Nasonville Dairy Inc. Public Noticed Permit Fact Sheet

General Information

Permit Number	WI-0040312-08-0
Permittee	Nasonville Dairy Inc, 10898 Highway 10 West, Marshfield, WI 54449
Facility Address	Nasonville Dairy, Inc., 10898 Highway 10 West, Marshfield, WI
Permit Term	July 01, 2026 to June 30, 2031
Discharge Location	Unnamed Creek 2-11 at the base of the north side of the facility embankment in the SW ¼ of the SW ¼, Section 33, T25N, R2E, Wood County, WI
Receiving Water	Unnamed Creek 2-11 in Upper Yellow (Wood Co.) River Watershed of Central Wisconsin River Basin in Wood County
Stream Flow ($Q_{7,10}$)	8 cfs
Stream Classification	Warm Water Sport Fish Community, Non-public Water Supply
Discharge Type	Existing, Continuous

Facility Description

The Nasonville Dairy uses on average per week, approximately 1.5 million pounds of milk per day to make American and feta cheese and also produces protein and lactose by ultra-filtration and reverse osmosis. Process wastewaters and condensate of whey (COW) waters flow by gravity from the production operations into a series of in-ground concrete tanks that allow grit to settle and which serve as a lift station pit. Two basket type screens are utilized to remove large solid particles from the pipeline. Wastewaters are periodically pumped into the aerobic treatment tank, which is operated in a sequencing batch reactor (SBR) or continuous mode. A jet mix aeration system is used to maintain required dissolved oxygen concentrations and the required system mixing. The SBR process has been engineered to allow biological phosphorus removal (BPR). Alum is used to polish the wastewater. At the end of the SBR cycle, treated wastewaters are decanted through a dissolved air flotation (DAF) system to clarify the final effluent. Sludge separated by the DAF is either returned to the SBR tank or wasted. Prior to discharge at Outfall 006 (to Unnamed Creek 2-11, an intermittent tributary of the Yellow River), the wastewaters are directed through a reaeration basin. The design flow of the facility is 0.175 million gallons per day (MGD) when operated in sequence batch reactor (SBR) mode and 0.247 MGD when operated in continuous mode. The facility discharged approximately 0.186 MGD in 2025 to surface water. Operational changes during the last permit term include installation of a cooling tower between the DAF and reaeration tank to cool treated effluent prior to discharge to surface water.

Wasted sludge is land applied on Department approved fields or sent to manure pits. A jet mix system is provided to maintain complete-mixed, aerobic conditions in the storage tanks. The proposed permit has two land application outfalls to track and regulate the discharge of co-mingled high-strength wastewater, whey permeate, process wastewater, and sludge.

Substantial Compliance Determination

Enforcement During Last Permit: Two NONs were issued regarding failed chronic WET Tests. The facility has submitted the required TRE and has been cooperating with the Department's requirements and requests. No further enforcement actions have been taken since the 4/2/2025 inspection.

After a desk top review of all discharge monitoring reports on 3/18/2026, this facility has been found to be in substantial compliance with their current permit.

Compliance determination made by Mike Chang, Wastewater Specialist on 03/18/2026.

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)**
104	0.209 MG (2025)	Representative samples shall be collected of the equalized wastewater inflow (FE-200) to the sequencing batch reactor.
006	0.186 MG (2025)	Representative effluent samples shall be collected prior to discharge to Unnamed Creek 2-11.
011	539,000 gallons to manure pits (2025)	Representative samples shall be collected prior to land application or prior to sending the wastestreams to manure pits. Discharge is limited to co-mingled high-strength wastewater, whey permeate, process wastewater, and whey permeate.
013	1.26 MG (2025) ~320,000 gallons to manure pits (2025)	Representative samples shall be collected prior to land application. Discharge is limited to sludge generated during the treatment of process wastewater.

Sample Point Designation For Groundwater Monitoring Systems			
System	**Sample Pt Number**	**Well Name**	**Comments**
Storage Lagoon System	801	MW-1 NW	Upgradient, Background
Storage Lagoon System	802	MW-2 SOUTH	Down-gradient, Non-point of standard
Storage Lagoon System	803	MW-3 EAST	Down-gradient, Non-point of standard

Permit Requirements

Inplant - Monitoring and Limitations

Sample Point Number: 104- WW TO SEQUENCING BATCH REACTOR

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow Rate		MGD	Daily	Total Daily	
BOD5, Total		mg/L	Weekly	24-Hr Flow Prop Comp	
Suspended Solids, Total		mg/L	Weekly	24-Hr Flow Prop Comp	
Phosphorus, Total		mg/L	Weekly	24-Hr Flow Prop Comp	
Nitrogen, Ammonia (NH3-N) Total		mg/L	Weekly	24-Hr Flow Prop Comp	
pH Field		su	Weekly	Grab	
Nitrogen, Total Kjeldahl		mg/L	2/Month	24-Hr Flow Prop Comp	
Chloride		mg/L	2/Month	24-Hr Flow Prop Comp	
Nitrogen, Nitrite + Nitrate Total		mg/L	2/Month	24-Hr Flow Prop Comp	

Changes from Previous Permit:

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

Explanation of Limits and Monitoring Requirements

Sample Point 104 is needed to track influent parameter loading variations to the sequencing batch reactor.

1 Surface Water - Monitoring and Limitations

1.1 Sample Point Number: 006- EFFLUENT TO UNNAMED CREEK 2-11

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow Rate		MGD	Daily	Total Daily	
BOD5, Total	Weekly Avg	10 mg/L	3/Week	24-Hr Flow Prop Comp	
BOD5, Total	Daily Max	40.6 lbs/day	3/Week	Calculated	
BOD5, Total	Monthly Avg	19.1 lbs/day	3/Week	Calculated	
Suspended Solids, Total	Daily Max	31.3 lbs/day	3/Week	Calculated	
Suspended Solids, Total	Monthly Avg	23.9 lbs/day	3/Week	Calculated	
pH Field	Daily Min	6.0 su	Daily	Grab	
pH Field	Daily Max	9.0 su	Daily	Grab	
Nitrogen, Ammonia Variable Limit		mg/L	3/Week	See Table	Daily max variable limit applies year-round. 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	3/Week	24-Hr Flow Prop Comp	Report the daily maximum Ammonia result in the Nitrogen, Ammonia (NH3-N) Total column of the eDMR. See Ammonia Limitation Section in permit.
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	8.2 mg/L	3/Week	24-Hr Flow Prop Comp	
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	3.3 mg/L	3/Week	24-Hr Flow Prop Comp	
Chlorine, Total Residual	Daily Max	19 ug/L	3/Week	Grab	
Chlorine, Total Residual	Weekly Avg	7.3 ug/L	3/Week	Grab	

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Chlorine, Total Residual	Monthly Avg	7.3 ug/L	3/Week	Grab	
Chloride		mg/L	Weekly	24-Hr Flow Prop Comp	
Phosphorus, Total	Monthly Avg	1.0 mg/L	3/Week	24-Hr Flow Prop Comp	
Phosphorus, Total	6-Month Avg	0.67 lbs/day	3/Week	Calculated	See TMDL section in permit
Phosphorus, Total	Monthly Avg	0.22 lbs/day	3/Week	Calculated	See TMDL section in permit
Phosphorus, Total		lbs/month	Monthly	Calculated	Calculate the Total Monthly Discharge of phosphorus and report on the last day of the month on the DMR. See TMDL section in permit.
Phosphorus, Total		lbs/yr	Monthly	Calculated	Calculate the 12-Month Rolling Sum of Total Monthly mass of phosphorus discharged and report on the last day of the month on the DMR. See TMDL section in permit.
Temperature Maximum	Daily Max	deg F, see table below for limits	3/Week	Continuous	See temperature section below for limits
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	Total Nitrogen shall be calculated as the sum of reported values for Total Kjeldahl Nitrogen and Total Nitrite + Nitrate Nitrogen.
Acute WET		TUa	See Listed Qtr(s)	24-Hr Flow Prop Comp	Acute WET testing is required annually in specific quarters. See WET testing section in permit

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Chronic WET		TUc	See Listed Qtr(s)	24-Hr Flow Prop Comp	Chronic WET testing is required twice annually in specific quarters. See WET testing section in permit.

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: 1) a reduction in the monthly average mass limits for BOD and TSS, 2) reduction in the monthly average phosphorus limit, 3) addition of daily maximum, weekly average and monthly average chlorine limits, 4) addition of daily maximum and weekly average temperature limits that vary by the month, 5) an increase in the chronic WET testing frequency, and 6) an increase in the monitoring frequency for BOD, TSS, phosphorus, ammonia and pH.

Explanation of Limits and Monitoring Requirements

INDUSTRIAL EFFLUENT LIMITS –In accordance with the federal regulation 40 CFR 122.45(d), limits in this permit are to be expressed as daily maximum and monthly average limits whenever practicable.

For more information see the following memos:1) January 27, 2026 WQBEL memo from Benjamin Hartenbower to Holly Heldstab titled "Water Quality-Based Effluent Limitations for Nasonville Dairy Inc. WPDES Permit No. WI-0040312" and 2) the January 27, 2026 TBEL memo from Ben Hartenbower to Holly Heldstab titled "Technology-Based Effluent Limitations for Nasonville Dairy Inc. WPDES Permit No. WI-0040312.

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. Based on the criteria mentioned and using the guidance referenced, the monitoring frequencies for BOD, TSS, phosphorus, ammonia and pH were all increased.

Ammonia: Water quality-based effluent limitations were evaluated for Ammonia Nitrogen based upon water quality criteria in ch. NR 105 (as revised March 2004), including acute toxicity criteria (ATC) and chronic toxicity criteria (CTC). Effluent limitations for ammonia are calculated using the procedures in s. NR 106.32, Wis. Adm. Code. In addition to weekly and monthly average ammonia, daily max ammonia limits that vary with effluent pH apply year-round. See table below for more information. Monitoring for pH shall occur on the same day total ammonia (NH3-N) sampling occurs.

