

Permit Fact Sheet

1 General Information

Permit Number:	WI-0020044-09-0	
Permittee Name:	CITY OF RHINELANDER	
Address:	135 S Stevens	
City/State/Zip:	Rhineland WI 54501	
Discharge Location:	2775 Highway 17 South, Rhineland. SW ¼ SE ¼ of section 14; T36N-R8E. The outfall is approximately 2.3 river miles north of the Hat Rapids Dam.	
Receiving Water:	Wisconsin River in the Upper Wisconsin River Drainage Basin in Oneida County (it is on the border of the Noisy & Pine Creeks Watershed and the Woodboro Watershed)	
StreamFlow (Q _{7,10}):	304 cfs	
Stream Classification:	Fish and aquatic life, warm water sport fishery	
Wild Rice Impacts	No impacts identified. There are wild rice areas present in a few location below the Hat Rapids dam in Lincoln County. The discharge from the facility has been in existence within the flowage over 45 years, the dilution factor is large and the few beds identified are considered healthy.	
Design Flow(s)	Daily Maximum	4.973 MGD
	Weekly Maximum	3.230 MGD
	Monthly Maximum	2.491 MGD
	Annual Average	1.543 MGD (2.153 MGD -Sustained Wet Weather)
Significant Industrial Loading?	No, there were no industries listed in the application as significant loaders	
Operator at Proper Grade?	Yes	

2 Facility Description

The City of Rhineland owns and operates a wastewater treatment facility located on Hwy 17 S. The facility has an annual average design flow of 1.543 million gallons per day (MGD); actual flows averaged 1.068 MGD (2011 to 2015 data).

The facility is an activated sludge plant which consists of headworks (mechanical screens and grit removal) that remove debris. The wastewater enters the primary clarifiers where solids are allowed to settle before flowing into four selector basins. The selectors provide an environment to trigger a release of orthophosphate which is a form of phosphorus that phosphate accumulating organisms (PAOs) will be able to uptake later in the process (aka the biological phosphorus removal process) and additional fermentation leading to the production of more volatile fatty acids (VFA) which provides food for the PAOs, The selectors also provide denitrification of the return activated sludge (RAS) and control the growth of filamentous organisms. After the selector basins the wastewater is pumped into three aeration basins for additional organic matter reduction. In the basins the wastewater mixes with activated sludge which breaks down organic matter further stabilizing the wastewater. Activated sludge is composed of settled solids containing active biological material recycled from the treatment system. In addition, the released orthophosphate from the selectors is taken up by PAOs in

the aeration basins at a rate more than what was initially released. Two final clarifiers allow the remaining solids to settle. The cleaned wastewater (effluent) is disinfected using an Ultraviolet light system and discharged to the Wisconsin River.

The solids (sludge) removed from the clarifiers that isn't returned to the selector basins to reseed the new wastewater entering the system is treated in two anaerobic digesters using a batch TPAD (Temperature Phase Anaerobic Digestion) process. Solids from the primary clarifiers are combined with waste activated sludge (WAS) thickened by Dissolved Air Flotation (DAF) in a raw sludge tank prior to sending them to the TPAD process. The process uses multiple levels of temperature (both thermophilic temperatures greater than 131⁰ F and mesophilic temperatures above 95⁰ F) at specified times optimizing particular types of bacteria (acidogenic and methanogenic bacteria) to stabilize the sludge and destroy pathogens.

The treated sludge is then dewatered with a belt filter press and stored under a covered structure or when the weather is conducive transferred to windrows for further drying until it can be distributed. The TPAD process can produce Class A Exceptional Quality sludge which is able to meet quality standards that allow it to be used as a soil amendment in more locations that just agricultural fields, including use by the public for private use.

Sample Point Designation		
Sample Point Number	Discharge Flow, Units, and Averaging Period	Sample Point Location, Waste Type/sample Contents and Treatment Description (as applicable)
702	INFLUENT Flow is not a required parameter.	Representative samples shall be collected from the influent force main sample tap located in the Headworks building.
005	EFFLUENT An average of 1.068 MGD (2011-2015 data)	Representative effluent samples shall be collected following the final clarifiers prior to UV disinfection. The permittee is authorized to discharge to the Wisconsin River, Upper Wisconsin River Drainage Basin. The average annual design flow for the facility is 1.543 MGD.
006	SLUDGE Estimate of 1,300 dry US tons	Samples shall be collected from the Sludge Storage Pads in a manner that will yield sample results representative of the sludge tested. All samples shall be collected at a time appropriate for the specific test being conducted.
007	SLUDGE – EMERGENCY Flow is not a required parameter.	Representative samples shall be collected prior to the belt press in the event of an Emergency Discharge.
104	SLUDGE PROCESS Flow is not a required parameter.	Representative samples shall be taken after the belt filter press. Sample point 104 is for purposes of monitoring the post TPAD "process to further reduce pathogens" (PFRP).

3 Substantial Compliance Determination

	Compliance?	Comments
Discharge limits	Yes	The new Rhinelander WWTP at the Hwy 17 South location, outfall 005 performs very well since coming on line in August 2011. The averages following are averages since start-up through October 2015. Flow-1.07 MGD, BOD ₅ -10.76 mg/L, TSS-4.6 mg/L, Hg-1.89 ng/L, NH ₃ -N-7.7 mg/L, TP-0.66 mg/L, pH-6.95 s.u., and Fecal Coliform 74 #/100ml.
Sampling/testing	Yes	All sampling and testing requirements have been met. It is suggested

requirements		for the biosolids an additional sample point be established following the TPAD process for fecal coliform. See comment on management plan area below.
Groundwater standards	N/A	
Reporting requirements	Yes	
Compliance schedules	N/A	There was not a specific compliance schedule in the latest permit as the City upon reissuance in April 2011 was nearing completion of the new WWTP which then came on line in August 2011. For this permit, as per all facilities, a CMOM program development and implementation should be required by August 1, 2016.
Management plan	N/A	A specific document identified as a management plan hasn't been required. Of significance though, the City produces a Class A Exceptional Quality bio-solid available for public distribution utilizing their Temperature Phased Anaerobic Digestion (TPAD) Process. Recently, the City has contracted with a purchaser of their bio-solid product. In addition to TPAD process recording requirements maintained by the City (temperature, time, batch volume, etc.), fecal coliform monitoring and testing following the process and prior to public distribution has been provided to the Department as agreed upon in a January 30, 2014 Department letter. For purposes of continuing compliance with the January 30, 2014 letter, at least one additional sample point should be considered to be included in the permit to facilitate DMR form reporting fecal coliform. This process reporting should occur on a monthly basis following the TPAD process. The sample location is immediately following the belt filter press prior to sludge storage. The other necessary sample point as in the past could remain as outfall 006. The reason for sampling at two locations is for Class A purposes, the permittee has to meet pathogen requirements following the process to remove pathogens as well as prior to public distribution to show no regrowth. Also the standard class A language applies regarding EQ metals monitoring and vector attraction requirements. The current permit addresses this in part in sections 5.4.12. Section 5.4.12.1 or equivalent language should similarly be included within the permit.
Operator at proper grade	Yes	
Other	Current plant subclasses - A1. Suspended Growth Processes; B. Solids Separation; C. Sludge Treatment; P. Total Phosphorus Removal; D. Disinfection; L. On-Site Laboratory Testing; SS. Sanitary Sewage Collection System	
Enforcement considerations	None	
In substantial compliance?	Yes	
	Concurrence: Steve Ohm	Date: 12/01/15

