# Permit Fact Sheet

## General Information

| | |
|---|---|
| Permit Number | WI-0060089-11-0 |
| Permittee Name and Address | Village of Winter<br>PO Box 277<br>Winter WI 54896 |
| Permitted Facility Name and Address | Winter Wastewater Treatment Facility<br>Lagoon Rd, Winter, Wisconsin |
| Permit Term | April 01, 2025 to March 31, 2030 |
| Discharge Location | Lagoon Road, Winter Wisconsin SW¼ -NW¼ Section 4:T38N-R5W |
| Receiving Water | Groundwater in Weirgor Creek and Brunet River Watershed of Chippewa River (upper) Drainage Basin in Sawyer County |
| Discharge Type | Existing seasonal (October 1st to December 31st) |
| Annual Average Design Flow (MGD) | 0.08 MGD |
| Industrial or Commercial Contributors | No |
| Plant Classification | A4 - Ponds, Lagoons and Natural Systems; SS - Sanitary Sewage Collection System |
| Approved Pretreatment Program? | N/A |
| Newspaper PN Last Published In | Sawyer County Gazette, PO Box 99, Winter, WI 54896-0099 |

## Facility Description

The Village of Winter owns and operates a domestic wastewater treatment system. The plant designed to treat 80,000 gallons per day currently treats an average of 42,000 gallons per day (2019-2024 data). The system consists of two stabilization ponds operated in series. In each pond naturally occurring bacteria already in the wastewater treat the waste stream by metabolize the organic matter. From the ponds the treated water (effluent) is discharged generally each fall to two seepage cells. Spring discharges are also permitted according to their approved land management plan. The sandy soil in the bottom of the seepage further treats the effluent as it percolates through the soil eventually reaching groundwater. There are four monitoring wells located around the seepage cells to assess any groundwater impacts of the discharge.

## Substantial Compliance Determination

There have been several minor violations of groundwater PALs, missed samples, and late reporting. However, the facility has taken the necessary steps to correct their actions and nothing further is required.

After a desk top review of all discharge monitoring reports, groundwater monitoring forms, CMARs, land app reports, compliance schedule items, and a site visit on 06/13/2024 by Arthur Ryzak WDNR, the Village of Winter 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 | INFLUENT<br>An average of 0.042 MGD<br>(June 2019 - June 2024) | Representative samples on the plant influent shall be collected at the influent monitoring shed. |
| 001 | EFFLUENT<br>An average of 0.266 MGD during periods of discharge. On average dischargers occur 33 days per year. (June 2019 – June 2024) | Representative samples of the plant effluent shall be collected at the wet well following the secondary pond. |
| 002 | SLUDGE<br>Sludge has not been removed since 1984. | Representative samples shall be collected from the accumulated sludge in the primary pond at various locations and depths that are composted for analysis. |

# Permit Requirements

| Sample Point Designation For Groundwater Monitoring Systems | | |
|---|---|---|
| **Sample Pt Number** | **Well Name** | **Comments** |
| 803 | MW 803 | Upgradient well used to measure background groundwater quality and to evaluate and calculate PALs and ACLs. |
| 804 | MW 804 | Down gradient non-point of standard well located southeast of seepage cell 2. |
| 805 | MW 805 | Upgradient non-point of standard well located southwest of seepage cell 2. |
| 806 | MW 806 | Side gradient non-point of standard well located east of pond 2. |

# 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 | Weekly | 24-Hr Flow Prop Comp | |
| Suspended Solids, Total | | mg/L | Weekly | 24-Hr Flow Prop Comp | |
| Nitrogen, Total Kjeldahl | | mg/L | Monthly | 24-Hr Flow Prop Comp | |

| Monitoring Requirements and Limitations | | | | | |
|---|---|---|---|---|---|
| **Parameter** | **Limit Type** | **Limit and Units** | **Sample Frequency** | **Sample Type** | **Notes** |
| Nitrogen, Organic Total | | mg/L | Monthly | Calculated | Organic Nitrogen = Total Kjeldahl Nitrogen (mg/L) - Ammonia Nitrogen (mg/L) |
| Nitrogen, Ammonia (NH3-N) Total | | mg/L | Monthly | 24-Hr Flow Prop Comp | |

### 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.

- The Flow Rate sample frequency was changed from "Continuous" to "Daily" to better represent practices at the facility.

### 1.1.2 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- EFFLUENT TO SEEPAGE POND

| Monitoring Requirements and Limitations | | | | | |
|---|---|---|---|---|---|
| **Parameter** | **Limit Type** | **Limit and Units** | **Sample Frequency** | **Sample Type** | **Notes** |
| Flow Rate | | MGD | Daily | Total Daily | |
| BOD5, Total | Monthly Avg | 50 mg/L | Weekly | Grab | |
| Suspended Solids, Total | | mg/L | Weekly | Grab | |
| pH Field | | su | Weekly | Grab | |
| Nitrogen, Total Kjeldahl | | mg/L | Monthly | Grab | |
| Nitrogen, Organic Total | | mg/L | Monthly | Calculated | Organic Nitrogen = Total Kjeldahl Nitrogen - Ammonia Nitrogen |
| Nitrogen, Ammonia (NH3-N) Total | | mg/L | Monthly | Grab | |
| Nitrogen, Nitrite + Nitrate Total | | mg/L | Monthly | Grab | |

| Monitoring Requirements and Limitations | | | | | |
|---|---|---|---|---|---|
| **Parameter** | **Limit Type** | **Limit and Units** | **Sample Frequency** | **Sample Type** | **Notes** |
| Solids, Total Dissolved | | mg/L | Monthly | Grab | |
| Nitrogen, Total | | mg/L | Monthly | Calculated | Total Nitrogen = Total Kjeldahl Nitrogen + (Nitrite + Nitrate) Nitrogen |
| Chloride | | mg/L | Monthly | Grab | |

### 2.1.1 Changes from Previous Permit:

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

- The Flow Rate sample frequency was changed from "Continuous" to "Daily" and sample type "Continuous" to "Total Daily" to better represent practices at the facility.

### 2.1.2 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(1) Wis. Adm. Code. More information on the limitations can be found in the "Winter Wastewater Treatment Facility – Land Disposal System Evaluation Report, WPDES Permit # WI-0060089" memo dated August 6, 2024.

**BOD** – Limitations are consistent with facilities approved or modified prior to January 1, 1985 (NR 206.05 Wis. Adm. Code).

