	0.65 - 18

A high sample result of 39.2 ng/L was reported on 04/13/2020. This value is much higher than the rest of the data set and there is no corresponding high value from the intake water and field blank measurements. In general, the mercury data set at Outfall 001 has high variability that doesn't appear to be related to variability in intake concentrations or field blank measurements. This could be the result of sample contamination issues. Considering this, the sample result from 04/13/2020 is excluded from the dataset for P_{99} calculations.

In the absence of a variance, a limit of 1.3 ng/L as a monthly average would apply (along with a respective mass limit and a daily max limit to meet expression of limits requirements).

TBELs at SP 101

The need for limits for toxic substances at Outfall 001 also needs to be assessed based on the categorical limits that apply to the treated metal finishing effluent wastewater. Section NR 106.04 (1) Wis. Adm. Code states that water quality–based effluent limitations should be required in the permit whenever the categorical effluent limits required are less stringent than necessary to achieve applicable water quality standards specified in chs. NR 102 to 105 Wis. Adm. Code.

To evaluate this, the applicable categorical limits for SP 101 are multiplied by the percentage of 001 flow which is made up of SP 101 flow (about 19%, based on actual flow monitoring) to determine the highest effluent concentration that the categorical limit would allow at Outfall 001. This maximum allowed concentration is compared to the calculated WQBELs to determine the need for a WQBEL at Outfall 001. A similar evaluation of the need for limits was completed in the February 16, 2010 WQBEL Memo, but production flows have changed significantly since then.

	Categorical SP 101 Limit		Highest Allowed Concentration at 001 (18% of SP 101 Limit)		Calculated Limits for Outfall 001			Respective Mass Limit (lbs/day)
	Monthly Avg. (µg/L)	Daily Max (µg/L)	Monthly Avg. (µg/L)	Daily Max (µg/L)	Monthly Avg. (µg/L)	Weekly Avg. (µg/L)	Daily Max (µg/L)	
Cadmium	260	690	50	**133**	1.01E+06	3390	**57**	**0.27**
Chromium (+3)	1710	2770	329	532	1.04E+10	185000	7460	
Nickel	2380	3980	457	765	1.17E+08	73900	1990	
Zinc	1480	2610	284	501	-	169000	523	
Cyanide	650	1200	125	**231**	2.54E+07	12300	**92**	**0.44**
Copper	2070	3380	398	**649**	-	14000	**69***	**0.34**
Lead	430	690	83	133	3.81E+05	40800	504	
Silver	240	430	46	83	7.64E+07	-	-	

ED_014293_00000430-00108

*The daily maximum copper limit calculated in Part 2 is 72 ug/L. However, a limit of 69 ug/L at Outfall 001 is included in the current permit. In absence of an antidegradation and antibacksliding demonstrations, the current copper limit should be continued in the reissued permit.

Based on this comparison, **daily maximum limits are needed at Outfall 001 for cadmium, cyanide, and copper.** The respective mass limits listed in the table above calculated based on the daily max flow rate of 0.57 MGD would also apply. However, the listed limit for copper is less restrictive than the current limit of 69 ug/L at Outfall 001. In absence of an antibacksliding and antidegradation demonstration, no changes to the current copper limits at 001 are recommended. The recommended limits are subject to change if categorical limits are revised due to changes in production levels.

PFAS

Perfluorooctane sulfonate (PFOS) and Perfluorooctanoic acid (PFOA) are part of a group of chemicals referred to as perfluoroalkyl substances (PFASs) used in firefighting foams and various consumer products which can pose a risk to human health. The Michigan Department of Environmental Quality (DEQ) has promulgated Human Non-Cancer Criteria (equivalent to Wisconsin's Human Threshold Criteria) of 0.42 µg/L for PFOA and 0.011 µg/L for PFOS for surface waters used for public drinking water supply.

Pursuant to Wis. Stat s. 283.31(3) and 40 CFR 122.4(d), the Department may only issue a WPDES permit if it includes water quality-based effluent limits in a WPDES permit that ensure compliance with the applicable water quality requirements of all affected states. Both the Menominee River and Lake Michigan are interstate waters shared with Michigan, so the Department must include water quality-based limits in the WPDES permit that ensure compliance with Michigan's requirements. Because Wisconsin does not have promulgated criteria for PFOA and PFOS, but Michigan does, the Department must include limits to meet Michigan's standards. Therefore, PFOA and PFOS limits for protection of the receiving water and downstream waters should be based on the criteria promulgated by Michigan DEQ, unless more stringent criteria are developed in the future.

Effluent levels of PFOS and PFOA are unknown at this time. However, these compounds have been detected in the remediation wells and influent water to the treatment plant for Outfall 003 (results are displayed below).

Sample Point	Sample Date	PFOA (ng/L)	PFOS (ng/L)
INF-01	05/01/2018	1800	64
INF-01 (duplicate)	05/01/2018	1700	67
MW008M	05/01/2018	3700	350
MW008M (duplicate)	05/01/2018	4100	340
MW032S	04/30/2018	520	140
MW041S	05/01/2018	1500	650
MW044S	04/30/2018	1500	340
MW054S	04/30/2018	3800	210
MW054S (duplicate)	04/30/2018	4100	200

ED_014293_00000430-00109

MW102S	04/30/2018	130	25
MW108S	05/01/2018	9100	530

The background values shown in the table below are the geometric means of Menominee River monitoring data from June through September 2019, 250 m downstream from the Marinette WWTF outfall.

Michigan's criteria consider PFOS to be a bioaccumulating chemical of concern (BCC, bioaccumulation factor over 1000) but do not consider PFOA to be a BCC. Because of this, no dilution would be allowed for PFOS and limits would be set equal to criteria in accordance with s. NR 106.06(2)(br), Wis. Adm. Code. However, dilution may be allowed for PFOA since it's not considered a BCC. The criteria and calculated limits for each substance are as follows:

RECEIVING WATER FLOW = 787 cfs (¼ of the Harmonic Mean)

SUBSTANCE	Human Health Criteria	MEAN BACK-GRD.	MO'LY AVE. LIMIT	1/5 OF EFFL. LIMIT	Outfall 003 Untreated Wastewater	
					Average	Max
PFOS (ng/L)	11	0.11	11	2.2	270	650
PFOA (ng/L)	420	0.16	1.15E+06	2.29E+05	2900	9100

Comparing the detected influent levels of PFOS to the calculated limit shows that there is reasonable potential to exceed this limit, lacking effluent data. No monitoring data is available to estimate the possible concentrations of these pollutants at Outfall 001 but monitoring data for other substances like mercury and arsenic has shown that pollutants present at Outfall 003 are often present at Outfall 001 as well. Due to the lack of effluent data, a PFOS limit is recommended at Outfall 001 as well.

Because dilution may be used to calculate limits for PFOA, the calculated limits for this substance are much higher than those for PFOS. The available well monitoring data does not show reasonable potential to exceed the calculated PFOA limits. Tyco will be installing granular activated carbon treatment which will be effective for treating both PFOS and PFOA. The PFOS limits would be most limiting in driving treatment, so the PFOA limits would have no effect if implemented.

A PFOS limit of 0.011 µg/L is recommended at Outfalls 001 and 003, expressed as a monthly average limit. A daily maximum limit is also required in accordance with s. NR 106.07(4). Respective mass limits based on the actual maximum annual average flow rate of 0.167 MGD at Outfall 001 and 0.0190 MGD at Outfall 003 are also recommended. (Mass Limit in g/day = Concentration Limit in ug/L x effluent flow rate x 3.78).

To summarize, the following limits are recommended:

Pollutant	Daily Max Limit (ng/L)	Monthly Average Limit (ng/L)	Monthly Average Mass Limit (g/day)
PFOS	11	11	0.0069 at Outfall 001 0.00079 at Outfall 003

The need for PFOS limits should be re-evaluated once representative effluent data is available. Following treatment, levels of PFOS may be lower than criteria.

PART 3 – WATER QUALITY-BASED EFFLUENT LIMITATIONS FOR AMMONIA NITROGEN

The State of Wisconsin promulgated revised water quality standards for this substance effective March 1, 2004 which includes criteria based on both acute and chronic toxicity to aquatic life. Given the fact that Tyco does not currently have ammonia nitrogen limits the need for limits is evaluated at this time. Ammonia-Nitrogen monitoring results from the previous permit application and with the most recent permit application are listed below.

Sample Date	Nitrogen, Ammonia mg/L Outfall 001	Nitrogen, Ammonia mg/L Outfall 003
12/12/2007	0.14	
12/18/2007	0.13	
12/27/2007	0.53	
01/04/2008	0.18	
02/01/2018	1.0	
02/13/2018	0.35	0.99 1.1
02/22/2018	1.6	

This data is well below any calculated limits. Therefore ammonia-nitrogen limits or monitoring are not recommended.

PART 4 –PHOSPHORUS

Technology Based Effluent Limit (TBL)
Wisconsin Administrative Code, ch. NR 217, requires industrial facilities that discharge greater than 60 pounds of Total Phosphorus per month to comply with a 12-month rolling average limit of 1.0 mg/L, or an approved Alternative Concentration limit. Since Tyco currently has an existing technology-based limit of 1.0 mg/L at Outfall 001, this limit should be included in the reissued permit. This limit remains applicable unless a more stringent water quality-based concentration limit is given.

Water Quality-Based Effluent Limits (WQBEL)
Revisions to administrative rules regulating phosphorus took effect on December 1, 2010. These rule revisions include additions to ch. NR 102 (s. NR 102.06), which establish phosphorus standards for surface waters. Revisions to ch. NR 217 (s. NR 217, Subchapter III) establish procedures for determining water quality based effluent limits for phosphorus, based on the applicable standards in ch. NR 102.

Section NR 102.06(3)(a) specifically names reaches of rivers for which a phosphorus criterion of 0.1 mg/l applies. For other stream segments that are not specified in s. NR 102.06(3)(a), s. NR 102.06(3)(b), Wis. Adm. Code, specifies a phosphorus criterion of 0.075 mg/L. The phosphorus criterion of 0.1 mg/L applies

ED_014293_00000430-00111

for the Menominee River.

The conservation of mass equation is described in s. NR 217.13 (2)(a), Wis. Adm. Code, for phosphorus WQBELs and includes variables of water quality criterion (WQC), receiving water flow rate (Qs), effluent flow rate (Qe), and upstream phosphorus concentrations (Cs):

$$\text{Limitation} = [(WQC)(Qs+(1-f)\ Qe) - (Qs-f\ Qe)\ (Cs)]/Qe$$

Where: WQC = 0.1 mg/L for the Menominee River
Qs = 100% of the 7-Q_2 of 1740 cfs
Cs = background concentration of phosphorus in the receiving water pursuant to s. NR 217.13(2)(d), Wis. Adm. Code
Qe = effluent flow rate from both outfalls = 0.186 MGD = 0.289 cfs
f = the fraction of effluent withdrawn from the receiving water, 0.05

Section NR 217.13(2)(d), Wis. Adm. Code, specifies that the background phosphorus concentration used in the limit calculation formula shall equal the median of at least four samples collected during the months of May through October, and that all samples collected during a 28-day period shall be considered as a single sample and the average of these concentrations used to determine a median. Averaging begins at date of the first sample in the range of May through October.

The following data were considered in estimating the background phosphorus concentration (phosphorus data is in mg/L):

SWIMS ID	383088	383021
Station Name	Upstream Monitoring station at Menominee River at USH 41 Marinette	Downstream Monitoring station at Menominee River – Marinette Ogden St
Waterbody	Menominee River	Menominee River
Sample Count	6	106
First Sample	10/30/2011	05/02/2006
Last Sample	09/09/2012	10/27/2014
Mean	0.0273 mg/L	0.034 mg/L
Median	0.027 mg/L	0.033 mg/L
NR 217 Median	0.027 mg/L	0.03275 mg/L

Substituting a median value of 0.027 mg/L for the upstream receiving water into the limit calculation equation above would result in a calculated limit of 440 mg/L. Since this limit is less restrictive than the calculated TBL of 1.0 mg/L, no phosphorus WQBEL is required in the reissued permit.

PART 5 –THERMAL

New surface water quality standards for temperature took effect on October 1, 2010. These new regulations are detailed in chs. NR 102 (Subchapter II – Water Quality Standards for Temperature) and NR 106 (Subchapter V – Effluent Limitations for Temperature) of the Wisconsin Administrative Code.

ED_014293_00000430-00112

Daily maximum and weekly average temperature criteria are available for the 12 different months of the year depending on the receiving water classification.

ED_014293_00000430-00113

Month	Representative Highest Monthly Effluent Temperature		**Calculated Effluent Limit**	
	Weekly Maximum (°F)	Daily Maximum (°F)	**Weekly Average Effluent Limitation** (°F)	**Daily Maximum Effluent Limitation** (°F)
JAN	63	70	-	**120**
FEB	63	80	-	**120**
MAR	65	82	-	**120**
APR	68	89	-	**120**
MAY	73	88	-	**120**
JUN	78	92	-	**120**
JUL	83	97	-	**120**
AUG	84	93	-	**120**
SEP	80	94	-	**120**
OCT	76	95	-	**120**
NOV	78	89	-	**120**
DEC	66	77	-	**120**

Due to the amount of upstream flow available for dilution in the limit calculation (Qs:Qe >20:1), the lowest calculated limitation is 120° F. Outfall 001 effluent temperature data from June 2015 to May 2020 is summarized in the table above. The maximum effluent temperature reported during this period was 97°F. No significant heat load is expected from the discharge from Outfall 003. Based on the available effluent data no effluent limits are recommended for temperature.

PART 6 – WHOLE EFFLUENT TOXICITY (WET)

WET testing is used to measure, predict, and control the discharge of toxic materials that may be harmful to aquatic life. In WET tests, organisms are exposed to a series of effluent concentrations for a given time and effects are recorded. The following evaluation is based on procedures in the Department's WET Program Guidance Document (revision #12, dated October 29, 2019).

- Acute tests predict the concentration that causes lethality of aquatic organisms during a 48 to 96-hour exposure. To assure that a discharge is not acutely toxic to organisms in the receiving water, WET tests must produce a statistically valid LC_{50} (Lethal Concentration to 50% of the test organisms) greater than 100% effluent.

- Chronic testing is usually not recommended where the ratio of the 7-Q_{10} to the effluent flow exceeds 100:1. For Tyco, that ratio is approximately 4500:1. With this amount of dilution, there is believed to be little potential for chronic toxicity effects in the Menominee River associated with the discharge from Tyco, so the need for chronic WET testing will not be considered further.

ED_014293_00000430-00114

- According to the *State of Wisconsin Aquatic Life Toxicity Testing Methods Manual* (s. NR 219.04, Table A, Wis. Adm. Code), a synthetic (standard) laboratory water may be used as the dilution water and primary control in acute WET tests, unless the use of different dilution water is approved by the Department prior to use. The primary control water must be specified in the WPDES permit.

- Shown below is a tabulation of all available WET data for Outfalls 001 and 003 reported since the February 16, 2010 WQBEL Memo. Efforts are made to ensure that decisions about WET monitoring and limits are made based on representative data. Data which is not believed to be representative of the discharge is not included in reasonable potential calculations. The table below differentiates between tests used and not used when making WET determinations.

Outfall 001

Date Test Initiated	Acute Results LC_{50} %				Footnotes or Comments
	C. dubia	Fathead minnow	Pass or Fail?	Used in RP?	
05/12/2010	>100	>100	Pass	Yes	
07/17/2013	>100	>100	Pass	Yes	
12/09/2015	>100	>100	Pass	Yes	
02/17/2016	>100	>100	Pass	Yes	
06/29/2016	>100	>100	Pass	Yes	
03/15/2017	51.8	>100	Fail	Yes	
06/01/2017	>100	>100	Pass	Yes	Retest of 03/15/2017 failure
06/28/2017	>100	>100	Pass	Yes	Retest of 03/15/2017 failure
11/29/2017	>100	>100	Pass	Yes	
05/02/2018	>100	>100	Pass	Yes	
05/22/2018	>100	>100	Pass	Yes	
11/28/2018	>100	>100	Pass	Yes	
12/18/2019	>100	>100	Pass	Yes	

Outfall 003

Date Test Initiated	Acute Results LC_{50} %				Footnotes or Comments
	C. dubia	Fathead minnow	Pass or Fail?	Used in RP?	
12/04/2013	57.4	>100	Fail	No	
01/15/2014	45.3	>100	Fail	No	Retests of 12/04/2013 failure with hardness comparison
	38.4	>100	Fail	No	
02/19/2014	>100	>100	Pass	Yes	Part of TIE
03/12/2014	>100	>100	Pass	Yes	Part of TIE
06/10/2015	>100	>100	Pass	Yes	
03/15/2017	75.8	>100	Fail	Yes	
06/01/2017	>100	>100	Pass	Yes	Retest of 03/15/2017 failure
06/28/2017	>100	>100	Pass	Yes	Retest of 03/15/2017 failure
01/16/2019	>100	>100	Pass	Yes	
08/21/2019	>100	>100	Pass	Yes	

ED_014293_00000430-00115

The first acute WET test performed on the discharge from Outfall 003 failed on 12/04/2013. It was suspected that the low effluent hardness might have caused this failure, so parallel sampling was completed on 01/15/2014. One of the tests artificially raised the sample hardness and the other was performed at the typical effluent hardness. Both tests failed, and Tyco initiated a Toxicity Identification Evaluation (TIE). Tyco performed a cleaning of the system piping before the 02/04/2014 test, and based on the results of this test and the subsequent tests, it appeared that this action resolved toxicity issues. Tyco planned to perform this type of system cleaning every three weeks in the future. Because a successful TIE was performed, tests before February 2014 at Outfall 003 are excluded from the reasonable potential analysis.

- WET reasonable potential is determined by multiplying the highest toxicity value that has been measured in the effluent by a safety factor, in order to predict the likelihood (95% probability) of toxicity occurring in the effluent above the applicable WET limit. The safety factor used in the equation changes based on the number of toxicity detects in the dataset. The fewer detects present, the higher the safety factor, because there is more uncertainty surrounding the predicted value. **WET limits must be given, according to s. NR 106.08(6), Wis. Adm. Code, whenever the applicable Reasonable Potential equation results in a value greater than 1.0.**

  According to s. NR 106.08(6)(d) Wis. Adm. Code, TUa effluent values are equal to zero whenever toxicity is not detected (i.e. when the LC50. IC25 or IC 50 ≥ 100%.)

  Acute Reasonable Potential = [(TUa effluent)(B)(AMZ)]

	TUa (maximum) 100/LC50	**B** (multiplication factor from s. NR 106.08(5)(c), Wis. Adm. Code, Table 4)	Acute Reasonable Potential
Outfall 001	100/51.8 = 1.93	6.2 Based on 1 detect	11.97
Outfall 003	100/75.8 = 1.32	6.2 Based on 1 detect	8.18

The acute reasonable potential factor is greater than one at both Outfall 001 and 003. Therefore, reasonable potential is shown for acute WET using the procedures in s. NR 106.08(6) Wis. Adm. Code and representative data from 2013 to 2017.

Expression of WET limits

Acute WET limit = 1.0 TU_a (daily maximum)

The WET Checklist was developed to help DNR staff make recommendations regarding WET limits, monitoring, and other permit conditions. The Checklist steps the user through a series of questions that evaluate the potential for effluent toxicity. The Checklist indicates whether acute and chronic WET limits are needed, based on requirements specified in s. NR 106.08, Wis. Adm. Code, and recommends monitoring frequencies based on points accumulated during the Checklist analysis. As toxicity potential increases, more points accumulate and more monitoring is recommended to ensure that toxicity is not occurring. The completed WET Checklist recommendations for this permittee are summarized in the table below. Staff

ED_014293_00000430-00116

recommendations, based on the WET Checklist and best professional judgment, are provided below the summary table. For guidance related to reasonable potential and the WET Checklist, see Chapter 1.3 of the WET Guidance Document: http://dnr.wi.gov/topic/wastewater/WETguidance.html.