Effluent pH s.u.	Limit mg/L	Effluent pH s.u.	Limit mg/L	Effluent pH s.u.	Limit mg/L
$6.0 \leq pH \leq 6.1$	54	$7.0 < pH \leq 7.1$	33	$8.0 < pH \leq 8.1$	6.9
$6.1 < pH \leq 6.2$	53	$7.1 < pH \leq 7.2$	30	$8.1 < pH \leq 8.2$	5.7
$6.2 < pH \leq 6.3$	52	$7.2 < pH \leq 7.3$	26	$8.2 < pH \leq 8.3$	4.7
$6.3 < pH \leq 6.4$	51	$7.3 < pH \leq 7.4$	23	$8.3 < pH \leq 8.4$	3.9
$6.4 < pH \leq 6.5$	49	$7.4 < pH \leq 7.5$	20	$8.4 < pH \leq 8.5$	3.2
$6.5 < pH \leq 6.6$	47	$7.5 < pH \leq 7.6$	17	$8.5 < pH \leq 8.6$	2.7
$6.6 < pH \leq 6.7$	45	$7.6 < pH \leq 7.7$	14	$8.6 < pH \leq 8.7$	2.2
$6.7 < pH \leq 6.8$	42	$7.7 < pH \leq 7.8$	12	$8.7 < pH \leq 8.8$	1.8
$6.8 < pH \leq 6.9$	39	$7.8 < pH \leq 7.9$	10	$8.8 < pH \leq 8.9$	1.6
$6.9 < pH \leq 7.0$	36	$7.9 < pH \leq 8.0$	8.4	$8.9 < pH \leq 9.0$	1.3

Phosphorus: Nasonville Diary is included within the Wisconsin River Basin (WRB) total maximum daily load (TMDL), which was approved by EPA April 26, 2019. The TMDL establishes Waste Load Allocations (WLAs) for point source dischargers and determines the maximum amount of phosphorus that can be discharged and still protect water quality. The final effluent limits and monitoring expressed in the permit were derived from Site-Specific Criteria (SSC) for Lakes Petenwell, Castle Rock, and Wisconsin originally included in Appendix K of the TMDL report and approved by the U.S. Environmental Protection Agency on July 9, 2020.

The permittee's approved SSC-based WLA for this permittee is 67 lbs/yr and results in calculated limits of 0.67 lbs/day monthly average and 0.22 lbs/day 6-month average. The monthly average phosphorus limit of 1.0 mg/L is an interim limit, set in accordance with s. NR. 217.17, Wis. Adm. Code. The interim limit will remain in effect unless a more stringent limit is required at a future permit issuance by ss. NR 217.13 and NR 217.16(2), Wis. Adm. Code, or the limit is relaxed following procedures outlined in ch. NR 207, Wis. Adm. Code.

The approved TMDL expresses WLAs as lbs/year and lbs/day (maximum annual load divided by 365 days). As outlined in Section 4.6 of the department's *TMDL Development and Implementation Guidance: Integrating the WPDES and Impaired Waters Program*, mass limits must be given in the permit that are consistent with the TMDL WLA and the phosphorus impracticability agreement that was approved by USEPA in 2012 (see NPDES MOA Addendum dated July 12, 2012 at https://prodoasint.dnr.wi.gov/swims/downloadDocument.do?id=167886175). Continuously discharging facilities covered by the WRB TMDL are given monthly average mass limits. Facilities with WRB TMDL based effluent limits for phosphorus must report the 12-month rolling sum of total monthly discharge (lbs/yr). If reported 12-month rolling sums exceed the facility's max annual WLA, the facility's mass limit may be recalculated using more appropriate CVs or monitoring frequencies when the permit is reissued to bring discharge levels into compliance with the facility's given WLA.

Temperature/Thermal: Requirements for temperature are included in NR 102 Subchapter II Water Quality Standards for Temperature and NR 106 Subchapter V Effluent Limitations for Temperature. Thermal discharges must meet the Public Health criterion of 120 degrees F and the Fish & Aquatic Life criteria which are established to protect aquatic communities from lethal and sub-lethal thermal effects. The following limits apply at the permit effective date:

Month	Weekly Avg. Effluent Limit (°F)	Daily Max. Effluent Limit (°F)
January	49	76
February	50	76
March	52	77
April	55	79
May	65	82
June	76	84
July	81	85
August	81	84
September	73	82
October	61	80
November	49	77
December	49	76

Total Nitrogen Monitoring (NO2+NO3, TKN and Total N): The Department has included quarterly 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. 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.

Whole Effluent Toxicity (WET) Testing: Whole effluent toxicity (WET) testing requirements and limits (if applicable) are determined in accordance with ss. NR 106.08 and NR 106.09 Wis. Adm. Code, as revised August 2016. (See the current version of the Whole Effluent Toxicity Program Guidance Document and checklist and WET information, guidance and test methods at http://dnr.wi.gov/topic/wastewater/wet.html). Chronic WET tests are required semi-annually and a monthly average limit of 1.0 TU_c applies to the chronic WET tests. Acute tests are required annually. See the permit for which quarters chronic and acute WET tests are required.

PFOS and PFOA: NR 106 Subchapter VIII – Permit Requirements for PFOS and PFOA Dischargers became effective on August 1, 2022. Pursuant to s. NR 106.98(3)(b), Wis. Adm. Code, the department evaluated the need for PFOS and PFOA monitoring. Based on information available at the time the proposed permit was drafted, the department has determined the permittee does not need to sample for PFOS or PFOA as part of this permit reissuance. The department may re-evaluate the need for sampling at the next permit reissuance if new information becomes available that suggests PFOS or PFOA may be present in the discharge.

2 Groundwater – Monitoring and Limitations

2.1 Groundwater Monitoring System for STORAGE LAGOON SYSTEM

Location of Monitoring system: around the area of the previously permitted storage lagoon that is located at SW ¼ of the SW ¼ of Section 34, T25N, R2E, Town of Lincoln and the previously permitted spray irrigation system that was located primarily in the NW ¼ of the NW ¼ of Section 3, T24N, R2E Town of Rock.

Groundwater Monitoring Well(s) to be Sampled: 801 (MW-1), 802 (MW-2) and 803 (MW-3)

Groundwater Monitoring Well(s) Used to Evaluate Background Groundwater Quality: 801 (MW-1)

Groundwater Monitoring Well(s) Used for Point of Standards Application: None

Parameter	Units	Preventative Action Limit	Enforcement Standard	Frequency
Depth To Groundwater	feet	N/A	N/A	1/ 6 Months
Groundwater Elevation	feet MSL	N/A	N/A	1/ 6 Months
Chloride Dissolved	mg/L	125	250	1/ 6 Months
Nitrogen, Nitrite + Nitrate (as N) Dissolved	mg/L	7.3	10	1/ 6 Months
pH Field	su	8.3	N/A	1/ 6 Months
Nitrogen, Ammonia Dissolved	mg/L	0.97	9.7	1/ 6 Months
Nitrogen, Organic Dissolved	mg/L	2.9	N/A	1/ 6 Months
Solids, Total Dissolved	mg/L	490	N/A	1/ 6 Months

Changes from Previous Permit:

Groundwater limitations and monitoring requirements were evaluated for this permit term. See the groundwater evaluation memo for changes from the previous permit.

Explanation of Limits and Monitoring Requirements

Groundwater limits and requirements are determined in accordance with ch. NR 140, Wis. Adm. Code. Indicator parameter Preventive Action Limit (PAL) values are established per s. NR 140.20, Wis. Adm. Code.

For more information, please refer to the November 6, 2025 Groundwater Evaluation Report for Nasonville Dairy, Inc, WI-0040312 from Woody Myers to File

3 Land Application – Industrial Wastewater

3.1 Sample Point Number: 011- COMINGLED WASTE

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Solids, Total		Percent	Monthly	Grab	
Nitrogen, Total Kjeldahl		Percent	Monthly	Grab	
Chloride		Percent	Monthly	Grab	
pH Field		su	Monthly	Grab	
Nitrogen, Ammonium (NH4-N) Total		Percent	Monthly	Grab	
Phosphorus, Total		Percent	Monthly	Grab	
Phosphorus, Water Extractable		% of Tot P	Monthly	Grab	
Potassium, Total Recoverable		Percent	Monthly	Grab	

Changes from Previous Permit:

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

Explanation of Limits and Monitoring Requirements

Requirements for land application of industrial liquid waste is determined in accordance with ch. NR 214 Wis. Adm. Code.

3.2 Sample Point Number: 013- SLUDGE

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Solids, Total		Percent	Monthly	Grab	
Nitrogen, Total Kjeldahl		Percent	Monthly	Grab	
Chloride		Percent	Monthly	Grab	
pH Field		su	Monthly	Grab	
Nitrogen, Ammonium (NH4-N) Total		Percent	Monthly	Grab	
Phosphorus, Total		Percent	Monthly	Grab	
Phosphorus, Water Extractable		% of Tot P	Monthly	Grab	
Potassium, Total Recoverable		Percent	Monthly	Grab	
PFOA + PFOS		ug/kg	Annual	Calculated	Report the sum of PFOA and PFOS. See PFAS Permit Sections for more information.
PFAS Dry Wt			Annual	Grab	Perfluoroalkyl and Polyfluoroalkyl Substances based on updated DNR PFAS List. See PFAS Permit Sections for more information.

3.2.1 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: PFAS monitoring has been added annually pursuant to s. NR 214.18(5)(b), Wis. Adm. Code

3.2.2 Explanation of Limits and Monitoring Requirements

Requirements for land application of industrial sludge are determined in accordance with ch. NR 214 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 Land Application Management Plan

A management plan is required for the land application system.

Required Action	Due Date
Land Application Management Plan: Submit an update to the management plan to optimize the land application system performance and demonstrate compliance with Wisconsin Administrative Code NR 214.	09/30/2026

Explanation of Schedule

Land Application Management Plan- An up-to-date Land Application Management plan is a standard requirement in reissued industrial permits per s. NR 214.17(6)(c), Wis. Adm. Code.

