

Permit Fact Sheet

1 General Information

Permit Number:	WI-0001040-08-0
Permittee Name:	Tyco Fire Protection Products LP
Address:	One Stanton Street
City/State/Zip:	Marinette WI 54143
Discharge Location:	Downtown Marinette
Receiving Water:	Menominee River
StreamFlow (Q _{7,10}):	1240 cubic feet per second
Stream Class:	Warm water sport fish, non-public water supply

2 Facility Description

Tyco Fire Protection Products (FPP) manufactures fire extinguishers and fire suppression packets. Metal finishing process wastewater (0.047 MGD) is treated at internal sample point 101 and combined in the industrial sewer with noncontact cooling water (NCCW - 0.059 MGD), boiler house wastewater (0.022 MGD), groundwater infiltration (0.066 MGD), and roof drain runoff (0.08 MGD) prior to discharging to the Menominee River through Outfall 001. The average discharge flows through outfall 001 have been reduced about 44% over the last several years due to water saving projects in the facility and lining the industrial sewers to reduce groundwater inflow. Limits and monitoring requirements for the metal finishing wastewater treatment system (in-plant sample point 101) and for the combined discharge through Outfall 001 are included in Tyco's WPDES permit. A location diagram, a water flow diagram and an excel spreadsheet of Discharge Monitoring Report data from 2009 thru 2012 are available upon request.

Tyco's processes include metal turning of CO₂ cylinders, metal finishing of fabricated steel shells and cartridges, and machining of aluminum parts for the fire extinguishers. Metal finishing processes include acid and alkaline cleaning, deep draw phosphatizing and spray cleaning. Counter current rinsing is used throughout the metal finishing process. Tyco's cadmium-cyanide plating process was discontinued in 1987.

Tyco's metal finishing wastewater treatment system (monitored at sample point 101) includes lime precipitation/coagulation, clarification with a micro-filter membrane and sludge dewatering in a filter press. The micro filter permeate is de-chlorinated with sodium meta-bisulfite and then passed through a reverse osmosis (RO) unit to provide permeate for reuse in the plant. The reverse osmosis concentrate is discharged via sample point 101. Final pH adjustment is also provided as necessary for the combined wastewater prior to discharge through Outfall 001. The sodium meta-bisulfite addition prior to sample point 101 is usually sufficient to de-chlorinate the whole wastewater discharge via outfall 001.

Previous manufacture of arsenical herbicides by Ansul Corp. resulted in arsenic contamination of groundwater in the area of the plant near an arsenic salt storage pile. Infiltration of groundwater into the industrial sewer discharging through Outfall 001 has resulted in periodic elevated arsenic concentrations in the effluent which has been addressed by locating and sealing leaks to reduce infiltration. Tyco previously performed a groundwater restoration program after removing the arsenic salt pile. Contaminated groundwater intercepted in the vicinity of the salt storage area was concentrated in an evaporation treatment system and transported to an out of state disposal site. Additional remedial actions at the plant site have been implemented through agreements between U.S. EPA, the Department and Tyco under RCRA. Provisions for discharge of treated wastewater from groundwater pumping and reverse osmosis treatment are included in this permit under outfall 003. Dredging of arsenic contaminated sediment from the river is continuing in the area of the 8th Street Slip

and the turning basin. The wastewater discharges from the river dredging project are regulated under a separate General WPDES permit.

Sample Point Designation		
Sample Point Number	Discharge Flow, Units, and Averaging Period	Sample Point Location, WasteType/sample Contents and Treatment Description (as applicable)
703		River water intake sampling point for Menominee River water supply taken into the facility for boiler water make-up
001	Historical average – 0.356 MGD, 2013 ave.discharge – 0.202 MGD, Max daily 0.800 MGD	Combined discharge to the Menominee River of: treated process wastewater from metal cleaning and surface coating, NCCW, wastewater from the boiler house, groundwater infiltration into the wastewater forcemain, and roof drain water.
003	Ave. May/June 2013 – 0.024 MGD, Max daily – 0.100 MGD	The discharge of treated remedial action wastewater to the Menominee River.
101	Projected average daily flow with new WW treatment plant – 0.047 MGD	Treated metal finishing wastewater sampled after the physical chemical process wastewater treatment system prior to mixing with other wastewater. After sample point 101 the wastewater travels to Outfall 001
107		Sample point for reporting field blank sample results needed to check for possible contamination during sample collection of outfall 001 effluent

3 Influent - Proposed Monitoring

3.1 Sample Point Number:703- River Water Intake Monitoring

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

3.1.1 Changes from Previous Permit:

The river intake water is used for boiler make-up water and is discharged via boiler blowdown into outfall 001. The blowdown makes up approximately 10% of the total wastewater discharge through outfall 001. The Marinette water utility supplies the water for the other plant needs.

3.1.2 Rational of Monitoring Requirements

The Department **highly recommends** that the permittee collect a monthly sample that is representative of the intake water from the river and have it analyzed for low level mercury to help determine the intake mercury contribution to the discharge. This permit does not **require** that the permittee report an influent mercury sample result for any month.