WET Checklist Summary

	Acute	
	Outfall 001	**Outfall 003**
AMZ	Not Applicable. **0 Points**	Not Applicable. **0 Points**
Historical Data	13 tests used to calculate RP. 1 test failed. **0 Points**	8 tests used to calculate RP. 1 test failed. **0 Points**
Effluent Variability	Little variability, no violations or upsets, consistent operations. **0 Points**	Little variability, no violations or upsets, consistent operations. **0 Points**
Receiving Water Classification	Full Fish & Aquatic Life **5 Points**	Full Fish & Aquatic Life **5 Points**
Chemical-Specific Data	Limits for chlorine and arsenic based on ATC (6 pts); Cd, Cu, Pb, Hg, Ni, Zn, Cn, and Cl- detected (3 pts); Additional Compounds of Concern: Chloroform and other HCC compounds detected (2 pts) **11 Points**	Limits for arsenic based on ATC (5 pts); Cu and Hg detected (2 pt); Additional Compounds of Concern: none **7 Points**
Additives	0 Biocides and 7 Water Quality Conditioners added. (7 pts) SorbX-100 Used: No **7 Points**	No additives **0 Points**
Discharge Category	Metal Finishing **15 Points**	Groundwater Remediation **8 Points**
Wastewater Treatment	Primary Treatment Only **8 Points**	Ultrafiltration and reverse osmosis, considered equivalent to secondary treatment or better **0 Points**
Downstream Impacts	No impacts known **0 Points**	No impacts known **0 Points**
Total Checklist Points:	**46 Points**	**20 Points**
Recommended Monitoring Frequency (from Checklist):	2x yearly	2 tests during permit term (year 2, 4, 6, etc.)
Limit Required?	Yes	Yes
TRE Recommended? (from Checklist)	No	No

ED_014293_00000430-00117

- Following the guidance provided in the Department's WET Program Guidance Document (revision #12, dated October 29, 2019), based upon the point totals generated by the WET Checklist, other information given above, and Chapter 1.3 of the WET Guidance Document, **2x annual acute WET testing is recommended at Outfall 001** in the reissued permit. Tests should be done in rotating quarters, in order to collect seasonal information about this discharge. WET testing shall continue after the permit expiration date (until the permit is reissued).

- According to the requirements specified in s. NR 106.08, Wis. Adm. Code, an acute WET limit is required at both Outfalls 001 and 003. The acute WET limit should be expressed as **1.0 TUa as a daily maximum** in the effluent limits table of the permit.

- **Annual acute WET testing is recommended at Outfall 003.** A minimum of annual monitoring is required because an acute WET limit is required. Federal regulations at 40 CFR Part 122.44(i) also require that monitoring occur at least once per year when a limit is present.

PART 7 – EXPRESSION OF LIMITS

Revisions to ch. NR 106 Wis. Adm. Code align Wisconsin's water quality-based effluent limitations with 40 CFR 122.45(d), which requires WPDES permits contain the following limits, whenever practicable and necessary to protect water quality:

- Weekly average and monthly average limitations for publicly owned treatment works (POTWs), and
- Daily maximum and monthly average limitations for all other discharges.

Tyco is an industrial discharge and is therefore subject to daily maximum and monthly average limitations whenever limitations are determined to be necessary.

This evaluation provides additional limitations necessary to comply with the expression of limits in s. NR 106.07 Wis. Adm. Code. Pollutants already compliant with s. NR 106.07 Wis. Adm. Code or that have an approved impracticability demonstration are excluded from this evaluation including water-quality based effluent limitations for phosphorus, temperature, and pH, among other parameters.

Method for calculation:
The methods for calculating limitations for industrial discharges to conform to 40 CFR 122.45(d) are specified in s. NR 106.07(3) Wis. Adm. Code, as follows:

- Whenever a daily maximum limitation is determined necessary to protect water quality, a monthly average limitation shall also be included in the permit and set equal to the daily maximum limit unless a more restrictive limit is already determined necessary to protect water quality.
- Whenever a monthly average limitation is determined necessary to protect water quality, a daily maximum limit shall be calculated using the following procedure and included in the permit unless a more restrictive limit is already determined necessary to protect water quality:
    - Daily Maximum Limit = (Monthly Average Limitation × MF)

  Where:
  MF= Multiplication factor as defined in Table 1
  CV= coefficient of variation (CV) as calculated in s. NR 106.07(5m)

ED_014293_00000430-00118

n= the number of samples per month required in the permit

s. NR 106.07 (3) (e) 4. Table 1 — Multiplication Factor (for CV = 0.6)

CV	n=1	n=2	n=3	n=4	n=8	n=12	n=16	n=20	n=24	n=30
0.6	1.00	1.31	1.51	1.64	1.95	2.12	2.23	2.30	2.36	2.43

Note: This methodology is based on the *Technical Support Document for Water Quality-based Toxics Control* (March 1991). PB91-127415.

For PFOS, a default CV of 0.6 is used in this calculation because no representative effluent data is available, and the amount of source wastewater data is limited. A multiplication factor of 1.00 is selected, assuming that monthly monitoring for PFOS will be required in the reissued permit.

Summary of Additional Limitations:
In conclusion, the following additional limitations are required to comply with s. NR 106.07 Wis. Adm. Code, Expression of Limits.

	Outfall 001		Outfall 003	
Parameter	Daily Maximum	Monthly Average	Daily Maximum	Monthly Average
Chlorine	38 µg/L	**38 µg/L**	38 µg/L	**38 µg/L**
Cadmium	57 µg/L	**57 µg/L**		
Cyanide	92 µg/L	**92 µg/L**		
Copper	72 µg/L	**72 µg/L**		
PFOS	**11 ng/L**	11 ng/L	**11 ng/L**	11 ng/L

PART 8 – ADDITIVE REVIEW

Unlike the metals and toxic substances evaluated in Part 2, most additives have not undergone the amount of toxicity testing needed to calculate water quality criteria. Instead, in cases where the minimum data requirements necessary to calculate a WQC are not met, a secondary value can be used to regulate the substance, according to s. NR 105.05, Wis. Adm. Code. Whenever an additive is discharged directly into a surface water without receiving treatment or an additive is used in the treatment process and is not expected to be removed before discharge, a review of the additive is needed. Secondary values should be derived according to s. NR 105.05, Wis. Adm. Code. Guidance related to conducting an additive review can be found in *Water Quality Review Procedures for Additives* (2019) (http://dnr.wi.gov/topic/wastewater/Guidance.html).

The following additives are used in the boiler house at the facility. The maximum possible effluent concentration is calculated with a mass balance, assuming none of the additive is removed or degraded in facility processes as a conservative estimate. Secondary chronic values are not calculated in this evaluation. Because of the very high amount of available dilution, any limits for secondary chronic values would be less restrictive than those based on secondary acute values.

ED_014293_00000430-00119

Attachment #1

Additive Name	Manufacturer	Purpose of Additive	Intermittent or Continuous Feed	Dosage Rate (Gal/yr)	Max Effluent Concentration (mg/L)	Secondary Acute Value (mg/L)[1]	Is Additive Authorized in Current Permit?[2]
CL16	ChemTreat	RO Cleaner	Monthly	15	7.1	125	No
FO140	ChemTreat	Defoamer	Monthly	30	14	98.2	No
BL1544	ChemTreat	Steam Line Treatment	Continuous	150	2.3	9.56	No
BL1342	ChemTreat	Boiler Water Treatment	Continuous	150	2.3	109	No
BL1253	ChemTreat	Boiler Water Treatment	Continuous	450	7.0	59.2	No
BL197	ChemTreat	Antifoam		2	11	76.9	No
BL122	ChemTreat	Boiler Water Treatment	Monthly	15	7.1	27.2	No

1. Calculated based on toxicity data provided
2. Evaluation are not necessary for additives that have active ingredients consisting only of chlorine, caustic soda (sodium hydroxide), hypochlorite, sulfuric acid, hydrochloric acid

Effluent concentrations of all of these water quality conditioners are much lower than the calculated secondary acute values. Therefore, these additives may be approved in the reissued permit at the reported usage rates.

PLANNED FACILITY CHANGES

In the next few years, the treated metal finishing process wastewater at Sampling Point 101 (SP 101) will be combined with Outfall 003 prior to discharge. The combined discharge will be referred to as Outfall 004 in the reissued permit. Outfall 001 will be decommissioned and the waste streams other than SP 101 will be rerouted. The stormwater from Outfall 001 will be transferred overland and covered under the facility's stormwater permit. The noncontact cooling water and boiler blowdown from the site will be discharged to the sanitary sewer. This section evaluates any implications this will have for permit limits and recommends any changes in limits that should occur following the facility changes.

Effluent limits and monitoring requirements for Outfalls 001 and 003 are recommended to be continued at Outfall 004 unless otherwise stated below.

TBELs at Sampling Point 101

The limits needed based on the categorical limits applied at SP 101 are re-evaluated for 004. Because the overall flow volume will be decreasing, SP 101 will make up a larger percentage of the discharge from 004 (about 63%). The applicable categorical limits for SP 101 are multiplied by the percentage of 004 flow which will be made up of SP 101 flow to determine the highest effluent concentration that the categorical limit would allow at Outfall 004. This maximum allowed concentration is compared to the calculated WQBELs to determine the need for a WQBEL at Outfall 004.

This comparison shows a need for Nickel and Zinc limits in addition to the Cadmium, Copper, and Cyanide limits already recommended for Outfall 001. These limits are accompanied by respective monthly average limits and daily max mass limits. The daily max mass limits are calculated using the expected daily max flow at Outfall 004, which is the sum of the daily max flow at SP 101 and the current Outfall 003 (0.448 MGD + 0.041 MGD = 0.489 MGD).

ED_014293_00000430-00120

	Categorical SP 101 Limit		Highest Allowed Concentration at 001 (63% of SP 101 Limit)		Calculated Limits for Outfall 001			Respective Mass Limit (lbs/day)
	Monthly Avg. (µg/L)	Daily Max (µg/L)	Monthly Avg. (µg/L)	Daily Max (µg/L)	Monthly Avg. (µg/L)	Weekly Avg. (µg/L)	Daily Max (µg/L)	
Cadmium	260	690	165	438	1.01E+06	3390	57	**0.23**
Chromium (+3)	1710	2770	1085	1758	1.04E+10	185000	7460	
Nickel	2380	3980	1511	2526	1.17E+08	73900	**1990**	**8.1**
Zinc	1480	2610	939	1657	-	169000	**523**	**2.1**
Cyanide	650	1200	413	762	2.54E+07	12300	92	**0.37**
Copper	2070	3380	1314	2146	-	14000	69*	**0.28**
Lead	430	690	273	438	3.81E+05	40800	504	
Silver	240	430	152	273	7.64E+07	-	-	

*The daily maximum copper limit calculated in Part 2 is 72 ug/L. However, a limit of 69 ug/L at Outfall 001 is included in the current permit. In absence of an antidegradation and antibacksliding demonstrations, the current copper limit should be continued in the reissued permit.

Variance Limit Application

Because limited data is currently available for SP 101, the facility conducted monitoring and provided 14 arsenic and mercury sample results for SP 101 from February 2020. The average of arsenic results at SP 101 was 3 ug/L and the maximum result was 14 ug/L. These levels exceed the Lake Michigan criteria of 0.2 ug/L and warrant a variance. Similarly, the 1-day P_{99} and 30-day P_{99} values of mercury monitoring results at SP 101 are 6.8 ng/L and 1.7 ng/L respectively. Because the 30-day P_{99} is greater than 1.3 ng/L, this discharge level warrants a mercury variance for the discharge from SP 101.

Because both Outfall 003 and SP 101 require mercury and arsenic variances, variance limits will be applied to the combined discharge at Outfall 004. To calculate appropriate interim limits, a predicted daily maximum value for Outfall 004 was calculated using a mass balance with flows and maximum expected discharge concentrations from Outfall 003 and SP 101.

Maximum expected mercury values for Outfall 003 and SP 101 are the 1-day P_{99} values from available, representative effluent data. For arsenic at Outfall 003, the 1-day P_{99} value exceeds the arsenic interim limit of 500 ug/L. Since the interim limit is the highest discharge level that will be allowed, this level is set as the maximum expected arsenic level for Outfall 003.

Because there are less than 11 effluent arsenic results available for SP 101, there is not sufficient data to calculate a 1-day P_{99}. When less than 11 effluent results are available for a pollutant, reasonable potential is determined by comparing one fifth of the limit to the average of available effluent data in accordance with s. NR 106.05(6), Wis. Adm. Code. In this situation, the same principle is applied to estimate a maximum expected value equal to five times the average of effluent data. This value is 15 ug/L (5 × 3 ug/L). For reference, this value is just higher than the maximum detected arsenic result of 14 ug/L.

ED_014293_00000430-00121

The mass balance results in recommended interim limits of 190 ug/L (194 rounded to 2 significant figures) for arsenic and 18 ng/L for mercury at Outfall 004.

	Max Annual Average Flow Rate	Arsenic	Mercury
SP 101	0.0325 MGD	15 ug/L (5x average)	6.8 ng/L (1-day P_{99})
Discharge from Outfall 003	0.0190 MGD	500 ug/L (interim limit)	24 ng/L (1-day P_{99})
Projected Outfall 004	0.0515 MGD	194 ug/L	18 ng/L

The majority of the arsenic and mercury sources at the facility are associated with the discharge from Outfall 003. The new treatment system and several source reduction measures are aimed at addressing this. Therefore, separate variance limits are also recommended for the future internal sample point for the Outfall 003 discharge. **The arsenic limit of 500 ug/L and the mercury limit of 24 ng/L which will be in effect at Outfall 003 at the time of facility changes will be transferred to the internal sample point for the same associated discharge** following facility changes.

Whole Effluent Toxicity

For the current discharge situation, the current permit will include an acute WET limit for both Outfalls 001 and 003. The permit will require two tests per year at Outfall 001 and annual testing at Outfall 003. **For the combined discharge at Outfall 004, two acute WET tests per year is recommended**, to maintain the recommendations for the Outfall 001 discharge.

Mass Limitations

Most of the currently applicable concentration limits do not change as the result of adjusted effluent flow rates. However, each mass limit needs adjustment to account for different facility flows. The flows used for calculating mass limits for the Outfall 004 discharge are the sums of applicable flow rates from Outfall 003 and SP 101. The flow used for daily max mass limits is the sum of the daily maximum flow rates and the flow used for monthly average mass limits is the sum of the maximum annual average flow rates.

The current mass limits and adjusted mass limits for Outfall 004 are as follows:

	Outfall 001 Daily max	Outfall 001 Monthly Avg	Outfall 003 Monthly Avg	Outfall 004 Daily max	Outfall 004 Monthly Avg
Relevant Effluent Flow Rate:	0.570 MGD	0.167 MGD	0.0190 MGD	0.489 MGD	0.0515 MGD
Cadmium	0.27 lbs/day			0.23 lbs/day	
Copper	0.34 lbs/day			0.28 lbs/day	
Nickel				8.1 lbs/day	
Zinc				2.1 lbs/day	
Cyanide	0.44 lbs/day			0.37 lbs/day	
PFOS		0.0069 g/day	0.00079 g/day		0.0021 g/day

ED_014293_00000430-00122

Attachment #2

FIGURE 2
Location of Outfall 003 and Outfall 001
Tyco Fire Products LP Facility
Marinette, WI

CH2MHILL

Substantial Compliance Determination

Permittee Name: Tyco Fire Protection Products LP		Permit Number: 0001040-08-0
	Compliance?	Comments
Discharge Limits	Yes	There have been a few arsenic exceedances during the current permit. The facility has a history of responding quickly to exceedances by stopping discharge and meeting their limits soon after.
Sampling/testing requirements	Yes	
Groundwater standards	NA	
Reporting requirements	Yes	The facility submits annual mercury minimization reports on time each year.
Compliance schedules	NA	The facility does not have compliance schedules.
Management plan	NA	
Other:	NA	
Enforcement Considerations	None	
In substantial compliance?	Yes Comments: The facility reports their TTO certification each month on their DMRs. Signature: Nicole Krueger Date: 2/21/2018 Concurrence: Trevor Moen Date: 02/21/2018	

State of Wisconsin
DEPARTMENT OF NATURAL RESOURCES
Northeast Region Headquarters
2984 Shawano Avenue
Green Bay, WI 54313-6727

Tony Evers, Governor
Preston D. Cole, Secretary
Telephone (920) 662-5100
Toll Free 1-888-936-7463
TTY Access via relay - 711

WISCONSIN DEPT. OF NATURAL RESOURCES

December 11, 2019

Eric Bretl
Director of Operations
Tyco Fire Products LP
One Stanton Street
Marinette, WI 54143

SUBJECT: Wastewater Facility Inspection
WPDES Permit No: WI-0001040-07-0
Inspection Date: 12/04/2019

Dear Mr. Bretl,

A compliance inspection of the Tyco Fire Products LP was performed on 12/04/2019 by Trevor Moen, Jason Knutson, and myself. The purpose of the inspection was to determine compliance with the conditions of the WPDES permit and review wastewater operations and management activities at the plant. Findings and recommendations are found in the attached report. Please take the time to read it carefully.

The treatment plant was found in compliance with the effluent limits and all terms and conditions of the permit. The following recommendations or follow-up actions are needed:

1. Per NR 149, the automatic sampler located at Outfall 003 needs to have a traceable thermometer located in the refrigerator next to the sample container.

2. In order for the permit reissuance process to move forward in a timely manner, the facility must update the pollutant minimization plans for arsenic and mercury as part of the variance applications to reflect intended actions during the next permit term that were discussed in recent DNR-Tyco meetings/calls. Please contact Trevor Moen at (920) 424-7883 to discuss the necessary updates.

I want to thank Ryan Suennen, Victoria Marineau, and Anne Fleury for the time and cooperation in the performance of this inspection. Within 30 days, please provide a written response to this inspection report if any follow-up actions are noted above. If you have any questions regarding the report, feel free to call me at (920) 662-5426 or e-mail me at Laura.Gerold@wisconsin.gov.

Sincerely,

Laura Gerold

Laura Gerold, PE
Wastewater Engineer

Wastewater Treatment Plant Compliance/Inspection Checklist

Tyco Fire Products LP				Inspection Date	12/4/2019
One Stanton Street Marinette, WI 54143				Evaluated By	Laura A Gerold
OIC Name	VICTORIA L MARINEAU	WPDES Permit #	0001040-07-0	Effective Date	8/1/2003
On-Site Representative	Mike Elliott	Design Flow (Avg)	0.000	Expiration Date	6/30/2008
Responsible Official	Eric Bretl One Stanton Street Marinette, WI 54143				

Part A: ON-SITE INSPECTION			
	Compliance Questions	Comments	Followup
Facility Site Review			
Yes	1. Is a schematic diagram available of the treatment plant? If yes, attach.	See attached graphic. The graphic was updated onsite to account for the VSEP System taking the place of the Brine Reverse Osmosis Unit in the Groundwater Treatment System. The location of the flow meters was also added to the graphic.	
Yes	2. Are all liquid treatment train unit operations and processes operating satisfactorily?	Overall, the treatment plant appears to be running well and in order. See below for additional comments and attached pictures. There were arsenic effluent exceedances at the Groundwater Treatment System Outfall #003 in July, August, and December 2017 that were caused by holes in the filter press which allowed sludge to return to the system. The clothes were replaced. The groundwater treatment system has not been run as much recently as there are system changes that are being designed to combine both Outfall #1 and Outfall #3, and update the groundwater treatment system.	
Yes	3. Are there any unique treatment units, processes or operations in the liquid treatment train? If yes, comment.	The facility utilizes equalization tanks, co-precipitation with iron and zinc compounds, pH adjustment, and microfiltration to treat the process wastewater. Sodium metabisulfite is also added to neutralize chlorine. Reverse osmosis is also used if the water is going back into the production line. The groundwater remediation water is treated the same way with the addition of reverse osmosis and the VSEP filter system. Liquid waste from the groundwater system is disposed of by Waste Management in a deep water injection well in Vickery, Ohio.	
Yes	4. Is effluent being discharged clear, free of floating solids or visible foam other than in trace amounts?	Observed the effluent at Outfall 001 and it appeared to be clear.	
Flow Measurement			
Yes	5. Is wastewater flow, influent and/or effluent, being accurately measured?	Outfall 001 has a flume with an ultrasonic flow meter that is located after the final tank, but before the outfall. Outfall 003 has a flow meter located after the final RO Permeate Tank.	
Yes	6. Are flow monitoring devices calibrated annually?	The flow meters are calibrated twice per year. One calibration per year is by Macaulay Shaw and the other calibration is by Synergy.	
No	7. Are there significant industrial/commercial contributors of wastewater to the plant? If yes, list in comments.	The only industrial wastewater is generated from the facility itself. Outfall 001 & Sample Point 101 - The wastewater treatment process treats wastewater from four industrial lines that consist primarily of rinse water in the system for manufacturing fire extinguishers. Outfall 003 - The groundwater treatment system treats pumped groundwater from onsite that has legacy contamination of arsenic.	

