

Permit Fact Sheet

General Information

Permit Number	WI-0032026-10-0
Permittee Name and Address	Delafield Hartland Water Pollution Control Commission 416 Butler Drive, Delafield, WI 53018-1871
Permitted Facility Name and Address	Delafield Hartland Water Pollution Control Commission 416 Butler Drive Delafield, WI 53018-1871
Permit Term	April 01, 2026 to March 31, 2031
Discharge Location	East bank of the Bark River, 1 mile south of the Genesee Lake Road bridge, in the Village of Summit. (Lat: 43.03286° N, Long: 88.45058°W)
Receiving Water	Bark River in Bark River Watershed of Lower Rock River Basin in Waukesha County
Stream Flow (Q _{7,10})	10 cubic feet per second
Stream Classification	Warm water sport fishery; non-public water supply
Discharge Type	Existing, continuous
Annual Average Design Flow (MGD)	3.23 million gallons per day (MGD)
Industrial or Commercial Contributors	Medline Industries
Plant Classification	A1 - Suspended Growth Processes; B - Solids Separation; C - Biological Solids/Sludges; P - Total Phosphorus; D - Disinfection; L - Laboratory; SS - Sanitary Sewage Collection System. Facility rated Advanced due to design flow over 1 MGD.
Approved Pretreatment Program?	N/A

Facility Description

Delafield-Hartland Water Pollution Control Commission owns and operates a 3.23 MGD extended aeration activated sludge plant, which commenced operation in May 2004. Treatment process includes bar screening and grit removal, primary clarification, anaerobic and anoxic zones for biological phosphorus removal, extended aeration activated sludge treatment, final clarification, and tertiary treatment via disc filters that replaced the previous sand filters in 2020. Seasonal disinfection is accomplished using a UV light system that was also installed in 2020. Effluent is discharged to the east bank of the Bark River one mile south of Genesee Lake Road via four miles of force main. The facility treats waste activated sludge into a class B cake sludge that is taken to a licensed and permitted contract hauler for beneficial reuse.

Delafield Hartfield facility is a regional facility and serves the City of Delafield, the Villages of Hartland, Nashotah, and Summit, and the Town of Delafield.

Substantial Compliance Determination

Enforcement During Last Permit: No formal enforcement actions taken during the previous permit term.

After a desk top review of all discharge monitoring reports, CMARs, land app reports, compliance schedule items, and a site visit on September 26, 2024, this facility has been found to be in substantial compliance with their current permit.

Compliance determination made by Nick Lent on September 26, 2024.

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)
701	1.98 MGD, October 2020 through February 2025	INFLUENT: 24-hr flow proportional composite samples shall be collected prior to grit removal and after the fine screen. Flow shall be monitored at the grit building in the Odor Control Room via magnetic flow meter.
001	1.94 MGD, October 2020 through February 2025	EFFLUENT: 24-hour flow proportional composite samples shall be collected from the disc filter effluent channel. Grab samples shall be collected after disinfection at the sink in Pump Station #1. Flow shall be monitored at the contact tank effluent channel via ultrasonic flow meter.
002	60 dry U.S. tons/yr anticipated	LIQUID SLUDGE: Anaerobically digested, Class B liquid sludge. Samples shall be collected from the recirculation pump directly after either mesophilic digester, post process. Test results shall be reported on Form 3400-49 'Waste Characteristics Report'. Hauled sludge reports shall be submitted on Form 3400-52 'Other Methods of Disposal or Distribution Report' following each year that the sludge is hauled.
006	400 dry U.S. tons/yr estimated per permit application	CAKE SLUDGE: Anaerobically digested, thickened, Class B cake sludge. Representative samples shall be collected from the sludge drying beds and composited. Test results shall be reported on Form 3400-49 'Waste Characteristics Report'. Hauled sludge reports shall be submitted on Form 3400-52 'Other Methods of Disposal or Distribution Report' following each year that the sludge is hauled.
101	N/A	FIELD BLANK: Collect mercury field blank using standard sample handling procedures.

Permit Requirements

1 Influent – Monitoring Requirements

1.1 Sample Point Number: 701- INFLUENT TO PLANT

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Flow Rate		MGD	Daily	Continuous	
BOD5, Total		mg/L	5/Week	24-Hr Flow Prop Comp	
Suspended Solids, Total		mg/L	5/Week	24-Hr Flow Prop Comp	
Mercury, Total Recoverable		ng/L	Quarterly	24-Hr Flow Prop Comp	See "Mercury Monitoring" section in permit.

1.1.1 Changes from Previous Permit:

Influent 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.

- **BOD5 and Total Suspended Solids-** monitoring frequency reduced from daily to 5/week to align with changes made to monitoring requirements for Outfall 001. Additional information included under “Explanation of Limits and Monitoring Requirements” for Outfall 001.

1.1.2 Explanation of Limits and Monitoring Requirements

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

Mercury monitoring is included pursuant to s. NR 106.145, Wis. Adm. Code. Required field blanks for Mercury monitoring are included per ss. NR 106.145 (9) and (10), Wis. Adm. Code, requirements. The permittee shall collect a mercury field blank for each set of mercury samples (a set of samples may include a combination of influent, effluent or other samples all collected on the same day). The permittee shall report results of influent and effluent samples and field blanks to the Department on Discharge Monitoring Reports.

2 Inplant - Monitoring and Limitations

2.1 Sample Point Number: 101- Mercury Effluent Blanks

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Mercury, Total Recoverable		ng/L	Quarterly	Blank	See "Mercury Monitoring" section in permit.

2.1.1 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.

2.1.2 Explanation of Limits and Monitoring Requirements

Mercury Field Blank- Monitoring is included in the permit pursuant to s. NR 106.145, Wis. Adm. Code. Field blanks must meet the requirements under s. NR 106.145(9) and (10), Wis. Adm. Code. The permittee shall collect a mercury field blank for each set of mercury samples (a set of samples may include a combination of influent, effluent or other samples all collected on the same day). Field blanks are required to verify a sample has not been contaminated during collection, transportation or analysis.

3 Surface Water - Monitoring and Limitations

3.1 Sample Point Number: 001- EFFLUENT

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Flow Rate		MGD	Daily	Continuous	
BOD5, Total	Weekly Avg	12 mg/L	5/Week	24-Hr Comp	Limit effective November through April.
BOD5, Total	Weekly Avg	7.0 mg/L	5/Week	24-Hr Comp	Limit effective May through October.
BOD5, Total	Monthly Avg	12 mg/L	5/Week	24-Hr Comp	Limit effective November through April.
BOD5, Total	Monthly Avg	7.0 mg/L	5/Week	24-Hr Comp	Limit effective May through October.
BOD5, Total	Weekly Avg	302 lbs/day	5/Week	Calculated	Limit effective November through April.
BOD5, Total	Weekly Avg	189 lbs/day	5/Week	Calculated	Limit effective May through October.
Suspended Solids, Total	Weekly Avg	14 mg/L	5/Week	24-Hr Comp	Limit effective November through April.
Suspended Solids, Total	Weekly Avg	10 mg/L	5/Week	24-Hr Comp	Limit effective May through October.
Suspended Solids, Total	Monthly Avg	14 mg/L	5/Week	24-Hr Comp	Limit effective November through April.
Suspended Solids, Total	Monthly Avg	10 mg/L	5/Week	24-Hr Comp	Limit effective May through October.
Suspended Solids, Total	Weekly Avg	278 lbs/day	5/Week	Calculated	Limit effective January.
Suspended Solids, Total	Weekly Avg	324 lbs/day	5/Week	Calculated	Limit effective February.