4 Inplant - Proposed Monitoring and Limitations

4.1 Sample Point Number: 101- Metal Finishing Effluent

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Flow Rate		MGD	Daily	Total Daily	Totalize continuous flow measurements for day
Suspended Solids, Total	Monthly Avg	31 mg/L	Daily	24-Hr Comp	
Suspended Solids, Total	Daily Max	60 mg/L	Daily	24-Hr Comp	
pH (Minimum)	Daily Min	4.0 su	Daily	Continuous	
pH (Maximum)	Daily Max	11 su	Daily	Continuous	
pH Total Exceedance Time Minutes	Monthly Total	446 minutes	Daily	Calculated	
pH Exceedances Greater Than 60 Minutes	Monthly Total	0 Number	Daily	Calculated	
Oil & Grease (Hexane)	Monthly Avg	26 mg/L	Weekly	Grab	
Oil & Grease (Hexane)	Daily Max	52 mg/L	Weekly	Grab	
Copper, Total Recoverable	Monthly Avg	2,070 ug/L	Weekly	24-Hr Comp	
Copper, Total Recoverable	Daily Max	3,380 ug/L	Weekly	24-Hr Comp	
Nickel, Total Recoverable	Monthly Avg	2,380 ug/L	Weekly	24-Hr Comp	
Nickel, Total Recoverable	Daily Max	3,980 ug/L	Weekly	24-Hr Comp	
Phosphorus, Total	Rolling 12 Month Avg	1.0 mg/L	Weekly	24-Hr Comp	Phosphorus limitation first effective on July 1, 2015
Zinc, Total Recoverable	Monthly Avg	1,480 ug/L	Weekly	24-Hr Comp	
Zinc, Total Recoverable	Daily Max	2,610 ug/L	Weekly	24-Hr Comp	

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 Comp	
Cadmium, Total Recoverable	Daily Max	690 ug/L	Monthly	24-Hr Comp	
Chromium, Total Recoverable	Monthly Avg	1,710 ug/L	Monthly	24-Hr Comp	
Chromium, Total Recoverable	Daily Max	2,770 ug/L	Monthly	24-Hr Comp	
Cyanide, Total	Monthly Avg	650 ug/L	Monthly	Grab	
Cyanide, Total	Daily Max	1,200 ug/L	Monthly	Grab	
Lead, Total Recoverable	Monthly Avg	430 ug/L	Monthly	24-Hr Comp	
Lead, Total Recoverable	Daily Max	690 ug/L	Monthly	24-Hr Comp	
Mercury, Total Recoverable		ng/L	Monthly	Grab	
Silver, Total Recoverable	Monthly Avg	240 ug/L	Monthly	24-Hr Comp	
Silver, Total Recoverable	Daily Max	430 ug/L	Monthly	24-Hr Comp	
Total Toxic Organics	Daily Max	2,130 ug/L	Monthly	24-Hr Comp	Certify monthly or monitor
Benzene		ug/L	Annual	Grab	
Bis(2-Ethylhexyl) phthalate		ug/L	Annual	24-Hr Comp	
Bromoform		ug/L	Annual	Grab	
Chlorobenzene		ug/L	Annual	Grab	
Chlorodibromo-methane		ug/L	Annual	Grab	
Chloroform		ug/L	Annual	Grab	
Dichlorobromo-methane (bromo-dichloromethane)		ug/L	Annual	Grab	
Di-n-butyl phthalate (dibutyl phthalate)		ug/L	Annual	24-Hr Comp	
Ethylbenzene		ug/L	Annual	Grab	

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Methylene chloride		ug/L	Annual	Grab	
Tetrachloroethylene		ug/L	Annual	Grab	
1,1,1-Trichloro-ethane		ug/L	Annual	Grab	
Trichloro- ethylene		ug/L	Annual	Grab	
Toluene		ug/L	Annual	Grab	

4.1.1 Changes from Previous Permit:

The permit contains a new 1.0 mg/L phosphorus limit for the metal finishing process wastewater based on the NR 217 requirement that process wastewaters meet the treatment based limit prior to dilution with cooling waters. Also, the monitoring frequency for a number of parameters has been reduced from 2/week to 1/week due to historical discharge levels less than 20% of the discharge limits. The new wastewater treatment process, operational in June 2013, utilizes micro-filtration membranes for solids removal, so the WWT effluent is expected to have less variability. For additional information on the new WWT system see the WWT construction plan approval dated October 21, 2011.

4.1.2 Explanation of Limits and Monitoring Requirements

Metal Finishing Categorical Effluent Limits - Sample Point 101

The categorical concentration limitations for sample point 101 (chemical precipitation wastewater treatment (WWT) system effluent) are specified in Wis. Adm. Code NR 261. The NR 261-Metal Finishing Standards limits are identical to the previous permit.

TTO Monitoring

TTO compounds required to be monitored are based on previously detected parameters in the permit reissuance application TTO characterization sampling and the start-up characterization monitoring for the new WWT. Tyco needs to submit updated TTO Plan by December 31, 2014 or forward a recent TTO Plan (before that date) that identifies which TTO compounds have a potential to be discharged through sample point 101. The final permit may require a full TTO pollutant scan if there is significant uncertainty regarding use of organics in the metal cleaning and corrosion prevent coating wastewater. Also, Tyco plans to bleed in more concentrated wastewater solutions as the company develops more experience operating the new WWT system.

4.2 Sample Point Number: 107- Effluent Field Blank

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

4.2.1 Changes from Previous Permit:

Reporting of the mercury field blank data on the discharge monitoring reports was required under the previous permit.

4.2.2 Explanation of Limits and Monitoring Requirements

This sample point has been added for reporting results of field blanks required for mercury monitoring events (i.e., sampling of intake water and effluent) on discharge monitoring reports as required by s. NR 106.145 Wis. Adm. Code (effective 11/01/2002). The field blank helps to identify if the mercury sampling protocol results in a measurable amount in the sample results.

