

Permit Fact Sheet

General Information

Permit Number	WI-0058904-06-0
Permittee Name and Address	Cushing Sanitary District #1 P O Box 457, Cushing, WI 54006
Permitted Facility Name and Address	Cushing Sanitary District #1 SW1/4, S31, T36N-R18W, Cushing, Wisconsin
Permit Term	January 01, 2026 to December 31, 2030
Discharge Location	SWQ, Section 31, T36N-R18W, Cushing, Wisconsin
Receiving Water	Groundwater of the St. Croix River drainage basin in Wolf Creek of St Croix River in Polk County
Discharge Type	Existing seasonal discharger
Annual Average Design Flow (MGD)	0.0178 MGD
Industrial or Commercial Contributors	N/A
Plant Classification	A4 - Ponds, Lagoons and Natural Systems; SS - Sanitary Sewage Collection System
Approved Pretreatment Program?	N/A

Facility Description

Cushing Sanitary District owns and operates a community wastewater treatment system. The plant designed to treat 17,780 gallons per day currently treats an average of 7,000 gallons per day (July 2020 – July 2025 data). The system consists of a stabilization pond followed by a large storage pond. In the pond, naturally occurring bacteria already in the wastewater metabolize organic matter in the waste stream. Treated wastewater is stored through the winter in the pond and spray irrigated on an 18-acre field using 2 center pivot irrigation units. The field supports a cover crop which takes up nutrients and water. The water not used by the cover crop percolates through the soil eventually reaching groundwater. Groundwater impacts from the discharge are measured by 4 monitoring wells located around the perimeter of the spray irrigation system.

Substantial Compliance Determination

Enforcement During Last Permit: There have been a few minor violations of groundwater limits and late reporting. However, in response to this inspection report, the department is working with the facility to take the necessary steps to correct the violations.

After a desk top review of all Discharge Monitoring Reports, Groundwater Monitoring Reports, CMARs, and a site visit on 07/09/2024 by Carson Johnson WDNR, Cushing Sanitary District has been found to be in substantial compliance with their current permit.

Sample Point Descriptions

Sample Point Designation		
Sample Point Number	Discharge Flow, Units, and Averaging Period	Sample Point Location, Waste Type/Sample Contents and Treatment Description (as applicable)
701	An average of 0.007 MGD (August 1, 2020 – July 31, 2025, data)	Representative samples shall be collected at the main lift station, located on 240th Street and Highway 87.
001	An average of 0.08 MGD during periods of discharge. An average of 47 days of discharge per year (mainly May-October) (August 1, 2020 – July 31, 2025, data)	Representative samples shall be taken from the effluent wet well in the spray irrigation pump station. Treated wastewater is authorized to discharge May through October via pivots A & B.
003	Sludge has not been removed from the facility.	Representative samples shall be taken from the accumulated sludge in the stabilization and storage ponds by compositing a series of grab samples taken across the bottom of the ponds.

Sample Point Designation For Groundwater Monitoring Systems		
Sample Pt Number	Well Name	Comments
801	MW801	Upgradient well located northwest of pivot A used to calculate PALs.
803	MW 803	Down gradient non-point of standard well west of pivot B, nested with well 807.
805	MW 805	Side gradient non-point of standard well located east of pivot B.
806	MW 806 (4R)	Side gradient non-point of standard well located between the pivots and the secondary/storage pond.
807	MW 807 (3R)	Down gradient non-point of standard well west of pivot B, nested with well 803.

Permit Requirements

1 Influent – Monitoring Requirements

1.1 Sample Point Number: 701- INFLUENT

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Flow Rate		MGD	Daily	Continuous	
BOD5, Total		mg/L	2/Month	Grab	
Suspended Solids,		mg/L	2/Month	Grab	

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Total					
Nitrogen, Total Kjeldahl		mg/L	Monthly	Grab	
Nitrogen, Organic Total		mg/L	Monthly	Calculated	Organic Nitrogen = Total Kjeldahl Nitrogen - Ammonia Nitrogen
Nitrogen, Ammonia (NH ₃ -N) Total		mg/L	Monthly	Grab	

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.

The Flow Rate sample frequency was changed from “Continuous” to “Daily” to reflect currently acceptable practices at the facility.

Explanation of Limits and Monitoring Requirements

Influent monitoring is needed to assess loading to the facility and treatment performance. The required parameters and sampling frequency are appropriate for a land treatment system as outlined in ch NR 206, Wis. Adm. Code.

2 Land Treatment – Monitoring and Limitations

2.1 Sample Point Number: 001- SPRAY IRRIGATION

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Flow Rate		MGD	Daily	Total Daily	
Hydraulic Application Rate	Monthly Avg - LT	10,000 gal/ac/day	Monthly	Calculated	The limit is effective during the spray season May through October.
Hydraulic Application Rate	Monthly Avg - LT	0 gal/ac/day	Monthly	Calculated	The limit is effective during the off-season November through April.
BOD ₅ , Total	Monthly Avg	50 mg/L	Weekly	Grab	
Suspended Solids, Total		mg/L	Weekly	Grab	
pH Field		su	Weekly	Grab	

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Nitrogen, Total Kjeldahl		mg/L	Monthly	Grab	
Nitrogen, Organic Total		mg/L	Monthly	Calculated	Organic nitrogen = total Kjeldahl nitrogen (mg/L) - ammonia nitrogen (mg/L)
Nitrogen, Ammonia (NH ₃ -N) Total		mg/L	Monthly	Grab	
Nitrogen, Nitrite + Nitrate Total		mg/L	Monthly	Grab	
Solids, Total Dissolved		mg/L	Monthly	Grab	
Chloride		mg/L	Monthly	Grab	
Nitrogen, Total		mg/L	Monthly	Calculated	Total nitrogen = total Kjeldahl nitrogen (mg/L) + [NO ₂ + NO ₃] nitrogen (mg/L)
Nitrogen, Max Applied On Any Zone		lbs/ac/yr	Annual	Total Annual	Use the nitrogen concentration when calculating the annual total. See the Maximum Applied Nitrogen On Any Zone section.
Soil - Nitrogen, Available		mg/kg	Annual	Grab	
Soil - Phosphorus, Available		mg/kg	Annual	Grab	
Soil - Potassium, Available		mg/kg	Annual	Grab	
Soil - pH Lab		su	Annual	Grab	
Other Sources of Nitrogen		lbs/ac/yr	Annual	Measure	

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.

- An off-season **hydraulic application rate** (HAR) of zero was added for the months of November through April.
- **Nitrogen max applied to any zone** has been moved from the annual report to the monitoring table.

- **Soil testing** (nitrogen, phosphorus, potassium and pH) and other sources of nitrogen applied (ie fertilizer or manure) has been moved from the annual report to the monitoring table.

Explanation of Limits and Monitoring Requirements

All requirements for land treatment of municipal wastewater are determined in accordance with ch. NR 206, Wis. Adm. Code. All categorical limits are based on s. NR 206.08(2) Wis. Adm. Code. More information on the limitations can be found in the “Groundwater Evaluation for Cushing Sanitary District #1” memo dated August 20, 2025.

Nitrogen and chloride max applied to any zone – These two parameters previously found in the Annual Report have been moved to the monitoring table. This eliminates the additional report allowing all data to be entered into eDMRs.

Soil testing (available nitrogen, available phosphorus, available potassium and pH) **and other sources of nitrogen** (ie fertilizer or manure) – Annual soil monitoring of the spray field(s) is required by NR 214.14(5)(c) Wis. Adm. Code and was previously submitted through the Annual Report. These parameters have been moved to the monitoring table. This eliminates the additional report allowing all data to be entered into eDMRs. One annual composite sample per outfall number is required, but if the permittee chooses to complete multiple soil tests for the fields used under Outfall 001 there is a feature within the eDMRs that allows additional data to be recorded. It is asked that the additional samples’ zones are identified in the form’s general comments section.

Sampling Frequency - The “[Monitoring Frequencies for Individual Wastewater Permits](#)” guidance document (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 fairness and 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. The department has determined at this time that the facility meets the guidance and no changes in the monitoring frequency is required this permit term.

3 Groundwater – Monitoring and Limitations

3.1 Groundwater Monitoring System for Groundwater Monitoring System

Location of Monitoring system: Around the perimeter of the spray system

Groundwater Monitoring Well(s) to be Sampled: MW801, MW 803, MW 805, MW 806 (4R), MW 807 (3R)

Groundwater Monitoring Well(s) Used to Evaluate Background Groundwater Quality: MW801

Groundwater Monitoring Well(s) Used for Point of Standards Application: Currently, the facility does not have wells that fit this standard.