Sampling and Testing			
Yes	8. Are wastewater influent, effluent, biosolids and groundwater samples, as applicable, being collected and tested as required by the WPDES permit?	The onsite lab has not been certified since 2017. Samples are collected and sent to Eurofins Test America. Northern Lake Service Environmental Laboratory tests the mercury samples. Pace Analytical performs the WET testing. Chain of Custody forms are sent by the labs, and filled out by the facility. One copy is kept by the facility. Sampling Point 101 - 24-hour flow proportional composite sampler located after the lift station before it leaves the wastewater treatment building and is sampling the physical chemical process wastewater treatment system effluent. Outfall 003 - 24-hour flow proportional composite sampler located in the Groundwater Treatment portion of the building and is after the RO Permeate Water Collection Tank. It is sampling the treated groundwater. Outfall 001 - 24-hour flow proportional composite sample located in a building with the final pumps before discharge into the river. After the water is pumped to the mixing tank, it is pumped to a sample point container where the composite sampler draws its sample. The water that is sampled at Outfall 001 is a combined discharge of treated process wastewater, boiler house water, non contact cooling water, roof drain runoff, and groundwater infiltration. Note Sampling Point 106 in the 2008 permit is now Sampling Point Outfall 003. pH is measured using a continuous read pH probe.	
No	9. Are wastewater composite samplers being maintained at or less than 6C?	Sampling Point 101 - 4?C Outfall 001 - 4?C Outfall 003 - No thermometer. The samplers are flow proportional. Tubing is replaced approximately once per month at Sampling Points 101 and Outfall 001. Tubing is replaced less frequently at Outfall 003 due to it being used less frequently.	The sampler located at Outfall 003 needs to have a traceable thermometer per NR 149.
Yes	10. Are sampling logs being used to record sample days, times, temperatures and collector?	There are sampling logs at each sampler that include the required details.	
No	11. Were samples collected as part of this inspection? If yes, include state lab results.	No samples were taken as a part of this inspection.	

Operations and Maintenance			
Yes	12. Is the Operator-in-Charge certified at the proper grade(s)?	The plant is classified as Basic for Subclasses C and U1. Victoria Marineau (#36303) is certified as Basic in Subclass C: Biological Solids/Sludge and in Subclass U1: Unique Treatment Systems which is what is required to be the OIC for this facility. Michael Stauber (#36966) also has the same certification and Anne Fleury (#35128) is certified as Basic for U1: Unique Treatment Systems.	
Yes	13. Is the treatment works and disposal system being properly operated and maintained, when in operation?	The plant was properly maintained and operated. The reverse osmosis system for the wastewater treatment system was not being utilized to treat process wastewater at the time of this inspection.	

Yes	14. Are process control tests being performed and recorded to properly operate and maintain the plant?	Process control tests are regularly performed. pH is continuously tested at many stages of the process to ensure that precipitation is efficiently taking place. Conductivity is also measured. HACH colorimeters are used to routinely measure phosphates, TSS, and chlorine.	
Yes	15. Does the plant have a documented and implemented preventative maintenance program for major equipment?	The facility uses two computer maintenance programs, Maximal System and SAP, in conjunction for maintenance with work orders printed out weekly and routed. Process control tests results are used to determine when to change the membranes in the microfiltration units.	
Yes	16. Is the permittee following the requirements contained in any approved management plan?	There are no required management plans, but there are is a Pollutant Minimization Plan (PMP) per the Mercury Variance. The facility submits an annual mercury report. Food grade chemicals are used in the processes at the facility. There have been no mercury spills in the last three years at the facility. The facility has been switching out old switches and old light bulbs to reduce any mercury sources. Future plans are to only use Marinette City water in the boilers and not use Menomonee River water for other source reduction potential.	

Biosolids Treatment, Handling and Storage			
Yes	17. Are all unit operations and processes for biosolids/sludge treatment and storage operating satisfactorily?	All biosolids/sludge treatment and storage units were operating satisfactory. The groundwater system was not operational at the time of the inspection. Solids are separated using a microfiltration system and then thickened. After thickening, a filter press is used to dewater the sludge. The sludge is then transported offsite for ultimate disposal.	
Yes	18. Are there any unique treatment units, processes or operations in the solids treatment train? If yes, comment.	Solids are separated using a microfiltration system and then thickened. After thickening, a filter press is used to dewater the sludge. The sludge is then transported offsite for ultimate disposal.	
Yes	19. Are biosolids/solids meeting all applicable sludge quality standards and processes standards before disposal or distribution?	The solids from the wastewater system and groundwater systems are held in separate dumpsters until they are ultimately disposed of offsite. The wastewater system solids are disposed of in the Menomonee Landfill. The groundwater system solids are disposed of in a hazardous waste landfill in Arlington, Oregon.	
N/A	20. Are biosolids/solids being landspread meeting all NR 204 or NR 214 landspreading requirements?	The sludge is not landspread.	
N/A	21. Are all biosolids/solids and land application reports completed and submitted on time?	None are required.	

Part B. PERMIT AND REPORTING REQUIREMENTS

Permit			
Yes	22. Is a copy of the current WPDES permit kept at the treatment plant?	The permit has been expired since June 30,2008. A copy is kept onsite. An updated permit is currently being drafted.	

Yes	23. Was the WPDES permit reviewed with the operator-in-charge?	Questions were discussed related to the permit update, arsenic variance, mercury variance, and plant updates. A preliminary design was discussed to reroute the onsite pipeline and abandon Outfall 001. The wastewater plant effluent would be rerouted to Outfall 003 which would be potentially be renamed Outfall 004. Sampler placement for this outfall was discussed. The department recommended updating the PMPs for arsenic and mercury to help with the variance process. Make sure to include documentation for alternatives analysis for groundwater system upgrades, address all sources of mercury and arsenic, and include that all onsite chemicals were switched to food grade.	Update PMPs for arsenic and mercury.

Records/Reports			
Yes	24. Are all Discharge Monitoring Reports completed correctly and submitted on time?	DMRs are typically submitted correctly and on time. Issues Include: two late reports in the past three years, and a couple of missed samples due to a bottle breaking during transit and an issue with the ISCO sampler at sampling point 101. The department appreciates the notification of these issues. There were high arsenic levels in 2017 and earlier that are being addressed with future plant constructed changes.	
Yes	25. Are all other WPDES permit required reports completed correctly and submitted on time?	The facility submits annual mercury reports on time.	
N/A	26. Were there any CMAR compliance recommendations made or actions required because of low CMAR grades (C, D or F)?	This is an industrial facility and a CMAR is not required.	
N/A	27. Were there any CMAR follow-up actions regardless of grades?	This is an industrial facility and a CMAR is not required.	

Compliance Schedules			
Yes	28. Is the permittee up to date on required actions as specified in the Schedule of Compliance?	The facility submits annual mercury reports on time.	

Sanitary Sewer Overflows			
No	29. Have any sanitary sewer overflows occurred since the last inspections?	No spills reported onsite since the last inspection.	
Yes	30. Have SSOs been reported as required?	No spills reported onsite since the last inspection.	
N/A	31. Does the facility have a documented collection system O&M or CMOM program?	This is an industrial facility and a CMOM is not required. The facility has lined its sewer system to help reduce infiltration and inflow of contaminated groundwater and is now in the design process to replace parts of the sewer system to reduce I/I. Current project understanding is that the sewer will be moved above ground. One short portion of underground piping will remain below grade (8' bgs) between building 14 (WWTF building) and outfall 003. Jason Knutson requested during the inspection that arsenic concentrations and quantity of I/I entering this section of piping be studied, as this will be important for achieving the "highest attainable condition" for the arsenic variance. The facility could potentially sample the manhole during periods of no discharge (i.e. weekends) to estimate I/I flow rate and quantify arsenic concentrations. This could be incorporated as part of the facility's updated arsenic PMP.	

Part C: EFFLUENT / RECEIVING WATERS

Effluent Limits

Yes	32. Is the permittee in compliance with all effluent limits based on a review of discharge monitoring reports?	There was a WET test failure in 2017, but the facility passed on retest. They were not able to pinpoint why there was a failure. There were arsenic exceedances in 2017 at Outfall 003. The facility is working with a consulting firm to determine the best updates to the facility to prevent future exceedances.	The facility will keep working closely with the department on future updates.
N/A	33. Is the permittee in compliance with all groundwater standards based on a review of groundwater monitoring forms?	Groundwater monitoring not required as part of this WPDES permit.	

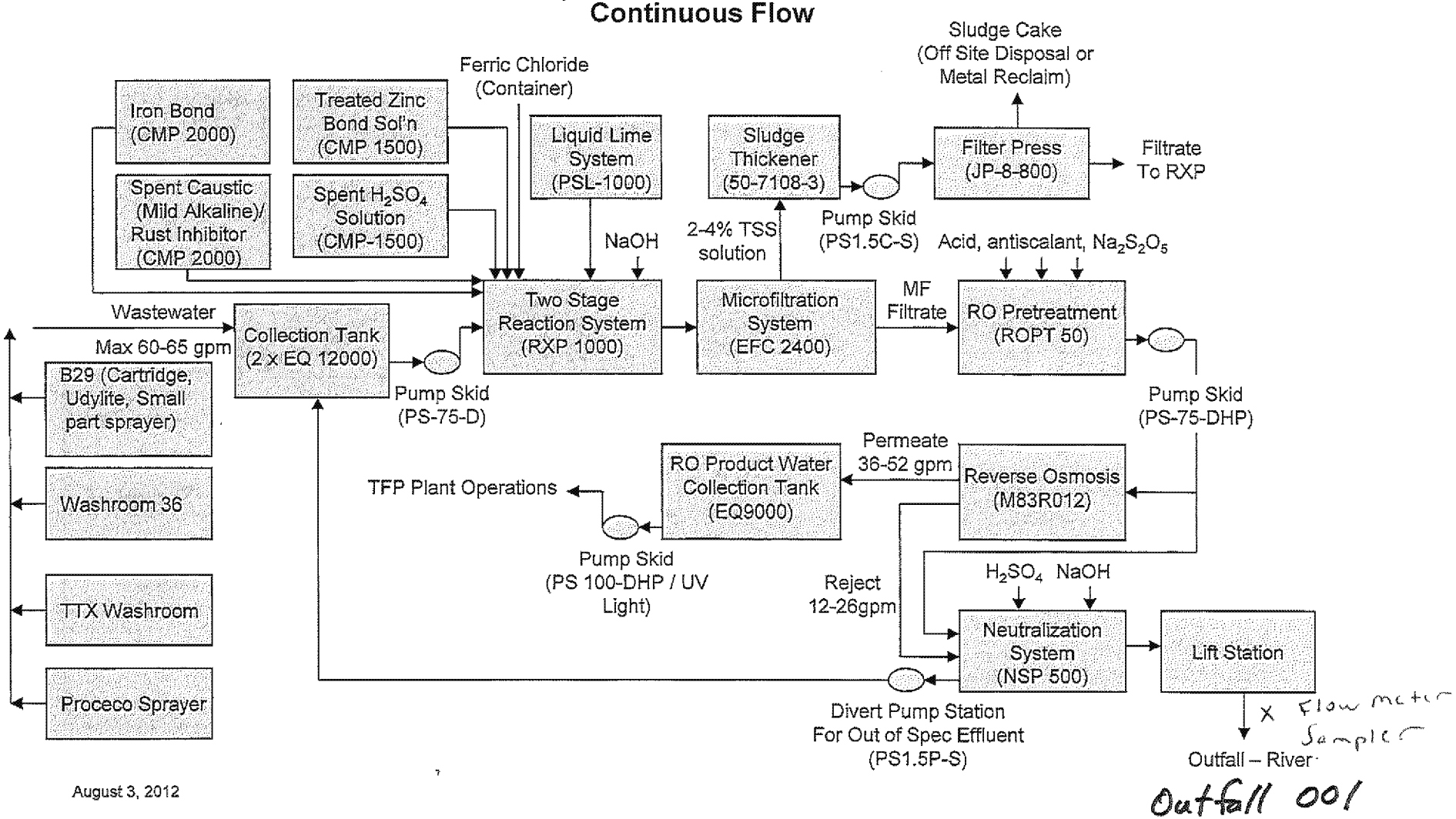
Outfalls			
No	34. Have you physically observed the effluent outfall?	The outfalls are submerged.	
N/E	35. If observable, does the outfall structure appear structurally sound and located as originally designed/constructed?	The outfalls are submerged.	

Receiving Waters			
Yes	36. Does the receiving water below the outfall appear acceptable compared to upstream water quality?	The Menomonee River is wide at this location and there was no difference before and after the outfalls. The River levels are high due to rain the past two years and high Lake Michigan levels. The facility is working on solutions to prevent flooding of the facility due to high river levels.	

General Comments			
Yes	37. Are there any general comments about this treatment facility?	The last mixing tank at Outfall 001 appears to need replacement, but it is scheduled to be removed as part of the near term facility updates.	

SUBSTANTIAL COMPLIANCE DETERMINATION			
Yes	38. Are all conditions of the permit, including standard conditions, being met?	All conditions and standard requirements of the current WPDES permit are being met.	
Yes	39. IS THE PERMITTEE IN SUBSTANTIAL COMPLIANCE WITH THE PERMIT? If not, please comment.	The permittee has been found to be in substantial compliance with their WPDES permit.	

Tyco Fire Products, LP
Marinette, WI
Process Flow Diagram of Wastewater Treatment / Water Reuse
Continuous Flow



