Permit Fact Sheet

General Information

Permit Number	WI-0004413-10-0
Permittee Name and Address	Foremost Farms USA 684 South Church Street, Richland Center WI 53581
Permitted Facility Name and Address	Foremost Farms USA Richland Center 684 S Church Street
Permit Term	April 01, 2025 to March 31, 2030
Discharge Location	43° 19’ 48.64” N, 90° 23’ 7.86” W
Receiving Water	The Pine River in the Willow Creek Watershed (LW12) of the Lower Wisconsin River Basin in Richland County and Groundwaters of the State via land application.
Stream Flow ($Q_{7,10}$)	66 cfs
Stream Classification	Warm water sport fish community, non-public water supply
Discharge Type	Existing, continuous

Facility Description

The Foremost Farms USA facility in Richland Center (FFRC) uses fluid milk, condensed milk, and dried milk products to process mozzarella cheese and dried (or concentrated liquid) whey by-products. FFRC’s cheese-making and whey processing wastewaters are segregated into three categories: dairy condensates and permeate clear waters, low strength equipment cleaning and sanitation wastewaters, and high strength dairy liquid wastes.

The condensate-of-whey (COW) water is reused in the plant as make-up water for the boiler and as first stage wash water for the cheese making equipment. The high strength liquid dairy wastes (cream separator, evaporator, and drier first cleaning rinses/washes, off-specification whey, and off-specification milk) are spread on department approved land application sites. Other wastewaters (excess whey permeate, equipment cleaning and sanitation wastewaters, water softener regeneration wastewater, and boiler blowdown water) are currently sent to the Richland Center Renewable Energy (RCRE) wastewater treatment plant.

Foremost actively surface water discharges noncontact cooling water to the Pine River from Outfall 008 via storm sewer and averages 0.4 MGD. Outfall 001 has formerly been used for the discharge of COW water and RO permeate along with noncontact cooling water, but it has not been used since 2007. In the previous permit term, a compliance schedule was included for compliance with Outfall 001 Total Phosphorus WQBELs. Foremost’s chosen compliance option was to continue non-use of Outfall 001, indicating an upgrade would be completed to meet limits prior to resuming discharge if Outfall 001 would be needed in the future. Outfall 001 limits are now effective and must be met upon first discharge of Outfall 001 in this permit term.

Any proposed changes to monitoring requirements or limitations are highlighted in gray in the “Monitoring Requirements and Limitations” Tables below.

Substantial Compliance Determination

Several notices of noncompliance (NONs) were issued to this facility in response to separate spill events over the previous permit term, including: a NON issued September 3, 2024 regarding a boiler chemical discharge on August 13, 2024, a NON issued March 12, 2024 regarding an unregulated release of milk on February 7, 2024, a NON issued May 18, 2023 regarding an industrial wastewater spill on April 13, 2023, and a NON issued January 27, 2021 regarding an industrial wastewater spill on November 10, 2020. The permittee has reported all noncompliance as required by the permit and has complied with actions requested by the DNR in response to enforcement. A schedule for a Spill Management Plan has been included in this permit to optimize spill response and prevention procedures. This is to be reviewed and approved by the DNR.

After a desk top review of all discharge monitoring reports, land application reports, compliance schedule items, and a site visit on November 16, 2023, this facility has been found to be in substantial compliance with their current permit. Compliance determination made by Jordan Main on 1/21/25.

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)**
001	0 Gallons in the last permit term [2020 -2024]	OUTFALL: Discharge of dairy condensate, reverse osmosis permeate, and noncontact cooling water to the Pine River. Outfall located South of Gage Street and reaches Pine River via a City of Richland Center storm sewer. Monitoring is only required during periods of active discharge. A continuous flow measuring device located in weir outside cheese dock is used to measure flow. Composite samples are gathered from the weir outside cheese dock while grab samples are attained from the manhole.
002	144,000 Gallons. One discharge in the last permit term which occurred September, 2023. [2020-2024]	OUTFALL: Land application/spreading of high strength dairy wastewaters, such as separator, evaporator, or dryer rinse waters, salt whey drippings, separator solids, and wet scrubber solids. Monthly monitoring and reporting are only required if land application through 002 occurred that month. Representative composite samples are gathered from the North and South liquid/by-product solid silos.
003	0 Gallons in the last permit term [2020 -2024]	OUTFALL: The land application/spreading of unusable whey permeate or other dairy solids on an infrequent basis. Quarterly monitoring and reporting are only required if land application through 003 occurred that quarter. Representative composite samples are gathered from the associated on-site storage tank prior to haul-out.
004	0 Gallons in the last permit term [2020 -2024]	OUTFALL: The land application/spreading of unusable whey protein concentrate on an infrequent basis. Quarterly monitoring and reporting are only required if land application through 004 occurred that quarter. Representative composite samples are gathered from the associated on-site storage tank prior to haul-out.
005	0 Gallons in the last permit term [2020-2024]	OUTFALL: The infrequent land application/spreading of unusable whole whey or milk, such as milk containing detectable antibiotics. Quarterly monitoring and reporting are only required if land application through 005 occurred that quarter. Representative

Sample Point Designation		
Sample Point Number	**Discharge Flow, Units, and Averaging Period**	**Sample Point Location, Waste Type/Sample Contents and Treatment Description (as applicable)**
		composite samples are gathered from the associated on-site storage tank prior to haul-out.
008	Average Flow: 0.38 MGD [2020-2024]	OUTFALL: Discharge of noncontact cooling waters to the Pine River. Monitoring is only required during periods of active discharge. Outfall located South of Gage Street and reaches Pine River via a City of Richland Center storm sewer. A continuous flow measuring device located in weir outside the cheese dock is used to measure flow. Composite samples are gathered from the weir outside cheese dock while grab samples are attained from the manhole.

Permit Requirements

1 Surface Water - Monitoring and Limitations

1.1 Sample Point Number: 008- NCCW ONLY

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow Rate		MGD	Daily	Continuous	
Temperature	Daily Max	120 deg F	Daily	Continuous	Limit effective August, October and December each year. See permit subsection 1.2.1.1 and 1.2.1.2
pH (Maximum)	Daily Max	9.0 su	5/Week	Grab	
pH (Minimum)	Daily Min	6.0 su	5/Week	Grab	
Chlorine, Total Residual	Daily Max	38 µg/L	5/Week	Grab	See permit subsection 1.2.1.3
Chlorine, Total Residual	Weekly Avg	28 µg/L	5/Week	Grab	See permit subsection 1.2.1.3
Chlorine, Total Residual	Monthly Avg	28 µg/L	5/Week	Grab	See permit subsection 1.2.1.3
Phosphorus, Total		mg/L	2/Year	24-Hr Flow Prop Comp	
BOD5, Total		mg/L	Annual	24-Hr Flow Prop Comp	

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Nitrogen, Ammonia (NH3-N) Total		mg/L	Annual	24-Hr Flow Prop Comp	
Acute WET		TUa	See Listed Qtr(s)	24-Hr Flow Prop Comp	See permit subsection 1.2.1.5
Chronic WET		TUc	See Listed Qtr(s)	24-Hr Flow Prop Comp	See permit subsection 1.2.1.5

1.1.1 Changes from Previous Permit

Sample point 008 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.

