# Permit Fact Sheet

## General Information

| | |
|---|---|
| Permit Number | WI-0029025-10-0 |
| Permittee Name and Mailing Address | Village of Potter, PO Box 162, Potter, WI 54160 |
| Permitted Facility Name and Address | Potter Wastewater Treatment Facility, 320 Pheasant St, Potter, WI |
| Permit Term | April 1, 2025 – March 31, 2030 |
| Discharge Location | SE ¼ of the NE ¼ of Section 15, T 19N R 20E in Calumet County |
| Receiving Water | An unnamed tributary to the North Branch of the Manitowoc River |
| Stream Flow (7-$Q_{10}$) | 0 cfs |
| Stream Classification | Limited Aquatic Life (LAL) |
| Discharge Type | Existing; Continuous |
| Annual Average Design Flow | 0.04 MGD |
| Industrial or Commercial Contributors | None |
| Plant Classification | WWTF is Classified as Basic for the following subclasses: A1 (Suspended Growth Processes), B (Solids Separation), C (Biological Solids/Sludges), and SS (Sanitary Sewage Collection System) |
| Approved Pretreatment Program? | N/A |

## Facility Description

The Village of Potter owns and operates the Potter Wastewater Treatment Facility that treats residential and commercial domestic wastewater from the Village sanitary sewer collection system. All sludge generated from the treatment facility is currently stored and hauled to the Village of Hilbert Wastewater Treatment Facility. The paragraphs below describe the liquid and solids treatment train at the Potter Wastewater Treatment Facility.

**Liquid Treatment Train:** The influent wastewater from the Village of Potter enters the treatment facility via gravity sewer to a raw wastewater lift station at the treatment facility. The wetwell contains two submersible pumps that lift the wastewater to a splitter box. At the splitter box, influent grab composite samples are collected. The splitter box then conveys the influent over a static fine screen with a static bar screen in case of overflow. The screenings are raked daily and placed in a trash bin. Following the fine screen, the wastewater flows into a single aeration basin with fine bubble diffusers. After the aeration basin, the wastewater flows into a single rectangular final clarifier. The final clarifier uses an air lift system for the return and waste activated sludge. The clarifier has flights and chains on the bottom of the tank for sludge removal. The clarified effluent overflows the clarifier weirs into an old chlorine contact chamber where composite samples are collected, and effluent flow rate is measured using an ultrasonic sensor prior to being conveyed through a V-notched weir and a cascade step aerator. Effluent composite samples are withdrawn by a 24-hour flow proportional composite sampler. Effluent grab samples are collected following the cascade step aerator. Effluent exits by gravity discharge to the unnamed tributary to the North Branch of the Manitowoc River via Outfall 001.

**Solids Treatment Train:** Waste activated sludge from the final clarifier is sent to two parallel aerobic digestors. The digestors have fine bubble diffusers to provide air for sludge treatment. The decant from the digestors is returned to the aeration basin. The facility has the ability to store sludge for approximately 90 days in the digestors. The digested sludge is loaded and hauled by truck to the Village of Hilbert Wastewater Treatment Facility and tracked under Outfall 002.

# Substantial Compliance Determination

**Enforcement During Last Permit:** A Notice of Noncompliance (NON) was sent in April 2021 for chloride effluent limit exceedances between January-March 2021 and for the lack of sludge monitoring 2018-2020. An additional NON was sent in March 2023 for chloride effluent limit exceedances between December 2021-February 2023. The facility has completed all previously required actions as part of the enforcement process.

After a desk top review on 9/18/24 of all discharge monitoring reports, compliance maintenance annual reports, land application reports, compliance schedule items, and a site visit on 9/22/22, this facility has been found to be in substantial compliance with their current permit.

**Compliance determination entered by Trevor Moen, Wastewater Engineer, on 9/18/24.**

| **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 | N/A – flow monitoring was not included in the previous permit | INFLUENT - Raw wastewater from the Village of Potter's sanitary sewage collection system. At Sampling Point 701, the permittee shall collect representative grab composite samples of the influent from the splitter box to the aeration basin following pumping from the main influent lift station until March 31, 2029. Starting on April 1, 2029, the permittee shall collect representative samples of the influent from the automatic composite sampler drawing 24-hour flow proportional composite samples from a sampling location prior to the aeration basin. Starting on April 1, 2029, the permittee shall measure the influent flow rate with a continuous flow recording device from a sampling location prior to the aeration basin. |
| 001 | 0.031 MGD (Avg. 1/1/18 – 8/31/24) | EFFLUENT - At Sampling Point 001, the permittee shall collect representative samples of effluent from the effluent automatic composite sampler drawing 24-hour flow proportional composite samples from the former chlorine contact tank except that the permittee shall collect representative grab samples of the effluent after the v-notched weir and cascade step aerator for pH, dissolved oxygen, and temperature prior to being discharged to the unnamed tributary to the North Branch of the Manitowoc River via Outfall 001. The permittee shall measure the effluent flow rate using a continuous flow recording device after the former chlorine contact tank. |
| 002 | 2018: 10,400 gallons 'hauled to another facility' (or, A)<br>2019: 10,400 gallons (A)<br>2020: 21,200 gallons (A) | LIQUID SLUDGE - Class B liquid sludge from the treatment of waste activated sludge that is aerobically digested. At Sampling Point 002, the permittee shall collect representative grab and/or composite samples of the liquid sludge from the aerobic digestor after complete mixing and be monitored annually for List 1 parameters and PFAS prior to being hauled to another permitted |

| Sample Point Designation | | |
|---|---|---|
| **Sample Point Number** | **Discharge Flow, Units, and Averaging Period** | **Sample Point Location, Waste Type/Sample Contents and Treatment Description (as applicable)** |
| | 2021: 40,800 gallons (A)<br>2022: 20,600 gallons (A)<br>2023: 41,200 gallons (A) | facility. If the permittee intends to land apply the liquid sludge to department approved sites in any given year, the permittee shall also monitor the liquid sludge annually for Lists 1, 2, 3, 4 and PFAS prior to being land applied on department approved sites via Outfall 002. |

# 1 Influent – Monitoring Requirements

## 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 | The Flow Rate sample type shall be reported as "Continuous" starting April 1, 2029. See also the Install Continuous Flow Recording Device and Influent Composite Sampler Schedule. |
| BOD5, Total | | mg/L | Weekly | 3-Hr Comp | The sample type shall be "3-Hr Comp" until March 31, 2029. See also the Install Continuous Flow Recording Device and Influent Composite Sampler Schedule. |
| BOD5, Total | | mg/L | Weekly | 24-Hr Flow Prop Comp | The sample type shall be "24-Hr Flow Prop Comp" starting April 1, 2029. See also the Install Continuous Flow Recording Device and Influent Composite Sampler Schedule. |
| Suspended Solids, Total | | mg/L | Weekly | 3-Hr Comp | The sample type shall be "3-Hr Comp" until March 31, 2029. See also the Install Continuous Flow Recording Device and Influent Composite Sampler Schedule. |
| Suspended Solids, | | mg/L | Weekly | 24-Hr Flow | The sample type shall be |

| Monitoring Requirements and Limitations | | | | | |
|---|---|---|---|---|---|
| **Parameter** | **Limit Type** | **Limit and Units** | **Sample Frequency** | **Sample Type** | **Notes** |
| Total | | | | Prop Comp | "24-Hr Flow Prop Comp" starting April 1, 2029. See also the Install Continuous Flow Recording Device and Influent Composite Sampler Schedule. |

## 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.

- Addition of flow rate monitoring and reporting beginning April 1, 2029.
- The sample type for $BOD_5$ and TSS is changed from 3-Hr Composite to 24-Hr Flow Proportional Composite.

## Explanation of Limits and Monitoring Requirements

Monitoring of influent flow, $BOD_5$ and total suspended solids (TSS) is required by s. NR 210.04(2), Wis. Adm. Code, to assess wastewater strengths and volumes and to demonstrate the percent removal requirements in s. NR 210.05, Wis. Adm. Code, and in the Standard Requirements section of the permit. See also the Install Continuous Flow Recording Device and Influent Composite Sampler Schedule (Schedule 4.2).

# 2 Surface Water - Monitoring and Limitations

## Sample Point Number: 001- EFFLUENT

| Monitoring Requirements and Limitations | | | | | |
|---|---|---|---|---|---|
| **Parameter** | **Limit Type** | **Limit and Units** | **Sample Frequency** | **Sample Type** | **Notes** |
| Flow Rate | | MGD | Daily | Continuous | |
| BOD5, Total | Weekly Avg | 30 mg/L | Weekly | 24-Hr Flow Prop Comp | |
| BOD5, Total | Monthly Avg | 20 mg/L | Weekly | 24-Hr Flow Prop Comp | |
| Suspended Solids, Total | Weekly Avg | 30 mg/L | Weekly | 24-Hr Flow Prop Comp | |
| Suspended Solids, Total | Monthly Avg | 20 mg/L | Weekly | 24-Hr Flow Prop Comp | |
| Suspended Solids, Total | Weekly Avg | 14 lbs/day | Weekly | Calculated | |
| Suspended Solids, Total | Monthly Avg | 8.4 lbs/day | Weekly | Calculated | |
| Suspended Solids, | | lbs/month | Monthly | Calculated | Calculate the Total |