Other Comments

None

Attachments

Categorical Limits Calculations: January 27, 2026 TBEL memo from Ben Hartenbower to Holly Heldstab titled "Technology-Based Effluent Limitations for Nasonville Dairy Inc. WPDES Permit No. WI-0040312

Water Quality Based Effluent Limits: January 27, 2026 WQBEL memo from Benjamin Hartenbower to Holly Heldstab titled "Water Quality-Based Effluent Limitations for Nasonville Dairy Inc. WPDES Permit No. WI-0040312"

NR 140 Groundwater Evaluation Report: November 6, 2025 Groundwater Evaluation Report for Nasonville Dairy, Inc, WI-0040312 from Woody Myers to File

Justification Of Any Waivers From Permit Application Requirements

No waivers requested or granted as part of this permit reissuance

Prepared By: Holly Heldstab, Wastewater Specialist **Date:** 05/05/2026

CORRESPONDENCE/MEMORANDUM

State of Wisconsin

DATE: January 27, 2026

TO: Holly Heldstab – WCR/Eau Claire

FROM: Benjamin Hartenbower – WCR/Eau Claire

SUBJECT: Water Quality-Based Effluent Limitations for Nasonville Dairy Inc
WPDES Permit No. WI-0040312

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 Nasonville Dairy Inc in Wood County. This industrial discharge is to an unnamed tributary, located in the Upper Yellow (Wood Co.) River Watershed in the Central Wisconsin River Basin. This discharge is included in the Wisconsin River Basin (WRB) Total Maximum Daily Load (TMDL) as approved by EPA on 04/26/2019 with site-specific criteria approved by EPA on 07/09/2020. 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 006:

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Six-Month Average	Footnotes
Flow Rate						1,2
BOD_5	40.6 lbs/day		10 mg/L	19.1 lbs/day		1,3
TSS	31.3 lbs/day			23.9 lbs/day		1,3
pH	9.0 s.u.	6.0 s.u.				1
Ammonia Nitrogen						1,4
April & May	Variable		8.2 mg/L	3.3 mg/L		
June - September	Variable		4.2 mg/L	1.7 mg/L		
October - March	Variable		10 mg/L	4.0 mg/L		
Chlorine	19 µg/L		7.3 µg/L	**7.3 µg/L**		5
Chloride						1,2
Phosphorus						6,7
TBEL				1.0 mg/L		
TMDL Limit				0.67 lbs/day	0.22 lbs/day	
Temperature						8
Acute WET						9,10
Chronic WET				1.0 TUc		9,11

Footnotes:

1. No changes from the current permit.
2. Monitoring only.
3. The mass limits are categorical limits based on ch. NR 240, Wis. Adm. Code.

4. The variable daily maximum ammonia nitrogen limit table corresponding to effluent pH values.

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	54	7.0 < pH ≤ 7.1	33	8.0 < pH ≤ 8.1	6.9
6.1 < pH ≤ 6.2	53	7.1 < pH ≤ 7.2	30	8.1 < pH ≤ 8.2	5.7
6.2 < pH ≤ 6.3	52	7.2 < pH ≤ 7.3	26	8.2 < pH ≤ 8.3	4.7
6.3 < pH ≤ 6.4	51	7.3 < pH ≤ 7.4	23	8.3 < pH ≤ 8.4	3.9
6.4 < pH ≤ 6.5	49	7.4 < pH ≤ 7.5	20	8.4 < pH ≤ 8.5	3.2
6.5 < pH ≤ 6.6	47	7.5 < pH ≤ 7.6	17	8.5 < pH ≤ 8.6	2.7
6.6 < pH ≤ 6.7	45	7.6 < pH ≤ 7.7	14	8.6 < pH ≤ 8.7	2.2
6.7 < pH ≤ 6.8	42	7.7 < pH ≤ 7.8	12	8.7 < pH ≤ 8.8	1.8
6.8 < pH ≤ 6.9	39	7.8 < pH ≤ 7.9	10	8.8 < pH ≤ 8.9	1.6
6.9 < pH ≤ 7.0	36	7.9 < pH ≤ 8.0	8.4	8.9 < pH ≤ 9.0	1.3

5. 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.
6. The mass limits are based on the Total Maximum Daily Load (TMDL) for the Wisconsin River to address phosphorus within the TMDL area. The TMDL was approved by EPA on 04/26/2019 with site-specific criteria approved by EPA on 07/09/2020.
7. This technology-based phosphorus limit is expressed as a 12-month rolling average in accordance with s. NR 217.04(1)(a), Wis. Adm. Code.
8. Temperature limits according to the following table are recommended.

Month	Calculated Effluent Limit	
	Weekly Avg. Effluent Limit (°F)	Daily Max. Effluent Limit (°F)
JAN	49	76
FEB	50	76
MAR	52	77
APR	55	79
MAY	65	82
JUN	76	84
JUL	81	85
AUG	81	84
SEP	73	82
OCT	61	80
NOV	49	77
DEC	49	76

9. Annual Acute and semi-annual Chronic WET tests are recommended. 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. Testing should continue after the permit expiration date (until the permit is reissued).
10. 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.
11. The Instream Waste Concentration (IWC) to assess chronic test results is 100%. 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%. The primary control water used in chronic WET tests conducted on Outfall 006 shall be a grab sample collected from the unnamed tributary.

Please consult the attached report for details regarding the above recommendations. If there are any questions or comments, please contact Benjamin Hartenbower at (715) 225-4705 or benjamin.hartenbower@wisconsin.gov or Diane Figiel at Diane.Figiel@wisconsin.gov.

Attachments (3) – Narrative, Thermal Table, & Map

PREPARED BY: _____ Date: 1/27/2026

Benjamin Hartenbower, PE,
Water Resources Engineer

E-cc: Michael Chang, Wastewater Specialist – WCR/Eau Claire
Geisa Bittencourt, Regional Wastewater Supervisor – WCR/Eau Claire
Diane Figiel, Water Resources Engineer – WY/3
Nate Willis, Wastewater Engineer – WY/3
Kari Fleming, Environmental Toxicologist – WY/3
Michael Polkinghorn, Water Resources Engineer – NOR/Rhinelander
Scott Provost, Water Quality Biologist – WCR/Wisconsin Rapids

Attachment #1

Water Quality-Based Effluent Limitations for
Nasonville Dairy Inc

WPDES Permit No. WI-0040312

Prepared by: Benjamin P. Hartenbower

PART 1 – BACKGROUND INFORMATION

Facility Description

The Nasonville Dairy, Inc. facility is located approximately 6 miles southwest of the City of Marshfield. Raw milk is brought in daily to produce American-style and feta cheeses. The facility typically operates on a 6-day per week schedule, with periodic increases to a 7-day per week schedule to meet customer production demands. Whey produced as a by-product of the cheese-making process is concentrated by a reverse osmosis system to generate a lactose by-product. Some of the whey goes through an additional processing step (ultrafiltration) to create whey protein concentrate (WPC). All condensate of whey (COW) water generated by the facility is combined with the process wastewaters to be treated in the onsite WWTP.

Changes to the treatment system included the addition of a new equalization (EQ) tank and conversion of the existing equalization tank to an anoxic selector for Enhanced Biological Phosphorus Removal (EBPR). The new EQ tank has been constructed and is currently operational. The conversion of the former EQ tank to an anoxic selector is also complete and operational. After the new EQ tank was constructed, the old EQ tank was converted to a selector tank. The facility also installed nozzles at the sequencing batch reactor (SBR) to enhance membrane suction and discharge for the installation of UF membranes for Aerobic Solid-Liquid Separation (SLS). The new membrane system was online in May of 2024 and a new screening system was installed in February 2025. Treated wastewaters are discharged to the unnamed creek through Outfall 006.

Attachment #3 is a map of the area showing the approximate location of Outfall 006.

Existing Permit Limitations

The current permit, expiring on March 31, 2026, includes the following effluent limitations and monitoring requirements.

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Six-Month Average	Footnotes
Flow Rate						1,2
BOD_5	40.6 lbs/day		10 mg/L	20.3 lbs/day		3
TSS	31.3 lbs/day			25.6 lbs/day		3
pH	9.0 s.u.	6.0 s.u.				1
Ammonia Nitrogen						4
April & May	Variable		8.2 mg/L	3.3 mg/L		
June - September	Variable		4.2 mg/L	1.7 mg/L		
October - March	Variable		10 mg/L	4.0 mg/L		
Chloride						2

Attachment #1

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Six-Month Average	Footnotes
Phosphorus TBEL TMDL Limit				 2.0 mg/L 0.67 lbs/day	 0.22 lbs/day	5
Temperature	86 deg F					
Acute WET						6
Chronic WET				1.0 TUc		7

Footnotes:

1. These limitations 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.
2. Monitoring only.
3. The mass limits are categorical limits based on ch. NR 240, Wis. Adm. Code.
4. The variable daily maximum ammonia nitrogen limit table corresponding to effluent pH values.

Effluent pH s.u.	**Limit mg/L**	**Effluent pH s.u.**	**Limit mg/L**	**Effluent pH s.u.**	**Limit mg/L**
$6.0 < pH \leq 6.1$	54	$7.0 < pH \leq 7.1$	33	$8.0 < pH \leq 8.1$	6.9
$6.1 < pH \leq 6.2$	53	$7.1 < pH \leq 7.2$	30	$8.1 < pH \leq 8.2$	5.7
$6.2 < pH \leq 6.3$	52	$7.2 < pH \leq 7.3$	26	$8.2 < pH \leq 8.3$	4.7
$6.3 < pH \leq 6.4$	51	$7.3 < pH \leq 7.4$	23	$8.3 < pH \leq 8.4$	3.9
$6.4 < pH \leq 6.5$	49	$7.4 < pH \leq 7.5$	20	$8.4 < pH \leq 8.5$	3.2
$6.5 < pH \leq 6.6$	47	$7.5 < pH \leq 7.6$	17	$8.5 < pH \leq 8.6$	2.7
$6.6 < pH \leq 6.7$	45	$7.6 < pH \leq 7.7$	14	$8.6 < pH \leq 8.7$	2.2
$6.7 < pH \leq 6.8$	42	$7.7 < pH \leq 7.8$	12	$8.7 < pH \leq 8.8$	1.8
$6.8 < pH \leq 6.9$	39	$7.8 < pH \leq 7.9$	10	$8.8 < pH \leq 8.9$	1.6
$6.9 < pH \leq 7.0$	36	$7.9 < pH \leq 8.0$	8.4	$8.9 < pH \leq 9.0$	1.3

5. A compliance schedule is in the current permit to meet the TMDL Limits by April 1, 2023.
6. Acute WET testing required: April - June 2024, July - September 2021, January - March 2022, April - June 2023, and October - December 2025.
7. Chronic WET testing required: July - September 2021, January - March 2022, April - June 2023, July - September 2024, and October - December 2025. The IWC for chronic WET was 100%.

Receiving Water Information

- Name: unnamed tributary
- Waterbody Identification Code (WBIC): 5016277
- Classification used in accordance with chs. NR 102 and 104, Wis. Adm. Code: Warm Water Forage Fish (WWFF) community, non-public water supply.
- Low flows used in accordance with chs. NR 106 and 217, Wis. Adm. Code: Due to the nature of the receiving water, the 7-Q_{10}, 7-Q_2, and Harmonic Mean are estimated to be zero.
  7-Q_{10} = 0 cubic feet per second (cfs)
  7-Q_2 = 0 cfs
  Harmonic Mean Flow = 0 cfs
- Hardness = 257 mg/L as $CaCO_3$. This value represents the geometric mean of effluent data from June and July 2025. Effluent hardness is used in place of receiving water because there is no receiving water flow upstream of the discharge.
- % of low flow used to calculate limits in accordance with s. NR 106.06(4)(c)5., Wis. Adm. Code: Not applicable where the receiving water low flows are zero.
- Source of background concentration data: Background concentrations are not included because they do not impact the calculated WQBEL when the receiving water low flows are equal to zero.
- Multiple dischargers: None.
- Impaired water status: The unnamed stream is impaired for Total Phosphorus from mile 0 to 1.94. This discharge is located within the Wisconsin River TMDL for phosphorus.