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Suspended Solids, Total	Weekly Avg	305 lbs/day	5/Week	Calculated	Limit effective March.
Suspended Solids, Total	Weekly Avg	259 lbs/day	5/Week	Calculated	Limit effective April.
Suspended Solids, Total	Weekly Avg	212 lbs/day	5/Week	Calculated	Limit effective May.
Suspended Solids, Total	Weekly Avg	222 lbs/day	5/Week	Calculated	Limit effective June.
Suspended Solids, Total	Weekly Avg	167 lbs/day	5/Week	Calculated	Limit effective July.
Suspended Solids, Total	Weekly Avg	157 lbs/day	5/Week	Calculated	Limit effective August and October.
Suspended Solids, Total	Weekly Avg	130 lbs/day	5/Week	Calculated	Limit effective September
Suspended Solids, Total	Weekly Avg	250 lbs/day	5/Week	Calculated	Limit effective November.
Suspended Solids, Total	Weekly Avg	286 lbs/day	5/Week	Calculated	Limit effective December.
Suspended Solids, Total	Monthly Avg	226 lbs/day	5/Week	Calculated	Limit effective January.
Suspended Solids, Total	Monthly Avg	264 lbs/day	5/Week	Calculated	Limit effective February.
Suspended Solids, Total	Monthly Avg	248 lbs/day	5/Week	Calculated	Limit effective March.
Suspended Solids, Total	Monthly Avg	211 lbs/day	5/Week	Calculated	Limit effective April.
Suspended Solids, Total	Monthly Avg	173 lbs/day	5/Week	Calculated	Limit effective May.
Suspended Solids, Total	Monthly Avg	181 lbs/day	5/Week	Calculated	Limit effective June.
Suspended Solids, Total	Monthly Avg	135 lbs/day	5/Week	Calculated	Limit effective July.
Suspended Solids, Total	Monthly Avg	128 lbs/day	5/Week	Calculated	Limit effective August and October.
Suspended Solids, Total	Monthly Avg	105 lbs/day	5/Week	Calculated	Limit effective September.

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Suspended Solids, Total	Monthly Avg	203 lbs/day	5/Week	Calculated	Limit effective November.
Suspended Solids, Total	Monthly Avg	233 lbs/day	5/Week	Calculated	Limit effective December.
pH Field	Daily Min	6.0 su	Daily	Grab	
pH Field	Daily Max	9.0 su	Daily	Grab	
Dissolved Oxygen	Daily Min	7.0 mg/L	Daily	Grab	
Nitrogen, Ammonia (NH3-N) Total	Daily Max	29 mg/L	5/Week	24-Hr Flow Prop Comp	Limit effective November through April.
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	11.4 mg/L	5/Week	24-Hr Flow Prop Comp	Limit effective November through March.
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	4.9 mg/L	5/Week	24-Hr Flow Prop Comp	Limit effective April.
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	3.6 mg/L	5/Week	24-Hr Flow Prop Comp	Limit effective May through September.
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	6.9 mg/L	5/Week	24-Hr Flow Prop Comp	Limit effective October.
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	5.2 mg/L	5/Week	24-Hr Flow Prop Comp	Limit effective November through March.
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	2.2 mg/L	5/Week	24-Hr Flow Prop Comp	Limit effective April.
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	2.1 mg/L	5/Week	24-Hr Flow Prop Comp	Limit effective May through September.
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	3.2 mg/L	5/Week	24-Hr Flow Prop Comp	Limit effective October.
E. coli	Geometric Mean - Monthly	126 #/100 ml	Weekly	Grab	Limit effective May through September.
E. coli	% Exceedance	10 Percent	Monthly	Calculated	Limit effective May through September. Enter the results in the DMR on the last day of the month.
Chloride		mg/L	4/Month	24-Hr Flow Prop Comp	Sampling shall be done on four consecutive days each month. See Chloride SRM and Schedules permit sections.

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Chloride		lbs/day	4/Month	Calculated	Chloride mass discharge shall be calculated using the daily concentration (mg/L) x daily flow (MGD) x 8.34. See Chloride permit section.
Mercury, Total Recoverable		ng/L	Quarterly	Grab	See 'Mercury Monitoring' section below.
Phosphorus, Total	Monthly Avg	1.0 mg/L	5/Week	24-Hr Flow Prop Comp	Technology Based Effluent Limit.
Phosphorus, Total	Monthly Avg	4.19 lbs/day	5/Week	Calculated	Limit effective January and December.
Phosphorus, Total	Monthly Avg	7.08 lbs/day	5/Week	Calculated	Limit effective February.
Phosphorus, Total	Monthly Avg	6.70 lbs/day	5/Week	Calculated	Limit effective March.
Phosphorus, Total	Monthly Avg	8.58 lbs/day	5/Week	Calculated	Limit effective April.
Phosphorus, Total	Monthly Avg	7.33 lbs/day	5/Week	Calculated	Limit effective May.
Phosphorus, Total	Monthly Avg	7.52 lbs/day	5/Week	Calculated	Limit effective June.
Phosphorus, Total	Monthly Avg	5.68 lbs/day	5/Week	Calculated	Limit effective July.
Phosphorus, Total	Monthly Avg	4.97 lbs/day	5/Week	Calculated	Limit effective August.
Phosphorus, Total	Monthly Avg	4.08 lbs/day	5/Week	Calculated	Limit effective September.
Phosphorus, Total	Monthly Avg	3.22 lbs/day	5/Week	Calculated	Limit effective October.
Phosphorus, Total	Monthly Avg	3.47 lbs/day	5/Week	Calculated	Limit effective November.
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.
PFOS		ng/L	1/ 2 Months	Grab	Monitoring only. See PFOS/PFOA Minimization Plan Determination of Need schedule.

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
PFOA		ng/L	1/ 2 Months	Grab	Monitoring only. See PFOS/PFOA Minimization Plan Determination of Need schedule.
Acute WET		TUa	See Listed Qtr(s)	24-Hr Flow Prop Comp	Annually in rotating quarters. See 'WET' permit section.
Chronic WET		2.3 TUc	See Listed Qtr(s)	24-Hr Flow Prop Comp	Annually in rotating quarters. See 'WET' permit section.

3.1.1 Changes from Previous Permit

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

- **BOD5 and Total Suspended Solids-** Monitoring frequency reduced from daily to 5/week. A weekly average mass limit of 189 lbs/day BOD5 has been added for the months of May through October.
- **PFOS and PFOA-** Bimonthly monitoring has been added for the permit term.

3.1.2 Explanation of Limits and Monitoring Requirements

Detailed discussions of limits and monitoring requirements can be found in the attached water quality-based effluent limits (WQBEL) memo dated February 05, 2026.

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.

Within the application for permit reissuance, the facility requested a reduction in monitoring frequency for influent and effluent BOD5 and TSS from daily to 5x/week based on results in the past permit term. Review of the data shows that the influent data variability is within the range of expected results, and the effluent data has been consistently near or below the 2 mg/L level of detection for over 10 years. Considering this information and the fact that there have been no limit exceedances over the last term for BOD5 and TSS, their request for lowered monitoring frequency has been incorporated into this permit issuance.

Expression of Limits- In accordance with the federal regulation 40 CFR 122.45(d) and s. NR 205.065, Wis. Adm. Code, limits in this permit are to be expressed as weekly average and monthly average limits whenever practicable.

4 Land Application - Monitoring and Limitations

Municipal Sludge Description

Sample Point	Sludge Class (A or B)	Sludge Type (Liquid or Cake)	Pathogen Reduction Method	Vector Attraction Method	Reuse Option	Amount Reused/Disposed (Dry Tons/Year)
002	B	Liquid	Fecal Coliform	Fecal Coliform	Hauled to another facility	60
006	B	Cake	Anaerobic digestion	Volatile solids reduction	Hauled to another facility	400
Does sludge management demonstrate compliance? Yes.						
Is additional sludge storage required? No.						
Is Radium-226 present in the water supply at a level greater than 2 pCi/liter? Yes. If yes, special monitoring and recycling conditions will be included in the permit to track any potential problems in landapplying sludge from this facility						
Is a priority pollutant scan required? No Priority pollutant scans are required once every 10 years at facilities with design flows between 5 MGD and 40 MGD, and once every 5 years if design flow is greater than 40 MGD.						