| Monitoring Requirements and Limitations | | | | | |
|---|---|---|---|---|---|
| **Parameter** | **Limit Type** | **Limit and Units** | **Sample Frequency** | **Sample Type** | **Notes** |
| Total | | | | | Monthly Discharge of TSS and report on the last day of the month on the eDMR. See TMDL Calculations section of the permit. |
| Suspended Solids, Total | | lbs/yr | Monthly | Calculated | Calculate the 12-month rolling sum of total monthly mass of TSS discharged and report on the last day of the month on the eDMR. See TMDL Calculations section of the permit. |
| pH Field | Daily Min | 6.0 su | 5/Week | Grab | |
| pH Field | Daily Max | 9.0 su | 5/Week | Grab | |
| Dissolved Oxygen | Daily Min | 4.0 mg/L | 5/Week | Grab | |
| E. coli | Geometric Mean - Monthly | 126 #/100 ml | Weekly | Grab | Monitoring and limit effective May through September annually per the Effluent Limitations for E. coli Schedule. |
| E. coli | % Exceedance | 10 Percent | Monthly | Calculated | Monitoring and limit effective May through September annually per the Effluent Limitations for E. coli Schedule. See the E. coli Percent Limit permit section. Enter the result in the eDMR on the last day of the month. |
| Chloride | Weekly Avg | 450 mg/L | 4/Month | 24-Hr Flow Prop Comp | Interim limit. Sampling shall be conducted on four consecutive days one week per month. See the Chloride Variance - Implement Source Reduction Measures permit section and the Chloride Source Reduction Measures (Target Value) Schedule. |
| Phosphorus, Total | Monthly Avg | 2.8 mg/L | Weekly | 24-Hr Flow Prop Comp | |

| Monitoring Requirements and Limitations | | | | | |
|---|---|---|---|---|---|
| **Parameter** | **Limit Type** | **Limit and Units** | **Sample Frequency** | **Sample Type** | **Notes** |
| Phosphorus, Total | Monthly Avg | 0.34 lbs/day | Weekly | Calculated | Monitoring only upon permit effective date. Final TMDL-Based Mass Limits for Total Phosphorus go into effect per the Schedule. See also the Phosphorus TMDL section of the permit. |
| Phosphorus, Total | | lbs/month | Monthly | Calculated | Calculate the Total Monthly Discharge of phosphorus and report on the last day of the month on the eDMR. See TMDL Calculations section of the permit. |
| Phosphorus, Total | | lbs/yr | Monthly | Calculated | Calculate the 12-month rolling sum of total monthly mass of phosphorus discharged and report on the last day of the month on the DMR. See TMDL Calculations section of the permit. |
| Nitrogen, Ammonia (NH3-N) Total | Daily Max - Variable | mg/L | Weekly | 24-Hr Flow Prop Comp | Applies year-round. See the Daily Maximum Ammonia Nitrogen (NH3-N) Limits permit section. |
| Nitrogen, Ammonia (NH3-N) Total | Weekly Avg | 15 mg/L | Weekly | 24-Hr Flow Prop Comp | Limit applies January-March. |
| Nitrogen, Ammonia (NH3-N) Total | Weekly Avg | 6.3 mg/L | Weekly | 24-Hr Flow Prop Comp | Limit applies April-May. |
| Nitrogen, Ammonia (NH3-N) Total | Weekly Avg | 4.7 mg/L | Weekly | 24-Hr Flow Prop Comp | Limit applies June-September. |
| Nitrogen, Ammonia (NH3-N) Total | Weekly Avg | 8.9 mg/L | Weekly | 24-Hr Flow Prop Comp | Limit applies October-December. |
| Nitrogen, Ammonia (NH3-N) Total | Monthly Avg | 5.9 mg/L | Weekly | 24-Hr Flow Prop Comp | Limit applies January-March. |
| Nitrogen, Ammonia (NH3-N) Total | Monthly Avg | 2.5 mg/L | Weekly | 24-Hr Flow Prop Comp | Limit applies April-May. |
| Nitrogen, Ammonia (NH3-N) Total | Monthly Avg | 1.9 mg/L | Weekly | 24-Hr Flow Prop Comp | Limit applies June-September. |

| Monitoring Requirements and Limitations | | | | | |
|---|---|---|---|---|---|
| **Parameter** | **Limit Type** | **Limit and Units** | **Sample Frequency** | **Sample Type** | **Notes** |
| Nitrogen, Ammonia (NH3-N) Total | Monthly Avg | 3.5 mg/L | Weekly | 24-Hr Flow Prop Comp | Limit applies October-December. |
| Temperature Maximum | | deg F | Monthly | Grab | Monitoring only January-December 2028. |
| Nitrogen, Total Kjeldahl | | mg/L | See Listed Qtr(s) | 24-Hr Flow Prop Comp | Annual in rotating quarters. See Nitrogen Series Monitoring permit section. |
| Nitrogen, Nitrite + Nitrate Total | | mg/L | See Listed Qtr(s) | 24-Hr Flow Prop Comp | Annual in rotating quarters. See Nitrogen Series Monitoring permit section. |
| Nitrogen, Total | | mg/L | See Listed Qtr(s) | Calculated | Annual in rotating quarters. See Nitrogen Series Monitoring permit section. Total Nitrogen shall be calculated as the sum of reported values for Total Kjeldahl Nitrogen and Total Nitrite + Nitrate Nitrogen. |
| Chronic WET | Monthly Avg | 2.9 TUc | See Listed Qtr(s) | 24-Hr Flow Prop Comp | See the Whole Effluent Toxicity (WET) Testing permit section. |

## 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.

- The sample type for $BOD_5$, TSS, chloride, phosphorus, ammonia nitrogen, and WET testing is changed from 3-Hr Composite to 24-Hr Flow Proportional Composite.
- Addition of TMDL-based mass limits for total suspended solids (TSS).
- Addition of Escherichia coli (E. coli) monitoring and limits, to become effective per the Effluent Limitations for E. coli Schedule.
- Updated chloride variance interim limit to 450 mg/L as a weekly average and updated source reduction measures (SRMs) throughout the permit term.
- Addition of TMDL-based mass limits for total phosphorus, to become effective per the TMDL-Based Effluent Mass Limits for Total Phosphorus Schedule.
- Updated ammonia nitrogen daily maximum, weekly average and monthly average limits.
- Addition of maximum temperature monitoring for one year (January-December 2028).
- Addition of annual total nitrogen monitoring (TKN, $NO_2$+$NO_3$ and Total N) in rotating quarters throughout the permit term.
- Addition of a Chronic Whole Effluent Toxicity (WET) testing effluent limit.

## Explanation of Limits and Monitoring Requirements

Detailed discussions of limits and monitoring requirements can be found in the Water Quality-Based Effluent Limits (WQBEL) Memo, by Nicole Krueger, Water Resources Engineer, dated June 24, 2024, updated October 14, 2024.

**Monitoring Frequencies –** The Monitoring Frequencies for Individual Wastewater Permits guidance (April 12, 2021) recommends that standard monitoring frequencies be included in individual wastewater permits based on the size and type of the facility, in order to characterize effluent quality and variability, to detect events of noncompliance, and to ensure consistency in permits issued across the state. Guidance and requirements in administrative code were considered when determining the appropriate monitoring frequencies for pollutants that have final effluent limits in effect during this permit term.

**Expression of Limits** – In accordance with the federal regulation 40 CFR 122.45(d) and s. NR 205.065, Wis. Adm. Code, limits in this permit are to be expressed as weekly average and monthly average limits whenever practicable. Minor changes have been made to the limits for $BOD_5$ and TSS.

**$BOD_5$, TSS, and pH –** Categorical limits and WQBELs are included in the permit as outlined in ch. NR 210, Wis. Adm. Code.

**Chloride –** The Village of Potter applied for a chloride variance, under the provisions of s. NR 106.83, Wis. Adm. Code, with its application for permit reissuance. The previous permit also included a chloride variance. The Department reviewed Potter's application for a chloride variance and the information supplied in the application supports the establishment of an interim effluent limit. The permittee and the Department have reached agreement on an interim chloride limit of 450 mg/L (expressed as a weekly average), a target value of 405 mg/L, implementation of chloride source reduction measures, and submittal of annual progress reports each year by June 30th. The chloride source reduction measures that are required to be implemented can be found in the proposed permit. The Department concludes that Potter is qualified for a variance from the water quality standard for chloride and proposes reissuance of this permit with the proposed variance.

**Total Nitrogen Monitoring (TKN, $NO_2$+$NO_3$, and Total N) –** The Department has included effluent monitoring for Total Nitrogen in the permit through the authority under s. 283.55(1)(e), Wis. Stats. Testing is required during the following quarters: October – December 2025; April – June 2026; July – September 2027; January – March 2028; and October – December 2029.

**Chronic WET –** Testing is required during the following quarters: October – December 2025; April – June 2026; July – September 2027; January – March 2028; and October – December 2029.

**PFOS and PFOA** – Permit Requirements for PFOS and PFOA Dischargers became effective on August 1, 2022. Pursuant to s. NR 106.98(3)(b), Wis. Adm. Code, the Department evaluated the need for PFOS and PFOA monitoring taking into consideration the presence of potential PFOS or PFOA industrial wastes, remediation sites and other potential sources of PFOS or PFOA. Based on information available at the time the proposed permit was drafted, the Department has determined the permittee does not need to sample for PFOS or PFOA as part of this permit reissuance. The Department may re-evaluate the need for sampling at the next permit reissuance if new information becomes available that suggests PFOS or PFOA may be present in the discharge.