Effluent Information

- Flow Rate(s):
  Peak Annual Average = 0.187 MGD (Million Gallons per Day)
  For reference, the actual average flow from April 2021 to November 2025 was 0.163 MGD.
- Hardness = 257 mg/L as $CaCO_3$. This value represents the geometric mean four samples collected in June and July 2025 which were reported in 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).
- Wastewater source: Wastewater from Natural and Processed Cheese production.
- Water supply: Private Wells
- Additives: Aluminum sulfate (Water Quality Conditioner), Polymer (Water Quality Conditioner)
- Total Phosphorus Wasteload Allocation: 67 lbs/year = 0.18 lbs/day
- Effluent characterization: This facility is categorized as a secondary industry, 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 hardness. The permit-required monitoring for Ammonia Nitrogen, Chloride, Phosphorus, and Temperature from April 2021 to December 2025 is used in this evaluation.
- Effluent data for substances for which a single sample was analyzed is shown in the tables in Part 2, in the column titled “MEAN EFFL. CONC.”. Otherwise, substances with multiple effluent data are shown in the tables below or in their respective parts in this evaluation.

Chloride Effluent Data for Outfall 006

	Chloride (mg/L)
1-day P_{99}	513
4-day P_{99}	378
30-day P_{99}	306
Mean	270
Std	81
Sample size	449
Range	108 - 577

Copper Effluent Data for Outfall 006

Sample Date	Copper µg/L
06/27/2025	<0.806
09/10/2025	<0.806
09/12/2025	<0.806
09/23/2025	<0.806
mean	<0.806

"<" means that the pollutant was not detected at the indicated limit of detection. The mean concentration was calculated using zero in place of the non-detected results.

The following table presents the average concentrations and loadings at Outfall 006 from April 2021 to December 2025 for all parameters with limits in the current permit to meet the requirements of s. NR 201.03(6), Wis. Adm. Code:

Parameters with Effluent Limits

	Average Measurement	Average Mass Discharged
BOD_5	1.0 mg/L*	1.8 lbs/day
TSS		4.7 lbs/day
Ammonia Nitrogen	0.45 mg/L*	
Phosphorus	0.394 mg/L*	0.50 lbs/day
Temperature	77.5 deg F	

*Results below the limit of detection (LOD) were included as zeros in calculation of average.

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

Acute Limits based on 1-Q_{10}

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-Q_{10} 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.

$$\text{Limitation} = \frac{(WQC)\,(Qs + (1-f)\,Qe) - (Qs - f\,Qe)\,(Cs)}{Qe}$$

Where:

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

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

Qe = 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

Cs = 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-Q_{10} method of limit calculation produces the most stringent daily maximum limitations and should be used while making reasonable potential determinations. This is the case for Nasonville Dairy Inc.

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).

Daily Maximum Limits based on Acute Toxicity Criteria (ATC)
RECEIVING WATER FLOW = 0.00 cfs, (1-Q_{10} (estimated as 80% of 7-Q_{10})), as specified in s. NR 106.06(3)(bm), Wis. Adm. Code.

SUBSTANCE	REF. HARD. mg/L	ATC	MEAN BACK-GRD.	MAX. EFFL. LIMIT**	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	1-day P_{99}	1-day MAX. CONC.
Chlorine		19.03		19	4	**120**		
Arsenic		339.8		340	68	<0.231		
Cadmium	257	30.45		30	6	<0.268		
Chromium (+3)	257	3908.21		3908	782	<0.282		
Copper	257	37.83		38	8	<0.806		
Lead	257	266.33		266	53	<0.385		
Nickel	257	1043.23		1043	209	3.611		
Zinc	257	274.97		275	55	14		
Chloride (mg/L)		757		757			513	577

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

Weekly Average Limits based on Chronic Toxicity Criteria (CTC)
RECEIVING WATER FLOW = 0.00 cfs, (¼ of 7-Q_{10}), 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}
Chlorine		7.28		7.3	1.5	**120**	
Arsenic		152.2		152	30	<0.231	
Cadmium	175	3.82		3.82	0.76	<0.268	
Chromium (+3)	257	286.36		286	57	<0.282	
Copper	257	23.23		23	5	<0.806	
Lead	257	69.76		70	14	<0.385	
Nickel	257	116.06		116	23	3.611	
Zinc	257	274.97		275	55	14	
Chloride (mg/L)		395		395			378

* 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 = 0.00 cfs, (¼ of Harmonic Mean), as specified in s. NR 106.06(4)(c), Wis. Adm. Code.

SUBSTANCE	HTC	MEAN BACK-GRD.	MO'LY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	30-day P_{99}
Cadmium	370		370	74	<0.268	
Chromium (+3)	3818000		3818000	763600	<0.282	
Lead	140		140	28	<0.385	
Nickel	43000		43000	8600	3.611	

Monthly Average Limits based on Human Cancer Criteria (HCC)
RECEIVING WATER FLOW = 0.00 cfs, (¼ of Harmonic Mean), as specified in s. NR 106.06(4)(c), Wis. Adm. Code.

SUBSTANCE	HCC	MEAN BACK-GRD.	MO'LY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	30-day P_{99}
Arsenic	13.3		13.3	2.7	<0.231	

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 calculated limitations and effluent data, effluent limitations are required for Chlorine. Limits and/or monitoring recommendations are made in the paragraphs below:

Total Residual Chlorine– Available data/information indicates the discharge contains concentrations of chlorine or halogen above the applicable WQBELs. Therefore, a daily maximum limit of 19 µg/L is required. Due to revisions to s. NR 106.07(2), Wis. Adm. Code, mass limitations are no longer required. The weekly average effluent limitation of 7.3 µg/L should be included in the permit because it is more restrictive than the daily maximum limit.

Sections NR 106.07(4) and NR 205.067(7), Wis. Adm. Code require WPDES permits contain daily maximum and monthly average limitations for industrial dischargers whenever practicable and necessary to protect water quality. **Therefore, a monthly average limit of 7.3 µg/L is required** to meet expression of limits requirements in addition to the daily maximum and weekly average limits.

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 available information, **PFOS and PFOA monitoring is not recommended.**

Attachment #1

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 variable daily maximum, weekly and monthly average limits.

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:

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

Where:

A = 0.411 and B = 58.4 for a Warm Water Forage Fishery, and

pH (s.u.) = that characteristic of the effluent.

The effluent pH data was examined as part of this evaluation. A total of 671 samples were reported from April 2021 to November 2025. The maximum reported value was 8.61 s.u. (Standard pH Units). The effluent pH was 8.48 s.u. or less 99% of the time. The 1-day P_{99}, calculated in accordance with s. NR 106.05(5), Wis. Adm. Code, is 8.42 s.u. The mean plus the standard deviation multiplied by a factor of 2.326, an estimate of the upper ninety ninth percentile for a normally distributed dataset, is 8.37 s.u. Therefore, a value of 8.48 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 8.48 s.u. into the equation above yields an ATC = 3.33 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 calculated using the 1-Q_{10} receiving water 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-Q_{10} (estimated as 80 % of 7-Q_{10}) and the 2×ATC approach are shown below.

Daily Maximum Ammonia Nitrogen Determination

	Ammonia Nitrogen Limit mg/L
2×ATC	6.66
1-Q_{10}	3.33

The 1-Q_{10} method yields the most stringent limits for Nasonville Dairy Inc.

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 – WWFF

Effluent pH s.u.	Limit mg/L	Effluent pH s.u.	Limit mg/L	Effluent pH s.u.	Limit mg/L
$6.0 \leq pH \leq 6.1$	54	$7.0 < pH \leq 7.1$	33	$8.0 < pH \leq 8.1$	6.9
$6.1 < pH \leq 6.2$	53	$7.1 < pH \leq 7.2$	30	$8.1 < pH \leq 8.2$	5.7
$6.2 < pH \leq 6.3$	52	$7.2 < pH \leq 7.3$	26	$8.2 < pH \leq 8.3$	4.7
$6.3 < pH \leq 6.4$	51	$7.3 < pH \leq 7.4$	23	$8.3 < pH \leq 8.4$	3.9
$6.4 < pH \leq 6.5$	49	$7.4 < pH \leq 7.5$	20	$8.4 < pH \leq 8.5$	3.2
$6.5 < pH \leq 6.6$	47	$7.5 < pH \leq 7.6$	17	$8.5 < pH \leq 8.6$	2.7
$6.6 < pH \leq 6.7$	45	$7.6 < pH \leq 7.7$	14	$8.6 < pH \leq 8.7$	2.2
$6.7 < pH \leq 6.8$	42	$7.7 < pH \leq 7.8$	12	$8.7 < pH \leq 8.8$	1.8
$6.8 < pH \leq 6.9$	39	$7.8 < pH \leq 7.9$	10	$8.8 < pH \leq 8.9$	1.6
$6.9 < pH \leq 7.0$	36	$7.9 < pH \leq 8.0$	8.4	$8.9 < pH \leq 9.0$	1.3

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

The ammonia limit calculation also warrants evaluation of weekly and monthly average limits based on chronic toxicity criteria for ammonia, because those limits relate to the assimilative capacity of the receiving water.

Weekly average and monthly average limits for ammonia nitrogen are based on chronic toxicity criteria in ch. NR 105, Wis. Adm. Code.

The 30-day chronic toxicity criterion (CTC) for ammonia in waters classified as a Warm Water Forage Fish Community is calculated by the following equation, according to subchapter IV of NR 106, Wis. Adm. Code.

$$CTC = E \times \{[0.0676 \div (1 + 10^{(7.688 - pH)})] + [2.912 \div (1 + 10^{(pH - 7.688)})]\} \times C$$

Where:

pH = the pH (s.u.) of the receiving water,
E = 0.854,
C = the minimum of 2.85 or $1.45 \times 10^{(0.028 \times (25 - T))}$ – (Early Life Stages Present), or
C = $1.45 \times 10^{(0.028 \times (25 - T))}$ – (Early Life Stages Absent), and
T = the temperature (°C) of the receiving water – (Early Life Stages Present), or
T = the maximum of the actual temperature (°C) and 7 - (Early Life Stages Absent)

The 4-day criterion is equal to the 30-day criterion multiplied by 2.5. The 4-day criteria are used in a mass-balance equation with the 7-Q_{10} (4-Q_3, if available) to derive weekly average limitations. And the 30-day criteria are used with the 30-Q_5 (estimated as 85% of the 7-Q_2 if the 30-Q_5 is not available) to derive monthly average limitations. The stream flow value is further adjusted to temperature; 100% of the flow is used if the Temperature ≥ 16 °C, 25% of the flow is used if the Temperature < 11°C, and 50% of the flow is used if the Temperature ≥ 11 °C but < 16 °C.