Temperature: Daily max limit of 120 deg F has been added for the months of August, October and December. For more information, see fact sheet Appendix A: Water Quality-Based Effluent Limits.

pH: Parameter name has been corrected to pH (Maximum) and pH (Minimum). pH field is reserved for land application samples, which is not the case here.

Chlorine, Total Residual: Sample frequency has been changed from 2/week to 5/week. DMR data and past exceedances support more frequent monitoring to adequately capture consistent compliance with the limit. Additionally, the minimum surface water monitoring frequency recommended in the Monitoring Frequencies for Individual Wastewater Permits guidance (April 12, 2021), is 5/week for dairy facilities.

Sample Type: Sample type has been corrected from "3-Grab Comp" to "24-Hr Flow Prop Comp" to accurately portray how samples are being taken.

Narrative Requirements: Order of the narrative requirements has been rearranged to match the order of parameters in the table.

- "Effluent Temperature Limitations" narrative requirements has been added.

1.1.2 Explanation of Limits and Monitoring Requirements

Detailed discussions of limits and monitoring requirements can be found in fact sheet Appendix A: Water Quality-Based Effluent Limits dated 8/12/2024.

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.

pH: pH limit established to ensure the water quality standards for pH in s. NR102.04(4)(c) are met. This monitoring also functions to catch abnormal effluent conditions, especially when identifying additive dosing issues.

WET Testing: Acute and Chronic WET testing requirement has been continued with no changes from the previous permit term. A determination was made by compliance staff that despite the recommendation made in Appendix A, continued monitoring is justified to confirm compliance with NR 205.07(1)(j) and the implementation of additive SOPs.

1.2 Sampling Point (Outfall) 001 - COW/PERMEATE/ NCCW TO RIVER

Monitoring Requirements and Effluent Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow Rate		MGD	Daily	Continuous	The compliance engineer must be contacted prior to the first-time discharge from this outfall in the current permit term.This is to verify WQBELS will be met immediately upon first discharge.
Temperature	Daily Max	120 deg F	Daily	Continuous	See permit subsection 1.2.2.1 and 1.2.2.2
Chlorine, Total Residual	Daily Max	38 µg/L	5/Week	Grab	See permit subsection 1.2.2.3
Chlorine, Total Residual	Weekly Avg	28 µg/L	5/Week	Grab	See permit subsection 1.2.2.3
Chlorine, Total Residual	Monthly Avg	28 µg/L	5/Week	Grab	See permit subsection 1.2.2.3
BOD_5, Total		mg/L	5/Week	24-Hr Flow Prop Comp	See permit subsection 1.2.2.4
BOD_5, Total	Daily Max	58 lbs/day	5/Week	Calculated	See permit subsection 1.2.2.4
BOD_5, Total	Monthly Avg	29 lbs/day	5/Week	Calculated	See permit subsection 1.2.2.4
Suspended Solids, Total		mg/L	5/Week	24-Hr Flow Prop Comp	See permit subsection 1.2.2.4
Suspended Solids, Total	Daily Max	74 lbs/day	5/Week	Calculated	See permit subsection 1.2.2.4
Suspended Solids, Total	Monthly Avg	37 lbs/day	5/Week	Calculated	See permit subsection 1.2.2.4
pH (Maximum)	Daily Max	9.0 su	5/Week	Grab	
pH (Minimum)	Daily Min	6.0 su	5/Week	Grab	
Phosphorus, Total	Monthly Avg	0.225 mg/L	Weekly	24-Hr Flow Prop Comp	
Phosphorus, Total	6-Month Avg	0.075 mg/L	Weekly	24-Hr Flow Prop Comp	
Nitrogen, Ammonia (NH_3-N) Total	Daily Max	17 mg/L	Weekly	24-Hr Flow Prop Comp	

Monitoring Requirements and Effluent Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Nitrogen, Ammonia (NH_3-N) Total	Monthly Avg	17 mg/L	Weekly	24-Hr Flow Prop Comp	Effective October - May
Nitrogen, Ammonia (NH_3-N) Total	Monthly Avg	13 mg/L	Weekly	24-Hr Flow Prop Comp	Effective June – September
Copper, Total Recoverable		µg/L	Annual	24-Hr Flow Prop Comp	See permit subsection 1.2.2.5
Hardness, Total as $CaCO_3$		mg/L	Annual	24-Hr Flow Prop Comp	
Zinc, Total Recoverable		µg/L	Annual	24-Hr Flow Prop Comp	See permit subsection 1.2.2.5
Acute WET		TU_a	See Listed Qtr(s)	24-Hr Flow Prop Comp	See permit subsection 1.2.2.7
Chronic WET		TUc	See Listed Qtr(s)	24-Hr Flow Prop Comp	See permit subsection 1.2.2.7

1.2.1 Changes from Previous Permit

Sample point 001 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.

Phosphorus, Total: The rolling 12-month avg of 1.0 mg/L limit has been removed. That is because the limit was placed as an interim limit that expired July 1, 2021 once the monthly and 6-month avg limit became effective in the last permit.

Chlorine, Total Residual: Sample frequency has been changed from 2/week to 5/week. DMR data and past exceedances support more frequent monitoring to adequately capture consistent compliance with the limit. Additionally, the minimum surface water monitoring frequency recommended in the Monitoring Frequencies for Individual Wastewater Permits guidance (April 12, 2021), is 5/week for dairy facilities.

pH: Parameter name has been corrected to pH (Maximum) and pH (Minimum). pH field is reserved for land application samples, which is not the case here.

Sample Type: Sample type has been corrected for the Nitrogen, Ammonia parameter from "24-Hr Comp" to "24-Hr Flow Prop Comp" to accurately portray how samples are being taken.

Narrative Requirements: Order of the narrative requirements has been rearranged to match the order of parameters in the table.

- "Effluent Temperature Limitations" narrative requirements has been added.

- "Phosphorus Water Quality Based Effluent Limitation(s)" narrative requirements have been deleted because limits are now immediately effective, therefore this section is no longer needed.

1.2.2 Explanation of Limits and Monitoring Requirements

Detailed discussions of limits and monitoring requirements can be found in fact sheet Appendix A: Water Quality-Based Effluent Limits dated 8/12/2024.

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.

