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October 15, 2020

Christopher Black
U.S. Environmental Protection Agency Region 5
Land, Chemicals & Redevelopment Division
77 West Jackson Blvd, LR-16J
Chicago, IL 60604-3590

Subject: ***Quarterly Progress Report (July through September 2020)***
Administrative Order on Consent (February 26, 2009)
Tyco Fire Products LP, Stanton Street Facility, Marinette, Wisconsin
WID 006 125 215

Dear Mr. Black:

In accordance with Section VI, 21, b (Page 10) of the Administrative Order on Consent (AOC), dated February 26, 2009, Tyco Fire Products LP (Tyco) has prepared this quarterly progress report for the U.S. Environmental Protection Agency (EPA) Region 5 and the Wisconsin Department of Natural Resources (WDNR) (collectively referred herein as the Agencies). The reports are required to document activities conducted as part of the Resource Conservation and Recovery Act (RCRA) corrective actions at the Tyco facility on Stanton Street in Marinette, Wisconsin. This report covers the period from July 1 through September 30, 2020 and presents a brief description of the work performed, data collected, problems encountered, and schedule of activities as required by the February 2009 AOC and subsequent agreements.

Work Completed During this Reporting Period

Attachment 1 summarizes the operational data for the groundwater collection and treatment system (GWCTS) during the third quarter 2020, and Attachment 2 contains the monthly Discharge Monitoring Reports. Operations still include a bypass of the first two reaction tanks and the lamella and connection of the equalization tank directly to Reaction Tank 3, then Reaction Tank 4, and then to the microfilter. The GWCTS operated continuously except for weekend and holiday downtime days and two longer downtimes (one the week of July 27, 2020 to reallocate waste truck resources to support an onsite water main break and one from September 15 to September 23, 2020 to source and replace the effluent pH probes that were not working properly and were replaced on September 24, 2020). While this resulted in a slightly lower total volume extracted and treated during the reporting period when compared to the prior quarter, the average volume treated per operating day increased by approximately 1,500 gallons. The overall volume of groundwater extracted was approximately 708,576 gallons. Reject volume rates were also decreased by approximately 10%. In addition, extraction well EW-1 (in the Wetlands Area) was turned off temporarily in early September 2020 to allow the focus to be on the Main Plant extraction wells. EW-1 will be turned back on in fourth quarter.

Pump down operations with the temporary system continued through third quarter 2020 in the former Salt Vault and former 8th Street Slip areas. Operations continued under management of Endpoint Solutions of Franklin, Wisconsin. From July 4 to September 25, 2020, approximately 409,300 gallons were extracted and disposed of offsite as part of the pump down program. Details of the pump down operations are reported to the Agencies in biweekly summary reports.

Asphalt at cover areas H and I and the former Salt Vault and former 8th Street Slip areas that had cracking observed during their spring 2020 inspection were sealed during the week of September 28, 2020 to limit infiltration of rain water in these areas.

Pressure transducer-related activities were completed on August 26, 2020. These activities included downloading data from each transducer and collecting manual water levels at the time of transducer download. Monitoring well nests MW047 and MW100 were not accessible because of dense vegetation and river levels, and MW107D was not accessible because of ponded water in the well area.

The vertical barrier wall (VBW) inspection (landside and water side above the water line) were completed on September 21 and September 22, 2020. The sheet pile VBW survey was conducted on September 23, 2020. No major issues were identified other than continued high river levels. The following observations were made:

- Minor erosion on the landside from the high river levels – to be addressed when river levels allow; anticipated to be in 2021.
- The same sheet pile wall cap welds that had cracks in 2019 – these are on top of the sheet pile wall and are not a concern regarding VBW integrity; the cracks will continue to be monitored.
- Missing VBW markers along the slurry wall portion – replacement markers have been ordered and will be addressed in 2021.

The VBW inspection details will be provided in the annual report.

The sitewide monitoring well survey required every 5 years as part of the barrier wall groundwater monitoring plan was started on September 1 and completed on September 21 through September 23, 2020. The updated survey coordinates will be provided in the annual report.

Agency comments were received in an email with two letters from EPA Project Manager Christopher Black on September 30, 2020 for both the 2019 Barrier Wall Groundwater Monitoring Annual Report and Arsenic Migration Pathways Evaluation Report. These draft documents were originally submitted to the Agencies on March 17, 2020 and March 9, 2020, respectively.

Additional Activities

The draft Wisconsin Pollutant Discharge and Elimination System (WPDES) variance permit was received from WDNR on July 1, 2020 and went to public comment on August 6, 2020. Because of the later date in getting the permit to public comment, a final permit is anticipated on December 1, 2020. The associated design efforts for the GWCTS improvements will be initiated in winter 2020/2021 and conveyance system construction work for the permanent pump down program is anticipated to begin in 2021.

The new ChemDesign building construction and related changes to RCRA remedy components continued in third quarter 2020. Work is anticipated to be completed in fall 2020.

Coleman Engineering Company (located in Iron Mountain, Michigan) completed repairs needed at MW109S and the staff gauge on August 27, 2020.

A project status teleconference meeting was held on August 27, 2020 with EPA, WDNR, Tyco, and Jacobs Engineering Group Inc. Sufficient time was not available to cover all agenda items; a follow-up meeting to complete this status update will be needed in fourth quarter 2020.

MJB Industries, Inc. (MJB; located in Marinette, Wisconsin) completed test pits in the former Salt Vault area on September 1 and September 2, 2020 to evaluate the top of slurry wall elevations on the western and southern boundaries of the former Salt Vault. A limited area was identified where groundwater from the Main Plant has the potential to overtop the former Salt Vault slurry wall when groundwater elevations are elevated. This condition may have contributed to the difficulties associated with achieving pump down targets in the former Salt Vault groundwater in 2019 and 2020 and portions of 2018. The location was identified in the southwestern corner where an approximately 125-foot-long section of the south wall has a top elevation of approximately 584 feet above mean sea level (amsl), and a buried electrical line with aggregate was notched into the wall down to an elevation of 583.3 feet amsl. Past water levels in the Main Plant in this area had periods where groundwater levels were higher than 584 feet amsl in 2018 to 2020. Tyco is evaluating options to extend the slurry wall to at least an elevation of 585 feet amsl along this portion of the south wall; it is anticipated that modifications would be implemented in 2021, if it is deemed necessary. As of the end of this reporting period and beginning in mid-August 2020, groundwater elevations in the Main Plant adjacent to the former Salt Vault had fallen below an elevation of 583.3 feet amsl indicating that overtopping is not currently a concern.

Data Collected

Extraction and treatment volumes, analytical testing, and discharge data are required as part of the WPDES permits obtained from WDNR for operating the GWCTS. The GWCTS operates under WPDES Permit WI-0001040-07-0. Attachment 2 includes the GWCTS monthly WPDES Discharge Monitoring Reports for June through August 2020. Attachment 1 contains additional data on the GWCTS operations.

Groundwater elevation data were collected from monitoring wells in the former 8th Street Slip and former Salt Vault areas in accordance with the pump down program requirements and have been reported to the Agencies in the biweekly summary reports.

Groundwater elevation data recorded by transducers are being compiled and evaluated. The transducer data will be provided in the annual report.

Survey data collected in August and September 2020 for the sitewide monitoring well and VBW surveys is being compiled by the surveyor. The survey data will be provided in the annual report.

Problems Encountered

Menomonee River Levels

Menominee River water levels remained high through third quarter 2020. During the reporting period, the river remained above the top of the VBW in the Wetlands Area of the site. Water levels exceeded the weirs in the Main Plant area throughout the reporting period. Temporary weir gates were installed at the two western most weirs in August 2020, and the eastern most weir had a gate installed in September 2020.

The second weir in the east does not require a gate. Permanent gates to replace the temporary ones have been constructed and are onsite; MJB is scheduled to install the gates in October 2020.

In addition to the super sacks temporarily placed on top of three catch basins near Building 29 in the southwestern corner of the site, a bypass was installed in one of the catch basins to better manage river water that occasionally backs up at these catch basins. The super sacks and bypass help limit river water that surfaces. The bypass and super sacks were removed in mid-September as river levels were low enough that back ups were no longer a concern. Long term, Tyco will be implementing a stormwater improvement plan as part of the WPDES permit that will abandon the subsurface stormwater lines and manage stormwater through above ground surface flow, as needed.

Also because of the high water levels, during the VBW survey, dimple points D-42 to D-53 (essentially the Wetlands Area or from just east of staff gauge SG-4 to the east) was not able to be surveyed nor was the wall able to be inspected from the land side. Portions of the slurry wall in the Wetlands Area also were not able to be inspected.

Sitewide Monitoring Well Survey

The following wells were not able to be surveyed as part of the site wide monitoring well survey. As conditions allow, these locations will be attempted during the 2021 VBW survey.

- MW047 nest – Not accessible because of dense wetlands vegetation overgrowth and high river levels. Not only is access to these wells difficult, but the site lines needed for surveying are not clear because of the height of the vegetation (this applies to all wells noted below with this issue).
- MW048S – Not accessible because of dense wetlands vegetation overgrowth and high river levels (proposed transducer location has been inaccessible in 2019 and 2020, consistent with the June 2019 Addendum to 2015 Barrier Wall Groundwater Monitoring Plan Update, this transducer location may not end up being installed).
- MW100 nest – Not accessible because of dense wetlands vegetation overgrowth and high river levels.
- EW-1 – Not accessible because of dense wetlands vegetation overgrowth and high river levels.
- EW-2 – Unable to open the flush-mount well vault, which is stuck shut, and may need to break the lid to obtain access, if needed. EW-2 is in the former 8th Street Slip, is not being used, and is not planned to be used for future extraction.

GWCTS Operations

Follow-up whole effluent toxicity (WET) test sampling was completed because of the GWCTS annual WET test collected in May 2020 that did not have passing results. The required follow-up WET tests were conducted the weeks of July 6 and July 20, 2020. Both follow-up tests passed, and no additional testing is required. Attachment 2 contains the follow-up WET test report forms and results.

Schedule of Upcoming Activities

The following is a summary of activities to be conducted during the next reporting period.

- Submit the quarterly progress report
- Continue constructing new ChemDesign building and related changes to RCRA remedy components

- Conduct fourth quarter 2020 semiannual barrier wall groundwater monitoring water levels
- Conduct transducer data download activities
- Continue pump down program operations in the former Salt Vault and former 8th Street Slip areas
- Continue operating the GWCTS
- Attend continuation of project status meeting to complete review of remaining agenda items
- Submit responses to Agency comments on the 2019 Barrier Wall Groundwater Monitoring Annual Report and Arsenic Migration Pathways Evaluation Report by November 29, 2020 (60 days from receipt of comments).
- Submit revised vapor intrusion assessment and work plan responding to Agency comments
- Receive final WPDES variance permit
- Submit conveyance improvements design
- Initiate GWCTS improvements design

List of Key Correspondence and Document Submittals

Table 1. Documents Submitted

Quarterly Progress Report (July to September 2020), Tyco Fire Products LP Facility, Marinette, WI

Description of Submittal	Submitted To	Date Submitted
Email – Comments on Draft WPDES Permit	WDNR	July 8, 2020
Biweekly Summary Report for Pump Down Program	EPA	July 9, 2020
Quarterly Progress Report (Second Quarter 2020)	EPA	July 14, 2020
Biweekly Summary Report for Pump Down Program	EPA	July 29, 2020
Biweekly Summary Report for Pump Down Program	EPA	August 5, 2020
Biweekly Summary Report for Pump Down Program	EPA	August 19, 2020
Email – Presentation Materials from August 27, 2020 Project Status Meeting	EPA	August 31, 2020
Biweekly Summary Report for Pump Down Program	EPA	September 9, 2020
Biweekly Summary Report for Pump Down Program	EPA	September 16, 2020

Table 2. Correspondence from Agency

Quarterly Progress Report (July through September 2020), Tyco Fire Products LP Facility, Marinette, WI

Description of Correspondence	Submitted By	Date Submitted
Draft WPDES Variance Permit for Tyco Review	WDNR	July 1, 2020
Public Notice for WPDES Variance Permit	WDNR	August 6, 2020
EPA and WDNR Review of 2019 Barrier Wall Groundwater Monitoring Annual Report	EPA	September 30, 2020
EPA and WDNR Review of Arsenic Migration Pathways Evaluation Report	EPA	September 30, 2020

If you have any questions or require additional information, please contact me at 262-644-6167 or Jeffrey Danko at 262-349-2528.

Respectfully Yours,

Jacobs Engineering Group Inc.

Heather Ziegelbauer
Project Manager

cc: Angela Carey, WDNR
Ryan Suennen, Tyco Fire Products
Jeff Danko, Johnson Controls
Mariel Carter, Stephenson Public Library

Attachments

1 Groundwater Collection and Treatment System Operation Summary

2 Discharge Monitoring Reports and WET Test Results for the Groundwater Collection and Treatment System

Document Control No.: D3394600.278

Attachment 1
Groundwater Collection and Treatment System Operation Summary

Groundwater Collection and Treatment System Operations for Tyco Fire Products LP, Marinette, Wisconsin, July 1 through September 30, 2020

The following summarizes groundwater collection and treatment system (GWCTS) operations from July 1 through September 30, 2020 at the Tyco Fire Products LP facility on Stanton Street in Marinette, Wisconsin:

- The GWCTS operated for 22 days in July 2020, 24 days in August 2020, and 13 days in September 2020, for a total of 59 days.
- For the reporting period, the precipitation recorded from the weather station in Marinette, Wisconsin was 11.8 inches of rain (http://www.ncdc.noaa.gov/cdo-web/datasets/GHCND/stations/GHCND:USC00475091/detail).
- An estimated 708,576 gallons of groundwater were extracted (not including volumes extracted as part of the pump down program) from the site during the reporting period. Table 1-1 lists the water volumes extracted from each area of the site for this quarter based on the recorded data.
- During the reporting period, an estimated 768,507 gallons of water were discharged to the Menominee River as effluent under the Wisconsin Pollutant Discharge and Elimination System permit.
- Approximately 269,805 gallons of reject water were produced this reporting period during system operations and subsequently disposed of offsite.

Table 1-1. Extraction Well Data Summary (July through September 2020)

GWCTS Operations, Tyco Fire Products LP Facility, Marinette, WI

Extraction Well	Gallons Run, Third Quarter 2020 (July 1 through September 30, 2020)
EW-1	57,171
EW-2	0
EW-3	0
EW-4	8,476
EW-5	168,387
EW-6	218,907
EW-7	255,635
Total	**708,576**

Attachment 2
Discharge Monitoring Reports and WET Test Results for the Groundwater Collection and Treatment System

Wastewater Discharge Monitoring Long Report

For DNR Use Only

Facility Name: TYCO FIRE PRODUCTS LP
Contact Address: One Stanton St
Marinette, WI 54143
Facility Contact: Mike Elliott, EHS Manager
Phone Number: 715-735-7411
Reporting Period: 06/01/2020 - 06/30/2020
Form Due Date: 07/21/2020
Permit Number: 0001040

Date Received:	
DOC:	445622
FIN:	7245
FID:	438039470
Region:	Northeast Region
Permit Drafter:	Trevor J Moen
Reviewer:	Laura A Gerold
Office:	Green Bay

	Sample Point	001	703	001	001	001
	Description	PRIOR TO MENOMINEE RIVER	Intake Water Monitoring	PRIOR TO MENOMINEE RIVER	PRIOR TO MENOMINEE RIVER	PRIOR TO MENOMINEE RIVER
	Parameter	211	280	487	374	373
	Description	Flow Rate	Mercury, Total Recoverable	Temperature	pH (Minimum)	pH (Maximum)
	Units	MGD	ng/L	degF	su	su
	Sample Type	CONTINUOUS	GRAB	GRAB	CONTINUOUS	CONTINUOUS
	Frequency	DAILY	MONTHLY	MONTHLY	DAILY	DAILY
Sample Results	Day 1	0.16982		67	6.5	7.1
	2	0.12866		70	7.1	7.3
	3	0.12196		73	7.0	7.1
	4	0.10334		73	7.1	7.2
	5	0.07538		71	6.7	7.4
	6	0.01369		75	7.4	7.5
	7	0.04309		74	7.1	7.8
	8	0.13494		72	7.1	7.3
	9	0.20342		72	6.6	7.4
	10	0.25792		75	6.4	6.8
	11	0.13534		70	6.8	7.3
	12	0.11968		71	7.1	7.3
	13	0.08587		72	7.2	7.6
	14	0.06525		72	7.2	7.6
	15	0.13838		70	7.0	7.3
	16	0.15059	<0.16	73	6.8	7.1
	17	0.14318		74	6.8	7.0
	18	0.13952		72	7.0	7.2
	19	0.09617		72	7.1	7.5
	20	0.10526		76	6.6	7.1
	21	0.08774		77	6.9	7.1
	22	0.37191		73	6.3	7.1
	23	0.11409		73	6.7	7.1
	24	0.14357		73	6.9	7.2
	25	0.12489		75	6.9	7.1
	26	0.08588		75	6.9	7.3
	27	0.03965		77	7.3	7.5
	28	0.08410		81	7.2	7.8
	29	0.11665		78	7.2	7.6
	30	0.11693		77	7.2	7.4
	31					

	Sample Point	001	703	001	001	001
	Description	PRIOR TO MENOMINEE RIVER	Intake Water Monitoring	PRIOR TO MENOMINEE RIVER	PRIOR TO MENOMINEE RIVER	PRIOR TO MENOMINEE RIVER
	Parameter	211	280	487	374	373
	Description	Flow Rate	Mercury, Total Recoverable	Temperature	pH (Minimum)	pH (Maximum)
	Units	MGD	ng/L	degF	su	su
Summary Values	**Monthly Avg**	0.123895667	0	73.433333333	6.936666667	7.303333333
	Monthly Total					
	Daily Max	0.37191	<0.16	81	7.4	7.8
	Daily Min	0.01369	<0.16	67	6.3	6.8
	Rolling 12 Month Avg					
Limit(s) in Effect	**Monthly Avg**					
	Monthly Total					
	Daily Max					11 0
	Daily Min				4 0	
	Rolling 12 Month Avg					
QA/QC Information	**LOD**		0.16			
	LOQ		0.5			
	QC Exceedance	N	N	N	N	N
	Lab Certification		999580010			

	Sample Point	001	001	001	001	001
	Description	PRIOR TO MENOMINEE RIVER	PRIOR TO MENOMINEE RIVER	PRIOR TO MENOMINEE RIVER	PRIOR TO MENOMINEE RIVER	PRIOR TO MENOMINEE RIVER
	Parameter	379	376	388	231	35
	Description	pH Total Exceedance Time Minutes	pH Exceedances Greater Than 60 Minutes	Phosphorus, Total	Hardness, Total as CaCO3	Arsenic, Total Recoverable
	Units	minutes	Number	mg/L	mg/L	ug/L
	Sample Type	CONTINUOUS	CONTINUOUS	24 HR COMP	24 HR COMP	24 HR COMP
	Frequency	DAILY	DAILY	WEEKLY	MONTHLY	MONTHLY
Sample Results	Day 1			0.86	270	130
	2					
	3					
	4					
	5					
	6					
	7					
	8				370	120
	9					
	10					
	11					
	12					
	13					
	14					
	15			0.26	380	110
	16					
	17					
	18					
	19					
	20					
	21					
	22					
	23			1.4	340	84
	24					
	25					
	26					
	27					
	28					
	29					
	30					
	31					

	Sample Point	001		001		001		001		001	
	Description	PRIOR TO MENOMINEE RIVER		PRIOR TO MENOMINEE RIVER		PRIOR TO MENOMINEE RIVER		PRIOR TO MENOMINEE RIVER		PRIOR TO MENOMINEE RIVER	
	Parameter	379		376		388		231		35	
	Description	pH Total Exceedance Time Minutes		pH Exceedances Greater Than 60 Minutes		Phosphorus, Total		Hardness, Total as CaCO3		Arsenic, Total Recoverable	
	Units	minutes		Number		mg/L		mg/L		ug/L	
Summary Values	**Monthly Avg**					0.84		340		111	
	Monthly Total										
	Daily Max					1.4		380		130	
	Daily Min					0.26		270		84	
	Rolling 12 Month Avg					0.5					
Limit(s) in Effect	**Monthly Avg**										
	Monthly Total	446	0								
	Daily Max			0	0					680	0
	Daily Min										
	Rolling 12 Month Avg					1	0				
QA/QC Information	**LOD**					0.024				2.1	
	LOQ					0.05				5	
	QC Exceedance	N		N		N		N		N	
	Lab Certification					999580010		999580010		999580010	

	Sample Point	001	001	001	001	001
	Description	PRIOR TO MENOMINEE RIVER	PRIOR TO MENOMINEE RIVER	PRIOR TO MENOMINEE RIVER	PRIOR TO MENOMINEE RIVER	PRIOR TO MENOMINEE RIVER
	Parameter	35	147	147	87	152
	Description	Arsenic, Total Recoverable	Copper, Total Recoverable	Copper, Total Recoverable	Cadmium, Total Recoverable	Cyanide, Amenable
	Units	lbs/day	ug/L	lbs/day	ug/L	ug/L
	Sample Type	CALCULATED	24 HR COMP	24 HR COMP	24 HR COMP	24 HR COMP
	Frequency	MONTHLY	MONTHLY	MONTHLY	MONTHLY	MONTHLY
Sample Results	Day 1	0.1846	23	0.03266	<0.49	<5.0
	2					
	3					
	4					
	5					
	6					
	7					
	8	0.1344	23	0.02576	0.72	
	9					
	10					
	11					
	12					
	13					
	14					
	15	0.1265	27	0.03105	0.58	
	16					
	17					
	18					
	19					
	20					
	21					
	22					
	23	0.0798	25	0.02375	<0.49	
	24					
	25					
	26					
	27					
	28					
	29					
	30					
	31					