August 3, 2012

Groundwater Treatment System

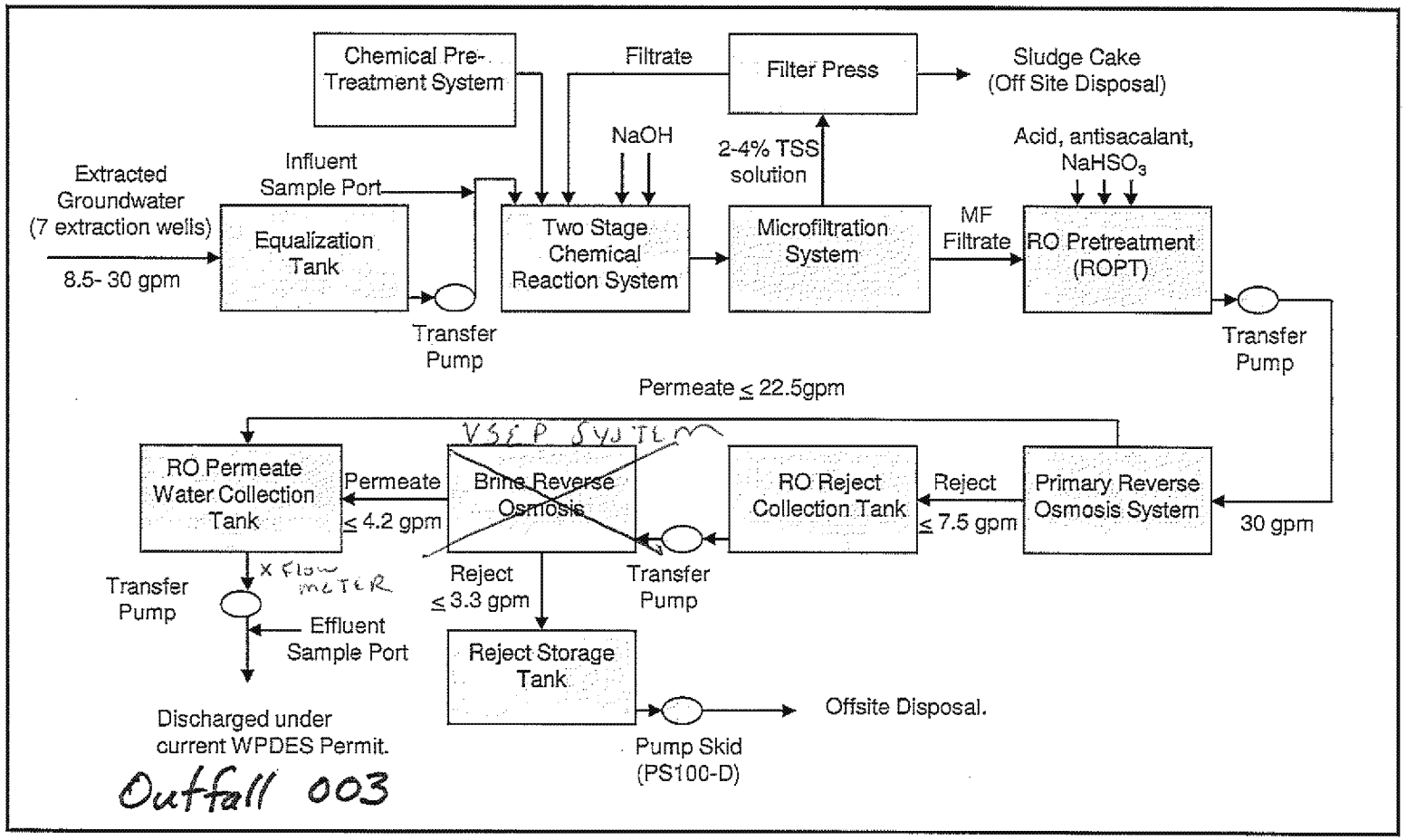
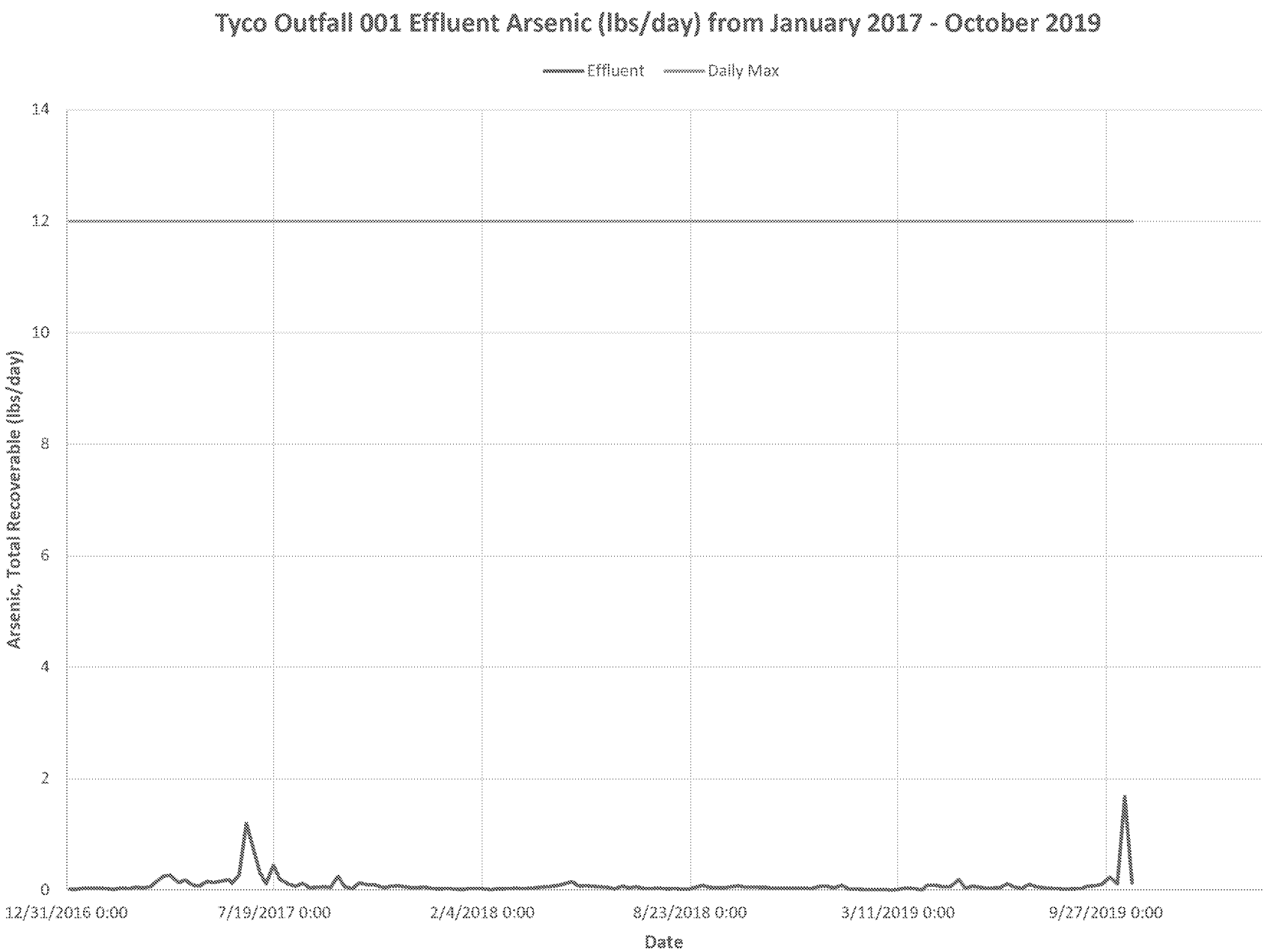
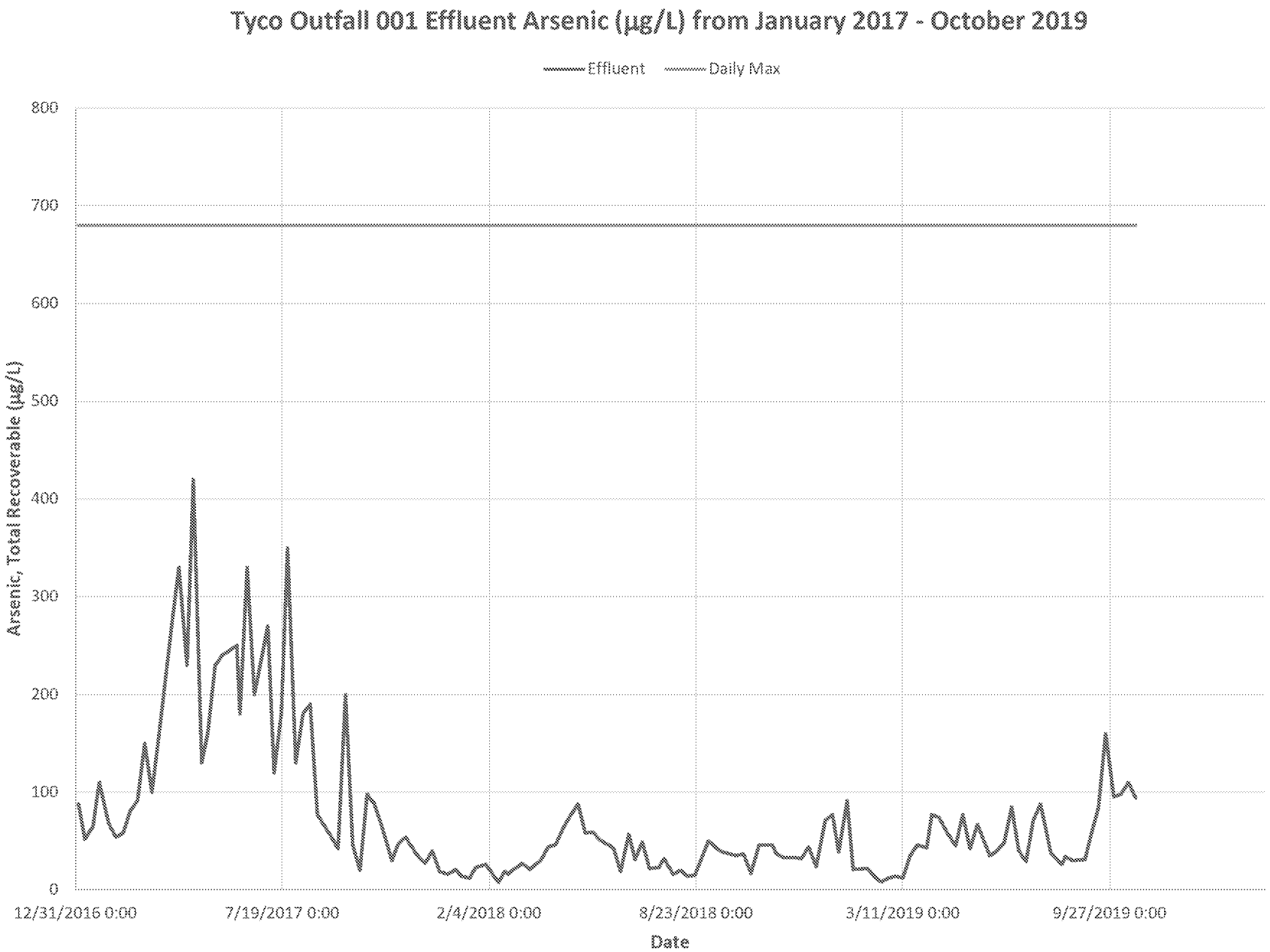
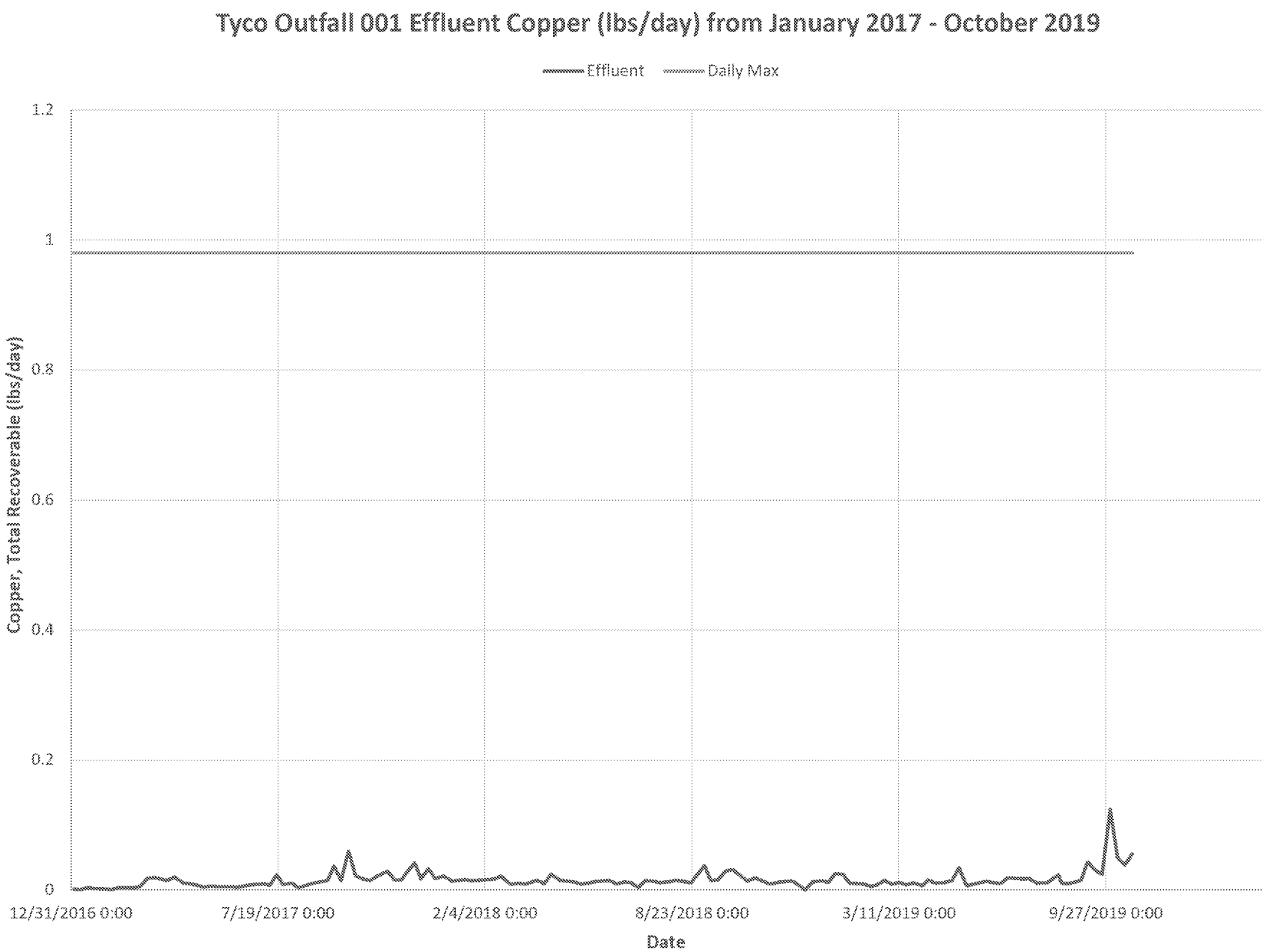


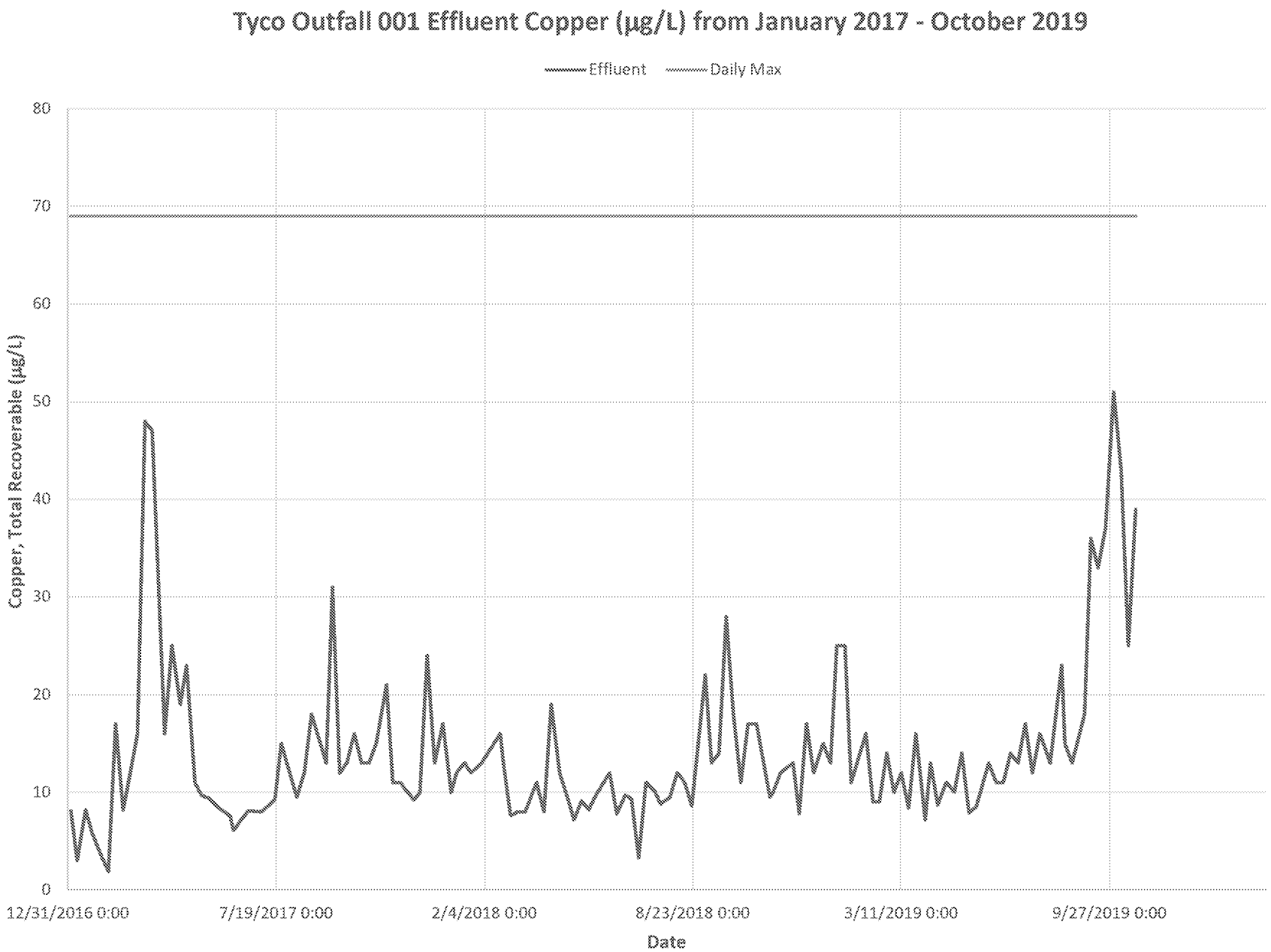
Figure 4
GWCT System Process Flow Diagram
Ansul Marinette Wisconsin Facility
Marinette, Wisconsin

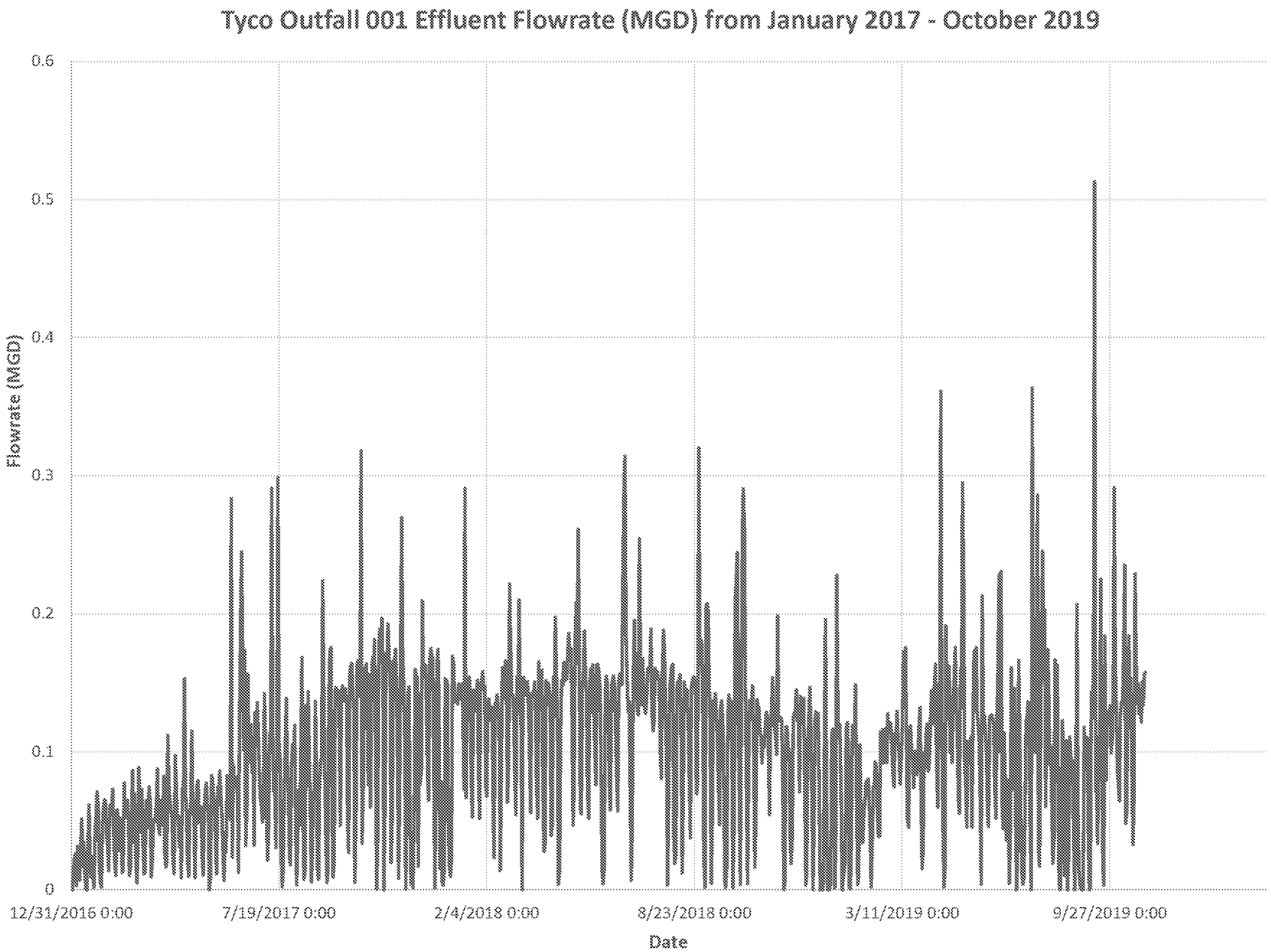
CH2M HILL

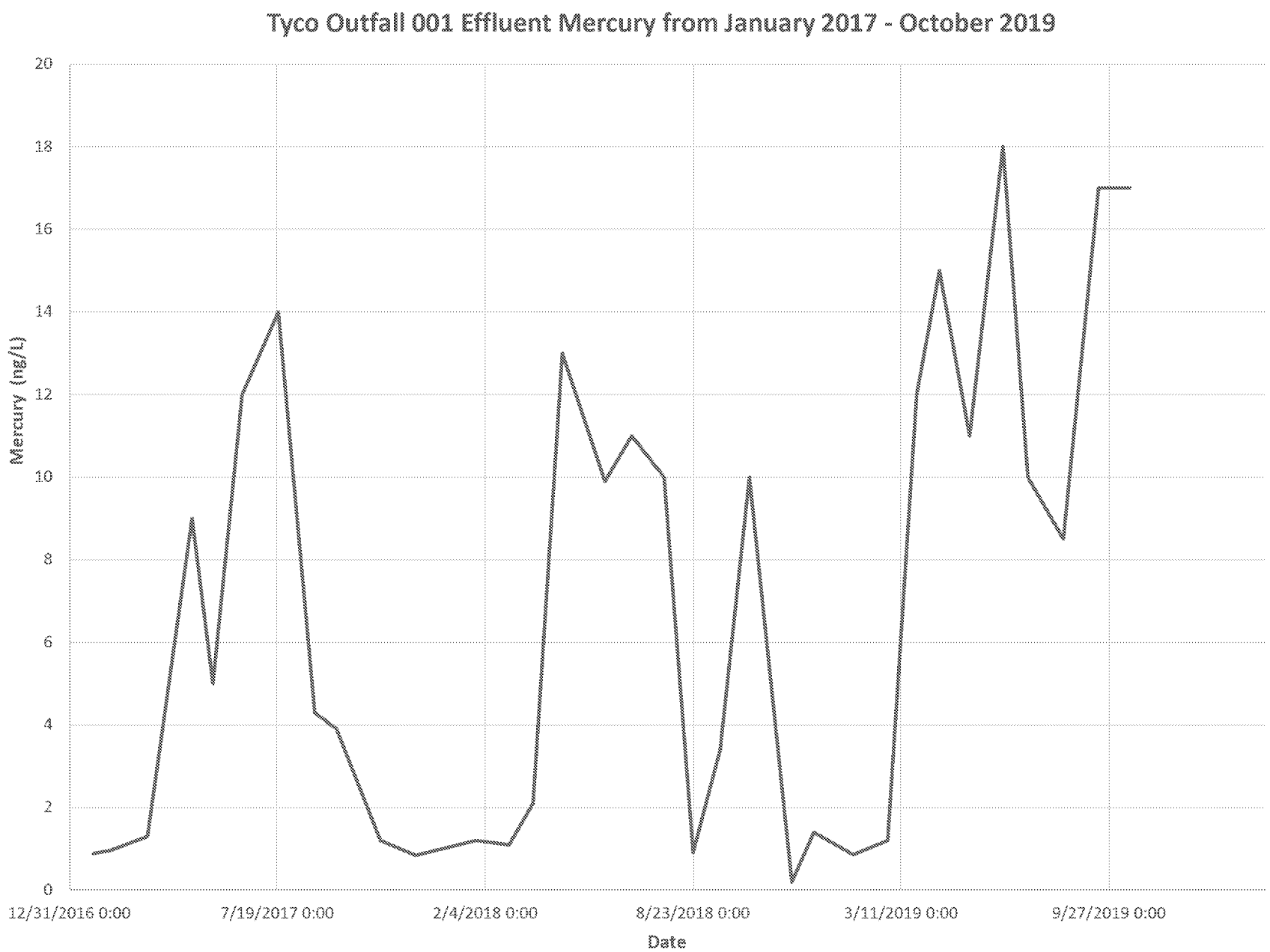

Tyco Outfall 001 Effluent Arsenic (lbs/day) from January 2017 - October 2019
Effluent
Daily Max
Arsenic, Total Recoverable (lbs/day)
14
12
10
8
6
4
2
0
12/31/2016 0:00
7/19/2017 0:00
2/4/2018 0:00
8/23/2018 0:00
3/11/2019 0:00
9/27/2019 0:00
Date

