

Permit Fact Sheet

General Information

Permit Number	WI-0031968-08-0
Permittee Name and Address	Little Suamico Sanitary District No. 1 P O Box 24, Little Suamico, WI 54141
Permitted Facility Name and Address	Little Suamico Sanitary District No 1 Fox Road, Little Suamico, Wisconsin
Permit Term	January 01, 2026 to December 31, 2030
Discharge Location	N44° 42.625' W88° 00.792'
Receiving Water	Little Suamico River in Suamico and Little Suamico Rivers of Pensaukee River in Oconto County
Stream Flow (Q _{7,10})	0.34 cfs
Stream Classification	Warm water sport fish community, non-public water supply
Discharge Type	Existing, noncontinuous
Annual Average Design Flow (MGD)	0.151 MGD
Industrial or Commercial Contributors	N/A
Plant Classification	A3 - Recirculating Media Filters; A4 - Ponds, Lagoons and Natural Systems; B - Solids Separation; P - Total Phosphorus; SS - Sanitary Sewage Collection System
Approved Pretreatment Program?	N/A

Facility Description

Treatment consists of two cell stabilization ponds; the primary pond is 5.7 acres and holds 8.7 million gallons, and the secondary pond is 7.8 acres and holds 14.3 million gallons. The wastewater travels by gravity through a mechanical fine screen for filtration and then through a recirculating gravel filter (RGF). The RGF includes three filter cells, a dosing tank/splitter box, dosing pumps, a gravel filter, and splitter weirs. There are three submersible pumps in the dosing tank which are controlled by level transducers. The wastewater is pumped to the gravel filter beds which consist of coarse layers and fine layers of gravel which the water flows through by gravity. An underdrain is below the gravel filter beds which sends the treated water back to the splitter box and on to the filter wet well. An upgrade in 2021 installed a tertiary reactive sand filtration system and new effluent channel. Filter reject from the reactive sand filters is returned to the second stabilization pond through flow control manhole number two. Ferric chloride is used in the reactive sand filter to treat the wastewater for phosphorus. Effluent is discharged through a Parshall flume and travels 1.5 mi via a gravity

discharge pipe. Effluent is discharged on a noncontinuous basis via Outfall 004 during April – December to the north bank of the Little Suamico River, just west of CTH J between Allen and Ballpark Roads.

Substantial Compliance Determination

Enforcement During Last Permit: There have been several violations of effluent limits, missed samples, and late reporting. However, the facility has taken the necessary steps to correct their actions. There continues to be a number of exceedances at this facility from a variety of sources. The number of exceedances is more than typically seen at a WWTP. To address these issues, compliance schedules will be part of the reissued permit.

After a desk top review of all discharge monitoring reports, CMARs, land app reports, compliance schedule items, and a site visit on **December 6, 2024**, this facility has been found to be in substantial compliance with their current permit.

Sample Point Descriptions

Sample Point Designation		
Sample Point Number	Discharge Flow, Units, and Averaging Period	Sample Point Location, Waste Type/Sample Contents and Treatment Description (as applicable)
704	0.064 MGD (2024)	INFLUENT: Representative samples of the influent shall be collected from the automatic sampling device from the influent manhole. Flow is measured before Pond 1 with a magmeter.
004	0.079 MGD (2024)	EFFLUENT: Representative samples of the discharge shall be collected following the reactive sand filter system upstream of the Parshall flume prior to discharge to the Little Suamico River. Flow is measured from a 3" Parshall flume using a ultrasonic flow meter.
003	N/A – No discharge in previous permit term	LAND APPLICATION: (Pond Sludge) Liquid sludge that accumulates in the two treatment lagoons. Representative samples shall be collected from various locations and depths within the cells of both lagoons and composited for analysis.

Permit Requirements

1 Influent – Monitoring Requirements

1.1 Sample Point Number: 704- Influent

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Flow Rate		MGD	Daily	Continuous	
BOD5, Total		mg/L	Weekly	24-Hr Flow Prop Comp	
Suspended Solids, Total		mg/L	Weekly	24-Hr Flow Prop Comp	

1.1.1 Changes from Previous Permit:

Influent limitations and monitoring requirements were evaluated for this permit term and no changes were required in this permit section.

1.1.2 Explanation of Limits and Monitoring Requirements

Monitoring of influent flow, BOD5 and total suspended solids is required by s. NR 210.04(2), Wis. Adm. Code, to assess wastewater strengths and volumes and to demonstrate the percent removal requirements in s. NR 210.05, Wis. Adm. Code, and in the Standard Requirements section of the permit.

2 Surface Water - Monitoring and Limitations

2.1 Sample Point Number: 004- Effluent, RGF System

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Flow Rate	Monthly Avg	0 MGD	Daily	Continuous	Discharge is not permitted January - March.
Flow Rate	Monthly Avg	0.217 MGD	Daily	Continuous	Applies April.
Flow Rate	Monthly Avg	0.148 MGD	Daily	Continuous	Applies May.
Flow Rate	Monthly Avg	0.183 MGD	Daily	Continuous	Applies June.
Flow Rate	Monthly Avg	0.09 MGD	Daily	Continuous	Applies July.
Flow Rate	Monthly Avg	0.065 MGD	Daily	Continuous	Applies August.
Flow Rate	Monthly Avg	0.203 MGD	Daily	Continuous	Applies September - November.
Flow Rate	Monthly Avg	0.04 MGD	Daily	Continuous	Applies December.
BOD5, Total	Weekly Avg	45 mg/L	2/Week	24-Hr Flow Prop Comp	Applies April - May.
BOD5, Total	Weekly Avg	24 mg/L	2/Week	24-Hr Flow Prop Comp	Applies June.
BOD5, Total	Weekly Avg	26 mg/L	2/Week	24-Hr Flow Prop Comp	Applies July.
BOD5, Total	Weekly Avg	25 mg/L	2/Week	24-Hr Flow Prop Comp	Applies August.
BOD5, Total	Weekly Avg	17 mg/L	2/Week	24-Hr Flow Prop Comp	Applies September.
BOD5, Total	Weekly Avg	22 mg/L	2/Week	24-Hr Flow Prop Comp	Applies October.
BOD5, Total	Weekly Avg	31 mg/L	2/Week	24-Hr Flow Prop Comp	Applies November.

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
BOD5, Total	Weekly Avg	34 mg/L	2/Week	24-Hr Flow Prop Comp	Applies December.
BOD5, Total	Monthly Avg	30 mg/L	2/Week	24-Hr Flow Prop Comp	Applies April, May, November, and December.
BOD5, Total	Monthly Avg	24 mg/L	2/Week	24-Hr Flow Prop Comp	Applies June.
BOD5, Total	Monthly Avg	26 mg/L	2/Week	24-Hr Flow Prop Comp	Applies July.
BOD5, Total	Monthly Avg	25 mg/L	2/Week	24-Hr Flow Prop Comp	Applies August.
BOD5, Total	Monthly Avg	17 mg/L	2/Week	24-Hr Flow Prop Comp	Applies September.
BOD5, Total	Monthly Avg	22 mg/L	2/Week	24-Hr Flow Prop Comp	Applies October.
BOD5, Total	Weekly Avg	37 lbs/day	2/Week	Calculated	Applies June.
BOD5, Total	Weekly Avg	19 lbs/day	2/Week	Calculated	Applies July.
BOD5, Total	Weekly Avg	13 lbs/day	2/Week	Calculated	Applies August.
BOD5, Total	Weekly Avg	28 lbs/day	2/Week	Calculated	Applies September.
BOD5, Total	Weekly Avg	38 lbs/day	2/Week	Calculated	Applies October.
BOD5, Total	Weekly Avg	53 lbs/day	2/Week	Calculated	Applies November.
BOD5, Total	Weekly Avg	11 lbs/day	2/Week	Calculated	Applies December.
Suspended Solids, Total	Weekly Avg	45 mg/L	2/Week	24-Hr Flow Prop Comp	Applies April - May.
Suspended Solids, Total	Weekly Avg	24 mg/L	2/Week	24-Hr Flow Prop Comp	Applies June.
Suspended Solids, Total	Weekly Avg	26 mg/L	2/Week	24-Hr Flow Prop Comp	Applies July.
Suspended Solids, Total	Weekly Avg	25 mg/L	2/Week	24-Hr Flow Prop Comp	Applies August.
Suspended Solids, Total	Weekly Avg	17 mg/L	2/Week	24-Hr Flow Prop Comp	Applies September.
Suspended Solids, Total	Weekly Avg	22 mg/L	2/Week	24-Hr Flow Prop Comp	Applies October.
Suspended Solids, Total	Weekly Avg	31 mg/L	2/Week	24-Hr Flow Prop Comp	Applies November.

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Suspended Solids, Total	Weekly Avg	34 mg/L	2/Week	24-Hr Flow Prop Comp	Applies December.
Suspended Solids, Total	Monthly Avg	30 mg/L	2/Week	24-Hr Flow Prop Comp	Applies April, May, November, December.
Suspended Solids, Total	Monthly Avg	24 mg/L	2/Week	24-Hr Flow Prop Comp	Applies June.
Suspended Solids, Total	Monthly Avg	26 mg/L	2/Week	24-Hr Flow Prop Comp	Applies July.
Suspended Solids, Total	Monthly Avg	25 mg/L	2/Week	24-Hr Flow Prop Comp	Applies August.
Suspended Solids, Total	Monthly Avg	17 mg/L	2/Week	24-Hr Flow Prop Comp	Applies September.
Suspended Solids, Total	Monthly Avg	22 mg/L	2/Week	24-Hr Flow Prop Comp	Applies October.
pH Field	Daily Max	9.0 su	5/Week	Grab	
pH Field	Daily Min	6.0 su	5/Week	Grab	
Dissolved Oxygen	Daily Min	7.0 mg/L	5/Week	Grab	
Nitrogen, Ammonia Variable Limit		mg/L	2/Week	See Table	Daily maximum ammonia limit varies with effluent pH. Look up the variable ammonia limit from the "Variable Ammonia Limitation" table and report the variable limit in the Ammonia Variable Limit column on the eDMR.
Nitrogen, Ammonia (NH3-N) Total	Daily Max - Variable	mg/L	2/Week	24-Hr Flow Prop Comp	
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	28 mg/L	2/Week	24-Hr Flow Prop Comp	Applies April.
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	14 mg/L	2/Week	24-Hr Flow Prop Comp	Applies May.
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	13 mg/L	2/Week	24-Hr Flow Prop Comp	Applies June - August and December.
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	10 mg/L	2/Week	24-Hr Flow Prop Comp	Applies September.
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	8.6 mg/L	2/Week	24-Hr Flow Prop Comp	Applies October.