	Sample Point	001		001		001		001		001	
	Description	PRIOR TO MENOMINEE RIVER		PRIOR TO MENOMINEE RIVER		PRIOR TO MENOMINEE RIVER		PRIOR TO MENOMINEE RIVER		PRIOR TO MENOMINEE RIVER	
	Parameter	35		147		147		87		152	
	Description	Arsenic, Total Recoverable		Copper, Total Recoverable		Copper, Total Recoverable		Cadmium, Total Recoverable		Cyanide, Amenable	
	Units	lbs/day		ug/L		lbs/day		ug/L		ug/L	
Summary Values	**Monthly Avg**	0.131325		24.5		0.028305		0.325		0	
	Monthly Total										
	Daily Max	0.1846		27		0.03266		0.72		<5	
	Daily Min	0.0798		23		0.02375		<0.49		<5	
	Rolling 12 Month Avg										
Limit(s) in Effect	**Monthly Avg**										
	Monthly Total										
	Daily Max	12	0	69	0	0.98	0				
	Daily Min										
	Rolling 12 Month Avg										
QA/QC Information	**LOD**			1.7				0.49		5	
	LOQ			5				1		10	
	QC Exceedance	N		N		N		N		N	
	Lab Certification			999580010				999580010		999580010	

	Sample Point	001	001	101	101	101
	Description	PRIOR TO MENOMINEE RIVER	PRIOR TO MENOMINEE RIVER	Metal Finishing Effluent	Metal Finishing Effluent	Metal Finishing Effluent
	Parameter	112	280	211	457	342
	Description	Chlorine, Total Residual	Mercury, Total Recoverable	Flow Rate	Suspended Solids, Total	Oil & Grease (Freon)
	Units	ug/L	ng/L	MGD	mg/L	mg/L
	Sample Type	GRAB	GRAB	CONTINUOUS	24 HR COMP	GRAB
	Frequency	MONTHLY	MONTHLY	DAILY	DAILY	2/WEEK
Sample Results	Day 1			0.02233	4.0	1.5
	2			0.01548	3.5	2.5
	3			0.02382	3.0	
	4			0.01932	<1.9	
	5			0.00752	3.5	
	6					
	7					
	8			0.02189	4.0	<1.5
	9			0.02209	4.0	<1.4
	10			0.02206	3.0	
	11			0.01425	2.0	
	12			0.00596	3.0	
	13			0.00639	2.5	
	14					
	15	22		0.02042	3.0	<1.5
	16		3.2	0.02186	3.5	<1.5
	17			0.02035	4.0	
	18			0.01579	3.0	
	19			0.00571	4.0	
	20					
	21					
	22			0.02794	4.0	<1.4
	23			0.03029	3.5	2.1
	24			0.02244	2.0	
	25			0.01576	4.5	
	26			0.00902	7.5	
	27					
	28					
	29			0.01557	10.0	
	30			0.01036	6.5	
	31					

	Sample Point	001	001	101	101	101
	Description	PRIOR TO MENOMINEE RIVER	PRIOR TO MENOMINEE RIVER	Metal Finishing Effluent	Metal Finishing Effluent	Metal Finishing Effluent
	Parameter	112	280	211	457	342
	Description	Chlorine, Total Residual	Mercury, Total Recoverable	Flow Rate	Suspended Solids, Total	Oil & Grease (Freon)
	Units	ug/L	ng/L	MGD	mg/L	mg/L
Summary Values	**Monthly Avg**	22	3.2	0.017244348	3.826086957	0.7625
	Monthly Total					
	Daily Max	22	3.2	0.03029	10	2.5
	Daily Min	22	3.2	0.00571	<1.9	<1.4
	Rolling 12 Month Avg					
Limit(s) in Effect	**Monthly Avg**				31 0	26 0
	Monthly Total					
	Daily Max				60 0	52 0
	Daily Min					
	Rolling 12 Month Avg					
QA/QC Information	**LOD**	30	0.16			1.4
	LOQ	100	0.5			5.7
	QC Exceedance	N	N	N	N	N
	Lab Certification		999580010		999580010	999580010

	Sample Point	101	101	101	101	101
	Description	Metal Finishing Effluent	Metal Finishing Effluent	Metal Finishing Effluent	Metal Finishing Effluent	Metal Finishing Effluent
	Parameter	87	133	315	553	155
	Description	Cadmium, Total Recoverable	Chromium, Total Recoverable	Nickel, Total Recoverable	Zinc, Total Recoverable	Cyanide, Total
	Units	ug/L	ug/L	ug/L	ug/L	ug/L
	Sample Type	24 HR COMP	24 HR COMP	24 HR COMP	24 HR COMP	GRAB
	Frequency	2/WEEK	MONTHLY	2/WEEK	2/WEEK	MONTHLY
Sample Results	**Day 1**	<0.49	<2.2	12	120	<3.0
	2	<0.49	<2.2	8.4	86	
	3					
	4					
	5					
	6					
	7					
	8	<0.49	<2.2	4.8	130	
	9	<0.49	<2.2	5.2	70	
	10					
	11					
	12					
	13					
	14					
	15	<0.49	<2.2	5.8	140	
	16	<0.49	<2.2	10.0	76	
	17					
	18					
	19					
	20					
	21					
	22	<0.49	<2.2	6.8	97	
	23	<0.49	<2.2	5.9	46	
	24					
	25					
	26					
	27					
	28					
	29					
	30					
	31					

	Sample Point	101		101		101		101		101	
	Description	Metal Finishing Effluent		Metal Finishing Effluent		Metal Finishing Effluent		Metal Finishing Effluent		Metal Finishing Effluent	
	Parameter	87		133		315		553		155	
	Description	Cadmium, Total Recoverable		Chromium, Total Recoverable		Nickel, Total Recoverable		Zinc, Total Recoverable		Cyanide, Total	
	Units	ug/L		ug/L		ug/L		ug/L		ug/L	
Summary Values	**Monthly Avg**	0		0		7.3625		95.625		0	
	Monthly Total										
	Daily Max	<0.49		<2.2		12		140		<3	
	Daily Min	<0.49		<2.2		4.8		46		<3	
	Rolling 12 Month Avg										
Limit(s) in Effect	**Monthly Avg**	260	0	1710	0	2380	0	1480	0	650	0
	Monthly Total										
	Daily Max	690	0	2770	0	3980	0	2610	0	1200	0
	Daily Min										
	Rolling 12 Month Avg										
QA/QC Information	**LOD**	0.49		2.2		1.5		3.6		3	
	LOQ	1		5		5		10		10	
	QC Exceedance	N		N		N		N		N	
	Lab Certification	999580010		999580010		999580010		999580010		999580010	

	Sample Point	101	101	101	101	101
	Description	Metal Finishing Effluent	Metal Finishing Effluent	Metal Finishing Effluent	Metal Finishing Effluent	Metal Finishing Effluent
	Parameter	147	264	430	374	373
	Description	Copper, Total Recoverable	Lead, Total Recoverable	Silver, Total Recoverable	pH (Minimum)	pH (Maximum)
	Units	ug/L	ug/L	ug/L	su	su
	Sample Type	24 HR COMP	24 HR COMP	24 HR COMP	CONTINUOUS	CONTINUOUS
	Frequency	2/WEEK	MONTHLY	MONTHLY	DAILY	DAILY
Sample Results	**Day 1**	7.7	<1.3	2.1	6.7	7.8
	2	5.8	1.8	<1.1	6.8	8.2
	3				6.7	7.9
	4				6.6	7.0
	5				6.3	6.5
	6					
	7					
	8	5.9	2.5	<1.1	7.0	8.9
	9	5.6	<1.3	<1.1	6.7	7.9
	10				6.8	7.6
	11				6.6	7.2
	12				6.3	6.5
	13				6.8	7.2
	14					
	15	5.6	2.8	<1.1	7.1	8.5
	16	6.0	1.4	<1.1	6.7	8.0
	17				6.8	7.6
	18				6.7	7.5
	19				6.7	6.8
	20					
	21					
	22	5.2	1.5	<1.1	7.0	8.4
	23	4.2	1.4	<1.1	6.9	7.5
	24				6.8	7.6
	25				7.0	7.6
	26				6.8	7.1
	27					
	28					
	29				7.0	8.2
	30				6.9	7.8
	31					

	Sample Point	101		101		101		101		101	
	Description	Metal Finishing Effluent		Metal Finishing Effluent		Metal Finishing Effluent		Metal Finishing Effluent		Metal Finishing Effluent	
	Parameter	147		264		430		374		373	
	Description	Copper, Total Recoverable		Lead, Total Recoverable		Silver, Total Recoverable		pH (Minimum)		pH (Maximum)	
	Units	ug/L		ug/L		ug/L		su		su	
Summary Values	**Monthly Avg**	5.75		1.425		0.2625		6.769565217		7.62173913	
	Monthly Total										
	Daily Max	7.7		2.8		2.1		7.1		8.9	
	Daily Min	4.2		<1.3		<1.1		6.3		6.5	
	Rolling 12 Month Avg										
Limit(s) in Effect	**Monthly Avg**	2070	0	430	0	240	0				
	Monthly Total										
	Daily Max	3380	0	690	0	430	0			11	0
	Daily Min							4	0		
	Rolling 12 Month Avg										
QA/QC Information	**LOD**	1.7		1.3		1.1					
	LOQ	5		2.5		2.5					
	QC Exceedance	N		N		N		N		N	
	Lab Certification	999580010		999580010		999580010					

	Sample Point	101	101	101	101	101
	Description	Metal Finishing Effluent	Metal Finishing Effluent	Metal Finishing Effluent	Metal Finishing Effluent	Metal Finishing Effluent
	Parameter	379	376	507	40	490
	Description	pH Total Exceedance Time Minutes	pH Exceedances Greater Than 60 Minutes	Total Toxic Organics	Benzene	Tetrachloroethylene
	Units	minutes	Number	ug/L	ug/L	ug/L
	Sample Type	CALCULATED	CALCULATED	24 HR COMP	24 HR COMP	24 HR COMP
	Frequency	DAILY	DAILY	MONTHLY	MONTHLY	MONTHLY
Sample Results	**Day 1**					
	2					
	3					
	4					
	5					
	6					
	7					
	8					
	9					
	10					
	11					
	12					
	13					
	14					
	15					
	16					
	17					
	18					
	19					
	20					
	21					
	22					
	23					
	24					
	25					
	26					
	27					
	28					
	29					
	30					
	31					

	Sample Point	101		101		101		101		101	
	Description	Metal Finishing Effluent		Metal Finishing Effluent		Metal Finishing Effluent		Metal Finishing Effluent		Metal Finishing Effluent	
	Parameter	379		376		507		40		490	
	Description	pH Total Exceedance Time Minutes		pH Exceedances Greater Than 60 Minutes		Total Toxic Organics		Benzene		Tetrachloroethylene	
	Units	minutes		Number		ug/L		ug/L		ug/L	
Summary Values	**Monthly Avg**										
	Monthly Total										
	Daily Max										
	Daily Min										
	Rolling 12 Month Avg										
Limit(s) in Effect	**Monthly Avg**										
	Monthly Total	446	0	0	0						
	Daily Max					2130					
	Daily Min										
	Rolling 12 Month Avg										
QA/QC Information	**LOD**										
	LOQ										
	QC Exceedance	N		N		N		N		N	
	Lab Certification										

	Sample Point	101	101	101	101	101
	Description	Metal Finishing Effluent	Metal Finishing Effluent	Metal Finishing Effluent	Metal Finishing Effluent	Metal Finishing Effluent
	Parameter	500	561	200	508	285
	Description	Toluene	1,1,1-Trichloro- ethane	Ethylbenzene	Trichloro- ethylene	Methylene chloride
	Units	ug/L	ug/L	ug/L	ug/L	ug/L
	Sample Type	24 HR COMP	24 HR COMP	24 HR COMP	24 HR COMP	24 HR COMP
	Frequency	MONTHLY	MONTHLY	MONTHLY	MONTHLY	MONTHLY
Sample Results	**Day 1**					
	2					
	3					
	4					
	5					
	6					
	7					
	8					
	9					
	10					
	11					
	12					
	13					
	14					
	15					
	16					
	17					
	18					
	19					
	20					
	21					
	22					
	23					
	24					
	25					
	26					
	27					
	28					
	29					
	30					
	31					

	Sample Point	101	101	101	101	101
	Description	Metal Finishing Effluent	Metal Finishing Effluent	Metal Finishing Effluent	Metal Finishing Effluent	Metal Finishing Effluent
	Parameter	500	561	200	508	285
	Description	Toluene	1,1,1-Trichloro- ethane	Ethylbenzene	Trichloro- ethylene	Methylene chloride
	Units	ug/L	ug/L	ug/L	ug/L	ug/L
Summary Values	**Monthly Avg**					
	Monthly Total					
	Daily Max					
	Daily Min					
	Rolling 12 Month Avg					
Limit(s) in Effect	**Monthly Avg**					
	Monthly Total					
	Daily Max					
	Daily Min					
	Rolling 12 Month Avg					
QA/QC Information	**LOD**					
	LOQ					
	QC Exceedance					
	Lab Certification					

	Sample Point	101	106	106	106	107
	Description	Metal Finishing Effluent	Future remedial action ww	Future remedial action ww	Future remedial action ww	Mercury Field Blank Results
	Parameter	167	211	35	457	280
	Description	Di-n-butyl phthalate (dibutyl phthalate)	Flow Rate	Arsenic, Total Recoverable	Suspended Solids, Total	Mercury, Total Recoverable
	Units	ug/L	gpd	ug/L	mg/L	ng/L
	Sample Type	24 HR COMP	CONTINUOUS	24 HR COMP	24 HR COMP	GRAB
	Frequency	MONTHLY	DAILY	WEEKLY	WEEKLY	MONTHLY
Sample Results	Day 1					
	2					
	3					
	4					
	5					
	6					
	7					
	8					
	9					
	10					
	11					
	12					
	13					
	14					
	15					
	16					<0.16
	17					
	18					
	19					
	20					
	21					
	22					
	23					
	24					
	25					
	26					
	27					
	28					
	29					
	30					
	31					

	Sample Point	101	106	106	106	107
	Description	Metal Finishing Effluent	Future remedial action ww	Future remedial action ww	Future remedial action ww	Mercury Field Blank Results
	Parameter	167	211	35	457	280
	Description	Di-n-butyl phthalate (dibutyl phthalate)	Flow Rate	Arsenic, Total Recoverable	Suspended Solids, Total	Mercury, Total Recoverable
	Units	ug/L	gpd	ug/L	mg/L	ng/L
Summary Values	**Monthly Avg**					0
	Monthly Total					
	Daily Max					<0.16
	Daily Min					<0.16
	Rolling 12 Month Avg					
Limit(s) in Effect	**Monthly Avg**					
	Monthly Total					
	Daily Max					
	Daily Min					
	Rolling 12 Month Avg					
QA/QC Information	**LOD**					0.16
	LOQ					0.5
	QC Exceedance	N	N	N	N	N
	Lab Certification					999580010

	Sample Point	003	003	003	003	003
	Description	Future remedial action dischg	Future remedial action dischg	Future remedial action dischg	Future remedial action dischg	Future remedial action dischg
	Parameter	211	457	35	374	373
	Description	Flow Rate	Suspended Solids, Total	Arsenic, Total Recoverable	pH (Minimum)	pH (Maximum)
	Units	MGD	mg/L	ug/L	su	su
	Sample Type	CONTINUOUS	24 HR COMP	24 HR COMP	CONTINUOUS	CONTINUOUS
	Frequency	DAILY	WEEKLY	WEEKLY	DAILY	DAILY
Sample Results	Day 1	0.015127	<1.9	42	6.9	8.6
	2	0.013370			7.0	8.3
	3	0.011336			6.3	8.1
	4	0.013553			6.9	8.1
	5	0.007729			7.0	7.6
	6	0.007522			6.9	8.2
	7	0.005986			6.7	8.0
	8	0.020688	2.0	40	6.0	6.7
	9	0.012522			6.0	7.3
	10	0.015697			6.8	7.0
	11	0.013472			6.5	6.7
	12					
	13	0.006703			6.0	6.6
	14	0.000741			6.0	6.4
	15	0.011057	<1.9	23	6.0	7.5
	16	0.014183			6.1	7.6
	17	0.011680			6.3	6.8
	18	0.011743			6.3	6.9
	19	0.006667			6.6	9.0
	20	0.007029			6.2	9.0
	21	0.003430			6.0	6.6
	22	0.015031	2.0	47	6.0	7.3
	23	0.015744			6.1	6.7
	24	0.015675			6.2	7.1
	25	0.015135			6.4	7.3
	26					
	27					
	28					
	29	0.021070			6.8	7.2
	30	0.008377			6.8	7.3
	31					

	Sample Point	003		003		003		003		003	
	Description	Future remedial action dischg		Future remedial action dischg		Future remedial action dischg		Future remedial action dischg		Future remedial action dischg	
	Parameter	211		457		35		374		373	
	Description	Flow Rate		Suspended Solids, Total		Arsenic, Total Recoverable		pH (Minimum)		pH (Maximum)	
	Units	MGD		mg/L		ug/L		su		su	
Summary Values	**Monthly Avg**	0.011587192		1		38		6.415384615		7.457692308	
	Monthly Total										
	Daily Max	0.02107		2		47		7		9	
	Daily Min	0.000741		<1.9		23		6		6.4	
	Rolling 12 Month Avg										
Limit(s) in Effect	**Monthly Avg**										
	Monthly Total										
	Daily Max					680	0			11	0
	Daily Min							4	0		
	Rolling 12 Month Avg										
QA/QC Information	**LOD**					2.1					
	LOQ					5					
	QC Exceedance	N		N		N		N		N	
	Lab Certification			999580010		999580010					

	Sample Point	003	003
	Description	Future remedial action dischg	Future remedial action dischg
	Parameter	379	376
	Description	pH Total Exceedance Time Minutes	pH Exceedances Greater Than 60 Minutes
	Units	minutes	Number
	Sample Type	CONTINUOUS	CONTINUOUS
	Frequency	DAILY	DAILY
Sample Results	**Day 1**		
	2		
	3		
	4		
	5		
	6		
	7		
	8		
	9		
	10		
	11		
	12		
	13		
	14		
	15		
	16		
	17		
	18		
	19		
	20		
	21		
	22		
	23		
	24		
	25		
	26		
	27		
	28		
	29		
	30		
	31		

	Sample Point	003		003	
	Description	Future remedial action dischg		Future remedial action dischg	
	Parameter	379		376	
	Description	pH Total Exceedance Time Minutes		pH Exceedances Greater Than 60 Minutes	
	Units	minutes		Number	
Summary Values	**Monthly Avg**				
	Monthly Total				
	Daily Max				
	Daily Min				
	Rolling 12 Month Avg				
Limit(s) in Effect	**Monthly Avg**				
	Monthly Total	446	0		
	Daily Max			0	0
	Daily Min				
	Rolling 12 Month Avg				
QA/QC Information	**LOD**				
	LOQ				
	QC Exceedance	N		N	
	Lab Certification				

Footnotes (DNR Use Only; Instructions for completing this form that are unique for your facility may be displayed here.)

1. Based on my inquiry of the person or persons directly responsible for managing compiliance with the permit limitation for TTO I certify that to the best of my knowledge and belief no dumping of concentrated toxic organics into the wastewaters has
2. occurred since filing of the last discharge monitoring report. I further certify that this facility is implementing the solvent management plan submitted to the department.

General Remarks

For the second week of sampling at OF001 we are missing the Total P reading because the Lab missed it and I didn't notice it wasn't done until now so, it was past it's holding time.