4.1 Sample Point Number: 002- Mesophilic Digester- Class B

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

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Selenium Dry Wt	Ceiling	100 mg/kg	Annual	Composite	
Selenium Dry Wt	High Quality	100 mg/kg	Annual	Composite	
Zinc Dry Wt	Ceiling	7,500 mg/kg	Annual	Composite	
Zinc Dry Wt	High Quality	2,800 mg/kg	Annual	Composite	
Nitrogen, Total Kjeldahl		Percent	Annual	Composite	
Nitrogen, Ammonium (NH4-N) Total		Percent	Annual	Composite	
Phosphorus, Total		Percent	Annual	Composite	
Phosphorus, Water Extractable		% of Tot P	Annual	Composite	
Potassium, Total Recoverable		Percent	Annual	Composite	
Radium 226 Dry Wt		pCi/g	Annual	Composite	
PCB Total Dry Wt	Ceiling	50 mg/kg	Once	Composite	Sample once in 2027.
PCB Total Dry Wt	High Quality	10 mg/kg	Once	Composite	Sample once in 2027.
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.

4.1.1 Changes from Previous Permit:

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

Monitoring Frequency- The monitoring frequency has been decreased from quarterly to annual based on the monitoring frequencies outlined in Table A of ch. NR 204, Wis. Adm. Code. Monitoring is only required at Outfall 002 during years in which digester clean out occurs.

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

4.1.2 Explanation of Limits and Monitoring Requirements

Requirements for disposal, including land application of municipal sludge, are determined in accordance with ch. NR 204, Wis. Adm. Code. Ceiling and high-quality limits for metals in sludge are specified in s. NR 204.07(5). Requirements for pathogens are specified in s. NR 204.07(6) and in s. NR 204.07 (7) for vector attraction requirements. Limitations for PCBs are addressed in s. NR 204.07(3)(k). Radium requirements are addressed in s. NR 204.07(3)(n).

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.

4.2 Sample Point Number: 006- Cake Sludge - Class B

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

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Nitrogen, Ammonium (NH4-N) Total		Percent	Quarterly	Composite	
Phosphorus, Total		Percent	Quarterly	Composite	
Phosphorus, Water Extractable		% of Tot P	Quarterly	Composite	
Potassium, Total Recoverable		Percent	Quarterly	Composite	
Radium 226 Dry Wt		pCi/g	Quarterly	Composite	
PCB Total Dry Wt	Ceiling	50 mg/kg	Once	Composite	Sample once in 2027.
PCB Total Dry Wt	High Quality	10 mg/kg	Once	Composite	Sample once in 2027.
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.

4.2.1 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. See additional explanation of limits under “Explanation of Limits and Monitoring Requirements” below.

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

4.2.2 Explanation of Limits and Monitoring Requirements

Requirements for disposal, including land application of municipal sludge, are determined in accordance with ch. NR 204, Wis. Adm. Code. Ceiling and high-quality limits for metals in sludge are specified in s. NR 204.07(5). Requirements for pathogens are specified in s. NR 204.07(6) and in s. NR 204.07 (7) for vector attraction requirements. Limitations for PCBs are addressed in s. NR 204.07(3)(k). Radium requirements are addressed in s. NR 204.07(3)(n).

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.

5 Schedules

5.1 Chloride Source Reduction Measures

Required Action	Due Date
<p>Final Chloride Report: Submit the final chloride report documenting the source reduction activities for the current permit term and the success in maintaining chloride effluent concentrations.</p> <p>The report shall:</p> <p>Summarize chloride source reduction measures that have been implemented during the current permit term;</p> <p>Include an assessment of which source reduction measures appear to have been effective or ineffective. Evaluate any needed changes to the pollutant reduction strategy accordingly;</p> <p>Include an analysis of trends in weekly, monthly and annual average chloride concentrations and total mass discharge of chloride based on chloride sampling and flow data during the current permit term; and</p> <p>Include an analysis of how influent and effluent chloride varies with time and with significant loadings of chloride.</p>	09/30/2030

5.1.1 Explanation of Schedule

Delafield-Hartland WPCC was previously granted a chloride variance to the calculated water quality standard. Water Quality Based Effluent Limit calculations for issuance 09 used updated stream flow information for the receiving water, and determined there was no longer any reasonable potential for the facility to exceed the calculated limits. As such, the numeric chloride effluent limitation was replaced with a narrative standard that requires maintenance of chloride levels at or below current concentrations for purposes of antidegradation and antibacksliding.

Chloride levels have increased since the previous permit term, but remain lower than calculated WQBELs, so the narrative criteria has been kept in the permit without the addition of numeric effluent limits. An increased loading of chloride beyond current chloride effluent concentrations may result in the imposition of a water quality-based effluent limitation for chloride and a demonstration and review under chapter NR 207. Delafield-Hartland WPCC must continue to maintain effluent quality at or below the current effluent concentration by continuing to implement chloride source reduction measures. The schedule requires that a final report be submitted that indicates which source reduction measures Delafield-Hartland WPCC has implemented during each permit term, and an analysis of chloride concentration and mass discharge data based on chloride sampling and flow data.

5.2 PFOS/PFOA Minimization Plan Determination of Need

Required Action	Due Date
<p>Report on Effluent Discharge: Submit a report on effluent PFOS and PFOA concentrations and include an analysis of trends in monthly and annual average PFOS and PFOA concentrations. This analysis should also include a comparison to the applicable narrative standard in s. NR 102.04(8)(d),</p>	03/31/2027

<p>Wis. Adm. Code.</p> <p>This report shall include all additional PFOS and PFOA data that may be collected including any influent, intake, in-plant, collection system sampling, and blank sample results.</p>	
<p>Report on Effluent Discharge and Evaluation of Need: Submit a final report on effluent PFOS and PFOA concentrations and include an analysis of trends in monthly and annual average PFOS and PFOA concentrations of data collected over the last 24 months. The report shall also provide a comparison on the likelihood of the facility needing to develop a PFOS/PFOA minimization plan.</p> <p>This report shall include all additional PFOS and PFOA data that may be collected including any influent, intake, in-plant, collection system sampling, and blank sample results.</p> <p>The permittee shall also submit a request to the department to evaluate the need for a PFOS/PFOA minimization plan.</p> <p>If the Department determines a PFOS/PFOA minimization plan is needed based on a reasonable potential evaluation, the permittee will be required to develop a minimization plan for Department approval no later than 90 days after written notification was sent from the Department. The Department will modify or revoke and reissue the permit to include PFOS/PFOA minimization plan reporting requirements along with a schedule of compliance to meet WQBELs. Effluent monitoring of PFOS and PFOA shall continue as specified in the permit until the modified permit is issued.</p> <p>If, however, the Department determines there is no reasonable potential for the facility to discharge PFOS or PFOA above the narrative standard in s. NR 102.04(8)(d), Wis. Adm. Code, no further action is required and effluent monitoring of PFOS and PFOA shall continue as specified in the permit.</p>	<p>03/31/2028</p>

5.2.1 Explanation of Schedule

As stated above, ch. NR 106 Subchapter VIII – Permit Requirements for PFOS and PFOA Dischargers became effective on August 1, 2022. Section NR 106.98, Wis. Adm. Code, specifies steps to generate data in order to determine the need for reducing PFOS and PFOA in the discharge. Data generated per the effluent monitoring requirements will be used to determine the need for developing a PFOS/PFOA minimization plan. As part of the schedule, the permittee is required to submit two annual Reports on Effluent Discharge.

If the Department determines that a minimization plan is needed, the permit will be modified or revoked/reissued to include additional requirements.