# 3 Land Application - Monitoring and Limitations

| Municipal Sludge Description | | | | | | |
|---|---|---|---|---|---|---|
| **Sample Point** | **Sludge Class (A or B)** | **Sludge Type (Liquid or Cake)** | **Pathogen Reduction Method** | **Vector Attraction Method** | **Reuse Option** | **Amount Reused/Disposed (Dry Tons/Year)** |
| 002 | B | Liquid | Fecal Coliform Reduction | Injection | Disposal at another WWTF | Avg. of 24,100 gal/yr (2018-2023) or 2 dry tons/year |
| 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. | | | | | | |
| Is a priority pollutant scan required? N/A | | | | | | |

## Sample Point Number: 002- LIQUID SLUDGE

| Monitoring Requirements and Limitations | | | | | |
|---|---|---|---|---|---|
| **Parameter** | **Limit Type** | **Limit and Units** | **Sample Frequency** | **Sample Type** | **Notes** |
| Solids, Total | | Percent | Annual | Composite | List 1 Parameters. Limits applicable only when sludge is land applied. |
| Arsenic Dry Wt | High Quality | 41 mg/kg | Annual | Composite | |
| Arsenic Dry Wt | Ceiling | 75 mg/kg | Annual | Composite | |
| Cadmium Dry Wt | High Quality | 39 mg/kg | Annual | Composite | |
| Cadmium Dry Wt | Ceiling | 85 mg/kg | Annual | Composite | |
| Copper Dry Wt | High Quality | 1,500 mg/kg | Annual | Composite | |
| Copper Dry Wt | Ceiling | 4,300 mg/kg | Annual | Composite | |
| Lead Dry Wt | High Quality | 300 mg/kg | Annual | Composite | |
| Lead Dry Wt | Ceiling | 840 mg/kg | Annual | Composite | |
| Mercury Dry Wt | High Quality | 17 mg/kg | Annual | Composite | |
| Mercury Dry Wt | Ceiling | 57 mg/kg | Annual | Composite | |
| Molybdenum Dry Wt | Ceiling | 75 mg/kg | Annual | Composite | |
| Nickel Dry Wt | High Quality | 420 mg/kg | Annual | Composite | |
| Nickel Dry Wt | Ceiling | 420 mg/kg | Annual | Composite | |
| Selenium Dry Wt | High Quality | 100 mg/kg | Annual | Composite | |
| Selenium Dry Wt | Ceiling | 100 mg/kg | Annual | Composite | |
| Zinc Dry Wt | High Quality | 2,800 mg/kg | Annual | Composite | |
| Zinc Dry Wt | Ceiling | 7,500 mg/kg | Annual | Composite | |

| Monitoring Requirements and Limitations | | | | | |
|---|---|---|---|---|---|
| **Parameter** | **Limit Type** | **Limit and Units** | **Sample Frequency** | **Sample Type** | **Notes** |
| Nitrogen, Total Kjeldahl | | Percent | Per Application | Composite | List 2 Parameters. Monitoring required only when sludge is land applied. See List 2 Analysis section of the permit. |
| Nitrogen, Ammonium (NH4-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 | |
| PFOA + PFOS | | ug/kg | Annual | Calculated | Report the sum of PFOA and PFOS. See PFAS Permit Sections for more information. |
| PFAS Dry Wt | | | Annual | Grab | Perfluoroalkyl and Polyfluoroalkyl Substances based on updated DNR PFAS List. See PFAS Permit Sections for more information. |

## 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.

- Removed PCB monitoring requirements. PCBs were sampled for in 2021; results were less than 1.2 mg/kg. PCB monitoring should be required in the next permit reissuance.
- Addition of annual PFAS (PFOA + PFOS) monitoring pursuant to s. NR 204.06(2)(b)9., Wis. Adm. Code.

## 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), Wis. Adm. Code.

**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.

# 4 Schedules

## 4.1 Chloride Source Reduction Measures (Target Value)

As a condition of the variance to the water quality based effluent limitation(s) for chloride granted in accordance with s. NR 106.83(2), Wis. Adm. Code, the permittee shall perform the following actions.

| Required Action | Due Date |
|---|---|
| **Annual Chloride Progress Report:** Submit an annual chloride progress report related to the source reduction activities for the previous year. The annual chloride progress report shall:<br><br>Indicate which chloride source reduction measures or activities in the Source Reduction Plan have been implemented and state which, if any, source reduction measures from the Source Reduction Plan were not pursued and why. Include an assessment of whether each implemented source reduction measure appears to be effective or ineffective at reducing pollutant discharge concentrations and identify actions planned for the upcoming year;<br><br>Include an analysis of trends in weekly, monthly and annual average chloride concentrations and total mass discharge of chloride based on chloride sampling and flow data; and<br><br>Include an analysis of how effluent chloride varies with time and with significant loadings of chloride. Note that the interim limitation listed in the Surface Water section of this permit remains enforceable until new enforceable limits are established in the next permit issuance.<br><br>The first annual chloride progress report is to be submitted by the Date Due. | 01/31/2026 |
| **Annual Chloride Progress Report #2:** Submit the chloride progress report, related to the source reduction activities for the previous year, as defined above. | 01/31/2027 |
| **Annual Chloride Progress Report #3:** Submit the chloride progress report, related to the source reduction activities for the previous year, as defined above. | 01/31/2028 |
| **Annual Chloride Progress Report #4:** Submit the chloride progress report, related to the source reduction activities for the previous year, as defined above. | 01/31/2029 |
| **Final Chloride Report:** Submit the final chloride report documenting the success in meeting the chloride target value of 405 mg/L, as well as the anticipated future reduction in chloride sources and chloride effluent concentrations.<br><br>The report shall:<br><br>Summarize chloride source reduction measures that have been implemented during the current permit term and state which, if any, source reduction measures from the Source Reduction Plan were not pursued and why;<br><br>Include an assessment of which source reduction measures appear to have been effective or ineffective. Evaluate any needed changes to the pollutant reduction strategy accordingly;<br><br>Include an analysis of trends in weekly, monthly and annual average chloride concentrations and total mass discharge of chloride based on chloride sampling and flow data during the current permit term; and<br><br>Include an analysis of how influent and effluent chloride varies with time and with significant loadings of chloride as identified in the source reduction plan.<br><br>If the permittee intends to reapply for a chloride variance, for the reissued permit, proposed target limits and a detailed source reduction measures plan, outlining the source reduction activities proposed for the upcoming permit term, shall also be included per ss. NR 106.90 (5) and NR 106.83 | 09/30/2029 |

| | |
|---|---|
| (4), Wis. Adm. Code. An updated source reduction measures plan shall:<br>Include an explanation of why or how each source reduction measure will result in reduced discharge of the target pollutant; and<br>Evaluate any available information on pollutant sources, timing, and concentration to update the mass balance assumptions and expected sources of the pollutant, and<br>Identify any information needs that would help to better determine pollutant sources and make plans to collect that information.<br>Note that the target value is the benchmark for evaluating the effectiveness of the chloride source reduction measures but is not an enforceable limitation under the terms of this permit. | |
| **Annual Chloride Reports After Permit Expiration:** In the event that this permit is not reissued by the date the permit expires the permittee shall continue to submit annual chloride reports for the previous year following the due date of Annual Chloride Progress Reports listed above. Annual Chloride Progress Reports shall include the information as defined above. | |

## 4.2 Install Continuous Flow Recording Device and Influent Composite Sampler

The permittee shall install a continuous flow recording device and influent composite sampler at Sampling Point 701 (Influent) in accordance with the following schedule.

| Required Action | Due Date |
|---|---|
| **Submit Facility Plan:** The permittee shall submit a Facility Plan per s. NR 110.09, Wis. Adm. Code. | 04/30/2026 |
| **Plans and Specifications:** Submit plans and specifications per ch. NR 108, Wis. Adm. Code, for installing a continuous flow recording device and influent composite sampler at Sampling Point 701 (Influent). | 03/31/2027 |
| **Complete Install:** The permittee shall complete installation of the continuous flow recording device and influent composite sampler at Sampling Point 701 (Influent). | 03/31/2029 |

## 4.3 Disinfection and Effluent Limitations for E. coli

The permittee shall install disinfection treatment and comply with surface water limitations for E. coli as specified. No later than 14 days following each compliance date, the permittee shall notify the Department in writing of its compliance or noncompliance. If a submittal is required, a timely submittal fulfills the notification requirement.

| Required Action | Due Date |
|---|---|
| **Progress Report:** The permittee shall submit a progress report on development and submittal of a facility plan for upgrades to meet disinfection requirements and E. coli limits. | 12/31/2025 |
| **Submit Facility Plan:** The permittee shall submit a Facility Plan per s. NR 110.09, Wis. Adm. Code for meeting disinfection requirements and complying with E. coli surface water limitations. The permittee may submit an abbreviated facility plan if the Department determines that the modifications are minor. | 04/30/2026 |
| **Final Plans and Specifications:** The permittee shall submit final construction plans to the Department for approval pursuant to ch. NR 108, Wis. Adm. Code, specifying treatment plant upgrades that must be constructed to meet disinfection requirements per s. NR 210.06(1), Wis. Adm Code, achieve compliance with final E. coli limitations, and a schedule for completing construction of the upgrades by the complete construction date specified below. | 03/31/2027 |

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| **Treatment Plant Upgrade to Meet Limitations:** The permittee shall initiate bidding, procurement, and/or construction of the project. The permittee shall obtain approval of the final construction plans and schedule from the Department pursuant to s. 281.41. Stats., prior to initiating activities defined as construction under ch. NR 108, Wis. Adm. Code. Upon approval of the final construction plans and schedule by the Department pursuant to s. 281.41, Stats., the permittee shall construct the treatment plant upgrades in accordance with the approved plans and specifications. | 09/30/2027 |
| **Construction Upgrade Progress Report:** The permittee shall submit a progress report on construction upgrades. | 09/30/2028 |
| **Complete Construction**: The permittee shall complete construction of wastewater treatment system upgrades. | 03/31/2029 |
| **Achieve Compliance:** The permittee shall achieve compliance with final E. coli limitations. | 04/30/2029 |

## 4.4 TMDL-Based Effluent Mass Limits for Total Phosphorus

The permittee shall comply with the limits for Phosphorus as specified. No later than 14 days following each compliance date, the permittee shall notify the Department in writing of its compliance or noncompliance. If a submittal is required, a timely submittal fulfills the notification requirement.