Laboratory Quality Control Comments

Submitted by Anne Fleury(afleury16) on 7/9/2020 12:48:40 PM

Wastewater Discharge Monitoring Long Report

For DNR Use Only

Facility Name: TYCO FIRE PRODUCTS LP
Contact Address: One Stanton St
Marinette, WI 54143
Facility Contact: Mike Elliott, EHS Manager
Phone Number: 715-735-7415
Reporting Period: 07/01/2020 - 07/31/2020
Form Due Date: 08/21/2020
Permit Number: 0001040

Date Received:	
DOC:	452766
FIN:	7245
FID:	438039470
Region:	Northeast Region
Permit Drafter:	Trevor J Moen
Reviewer:	Laura A Gerold
Office:	Green Bay

	Sample Point	001	703	001	001	001
	Description	PRIOR TO MENOMINEE RIVER	Intake Water Monitoring	PRIOR TO MENOMINEE RIVER	PRIOR TO MENOMINEE RIVER	PRIOR TO MENOMINEE RIVER
	Parameter	211	280	487	374	373
	Description	Flow Rate	Mercury, Total Recoverable	Temperature	pH (Minimum)	pH (Maximum)
	Units	MGD	ng/L	degF	su	su
	Sample Type	CONTINUOUS	GRAB	GRAB	CONTINUOUS	CONTINUOUS
	Frequency	DAILY	MONTHLY	MONTHLY	DAILY	DAILY
Sample Results	Day 1	0.11117		78	7.1	7.4
	2	0.08796		77	7.0	7.6
	3	0.05141		81	7.5	7.6
	4	0.09892		80	7.4	7.6
	5	0.11531		76	7.2	7.7
	6	0.17946		78	6.5	7.4
	7	0.14166		80	7.1	7.4
	8	0.15398		79	6.8	7.4
	9	0.30529		81	6.6	7.3
	10	0.15345		80	6.6	7.5
	11	0.06815		84	7.4	7.8
	12	0.09152		82	7.2	7.5
	13	0.19835	0.16	79	7.0	7.3
	14	0.31364		81	6.6	7.3
	15	0.20010		77	6.6	7.1
	16	0.14339		77	6.7	7.4
	17	0.11202		78	7.0	7.6
	18	0.27707		80	7.2	7.7
	19	0.11062		82	6.8	7.4
	20	0.13241		75	7.2	7.3
	21	0.32072		73	6.6	7.3
	22	0.17559		75	6.7	7.0
	23	0.15050		76	6.9	7.1
	24	0.09170		78	7.1	7.4
	25	0.06233		83	7.1	7.4
	26	0.19098		80	6.7	7.1
	27	0.18228		80	6.8	7.0
	28	0.14826		77	6.9	7.2
	29	0.14167		78	7.1	7.3
	30	0.13854		75	7.2	7.5
	31	0.07125		84	7.3	7.5

	Sample Point	001	703	001	001	001
	Description	PRIOR TO MENOMINEE RIVER	Intake Water Monitoring	PRIOR TO MENOMINEE RIVER	PRIOR TO MENOMINEE RIVER	PRIOR TO MENOMINEE RIVER
	Parameter	211	280	487	374	373
	Description	Flow Rate	Mercury, Total Recoverable	Temperature	pH (Minimum)	pH (Maximum)
	Units	MGD	ng/L	degF	su	su
Summary Values	**Monthly Avg**	0.152248387	0.16	78.838709677	6.964516129	7.390322581
	Monthly Total					
	Daily Max	0.32072	0.16	84	7.5	7.8
	Daily Min	0.05141	0.16	73	6.5	7
	Rolling 12 Month Avg					
Limit(s) in Effect	**Monthly Avg**					
	Monthly Total					
	Daily Max					11 / 0
	Daily Min				4 / 0	
	Rolling 12 Month Avg					
QA/QC Information	**LOD**		0.16			
	LOQ		0.5			
	QC Exceedance	N	N	N	N	N
	Lab Certification		999580010			

	Sample Point	001	001	001	001	001
	Description	PRIOR TO MENOMINEE RIVER	PRIOR TO MENOMINEE RIVER	PRIOR TO MENOMINEE RIVER	PRIOR TO MENOMINEE RIVER	PRIOR TO MENOMINEE RIVER
	Parameter	379	376	388	231	35
	Description	pH Total Exceedance Time Minutes	pH Exceedances Greater Than 60 Minutes	Phosphorus, Total	Hardness, Total as CaCO3	Arsenic, Total Recoverable
	Units	minutes	Number	mg/L	mg/L	ug/L
	Sample Type	CONTINUOUS	CONTINUOUS	24 HR COMP	24 HR COMP	24 HR COMP
	Frequency	DAILY	DAILY	WEEKLY	MONTHLY	MONTHLY
Sample Results	Day 1			0.34	290	130
	2					
	3					
	4					
	5					
	6					
	7					
	8			0.48	340	130
	9					
	10					
	11					
	12					
	13					
	14					
	15					
	16					
	17			0.29	300	130
	18					
	19					
	20					
	21					
	22				310	140
	23					
	24					
	25					
	26					
	27					
	28					
	29					
	30					
	31					

	Sample Point	001		001		001		001		001	
	Description	PRIOR TO MENOMINEE RIVER		PRIOR TO MENOMINEE RIVER		PRIOR TO MENOMINEE RIVER		PRIOR TO MENOMINEE RIVER		PRIOR TO MENOMINEE RIVER	
	Parameter	379		376		388		231		35	
	Description	pH Total Exceedance Time Minutes		pH Exceedances Greater Than 60 Minutes		Phosphorus, Total		Hardness, Total as CaCO3		Arsenic, Total Recoverable	
	Units	minutes		Number		mg/L		mg/L		ug/L	
Summary Values	**Monthly Avg**					0.37		310		132.5	
	Monthly Total										
	Daily Max					0.48		340		140	
	Daily Min					0.29		290		130	
	Rolling 12 Month Avg					0.5					
Limit(s) in Effect	**Monthly Avg**										
	Monthly Total	446	0								
	Daily Max			0	0					680	0
	Daily Min										
	Rolling 12 Month Avg					1	0				
QA/QC Information	**LOD**					0.024				2.1	
	LOQ					0.05				5	
	QC Exceedance	N		N		N		N		N	
	Lab Certification					999580010		999580010		999580010	

	Sample Point	001	001	001	001	001
	Description	PRIOR TO MENOMINEE RIVER	PRIOR TO MENOMINEE RIVER	PRIOR TO MENOMINEE RIVER	PRIOR TO MENOMINEE RIVER	PRIOR TO MENOMINEE RIVER
	Parameter	35	147	147	87	152
	Description	Arsenic, Total Recoverable	Copper, Total Recoverable	Copper, Total Recoverable	Cadmium, Total Recoverable	Cyanide, Amenable
	Units	lbs/day	ug/L	lbs/day	ug/L	ug/L
	Sample Type	CALCULATED	24 HR COMP	24 HR COMP	24 HR COMP	24 HR COMP
	Frequency	MONTHLY	MONTHLY	MONTHLY	MONTHLY	MONTHLY
Sample Results	Day 1	0.1209	38	0.03534	0.53	
	2					
	3					
	4					
	5					
	6					
	7					
	8	0.1664	31	0.03968	<0.49	<5.0
	9					
	10					
	11					
	12					
	13					
	14					
	15					
	16					
	17	0.1209	25	0.02325	<0.49	
	18					
	19					
	20					
	21					
	22	0.2044	29	0.02697	0.52	
	23					
	24					
	25					
	26					
	27					
	28					
	29					
	30					
	31					

	Sample Point	001		001		001		001		001	
	Description	PRIOR TO MENOMINEE RIVER		PRIOR TO MENOMINEE RIVER		PRIOR TO MENOMINEE RIVER		PRIOR TO MENOMINEE RIVER		PRIOR TO MENOMINEE RIVER	
	Parameter	35		147		147		87		152	
	Description	Arsenic, Total Recoverable		Copper, Total Recoverable		Copper, Total Recoverable		Cadmium, Total Recoverable		Cyanide, Amenable	
	Units	lbs/day		ug/L		lbs/day		ug/L		ug/L	
Summary Values	**Monthly Avg**	0.15315		30.75		0.03131		0.2625		0	
	Monthly Total										
	Daily Max	0.2044		38		0.03968		0.53		<5	
	Daily Min	0.1209		25		0.02325		<0.49		<5	
	Rolling 12 Month Avg										
Limit(s) in Effect	**Monthly Avg**										
	Monthly Total										
	Daily Max	12	0	69	0	0.98	0				
	Daily Min										
	Rolling 12 Month Avg										
QA/QC Information	**LOD**			1.7				0.49		5	
	LOQ			5				1		10	
	QC Exceedance	N		N		N		N		N	
	Lab Certification			999580010				999580010		999580010	

	Sample Point	001	001	101	101	101
	Description	PRIOR TO MENOMINEE RIVER	PRIOR TO MENOMINEE RIVER	Metal Finishing Effluent	Metal Finishing Effluent	Metal Finishing Effluent
	Parameter	112	280	211	457	342
	Description	Chlorine, Total Residual	Mercury, Total Recoverable	Flow Rate	Suspended Solids, Total	Oil & Grease (Freon)
	Units	ug/L	ng/L	MGD	mg/L	mg/L
	Sample Type	GRAB	GRAB	CONTINUOUS	24 HR COMP	GRAB
	Frequency	MONTHLY	MONTHLY	DAILY	DAILY	2/WEEK
Sample Results	Day 1			0.00784	9.0	<1.3
	2			0.00309	9.0	1.5
	3					
	4					
	5					
	6			0.02049	5.5	
	7			0.02455	2.0	
	8			0.01186	2.0	<1.3
	9			0.02339	3.0	<1.3
	10			0.00532	5.0	
	11					
	12					
	13		4.04	0.03216	3.0	
	14			0.01220	2.0	
	15			0.01296	3.5	
	16			0.01939	7.5	<1.3
	17	46		0.00694	3.0	<1.3
	18					
	19					
	20			0.02110	3.5	
	21			0.02355	2.0	
	22			0.01927	2.0	1.7
	23			0.02656	<1.9	<1.3
	24			0.00473	2.5	
	25					
	26					
	27			0.03855	2.5	
	28			0.02368	2.0	
	29			0.01822	2.5	
	30			0.01287	2.0	
	31			0.00340	3.0	

	Sample Point	001		001		101		101		101	
	Description	PRIOR TO MENOMINEE RIVER		PRIOR TO MENOMINEE RIVER		Metal Finishing Effluent		Metal Finishing Effluent		Metal Finishing Effluent	
	Parameter	112		280		211		457		342	
	Description	Chlorine, Total Residual		Mercury, Total Recoverable		Flow Rate		Suspended Solids, Total		Oil & Grease (Freon)	
	Units	ug/L		ng/L		MGD		mg/L		mg/L	
Summary Values	**Monthly Avg**	46		4.04		0.016914545		3.477272727		0.4	
	Monthly Total										
	Daily Max	46		4.04		0.03855		9		1.7	
	Daily Min	46		4.04		0.00309		<1.9		<1.3	
	Rolling 12 Month Avg										
Limit(s) in Effect	**Monthly Avg**							31	0	26	0
	Monthly Total										
	Daily Max							60	0	52	0
	Daily Min										
	Rolling 12 Month Avg										
QA/QC Information	**LOD**	30		0.16						1.3	
	LOQ	100		0.5						5.3	
	QC Exceedance	N		N		N		N		N	
	Lab Certification			999580010				999580010		999580010	

	Sample Point	101	101	101	101	101
	Description	Metal Finishing Effluent	Metal Finishing Effluent	Metal Finishing Effluent	Metal Finishing Effluent	Metal Finishing Effluent
	Parameter	87	133	315	553	155
	Description	Cadmium, Total Recoverable	Chromium, Total Recoverable	Nickel, Total Recoverable	Zinc, Total Recoverable	Cyanide, Total
	Units	ug/L	ug/L	ug/L	ug/L	ug/L
	Sample Type	24 HR COMP	24 HR COMP	24 HR COMP	24 HR COMP	GRAB
	Frequency	2/WEEK	MONTHLY	2/WEEK	2/WEEK	MONTHLY
Sample Results	**Day 1**	<0.49	<2.2	13	150	
	2	<0.49	<2.2	8.9	160	
	3					
	4					
	5					
	6					
	7					
	8	<0.49	<2.2	6.2	78	4.5
	9	<0.49	<2.2	8.3	69	
	10					
	11					
	12					
	13					
	14					
	15	<0.49	<2.2	9.1	65	
	16	<0.49	<2.2	8.1	68	
	17					
	18					
	19					
	20					
	21					
	22	<0.49	<2.2	4.2	64	
	23	<0.49	<2.2	14	110	
	24					
	25					
	26					
	27					
	28					
	29					
	30					
	31					

	Sample Point	101		101		101		101		101	
	Description	Metal Finishing Effluent		Metal Finishing Effluent		Metal Finishing Effluent		Metal Finishing Effluent		Metal Finishing Effluent	
	Parameter	87		133		315		553		155	
	Description	Cadmium, Total Recoverable		Chromium, Total Recoverable		Nickel, Total Recoverable		Zinc, Total Recoverable		Cyanide, Total	
	Units	ug/L		ug/L		ug/L		ug/L		ug/L	
Summary Values	**Monthly Avg**	0		0		8.975		95.5		4.5	
	Monthly Total										
	Daily Max	<0.49		<2.2		14		160		4.5	
	Daily Min	<0.49		<2.2		4.2		64		4.5	
	Rolling 12 Month Avg										
Limit(s) in Effect	**Monthly Avg**	260	0	1710	0	2380	0	1480	0	650	0
	Monthly Total										
	Daily Max	690	0	2770	0	3980	0	2610	0	1200	0
	Daily Min										
	Rolling 12 Month Avg										
QA/QC Information	**LOD**	0.49		2.2		1.5		3.6		3	
	LOQ	1		5		5		10		10	
	QC Exceedance	N		N		N		N		N	
	Lab Certification	999580010		999580010		999580010		999580010		999580010	

	Sample Point	101	101	101	101	101
	Description	Metal Finishing Effluent	Metal Finishing Effluent	Metal Finishing Effluent	Metal Finishing Effluent	Metal Finishing Effluent
	Parameter	147	264	430	374	373
	Description	Copper, Total Recoverable	Lead, Total Recoverable	Silver, Total Recoverable	pH (Minimum)	pH (Maximum)
	Units	ug/L	ug/L	ug/L	su	su
	Sample Type	24 HR COMP	24 HR COMP	24 HR COMP	CONTINUOUS	CONTINUOUS
	Frequency	2/WEEK	MONTHLY	MONTHLY	DAILY	DAILY
Sample Results	**Day 1**	10	2.9	<1.1	7.0	8.2
	2	7.7	2.7	<1.1	7.2	8.0
	3					
	4					
	5					
	6				6.9	8.1
	7				6.7	7.8
	8	5.6	1.5	<1.1	6.6	7.9
	9	7.1	2.6	<1.1	7.0	8.1
	10				6.6	7.3
	11					
	12					
	13				7.3	8.0
	14				6.6	7.4
	15	7.6	<1.3	<1.1	6.4	8.2
	16	6.2	2.5	<1.1	7.0	8.2
	17				6.6	7.7
	18					
	19					
	20				6.4	7.7
	21				6.5	8.3
	22	4.6	1.6	<1.1	6.6	8.4
	23	3.4	2.8	<1.1	6.8	8.6
	24				6.2	8.6
	25					
	26					
	27				6.8	7.7
	28				6.6	7.2
	29				6.3	7.0
	30				6.6	7.9
	31				6.4	7.8

	Sample Point	101		101		101		101		101	
	Description	Metal Finishing Effluent		Metal Finishing Effluent		Metal Finishing Effluent		Metal Finishing Effluent		Metal Finishing Effluent	
	Parameter	147		264		430		374		373	
	Description	Copper, Total Recoverable		Lead, Total Recoverable		Silver, Total Recoverable		pH (Minimum)		pH (Maximum)	
	Units	ug/L		ug/L		ug/L		su		su	
Summary Values	**Monthly Avg**	6.525		2.075		0		6.686363636		7.913636364	
	Monthly Total										
	Daily Max	10		2.9		<1.1		7.3		8.6	
	Daily Min	3.4		<1.3		<1.1		6.2		7	
	Rolling 12 Month Avg										
Limit(s) in Effect	**Monthly Avg**	2070	0	430	0	240	0				
	Monthly Total										
	Daily Max	3380	0	690	0	430	0			11	0
	Daily Min							4	0		
	Rolling 12 Month Avg										
QA/QC Information	**LOD**	1.7		1.3		1.1					
	LOQ	5		2.5		2.5					
	QC Exceedance	N		N		N		N		N	
	Lab Certification	999580010		999580010		999580010					

	Sample Point	101	101	101	101	101
	Description	Metal Finishing Effluent	Metal Finishing Effluent	Metal Finishing Effluent	Metal Finishing Effluent	Metal Finishing Effluent
	Parameter	379	376	507	40	490
	Description	pH Total Exceedance Time Minutes	pH Exceedances Greater Than 60 Minutes	Total Toxic Organics	Benzene	Tetrachloroethylene
	Units	minutes	Number	ug/L	ug/L	ug/L
	Sample Type	CALCULATED	CALCULATED	24 HR COMP	24 HR COMP	24 HR COMP
	Frequency	DAILY	DAILY	MONTHLY	MONTHLY	MONTHLY
Sample Results	**Day 1**					
	2					
	3					
	4					
	5					
	6					
	7					
	8					
	9					
	10					
	11					
	12					
	13					
	14					
	15					
	16					
	17					
	18					
	19					
	20					
	21					
	22					
	23					
	24					
	25					
	26					
	27					
	28					
	29					
	30					
	31					

	Sample Point	101		101		101		101		101	
	Description	Metal Finishing Effluent		Metal Finishing Effluent		Metal Finishing Effluent		Metal Finishing Effluent		Metal Finishing Effluent	
	Parameter	379		376		507		40		490	
	Description	pH Total Exceedance Time Minutes		pH Exceedances Greater Than 60 Minutes		Total Toxic Organics		Benzene		Tetrachloroethylene	
	Units	minutes		Number		ug/L		ug/L		ug/L	
Summary Values	**Monthly Avg**										
	Monthly Total										
	Daily Max										
	Daily Min										
	Rolling 12 Month Avg										
Limit(s) in Effect	**Monthly Avg**										
	Monthly Total	446	0	0	0						
	Daily Max					2130					
	Daily Min										
	Rolling 12 Month Avg										
QA/QC Information	**LOD**										
	LOQ										
	QC Exceedance	N		N		N		N		N	
	Lab Certification										

	Sample Point	101	101	101	101	101
	Description	Metal Finishing Effluent	Metal Finishing Effluent	Metal Finishing Effluent	Metal Finishing Effluent	Metal Finishing Effluent
	Parameter	500	561	200	508	285
	Description	Toluene	1,1,1-Trichloro- ethane	Ethylbenzene	Trichloro- ethylene	Methylene chloride
	Units	ug/L	ug/L	ug/L	ug/L	ug/L
	Sample Type	24 HR COMP	24 HR COMP	24 HR COMP	24 HR COMP	24 HR COMP
	Frequency	MONTHLY	MONTHLY	MONTHLY	MONTHLY	MONTHLY
Sample Results	**Day 1**					
	2					
	3					
	4					
	5					
	6					
	7					
	8					
	9					
	10					
	11					
	12					
	13					
	14					
	15					
	16					
	17					
	18					
	19					
	20					
	21					
	22					
	23					
	24					
	25					
	26					
	27					
	28					
	29					
	30					
	31					

	Sample Point	101	101	101	101	101
	Description	Metal Finishing Effluent	Metal Finishing Effluent	Metal Finishing Effluent	Metal Finishing Effluent	Metal Finishing Effluent
	Parameter	500	561	200	508	285
	Description	Toluene	1,1,1-Trichloro- ethane	Ethylbenzene	Trichloro- ethylene	Methylene chloride
	Units	ug/L	ug/L	ug/L	ug/L	ug/L
Summary Values	**Monthly Avg**					
	Monthly Total					
	Daily Max					
	Daily Min					
	Rolling 12 Month Avg					
Limit(s) in Effect	**Monthly Avg**					
	Monthly Total					
	Daily Max					
	Daily Min					
	Rolling 12 Month Avg					
QA/QC Information	**LOD**					
	LOQ					
	QC Exceedance					
	Lab Certification					

	Sample Point	101	106	106	106	107
	Description	Metal Finishing Effluent	Future remedial action ww	Future remedial action ww	Future remedial action ww	Mercury Field Blank Results
	Parameter	167	211	35	457	280
	Description	Di-n-butyl phthalate (dibutyl phthalate)	Flow Rate	Arsenic, Total Recoverable	Suspended Solids, Total	Mercury, Total Recoverable
	Units	ug/L	gpd	ug/L	mg/L	ng/L
	Sample Type	24 HR COMP	CONTINUOUS	24 HR COMP	24 HR COMP	GRAB
	Frequency	MONTHLY	DAILY	WEEKLY	WEEKLY	MONTHLY
Sample Results	Day 1					
	2					
	3					
	4					
	5					
	6					
	7					
	8					
	9					
	10					
	11					
	12					
	13					<0.16
	14					
	15					
	16					
	17					
	18					
	19					
	20					
	21					
	22					
	23					
	24					
	25					
	26					
	27					
	28					
	29					
	30					
	31					

	Sample Point	101	106	106	106	107
	Description	Metal Finishing Effluent	Future remedial action ww	Future remedial action ww	Future remedial action ww	Mercury Field Blank Results
	Parameter	167	211	35	457	280
	Description	Di-n-butyl phthalate (dibutyl phthalate)	Flow Rate	Arsenic, Total Recoverable	Suspended Solids, Total	Mercury, Total Recoverable
	Units	ug/L	gpd	ug/L	mg/L	ng/L
Summary Values	**Monthly Avg**					0
	Monthly Total					
	Daily Max					<0.16
	Daily Min					<0.16
	Rolling 12 Month Avg					
Limit(s) in Effect	**Monthly Avg**					
	Monthly Total					
	Daily Max					
	Daily Min					
	Rolling 12 Month Avg					
QA/QC Information	**LOD**					0.16
	LOQ					0.5
	QC Exceedance	N	N	N	N	N
	Lab Certification					999580010

	Sample Point	003	003	003	003	003
	Description	Future remedial action dischg	Future remedial action dischg	Future remedial action dischg	Future remedial action dischg	Future remedial action dischg
	Parameter	211	457	35	374	373
	Description	Flow Rate	Suspended Solids, Total	Arsenic, Total Recoverable	pH (Minimum)	pH (Maximum)
	Units	MGD	mg/L	ug/L	su	su
	Sample Type	CONTINUOUS	24 HR COMP	24 HR COMP	CONTINUOUS	CONTINUOUS
	Frequency	DAILY	WEEKLY	WEEKLY	DAILY	DAILY
Sample Results	**Day 1**	0.012617	2.0	38	6.4	7.8
	2	0.003600			6.8	7.8
	3					
	4					
	5					
	6	0.009410			6.0	7.5
	7	0.014177			6.5	7.4
	8	0.011809	<1.9	31	6.0	7.3
	9	0.016455			6.0	6.8
	10	0.009589			6.0	7.0
	11	0.006100			6.6	8.1
	12	0.003871			6.0	7.7
	13	0.015990			6.0	7.9
	14	0.013170			6.0	7.0
	15	0.011070			6.0	6.8
	16	0.015576	<1.9	17	6.5	8.0
	17	0.010985			7.5	8.0
	18	0.007870			7.6	8.0
	19	0.002306			8.1	8.4
	20	0.020910			7.6	8.6
	21	0.013548			6.0	7.8
	22	0.006027	<1.9	30	6.0	9.0
	23	0.012723			7.6	8.6
	24	0.012800			6.1	8.7
	25	0.001778			6.0	6.8
	26					
	27					
	28					
	29					
	30					
	31					

	Sample Point	003		003		003		003		003	
	Description	Future remedial action dischg		Future remedial action dischg		Future remedial action dischg		Future remedial action dischg		Future remedial action dischg	
	Parameter	211		457		35		374		373	
	Description	Flow Rate		Suspended Solids, Total		Arsenic, Total Recoverable		pH (Minimum)		pH (Maximum)	
	Units	MGD		mg/L		ug/L		su		su	
Summary Values	**Monthly Avg**	0.010562773		0.5		29		6.513636364		7.772727273	
	Monthly Total										
	Daily Max	0.02091		2		38		8.1		9	
	Daily Min	0.001778		<1.9		17		6		6.8	
	Rolling 12 Month Avg										
Limit(s) in Effect	**Monthly Avg**										
	Monthly Total										
	Daily Max					680	0			11	0
	Daily Min							4	0		
	Rolling 12 Month Avg										
QA/QC Information	**LOD**					2.1					
	LOQ					5					
	QC Exceedance	N		N		N		N		N	
	Lab Certification			999580010		999580010					

	Sample Point	003	003
	Description	Future remedial action dischg	Future remedial action dischg
	Parameter	379	376
	Description	pH Total Exceedance Time Minutes	pH Exceedances Greater Than 60 Minutes
	Units	minutes	Number
	Sample Type	CONTINUOUS	CONTINUOUS
	Frequency	DAILY	DAILY
Sample Results	**Day 1**		
	2		
	3		
	4		
	5		
	6		
	7		
	8		
	9		
	10		
	11		
	12		
	13		
	14		
	15		
	16		
	17		
	18		
	19		
	20		
	21		
	22		
	23		
	24		
	25		
	26		
	27		
	28		
	29		
	30		
	31		

	Sample Point	003		003	
	Description	Future remedial action dischg		Future remedial action dischg	
	Parameter	379		376	
	Description	pH Total Exceedance Time Minutes		pH Exceedances Greater Than 60 Minutes	
	Units	minutes		Number	
Summary Values	**Monthly Avg**				
	Monthly Total				
	Daily Max				
	Daily Min				
	Rolling 12 Month Avg				
Limit(s) in Effect	**Monthly Avg**				
	Monthly Total	446	0		
	Daily Max			0	0
	Daily Min				
	Rolling 12 Month Avg				
QA/QC Information	**LOD**				
	LOQ				
	QC Exceedance	N		N	
	Lab Certification				

Footnotes (DNR Use Only; Instructions for completing this form that are unique for your facility may be displayed here.)