**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 Treatment System & Seepage Cells

**Location of Monitoring system:** Around the perimeter of the seepage cells and treatment ponds

**Groundwater Monitoring Well(s) to be Sampled:** MW 803, MW 804, MW 805, MW 806

**Groundwater Monitoring Well(s) Used to Evaluate Background Groundwater Quality:** MW 803

**Groundwater Monitoring Well(s) Used for Point of Standards Application:** None of the wells meet the point of standards application well criteria. the wells are within both the property boundary and the design management zone.

| Parameter | Units | Preventative Action Limit | Enforcement Standard | Frequency |
|---|---|---|---|---|
| Depth To Groundwater | feet | N/A | N/A | Quarterly |
| Groundwater Elevation | feet MSL | N/A | N/A | Quarterly |
| Nitrogen, Nitrite + Nitrate (as N) Dissolved | mg/L | 2.0 | 10 | 1/ 6 Months |
| Chloride Dissolved | mg/L | 125 | 250 | 1/ 6 Months |
| pH Field | su | 6.7 | N/A | 1/ 6 Months |
| Nitrogen, Ammonia Dissolved | mg/L | 0.97 | 9.7 | 1/ 6 Months |
| Nitrogen, Organic Dissolved | mg/L | 2.5 | N/A | 1/ 6 Months |
| Solids, Total Dissolved | mg/L | 330 | N/A | 1/ 6 Months |

### 3.1.1 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.

- Based on groundwater background, the Preventative Action Limits (PAL) for pH, organic nitrogen and total dissolved solids have been adjusted.

### 3.1.2 Explanation of Limits and Monitoring Requirements

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

For more information, please refer to the "Winter Wastewater Treatment Facility – Land Disposal System Evaluation Report, WPDES Permit # WI-0060089" memo dated August 6, 2024.

# 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 | Sludge was last removed in 1984 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? No, the most recent sample taken in 2017 were 0.6 pCi/liter. | | | | | | |
| Is a priority pollutant scan required? No | | | | | | |

## 4.1 Sample Point Number: 002- From the stabilization 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 section. |
| PCB Total Dry Wt | High Quality | 10 mg/kg | Once | Composite | See the Sludge Analysis for |

| Monitoring Requirements and Limitations | | | | | |
|---|---|---|---|---|---|
| **Parameter** | **Limit Type** | **Limit and Units** | **Sample Frequency** | **Sample Type** | **Notes** |
| | | | | | PCBs section. |
| 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. |

### 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.

- List 1 (Metals) and PCB monitoring is required during the second year of the permit term (2026).
- Because it's recommended that List 2 (Nutrients) are monitored with the List 1 monitoring, they have been added to the table.
- Monitoring PFAS is required once pursuant to s. NR 204.06(2)(b)9., Wis. Adm. Code.
- 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.

### 4.1.2 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).

- **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 (2026). 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 indicting information can be entered on the report.
- **PFAS -** The presence and fate of PFAS in municipal and industrial sludges is an emerging public health concern. EPA is currently developing a risk assessment to determine future land application rates and expects to release this risk assessment by the end of 2024. In the interim, the department has developed the "Interim Strategy for Land Application of Biosolids and Industrial Sludges Containing PFAS."

  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 Groundwater Monitoring Well Verification

| Required Action | Due Date |
|---|---|
| Survey the groundwater monitoring wells: The survey should include the elevation of the top of casing (TOC) above msl for the wells. A measurement of the TOC above the ground surface should be measured and a calculated ground surface elevation reported. In addition, the total depth of each well should be measured and reported. A table of the measurements needs to be submitted to the department by the date due. | 06/30/2025 |

### 5.1.1 Explanation of Schedule

Accurate well information is needed to ensure the requirements of NR 140 Wis. Adm. Code are met.

## 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 a 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. | 06/30/2025 |

### 5.2.1 Explanation of Schedule

A management plan is a required to update the plan that will outline changes to the land treatment system that will further optimize the efficiencies of the system.

## 5.3 Sludge Management Plan

A management plan is required for the land treatment system.

| 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<br><br>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.<br><br>The plan is due at least 60 days prior to desludging. | |

### 5.3.1 Explanation of Schedule

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 created 2018

"Winter Wastewater Treatment Facility – Land Disposal System Evaluation Report, WPDES Permit # WI-0060089" memo dated August 6, 2024

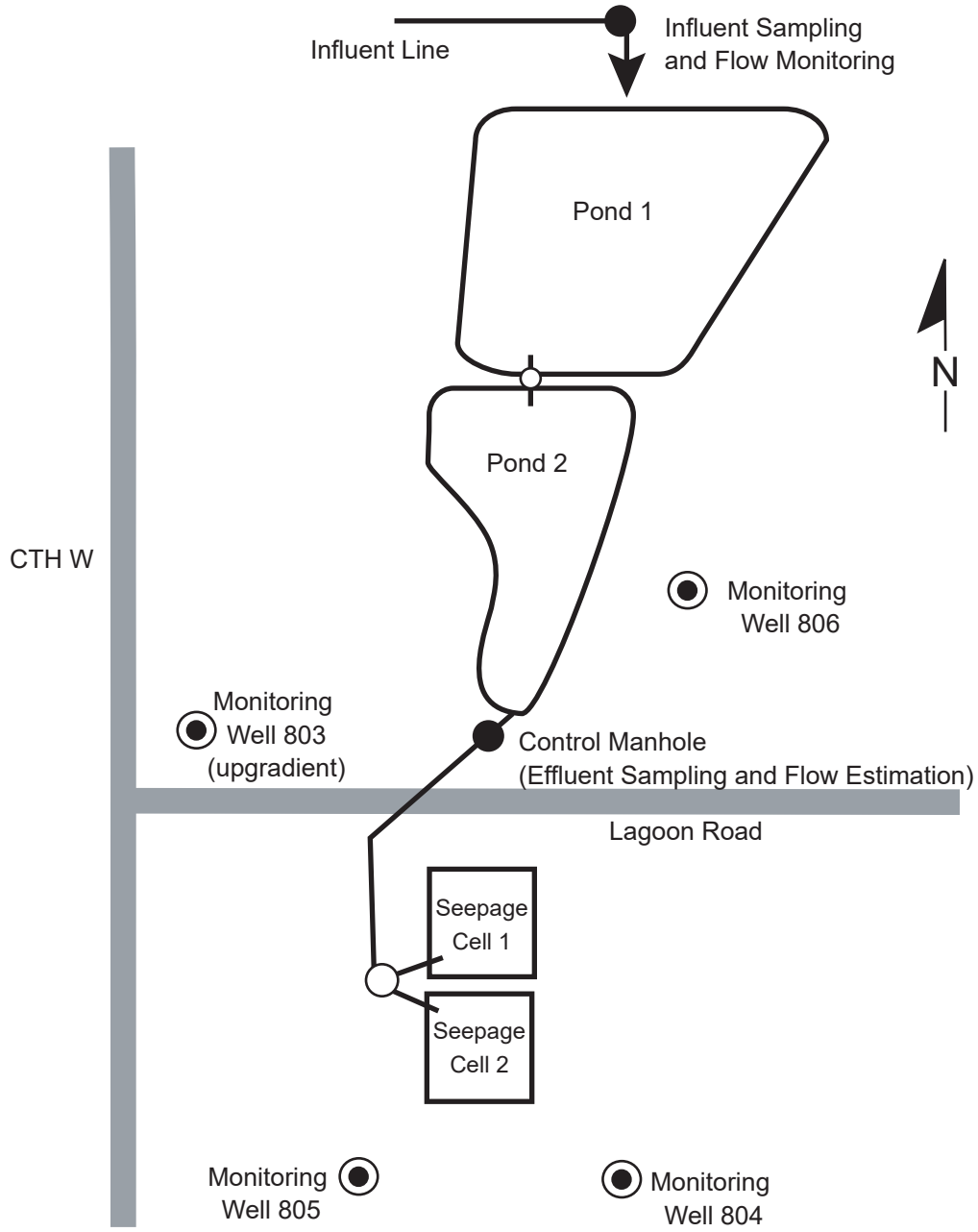
# Justification Of Any Waivers From Permit Application Requirements