4 Influent - Proposed Monitoring

4.1 Sample Point Number: 702- INFLUENT PLANT

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
BOD5, Total		mg/L	5/Week	24-Hr Flow Prop Comp	
Suspended Solids, Total		mg/L	5/Week	24-Hr Flow Prop Comp	

4.1.1 Changes from Previous Permit and Explanation of Limits and Monitoring Requirements:

The parameters are standard monitoring requirements and frequency for major municipal facilities with activated sludge treatment plants.

Mercury – The facility sampled quarterly during the last permit term to obtain data from the new facility. The calculated acute limit (1.66 ug/L daily maximum) and chronic limits (14.41 ug/L Weekly Average and 11.9 ug/L Monthly Average) were compared to sample data. A reasonable potential analysis was performed; the 1-day, 4-day and 30-day P99 values, were well below their respected calculated limits. Therefore, limits are not required this permit term. Sampling shall be a part of the next reissuance application. (See the “Water Quality-Based Effluent Limitations for the City of Rhinelander Wastewater Treatment Facility (WPDES Permit # WI-0020044)” memo dated November 6, 2015 for more information).

5 Inplant - Proposed Monitoring and Limitations

5.1 Sample Point Number: 104- SLUDGE PROCESS SAMPLES

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Fecal Coliform		MPN/g TS	Monthly	Grab	
Volatile Solids Reduction		Percent	Monthly	Grab	

5.1.1 Changes from Previous Permit and Explanation of Limits and Monitoring Requirements:

This is a new sample point this permit reissuance. The permittee currently tests for pathogens and vector attraction reduction prior to storage to monitor the effectiveness of their process to further reduce pathogens (PFRP). Sample point 104 allows a standardized way to submit sample results. Outfall 006 is for the purpose of demonstrating compliance with sludge requirements for Class A or Class B immediately (within 30 days) prior to public distribution/sale or land application.

The sludge is treated in two anaerobic digesters using a batch TPAD (Temperature Phase Anaerobic Digestion) process. The process uses multiple levels of temperature at specified times, optimizing particular types of bacteria (acidogenic and

methanogenic bacteria) to stabilize the sludge and destroy pathogens. The TPAD process has been approved by the EPA as a process to further reduce pathogens (PFRP) for one site, but the technology has not been approved for a national PFRP equivalency. The permittee has shown the Department they are able to consistently meet Class A criteria with this process. As allowed in 40 CFR Part 503.32(a)(8) and NR 204.07(6)2i, the Department has approved the TPAD process as an equivalent PFRP.

The facility is also considering using Temperature/Time treatment (approved PFRP method 40 CFR Part 503.32(a)(3)) by maintaining a sewage sludge temperature for a prescribed period of time according to prescribed guidelines identified in the “Standard Requirements” section of the permit.

6 Surface Water - Proposed Monitoring and Limitations

6.1 Sample Point Number: 005- EFFLUENT (HWY 17 South)

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Flow Rate		MGD	Continuous	Continuous	
BOD5, Total	Monthly Avg	30 mg/L	5/Week	24-Hr Flow Prop Comp	
BOD5, Total	Weekly Avg	45 mg/L	5/Week	24-Hr Flow Prop Comp	
WLA Previous Day River Flow		cfs	Daily	Gauge Station	Monitoring is required May through October. See the permit "Wasteload Allocation Requirements" section for more information.
WLA Previous Day River Temp		deg F	Daily	Gauge Station	Monitoring is required May through October. See the permit "Wasteload Allocation Requirements" section for more information.
WLA BOD5 Discharged	Daily Max - Variable	lbs/day	Daily	Calculated	Monitoring and limits apply May through October. See the permit "Wasteload Allocation Requirements" section for more information.
BOD5, Variable Limit		lbs/day	Daily	See Table	Limits apply May through October. See the permit "Wasteload Allocation Requirements" section for more information.
Suspended Solids,	Monthly Avg	30 mg/L	5/Week	24-Hr Flow	

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Total				Prop Comp	
Suspended Solids, Total	Weekly Avg	45 mg/L	5/Week	24-Hr Flow Prop Comp	
pH Field	Daily Max	9.0 su	Daily	Grab	
pH Field	Daily Min	6.0 su	Daily	Grab	
Fecal Coliform	Geometric Mean	400 #/100 ml	Weekly	Grab	Monitoring and limits are in effect May through September.
Phosphorus, Total	Monthly Avg	1.0 mg/L	5/Week	24-Hr Flow Prop Comp	
Nitrogen, Ammonia (NH ₃ -N) Total		mg/L	3/Week	24-Hr Flow Prop Comp	
Nitrogen, Total Kjeldahl		mg/L	Quarterly	24-Hr Flow Prop Comp	
Nitrogen, Nitrite + Nitrate Total		mg/L	Quarterly	24-Hr Flow Prop Comp	
Nitrogen, Total		mg/L	Quarterly	Calculated	
Acute WET		TUa	See Listed Qtr(s)	24-Hr Flow Prop Comp	Annual monitoring is required in rotating quarters. See the "Whole Effluent Toxicity (WET) Testing" section for more information.
Chronic WET		rTUc	See Listed Qtr(s)	24-Hr Flow Prop Comp	Annual monitoring is required in rotating quarters. See the "Whole Effluent Toxicity (WET) Testing" section for more information.

6.1.1 Changes from Previous Permit and Explanation of Limits and Monitoring Requirements:

The monitoring frequency and limits for **Flow**, **BOD5**, **Suspended Solids**, **fecal coliform** and **pH** have not changed from the previous permit term. All categorical limits are based on NR 104.02 and NR 210 (subchapter II) Wis Adm Code. More information on calculating limits for these parameters as well as **Ammonia**, **Phosphorus**, **Temperature** and **WET Testing** can be found in the "Water Quality-Based Effluent Limitations for the City of Rhinelander Wastewater Treatment Facility (WPDES Permit # WI-0020044)" memo dated November 6, 2015.