Section NR 106.32 (3), Wis. Adm. Code, provides a mechanism for less stringent weekly average and monthly average effluent limitations when early life stages (ELS) of critical organisms are absent from the receiving water. This applies only when the water temperature is less than 14.5 °C, during the winter and spring months. Burbot, an early spawning species, are not believed to be present in the unnamed tributary, based on raw fish data in the Fisheries Management Information System. So "ELS Absent" criteria apply from October through March, and "ELS Present" criteria will apply from April through September for a Warm Water Forage Fish classification.

The default basin assumed values are used for temperature. The pH values are from the Upper Yellow (Wood Co.) River Watershed. These values are shown in the table below, with the resulting criteria and effluent limitations.

Weekly and Monthly Average Ammonia Nitrogen Limits – WWFF

		April & May	June - September	October - March
Effluent Flow	Qe (MGD)	0.187	0.187	0.187
Background Information	7-Q_{10} (cfs)	0	0	0
	7-Q_2 (cfs)	0	0	0
	Ammonia (mg/L)	N/A	N/A	N/A
	Average Temperature (°C)	12	19	3.5
	Maximum Temperature (°C)	14	21	10
	pH (s.u.)	7.34	7.56	7.35
	% of Flow used	50	100	25
	Reference Weekly Flow (cfs)	0.00	0.00	0.00
	Reference Monthly Flow (cfs)	0.00	0.00	0.00
Criteria mg/L	4-day Chronic			
	Early Life Stages Present	12.36	7.00	12.27
	Early Life Stages Absent	12.42	7.00	16.42
	30-day Chronic			
	Early Life Stages Present	4.94	2.80	4.91
	Early Life Stages Absent	4.97	2.80	6.57
Effluent Limitations mg/L	Weekly Average			
	Early Life Stages Present	12	7.0	
	Early Life Stages Absent			16
	Monthly Average			
	Early Life Stages Present	4.9	2.8	
	Early Life Stages Absent			6.6

Effluent Data
The following table evaluates the statistics based upon ammonia data reported from April 2021 to November 2025.

Ammonia Nitrogen Effluent Data

Ammonia Nitrogen mg/L	April & May	June - September	October - March
1-day P_{99}	5.25	3.85	3.71
4-day P_{99}	2.80	2.03	2.00
30-day P_{99}	1.26	0.88	0.90
Mean*	0.61	0.37	0.44
Std	1.40	1.14	0.97
Sample size	80	161	208
Range	<0.13 - 5.27	<0.13 - 4.739	<0.127 - 4.112

*Values lower than the limit of detection were substituted with a zero.

Reasonable Potential
The need to include ammonia limits in the Nasonville Dairy Inc permit is determined by calculating 99th upper percentile (or P_{99}) values for ammonia during the month ranges and comparing those to the calculated limits. Based on this comparison, only daily limits would be required throughout the year. However, since the permit currently has variable daily maximum, weekly and monthly average limits, **all 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.

Conclusions and Recommendations
In summary, the following ammonia nitrogen limitations are recommended to continue. No mass limitations are recommended in accordance with s. NR 106.32(5), Wis. Adm Code.

Final Ammonia Nitrogen Limits

	Daily Maximum mg/L	Weekly Average mg/L	Monthly Average mg/L
April & May	Variable	8.2	3.3
June - September	Variable	4.2	1.7
October - March	Variable	10	4.0

PART 4 – PHOSPHORUS

Technology-Based Effluent Limit
Subchapter II of Chapter NR 217, Wis. Adm. Code, requires dischargers of 60 pounds of total phosphorus per month to comply with a 12-month rolling average limit of 1.0 mg/L, or an approved alternative concentration limit.

Nasonville Dairy Inc. exceeded the 150 lbs. per month threshold and has an alternative effluent limit (AEL) of 2.0 mg/L in the current permit based on biological phosphorus removal in s. NR 217.04(2)(a)2, Wis. Adm. Code. However, an AEL was not requested again, and the average phosphorus concentration from April 2021 to November 2025 is 0.39 mg/L and the 30-day P_{99} is 0.73 mg/L. **Therefore, the TBEL of 1.0 mg/L is effective upon reissuance.**

In addition, the need for a WQBEL for phosphorus must be considered.

TMDL Limits
Total phosphorus (TP) effluent limits in lbs/day are calculated as recommended in the *TMDL Development and Implementation Guidance: Integrating the WPDES and Impaired Waters Programs (April 2020)* and are based on the annual phosphorus wasteload allocation (WLA) given in lbs/yr. This WLA is found in Appendix K of the *Wisconsin River TMDL Report (April 2019)* and is expressed as a maximum annual load (lbs/yr). For Nasonville Dairy Inc, this WLA is 67 lbs/yr and 0.183 lbs/day.

The TMDL-based phosphorus WQBEL(s) will be re-evaluated if the annual phosphorus WLA is not being met as described in the prior stated guidance. This is done by comparing each rolling sum of 12 consecutive months of total monthly mass phosphorus discharges over the current permit term directly against the annual WLA.

In this case, Nasonville Dairy Inc has been 49% compliant in meeting the Annual WLA of 67 lbs/yr, or 23 of the 45 available rolling sums have exceeded the annual WLA during April 2021 – November 2025. Nasonville Dairy Inc is not considered to be meeting their annual WLA. Therefore, the TMDL-based phosphorus WQBELs will be reevaluated at this time.

TP Equivalent Effluent Concentration = Daily WLA ÷ (Flow Rate * Conversion Factor)
= 0.183 lbs/day ÷ (0.187 MGD * 8.34)
= 0.12 mg/L

Since this value is greater than 0.3 mg/L, the WLA should be expressed as a monthly average mass limit for total phosphorus and no six-month average limit is required.

TP Six-month Average Permit Limit = Daily WLA * Six-month Average Multiplier
= 0.183 lbs/day * 1.20
= 0.222 lbs/day

TP Monthly Average Permit Limit = TP 6-Month Average Permit Limit * 3
= 0.222 lbs/day * 3
= 0.666 lbs/day

The multiplier used in the monthly average calculation was determined according to TMDL implementation guidance. The standard coefficient of variation (CV) of 0.60, along with the monitoring frequency, is used to select the multiplier. The current permit specifies phosphorus monitoring as twice weekly; if a different monitoring frequency is used, the stated limits should be reevaluated. No changes to the TMDL-based limits are recommended at this time.

The Guidance for Implementing Wisconsin's Phosphorus Water Quality Standards for Point Source Discharges (2020) suggests setting effluent limits equal to the criterion in the absence of an EPA approved total maximum daily load for discharges to phosphorus impaired waters.
Because the WLA-based WQBELs are protective of immediate receiving waters, TP WQBELs derived according to s. NR 217.13, Wis. Adm. Code are not required.

Since wasteload allocations are expressed as annual loads (lbs/yr), permits with TMDL-derived monthly average permit limits should require the permittee to calculate and report rolling 12-month sums of total monthly loads for TP. Rolling 12-month sums can be compared directly to the annual wasteload allocation. Six-month average limits apply in the periods May – October and November – April.

Phosphorus Effluent Data

	Concentration (mg/L)	Mass Discharge (lbs/day)
1-day P_{99}	2.83	3.538
4-day P_{99}	1.55	1.931
30-day P_{99}	0.73	0.919
Mean	0.39	0.509
Std	0.62	0.765
Sample size	448	438
Range	<0.011 - 4.7	0.01 - 5.98

Conclusions:
In summary, the following limits are recommended by this evaluation:

- 12-month rolling average Total Phosphorus concentration limit of 1.0 mg/L
- Six-Month Average Total Phosphorus mass limit of 0.22 lbs/day
- Monthly Average Total Phosphorus mass limit of 0.67 lbs/day

Attachment #1

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.

Previous WQBEL memos have designated the receiving water as a Limited Aquatic Life Community for thermal limit calculation purposes. The receiving water is considered an ephemeral stream due to the intermittent nature of the effluent discharge. Flow data submitted by Nasonville Dairy Inc indicates that weekly discharge occurrences have increased greater than 6 days/week (1667 of 1705 discharge days from April 2021 to November 2025 with a peak annual non-zero flow increase from 0.147 MGD during the previous evaluation to 0.195 MGD). Because of the change in the nature of the discharge, the stream can longer be viewed hydraulically as a diffuse surface water since it is unlikely to be dry at least one day a week. Therefore, temperature limits will be calculated for the protection of a fish and aquatic life community near the outfall location.

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 April 2021 to November 2025.

The table below summarizes the maximum temperatures reported during monitoring from April 2021 to November 2025.

Monthly Temperature Effluent Data & Limits

Month	Representative Highest Monthly Effluent Temperature		Calculated Effluent Limit	
	Weekly Maximum (°F)	Daily Maximum (°F)	Weekly Average Effluent Limitation (°F)	Daily Maximum Effluent Limitation (°F)
JAN	79	82	**49**	**76**
FEB	81	83	**50**	**76**
MAR	81	85	**52**	**77**
APR	81	85	**55**	**79**
MAY	83	85	**65**	**82**
JUN	85	86	**76**	**84**
JUL	85	86	**81**	**85**
AUG	84	86	**81**	**84**
SEP	81	86	**73**	**82**
OCT	81	85	**61**	**80**
NOV	79	83	**49**	**77**
DEC	78	83	**49**	**76**

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. Based on this analysis, **daily maximum and weekly average temperature limits are required year-round. A compliance schedule may be needed to meet the temperature limits.**

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 100%** shown in the WET Checklist summary below, was calculated according to the following equation, as specified in s. NR 106.03(6), Wis. Adm Code:

Attachment #1

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

Where:

Q_e = annual average flow = 0.187 MGD = 0.289 cfs
f = fraction of the Q_e withdrawn from the receiving water = 0
Q_s = ¼ of the 7-Q_{10} = 0 cfs ÷ 4 = 0 cfs