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Nitrogen, Ammonia (NH ₃ -N) Total	Weekly Avg	15 mg/L	2/Week	24-Hr Flow Prop Comp	Applies November.
Nitrogen, Ammonia (NH ₃ -N) Total	Monthly Avg	28 mg/L	2/Week	24-Hr Flow Prop Comp	Applies April.
Nitrogen, Ammonia (NH ₃ -N) Total	Monthly Avg	14 mg/L	2/Week	24-Hr Flow Prop Comp	Applies May.
Nitrogen, Ammonia (NH ₃ -N) Total	Monthly Avg	13 mg/L	2/Week	24-Hr Flow Prop Comp	Applies June and November.
Nitrogen, Ammonia (NH ₃ -N) Total	Monthly Avg	11 mg/L	2/Week	24-Hr Flow Prop Comp	Applies July and December.
Nitrogen, Ammonia (NH ₃ -N) Total	Monthly Avg	12 mg/L	2/Week	24-Hr Flow Prop Comp	Applies August.
Nitrogen, Ammonia (NH ₃ -N) Total	Monthly Avg	8.6 mg/L	2/Week	24-Hr Flow Prop Comp	Applies September.
Nitrogen, Ammonia (NH ₃ -N) Total	Monthly Avg	6.6 mg/L	2/Week	24-Hr Flow Prop Comp	Applies October.
Phosphorus, Total	Monthly Avg	0.23 mg/L	Weekly	24-Hr Flow Prop Comp	
Phosphorus, Total	Annual Avg	0.075 mg/L	Weekly	24-Hr Flow Prop Comp	
Phosphorus, Total		lbs/day	Weekly	Calculated	
Phosphorus, Total		lbs/month	Monthly	Calculated	
Phosphorus, Total	Annual Total	26 lbs/yr	Annual	Calculated	
Chloride		mg/L	Monthly	24-Hr Flow Prop Comp	Monitoring only in 2028.
Nitrogen, Total Kjeldahl		mg/L	See Listed Qtr(s)	24-Hr Flow Prop Comp	
Nitrogen, Nitrite + Nitrate Total		mg/L	See Listed Qtr(s)	24-Hr Flow Prop Comp	
Nitrogen, Total		mg/L	See Listed Qtr(s)	Calculated	Total Nitrogen shall be calculated as the sum of reported values for Total Kjeldahl Nitrogen and Total Nitrite + Nitrate Nitrogen.
Temperature		deg F	Monthly	Grab	Monitoring only October – December in 2027.

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Acute WET		TUc	See Listed Qtr(s)	24-Hr Flow Prop Comp	
Chronic WET	Monthly Avg	1.6 TUc	See Listed Qtr(s)	24-Hr Flow Prop Comp	

2.1.1 Changes from Previous Permit

Effluent limitations and monitoring requirements were evaluated for this permit term and the following changes were made from the previous permit. See additional explanation of limits under “Explanation of Limits and Monitoring Requirements” below.

- **Chloride:** Monthly monitoring is required in 2028.
- **Total Nitrogen Monitoring (TKN, NO₂+NO₃ and Total N):** Annual monitoring is required in specific quarters as outlined in the permit.
- **Temperature:** Monitoring October – December is required in 2027.
- **Acute WET:** Acute WET is required twice during the permit term.
- **Chronic WET:** Monthly average limit has been added.

2.1.2 Explanation of Limits and Monitoring Requirements

Detailed discussions of limits and monitoring requirements can be found in the attached Water Quality-Based Effluent Limitations for the Little Suamico Sanitary District #1 WPDES Permit No. WI-0031968-08-8 memo, Michael Polkinghorn, dated December 4, 2024.

Monitoring Frequencies: The Monitoring Frequencies for Individual Wastewater Permits guidance (April 12, 2021) recommends that standard monitoring frequencies be included in individual wastewater permits based on the size and type of the facility, in order to characterize effluent quality and variability, to detect events of noncompliance, and to ensure consistency in permits issued across the state. Guidance and requirements in administrative code were considered when determining the appropriate monitoring frequencies for pollutants that have final effluent limits in effect during this permit term.

Chloride: Monthly monitoring in 2027 has been added to the permit to ensure that sufficient sample results are available at the next permit issuance to meet the data requirements of s. NR 106.85, Wis. Adm. Code.

Total Nitrogen Monitoring (TKN, NO₂+NO₃, and Total N): The Department has included effluent monitoring for Total Nitrogen in the permit through the authority under §§ 283.55(1)(e), Wis. Stats., which allows the department to require the permittee to submit information necessary to identify the type and quantity of any pollutants discharged from the point source, and through s. NR 200.065(1)(h), Wis. Adm. Code, which allows for this monitoring to be collected during the permit term. Quarterly effluent monitoring for Total Nitrogen is included in the permit because of the potential for higher nitrogen loading resulting from higher flows (major facilities), higher concentrations, or both. More information on the justification to include total nitrogen monitoring in wastewater permits can be found in the “Guidance for Total Nitrogen Monitoring in Wastewater Permits” dated October 1, 2019.

Temperature: Monthly monitoring October – December for one year is recommended during the reissued permit term to have updated temperature data at the next permit reissuance.

3 Land Application - 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)
003	B	Liquid	Fecal coliform reduction	Incorporation	Land application	No land application in previous permit term
Does sludge management demonstrate compliance? Yes						
Is additional sludge storage required? N/A						
Is Radium-226 present in the water supply at a level greater than 2 pCi/liter? No						
Is a priority pollutant scan required? No						

3.1 Sample Point Number: 003- Pond Sludge

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Solids, Total		Percent	Once	Composite	
Nitrogen, Total Kjeldahl		Percent	Once	Composite	
Nitrogen, Ammonium (NH ₄ -N) Total		Percent	Once	Composite	
Phosphorus, Total		Percent	Once	Composite	
Phosphorus, Water Extractable		Percent	Once	Composite	
Potassium, Total Recoverable		Percent	Once	Composite	
Arsenic Dry Wt	Ceiling	75 mg/kg	Once	Composite	
Arsenic Dry Wt	High Quality	41 mg/kg	Once	Composite	
Cadmium Dry Wt	Ceiling	85 mg/kg	Once	Composite	
Cadmium Dry Wt	High Quality	39 mg/kg	Once	Composite	
Copper Dry Wt	Ceiling	4,300 mg/kg	Once	Composite	
Copper Dry Wt	High Quality	1,500 mg/kg	Once	Composite	
Lead Dry Wt	Ceiling	840 mg/kg	Once	Composite	
Lead Dry Wt	High Quality	300 mg/kg	Once	Composite	
Mercury Dry Wt	Ceiling	57 mg/kg	Once	Composite	

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Mercury Dry Wt	High Quality	17 mg/kg	Once	Composite	
Molybdenum Dry Wt	Ceiling	75 mg/kg	Once	Composite	
Nickel Dry Wt	Ceiling	420 mg/kg	Once	Composite	
Nickel Dry Wt	High Quality	420 mg/kg	Once	Composite	
Selenium Dry Wt	Ceiling	100 mg/kg	Once	Composite	
Selenium Dry Wt	High Quality	100 mg/kg	Once	Composite	
Zinc Dry Wt	Ceiling	7,500 mg/kg	Once	Composite	
Zinc Dry Wt	High Quality	2,800 mg/kg	Once	Composite	
PCB Total Dry Wt	Ceiling	50 mg/kg	Once	Composite	
PCB Total Dry Wt	High Quality	10 mg/kg	Once	Composite	
PFOA + PFOS		ug/kg	Once	Calculated	Report the sum of PFOA and PFOS. See PFAS Permit Sections for more information.
PFAS Dry Wt			Once	Grab	Perfluoroalkyl and Polyfluoroalkyl Substances based on updated DNR PFAS List. See PFAS Permit Sections for more information.

3.1.1 Changes from Previous Permit:

Sludge limitations and monitoring requirements were evaluated for this permit term and the following changes were made from the previous permit. See additional explanation of limits under “Explanation of Limits and Monitoring Requirements” below.

PFAS: Monitoring is required once pursuant to s. NR 204.06(2)(b)9., Wis. Adm. Code.

Nitrogen, Total Kjeldahl: Monitoring added.

Nitrogen, Ammonium Total: Monitoring added.

Phosphorus, Total: Monitoring added.

Phosphorus, Water Extractable: Monitoring added.

Potassium, Total Recoverable: Monitoring added.

3.1.2 Explanation of Limits and Monitoring Requirements

Requirements for disposal, including land application of municipal sludge, are determined in accordance with ch. NR 204, Wis. Adm. Code. Ceiling and high-quality limits for metals in sludge are specified in s. NR 204.07(5). Requirements for pathogens are specified in s. NR 204.07(6), Wis. Adm. Code and in s. NR 204.07 (7), Wis. Adm. Code for vector

attraction requirements. Limitations for PCBs are addressed in s. NR 204.07(3)(k). Radium requirements are addressed in s. NR 204.07(3)(n), Wis. Adm. Code.

PFAS- The presence and fate of PFAS in municipal and industrial sludges is an emerging public health concern. EPA has developed a draft risk assessment to determine future land application rates and released this risk assessment in January of 2025. The department is evaluating this new information. Until a decision is made, the “Interim Strategy for Land Application of Biosolids and Industrial Sludges Containing PFAS” should be followed

Collecting sludge data on PFAS concentrations from a wide range of wastewater treatment facilities will help protect public health from exposure to elevated levels of PFAS and determine the department’s implementation of EPA’s recommendations. To quantitate this risk, PFAS sampling has been included in this WPDES permit pursuant to ss. NR 214.18(5)(b) and NR 204.06(2)(b)9., Wis. Adm. Code.