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

**Prepared By:** Sheri A. Snowbank Wastewater Specialist **Date:** November 14, 2024

# VILLAGE OF WINTER
# Wastewater Treatment Plant

The Winter Wastewater Treatment Facility consists of two stabilization ponds followed by two seepage cells. Effluent is discharged to the seepage cells once or twice each year. There are four monitoring wells around the perimeter of the system to sample groundwater impacts. The diagram below shows the treatment units and sampling locations.




Groundwater Monitoring Well

Sampling Point

NOT TO SCALE

Flow: 0.080 MGD
BOD: 168 pounds/day
Construction Year: 1984

# CORRESPONDENCE/MEMORANDUM

State of Wisconsin

DATE: August 6, 2024 FILE REF: 7140

TO: File

FROM: Woody Myers - WCR

SUBJECT: Winter Wastewater Treatment Facility - Land Disposal System Evaluation Report, WPDES Permit # WI-0060089

**Site Information**

The Winter wastewater treatment facility, a municipal facility, is located at Lagoon Road, Winter, Sawyer County. Wastewater is currently treated and discharged to groundwater via infiltration by way of absorption ponds (seepage cells) located in the NW ¼ of the NW ¼ of Section 4, T39N, R05W, Town of Winter.

**Land Disposal Effluent & Groundwater Evaluation Summary**

**Table 1 Land Disposal Outfall Sampling Point Parameters and Limits**
**Outfall 001 Absorption Ponds**

| | Current Permit WI-0060089-10 | | Proposed Permit WI-0060089-11 | |
|---|---|---|---|---|
| Parameter | Limits and Units | Limit Type | Limits and Units | Limit Type |
| Flow Rate | - MGD | | - MGD | |
| $BOD_5$ | 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 | | - mg/l | |
| Nitrogen. Ammonia | - mg/l | | - mg/l | |
| Nitrogen, Nitrite + Nitrate | - mg/l | | - mg/l | |
| Total Dissolved Solids | - mg/l | | - mg/l | |
| Nitrogen, Total | - mg/l | | | |
| Chloride | - mg/l | | - mg/l | |

* Proposed permit changes

**Table 2 Monitoring Wells**

| Well | Current Permit WI-0060089-10 | | Proposed Permit WI-0060089-11 | |
|---|---|---|---|---|
| | Well Location | Well Designation | Well Location | Well Designation |
| 803 (MW803) | Up-gradient | Background | Up-gradient | Background |
| 804 (MW804) | | Non-Point of Standard | ***Down-gradient** | Non-Point of Standard |
| 805 (MW805) | Down-gradient | Point of Standard | ***Up-gradient** | ***Non-Point of Standard** |
| 806 (MW806) | Down-gradient | Point of Standard | ***Side-gradient** | ***Non-Point of Standard** |

* Proposed permit changes

**Table 3 Groundwater Quality Standards**

| Parameter | Current Permit WI-0060089-10 | | Proposed WI-0060089-11 | |
|---|---|---|---|---|
| | 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 | 2.0 mg/l | 10.0 mg/l | 2.0 mg/l | 10.0 mg/l |
| Chloride | 125 mg/l | 250 mg/l | mg/l | 250 mg/l |
| pH, Field | 4.9-6.9 su | N/A | ***4.7-6.7 su** | N/A |
| Nitrogen, Ammonia | 0.97 mg/l | 9.7 mg/l | 0.97 mg/l | 9.7 mg/l |
| Nitrogen, Organic | 2.3 mg/l | N/A | ***2.5 mg/l** | N/A |
| Total Dissolved Solids | 367 mg/l | N/A | ***330 mg/l** | N/A |

* Proposed permit changes

**Geology**

The bedrock under this facility is the Flambeau Granite that consists of granite to tonalite with medium grained and strong foliation defined by biotite and hornblende. All of these rock units contain concentrically zoned plagioclase (*Bedrock Geology of Wisconsin, Regional Map Series Northwest Sheet*, Wisconsin Geological and Natural History Survey (WGNHS), 1987). Bedrock is anticipated to be between 100 and 200 feet below ground surface (bgs) (*Depth to Bedrock in Wisconsin,* WGNHS, 1973). The regolith consists of material ranging from fine gravel to sand. Surface soil primarily consists of the Antigo and Ossmer silt loams (USDA NRCS Web Soil Survey).

**Hydrogeology**

Calculated groundwater elevations range between 1323 and 1329 feet above mean sea level (msl). Depth to groundwater was reported to be between 6 and 25 feet bgs. Groundwater flow direction was calculated to be predominately to the east southeast with low confidence. This direction significantly differs from the direction calculated in the previous groundwater evaluation. Regional groundwater is to the southwest in this area of Sawyer County (*Mean Elevation of Water Table*, Map, United States Department of Interior, 1968). The site is approximately 1,925 feet west of Lake Winter. There are five wells (municipal, other than municipal, private and high-capacity) within a 1,500-foot range of this facility's groundwater discharge.

**Land Disposal Effluent Quality and Loading Rates**

The following table is the average flow (hydraulic loading), total nitrogen, ammonia, chloride and $BOD_5$ loading summations for the land disposal system.