BOD5 – The limits for BOD5 are based on s. NR 210 Wis. Adm. Code requirements. This segment of the Wisconsin River is also subject to a waste load allocation (WLA) from May through October annually, therefore the WPDES permit

for this facility contains daily mass loading limits for BOD5 that have been calculated based on s. NR 212.60 Wis. Adm. Code requirements. All parameters listed in the “Monitoring Requirements and Limitation” table labeled as BOD and WLA as well as the permit section “Waste Load Allocation Requirements” pertain to the conditions needed to fulfill BOD5 and WLA BOD5 limits

Disinfection. This facility discharges to a water body used for recreational purposes; seasonal disinfection from May 1st through September 30th is necessary.

Phosphorus - Phosphorus requirements are based on the Phosphorus Rules that became effective 12/1/2010 as detailed in NR 102 Water Quality Standards and NR 217 Effluent Standards and Limitations for Phosphorus. Chapter NR 217 of the Wis. Adm. Code addresses point source dischargers of phosphorus to surface waters. Currently in NR 217 Wis. Adm. Code there are two methods used to determine if a phosphorus limit is needed: a technology based limit (TBL) and a water quality based limit (WQBEL). A TBL of 1 mg/L is appropriate because the facility discharges more than the threshold of 150 pounds per month. Based on the size and classification of the Wisconsin River, the WQBEL is 2.39 mg/L. The TBL is more protective than the WQBEL therefore remains in effect this permit term.

Phosphorus (TMDL) - This facility is within the limits of the Wisconsin River Basin Total Maximum Daily Load (TMDL) boundaries. The TMDL is under development with a goal of EPA approval in 2017 (Due to uncertainty in available resources for completing the TMDL, a specific completion date cannot be given at this time). This permit may be modified or reissued in the future to include mass limits for phosphorus that will be set as part of the Wisconsin River Basin TMDL report.

Ammonia - Using current acute and chronic ammonia toxicity criteria for the protection of aquatic life and limit calculating procedures found in NR 105 and 106, Wis. Adm. Code (both effective March 1, 2004) Ammonia limitations were calculated for the facility. Daily Maximum (49 mg/L) Weekly Average (6.8 mg/L* (May-October) and 15.33* mg/L (November-April)) and Monthly Average (2.72 mg/L* (May-October) and 6.13 mg/L* (November-April)) limits were considered. A reasonable potential analysis was completed, the peak daily result (40 mg/L) was below the calculated daily maximum and taking into account the dilution factors of the receiving water chronic toxicity (weekly and monthly averages) are not a concern downstream. Limits are not required this permit term, but monitoring three times a week shall continue.

*The most restrictive limits were chosen from those calculated for the Wisconsin River or Rhinelander Flowage.

Nitrogen (Total Kjeldahl, Nitrite+Nitrate and Total Nitrogen) - Based on the “Guidance for Total Nitrogen Monitoring in WPDES Permits” dated October 2012, quarterly effluent monitoring for Total Nitrogen (Total Nitrogen = Total Kjeldahl + (Nitrite+Nitrate)) is required for muni majors discharging to the Mississippi River Basin.

WET Testing (Acute and Chronic) – Based on historical WET test data and reasonable potential factor (RPF) calculations (NR 106.08 Wis. Adm. Code) WET limits are not required this permit term. A WET Checklist was prepared to determine the number of WET tests needed. As toxicity potential increases, more points accumulate and more monitoring is required to assure toxicity is not occurring over the short (acute) and long (chronic) term. Based on the facility’s classification (a major because the design flow is above 1 MGD), total points accumulated and Chapter 1.3 of the WET Guidance Document Annual Acute and Chronic WET Tests are required in rotating quarters. WET tests are required in the following quarters:

- **2016** - Third Quarter (July 1 to September 30)
- **2017** – Fourth Quarter (October 1 to December 31)
- **2018** – First Quarter (January 1 to March 31)
- **2019** – Second Quarter (April 1 to June 30)
- **2020** - Third Quarter (July 1 to September 30)

If the permit cannot be reissued prior to or by the expiration date WET testing shall occur during the fourth quarter (October 1 to December 31) 2021.

Thermal - Using the administrative rules for thermal discharges detailed in NR 102 Wis. Adm. Code effective October 2010, effluent thermal limits were calculated. The calculated thermal limits for the Wisconsin River indicate a daily

maximum temperature limit of 120 degrees F year round. Typically, effluent temperatures in a municipal treatment plant need to be less than 90 degrees F in order to guarantee typical treatment plant operation. A limit and monitoring are not required this permit term.

Mercury – The facility sampled quarterly during the last permit term to obtain data from the new facility. The calculated acute limit (1.66 ug/L daily maximum) and chronic limits (14.41 ug/L Weekly Average and 11.9 ug/L Monthly Average) were compared to sample data. A reasonable potential analysis was performed, the 1-day, 4-day and 30-day P99 values, were well below their respected calculated limits. Therefore, limits are not required this permit term. Sampling shall be a part of the next reissuance application.

7 Land Application - Sludge/By-Product Solids (industrial only)

7.1 Sample Point Number:007- LIQUID SLUDGE - EMERGENCY

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Solids, Total		Percent	Annual	Composite	
Arsenic Dry Wt	Ceiling	75 mg/kg	Annual	Composite	
Arsenic Dry Wt	High Quality	41 mg/kg	Annual	Composite	
Cadmium Dry Wt	Ceiling	85 mg/kg	Annual	Composite	
Cadmium Dry Wt	High Quality	39 mg/kg	Annual	Composite	
Copper Dry Wt	Ceiling	4,300 mg/kg	Annual	Composite	
Copper Dry Wt	High Quality	1,500 mg/kg	Annual	Composite	
Lead Dry Wt	Ceiling	840 mg/kg	Annual	Composite	
Lead Dry Wt	High Quality	300 mg/kg	Annual	Composite	
Mercury Dry Wt	Ceiling	57 mg/kg	Annual	Composite	
Mercury Dry Wt	High Quality	17 mg/kg	Annual	Composite	
Molybdenum Dry Wt	Ceiling	75 mg/kg	Annual	Composite	
Nickel Dry Wt	Ceiling	420 mg/kg	Annual	Composite	
Nickel Dry Wt	High Quality	420 mg/kg	Annual	Composite	
Selenium Dry Wt	Ceiling	100 mg/kg	Annual	Composite	
Selenium Dry Wt	High Quality	100 mg/kg	Annual	Composite	
Zinc Dry Wt	Ceiling	7,500 mg/kg	Annual	Composite	
Zinc Dry Wt	High Quality	2,800 mg/kg	Annual	Composite	
Nitrogen, Total Kjeldahl		Percent	Annual	Composite	
Nitrogen, Ammonium		Percent	Annual	Composite	

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
(NH4-N) Total					
Phosphorus, Total		Percent	Annual	Composite	
Phosphorus, Water Extractable		% of Tot P	Annual	Composite	
Potassium, Total Recoverable		Percent	Annual	Composite	

7.1.1 Changes from Previous Permit and Explanation of Limits and Monitoring Requirements:

This is a new outfall this permit reissuance. The outfall/sample point shall be used only for the emergency discharge of sludge from the process prior to the filter belt press. If a situation arises and the outfall is needed the permittee shall notify the assigned Department wastewater engineer so that the appropriate monitoring forms can be generated.