BOD_5, Total and Suspended Solids, Total:

Categorical effluent limitation calculations are available in fact sheet attachment Appendix B: Categorical Limits Evaluation, however, allocations for these technology-based effluent limitations are already applied in RCRE's WPDES permit (permit no. WI-0064718-03-0). Pursuant to s. NR 220.15(2)(b), Wis. Adm. Code, because Foremost Farms Richland Center (FFRC) currently discharges 100% of the reverse osmosis permeate and condensate of whey (COW) to RCRE, RCRE gets 100% of the allocated BOD_5 and TSS loads. If FFRC were to choose to discharge through Outfall 001, then a discharge of RO permeate and COW to RCRE would be limited according to the following equation:

$$P = \frac{E \times N}{T}$$

Where:
P is the final, adjusted permit effluent limitation.
E is the limitation derived by applying effluent guidelines to the total wastestream.
N is the wastewater flow to be treated and discharged to surface waters.
T is the total wastewater flow.

Using this equation, 'N' would be zero in all cases for both BOD_5 and TSS when discharge of RO permeate and COW to RCRE is occurring.

pH: pH limit established to ensure the water quality standards for pH in s. NR102.04(4)(c) are met. This monitoring also functions to catch abnormal effluent conditions, especially when identifying additive dosing issues.

2 Land Application - Liquid/By-Product Solids (industrial only)

2.1 Sample Point Number: 002- HIGH STRENGTH WW TO FIELDS

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow Rate		gal	Daily	Estimated	Report only if land application through this outfall occurred that day.
COD		mg/L	Monthly	Grab Comp	
Chloride		mg/L	Monthly	Grab Comp	
Nitrogen, Total Kjeldahl		mg/L	Monthly	Grab Comp	
Phosphorus, Total		mg/L	Monthly	Grab Comp	
Phosphorus, Water		% of Tot P	Monthly	Grab Comp	

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Extractable					
Solids, Total		Percent	Monthly	Grab Comp	

2.1.1 Changes from Previous Permit:

Sample point 002 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.

Parameters: Solids Total monthly monitoring added.

Sample Type: Sample type corrected from "Composite" to "Grab Composite". This was done to accurately portray how samples are being taken.

Narrative Requirements:

- Name of narrative requirement named "Composite Sample" changed to "Grab Composite Sample" for clarity.
- "Sampling" narrative requirement added to explain how to handle large pieces of byproduct solids.

2.1.2 Explanation of Limits and Monitoring Requirements

Requirements for land application of industrial sludge are determined in accordance with ch. NR 214 Wis. Adm. Code.

Chloride: Dairy processing contains chloride. This chloride has the potential to be held and removed in sludge. Therefore, monitoring requirements for chloride are retained in the proposed permit in accordance with s. NR 214.18(5)(b), Wis. Adm. Code.

Nitrogen: The maximum application rate of nitrogen shall be limited to the nitrogen needs of the crop or cover vegetation minus any other nitrogen, including fertilizer or manure, added to the landspreading site as specified in s. NR 214.17(4)(d)9., Wis. Adm. Code.

Total Phosphorus and Water Extractable Phosphorus: Water extractable phosphorus (WEP) is the coefficient for determining plant available phosphorus from measured total phosphorus. In Wisconsin, the Penn State Method is utilized and is expressed in percent. While total phosphorus may be significant, the WEP may show that only a small percentage of the phosphorus is available to plants because of factors such as treatment processes and chemical addition that "tie-up" phosphorus, limiting the amount of phosphorus that is plant available. As part of the Wisconsin's nutrient management plan (NMP) requirements, the accounting of all fertilizers must be included over the NMP cycle. The fertilizer value of the waste needs to be communicated to the farmer and accounted for in the NMP.

Manure Pit(s) Disposal: Industrial liquid waste discharges to manure pits is possible if the industrial liquid is less than 10% of the mixture in the manure pit, as specified in s. NR 214.17(1), Wis. Adm. Code. However, the manure pit must be approved by the Department.

2.2 Sample Point Number: 003- WHEY PERMEATE TO FIELDS; 004- WHEY PROTEIN CONC TO FIELDS, and 005- WHOLE WHEY TO FIELDS

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow Rate		gal	Daily	Estimated	Report only if land application through this outfall occurred that day.
COD		mg/L	Quarterly	Grab Comp	
Chloride		mg/L	Quarterly	Grab Comp	
Nitrogen, Total Kjeldahl		mg/L	Quarterly	Grab Comp	
Phosphorus, Total		mg/L	Quarterly	Grab Comp	
Phosphorus, Water Extractable		% of Tot P	Quarterly	Grab Comp	
Solids, Total		Percent	Quarterly	Grab Comp	

2.2.1 Changes from Previous Permit:

Sample point 003, 004 and 005 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.

Parameters: Solids Total quarterly monitoring added.

Sample Type: Sample type corrected from "Composite" to "Grab Composite". This was done to accurately portray how samples are being taken.

Narrative Requirements:

- Name of narrative requirement named "Composite Sample" changed to "Grab Composite Sample" for clarity.
- "Sampling" narrative requirement added to explain how to handle large pieces of byproduct solids.

2.2.2 Explanation of Limits and Monitoring Requirements

Requirements for land application of industrial liquid wastes and by-product solid are determined in accordance with ch. NR 214 Wis. Adm. Code.

Chloride: The wastes associated with these outfalls are from dairy processing which contains chloride in their process wastewater. Therefore, sampling for chloride is needed at these outfalls in accordance with s. NR 214.17(4)(d)7., Wis. Adm. Code.

Nitrogen: The maximum application rate of nitrogen shall be limited to the nitrogen needs of the crop or cover vegetation minus any other nitrogen, including fertilizer or manure, added to the landspreading site as specified in s. NR 214.17(4)(d)9., Wis. Adm. Code.

Total Phosphorus and Water Extractable Phosphorus: Water extractable phosphorus (WEP) is the coefficient for determining plant available phosphorus from measured total phosphorus. In Wisconsin, the Penn State Method is utilized and is expressed in percent. While total phosphorus may be significant, the WEP may show that only a small percentage of the phosphorus is available to plants because of factors such as treatment processes and chemical addition that "tie-up" phosphorus, limiting the amount of phosphorus that is plant available. As part of the Wisconsin's nutrient management

plan (NMP) requirements, the accounting of all fertilizers must be included over the NMP cycle. The fertilizer value of the waste needs to be communicated to the farmer and accounted for in the NMP.

Manure Pit(s) Disposal: Industrial liquid waste discharges to manure pits is possible if the industrial liquid is less than 10% of the mixture in the manure pit, as specified in s. NR 214.17(1), Wis. Adm. Code. However, the manure pit must be approved by the Department.

3 Schedules

3.1 Spill Management Plan

A management plan is required to optimize spill response and prevention procedures for unauthorized discharges.