1. Based on my inquiry of the person or persons directly responsible for managing compiliance with the permit limitation for TTO I certify that to the best of my knowledge and belief no dumping of concentrated toxic organics into the wastewaters has
2. occurred since filing of the last discharge monitoring report. I further certify that this facility is implementing the solvent management plan submitted to the department.

General Remarks

The lab at Test America forgot to run the fourth weeks sample at OF001 for Total P so, we are missing that one only.

Laboratory Quality Control Comments

Submitted by Anne Fleury(afleury16) on 8/17/2020 12:59:43 PM

Wastewater Discharge Monitoring Long Report

For DNR Use Only

Facility Name: TYCO FIRE PRODUCTS LP
Contact Address: One Stanton St
Marinette, WI 54143
Facility Contact: Mike Elliott, EHS Manager
Phone Number: 715-735-7415
Reporting Period: 08/01/2020 - 08/31/2020
Form Due Date: 09/21/2020
Permit Number: 0001040

Date Received:	
DOC:	452767
FIN:	7245
FID:	438039470
Region:	Northeast Region
Permit Drafter:	Trevor J Moen
Reviewer:	Laura A Gerold
Office:	Green Bay

	Sample Point	001	703	001	001	001
	Description	PRIOR TO MENOMINEE RIVER	Intake Water Monitoring	PRIOR TO MENOMINEE RIVER	PRIOR TO MENOMINEE RIVER	PRIOR TO MENOMINEE RIVER
	Parameter	211	280	487	374	373
	Description	Flow Rate	Mercury, Total Recoverable	Temperature	pH (Minimum)	pH (Maximum)
	Units	MGD	ng/L	degF	su	su
	Sample Type	CONTINUOUS	GRAB	GRAB	CONTINUOUS	CONTINUOUS
	Frequency	DAILY	MONTHLY	MONTHLY	DAILY	DAILY
Sample Results	Day 1	0.069780		83	7.5	7.7
	2	0.091610		83	7.3	7.7
	3	0.160820		79	7.2	7.5
	4	0.154570		79	7.1	7.4
	5	0.154490		80	7.0	7.2
	6	0.119680		84	7.2	7.8
	7	0.074380		84	7.0	7.8
	8	0.212980		84	6.3	7.4
	9	0.125660		82	6.6	7.0
	10	0.177000		79	6.6	8.0
	11	0.153810		77	7.3	7.6
	12	0.155270		79	7.3	7.6
	13	0.134170		78	7.4	7.6
	14	0.080990		82	7.6	7.8
	15	0.067860		81	7.6	7.7
	16	0.161020		81	7.1	7.9
	17	0.144480		78	6.9	7.2
	18	0.142830		77	7.0	7.1
	19	0.159040	0.41	78	6.9	7.8
	20	0.103600		82	6.9	7.6
	21	0.078990		88	7.0	7.9
	22	0.067790		84	7.0	7.8
	23	0.083380		85	7.6	7.8
	24	0.147380		80	7.2	7.5
	25	0.184710		81	6.5	8.0
	26	0.151370		80	6.5	7.0
	27	0.136370		83	6.4	6.8
	28	0.109490		78	6.4	7.0
	29	0.083580		84	7.1	7.5
	30	0.083080		86	7.1	7.8
	31	0.151820		80	6.5	7.1

	Sample Point	001	703	001	001	001
	Description	PRIOR TO MENOMINEE RIVER	Intake Water Monitoring	PRIOR TO MENOMINEE RIVER	PRIOR TO MENOMINEE RIVER	PRIOR TO MENOMINEE RIVER
	Parameter	211	280	487	374	373
	Description	Flow Rate	Mercury, Total Recoverable	Temperature	pH (Minimum)	pH (Maximum)
	Units	MGD	ng/L	degF	su	su
Summary Values	**Monthly Avg**	0.126516129	0.41	81.258064516	7.003225806	7.535483871
	Monthly Total					
	Daily Max	0.21298	0.41	88	7.6	8
	Daily Min	0.06779	0.41	77	6.3	6.8
	Rolling 12 Month Avg					
Limit(s) in Effect	**Monthly Avg**					
	Monthly Total					
	Daily Max					11 / 0
	Daily Min				4 / 0	
	Rolling 12 Month Avg					
QA/QC Information	**LOD**		0.16			
	LOQ		0.5			
	QC Exceedance	N	N	N	N	N
	Lab Certification		999580010			

	Sample Point	001	001	001	001	001
	Description	PRIOR TO MENOMINEE RIVER	PRIOR TO MENOMINEE RIVER	PRIOR TO MENOMINEE RIVER	PRIOR TO MENOMINEE RIVER	PRIOR TO MENOMINEE RIVER
	Parameter	379	376	388	231	35
	Description	pH Total Exceedance Time Minutes	pH Exceedances Greater Than 60 Minutes	Phosphorus, Total	Hardness, Total as CaCO3	Arsenic, Total Recoverable
	Units	minutes	Number	mg/L	mg/L	ug/L
	Sample Type	CONTINUOUS	CONTINUOUS	24 HR COMP	24 HR COMP	24 HR COMP
	Frequency	DAILY	DAILY	WEEKLY	MONTHLY	MONTHLY
Sample Results	Day 1					
	2					
	3			0.23	320	55
	4					
	5					
	6					
	7					
	8					
	9					
	10			0.51	210	76
	11					
	12					
	13					
	14					
	15					
	16					
	17			0.29	280	67
	18					
	19					
	20					
	21					
	22					
	23					
	24			0.22	340	64
	25					
	26					
	27					
	28					
	29					
	30					
	31					

	Sample Point	001		001		001		001		001	
	Description	PRIOR TO MENOMINEE RIVER		PRIOR TO MENOMINEE RIVER		PRIOR TO MENOMINEE RIVER		PRIOR TO MENOMINEE RIVER		PRIOR TO MENOMINEE RIVER	
	Parameter	379		376		388		231		35	
	Description	pH Total Exceedance Time Minutes		pH Exceedances Greater Than 60 Minutes		Phosphorus, Total		Hardness, Total as CaCO3		Arsenic, Total Recoverable	
	Units	minutes		Number		mg/L		mg/L		ug/L	
Summary Values	**Monthly Avg**					0.3125		287.5		65.5	
	Monthly Total										
	Daily Max					0.51		340		76	
	Daily Min					0.22		210		55	
	Rolling 12 Month Avg					0.5					
Limit(s) in Effect	**Monthly Avg**										
	Monthly Total	446	0								
	Daily Max			0	0					680	0
	Daily Min										
	Rolling 12 Month Avg					1	0				
QA/QC Information	**LOD**					0.024				2.1	
	LOQ					0.05				5	
	QC Exceedance	N		N		N		N		N	
	Lab Certification					999580010		999580010		999580010	

	Sample Point	001	001	001	001	001
	Description	PRIOR TO MENOMINEE RIVER	PRIOR TO MENOMINEE RIVER	PRIOR TO MENOMINEE RIVER	PRIOR TO MENOMINEE RIVER	PRIOR TO MENOMINEE RIVER
	Parameter	35	147	147	87	152
	Description	Arsenic, Total Recoverable	Copper, Total Recoverable	Copper, Total Recoverable	Cadmium, Total Recoverable	Cyanide, Amenable
	Units	lbs/day	ug/L	lbs/day	ug/L	ug/L
	Sample Type	CALCULATED	24 HR COMP	24 HR COMP	24 HR COMP	24 HR COMP
	Frequency	MONTHLY	MONTHLY	MONTHLY	MONTHLY	MONTHLY
Sample Results	Day 1					
	2					
	3	0.0737	33	0.04422	<0.49	<5.0
	4					
	5					
	6					
	7					
	8					
	9					
	10	0.11248	24	0.03552	<0.49	
	11					
	12					
	13					
	14					
	15					
	16					
	17	0.0804	28	0.0336	1.2	
	18					
	19					
	20					
	21					
	22					
	23					
	24	0.07872	37	0.04551	1.3	
	25					
	26					
	27					
	28					
	29					
	30					
	31					

	Sample Point	001		001		001		001		001	
	Description	PRIOR TO MENOMINEE RIVER		PRIOR TO MENOMINEE RIVER		PRIOR TO MENOMINEE RIVER		PRIOR TO MENOMINEE RIVER		PRIOR TO MENOMINEE RIVER	
	Parameter	35		147		147		87		152	
	Description	Arsenic, Total Recoverable		Copper, Total Recoverable		Copper, Total Recoverable		Cadmium, Total Recoverable		Cyanide, Amenable	
	Units	lbs/day		ug/L		lbs/day		ug/L		ug/L	
Summary Values	**Monthly Avg**	0.086325		30.5		0.0397125		0.625		0	
	Monthly Total										
	Daily Max	0.11248		37		0.04551		1.3		<5	
	Daily Min	0.0737		24		0.0336		<0.49		<5	
	Rolling 12 Month Avg										
Limit(s) in Effect	**Monthly Avg**										
	Monthly Total										
	Daily Max	12	0	69	0	0.98	0				
	Daily Min										
	Rolling 12 Month Avg										
QA/QC Information	**LOD**			1.7				0.49		5	
	LOQ			5				1		10	
	QC Exceedance	N		N		N		N		N	
	Lab Certification			999580010				999580010		999580010	

	Sample Point	001	001	101	101	101
	Description	PRIOR TO MENOMINEE RIVER	PRIOR TO MENOMINEE RIVER	Metal Finishing Effluent	Metal Finishing Effluent	Metal Finishing Effluent
	Parameter	112	280	211	457	342
	Description	Chlorine, Total Residual	Mercury, Total Recoverable	Flow Rate	Suspended Solids, Total	Oil & Grease (Freon)
	Units	ug/L	ng/L	MGD	mg/L	mg/L
	Sample Type	GRAB	GRAB	CONTINUOUS	24 HR COMP	GRAB
	Frequency	MONTHLY	MONTHLY	DAILY	DAILY	2/WEEK
Sample Results	Day 1					
	2					
	3			0.028735	2.5	<1.3
	4			0.031753	3.5	<1.4
	5			0.025547	2.5	
	6			0.018172	<1.9	
	7			0.000160	6.5	
	8					
	9					
	10	20		0.022480	3.0	
	11			0.025283	2.0	<1.4
	12			0.025611	<1.9	<1.3
	13			0.014653	<1.9	
	14			0.000227	3.0	
	15					
	16					
	17			0.026413	<1.9	<1.3
	18			0.021897	3.0	5.3
	19			0.026365	2.5	
	20			0.016975	2.0	
	21			0.002649	3.0	
	22					
	23					
	24		1.89	0.028207	<1.9	<1.3
	25			0.024421	2.0	<1.3
	26			0.027823	2.0	
	27			0.018781	<1.9	
	28			0.008103	<1.9	
	29					
	30					
	31			0.027435	2.5	

	Sample Point	001	001	101	101	101
	Description	PRIOR TO MENOMINEE RIVER	PRIOR TO MENOMINEE RIVER	Metal Finishing Effluent	Metal Finishing Effluent	Metal Finishing Effluent
	Parameter	112	280	211	457	342
	Description	Chlorine, Total Residual	Mercury, Total Recoverable	Flow Rate	Suspended Solids, Total	Oil & Grease (Freon)
	Units	ug/L	ng/L	MGD	mg/L	mg/L
Summary Values	**Monthly Avg**	20	1.89	0.020080476	1.904761905	0.6625
	Monthly Total					
	Daily Max	20	1.89	0.031753	6.5	5.3
	Daily Min	20	1.89	0.00016	<1.9	<1.3
	Rolling 12 Month Avg					
Limit(s) in Effect	**Monthly Avg**				31 0	26 0
	Monthly Total					
	Daily Max				60 0	52 0
	Daily Min					
	Rolling 12 Month Avg					
QA/QC Information	**LOD**	30	0.16			1.3
	LOQ	100	0.5			5.2
	QC Exceedance	N	N	N	N	N
	Lab Certification		999580010		999580010	999580010

	Sample Point	101	101	101	101	101
	Description	Metal Finishing Effluent	Metal Finishing Effluent	Metal Finishing Effluent	Metal Finishing Effluent	Metal Finishing Effluent
	Parameter	87	133	315	553	155
	Description	Cadmium, Total Recoverable	Chromium, Total Recoverable	Nickel, Total Recoverable	Zinc, Total Recoverable	Cyanide, Total
	Units	ug/L	ug/L	ug/L	ug/L	ug/L
	Sample Type	24 HR COMP	24 HR COMP	24 HR COMP	24 HR COMP	GRAB
	Frequency	2/WEEK	MONTHLY	2/WEEK	2/WEEK	MONTHLY
Sample Results	**Day 1**					
	2					
	3	<0.49	<2.2	6.6	61	<3.0
	4	<0.49	<2.2	6.0	46	
	5					
	6					
	7					
	8					
	9					
	10	<0.49	<2.2	11	94	
	11	<0.49	<2.2	3.8	170	
	12					
	13					
	14					
	15					
	16					
	17	<0.49	<2.2	4.3	66	
	18	<0.49	<2.2	7.6	80	
	19					
	20					
	21					
	22					
	23					
	24	<0.49	<2.2	9.3	95	
	25	<0.49	<2.2	9.0	81	
	26					
	27					
	28					
	29					
	30					
	31					

	Sample Point	101		101		101		101		101	
	Description	Metal Finishing Effluent		Metal Finishing Effluent		Metal Finishing Effluent		Metal Finishing Effluent		Metal Finishing Effluent	
	Parameter	87		133		315		553		155	
	Description	Cadmium, Total Recoverable		Chromium, Total Recoverable		Nickel, Total Recoverable		Zinc, Total Recoverable		Cyanide, Total	
	Units	ug/L		ug/L		ug/L		ug/L		ug/L	
Summary Values	**Monthly Avg**	0		0		7.2		86.625		0	
	Monthly Total										
	Daily Max	<0.49		<2.2		11		170		<3	
	Daily Min	<0.49		<2.2		3.8		46		<3	
	Rolling 12 Month Avg										
Limit(s) in Effect	**Monthly Avg**	260	0	1710	0	2380	0	1480	0	650	0
	Monthly Total										
	Daily Max	690	0	2770	0	3980	0	2610	0	1200	0
	Daily Min										
	Rolling 12 Month Avg										
QA/QC Information	**LOD**	0.49		2.2		1.5		3.6		3	
	LOQ	1		5		5		10		10	
	QC Exceedance	N		N		N		N		N	
	Lab Certification	999580010		999580010		999580010		999580010		999580010	

	Sample Point	101	101	101	101	101
	Description	Metal Finishing Effluent	Metal Finishing Effluent	Metal Finishing Effluent	Metal Finishing Effluent	Metal Finishing Effluent
	Parameter	147	264	430	374	373
	Description	Copper, Total Recoverable	Lead, Total Recoverable	Silver, Total Recoverable	pH (Minimum)	pH (Maximum)
	Units	ug/L	ug/L	ug/L	su	su
	Sample Type	24 HR COMP	24 HR COMP	24 HR COMP	CONTINUOUS	CONTINUOUS
	Frequency	2/WEEK	MONTHLY	MONTHLY	DAILY	DAILY
Sample Results	Day 1					
	2					
	3	7.7	1.9	<1.1	7.0	8.1
	4	5.6	<1.3	<1.1	6.7	8.2
	5				6.9	8.0
	6				6.8	8.2
	7				6.6	6.9
	8					
	9					
	10	6.7	<1.3	<1.1	6.7	7.8
	11	4.8	2.4	<1.1	6.5	6.9
	12				6.2	8.5
	13				6.3	6.9
	14				6.2	6.8
	15					
	16					
	17	3.3	<1.3	<1.1	6.7	7.4
	18	4.7	1.6	<1.1	6.7	7.5
	19				6.4	7.3
	20				6.5	7.2
	21				6.4	7.1
	22					
	23					
	24	3.4	<1.3	<1.1	6.7	7.0
	25	3.2	2.5	<1.1	6.4	7.2
	26				6.2	6.8
	27				6.4	7.0
	28				6.4	7.0
	29					
	30					
	31				6.6	7.1

	Sample Point	101		101		101		101		101	
	Description	Metal Finishing Effluent		Metal Finishing Effluent		Metal Finishing Effluent		Metal Finishing Effluent		Metal Finishing Effluent	
	Parameter	147		264		430		374		373	
	Description	Copper, Total Recoverable		Lead, Total Recoverable		Silver, Total Recoverable		pH (Minimum)		pH (Maximum)	
	Units	ug/L		ug/L		ug/L		su		su	
Summary Values	**Monthly Avg**	4.925		1.05		0		6.538095238		7.376190476	
	Monthly Total										
	Daily Max	7.7		2.5		<1.1		7		8.5	
	Daily Min	3.2		<1.3		<1.1		6.2		6.8	
	Rolling 12 Month Avg										
Limit(s) in Effect	**Monthly Avg**	2070	0	430	0	240	0				
	Monthly Total										
	Daily Max	3380	0	690	0	430	0			11	0
	Daily Min							4	0		
	Rolling 12 Month Avg										
QA/QC Information	**LOD**	1.7		1.3		1.1					
	LOQ	5		2.5		2.5					
	QC Exceedance	N		N		N		N		N	
	Lab Certification	999580010		999580010		999580010					

	Sample Point	101	101	101	101	101
	Description	Metal Finishing Effluent	Metal Finishing Effluent	Metal Finishing Effluent	Metal Finishing Effluent	Metal Finishing Effluent
	Parameter	379	376	507	40	490
	Description	pH Total Exceedance Time Minutes	pH Exceedances Greater Than 60 Minutes	Total Toxic Organics	Benzene	Tetrachloroethylene
	Units	minutes	Number	ug/L	ug/L	ug/L
	Sample Type	CALCULATED	CALCULATED	24 HR COMP	24 HR COMP	24 HR COMP
	Frequency	DAILY	DAILY	MONTHLY	MONTHLY	MONTHLY
Sample Results	**Day 1**					
	2					
	3					
	4					
	5					
	6					
	7					
	8					
	9					
	10					
	11					
	12					
	13					
	14					
	15					
	16					
	17					
	18					
	19					
	20					
	21					
	22					
	23					
	24					
	25					
	26					
	27					
	28					
	29					
	30					
	31					

	Sample Point	101		101		101		101		101	
	Description	Metal Finishing Effluent		Metal Finishing Effluent		Metal Finishing Effluent		Metal Finishing Effluent		Metal Finishing Effluent	
	Parameter	379		376		507		40		490	
	Description	pH Total Exceedance Time Minutes		pH Exceedances Greater Than 60 Minutes		Total Toxic Organics		Benzene		Tetrachloroethylene	
	Units	minutes		Number		ug/L		ug/L		ug/L	
Summary Values	**Monthly Avg**										
	Monthly Total										
	Daily Max										
	Daily Min										
	Rolling 12 Month Avg										
Limit(s) in Effect	**Monthly Avg**										
	Monthly Total	446	0	0	0						
	Daily Max					2130					
	Daily Min										
	Rolling 12 Month Avg										
QA/QC Information	**LOD**										
	LOQ										
	QC Exceedance	N		N		N		N		N	
	Lab Certification										

	Sample Point	101	101	101	101	101
	Description	Metal Finishing Effluent	Metal Finishing Effluent	Metal Finishing Effluent	Metal Finishing Effluent	Metal Finishing Effluent
	Parameter	500	561	200	508	285
	Description	Toluene	1,1,1-Trichloro- ethane	Ethylbenzene	Trichloro- ethylene	Methylene chloride
	Units	ug/L	ug/L	ug/L	ug/L	ug/L
	Sample Type	24 HR COMP	24 HR COMP	24 HR COMP	24 HR COMP	24 HR COMP
	Frequency	MONTHLY	MONTHLY	MONTHLY	MONTHLY	MONTHLY
Sample Results	**Day 1**					
	2					
	3					
	4					
	5					
	6					
	7					
	8					
	9					
	10					
	11					
	12					
	13					
	14					
	15					
	16					
	17					
	18					
	19					
	20					
	21					
	22					
	23					
	24					
	25					
	26					
	27					
	28					
	29					
	30					
	31					

	Sample Point	101	101	101	101	101
	Description	Metal Finishing Effluent	Metal Finishing Effluent	Metal Finishing Effluent	Metal Finishing Effluent	Metal Finishing Effluent
	Parameter	500	561	200	508	285
	Description	Toluene	1,1,1-Trichloro- ethane	Ethylbenzene	Trichloro- ethylene	Methylene chloride
	Units	ug/L	ug/L	ug/L	ug/L	ug/L
Summary Values	**Monthly Avg**					
	Monthly Total					
	Daily Max					
	Daily Min					
	Rolling 12 Month Avg					
Limit(s) in Effect	**Monthly Avg**					
	Monthly Total					
	Daily Max					
	Daily Min					
	Rolling 12 Month Avg					
QA/QC Information	**LOD**					
	LOQ					
	QC Exceedance					
	Lab Certification					