**Table 5 Land Treatment Disposal Loading Averages**

| Year | Flow (MGD) | Total Nitrogen (mg/l) | Ammonia (mg/l) | Chloride (mg/l) | BOD5 (mg/l) |
|---|---|---|---|---|---|
| 2023 | 0.237 | 13.1 | 9.5 | 54 | 11.3 |
| 2022 | 0.222 | 9.9 | 8.5 | 54 | 3.3 |
| 2021 | 0.243 | 9.1 | 0.1 | 61 | 13.0 |
| 2020 | 0.328 | 12.0 | 8.7 | 44 | 8.6 |
| 2019 | 0.309 | No Data | 3.9 | 45 | 13.0 |

The magnitude and their trends are inconsistent omitting the chloride results. There was no reported data of total nitrogen for 2019.

**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 6 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 | |
| 803 | MW803 | 1348.12 | | | | 10.0 | 31.1 | |
| 804 | MW804 | 1344.87 | | | | 10.0 | 28.9 | |
| 805 | MW805 | 1333.38 | | | | 10.0 | 17.4 | |
| 806 | MW806 | 1349.30 | | | | 10.0 | 31.0 | |

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 March 26, 2018 – September 25, 2023.

**Background Groundwater Quality**

Background groundwater sampling results have been analyzed for each well to evaluate trends of the regulated compounds in groundwater and to calculate PALs and Alternative Concentration Limits (ACL) where appropriate. The groundwater was evaluated by looking at approximately five years of monitoring results. PALs and ACLs are calculated from this time range.

There were no PAL exceedances observed in the background groundwater quality and the trends for the results were stable.

### Down-Gradient Groundwater Quality

The only compound that exceeded its PAL was ammonia. These exceedances were observed in groundwater monitoring wells 804 and 806. The exceedances were consistent in frequency and in magnitude. The ammonia results in well 804 have an increasing trend over time and well 806 have a stable trend.

### 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 ammonia and the groundwater monitoring results.

### Proposed Groundwater Monitoring Requirements

**Table 7 a & b Groundwater Quality Sampling Frequency and Limits**
**Outfall 001 Permit WI-0060089-11**

| Sample Point | Well Name | Sample Frequency | Well Designation |
|---|---|---|---|
| 803 | MW801 | Semi Annually | Background |
| 804 | MW802 | Semi Annually | Non-point of standard |
| 805 | MW805 | Semi Annually | Non-point of standard |
| 806 | MW806 | Semi Annually | Non-point of standard |
| Parameter | PAL | ES | Source |
| Nitrogen, Nitrite + Nitrate | 2.0 mg/l | 10.0 mg/l | NR 140 Table 1 |
| Chloride | 125 mg/l | 250 mg/l | NR 140 Table 2 |
| pH, Field | ***4.7-6.7 su** | N/A | Calculated |
| Nitrogen, Ammonia | 0.97 mg/l | 9.7 mg/l | NR 140 Table 1 |
| Nitrogen, Organic | ***2.5 mg/l** | N/A | Calculated |
| Total Dissolved Solids | ***330 mg/l** | N/A | Calculated |

| Sample Point | Well Name | Sample Frequency | Well Designation |
|---|---|---|---|
| 803 | MW801 | Quarterly | Background |
| 804 | MW802 | Quarterly | Non-point of standard |
| 805 | MW805 | Quarterly | Non-point of standard |
| 806 | MW806 | Quarterly | Non-point of standard |
| Parameter | PAL | ES | Source |
| Depth to Groundwater | N/A | N/A | Measured |
| Groundwater Elevation | N/A | N/A | Measured |

* 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:

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

And for pH:

$\sum$ [Mean of the background groundwater quality ± 1 su] = 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:

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

**Conclusions**

The groundwater flow direction was calculated, but with low confidence. The reasoning maybe a combination of several factors, including a relatively flat piezometric surface, the area being surrounded by wetlands and the age of the groundwater monitoring wells. Because of this the determination of the well placement is uncertain. A survey of the groundwater monitoring wells will be required as a first step in addressing this concern. In addition, the measurement and subsequent calculation of the depth to groundwater and groundwater elevation frequency will be increased from semi-annually to quarterly. Groundwater sample analysis results will not be increased in frequency, these will remain semi-annual.

No changes in effluent sampling parameters or their associated limits are being recommended at this time.

Exemptions, including ACLs were evaluated for this facility and based on the background groundwater quality exemptions are not warranted.

The indicator parameter PALs for organic nitrogen and TDS were changed based on background groundwater quality. The PAL for organic nitrogen was increased from 2.3 to 2.5 mg/l and the PAL for TDS was reduced from 367 to 330 mg/l. The PAL range for pH was decreased from 4.9-6.9 su to 4.7-6.7 su.

**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 groundwater monitoring wells should be surveyed. The new survey should include the elevation of the top of casing (TOC) above msl for the wells. A measurement of the TOC above the ground surface should be measured and a calculated ground surface elevation reported. In addition, the total depth of each well should be measured and reported. These tasks should be performed and reported to the department within 90 days of permit reissuance.