8 Land Application - Proposed Monitoring and Limitations

Municipal Sludge Description						
Sample Point	Sludge Class (A or B)	Sludge Type (Liquid or Cake)	Pathogen Reduction Method	Vector Attraction Method	Reuse Option	Amount Reused/Disposed (Dry Tons/Year)
006	A	Cake	PFRP equivalent – (TPAD) or Temp/Time	Volatile Solids Reduction	Bulk sale	Estimated 1,300 Dry Tons/Year
Does sludge management demonstrate compliance? Yes						
Is additional sludge storage required? No						
Is Radium-226 present in the water supply at a level greater than 2 pCi/liter? No, the most recent sample results were below the threshold (the values were 1.45,1.4 and 1.3 pCi/liter). If yes, special monitoring and recycling conditions will be included in the permit to track any potential problems in landapplying sludge from this facility						
Is a priority pollutant scan required? No Priority pollutant scans are required once every 10 years at facilities with design flows between 5 MGD and 40 MGD, and once every 5 years if design flow is greater than 40 MGD.						

8.1 Sample Point Number: 006- CAKE SLUDGE

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Solids, Total		Percent	Annual	Composite	

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Arsenic Dry Wt	Ceiling	75 mg/kg	Annual	Composite	
Arsenic Dry Wt	High Quality	41 mg/kg	Annual	Composite	
Cadmium Dry Wt	Ceiling	85 mg/kg	Annual	Composite	
Cadmium Dry Wt	High Quality	39 mg/kg	Annual	Composite	
Copper Dry Wt	Ceiling	4,300 mg/kg	Annual	Composite	
Copper Dry Wt	High Quality	1,500 mg/kg	Annual	Composite	
Lead Dry Wt	Ceiling	840 mg/kg	Annual	Composite	
Lead Dry Wt	High Quality	300 mg/kg	Annual	Composite	
Mercury Dry Wt	Ceiling	57 mg/kg	Annual	Composite	
Mercury Dry Wt	High Quality	17 mg/kg	Annual	Composite	
Molybdenum Dry Wt	Ceiling	75 mg/kg	Annual	Composite	
Nickel Dry Wt	Ceiling	420 mg/kg	Annual	Composite	
Nickel Dry Wt	High Quality	420 mg/kg	Annual	Composite	
Selenium Dry Wt	Ceiling	100 mg/kg	Annual	Composite	
Selenium Dry Wt	High Quality	100 mg/kg	Annual	Composite	
Zinc Dry Wt	Ceiling	7,500 mg/kg	Annual	Composite	
Zinc Dry Wt	High Quality	2,800 mg/kg	Annual	Composite	
Nitrogen, Total Kjeldahl		Percent	Annual	Composite	
Nitrogen, Ammonium (NH4-N) Total		Percent	Annual	Composite	
Phosphorus, Total		Percent	Annual	Composite	
Phosphorus, Water Extractable		% of Tot P	Annual	Composite	
Potassium, Total Recoverable		Percent	Annual	Composite	
PCB Total Dry Wt	Ceiling	50 mg/kg	Once	Composite	Sampling is required during the 2019 calendar year.
PCB Total Dry Wt	High Quality	10 mg/kg	Once	Composite	Sampling is required during the 2019 calendar year.

8.1.1 Changes from Previous Permit and Explanation of Limits and Monitoring Requirements:

Requirements for land application of municipal sludge are determined in accordance with ch. NR 204 Wis. Adm. Code. Sampling for PCBs is required once during the 2019 calendar year.

The sludge is treated in two anaerobic digesters using a batch TPAD (Temperature Phase Anaerobic Digestion) process. The process uses multiple levels of temperature at specified times, optimizing particular types of bacteria (acidogenic and methanogenic bacteria) to stabilize the sludge and destroy pathogens. The TPAD process has been approved by the EPA as a process to further reduce pathogens (PFRP) for one site, but the technology has not been approved for a national PFRP equivalency. The permittee has shown the Department they are able to consistently meet Class A criteria with this process. As allowed in 40 CFR Part 503.32(a)(8) and NR 204.07(6)2i the Department has approved the process as an equivalent PFRP.

The facility is also considering using Temperature/Time treatment (approved PFRP method 40 CFR Part 503.32(a)(3)) by maintaining a sewage sludge temperature for a prescribed period of time according to prescribed guidelines identified in the “Standard Requirements” section of the permit.

9 Compliance Schedules

9.1 CMOM (Capacity, Management, Operation and Maintenance) Program Development

Required Action	Due Date
Complete Program Development: Complete development of CMOM Program by August 1, 2016. See CMOM requirements in the Standard Requirements section.	08/01/2016

9.2 Sludge Management Plan

Required Action	Due Date
Submit a management plan: The plan shall include the protocols for: <ol style="list-style-type: none"> 1) Sludge storage 2) Cake sludge sampling 3) Actions needs when samples don't meet Class A limits 4) Distribution of Class A EQ solids 5) Landspreading of Class A or B solids 6) Emergency landspreading of liquid sludge 	07/01/2017

9.3 Sludge Summary

Required Action	Due Date
Annual Summary: Submit a summary of sampling (List 3 - Pathogen Control and List 4 - Vector Attraction Reduction) and a short narrative of distribution of cake sludge by January 31st for the previous calendar year.	01/31/2017
Annual Summary: Submit a summary of sampling (List 3 - Pathogen Control and List 4 - Vector Attraction Reduction) and a short narrative of distribution of cake sludge by January 31st for the previous calendar year.	01/31/2018

Annual Summary: Submit a summary of sampling (List 3 - Pathogen Control and List 4 - Vector Attraction Reduction) and a short narrative of distribution of cake sludge by January 31st for the previous calendar year.	01/31/2019
Annual Summary: Submit a summary of sampling (List 3 - Pathogen Control and List 4 - Vector Attraction Reduction) and a short narrative of distribution of cake sludge by January 31st for the previous calendar year.	01/31/2020
Annual Summary: Submit a summary of sampling (List 3 - Pathogen Control and List 4 - Vector Attraction Reduction) and a short narrative of distribution of cake sludge by January 31st for the previous calendar year. Continue submitting the annual report until the next permit issuance.	01/31/2021

9.4 Explanation of Compliance Schedules

CMOM Program Development - A compliance schedule has been added to ensure the community's collection system is not subject to continued excessive inflow and infiltration issues. On August 1, 2013 rules related to sanitary sewer overflows (SSO) were modified. NR 210.23(2) Wis. Adm. Code now requires all communities with collection systems to submit to the Department verification that a CMOM program for the sewage collection system has been developed which is consistent with the requirements of NR 210.23, Wis. Adm. Code August 1, 2016. All information will be kept on site, but shall be available for inspection upon request.