4 Schedules

4.1 Sludge Depth

Required Action	Due Date
Sludge Depth: Measure sludge depth of the two ponds and report findings.	01/01/2028

4.1.1 Explanation of Schedule

4.2 Desludging Management Plan

Required Action	Due Date
Submit Desludging Management Plan: The permittee shall submit a management plan for approval if removal of sludge will occur during the life of this permit. At a minimum, the plan shall address how the sludge will be sampled, removed, transported and disposed of. No desludging may occur unless approval of the Department is obtained. Daily logs shall be kept that record where the sludge has been disposed. The plan is due sixty days prior to desludging.	

4.3 CMOM Update

Required Action	Due Date
CMOM Update: Per NR210.23(7), submit an updated CMOM to meet the requirements of NR210.23(4). Update the following in the CMOM to meet the comments in the April 2, 2025, inspection report: 1. The goals should be reviewed and updated for what the facility has for goals moving forward. Reword the CMOM goals to be measurable goals to work on each year. The CMOM goals should match the goals in the annual CMAR. 2. Include a list of critical replacement parts. Also include an example O&M checklist as well as specific timing for the O&M items. For example, how often, and how much of the collection system	04/01/2026

is cleaned annually?	
3. More detail is needed on adequate training in the CMOM. The following should be included: records of continuing education credits, lists of regularly attended trainings, safety training and certifications with expirations, and mandatory emergency response trainings.	
4. The emergency response plan should include more detail on public notification procedures and emergency response training.	
5. The CMOM should include proper communications that need to be taken in the event of an emergency. This should include public notification procedures such as indicating varying notification based on risk of exposure (low -notify newspaper, high – door to door, barricades, etc.). Public notification templates should be included. Update DNR Contact to Laura Gerold.	

4.4 Operational Needs Review

Required Action	Due Date
Operational Needs Review: Complete an analysis of the wastewater plant (also known as an operational needs review) to identify and address operational and maintenance issues through identifying equipment and changes that are needed in the short term and the next five years in order to meet effluent limits.	07/01/2026
Submit Progress Report #1: Initiate and complete the actions by associated due dates in accordance with schedule include in the department approved operational needs review plan. Submit a report on the status of the actions taken during the previous six months and what is planned for the next six months. These reports shall be submitted every 6 months until compliance has been determined by the department.	01/01/2027
Submit Progress Report #2: Submit a report on the status of the actions taken during the previous six months to address effluent violations.	07/01/2027
Submit Progress Report #3: Submit a report on the status of the actions taken during the previous six months to address effluent violations.	01/01/2028

4.5 Operator Certification

Required Action	Due Date
Basic Level Certification in Subclass P: The Operator-in-Charge shall obtain basic level certification in Subclass P - Phosphorus by the due date.	04/01/2026
Basic Level Certification in Subclass B: The Operator-in-Charge shall obtain basic level certification in Subclass B - Solids Separation by the due date.	04/01/2026
Advanced Level Certification: The Operator-in-Charge shall obtain basic level certification in Advanced certification by the due date.	07/01/2026

Attachments

Water Quality-Based Effluent Limitations for the Little Suamico Sanitary District #1 WPDES Permit No. WI-0031968-08-0, Michael Polkinghorn, dated December 4, 2024

Justification Of Any Waivers From Permit Application Requirements

No waivers requested or granted as part of this permit reissuance

Prepared By: Ashley Clark, Wastewater Specialist

Date: September 8, 2025

CORRESPONDENCE/MEMORANDUM

State of Wisconsin

DATE: December 4, 2024

TO: Sarah Adkins – NER/Oshkosh Service Center

FROM: Michael Polkinghorn – NOR/Rhineland Service Center *Michael Polkinghorn*

SUBJECT: Water Quality-Based Effluent Limitations for the Little Suamico Sanitary District #1
WPDES Permit No. WI-0031968-08-0

This is in response to your request for an evaluation of the need for water quality-based effluent limitations (WQBELs) using chapters NR 102, 104, 105, 106, 207, 210, 212, and 217 of the Wisconsin Administrative Code (where applicable), for the discharge from the Little Suamico Sanitary District #1 in Oconto County. This municipal wastewater treatment facility (WWTF) discharges to the Little Suamico River, located in the Suamico & Little Suamico Rivers Watershed in the Upper Green Bay Basin. 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 at Outfall 004:

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Annual Average	Annual Total	Footnotes
Flow Rate							
January – March	0 MGD						
April	0.217 MGD						
May	0.148 MGD						
June	0.183 MGD						1, 2
July	0.09 MGD						
August	0.065 MGD						
September – November	0.203 MGD						
December	0.04 MGD						
BOD ₅							
April – May			45 mg/L	30 mg/L			
June			24 mg/L	24 mg/L			
			37 lbs/day				
July			26 mg/L	26 mg/L			
			19 lbs/day				
August			25 mg/L	25 mg/L			
			13 lbs/day				
September			17 mg/L	17 mg/L			1, 2, 3
			28 lbs/day				
October			22 mg/L	22 mg/L			
			38 lbs/day				
November			31 mg/L	30 mg/L			
			53 lbs/day				
December			34 mg/L	30 mg/L			
			11 lbs/day				
TSS							
April – May			45 mg/L	30 mg/L			
June			24 mg/L	24 mg/L			1, 2, 3
July			26 mg/L	26 mg/L			
August			25 mg/L	25 mg/L			

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Annual Average	Annual Total	Footnotes
September			17 mg/L	17 mg/L			
October			22 mg/L	22 mg/L			
November			31 mg/L	30 mg/L			
December			34 mg/L	30 mg/L			
pH	9.0 s.u.	6.0 s.u.					1
Dissolved Oxygen		7.0 mg/L					1, 2
Ammonia Nitrogen	Variable						3, 4
April – December							
April			28 mg/L	28 mg/L			
May			14 mg/L	14 mg/L			
June			13 mg/L	13 mg/L			
July			13 mg/L	11 mg/L			
August			13 mg/L	12 mg/L			
September			10 mg/L	8.6 mg/L			
October			8.6 mg/L	6.6 mg/L			
November			15 mg/L	13 mg/L			
December			13 mg/L	11 mg/L			
Phosphorus				0.23 mg/L	0.075 mg/L	26 lbs/yr	1
Chloride							5
PFOS and PFOA							6
TKN, Nitrate+Nitrite, and Total Nitrogen							7
Temperature							8
Acute WET							9, 11
Chronic WET				1.6 TU _c			10, 11

Footnotes:

1. No changes from the current permit.
2. These limits are based on the protection of the dissolved oxygen water quality standard of the receiving water.
3. Additional limits to comply with the expression of limits requirements in ss. NR 106.07 and NR 205.065(7), Wis. Adm. Codes, are included in bold.
4. The variable daily maximum ammonia nitrogen limit table corresponding to various effluent pH values may be included in the permit in place of the single limit of 5.6 mg/L.

Daily Maximum Ammonia Nitrogen Limits

Effluent pH s.u.	Limit mg/L	Effluent pH s.u.	Limit mg/L	Effluent pH s.u.	Limit mg/L
6.0 ≤ pH ≤ 6.1	108	7.0 < pH ≤ 7.1	66	8.0 < pH ≤ 8.1	14
6.1 < pH ≤ 6.2	106	7.1 < pH ≤ 7.2	59	8.1 < pH ≤ 8.2	11
6.2 < pH ≤ 6.3	104	7.2 < pH ≤ 7.3	52	8.2 < pH ≤ 8.3	9.4
6.3 < pH ≤ 6.4	101	7.3 < pH ≤ 7.4	46	8.3 < pH ≤ 8.4	7.8
6.4 < pH ≤ 6.5	98	7.4 < pH ≤ 7.5	40	8.4 < pH ≤ 8.5	6.4
6.5 < pH ≤ 6.6	94	7.5 < pH ≤ 7.6	34	8.5 < pH ≤ 8.6	5.3
6.6 < pH ≤ 6.7	89	7.6 < pH ≤ 7.7	29	8.6 < pH ≤ 8.7	4.4
6.7 < pH ≤ 6.8	84	7.7 < pH ≤ 7.8	24	8.7 < pH ≤ 8.8	3.7

6.8 < pH ≤ 6.9	78	7.8 < pH ≤ 7.9	20	8.8 < pH ≤ 8.9	3.1
6.9 < pH ≤ 7.0	72	7.9 < pH ≤ 8.0	17	8.9 < pH ≤ 9.0	2.6

5. Monitoring at a frequency to ensure that 11 samples are available at the next permit issuance.
6. Once every two months monitoring is required in accordance with s. NR 106.98(2), Wis. Adm. Code.
7. As recommended in the Department's October 1, 2019 Guidance for Total Nitrogen Monitoring in Wastewater Permits, annual total nitrogen monitoring is recommended for all minor municipal permittees. Total nitrogen is the sum of nitrate (NO₃), nitrite (NO₂), and total Kjeldahl nitrogen (TKN) (all expressed as N).
8. Monthly monitoring for 1 year during October – December is recommended during the reissued permit term to have updated temperature data at the next permit reissuance.
9. Three acute whole effluent toxicity (WET) tests are recommended during the reissued permit term. According to the *State of Wisconsin Aquatic Life Toxicity Testing Methods Manual* (s. NR 219.04, Table A, Wis. Adm. Code), a synthetic (standard) laboratory water may be used as the dilution water and primary control in acute WET tests. If a satisfactory phosphorus chemical SOP is established and implemented at the facility prior to permit reissuance, then acute WET testing can be reduced to 2 tests in the reissued permit.
10. Annual chronic WET testing is recommended during the reissued permit term. According to the requirements specified in s. NR 106.08, Wis. Adm. Code, a chronic WET limit is required. The Instream Waste Concentration (IWC) to assess chronic test results is 64%. According to the *State of Wisconsin Aquatic Life Toxicity Testing Methods Manual* (s. NR 219.04, Table A, Wis. Adm. Code), chronic testing shall be performed using a dilution series of 100%, 75%, 50%, 25% & 12.5% and the dilution water used in WET tests conducted on Outfall 004 shall be a grab sample collected from the Little Suamico River upstream of the confluence of Outfall 004.
11. Sampling WET concurrently with any chemical-specific toxic substances is recommended. Tests should be done in rotating quarters, to collect seasonal information about this discharge and should continue after the permit expiration date (until the permit is reissued).