| Required Action | Due Date |
|---|---|
| **Construction Upgrade Progress Report #2**: The permittee shall submit a progress report on construction upgrades. | 03/31/2026 |
| **Complete Construction:** The permittee shall complete construction of wastewater treatment system upgrades. | 12/31/2026 |
| **Achieve Compliance:** The permittee shall achieve compliance with final phosphorus effluent limits. | 01/01/2027 |

## 4.5 Sludge Management Plan

A sludge management plan is required 60 days prior to sludge removal.

| Required Action | Due Date |
|---|---|
| **Sludge Management Plan Submittal:** Submit a management plan to optimize the land application system performance and demonstrate compliance with ch. NR 204, Wis. Adm. Code. This management plan shall 1) specify information on pretreatment processes (if any); 2) identify land application sites; 3) describe site limitations; 4) address vegetative cover management and removal; 5) specify availability of storage; 6) describe the type of transporting and spreading vehicle(s); 7) specify monitoring procedures; 8) track site loading; 9) address contingency plans for adverse weather and odor/nuisance abatement; and 10) include any other pertinent information. Once approved, all landspreading 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. | 04/01/2026 |

## Explanation of Schedules

**4.1 Chloride Source Reduction Measures (Target Value)** – This schedule is required to ensure that the permittee maintains compliance with the conditions and requirements of receiving a variance from the water quality-based chloride effluent limit of 395 mg/L as a weekly average. Since a compliance schedule is being granted, an interim limit is required, and for Potter the limit is established as 450 mg/L (as a weekly average). The schedule requires that annual reports shall indicate which source reduction measures Potter has implemented during each calendar year, and an analysis of chloride

concentration and mass discharge data based on chloride sampling and flow data. The annual reports shall document progress made towards meeting the chloride target value of 405 mg/L by the end of the permit term.

**4.2 Install Continuous Flow Recording Device and Influent Composite Sampler** – This schedule is included for the facility to install a continuous flow recording device and influent composite sampler at Sampling Point 701. Installation of a continuous flow recording device is a reviewable project per ch. NR 108, Wis. Adm. Code, therefore, a plans and specifications submittal requirement is included in this schedule.

**4.3 Disinfection and Effluent Limitations for E. coli –** A compliance schedule is included in the permit to provide time for the permittee to submit plans and specs and install disinfection treatment for meeting effluent E. coli water quality-based effluent limits and disinfection requirements pursuant s. NR 210.06, Wis. Adm. Code.

**4.4 TMDL-Based Effluent Mass Limits for Total Phosphorus –** This compliance schedule contains the remaining Required Actions from the previous permit in order to achieve compliance with the TMDL-based effluent mass limits for total phosphorus by January 1, 2027.

**4.5 Sludge Management Plan –** A sludge management plan submittal is required at least 60 days prior to sludge removal, but no later than the Due Date.

## Attachments:

WQBEL Memo: Water Quality-Based Effluent Limitations for Potter Wastewater Treatment Facility WPDES Permit No. WI-0029025-10, by Nicole Krueger, Water Resources Engineer, dated June 24, 2024, updated October 14, 2024

Chloride Variance EPA Data Sheet

Chloride SRM (Source Reduction Measures) Plan, Village of Potter, dated 2023-2028

## Justification Of Any Waivers From Permit Application Requirements:

No waivers from permit application requirements have been requested or granted.

**Prepared By:** Sarah Donoughe, Wastewater Specialist-Adv **Date:** October 14, 2024

# CORRESPONDENCE/MEMORANDUM

State of Wisconsin

DATE: 06/24/2024 – updated 10/14/2024

TO: Sarah Donoughe – SER

FROM: Nicole Krueger – SER Nicole Krueger

SUBJECT: Water Quality-Based Effluent Limitations for Potter Wastewater Treatment Facility
WPDES Permit No. WI-0029025-10

This is in response to your request for an evaluation of the need for water quality-based effluent limitations (WQBELs) using chapters NR 102, 104, 105, 106, 207, 210, 212, and 217 of the Wisconsin Administrative Code (where applicable), for the discharge from Potter Wastewater Treatment Facility in Calumet County. This municipal wastewater treatment facility (WWTF) discharges to an unnamed tributary to the North Branch of the Manitowoc River, located in the North Branch Manitowoc River Watershed in the Manitowoc River Basin. This discharge is included in the Northeast Lakeshore River Basin TMDL as approved by EPA. The evaluation of the permit recommendations is discussed in more detail in the attached report.

Based on our review, the following recommendations are made on a chemical-specific basis at Outfall 001:

| Parameter | Daily Maximum | Daily Minimum | Weekly Average | Monthly Average | Footnotes |
|---|---|---|---|---|---|
| Flow Rate | | | | | 1,2 |
| $BOD_5$ | | | 30 mg/L | 20 mg/L | 1 |
| TSS<br>TMDL | | | 30 mg/L<br>14 lbs/day | 20 mg/L<br>8.4 lbs/day | 3 |
| pH | 9.0 s.u. | 6.0 s.u. | | | 1 |
| Dissolved Oxygen | | 4.0 mg/L | | | 1 |
| Bacteria | | | | | 4 |
| Final Limit<br>*E. coli* | | | | 126 #/100 mL<br>geometric mean | |
| Chloride | | | 395 mg/L | | 5 |
| Phosphorus<br><br>TMDL | | | | <br>2.8 mg/L<br>0.34 lbs/day | 3,6 |
| Ammonia Nitrogen<br>January – March<br>April – May<br>June – September<br>Oct. – December | <br>Variable<br>Variable<br>Variable<br>Variable | | <br>15 mg/L<br>6.3 mg/L<br>4.7 mg/L<br>8.9 mg/L | <br>5.9 mg/L<br>2.5 mg/L<br>1.9 mg/L<br>3.5 mg/L | 1,7 |
| Temperature Maximum | | | | | 2 |
| TKN, Nitrate+Nitrite, and Total Nitrogen | | | | | 8 |
| Chronic WET | | | | 2.9 TUc | 9,10 |

Footnotes:

1. No changes from the current permit.
2. Monitoring only.

3. The TSS and phosphorus mass limits are based on the Total Maximum Daily Load (TMDL) for the Northeast Lakeshore TMDL to address phosphorus water quality impairments within the TMDL area. The TMDL was approved by EPA on October 2023.
4. A compliance schedule may be included in the reissued permit to meet disinfection requirements. Bacteria limits apply during the disinfection season of May through September. Additional final limit: No more than 10 percent of *E. coli* bacteria samples collected in any calendar month may exceed 410 count/100 mL.
5. This is the WQBEL for chloride. An alternative effluent limitation of 450 mg/L (equivalent to a previous 4-day $P_{99}$) as a weekly average may be included in the permit in place of this limit if the chloride variance application that was submitted is approved by EPA. If the variance is not approved, a wet weather mass limit would also be required.
6. A compliance schedule to meet the TMDL-based limit may be included in the reissued permit.
7. The variable daily maximum ammonia nitrogen limit table corresponding to various effluent pH values may be included in the permit in place of the single limit. These limits apply year-round.

| Effluent pH s.u. | Limit mg/L | Effluent pH s.u. | Limit mg/L | Effluent pH s.u. | Limit mg/L |
|---|---|---|---|---|---|
| $6.0 \leq pH \leq 6.1$ | 83 | $7.0 < pH \leq 7.1$ | 51 | $8.0 < pH \leq 8.1$ | 11 |
| $6.1 < pH \leq 6.2$ | 82 | $7.1 < pH \leq 7.2$ | 46 | $8.1 < pH \leq 8.2$ | 8.8 |
| $6.2 < pH \leq 6.3$ | 80 | $7.2 < pH \leq 7.3$ | 40 | $8.2 < pH \leq 8.3$ | 7.3 |
| $6.3 < pH \leq 6.4$ | 78 | $7.3 < pH \leq 7.4$ | 35 | $8.3 < pH \leq 8.4$ | 6.0 |
| $6.4 < pH \leq 6.5$ | 75 | $7.4 < pH \leq 7.5$ | 31 | $8.4 < pH \leq 8.5$ | 5.0 |
| $6.5 < pH \leq 6.6$ | 72 | $7.5 < pH \leq 7.6$ | 26 | $8.5 < pH \leq 8.6$ | 4.1 |
| $6.6 < pH \leq 6.7$ | 69 | $7.6 < pH \leq 7.7$ | 22 | $8.6 < pH \leq 8.7$ | 3.4 |
| $6.7 < pH \leq 6.8$ | 65 | $7.7 < pH \leq 7.8$ | 19 | $8.7 < pH \leq 8.8$ | 2.8 |
| $6.8 < pH \leq 6.9$ | 60 | $7.8 < pH \leq 7.9$ | 16 | $8.8 < pH \leq 8.9$ | 2.4 |
| $6.9 < pH \leq 7.0$ | 56 | $7.9 < pH \leq 8.0$ | 13 | $8.9 < pH \leq 9.0$ | 2.0 |

8. As recommended in the Department's October 1, 2019 Guidance for Total Nitrogen Monitoring in Wastewater Permits, annual total nitrogen monitoring is recommended for all minor municipal permittees. Total Nitrogen is the sum of nitrate ($NO_3$), nitrite ($NO_2$), and total Kjeldahl nitrogen (TKN) (all expressed as N).
9. Annual chronic WET testing is required. The Instream Waste Concentration (IWC) to assess chronic test results is 34%. According to the *State of Wisconsin Aquatic Life Toxicity Testing Methods Manual* (s. NR 219.04, Table A, Wis. Adm. Code), chronic testing shall be performed using a dilution series of 100%, 75%, 50%, 25% & 12.5% and the dilution water used in WET tests conducted on Outfall 001 shall be a grab sample collected from the North Branch of the Manitowoc River upstream of the confluence with the unnamed tributary.
10. Sampling WET concurrently with any chemical-specific toxic substances is recommended. Tests should be done in rotating quarters, to collect seasonal information about this discharge and should continue after the permit expiration date (until the permit is reissued).