Parameter	Units	Preventative Action Limit	Enforcement Standard	Frequency
Depth To Groundwater	feet	N/A	N/A	1/ 6 Months
Groundwater Elevation	feet MSL	N/A	N/A	1/ 6 Months
Nitrogen, Nitrite + Nitrate (as N) Dissolved	mg/L	N/A	N/A	1/ 6 Months
Chloride Dissolved	mg/L	125	250	1/ 6 Months
pH Field	su	8.0	N/A	1/ 6 Months
Nitrogen, Ammonia Dissolved	mg/L	0.97	9.7	1/ 6 Months

Nitrogen, Organic Dissolved	mg/L	3.1	N/A	1/ 6 Months
Solids, Total Dissolved	mg/L	710	N/A	1/ 6 Months

Changes from Previous Permit:

Groundwater 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.

- To provide more accurate data, **pH** samples shall be tested at the facility instead of sending them to an outside laboratory.
- The Preventative Action Limits (PALs) and Enforcement Standard (ES) limits will remain the same except for parameters, organic nitrogen and total dissolved solids.
- The Nitrite + Nitrate PAL and ES are extremely high due to significant impacts upgradient. A decision was made per s. NR 140.28 Wis, Adm. Code to exempt the facility from limits but collection and analysis of groundwater samples continues to be required.

Explanation of Limits and Monitoring Requirements

Groundwater limits and requirements are determined in accordance with ch. NR 140, Wis. Adm. Code. Indicator parameter Preventive Action Limit (PAL) values are established per s. NR 140.20, Wis. Adm. Code. Alternative Concentration Limits as allowed under s. NR 140.28, Wis. Adm. Code, are established on a case-by-case basis.

For more information, please refer to the “Groundwater Evaluation for Cushing Sanitary District #1” memo dated August 20, 2025.

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

Municipal Sludge Description					
Sludge Class (A or B)	Sludge Type (Liquid or Cake)	Pathogen Reduction Method	Vector Attraction Method	Reuse Option	Amount Reused/Disposed (Dry Tons/Year)
B	Liquid	Sludge has not been removed, and removal is not anticipated this permit term. If removal is needed see the land application and schedule sections of the permit for more information.			
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? The community water supply is provided by private wells. Radium-226 levels are unknown since private water wells are not required to be tested for radium.					
Is a priority pollutant scan required? No					

4.1 Sample Point Number: 003- SLUDGE FROM PONDS

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Solids, Total		Percent	Once	Composite	
Arsenic Dry Wt	Ceiling	75 mg/kg	Once	Composite	
Arsenic Dry Wt	High Quality	41 mg/kg	Once	Composite	
Cadmium Dry Wt	Ceiling	85 mg/kg	Once	Composite	
Cadmium Dry Wt	High Quality	39 mg/kg	Once	Composite	
Copper Dry Wt	Ceiling	4,300 mg/kg	Once	Composite	
Copper Dry Wt	High Quality	1,500 mg/kg	Once	Composite	
Lead Dry Wt	Ceiling	840 mg/kg	Once	Composite	
Lead Dry Wt	High Quality	300 mg/kg	Once	Composite	
Mercury Dry Wt	Ceiling	57 mg/kg	Once	Composite	
Mercury Dry Wt	High Quality	17 mg/kg	Once	Composite	
Molybdenum Dry Wt	Ceiling	75 mg/kg	Once	Composite	
Nickel Dry Wt	Ceiling	420 mg/kg	Once	Composite	
Nickel Dry Wt	High Quality	420 mg/kg	Once	Composite	
Selenium Dry Wt	Ceiling	100 mg/kg	Once	Composite	
Selenium Dry Wt	High Quality	100 mg/kg	Once	Composite	
Zinc Dry Wt	Ceiling	7,500 mg/kg	Once	Composite	
Zinc Dry Wt	High Quality	2,800 mg/kg	Once	Composite	
Nitrogen, Total Kjeldahl		Percent	Per Application	Composite	
Nitrogen, Ammonia (NH3-N) Total		Percent	Per Application	Composite	
Phosphorus, Total		Percent	Per Application	Composite	
Phosphorus, Water Extractable		% of Tot P	Per Application	Composite	
Potassium, Total Recoverable		Percent	Per Application	Composite	
PCB Total Dry Wt	Ceiling	50 mg/kg	Once	Composite	See the Sludge Analysis for PCBs permit section.
PCB Total Dry Wt	High Quality	10 mg/kg	Once	Composite	See the Sludge Analysis for PCBs permit section.

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
PFOA + PFOS		ug/kg	Once	Calculated	Report the sum of PFOA and PFOS. See PFAS permit sections for more information.
PFAS Dry Wt			Once	Grab	Perfluoroalkyl and Polyfluoroalkyl Substances based on updated DNR PFAS List. See PFAS Permit Sections for more information.

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.

- **List 1 (Metals), PCBs and PFAS** monitoring is required during the second year of the permit term (2027).
- Because it’s recommended that **List 2 (Nutrients)** are monitored with the List 1 monitoring, they have been added to the table.
- Due to changes within the land application forms, the 3400-049 (“Characteristics Report”), 3400-052 (“Other Methods of Disposal”) and 3400-055 (Annual Land Application”) will need to be submitted each year.

4.1.1 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.

List 2 Nutrient monitoring – Monitoring for list 2 (nutrients) is highly recommended at the same time as the monitoring of List 1 (metals) in year 2 of the permit (2027). Results will assist in the determination of the acres needed for land application of sludge should it be necessary. The number of acres needed is also required for the Sludge Management Schedule (see schedules for more information).

Change in form submittal – In prior permit reissuances when it has been noted in the application that sludge would not be removed during the permit term, the department required sampling during the second year of the permit term and the sludge characteristic report (3400-049) would be generated only during that year. Due to moving to electronic submittal

of forms via Switchboard, forms 3400-049 (“Characteristics Report”), 3400-052 (“Other Methods of Disposal”) and 3400-055 (“Annual Land Application”) will now be generated by the department and the permittee will be required to submit all three reports each year of the permit term. This change was adopted to provide the permittee flexibility because many lagoon desludging projects can be unexpected, are delayed or staggered over multiple years. Additionally, it is used to officially report that no land application of sludge has occurred, and annual submittal of the forms is required per the standard requirements section.

- Sludge analysis during the second year of the permit term has been included. There are check boxes available on the electronic forms to identify if desludging didn’t occur.
- Sludge characteristics report (3400-049) – at the top of the form check “yes” or “no” in the box identifying if any land application occurred that year. Complete the form if required or identify the year samples will be or have been taken in the comments section.
- 3400-052 (“Other Methods of Disposal”) and 3400-055 (“Annual Land Application”) - The reports are technically 2 separate forms that are now combined in one location but separated onto two different tabs. If you answer “No” to both listed questions the forms are complete. If you need to answer “Yes” to either question the corresponding form tabs will go from gray to blue indicating information can be entered on the report.

5 Schedules

5.1 Load Rest Evaluation

Required Action	Due Date
Load Rest Evaluation: Evaluate the load/rest cycles of the spray irrigation system with the intent to increase the rest cycles in between the loaded periods.	12/31/2026
Submit an Update: Submit an update to the load/rest evaluation.	12/31/2027
Final Report: Submit a final report summarizing the findings of the load/rest cycle evaluation.	12/31/2028

Explanation of Schedule

Load Rest Evaluation – Because of past ACL exceedances of nitrite + nitrate the department is requiring a load rest evaluation under s. NR 140.27 Wis. Adm. Code. Adjusting the load/rest cycles can significantly optimize the amount of nitrogen taken up by the cover crop reducing the amount found in the soil column.

5.2 Land Treatment Management Plan

A management plan is required for the land treatment system.

Required Action	Due Date
Land Treatment Management Plan Submittal: Submit an update to the management plan to optimize the land treatment system performance and demonstrate compliance with ch. NR 206, Wis. Adm. Code. The land treatment system shall be operated in accordance with the approved management plan.	12/31/2028

Explanation of Schedule

Land Treatment Management Plan - An up-to-date Land Treatment Management plan is a standard requirement in reissued municipal permits per ch. NR 206, Wis. Adm. Code.