5 Surface Water - Proposed Monitoring and Limitations

5.1 Sample Point Number:001- Process WW to Menominee R

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Flow Rate		MGD	Daily	Total Daily	Totalize continuous flow measurements for day
Temperature	Daily Max	120 deg F	Daily	Continuous	
pH (Minimum)	Daily Min	4.0 su	Daily	Continuous	
pH (Maximum)	Daily Max	11 su	Daily	Continuous	
pH Total Exceedance Time Minutes	Monthly Total	446 minutes	Daily	Continuous	
pH Exceedances Greater Than 60 Minutes	Daily Max	0 Number	Daily	Continuous	
Chloride	Daily Max	1,514 mg/L	2/Week	24-Hr Comp	
Chloride	Daily Max	10,100 lbs/day	2/Week	Calculated	
Chlorine, Total Residual	Daily Max	38 ug/L	2/Week	Grab	Total Residual Chlorine limitation effective January 1, 2017
Chlorine, Total Residual	Daily Max	0.25 lbs/day	2/Week	Calculated	Total Residual Chlorine limitation effective January 1, 2017
Copper, Total Recoverable	Daily Max	55 ug/L	2/Week	24-Hr Comp	
Copper, Total Recoverable	Daily Max	0.37 lbs/day	2/Week	Calculated	
Phosphorus, Total	Rolling 12 Month Avg	1.0 mg/L	2/Week	24-Hr Comp	

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Zinc, Total Recoverable	Daily Max	410 ug/L	2/Week	24-Hr Comp	
Zinc, Total Recoverable	Daily Max	2.8 lbs/day	2/Week	Calculated	
Arsenic, Total Recoverable	Daily Max	680 ug/L	Monthly	24-Hr Comp	
Arsenic, Total Recoverable	Daily Max	4.5 lbs/day	Monthly	Calculated	
Cadmium, Total Recoverable	Daily Max	42 ug/L	Monthly	24-Hr Comp	
Cadmium, Total Recoverable	Daily Max	0.28 lbs/day	Monthly	Calculated	
Cyanide, Total	Daily Max	92 ug/L	Monthly	Grab	
Cyanide, Total	Daily Max	0.61 lbs/day	Monthly	Calculated	
Hardness, Total as CaCO ₃		mg/L	Monthly	24-Hr Comp	
Mercury, Total Recoverable	Daily Max	15 ng/L	Monthly	Grab	
Nickel, Total Recoverable	Daily Max	1,500 ug/L	Monthly	24-Hr Comp	
Nickel, Total Recoverable	Daily Max	10 lbs/day	Monthly	Calculated	
Acute WET		TUa	Annual	24-Hr Comp	

5.1.1 Changes from Previous Permit

Water quality based daily maximum limits for Cadmium, Nickel Zinc and Cyanide have been added to the permit for the same reason as explained for the copper limit on the next page. An alternative for the 001 limits for these parameters are reduced limitations at sample point 101 to insure that the outfall 001 discharge would not exceed water quality standards. Also, the mercury water quality variance limit of 15 ng/L has been added to the permit based on historical discharge amounts. See the mercury variance documents for more information on this limitation.

5.1.2 Explanation of Limits and Monitoring Requirements

Water Quality Based Limits and WET Requirements

The rationale for water quality based limits and whole effluent toxicity testing requirements is presented in the Water Quality Limits Evaluations dated February 16, 2010 and May 9, 2011. Daily Maximum Mass limits are based on daily maximum flows of 0.80 MGD for outfall 001.

Arsenic

Arsenic limits and monitoring requirements are continued from the previous permit based on best professional judgment and historical discharge amounts. A daily maximum arsenic water quality limit of 680 ug/L is based on NR 105 & NR 106 Wis. Adm. Code. The previous permit contained a daily maximum arsenic mass limit of 12 lb/d based on a flow of 2.1 MGD reported during previous permit terms more than 10 years ago. During the last permit term the daily maximum discharge flow through outfall 001 is 0.0800 MGD which would result in a daily maximum mass discharge limit of 4.5 lbs/day. Tyco has been very successful in reducing the wastewater discharge volumes from this facility.

Copper Limits

Limits for these pollutants are included at internal sample point 101 for treated metal finishing wastewater based on categorical industrial standards and other rationale discussed further below. Evaluation of the limits at this internal sample point indicates that copper limits are less stringent than necessary to achieve water quality based limits for the combined discharge at Outfall 001. In accordance with NR 106.04(1), water quality based limits for copper have been included for the combined discharge through Outfall 001. The attached WQS memo documents the rationale for imposing these limits.

Chloride

Acute and chronic chloride toxicity criteria for the protection of aquatic life are included in Tables 1 and 5 of ch. NR 105, Wis. Adm. Code (effective February 1, 2000). Subchapter IV of ch. NR 106 establishes the procedure for calculating water quality based effluent limitations (WQBELs) for chloride (effective February 1, 2000). Since the permittee periodically discharges ion exchange regeneration brine from softening the boiler make-up water the permit includes chloride effluent limitations.

Chlorine, Total Residual

Recent communication with the U.S. EPA has clarified that mixtures of process wastewater and noncontact cooling water must meet NR 105/106 total residual chlorine water quality based effluent limits. For the outfall 001 discharge, the chlorinated Lake Michigan water supplied by the Marinette water utility is the likely source for much of the chlorine remaining in the wastewater discharged through outfall 001. The permit contains a compliance schedule for Tyco to investigate the sources of the chlorine, evaluate possible solutions and implement the chosen alternative prior to January 1, 2017.

Phosphorus Limits and Monitoring

A monthly average concentration limit of 1 mg/L is continued from the previous permit to insure that phosphorus added to the boiler water and the noncontact cooling water does not exceed 1 mg/L over a 12 month rolling average in accordance with NR 217, Wis. Adm. Code

Mercury Requirements

In the previous permit Tyco agreed to voluntarily conduct a mercury source review and implement cost effective reduction measures. Requirements for mercury monitoring and Pollutant Minimization Plans are included in accordance with s. NR 106.145 Wis. Adm. Code (effective 11/01/2002).

Whole Effluent Toxicity Testing

Acute whole effluent toxicity testing will be required 1 times per 12 months for Outfall 001 (in calendar quarters specified in the permit).