Required Action	Due Date
Spill Management Plan: Submit a management plan for review and approval optimizing spill response and prevention procedures for unauthorized discharges. The management plan must demonstrate compliance with Wisconsin Administrative Code NR 205.07(1)(j).	10/01/2025

3.1.1 Explanation of Schedule

A compliance history of multiple industrial wastewater and chemical spill events has resulted in inclusion of this schedule to improve the permittee's internal procedures to maintain proper operations and maintenance and prevent unauthorized discharges.

3.2 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. An approvable submission will contain information detailing the land application outfalls, related upstream processes and manure pit exemptions.	10/01/2025

3.2.1 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

No comments

Attachments

Appendix A: Water Quality Based Effluent Limits (8/12/2024 and updated 2/18/2025)

Appendix B: Categorical Limits Evaluation (02/19/2025)

Justification Of Any Waivers From Permit Application Requirements

No waivers requested or granted as part of this permit reissuance.

Prepared By: Laura Rodriguez Alvarez Wastewater Engineer Date: February 19, 2025

Appendix A

CORRESPONDENCE/MEMORANDUM

State of Wisconsin

DATE: 08/12/2024 – updated 02/18/2025 for units typo

TO: Laura Rodriguez Alvarez – WY/3

FROM: Nicole Krueger – SER Nicole Krueger

SUBJECT: Water Quality-Based Effluent Limitations for Foremost Farms USA Richland Center WPDES Permit No. WI-0004413-10

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 Foremost Farms Richland Center in Richland County. This industrial facility discharges to the Pine River, located in the Willow Creek Watershed in Lower Wisconsin River 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 Outfalls 001 and 008:

Outfall 008 – NCCW

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Six-Month Average	Footnotes
Flow Rate						1,2
Temperature August October December	 120° F 120° F 120° F					3
pH	9.0 s.u.	6.0 s.u.				1
Residual Chlorine	38 µg/L		28 µg/L	**28 µg/L**		1,4
Phosphorus						2
BOD_5						2
Ammonia Nitrogen						2

Outfall 001 – COW/Permate/NCCW to River (Inactive)

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Six-Month Average	Footnotes
Flow Rate						2
Temperature	120 deg F					1
Residual Chlorine	38 µg/L		28 µg/L	**28 µg/L**		1,4
BOD_5	58 lbs/day			29 lbs/day		5
TSS	74 lbs/day			37 lbs/day		5
pH	9.0 s.u.	6.0 s.u.				1
Phosphorus				0.225 mg/L	0.075 mg/L	1
Ammonia Nitrogen October – May June – September	 17 mg/L 17 mg/L			 **17 mg/L** 13 mg/L		1,4
Copper						2

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Six-Month Average	Footnotes
Hardness, Total as $CaCO_3$						2
Zinc						2
Acute WET						6,7
Chronic WET						6,7

Footnotes:

1. No changes from the current permit.
2. Monitoring only.
3. A compliance schedule may be included in the reissued permit to meet the temperature limits.
4. 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.
5. The mass limits are categorical limits based on ch. NR 240, Wis. Adm. Code. These limits are not addressed in this memo and may need to be adjusted based on current production.
6. **Outfall 001:** Acute WET testing is required 3x during the permit term and chronic WET testing is required 2x during the permit term. The Instream Waste Concentration (IWC) to assess chronic test results is 6%. 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 30% or 100%, 30%, 10%, 3% & 1% and the dilution water used in WET tests conducted on Outfall 001 shall be a grab sample collected from Pine River.
7. 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 Nicole Krueger at Nicole.Krueger@wisconsin.gov or Diane Figiel at Diane.Figiel@wisconsin.gov.

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

PREPARED BY: Nicole Krueger, Water Resources Engineer – SER

E-cc: Jordan Main, Wastewater Engineer – SCR/Fitchburg
Jason Knutson, Wastewater Section Chief
Diane Figiel, Water Resources Engineer – WY/3
Nate Willis, Wastewater Engineer – WY/3

Attachment #1

Water Quality-Based Effluent Limitations for
Foremost Farms USA Richland Center

WPDES Permit No. WI-0014413-10

Prepared by: Nicole Krueger

PART 1 – BACKGROUND INFORMATION

Facility Description

The Foremost Farms USA facility in Richland Center (FFRC) uses fluid milk, condensed milk, and dried milk products to process mozzarella cheese and dried (or concentrated liquid) whey by-products. FFRC's cheese-making and whey processing wastewaters are segregated into three categories: dairy condensates and permeate clear waters, low strength equipment cleaning and sanitation wastewaters, and high strength dairy liquid wastes. The proposed permit contains Outfall 008, with limitations and monitoring requirements for when the discharge to the river is exclusively non-contact cooling water.

The condensate-of-whey (COW) water is reused in the plant as make-up water for the boiler and as first stage wash water for the cheese making equipment. The high strength liquid dairy wastes (cream separator, evaporator, and drier first cleaning rinses/washes, off-specification whey, and off-specification milk) are spread on department approved land application sites. Other wastewaters (excess whey permeate, equipment cleaning and sanitation wastewaters, water softener regeneration wastewater, and boiler blowdown water) are currently being sent to the Richland Center Renewable Energy (RCRE) wastewater treatment plant.

The only active surface water discharge from the facility is a noncontact cooling water discharge to the Pine River via storm sewer. The discharge averages less than 0.5 MGD and is designated as Outfall 008 in the current permit. The permit also includes Outfall 001 for the discharge of COW water and RO permeate along with the noncontact cooling water. This outfall has not been utilized since 2007and will be retained as an inactive outfall in the reissued permit. **Because there is no new data or criteria for this outfall, the current limits and monitoring requirements are not evaluated in this memo.**

Attachment #2 is a map of the area showing the approximate location of Outfall 008.

Existing Permit Limitations

The current permit, which expired June 30, 2024, includes the following effluent limitations and monitoring requirements.

Outfall 008 – NCCW

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Six-Month Average	Footnotes
Flow Rate						1
Temperature						1
pH	9.0 s.u.	6.0 s.u.				2
Residual Chlorine	38 mg/L		28 mg/L	**28 mg/L**		3
Phosphorus						1
BOD_5						1

Attachment #1

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Six-Month Average	Footnotes
Ammonia Nitrogen						1
Acute WET						4
Chronic WET						4

Outfall 001 – COW/Permate/NCCW to River

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Six-Month Average	Footnotes
Flow Rate						1
Temperature	120 deg F					2
Residual Chlorine	38 mg/L		28 mg/L	**28 mg/L**		2,3
BOD_5	58 lbs/day			29 lbs/day		
TSS	74 lbs/day			37 lbs/day		
pH	9.0 s.u.	6.0 s.u.				2
Phosphorus				0.225 mg/L	0.075 mg/L	2
Ammonia Nitrogen October – May June – September	 17 mg/L 17 mg/L			 **17 mg/L** 13 mg/L		3
Copper						1
Hardness, Total as $CaCO_3$						1
Zinc						1
Acute WET						5
Chronic WET						5

Footnotes:

1. Monitoring only.
2. 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.
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. 2x/permit term acute and chronic WET testing is required. The IWC for chronic WET was 5%.
5. 3x/permit term acute and 2x/permit term chronic WET testing is required. The IWC for chronic WET was 6%.