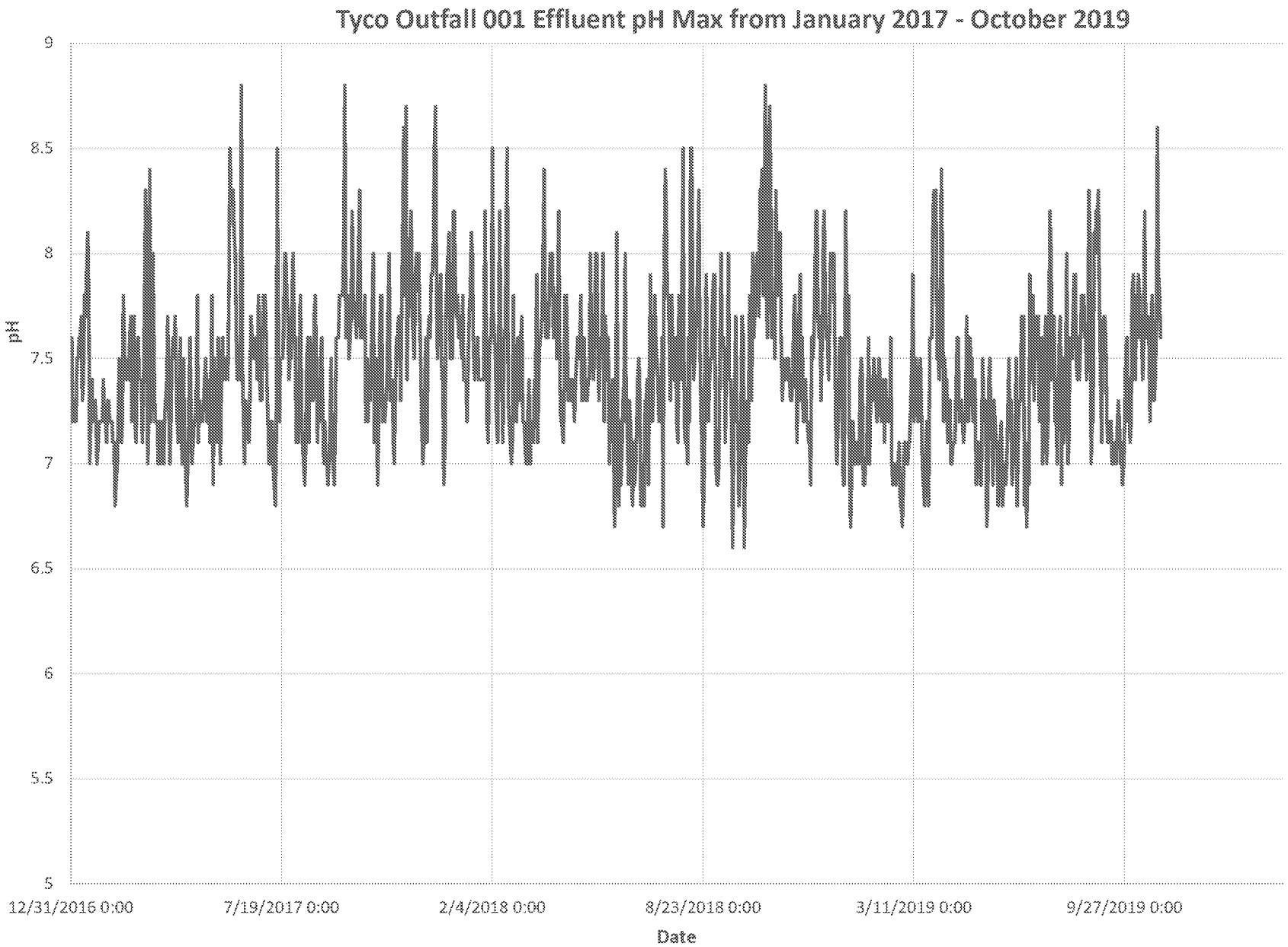

Tyco Outfall 001 Effluent Arsenic (µg/L) from January 2017 - October 2019
Effluent
Daily Max
800
700
600
500
400
300
200
100
0
Arsenic, Total Recoverable (µg/L)
12/31/2016 0:00
7/19/2017 0:00
2/4/2018 0:00
8/23/2018 0:00
3/11/2019 0:00
9/27/2019 0:00
Date

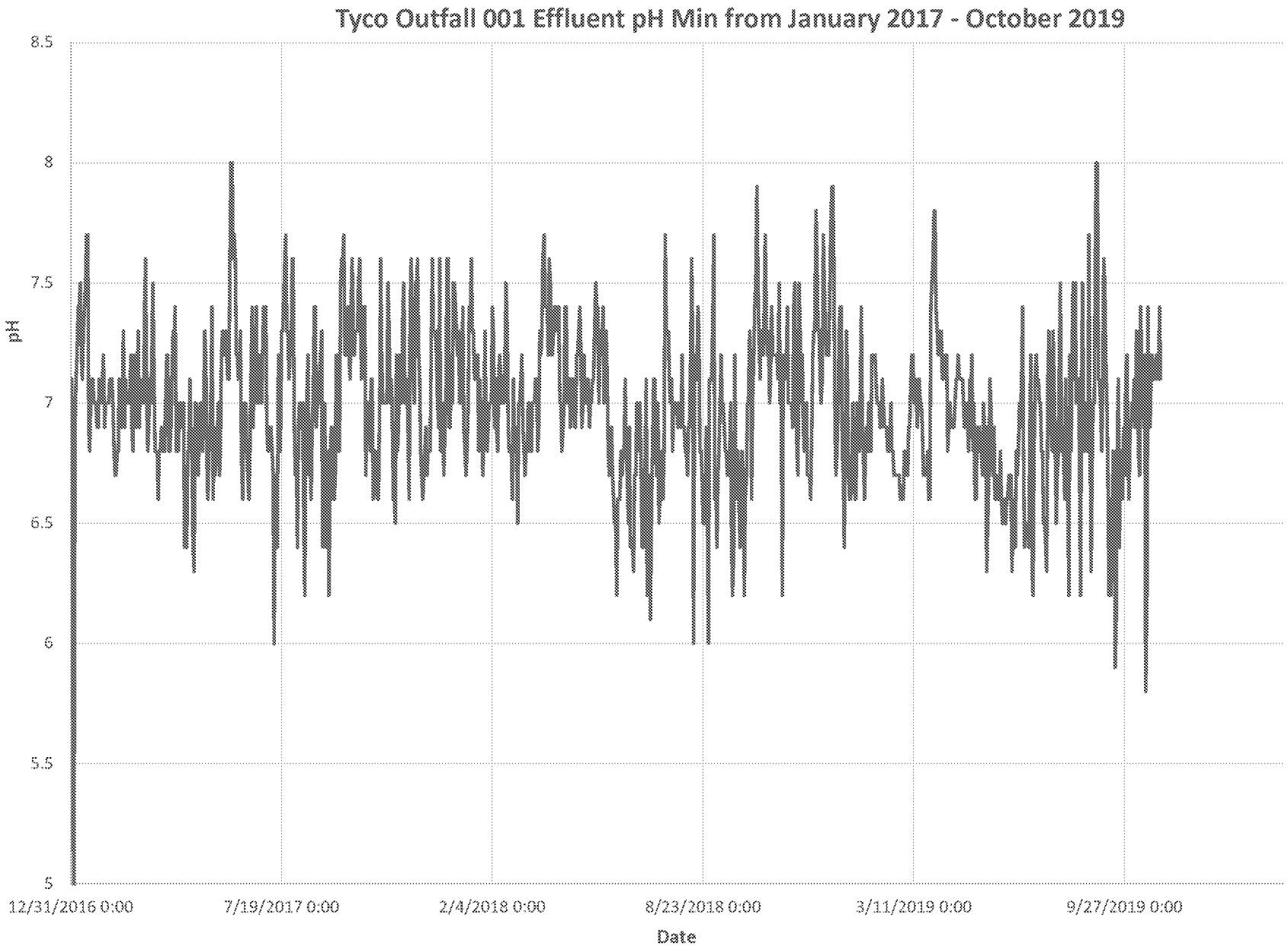

Tyco Outfall 001 Effluent Copper (lbs/day) from January 2017 - October 2019
Effluent
Daily Max
1.2
1
0.8
0.6
0.4
0.2
0
Copper, Total Recoverable (lbs/day)
12/31/2016 0:00
7/19/2017 0:00
2/4/2018 0:00
8/23/2018 0:00
3/11/2019 0:00
9/27/2019 0:00
Date

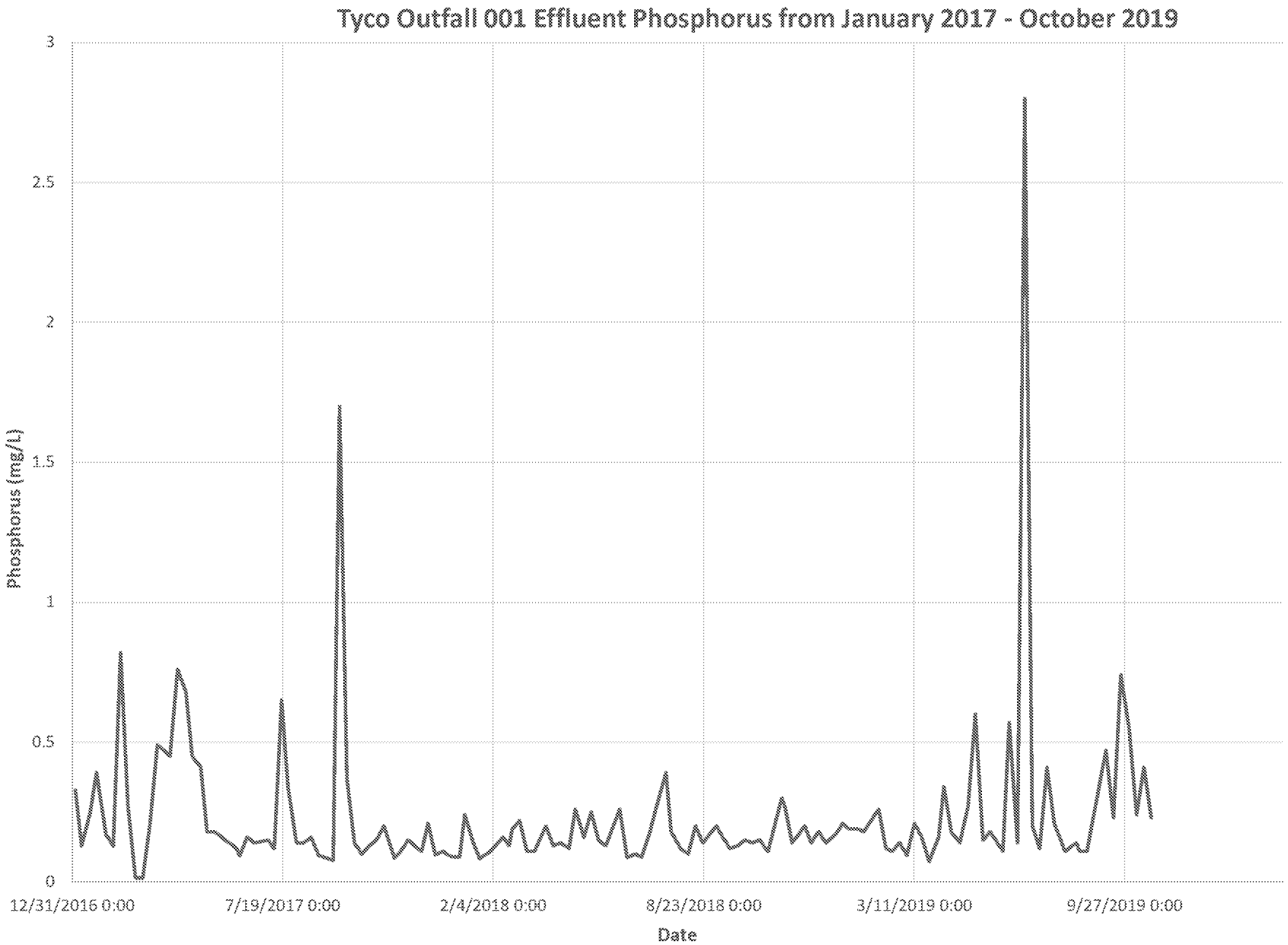

Tyco Outfall 001 Effluent Copper (µg/L) from January 2017 - October 2019
Effluent
Daily Max
Copper, Total Recoverable (µg/L)
80
70
60
50
40
30
20
10
0
12/31/2016 0:00
7/19/2017 0:00
2/4/2018 0:00
8/23/2018 0:00
3/11/2019 0:00
9/27/2019 0:00
Date

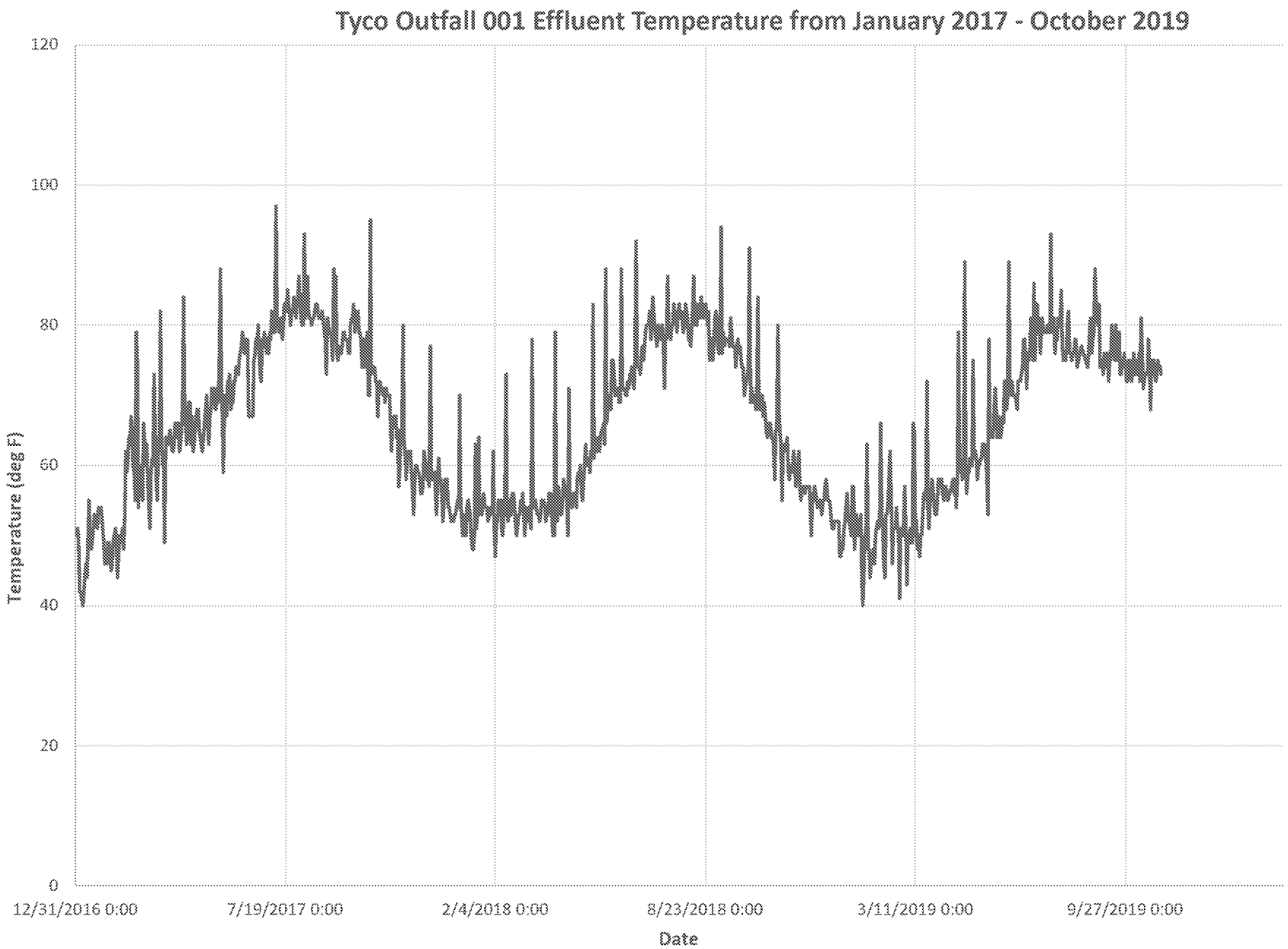

Tyco Outfall 001 Effluent Flowrate (MGD) from January 2017 - October 2019
Flowrate (MGD)
0.6
0.5
0.4
0.3
0.2
0.1
0
12/31/2016 0:00
7/19/2017 0:00
2/4/2018 0:00
8/23/2018 0:00
3/11/2019 0:00
9/27/2019 0:00
Date

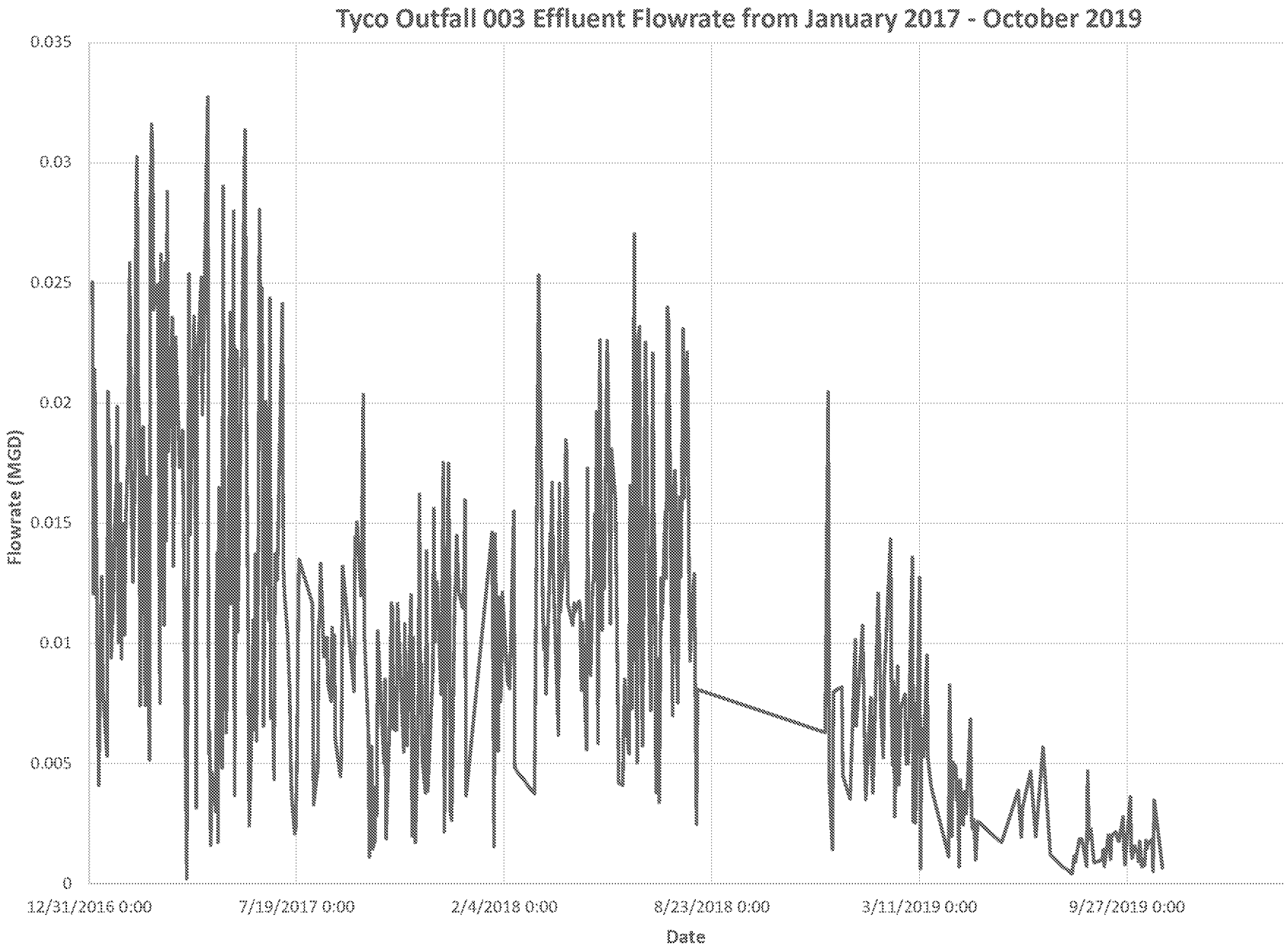

Tyco Outfall 001 Effluent Mercury from January 2017 - October 2019
Mercury (ng/L)
20
18
16
14
12
10
8
6
4
2
0
12/31/2016 0:00
7/19/2017 0:00
2/4/2018 0:00
8/23/2018 0:00
3/11/2019 0:00
9/27/2019 0:00
Date