5.2 Sample Point Number:003- Treated GW to Menominee R

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Flow Rate		MGD	Daily	Total Daily	Totalize continuous flow measurements for day
pH (Minimum)	Daily Min	4.0 su	Daily	Continuous	
pH (Maximum)	Daily Max	11 su	Daily	Continuous	
pH Exceedances Greater Than 60 Minutes	Daily Max	0 Number	Daily	Continuous	
pH Total Exceedance Time Minutes	Monthly Total	446 minutes	Daily	Continuous	
Arsenic, Total Recoverable	Daily Max	680 ug/L	2/Week	24-Hr Comp	
Arsenic, Total Recoverable	Daily Max	0.60 lbs/day	2/Week	24-Hr Comp	
Phosphorus, Total	Rolling 12 Month Avg	1.0 ug/L	Monthly	24-Hr Comp	Phosphorus limitation is first effective July 1, 2015
Suspended Solids, Total	Daily Max	40 mg/L	Monthly	24-Hr Comp	
Mercury, Total Recoverable	Daily Max	4.0 ng/L	Monthly	Grab	
Hardness, Total as CaCO ₃		mg/L	Monthly	24-Hr Comp	
Acute WET		TUa	Annual	24-Hr Comp	

5.2.1 Changes from Previous Permit

The permit contains new treatment technology based effluent limitations for phosphorus and total suspended solids. The outfall 003 monitoring data from start-up of this groundwater remediation discharge shows the reverse osmosis treatment system can consistently meet these limitations. The arsenic maximum mass limit is based on an increased 70 gal/min (0.100 MGD) daily maximum flow required for gradient control at the sites. The previous historical daily maximum flow was 0.0436 MGD for outfall 003. A mercury variance limitation of 4.0 ng/L has been added to the permit based on historical discharge amounts. See the mercury variance documents for more information on this limitation.

5.2.2 Explanation of Limits and Monitoring Requirements

Water Quality Based Limits and WET Requirements

The characterization data for outfall 003 indicates that no additional water quality limits are needed for this discharge of permeate from reverse osmosis treatment of groundwater pumped from beneath the Tyco facility.

Phosphorus

A monthly average concentration limit of 1 mg/L is also added to outfall 003 because the facility discharges more than 60 lbs/month as specified in NR 217, Wis. Adm. Code. Chapter NR 217 of the Wis. Adm. Code addresses point source dischargers of phosphorus to surface waters. The code categorically limits industrial dischargers of more than 60 pounds of phosphorus per month to 1.0 mg/L unless an alternative limit is approved. NR 217 also specifies WQBELs (water quality based effluent limits) for discharges of phosphorus to surface waters of the state from privately owned wastewater facilities. Discharges are also to be limited when the phosphorus concentrations or loadings will cause or contribute to an exceedance of the water quality standards.

Mercury Requirements

A mercury variance limitation of 4.0 ng/L has been added to the permit based on historical discharge amounts. See the mercury variance documents for more information on this limitation. In the previous permit Tyco agreed to voluntarily conduct a mercury source review and implement cost effective reduction measures. Requirements for mercury monitoring and Pollutant Minimization Plans are included in accordance with s. NR 106.145 Wis. Adm. Code (effective 11/01/2002).

Whole Effluent Toxicity Testing

Acute whole effluent toxicity testing will be required 1 times per 12 months for Outfall 003 (in calendar quarters specified in the permit).

6 Compliance Schedules

6.1 Dechlorination

This compliance schedule requires the permittee to achieve compliance with the total residual chlorine limitation by January 1, 2017

Required Action	Date Due
Evaluation of Chlorine Sources: Evaluate sources of chlorine in the 001 discharge and submit recommendations for chlorine discharge control to the Department.	12/31/2014
Plans and Specifications: Submit plans and specifications for treatment plant modifications if necessary for control of total residual chlorine in the outfall 001 discharge.	12/31/2015
Complete Construction: Complete construction and begin compliance with the total residual chlorine daily maximum limitation.	01/01/2017

6.2 Mercury Pollutant Minimization Program

The permittee shall continue to implement a pollutant minimization program as defined in s. NR 106.145(7), Wis. Adm. Code.

Required Action	Date Due
Implement the Mercury Pollutant Minimization Program: The permittee shall continue implementation of the Mercury PMP as approved by the Department.	01/01/2014
Submit Annual Status Reports: The permittee shall submit to the Department an annual status report on the progress of the PMP as required by s. NR 106.145(7), Wis. Adm. Code. Submittal of the first annual status report is required by the Date Due. Note: If the permittee wishes to apply for an alternative mercury effluent limitation, that application is due with the application for permit reissuance by 6 months prior to permit expiration. The	12/31/2014

permittee should submit or reference the PMP plan as updated by the Annual Status Report or more recent developments as part of that application.	
Submit Annual Status Report #2: Submit second annual status report.	12/31/2015
Submit Annual Status Report #3: Submit third annual status report.	12/31/2016
Submit Annual Status Report #4: Submit fourth annual status report.	12/31/2017
Submit Annual Status Report #5: Submit fifth annual status report.	12/31/2018

6.3 Total Toxic Organics Minimization Plan

The permittee shall submit an updated Total Toxic Organics (TTO) management plan.

Required Action	Due Date
Submit Updated TTO Plan: Submit plan that insures that concentrated toxic organics are not dumped into the wastewater and that the facility is minimizing the discharge of toxic organic compounds via sample point 101 into the discharge to the river.	12/31/2014

6.4 Explanation of Compliance Schedules

The permit contains a compliance schedule for Tyco to investigate the sources of the chlorine, evaluate possible solutions and implement the chosen alternative prior to January 1, 2017. The mercury pollutant minimization compliance schedule is required for all facilities that are granted a mercury water quality variance under NR 106, Wis. Adm. Code.

7 Attachments:

Water Quality Based Effluent Limit evaluations – February 16, 2010 and May 9, 2011

8 Proposed Expiration Date:

December 31, 2018

Prepared By:

Jeffrey Brauer Wastewater Engineer

Date: November 5th, 2013

cc: **Bruce Oman – Peshtigo DNR**

Jim Schmidt – NER WQ limits

Scott Stacy - Tyco

CORRESPONDENCE / MEMORANDUM

State of Wisconsin

DATE: February 16, 2010

FILE REF: 3200

TO: Jeff Brauer - WT/3

FROM: Susan Sylvester - WT/3

SUBJECT: Water Quality-Based Effluent Limitations for the Tyco Safety Products - Ansul (WI-0001040)

This is in response to your request for an evaluation of water quality-based effluent limitations for toxic substances using chs. NR 102, 105, 106, and 207 of the Wisconsin Administrative Code (where applicable), for the Tyco Safety Products - Ansul's discharge to the Menominee River. The discharge is located in the Wausaukee and Lower Menominee Rivers Watershed of the Upper Green Bay Basin in Marinette County.