- 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 006 shall be a grab sample collected from 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 006. 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	Acute Results LC_{50} %				Chronic Results IC_{25} %					Footnotes or Comments
	C. dubia	Fathead minnow	Pass or Fail?	Used in RP?	*C. dubia*	Fathead Minnow	Algae (IC_{50})	Pass or Fail?	Use in RP?	
06/27/2002	>100	>100	Pass	No	>100	>100			No	1
08/26/2003	>100	>100	Pass	No	>100	>100			No	1
12/07/2004	>100	>100	Pass	No	>100	>100			No	1
08/09/2005					54.18	77.57			No	2
08/30/2005					>100	>100			No	2
09/29/2005					>100	>100			No	2
01/19/2006					>100	>100			No	2
08/14/2007	>100	>100	Pass	No	>100	>100			No	2
12/02/2008					>100	>100			No	2
05/14/2009					>100	>100			No	2
03/02/2010	>100	>100	Pass	No	>100	>100			No	2
09/08/2011					>100	**36.6**		Fail	Yes	
10/25/2011					>100	>100		Pass	Yes	
12/06/2011					>100	>100		Pass	Yes	
02/26/2015	>100	>100	Pass	Yes	>100	>100		Pass	Yes	
06/02/2015	>100	>100	Pass	Yes	>100	>100		Pass	Yes	
06/07/2016					>100	>100		Pass	Yes	
09/20/2016					**20.8**	>100		Fail	Yes	
10/11/2016					>100	>100		Pass	Yes	

Attachment #1

Date Test Initiated	Acute Results LC_{50} %				Chronic Results IC_{25} %					Footnotes or Comments
	C. dubia	Fathead minnow	Pass or Fail?	Used in RP?	*C. dubia*	Fathead Minnow	Algae (IC_{50})	Pass or Fail?	Use in RP?	
11/01/2016					>100	>100		Pass	Yes	
09/19/2017					>100	>100		Pass	Yes	
10/17/2017					>100	>100		Pass	Yes	
01/30/2018					>100	>100		Pass	Yes	
04/17/2018	>100	>100	Pass	Yes	>100	>100		Pass	Yes	
01/22/2019					>100	>100		Pass	Yes	
04/23/2019					>100	>100		Pass	Yes	
02/25/2020					>100	>100		Pass	Yes	
06/23/2020					>100	>100		Pass	Yes	
02/18/2021					>100	>100		Pass	Yes	
09/22/2021	>100	>100	Pass	Yes	>100	>100		Pass	Yes	
02/08/2022	>100	>100	Pass	Yes	>100	>100		Pass	Yes	
04/25/2023	>100	>100	Pass	Yes	>100	>100		Pass	Yes	
05/14/2024	>100	>100	Pass	Yes						
08/13/2024	>100	>100	Pass	Yes	**52.7**	>100		Fail	Yes	
01/21/2025					>100	>100		Pass	Yes	
02/04/2025					**12.1**	>100		Fail	Yes	
09/29/2025					>100	>100		Pass	Yes	

Footnotes:

1. *Data Not Representative.* Significant changes were made to WET test methods in 2004 and these changes were assumed to be fully implemented by certified labs by no later than June 2005.
2. *Tests done by S-F Analytical, July 2008 – March 2011.* The DNR has reason to believe that WET tests completed by SF Analytical Labs from July 2008 through March 31, 2011 were not performed using proper test methods. Therefore, WET data from this lab during this period has been disqualified and was not included in the analysis.

- 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.**

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

  According to s. NR 106.08(6)(d), Wis. Adm. Code, TUa and TUc effluent values are equal to zero whenever toxicity is not detected (i.e. when the LC_{50}, IC_{25} or $IC_{50} \geq 100\%$).

  Acute Reasonable Potential = 0 < 1.0, reasonable potential is not shown, and a limit is not required.

Chronic Reasonable Potential = [(TUc effluent) (B) (IWC)]

Chronic WET Limit Parameters

TUc(maximum) $100/IC_{25}$	**B** (multiplication factor from s. NR 106.08(6)(c), Wis. Adm. Code, Table 4)	IWC
100/12.1 = 8.3 TUc	2.6 Based on 4 detects.	100%

[(TUc effluent) (B) (IWC)] = 21 > 1.0

Therefore, reasonable potential is shown a chronic WET limit using the procedures in s. NR 106.08(6), Wis. Adm. Code, and representative data from 2011 to 2025.

Expression of WET limits

Chronic WET limit = [100/IWC] TU_c = 1.0 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 = 100%. **15 Points**
Historical Data	Eight tests used to calculate RP. No tests failed. **0 Points**	25 tests used to calculate RP. Four tests failed. **0 Points**
Effluent Variability	Little variability, consistent WWTF operations. NON sent 2024. **0 Points**	Same as Acute. **0 Points**
Receiving Water Classification	Warm Water Forage Fish (5 pts) **5 Points**	Same as Acute. **5 Points**
Chemical-Specific Data	Reasonable potential for Chlorine and ammonia nitrogen limits based on ATC. (6 pts) Chloride, Nickel, and Zinc detected. (3 pts) Additional Compounds of Concern: None. **9 Points**	Reasonable potential for Chlorine limits based on CTC. (5 pts) Ammonia nitrogen limit carried over from the current permit. Ammonia, Chloride, Nickel, and Zinc detected. (3 pts) Additional Compounds of Concern: None. **8 Points**

Attachment #1

	Acute	Chronic
Additives	Two Water Quality Conditioners (2 pts) added. Permittee has proper P chemical SOPs in place. **2 Points**	All additives are used more frequently than once per 4 days. **2 Points**
Discharge Category	Cheese, Natural and Processed (20 pts) **20 Points**	Same as Acute. **20 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:		**50 Points**
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, **Annual acute and semi-annual chronic WET tests are recommended in the reissued permit.** 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. Testing should continue after the permit expiration date (until the permit is reissued).

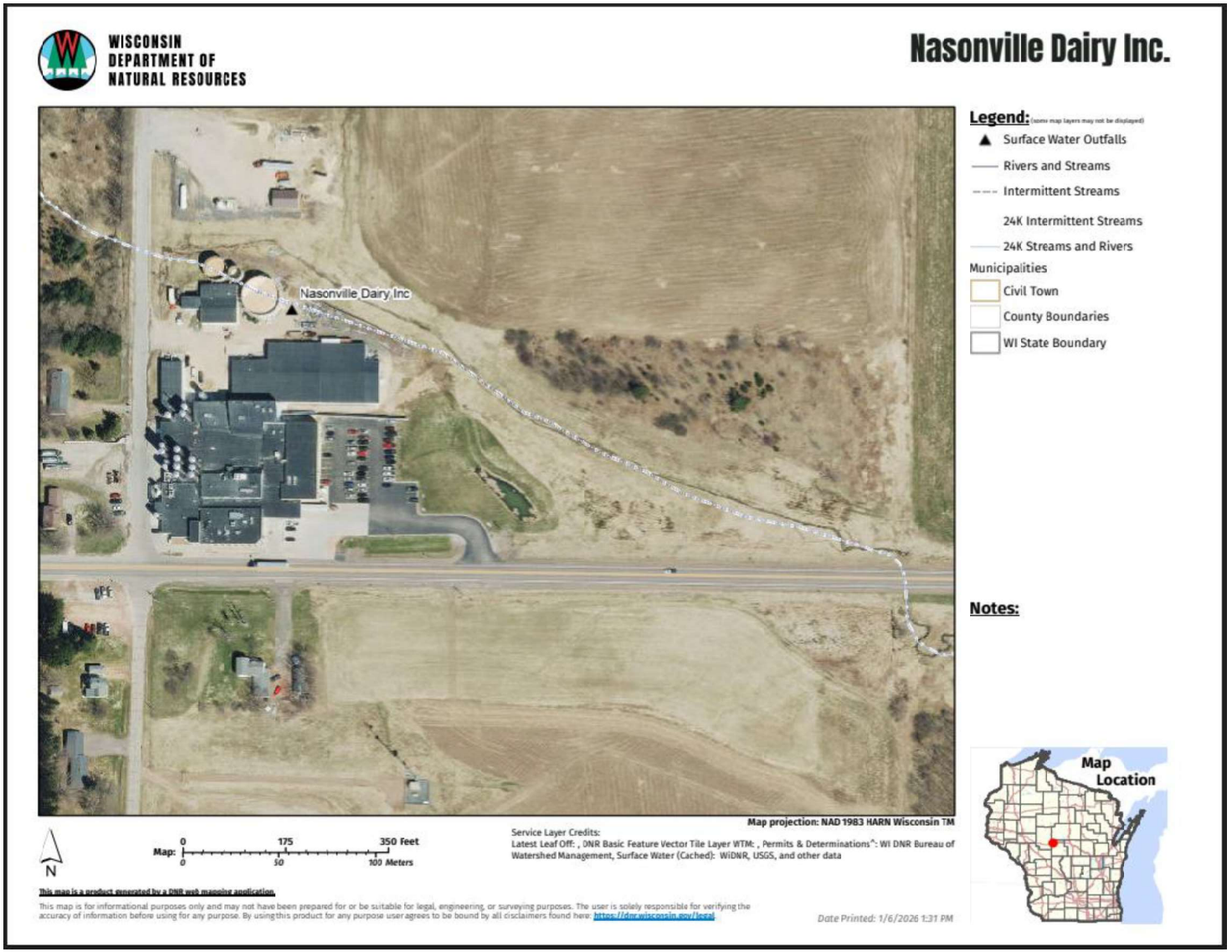
Attachment #2

Temperature limits for receiving waters with unidirectional flow

(calculation using default ambient temperature data)

Facility:	Nasonville Dairy Inc		**7-Q10:**	0.00	cfs	**Temp Dates**	**Flow Dates**
Outfall(s):	006		**Dilution:**	25%	**Start:**	04/01/21	04/01/21
Date Prepared:	01/06/2026		**f:**	0	**End:**	11/30/25	11/30/25
Design Flow (Qe):	0.187	MGD	**Stream type:**	Small warm water sport or forage fish community			
Storm Sewer Dist.	0		**Qs:Qe ratio:**	0.0 :1			
			Calculation Needed?	YES			