Attachments

Water Quality-Based Effluent Limitations for Delafield Hartfield Water Pollution Control Commission, WPDES Permit No. WI-0032026-10, February 02, 2026

Justification Of Any Waivers From Permit Application Requirements

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

Prepared By: Amanda Perdsock, Wastewater Specialist

Date: January 21, 2026

CORRESPONDENCE/MEMORANDUM

DATE: 05/14/2025 – updated 02/05/2026 for BOD₅ mass limit

TO: Amanda Perdsock – WY/3

FROM: Nicole Krueger – SER *Nicole Krueger*

SUBJECT: Water Quality-Based Effluent Limitations for Delafield Hartfield Water Pollution Control Commission
 WPDES Permit No. WI-0032026-10

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 Delafield Hartland in Waukesha County. This municipal wastewater treatment facility (WWTF) discharges to the Bark River, located in the Bark River Watershed in the Lower Rock River Basin. This discharge is included in the Rock River Total Maximum Daily Load (TMDL) as approved by EPA on 09/28/2011. 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 001:

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Footnotes
Flow Rate					1,2
BOD ₅ November – April			12 mg/L 302 lbs/day	12 mg/L	3
May – October			7.0 mg/L 189 lbs/day	7.0 mg/L	
TSS November – April			14 mg/L	14 mg/L	1,3,4
May – October			10 mg/L	10 mg/L	
pH	9.0 s.u.	6.0 s.u.			1
Dissolved Oxygen		7.0 mg/L			1
Ammonia Nitrogen April	29 mg/L		4.9 mg/L	2.2 mg/L	1
May – September			3.6 mg/L	2.1 mg/L	
October			6.9 mg/L	3.2 mg/L	
November – March	29 mg/L		11.4 mg/L	5.2 mg/L	
Bacteria					5
<i>E. coli</i>				126#/100 mL geometric mean	
Chloride					1,2
Mercury					1,2
Phosphorus				1.0 mg/L	1,4
TKN, Nitrate+Nitrite, and Total Nitrogen					6
PFOS and PFOA					7
Acute WET					8,9
Chronic WET				2.3 TU _c	8,9

Footnotes:

1. No changes from the current permit.
2. Monitoring only.
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. Additional phosphorus and TSS mass limitations are required in accordance with the waste load allocations specified in the Rock River TMDL.

Month	Monthly Average TP Effluent Limit (lbs/day)	Monthly Average TSS Effluent Limit (lbs/day)	Weekly Average TSS Effluent Limit (lbs/day)
January	4.19	226	278
February	7.08	264	324
March	6.70	248	305
April	8.58	211	259
May	7.33	173	212
June	7.52	181	222
July	5.68	135	167
August	4.97	128	157
September	4.08	105	130
October	3.22	128	157
November	3.47	203	250
December	4.19	233	286

5. Bacteria limits apply during the disinfection season of May through September. Additional limit: No more than 10 percent of *E. coli* bacteria samples collected in any calendar month may exceed 410 count/100 mL.
6. As recommended in the Department's October 1, 2019 Guidance for Total Nitrogen Monitoring in Wastewater Permits, quarterly total nitrogen monitoring is recommended for all municipal major permittees. Sections 283.37(5) and 283.55(1)(e), Wis. Stats, and ss. NR 200.065(1)(g) and NR 200.065(1)(h), Wis. Adm. Codes, provide the authority to request this monitoring during the permit term. Total Nitrogen is the sum of nitrate (NO₃), nitrite (NO₂), and total Kjeldahl nitrogen (TKN) (all expressed as N).
7. PFOS and PFOA monitoring is recommended at a frequency of once every other month in accordance with s. NR 106.98(2), Wis. Adm. Code.
8. Annual acute and chronic WET tests are recommended in the reissued permit. The Instream Waste Concentration (IWC) to assess chronic test results is 44%. 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 001 shall be a grab sample collected from the Bark River.
9. 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).

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 (4) – Narrative, Outfall Map, 2006 Ammonia Limits Calculations, & Thermal Table

PREPARED BY: Nicole Krueger, Water Resources Engineer – SER

E-cc: Nick Lent, Wastewater Engineer – SER

Diane Figiel, Water Resources Engineer – WY/3
Nate Willis, Wastewater Engineer – WY/3

Attachment #1
**Water Quality-Based Effluent Limitations for
 Delafield Hartland Water Pollution Control Commission**

WPDES Permit No. WI-0032026-10

Prepared by: Nicole Krueger

PART 1 – BACKGROUND INFORMATION

Facility Description

DeLafield-Hartland Water Pollution Control Commission owns and operates a 3.23 MGD extended aeration activated sludge plant, which commenced operation in May 2004. Treatment process include bar screening and grit removal, primary clarification, extended aeration activated sludge treatment, final clarification, and tertiary treatment via disc filters that replaced the previous sand filters in 2020. Seasonal disinfection is accomplished using a UV light system that was also installed in 2020. Effluent is discharged to the east bank of the Bark River one mile south of Genesee Lake Road via four miles of force main. The facility treats waste activated sludge into a class B cake sludge that is taken to a licensed and permitted contract hauler for beneficial reuse. Delafield Hartfield facility is a regional facility and serves the City of Delafield, the Villages of Hartland, Nashotah, and Summit, and the Town of Delafield.

Attachment #2 is a map of the area showing the approximate location of Outfall 001.

Existing Permit Limitations

The current permit, expiring on 09/30/2025, includes the following effluent limitations and monitoring requirements.

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Footnotes
Flow Rate					1
BOD ₅					2,3
November – April			12 mg/L 302 lbs/day	12 mg/L	
May – October			7.0 mg/L	7.0 mg/L	
TSS					3,4
November – April			14 mg/L	14 mg/L	
May – October			10 mg/L	10 mg/L	
pH	9.0 s.u.	6.0 s.u.			2
Dissolved Oxygen		7.0 mg/L			2
Ammonia Nitrogen					
April	29 mg/L		4.9 mg/L	2.2 mg/L	
May – September			3.6 mg/L	2.1 mg/L	
October			6.9 mg/L	3.2 mg/L	
November – March	29 mg/L		11.4 mg/L	5.2 mg/L	
Bacteria					2,5
<i>E. coli</i>				126#/100 mL geometric mean	
Chloride					1

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Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Footnotes
Mercury					1
Phosphorus				1.0 mg/L	4
TKN, Nitrate+Nitrite, and Total Nitrogen					1
Acute WET					6
Chronic WET				2.3 TU _c	6

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. Additional phosphorus and TSS mass limitations are required in accordance with the waste load allocations specified in the Rock River TMDL, shown below:

Month	Monthly Average TP Effluent Limit (lbs/day)	Monthly Average TSS Effluent Limit (lbs/day)	Weekly Average TSS Effluent Limit (lbs/day)
January	4.19	226	278
February	7.08	264	324
March	6.70	248	305
April	8.58	211	259
May	7.33	173	212
June	7.52	181	222
July	5.68	135	167
August	4.97	128	157
September	4.08	105	130
October	3.22	128	157
November	3.47	203	250
December	4.19	233	286

5. Bacteria limits apply during the disinfection season of May through September. Additional limit: No more than 10 percent of *E. coli* bacteria samples collected in any calendar month may exceed 410 count/100 mL.
6. Annual acute and chronic WET monitoring is required. The IWC for chronic WET was 44%.

Receiving Water Information

- Name: Bark River
- Waterbody Identification Code (WBIC): 813500
- The following 7-Q₁₀ and 7-Q₂ values are from USGS for Station 05426078 which is located between Delafield and Dousman, about 0.4 miles south of Genessee Lake Rd. The low flows were updated 04/20/2020 and used stream gauges on the Bark River at Nagawicka (05426067) and the Bark River at Rome (0542650) as references. The Harmonic Mean has been estimated as recommended in *State of Wisconsin Water Quality Rules Implementation Plan* (Publ. WT-511-98).
Annual 7-Q₁₀ = 10 cfs (cubic feet per second)

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Annual 7-Q₂ = 18 cfs
 90-Q₁₀ = 15.3 cfs
 Harmonic Mean Flow = 23.4 cfs

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
7-Q ₁₀ (cfs)	18	17	21	28	24	14	12	12	12	13	19	19
7-Q ₂ (cfs)	28	29	40	46	42	31	26	24	24	25	30	29

- Hardness = 234 mg/L as CaCO₃. This value represents the geometric mean of data from chronic WET testing from 11/10/2020 – 02/28/2023.
- % 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 the Bark River at Sth 135 (Station ID #283029) is used for this evaluation. Background chloride data was collected by Delafield Hartland at Genesee Lake Road upstream of their outfall in 2016 to 2020. 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 Bark 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 Bark River at the outfall was previously 303(d) listed as impaired for total phosphorus. During the 2018 listing, total phosphorus and biological sample data were shown to be under the 2018 WisCALM listing thresholds. Therefore, the Bark River at the outfall was delisted and not considered impaired.