Please consult the attached report for details regarding the above recommendations. If there are any questions or comments, please contact Nicole Krueger at Nicole.Krueger@wisconsin.gov or Diane Figiel at Diane.Figiel@wisconsin.gov.

Attachments (2) – Narrative & Map

PREPARED BY: Nicole Krueger, Water Resources Engineer – SER

E-cc: Trevor Moen, Wastewater Engineer – NER
Heidi Schmitt Marquez, Regional Wastewater Supervisor – NER

Diane Figiel, Water Resources Engineer – WY/3
Kari Fleming, Environmental Toxicologist – WY/3
Michael Polkinghorn, Water Resources Engineer – NOR/Rhinelander Service Center
Nate Willis, Wastewater Engineer – WY/3

Attachment #1

**Water Quality-Based Effluent Limitations for**
**Potter Wastewater Treatment Facility**

**WPDES Permit No. WI-0029025-10**

Prepared by: Nicole Krueger

## PART 1 – BACKGROUND INFORMATION

### Facility Description

The Village of Potter WWTF consists of an activated sludge plant with secondary clarification and a chlorine contact tank. The plant also uses an aerated holding tank to store sludge which is hauled to another WWTF for disposal. The effluent flow is registered before the effluent leaves the treatment plant via a V-notch weir.

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

### Existing Permit Limitations

The current permit, which expired on December 31 2022, includes the following effluent limitations and monitoring requirements.

| Parameter | Daily Maximum | Daily Minimum | Weekly Average | Monthly Average | Six-Month Average | Footnotes |
|---|---|---|---|---|---|---|
| Flow Rate | | | | | | 1 |
| $BOD_5$ | | | 30 mg/L | 20 mg/L | | 2 |
| TSS | | | 30 mg/L | 20 mg/L | | 2 |
| pH | 9.0 s.u. | 6.0 s.u. | | | | 3 |
| Dissolved Oxygen | | 4.0 mg/L | | | | 2 |
| Chloride | | | 450 mg/L | | | 4 |
| Phosphorus<br>Interim<br>Final | | | | <br>2.8 mg/L<br>0.225 mg/L | <br>0.075 mg/L<br>0.30 lbs/day | 5 |
| Ammonia Nitrogen<br>January – March<br>April – May<br>June – September<br>Oct. – December | <br>Variable<br>Variable<br>Variable<br>Variable | | <br>15 mg/L<br>6.3 mg/L<br>4.7 mg/L<br>8.9 mg/L | <br>5.9 mg/L<br>2.5 mg/L<br>1.9 mg/L<br>3.5 mg/L | | 6 |
| Chronic WET | | | | | | 7 |

Footnotes:

1. Monitoring only.
2. These limits are based on the Limited Aquatic Life (LAL) community of the immediate receiving water as described in s. NR 104.02(3)(b), Wis. Adm. Code.
3. These limitations are not being evaluated as part of this review. Because the water quality criteria (WQC), reference effluent flow rates, and receiving water characteristics have not changed, limitations for these water quality characteristics do not need to be re-evaluated at this time.
4. This is a variance interim limit to the WQBEL 395 mg/L.

5. A compliance schedule is in the current permit to meet the final WQBEL by 01/01/2027.
6. Variable daily maximum ammonia limits:

| Effluent pH s.u. | Limit mg/L | Effluent pH s.u. | Limit mg/L |
|---|---|---|---|
| pH ≤ 7.7 | >19 | 8.3 < pH ≤ 8.4 | 6.0 |
| 7.7 < pH ≤ 7.8 | 19 | 8.4 < pH ≤ 8.5 | 4.9 |
| 7.8 < pH ≤ 7.9 | 16 | 8.5 < pH ≤ 8.6 | 4.1 |
| 7.9 < pH ≤ 8.0 | 13 | 8.6 < pH ≤ 8.7 | 3.4 |
| 8.0 < pH ≤ 8.1 | 11 | 8.7 < pH ≤ 8.8 | 2.8 |
| 8.1 < pH ≤ 8.2 | 8.8 | 8.8 < pH ≤ 8.9 | 2.4 |
| 8.2 < pH ≤ 8.3 | 7.3 | 8.9 < pH ≤ 9.0 | 2.0 |
| | | pH > 9.0 | <2.0 |

7. Chronic WET testing is required once every 5 years . The IWC is 100%.

**Receiving Water Information**

- Name: Unnamed Tributary to the North Branch of the Manitowoc River
- Waterbody Identification Code (WBIC): 76500
- Classification used in accordance with chs. NR 102 and 104, Wis. Adm. Code: The immediate receiving water is classified as a Limited Aquatic Life (LAL) community per Table 5 in ch. NR 104, Wis. Adm. Code. The North Branch of the Manitowoc River, approximately 0.2 miles downstream of Outfall 001, is classified as a Warm Water Sport Fish (WWSF) community, non-public water supply. Note: Cold Water and Public Water Supply criteria are used for bioaccumulating compounds of concern, because the discharge is within the Great Lakes basin.
- Low flows used in accordance with chs. NR 106 and 217, Wis. Adm. Code: The following 7-$Q_{10}$ and 7-$Q_2$ values are estimates from USGS, where Outfall 001 is located.
  7-$Q_{10}$ = 0 cfs (cubic feet per second)
  7-$Q_2$ = 0 cfs
  North Branch Manitowoc River (0.2 miles downstream, WWSF classification)
  7-$Q_{10}$ = 0.49 cfs
  7-$Q_2$ = 1.36 cfs
- Hardness = Effluent hardness is used in place of receiving water because there is no receiving water flow upstream of the discharge.
- % of low flow used to calculate limits in accordance with s. NR 106.06(4)(c)5., Wis. Adm. Code: Not applicable where the receiving water low flows are zero.
- Source of background concentration data: Background concentrations are not included because they don't impact the calculated WQBEL when the receiving water low flows are equal to zero.
- Multiple dischargers: None.
- Impaired water status: The North Branch Manitowoc River approximately 0.2 miles downstream of Outfall 001 is 303(d) listed as impaired for total phosphorus and total suspended solids.

**Effluent Information**

- Design flow rate(s):
  Annual average = 0.04 MGD (Million Gallons per Day)
  Peak weekly = 0.17 MGD
  The peak design flows were estimated from the annual average design flow and a peaking factor based on data from 01/01/2019 – 03/31/2024.

For reference, the actual average flow from 01/01/2019 – 03/31/2024 was 0.030 MGD.

- Hardness = 449 mg/L as $CaCO_3$. This value represents the geometric mean of data from 12/02/2021 – 12/14/2021 from the permit reissuance application.
- Acute dilution factor used in accordance with s. NR 106.06(3)(c), Wis. Adm. Code: Not applicable – this facility does not have an approved Zone of Initial Dilution (ZID).
- Water source: Domestic wastewater with water supply from wells.
- Additives: None.
- Effluent characterization: This facility is categorized as a minor municipality, so the permit application required effluent sample analyses for a limited number of common pollutants, as specified in s. NR 200.065, Table 1, Wis. Adm. Code, primarily metal substances plus ammonia, chloride, hardness and phosphorus.
- Effluent data for substances for which a single sample was analyzed is shown in the tables in Part 2 below, in the column titled "MEAN EFFL. CONC.". Otherwise, substances with multiple effluent data are shown in the tables below or in their respective parts in this evaluation.

**Effluent Copper**

| Sample Date | Copper µg/L | Sample Date | Copper µg/L | Sample Date | Copper µg/L |
|---|---|---|---|---|---|
| 12/2/2021 | 13.8 | 12/18/2021 | 18.3 | 1/3/2022 | 18.6 |
| 12/6/2021 | 14.8 | 12/22/2021 | 17.7 | 1/7/2022 | 17.4 |
| 12/10/2021 | 22.6 | 12/26/2021 | 21.0 | 1/11/2022 | 16.4 |
| 12/14/2021 | 21.1 | 12/30/2021 | 17.6 | | |
| 1-day $P_{99}$ = 25.2 µg/L | | | | | |
| 4-day $P_{99}$ = 21.4 µg/L | | | | | |

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**Effluent Chloride**

| | Chloride mg/L |
|---|---|
| 1-day $P_{99}$ | 687 |
| 4-day $P_{99}$ | 530 |
| 30-day $P_{99}$ | 445 |
| Mean | 401 |
| Std | 99.4 |
| Sample size | 252 |
| Range | 129 - 751 |

The following table presents the average concentrations and loadings at Outfall 001 from 01/01/2019 – 03/31/2024 for all parameters with limits in the current permit to meet the requirements of s. NR 201.03(6), Wis. Adm. Code:

**Parameter Averages with Limits**

| Parameter | Average Measurement |
|---|---|
| $BOD_5$ | 3.6 mg/L* |
| TSS | 5.5 mg/L* |
| Dissolved Oxygen | 9.1 mg/L |
| pH field | 7.7 s.u. |
| Phosphorus | 2.1 mg/L |
| Ammonia Nitrogen | 0.13 mg/L* |

Attachment #1

| Parameter | Average Measurement |
|---|---|
| Chloride | 401 mg/L |

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

## PART 2 – BIOLOGICAL OXYGEN DEMAND AND TOTAL SUSPENDED SOLIDS

The unnamed tributary is classified as a LAL community and is subject to the categorical limits based on a LAL community as described in s. NR 104.02(3)(b), Wis. Adm. Code. These are 30 mg/L as a weekly average and 20 mg/L as a monthly average for both $BOD_5$ and TSS. In addition, a daily minimum of 4.0 mg/L for dissolved oxygen is also required.