Receiving Water Information

- Name: Pine River
- Waterbody Identification Code (WBIC): 1220600
- Classification used in accordance with chs. NR 102 and 104, Wis. Adm. Code: Warm Water Sport Fish (WWSF) community, non-public water supply.
- Low flows used in accordance with chs. NR 106 and 217, Wis. Adm. Code: The following 7-Q_{10} and 7-Q_2 values are from USGS for Station LW46, where Outfall 001 is located.

7-Q_{10} = 66 cfs (cubic feet per second)
7-Q_2 = 82 cfs

- Hardness = 202 mg/L as $CaCO_3$. This value represents the geometric mean of data from 11/05/2019 – 10/17/2023 from chronic WET testing from Richland Center and Foremost Farms.
- % 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: Metals data from Pine River at South 14th in Richland Center is used for this evaluation The numerical values are shown in the tables below. If no data is available, the background concentration is assumed to be negligible and a value of zero is used in the computations. Background data for calculating effluent limitations for ammonia nitrogen are described later.
- Multiple dischargers: There are several other dischargers to the Pine River, however they are not in the immediate vicinity and the mixing zones do not overlap. Therefore, the other dischargers do not impact this evaluation.
- Impaired water status: The immediate receiving water is 303(d) listed as impaired for total phosphorus.

Effluent Information

- Flow rate(s):
  Maximum annual average = 0.39 MGD (Million Gallons per Day)
  For reference, the actual average flow from 07/01/2019 – 06/30/2024 was 0.38 MGD.
- Hardness = 233 mg/L as $CaCO_3$. This value represents the geometric mean of data from the permit reissuance application from 09/27/2023 – 10/06/2023.
- 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: Private well.
- Additives: Chlorine and sodium bisulfite is used.
- 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 ammonia, chloride, hardness and phosphorus.
- 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 data are shown in the tables below or in their respective parts in this evaluation.

Effluent Copper Data

Sample Date	Copper µg/L
09/27/2023	<0.8
09/30/2023	<0.8
10/03/2023	<0.8
10/06/2023	<0.8

The following table presents the average concentrations and loadings at Outfall 008 from 07/01/2019 – 06/30/2024 for all parameters with limits in the current permit to meet the requirements of s. NR 201.03(6), Wis. Adm. Code:

Attachment #1

Parameter Averages with Limits

	Average Measurement
pH field	7.7 s.u.
Chlorine	0.07 µg/L*

*Results below the level of detection (LOD) were included as zeroes 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 not the case for Foremost Farms 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).

Daily Maximum Limits based on Acute Toxicity Criteria (ATC)
RECEIVING WATER FLOW = 52.8 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.
Arsenic		340		680	136	<14
Cadmium	233	27.2	0.08	54	10.9	0.4
Chromium	233	3605	3	7209	1442	<1.3
Copper	233	34.5	3.64	69	13.8	<0.8
Lead	233	242		484	97	<3.5
Nickel	233	960		1919	384	3.2
Zinc	233	252		504	101	5.2
Chloride (mg/L)		757	4.88	1514	303	8.0

* The indicated hardness may differ from the effluent hardness because the effluent hardness exceeded the maximum range in ch. NR 105, Wis. Adm. Code, over which the acute criteria are applicable. In that case, the maximum of the range is used to calculate the criterion.
* * The 2 × ATC method of limit calculation yields a more restrictive limit than consideration of ambient concentrations and 1-Q_{10} 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 = 16.5 cfs (¼ of the 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.
Arsenic		152		4314	863	<14
Cadmium	175	3.82	0.08	106	21.2	0.4
Chromium	202	235	3	6578	1316	<1.3
Copper	202	18.9	3.64	436	87.2	<0.8
Lead	202	55.2		1566	313	<3.5
Nickel	202	94.6		2682	536	3.2
Zinc	202	223		6310	1262	5.2
Chloride (mg/L)		395	4.88	11062	2212	8.0

* 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.

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Monthly Average Limits based on Human Threshold Criteria (HTC)

RECEIVING WATER FLOW = 28.1 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	0.08	17600	3520	0.4
Chromium (+3)	3818000	3	181655840	36331168	<1.3
Lead	140		6661	1332	<3.5
Nickel	43000		2045890	409178	3.2

Monthly Average Limits based on Human Cancer Criteria (HCC)

RECEIVING WATER FLOW = 28.1 cfs (¼ 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		633	127	<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 required for toxic substances in this section.

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 type of discharge, PFOS and PFOA monitoring is not recommended. 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.

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. Given the fact that Foremost Farms does not currently have ammonia nitrogen limits for Outfall 008, the need for limits is evaluated at this time.

Effluent Data

The following table summarizes ammonia data reported from 09/10/2019 – 09/06/2023.

Ammonia Nitrogen Effluent Data

Sample Date	Ammonia Nitrogen mg/L
09/10/2019	<0.24
09/02/2020	<0.24

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Sample Date	Ammonia Nitrogen mg/L
09/01/2021	0.29
09/01/2022	<0.21
09/06/2023	0.46
Average	0.15

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

Theses concentrations are low, and well below any of the applicable criteria or acute water quality-based effluent limits. Therefore, **no water quality-based effluent limits for ammonia nitrogen are recommended in the reissued permit. Monitoring is recommended to continue.**

PART 4 – PHOSPHORUS

Technology-Based Effluent Limit
Subchapter II of Chapter NR 217, Wis. Adm. Code, requires industrial facilities that discharge greater than 60 pounds of Total Phosphorus per month to comply with a monthly average limit of 1.0 mg/L, or an approved alternative concentration limit.

Because Foremost Farms does not currently have an existing technology-based limit, the need for this limit in the reissued permit is evaluated. The data demonstrates that the annual monthly average phosphorus loading is less than 60 lbs/month, which is the threshold for industrial facilities in accordance to s. NR 217.04(1)(a)2, Wis. Adm. Code, and therefore no technology-based limit is required.

Annual Average Mass Total Phosphorus Loading

Month	Result mg/L	Total Flow MG/month	Total Phosphorus lb./mo.
Mar 2023	<0.03	11.9	0
April 2023	<0.03	11.9	0
Sept 2023	<0.03	11.4	0
Mar 2024	0.05	11.9	4.95

Total P (lbs/month) = Monthly average (mg/L) × total flow (MG/month) × 8.34 (lbs/gallon)
Where total flow is the sum of the actual (not design) flow (in MGD) for that month

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

Water Quality-Based Effluent Limits (WQBEL)
Revisions to administrative rules regulating phosphorus took effect on December 1, 2010. These rule revisions include additions to s. NR 102.06, Wis. Adm. Code, which establish phosphorus standards for surface waters. Subchapter III of NR 217, Wis. Adm. Code, establishes procedures for determining WQBELs for phosphorus, based on the applicable standards in ch. NR 102, Wis. Adm. Code.