Effluent Information

- Design flow rate(s):
 Annual average = 3.23 million gallons per day (MGD)
 For reference, the actual average flow from 10/01/2020 – 02/28/2025 was 1.94 MGD.
- Hardness = 447 mg/L as CaCO₃. This value represents the geometric mean of four samples collected 01/09/2025 – 02/05/2025 which were reported on 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: Domestic wastewater with 1 industrial contributor (Medline Industries).
- Water supply: Municipality waterworks and private wells.
- Additives:
 - Sodium hypochlorite – disinfection of disc filter backwash
 - Alum – phosphorus reduction
 - Polymer – sludge conditioning
 - An additive review is not necessary for any additives where either the toxicity is well documented and understood, can be controlled by a WQBEL, or are not believed to be present in the discharge. Therefore, an additive review is not needed at this time.
- Effluent characterization: This facility is categorized as a major municipal, so the permit application required effluent sample analyses for all the “priority pollutants” except for the Dioxins and Furans as specified in s. NR 200.065, Table 1, Wis. Adm. Code. The permit-required monitoring for chloride,

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ammonia, and phosphorus 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.

Copper Effluent Data

Sample Date	Copper (µg/L)	Sample Date	Copper (µg/L)	Sample Date	Copper (µg/L)
01/06/2025	7.0	01/18/2025	5.2	01/30/2025	5.5
01/09/2025	6.2	01/21/2025	5.9	02/02/2025	5.5
01/12/2025	5.1	01/24/2025	5.7	02/05/2025	5.2
01/15/2025	5.8	01/27/2025	4.9		
1-day P ₉₉ = 7.2 µg/L					
4-day P ₉₉ = 6.4 µg/L					

Chloride Effluent Data

	Chloride (mg/L)
1-day P ₉₉	658
4-day P ₉₉	610
30-day P ₉₉	581
Mean	564
Std	37.9
Sample size	216
Range	368 – 674

The following table presents the average concentrations and loadings at Outfall 001 from 10/18/2020 – 02/05/2025 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	1.77 mg/L*	15.3 lbs/day
TSS	0.18 mg/L*	1.55 lbs/day
pH field	7.3 s.u.	
Dissolved Oxygen	8.4 mg/L	
Ammonia Nitrogen	0.04 mg/L*	
<i>E. coli</i>	2.2 #/100 mL**	
Phosphorus	0.58 mg/L	9.3 lbs/day

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

** The average measurement for bacteria is calculated as a geometric mean. Values reported below the LOD are replaced with a value of 1 for the calculation of the geometric mean.

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:

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

Acute Limits based on 1-Q₁₀

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

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

Where:

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

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

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

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

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

If the receiving water is effluent dominated under low stream flow conditions, the 1-Q₁₀ method of limit calculation produces the most stringent daily maximum limitations and should be used while making reasonable potential determinations. This is not the case for Delafield Hartland, 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 for all the detected substances. All concentrations are expressed in terms of micrograms per Liter (µg/L), except for hardness and chloride (mg/L) and mercury (ng/L).

Daily Maximum Limits based on Acute Toxicity Criteria (ATC)

RECEIVING WATER FLOW = 8.0 cfs, (1-Q₁₀ (estimated as 80% of 7-Q₁₀)), as specified in s. NR 106.06(3)(bm), Wis. Adm. Code.

SUBSTANCE	REF. HARD.* mg/L	ATC	MEAN BACK-GRD.	MAX. EFFL. LIMIT**	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	1-day P ₉₉	1-day MAX. CONC.
Arsenic		340		680	136	0.54		
Cadmium	447	57.4	0.028	115	23.0	<0.03		
Chromium	301	4446		8892	1778	0.88		

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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.
Copper	447	63.7	1.67	127			7.2	7.0
Lead	356	365		729	146	<0.54		
Mercury (ng/L)		830		1660			2.57	
Nickel	268	1080		2161	432	1.3		
Zinc	333	345		689	137.9	20		
Chloride (mg/L)		757	112	1514			658	674

* 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-Q₁₀ flow rates per the changes to s. NR 106.07(3), Wis. Adm. Code, effective 09/01/2016.

Weekly Average Limits based on Chronic Toxicity Criteria (CTC)

RECEIVING WATER FLOW = 6.4 cfs (¼ of the 7-Q₁₀), as specified in s. NR 106.06(4)(c), Wis. Adm. Code

SUBSTANCE	REF. HARD.* mg/L	CTC	MEAN BACK-GRD.	WEEKLY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	4-day P ₉₉
Arsenic		152		347	69.4	0.54	
Cadmium	175	3.82	0.03	8.68	1.74	<0.03	
Chromium	234	265		604	121	0.88	
Copper	234	21.4	1.67	46.7			6.4
Lead	234	63.7		145	29.0	<0.54	
Mercury (ng/L)		440		1003			1.65
Nickel	234	107		244	48.9	1.30	
Zinc	234	253		577	115	20	
Chloride (mg/L)		395	112	757			610

* 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)

RECEIVING WATER FLOW = 9.8 cfs (¼ of the 90-Q₁₀), as specified in s. NR 106.06(4), Wis. Adm. Code

SUBSTANCE	WC	MEAN BACK-GRD.	MO'LY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	30-day P ₉₉
Mercury (ng/L)	1.3		3.85			1.11

Monthly Average Limits based on Human Threshold Criteria (HTC)

RECEIVING WATER FLOW = 15 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.	30-day P ₉₉
Antimony	373		1492	298	0.87	
Cadmium	370	0.03	1479	296	<0.03	

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SUBSTANCE	HTC	MEAN BACK-GRD.	MO'LY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	30-day P ₉₉
Chromium (+3)	3818000		15267256	3053451	0.88	
Lead	140		560	112	<0.54	
Mercury (ng/L)	1.5		6.0			1.11
Nickel	43000		171947	34389	1.3	
Selenium	2600		10397	2079	0.64	
2,4-Dichlorophenol	580		2319	464	2.1	

Monthly Average Limits based on Human Cancer Criteria (HCC)

RECEIVING WATER FLOW = 15 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		53.2	10.6	0.54

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. Limits and/or monitoring recommendations are made in the paragraphs below:

Chloride – Considering available effluent data from the current permit term (10/18/2020 – 02/05/2025), the 1-day P₉₉ chloride concentration is 658 mg/L, and the 4-day P₉₉ of effluent data is 610 mg/L. These effluent concentrations are below the calculated WQBELs for chloride, therefore no effluent limits are needed. **Chloride monitoring is recommended to continue to meet the data requirements of s. NR 106.85, Wis. Adm. Code.**

Mercury – The WQBEL for total recoverable mercury is set equal to the most stringent criterion of 1.3 ng/L, according to s. NR 106.06(6), Wis. Adm. Code, because the background concentration in the receiving water and similar inland streams is known to exceed 1.3 ng/L.