5.3 Sludge Mapping

Required Action	Due Date
Map Sludge Depth: Sludge depth measurements should be taken across the ponds. A map showing the sludge profile shall be prepared and submitted.	12/31/2027

Explanation of Schedule

Sludge Mapping - The depth and distribution of the sludge in the ponds is not currently known. This information is important to determine the effectiveness of the ponds and estimate when sludge removal is needed.

5.4 Sludge Management Plan

Required Action	Due Date
Submit a Sludge Management Plan: The permittee shall submit an update to the management plan for approval if removal of sludge will occur during this permit term. The plan shall demonstrate compliance with ch. NR 204 Wis. Adm. Code and at minimum address 1) How and where is sludge sampled; 2) Available sludge storage details and location(s); 3) How will the sludge be removed with details on volume, characterization and how will the treatment plant continue to function during the drawdown; 4) Describe the type of transportation and spreading vehicles and loading and unloading practices; 5) Identify approved land application sites, apply for needed sites, site limitations, total acres needed and vegetative cover management; 6) Specify record keeping procedures including site loading; 7) Address contingency plans for adverse weather and odor/nuisance abatement; and 8) Include any other pertinent information such as other disposal options that may be used or specifications of any pretreatment processes Once approved, all sludge management activities shall be conducted in accordance with the plan. Any changes to the plan must be approved by the Department prior to implementing the changes. No desludging may occur unless approval from the Department is obtained. Daily logs shall be kept that record where the sludge has been disposed. The plan is due at least 60 days prior to desludging.	

Explanation of Schedule

Sludge Management Plan - If the lagoons are to be de-sludged during this permit term a management plan is needed to show compliance with ch. NR 204, Wis. Adm. Code. There are outlines available to assist in plan development.

Attachments

Water Flow Schematic

“Groundwater Evaluation for Cushing Sanitary District #1” memo dated August 20, 2025

Justification Of Any Waivers From Permit Application Requirements

No waivers requested or granted as part of this permit reissuance

Prepared By: Sheri A. Snowbank

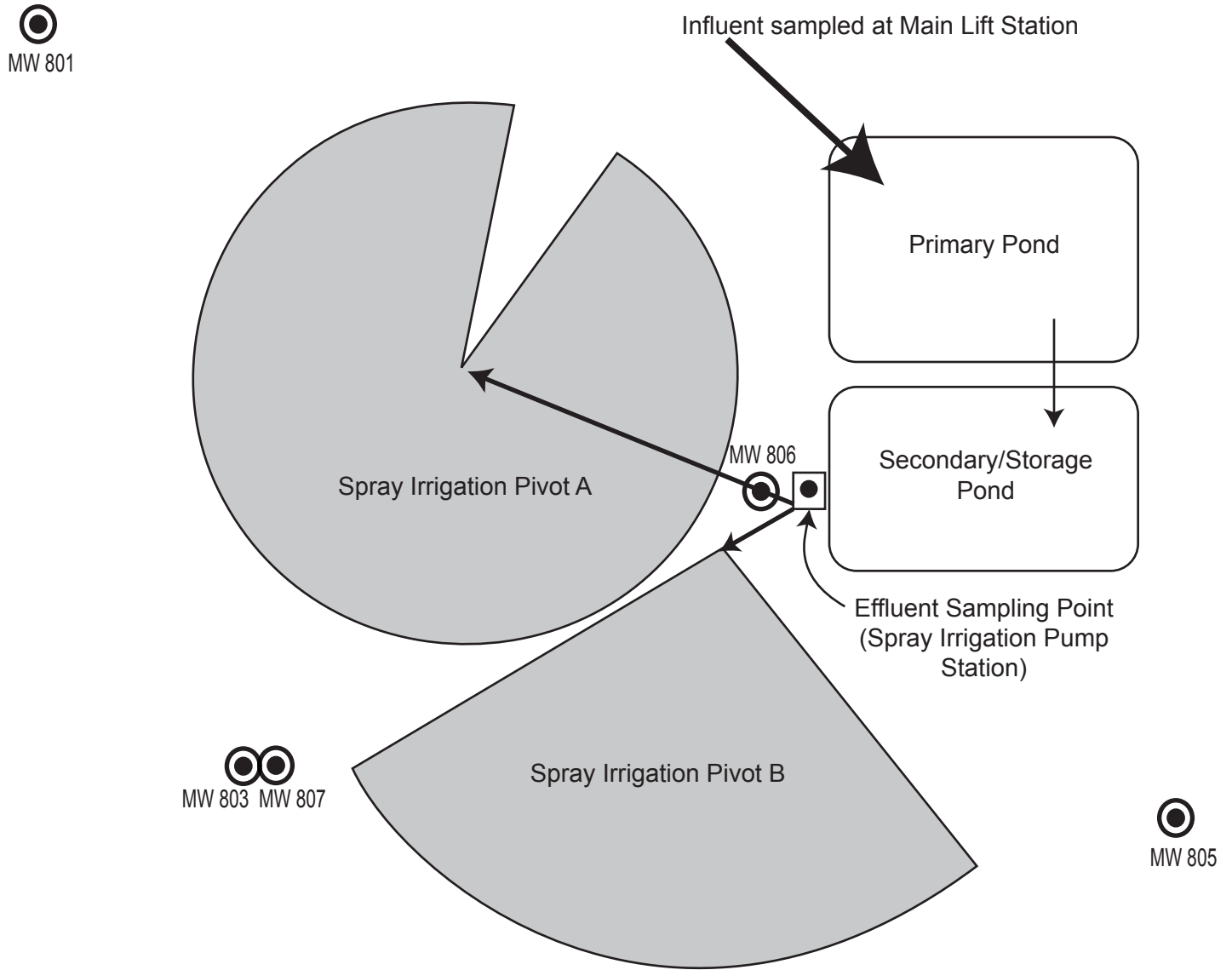
Wastewater Specialist

Date: September 5, 2025

CUSHING SANITARY DISTRICT

Wastewater Treatment Facility

The Cushing wastewater treatment facility consists of a stabilization pond, a storage pond, and two spray irrigation fields. Effluent is discharged to the groundwater of the St. Croix River drainage basin. Treated effluent will be spray irrigated during the summer months. The diagram below shows the treatment units and sampling locations.



Design Data

Flow: 0.01778 MGD
 BOD: 43 pounds/day
 Suspended Solids: 51 pounds/day
 Construction year: 1998

- ⊙ Represents monitoring well locations
- Represents sample locations

NOT TO SCALE

DATE: August 20, 2025

TO: File

FROM: Woody Myers - WCR



SUBJECT: Groundwater Evaluation for Cushing Sanitary District #1, WI-0058904

Site Information

The Cushing Sanitary District #1 is located in Cushing, Polk County. This is a municipal wastewater treatment facility. Wastewater is currently treated and discharged to groundwater via infiltration by way of spray irrigation fields a land disposal system. These fields are located in the SW ¼ of Section 31, T36N, R18W, Town of Laketown.

Land Disposal Effluent & Groundwater Evaluation Summary

Table 1 Land Disposal Outfall Sampling Point Parameters and Limits
Outfall 001 Spray Irrigation

Parameter	Current Permit WI-0058904-05		Proposed Permit WI-0058904-06	
	Limits and Units	Limit Type	Limits and Units	Limit Type
Flow Rate	- MGD		- MGD	
Hydraulic Application Rate *(May-Oct)	10,000 gal/ac/day	Monthly Avg LT	10,000 gal/ac/day	Monthly Avg LT
*Hydraulic Application Rate (Nov-Apr)			0 gal/ac/day	
BOD ₅	50 mg/l	Monthly Avg	50 mg/l	Monthly Avg
Total Suspended Solids	- mg/l		- mg/l	
pH, Field	- su		- su	
Nitrogen, Total Kjeldahl	- mg/l		- mg/l	
Nitrogen, Organic	- mg/l		-	
Nitrogen, Ammonia	- mg/l		- mg/l	
Nitrogen, Nitrite + Nitrate	- mg/l		- mg/l	
Total Dissolved Solids	- mg/l		- mg/l	
Chloride	- mg/l		- mg/l	
Nitrogen, Total	- mg/l		- mg/l	
*Nitrogen, Max Applied to Any Zone	Not Listed		- lbs/ac/yr	

* Proposed permit changes



**Table 1 (Continued) Land Disposal Outfall Sampling Point Parameters and Limits
Outfall 001 Spray Irrigation**

Parameter	Current Permit WI-0058904-05		Current Permit WI-0058904-06	
	Limits and Units	Limit Type	Limits and Units	Limit Type
* Soil Nitrogen, Available	This information was previously required in the annual report. It is the spray field annual soil sample required in s. NR 206.08 (2) (b) 7, Wis. Adm. Code		- mg/kg	
*Soil Phosphorus, Available			- mg/kg	
* Soil Potassium, Available			- mg/kg	
* Soil pH, Lab			- su	
* Fertilizer Used			- lbs/ac/yr	