Section NR 102.06(3)(a), Wis. Adm. Code, specifically names river segments for which a phosphorus criterion of 0.100 mg/L applies. For other stream segments that are not specified in s. NR 102.06(3)(a), Wis. Adm. Code, s. NR 102.06(3)(b), Wis. Adm. Code, specifies a phosphorus criterion of 0.075 mg/L. The phosphorus criterion of 0.075 mg/L applies for the Pine River.

The conservation of mass equation is described in s. NR 217.13(2)(a), Wis. Adm. Code, for phosphorus

WQBELs and includes variables of water quality criterion (WQC), receiving water flow rate (Qs), effluent flow rate (Qe), and upstream phosphorus concentrations (Cs) provided below.

$$\text{Limitation} = [(WQC)(Qs+(1-f)\ Qe) - (Qs-f\ Qe)\ (Cs)]/Qe$$

Where:

WQC = 0.075 mg/L for the Pine River
Qs = 100% of the 7-Q_2 of 82 cfs
Cs = background concentration of phosphorus in the receiving water pursuant to s. NR 217.13(2)(d), Wis. Adm. Code
Qe = effluent flow rate = 0.39 MGD = 0.603 cfs
f = the fraction of effluent withdrawn from the receiving water = 0

Section NR 217.13(2)(d), Wis. Adm. Code, specifies that the background phosphorus concentration used in the limit calculation formula shall be calculated as a median using the procedures specified in s. NR 102.07(1)(b) to (c), Wis. Code.

A previous evaluation resulted in a WQBEL of 0.075 mg/L using a background concentration of 0.088 mg/L. Section NR 217.13(2)(d), Wis. Adm. Code, states that the determination of upstream concentrations shall be evaluated at each permit reissuance.

There is not additional instream phosphorus data since the last WQBEL memo. The instream total phosphorus data from the Pine River at Hwy 14 from 07/13/2005 – 09/19/2006 stored in the Surface Water Integrated Monitoring System database indicates the median background total phosphorus concentration in the Pine River at Hwy 14 (SWIMS station ID 533029) is 0.088 mg/L.

Substituting a background concentration above criteria into the limit calculation equation above would result in a calculated limit that is less than the applicable criterion of 0.075 mg/L. However, s. NR 217.13(7), Wis. Adm. Code, specifies that "if the WQBEL calculated pursuant to the procedures in this section is less than the phosphorus criterion specified in s. NR 102.06, Wis. Adm. Code, for the water body, the effluent limit shall be set equal to the criterion."

Effluent Data

The following table summarizes effluent total phosphorus monitoring data from 09/10/2019 – 03/19/2024.

Total Phosphorus Effluent Data

Sample Date	Phosphorus mg/L	Sample Date	Phosphorus mg/L	Sample Date	Phosphorus mg/L
09/10/2019	0.01	09/01/2021	<0.04	04/06/2023	<0.03
03/04/2020	<0.01	03/01/2022	0.05	09/06/2023	<0.03
09/02/2020	0.04	09/01/2022	<0.03	03/19/2024	0.05
03/01/2021	<0.04	03/06/2023	<0.03		
Average = 0.014 mg/L					

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

Reasonable Potential Determination

The discharge does not have reasonable potential to cause or contribute to an exceedance of the water quality criterion because the average of the reported effluent total phosphorus data is less than 1/5th of the the calculated WQBEL**.** Therefore, **a WQBEL is not required. Monitoring is recommended to continue in the reissued permit.**

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.

Due to the amount of upstream flow available for dilution in the limit calculation (Qs:Qe >20:1), the lowest calculated limitation is 120° F (s. NR 106.55(6)(a), Wis. Adm. Code).

The table below summarizes the maximum temperatures reported during monitoring from 07/01/2019 – 06/30/2024.

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	103	107	NA	120
FEB	106	110	NA	120
MAR	102	109	NA	120
APR	103	108	NA	120
MAY	103	112	NA	120
JUN	106	117	NA	120
JUL	106	116	NA	120
AUG	107	128	NA	**120**
SEP	102	107	NA	120
OCT	105	123	NA	**120**
NOV	102	105	NA	120
DEC	103	123	NA	**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, **a daily maximum temperature limit of 120° F is needed for the months of August, October, and December.**

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 LC_{50} (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 IC_{25} (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 **5%** 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:

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

Where:

Q_e = annual average flow = 0.39 MGD = 0.603 cfs
f = fraction of the Q_e withdrawn from the receiving water = 0
Q_s = ¼ of the 7-Q_{10} = 66 cfs ÷ 4 = 16.5 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 008 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 008. 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	Pass or Fail?	Use in RP?	
11/29/2006	>100	64.75	Fail	No					1
12/13/2006	>100	>100	Pass	No					1
01/17/2007	>100	>100	Pass	No					1
05/27/2015	>100	>100	Pass	No					1
12/14/2016	>100	84.3	Fail	No					1
02/15/2017	>100	67.4	Fail	No					1
03/08/2017	>100	>100	Pass	No					1
02/13/2018	>100	>100	Pass	Yes					
08/10/2021	>100	>100	Pass	Yes	>100	>100	Pass	Yes	
10/17/2023	>100	>100	Pass	Yes	>100	>100	Pass	Yes	

Footnotes:

1. Data prior to 2017 is not representative because the facility was overdosing sodium bisulfite and has since changed operations.

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

  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.

Attachment #1

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

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 = 5%. **0 Points**
Historical Data	3 tests used to calculate RP. No tests failed. **0 Points**	2 tests used to calculate RP. No tests failed. **0 Points**
Effluent Variability	Little variability, no violations or upsets, consistent WWTF operations. **0 Points**	Same as Acute. **0 Points**
Receiving Water Classification	Warmwater sport fish. **5 Points**	Same as Acute. **5 Points**
Chemical-Specific Data	Reasonable potential for limits for no limits based on ATC; Ammonia, cadmium, nickel, zinc, and chloride detected. Additional Compounds of Concern: None. **3 Points**	Reasonable potential for limits for no limits based on CTC; Ammonia, cadmium, nickel, zinc, and chloride detected. Additional Compounds of Concern: None. **3 Points**
Additives	3 Biocides and 1 Water Quality Conditioner added. **4 Points**	All additives used more than once per 4 days. **4 Points**
Discharge Category	NCCW **0 Points**	Same as Acute. **0 Points**
Wastewater Treatment	NCCW only, no treatment needed. **0 Points**	Same as Acute. **0 Points**
Downstream Impacts	No impacts known. **0 Points**	Same as Acute. **0 Points**
Total Checklist Points:	**12 Points**	**12 Points**

	Acute	Chronic
Recommended Monitoring Frequency (from Checklist):	No tests recommended.	No tests recommended.
Limit Required?	No	No
TRE Recommended? (from Checklist)	No	No

- No WET testing is required because information related to the discharge indicates the potential for effluent toxicity is believed to be low.