**Appendix A**

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

| well | param | unit | sample_date | | result |
|---|---|---|---|---|---|
| 803 MW 803 | Chloride Dissolved | mg/L | 06/10/2019 | | 45 |
| 803 MW 803 | Chloride Dissolved | mg/L | 10/29/2019 | | 32 |
| 803 MW 803 | Chloride Dissolved | mg/L | 06/17/2020 | | 34 |
| 803 MW 803 | Chloride Dissolved | mg/L | 10/14/2020 | | 39 |
| 803 MW 803 | Chloride Dissolved | mg/L | 06/22/2021 | | 50 |
| 803 MW 803 | Chloride Dissolved | mg/L | 11/22/2021 | | 39 |
| 803 MW 803 | Chloride Dissolved | mg/L | 06/22/2022 | | 35 |
| 803 MW 803 | Chloride Dissolved | mg/L | 11/07/2022 | | 28 |
| 803 MW 803 | Chloride Dissolved | mg/L | 07/19/2023 | | 40 |
| 803 MW 803 | Chloride Dissolved | mg/L | 12/06/2023 | | 45 |
| | | | Mean | | 38.7 |
| | | | Standard Deviation | | 6.356886 |
| 803 MW 803 | Nitrogen, Ammonia Dissolved | mg/L | 06/10/2019 | < | 0.1 |
| 803 MW 803 | Nitrogen, Ammonia Dissolved | mg/L | 10/29/2019 | < | 0.1 |
| 803 MW 803 | Nitrogen, Ammonia Dissolved | mg/L | 06/17/2020 | < | 0.1 |
| 803 MW 803 | Nitrogen, Ammonia Dissolved | mg/L | 10/14/2020 | < | 0.1 |
| 803 MW 803 | Nitrogen, Ammonia Dissolved | mg/L | 06/22/2021 | < | 0.1 |
| 803 MW 803 | Nitrogen, Ammonia Dissolved | mg/L | 11/22/2021 | < | 0.1 |
| 803 MW 803 | Nitrogen, Ammonia Dissolved | mg/L | 06/22/2022 | | 2.4 |
| 803 MW 803 | Nitrogen, Ammonia Dissolved | mg/L | 11/07/2022 | < | 0.1 |
| 803 MW 803 | Nitrogen, Ammonia Dissolved | mg/L | 07/19/2023 | < | 0.1 |
| 803 MW 803 | Nitrogen, Ammonia Dissolved | mg/L | 12/06/2023 | < | 0.1 |
| | | | Mean | | 0.33 |
| | | | Standard Deviation | | 0.69 |
| 803 MW 803 | Nitrogen, Nitrite + Nitrate (as N) Dissolved | mg/L | 06/10/2019 | | 0.3 |
| 803 MW 803 | Nitrogen, Nitrite + Nitrate (as N) Dissolved | mg/L | 10/29/2019 | | 0.4 |
| 803 MW 803 | Nitrogen, Nitrite + Nitrate (as N) Dissolved | mg/L | 06/17/2020 | | 0.2 |
| 803 MW 803 | Nitrogen, Nitrite + Nitrate (as N) Dissolved | mg/L | 10/14/2020 | | 0.3 |
| 803 MW 803 | Nitrogen, Nitrite + Nitrate (as N) Dissolved | mg/L | 06/22/2021 | | 0.3 |
| 803 MW 803 | Nitrogen, Nitrite + Nitrate (as N) Dissolved | mg/L | 11/22/2021 | | 0.3 |
| 803 MW 803 | Nitrogen, Nitrite + Nitrate (as N) Dissolved | mg/L | 06/22/2022 | | 0.4 |
| 803 MW 803 | Nitrogen, Nitrite + Nitrate (as N) Dissolved | mg/L | 11/07/2022 | | 0.4 |
| 803 MW 803 | Nitrogen, Nitrite + Nitrate (as N) Dissolved | mg/L | 07/19/2023 | | 0.4 |
| 803 MW 803 | Nitrogen, Nitrite + Nitrate (as N) Dissolved | mg/L | 12/06/2023 | | 0.35 |
| | | | Mean | | 0.335 |
| | | | Standard Deviation | | 0.063443 |

| well | param | unit | sample_date | | result |
|---|---|---|---|---|---|
| 803 MW 803 | Nitrogen, Organic Dissolved | mg/L | 06/10/2019 | < | 0.5 |
| 803 MW 803 | Nitrogen, Organic Dissolved | mg/L | 10/29/2019 | < | 0.5 |
| 803 MW 803 | Nitrogen, Organic Dissolved | mg/L | 06/17/2020 | < | 0.5 |
| 803 MW 803 | Nitrogen, Organic Dissolved | mg/L | 10/14/2020 | < | 0.5 |
| 803 MW 803 | Nitrogen, Organic Dissolved | mg/L | 06/22/2021 | < | 0.5 |
| 803 MW 803 | Nitrogen, Organic Dissolved | mg/L | 11/22/2021 | < | 0.5 |
| 803 MW 803 | Nitrogen, Organic Dissolved | mg/L | 06/22/2022 | < | 0.5 |
| 803 MW 803 | Nitrogen, Organic Dissolved | mg/L | 11/07/2022 | < | 0.5 |
| 803 MW 803 | Nitrogen, Organic Dissolved | mg/L | 07/19/2023 | < | 0.5 |
| 803 MW 803 | Nitrogen, Organic Dissolved | mg/L | 12/06/2023 | < | 0.5 |
| | | | Mean | | 0.5 |
| | | | Standard Deviation | | 0 |
| 803 MW 803 | pH Field | su | 06/10/2019 | | 5.3 |
| 803 MW 803 | pH Field | su | 10/29/2019 | | 6 |
| 803 MW 803 | pH Field | su | 06/17/2020 | | 5.5 |
| 803 MW 803 | pH Field | su | 10/14/2020 | | 6 |
| 803 MW 803 | pH Field | su | 06/22/2021 | | 5.9 |
| 803 MW 803 | pH Field | su | 11/22/2021 | | 5.5 |
| 803 MW 803 | pH Field | su | 06/22/2022 | | 5.5 |
| 803 MW 803 | pH Field | su | 11/07/2022 | | 5.7 |
| 803 MW 803 | pH Field | su | 07/19/2023 | | 5.5 |
| 803 MW 803 | pH Field | su | 12/06/2023 | | 5.7 |
| | | | Mean | | 5.66 |
| 803 MW 803 | Solids, Total Dissolved | mg/L | 06/10/2019 | | 145 |
| 803 MW 803 | Solids, Total Dissolved | mg/L | 10/29/2019 | | 100 |
| 803 MW 803 | Solids, Total Dissolved | mg/L | 06/17/2020 | | 99 |
| 803 MW 803 | Solids, Total Dissolved | mg/L | 10/14/2020 | | 122 |
| 803 MW 803 | Solids, Total Dissolved | mg/L | 06/22/2021 | | 174 |
| 803 MW 803 | Solids, Total Dissolved | mg/L | 11/22/2021 | | 151 |
| 803 MW 803 | Solids, Total Dissolved | mg/L | 06/22/2022 | | 114 |
| 803 MW 803 | Solids, Total Dissolved | mg/L | 11/07/2022 | | 100 |
| 803 MW 803 | Solids, Total Dissolved | mg/L | 07/19/2023 | | 137 |
| 803 MW 803 | Solids, Total Dissolved | mg/L | 12/06/2023 | | 144 |
| | | | Mean | | 128.6 |
| | | | Standard Deviation | | 24.3072 |
| 804 MW 804 | Chloride Dissolved | mg/L | 06/10/2019 | | 53 |
| 804 MW 804 | Chloride Dissolved | mg/L | 10/29/2019 | | 35 |
| 804 MW 804 | Chloride Dissolved | mg/L | 06/17/2020 | | 31 |
| 804 MW 804 | Chloride Dissolved | mg/L | 10/14/2020 | | 18 |
| 804 MW 804 | Chloride Dissolved | mg/L | 06/22/2021 | | 35 |
| 804 MW 804 | Chloride Dissolved | mg/L | 11/22/2021 | | 24 |
| 804 MW 804 | Chloride Dissolved | mg/L | 06/22/2022 | | 52 |
| 804 MW 804 | Chloride Dissolved | mg/L | 11/07/2022 | | 33 |
| 804 MW 804 | Chloride Dissolved | mg/L | 07/19/2023 | | 29 |
| 804 MW 804 | Chloride Dissolved | mg/L | 12/06/2023 | | 43 |