Because there is only 0.2 miles from the discharge to the warmwater sport fish classification, downstream protection for $BOD_5$ and DO is considered due to the DO concentration in a given river or stream changing over time.

In establishing $BOD_5$ (Biochemical Oxygen Demand) limitations, the primary intent is to prevent a lowering of dissolved oxygen levels in the receiving water below water quality standards as specified in ss. NR 102.04(4)(a) and (b). The 26-lb method is the most frequently used approach for calculating $BOD_5$ limits when resources are not available to develop a detailed water quality model. This simplified model was developed in the 1970's by the Wisconsin Committee on Water Pollution on the Fox, Wisconsin, Oconto, and Flambeau Rivers. Further studies throughout the 1970's proved this model to be relatively accurate. The model has since then been used by the Department on many occasions when resources are not available to perform a site-specific model. The "26" value stems from the following equation:

$$\frac{26\ {}^{\text{lbs}}/_{\text{day}}}{{}^{\text{ft}^3}/_{\text{sec}}} * \frac{1\,\text{day}}{86{,}400\,\text{sec}} * \frac{454{,}000\,\text{mg}}{\text{lbs}} * \frac{1\,\text{ft}^3}{28.32\,\text{L}} = 4.8 = 2.4 * 2\ {}^{\text{mg}}/_{\text{L}}$$

The 4.8 has been calculated by taking 2.4 which is the number one receives when converting 26 lbs of BOD/day/cfs into mg/L, multiplied by 2.0 which is the change in the DO level. A typical background DO level for Wisconsin waters is 7 mg/L, so a 2 mg/L decrease is allowed in order to meet the 5 mg/L standard for warm water streams. The above relationship is temperature dependent and an appropriate temperature correction factor is applied. The 26-lb method is based on a typical 24°C summer value for warm water streams. Adjustments for temperature are made using the following equation:

$$k_t = k_{24}\left(0.967^{(T-24)}\right)$$

Where $k_{24}$ = 26 lbs of BOD/day/cfs

<u>Calculations based on Full Assimilative Capacity at 7Q10 Conditions:</u>

$$Limitation(mg/L) = 2.4\left(DO_{stream} - DO_{std}\right)\left(\frac{\left({}_7Q_{10} + Q_{eff}\right)}{Q_{eff}}\right)\left(0.967^{(T-24)}\right)$$

Where:
$Q_{eff}$ = effluent design flow = 0.04 MGD
$DO_{stream}$ = background dissolved oxygen = 7 mg/L

$DO_{std}$ = dissolved oxygen criteria from s. NR 102.04(4) = 5.0 mg/L
$_7Q_{10}$ = 0.49 cfs
T = Receiving water temperature from s. NR 102.25

| BOD Effluent Limitations (26 LB Method) | | Winter | Summer |
|---|---|---|---|
| **Background Information:** | 7-$Q_{10}$ (cfs) | 0.49 | 0.49 |
| | River Temperature (°C) | 3.3 | 17 |
| **Dissolved Oxygen mg/L:** | Effluent | 4.0 | 4.0 |
| | Background | 7.0 | 7.0 |
| | Mix DO | 6.66 | 6.66 |
| | Criteria | 5 | 5 |
| **Weekly Ave BOD Effluent Limitations** | Concentration Limits (mg/L) | **71** | **45** |
| | Mass (lbs/d) | **24** | **15** |

These calculated limits are much greater than the limits in the current permit. Therefore, **no changes are recommended for $BOD_5$ and DO.**

## PART 3 – WATER QUALITY-BASED EFFLUENT LIMITATIONS FOR TOXIC SUBSTANCES – EXCEPT AMMONIA NITROGEN

Permit limits for toxic substances are required whenever any of the following occur:

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

**Acute Limits based on 1-$Q_{10}$**

Daily maximum effluent limitations for toxic substances are based on the acute toxicity criteria (ATC), listed in ch. NR 105, Wis. Adm. Code. Previously daily maximum limits for toxic substances were calculated as two times the ATC. However, changes to ch. NR 106, Wis. Code, (September 1, 2016) require the Department to calculate acute limitations using the same mass balance equation as used for other limits along with the 1-$Q_{10}$ receiving water low flow to determine if more restrictive effluent limitations are needed to protect the receiving stream from discharges which may cause or contribute to an exceedance of the acute water quality standards. The mass balance equation is provided below.

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

Where:

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

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

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

Adm. Code.
f = Fraction of the effluent flow that is withdrawn from the receiving water, and
Cs = Background concentration of the substance (in units of mass per unit volume) as specified in s. NR 106.06(4)(e), Wis. Adm. Code.

If the receiving water is effluent dominated under low stream flow conditions, the 1-$Q_{10}$ method of limit calculation produces the most stringent daily maximum limitations and should be used while making reasonable potential determinations. This is the case for Potter.

The following tables list the calculated WQBELs for this discharge along with the results of effluent sampling. All concentrations are expressed in terms of micrograms per Liter (µg/L), except for hardness and chloride (mg/L).

**Daily Maximum Limits based on Acute Toxicity Criteria (ATC)**
RECEIVING WATER FLOW = 0 cfs

| SUBSTANCE | REF. HARD.* mg/L | ATC | MEAN BACK-GRD. | MAX. EFFL. LIMIT** | 1/5 OF EFFL. LIMIT | MEAN EFFL. CONC. | 1-day $P_{99}$ | 1-day MAX. CONC. |
|---|---|---|---|---|---|---|---|---|
| Arsenic | | 340 | | 340 | 68.0 | 0.63 | | |
| Cadmium | 449 | 57.7 | | 57.7 | 11.5 | <1.3 | | |
| Chromium | 301 | 4446 | | 4446 | 889 | <2.5 | | |
| Copper | 449 | 64.0 | | 64.0 | | | | |
| Lead | 356 | 365 | | 365 | 72.9 | <5.9 | | |
| Nickel | 268 | 1080 | | 1080 | 216 | 4.50 | | |
| Zinc | 333 | 345 | | 345 | 68.9 | 37.6 | | |
| Chloride (mg/L) | | 757 | | 757 | | | 687 | 751 |

* The indicated hardness may differ from the effluent hardness because the effluent hardness exceeded the maximum range in ch. NR 105, Wis. Adm. Code, over which the acute criteria are applicable. In that case, the maximum of the range is used to calculate the criterion.
* * Per the changes to s. NR 106.07(3), Wis. Adm. Code, effective 09/01/2016 consideration of ambient concentrations and 1-$Q_{10}$ flow rates yields a more restrictive limit than the 2 × ATC method of limit calculation.

**Weekly Average Limits based on Chronic Toxicity Criteria (CTC)**
RECEIVING WATER FLOW = 0 cfs

| SUBSTANCE | REF. HARD.* mg/L | CTC | MEAN BACK-GRD. | WEEKLY AVE. LIMIT | 1/5 OF EFFL. LIMIT | MEAN EFFL. CONC. | 4-day $P_{99}$ |
|---|---|---|---|---|---|---|---|
| Arsenic | | 152 | | 152 | 30.4 | 0.63 | |
| Cadmium | 175 | 3.8 | | 3.82 | 0.76 | <1.3 | |
| Chromium | 301 | 326 | | 326 | 65.2 | <2.5 | |
| Copper | 449 | 37.4 | | 37.4 | | | 21.4 |
| Lead | 356 | 95.5 | | 95.5 | 19.1 | <5.9 | |
| Nickel | 268 | 120 | | 120 | 24.0 | 4.5 | |
| Zinc | 333 | 345 | | 345 | 68.9 | 37.6 | |
| Chloride (mg/L) | | 395 | | 395 | | | **530** |

* The indicated hardness may differ from the receiving water hardness because the receiving water hardness exceeded the maximum range in ch. NR 105, Wis. Adm. Code, over which the chronic criteria are applicable. In that case, the maximum of the range is used to calculate the criterion.

**Monthly Average Limits based on Wildlife Criteria (WC)**

The effluent characterization did not include any effluent sampling results for substances for which Wildlife Criteria exist.

**Monthly Average Limits based on Human Threshold Criteria (HTC)**

RECEIVING WATER FLOW = 0 cfs

| SUBSTANCE | HTC | MEAN BACK-GRD. | MO'LY AVE. LIMIT | 1/5 OF EFFL. LIMIT | MEAN EFFL. CONC. |
|---|---|---|---|---|---|
| Cadmium | 370 | | 370 | 74.0 | <1.3 |
| Chromium (+3) | 3818000 | | 3818000 | 763600 | <2.5 |
| Lead | 140 | | 140 | 28.0 | <5.9 |
| Nickel | 43000 | | 43000 | 8600 | 4.5 |

**Monthly Average Limits based on Human Cancer Criteria (HCC)**

RECEIVING WATER FLOW = 0 cfs

| SUBSTANCE | HCC | MEAN BACK-GRD. | MO'LY AVE. LIMIT | 1/5 OF EFFL. LIMIT | MEAN EFFL. CONC. |
|---|---|---|---|---|---|
| Arsenic | 13.3 | | 13.3 | 2.66 | 0.63 |

In addition to evaluating the need for limits for each individual substance for which HCC exist, s. NR 106.06(8), Wis. Adm. Code, requires the evaluation of the cumulative cancer risk. Because no effluent limits are needed based on HCC, determination of the cumulative cancer risk is not needed per s. NR 106.06(8), Wis. Adm. Code.

**Conclusions and Recommendations**

Based on a comparison of the effluent data and calculated effluent limitations, effluent limitations are required for chloride.