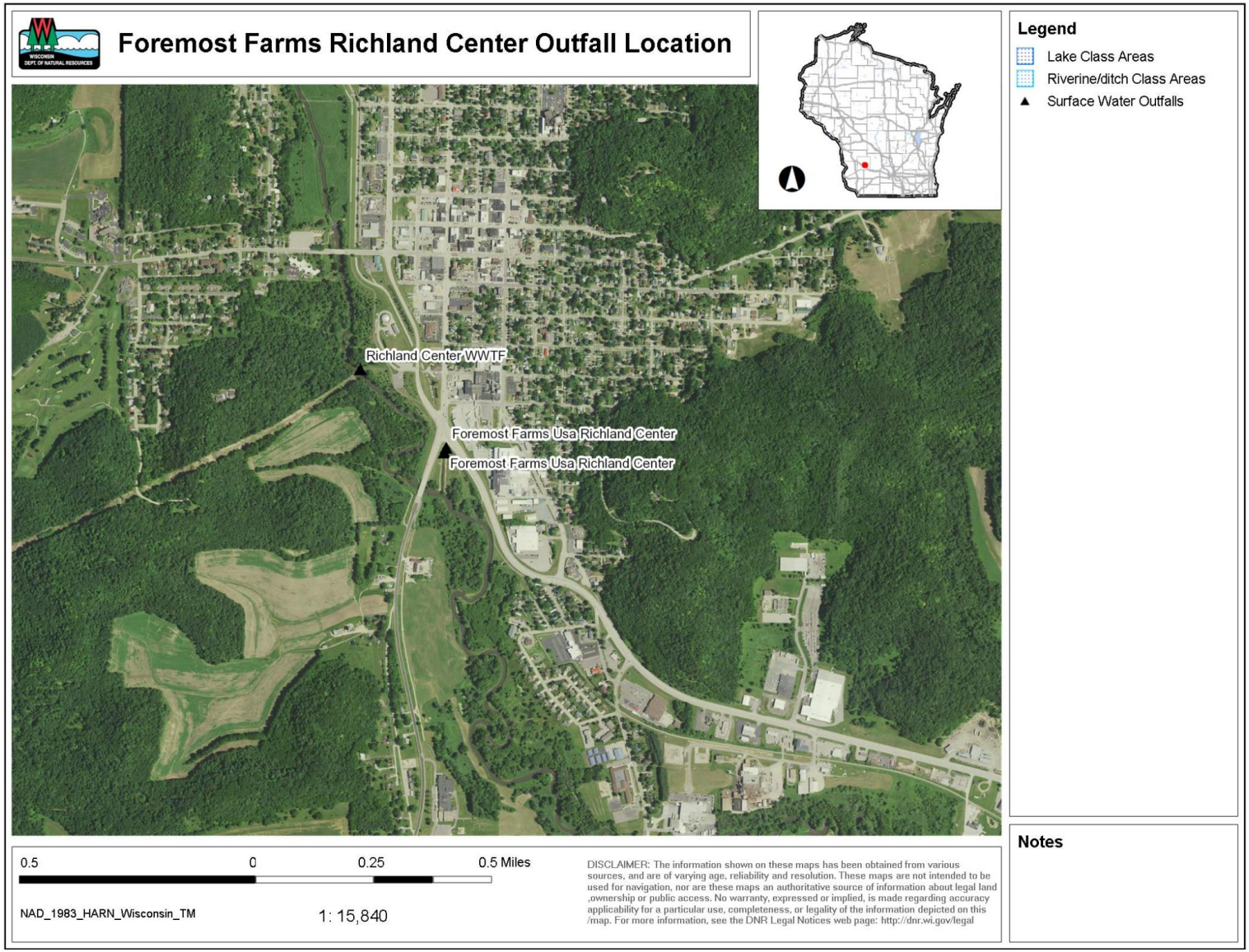
Attachment #2

Temperature limits for receiving waters with unidirectional flow

(calculation using default ambient temperature data)

						Temp Dates	Flow Dates
Facility:	Foremost Farms		**7-Q_{10}:**	66.00	cfs		
Outfall(s):	001		**Dilution:**	25%		**Start:**	07/01/2019	07/01/19
Date Prepared:	7/22/2024		**f:**	0		**End:**	06/30/2024	06/30/24
Design Flow (Qe):	0.39	MGD	**Stream type:**	Small warm water sport or forage fish com			
Storm Sewer Dist.	0	ft	**Qs:Qe ratio:**	27.3	:1		
			Calculation Needed?	NO			

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	66	0.413	0.438	0	103	107	NA	120
FEB	34	50	76	66	0.435	0.453	0	106	110	NA	120
MAR	38	52	77	66	0.443	0.466	0	102	109	NA	120
APR	48	55	79	66	0.429	0.445	0	103	108	NA	120
MAY	58	65	82	66	0.417	0.438	0	103	112	NA	120
JUN	66	76	84	66	0.417	0.447	0	106	117	NA	120
JUL	69	81	85	66	0.537	0.537	0	106	116	NA	120
AUG	67	81	84	66	0.504	0.549	0	107	128	NA	**120**
SEP	60	73	82	66	0.427	0.447	0	102	107	NA	120
OCT	50	61	80	66	0.425	0.448	0	105	123	NA	**120**
NOV	40	49	77	66	0.416	0.430	0	102	105	NA	120
DEC	35	49	76	66	0.415	0.458	0	103	123	NA	**120**


Foremost Farms Richland Center Outfall Location
Richland Center WWTF
Foremost Farms Usa Richland Center
Foremost Farms Usa Richland Center
Legend
Lake Class Areas
Riverine/ditch Class Areas
Surface Water Outfalls
Notes
0.5
0
0.25
0.5 Miles
NAD_1983_HARN_Wisconsin_TM
1: 15,840
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Appendix B: Categorical Limits Evaluation

Overview: Categorical limits will be evaluated. If the calculated limits are less than or equal to the limits in the previous permit, then the limits would be lowered or remain the same respectively. If the limits are more than the limits from the previous permit, they cannot be increased unless the permittee requests it and they meet the antidegradation provisions of ch. NR 207, Wis. Adm. Code as well as the anti-backsliding provisions of CWA ss. 303(d)(4) and 402(o) and 40 CFR §122.44(L).

Chapter NR 240, Wis. Adm. Code, specifies effluent guidelines for discharges from dairy product processing categories of point sources and subcategories thereof and are based on 40 CFR §405 federal guidelines, with a few omissions. The omissions are described below.