Please consult the attached report for details regarding the above recommendations. If there are any questions or comments, please contact Michael Polkinghorn at (715) 360-3379 or Michael.Polkinghorn@wisconsin.gov and Diane Figiel at Diane.Figiel@wisconsin.gov.

Attachments (4) – Narrative, discharge area map, weekly/monthly average ammonia nitrogen limits calculation, & thermal table.

PREPARED BY: Michael A. Polkinghorn – Water Resources Engineer

E-cc: Laura Gerold, Wastewater Engineer – NOR/Green Bay Service Center
Heidi Schmitt-Marquez, Regional Wastewater Supervisor – NER/Green Bay Service Center
Diane Figiel, Water Resources Engineer – WY/3
Kari Fleming, Environmental Toxicologist – WY/3
Nathaniel Willis, Wastewater Engineer – WY/3

**Water Quality-Based Effluent Limitations for
Little Suamico Sanitary District #1**

WPDES Permit No. WI-0031968-08-0

Prepared by: Michael A. Polkinghorn

PART 1 – BACKGROUND INFORMATION

Facility Description

Treatment consists of two cell stabilization ponds; the primary pond is 5.7 acres and holds 8.7 million gallons, and the secondary pond is 7.8 acres and holds 14.3 million gallons. The wastewater travels by gravity through a mechanical fine screen for filtration and then through a recirculating gravel filter (RGF). The RGF includes three filter cells, a dosing tank/splitter box, dosing pumps, a gravel filter, and splitter weirs. There are three submersible pumps in the dosing tank which are controlled by level transducers. The wastewater is pumped to the gravel filter beds which consist of coarse layers and fine layers of gravel which the water flows through by gravity. An underdrain is below the gravel filter beds which sends the treated water back to the splitter box and on to the filter wet well. An upgrade in 2021 installed a tertiary reactive sand filtration system and new effluent channel. Filter reject from the reactive sand filters is returned to the second stabilization pond through flow control manhole number two. Ferric chloride is used in the reactive sand filter to treat the wastewater for phosphorus. Effluent is discharged through a Parshall flume and travels 1.5 mi via a gravity discharge pipe. Effluent is discharged on a noncontinuous basis via Outfall 004 during April – December to the north bank of the Little Suamico River, just west of CTH J between Allen and Ballpark Roads.

Attachment #2 is a discharge area map of Outfall 004.

Existing Permit Limitations

The current permit, expired on 06/30/2023, includes the following effluent limitations and monitoring requirements.

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Annual Average	Annual Total	Footnotes
Flow Rate							
January – March	0 MGD						
April	0.217 MGD						
May	0.148 MGD						
June	0.183 MGD						1, 2
July	0.09 MGD						
August	0.065 MGD						
September – November	0.203 MGD						
December	0.04 MGD						
BOD ₅							
April – May			45 mg/L	30 mg/L			1, 2, 3
June			24 mg/L	24 mg/L			
			37 lbs/day				

Attachment #1

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Annual Average	Annual Total	Footnotes
July			26 mg/L 19 lbs/day	26 mg/L			
August			25 mg/L 13 lbs/day	25 mg/L			
September			17 mg/L 28 lbs/day	17 mg/L			
October			22 mg/L 38 lbs/day	22 mg/L			
November			31 mg/L 53 lbs/day	30 mg/L			
December			34 mg/L 11 lbs/day	30 mg/L			
TSS							
April – May			45 mg/L	30 mg/L			
June			24 mg/L	24 mg/L			
July			26 mg/L	26 mg/L			
August			25 mg/L	25 mg/L			
September			17 mg/L	17 mg/L			
October			22 mg/L	22 mg/L			
November			31 mg/L	30 mg/L			
December			34 mg/L	30 mg/L			
pH	9.0 s.u.	6.0 s.u.					2
Dissolved Oxygen		7.0 mg/L					1, 2
Ammonia Nitrogen							
April – December	Variable						
April			28 mg/L	28 mg/L			
May			14 mg/L	14 mg/L			
June			13 mg/L	13 mg/L			
July			13 mg/L	11 mg/L			
August			13 mg/L	12 mg/L			
September			10 mg/L	8.6 mg/L			
October			8.6 mg/L	6.6 mg/L			
November			15 mg/L	13 mg/L			
December			13 mg/L	11 mg/L			
Phosphorus				0.23 mg/L	0.075 mg/L	26 lbs/yr	2, 5
Fecal Coliform							6
Chronic WET							7

Footnotes:

1. These limits are based on the protection of the dissolved oxygen water quality standard of the receiving water.
2. **These limits are not being evaluated as part of this review.** Because the water quality criteria (WQC), reference effluent flow rates, and receiving water characteristics have not changed, limitations for these water quality characteristics do not need to be re-evaluated at this time.

Attachment #1

3. Additional limits to comply with the expression of limits requirements in ss. NR 106.07 and NR 205.065(7), Wis. Adm. Codes, are included in bold.
4. The variable daily maximum ammonia nitrogen limit table corresponding to various effluent pH values may be included in the permit in place of the single limit.

Daily Maximum Ammonia Nitrogen Limits

Effluent pH - s.u.	Ammonia Limit – mg/L	Effluent pH - s.u.	Ammonia Limit – mg/L
pH ≤ 7.5	> 34	8.2 < pH ≤ 8.3	9.4
7.5 < pH ≤ 7.6	34	8.3 < pH ≤ 8.4	7.8
7.6 < pH ≤ 7.7	29	8.4 < pH ≤ 8.5	6.4
7.7 < pH ≤ 7.8	24	8.5 < pH ≤ 8.6	5.3
7.8 < pH ≤ 7.9	20	8.6 < pH ≤ 8.7	4.4
7.9 < pH ≤ 8.0	17	8.7 < pH ≤ 8.8	3.7
8.0 < pH ≤ 8.1	14	8.8 < pH ≤ 8.9	3.1
8.1 < pH ≤ 8.2	11	8.9 < pH ≤ 9.0	2.6
		pH > 9.0	< 2.6

5. The monthly average phosphorus WQBEL became effective in the current permit on 10/01/2021. The two annual-based phosphorus WQBELs became effective in the current permit in 2022. The annual average limit of 0.075 mg/L is based on a 9-month averaging period (April – December) corresponding to months the discharge occurs rather than the current Department policy of having 2, 6-month averaging periods, during May – October and November – April. The annual total limit of 26 lbs/yr was calculated using the concentration of 0.075 mg/L and the total annual volume flow of 41.1 MG/yr assuming the facility discharges daily up to the monthly flow rate limit during the discharge range or April – December. These recommendations were made in the previous limit evaluation (June 2017) and upon review are believed to be protective of the phosphorus water quality standards of the receiving water. **Therefore, these limits are not being evaluated as part of this review.**
6. Monitoring only.
7. Three chronic whole effluent toxicity (WET) tests were required during the current permit term. The IWC is variable on a monthly basis and ranges from 22 – 70% depending on the month-specific flow rate limit and receiving water flow.

Receiving Water Information

- Name: Little Suamico River
- Waterbody Identification Code (WBIC): 411800
- Classification used in accordance with chs. NR 102 and 104, Wis. Adm. Code: Warm Water Sport Fish (WWSF) community, non-public water supply. Cold Water and Public Water Supply criteria are used for bioaccumulating compounds of concern, because the discharge is within the Great Lakes basin.
- Low flows used in accordance with chs. NR 106 and 217, Wis. Adm. Code: The following 7-Q₁₀ and 7-Q₂ values are from USGS for Station DP3 or SE ¼, SE ¼, Section 24, T26N – R20E, at CTH J where Outfall 004 is located.
 Annual 7-Q₁₀ = 0.34 cubic feet per second (cfs)
 Annual 7-Q₂ = 0.84 cfs
 Harmonic Mean Flow = 4.5 cfs using a drainage area of 59.5 mi²

Attachment #1

The Harmonic Mean has been estimated based on average flow and the 7-Q₁₀ using an equation from U.S. EPA's *Technical Support Document for Water Quality-Based Toxics Control* (March 1991, EPA/505/2-90-001, pgs. 88-89).

Monthly Low Flows

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
7-Q ₁₀ (cfs)	0.6	0.59	0.82	4.7	2.47	1.01	0.59	0.38	0.53	0.76	1.1	0.69
7-Q ₂ (cfs)	1.44	1.37	2.16	21	8.85	3.79	1.73	1.21	1.64	2.41	3.35	2.05

- Hardness = 295 mg/L as CaCO₃. This value represents the geometric mean of data (n = 5, August 2020 – September 2024) from WET testing.
- % of low flow used to calculate limits in accordance with s. NR 106.06(4)(c)5., Wis. Adm. Code: 25%.
- Source of background concentration data: Background data for substances came from multiple sources listed below:
 - o Chloride: Little Suamico River at various locations (Surface Water Information Monitoring System (SWIMS) IDs: 433309 and 433065.
 - o Remaining substances: Wolf River at New London WI.
 - o All numerical values are shown in the tables in Part 2 below in the columns titled “Mean Background”. If no data is available, the background concentration is assumed to be negligible and a value of zero is used in the computations.
- Multiple dischargers: None.
- Impaired water status: The Little Suamico River is on the Clean Water Act Section 303(d) list for a phosphorus impairment (stream mi: 0 – 23.78).