* Proposed permit changes

Table 2 Monitoring Wells

Well	Current Permit WI-0058904-05		Proposed Permit WI-0058904-06	
	Well Location	Well Designation	Well Location	Well Designation
MW 801	Up-gradient	Non-point of standard	Up-gradient	*Background
MW 803	Down-gradient	Non-point of standard	Down-gradient	Non-point of standard
MW 805	Side-gradient	Background	Side-gradient	*Non-point of standard
MW 806 (4R)	Mid field	Non-point of standard	*Side-gradient	Non-point of standard
MW 807 (3R)	Down-gradient	Non-point of standard	Down-gradient	Non-point of standard

* Proposed permit changes

Table 3 Groundwater Quality Standards

Parameter	Current Permit WI-0058904-05		Proposed WI-0058904-06	
	PAL	ES	PAL	ES
Depth to Groundwater	N/A	N/A	N/A	N/A
Groundwater Elevation	N/A	N/A	N/A	N/A
Nitrogen, Nitrite + Nitrate	10.0 mg/l (ACL)	10.0 mg/l	*Exempt	*Exempt
Chloride	125 mg/l	250 mg/l	125 mg/l	250 mg/l
pH, Lab	6.0-8.0 su	N/A	*Discontinue	
Nitrogen, Ammonia	0.97 mg/l	9.7 mg/l	0.97 mg/l	9.7 mg/l
Nitrogen, Organic	2.5 mg/l	N/A	*3.1 mg/l	N/A
Total Dissolved Solids	590 mg/l	N/A	*710 mg/l	N/A
Nitrogen Total	6.4 mg/l	N/A	*Discontinue	
*pH, Field	Not Required		*6.0-8.0 su	N/A

* Proposed permit changes

Geology

The bedrock under this facility is the Mount Simon Formation. This formation is comprised of sandstone, conglomerate and shale. (*Bedrock Geology of Wisconsin, Regional Map Series Northwest Sheet*, Wisconsin Geological and Natural History Survey (WGNHS), 1987). Bedrock is anticipated to be greater than 100 feet below ground surface (bgs) (*Depth to Bedrock in Wisconsin*, WGNHS, 1973). The regolith consists of a moderately tight clay from the ground surface to approximately 22 feet bgs and sandy material ranging from silty sand to gravely sand. Surface soil primarily consists of the Cushing loam (USDA NRCS Web Soil Survey).

Hydrogeology

Calculated groundwater elevations range between 900 and 977 feet above mean sea level (msl). Depth to groundwater was reported to be between 20 and 85 feet bgs. Groundwater flow direction was calculated to be to the south with very low confidence. The surface top lithology of the regolith as stated earlier is a clay layer; this clay is an aquitard with a highly permeable sand layer underneath. Given this geologic environment it is possible to observe vertical flow gradients that flow up (artesian effect). Regional groundwater is to the west in this area of Polk County (*Generalized Water Table Elevation Map of Polk County, Wisconsin*, WGNHS, 2000). There are three wells (municipal, other than municipal, private and high-capacity) within a 1,500-foot range of this facility's groundwater discharge. The spray irrigation fields are west approximately 600 feet from McKeith Lake and northwest approximately 1,000 feet from Round Lake.

Land Disposal Effluent Quality and Loading Rates

The following table is the average flow (hydraulic loading), total nitrogen, chloride and BOD₅ loading summations for the land disposal system.

Table 4 Land Treatment Disposal Loading Averages

Year	Flow (MGD)	Total Nitrogen (mg/l)	Chloride (mg/l)	BOD ₅ (mg/l)
2025 [#]	0.069	11.02	94	15.0
2024	0.075	4.57	69	12.7
2023	0.077	9.82	77	8.3
2022	0.081	8.52	67	13.7
2021	0.084	5.18	72	4.8
2020	0.090	5.45	53	9.4

Indicates partial year

Groundwater Monitoring System and Sampling Frequency

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

Table 5 Groundwater Monitoring Well Data

Sample Point	Well Name	Elevation (feet above msl)				Length (feet)		Well Type
		Casing Top	Ground Surface	Screen Top	Screen Bottom	Screen Length	Well Depth	
801	MW 801	995.60	993.69					
803	MW 803	984.84	982.42	921.4	896.4	25.0	86.0	
805	MW 805	958.71	956.78	935.8	920.8	15.0	36.0	
806	MW 806 (4R)	980.03	977.9	932.9	917.9	15.0	62.5	
807	MW 807 (3R)	985.17	982.67	898.7	883.7	15.0	99.0	

All measurements in feet

WT-Water table Observation P-Piezometer O-Other

Groundwater sampling results from this facility have been analyzed for each well to evaluate trends of the regulated compounds in groundwater and to calculate PALs for s. NR 140.22 Wis. Adm. Code Indicator Parameters and to evaluate potential exemptions under s. NR 140.28 Wis. Adm. Code. The groundwater was evaluated by looking at the groundwater data from April 28, 2020 – October 19, 2024.

Background Groundwater Quality

Historically groundwater monitoring well 801 was thought to be in a perched aquifer and representative only of loading from nearby agricultural activities, but through this evaluation it was determined to be up-gradient of the land disposal system. In addition, this well is screened in the sand layer (previously discussed in the Geology section of this report) and has been found to be representative of the background groundwater quality. Well 801 will be used to calculate indicator parameter PALs and evaluate exemptions under s. NR 140.28 Wis. Adm. Code.

Nitrite + nitrate in well 801 is consistently above the s. NR 140.10 Wis. Adm. Code, Table 1 PAL and occasionally above the Table 1 ES. The fluctuations in these results are moderate and there is a slightly increasing trend. All other parameters are below groundwater quality thresholds and have consistent and stable trends.

Down-Gradient Groundwater Quality

The only compound that exceeded its threshold was nitrite + nitrate. These exceedances were observed in groundwater monitoring wells 803, 806 and 807. The exceedances were sporadic in magnitude and without a clear trend. See Figure 1. Please note that well 801 has been re-designated as the background well. It was placed on Figure 1 for reference and comparison. Groundwater monitoring wells 803, 806 and 807 are non-Point of Standards Application wells.

Land Disposal System Impact to Groundwater Quality

Concentrations and trends in the groundwater monitoring data were compared to the loading data for the land disposal system. There is not a clear correlation between the effluent loading levels of nitrite + nitrate and the groundwater monitoring results.

Proposed Groundwater Monitoring Requirements

Table 6 Groundwater Quality Sampling Frequency and Limits
Outfall 001 Permit WI-0058904-06

Sample Point	Well Name	Sample Frequency	Well Designation
801	MW801	1/6 Months	*Background
803	MW803	1/6 Months	Non-Point of Standard
805	MW805	1/6 Months	*Non-Point of Standard
806	MW806 (4R)	1/6 Months	Non-Point of Standard
807	MW807 (3R)	1/6 Months	Non-Point of Standard
Parameter	PAL	ES	Source
Depth to Groundwater	N/A	N/A	Measured
Groundwater Elevation	N/A	N/A	Measured
Nitrogen, Nitrite + Nitrate	*Exempt	*Exempt	NR 140.28
Chloride	125 mg/l	250 mg/l	NR 140 Table 2
pH, Lab	*Discontinue		
Nitrogen, Ammonia	0.97 mg/l	9.7 mg/l	NR 140 Table 1
Nitrogen, Organic	*3.1 mg/l	N/A	Calculated
Total Dissolved Solids	*710 mg/l	N/A	Calculated
Nitrogen, Total	*Discontinue		
*pH, Field	*6.0-8.0	N/A	Calculated

* Proposed permit changes

Indicator Parameter PALs

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

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

And for pH:

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

Alternative Concentration Limits

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

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

Conclusions

There are several changes to the Sampling Point Outfall 001 Table 1 (Spray Irrigation). An additional hydraulic application rate is added; one indicates the limit for the spray season (carried over from the previous permit) and one for the off-season with a zero limit per s. NR 110.255 (2) (a) 2 Wis. Adm. Code. There is an addition to the effluent table for the nitrogen max applied to any zone based on the need to report the total nitrogen mass loading for the spray season. This requirement was previously found in the annual report. As a note if the spray irrigation is loaded as one unit then Cushing should report the total field mass loading. The final change is the new reporting location for the soil sampling required under s. NR 206.08 (2) (b) 7, Wis. Adm. Code. As a result of the new reporting location a separate annual report will no longer be required.