New source performance standards (NSPS) for the "Dairy Products Processing" category has a May 28, 1974, promulgation date of the rule for purposes of judicial review. However, the state administrative rules do not specify a date to define a new source. Therefore, it was necessary to review the available federal rules or guidance. The Boornazian memo (September 28, 2006) specifies a date of May 28, 1974 which is consistent with the promulgation date of the final rule revisions (promulgation date for judicial review purposes). The Department will therefore rely on the Boornazian memo to establish the date of applicability for NSPS.

The federal standards rule amendment (44 FR 50738; August 29, 1979) withdrew and redesignated/ revised best available technology (BAT) standard sections of 40 CFR §405 for all subcategories. As a result, state rules incorrectly list BAT standards for BOD, TSS, and pH even though BAT does not apply to such conventional pollutants.

The federal standard rule amendment (51 FR 24996; July 9, 1986) 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.

Lastly, the federal standards of performance for new sources in the dry whey subcategory, 40 CFR subpart L, §405.125, has a more stringent TSS maximum limit of 0.23 per 1,000 lb of BOD5 input than the one contained in ss. NR240.12 which is 0.28 per 1,000 lb of BOD5 input. Pursuant ss. NR 220.13, federal standards will be used to calculate the maximum TSS limit as it is the more stringent number.

New Source Evaluation:
According to 40 CFR §122.2 a new source is defined as "any building, structure, facility, or installation from which there is or may be a discharge of pollutants" and for which construction began after promulgation of the applicable effluent guidelines or after proposal of the applicable effluent guidelines, but only if the effluent guidelines are promulgated within 120 days. Therefore, a source is a new source if it meets this definition and the additional criteria for determining whether a discharge is a new source as defined in 40 CFR §122.29(b). This covers situations where a facility is adding a new building or process line that results in a discharge to the waters of the United States.

The Foremost Farms cheese plant was built in 1970 and upgraded in 2001 with the conversion to mozzarella. The Foremost Farms whey plant was built in 1974 and reverse osmosis, ultrafiltration, condenser, and dryer systems were all installed after May 28, 1974 (the federal promulgation date of effluent limitation standards for Dairy Products Processing). Since cheese process wastewater is a minimal and rare contribution to the surface water discharge from outfall 008, only the whey plant data will be acknowledged in this analysis.

Current Production Data:
Foremost Farms submitted daily average material input data for the maximum month period to produce the final whey products. The data used in this analysis for Foremost Farms is the same production data used for the reissuance of Richland Center Renewable Energy (RCRE) [permit no. WI-00694718-03-0], however, "Whey Dryer" input has been removed from this analysis because it stopped operation January, 2025. The following shows the breakdown of material input and the final total BOD Input.

Condensed Whey			
Proces s	Material Used (lb/d)	BOD Factor	BOD input
Whey R/O	2,688,000	4.72	126873.60
		Total BOD Input	126,873.60

Dry Whey			
Process	Material Used (lb/d)	BOD Factor	BOD input
Whey UF	2,688,000	4.72	126873.60
Whey Evaporator	1,100,000	4.72	51920.00
		Total BOD Input	178,793.60

Condensed Whey Subcategory

A. BPT
Foremost Farms would be considered a Class A facility under ch. NR 240, Wis. Adm. Code for the "Condensed Whey" subcategory as it receives more than 14,160 pounds per day of BOD Input.

BPT Effluent Limitations			
Parameter	BOD Input (lb)	Class A Conversion Factor	Limit (lbs/day)
BOD5 Daily Max	126,873.60	1.00	126.87
BOD5 Monthly Avg	126,873.60	0.40	50.75
TSS Daily Max	126,873.60	1.50	190.31
TSS Monthly Avg	126,873.60	0.60	76.12
pH Limit: 6.0 to 9.0			

B. NSPS

The resulting NSPS loadings are shown below:

NSPS Effluent Limitations			
Parameter	BOD Input (lb)	Conversion Factor	Limit (lbs/day)
BOD5 Daily Max	126,873.60	0.22	27.91
BOD5 Monthly Avg	126,873.60	0.11	13.96
TSS Daily Max	126,873.60	0.28	35.52
TSS Monthly Avg	126,873.60	0.14	17.76
pH Limit: 6.0 to 9.0			

Since NSPS loadings are more restrictive than BPT loadings, the NSPS loadings for condensed whey production will be used to determine final limits.

Dry Whey Subcategory

A. BPT

Foremost Farms would be considered a Class A facility under ch. NR 240, Wis. Adm. Code for the "Dry Whey" subcategory as it receives more than 15,620 pounds per day of BOD input.

The resulting BPT loadings are shown below:

BPT Effluent Limitations			
Parameter	BOD Input (lb)	Class A Conversion Factor	Limit (lbs/day)
BOD5 Daily Max	178,793.60	1.00	178.79
BOD5 Monthly Avg	178,793.60	0.40	71.52
TSS Daily Max	178,793.60	1.50	268.19
TSS Monthly Avg	178,793.60	0.60	107.28
pH Limit: 6.0 to 9.0			

B. NSPS

The resulting NSPS loadings are shown below:

NSPS Effluent Limitations			
Parameter	BOD Input (lb)	Conversion Factor	Limit (lbs/day)
BOD5 Daily Max	178,793.60	0.22	39.33
BOD5 Monthly Avg	178,793.60	0.11	19.67
TSS Daily Max	178,793.60	0.23*	41.12
TSS Monthly Avg	178,793.60	0.14	25.03
pH Limit: 6.0 to 9.0			

*The last categorical limit evaluation used the wrong conversion factor. The federal standards of performance for new sources in the dry whey subcategory, 40 CFR §405.125, has a more stringent TSS maximum limit of 0.23 per 1,000 lb of BOD5 input than the one contained in ss. NR140.12 which is 0.28 per 1,000 lb of BOD5 input. Pursuant ss. NR 220.13, federal standards will be used to calculate the maximum TSS limit as it is the more stringent number.

Since NSPS loadings are more restrictive than BPT loadings, the NSPS loadings for dry whey production will be considered in the final effluent limit determination.

Final Categorical Limits:

Foremost Farms - Richland Center Final Categorical Limitations (Ch. 240, Wis. Adm. Code)			
BOD Daily Max (lb/day)	BOD Monthly Avg(lb/day)	TSS Daily Max (lb/day)	TSS Monthly Avg (lb/day)
67.25	33.62	76.55	42.79

Conclusion: In conclusion, BPT and NSPS loadings were calculated and final limitations were determined based on the most restrictive standard. Since the final categorical limits for this reissuance are higher than the limits in the previous permit, the limits from the last permit will remain.

Prepared by: Laura Rodriguez Alvarez Date: 02/19/2025