Effluent Information

- Flow rate(s):
 - Maximum calendar year average = 0.109 million gallons per day (MGD)
 - Annual average design = 0.151 MGD
 - o The maximum calendar average flow of 0.109 MGD, excluding days discharge did not occur, is used in place of the annual average design flow to account for the seasonal nature of the discharge. The flow rate limits are also used as the representative effluent flow where applicable. For reference, the actual average flow from July 2018 – August 2024 was 0.086 MGD excluding days discharge did not occur.
- Hardness = 244 mg/L as CaCO₃. This value represents the geometric mean of data (n = 4, December 2022) from the permit application.
- Acute dilution factor used in accordance with s. NR 106.06(3)(c), Wis. Adm. Code: Not applicable – this facility does not have an approved Zone of Initial Dilution (ZID).
- Water source: Domestic wastewater with no industrial contributors. Water supply from private wells.
- Additives: Ferric chloride for chemical phosphorus treatment.
- Effluent characterization: This facility is categorized as a minor municipality, so the permit application required effluent sample analyses for a limited number of common pollutants, as specified in s. NR 200.065, Table 1, Wis. Adm. Code, primarily metal substances plus chloride and hardness. The current permit required fecal coliform monitoring.
- Effluent data for substances for which a single sample was analyzed is shown in the tables in Part 2 below, in the column titled “MEAN EFFL. CONC.”. Otherwise, substances with multiple effluent

Attachment #1

data are shown in the tables below or in their respective parts in this evaluation.

- Additional effluent chloride data (n = 8, March 2008 – November 2016) is used in this evaluation to better determine the need for chloride limits in the reissued permit.

Chloride & Copper Effluent Data

Sample Date	Copper (µg/L)	Chloride (mg/L)
05/12/2008		238
06/02/2008		277
10/06/2008		331
11/26/2008		374
11/07/2016		225
11/11/2016		220
11/16/2016		254
11/21/2016		237
11/01/2022	14	
11/05/2022	9.3	
11/22/2022	9.9	
11/30/2022	9.7	
12/06/2022	11	323
12/09/2022	7.7	343
12/12/2022	9.8	341
12/15/2022	17	356
12/19/2022	13	
12/22/2022	16	
12/28/2022	9.2	
1-day P ₉₉	20	450
4-day P ₉₉	15	367

The following table presents the average concentrations and loadings at Outfall 004 from July 2018 – August 2024 for all parameters with limits in the current permit to meet the requirements of s. NR 201.03(6), Wis. Adm. Code:

Parameter Averages with Limits

	Average Measurement	Average Mass Discharged
Flow Rate	0.086 MGD	
BOD ₅	11 mg/L	7.5 lbs/day
TSS	14 mg/L	
Dissolved Oxygen	7.9 mg/L	
pH field	7.2 s.u.	
Ammonia Nitrogen	2.0 mg/L	
Phosphorus	1.8 mg/L	0.7 lbs/day

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

Permit limits for toxic substances are required whenever any of the following occur:

1. The maximum effluent concentration exceeds the calculated limit (s. NR 106.05(3), Wis. Adm. Code)
2. If 11 or more detected results are available in the effluent, the upper 99th percentile (or P₉₉) value exceeds the comparable calculated limit (s. NR 106.05(4), Wis. Adm. Code)
3. If fewer than 11 detected results are available, the mean effluent concentration exceeds 1/5 of the calculated limit (s. NR 106.05(6), Wis. Adm. Code)

Acute Limits based on 1-Q₁₀

Daily maximum effluent limitations for toxic substances are based on the acute toxicity criteria (ATC), listed in ch. NR 105, Wis. Adm. Code. Previously daily maximum limits for toxic substances were calculated as two times the ATC. However, changes to ch. NR 106, Wis. Code, (September 1, 2016) require the Department to calculate acute limitations using the same mass balance equation as used for other limits along with the 1-Q₁₀ receiving water low flow to determine if more restrictive effluent limitations are needed to protect the receiving stream from discharges which may cause or contribute to an exceedance of the acute water quality standards. The mass balance equation is provided below.

$$\text{Limitation} = \frac{(\text{WQC}) (Q_s + (1-f) Q_e) - (Q_s - f Q_e) (C_s)}{Q_e}$$

Where:

WQC = Acute toxicity criterion or secondary acute value according to ch. NR 105, Wis. Adm. Code.

Q_s = average minimum 1-day flow which occurs once in 10 years (1-day Q₁₀)
if the 1-day Q₁₀ flow data is not available = 80% of the average minimum 7-day flow which occurs once in 10 years (7-day Q₁₀).

Q_e = Effluent flow (in units of volume per unit time) as specified in s. NR 106.06(4)(d), Wis. Adm. Code.

f = Fraction of the effluent flow that is withdrawn from the receiving water, and

C_s = Background concentration of the substance (in units of mass per unit volume) as specified in s. NR 106.06(4)(e), Wis. Adm. Code.

If the receiving water is effluent dominated under low stream flow conditions, the 1-Q₁₀ method of limit calculation produces the most stringent daily maximum limitations and should be used while making reasonable potential determinations. This is not the case for Little Suamico SD #1 and the limits are set based on two times the acute toxicity criteria.

The following tables list the calculated WQBELs for this discharge along with the results of effluent sampling. All concentrations are expressed in terms of micrograms per liter (µg/L), except for hardness and chloride (mg/L).

Attachment #1

Daily Maximum Limits based on Acute Toxicity Criteria (ATC)

RECEIVING WATER FLOW = 0.30 cfs, (1-Q₁₀ (estimated as 80% of 7-Q₁₀)), as specified in s. NR 106.06(3)(bm), Wis. Adm. Code.

SUBSTANCE	REF. HARD. mg/L	ATC	MAX. EFFL. LIMIT*	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	1-day P ₉₉	1-day MAX. CONC.
Arsenic		340	679.6	135.9	<14		<14
Cadmium	244	28.7	57.4	11.5	<0.3		<0.3
Chromium	244	3,746	7,493	1,499	4.7		4.7
Copper	244	36.0	72.1			20	16
Lead	244	253	506.7	101.3	<3.5		<3.5
Nickel	244	999	1,997	399	7.0		7.0
Zinc	244	263	525.6	105.1	<2.2		<2.2
Chloride (mg/L)		757	1,514			450	374

* The 2 × ATC method of limit calculation yields a more restrictive limit than consideration of ambient concentrations and 1-Q₁₀ flow rates per the changes to s. NR 106.07(3), Wis. Adm. Code, effective 09/01/2016.

Weekly Average Limits based on Chronic Toxicity Criteria (CTC)

RECEIVING WATER FLOW = 0.095 cfs (¼ of the 7-Q₁₀), as specified in s. NR 106.06(4)(c), Wis. Adm. Code

SUBSTANCE	REF. HARD.* mg/L	CTC	MEAN BACK- GRD.	WEEKLY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	4-day P ₉₉
Arsenic		152.2		238	47.6	<14	
Cadmium	175	3.82	0.133	5.90	1.2	<0.3	
Chromium	295	320.02	0.704	500	100.1	4.7	
Copper	295	26.09	1.06	40.2			15
Lead	295	79.53	0.247	124.3	24.9	<3.5	
Nickel	268	120.18		188	37.6	7.0	
Zinc	295	309.61	1.8	483	96.7	<2.2	
Chloride (mg/L)		395	31	601			367

* The indicated hardness may differ from the receiving water hardness because the receiving water hardness exceeded the maximum range in ch. NR 105, Wis. Adm. Code, over which the chronic criteria are applicable. In that case, the maximum of the range is used to calculate the criterion.

Monthly Average Limits based on Wildlife Criteria (WC)

The effluent characterization did not include any effluent sampling results for substances for which Wildlife Criteria exist.

Monthly Average Limits based on Human Threshold Criteria (HTC)

RECEIVING WATER FLOW = 1.2 cfs (¼ of Harmonic Mean), as specified in s. NR 106.06(4), Wis. Adm. Code.

SUBSTANCE	HTC	MEAN BACK- GRD.	MO'LY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.
Cadmium	370	0.133	2,993	599	<0.3
Chromium	3,818,000	0.704	30,893,686	6,178,737	4.7
Lead	140	0.247	1,131	226	<3.5
Nickel	43,000		347,938	69,588	7.0

Monthly Average Limits based on Human Cancer Criteria (HCC)

RECEIVING WATER FLOW = 1.2 cfs ($\frac{1}{4}$ of Harmonic Mean), as specified in s. NR 106.06(4), Wis. Adm. Code.

SUBSTANCE	HCC	MEAN BACK- GRD.	MO'LY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.
Arsenic	13.3		108	21.5	<14

In addition to evaluating the need for limits for each individual substance for which HCC exist, s. NR 106.06(8), Wis. Adm. Code, requires the evaluation of the cumulative cancer risk. Because no effluent limits are needed based on HCC, determination of the cumulative cancer risk is not needed per s. NR 106.06(8), Wis. Adm. Code.

Conclusions and Recommendations

Based on a comparison of the effluent data and calculated effluent limitations, effluent limitations are not recommended for any toxic substances. Monitoring recommendations are made in the paragraphs below:

Chloride – Considering available effluent data (March 2008 – December 2022), the 1-day and 4-day P_{99} concentrations are 450 and 367 mg/L respectively. These effluent concentrations are below the calculated WQBELs for chloride; **therefore no effluent limits are needed. Chloride monitoring is recommended to ensure that 11 sample results are available at the next permit issuance to meet the data requirements of s. NR 106.85, Wis. Adm. Code.**

Mercury – The permit application did not require monitoring for mercury because the Little Suamico SD #1 is categorized as a minor facility as defined in s. NR 200.02(8), Wis. Adm. Code. In accordance with s. NR 106.145(3)(a)3, Wis. Adm. Code, a minor municipal discharger shall monitor, and report results of influent and effluent mercury monitoring once every three months if, “there are two or more exceedances in the last five years of the high-quality sludge mercury concentration of 17 mg/kg specified in s. NR 204.07(5), Wis. Adm. Code.” A review of sludge characteristics data reveals that all the sample results are within expected analytical ranges and well below the 17 mg/kg level, with a maximum reported concentration of 0.569 mg/kg (December 2019). **Therefore, mercury monitoring is not recommended during the reissued permit term.**

PFOS and PFOA – The need for PFOS and PFOA monitoring is evaluated in accordance with s. NR 106.98(2), Wis. Adm. Code. Based on the presence of a PFOS fish consumption advisory in this section of the Little Suamico River; **PFOS and PFOA monitoring is recommended at a frequency of once every other month during the reissued permit term.**

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

The State of Wisconsin promulgated revised water quality standards for ammonia nitrogen in ch. NR 105, Wis. Adm. Code, effective March 1, 2004 which includes criteria based on both acute and chronic toxicity to aquatic life. The current permit has daily maximum, weekly average and monthly average limits during April – December. These limits are re-evaluated at this time due to the following changes:

- Subchapter IV of ch. NR 106, Wis. Adm. Code allows limits based on available dilution instead of limits set to twice the acute criteria.