	Sample Point	101	106	106	106	107
	Description	Metal Finishing Effluent	Future remedial action ww	Future remedial action ww	Future remedial action ww	Mercury Field Blank Results
	Parameter	167	211	35	457	280
	Description	Di-n-butyl phthalate (dibutyl phthalate)	Flow Rate	Arsenic, Total Recoverable	Suspended Solids, Total	Mercury, Total Recoverable
	Units	ug/L	gpd	ug/L	mg/L	ng/L
	Sample Type	24 HR COMP	CONTINUOUS	24 HR COMP	24 HR COMP	GRAB
	Frequency	MONTHLY	DAILY	WEEKLY	WEEKLY	MONTHLY
Sample Results	Day 1					
	2					
	3					
	4					
	5					
	6					
	7					
	8					
	9					
	10					
	11					
	12					
	13					
	14					
	15					
	16					
	17					
	18					
	19					0.25
	20					
	21					
	22					
	23					
	24					
	25					
	26					
	27					
	28					
	29					
	30					
	31					

	Sample Point	101	106	106	106	107
	Description	Metal Finishing Effluent	Future remedial action ww	Future remedial action ww	Future remedial action ww	Mercury Field Blank Results
	Parameter	167	211	35	457	280
	Description	Di-n-butyl phthalate (dibutyl phthalate)	Flow Rate	Arsenic, Total Recoverable	Suspended Solids, Total	Mercury, Total Recoverable
	Units	ug/L	gpd	ug/L	mg/L	ng/L
Summary Values	**Monthly Avg**					0.25
	Monthly Total					
	Daily Max					0.25
	Daily Min					0.25
	Rolling 12 Month Avg					
Limit(s) in Effect	**Monthly Avg**					
	Monthly Total					
	Daily Max					
	Daily Min					
	Rolling 12 Month Avg					
QA/QC Information	**LOD**					0.16
	LOQ					0.5
	QC Exceedance	N	N	N	N	N
	Lab Certification					999580010

	Sample Point	003	003	003	003	003
	Description	Future remedial action dischg	Future remedial action dischg	Future remedial action dischg	Future remedial action dischg	Future remedial action dischg
	Parameter	211	457	35	374	373
	Description	Flow Rate	Suspended Solids, Total	Arsenic, Total Recoverable	pH (Minimum)	pH (Maximum)
	Units	MGD	mg/L	ug/L	su	su
	Sample Type	CONTINUOUS	24 HR COMP	24 HR COMP	CONTINUOUS	CONTINUOUS
	Frequency	DAILY	WEEKLY	WEEKLY	DAILY	DAILY
Sample Results	Day 1	0.011924			8.1	8.5
	2	0.010946			8.1	8.5
	3	0.012106			8.4	8.9
	4	0.013352			8.2	8.6
	5	0.010679	<1.9	60	7.7	8.1
	6	0.018250			7.8	8.2
	7	0.005189			7.4	8.1
	8					
	9					
	10	0.029028	<1.9	30	6.0	8.3
	11	0.014240			7.9	8.7
	12	0.016336			7.4	8.8
	13	0.014144			6.0	7.8
	14	0.013509			6.7	7.5
	15	0.007938			6.5	7.8
	16	0.004760			6.4	6.5
	17	0.011357	2.0	25	6.5	6.5
	18	0.016667			6.5	6.5
	19	0.018425			7.9	8.1
	20	0.014530			7.8	8.2
	21	0.008515			8.2	8.5
	22	0.012063			6.5	8.1
	23	0.002965			7.1	7.8
	24	0.016790	<1.9	25	6.0	8.0
	25	0.014466			6.9	7.8
	26	0.018943			6.8	8.1
	27					
	28					
	29					
	30					
	31	0.016280			7.3	8.5

	Sample Point	003		003		003		003		003	
	Description	Future remedial action dischg		Future remedial action dischg		Future remedial action dischg		Future remedial action dischg		Future remedial action dischg	
	Parameter	211		457		35		374		373	
	Description	Flow Rate		Suspended Solids, Total		Arsenic, Total Recoverable		pH (Minimum)		pH (Maximum)	
	Units	MGD		mg/L		ug/L		su		su	
Summary Values	**Monthly Avg**	0.01333608		0.5		35		7.204		8.016	
	Monthly Total										
	Daily Max	0.029028		2		60		8.4		8.9	
	Daily Min	0.002965		<1.9		25		6		6.5	
	Rolling 12 Month Avg										
Limit(s) in Effect	**Monthly Avg**										
	Monthly Total										
	Daily Max					680	0			11	0
	Daily Min							4	0		
	Rolling 12 Month Avg										
QA/QC Information	**LOD**					2.1					
	LOQ					5					
	QC Exceedance	N		N		N		N		N	
	Lab Certification			999580010		999580010					

	Sample Point	003	003
	Description	Future remedial action dischg	Future remedial action dischg
	Parameter	379	376
	Description	pH Total Exceedance Time Minutes	pH Exceedances Greater Than 60 Minutes
	Units	minutes	Number
	Sample Type	CONTINUOUS	CONTINUOUS
	Frequency	DAILY	DAILY
Sample Results	**Day 1**		
	2		
	3		
	4		
	5		
	6		
	7		
	8		
	9		
	10		
	11		
	12		
	13		
	14		
	15		
	16		
	17		
	18		
	19		
	20		
	21		
	22		
	23		
	24		
	25		
	26		
	27		
	28		
	29		
	30		
	31		

	Sample Point	003		003	
	Description	Future remedial action dischg		Future remedial action dischg	
	Parameter	379		376	
	Description	pH Total Exceedance Time Minutes		pH Exceedances Greater Than 60 Minutes	
	Units	minutes		Number	
Summary Values	**Monthly Avg**				
	Monthly Total				
	Daily Max				
	Daily Min				
	Rolling 12 Month Avg				
Limit(s) in Effect	**Monthly Avg**				
	Monthly Total	446	0		
	Daily Max			0	0
	Daily Min				
	Rolling 12 Month Avg				
QA/QC Information	**LOD**				
	LOQ				
	QC Exceedance	N		N	
	Lab Certification				

Footnotes (DNR Use Only; Instructions for completing this form that are unique for your facility may be displayed here.)

1. Based on my inquiry of the person or persons directly responsible for managing compiliance with the permit limitation for TTO I certify that to the best of my knowledge and belief no dumping of concentrated toxic organics into the wastewaters has
2. occurred since filing of the last discharge monitoring report. I further certify that this facility is implementing the solvent management plan submitted to the department.

General Remarks

On 8-11-20 and 8-12-20 the TSS samples were past the 7 day hold time because the cooler was lost in transit by UPS.

Laboratory Quality Control Comments

Submitted by Anne Fleury(afleury16) on 9/15/2020 1:45:14 PM

WHOLE EFFLUENT TOXICITY (WET) TEST REPORT FORM

GENERAL INFORMATION

FACILITY:	**Tyco Fire Protection Products**	WPDES PERMIT NO.:	WI-0001040-07-0
OUTFALL NO.:	OF003	LABORATORY NAME:	Pace Analytical Services, LLC
RECEIVING WATER:	Menominee River		

SAMPLE INFORMATION

SAMPLE NO.	SAMPLE COLLECTION: SAMPLE TYPE	BEGINNING DATE	END DATE	SAMPLE TEMP °C: COLLECTION	AT LAB	pH at LAB	HAND DELIVER? (If Yes, ≤ 4 hr?)	HOLD TIME ≤ 36 HR?	SAMPLE ACCEP-TABLE?
1	EFF-24C	07/06/20	07/07/20	2.7	1.1	10.2	No	Yes	No
2	EFF-24C	07/08/20	07/09/20	3.7	1.6	6.9	No	Yes	Yes

Describe any unusual conditions during sampling that may influence test results. (see Part 6.1.2 of the Methods Manual for examples.)

COMMENTS: **The pH of sample upon receipt was >9.0. The WIDNR was contacted about this situation after the testing was completed. In this instance, the WIDNR has accepted the results of this test.**

TEST INFORMATION

	ACUTE		
Date Test Initiated:	**7/8/2020**		
Tests Are For:	#1 Retest of Failure From:(Specify Date)		
Date of Initial Test:	5/20/2020		
ZID/IWC Info.:	ZID Compliance Concentration =		
Dilution Water:	*C.dubia*	FHM	Other
	☐ RW	☐ RW	☐ RW
	☑ LW	☑ LW	☐ LW

QA/QC CONDITIONS

	ACUTE
Temperatures maintained during test? (20 ± 1°C or 25 ± 1°C)	Yes
Dissolved oxygen ≥ 4.0 mg/l throughout test?	Yes
Effluent pH maintained within 6.0 - 9.0 s.u. throughout test?	No*
Concurrent or monthly reference tests within acceptable limits?	No*
Tests conducted in a carbon dioxide atmosphere throughout test?	Yes
Were effluent samples modified prior to testing?(ex. filtration, aeration, chem addition)	No

COMMENTS: ***The pH value of the effluent was over 9.0 on 7/8/2020(9.8) and 7/9/2020(9.9). There is not a record that the WI DNR was contacted about the pH. The concurrent fathead minnow RTT LC_{50} was 6.83 g/L which is outside the limits of 6.86-7.20 g/L.**

WATER CHEMISTRY (All values reported in mg/L, except pH)

SAMPLE TYPE	NO.	HARDNESS	ALKALINITY	TOTAL AMMONIA	pH (s.u.) After Warming	TOTAL RESIDUAL CHLORINE
Effluent	#1	<0.20	40.6	0.036 J	10.2	<0.042
	#2	<0.20	<10.0	<0.028	6.9	<0.042
Lab Water	LRW 20-034	338	135	<0.028	8.3	<0.042
	LRW 20-037	384	158	<0.028	8.5	<0.042
	TT 070620	52.6	47.9	<0.028	7.4	<0.042

COMMENTS: J - Estimated concentration at or above the LOD and below the LOQ.

ACUTE TEST CONTROL PERFORMANCE

PRIMARY WATER CONTROLS LRW		LAB WATER CONTROLS (Secondary Control)	
Fathead Minnow	*Ceriodaphnia dubia*	Fathead Minnow	*Ceriodaphnia dubia*
Survival ≥ 90%	Survival ≥ 90%	Survival ≥ 90%	Survival ≥ 90%
Yes	**Yes**	**Yes**	**Yes**

COMMENTS:

ACUTE TEST DATA

SPECIES	EFFLUENT TREATMENT	Percent Survival By Replicate				Mean Percent Survival
		1	2	3	4	
Fathead Minnow	Lab Water Control - TT	100	100	90	100	98
	Lab Water Control - LRW	100	90	90	100	95
Age of Organism:	6.25%	90	100	100	100	98
	12.5%	100	80	100	100	95
8 Days	25%	100	100	100	100	100
	50%	100	100	100	100	100
	100%	100	100	100	100	100

FATHEAD MINNOW ACUTE RESULTS: LC_{50} = **>100%** C.I.% = **Not Calc** TU_a = **1.0**

Please describe any unusual behavior and/or appearance of organisms.(see Part 6.1.2 of the Methods Manual for ex.)

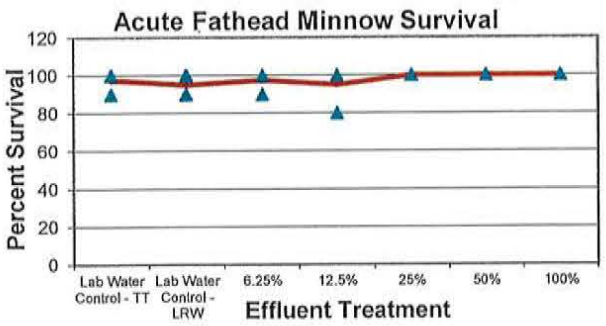
COMMENTS:

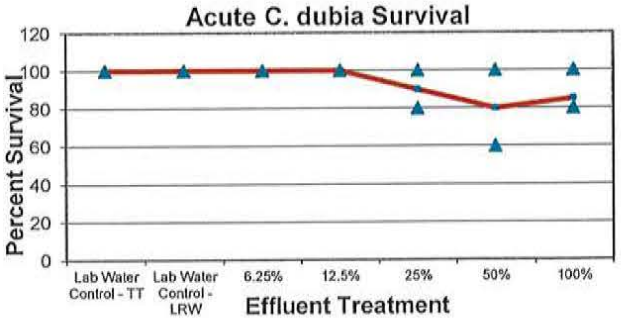
SPECIES	EFFLUENT TREATMENT	Percent Survival By Replicate				Mean Percent Survival
		1	2	3	4	
Ceriodaphnia dubia	Lab Water Control - TT	100	100	100	100	100
	Lab Water Control - LRW	100	100	100	100	100
Age of Organism:	6.25%	100	100	100	100	100
	12.5%	100	100	100	100	100
< 24 Hours Old	25%	100	100	80	80	90
	50%	60	60	100	100	80
	100%	80	80	80	100	85

***Ceriodaphnia dubia* ACUTE RESULTS:** LC_{50} = **>100%** C.I.% = **Not Calc** TU_a = **1.0**

Please describe any unusual behavior and/or appearance of organisms.(see Part 6.1.2 of the Methods Manual for ex.)

COMMENTS:





Facility : Tyco Fire Protection Products
Permit # : WI-0001040-07-0
Acute Test Date : 7/8/2020

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

LAB REPRESENTATIVE:	Dan Toms		SIGNATURE:	Dan Toms	
PHONE:	218-336-2120	LAB CERT #:	999446800	DATE:	8/13/2020
PERMITTEE REPRESENTATIVE:	Anne Fleury		SIGNATURE:		
PHONE:	715-735-7411		DATE:		

Send *all 3 pages* of this form (plus any attachments or additional information which you believe to be relevant to the test) to: Biomonitoring Coordinator, Bureau of Watershed Management, Department of Natural Resources, 101 South Webster St., P.O. Box 7921, Madison, WI 53707-7921; according to the timelines specified in your WPDES permit.

Copies of the State of Wisconsin Aquatic Life Toxicity Testing Methods Manual (Methods Manual) and the WET Guidance Document can be obtained from the Biomonitoring Coordinator at the address given above or at: http://dnr.wi.gov/org/water/wm/ww/biomon/biomon.htm

TO BE COMPLETED BY THE WISCONSIN DEPARTMENT OF NATURAL RESOURCES					
		DID TESTS PASS?			
ACUTE	Fathead Minnow	☐ Yes	☐ No	☐ Inconclusive	☐ Unacceptable
	Ceriodaphnia dubia	☐ Yes	☐ No	☐ Inconclusive	☐ Unacceptable
CHRONIC	Fathead Minnow	☐ Yes	☐ No	☐ Inconclusive	☐ Unacceptable
	Ceriodaphnia dubia	☐ Yes	☐ No	☐ Inconclusive	☐ Unacceptable
Retests Required?	☐ Yes ☐ No ____	Acute / Chronic:	Both Species	*C.dubia* only	FHM only
Due To:	☐ Failure ☐ QA Problem				
WET Limit Violation?	☐ Yes ☐ No limit in permit	Results Entered Into Database?	☐ Yes ☐ No		
COMMENTS:					
REVIEWED BY:		**DATE:**			
CC:		BASIN ENGINEER			
		PERMIT COORDINATOR			
		PERMIT FILE			

Facility : Tyco Fire Protection Products
Permit # : WI-0001040-07-0
Test Date : 7/8/2020

Client Color Code: Blue

Pace Analytical Services, LLC

Client: Tyco OF003

State: Wisconsin

Pace Project # 12146752

Test: Acute Toxicity Evaluation

Tested in CO_2 Enriched Atmosphere

Test Initiation Date: 07/08/2020

Test Termination Date: 07/12/2020

ENVIRONMENTAL SAMPLE TEST INFORMATION

Date:	07/08/2020
Client:	Tyco OF003
Pace Project #:	12146752
Dilution Water:	Laboratory Reconstituted Water (LRW)
Test Chamber:	1oz plastic, 250 mL plastic
Food:	Artemia for fish before 48-hour renewal - IDs 205981
Required Temperature Setting:	19- 21°C

Concentration/Solution	LRW (mL)	Effluent (mL)
(1) Treated Tap	0	0
(2) LRW	900	0
(3) 6.25%	844	56
(4) 12.5%	788	112
(5) 25%	675	225
(6) 50%	450	450
(7) 100%	0	900
Daily Totals	**~3.7 Liter**	**~1.8 Liter**

Comments: Tested in CO_2 enriched atmosphere.

Retest #1

Pace Analytical	Document Name: WI Acute Toxicity Evaluation	Document Revised: 21Jun2019 Page 3 of 9	Client Color Code: Blue
	Document No.: F-DUL-BIO-024A-rev:01	Issuing Authority: Pace Duluth, MN Quality Office	

TOXICITY TEST RENEWAL FORM

Client: Tyco OF003 Pace Project #: 12146752

Test: Acute Toxicity Evaluation Test Initiation Date: 07/08/2020

Organism: *Ceriodaphnia dubia*, Fathead Minnow Test Termination Date: 07/12/2020

EFFLUENT

Test Organism			Age	Source	Culture ID	Bath #
		C. dubia	<24 hours	Pace	ACD - 218	4
		FHM	8 Days	Aquatox	N/A	4
Test Day		0 (Test Initiation)	1	2	3	4
Date		7/8/20	7/9/20	7/10/20	7/11/20	7/12/20
Renewal/Reading (±1 hour of initiation)	*C. dubia*	1345	1400	1307	N/A	N/A
	Initials	[redacted]	BEM	KRG	N/A	N/A
	FHM	1341	1358	1321	1327	1323
	Initials	[redacted]	KRG	KRG	KRG	BEM
Feeding / Food IDs	*C. dubia*	0936	N/A	N/A	N/A	N/A
	Initials	KRG	N/A	N/A	N/A	N/A
	FHM	0721	N/A	0745	N/A	N/A
	Initials	[redacted]	N/A	BEM	N/A	N/A
	Primary Control	LRW 20- 034	LRW 20- 034	LRW 20- 037	LRW 20- 037	N/A
	Secondary Control	Treated Tap 070620	Treated Tap 070620	Treated Tap 070620	Treated Tap 070620	N/A
	Sample #	#1	#1	#2	#2	N/A
	Effluent Filtered (Yes / No)	No	No	No	No	N/A
	Initials	[redacted]	KRG	KRG	KRG	N/A

INITIAL CHEMISTRIES - EFFLUENT

Client: Tyco OF003 Pace Project #: 12146752

Test: Acute Toxicity Evaluation Test Initiation Date: 07/08/2020

Organism(s): *Ceriodaphnia dubia*, Fathead Minnow Test Termination Date: 07/12/2020

Meter IDs: 13WETA, 13WETB, 13WETC

	Date/Time/Initials			
	7/8/20 1158 [illegible]	7/9/20 1006 KRG	7/10/20 KRG 1240	7/11/20 KRG 0837
CONCENTRATION: (1) **SECONDARY CONTROL - TREATED TAP**				
DO (mg/L)	8.4	8.5	8.5	8.4
Conductivity (umhos/cm)	149	151	155	134
pH (s.u.)	7.0	7.4	7.1	7.0
CONCENTRATION: (2) **PRIMARY CONTROL - LRW**				
DO (mg/L)	8.8	8.6	8.8	8.8
Conductivity (umhos/cm)	900	910	1053	1054
pH (s.u.)	7.7	8.1	8.2	8.1
CONCENTRATION: (3) **6.25%**				
DO (mg/L)	8.8	8.8	8.9	8.9
Conductivity (umhos/cm)	884	890	1011	1024
pH (s.u.)	8.0	8.2	8.3	8.4
CONCENTRATION: (4) **12.5%**				
DO (mg/L)	8.8	8.8	8.9	9.0
Conductivity (umhos/cm)	856	863	968	985
pH (s.u.)	8.1	8.3	8.4	8.4
CONCENTRATION: (5) **25%**				
DO (mg/L)	8.9	8.9	9.0	9.0
Conductivity (umhos/cm)	799	803	KRG 7/10/20 860	897
pH (s.u.)	8.2	8.6	8.4	8.4
CONCENTRATION: (6) **50%**				
DO (mg/L)	8.9	9.0	9.1	9.2
Conductivity (umhos/cm)	695	695	706	717
pH (s.u.)	8.6	8.9	8.5	8.5
CONCENTRATION: (7) **100%**				
DO (mg/L)	9.1	9.5	9.4	9.4
Conductivity (umhos/cm)	461	461	283	273
pH (s.u.)	9.8	9.9	8.5	8.6

FINAL CHEMISTRIES - EFFLUENT

Client: Tyco OF003 Pace Project #: 12146752

Test: Acute Toxicity Evaluation Test Initiation Date: 07/08/2020

Organism(s): *Ceriodaphnia dubia* Test Termination Date: 07/10/2020

Meter IDs: 13WETA, 13WETC

	Date/Time/Initials	
	7/9/20 BEM 1431	7/10/20 1314 KRG
CONCENTRATION: (1) **SECONDARY CONTROL - TREATED TAP**		
DO (mg/L)	8.6	8.3
pH (s.u.)	6.8	6.7
CONCENTRATION: (2) **PRIMARY CONTROL - LRW**		
DO (mg/L)	8.6	8.6
pH (s.u.)	7.2	7.1
CONCENTRATION: (3) **6.25%**		
DO (mg/L)	8.6	8.6
pH (s.u.)	7.2	7.1
CONCENTRATION: (4) **12.5%**		
DO (mg/L)	8.6	8.6
pH (s.u.)	7.2	7.2
CONCENTRATION: (5) **25%**		
DO (mg/L)	8.6	8.7
pH (s.u.)	7.3	7.2
CONCENTRATION: (6) **50%**		
DO (mg/L)	8.6	8.7
pH (s.u.)	7.3	7.2
CONCENTRATION: (7) **100%**		
DO (mg/L)	8.5	8.7
pH (s.u.)	7.2	7.6