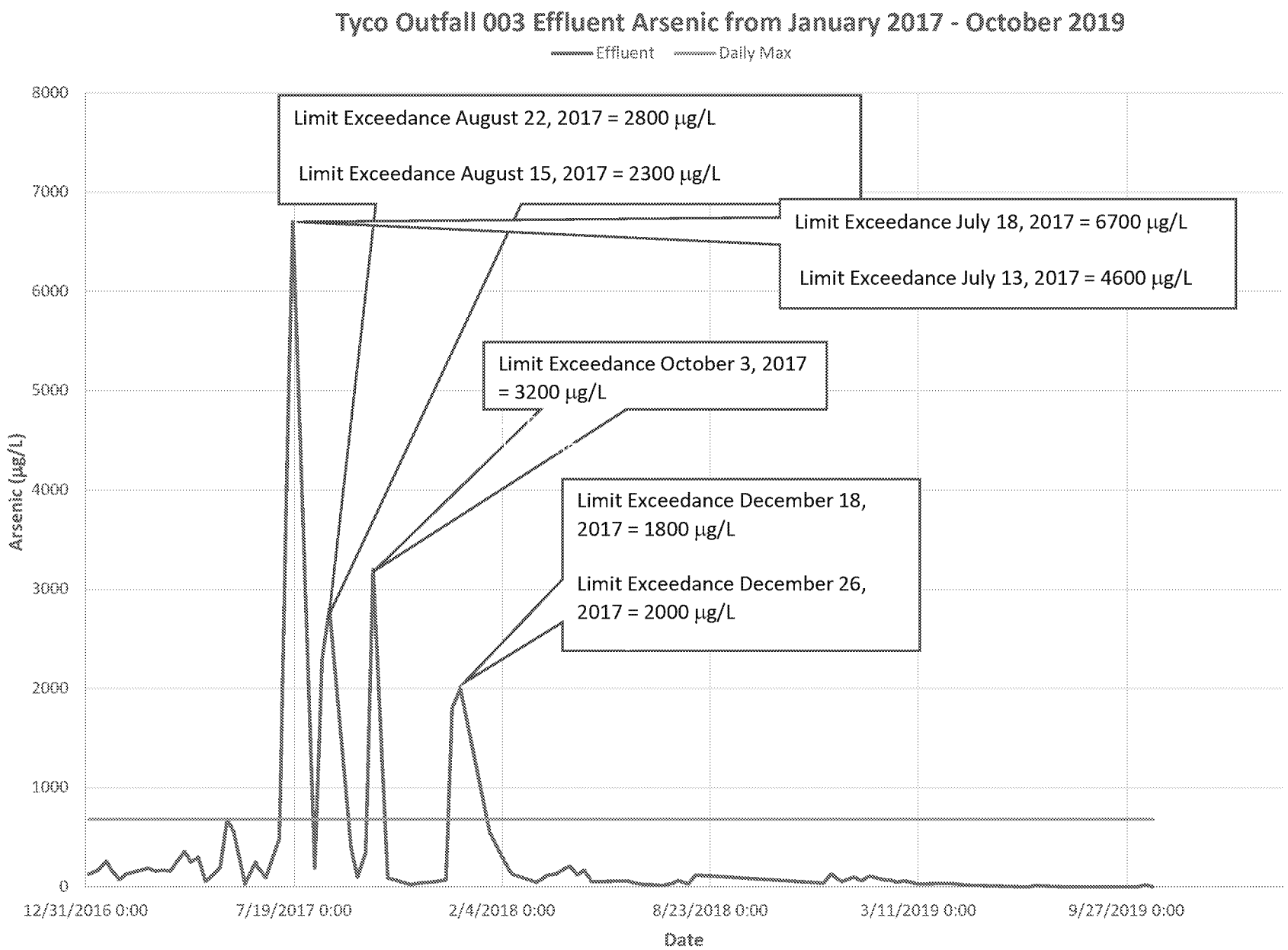

Tyco Outfall 001 Effluent pH Max from January 2017 - October 2019
9
8.5
8
7.5
7
6.5
6
5.5
5
pH
12/31/2016 0:00
7/19/2017 0:00
2/4/2018 0:00
8/23/2018 0:00
3/11/2019 0:00
9/27/2019 0:00
Date

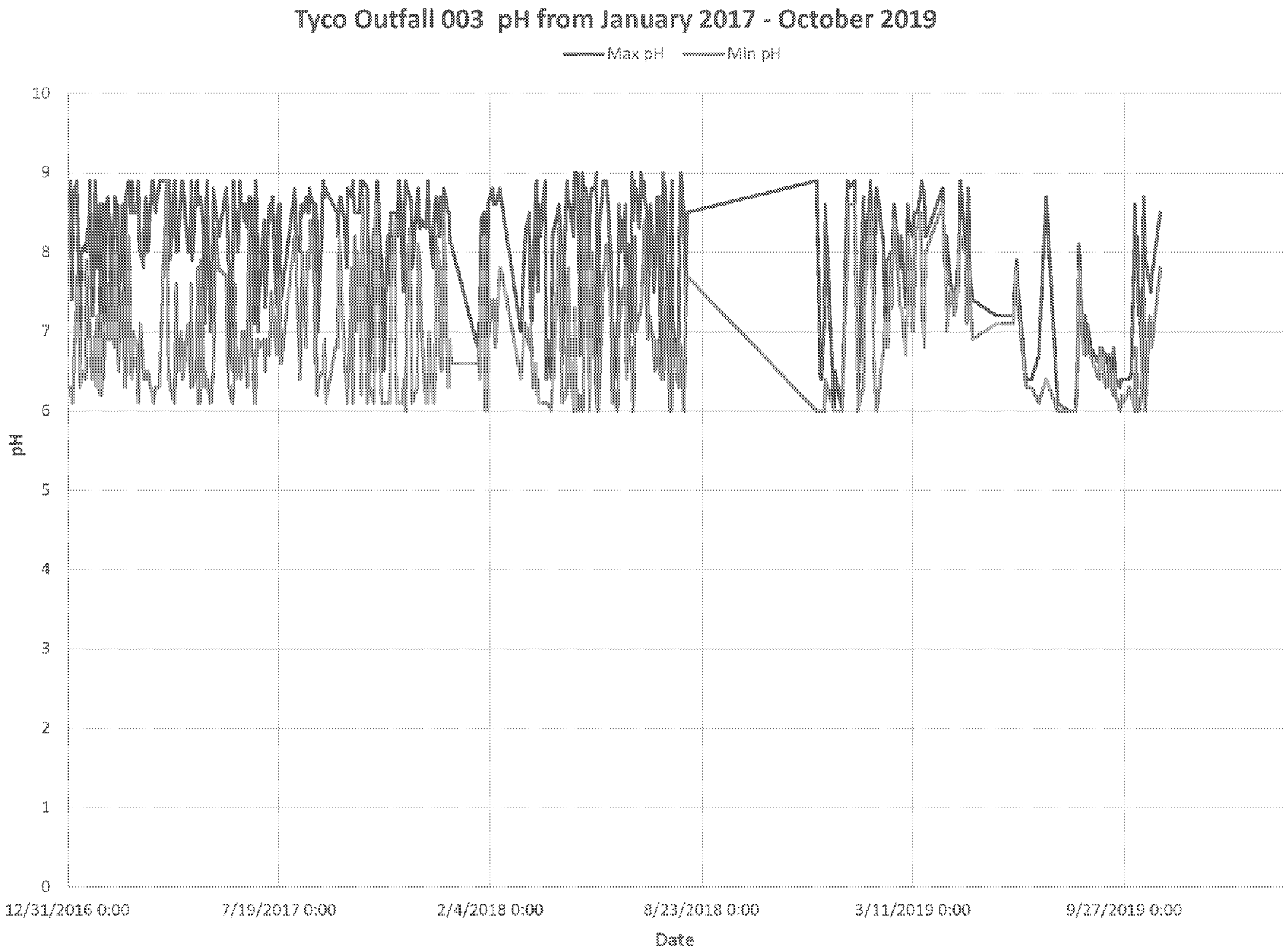

Tyco Outfall 001 Effluent pH Min from January 2017 - October 2019
8.5
8
7.5
7
6.5
6
5.5
5
pH
12/31/2016 0:00
7/19/2017 0:00
2/4/2018 0:00
8/23/2018 0:00
3/11/2019 0:00
9/27/2019 0:00
Date

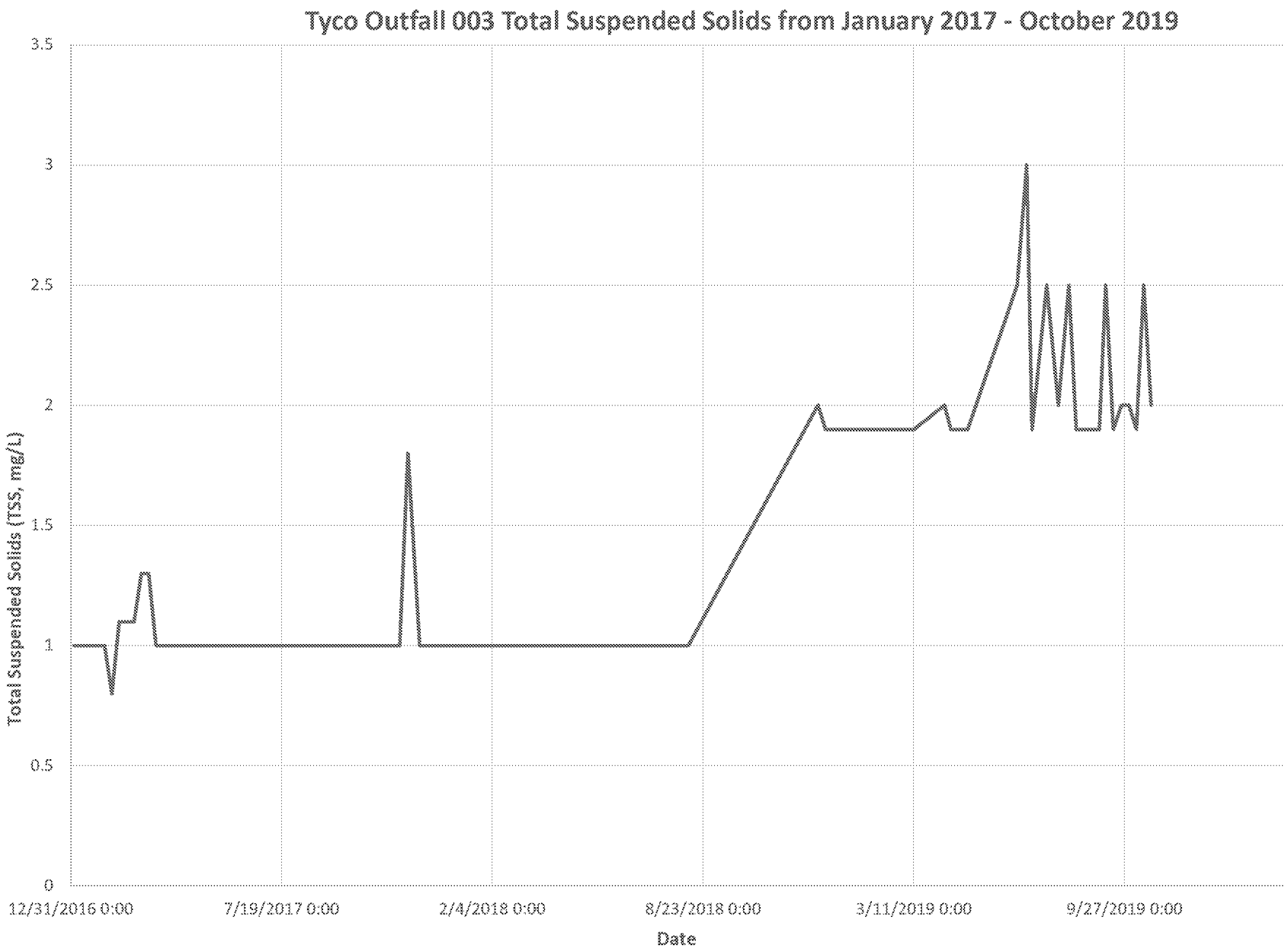

Tyco Outfall 001 Effluent Phosphorus from January 2017 - October 2019
Phosphorus (mg/L)
3
2.5
2
1.5
1
0.5
0
12/31/2016 0:00
7/19/2017 0:00
2/4/2018 0:00
8/23/2018 0:00
3/11/2019 0:00
9/27/2019 0:00
Date

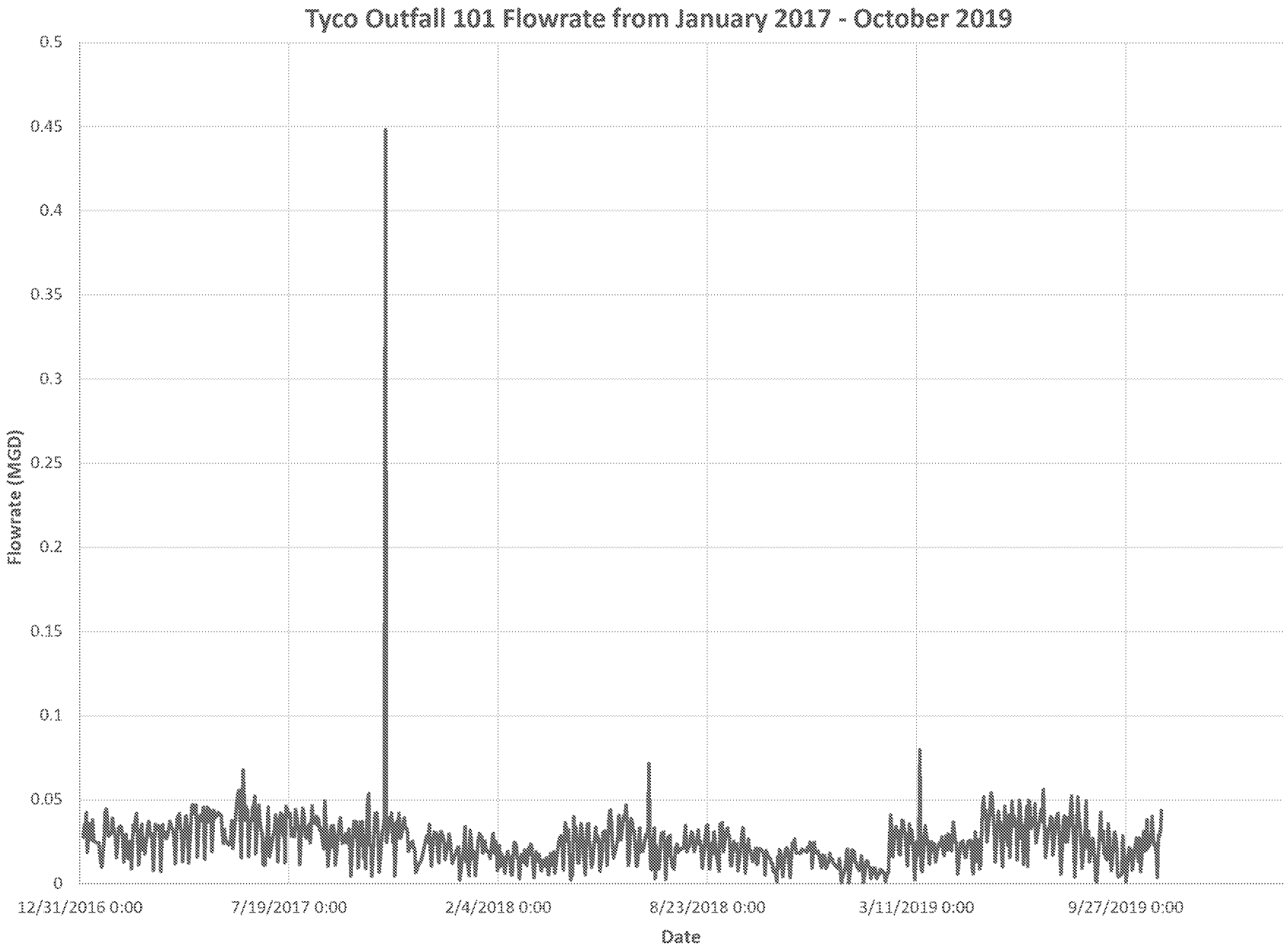

Tyco Outfall 001 Effluent Temperature from January 2017 - October 2019
120
100
80
60
40
20
0
Temperature (deg F)
12/31/2016 0:00
7/19/2017 0:00
2/4/2018 0:00
8/23/2018 0:00
3/11/2019 0:00
9/27/2019 0:00
Date

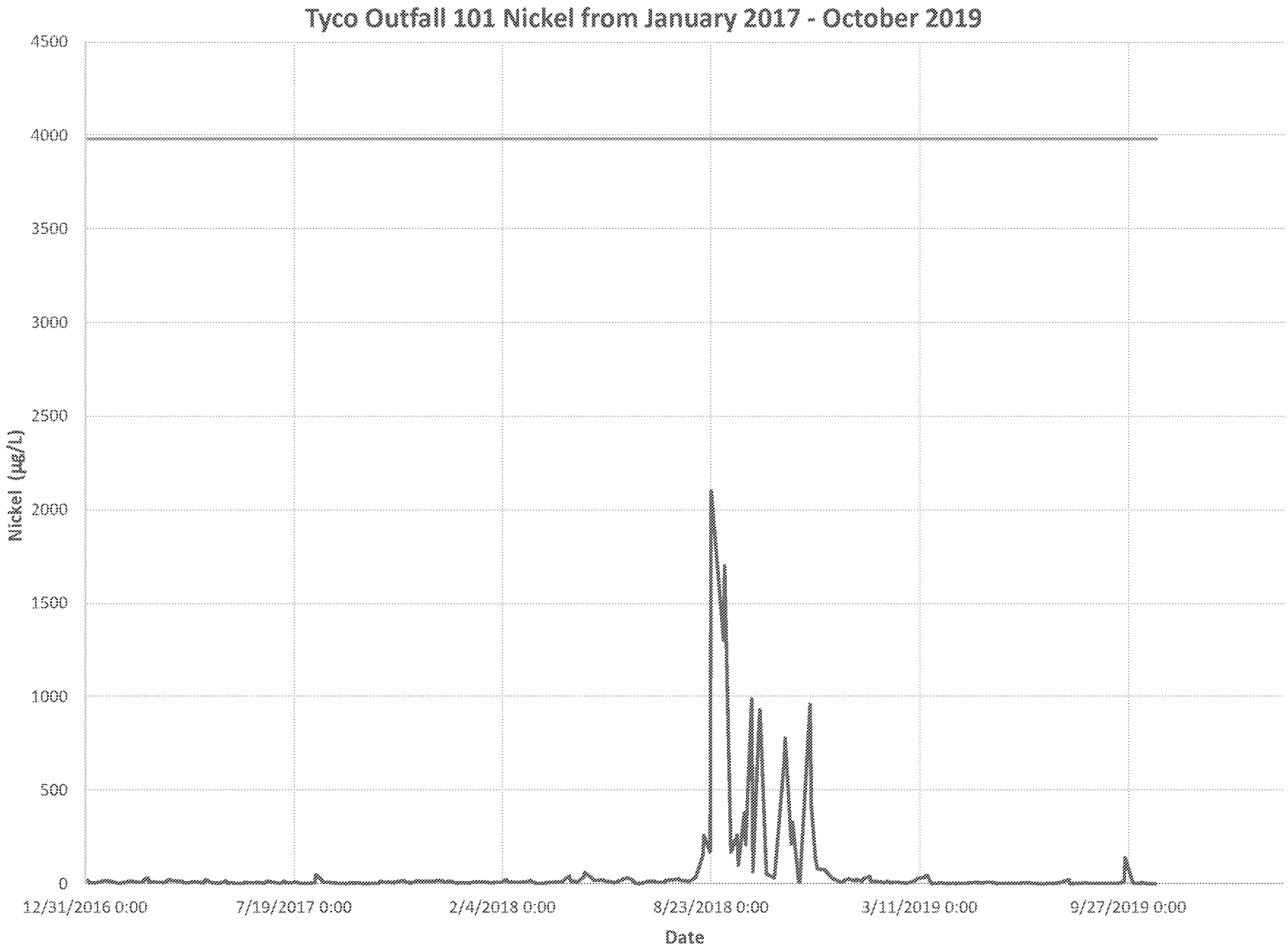

Tyco Outfall 003 Effluent Flowrate from January 2017 - October 2019
Flowrate (MGD)
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
12/31/2016 0:00
7/19/2017 0:00
2/4/2018 0:00
8/23/2018 0:00
3/11/2019 0:00
9/27/2019 0:00
Date