- The maximum expected effluent pH has changed.

Daily Maximum Limits based on Acute Toxicity Criteria (ATC)

Daily maximum limitations are based on acute toxicity criteria in ch. NR 105, Wis. Adm. Code, which are a function of the effluent pH and the receiving water classification. The acute toxicity criterion (ATC) for ammonia is calculated using the following equation:

$$\text{ATC in mg/L} = [A \div (1 + 10^{(7.204 - \text{pH})})] + [B \div (1 + 10^{(\text{pH} - 7.204)})]$$

Where:

A = 0.411 and B = 58.4 for a WWSF community, and
pH (s.u.) = that characteristic of the effluent.

The effluent pH data was examined as part of this evaluation. A total of 1,195 sample results were reported from July 2018 – August 2024. The maximum reported value was 8.2 s.u. (Standard pH Units). The effluent pH was 8.1 s.u. or less 99% of the time. The 1-day P₉₉, calculated in accordance with s. NR 106.05(5), Wis. Adm. Code, is 8.6 s.u. The mean plus the standard deviation multiplied by a factor of 2.33, an estimate of the upper ninety ninth percentile for a normally distributed dataset, is 8.5 s.u. Therefore, a value of 8.6 s.u. is believed to represent the maximum reasonably expected pH, and therefore most appropriate for determining daily maximum limitations for ammonia nitrogen. Substituting a value of 8.6 s.u. into the equation above yields an ATC = 2.8 mg/L.

Daily Maximum Ammonia Nitrogen Effluent Limitations Calculation Method

In accordance with s. NR 106.32(2), Wis. Adm. Code daily maximum ammonia limitations are either set equal to two times the ATC or mass balance based on the 1-Q₁₀ low flow if it is determined that the previous method of acute ammonia limit calculation (2×ATC) is not sufficiently protective of the fish and aquatic life. The more restrictive calculated limits shall apply.

The calculated daily maximum ammonia nitrogen effluent limits using the mass balance approach with the 1-Q₁₀ (estimated as 80 % of 7-Q₁₀) and the 2×ATC approach are shown below.

Daily Maximum Ammonia Nitrogen Determination

Method	Ammonia Nitrogen Limit (mg/L)
2×ATC	5.6
1-Q ₁₀	7.9

The 2×ATC method yields the most stringent limits for Little Suamico SD #1.

The current permit has variable daily maximum effluent limits based on effluent pH. Presented below is a table of daily maximum limitations corresponding to various effluent pH values.

Daily Maximum Ammonia Nitrogen Limits – WWSF Community

Effluent pH s.u.	Limit mg/L	Effluent pH s.u.	Limit mg/L	Effluent pH s.u.	Limit mg/L
6.0 ≤ pH ≤ 6.1	108	7.0 < pH ≤ 7.1	66	8.0 < pH ≤ 8.1	14
6.1 < pH ≤ 6.2	106	7.1 < pH ≤ 7.2	59	8.1 < pH ≤ 8.2	11
6.2 < pH ≤ 6.3	104	7.2 < pH ≤ 7.3	52	8.2 < pH ≤ 8.3	9.4

Attachment #1					
6.3 < pH ≤ 6.4	101	7.3 < pH ≤ 7.4	46	8.3 < pH ≤ 8.4	7.8
6.4 < pH ≤ 6.5	98	7.4 < pH ≤ 7.5	40	8.4 < pH ≤ 8.5	6.4
6.5 < pH ≤ 6.6	94	7.5 < pH ≤ 7.6	34	8.5 < pH ≤ 8.6	5.3
6.6 < pH ≤ 6.7	89	7.6 < pH ≤ 7.7	29	8.6 < pH ≤ 8.7	4.4
6.7 < pH ≤ 6.8	84	7.7 < pH ≤ 7.8	24	8.7 < pH ≤ 8.8	3.7
6.8 < pH ≤ 6.9	78	7.8 < pH ≤ 7.9	20	8.8 < pH ≤ 8.9	3.1
6.9 < pH ≤ 7.0	72	7.9 < pH ≤ 8.0	17	8.9 < pH ≤ 9.0	2.6

Section NR 106.33(2), Wis. Adm. Code, was updated effective September 1, 2016. As a result, seasonal 20 and 40 mg/L thresholds for including ammonia limits in municipal discharge permits are no longer applicable under current rules. **As such, the table has been expanded from the table in the current permit to included ammonia nitrogen limits throughout the pH range.**

Weekly and Monthly Average Limits based on Chronic Toxicity Criteria (CTC)

The weekly and monthly average ammonia nitrogen limits calculation from the previous limit evaluation do not change because there have been no changes in the effluent and receiving water flow rates. The calculations from the previous limit evaluation (February 2005) are shown in attachment #3.

Effluent Data

The following table evaluates the statistics based upon ammonia data reported from July 2018 – August 2024, with those results being compared to the calculated limits to determine the need to include ammonia limits in the Little Suamico SD #1 permit. That need is determined by calculating 99th upper percentile (or P₉₉) values for ammonia during each of the month ranges and comparing the daily maximum values to the daily maximum limit. In this case the effluent ammonia nitrogen data is not separated on a monthly basis since weekly and monthly average limits are already present in the current permit during every discharge month.

Ammonia Nitrogen Effluent Data	
Statistics	Conc. (mg/L)
1-day P ₉₉	15
4-day P ₉₉	8.5
30-day P ₉₉	3.9
Mean*	2.0
Std	3.4
Sample size	467
Range	0.03 - 26

Based on this comparison, daily maximum limits are recommended during the reissued permit term. The current permit has daily maximum, weekly average and monthly average limits during April – December.

Where there are existing ammonia nitrogen limits in the permit, the limits must be retained regardless of reasonable potential, consistent with s. NR 106.33(1)(b), Wis. Adm. Code:

(b) If a permittee is subject to an ammonia limitation in an existing permit, the limitation shall be included in any reissued permit. Ammonia limitations shall be included in the permit if the permitted facility will be providing treatment for ammonia discharges.

PART 4 – WATER QUALITY-BASED EFFLUENT LIMITATIONS FOR BACTERIA

Section NR 102.04(5), Wis. Adm. Code, states that all surface waters shall be suitable for supporting recreational use and shall meet *E. coli* criteria during the recreation season. Section NR 102.04(5)(b), Wis. Adm. Code, allows the Department to make exceptions when it determines, in accordance with s. NR 210.06(3), Wis. Adm. Code, that wastewater disinfection is not required to meet *E. coli* limits and protect the recreational use. Section NR 210.06(3), Wis. Adm. Code, tasks the Department with determining the need for disinfection using a site-specific analysis based on potential risk to human or animal health. It sets out the factors that must be considered in determining the necessity to disinfect municipal wastewater or to change the length of the disinfection season.

It is recognized Little Suamico SD #1 potentially has a detention time of at least 180 days, in which the resulting discharged effluent is thought to not pose a risk to human and animal health, as described in s. NR 210.06(3)(h), Wis. Adm. Code. The maximum 180-day rolling average flowrate for the facility is 0.120 MGD (July 2018 – August 2024) including days discharge did not occur. The volumetric capacity of the lagoons is approx. 23 MG, based on the given volumes of ponds 1 and 2 available to the Department. Therefore, the estimated shortest detention time for the facility is approx. 23 MG / 0.120 MGD = 191 days and is greater than the 180-day minimum. This detention time is essentially providing disinfection where additional disinfection treatment is not expected to be needed. **Therefore, bacteria limits or monitoring are not recommended during the reissued permit term.**

PART 5 – WATER QUALITY-BASED EFFLUENT LIMITATIONS FOR THERMAL

Surface water quality standards for temperature took effect on October 1, 2010. These regulations are detailed in chs. NR 102 (Subchapter II – Water Quality Standards for Temperature) and NR 106 (Subchapter V – Effluent Limitations for Temperature) of the Wisconsin Administrative Code. Daily maximum and weekly average temperature criteria are available for the 12 different months of the year depending on the receiving water classification.

In accordance with s. NR 106.53(2)(b), Wis. Adm. Code, the highest daily maximum flow rate for a calendar month is used to determine the acute (daily maximum) effluent limitation. In accordance with s. NR 106.53(2)(c), Wis. Adm. Code, the highest 7-day rolling average flow rate for a calendar month is used to determine the sub-lethal (weekly average) effluent limitation. These values were based off actual flow reported from July 2018 – June 2024.

A heat loss equation is used to adjust the calculated limit based upon the length of discharge pipe before discharge to waters of the state. The discharge from permit Outfall 004 travels through at least 1.5 mi of discharge pipe before reaching the Little Suamico River. Under s. NR 106.55(5), Wis. Adm. Code, the default cooling rate is estimated as 1° F for every 400 ft of pipe.

The table below summarizes the maximum temperatures reported during monitoring from October 2012 – December 2024 along with the cooling adjusted temperature limits. The complete thermal calculations are included as attachment #4.