The PAL and ES for nitrite + nitrate are conditionally exempt for the groundwater monitoring wells associated with Outfall 001. The collection and analysis of groundwater samples for nitrite + nitrate continues to be required, but there will be no limits (PAL/ACL/ES) for nitrite + nitrate. The exemption is in place under the following conditions:

- There are no significant increases in the nitrogen effluent concentration to the spray irrigation fields
- The exemption is in place for the term of this permit
- The facility remains in compliance with the other restrictions and limits for this Outfall.

The requirement for pH has been changed. In the previous permit the pH analysis was performed by the laboratory. Because of the potential changes in pH between the sample collection and the Lab testing the groundwater sample the department is requiring the pH to be sampled in the field.

Based on background groundwater quality the indicator parameters of organic nitrogen and TDS have been increased from 2.5 to 3.1 mg/l and 590 to 710 mg/l respectively.

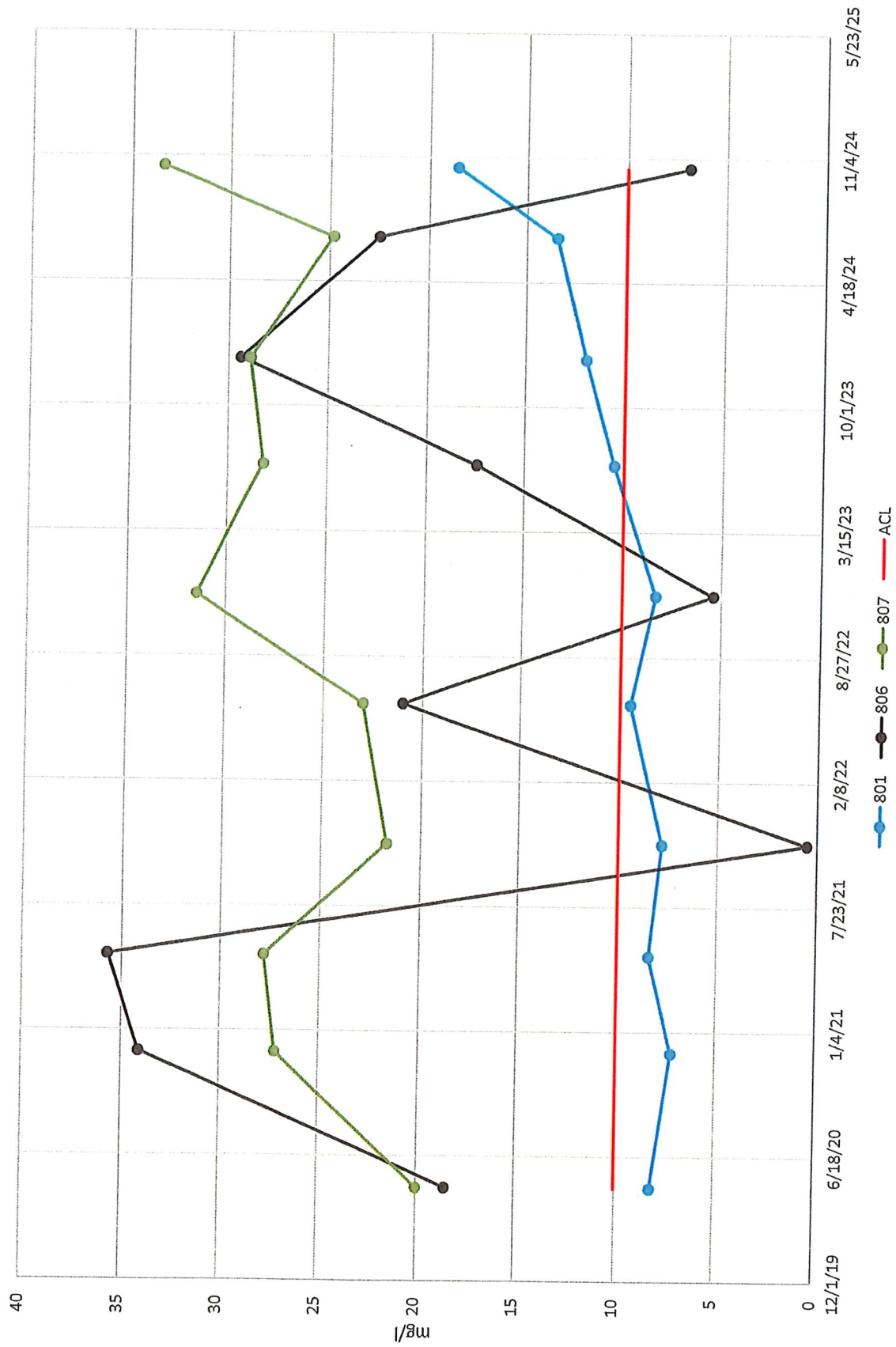
Because of the past ACL exceedances of nitrite + nitrate the department can require a response action for the ES exceedances in the non-point of standards wells under s. NR 140.27, Wis. Adm. Code. The response action will be to evaluate the load/rest cycles for the spray field. An important part of this evaluation is to ensure good record keeping in the form of the daily log with start and stop times and irrigation volumes. Adjusting the load/rest cycles can significantly optimize the amount of nitrogen taken up by the cover crop and increase the amount of nitrogen reduced in the soil column.

Compliance Schedule Recommendations

The s. NR 206.07 (2)(h) 1. Wis. Adm. Code requires a land disposal management plan for facilities with land disposal systems. The facility should review their plan within 90 days of permit reissuance and any revisions should be submitted to the department for approval.

The facility should evaluate the load/rest cycles of the spray irrigation system with the intent to increase the rest cycles in between the loaded periods. The facility should provide a status update each year of the permit after reissuance and a final report at the end of the third year.

Figure 1
Nitrite + Nitrate



Appendix

The preceding results were provided by the facility or their agent. The mean and standard deviation were calculated electronically.

well	param	unit	sample_date	rest result_amt
801 MW801	Chloride Dissolved	mg/L	04/28/2020	60
801 MW801	Chloride Dissolved	mg/L	12/01/2020	72
801 MW801	Chloride Dissolved	mg/L	05/05/2021	73
801 MW801	Chloride Dissolved	mg/L	10/31/2021	56
801 MW801	Chloride Dissolved	mg/L	06/12/2022	41
801 MW801	Chloride Dissolved	mg/L	12/03/2022	47
801 MW801	Chloride Dissolved	mg/L	06/30/2023	47
801 MW801	Chloride Dissolved	mg/L	12/16/2023	45
801 MW801	Chloride Dissolved	mg/L	06/29/2024	50
801 MW801	Chloride Dissolved	mg/L	10/19/2024	50
			Average	54.1
			St Dev	10.51142
801 MW801	Nitrogen, Ammonia Dissolved	mg/L	04/28/2020	0.1
801 MW801	Nitrogen, Ammonia Dissolved	mg/L	12/01/2020	0.1
801 MW801	Nitrogen, Ammonia Dissolved	mg/L	05/05/2021	0.1
801 MW801	Nitrogen, Ammonia Dissolved	mg/L	10/31/2021 <	0.1
801 MW801	Nitrogen, Ammonia Dissolved	mg/L	06/12/2022 <	0.1
801 MW801	Nitrogen, Ammonia Dissolved	mg/L	12/03/2022 >	0.1
801 MW801	Nitrogen, Ammonia Dissolved	mg/L	06/30/2023 <	0.1
801 MW801	Nitrogen, Ammonia Dissolved	mg/L	12/16/2023 <	0.1
801 MW801	Nitrogen, Ammonia Dissolved	mg/L	06/29/2024 <	0.1
801 MW801	Nitrogen, Ammonia Dissolved	mg/L	10/19/2024 <	0.01
801 MW801	Nitrogen, Nitrite + Nitrate (as N) Dissolved	mg/L	04/28/2020	8.2
801 MW801	Nitrogen, Nitrite + Nitrate (as N) Dissolved	mg/L	12/01/2020	7.2
801 MW801	Nitrogen, Nitrite + Nitrate (as N) Dissolved	mg/L	05/05/2021	8.4
801 MW801	Nitrogen, Nitrite + Nitrate (as N) Dissolved	mg/L	10/31/2021	7.8
801 MW801	Nitrogen, Nitrite + Nitrate (as N) Dissolved	mg/L	06/12/2022	9.5
801 MW801	Nitrogen, Nitrite + Nitrate (as N) Dissolved	mg/L	12/03/2022	8.3
801 MW801	Nitrogen, Nitrite + Nitrate (as N) Dissolved	mg/L	06/30/2023	10.5
801 MW801	Nitrogen, Nitrite + Nitrate (as N) Dissolved	mg/L	12/16/2023	12
801 MW801	Nitrogen, Nitrite + Nitrate (as N) Dissolved	mg/L	06/29/2024	13.5
801 MW801	Nitrogen, Nitrite + Nitrate (as N) Dissolved	mg/L	10/19/2024	18.5
			Average	10.39
			St Dev	3.299227