The current permit requires quarterly monitoring of the influent and effluent for total recoverable mercury. A total of 17 effluent sampling results are available from 11/08/2020 – 10/18/2024 for total recoverable mercury. The average concentration was 0.87 ng/L, and the maximum was 2.5 ng/L. Because the 30-day P₉₉ of available data (1.11 ng/L) is less than the most stringent WQBEL of 1.3 ng/L, **no WQBEL for mercury is required for permit reissuance. Monitoring is recommended to continue in the reissued permit to determine if there is reasonable potential in the next permit reissuance.**

PFOS and PFOA – The need for PFOS and PFOA monitoring is evaluated in accordance with s. NR 106.98(2), Wis. Adm. Code. Available monitoring sample data from the Hartland and Delafield Waterworks (PWS ID: 26835985 and 26846424) are provided in the table below:

Water Supply PFAS Data – Hartland Waterworks

Sample Date	Sample ID	Well #	PFOS (ng/L)	PFOA (ng/L)
05/15/2023	WB02785-07	BH397	1.9	1.2
05/15/2023	WB02785-05	BH399	0.87	1.6
05/15/2023	WB02785-01	BH398	3	2.1
05/15/2023	WB02785-03	BH400	0.71	0.93
05/15/2023	WB02785-09	RG658	4.5	4.1
06/05/2024	WC03307-01	BH398	3.1	2.4
06/05/2024	WC03307-05	BH399	1	1.7
06/05/2024	WC03307-07	BH397	1.6	1.6
06/05/2024	WC03307-03	BH400	0.76	1.1
06/05/2024	WC03307-09	RG658	2.3	1.9
02/25/2025	WD01149-13	BH400	0.57	0.79
02/25/2025	WD01149-06	BH398	2.5	1.7
02/25/2025	WD01149-16	RG658	4.1	3.5
02/25/2025	WD01149-10	BH399	1	1.7
02/25/2025	WD01149-02	BH397	1.6	1.6
Average =			1.97	1.86

Water Supply PFAS Data – Delafield Waterworks

Sample Date	Sample ID	Well #	PFOS (ng/L)	PFOA (ng/L)
04/10/2023	WB01994-01	IG412	ND	ND
04/10/2023	WB01994-03	WG763	ND	ND
Average =			ND	ND

The limited data above shows the municipal water supply is below 1/5th of the PFOA criteria but above 1/5th of the PFOS criteria for Hartland Waterworks.

Previous effluent monitoring produced a PFOS result of 0.958 ng/L and a PFOA result of 5.54 ng/L. These results are less than one fifth of the respective criteria for each substance. Based on the effluent flow rate and known levels of PFOS/PFOA in the source water, PFOS and PFOA monitoring is recommended at a once every two months frequency.

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

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

- Subchapter IV of ch. NR 106, Wis. Adm. Code allows limits based on available dilution instead of limits set to twice the acute criteria.
- The maximum expected effluent pH has changed

Daily Maximum Limits based on Acute Toxicity Criteria (ATC)

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

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

Where:

A = 0.411 and B = 58.4 for a Warm Water Sport fishery, and pH (s.u.) = that characteristic of the effluent.

The effluent pH data was examined as part of this evaluation. A total of 1612 sample results were reported from 10/02/2020 – 02/28/2025. The maximum reported value was 7.8 s.u. (Standard pH Units). The effluent pH was 7.6 s.u. or less 99% of the time. The 1-day P₉₉, calculated in accordance with s. NR 106.05(5), Wis. Adm. Code, is 7.7 s.u. The mean plus the standard deviation multiplied by a factor of 2.33, an estimate of the upper ninety ninth percentile for a normally distributed dataset, is 7.7 s.u. Therefore, a value of 7.7 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 7.7 s.u. into the equation above yields an ATC = 14 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 the 1-Q₁₀ 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-Q₁₀ (estimated as 80 % of 7-Q₁₀) and the 2×ATC approach are shown below.

Daily Maximum Ammonia Nitrogen Determination

	Ammonia Nitrogen Limit mg/L
2×ATC	29
1-Q ₁₀	37

The 2×ATC method yields the most stringent limits for Delafield Hartland. **This is the equivalent to the current daily maximum limit for November – April, so no changes are recommended to the daily maximum limits.**

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

The weekly and monthly average ammonia nitrogen limits calculation from the previous memo do not change because there have been no changes in the effluent and receiving water flow rates. The calculations from the previous WQBEL memo are shown in Attachment #3.

Effluent Data

The following table evaluates the statistics based upon ammonia data reported from 10/01/2020 – 02/28/2025.

Ammonia Nitrogen Effluent Data

Ammonia Nitrogen mg/L	April	May - September	October	November - March
1-day P ₉₉	0.27	0.15	0.34	0.47
4-day P ₉₉	0.15	0.11	0.19	0.28
30-day P ₉₉	0.06	0.07	0.08	0.12
Mean*	0.03	0.05	0.04	0.04
Std	0.08	0.03	0.09	0.15
Sample size	84	438	111	536
Range	<0.04 - 0.53	<0.04 - 0.26	<0.04 - 0.76	<0.04 - 2.56

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

Reasonable Potential

The need to include ammonia limits in Delafield Hartland's permit is determined by calculating 99th upper percentile (or P₉₉) values for ammonia and comparing those to the calculated limits. Based on this comparison, there is no reasonable potential for the discharge to exceed any of the calculated ammonia nitrogen limits. However, since the permit currently has weekly and monthly average limits year-round, **the limits must be retained regardless of reasonable potential**, consistent with s. NR 106.33(1)(b), Wis. Adm. Code:

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

Conclusions and Recommendations

In summary, after rounding to two significant figures, the following ammonia nitrogen limitations are recommended. 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	29	4.9	2.2
May – September		3.6	2.1
October		6.9	3.2
November – March	29	11.4	5.2

PART 5 – PHOSPHORUS**Technology-Based Effluent Limit**

Subchapter II of Chapter NR 217, Wis. Adm. Code, requires municipal wastewater treatment facilities that discharge greater than 150 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 Delafield Hartland currently has a limit of 1.0 mg/L, this limit should be included in the reissued permit. This limit remains applicable unless a more stringent WQBEL is given.

Water Quality-Based Effluent Limits (WQBEL) - Phosphorus

Revisions to administrative rules regulating phosphorus took effect on December 1, 2010. These rule revisions include additions to ch. NR 102 (s. NR 102.06), which establish phosphorus standards for surface waters. Revisions to ch. NR 217 (s. NR 217, Subchapter III) establish procedures for determining WQBELs for phosphorus, based on the applicable standards in ch. NR 102.

The Department has developed a TMDL for the Upper and Lower Rock River Basins which was approved by the US EPA in September 2011.

Section NR 217.16, Wis. Adm. Code, states that the Department may include a TMDL based limitation for phosphorus in addition to, or in lieu of, a s. NR 217.13 WQBEL in a WPDES permit. The Rock River TMDL was developed to protect and improve water quality of phosphorus impaired waters by determining wasteload allocations (WLA) for point and non-point sources of phosphorus. Delafield Hartland discharges to the Bark River which was listed as impaired for phosphorus at the time of TMDL development, so the TMDL-based limit can be included in the WPDES permit absent the s. NR 217.13 WQBEL. This is consistent with the current permit.

Total Maximum Daily Load

The approved Rock River TMDL report provides effluent limitations that are given in lbs/month in the document *Final Rock River TMDL Report with Tables*. The monthly WLA were calculated as monthly averages in lbs/day as shown in the table below. **There are no changes recommended from the current permit.**

TMDL-based Phosphorus Limits

Month	Monthly TP WLA ¹ (lbs/month)	Monthly Average TP Effluent Limit (lbs/day)
January	129.89	4.19
February	198.21	7.08
March	207.67	6.70
April	257.50	8.58
May	227.26	7.33
June	225.57	7.52
July	176.19	5.68
August	154.03	4.97
September	122.43	4.08
October	99.81	3.22
November	104.15	3.47
December	129.78	4.19

Footnotes:

1. Rock River TMDL Appendix P. Monthly Total Phosphorus Allocations by Wastewater Treatment Facility

These limits are already effective and no changes are recommended in the reissued permit.

Effluent Data

The following table summarizes effluent total phosphorus monitoring data from 10/01/2020 – 02/07/2025.