| well | param | unit | sample_date | result |
|---|---|---|---|---|
| 804 MW 804 | Nitrogen, Ammonia Dissolved | mg/L | 06/10/2019 | 1.2 |
| 804 MW 804 | Nitrogen, Ammonia Dissolved | mg/L | 10/29/2019 | 1.2 |
| 804 MW 804 | Nitrogen, Ammonia Dissolved | mg/L | 06/17/2020 | 1.4 |
| 804 MW 804 | Nitrogen, Ammonia Dissolved | mg/L | 10/14/2020 | 1.4 |
| 804 MW 804 | Nitrogen, Ammonia Dissolved | mg/L | 06/22/2021 < | 0.1 |
| 804 MW 804 | Nitrogen, Ammonia Dissolved | mg/L | 11/22/2021 | 2 |
| 804 MW 804 | Nitrogen, Ammonia Dissolved | mg/L | 06/22/2022 < | 0.1 |
| 804 MW 804 | Nitrogen, Ammonia Dissolved | mg/L | 11/07/2022 | 2.9 |
| 804 MW 804 | Nitrogen, Ammonia Dissolved | mg/L | 07/19/2023 | 3.3 |
| 804 MW 804 | Nitrogen, Ammonia Dissolved | mg/L | 12/06/2023 | 3.7 |
| 804 MW 804 | Nitrogen, Nitrite + Nitrate (as N) Dissolved | mg/L | 06/10/2019 | 0.2 |
| 804 MW 804 | Nitrogen, Nitrite + Nitrate (as N) Dissolved | mg/L | 10/29/2019 | 1.2 |
| 804 MW 804 | Nitrogen, Nitrite + Nitrate (as N) Dissolved | mg/L | 06/17/2020 | 0.1 |
| 804 MW 804 | Nitrogen, Nitrite + Nitrate (as N) Dissolved | mg/L | 10/14/2020 | 0.2 |
| 804 MW 804 | Nitrogen, Nitrite + Nitrate (as N) Dissolved | mg/L | 06/22/2021 | 0.3 |
| 804 MW 804 | Nitrogen, Nitrite + Nitrate (as N) Dissolved | mg/L | 11/22/2021 | 0.2 |
| 804 MW 804 | Nitrogen, Nitrite + Nitrate (as N) Dissolved | mg/L | 06/22/2022 | 0.3 |
| 804 MW 804 | Nitrogen, Nitrite + Nitrate (as N) Dissolved | mg/L | 11/07/2022 | 0.2 |
| 804 MW 804 | Nitrogen, Nitrite + Nitrate (as N) Dissolved | mg/L | 07/19/2023 | 0.85 |
| 804 MW 804 | Nitrogen, Nitrite + Nitrate (as N) Dissolved | mg/L | 12/06/2023 | 0.33 |
| 804 MW 804 | Nitrogen, Organic Dissolved | mg/L | 06/10/2019 | 0.6 |
| 804 MW 804 | Nitrogen, Organic Dissolved | mg/L | 10/29/2019 | 0.6 |
| 804 MW 804 | Nitrogen, Organic Dissolved | mg/L | 06/17/2020 < | 0.5 |
| 804 MW 804 | Nitrogen, Organic Dissolved | mg/L | 10/14/2020 < | 0.5 |
| 804 MW 804 | Nitrogen, Organic Dissolved | mg/L | 06/22/2021 < | 0.5 |
| 804 MW 804 | Nitrogen, Organic Dissolved | mg/L | 11/22/2021 | 2 |
| 804 MW 804 | Nitrogen, Organic Dissolved | mg/L | 06/22/2022 | 3.2 |
| 804 MW 804 | Nitrogen, Organic Dissolved | mg/L | 11/07/2022 | 0.8 |
| 804 MW 804 | Nitrogen, Organic Dissolved | mg/L | 07/19/2023 < | 0.5 |
| 804 MW 804 | Nitrogen, Organic Dissolved | mg/L | 12/06/2023 | 0.8 |
| 804 MW 804 | pH Field | su | 06/10/2019 | 5.8 |
| 804 MW 804 | pH Field | su | 10/29/2019 | 6.7 |
| 804 MW 804 | pH Field | su | 06/17/2020 | 5.5 |
| 804 MW 804 | pH Field | su | 10/14/2020 | 6 |
| 804 MW 804 | pH Field | su | 06/22/2021 | 6.5 |
| 804 MW 804 | pH Field | su | 11/22/2021 | 6 |
| 804 MW 804 | pH Field | su | 06/22/2022 | 6 |
| 804 MW 804 | pH Field | su | 11/07/2022 | 6.3 |
| 804 MW 804 | pH Field | su | 07/19/2023 | 6.1 |
| 804 MW 804 | pH Field | su | 12/06/2023 | 6.2 |