well	param	unit	sample_date	resl result_amt
801	MW801 Nitrogen, Organic Dissolved	mg/L	04/28/2020	0.8
801	MW801 Nitrogen, Organic Dissolved	mg/L	12/01/2020	0.9
801	MW801 Nitrogen, Organic Dissolved	mg/L	05/05/2021	1
801	MW801 Nitrogen, Organic Dissolved	mg/L	10/31/2021	0.7
801	MW801 Nitrogen, Organic Dissolved	mg/L	06/12/2022	1.5
801	MW801 Nitrogen, Organic Dissolved	mg/L	12/03/2022	0.9
801	MW801 Nitrogen, Organic Dissolved	mg/L	06/30/2023	1.2
801	MW801 Nitrogen, Organic Dissolved	mg/L	12/16/2023	1.1
801	MW801 Nitrogen, Organic Dissolved	mg/L	06/29/2024	1.1
801	MW801 Nitrogen, Organic Dissolved	mg/L	10/19/2024	1.2
			Average	1.04
			St Dev	0.22
801	MW801 Nitrogen, Total	mg/L	04/28/2020	9
801	MW801 Nitrogen, Total	mg/L	12/01/2020	8.1
801	MW801 Nitrogen, Total	mg/L	05/05/2021	9.4
801	MW801 Nitrogen, Total	mg/L	10/31/2021	8.5
801	MW801 Nitrogen, Total	mg/L	06/12/2022	11
801	MW801 Nitrogen, Total	mg/L	12/03/2022	9.2
801	MW801 Nitrogen, Total	mg/L	06/30/2023	11.7
801	MW801 Nitrogen, Total	mg/L	12/16/2023	13.1
801	MW801 Nitrogen, Total	mg/L	06/29/2024	14.6
801	MW801 Nitrogen, Total	mg/L	10/19/2024	19.7
			Average	11.43
801	MW801 pH Lab	su	04/28/2020	6.5
801	MW801 pH Lab	su	12/01/2020	6.7
801	MW801 pH Lab	su	05/05/2021	6.7
801	MW801 pH Lab	su	10/31/2021	7.8
801	MW801 pH Lab	su	06/12/2022	7.1
801	MW801 pH Lab	su	12/03/2022	7
801	MW801 pH Lab	su	06/30/2023	7.8
801	MW801 pH Lab	su	12/16/2023	6.8
801	MW801 pH Lab	su	06/29/2024	6.6
801	MW801 pH Lab	su	10/19/2024	6.4
			Average	6.94
801	MW801	462019 mg/L	04/28/2020	557
801	MW801	462019 mg/L	12/01/2020	497
801	MW801	462019 mg/L	05/05/2021	578
801	MW801	462019 mg/L	10/31/2021	486
801	MW801	462019 mg/L	06/12/2022	417
801	MW801	462019 mg/L	12/03/2022	484
801	MW801	462019 mg/L	06/30/2023	508
801	MW801	462019 mg/L	12/16/2023	473
801	MW801	462019 mg/L	06/29/2024	529
801	MW801	462019 mg/L	10/19/2024	501
			Average	503
			St Dev	42.69426

well	param	unit	sample_date	rest result_amt
803	MW 803 Chloride Dissolved	mg/L	05/05/2021	45
803	MW 803 Chloride Dissolved	mg/L	10/31/2021	43
803	MW 803 Chloride Dissolved	mg/L	12/16/2023	75
803	MW 803 Chloride Dissolved	mg/L	06/29/2024	39
803	MW 803 Chloride Dissolved	mg/L	10/19/2024	38
803	MW 803 Nitrogen, Ammonia Dissolved	mg/L	05/05/2021	30.1
803	MW 803 Nitrogen, Ammonia Dissolved	mg/L	10/31/2021 <	0.1
803	MW 803 Nitrogen, Ammonia Dissolved	mg/L	12/16/2023 <	0.1
803	MW 803 Nitrogen, Ammonia Dissolved	mg/L	06/29/2024 <	0.1
803	MW 803 Nitrogen, Ammonia Dissolved	mg/L	10/19/2024 <	0.1
803	MW 803 Nitrogen, Nitrite + Nitrate (as N) Dissolved	mg/L	05/05/2021	30.1
803	MW 803 Nitrogen, Nitrite + Nitrate (as N) Dissolved	mg/L	10/31/2021	26.8
803	MW 803 Nitrogen, Nitrite + Nitrate (as N) Dissolved	mg/L	12/16/2023	27
803	MW 803 Nitrogen, Nitrite + Nitrate (as N) Dissolved	mg/L	06/29/2024	31
803	MW 803 Nitrogen, Nitrite + Nitrate (as N) Dissolved	mg/L	10/19/2024	32.6
803	MW 803 Nitrogen, Organic Dissolved	mg/L	05/05/2021	1.4
803	MW 803 Nitrogen, Organic Dissolved	mg/L	10/31/2021	0.9
803	MW 803 Nitrogen, Organic Dissolved	mg/L	12/16/2023	1.5
803	MW 803 Nitrogen, Organic Dissolved	mg/L	06/29/2024	1.8
803	MW 803 Nitrogen, Organic Dissolved	mg/L	10/19/2024	1.8
803	MW 803 Nitrogen, Total	mg/L	05/05/2021	31.5
803	MW 803 Nitrogen, Total	mg/L	10/31/2021	27.7
803	MW 803 Nitrogen, Total	mg/L	12/16/2023	28.5
803	MW 803 Nitrogen, Total	mg/L	06/29/2024	32.8
803	MW 803 Nitrogen, Total	mg/L	10/19/2024	34.4
803	MW 803 pH Lab	su	05/05/2021	7.2
803	MW 803 pH Lab	su	10/31/2021	7.3
803	MW 803 pH Lab	su	12/16/2023	7.2
803	MW 803 pH Lab	su	06/29/2024	7.2
803	MW 803 pH Lab	su	10/19/2024	6.7
803	MW 803	462019 mg/L	05/05/2021	478
803	MW 803	462019 mg/L	10/31/2021	420
803	MW 803	462019 mg/L	12/16/2023	641
803	MW 803	462019 mg/L	06/29/2024	485
803	MW 803	462019 mg/L	10/19/2024	502