Monthly Temperature Effluent Data & Limits

Month	Representative Highest Monthly Effluent Temperature		Calculated Effluent Limit	
	Weekly Maximum	Daily Maximum	Weekly Average Effluent Limitation	Daily Maximum Effluent Limitation
	(°F)	(°F)	(°F)	(°F)
APR			106	120
MAY			104	120
JUN			105	120
JUL			105	111
AUG			108	110
SEP			98	106
OCT	56	57	88	118
NOV	47	50	77	120
DEC	46	46	89	120

Reasonable Potential

Permit limits for temperature are recommended based on the procedures in s. NR 106.56, Wis. Adm. Code.

- An acute limit for temperature is recommended for each month in which the representative daily maximum effluent temperature for that month exceeds the acute WQBEL. The representative daily maximum effluent temperature is the greater of the following:
 - (a) The highest recorded representative daily maximum effluent temperature
 - (b) The projected 99th percentile of all representative daily maximum effluent temperatures
- A sub-lethal limitation for temperature is recommended for each month in which the representative weekly average effluent temperature for that month exceeds the weekly average WQBEL. The representative weekly average effluent temperature is the greater of the following:
 - (a) The highest weekly average effluent temperature for the month.
 - (b) The projected 99th percentile of all representative weekly average effluent temperatures for the month

Comparing the representative highest effluent temperature to the calculated effluent limits determines the reasonable potential of exceeding the effluent limits. The months in which limitations are recommended are shown in bold. Based on this analysis, temperature limits are not recommended during October – December. At temperatures above approximately 103 °F, conventional biological treatment systems do not function properly and experience upsets. There is no indication that this has ever occurred in this treatment system. There is no reasonable potential for the discharge to exceed limits calculated during April – August due to this consideration. In addition, municipal WWTFs that treat solely domestic wastewater have been generally found to not exceed calculated temperature limits of 90 °F or greater so exceedance of temperature limits during September are also not a concern. **Therefore, temperature limits are not recommended during the reissued permit term. Monthly monitoring for 1 year during October – December is recommended during the reissued permit term to have updated temperature data at the next permit reissuance.**

PART 6 – WHOLE EFFLUENT TOXICITY (WET)

WET testing is used to measure, predict, and control the discharge of toxic materials that may be harmful to aquatic life. In WET tests, organisms are exposed to a series of effluent concentrations for a given time and effects are recorded. Decisions below related to the selection of representative data and the need for WET limits were made according to ss. NR 106.08 and 106.09, Wis. Adm. Code. WET monitoring frequency and toxicity reduction evaluation (TRE) recommendations were made using the best professional judgment of staff familiar with the discharge after consideration of the guidance in the *Whole Effluent Toxicity (WET) Program Guidance Document (2022)*.

- Acute tests predict the concentration that causes lethality of aquatic organisms during a 48 to 96-hour exposure. To assure that a discharge is not acutely toxic to organisms in the receiving water, WET tests must produce a statistically valid LC₅₀ (Lethal Concentration to 50% of the test organisms) greater than 100% effluent, according to s. NR 106.09(2)(b), Wis. Adm Code.
- Chronic tests predict the concentration that interferes with the growth or reproduction of test organisms during a seven-day exposure. To assure that a discharge is not chronically toxic to organisms in the receiving water, WET tests must produce a statistically valid IC₂₅ (Inhibition Concentration) greater than the instream waste concentration (IWC), according to s. NR 106.09(3)(b), Wis. Adm Code. The IWC is an estimate of the proportion of effluent to total volume of water (receiving water + effluent). The IWC of 64% used in the WET Checklist summary below was calculated according to the following equation, as specified in s. NR 106.03(6), Wis. Adm Code:

$$\text{IWC (as \%)} = Q_e \div \{(1 - f) Q_e + Q_s\} \times 100$$

Where:

Q_e = 0.109 MGD = 0.168 cfs.

f = fraction of the Q_e withdrawn from the receiving water = 0

Q_s = 1/4 of the minimum monthly 7-Q₁₀ low flow applicable to discharge (August) = 0.38 cfs

- Previous permits for Suamico SD #1 regulated chronic WET limits and IWCs as variable on a monthly basis because the facility has both month-specific flow rate limits and receiving water flows. This methodology is not appropriate to determine requirements for chronic WET because chronic WET testing is typically implemented on less than a monthly frequency. Chronic WET testing would have to be increased to monthly during April – December each year for this methodology to continue. Therefore, the single IWC of 64% as calculated prior will be used to determine chronic WET recommendations in this evaluation.
- According to the *State of Wisconsin Aquatic Life Toxicity Testing Methods Manual* (s. NR 219.04, Table A, Wis. Adm. Code), a synthetic (standard) laboratory water may be used as the dilution water and primary control in acute WET tests, unless the use of different dilution water is approved by the Department prior to use. The primary control water must be specified in the WPDES permit.
- According to the *State of Wisconsin Aquatic Life Toxicity Testing Methods Manual* (s. NR 219.04, Table A, Wis. Adm. Code), receiving water must be used as the dilution water and primary control in chronic WET tests, unless the use of different dilution water is approved by the Department prior to use. The dilution water used in WET tests conducted on Outfall 004 shall be a grab sample collected from

Attachment #1

the receiving water location, upstream and out of the influence of the mixing zone and any other known discharge. The specific receiving water location must be specified in the WPDES permit.

- Shown below is a tabulation of all available WET data for Outfall 004. Efforts are made to ensure that decisions about WET monitoring and limits are made based on representative data, as specified in s. NR 106.08(3), Wis. Adm Code. Data which is not believed to be representative of the discharge was not included in reasonable potential calculations. The table below differentiates between tests used and not used when making WET determinations.

WET Data History

Date Test Initiated	Chronic Results IC ₂₅ %				Footnotes or Comments
	<i>C. dubia</i>	Fathead Minnow	Pass or Fail?	Use in RP?	
05/06/2008	>100	>100	Pass	Yes	
06/17/2014	93.7	>100	Pass	Yes	
09/15/2015	>100	>100	Pass	Yes	
11/08/2016	89.2	>100	Pass	Yes	
04/21/2020	>100	>100	Pass	Yes	
08/04/2020	47.9	>100	Fail	Yes	
09/15/2020	>100	>100	Pass	Yes	Retest
12/15/2020	>100	69	Pass	Yes	Retest
08/09/2022	>100	>100	Pass	Yes	
09/20/2022	12.2	>100	Fail	No	1
05/02/2023	>100	>100	Pass	Yes	
05/16/2023	99.7	>100	Pass	Yes	
08/20/2024	>100	>100	Pass	Yes	
09/17/2024	>100	>100	Pass	Yes	

1. *Data Not Representative.* The operator had stated multiple issues occurring at the WWTF in response to the NON for exceeding the chronic WET limit for September. The significant issue was both control values that control the pond water levels had failed. To allow a construction company to replace the values, both pond water levels had to be drawn down via a pump installed at the bottom of one of the ponds. TSS and phosphorus concentrations had increased significantly because the pump was drawing off the bottom of the pond. The use of ferric chloride was also increased in response to the increased effluent flow and phosphorus concentrations from the drawdown event. This indicates effluent during this time is likely not representative of typical discharge conditions. Therefore, this test is not used in this evaluation.
- According to s. NR 106.08, Wis. Adm. Code, WET reasonable potential is determined by multiplying the highest toxicity value that has been measured in the effluent by a safety factor, to predict the likelihood (95% probability) of toxicity occurring in the effluent above the applicable WET limit. The safety factor used in the equation changes based on the number of toxicity detects in the dataset. The fewer detects present, the higher the safety factor, because there is more uncertainty surrounding the predicted value. WET limits must be given, according to s. NR 106.08(6), Wis. Adm. Code, whenever the applicable Reasonable Potential equation results in a value greater than 1.0.

$$\text{Chronic Reasonable Potential} = [(TU_c \text{ effluent}) (B)(IWC)]$$

Chronic WET Limit Parameters

TU_c (maximum) 100/IC ₂₅	B (multiplication factor from s. NR 106.08(6)(c), Wis. Adm. Code, Table 4)	IWC
100/47.9 = 2.09	2.3 Based on 5 detects	64%

$$[(TU_c \text{ effluent}) (B)(IWC)] = 3.1 > 1.0$$

Therefore, reasonable potential is shown for chronic WET limits using the procedures in s. NR 106.08(6), Wis. Adm. Code, and representative data from May 2008 – September 2024.

Expression of WET limits

Chronic WET limit = $[100/IWC] TU_c = 1.6 TU_c$ **expressed as a monthly average**

The WET checklist was developed to help DNR staff make recommendations regarding WET limits, monitoring, and other related permit conditions. The checklist indicates whether acute and chronic WET limits are needed, based on requirements specified in s. NR 106.08, Wis. Adm. Code. The checklist steps the user through a series of questions, assesses points based on the potential for effluent toxicity, and suggests monitoring frequencies based on points accumulated during the checklist analysis. As toxicity potential increases, more points accumulate, and more monitoring is recommended to ensure that toxicity is not occurring. A summary of the WET checklist analysis completed for this permittee is shown in the table below. Staff recommendations based on best professional judgment are provided below the summary table. For guidance related to reasonable potential and the WET checklist, see Chapter 1.3 of the WET Guidance Document: <https://dnr.wisconsin.gov/topic/Wastewater/WET.html>.