Month	Water Quality Criteria			Receiving Water Flow Rate (Qs)	Representative Highest Effluent Flow Rate (Qe)		f	Representative Highest Monthly Effluent Temperature		Calculated Effluent Limit	
	Ta (default)	Sub-Lethal WQC	Acute WQC		7-day Rolling Average (Qesl)	Daily Maximum Flow Rate (Qea)		Weekly Average	Daily Maximum	Weekly Average Effluent Limitation	Daily Maximum Effluent Limitation
	(°F)	(°F)	(°F)	(cfs)	(MGD)	(MGD)		(°F)	(°F)	(°F)	(°F)
JAN	33	49	76	0.00	0.177	0.280	0	79	82	**49**	**76**
FEB	34	50	76	0.00	0.174	0.246	0	81	83	**50**	**76**
MAR	38	52	77	0.00	0.182	0.254	0	81	85	**52**	**77**
APR	48	55	79	0.00	0.218	0.367	0	81	85	**55**	**79**
MAY	58	65	82	0.00	0.214	0.352	0	83	85	**65**	**82**
JUN	66	76	84	0.00	0.217	0.385	0	85	86	**76**	**84**
JUL	69	81	85	0.00	0.237	0.469	0	85	86	**81**	**85**
AUG	67	81	84	0.00	0.211	0.388	0	84	86	**81**	**84**
SEP	60	73	82	0.00	0.214	0.357	0	81	86	**73**	**82**
OCT	50	61	80	0.00	0.224	0.357	0	81	85	**61**	**80**
NOV	40	49	77	0.00	0.210	0.378	0	79	83	**49**	**77**
DEC	35	49	76	0.00	0.217	0.362	0	78	83	**49**	**76**


WISCONSIN
DEPARTMENT OF
NATURAL RESOURCES
Nasonville Dairy Inc.
Nasonville Dairy Inc
Legend:
Surface Water Outfalls
Rivers and Streams
Intermittent Streams
24K Intermittent Streams
24K Streams and Rivers
Municipalities
Civil Town
County Boundaries
WI State Boundary
Notes:
Map Location
Map projection: NAD 1983 HARN Wisconsin TM
Map: 0 175 350 Feet
0 50 100 Meters
N
Service Layer Credits:
Latest Leaf Off: , DNR Basic Feature Vector Tile Layer WTM: , Permits & Determinations^: WI DNR Bureau of Watershed Management, Surface Water (Cached): WiDNR, USGS, and other data
This map is a product generated by a DNR web mapping application.
This map is for informational purposes only and may not have been prepared for or be suitable for legal, engineering, or surveying purposes. The user is solely responsible for verifying the accuracy of information before using for any purpose. By using this product for any purpose user agrees to be bound by all disclaimers found here: https://dnr.wisconsin.gov/legal
Date Printed: 1/6/2026 1:31 PM

CORRESPONDENCE/MEMORANDUM

State of Wisconsin

DATE: January 27, 2026

TO: Holly Heldstab – WCR/Eau Claire

FROM: Benjamin Hartenbower – WCR/Eau Claire

SUBJECT: Technology-Based Effluent Limitations for Nasonville Dairy Inc
WPDES Permit No. WI-00040312

Technology-Based Effluent Limitations (TBELs) Recommended for Outfall 006:

Parameter	Daily Maximum	Daily Minimum	Monthly Average
BOD_5, Total	40.6 lbs/day		19.1 lbs/day
TSS	31.3 lbs/day		23.9 lbs/day
pH	9.0 su	6.0 su	

PART 1 – BACKGROUND INFORMATION

The Nasonville Dairy, Inc. facility is located approximately 6 miles southwest of the City of Marshfield. 1.2 million pounds of raw milk is brought in daily to produce American-style and feta cheeses. The facility typically operates on a 6-day per week schedule, with periodic increases to a 7-day per week schedule to meet customer production demands. Whey produced as a by-product of the cheese-making process is concentrated by a reverse osmosis system to generate a lactose by-product. Some of the whey goes through an additional processing step (ultrafiltration) to create whey protein concentrate (WPC). All condensate of whey (COW) water generated by the facility is combined with the process wastewaters to be treated in the onsite WWTP. Treated wastewaters are discharged to surface water Outfall 006.

PART 2 – INDUSTRIAL CATEGORIES

Chapter NR 240, Wis. Adm. Code, specifies effluent guidelines for discharges from dairy product categories of point sources and subcategories. Nasonville Dairy Inc would fall under the Natural and Processed Cheese and Condensed Whey subcategories as defined in s. NR 240.02, Wis. Adm. Code. These guidelines are based on federal effluent guidelines in 40 CFR Part 405 Subparts F and K. The permittee must meet the applicable effluent limit guidelines as described in this chapter. These effluent limit guidelines include:

- Effluent limitations representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available (BPT) in s. NR 240.10, Wis. Adm. Code.
- Effluent limitations representing the degree of effluent reduction attainable by the application of the best available technology economically achievable (BAT) in s. NR 240.11, Wis. Adm. Code.
- If determined to be a new source, new source performance standards (NSPS) in s. NR 240.12, Wis. Adm. Code.

If the calculated limits are less than or equal to the limits in the current permit, then the limits would be set equal to the recalculated limits. If the recalculated limits are less restrictive than the limits from the current permit, they cannot be increased unless the the antidegradation and anti-backsliding provisions of ch. NR 207, Wis. Adm. Code, are met.

Section NR 220.13, Wis. Adm. Code, includes provisions that address cases where federal and state rule differ. Section 283.11, Wis. Stats., address compliance with federal standards. In this case, the state rules are consistent with federal rules with a few exceptions. In such cases, the permit will in all cases be based on the state rule notwithstanding the federal regulations. The omissions are described below.

- The state or federal rules do not specify a date for the definition for a new source. Therefore, it is necessary to review available federal guidance. The Boornazian memo (September 28, 2006) specifies a new source date for 40 CFR Part 405 Subparts A – L of May 28, 1974. The Department relies on the Boornazian memo to establish date of applicability for NSPS.

- State rules incorrectly list best available treatment (BAT) standards for BOD, TSS, and pH. BAT applies to priority pollutants and nonconventional pollutants and does not apply to BOD, TSS or pH.
- The federal standard rule lists revised BCT standards requirements. All BCT limitations are set to be the same as the best practicable control technology (BPT) standards. State rules in ch. NR 240, Wis. Adm. Code, do not list standards for BCT.

PART 3 – LEVELS OF CONTROL

American-style and feta cheese and Whey Protein Concentrate production lines have processes which construction commenced after May 28, 1974. Therefore, the process wastewater from these lines is subject to BPT, BCT, BAT and NSPS standards for the Natural and Processed Cheese and Condensed Whey subcategories are applicable as specified in 40 CFR Part 405 Subparts F and K and ch. NR 240.12, Wis. Adm. Code.

PART 4 – CURRENT PRODUCTION LEVELS

The current levels of production for each Subcategory are provided by Nasonville Dairy Inc.

Natural and Processed Cheese

Process	Material Used (lbs/day)	Flow % Discharged to Surface Water	Material Used for Calculation[1] (lbs/day)	Material Used for Calculation[2] (lbs/month)
American-style and feta cheese	1,800,000 (Milk, 3.7%)	100%	1,800,000	45,004,018

Condensed Whey

Process	Material Used (lbs/day)	Flow % Discharged to Surface Water	Material Used for Calculation[1] (lbs/day)	Material Used for Calculation[2] (lbs/month)
Whey Protein Concentrate	1,600,000 (Whey)	100%	1,600,000	40,003,571

PART 5 – BOD INPUT

The BOD_5 input is the 5-day biochemical oxygen demand of raw materials that enter the process. The current production levels in Part 4 are converted to BOD input equivalents by multiplying the amount of raw material by BOD factors specified in s. NR 240.03(1) or s. NR 240.07 Wis. Adm. Code and 40 CFR Part 405.

Natural and Processed Cheese (Daily)

Process	Material Used (lbs/day)	BOD Factor[1] (lbs/100 lbs)	Adjusted Total BOD Input (lbs/day)
American-style and feta cheese	1,800,000	10.39	187,020
Total			**187,020**

Natural and Processed Cheese (Average Monthly)

Process	Material Used (lbs/month)	BOD Factor[1] (lbs/100 lbs)	Adjusted Total BOD Input[2] (lbs/month)	Adjusted Total BOD Input (lbs/day)
American-style and feta cheese	45,004,018	10.39	4,675,917	153,624
Total				**153,624**

Condensed Whey (Daily)

Process	Material Used (lbs/day)	BOD Factor[1] (lbs/100 lbs)	Adjusted Total BOD Input (lbs/day)
Whey Protein Concentrate	1,600,000	4.72	75,520
Total			**75,520**

Condensed Whey (Average Monthly)

Process	Material Used (lbs/month)	BOD Factor[1] (lbs/100 lbs)	Adjusted Total BOD Input[2] (lbs/month)	Adjusted Total BOD Input (lbs/day)
Whey Protein Concentrate	40,003,571	4.72	1,888,169	62,034
Total				**62,034**

Footnotes:

1. The BOD Factors are listed in ch. NR 240.07 Wis. Adm. Code, Table 1 for generally accepted published values for protein, fat, and carbohydrate content.
2. Adjusted Total BOD input = BOD input * BOD factor / 100

PART 6 – TBEL CALCULATIONS FOR NATURAL AND PROCESSED CHEESE

pH

Any discharge subject to BPT, BCT, or NSPS limitations or standards in this part must remain within the pH range of 6.0 to 9.0.

New Source Performance Standards (NSPS)

The production processes for American-style and feta cheese commenced construction after May 28th, 1974.

Therefore, the NSPS limitations of 40 CFR Part 405.65 would apply.

Total BOD Input (lbs/day)	NSPS Effluent Limitations				Calculated Limits			
	BOD (lbs/1,000 lbs)		TSS (lbs/1,000 lbs)		BOD (lbs/day)[1]		TSS (lbs/day)[1]	
	Avg	Max	Avg	Max	Avg	Max	Avg	Max
187,020.00		0.160		0.200		29.923		37.404
153,623.57	0.080		0.100		12.290		15.362	

Footnotes:

1. The limits (lbs/day) = total BOD input (lbs/day) / 1000 * NSPS limitations

PART 7 – TBEL CALCULATIONS FOR CONDENSED WHEY

pH

Any discharge subject to BPT, BCT, or NSPS limitations or standards in this part must remain within the pH range of 6.0 to 9.0.

New Source Performance Standards (NSPS)

The production processes for Whey Protein Concentrate commenced construction after May 28th, 1974.

Therefore, the NSPS limitations of 40 CFR Part 405.115 would apply.

Total BOD Input (lbs/day)	NSPS Effluent Limitations				Calculated Limits			
	BOD (lbs/1,000 lbs)		TSS (lbs/1,000 lbs)		BOD (lbs/day)[1]		TSS (lbs/day)[1]	
	Avg	Max	Avg	Max	Avg	Max	Avg	Max
75,520.00		0.220		0.276		16.614		20.844
62,034.29	0.110		0.138		6.824		8.561	

Footnotes:

1. The limits (lbs/day) = total BOD input (lbs/day) / 1000 * NSPS limitations

PART 8 – FINAL CALCULATED LIMITS

Per s. NR 240.06(3) Wis. Adm. Code, the total discharge limits shall be the total of the amounts calculated from the BOD input in the final product subcategory and all of the other subcategories with intermediate products in Parts 6 and 7 of this memo.