Sludge Management Plan – The management plan shall describe the actions and decision-making processes used in sludge production.

Sludge Summary – The annual summary shall provide details of the cake sludge samples taken for pathogen control and vector attraction reduction (excluding the samples taken at sample point 104) and a short narrative describing the sludge distribution for the year.

10 Attachments:

Water Flow Schematic(s)

“Water Quality-Based Effluent Limitations for the City of Rhinelander Wastewater Treatment Facility (WPDES Permit # WI-0020044)” memo data November 6, 2015

11 Proposed Expiration Date:

June 30, 2021

Prepared By:

Sheri A. Snowbank Wastewater Specialist

Date: March 1, 2016

cc: Steve Ohm, Rhineland

DATE: November 6, 2015

TO: Sheri Snowbank – North Water District / Spooner

FROM: Jim Schmidt – WY/3 

SUBJECT: Water Quality-Based Effluent Limitations for the City of Rhinelander Wastewater Treatment Facility (WPDES Permit # WI-0020044)

This is in response to your request for an evaluation of water quality-based effluent limitations using chs. NR 102, 105, 106, 207, and 217 of the Wisconsin Administrative Code (where applicable), for Rhinelander's discharge to the Wisconsin River. The evaluation of the permit recommendations is discussed in more detail in the attached report. Based on our review, the following recommendations are made on a chemical-specific basis for Outfall 005:

<u>Substance</u>	<u>Effluent Limitations</u>
BOD5	30 mg/L monthly average, 45 mg/L weekly average, NR 212-based wasteload allocation limits (May – October)
Total Suspended Solids	30 mg/L monthly average, 45 mg/L weekly average
pH	6.0 s.u. daily minimum, 9.0 s.u. daily maximum
Fecal Coliforms	400 colonies / 100 mL monthly geometric mean (May – Sept.)
Total Phosphorus	1.0 mg/L monthly average
Ammonia	Monitoring only, three times per week

Along with the chemical-specific recommendations mentioned above, acute and chronic whole effluent toxicity testing is recommended for this permittee. Accordingly, following the guidance provided in the most recent version of the Department's Whole Effluent Toxicity Program Guidance Document, acute and chronic whole effluent toxicity test batteries are recommended at a frequency of once per year (each) in rotating quarters. Please consult the attached report regarding relevant monitoring conditions that relate to this discharge.

If there are any questions or comments, please contact me at (608) 267-7658 or via e-mail at jamesw.schmidt@wisconsin.gov.

Attachment

cc: Steve Ohm – North Water District / Rhinelander

**Water Quality-Based Effluent Limitations for
City of Rhinelander WWTF
WPDES Permit # WI-0020044
Prepared by:
Jim Schmidt - WY/3**

Existing Permit Limitations (WPDES Permit #WI-0020044-08, effective April 1, 2011 and expiring March 31, 2016):

Outfall 005 – Treatment plant outfall

<u>Substance</u>	<u>Effluent Limitations</u>
BOD5	30 mg/L monthly average, 45 mg/L weekly average, NR 212-based wasteload allocation limits (May – October)
Total Suspended Solids	30 mg/L monthly average, 45 mg/L weekly average
pH	6.0 s.u. daily minimum, 9.0 s.u. daily maximum
Fecal Coliforms	400 colonies / 100 mL monthly geometric mean (May – Sept.)
Total Phosphorus	1.0 mg/L monthly average

Of the limits listed above, only the total phosphorus limit shall be re-evaluated as part of this document. Since the design effluent and streamflows have not changed, there are no changes needed to the limits on BOD5, TSS, pH, and fecal coliforms.

Information for Permit Reissuance Evaluation:

Receiving Water Information

Name: Wisconsin River (WBIC = 1179900)
 Classification: Warmwater sport fish community, not designated as a public water supply
 Flows: 7Q10 = 304 cfs
 7Q2 = 442 cfs
 Estimated Harmonic Mean Flow = 562 cfs
 Source of water = Groundwater
 % of Flow used to calculate limits = 25%

Source of background concentration data = Expera – Rhinelander paper mill intake water for mercury, Wisconsin River in Oneida County for the other listed parameters

Background results used in limit calculations:

<u>Substance</u>	<u>Result</u>
Hardness	33 PPM
Chloride	3.0 mg/L
Copper	0.434 ug/L
Lead	0.171 ug/L
Silver	0.0084 ug/L
Zinc	1.11 ug/L
Mercury	1.03 ng/L (mean of data from 2005 – 2014)

Effluent Information

Actual Flow (8/16/2011 – 9/30/2015), Outfall 005 discharge commenced on 8/16/2011:

- Peak daily = 2.444 MGD (9/10/2014)
- Peak 7-day average = 2.047 MGD (4/7 – 4/13/2014)
- Peak 30-day average = 1.910 MGD (4/3 – 5/2/2014)
- Peak 365-day average = 1.357 MGD (2/4/2014 – 2/3/2015)

Design Flow (reported by the permittee):

- Annual Average = 1.543 MGD
- Sustained Wet-weather = 2.153 MGD (not used for limit calculations)
- Peak Daily = 4.973 MGD
- Peak Weekly = 3.230 MGD
- Peak Monthly = 2.491 MGD

Acute dilution factor used = Not applicable

Effluent concentration data - Substances tested:

During the term of the current permit = Mercury, ammonia, phosphorus

As part of permit reissuance application = Since Rhinelander’s design flow exceeds 1 MGD, it is designated as a “major municipal” discharge and was therefore required to test for each of the substances on the EPA priority pollutant list.

Results:

Single test results are available from the priority pollutant list testing. The only detected substances were antimony (0.34 ug/L), total chromium (0.84 ug/L), nickel (3.2 ug/L), zinc (38 ug/L), chloroform (0.85 ug/L), and bis(2-ethylhexyl)phthalate (7.5 ug/L). A concentration of 11 ug/L was reported for hexavalent chromium, but the level of detection was much higher than that for total chromium, and since the hexavalent chromium concentration is a subset of total, the hexavalent chromium result is considered to be less than 0.84 ug/L.

Multiple test results are available for mercury, ammonia, phosphorus, chloride, hardness, and copper. Those results are summarized below.