| well | param | unit | sample_date | result |
|---|---|---|---|---|
| 804 MW 804 | Solids, Total Dissolved | mg/L | 06/10/2019 | 246 |
| 804 MW 804 | Solids, Total Dissolved | mg/L | 10/29/2019 | 187 |
| 804 MW 804 | Solids, Total Dissolved | mg/L | 06/17/2020 | 209 |
| 804 MW 804 | Solids, Total Dissolved | mg/L | 10/14/2020 | 163 |
| 804 MW 804 | Solids, Total Dissolved | mg/L | 06/22/2021 | 216 |
| 804 MW 804 | Solids, Total Dissolved | mg/L | 11/22/2021 | 187 |
| 804 MW 804 | Solids, Total Dissolved | mg/L | 06/22/2022 | 207 |
| 804 MW 804 | Solids, Total Dissolved | mg/L | 11/07/2022 | 177 |
| 804 MW 804 | Solids, Total Dissolved | mg/L | 07/19/2023 | 189 |
| 804 MW 804 | Solids, Total Dissolved | mg/L | 12/06/2023 | 215 |
| | | | | |
| 805 MW 805 | Chloride Dissolved | mg/L | 06/10/2019 | 3 |
| 805 MW 805 | Chloride Dissolved | mg/L | 10/29/2019 | 3 |
| 805 MW 805 | Chloride Dissolved | mg/L | 06/17/2020 | 4 |
| 805 MW 805 | Chloride Dissolved | mg/L | 10/14/2020 | 4 |
| 805 MW 805 | Chloride Dissolved | mg/L | 06/22/2021 | 9 |
| 805 MW 805 | Chloride Dissolved | mg/L | 11/22/2021 | 13 |
| 805 MW 805 | Chloride Dissolved | mg/L | 06/22/2022 | 8 |
| 805 MW 805 | Chloride Dissolved | mg/L | 11/07/2022 | 15 |
| 805 MW 805 | Chloride Dissolved | mg/L | 07/19/2023 | 8 |
| 805 MW 805 | Chloride Dissolved | mg/L | 12/06/2023 | 5 |
| | | | | |
| 805 MW 805 | Nitrogen, Ammonia Dissolved | mg/L | 06/10/2019 < | 0.1 |
| 805 MW 805 | Nitrogen, Ammonia Dissolved | mg/L | 10/29/2019 < | 0.1 |
| 805 MW 805 | Nitrogen, Ammonia Dissolved | mg/L | 06/17/2020 < | 0.1 |
| 805 MW 805 | Nitrogen, Ammonia Dissolved | mg/L | 10/14/2020 < | 0.1 |
| 805 MW 805 | Nitrogen, Ammonia Dissolved | mg/L | 06/22/2021 < | 0.1 |
| 805 MW 805 | Nitrogen, Ammonia Dissolved | mg/L | 11/22/2021 | 0.5 |
| 805 MW 805 | Nitrogen, Ammonia Dissolved | mg/L | 06/22/2022 | 3.3 |
| 805 MW 805 | Nitrogen, Ammonia Dissolved | mg/L | 11/07/2022 | 0.4 |
| 805 MW 805 | Nitrogen, Ammonia Dissolved | mg/L | 07/19/2023 < | 0.1 |
| 805 MW 805 | Nitrogen, Ammonia Dissolved | mg/L | 12/06/2023 < | 0.1 |
| | | | | |
| 805 MW 805 | Nitrogen, Nitrite + Nitrate (as N) Dissolved | mg/L | 06/10/2019 | 2.2 |
| 805 MW 805 | Nitrogen, Nitrite + Nitrate (as N) Dissolved | mg/L | 10/29/2019 | 0.3 |
| 805 MW 805 | Nitrogen, Nitrite + Nitrate (as N) Dissolved | mg/L | 06/17/2020 | 1 |
| 805 MW 805 | Nitrogen, Nitrite + Nitrate (as N) Dissolved | mg/L | 10/14/2020 | 0.5 |
| 805 MW 805 | Nitrogen, Nitrite + Nitrate (as N) Dissolved | mg/L | 06/22/2021 | 0.6 |
| 805 MW 805 | Nitrogen, Nitrite + Nitrate (as N) Dissolved | mg/L | 11/22/2021 < | 0.1 |
| 805 MW 805 | Nitrogen, Nitrite + Nitrate (as N) Dissolved | mg/L | 06/22/2022 | 0.8 |
| 805 MW 805 | Nitrogen, Nitrite + Nitrate (as N) Dissolved | mg/L | 11/07/2022 < | 0.1 |
| 805 MW 805 | Nitrogen, Nitrite + Nitrate (as N) Dissolved | mg/L | 07/19/2023 | 0.47 |
| 805 MW 805 | Nitrogen, Nitrite + Nitrate (as N) Dissolved | mg/L | 12/06/2023 | 1.55 |

| well | | param | unit | sample_date | result | |
|---|---|---|---|---|---|---|
| 805 | MW 805 | Nitrogen, Organic Dissolved | mg/L | 06/10/2019 | < | 0.5 |
| 805 | MW 805 | Nitrogen, Organic Dissolved | mg/L | 10/29/2019 | < | 0.5 |
| 805 | MW 805 | Nitrogen, Organic Dissolved | mg/L | 06/17/2020 | < | 0.5 |
| 805 | MW 805 | Nitrogen, Organic Dissolved | mg/L | 10/14/2020 | | 0.5 |
| 805 | MW 805 | Nitrogen, Organic Dissolved | mg/L | 06/22/2021 | | 0.5 |
| 805 | MW 805 | Nitrogen, Organic Dissolved | mg/L | 11/22/2021 | | 5.6 |
| 805 | MW 805 | Nitrogen, Organic Dissolved | mg/L | 06/22/2022 | < | 0.5 |
| 805 | MW 805 | Nitrogen, Organic Dissolved | mg/L | 11/07/2022 | < | 0.5 |
| 805 | MW 805 | Nitrogen, Organic Dissolved | mg/L | 07/19/2023 | < | 0.5 |
| 805 | MW 805 | Nitrogen, Organic Dissolved | mg/L | 12/06/2023 | | 0.5 |
| 805 | MW 805 | pH Field | su | 06/10/2019 | | 5 |
| 805 | MW 805 | pH Field | su | 10/29/2019 | | 5.6 |
| 805 | MW 805 | pH Field | su | 06/17/2020 | | 4.7 |
| 805 | MW 805 | pH Field | su | 10/14/2020 | | 5 |
| 805 | MW 805 | pH Field | su | 06/22/2021 | | 5.6 |
| 805 | MW 805 | pH Field | su | 11/22/2021 | | 5.5 |
| 805 | MW 805 | pH Field | su | 06/22/2022 | | 4.9 |
| 805 | MW 805 | pH Field | su | 11/07/2022 | | 5.2 |
| 805 | MW 805 | pH Field | su | 07/19/2023 | | 4.7 |
| 805 | MW 805 | pH Field | su | 12/06/2023 | | 5 |
| 805 | MW 805 | Solids, Total Dissolved | mg/L | 06/10/2019 | | 77 |
| 805 | MW 805 | Solids, Total Dissolved | mg/L | 10/29/2019 | | 69 |
| 805 | MW 805 | Solids, Total Dissolved | mg/L | 06/17/2020 | | 209 |
| 805 | MW 805 | Solids, Total Dissolved | mg/L | 10/14/2020 | | 60 |
| 805 | MW 805 | Solids, Total Dissolved | mg/L | 06/22/2021 | | 107 |
| 805 | MW 805 | Solids, Total Dissolved | mg/L | 11/22/2021 | | 169 |
| 805 | MW 805 | Solids, Total Dissolved | mg/L | 06/22/2022 | | 53 |
| 805 | MW 805 | Solids, Total Dissolved | mg/L | 11/07/2022 | | 66 |
| 805 | MW 805 | Solids, Total Dissolved | mg/L | 07/19/2023 | | 71 |
| 805 | MW 805 | Solids, Total Dissolved | mg/L | 12/06/2023 | | 79 |
| 806 | MW 806 | Chloride Dissolved | mg/L | 06/10/2019 | | 38 |
| 806 | MW 806 | Chloride Dissolved | mg/L | 10/29/2019 | | 51 |
| 806 | MW 806 | Chloride Dissolved | mg/L | 06/17/2020 | | 31 |
| 806 | MW 806 | Chloride Dissolved | mg/L | 10/14/2020 | | 40 |
| 806 | MW 806 | Chloride Dissolved | mg/L | 06/22/2021 | | 41 |
| 806 | MW 806 | Chloride Dissolved | mg/L | 11/22/2021 | | 48 |
| 806 | MW 806 | Chloride Dissolved | mg/L | 06/22/2022 | | 45 |
| 806 | MW 806 | Chloride Dissolved | mg/L | 11/07/2022 | | 52 |
| 806 | MW 806 | Chloride Dissolved | mg/L | 07/19/2023 | | 51 |
| 806 | MW 806 | Chloride Dissolved | mg/L | 12/06/2023 | | 56 |