Total Phosphorus Effluent Data

	Concentration mg/L	Mass lbs/day
1-day P ₉₉	1.53	24.5
4-day P ₉₉	0.99	15.8
30-day P ₉₉	0.71	11.4
Mean	0.58	9.35
Std	0.28	4.53
Sample size	1152	1152
Range	0.035 – 2	0.61 – 31

PART 6 – TOTAL SUSPENDED SOLIDS

The Rock River TMDL includes wasteload allocations (WLA) for total suspended solids (TSS) which shall be expressed as both weekly and monthly limits for a municipal facility. **Delafield Hartland is already complying with the TMDL limits for TSS and there are no changes from the current permit for the monthly or weekly WLAs.**

TMDL-based TSS Limits

Month	Monthly TSS WLA ¹ (tons/month)	Monthly Average TSS Effluent Limit (lbs/day)	Weekly Average TSS Effluent Limit (lbs/day)
January	3.50	226	278
February	3.69	264	324
March	3.85	248	305
April	3.16	211	259
May	2.68	173	212
June	2.71	181	222
July	2.10	135	167
August	1.98	128	157
September	1.58	105	130
October	1.98	128	157
November	3.05	203	250
December	3.61	233	286

Footnotes:

1. From the Rock River TMDL Appendix Q.

Total Suspended Solids Effluent Data

	Concentration mg/L	Mass lbs/day
1-day P ₉₉	4.05	23.9
4-day P ₉₉	1.64	16.8
30-day P ₉₉	0.66	8.21
Mean	0.18	1.55
Std	1.34	12.7

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	Concentration mg/L	Mass lbs/day
Sample size	1611	3118
Range	<2 – 9.4	0 – 143

*Results below the level of detection (LOD) were included as zeroes in calculation of the mean

**PART 7 – WATER QUALITY-BASED EFFLUENT LIMITATIONS
FOR THERMAL**

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

In accordance with s. NR 106.53(2)(b), Wis. Adm. Code, the highest daily maximum flow rate for a calendar month is used to determine the acute (daily maximum) effluent limitation. In accordance with s. NR 106.53(2)(c), Wis. Adm. Code, the highest 7-day rolling average flow rate for a calendar month is used to determine the sub-lethal (weekly average) effluent limitation. These values were based off actual flow reported from 10/01/2020 – 02/28/2025.

The table below summarizes the maximum temperatures reported during monitoring from 01/01/2018 – 12/31/2018.

Monthly Temperature Effluent Data & Limits

Month	Representative Highest Monthly Effluent Temperature		Calculated Effluent Limit	
	Weekly Maximum	Daily Maximum	Weekly Average Effluent Limitation	Daily Maximum Effluent Limitation
	(°F)	(°F)	(°F)	(°F)
JAN	51	52	82	120
FEB	49	50	82	120
MAR	50	51	78	120
APR	52	52	68	120
MAY	56	59	79	120
JUN	62	64	97	119
JUL	64	64	107	116
AUG	66	67	110	116
SEP	66	66	93	103
OCT	63	64	83	120
NOV	58	59	66	120
DEC	54	55	76	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

Based on the available effluent data, **no effluent limits or monitoring are recommended for temperature.** The complete thermal table used for the limit calculation is attached.

PART 8 – 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 44%**, 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:

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

Where:

Q_e = annual average flow = 3.23 MGD = 5.0 cfs

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

Q_s = ¼ of the 7-Q₁₀ = 3.8 cfs ÷ 4 = 0.95 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

Attachment #1

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 001 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 001. 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. 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. Data collected prior to July 1, 2005 is excluded from this evaluation.

WET Data History

Date Test Initiated	Acute Results LC ₅₀ %				Chronic Results IC ₂₅ %				Footnotes or Comments
	<i>C. dubia</i>	Fathead minnow	Pass or Fail?	Used in RP?	<i>C. dubia</i>	Fathead Minnow	Pass or Fail?	Use in RP?	
07/11/2006	>100	>100	Pass		>100	>100	Pass		
06/05/2007	>100	>100	Pass		>100	>100	Pass		
07/29/2008	>100	>100	Pass	No	>100	>100	Pass	No	1
03/10/2009	>100	>100	Pass	No	>100	>100	Pass	No	1
10/12/2010	>100	>100	Pass	No	>100	>100	Pass	No	1
04/21/2015	>100	>100	Pass		>100	>100	Pass		
11/29/2016	>100	>100	Pass		>100	86.6	Pass		
08/22/2017	>100	>100	Pass		>100	>100	Pass		
02/20/2018	>100	>100	Pass		95.3	>100	Pass		
06/04/2019	>100	>100	Pass		>100	>100	Pass		
11/10/2020	>100	>100	Pass		>100	>100	Pass		
05/11/2021	>100	>100	Pass		>100	>100	Pass		
09/13/2022	>100	>100	Pass		>100	>100	Pass		
02/28/2023	>100	>100	Pass		>100	>100	Pass		

Footnotes:

1. *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.**

$$\text{Acute Reasonable Potential} = [(TUa \text{ effluent}) (B)(AMZ)]$$

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

According to s. NR 106.08(6)(d), Wis. Adm. Code, TU_a and TU_c effluent values are equal to zero whenever toxicity is not detected (i.e. when the LC₅₀, IC₂₅ or IC₅₀ ≥ 100%).

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

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

Chronic WET Limit Parameters

TU _c (maximum) 100/IC ₂₅	B (multiplication factor from s. NR 106.08(6)(c), Wis. Adm. Code, Table 4)	IWC
100/86.6 = 1.15	3.8 Based on 2 detects	44%

[(TU_c effluent) (B)(IWC)] = 1.9 > 1.0

Therefore, reasonable potential is shown for chronic WET limits using the procedures in s. NR 106.08(6), Wis. Adm. Code, and representative data from 07/11/2006 – 02/28/2023.

Expression of WET limits

Chronic WET limit = [100/IWC] TU_c = 2.3 TU_c expressed as a monthly average

This limit is equal to the current chronic WET limit and no changes are recommended.

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 = 44%. 10 Points
Historical Data	11 tests used to calculate RP. No tests failed. 0 Points	11 tests used to calculate RP. No tests failed. 0 Points
Effluent Variability	Little variability, no violations or upsets, consistent WWTF operations.	Same as Acute.

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	Acute	Chronic
	0 Points	0 Points
Receiving Water Classification	Warmwater sport fish community. 5 Points	Same as Acute. 5 Points
Chemical-Specific Data	No reasonable potential for limits based on ATC; Ammonia nitrogen limit carried over from the current permit. Arsenic, chromium, copper, mercury, nickel, zinc, ammonia, and chloride detected. Additional Compounds of Concern: Antimony, selenium, and 2,4-dichlorophenol. 5 Points	No reasonable potential for limits based on CTC; Ammonia nitrogen limit carried over from the current permit. Arsenic, chromium, copper, mercury, nickel, zinc, ammonia, and chloride detected. Additional Compounds of Concern: Antimony, selenium, and 2,4-dichlorophenol. 5 Points
Additives	1 Biocide and 2 Water Quality Conditioners added. Permittee has proper P chemical SOPs in place. 5 Points	All additives used more than once per 4 days. 5 Points
Discharge Category	1 Industrial Contributor 5 Points	Same as Acute. 5 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
Recommended Monitoring Frequency (from Checklist):	1x yearly	1x yearly
(from Checklist)		

- After consideration of the guidance provided in the Department's *WET Program Guidance Document* (2022) and other information described above, annual acute and 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).
- According to the requirements specified in s. NR 106.08, Wis. Adm. Code, a chronic WET limit is required. The chronic WET limit shall be expressed as 2.3 TUc as a monthly average in the effluent limits table of the permit.
- A minimum of annual chronic monitoring is required because a chronic WET limit is required. Federal regulations in 40 CFR Part 122.44(i) require that monitoring occur at least once per year when a limit is present.
- A minimum of annual acute and chronic monitoring is recommended because Delafield Hartland is a major municipal discharger with a design flow greater than 1.0 MGD. Federal regulations at 40 CFR