Date:	10/25/2011*	6/9/2015	6/12/2015	6/16/2015	6/19/2015	Mean
Hardness (PPM)	127*	110	130	120	120	121
Chloride (mg/L)		130	180	150	170	157.5

* - 10/25/2011 hardness result was from the whole effluent toxicity test, reported result is an average of three results.

Because of the large number of results for copper, mercury, ammonia and phosphorus, only the relevant statistics shall be summarized here.

	Copper	Mercury	Ammonia	Phosphorus
# of Results	11 (all detects)	17 (16 detects)	646 (all detects)	997 (all detects)
Mean	16.64 ug/L	1.92 ng/L	7.89 mg/L	0.687 mg/L
Maximum (with date)	21 ug/L (6/25/2015)	4.8 ng/L (9/3/2013)	40 mg/L (3/21/2013)	15.7 mg/L (1/19/2012)
1-day P99	23.17 ug/L	4.66 ng/L	48.08 mg/L	4.85 mg/L
4-day P99	19.70 ug/L	3.27 ng/L	25.99 mg/L	2.65 mg/L
30-day P99	17.71 ug/L	2.35 ng/L	13.15 mg/L	1.25 mg/L

“P99” refers to the 99th upper percentile value calculated using the procedure in s. NR 106.05(5) when 11 or more detected results are available.

Effluent Limit Summary

Only the substances detected in Rhinelander's effluent which have NR 105 criteria or secondary values shall be evaluated here. Ammonia will be evaluated later in this document, though. Results are in units of ug/L unless indicated otherwise.

DAILY MAXIMUM LIMITS based on ACUTE TOXICITY CRITERIA

<u>Substance</u>	<u>Crit- erion</u>	<u>Effl. Limit</u>	<u>1/5 of Limit</u>	<u>Effluent Concentrations</u>		
				<u>Mean</u>	<u>1-d P99</u>	<u>Max.</u>
Chromium (total or +3)	2107.70 *	4215.40	843.08	0.84		
Chromium (+6)	16.02	32.04	6.41	< 0.84		
Copper	18.57 *	37.14			23.17	21
Mercury	0.83	1.66			0.00466	0.0048
Nickel	535.25 *	1070.50	214.10	2.2		
Zinc	142.21 *	284.42	56.88	38		
Chlorides (mg/L)	757	1514	302.80	157.5		180

* - Criterion is based on a mean effluent hardness of 121 PPM.

WEEKLY AVERAGE LIMITS based on CHRONIC TOXICITY CRITERIA

<u>Substance</u>	<u>Crit- erion</u>	<u>Effl. Limit</u>	<u>1/5 of Limit</u>	<u>Effluent Concentrations</u>	
				<u>Mean</u>	<u>4-d P99</u>
Chromium (total or +3)	53.28 *	1749.86	349.87	0.84	
Chromium (+6)	10.98	360.51	72.10	< 0.84	
Copper	4.01 *	117.85			19.7
Mercury	0.44	14.41			0.00327
Nickel	20.43 *	670.78	134.16	3.2	
Zinc	45.65 *	1463.51	292.70	38	
Chlorides (mg/L)	395	12873.66	2574.73	157.5	

* - Criterion is based on a mean river hardness of 33 PPM.

MONTHLY AVERAGE LIMITS based on WILDLIFE CRITERIA

<u>Substance</u>	<u>Crit- erion</u>	<u>Effl. Limit</u>	<u>1/5 of Limit</u>	<u>Effluent Concentrations</u>	
				<u>Mean</u>	<u>30-d P99</u>
Mercury (ng/L)	1.3	11.9			2.35

MONTHLY AVERAGE LIMITS based on HUMAN THRESHOLD CRITERIA

<u>Substance</u>	<u>Crit- erion</u>	<u>Effl. Limit</u>	<u>1/5 of Limit</u>	<u>Effluent Concentrations</u>	
				<u>Mean</u>	<u>30-d P99</u>
Antimony	373	22324	4465	0.34	
Chromium (total or +3)	3.82 E+06	2.29E+08	4.57E+07	0.84	
Chromium (+6)	7636	4.57E+05	9.14E+04	< 0.84	
Mercury (ng/L)	1.5	29.2			2.35

MONTHLY AVERAGE LIMITS based on HUMAN CANCER CRITERIA

<u>Substance</u>	<u>Crit- erion</u>	<u>Effl. Limit</u>	<u>1/5 of Limit</u>	<u>Effluent Concentrations</u>	
				<u>Mean</u>	
Chloroform	1960	117305	23461	0.85	

"E" = Exponent of 10, so 1E+03 = 1,000.

NOTE: Bis(2-ethylhexyl)phthalate was detected in Rhinelander's effluent. Although no water quality criteria are available for it in ch. NR 105, some toxicity information is available such that secondary values could be calculated. However, pursuant to s. NR 106.05(1)(b), the need to calculate and apply secondary values at Outfall 005 cannot be demonstrated under information available to the Department. Pursuant to s. NR 106.05(1)(b)3, secondary values can be calculated if information is available to show that industrial or other point sources discharging to the municipal treatment system discharge this compound. Although pulp and paper mills are considered to be a source of this compound, the Expera mill in Rhinelander does not discharge process water to the municipal sewer system; rather it has its own permitted outfall to the river. As a result, the detection of bis(2-ethylhexyl)phthalate is only considered in terms of potential contribution to whole effluent toxicity, which is addressed later in this document.

Antimony and chloroform also have secondary values available, but also have no identified sources from industries contributing to the municipal sewer system. Limits based on secondary values are not calculated for antimony or chloroform.

Permit Recommendations:

Based on the above information, no permit limits are recommended for any of the substances. All of the appropriate P99 values are below the associated limits, the daily maximum values are below the daily maximum limits, and the mean effluent concentrations are below 1/5 of the calculated limits.

NOTE: Given the large amount of dilution available here and the extra mixing plus low concentrations at the Expera mill's discharge upstream, there appear to be no issues regarding the total discharge of toxic substances between Outfall 005 and Expera.

Other Evaluations)

Temperature: New surface water quality standards for temperature took effect on October 1, 2010. These new regulations are detailed in Chapter NR 102 (Subchapter II – Water Quality Standards for Temperature) and NR 106 (Subchapter V – Effluent Limitations for Temperature) of the Wisconsin Administrative Code. The following table is used to screen the need to calculate limitations for temperature:

Warm Water and Limited Forage Fish designated Waters	Cold Water Designated Waters	Effluent Temperature Limitation
$Q_s:Q_e \geq 20:1$	$Q_s:Q_e \geq 30:1$	120°F (no calculation needed)
$20:1 > Q_s:Q_e > 2:1$	$30:1 > Q_s:Q_e > 2.5:1$	120°F or the sub-lethal WQBEL (calculation needed), whichever is lower
$Q_s:Q_e \leq 2:1$	$Q_s:Q_e \leq 2.5:1$	Sub-Lethal and Acute WQBELs (calculation needed)

Determination of $Q_s:Q_e$ for Outfall 005:

$7Q_{10}$ (cfs)	Q_s (25% of $7Q_{10}$) (cfs)	Q_e from page 2	$Q_s:Q_e$
304	76	1.543 MGD = 2.39 cfs	32 : 1

Based on that information, the calculated thermal limits for every month of the year are 120°F daily maximum. Typically, effluent temperatures in a municipal treatment plant need to be under 90°F in order to guarantee typical treatment plant operation. As a result, thermal limits are not needed in the Rhinelander permit. Effluent limits are not recommended at this time, and testing is not needed in the

future.