FINAL CHEMISTRIES - EFFLUENT

Client: Tyco OF003 Pace Project #: 12146752

Test: Acute Toxicity Evaluation Test Initiation Date: 07/08/2020

Organism(s): Fathead Minnow Test Termination Date: 07/12/2020

Meter IDs: 13WETA, 13WETC

	Date/Time/Initials			
	7/9/20 BEM 1422	7/10/20 KRG 1259	7/11/20 KRG 1317	7/12/20 BEM 1329
CONCENTRATION: (1) **SECONDARY CONTROL - TREATED TAP**				
DO (mg/L)	8.1	8.1	8.3	8.3
pH (s.u.)	6.7	6.8	7.3	6.9
CONCENTRATION: (2) **PRIMARY CONTROL – LRW**				
DO (mg/L)	8.1	8.0	8.3	8.3
pH (s.u.)	7.1	7.2	7.2	7.4
CONCENTRATION: (3) **6.25%**				
DO (mg/L)	7.9	8.0	8.2	8.2
pH (s.u.)	7.1	7.2	7.3	7.4
CONCENTRATION: (4) **12.5%**				
DO (mg/L)	8.1	8.0	8.2	8.3
pH (s.u.)	7.1	7.2	7.4	7.4
CONCENTRATION: (5) **25%**				
DO (mg/L)	8.1	7.9	8.2	BEM 7/12/20 ~~7.6~~ 8.3
pH (s.u.)	7.2	7.2	7.4	7.4
CONCENTRATION: (6) **50%**				
DO (mg/L)	8.0	8.0	8.3	8.2
pH (s.u.)	7.1	7.3	7.4	7.5
CONCENTRATION: (7) **100%**				
DO (mg/L)	8.1	7.5	8.1	8.2
pH (s.u.)	7.1	7.6	7.7	7.1

ACUTE TOXICITY DATA LOG

Client: Tyco OF003	Species: *Ceriodaphnia dubia*
Project #: 12146752	Age: <24 hours
Test: Acute Toxicity Evaluation	No. Animals/No. Reps: 5/4
Template ID: A	Sources of Animals: Pace
Test Initiation Date: 07/08/2020	Dilution Water/Control: LRW/TREATED TAP
Investigator: Toms	Test Volume: 20 mL
Test Duration: 48-hours	Required Testing Temperature: 19-21 °C
Renewal: **Daily**	**Randomized Board Readings**

EFFLUENT

Survival Readings (Randomized):

(# alive out of # exposed from above unless shown otherwise)

ROW	24 Hour Column ID				48 Hour Column ID			
	A	B	C	D	A	B	C	D
7	1 5	3 5	4 5	7 5	1 5	3 5	4 5	7 5
6	7 5	2 5	5 4 BEM 7/9	3 5	7 4	2 5	5 4	3 5
5	4 5	4 5	2 5	1 5	4 5	4 5	2 5	1 5
4	2 5	7 5	7 4	2 5	2 5	7 4	7 4	2 5
3	5 5	1 5	3 5	5 5	5 5	1 5	3 5	5 4
2	3 5	5 5	6 5	6 5	3 5	5 5	6 5	6 5
1	6 4	6 5	1 5	4 5	6 3	6 3	1 5	4 5

2 = Concentration ID

Readings By (Date/Time/Initials): BEM 7/9/20 1400 KRG 7/10/20 1307

Comments:

ACUTE TOXICITY DATA LOG

Client: Tyco OF003	Species: Fathead Minnow
Project #: 12146752	Age: 8 day
Test: Acute Toxicity Evaluation	No. Animals/No. Reps: 10/4
Template ID: F	Sources of Animals: Aquatox
Test Initiation Date: 07/08/2020	Dilution Water/Control: LRW/TREATED TAP
Investigator: Toms	Test Volume: 200 mL
Test Duration: 96-hours	Required Testing Temperature: 19-21 °C
Renewal: **Daily**	Minimum Control Survival ≥ 90%: (Yes / No)

Concentration	EFFLUENT Survival Readings: (# alive out of # exposed from above unless shown otherwise)			
	24-Hour Replicate A B C D	48-Hour Replicate A B C D	72-Hour Replicate A B C D	96-Hour Replicate A B C D
(1) Treated Tap	10 10 10 10	10 10 10 10	10 10 9 10	10 10 9 10
(2) LRW	10 10 10 10	10 9 10 10	10 9 9 10	10 9 9 10
(3) 6.25%	10 10 10 10	10 10 10 10	9 10 10 10	9 10 10 10
(4) 12.5%	10 10 10 10	10 8 10 10	10 8 10 10	10 8 10 10
(5) 25%	10 10 10 10	10 10 10 10	10 10 10 10	10 10 10 10
(6) 50%	10 10 10 10	10 10 10 10	10 10 10 10	10 10 9/9 10
(7) 100%	10 10 10 10	9/9 10 10 10	9/9 10 10 10	9/9 10 10 10
	Date / Time / Initials KRG 7/9/20 5/11/20 1358 7/9/20 KRG	Date / Time / Initials KRG 1321 7/10/20	Date / Time / Initials 1327 KRG 7/11/20	Date / Time / Initials 7/12/20 BEM 1323

Comments:

ACUTE TOXICITY DATA LOG

Client: Tyco OF003	Species: *Ceriodaphnia dubia*
Project #: 12146752	Age: <24 hours
Test: Acute Toxicity Evaluation	No. Animals/No. Reps: 5/4
Template ID: A	Sources of Animals: Pace
Test Initiation Date: 07/08/2020	Dilution Water/Control: LRW/TREATED TAP
Investigator: Toms	Test Volume: 20 mL
Test Duration: 48-hours	Required Testing Temperature: 19-21 °C
Renewal: **Daily**	**Minimum Control Survival ≥ 90%: (Yes / No)**

Concentration (#) Conc ID	**EFFLUENT** Survival Readings (# alive out of # exposed from above unless shown otherwise)							
	24-Hour Replicate				**48-Hour** Replicate			
	A	B	C	D	A	B	C	D
(1) TREATED TAP	5	5	5	5	5	5	5	5
(2) LRW	5	5	5	5	5	5	5	5
(3) 6.25%	5	5	5	5	5	5	5	5
(4) 12.5%	5	5	5	5	5	5	5	5
(5) 25%	5	5	4	5	5	5	4	4
(6) 50%	4	5	5	5	3	3	5	5
(7) 100%	5	5	4	5	4	4	4	5
Deciphered By Date/Initials:	DJT 7/13/20							
Comments:								

Data Package Reviewed for Completeness by: DJT **Date:** 7/13/20

Pace Analytical Services, LLC
4730 Oneota Street
Duluth, MN 55807
(218) 727-6380

August 06, 2020

Anne Fleury
Tyco Fire Protection Products
One Stanton Street
Marinette, WI 54143

RE: Project: Bioassay
Pace Project No.: 12146752

Dear Anne Fleury:

Enclosed are the analytical results for sample(s) received by the laboratory between July 08, 2020 and July 10, 2020. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

- Pace Analytical Services - Duluth
- Pace Analytical Services - Virginia

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Dan Toms

Dan J Toms
dan.toms@pacelabs.com
(218) 727-6380
Project Manager

Enclosures

Pace Analytical Services, LLC
4730 Oneota Street
Duluth, MN 55807
(218) 727-6380

CERTIFICATIONS

Project: Bioassay
Pace Project No.: 12146752

Pace Analytical Services Virginia Minnesota
315 Chestnut Street, Virginia, MN 55792
Alaska Certification UST-107
Montana Certificate #CERT0103
Minnesota Dept of Health Certification #: 027-137-445
North Dakota Certification: # R-203
Wisconsin DNR Certification # : 998027470
WA Department of Ecology Lab ID# C1007

Pace Analytical Services Duluth Minnesota
4730 Oneota St., Duluth, MN 55807
Montana DHHS Certification #: CERT0102
Minnesota Dept of Ag Certification #: Via MN Dept of Health 027-137-152
Minnesota Dept of Health Certification #: 1733125
Wisconsin Dept of Agriculture Certification #: 480341
Wisconsin DNR Certification # : 999446800
North Dakota Certification #: R-105
Nevada DCNR Certification #: MN000372019-1

Pace Analytical Services, LLC
4730 Oneota Street
Duluth, MN 55807
(218) 727-6380

SAMPLE SUMMARY

Project: Bioassay
Pace Project No.: 12146752

Lab ID	Sample ID	Matrix	Date Collected	Date Received
12146752001	Tyco OF 003 Effluent #1	Water	07/07/20 07:40	07/08/20 10:50
12146752002	Tyco OF003 Effluent #2	Water	07/09/20 08:00	07/10/20 11:15

Pace Analytical Services, LLC
4730 Oneota Street
Duluth, MN 55807
(218) 727-6380

SAMPLE ANALYTE COUNT

Project: Bioassay
Pace Project No.: 12146752

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
12146752001	Tyco OF 003 Effluent #1	EPA 350.1	KJD	1	PASI-DUL
		SM 4500-Cl G-2011	AXP	1	PASI-DUL
		EPA 200.7	AK1	1	PASI-V
		SM 2320 B-2011	BE1	1	PASI-V
		SM 2510 B-2011	BE1	1	PASI-V
		SM 4500-H+ B-2011	BE1	1	PASI-V
12146752002	Tyco OF003 Effluent #2	EPA 350.1	DW1	1	PASI-DUL
		SM 4500-Cl G-2011	AXP	1	PASI-DUL
		EPA 200.7	AK1	1	PASI-V
		SM 2320 B-2011	BE1	1	PASI-V
		SM 2510 B-2011	BE1	1	PASI-V
		SM 4500-H+ B-2011	BE1	1	PASI-V

PASI-DUL = Pace Analytical Services - Duluth
PASI-V = Pace Analytical Services - Virginia

Pace Analytical Services, LLC
4730 Oneota Street
Duluth, MN 55807
(218) 727-6380

ANALYTICAL RESULTS

Project: Bioassay
Pace Project No.: 12146752

Sample: Tyco OF 003 Effluent #1 **Lab ID: 12146752001** Collected: 07/07/20 07:40 Received: 07/08/20 10:50 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
350.1 Ammonia	Analytical Method: EPA 350.1 Pace Analytical Services - Duluth								
Nitrogen, Ammonia	**0.036J**	mg/L	0.092	0.028	1		07/10/20 14:19	7664-41-7	
4500CL G Chlorine, Residual	Analytical Method: SM 4500-Cl G-2011 Pace Analytical Services - Duluth								
Chlorine, Total Residual	**<0.042**	mg/L	0.14	0.042	1		07/28/20 14:02	7782-50-5	H6
200.7 MET ICP	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7 Pace Analytical Services - Virginia								
Total Hardness	**<0.20**	mg/L	0.68	0.20	1	07/10/20 08:40	07/13/20 11:45		
2320B Alkalinity	Analytical Method: SM 2320 B-2011 Pace Analytical Services - Virginia								
Alkalinity, Total as CaCO3	**40.6**	mg/L	10.0	10.0	1		07/14/20 15:23		
2510B Specific Conductance	Analytical Method: SM 2510 B-2011 Pace Analytical Services - Virginia								
Specific Conductance	**427**	umhos/cm	10.0	10.0	1		07/14/20 15:23		
4500H+ pH, Electrometric	Analytical Method: SM 4500-H+ B-2011 Pace Analytical Services - Virginia								
pH at 25 Degrees C	**10.2**	Std. Units	0.10	0.10	1		07/14/20 15:23		H6

Sample: Tyco OF003 Effluent #2 **Lab ID: 12146752002** Collected: 07/09/20 08:00 Received: 07/10/20 11:15 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
350.1 Ammonia	Analytical Method: EPA 350.1 Pace Analytical Services - Duluth								
Nitrogen, Ammonia	**<0.028**	mg/L	0.092	0.028	1		07/15/20 16:56	7664-41-7	
4500CL G Chlorine, Residual	Analytical Method: SM 4500-Cl G-2011 Pace Analytical Services - Duluth								
Chlorine, Total Residual	**<0.042**	mg/L	0.14	0.042	1		07/28/20 14:02	7782-50-5	H6
200.7 MET ICP	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7 Pace Analytical Services - Virginia								
Total Hardness	**<0.20**	mg/L	0.68	0.20	1	07/17/20 09:14	07/20/20 13:03		
2320B Alkalinity	Analytical Method: SM 2320 B-2011 Pace Analytical Services - Virginia								
Alkalinity, Total as CaCO3	**<10.0**	mg/L	10.0	10.0	1		07/14/20 15:06		

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ANALYTICAL RESULTS

Project: Bioassay
Pace Project No.: 12146752

Sample: Tyco OF003 Effluent #2 **Lab ID: 12146752002** Collected: 07/09/20 08:00 Received: 07/10/20 11:15 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
2510B Specific Conductance	Analytical Method: SM 2510 B-2011 Pace Analytical Services - Virginia								
Specific Conductance	**250**	umhos/cm	10.0	10.0	1		07/14/20 15:06		
4500H+ pH, Electrometric	Analytical Method: SM 4500-H+ B-2011 Pace Analytical Services - Virginia								
pH at 25 Degrees C	**6.9**	Std. Units	0.10	0.10	1		07/14/20 15:06		H6

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QUALITY CONTROL DATA

Project: Bioassay
Pace Project No.: 12146752

QC Batch: 193283
QC Batch Method: EPA 350.1
Analysis Method: EPA 350.1
Analysis Description: 350.1 Ammonia
Laboratory: Pace Analytical Services - Duluth

Associated Lab Samples: 12146752001

METHOD BLANK: 762166 Matrix: Water
Associated Lab Samples: 12146752001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, Ammonia	mg/L	0.028J	0.10	07/10/20 13:02	

LABORATORY CONTROL SAMPLE: 762165

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Ammonia	mg/L	10	9.7	97	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 762167 762168

Parameter	Units	12146818002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Ammonia	mg/L	<0.10	10	10	10.1	9.9	101	99	90-110	2	10	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Bioassay
Pace Project No.: 12146752

QC Batch: 193664
QC Batch Method: EPA 350.1
Analysis Method: EPA 350.1
Analysis Description: 350.1 Ammonia
Laboratory: Pace Analytical Services - Duluth

Associated Lab Samples: 12146752002

METHOD BLANK: 763979 Matrix: Water
Associated Lab Samples: 12146752002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, Ammonia	mg/L	<0.028	0.10	07/15/20 16:25	

LABORATORY CONTROL SAMPLE: 763978

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Ammonia	mg/L	10	9.9	99	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 763980 763981

Parameter	Units	12145071001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Ammonia	mg/L	0.24	10	10	10.4	10.0	101	98	90-110	3	10	H2

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 764217 764218

Parameter	Units	12146507001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Ammonia	mg/L	ND	10	10	10.4	10.2	104	102	90-110	2	10	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Bioassay
Pace Project No.: 12146752

QC Batch: 194577
QC Batch Method: SM 4500-Cl G-2011
Analysis Method: SM 4500-Cl G-2011
Analysis Description: 4500CL G Chlorine, Total Residual
Laboratory: Pace Analytical Services - Duluth
Associated Lab Samples: 12146752001, 12146752002

METHOD BLANK: 768483 Matrix: Water
Associated Lab Samples: 12146752001, 12146752002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chlorine, Total Residual	mg/L	<0.042	0.10	07/28/20 14:01	H6

LABORATORY CONTROL SAMPLE: 768482

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chlorine, Total Residual	mg/L	1	1.0	102	90-110	H6

SAMPLE DUPLICATE: 768484

Parameter	Units	12146719001 Result	Dup Result	RPD	Max RPD	Qualifiers
Chlorine, Total Residual	mg/L	<0.042	<0.042		10	H6

SAMPLE DUPLICATE: 768485

Parameter	Units	12147131002 Result	Dup Result	RPD	Max RPD	Qualifiers
Chlorine, Total Residual	mg/L	ND	<0.042		10	H6

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Bioassay
Pace Project No.: 12146752

QC Batch: 193541
QC Batch Method: SM 2320 B-2011
Analysis Method: SM 2320 B-2011
Analysis Description: 2320B Alkalinity
Laboratory: Pace Analytical Services - Virginia
Associated Lab Samples: 12146752001, 12146752002

METHOD BLANK: 763357 Matrix: Water
Associated Lab Samples: 12146752001, 12146752002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	<10.0	10.0	07/14/20 14:24	

LABORATORY CONTROL SAMPLE: 763358

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity, Total as CaCO3	mg/L	100	96.2	96	90-110	

SAMPLE DUPLICATE: 763359

Parameter	Units	12147060001 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	158	159	0	20	

SAMPLE DUPLICATE: 763360

Parameter	Units	12146752002 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	<10.0	<10.0		20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Bioassay
Pace Project No.: 12146752

QC Batch: 193542
QC Batch Method: SM 2510 B-2011
Analysis Method: SM 2510 B-2011
Analysis Description: 2510B Specific Conductance
Laboratory: Pace Analytical Services - Virginia
Associated Lab Samples: 12146752001, 12146752002

METHOD BLANK: 763368 Matrix: Water
Associated Lab Samples: 12146752001, 12146752002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Specific Conductance	umhos/cm	<10.0	10.0	07/14/20 14:39	

LABORATORY CONTROL SAMPLE: 763369

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Specific Conductance	umhos/cm	1000	1010	101	90-110	

SAMPLE DUPLICATE: 763370

Parameter	Units	12147060001 Result	Dup Result	RPD	Max RPD	Qualifiers
Specific Conductance	umhos/cm	994	1002	1	20	

SAMPLE DUPLICATE: 763371

Parameter	Units	12146752002 Result	Dup Result	RPD	Max RPD	Qualifiers
Specific Conductance	umhos/cm	250	249	0	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Bioassay
Pace Project No.: 12146752

QC Batch: 193543
QC Batch Method: SM 4500-H+ B-2011
Analysis Method: SM 4500-H+ B-2011
Analysis Description: 4500H+B pH
Laboratory: Pace Analytical Services - Virginia
Associated Lab Samples: 12146752001, 12146752002

LABORATORY CONTROL SAMPLE: 763372

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
pH at 25 Degrees C	Std. Units	7	7.0	99	98-102	H6

SAMPLE DUPLICATE: 763373

Parameter	Units	12147060001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	8.5	8.5	0	10	H6

SAMPLE DUPLICATE: 763374

Parameter	Units	12146752002 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	6.9	6.9	0	10	H6

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: Bioassay
Pace Project No.: 12146752

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above LOD.

J - Estimated concentration at or above the LOD and below the LOQ.

LOD - Limit of Detection adjusted for dilution factor, percent moisture, initial weight and final volume.

LOQ - Limit of Quantitation adjusted for dilution factor, percent moisture, initial weight and final volume.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected at or above the adjusted LOD.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

ANALYTE QUALIFIERS

H2	Extraction or preparation was conducted outside of the recognized method holding time.
H6	Analysis initiated outside of the 15 minute EPA required holding time.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Bioassay
Pace Project No.: 12146752

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
12146752001	Tyco OF 003 Effluent #1	EPA 350.1	193283		
12146752002	Tyco OF003 Effluent #2	EPA 350.1	193664		
12146752001	Tyco OF 003 Effluent #1	SM 4500-Cl G-2011	194577		
12146752002	Tyco OF003 Effluent #2	SM 4500-Cl G-2011	194577		
12146752001	Tyco OF 003 Effluent #1	EPA 200.7	193279	EPA 200.7	193411
12146752002	Tyco OF003 Effluent #2	EPA 200.7	193841	EPA 200.7	193970
12146752001	Tyco OF 003 Effluent #1	SM 2320 B-2011	193541		
12146752002	Tyco OF003 Effluent #2	SM 2320 B-2011	193541		
12146752001	Tyco OF 003 Effluent #1	SM 2510 B-2011	193542		
12146752002	Tyco OF003 Effluent #2	SM 2510 B-2011	193542		
12146752001	Tyco OF 003 Effluent #1	SM 4500-H+ B-2011	193543		
12146752002	Tyco OF003 Effluent #2	SM 4500-H+ B-2011	193543		

WO#: 12146752

PM: DJT Due Date: 07/20/20

CLIENT: 13_TYCO

Pace Analytical

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Required Client Information:			Required Project Information:		Invoice Information:	
Company:	Johnson Controls		Report To:	Anne Fleury	Company:	
Address:	One Stanton Street		Copy To:		Address:	
	Marinette, Wisconsin 54143					Regulatory Agency
Email To:	anne.fleury@jci.com		Purchase Order No.		Attention:	
Phone:	715-735-7411	Cell 715-587-6602	Client Project ID:		Email To:	State / Location
Requested Due Date:			Pace Profile #:	3961	Pace Project Manager: DJT	Wisconsin

Sample #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED START DATE	COLLECTED START TIME	COLLECTED END DATE	COLLECTED END TIME	SAMPLE TEMP AT COLLECTION °C	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	Cubitainer	Analysis: pH, Cond, Alkalinity	Total Residual Chlorine	Hardness	Ammonia	Acute CD	Acute FHM	Corrected Temp at Time of Receipt at Lab: Cubitainer Temp °C Take Temp of Each Cubitainer
1	Tyco OF 003 Effluent #1	WW	C	7-6-20	7:40	7-7-20	7:40	2.7	5	2	1	1		1	X	X	X	X	X	X	1.7
2																					
3																					
4																					

Matrix codes: Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Other OT; Tissue TS

SAMPLER NAME / SIGNATURE / Date: Print Name: Anne M. Fleury Signature: Anne M. Fleury Date: 7-7-20

Client Comments:

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
TYCO/EHS Tech.	7-7-20	7:40	Stelacich/Pace	7/8/20	10:50
			Received for Laboratory By:		

SAMPLE CONDITION ON RECEIPT			
Samples Intact	(Y) N	Samples Received on Ice	(Y) N
Custody Seals Intact	(Y) N	Temperatures 0-6 °C	(Y) N
Signs of Ice formation	Y (N)	PM Need to Notified?	Y (N)
COC Dates and Times Match Sample Containers?			(Y) N