Tyco Outfall 003 Effluent Arsenic from January 2017 - October 2019
Effluent
Daily Max
Limit Exceedance August 22, 2017 = 2800 µg/L
Limit Exceedance August 15, 2017 = 2300 µg/L
Limit Exceedance July 18, 2017 = 6700 µg/L
Limit Exceedance July 13, 2017 = 4600 µg/L
Limit Exceedance October 3, 2017 = 3200 µg/L
Limit Exceedance December 18, 2017 = 1800 µg/L
Limit Exceedance December 26, 2017 = 2000 µg/L
Arsenic (µg/L)
8000
7000
6000
5000
4000
3000
2000
1000
0
12/31/2016 0:00
7/19/2017 0:00
2/4/2018 0:00
8/23/2018 0:00
3/11/2019 0:00
9/27/2019 0:00
Date

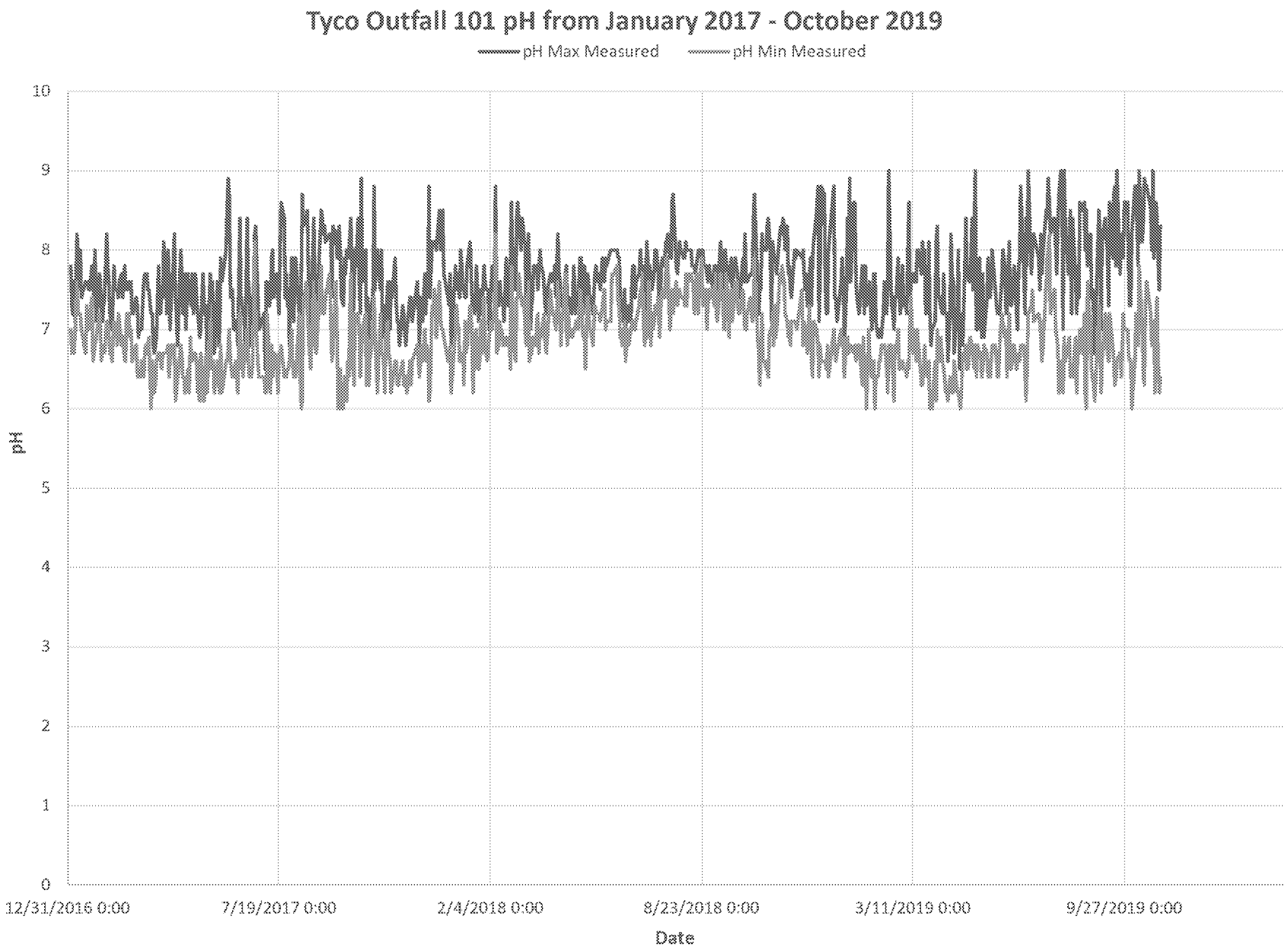

Tyco Outfall 003 pH from January 2017 - October 2019
Max pH
Min pH
pH
10
9
8
7
6
5
4
3
2
1
0
12/31/2016 0:00
7/19/2017 0:00
2/4/2018 0:00
8/23/2018 0:00
3/11/2019 0:00
9/27/2019 0:00
Date

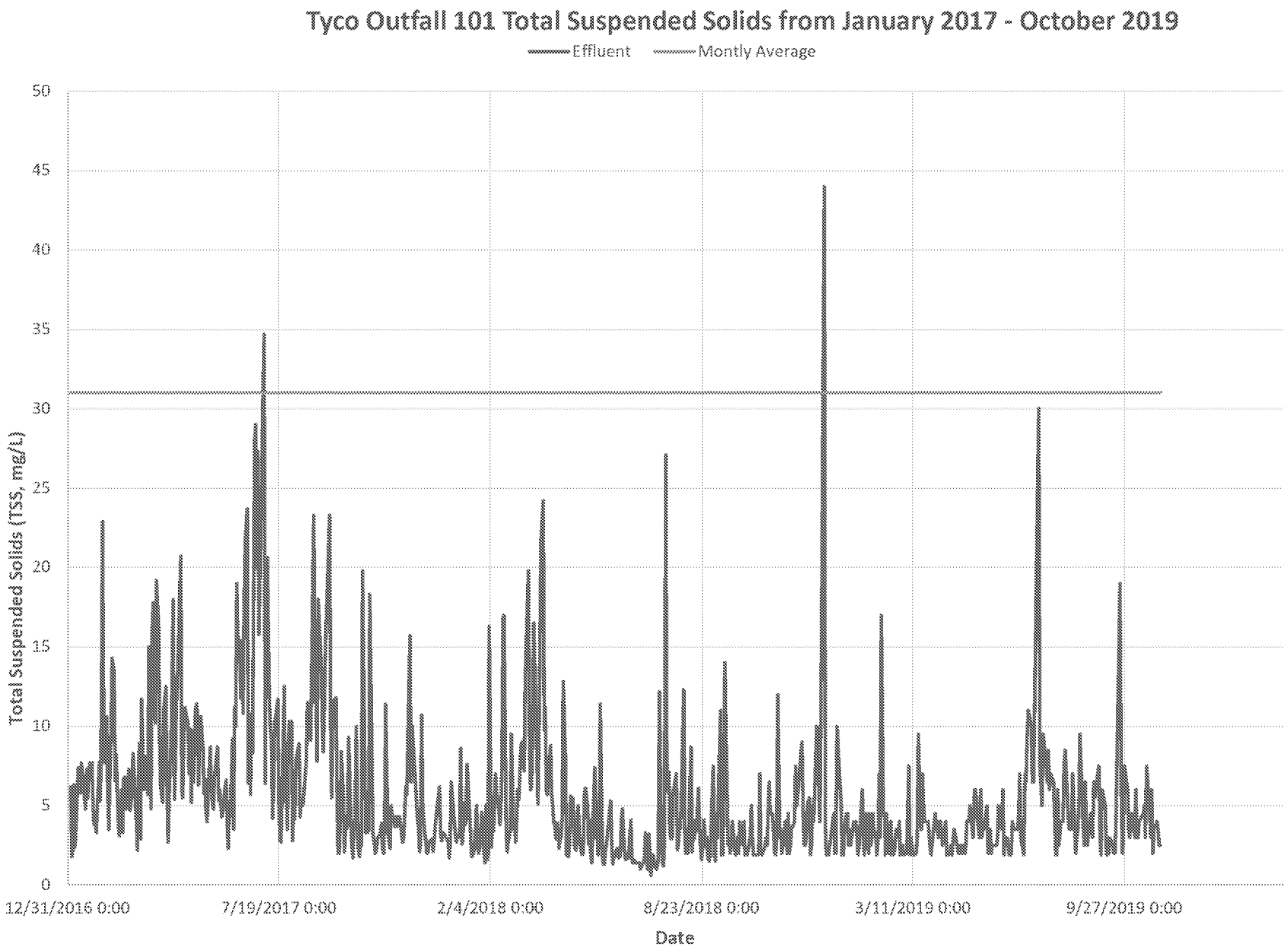

Tyco Outfall 003 Total Suspended Solids from January 2017 - October 2019
Total Suspended Solids (TSS, mg/L)
3.5
3
2.5
2
1.5
1
0.5
0
12/31/2016 0:00
7/19/2017 0:00
2/4/2018 0:00
8/23/2018 0:00
3/11/2019 0:00
9/27/2019 0:00
Date

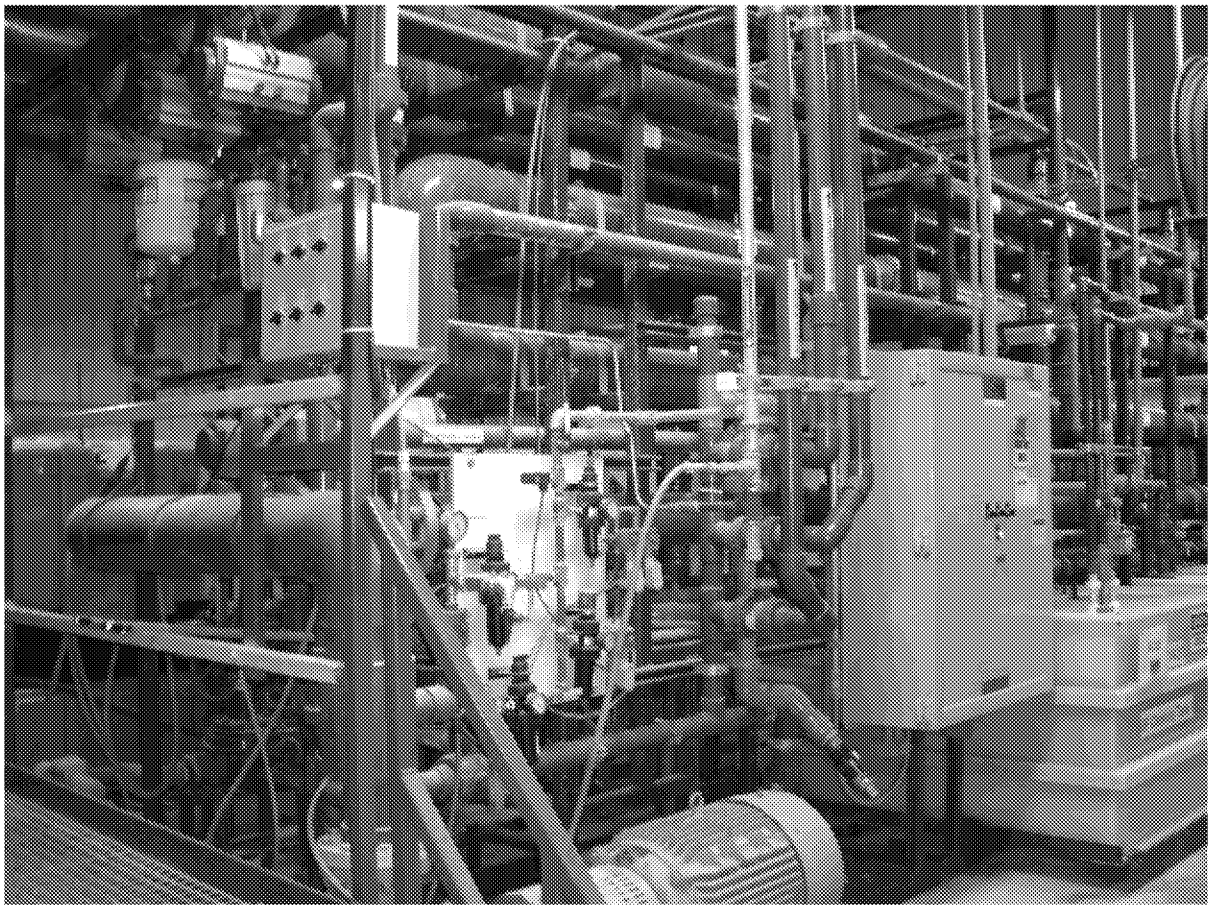

Tyco Outfall 101 Flowrate from January 2017 - October 2019
Flowrate (MGD)
0.5
0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
12/31/2016 0:00
7/19/2017 0:00
2/4/2018 0:00
8/23/2018 0:00
3/11/2019 0:00
9/27/2019 0:00
Date



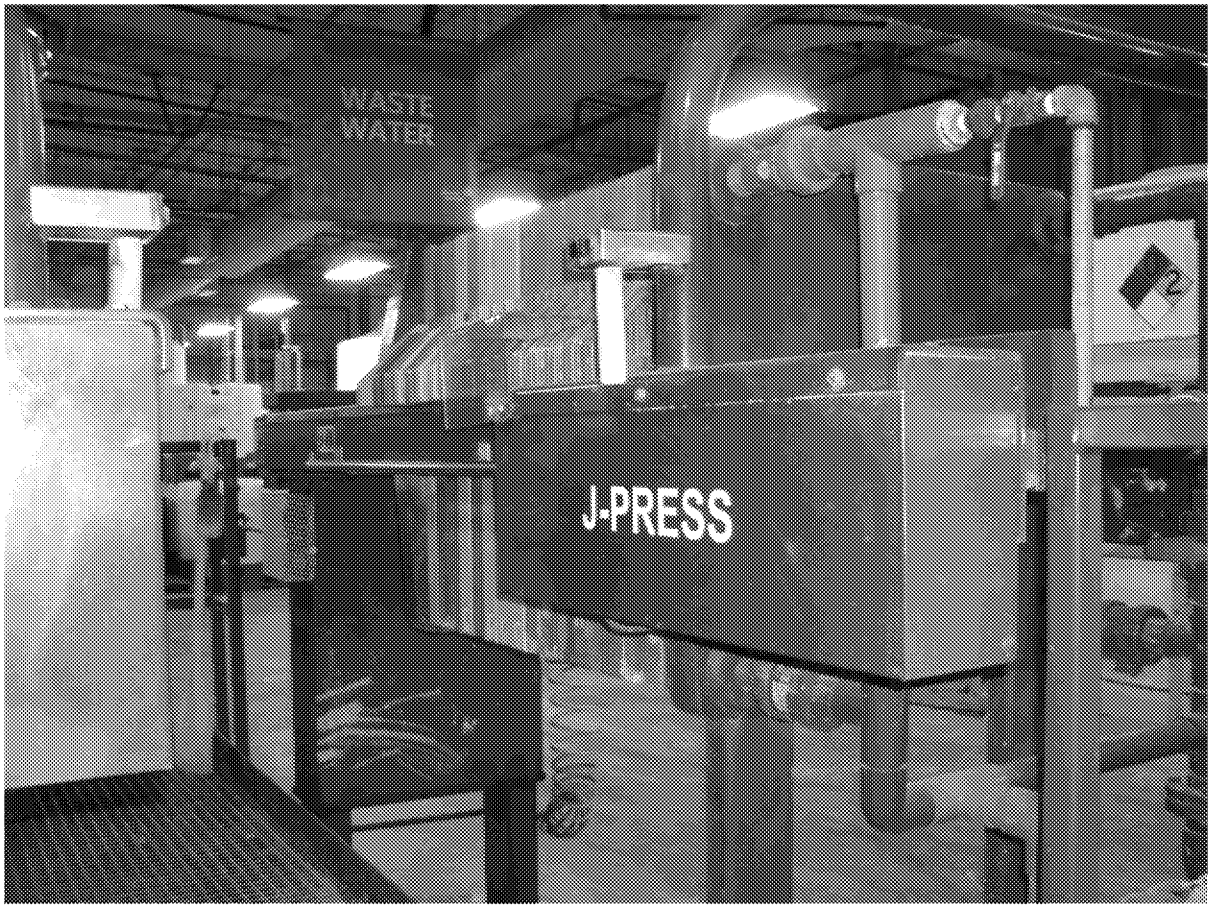
ED_014293_00000430-00148


Tyco Outfall 101 pH from January 2017 - October 2019
pH Max Measured
pH Min Measured
pH
10
9
8
7
6
5
4
3
2
1
0
12/31/2016 0:00
7/19/2017 0:00
2/4/2018 0:00
8/23/2018 0:00
3/11/2019 0:00
9/27/2019 0:00
Date


Tyco Outfall 101 Total Suspended Solids from January 2017 - October 2019
Effluent
Montly Average
Total Suspended Solids (TSS, mg/L)
50
45
40
35
30
25
20
15
10
5
0
12/31/2016 0:00
7/19/2017 0:00
2/4/2018 0:00
8/23/2018 0:00
3/11/2019 0:00
9/27/2019 0:00
Date