Subcategory	Monthly average BOD (lbs/day)	Daily maximum BOD (lbs/day)	Monthly average TSS (lbs/day)	Daily maximum TSS (lbs/day)
Natural and Processed Cheese	12.290	29.923	15.362	37.404
Condensed Whey	6.824	16.614	8.561	20.844
Total	**19.11**	**46.54**	**23.92**	**58.25**

Final Calculated Effluent Limitations			
Parameter & Units	**Daily Maximum**	**Daily Minimum**	**Monthly Average**
BOD_5	46.5 lbs/day		19.1 lbs/day
TSS	58.2 lbs/day		23.9 lbs/day
pH	9.0 su	6.0 su	

The Department has determined that the calculated Daily Maximum limits are less restrictive than the limits calculated in the previous permit. Therefore, these limits remain the same as in the current permit. If Nasonville Dairy Inc would like to request an increase to the existing permit limits, an assessment of their effluent data consistent with the requirements of ss. NR 207.04(1)(a) and (c), Wis. Adm. Code, must be provided. This evaluation is on a parameter by parameter basis and includes consideration of operations, maintenance and temporary upsets.

CORRESPONDENCE/MEMORANDUM

State of Wisconsin

DATE: November 6, 2025

TO: File

FROM: Woody Myers - WCR

SUBJECT: Groundwater Evaluation Report for Nasonville Dairy, Inc, WI-0040312

Site Information

The Nasonville Dairy facility is located at 10898 US Highway 10, Marshfield, Wood County. This is an industrial wastewater treatment system. Cheese making wastewater is currently treated and discharged to a surface water. The facility had two land treatment systems, lagoons that are acting as absorption ponds and spray irrigation fields. The lagoons and spray irrigation fields are not used and are no longer permitted. The lagoons are located in the SW ¼ of the SW ¼ of Section 34, T25N, R2E, Town of Lincoln. The spray irrigation fields are primarily located in the NW ¼ of the NW ¼ of Section 3, T24N, R2E Town of Rock.

Land Treatment & Groundwater Evaluation Summary

Table 1 Monitoring Wells

Well	Current Permit WI-0040312-07		Proposed Permit WI-0040312-08	
	Well Location	Well Designation	Well Location	Well Designation
801	Up-gradient	Background	Up-gradient	Background
802	Down-gradient	Non-Point of Standard	Down-gradient	Non-Point of Standard
803	Down-gradient	Non-Point of Standard	Down-gradient	Non-Point of Standard
804	Groundwater monitoring wells abandoned July 23, 2021			
805				
806				

No recommended changes from previous permit

Table 2 Groundwater Quality Standards

Parameter	Current Permit WI-0040312-07		Proposed WI-0040312-08	
	PAL	ES	PAL	ES
Depth to Groundwater	N/A	N/A	N/A	N/A
Groundwater Elevation	N/A	N/A	N/A	N/A
Chloride, Dissolved	125 mg/l	250 mg/l	125 mg/l	250 mg/l
Nitrogen, Nitrite + Nitrate	7.3 mg/l (ACL)	10.0 mg/l	7.3 mg/l (ACL)	10.0 mg/l
pH, Field	5.9-7.9 su	N/A	***6.3-8.3 su**	N/A
Nitrogen, Ammonia	0.97 mg/l	9.7 mg/l	0.97 mg/l	9.7 mg/l
Nitrogen, Organic	2.5 mg/l	N/A	***2.9** mg/l	N/A
Total Dissolved Solids	390 mg/l	N/A	***490** mg/l	N/A

* Recommended changes from previous permit

Geology

The bedrock under this facility is the undifferentiated Elk Mound Group. This group is comprised of sandstone with local occurrences of red and green shale (*Bedrock of Wood County, Wisconsin*, Wisconsin Geologic and Natural History Survey (WGNHS), 19860. Bedrock is anticipated to be no deeper than 100 feet below ground surface (bgs)(*Depth to Bedrock in Wisconsin,* WGNHS, 1973). The regolith consists of material ranging from silty sand to sand. Surface soil primarily consists of the Loyal silt loam and the Withee silt loam (USDA NRCS Web Soil Survey).

Hydrogeology

Calculated groundwater elevation ranges between 1282 and 1294 feet above mean sea level (msl). Depth to groundwater was reported to be between 47 and 57 feet bgs. Groundwater flow direction was calculated to be predominantly to the east. Regional groundwater flow direction in this area of Wood County is highly variable (*Water Table Elevation*, Map WGNHS, 1981). The site is adjacent to an unnamed creek that eventually discharges to the Yellow River. There are seven wells (municipal, other than municipal, private and high-capacity) within a 1,500-foot range of this facility's groundwater discharge.

Land Treatment Effluent Quality and Loading Rates

There are no active land treatment outfalls at this facility. Groundwater monitoring has been continued due to the residual chloride pollution present and accounted to past facility activities. Monitoring of the groundwater monitoring wells are required to monitor groundwater impacts around the area of the lagoon. The lagoon is not currently used to treat wastewater at the facility, but it was in the past and now collects runoff and precipitation. Groundwater monitoring data has indicated the presence of elevated chloride, therefore monitoring shall continue

Groundwater Monitoring System and Sampling Frequency

Groundwater samples were collected quarterly from all wells. All of the groundwater sampling parameters were analyzed for the dissolved phase in groundwater. Established groundwater quality standards are found in Table 1 Public Health Groundwater Quality Standards s. NR 140.10 Wis. Adm. Code, and Table 2 Public Welfare Groundwater Standards s. NR 140.12 Wis. Adm. Code. The thresholds of these standards are the Enforcement Standard (ES) and the Preventative Action Limit (PAL).

Table 3 Groundwater Monitoring Well Data

Sample Point	Well Name	Elevation (feet above msl)				Length (feet)		Well Type
		Casing Top	Ground Surface	Screen Top	Screen Bottom	Screen Length	Well Depth	
801	MW-1	1339.91	1337.9	1289.9	1274.9	15.0	63.0	WT
802	MW-2	1340.98	1339.0	1285.0	1263.0	22.0	76.0	WT
803	MW-3	1338.62	1336.6	1288.6	1273.6	15.0	63.0	WT
804	MW-4	1317.10	1313.68	1274.7	1264.7	10.0	46.0	Abandoned
805	MW-5	1275.66	1272.65	1257.7	1247.7	10.0	25.0	Abandoned
806	MW-6	1237.17	1234.62	1226.6	1216.6	10.0	18.0	Abandoned

All measurements in feet
WT-Water table Observation P-Piezometer O-Other

Groundwater Sampling Results

Groundwater sampling results from this facility have been analyzed for each well to evaluate trends of the regulated compounds in groundwater and to calculate PALs for s. NR 140.22 Wis. Adm. Code Indicator Parameters and to evaluate potential exemptions under s. NR 140.28 Wis. Adm. Code. The groundwater was evaluated by looking at the groundwater data from April 24, 2020 – June 15, 2025.

Background Groundwater Quality

The background (up-gradient) groundwater quality sample results for nitrite + nitrate were frequently above the s. NR 140.10 Wis. Adm. Code ES. The trend is stable. There were no other significant exceedances observed in the background groundwater quality sample results.

Down-gradient Groundwater Quality

The down-gradient groundwater quality for chloride exceeds the s. NR 140.12 Wis. Adm. Code PAL and ES frequently in wells 802 and 803 (See Figure 1). A best-fit line with a slope intercept equation was estimated. The slope in both cases in negative meaning the chloride concentration is declining over time.

There are no other significant exceedances in the down-gradient groundwater monitoring wells.

Proposed Groundwater Monitoring Requirements for Permit WI-0040312-08

Table 4 Groundwater Quality Sampling Frequency and Limits

Sample Point	Well Name	Sample Frequency	Well Designation
801	MW-1	***Semi-Annual**	Background
802	MW-2	***Semi-Annual**	Non-Point of Standard
803	MW-3	***Semi-Annual**	Non-Point of Standard
Parameter	PAL	ES	Source
Depth to Groundwater	N/A	N/A	Measured
Groundwater Elevation	N/A	N/A	Measured
Chloride, Dissolved	125 mg/l	250 mg/l	NR 140 Table 2
Nitrogen, Nitrite + Nitrate	7.3 mg/l (ACL)	10.0 mg/l	Calculated, NR 140 Table 1
pH, Field	***6.3-8.3 su**	N/A	Calculated
Nitrogen, Ammonia	0.97 mg/l	9.7 mg/l	NR 140 Table 1
Nitrogen, Organic	***2.9 mg/l**	N/A	Calculated
Total Dissolved Solids	***490** mg/l	N/A	Calculated

* Recommended changes from previous permit

Indicator Parameter PALs

Indicator Parameter PALs are developed following the procedures described in s. NR 140.20(2), Wis. Adm. Code. Indicator parameters do not have Enforcement Standards. The PAL for an indicator parameter is a benchmark for evaluating site specific trends. When significant increases in the trends are observed, the facility and the department's response action under s. NR 140.24 Wis. Adm. Code should be to investigate the source of the compound. The following equations were used to calculate the indicator parameter PALs:

$$\sum [\text{Mean of the background groundwater quality} + \text{Minimum Increase (NR 140.20 Table 3)}] = \text{PAL}$$

And for pH:

$$\sum [\text{Mean of the background groundwater quality} \pm 1 \text{ su}] = \text{upper and lower PAL}$$

Alternative Concentration Limits

Alternative concentration Limits (ACLs) can be developed and provided for a groundwater monitoring system utilizing the procedures described in s. NR 140.28, Wis. Adm. Code. ACLs were calculated using the following equation:

$$\sum [\text{Mean of the background groundwater quality} + (2) \times \text{Standard Deviation of Results}] = \text{ACL}$$

Conclusions

There are no active land treatment outfalls at this facility, the groundwater sampling is required to establish compliance with ch. NR 140 Wis. Adm. Code groundwater quality standards. Monitoring of these wells are required to monitor groundwater impacts around the area of the lagoon. The lagoon is not currently used to treat wastewater at the facility, but it was in the past and now collects runoff and precipitation. Groundwater monitoring data has indicated the presence of elevated chloride, therefore monitoring shall continue

Based on background groundwater quality sample results (well 801) the PAL for organic nitrogen and TDS have been increased. In addition, the PAL range for pH has been increased based on background groundwater quality data.

The sampling frequency can be reduced from quarterly to semi-annually based on the declining trends of chloride in the two down-gradient groundwater monitoring wells.

Figure 1
Chloride