NOTE: Thermal limits were evaluated at the Expera mill which is about 4 miles upstream of Outfall 005. Given the low temperatures in the river, the extra mixing at Expera with its discharge at a dam (thereby allowing mixture with the full river flow) and the distance involved between the two facilities, it is believed there is no issue regarding combined thermal mixing zones.

Phosphorus – Technology Based: Wisconsin Administrative Code, ch. NR 217, requires municipal wastewater treatment facilities that discharge greater than 150 pounds of total phosphorus per month to comply with a monthly average technology-based limit of 1.0 mg/L, or an approved alternative concentration limit. A 1.0 mg/L limit is in the current permit at Outfall 005. The following table summarizes annual average effluent flows and phosphorus concentrations at Outfall 005 over recent years.

Calendar Year	Annual Average Effluent Flow (MGD)	Annual Average P Concentration (mg/L)	Estimated Annual Total P Loading (lbs/year)
2012	0.852	1.21	3147
2013	1.03	0.33	1035
2014	1.34	0.51	2080
2015 (so far)	1.15	0.53	1855

Earlier information was not included here because Outfall 005 began discharging during 2011.

Since the discharge exceeds 1800 pounds per year (or 150 pounds per month), the 1.0 mg/L monthly average limit is still recommended to stay in the permit pending the determination of the need for water quality-based limits.

Phosphorus – WQBEL: Revisions to the administrative rules regulating phosphorus took effect on December 1, 2010 and established water quality criteria (WQC) for phosphorus. The criterion for the Wisconsin River is 0.1 mg/L or 100 ug/L as described in s. NR 102.06 (5)(a)44. The median phosphorus concentration (Cs) in the river upstream of Rhinelander is 38.25 ug/L, based on a total of 14 samples collected from Rainbow Flowage in the months of July through October in the years 2010 through 2014. The limit calculation formula is described in s. NR 217.13 (2)(a), Wis. Adm. Code, for phosphorus WQBELs and the limit calculation is noted below.

$$[(100 \text{ ug/L})(442 + 2.39 \text{ cfs}) - ((442 \text{ cfs})(38.25 \text{ ug/L}))] / 2.39 \text{ cfs} = \text{Effluent limit}$$

Where: Qs = 442 cfs (the 7Q2 low flow at Rhinelander)

Qe = 2.39 cfs (the peak annual average effluent flow, 1.543 MGD at Outfall 005)

f = 0 (all water used by the city of Rhinelander comes from groundwater)

The calculated water quality-based effluent limit on the discharge from Outfall 005 is approximately 11.5 mg/L. It is noted that Expera discharges approximately 4 miles upstream of Outfall 005. To be conservative, a phosphorus limit may be recalculated using the total flows to the river. Expera's Outfall 011 flow is 6.99 MGD or 10.82 cfs (peak annual average). The Outfall 011 flow is withdrawn from, and returned to the river, so the limit is calculated based on a total flow of 444.39 cfs below the WWTF outfall 005 as in the above formula; the only difference is that the denominator in the above equation

would be 13.21 cfs to cover both flows. Even doing this, the theoretical WQBEL on the combined discharge is still 2.1 mg/L, which still exceeds the 1.0 mg/L technology-based limit. The technology-based limit is considered to be protective of water quality whether or not both facilities' discharges are considered together.

It should be noted that a Total Maximum Daily Load is currently under development for the Wisconsin River basin. This may impact the limits for both the Rhinelander WWTF and Expera in the future, but would most likely result in a mass limit along with the 1.0 mg/L concentration. Since this effort has not yet been completed, only the 1.0 mg/L limit is necessary at this time.

Ammonia: Typically, ammonia limits are evaluated based on effluent pH (because NR 105 acute toxicity criteria are related to pH) and receiving water pH and temperature (because NR 105 chronic toxicity criteria are related to pH). Although the ammonia results at Outfall 005 are fairly high at times, the effluent pH during the current permit term is fairly low. Since mid-August of 2011 when discharge began at Outfall 005, a total of 1,077 daily pH values have been reported. Those results range from 6.14 to 7.47 s.u. Typically the upper 99th percentile pH value is used to calculate daily maximum ammonia limits since ammonia is more toxic at higher pH. In this database of 1,077 values, the 99th percentile would lie between the 10th and 11th highest pH result, both of which are 7.36 s.u. At pH 7.36, the daily maximum limit based on the acute toxicity criterion for warmwater sport fish communities is 49 mg/L after rounding. From the database summary on page 2 of this document, the peak daily ammonia result reported during the current permit term was 40 mg/L while the calculated 1-day P99 value was 48.08 mg/L, both of which are below the 49 mg/L limit. As a result, a daily maximum ammonia limit is not needed in the reissued permit for Rhinelander.

As for weekly and monthly average limits based on chronic toxicity criteria for ammonia, given the large amount of dilution available, the calculated limits are all far in excess of the daily maximum limit during any season of the year. In addition, the reported ammonia values at Expera are well below those at Outfall 005, so there is no concern regarding combined ammonia loads. The following tables summarize the applicable chronic criteria based on seasonal ambient temperature and pH values for the Wisconsin River at two locations upstream of Outfall 005.

Wisconsin River	May – October	November - April
Seasonal Mean pH	7.33 s.u.	7.27 s.u.
Peak Monthly Temperature	75°F	44°F
4-d Chronic Ammonia Criterion	6.80 mg/L	21.00 mg/L
30-d Chronic Ammonia Criterion	2.72 mg/L	8.40 mg/L

Rhinelander Flowage	May – October	November - April
Seasonal Mean pH	7.32 s.u.	7.65 s.u.
Peak Monthly Temperature	75°F	44°F
4-d Chronic Ammonia Criterion	6.85 mg/L	15.33 mg/L
30-d Chronic Ammonia Criterion	2.74 mg/L	6.13 mg/L

Using a worst-case condition of ¼ of the river flows with the design effluent flow 1.543 MGD (2.39 cfs), there is a dilution factor of about 32:1 with the 7Q10 (same factor as mentioned above for thermal) and 46:1 with the 7Q2. Applying these dilution factors with the P99 results for ammonia, this confirms the determination that chronic toxicity criteria for ammonia are not an issue below Outfall 005.