well	param	unit	sample_date	rest result_amt
805	MW 805 Chloride Dissolved	mg/L	04/28/2020	13
805	MW 805 Chloride Dissolved	mg/L	12/01/2020	30
805	MW 805 Chloride Dissolved	mg/L	05/05/2021	22
805	MW 805 Chloride Dissolved	mg/L	10/31/2021	16
805	MW 805 Chloride Dissolved	mg/L	06/13/2022	18
805	MW 805 Chloride Dissolved	mg/L	12/03/2022	15
805	MW 805 Chloride Dissolved	mg/L	06/30/2023	53
805	MW 805 Chloride Dissolved	mg/L	12/16/2023	25
805	MW 805 Chloride Dissolved	mg/L	06/29/2024	18
805	MW 805 Chloride Dissolved	mg/L	10/19/2024	17
805	MW 805 Nitrogen, Ammonia Dissolved	mg/L	04/28/2020	0.1
805	MW 805 Nitrogen, Ammonia Dissolved	mg/L	12/01/2020	0.1
805	MW 805 Nitrogen, Ammonia Dissolved	mg/L	05/05/2021	0.1
805	MW 805 Nitrogen, Ammonia Dissolved	mg/L	10/31/2021 <	0.1
805	MW 805 Nitrogen, Ammonia Dissolved	mg/L	06/13/2022 <	0.1
805	MW 805 Nitrogen, Ammonia Dissolved	mg/L	12/03/2022 <	0.1
805	MW 805 Nitrogen, Ammonia Dissolved	mg/L	06/30/2023 <	0.1
805	MW 805 Nitrogen, Ammonia Dissolved	mg/L	12/16/2023 <	0.1
805	MW 805 Nitrogen, Ammonia Dissolved	mg/L	06/29/2024 <	0.1
805	MW 805 Nitrogen, Ammonia Dissolved	mg/L	10/19/2024 <	0.1
805	MW 805 Nitrogen, Nitrite + Nitrate (as N) Dissolved	mg/L	04/28/2020	0.4
805	MW 805 Nitrogen, Nitrite + Nitrate (as N) Dissolved	mg/L	12/01/2020	0.2
805	MW 805 Nitrogen, Nitrite + Nitrate (as N) Dissolved	mg/L	05/05/2021	0.4
805	MW 805 Nitrogen, Nitrite + Nitrate (as N) Dissolved	mg/L	10/31/2021	0.1
805	MW 805 Nitrogen, Nitrite + Nitrate (as N) Dissolved	mg/L	06/13/2022	0.3
805	MW 805 Nitrogen, Nitrite + Nitrate (as N) Dissolved	mg/L	12/03/2022 <	0.1
805	MW 805 Nitrogen, Nitrite + Nitrate (as N) Dissolved	mg/L	06/30/2023	0.12
805	MW 805 Nitrogen, Nitrite + Nitrate (as N) Dissolved	mg/L	12/16/2023	0.13
805	MW 805 Nitrogen, Nitrite + Nitrate (as N) Dissolved	mg/L	06/29/2024	0.3
805	MW 805 Nitrogen, Nitrite + Nitrate (as N) Dissolved	mg/L	10/19/2024 <	0.02
805	MW 805 Nitrogen, Organic Dissolved	mg/L	04/28/2020	0.5
805	MW 805 Nitrogen, Organic Dissolved	mg/L	12/01/2020	0.5
805	MW 805 Nitrogen, Organic Dissolved	mg/L	05/05/2021	0.5
805	MW 805 Nitrogen, Organic Dissolved	mg/L	10/31/2021 <	0.5
805	MW 805 Nitrogen, Organic Dissolved	mg/L	06/13/2022	0.5
805	MW 805 Nitrogen, Organic Dissolved	mg/L	12/03/2022 <	0.5
805	MW 805 Nitrogen, Organic Dissolved	mg/L	06/30/2023 <	0.5
805	MW 805 Nitrogen, Organic Dissolved	mg/L	12/16/2023 <	0.5
805	MW 805 Nitrogen, Organic Dissolved	mg/L	06/29/2024 <	0.5
805	MW 805 Nitrogen, Organic Dissolved	mg/L	10/19/2024 <	0.5

well	param	unit	sample_date	resl result_amt
805	MW 805 Nitrogen, Total	mg/L	04/28/2020	0.9
805	MW 805 Nitrogen, Total	mg/L	12/01/2020	0.7
805	MW 805 Nitrogen, Total	mg/L	05/05/2021	0.9
805	MW 805 Nitrogen, Total	mg/L	10/31/2021	0.6
805	MW 805 Nitrogen, Total	mg/L	06/13/2022	0.8
805	MW 805 Nitrogen, Total	mg/L	12/03/2022 <	0.6
805	MW 805 Nitrogen, Total	mg/L	06/30/2023	0.42
805	MW 805 Nitrogen, Total	mg/L	12/16/2023	0.53
805	MW 805 Nitrogen, Total	mg/L	06/29/2024	0.7
805	MW 805 Nitrogen, Total	mg/L	10/19/2024	0.42
805	MW 805 pH Lab	su	04/28/2020	6.4
805	MW 805 pH Lab	su	12/01/2020	6.3
805	MW 805 pH Lab	su	05/05/2021	6.2
805	MW 805 pH Lab	su	10/31/2021	6.4
805	MW 805 pH Lab	su	06/13/2022	6.7
805	MW 805 pH Lab	su	12/03/2022	6.5
805	MW 805 pH Lab	su	06/30/2023	6.3
805	MW 805 pH Lab	su	12/16/2023	6.2
805	MW 805 pH Lab	su	06/29/2024	6.2
805	MW 805 pH Lab	su	10/19/2024	6.4
805	MW 805	462019 mg/L	04/28/2020	244
805	MW 805	462019 mg/L	12/01/2020	262
805	MW 805	462019 mg/L	05/05/2021	250
805	MW 805	462019 mg/L	10/31/2021	221
805	MW 805	462019 mg/L	06/13/2022	255
805	MW 805	462019 mg/L	12/03/2022	248
805	MW 805	462019 mg/L	06/30/2023	283
805	MW 805	462019 mg/L	12/16/2023	300
805	MW 805	462019 mg/L	06/29/2024	265
805	MW 805	462019 mg/L	10/19/2024	234
806	MW 806 Chloride Dissolved	mg/L	04/28/2020	75
806	MW 806 Chloride Dissolved	mg/L	12/01/2020	82
806	MW 806 Chloride Dissolved	mg/L	05/05/2021	65
806	MW 806 Chloride Dissolved	mg/L	10/31/2021	21
806	MW 806 Chloride Dissolved	mg/L	06/12/2022	47
806	MW 806 Chloride Dissolved	mg/L	12/03/2022	28
806	MW 806 Chloride Dissolved	mg/L	06/30/2023	53
806	MW 806 Chloride Dissolved	mg/L	12/16/2023	36
806	MW 806 Chloride Dissolved	mg/L	06/29/2024	62
806	MW 806 Chloride Dissolved	mg/L	10/19/2024	31

well	param	unit	sample_date	resl result_amt
806	MW 806 Nitrogen, Ammonia Dissolved	mg/L	04/28/2020	0.1
806	MW 806 Nitrogen, Ammonia Dissolved	mg/L	12/01/2020	0.1
806	MW 806 Nitrogen, Ammonia Dissolved	mg/L	05/05/2021	0.1
806	MW 806 Nitrogen, Ammonia Dissolved	mg/L	10/31/2021 <	0.1
806	MW 806 Nitrogen, Ammonia Dissolved	mg/L	06/12/2022 <	0.1
806	MW 806 Nitrogen, Ammonia Dissolved	mg/L	12/03/2022 <	0.1
806	MW 806 Nitrogen, Ammonia Dissolved	mg/L	06/30/2023 <	0.1
806	MW 806 Nitrogen, Ammonia Dissolved	mg/L	12/16/2023 <	0.1
806	MW 806 Nitrogen, Ammonia Dissolved	mg/L	06/29/2024 <	0.1
806	MW 806 Nitrogen, Ammonia Dissolved	mg/L	10/19/2024 <	0.1
806	MW 806 Nitrogen, Nitrite + Nitrate (as N) Dissolved	mg/L	04/28/2020	18.5
806	MW 806 Nitrogen, Nitrite + Nitrate (as N) Dissolved	mg/L	12/01/2020	34.1
806	MW 806 Nitrogen, Nitrite + Nitrate (as N) Dissolved	mg/L	05/05/2021	35.7
806	MW 806 Nitrogen, Nitrite + Nitrate (as N) Dissolved	mg/L	10/31/2021	0.5
806	MW 806 Nitrogen, Nitrite + Nitrate (as N) Dissolved	mg/L	06/12/2022	21
806	MW 806 Nitrogen, Nitrite + Nitrate (as N) Dissolved	mg/L	12/03/2022	5.4
806	MW 806 Nitrogen, Nitrite + Nitrate (as N) Dissolved	mg/L	06/30/2023	17.4
806	MW 806 Nitrogen, Nitrite + Nitrate (as N) Dissolved	mg/L	12/16/2023	29.4
806	MW 806 Nitrogen, Nitrite + Nitrate (as N) Dissolved	mg/L	06/29/2024	22.5
806	MW 806 Nitrogen, Nitrite + Nitrate (as N) Dissolved	mg/L	10/19/2024	6.85
806	MW 806 Nitrogen, Organic Dissolved	mg/L	04/28/2020	1
806	MW 806 Nitrogen, Organic Dissolved	mg/L	12/01/2020	1.7
806	MW 806 Nitrogen, Organic Dissolved	mg/L	05/05/2021	3.6
806	MW 806 Nitrogen, Organic Dissolved	mg/L	10/31/2021 <	0.5
806	MW 806 Nitrogen, Organic Dissolved	mg/L	06/12/2022	1.1
806	MW 806 Nitrogen, Organic Dissolved	mg/L	12/03/2022	0.6
806	MW 806 Nitrogen, Organic Dissolved	mg/L	06/30/2023	1.4
806	MW 806 Nitrogen, Organic Dissolved	mg/L	12/16/2023	1.2
806	MW 806 Nitrogen, Organic Dissolved	mg/L	06/29/2024	0.9
806	MW 806 Nitrogen, Organic Dissolved	mg/L	10/19/2024	1.1
806	MW 806 Nitrogen, Total	mg/L	04/28/2020	19.5
806	MW 806 Nitrogen, Total	mg/L	12/01/2020	35.8
806	MW 806 Nitrogen, Total	mg/L	05/05/2021	39.3
806	MW 806 Nitrogen, Total	mg/L	10/31/2021	1
806	MW 806 Nitrogen, Total	mg/L	06/12/2022	8.3
806	MW 806 Nitrogen, Total	mg/L	12/03/2022	6
806	MW 806 Nitrogen, Total	mg/L	06/30/2023	18.8
806	MW 806 Nitrogen, Total	mg/L	12/16/2023	30.6
806	MW 806 Nitrogen, Total	mg/L	06/29/2024	23.4
806	MW 806 Nitrogen, Total	mg/L	10/19/2024	7.95