Chloride – Considering available effluent data from the current permit term (01/01/2019 – 03/13/2024), the 1-day $P_{99}$ chloride concentration is 687 mg/L, and the 4-day $P_{99}$ of effluent data is 530 mg/L. Because the 4-day $P_{99}$ exceeds the calculated weekly average WQBEL, an effluent limit is needed in accordance with s. NR 106.05(4)(b), Wis. Adm. Code.

However, Subchapter VII of ch. NR 106, Wis. Adm. Code, provides for a variance from water quality standards for this substance, and Potter has requested such a variance. That variance may be granted subject to the following conditions:

1) The permit shall include an “Interim” limitation intended to prevent an increase in the discharge of Chloride;
2) The permit shall specify “Source Reduction Measures” to be implemented during the permit term, with periodic progress reports; and
3) The permit shall include a “Target Limit” or “Target Value” to gage the effectiveness of the Source Reduction Measures, and progress toward the WQBELs. A target value is suggested for the first

iteration of a permit with such a variance.

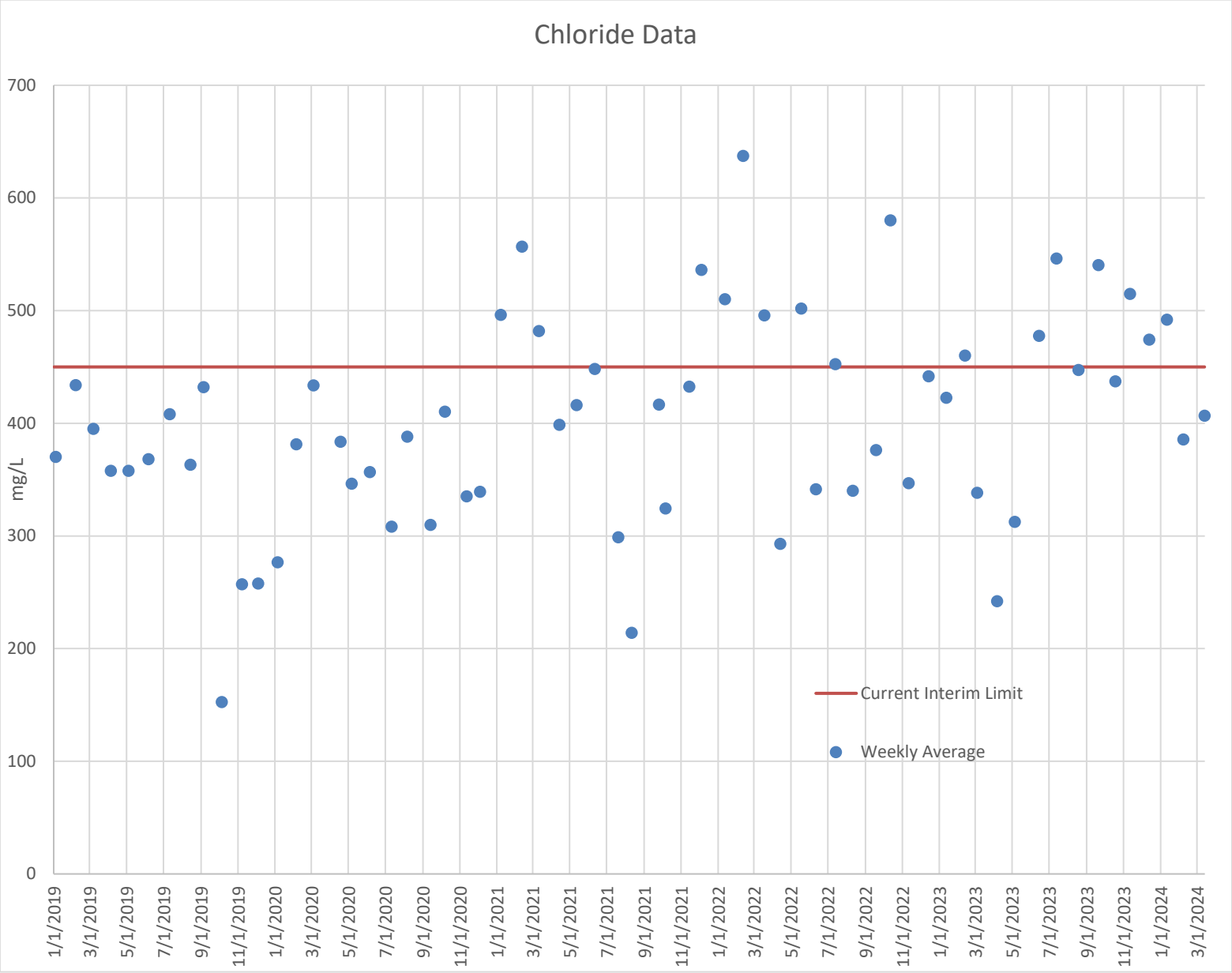
**Interim Limit for Chloride**

Section NR 106.82(9), Wis. Adm. Code, defines a "Weekly average interim limitation" as either the 4-day $P_{99}$ concentration or 105% of the highest weekly average concentration of the representative data.

Ideally, the effluent chloride concentration at facilities with variances will trend downward as time goes on as a result of source reduction measures, and the recalculated interim limit will decline until the plant can meet the WQBEL. Unfortunately, effluent concentrations at Potter have apparently increased in the past few years.

Although the 4-day $P_{99}$ effluent chloride concentrations at Potter are higher than the current interim limit of 450 mg/L, the Department does not find it appropriate to increase the interim concentration limit in the reissued permit, because it would be counterproductive to meeting the final WQBEL. **Therefore, the current weekly average interim chloride limit is recommended for permit reissuance.**

Attachment #1




A target limit and permit language for Source Reduction Measures are not recommended as part of this evaluation. These should follow contact with Potter. Though if the Department and Potter are unable to reach agreement on all the terms of a Chloride Variance, the calculated limits described earlier should be included in the permit, in accordance with s. NR 106.83(3), Wis. Adm. Code.

**Chloride Monitoring Recommendations**

Four samples per month (on consecutive days) are recommended. This allows for averaging of the results to compare with the interim limit and allows the use of the average in determining future interim limits, and degree of success with chloride reduction measures.

**In the absence of a variance,** Potter would be subject to the WQBEL of 395 mg/L as a weekly average; the weekly average mass limit of 132 lbs/day (395 mg/L × 0.04 MGD × 8.34); and an alternative wet weather mass limit.

Mercury – The permit application did not require monitoring for mercury because Potter is categorized as a minor facility as defined in s. NR 200.02(8), Wis. Adm. Code. In accordance with s. NR 106.145(3)(a)3, Wis. Adm. Code, a minor municipal discharger shall monitor, and report results of influent and effluent mercury monitoring once every three months if, "there are two or more exceedances in the last five years of the high-quality sludge mercury concentration of 17 mg/kg specified in s. NR 204.07(5), Wis. Adm. Code." A review of the past five years of sludge characteristics data reveals that all the sample results are within expected analytical ranges and well below the 17 mg/kg level. The average concentration in the sludge from 04/27/2021 – 03/18/2024 was 0.30 mg/kg, with a maximum reported concentration of 1.2 mg/kg. Therefore, no mercury monitoring is recommended at Outfall 001.

PFOS and PFOA – The need for PFOS and PFOA monitoring is evaluated in accordance with s. NR 106.98(2), Wis. Adm. Code. Based on the effluent flow rate and type of discharge, **PFOS and PFOA monitoring is not recommended at this time.** The Department may re-evaluate the need for sampling at the next permit reissuance if new information becomes available that suggests PFOS or PFOA may be present in the discharge.

## PART 4 – WATER QUALITY-BASED EFFLUENT LIMITATIONS FOR AMMONIA NITROGEN

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

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

**Daily Maximum Limits based on Acute Toxicity Criteria (ATC)**

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

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

Where:

A = 0.633 and B = 90.0 for Limited Aquatic Life, and
pH (s.u.) = that characteristic of the effluent.

The effluent pH data was examined as part of this evaluation. A total of 1369 sample results were reported from 01/02/2019 – 03/29/2024. The maximum reported value was 8.25 s.u. (Standard pH Units). The effluent pH was 8.10 s.u. or less 99% of the time. The 1-day $P_{99}$, calculated in accordance with s. NR 106.05(5), Wis. Adm. Code, is 8.08 s.u. The mean plus the standard deviation multiplied by a factor of 2.33, an estimate of the upper ninety ninth percentile for a normally distributed dataset, is 8.07 s.u. Therefore, a value of 8.10 s.u. is believed to represent the maximum reasonably expected pH, and

therefore most appropriate for determining daily maximum limitations for ammonia nitrogen. Substituting a value of 8.10 s.u. into the equation above yields an ATC = 11 mg/L.

**Daily Maximum Ammonia Nitrogen Effluent Limitations Calculation Method**
In accordance with s. NR 106.32(2), Wis. Adm. Code daily maximum ammonia limitations are calculated using the the 1-$Q_{10}$ receiving water low flow if it is determined that the previous method of acute ammonia limit calculation (2×ATC) is not sufficiently protective of the fish and aquatic life. The more restrictive calculated limits shall apply.

The calculated daily maximum ammonia nitrogen effluent limits using the mass balance approach with the 1-$Q_{10}$ (estimated as 80 % of 7-$Q_{10}$) and the 2×ATC approach are shown below.

**Daily Maximum Ammonia Nitrogen Determination**

| | Ammonia Nitrogen Limit mg/L |
|---|---|
| 2×ATC | 21 |
| 1-$Q_{10}$ | 11 |

The 1-$Q_{10}$ method yields the most stringent limits for Potter.

The current permit has variable daily maximum effluent limits based on effluent pH. Presented below is a table of daily maximum limitations corresponding to various effluent pH values. Use of this table is not necessarily recommended in the permit, but it is presented herein for informational purposes.