Based on our review, the following recommendations are made on a chemical-specific basis for Outfall 001:

Parameter	Limit Type	Limit and Units	Notes
Flow Rate		MGD	1
Temperature		deg F	1
Phosphorus, Total	Rolling 12 Month Avg	1.0 mg/L	1
Hardness, Total as CaCO ₃		mg/L	1
Arsenic, Total Recoverable			2
Cadmium, Total Recoverable	Daily Max	42 µg/L; 0.28 lbs/day	
Copper, Total Recoverable	Daily Max	55 µg/L; 0.37 lbs/day	
Nickel, Total Recoverable	Daily Max	1500 µg/L; 10 lbs/day	
Zinc, Total Recoverable	Daily Max	410 µg/L; 2.8 lbs/day	
Cyanide, Amenable	Daily Max	92 µg/L; 0.61 lbs/day	
Chlorine, Total Residual		µg/L	2
Mercury, Total Recoverable		1.3 ng/L; 2.5 mg/day	3
Acute WET		TU _a	4
pH (Continuous)			5

- Continued from last permit.
- Continued monitoring is at the discretion of basin staff and the permit drafter. See discussion in the attachment.
- These values represent the water quality based limits for mercury; the permittee may be eligible for an alternative limit under s. NR 106.45.
- 1x yearly throughout permit term (rotating quarters).
- See "Continuous pH monitoring" requirements in current permit (WI-0001040-07) for categorical pH limits and allowed excursions.

The current permit (WI-0001040-07) also contains another outfall (003), for the discharge of remedial action wastewater. This outfall is not active and there is currently no characterization data of this discharge. Until data on the nature of this wastewater are made available, no changes

are recommended to the current limitations or other permit requirements regarding this potential discharge.

If there are any questions or comments, please contact Pat Oldenburg at (715) 831-3262 or via e-mail at Patrick.Oldenburg@wisconsin.gov.

Prepared by: Patrick Oldenburg, WCR Water Resources Engineer

Approved for Signature by: _____
Diane Figiel, Water Resources Engineer - Madison

cc: Bruce Oman - NER/Peshtigo (via e-mail)
Pat Oldenburg - WCR

**Addendum 1:
Water Quality-Based Effluent Limitations for
Tyco Safety Products - Ansul (WI-0001040)**

**Prepared by:
Pat Oldenburg - WCR
January 6, 2010**

Facility Description:

Ansul manufactures fire extinguishers and fire suppression packets. Metal finishing process wastewater (0.0826 MGD) is treated at internal sample point 101 and combined with noncontact cooling water (0.0588 MGD), boiler blowdown (0.010 MGD), groundwater infiltration into the industrial sewer (0.138 MGD) and of roof drain runoff (0.08 MGD) prior to discharging to the Menominee River through Outfall 001. Flows listed above are based on the permittee supplied water flow line drawing in the permit application and a phone contact regarding the boiler house wastewater discharges. The source for the process and noncontact cooling water is the City of Marinette public water supply. River water supply is used for the boiler steam generation system which has a 0.010 MGD boiler blowdown discharge to the river.

The current permit (WI-0001040-07) also contains another outfall (003), for the discharge of remedial action wastewater. This outfall is not active and there is currently no characterization data of this discharge. Until data on the nature of this wastewater are made available, no changes are recommended to the current limitations or other permit requirements regarding this potential discharge.

Effluent Data:

Effluent concentration data:

Substances tested: Aside from permit required sampling, Ansul was required to test for common pollutants, metals, cyanide, hardness, phenols, volatile organics, acid extractable compounds, and pesticides. A summary of the results for substances tested multiple times during the permit are shown below and single samples where there was a detected result are shown in the following effluent limit summary section.

Substance	As (µg/L)	Cd (µg/L)	Cu (µg/L)	CN- (µg/L)	Cl ₂ (µg/L)	Hg (ng/L) 001	Hg (ng/L) Intake
# Samples	457	73	74	72	71	72	71
# Detects	291	26	41	4	62	72	70
# No Detects	166	47	33	68	9	0	1
1-day P99	151.0	2.2	52.7	NA	329.0	15.3	10.4
4-day P99	83.0	1.2	29.9	NA	179.3	8.6	5.8
30-day P99	36.1	0.52	15.0	NA	89.8	5.2	3.4
Max	460	2.3	54	9	460	14	11

Effluent limit calculations for: Tyco Safety Products - Ansul
 WPDES Permit #: 0001040
 Permit Drafter: Jeff Brauer - WT/3
 Basin Engineer: Bruce Oman - NER/Peshtigo
 WQ Reviewer:

Receiving Water Information:
 Receiving Water: Menominee River
 Watershed: Wausaukee and Lower Menominee Rivers Watershed
 Basin: Upper Green Bay Basin
 County: Marinette
 Classification: Warm Water Sport Fish Community, Non-public Water Supply

				Estimated	Basin
				Harmonic	Area
Flows	7Q10	7Q2	90Q10	Mean	(mi 2)
	1240	1740		3146	

% Used For Mixing = 25
 Hardness = 116 PPM

Background Metals Data Source: Popple River; chloride and mercury data from Menomonie River

Substance	Result
Cadmium	0.021
Chromium	0.462
Copper	0.455
Lead	0.404
Mercury	1.80E-03
Zinc	3.003