Ammonia limits are not recommended for the reissued permit, but monitoring is recommended in the permit due to the variable results reported in the past. The current permit contains thrice-weekly ammonia monitoring, and no change is recommended to that monitoring frequency.

Whole Effluent Toxicity Evaluation: WET testing is used to measure, predict, and control the discharge of toxic materials that may be harmful to aquatic life. In WET tests, organisms are exposed to a series of effluent concentrations for a given time. Acute tests predict the concentration that causes lethality of aquatic organisms during a 48-96 hour exposure. Chronic tests predict the concentration that interferes with the growth or reproduction of test organisms during a seven day exposure.

Acute WET: In order to assure that the discharge from outfall 005 is not acutely toxic to organisms in the receiving water, WET tests must produce a statistically valid LC₅₀ greater than 100% effluent.

Chronic WET: In order to assure that the discharge from outfall 005 is not chronically toxic to organisms in the receiving water, WET tests must produce a statistically valid IC₂₅ greater than the instream waste concentration (IWC). The IWC is an estimate of the proportion of effluent to total volume of water (receiving water + effluent). The IWC of 3.0% shown in the WET Checklist summary below was based on the 1.543 MGD (2.39 cfs) design flow, ¼ of the 7Q10 (304 cfs / 4 = 76 cfs), and zero water withdrawn from and returned to the river.

Dilution Series: According to the *State of Wisconsin Aquatic Life Toxicity Testing Methods Manual* (s. NR 219.04, Wis. Adm. Code), the default acute dilution series is: 6.25, 12.5, 25, 50, 100%, and the default chronic dilution series is 100, 30, 10, 3, 1%. Other dilution series may be chosen by the permittee or Department staff, but alternate dilution series must be specified in the WPDES permit. For guidance on selecting an alternate dilution series, see Chapter 2.11 of the WET Guidance Document.

Receiving water: According to the *State of Wisconsin Aquatic Life Toxicity Testing Methods Manual* (s. NR 219.04, Wis. Adm. Code) receiving water must be used as the dilution water and primary control in WET tests, unless the use of another dilution water is approved by the Department prior to use. The dilution water used in WET tests conducted on outfall 005 shall be a grab sample collected from the Wisconsin River, upstream/out of the influence of the mixing zone and any other known discharge. The receiving water location must be specified in the WPDES permit.

Historical WET Data: Below is a tabulation of all available WET data for outfall 005.

Date Initiated	Acute Results LC ₅₀ (% survival in 100% effluent)				Chronic Results IC ₂₅					Footnotes
	<i>C. dubia</i>	Fathead minnow	Pass or Fail ?	Use in RPF ?	<i>C. dubia</i>	Fathead Minnow	Algae	Pass or Fail ?	Use in RPF ?	
10/25/2011	100	100	Pass		100	100		Pass		

RPF = Reasonable Potential Factor

WET Checklist: Department staff use the WET Checklist when deciding whether WET limits and monitoring are needed. As toxicity potential increases, more points accumulate and more monitoring is needed to insure that toxicity is not occurring. The Checklist recommends acute and chronic WET limits (as needed) based on the Reasonable Potential Factor (RPF), as required by s. NR 106.08, Wis. Adm. Code, and monitoring frequencies based on points accumulated during the Checklist analysis. The completed WET

Checklist and monitoring recommendations are summarized in the table below. (For more on the RPF and WET Checklist, see Chapter 1.3 of the WET Guidance Document, at: <http://dnr.wi.gov/topic/wastewater/documents/Chap1x3MonitoringLimits.pdf>)

WHOLE EFFLUENT TOXICITY (WET) CHECKLIST SUMMARY

	A C U T E	C H R O N I C
1. INSTREAM WASTE CONC.	1A. Not Applicable TOTAL POINTS = 0	1B. IWC = 3.0% TOTAL POINTS = 0
2. HISTORICAL DATA	2A. One test used in RPF, it passed; RPF = 0 TOTAL POINTS = 0	2B. One test used in RPF, it passed; RPF = 0 TOTAL POINTS = 0
3. EFFLUENT VARIABILITY	3A. Little significant variability, no violations or upsets, consistent WWTF operations. It is noted that the ammonia results were variable, but all were low enough to warrant no permit limit recommendations. Phosphorus limits were also variable, but this may have been due to start-up issues with the upgraded treatment plant; it is also noted that phosphorus criteria are not based on aquatic life toxicity. TOTAL POINTS = 0	3B. Same as Acute TOTAL POINTS = 0
4. STREAM CLASSIFICATION	4A. Warmwater sport fish community. TOTAL POINTS = 5	4B. Same as Acute TOTAL POINTS = 5
5. CHEMICAL SPECIFIC DATA	5A. No limits recommended based on acute toxicity criteria. Detected substances not warranting limits based on acute criteria include ammonia, chloride, copper, chromium, mercury, nickel, and zinc (3 pts). Other detected substances with toxicity data include chloroform, antimony, and bis(2-ethylhexyl)phthalate (2 pts). TOTAL POINTS = 5	5B. The summary in Item 5A applies to chronic toxicity as well. TOTAL POINTS = 5
6. ADDITIVES	6A. Ferric chloride added for phosphorus removal. TOTAL POINTS = 1	6B. Additive used more than once per 4 days, same points as acute. TOTAL POINTS = 1

Continued on next page

Checklist continued	A C U T E	C H R O N I C
7. DISCHARGE CATEGORY	7A. No significant industrial contributors (paper mill has a direct process water discharge rather than discharging that wastewater to the municipal sewer system) TOTAL POINTS = 0	7B. Same as Acute TOTAL POINTS = 0
8. WASTEWATER TREATMENT	8A. Secondary Treatment TOTAL POINTS = 0	8B. Same as Acute TOTAL POINTS = 0
9. DOWNSTREAM IMPACTS	9A. None attributable to discharge TOTAL POINTS = 0	9B. Same as Acute TOTAL POINTS = 0
TOTAL POINTS	11	11

WET Monitoring and Limit Recommendations: Based on historical WET data and RPF calculations (as required in s. NR 106.08, Wis. Adm. Code), neither an acute WET limit nor a chronic WET limit is required at this time. Typically, for major municipal discharges (above 1 MGD design flow), at least one acute and one chronic WET test batter is required per year. Based upon the point totals generated by the WET Checklist, other information given above, and Chapter 1.3 of the WET Guidance Document, no additional testing is warranted beyond this minimum frequency of once per year. Tests should be done in rotating quarters, in order to collect seasonal information about this discharge. When including recommended monitoring frequencies in the WPDES permit, staff should specify required quarters (e.g., Jan-Mar, Apr-Jun, Jul-Sep, or Oct-Dec).