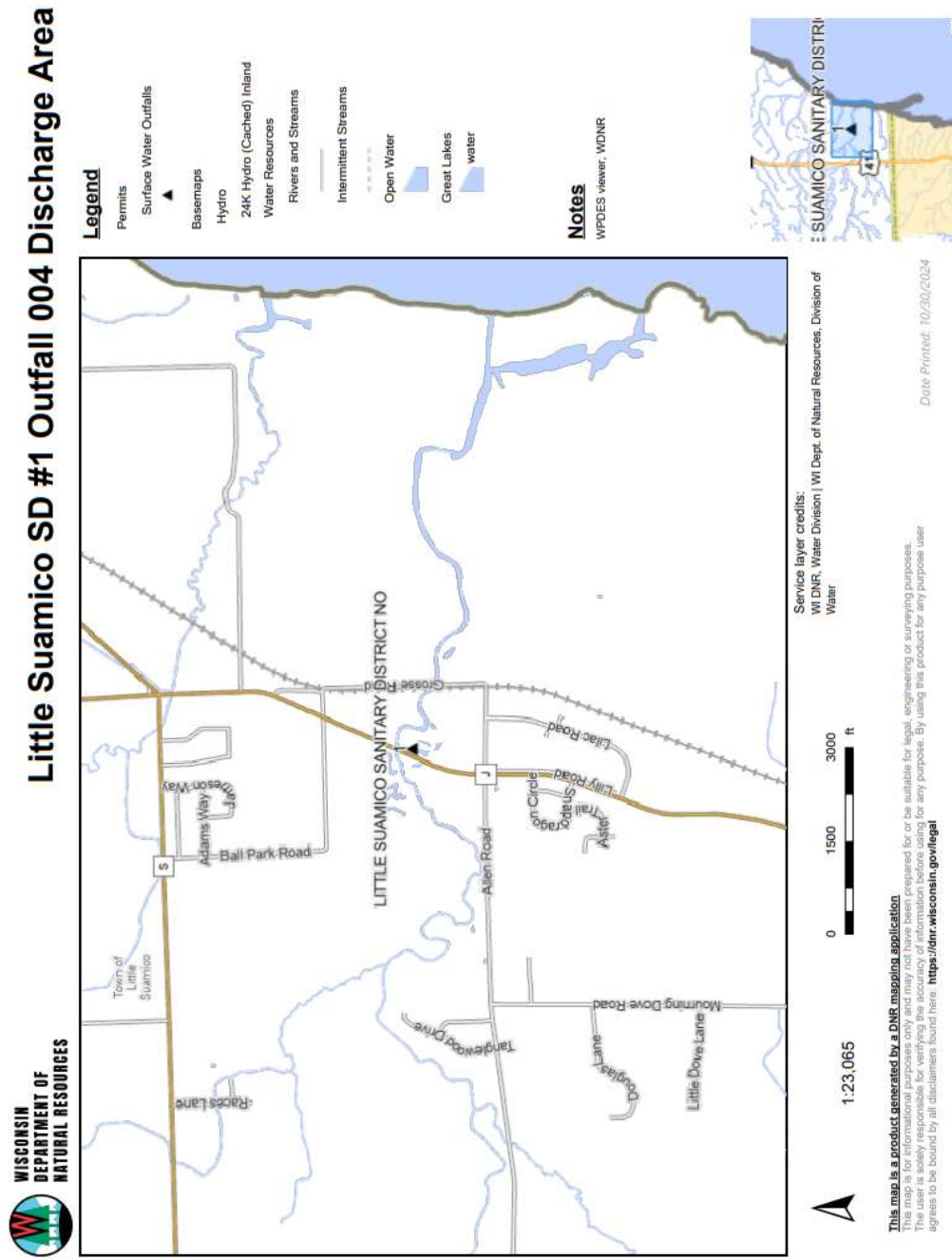
WET Checklist Summary

	Acute	Chronic
AMZ/IWC	Not applicable. 0 Points	IWC = 64%. 10 Points
Historical Data	No acute tests available. 5 Points	Thirteen tests used to calculate RP. One test failed. 0 Points
Effluent Variability	Multiple TSS and phosphorus limit exceedances. 5 Points	Same as acute. 5 Points
Receiving Water Classification	WWSF community. 5 Points	Same as acute. 5 Points
Chemical-Specific Data	No reasonable potential for limits based on ATC; Ammonia nitrogen limit carried over from the current permit. Chromium, nickel, copper, and chloride detected. Additional Compounds of Concern: No. 3 Points	No reasonable potential for limits based on CTC; Ammonia nitrogen limit carried over from the current permit. Chromium, nickel, copper, and chloride detected. Additional Compounds of Concern: No. 3 Points
Additives	No biocides and 1 water quality conditioner added. Permittee has proper P chemical SOPs in place: No.	All additives used more than once per 4 days.

Attachment #1

	Acute	Chronic
	16 Points	16 Points
Discharge Category	No industrial contributors. 0 Points	Same as acute. 0 Points
Wastewater Treatment	Secondary or better. 0 Points	Same as acute. 0 Points
Downstream Impacts	No impacts known. 0 Points	Same as acute. 0 Points
Total Checklist Points:	34 Points	39 Points
Recommended Monitoring Frequency (from Checklist):	Three acute tests recommended.	Annual chronic tests recommended.
Limit Required?	No.	Limit = 1.6 TU _c
TRE Recommended? (from Checklist)	No.	No.

- After consideration of the guidance provided in the Department's WET Program Guidance Document (2022) and other information described above, **3x acute and annual chronic WET tests are recommended in the reissued permit.** Tests should be done in rotating quarters to collect seasonal information about this discharge. WET testing should continue after the permit expiration date (until the permit is reissued). **If a satisfactory phosphorus chemical SOP is established and implemented at the facility prior to permit reissuance, then acute WET testing can be reduced to 2 tests in the reissued permit.**
- According to the requirements specified in s. NR 106.08, Wis. Adm. Code, a chronic WET limit is required. The chronic WET limit shall be expressed as 1.6 TU_c as a monthly average in the effluent limits table of the permit. A minimum of annual chronic monitoring is required because a chronic WET limit is required. Federal regulations in 40 CFR Part 122.44(i) require that monitoring occur at least once per year when a limit is present.



Attachment #3

Weekly & Monthly Average Ammonia Nitrogen Limits – February 2005

Month	Background Conditions					Effluent
	7-Q ₁₀	7-Q ₂	Temp.	pH	NH ₃ -N	Flow
	cfs	cfs	°C	S.U.	mg/L	MGD
January	0.6	1.44	1	7.97	0.07	No Discharge
February	0.59	1.37	1	7.97	0.07	No Discharge
March	0.82	2.16	4	7.97	0.04	No Discharge
April	4.7	21	9	7.97	0.04	0.217
May	2.47	8.85	17	8.21	0.04	0.148
June	1.01	3.79	21	8.21	0.03	0.183
July	0.59	1.73	23	8.21	0.03	0.090
August	0.38	1.21	22	8.21	0.03	0.065
September	0.53	1.64	16	8.21	0.03	0.203
October	0.76	2.41	9	8.21	0.03	0.203
November	1.1	3.35	7	7.97	0.03	0.203
December	0.69	2.05	3	7.97	0.07	0.040

Monitoring Requirements and Effluent Limitations [Sampling Point (Outfall) 004]					
Parameter	Sample Freq.	Sample Type	Limit Type	Limit & Unit	Notes
Flow Rate	Daily	Continuous	Monthly Average	0 MGD	Jan., Feb. & March
				0.217 MGD	April
				0.148 MGD	May
				0.183 MGD	June
				0.09 MGD	July
				0.065 MGD	August
				0.203 MGD	Sept., Oct. & Nov.
				0.04 MGD	December
BOD ₅ & TSS	3/Week	24-Hour, Flow-Proportionate	Weekly Average	45 mg/L	April & May
				24 mg/L	June
				26 mg/L	July
				25 mg/L	August
				17 mg/L	September
				22 mg/L	October
				31 mg/l	November
				34 mg/L	December
BOD ₅	3/Week	Calculated	Weekly Average	30 mg/L	April, May, November & December
				37 Lb./day	June
				19 Lb./day	July
				13 Lb./day	August
				28 Lb./day	September
				38 Lb./day	October
				53 Lb./day	November
Nitrogen,	3/Week	See Table	Report Value	11 Lb./day	December
				mg/L	Report

Attachment #3

Ammonia		24-Hour, Flow- Proportionate	Daily Maximum	mg/L	April - December
			Variable		
			Weekly Average	28 mg/L	April
				14 mg/L	May
				13 mg/L	June, July & August
				10 mg/L	September
				8.6 mg/L	October
				15 mg/L	November
				13 mg/L	December
			Monthly Average	36 mg/L	April
				14 mg/L	June
				11 mg/L	July
				12 mg/L	August
				8.6 mg/L	September
				6.6 mg/L	October
				13 mg/L	November
				11 mg/L	December

Temperature Limits for Receiving Waters with Unidirectional Flow

(calculation using default ambient temperature data)

Facility:	Little Suamico SD #1		7-Q₁₀:	0.38	cfs	Flow Dates	
Outfall(s):	004		Dilution:	25%		Temp Dates	07/01/18
Date Prepared:	10/25/2024		f:	0		Start:	NA
Design Flow (Q_e):	0.109	MGD	Stream type:	Small warm water sport or forage fish co			
Storm Sewer Dist.	7920	ft	Qs:Q_e ratio:	0.6	:1	End:	06/21/24
			Calculation Needed?	YES			

Month	Water Quality Criteria		Receiving Water Flow Rate (Qs) (cfs)	Representative Highest Effluent Flow Rate (Qe)			f	Representative Highest Monthly Effluent Temperature		Calculated Effluent Limit		Adjusted Thermal Limits	
	Ta (default) (°F)	Sub-Lethal WQC (°F)	Acute WQC (°F)	7-day Rolling Average (Qesl) (MGD)	Daily Maximum Flow Rate (Qea) (MGD)	(°F)		Weekly Average (°F)	Daily Maximum (°F)	Weekly Average Effluent Limitation (°F)	Daily Maximum Effluent Limitation (°F)	Weekly Average (°F)	Daily Maximum (°F)
APR	48	55	79	0.171	0.211		0			86	120	106	120
MAY	58	65	82	0.145	0.158		0			84	120	104	120
JUN	66	76	84	0.174	0.182		0			85	100	105	120
JUL	69	81	85	0.246	0.261		0			86	91	105	111
AUG	67	81	84	0.112	0.161		0			89	90	108	110
SEP	60	73	82	0.204	0.456		0			78	86	98	106
OCT	50	61	80	0.196	0.203		0			68	98	88	118
NOV	40	49	77	0.184	0.202		0			58	110	77	120
DEC	35	49	76	0.076	0.128		0			70	112	89	120