Effluent Information:		Daily Average Flow		
Outfall Number	f	(mgd)	(cfs)	
001	0.07	0.356	0.551	
Σ		0.07	0.356	0.55

Effluent Hardness	=	185	PPM	Geometric mean of 72 samples collected during the permit term.
Effluent Dilution due to ZID	=		NA	
7Q10:Qe	=	2251.2	:1	

CALCULATION OF EFFLUENT LIMITATIONS BASED ON ATC (ug/L)

SUBSTANCE	Ref. Hard. or pH	ATC	Daily Effl. Limit	1/5 of Effl. Limit	Mean Effl. Conc.	1-day P99	1-day Max. Conc.
Chlorine		19.03	38.06			329.0	460
Arsenic		339.80	679.60			150.95	460
Cadmium	185	20.87	41.74			2.2	2.3
Chromium (+6)		16.02	32.04	6.41	5.6		
Chromium (+3)	185	2984.15	5968.30	1193.66	<6		
Copper	185	27.72	55.44			52.7	54
Lead	185	193.74	387.48	77.50	<1		
Mercury		0.83	1.66			1.53E-02	1.40E-02
Zinc	185	206.15	412.30	82.46	8.1		
Cyanide		45.78	91.56	18.31	0.2		
Chloride (mg/L)		757	1514.00		76		

CALCULATION OF EFFLUENT LIMITATIONS BASED ON CTC (ug/L)

Receiving Water Flow = 310cfs

SUBSTANCE	Ref. Hard. or pH	CTC	Mean Back-ground	Weekly Effl. Limit	1/5 of Effl. Limit	Mean Effl. Conc.	4-day P99	4-day Max. Conc.
Chlorine		7.28		4103.87			179.3	
Arsenic		152.20		85797.93			82.96	
Cadmium	116	2.77	0.0214	1549.46			1.2	
Chromium (+6)		10.98		6189.63	1237.93	5.60		
Copper	116	11.75	0.455	6367.65			29.9	
Mercury		0.44	0.002	247.02			8.61E-03	
Zinc	116	137.06	3.003	75573.39	15114.68	8.10		
Cyanide		11.47		6465.85	1293.17	0.20		
Chlorides		395.00	7.2	218617.16	43723.43	76.00		

CALCULATION OF EFFLUENT LIMITATIONS BASED ON WC (ug/L)

Receiving Water Flow = 369.75cfs

SUBSTANCE	WC	Mean Back-ground	Monthly Effl. Limit	1/5 of Effl. Limit	Mean Effl. Conc.	30-day P99	30-day Max. Conc.
Mercury	1.30E-03	1.80E-03	1.30E-03			5.20E-03	

CALCULATION OF EFFLUENT LIMITATIONS BASED ON HTC (ug/L)

Receiving Water Flow = 786.50cfs

SUBSTANCE	HTC	Mean Back-ground	Monthly Effl. Limit	1/5 of Effl. Limit	Mean Effl. Conc.	30-day P99	30-day Max. Conc.
Antimony	373		5.33E+05	1.07E+05	4.4		
Cadmium	370	0.0214	5.29E+05			0.5	
Mercury	1.50E-03	1.80E-03	1.50E-03			5.20E-03	
Cyanide	9300		1.33E+07	2.66E+06	0.2		
Chlorobenzene	1210		1.73E+06	3.46E+05	2		
Ethylbenzene	2920		4.17E+06	8.34E+05	3.5		

CALCULATION OF EFFLUENT LIMITATIONS BASED ON HCC (ug/L)

Receiving Water Flow = 786.50cfs

SUBSTANCE	HCC	Mean Back-ground	Monthly Effl. Limit	1/5 of Effl. Limit	Mean Effl. Conc.	30-day P99	30-day Max. Conc.
Arsenic	13.3		1.90E+04			36.1	
Chloroform	1960		2.80E+06	5.60E+05	13		
Dichlorobromomethane	1960		2.80E+06	5.60E+05	6.1		

CALCULATION OF CUMULATIVE CANCER RISK

	HCC-Based Effluent Limit	Mean Effl. Conc.	Effl. Conc./ Limit
Detected Carcinogen			
Arsenic	1.90E+04	16.6	8.73E-04
Chloroform	2.80E+06	13	4.64E-06
Dichlorobromomethane	2.80E+06	6.1	2.18E-06
Total	(must be < 1)	=	8.80E-04

Effluent Limit and Monitoring Recommendations:

Mercury: The effluent limits in the tables for limitations based on wildlife and human threshold criteria are set equal to the criterion in accordance with s. NR 106.06(6), because the background concentration exceeds the wildlife and human threshold criteria.

Ansul collected 72 valid test results for mercury from August 2003 through October 2007. The upper 99th percentile of 30 day average discharge concentrations, as determined by the procedure specified in NR 106.05(5)(a), is 5.2 ng/l, which exceeds a potential limit of 1.3 ng/l. Therefore, a limit for mercury is recommended at Ansul. The water quality based limit would be 1.3 ng/L and 2.5 mg/day (5.7E-06 lbs/day).

Ch. NR 106.145(4) allows for eligibility for an alternative mercury effluent limitation if the permittee submits an application for an alternative mercury limit, which includes the submittal of a pollutant minimization plan. Ch. NR 106.145(5) specifies that an alternative limitation shall equal the 1-day P99 of the effluent data, and shall be expressed as a daily maximum concentration. Using this approach, the calculated alternative mercury limitation would be 15

ng/L.

Ammonia: The Department has recently revised its methods of developing ammonia limitations based on USEPA's 1999 Update of Ambient Water Quality Criteria for Ammonia. This included changes to the ammonia criteria and associated limits for all surface waters. Based on effluent sampling results (0.14, 0.13, 0.55 and 0.018 mg-N/L) and lack of nitrogen inputs to the treatment system, neither ammonia limits nor additional monitoring are recommended at this time.