well	param	unit	sample_date	resl result_amt
806	MW 806 pH Lab	su	04/28/2020	7.1
806	MW 806 pH Lab	su	12/01/2020	7
806	MW 806 pH Lab	su	05/05/2021	7.2
806	MW 806 pH Lab	su	10/31/2021	6.9
806	MW 806 pH Lab	su	06/12/2022	7.2
806	MW 806 pH Lab	su	12/03/2022	7
806	MW 806 pH Lab	su	06/30/2023	6.8
806	MW 806 pH Lab	su	12/16/2023	6.9
806	MW 806 pH Lab	su	06/29/2024	7
806	MW 806 pH Lab	su	10/19/2024	6.9
806	MW 806	462019 mg/L	04/28/2020	566
806	MW 806	462019 mg/L	12/01/2020	615
806	MW 806	462019 mg/L	05/05/2021	636
806	MW 806	462019 mg/L	10/31/2021	239
806	MW 806	462019 mg/L	06/12/2022	437
806	MW 806	462019 mg/L	12/03/2022	340
806	MW 806	462019 mg/L	06/30/2023	491
806	MW 806	462019 mg/L	12/16/2023	473
806	MW 806	462019 mg/L	06/29/2024	542
806	MW 806	462019 mg/L	10/19/2024	329
807	MW 807 Chloride Dissolved	mg/L	04/28/2020	36
807	MW 807 Chloride Dissolved	mg/L	12/01/2020	44
807	MW 807 Chloride Dissolved	mg/L	05/05/2021	43
807	MW 807 Chloride Dissolved	mg/L	10/31/2021	39
807	MW 807 Chloride Dissolved	mg/L	06/13/2022	40
807	MW 807 Chloride Dissolved	mg/L	12/03/2022	36
807	MW 807 Chloride Dissolved	mg/L	06/30/2023	32
807	MW 807 Chloride Dissolved	mg/L	12/16/2023	36
807	MW 807 Chloride Dissolved	mg/L	06/29/2024	39
807	MW 807 Chloride Dissolved	mg/L	10/19/2024	39
807	MW 807 Nitrogen, Ammonia Dissolved	mg/L	04/28/2020	0.1
807	MW 807 Nitrogen, Ammonia Dissolved	mg/L	12/01/2020	0.1
807	MW 807 Nitrogen, Ammonia Dissolved	mg/L	05/05/2021	0.1
807	MW 807 Nitrogen, Ammonia Dissolved	mg/L	10/31/2021 <	0.1
807	MW 807 Nitrogen, Ammonia Dissolved	mg/L	06/13/2022 <	0.1
807	MW 807 Nitrogen, Ammonia Dissolved	mg/L	12/03/2022 <	0.1
807	MW 807 Nitrogen, Ammonia Dissolved	mg/L	06/30/2023	0.1
807	MW 807 Nitrogen, Ammonia Dissolved	mg/L	12/16/2023 <	0.1
807	MW 807 Nitrogen, Ammonia Dissolved	mg/L	06/29/2024 <	0.1
807	MW 807 Nitrogen, Ammonia Dissolved	mg/L	10/19/2024 <	0.1

well	param	unit	sample_date	rest result_amt
807 MW 807	Nitrogen, Nitrite + Nitrate (as N) Dissolved	mg/L	04/28/2020	20
807 MW 807	Nitrogen, Nitrite + Nitrate (as N) Dissolved	mg/L	12/01/2020	27.2
807 MW 807	Nitrogen, Nitrite + Nitrate (as N) Dissolved	mg/L	05/05/2021	27.8
807 MW 807	Nitrogen, Nitrite + Nitrate (as N) Dissolved	mg/L	10/31/2021	21.7
807 MW 807	Nitrogen, Nitrite + Nitrate (as N) Dissolved	mg/L	06/13/2022	23
807 MW 807	Nitrogen, Nitrite + Nitrate (as N) Dissolved	mg/L	12/03/2022	31.5
807 MW 807	Nitrogen, Nitrite + Nitrate (as N) Dissolved	mg/L	06/30/2023	28.2
807 MW 807	Nitrogen, Nitrite + Nitrate (as N) Dissolved	mg/L	12/16/2023	28.9
807 MW 807	Nitrogen, Nitrite + Nitrate (as N) Dissolved	mg/L	06/29/2024	24.8
807 MW 807	Nitrogen, Nitrite + Nitrate (as N) Dissolved	mg/L	10/19/2024	33.4
807 MW 807	Nitrogen, Organic Dissolved	mg/L	04/28/2020	1.2
807 MW 807	Nitrogen, Organic Dissolved	mg/L	12/01/2020	1.3
807 MW 807	Nitrogen, Organic Dissolved	mg/L	05/05/2021	1.4
807 MW 807	Nitrogen, Organic Dissolved	mg/L	10/31/2021	1.1
807 MW 807	Nitrogen, Organic Dissolved	mg/L	06/13/2022	1.8
807 MW 807	Nitrogen, Organic Dissolved	mg/L	12/03/2022	1.1
807 MW 807	Nitrogen, Organic Dissolved	mg/L	06/30/2023	1.4
807 MW 807	Nitrogen, Organic Dissolved	mg/L	12/16/2023	0.9
807 MW 807	Nitrogen, Organic Dissolved	mg/L	06/29/2024	1.2
807 MW 807	Nitrogen, Organic Dissolved	mg/L	10/19/2024	1.7
807 MW 807	Nitrogen, Total	mg/L	04/28/2020	19.7
807 MW 807	Nitrogen, Total	mg/L	12/01/2020	28.5
807 MW 807	Nitrogen, Total	mg/L	05/05/2021	29.2
807 MW 807	Nitrogen, Total	mg/L	10/31/2021	22.8
807 MW 807	Nitrogen, Total	mg/L	06/13/2022	24.8
807 MW 807	Nitrogen, Total	mg/L	12/03/2022	32.6
807 MW 807	Nitrogen, Total	mg/L	06/30/2023	29.7
807 MW 807	Nitrogen, Total	mg/L	12/16/2023	29.8
807 MW 807	Nitrogen, Total	mg/L	06/29/2024	26
807 MW 807	Nitrogen, Total	mg/L	10/19/2024	35.1
807 MW 807	pH Lab	su	04/28/2020	6.9
807 MW 807	pH Lab	su	12/01/2020	6.9
807 MW 807	pH Lab	su	05/05/2021	7.1
807 MW 807	pH Lab	su	10/31/2021	7.3
807 MW 807	pH Lab	su	06/13/2022	7.4
807 MW 807	pH Lab	su	12/03/2022	7.2
807 MW 807	pH Lab	su	06/30/2023	7
807 MW 807	pH Lab	su	12/16/2023	7
807 MW 807	pH Lab	su	06/29/2024	6.9
807 MW 807	pH Lab	su	10/19/2024	6.9

well	param	unit	sample_date	resl result_amt
807 MW 807		462019 mg/L	04/28/2020	367
807 MW 807		462019 mg/L	12/01/2020	348
807 MW 807		462019 mg/L	05/05/2021	439
807 MW 807		462019 mg/L	10/31/2021	406
807 MW 807		462019 mg/L	06/13/2022	479
807 MW 807		462019 mg/L	12/03/2022	465
807 MW 807		462019 mg/L	06/30/2023	447
807 MW 807		462019 mg/L	12/16/2023	444
807 MW 807		462019 mg/L	06/29/2024	466
807 MW 807		462019 mg/L	10/19/2024	470