| well | | param | unit | sample_date | result |
|---|---|---|---|---|---|
| 806 | MW 806 | Nitrogen, Ammonia Dissolved | mg/L | 06/10/2019 | 3.9 |
| 806 | MW 806 | Nitrogen, Ammonia Dissolved | mg/L | 10/29/2019 | 4.2 |
| 806 | MW 806 | Nitrogen, Ammonia Dissolved | mg/L | 06/17/2020 | 3.1 |
| 806 | MW 806 | Nitrogen, Ammonia Dissolved | mg/L | 10/14/2020 | 3.1 |
| 806 | MW 806 | Nitrogen, Ammonia Dissolved | mg/L | 06/22/2021 | 3.1 |
| 806 | MW 806 | Nitrogen, Ammonia Dissolved | mg/L | 11/22/2021 | 4.2 |
| 806 | MW 806 | Nitrogen, Ammonia Dissolved | mg/L | 06/22/2022 < | 0.1 |
| 806 | MW 806 | Nitrogen, Ammonia Dissolved | mg/L | 11/07/2022 | 3.6 |
| 806 | MW 806 | Nitrogen, Ammonia Dissolved | mg/L | 07/19/2023 | 2.5 |
| 806 | MW 806 | Nitrogen, Ammonia Dissolved | mg/L | 12/06/2023 | 3.1 |
| 806 | MW 806 | Nitrogen, Nitrite + Nitrate (as N) Dissolved | mg/L | 06/10/2019 | 1.3 |
| 806 | MW 806 | Nitrogen, Nitrite + Nitrate (as N) Dissolved | mg/L | 10/29/2019 | 0.1 |
| 806 | MW 806 | Nitrogen, Nitrite + Nitrate (as N) Dissolved | mg/L | 06/17/2020 < | 0.1 |
| 806 | MW 806 | Nitrogen, Nitrite + Nitrate (as N) Dissolved | mg/L | 10/14/2020 | 0.1 |
| 806 | MW 806 | Nitrogen, Nitrite + Nitrate (as N) Dissolved | mg/L | 06/22/2021 | 0.6 |
| 806 | MW 806 | Nitrogen, Nitrite + Nitrate (as N) Dissolved | mg/L | 11/22/2021 | 0.8 |
| 806 | MW 806 | Nitrogen, Nitrite + Nitrate (as N) Dissolved | mg/L | 06/22/2022 | 1.3 |
| 806 | MW 806 | Nitrogen, Nitrite + Nitrate (as N) Dissolved | mg/L | 11/07/2022 | 0.5 |
| 806 | MW 806 | Nitrogen, Nitrite + Nitrate (as N) Dissolved | mg/L | 07/19/2023 | 0.78 |
| 806 | MW 806 | Nitrogen, Nitrite + Nitrate (as N) Dissolved | mg/L | 12/06/2023 | 0.19 |
| 806 | MW 806 | Nitrogen, Organic Dissolved | mg/L | 06/10/2019 | 0.7 |
| 806 | MW 806 | Nitrogen, Organic Dissolved | mg/L | 10/29/2019 | 0.5 |
| 806 | MW 806 | Nitrogen, Organic Dissolved | mg/L | 06/17/2020 | 0.5 |
| 806 | MW 806 | Nitrogen, Organic Dissolved | mg/L | 10/14/2020 | 0.5 |
| 806 | MW 806 | Nitrogen, Organic Dissolved | mg/L | 06/22/2021 | 0.7 |
| 806 | MW 806 | Nitrogen, Organic Dissolved | mg/L | 11/22/2021 | 0.8 |
| 806 | MW 806 | Nitrogen, Organic Dissolved | mg/L | 06/22/2022 | 4.3 |
| 806 | MW 806 | Nitrogen, Organic Dissolved | mg/L | 11/07/2022 | 1.1 |
| 806 | MW 806 | Nitrogen, Organic Dissolved | mg/L | 07/19/2023 < | 0.5 |
| 806 | MW 806 | Nitrogen, Organic Dissolved | mg/L | 12/06/2023 | 0.8 |
| 806 | MW 806 | pH Field | su | 06/10/2019 | 5.9 |
| 806 | MW 806 | pH Field | su | 10/29/2019 | 6.8 |
| 806 | MW 806 | pH Field | su | 06/17/2020 | 5.8 |
| 806 | MW 806 | pH Field | su | 10/14/2020 | 6 |
| 806 | MW 806 | pH Field | su | 06/22/2021 | 6.5 |
| 806 | MW 806 | pH Field | su | 11/22/2021 | 6 |
| 806 | MW 806 | pH Field | su | 06/22/2022 | 6.1 |
| 806 | MW 806 | pH Field | su | 11/07/2022 | 6.2 |
| 806 | MW 806 | pH Field | su | 07/19/2023 | 5.9 |
| 806 | MW 806 | pH Field | su | 12/06/2023 | 6.5 |

| well | | param | unit | sample_date | result |
|---|---|---|---|---|---|
| 806 | MW 806 | Solids, Total Dissolved | mg/L | 06/10/2019 | 217 |
| 806 | MW 806 | Solids, Total Dissolved | mg/L | 10/29/2019 | 229 |
| 806 | MW 806 | Solids, Total Dissolved | mg/L | 06/17/2020 | 159 |
| 806 | MW 806 | Solids, Total Dissolved | mg/L | 10/14/2020 | 206 |
| 806 | MW 806 | Solids, Total Dissolved | mg/L | 06/22/2021 | 241 |
| 806 | MW 806 | Solids, Total Dissolved | mg/L | 11/22/2021 | 241 |
| 806 | MW 806 | Solids, Total Dissolved | mg/L | 06/22/2022 | 193 |
| 806 | MW 806 | Solids, Total Dissolved | mg/L | 11/07/2022 | 218 |
| 806 | MW 806 | Solids, Total Dissolved | mg/L | 07/19/2023 | 224 |
| 806 | MW 806 | Solids, Total Dissolved | mg/L | 12/06/2023 | 238 |