Chlorine: In accordance with s. NR 106.05(3) and (6) daily maximum effluent limitations could be recommended for Chlorine, to be expressed as Total Residual Chlorine. However, Ansul has supplied additional information with a letter dated March 26, 2003 in which they conclude that the only source of chlorine at Outfall 001 is the water purchased from the Marinette Waterworks. This municipal water system is known to use a relatively high chlorine dosage in order to maintain a residual throughout the distribution system. Ansul is located near the water treatment plant, where residual levels are the highest. Consequently, effluent limitations for chlorine residual are not recommended, consistent with s. NR 106.10(1). Continued monitoring is at the discretion of basin staff and the permit drafter. If chlorine monitoring is continued it is recommended that the monitoring be done at sample point 101 (process wastewater) due to the s. NR 106.10(1) exemption.

Arsenic: Since the last water quality based effluent limits review, arsenic levels in the effluent have dropped substantially. Based on data collected during this permit term a limit is no longer warranted. Continued monitoring is at the discretion of basin staff and the permit drafter.

Impact of categorical limitations for ch. NR 105 substances: Categorical effluent limits for the metal finishing category are included for several metals and cyanide at Sample Point 101. These effluent limitations (and other categorical limitations) are not being reviewed as part of this evaluation. It may be necessary to re-evaluate those limits based upon current production. Limitations for substances with ch. NR 105 criteria are tabulated immediately below, along with a "Calculated" concentration possible at Outfall 001 based upon the ratio of the flow from 101 to flow at 001. The period of record used in this analysis was from August 2003 through July 2009. This calculation assumes that the flow from Sample Point 101 is the sole source of each substance. It is conceivable that the other sources to Outfall 001 contain these substances.

Substance	Cadmium	Chromium (+3)	Nickel	Zinc	Cyanide	Copper	Lead
Daily Maximum Categorical Limit (µg/L)	690	2,770	3,980	2,610	1,200	3,380	690
Estimated Discharge Concentration at 001 based on Sample Point 101 Categorical Limit							
Mean	164	661	949	622	286	806	165
Median	163	655	941	617	284	799	163
95th Percentile	244	981	1,409	924	425	1,196	244
99th Percentile	294	1,186	1,704	1,117	514	1,447	295
Calculated Daily Maximum WQBEL (µg/L)	42	5,968	1,533	412	92	55	387

Even though the categorical limit at Sample Point 101 is met, the estimated concentration of cadmium, nickel, zinc, cyanide, and copper at Outfall 001 may exceed the water quality-based effluent limit, therefore effluent limits are recommended at Outfall 001, in accordance with s.

NR 106.04(1). Specifically, the following daily maximum limitations are recommended:

Parameter	Daily Maximum Limit	
	(ug/L)	(lbs/day)
Cadmium	42	0.28
Copper	55	0.37
Nickel	1500	10
Zinc	410	2.8
Cyanide	92	0.61

All limits above are rounded to two significant digits and mass limits are based on the reported peak daily flow of 0.800 MGD. No limitations based on the monthly average categorical limitations are recommended. Since the toxicity of the metals is a function of effluent hardness, continued hardness monitoring is recommended; though the frequency of sampling may be reduced in recognition of the volume of data available.

One approach that could be considered is that the permittee could voluntarily accept a lower daily maximum limit at sample point 101 to avoid the inclusion of metals limits at outfall 003. Based on the statistics outlined above, in order for the calculated 99th percentile of data to be less than the water quality based daily maximum limit, the daily maximum limits at sample point 101 would need to be lowered to the following values: Cadmium – 97 µg/L, Copper – 126 µg/L, Nickel - 3580 µg/L, Zinc - 960 µg/L, and Cyanide - 212 µg/L.

Other substances detected without ch. NR 105 criteria: As part of the permit application sampling, the following substances were detected: chlorodibromomethane @ 1.2 µg/L; 4-nitrophenol @ 1.2 µg/L; benzo(a)athracene @ 0.018 µg/L; flouranthene @ 0.024 µg/L; phenanthrene @ 0.025 µg/L; and pyrene @ 0.022 µg/L. After a review of relevant data sources including past WDNR secondary value calculations and EPA’s Great Lakes Initiative Clearinghouse, neither calculation of secondary values nor additional monitoring for these substances is recommended at Outfall 001 as the levels present in the effluent are much lower than any potential limitation based on secondary values.

Whole Effluent Toxicity Evaluation:

For purposes of interpreting toxicity test data the following dilutions were applied:

Acute: Test organism survival after species-specific exposure period shall not be less than 50% in an effluent concentration of 100% (v:v).

Chronic: As the ratio of stream flow to effluent flow is greater than 100:1 no chronic WET testing is recommended, due to the low potential for impacts due to chronic toxicity.

Summary of Available Toxicity Test Data

Summary of Recent Acute Toxicity Test Data for Effluent Discharged. (Note: All pass/fail interpretations are based on dilution criteria described above.)

Date	Acute WET Test Results		Pass/Fail
	FHM LC50	C. dubia LC50	
28-Apr-04	>100	>100	Pass
16-Feb-05	>100	>100	Pass
17-Aug-05	>100	>100	Pass
3-May-06	>100	>100	Pass
8-Nov-06	>100	>100	Pass
9-May-07	>100	>100	Pass
15-Nov-07	>100	>100	Pass
30-Apr-08	>100	>100	Pass