Attachment #1

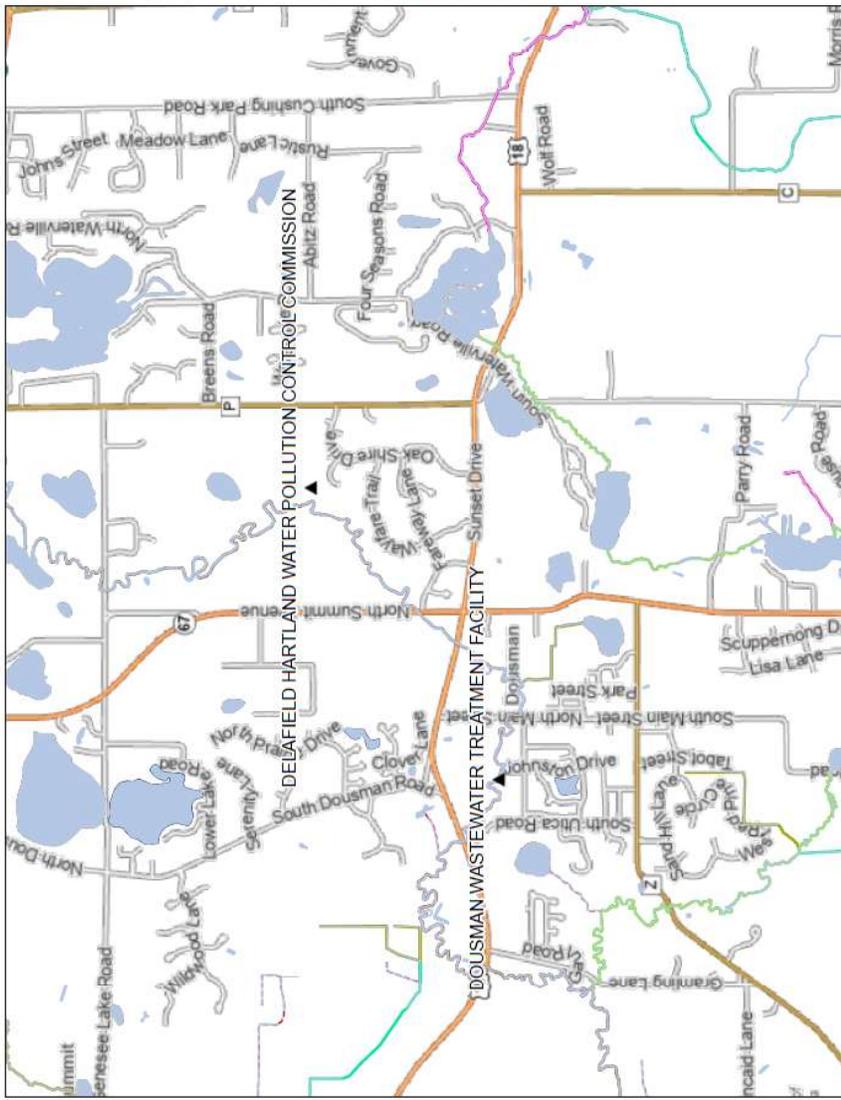
Part 122.21(j) require at least 4 acute and chronic WET tests with each permit application on samples collected since the previous reissuance. Therefore, annual monitoring is recommended in the permit term, so that data will be available for the next permit application.

- 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).

PART 9 – BIOLOGICAL OXYGEN DEMAND

The current permit has a weekly average limit of 7.0 mg/L for May – October but no corresponding mass limit. Mass limits are recommended for BOD₅ to limit the use of assimilative capacity in the receiving water. Therefore, **a mass limit of 189 lbs/day (7.0 mg/L x 3.23 MGD x 8.34) is recommended as a weekly average for May – October.**

Delafield Hartland Outfall Location



Legend:

- ▲ Surface Water Outfalls
- 24K Streams and Rivers
- 24K Lakes and Open Water
- Streams Natural Communities**
- Cool-Cold Headwater
- Cool-Warm Headwater
- Cool-Warm Mainstem
- Macroinvertebrate
- Warm Headwater
- Warm Mainstem
- Lake Natural Communities**
- No Classification
- Deep Headwater
- Deep Lowland
- Deep Seepage
- Impounded Flowing Water
- Reservoir
- Shallow Lowland
- Shallow Seepage

Notes:



Map projection: NAD 1983 HARN Wisconsin TM

Service Layer Credits:
 Latest Leaflet Imagery... Basic Basemap (Cdn):
 Map: 0 3,000 6,000 Feet
 0 830 1,780 Meters

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2006 Ammonia Limits Calculations

Overview of Ammonia Rule Changes: The changes to ch. NR 105 establish acute (daily) and chronic (weekly and monthly) criteria for ammonia in-stream, based on updated information on ammonia toxicity. Acute criteria are dependent on the classification of the receiving water and on the pH of the discharge. Chronic criteria are dependent on the classification, temperature and pH of the receiving water. In addition, the chronic criteria for most classifications of receiving water are dependent on the presence or absence of early life stages of fish. For fish species other than burbot, the presence of early life stages is assumed in April and when the average temperature is equal to or greater than 14.6 degrees Celsius. Burbot are known to reproduce in colder water beginning in January of the year. There have been a large number of surveys in the Southeastern Wisconsin river basins over the years, and no burbot have been found (communication with Sue Beyler, SER Fisheries Biologist). In addition, the Department's Master Fish file and Becker's Fishes of Wisconsin have no record of burbot in the Bark River. Therefore the criteria for the Bark River will not be determined to protect the early life stages of burbot.

The changes to ch. NR 106 establish procedures for determining effluent limitations. For acute (daily maximum) limits, the limit equals twice the acute criterion established in conformance with ch. NR 105, unless a zone of initial dilution has been approved for a discharger. The acute limit is dependent on the maximum effluent pH, which in this case is represented by the 99th percentile of 7.7 s.u.

For chronic (weekly average) limits, the limit is a mass balance based on the average annual design flow of the plant and a percentage of the average minimum 7-day flow that occurs once every ten years (7Q10). The percentage of stream flow used is related to the temperature of the stream. When the geometric average of the stream temperature is less than 11 degrees C., 25% of the stream flow is used. When the geometric average stream temperature is equal to or less than 16 degrees C., 50% of the stream flow is used. When the geometric average stream temperature is greater than 16 degrees C., 100% of the stream flow is used. Since the rate of breakdown of ammonia increases with increasing temperature, a greater percentage of the stream flow can be used.

For the purposes of determining ammonia limits, additional stream data is used:

Receiving Water Temperature:

May through September = 23 degrees C

April and October

= 9 degrees C.

November-March

= 3 degrees C.

(based on default temperature data for small streams in Wisconsin)

Background Ammonia Levels:

April

= 0.121 mg/L

May-September = 0.052 mg/l

October = 0.063 mg/l

November-March = 0.266 mg/l

(based on 1/11/2000 design limit memo)

River pH:

November-March = 7.97 su

Other months = 8.21 su

Attachment #3

(Note = these are default values that differ from the pH values used in the 1/11/2000 design limit memo. The data used in the design memo was collected in 1977 and 1978, before the existence of the Dela-Hart discharge. Hydrolab monitoring done by DNR staff in late March of 2004 indicated that the river pH significantly exceeded the pH values used in the design limits memo, possibly due to stream productivity).

Based on the criteria in ch. NR 105, the procedures for limit determinations in ch. NR 106, and the effluent and stream data noted above, the following limitations for ammonia are recommended for Dela-Hart:

Ammonia Effluent Limitations (mg/l)	
Month(s)	Limitations
November-April	29 mg/l, daily maximum (daily maximum limits are not recommended for the months of May-October if the limit would be at or above 20 mg/l)
April	4.9 mg/l, weekly average
May-September	3.6 mg/l, weekly average
October	6.9 mg/l, weekly average
November-March	11.4 mg/l, weekly average
April	2.2 mg/l, monthly average
May-September	2.1 mg/l, monthly average
October	3.2 mg/l, monthly average
November-March	5.2 mg/l, monthly average

In accordance with s. NR 106.32 (5), no mass limitations are recommended.

Applicability of NR 207 (Antidegradation) for Ammonia Limitations:

In accordance with s. NR 106.34 and with s. NR 207.03, any increases in weekly effluent limitations for ammonia are not subject to the provisions in ch. NR 207 due to the change in criteria. To determine the need for a ch. NR 207 review for weekly limits, the limits based on the old design flow of 2.2 MGD and the new criteria and procedures are compared to the limits based on the new design flow, criteria, and procedures. Since the limits are lower when the design flow is increased, ch. NR 207 does not apply. Since this is the initial proposal for daily and monthly ammonia limits, these limits are also exempt from ch. NR 207.