Lab Use Only

Thermometer Used: ☑ 01339252/1710 ☐ 122639816 ☐ Other

Correction Factor: -0.1 °C

Uncorrected Temps: Effluent 1.8 Receiving Water

Lab Comments:

Completed By: Stelacich Reviewed By: AP for DJT 7-8-20

WO#: 12146752

PM: DJT **Due Date: 07/20/20**

CLIENT: 13_TYCO

Pace Analytical

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page : 1 Of 1

Required Client Information:			Required Project Information:		Invoice Information:	
Company:	Johnson Controls		Report To:	Anne Fleury	Company:	
Address:	One Stanton Street		Copy To:		Address:	
	Marinette, Wisconsin 54143					Regulatory Agency
Email To:	anne.fleury@jci.com		Purchase Order No.		Attention:	
Phone:	715-735-7411	Cell 715-587-6602	Client Project ID:		Email To:	State / Location
Requested Due Date:			Pace Profile #:	3961	Pace Project Manager: DJT	Wisconsin

Sample #	SAMPLE ID (MATRIX: Drinking Water DW, Water WT, Waste Water WW, Product P, Soil/Solid SL, Oil OL, Wipe WP, Air AR, Other OT, Tissue TS)	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED START DATE	COLLECTED START TIME	COLLECTED END DATE	COLLECTED END TIME	SAMPLE TEMP AT COLLECTION °C	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	Cubitainer	Analysis: pH, Cond, Alkalinity	Total Residual Chlorine	Hardness	Ammonia	Acute CD	Acute FHM	Corrected Temp at Time of Receipt at Lab: Cubitainer Temp °C Take Temp of Each Cubitainer
1	Tyco OF003 Effluent #2	WW	C	7-8-20	8am	7-9-20	8am	3.7°	5	2	1	1		1	X	X	X	X				1.6
2																						
3																						
4																						

SAMPLER NAME / SIGNATURE / Date: Print Name: Anne M. Fleury Signature: Anne M. Fleury Date: 7-9-20

Client Comments:

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
Tyco/EHS Tech Anne M. Fleury	7-9-20	8am	Sklacich/Pace	7/10/20	11:15
			Received for Laboratory By:		

SAMPLE CONDITION ON RECEIPT			
Samples Intact	Y / N	Samples Received on Ice	Y / N
Custody Seals Intact	Y / N	Temperatures 0-6 °C	Y / N
Signs of Ice formation	Y / N	PM Need to Notified?	Y / N
COC Dates and Times Match Sample Containers?			Y / N

Lab Use Only

Thermometer Used: ☑ 01339252/1710 ☐ 122639816 ☐ Other

Correction Factor: -0.1 °C

Uncorrected Temps: Effluent 1.7 Receiving Water

Lab Comments:

Completed By: Sklacich Reviewed By: AP for DJT 7-13-20

WHOLE EFFLUENT TOXICITY (WET) TEST REPORT FORM

GENERAL INFORMATION

FACILITY:	Tyco Fire Protection Products	WPDES PERMIT NO.:	WI-0001040-07-0
OUTFALL NO.:	OF003	LABORATORY NAME:	Pace Analytical Services, LLC
RECEIVING WATER:	Menominee River		

SAMPLE INFORMATION

SAMPLE NO.	SAMPLE COLLECTION: SAMPLE TYPE	SAMPLE COLLECTION: BEGINNING DATE	SAMPLE COLLECTION: END DATE	SAMPLE TEMP °C: COLLECTION	SAMPLE TEMP °C: AT LAB	pH at LAB	HAND DELIVER? (If Yes, ≤ 4 hr?)	HOLD TIME ≤ 36 HR?	SAMPLE ACCEP-TABLE?
1	EFF-24C	07/20/20	07/21/20	3.5	2.0	8.7	No	Yes	Yes
2	EFF-24C	07/22/20	07/23/20	3.7	2.0	6.9	No	Yes	Yes

Describe any unusual conditions during sampling that may influence test results. (see Part 6.1.2 of the Methods Manual for examples.)

COMMENTS:

TEST INFORMATION

	ACUTE		
Date Test Initiated:	**7/22/2020**		
Tests Are For:	#2 Retest of Failure From: (Specify Date)		
Date of Initial Test:	5/20/2020		
ZID/IWC Info.:	ZID Compliance Concentration =		
	C.dubia	FHM	Other
Dilution Water:	☐ RW	☐ RW	☐ RW
	☑ LW	☑ LW	☐ LW

QA/QC CONDITIONS

	ACUTE
Temperatures maintained during test? (20 ± 1°C or 25 ± 1°C)	Yes
Dissolved oxygen ≥ 4.0 mg/l throughout test?	Yes
Effluent pH maintained within 6.0 - 9.0 s.u. throughout test?	Yes
Concurrent or monthly reference tests within acceptable limits?	Yes
Tests conducted in a carbon dioxide atmosphere throughout test?	Yes
Were effluent samples modified prior to testing?(ex. filtration, aeration, chem addition)	No

COMMENTS:

WATER CHEMISTRY (All values reported in mg/L, except pH)

SAMPLE TYPE	NO.	HARDNESS	ALKALINITY	TOTAL AMMONIA	pH (s.u.) After Warming	TOTAL RESIDUAL CHLORINE
Effluent	#1	<0.20	15.1	0.54	8.7	<0.042
	#2	<0.20	<10.0	0.052 J	6.9	<0.042
Lab Water	LRW 20-038	396	159	<0.028	8.5	<0.042
	TT 070620	52.6	47.9	<0.028	7.4	<0.042

COMMENTS: J - Estimated concentration at or above the LOD and below the LOQ.

ACUTE TEST CONTROL PERFORMANCE

PRIMARY WATER CONTROLS LRW		LAB WATER CONTROLS (Secondary Control)	
Fathead Minnow	*Ceriodaphnia dubia*	Fathead Minnow	*Ceriodaphnia dubia*
Survival ≥ 90%	Survival ≥ 90%	Survival ≥ 90%	Survival ≥ 90%
Yes	**Yes**	**Yes**	**Yes**

COMMENTS:

ACUTE TEST DATA

SPECIES	EFFLUENT TREATMENT	Percent Survival By Replicate				Mean Percent Survival
		1	2	3	4	
Fathead Minnow	Lab Water Control - TT	100	100	100	100	100
	Lab Water Control - LRW	100	100	100	100	100
Age of Organism:	6.25%	100	100	90	100	98
	12.5%	100	90	90	100	95
8 Days	25%	100	100	100	100	100
	50%	100	100	100	100	100
	100%	100	89	100	90	95

FATHEAD MINNOW ACUTE RESULTS: LC_{50} = **>100%** **C.I.% =** **Not Calc** TU_a = **1.0**

Please describe any unusual behavior and/or appearance of organisms.(see Part 6.1.2 of the Methods Manual for ex.)

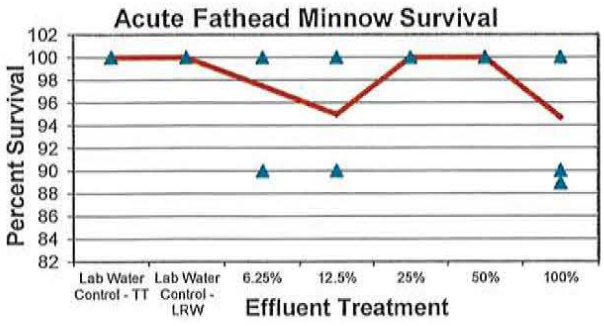
COMMENTS:

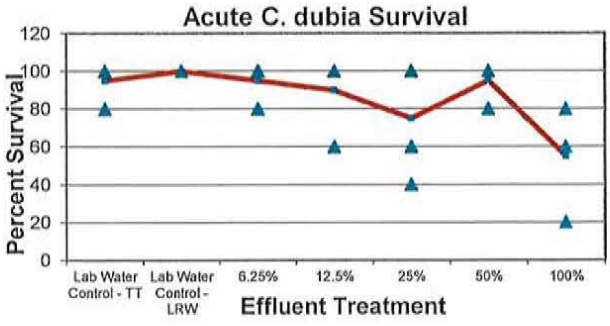
SPECIES	EFFLUENT TREATMENT	Percent Survival By Replicate				Mean Percent Survival
		1	2	3	4	
Ceriodaphnia dubia	Lab Water Control - TT	100	100	100	80	95
	Lab Water Control - LRW	100	100	100	100	100
Age of Organism:	6.25%	80	100	100	100	95
	12.5%	100	60	100	100	90
< 24 Hours Old	25%	100	100	40	60	75
	50%	100	100	80	100	95
	100%	80	60	60	20	55

***Ceriodaphnia dubia* ACUTE RESULTS:** LC_{50} = **>100%** **C.I.% =** **Not Calc** TU_a = **1.0**

Please describe any unusual behavior and/or appearance of organisms.(see Part 6.1.2 of the Methods Manual for ex.)

COMMENTS:





Facility : Tyco Fire Protection Products
Permit # : WI-0001040-07-0
Acute Test Date : 7/22/2020

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

LAB REPRESENTATIVE:	Dan Toms		SIGNATURE:	Dan Toms	
PHONE:	218-336-2120	LAB CERT #:	999446800	DATE:	8/13/2020
PERMITTEE REPRESENTATIVE:	Anne Fleury		SIGNATURE:		
PHONE:	715-735-7411		DATE:		

Send *all 3 pages* of this form (plus any attachments or additional information which you believe to be relevant to the test) to: Biomonitoring Coordinator, Bureau of Watershed Management, Department of Natural Resources, 101 South Webster St., P.O. Box 7921, Madison, WI 53707-7921; according to the timelines specified in your WPDES permit.

Copies of the State of Wisconsin Aquatic Life Toxicity Testing Methods Manual (Methods Manual) and the WET Guidance Document can be obtained from the Biomonitoring Coordinator at the address given above or at: http://dnr.wi.gov/org/water/wm/ww/biomon/biomon.htm

TO BE COMPLETED BY THE WISCONSIN DEPARTMENT OF NATURAL RESOURCES					
		DID TESTS PASS?			
ACUTE	Fathead Minnow	☐ Yes	☐ No	☐ Inconclusive	☐ Unacceptable
	Ceriodaphnia dubia	☐ Yes	☐ No	☐ Inconclusive	☐ Unacceptable
CHRONIC	Fathead Minnow	☐ Yes	☐ No	☐ Inconclusive	☐ Unacceptable
	Ceriodaphnia dubia	☐ Yes	☐ No	☐ Inconclusive	☐ Unacceptable
Retests Required?	☐ Yes ☐ No ____	Acute / Chronic:	Both Species	*C.dubia* only	FHM only
Due To:	☐ Failure ☐ QA Problem				
WET Limit Violation?	☐ Yes ☐ No limit in permit	Results Entered Into Database?	☐ Yes ☐ No		
COMMENTS:					
REVIEWED BY:		**DATE:**			
CC:		BASIN ENGINEER			
		PERMIT COORDINATOR			
		PERMIT FILE			

Facility : Tyco Fire Protection Products
Permit # : WI-0001040-07-0
Test Date : 7/22/2020

Client Color Code: Blue

Pace Analytical Services, LLC

Client: Tyco OF003

State: Wisconsin

Pace Project # 12147653

Test: Acute Toxicity Evaluation

Tested in CO_2 Enriched Atmosphere

Test Initiation Date: 07/22/2020

Test Termination Date: 07/26/2020

ENVIRONMENTAL SAMPLE TEST INFORMATION

Date:	07/22/2020
Client:	Tyco OF003
Pace Project #:	12147653
Dilution Water:	Laboratory Reconstituted Water (LRW)
Test Chamber:	1oz plastic, 250 mL plastic
Food:	Artemia for fish before 48-hour renewal - IDs 205981
Required Temperature Setting:	19- 21°C

Concentration/Solution	LRW (mL)	Effluent (mL)
(1) Treated Tap	0	0
(2) LRW	900	0
(3) 6.25%	844	56
(4) 12.5%	788	112
(5) 25%	675	225
(6) 50%	450	450
(7) 100%	0	900
Daily Totals	**~3.7 Liter**	**~1.8 Liter**

Comments: Tested in CO_2 enriched atmosphere.

Retest #2

TOXICITY TEST RENEWAL FORM

Client: Tyco OF003 Pace Project #: 12147653

Test: Acute Toxicity Evaluation Test Initiation Date: 07/22/2020

Organism: *Ceriodaphnia dubia*, Fathead Minnow Test Termination Date: 07/26/2020

EFFLUENT

Test Organism			Age	Source	Culture ID	Bath #
		C. dubia	<24 hours	Pace	ACD-2.22	4
		FHM	8 Days	Aquatox	N/A	4
Test Day		0 (Test Initiation)	1	2	3	4
Date		7/22/20	7/23/20	7/24/20	7/25/20	7/26/20
Renewal/Reading (±1 hour of initiation)	*C. dubia*	1250	1244	1253	N/A	N/A
	Initials	[redacted]	KRG	KRG	N/A	N/A
	FHM	1305	1305	1320	1335	1315
	Initials	[redacted]	KRG	KRG	[redacted]	BEM
Feeding / Food IDs	*C. dubia*	0947	N/A	N/A	N/A	N/A
	Initials	KRG	N/A	N/A	N/A	N/A
	FHM	0718	N/A	0648	N/A	N/A
	Initials	[redacted]	N/A	KRG	N/A	N/A
	Primary Control	LRW 20-038	LRW 20-038	LRW 20-038	LRW 20-038	N/A
	Secondary Control	Treated Tap 071020	Treated Tap 070620	Treated Tap 070620	Treated Tap 070620	N/A
	Sample #	#1	#1	#2	#2	N/A
	Effluent Filtered (Yes / No)	No	No	No	No	N/A
	Initials	APR	KRG	APR	[redacted]	N/A

INITIAL CHEMISTRIES - EFFLUENT

Client: Tyco OF003 Pace Project #: 12147653

Test: Acute Toxicity Evaluation Test Initiation Date: 07/22/2020

Organism(s): *Ceriodaphnia dubia*, Fathead Minnow Test Termination Date: 07/26/2020

Meter IDs: 13WETA, 13WETB, 13WETC

	Date/Time/Initials			
	7/22/20 1206 KRG	7/23/20 APR 1024	7/24/20 APR. 1215	7/25/20 APR 1325
CONCENTRATION: (1) **SECONDARY CONTROL - TREATED TAP**				
DO (mg/L)	8.10	8.7	5.9/8.7	8.6
Conductivity (umhos/cm)	123	124	127	127
pH (s.u.)	7.1	8.0.	6.9	7.2
CONCENTRATION: (2) **PRIMARY CONTROL - LRW**				
DO (mg/L)	9.0	9.1	8.8	8.8
Conductivity (umhos/cm)	1032	1021	1034	1059
pH (s.u.)	8.1	8.2	7.9	~~7.~~ 8.1 APR 7/25/20
CONCENTRATION: (3) **6.25%**				
DO (mg/L)	9.0	9.2	8.9	8.9
Conductivity (umhos/cm)	991	997	949	1025
pH (s.u.)	8.3	8.3	8.3	8.3
CONCENTRATION: (4) **12.5%**				
DO (mg/L)	9.1	9.2	9.0	8.9
Conductivity (umhos/cm)	945	956	955	973
pH (s.u.)	8.4	8.4	8.4	8.3
CONCENTRATION: (5) **25%**				
DO (mg/L)	9.1	9.1	9.0	9.0
Conductivity (umhos/cm)	854	864	860	873
pH (s.u.)	8.4	8.4	8.4	8.4
CONCENTRATION: (6) **50%**				
DO (mg/L)	9.1	9.1	9.0	9.0
Conductivity (umhos/cm)	676	691	676	680
pH (s.u.)	8.5	8.4	8.4	8.4
CONCENTRATION: (7) **100%**				
DO (mg/L)	9.4	9.1	8.9	9.3
Conductivity (umhos/cm)	232	241	196	191
pH (s.u.)	8.7	8.6	8.6	8.5

FINAL CHEMISTRIES - EFFLUENT

Client: Tyco OF003 Pace Project #: 12147653

Test: Acute Toxicity Evaluation Test Initiation Date: 07/22/2020

Organism(s): *Ceriodaphnia dubia* Test Termination Date: 07/24/2020

Meter IDs: 13WETA, 13WETC

	Date/Time/Initials	
	7/23/20 1311 APR LBO 7/23/20	7/24/20 KRG 1305
CONCENTRATION: (1) **SECONDARY CONTROL - TREATED TAP**		
DO (mg/L)	8.8	8.7
pH (s.u.)	7.0	6.6
CONCENTRATION: (2) **PRIMARY CONTROL - LRW**		
DO (mg/L)	8.9	8.8
pH (s.u.)	7.3	7.2
CONCENTRATION: (3) **6.25%**		
DO (mg/L)	8.9	8.9
pH (s.u.)	7.3	7.2
CONCENTRATION: (4) **12.5%**		
DO (mg/L)	8.9	8.9
pH (s.u.)	7.4	7.2
CONCENTRATION: (5) **25%**		
DO (mg/L)	8.9	8.9
pH (s.u.)	7.4	7.2
CONCENTRATION: (6) **50%**		
DO (mg/L)	8.9	8.9
pH (s.u.)	7.4	7.3
CONCENTRATION: (7) **100%**		
DO (mg/L)	8.9	8.8
pH (s.u.)	7.7	7.7

FINAL CHEMISTRIES - EFFLUENT

Client: Tyco OF003 Pace Project #: 12147653

Test: Acute Toxicity Evaluation Test Initiation Date: 07/22/2020

Organism(s): Fathead Minnow Test Termination Date: 07/26/2020

Meter IDs: 13WETA, 13WETC

	Date/Time/Initials			
	7/23/20 APR 1326	7/24/20 KRG 1314	7/25/20 APR 1309	7/26/20 BEM 1333
CONCENTRATION: (1) **SECONDARY CONTROL - TREATED TAP**				
DO (mg/L)	8.1	7.6	8.1	8.0
pH (s.u.)	7.3	7.5	6.7	6.7
CONCENTRATION: (2) **PRIMARY CONTROL – LRW**				
DO (mg/L)	8.2	7.0	8.1	7.9
pH (s.u.)	7.3	7.2	7.2	7.2
CONCENTRATION: (3) **6.25%**				
DO (mg/L)	8.1	7.2	8.0	7.8
pH (s.u.)	7.4	7.3	7.3	7.2
CONCENTRATION: (4) **12.5%**				
DO (mg/L)	8.2	7.5	8.1	8.0
pH (s.u.)	7.4	7.3	7.3	7.2
CONCENTRATION: (5) **25%**				
DO (mg/L)	8.1	7.5	8.1	7.9
pH (s.u.)	7.3	7.3	7.3	7.2
CONCENTRATION: (6) **50%**				
DO (mg/L)	8.1	7.4	8.1	7.8
pH (s.u.)	7.3	7.3	7.3	7.3
CONCENTRATION: (7) **100%**				
DO (mg/L)	8.0	7.4	7.5	7.8
pH (s.u.)	7.4	7.7	7.4	7.4

Pace Analytical	Document Name: WI Acute Toxicity Evaluation	Document Revised: 21Jun2019 Page 7 of 9	Client Color Code: Blue
	Document No.: F-DUL-BIO-024A-rev:01	Issuing Authority: Pace Duluth, MN Quality Office	

ACUTE TOXICITY DATA LOG

Client: Tyco OF003	Species: *Ceriodaphnia dubia*
Project #: 12147653	Age: <24 hours
Test: Acute Toxicity Evaluation	No. Animals/No. Reps: 5/4
Template ID: A	Sources of Animals: Pace
Test Initiation Date: 07/22/2020	Dilution Water/Control: LRW/TREATED TAP
Investigator: Toms	Test Volume: 20 mL
Test Duration: 48-hours	Required Testing Temperature: 19-21 °C
Renewal: **Daily**	**Randomized Board Readings**

EFFLUENT

Survival Readings (Randomized):

(# alive out of # exposed from above unless shown otherwise)

ROW	24 Hour Column ID				48 Hour Column ID			
	A	B	C	D	A	B	C	D
7	1 5	3 5	4 5	7 5	1 5	3 5	4 5	7 1
6	7 5	2 5	5 5	3 5	7 4	2 5	5 2	3 5
5	4 5	4 4	2 5	KRG 7/23/20 5 4	4 5	4 3	2 5	1 4
4	2 4/4	7 5	7 5	2 5	2 4/4	7 3	7 3	2 5
3	5 5	1 5	3 5	5 3	5 5	1 5	3 5	5 3
2	3 5	5 5	6 4	6 5	3 4	5 5	6 4 5 KRG 7/24/20	6 5
1	6 5	6 5	1 5	4 5	6 5	6 5	1 5	4 5

2 = Concentration ID

Readings By (Date/Time/Initials): 7/23/20 KRG 1244 7/24/20 KRG 1253

Comments:

ACUTE TOXICITY DATA LOG

Client: Tyco OF003	Species: Fathead Minnow
Project #: 12147653	Age: 8 day
Test: Acute Toxicity Evaluation	No. Animals/No. Reps: 10/4
Template ID: B	Sources of Animals: Aquatox
Test Initiation Date: 07/22/2020	Dilution Water/Control: LRW/TREATED TAP
Investigator: Toms	Test Volume: 200 mL
Test Duration: 96-hours	Required Testing Temperature: 19-21 °C
Renewal: **Daily**	Minimum Control Survival ≥ 90% (Yes / No)

Concentration	EFFLUENT Survival Readings: (# alive out of # exposed from above unless shown otherwise)			
	24-Hour Replicate A B C D	48-Hour Replicate A B C D	72-Hour Replicate A B C D	96-Hour Replicate A B C D
(1) Treated Tap	10 10 10 10	10 10 10 10	10 10 10 10	10 10 10 10
(2) LRW	10 10 10 10	10 10 9/9 10	10 10 9/9 10	10 9/9 10 9/9
(3) 6.25%	10 10 10 10	10 10 9 10	10 10 9 10	10 10 9 10
(4) 12.5%	10 10 10 10	10 10 9 10	10 10 9 10	10 9 9 10
(5) 25%	10 10 10 10	10 10 10 10	10 10 10 10	10 10 10 10
(6) 50%	10 10 10 10	10 10 10 10	10 10 10 10	10 10 10 10
(7) 100%	10 9 10 10	10 8/9 10 9	10 8/9 10 9	10 8/9 9/9 9
	Date / Time / Initials 7/23/20 1305 KRG	Date / Time / Initials 7/24/20 1320 KRG	Date / Time / Initials 7/25/20 1335 [illegible]	Date / Time / Initials 7/26/20 BEM 1315