WHOLE EFFLUENT TOXICITY (WET) TESTING CHECKLIST SUMMARY

	Acute	Chronic
IWC	Not Applicable for Acute	Instream Waste Concentration : NA (< 35% = 0 pts; 36 - 65% = 1- pts; >65% = 15 pts) Total Points: NA
Historical Data	Acute RPF : 0 a limit is required if >= 0.3 Total Points: 0	Chronic RPF : 0 a limit is required if >= 0.3 Total Points: NA
Effluent Variability	Points assessed for effluent variability, permit violations and WWTP operations Total Points: 0	Same as Acute Total Points: 0
Stream Classification	Points assessed due to receiving water classification 5	Same as Acute Total Points: NA
Chemical Specific Data	Acute WQBEL required: 0 Substances detected without WQBEL: 9 Additional compounds of concern: 6 Total Points: 5	Chronic WQBEL required: 0 Substances detected without WQBEL: 11 Additional compounds of concern: 6 Total Points: NA
Additives	# Biocide(s): 0 # Water Quality Conditioners: 11 Total Points: 11	Same as Acute Total Points: NA
Discharge Category	Industrial Type Total Points: 15	Same as Acute Total Points: NA
Wastewater Treatment	Points assessed for effluent variability, permit violations and WWTP operations Total Points: 8	Same as Acute Total Points: NA
Downstream Impacts	Points assessed due to ecological impacts solely or partially due to the discharge Total Points: 0	Same as Acute Total Points: NA
TOTAL POINTS	Acute : 44	Chronic : NA

Facility Type:	Industrial
Secondary values considered and no WET data?	N
Is this facility classified as either a Major Municipal or Primarily Industrial Facility?	Y
Effluent limits based on a dissolved water quality criterion?	N
Acute Frequency:	1x yearly throughout permit term (rotating quarters)
Chronic Frequency:	NA
Recommended Chronic Dilution Series:	NA
NEW IWC:	NA

CORRESPONDENCE / MEMORANDUM**State of Wisconsin**

DATE: May 9, 2011 FILE REF: 3200

TO: Jeff Brauer - WT/3

FROM: Pat Oldenburg - WCR

SUBJECT: Water Quality-Based Effluent Limitations for Tyco Safety Products - Ansul (WI-0001040)

This is in response to your request for an evaluation of water quality-based effluent limitations for phosphorus and temperature using chs. NR 102, 106, and 217 of the Wisconsin Administrative Code (where applicable), for Tyco Safety Products - Ansul's discharge to the Menominee River. The discharge is located in the Wausaukee and Lower Menominee Rivers Watershed of the Upper Green Bay Basin in Marinette County.

Recent changes to chs. NR 102 and 106 include new temperature criteria and related procedures for calculating water quality based effluent limitations for temperature. The calculated effluent limitation for temperature is 120° F daily maximum. Based on multiple grab samples taken several times per week from 2006-2010, there is no reasonable potential for the calculated effluent limit to be exceeded as the highest reported value over that time period was 82°F. Therefore no water quality based limit for temperature is recommended at this time.

Recent changes to chs. NR 102 and 217 include new phosphorus criteria and related procedures for calculating water quality based effluent limitations for phosphorus. Based on best available information, the Menominee River is well below the 0.100 mg/L water quality criterion:

SWIMS ID	383088	383021
Station Name	Menominee River at County Hwy JJ	Menominee River - Marinette Ogden St
Waterbody	Menominee River	Menominee River
Sample Count	23	55
First Sample	10/09/2001	05/03/2006
Last Sample	08/30/2010	10/27/2010
Mean	0.03	0.036
Median	0.028	0.034
NR 217 Median	0.028	0.034

Note that the Ogden St site is below several discharges located in Marinette/ Menominee, whereas the CTH JJ site is further upstream. The impact of phosphorus loading from the multiple wastewater discharges in this area was recently considered during the effluent limit evaluation for the City of Marinette. That evaluation demonstrated that the current technology based phosphorus limits will be protective of phosphorus water quality criteria in the Menominee River. A lower water quality based effluent limit may be implemented in the future pending the outcome of a Lake Michigan modeling effort for the local area.

cc: Bruce Oman - NER/Peshtigo (via e-mail)
Jim Schmidt – WT/3 (via e-mail)

Temperature limits for receiving waters with unidirectional flow

(calculation using default ambient temperature data)

Facility:	Tyco Safety Products - Ansul	Data Range	7Q10 or 4Q3:	1240	cfs
Outfall(s):	001	Start:	01/01/06	Dilution:	25%
Date Prepared:		End:	12/31/10	f:	0

Large warm water sport or forage fish community ▼

Stream type:

Qs:Qe ratio: 562.8 :1

Calculation Needed? NO

Month	Water Quality Criteria			Receiving Water Flow Rate (Qs) (cfs)	Representative Highest Effluent Flow Rate (Qe)		Representative Highest Monthly Effluent Temperature		99th Percentile of Representative Data		Calculated Effluent Limits	
	Ta (default) (°F)	Sub-Lethal WQC (°F)	Acute WQC (°F)		7-day Rolling Ave (Qesl) (mgd)	Daily Max Flow Rate (Qea) (mgd)	Weekly Ave (°F)	Daily Max (°F)	Weekly Ave (°F)	Daily Max* (°F)	Weekly Ave Limit (°F)	Daily Max Limit (°F)
JAN	33	49	76	1240.00	0.604	0.801	54	59	54	58	-	120
FEB	33	50	76	1240.00	0.469	0.588	54	58	54	57	-	120
MAR	36	52	76	1240.00	0.268	0.381	58	60	56	59	-	120
APR	46	55	79	1240.00	0.320	0.491	64	64	61	66	-	120
MAY	60	65	82	1240.00	0.320	0.579	71	72	68	72	-	120
JUN	71	75	85	1240.00	0.406	0.929	78	79	75	79	-	120
JUL	75	80	86	1240.00	0.454	0.606	80	82	80	85	-	120
AUG	74	79	86	1240.00	0.426	0.575	82	82	82	86	-	120
SEP	65	72	84	1240.00	0.452	0.597	80	80	78	82	-	120
OCT	52	61	80	1240.00	0.346	0.453	74	76	73	79	-	120
NOV	39	50	77	1240.00	0.398	0.442	68	69	65	70	-	120
DEC	33	49	76	1240.00	0.316	0.384	57	60	57	61	-	120

*NA - Indicates that there are greater than 100 daily maximum values, therefore 99th percentile would be a value less than the recorded daily maximum.