Membrane Filtration System

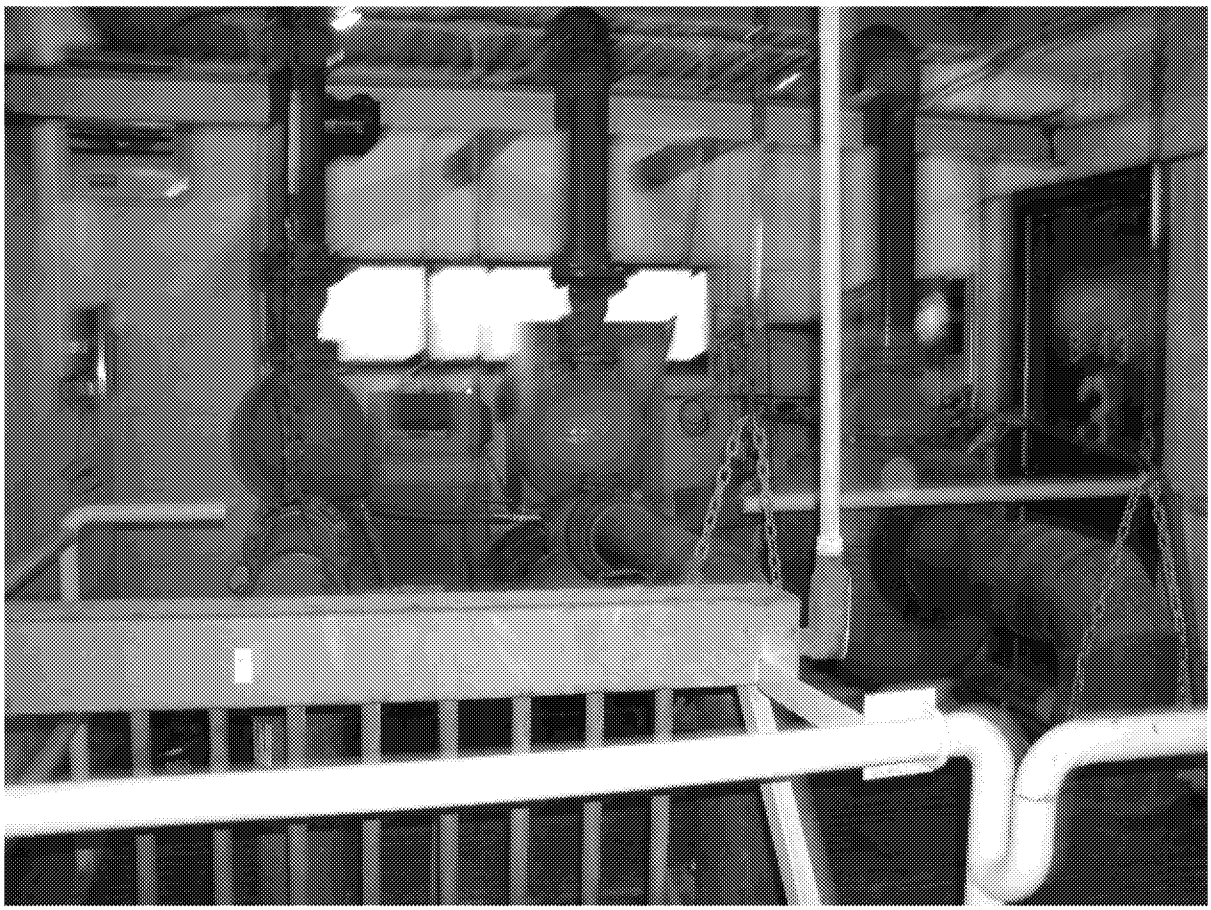


Filter Press

Solids from Filter Press

VSEP System

Sampling Location for Outfall 001



Pumps at Outfall 001

Outfall 001 Effluent at Final Tank

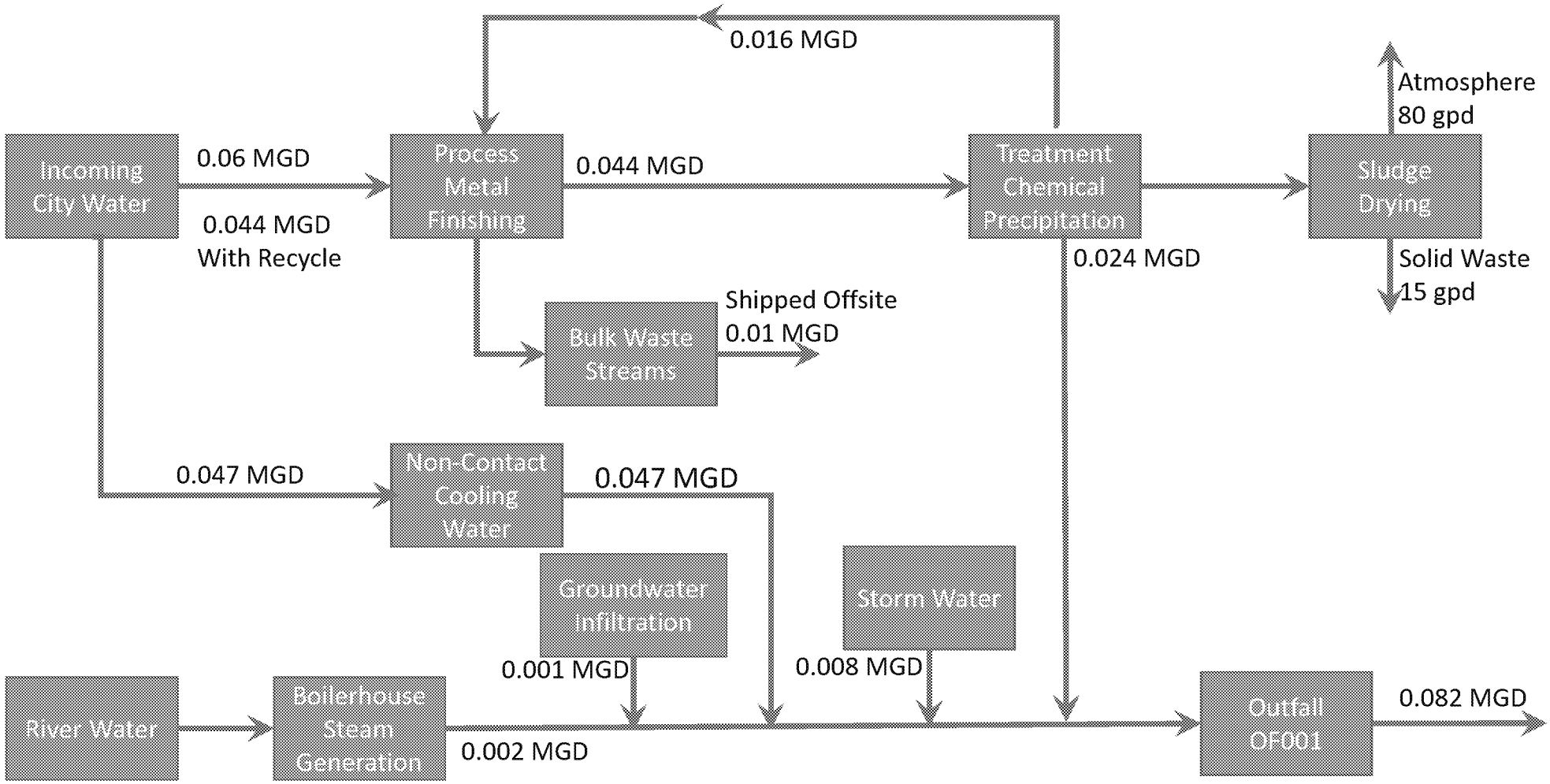
Wastewater Facility Inspection Report Response

Response by : Anne Fleury - Lab Tech

Response date : 1/14/2020 9:54:17 AM

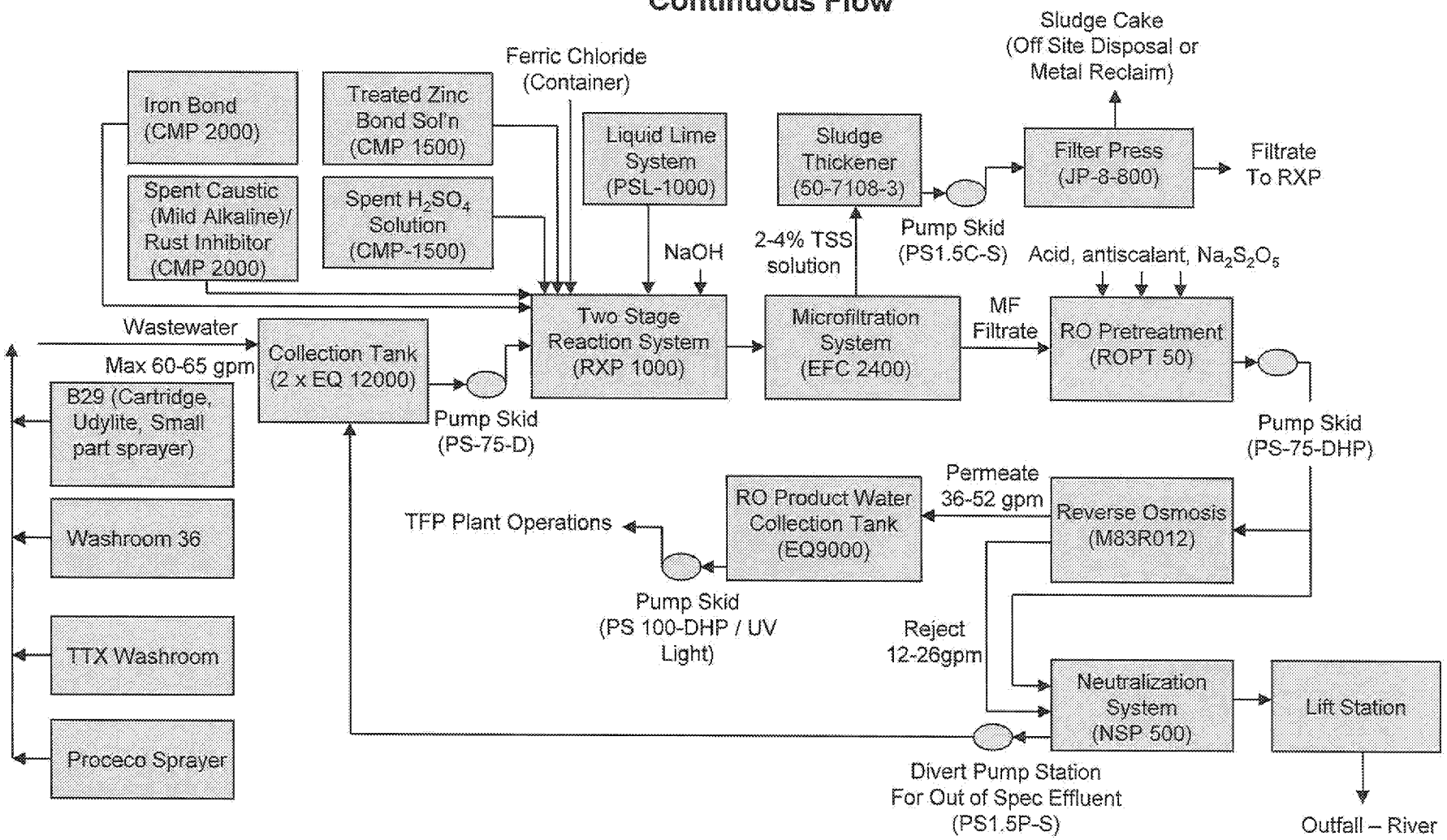
Response : Traceable Thermometer was replaced in the Outfall 003 ISCO sampler on December 18th and is being checked weekly.

PMP plans will be updated to reflect requested changes by January 31st 2020.



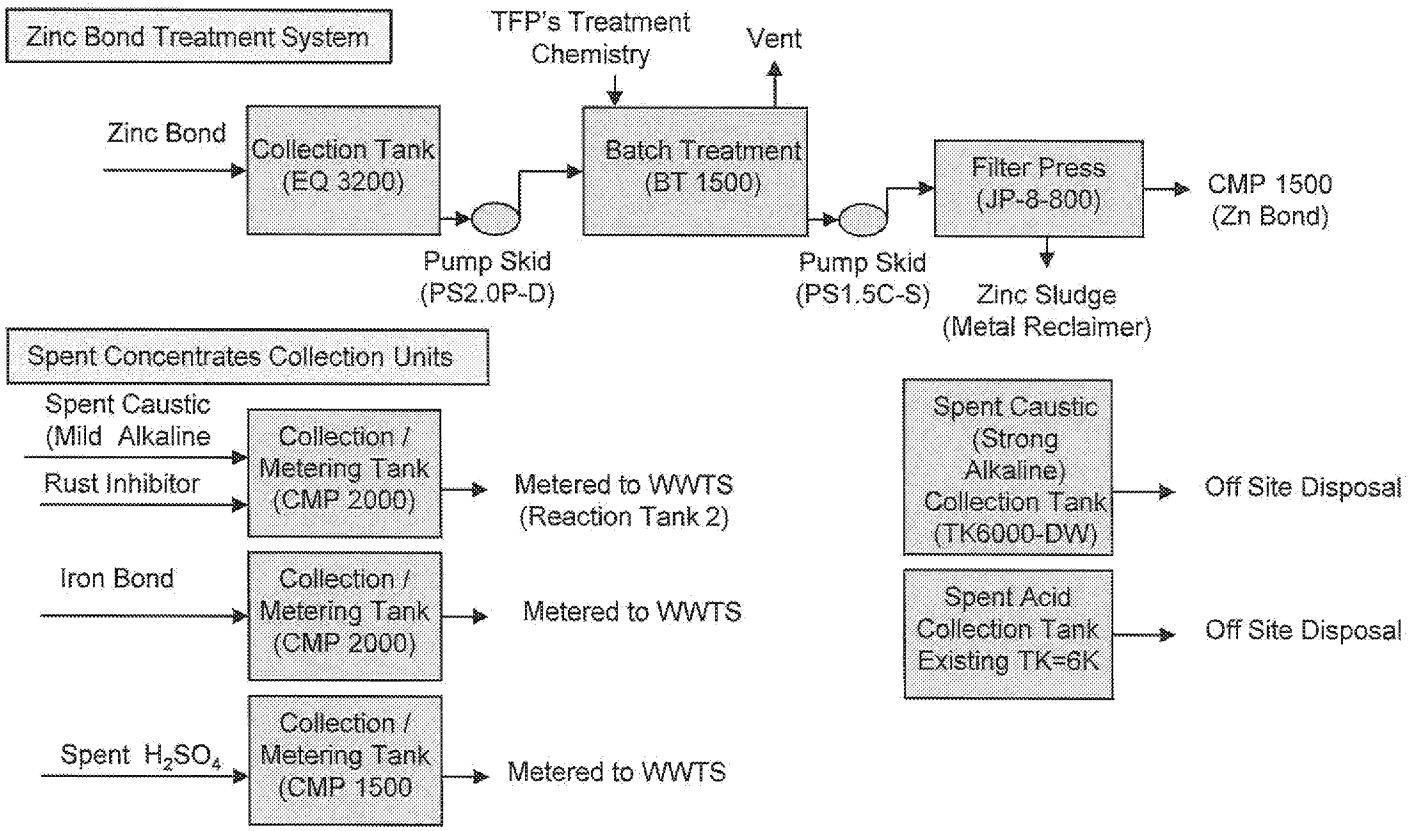
Water Flow – Line Drawing

Tyco Fire Products, LP
Marinette, WI
Process Flow Diagram of Wastewater Treatment / Water Reuse
Continuous Flow



August 3, 2012

Tyco Fire Products, LP
Marinette, WI
Process Flow Diagram of Wastewater Treatment / Water Reuse Concept



Aug 3 , 2012

Groundwater Treatment System

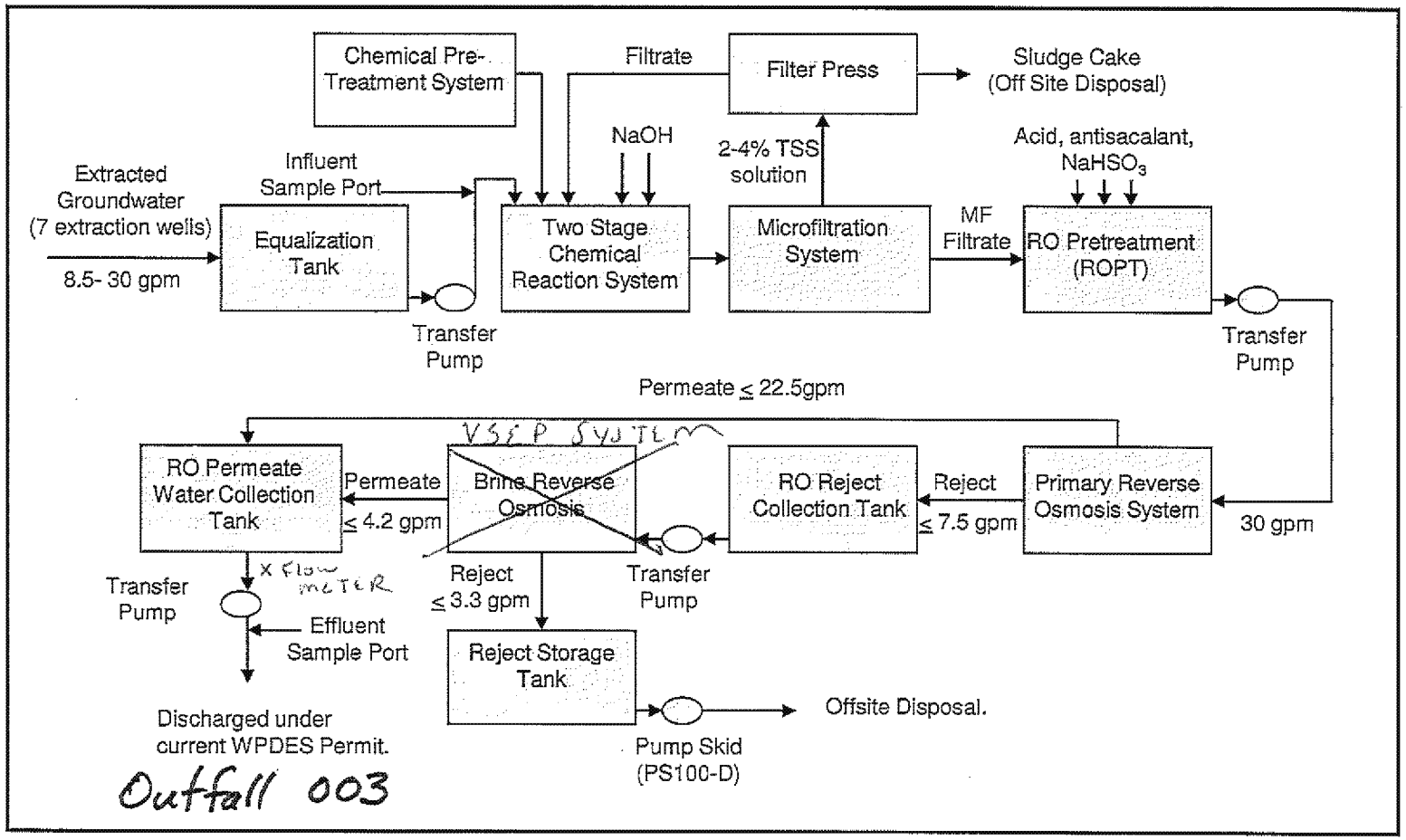
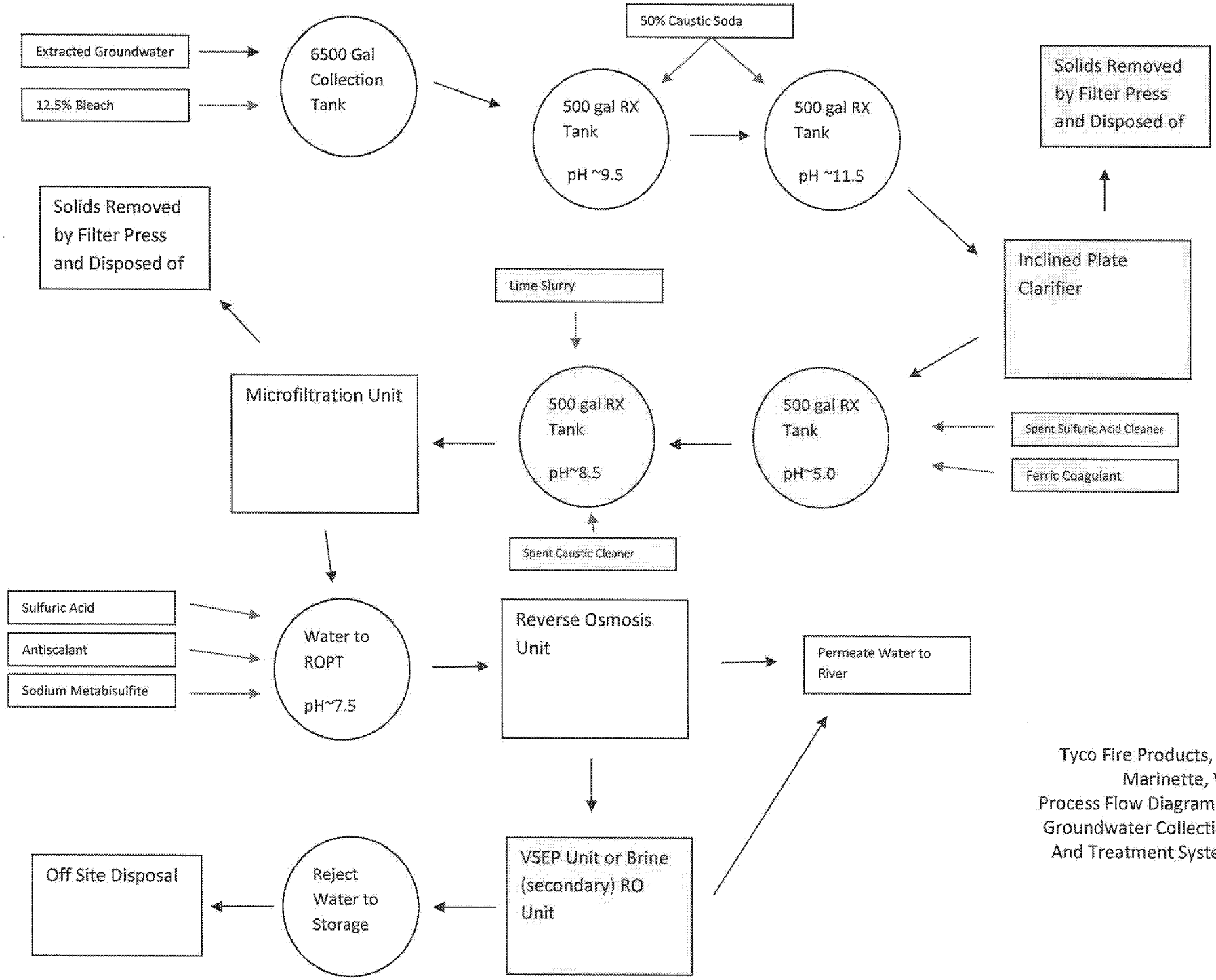


Figure 4
GWCT System Process Flow Diagram
Ansul Marinette Wisconsin Facility
Marinette, Wisconsin

CH2M HILL



Tyco Fire Products, LP
Marinette, WI
Process Flow Diagram of
Groundwater Collection
And Treatment System

Figure 2 Flow Chart of the GWCTS