Comments:

ACUTE TOXICITY DATA LOG

Client: Tyco OF003	Species: *Ceriodaphnia dubia*
Project #: 12147653	Age: <24 hours
Test: Acute Toxicity Evaluation	No. Animals/No. Reps: 5/4
Template ID: A	Sources of Animals: Pace
Test Initiation Date: 07/22/2020	Dilution Water/Control: LRW/TREATED TAP
Investigator: Toms	Test Volume: 20 mL
Test Duration: 48-hours	Required Testing Temperature: 19-21 °C
Renewal: **Daily**	**Minimum Control Survival ≥ 90%: (Yes / No)**

Concentration (#) Conc ID	EFFLUENT Survival Readings (# alive out of # exposed from above unless shown otherwise)							
	24-Hour Replicate				48-Hour Replicate			
	A	B	C	D	A	B	C	D
(1) TREATED TAP	5	5	5	4	5	5	5	4
(2) LRW	4/4	5	5	5	4/4	5	5	5
(3) 6.25%	5	5	5	5	4	5	5	5
(4) 12.5%	5	4	5	5	5	3	5	5
(5) 25%	5	5	5	3	5	5	2	3
(6) 50%	5	5	4	5	5	5	4	5
(7) 100%	5	5	5	5	4	3	3	1
Deciphered By Date/Initials:	DJT 7/27/20							

Comments:

Data Package Reviewed for Completeness by: APR **Date:** 8/6/20

Pace Analytical Services, LLC
4730 Oneota Street
Duluth, MN 55807
(218) 727-6380

August 06, 2020

Anne Fleury
Tyco Fire Protection Products
One Stanton Street
Marinette, WI 54143

RE: Project: Bioassay
Pace Project No.: 12147653

Dear Anne Fleury:

Enclosed are the analytical results for sample(s) received by the laboratory between July 22, 2020 and July 24, 2020. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

- Pace Analytical Services - Duluth
- Pace Analytical Services - Virginia

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Dan Toms

Dan J Toms
dan.toms@pacelabs.com
(218) 727-6380
Project Manager

Enclosures

Pace Analytical Services, LLC
4730 Oneota Street
Duluth, MN 55807
(218) 727-6380

CERTIFICATIONS

Project: Bioassay
Pace Project No.: 12147653

Pace Analytical Services Virginia Minnesota
315 Chestnut Street, Virginia, MN 55792
Alaska Certification UST-107
Montana Certificate #CERT0103
Minnesota Dept of Health Certification #: 027-137-445
North Dakota Certification: # R-203
Wisconsin DNR Certification # : 998027470
WA Department of Ecology Lab ID# C1007

Pace Analytical Services Duluth Minnesota
4730 Oneota St., Duluth, MN 55807
Montana DHHS Certification #: CERT0102
Minnesota Dept of Ag Certification #: Via MN Dept of Health 027-137-152
Minnesota Dept of Health Certification #: 1733125
Wisconsin Dept of Agriculture Certification #: 480341
Wisconsin DNR Certification # : 999446800
North Dakota Certification #: R-105
Nevada DCNR Certification #: MN000372019-1

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
4730 Oneota Street
Duluth, MN 55807
(218) 727-6380

SAMPLE SUMMARY

Project: Bioassay
Pace Project No.: 12147653

Lab ID	Sample ID	Matrix	Date Collected	Date Received
12147653001	Tyco OF003 Effluent #1	Water	07/21/20 07:40	07/22/20 11:00
12147653002	Tyco OF003 Effluent #2	Water	07/23/20 12:00	07/24/20 10:30

Pace Analytical Services, LLC
4730 Oneota Street
Duluth, MN 55807
(218) 727-6380

SAMPLE ANALYTE COUNT

Project: Bioassay
Pace Project No.: 12147653

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
12147653001	Tyco OF003 Effluent #1	EPA 350.1	KJD	1	PASI-DUL
		SM 4500-Cl G-2011	AXP	1	PASI-DUL
		EPA 200.7	AK1	1	PASI-V
		SM 2320 B-2011	CSD	1	PASI-V
		SM 2510 B-2011	CSD	1	PASI-V
		SM 4500-H+ B-2011	CSD	1	PASI-V
12147653002	Tyco OF003 Effluent #2	EPA 350.1	KJD	1	PASI-DUL
		SM 4500-Cl G-2011	AXP	1	PASI-DUL
		EPA 200.7	AK1	1	PASI-V
		SM 2320 B-2011	CSD	1	PASI-V
		SM 2510 B-2011	CSD	1	PASI-V
		SM 4500-H+ B-2011	CSD	1	PASI-V

PASI-DUL = Pace Analytical Services - Duluth
PASI-V = Pace Analytical Services - Virginia

Pace Analytical Services, LLC
4730 Oneota Street
Duluth, MN 55807
(218) 727-6380

ANALYTICAL RESULTS

Project: Bioassay
Pace Project No.: 12147653

Sample: Tyco OF003 Effluent #1 **Lab ID: 12147653001** Collected: 07/21/20 07:40 Received: 07/22/20 11:00 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
350.1 Ammonia	Analytical Method: EPA 350.1 Pace Analytical Services - Duluth								
Nitrogen, Ammonia	**0.54**	mg/L	0.092	0.028	1		08/01/20 10:33	7664-41-7	
4500CL G Chlorine, Residual	Analytical Method: SM 4500-Cl G-2011 Pace Analytical Services - Duluth								
Chlorine, Total Residual	**<0.042**	mg/L	0.14	0.042	1		07/28/20 14:08	7782-50-5	H6
200.7 MET ICP	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7 Pace Analytical Services - Virginia								
Total Hardness	**<0.20**	mg/L	0.68	0.20	1	07/24/20 09:00	07/27/20 11:36		
2320B Alkalinity	Analytical Method: SM 2320 B-2011 Pace Analytical Services - Virginia								
Alkalinity, Total as CaCO3	**15.1**	mg/L	10.0	10.0	1		07/24/20 10:51		
2510B Specific Conductance	Analytical Method: SM 2510 B-2011 Pace Analytical Services - Virginia								
Specific Conductance	**216**	umhos/cm	10.0	10.0	1		07/24/20 10:51		
4500H+ pH, Electrometric	Analytical Method: SM 4500-H+ B-2011 Pace Analytical Services - Virginia								
pH at 25 Degrees C	**8.7**	Std. Units	0.10	0.10	1		07/24/20 10:51		H6

Sample: Tyco OF003 Effluent #2 **Lab ID: 12147653002** Collected: 07/23/20 12:00 Received: 07/24/20 10:30 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
350.1 Ammonia	Analytical Method: EPA 350.1 Pace Analytical Services - Duluth								
Nitrogen, Ammonia	**0.052J**	mg/L	0.092	0.028	1		08/01/20 11:03	7664-41-7	BL
4500CL G Chlorine, Residual	Analytical Method: SM 4500-Cl G-2011 Pace Analytical Services - Duluth								
Chlorine, Total Residual	**<0.042**	mg/L	0.14	0.042	1		07/28/20 14:10	7782-50-5	H6
200.7 MET ICP	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7 Pace Analytical Services - Virginia								
Total Hardness	**<0.20**	mg/L	0.68	0.20	1	07/31/20 09:20	07/31/20 14:41		
2320B Alkalinity	Analytical Method: SM 2320 B-2011 Pace Analytical Services - Virginia								
Alkalinity, Total as CaCO3	**<10.0**	mg/L	10.0	10.0	1		07/28/20 17:42		

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
4730 Oneota Street
Duluth, MN 55807
(218) 727-6380

ANALYTICAL RESULTS

Project: Bioassay
Pace Project No.: 12147653

Sample: Tyco OF003 Effluent #2 **Lab ID: 12147653002** Collected: 07/23/20 12:00 Received: 07/24/20 10:30 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
2510B Specific Conductance	Analytical Method: SM 2510 B-2011 Pace Analytical Services - Virginia								
Specific Conductance	**167**	umhos/cm	10.0	10.0	1		07/28/20 12:03		
4500H+ pH, Electrometric	Analytical Method: SM 4500-H+ B-2011 Pace Analytical Services - Virginia								
pH at 25 Degrees C	**6.9**	Std. Units	0.10	0.10	1		07/28/20 12:03		H6

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
4730 Oneota Street
Duluth, MN 55807
(218) 727-6380

QUALITY CONTROL DATA

Project: Bioassay
Pace Project No.: 12147653

QC Batch: 194980
QC Batch Method: EPA 350.1
Analysis Method: EPA 350.1
Analysis Description: 350.1 Ammonia
Laboratory: Pace Analytical Services - Duluth
Associated Lab Samples: 12147653001, 12147653002

METHOD BLANK: 770250 Matrix: Water
Associated Lab Samples: 12147653001, 12147653002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, Ammonia	mg/L	<0.028	0.10	08/01/20 10:21	

LABORATORY CONTROL SAMPLE: 770249

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Ammonia	mg/L	10	10	100	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 770255 770256

Parameter	Units	12147697002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Ammonia	mg/L	25.7	50	50	76.1	76.3	101	101	90-110	0	10	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 770257 770258

Parameter	Units	12147701001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Ammonia	mg/L	0.13	10	10	10.2	10.4	101	103	90-110	2	10	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
4730 Oneota Street
Duluth, MN 55807
(218) 727-6380

QUALITY CONTROL DATA

Project: Bioassay
Pace Project No.: 12147653

QC Batch: 194578
QC Batch Method: SM 4500-Cl G-2011
Analysis Method: SM 4500-Cl G-2011
Analysis Description: 4500CL G Chlorine, Total Residual
Laboratory: Pace Analytical Services - Duluth
Associated Lab Samples: 12147653001, 12147653002

METHOD BLANK: 768487 Matrix: Water
Associated Lab Samples: 12147653001, 12147653002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chlorine, Total Residual	mg/L	<0.042	0.10	07/28/20 14:06	H6

LABORATORY CONTROL SAMPLE: 768486

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chlorine, Total Residual	mg/L	1	0.98	98	90-110	H6

SAMPLE DUPLICATE: 768488

Parameter	Units	12147129004 Result	Dup Result	RPD	Max RPD	Qualifiers
Chlorine, Total Residual	mg/L	<0.042	<0.042		10	H6

SAMPLE DUPLICATE: 768489

Parameter	Units	12147651002 Result	Dup Result	RPD	Max RPD	Qualifiers
Chlorine, Total Residual	mg/L	<0.042	<0.042		10	H6

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

Pace Analytical Services, LLC
4730 Oneota Street
Duluth, MN 55807
(218) 727-6380

QUALITY CONTROL DATA

Project: Bioassay
Pace Project No.: 12147653

QC Batch: 194360
QC Batch Method: SM 2320 B-2011
Analysis Method: SM 2320 B-2011
Analysis Description: 2320B Alkalinity
Laboratory: Pace Analytical Services - Virginia
Associated Lab Samples: 12147653001

METHOD BLANK: 767311 Matrix: Water
Associated Lab Samples: 12147653001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	<10.0	10.0	07/24/20 09:36	

LABORATORY CONTROL SAMPLE: 767312

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity, Total as CaCO3	mg/L	100	96.9	97	90-110	

SAMPLE DUPLICATE: 767313

Parameter	Units	12147595005 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	147	147	0	20	

SAMPLE DUPLICATE: 767314

Parameter	Units	12147817006 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	198	202	2	20	

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QUALITY CONTROL DATA

Project: Bioassay
Pace Project No.: 12147653

QC Batch: 194625
QC Batch Method: SM 2320 B-2011
Analysis Method: SM 2320 B-2011
Analysis Description: 2320B Alkalinity
Laboratory: Pace Analytical Services - Virginia

Associated Lab Samples: 12147653002

METHOD BLANK: 768757 Matrix: Water
Associated Lab Samples: 12147653002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	<10.0	10.0	07/28/20 16:02	

LABORATORY CONTROL SAMPLE: 768758

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity, Total as CaCO3	mg/L	100	95.2	95	90-110	

SAMPLE DUPLICATE: 768759

Parameter	Units	12148055003 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	302	300	1	20	

SAMPLE DUPLICATE: 768768

Parameter	Units	12148055006 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	299	295	2	20	

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QUALITY CONTROL DATA

Project: Bioassay
Pace Project No.: 12147653

QC Batch: 194362
QC Batch Method: SM 2510 B-2011
Analysis Method: SM 2510 B-2011
Analysis Description: 2510B Specific Conductance
Laboratory: Pace Analytical Services - Virginia

Associated Lab Samples: 12147653001

METHOD BLANK: 767318 Matrix: Water
Associated Lab Samples: 12147653001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Specific Conductance	umhos/cm	<10.0	10.0	07/24/20 09:29	

LABORATORY CONTROL SAMPLE: 767319

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Specific Conductance	umhos/cm	1000	990	99	90-110	

SAMPLE DUPLICATE: 767320

Parameter	Units	12147595005 Result	Dup Result	RPD	Max RPD	Qualifiers
Specific Conductance	umhos/cm	522	528	1	20	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
4730 Oneota Street
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QUALITY CONTROL DATA

Project: Bioassay
Pace Project No.: 12147653

QC Batch: 194565
QC Batch Method: SM 2510 B-2011
Analysis Method: SM 2510 B-2011
Analysis Description: 2510B Specific Conductance
Laboratory: Pace Analytical Services - Virginia
Associated Lab Samples: 12147653002

METHOD BLANK: 768434 Matrix: Water
Associated Lab Samples: 12147653002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Specific Conductance	umhos/cm	<10.0	10.0	07/28/20 11:28	

LABORATORY CONTROL SAMPLE: 768435

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Specific Conductance	umhos/cm	1000	997	100	90-110	

SAMPLE DUPLICATE: 768436

Parameter	Units	12147653002 Result	Dup Result	RPD	Max RPD	Qualifiers
Specific Conductance	umhos/cm	167	165	1	20	

SAMPLE DUPLICATE: 768437

Parameter	Units	12147920003 Result	Dup Result	RPD	Max RPD	Qualifiers
Specific Conductance	umhos/cm	46	46	0	20	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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QUALITY CONTROL DATA

Project: Bioassay
Pace Project No.: 12147653

QC Batch: 194361
QC Batch Method: SM 4500-H+ B-2011
Analysis Method: SM 4500-H+ B-2011
Analysis Description: 4500H+B pH
Laboratory: Pace Analytical Services - Virginia

Associated Lab Samples: 12147653001

LABORATORY CONTROL SAMPLE: 767316

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
pH at 25 Degrees C	Std. Units	7	7.0	100	98-102	H6

SAMPLE DUPLICATE: 767317

Parameter	Units	12147595005 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.7	7.7	0	10	H6

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
4730 Oneota Street
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QUALITY CONTROL DATA

Project: Bioassay
Pace Project No.: 12147653

QC Batch: 194561
QC Batch Method: SM 4500-H+ B-2011
Analysis Method: SM 4500-H+ B-2011
Analysis Description: 4500H+B pH
Laboratory: Pace Analytical Services - Virginia

Associated Lab Samples: 12147653002

LABORATORY CONTROL SAMPLE: 768428

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
pH at 25 Degrees C	Std. Units	7	7.0	100	98-102	H6

SAMPLE DUPLICATE: 768429

Parameter	Units	12147653002 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	6.9	6.9	0	10	H6

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QUALIFIERS

Project: Bioassay
Pace Project No.: 12147653

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above LOD.

J - Estimated concentration at or above the LOD and below the LOQ.

LOD - Limit of Detection adjusted for dilution factor, percent moisture, initial weight and final volume.

LOQ - Limit of Quantitation adjusted for dilution factor, percent moisture, initial weight and final volume.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected at or above the adjusted LOD.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

ANALYTE QUALIFIERS

BL	Analyte was detected in an instrument blank at a negative value. The result may be biased low.
H6	Analysis initiated outside of the 15 minute EPA required holding time.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Bioassay
Pace Project No.: 12147653

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
12147653001	Tyco OF003 Effluent #1	EPA 350.1	194980		
12147653002	Tyco OF003 Effluent #2	EPA 350.1	194980		
12147653001	Tyco OF003 Effluent #1	SM 4500-Cl G-2011	194578		
12147653002	Tyco OF003 Effluent #2	SM 4500-Cl G-2011	194578		
12147653001	Tyco OF003 Effluent #1	EPA 200.7	194359	EPA 200.7	194460
12147653002	Tyco OF003 Effluent #2	EPA 200.7	194900	EPA 200.7	194939
12147653001	Tyco OF003 Effluent #1	SM 2320 B-2011	194360		
12147653002	Tyco OF003 Effluent #2	SM 2320 B-2011	194625		
12147653001	Tyco OF003 Effluent #1	SM 2510 B-2011	194362		
12147653002	Tyco OF003 Effluent #2	SM 2510 B-2011	194565		
12147653001	Tyco OF003 Effluent #1	SM 4500-H+ B-2011	194361		
12147653002	Tyco OF003 Effluent #2	SM 4500-H+ B-2011	194561		

WO#:12147653

PM: DJT Due Date: 08/02/20

CLIENT: 13_TYCO

Pace Analytical

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Required Client Information:		Required Project Information:		Invoice Information:	
Company:	Johnson Controls	Report To:	Anne Fleury	Company:	
Address:	One Stanton Street	Copy To:		Address:	
	Marinette, Wisconsin 54143				
Email To:	anne.fleury@jci.com	Purchase Order No.		Attention:	
Phone:	715-735-7411 Cell 715-587-6602	Client Project ID:		Email To:	
Requested Due Date:		Pace Profile #:	3961	Pace Project Manager:	DJT

Regulatory Agency:

State / Location: Wisconsin

MATRIX / CODE: Drinking Water DW, Water WT, Waste Water WW, Product P, Soil/Solid SL, Oil OL, Wipe WP, Air AR, Other OT, Tissue TS

Sample #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED START DATE	COLLECTED START TIME	COLLECTED END DATE	COLLECTED END TIME	SAMPLE TEMP AT COLLECTION °C	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	Cubitainer	Analysis: pH, Cond, Alkalinity	Total Residual Chlorine	Hardness	Ammonia	Acute CD	Acute FHM				Corrected Temp at Time of Receipt at Lab: Cubitainer Temp °C Take Temp of Each Cubitainer
1	Tyco OF003 Effluent #1	WW	C	7-20-20	7:40	7-21-20	7:40	3.5	5	2	1	1		1	X	X	X	X	X	X				2.0
2																								
3																								
4																								

SAMPLER NAME / SIGNATURE / Date: Print Name: Anne M. Fleury Signature: Anne M. Fleury Date: 7-21-20

Client Comments:

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
TYCO / EHS Tech. Anne M. Fleury	7-21-20	7:40	S. Vlacich / Pace	7/22/20	11:00
			Received for Laboratory By:		

SAMPLE CONDITION ON RECEIPT

Samples Intact	(Y) N	Samples Received on Ice	(Y) N
Custody Seals Intact	(Y) N	Temperatures 0-6 °C	(Y) N
Signs of Ice formation	Y (N)	PM Notified?	Y (N)
COC Dates and Times Match Sample Containers?			(Y) N

Lab Use Only

Thermometer Used: ☑ 01339252/1710 ☐ 122639816 ☐ Other

Correction Factor: -0.1 °C

Uncorrected Temps: Effluent 2.1 Receiving Water ______

Lab Comments:

Completed By: S. Vlacich Reviewed By: AP for DJT 7-22-20

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

WO#: 12147653

PM: DJT Due Date: 08/03/20

CLIENT: 13_TYCO

Required Client Information:			Required Project Information:		Invoice Information:	
Company:	Johnson Controls		Report To:	Anne Fleury	Company:	
Address:	One Stanton Street		Copy To:		Address:	
	Marinette, Wisconsin 54143					Regulatory Agency
Email To:	anne.fleury@jci.com		Purchase Order No.		Attention:	
Phone:	715-735-7411	Cell 715-587-6602	Client Project ID		Email To:	State / Location
Requested Due Date:			Pace Profile #:	3961	Pace Project Manager: DJT	Wisconsin

Sample #	SAMPLE ID (MATRIX: Drinking Water DW, Water WT, Waste Water WW, Product P, Soil/Solid SL, Oil OL, Wipe WP, Air AR, Other OT, Tissue TS)	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED START DATE	COLLECTED START TIME	COLLECTED END DATE	COLLECTED END TIME	SAMPLE TEMP AT COLLECTION °C	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	Cubitainer	Analysis: pH, Cond, Alkalinity	Total Residual Chlorine	Hardness	Ammonia	Acute CD	Acute FHM	Corrected Temp at Time of Receipt at Lab: Cubitainer Temp °C Take Temp of Each Cubitainer
1	Tyco OF003 Effluent #2	WW	C	7-22-20	12pm	7-23-20	12p.m	3.7°	5	2	1	1		1	X	X	X	X			2.0
2																					
3																					
4																					

SAMPLER NAME / SIGNATURE / Date: Print Name: Anne M. Fleury Signature: Anne M. Fleury Date: 7-23-20

Client Comments:

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
TYCO/ EHS Tech.	7-2320	12p.m	Sklacicki/Pace	7/24/20	10:30
			Received for Laboratory By:		

SAMPLE CONDITION ON RECEIPT			
Samples Intact	(Y) N	Samples Received on Ice	(Y) N
Custody Seals Intact	(Y) N	Temperatures 0-6 °C	(Y) N
Signs of Ice formation	Y (N)	PM Notified?	Y (N)
COC Dates and Times Match Sample Containers?			(Y) N

Lab Use Only

Thermometer Used: ☒ 01339252/1710 ☐ 122639816 ☐ Other

Correction Factor: −0.1 °C

Uncorrected Temps: Effluent 2.1 Receiving Water

Lab Comments:

Completed By: Sklacicki Reviewed By: AP for DJT 7-27-20