**Daily Maximum Ammonia Nitrogen Limits – LAL**

| Effluent pH s.u. | Limit mg/L | Effluent pH s.u. | Limit mg/L | Effluent pH s.u. | Limit mg/L |
|---|---|---|---|---|---|
| 6.0 ≤ pH ≤ 6.1 | 83 | 7.0 < pH ≤ 7.1 | 51 | 8.0 < pH ≤ 8.1 | 11 |
| 6.1 < pH ≤ 6.2 | 82 | 7.1 < pH ≤ 7.2 | 46 | 8.1 < pH ≤ 8.2 | 8.8 |
| 6.2 < pH ≤ 6.3 | 80 | 7.2 < pH ≤ 7.3 | 40 | 8.2 < pH ≤ 8.3 | 7.3 |
| 6.3 < pH ≤ 6.4 | 78 | 7.3 < pH ≤ 7.4 | 35 | 8.3 < pH ≤ 8.4 | 6.0 |
| 6.4 < pH ≤ 6.5 | 75 | 7.4 < pH ≤ 7.5 | 31 | 8.4 < pH ≤ 8.5 | 5.0 |
| 6.5 < pH ≤ 6.6 | 72 | 7.5 < pH ≤ 7.6 | 26 | 8.5 < pH ≤ 8.6 | 4.1 |
| 6.6 < pH ≤ 6.7 | 69 | 7.6 < pH ≤ 7.7 | 22 | 8.6 < pH ≤ 8.7 | 3.4 |
| 6.7 < pH ≤ 6.8 | 65 | 7.7 < pH ≤ 7.8 | 19 | 8.7 < pH ≤ 8.8 | 2.8 |
| 6.8 < pH ≤ 6.9 | 60 | 7.8 < pH ≤ 7.9 | 16 | 8.8 < pH ≤ 8.9 | 2.4 |
| 6.9 < pH ≤ 7.0 | 56 | 7.9 < pH ≤ 8.0 | 13 | 8.9 < pH ≤ 9.0 | 2.0 |

Section NR 106.33(2), Wis. Adm. Code, was updated effective September 1, 2016. As a result, seasonal 20 and 40 mg/L thresholds for including ammonia limits in municipal discharge permits are no longer applicable under current rules. As such, the table has been expanded from the table in the current permit to included ammonia nitrogen limits throughout the pH range.

**Weekly and Monthly Average Limits based on Chronic Toxicity Criteria (CTC)**
The ammonia limit calculation also warrants evaluation of weekly and monthly average limits based on chronic toxicity criteria for ammonia, because those limits relate to the assimilative capacity of the receiving water.

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

*Unnamed Tributary (LAL)*
The 30-day chronic toxicity criterion (CTC) for ammonia in waters classified as Limited Aquatic Life is calculated by the following equation, according to subchapter IV of NR 106, Wis. Adm. Code.

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

Where:

pH = the pH (s.u.) of the receiving water,
E = 1.0,
$C = 8.09 \times 10^{(0.028 \times (25 - T))}$
T = the temperature of the receiving (ºC)

The "default" basin assumed values are used for Temperature, pH and background ammonia concentrations, because minimum ambient data is available. These values are shown in the table below, with the resulting criteria and effluent limitations.

**Weekly and Monthly Ammonia Nitrogen Limits – LAL**

| | | Spring | Summer | Winter |
|---|---|---|---|---|
| | | April & May | June – Sept. | Oct. - March |
| **Effluent Flow** | Qe (MGD) | 0.04 | 0.04 | 0.04 |
| **Background Information** | 7-$Q_{10}$ (cfs) | 0 | 0 | 0 |
| | 7-$Q_2$ (cfs) | 0 | 0 | 0 |
| | Ammonia (mg/L) | 0.04 | 0.05 | 0.105 |
| | Average Temperature (°C) | 12 | 19 | 4 |
| | Maximum Temperature (°C) | 14 | 21 | 10 |
| | pH (s.u.) | 8.21 | 8.21 | 7.97 |
| | % of Flow used | 50 | 100 | 25 |
| | Reference Weekly Flow (cfs) | 0 | 0 | 0 |
| | Reference Monthly Flow (cfs) | 0 | 0 | 0 |
| **Criteria mg/L** | 4-day Chronic | 29 | 20 | 56 |
| | 30-day Chronic | 12 | 7.8 | 22 |
| **Effluent Limits mg/L** | Weekly Average | **29** | **20** | **56** |
| | Monthly Average | **12** | **7.8** | **22** |

*North Branch Manitowoc River (WWSF 0.2 miles downstream of Outfall 001)*
The 30-day chronic toxicity criterion (CTC) for ammonia in waters classified as a Warm Water Sport Fish Community is calculated by the following equation, according to subchapter IV of NR 106, Wis. Adm. Code.

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

Where:

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

T = the temperature (ºC) of the receiving water – (Early Life Stages Present), or
T = the maximum of the actual temperature (ºC) and 7 - (Early Life Stages Absent)

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

Section NR 106.32 (3), Wis. Adm. Code, provides a mechanism for less stringent weekly average and monthly average effluent limitations when early life stages (ELS) of critical organisms are absent from the receiving water. This applies only when the water temperature is less than 14.5 ºC, during the winter and spring months. Burbot, an early spawning species, are not believed to be present in the North Branch Manitowoc River. So "ELS Absent" criteria apply from October through March, and "ELS Present" criteria will apply from April through September for a WWSF classification.

The "default" basin assumed values are used for Temperature, pH and background ammonia concentrations, because minimum ambient data is available. These values are shown in the table below, with the resulting criteria and effluent limitations.

**Weekly and Monthly Ammonia Nitrogen Limits – WWSF**

| | | Spring | Summer | Winter |
|---|---|---|---|---|
| | | April & May | June – Sept. | Oct. - March |
| **Effluent Flow** | Qe (MGD) | 0.04 | 0.04 | 0.04 |
| **Background Information** | 7-$Q_{10}$ (cfs) | 0.49 | 0.49 | 0.49 |
| | 7-$Q_2$ (cfs) | 1.36 | 1.36 | 1.36 |
| | Ammonia (mg/L) | 0.04 | 0.05 | 0.105 |
| | Average Temperature (°C) | 12 | 19 | 4 |
| | Maximum Temperature (°C) | 14 | 21 | 10 |
| | pH (s.u.) | 8.21 | 8.21 | 7.97 |
| | % of Flow used | 50 | 100 | 25 |
| | Reference Weekly Flow (cfs) | 0.25 | 0.49 | 0.12 |
| | Reference Monthly Flow (cfs) | 0.58 | 1.16 | 0.29 |
| **Criteria mg/L** | 4-day Chronic | | | |
| | Early Life Stages Present | 4.4 | 3.0 | |
| | Early Life Stages Absent | | | 8.5 |
| | 30-day Chronic | | | |
| | Early Life Stages Present | 1.8 | 1.2 | |
| | Early Life Stages Absent | | | 3.4 |
| **Effluent Limitations mg/L** | Weekly Average | | | |
| | Early Life Stages Present | **21.7** | **26.3** | |
| | Early Life Stages Absent | | | **25.1** |
| | Monthly Average | | | |
| | Early Life Stages Present | **17.9** | **22.6** | |
| | Early Life Stages Absent | | | **18.8** |

The current limits are more stringent than the calculated limits based on a direct discharge to the WWSF section. If Potter would like to request an increase to the existing permit limits an assessment of their

effluent data consistent with the requirements of ss. NR 207.04(1)(a) and (c), Wis. Adm. Code, must be provided. This evaluation is on a parameter by parameter basis and includes consideration of operations, maintenance and temporary upsets. Without a demonstration of need for a higher limit in accordance with s. NR 207.04, Wis. Adm. Code, the current limits must be continued in the reissued permit.

**Effluent Data**

The following table evaluates the statistics based upon ammonia data reported from 01/01/2019 – 03/12/2024, with those results being compared to the calculated limits to determine the need to include ammonia limits in Potter's permit for the respective month ranges. That need is determined by calculating 99th upper percentile (or $P_{99}$) values for ammonia during each of the month ranges and comparing the daily maximum values to the daily maximum limit.

**Ammonia Nitrogen Effluent Data**

| Ammonia Nitrogen mg/L | April - May | June - September | October – December | January – March |
|---|---|---|---|---|
| 1-day $P_{99}$ | 0.326 | 3.13 | 0.307 | 0.356 |
| 4-day $P_{99}$ | 0.193 | 2.28 | 0.186 | 0.201 |
| 30-day $P_{99}$ | 0.110 | 1.03 | 0.112 | 0.112 |
| Mean* | 0.074 | 0.24 | 0.079 | 0.075 |
| Std | 0.068 | 1.16 | 0.062 | 0.074 |
| Sample size | 40 | 80 | 60 | 72 |
| Range | <0.038 - 0.282 | <0.038 - 10.1 | <0.038 - 0.328 | <0.038 - 0.62 |

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

**The permit currently has daily maximum, weekly average, and monthly average limits year-round. Where there are existing ammonia nitrogen limits in the permit, the limits must be retained regardless of reasonable potential**, consistent with s. NR 106.33(1)(b), Wis. Adm. Code:

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

**Conclusions and Recommendations**

In summary, after rounding to two significant figures, the following ammonia nitrogen limitations are recommended. No mass limitations are recommended in accordance with s. NR 106.32(5), Wis. Adm Code.

**Final Ammonia Nitrogen Limits**

| | Daily Maximum mg/L | Weekly Average mg/L | Monthly Average mg/L |
|---|---|---|---|
| January – March | Variable | 15 | 5.9 |
| April – May | Variable | 6.3 | 2.5 |
| June – September | Variable | 4.7 | 1.9 |
| Oct. – December | Variable | 8.9 | 3.5 |

## PART 5 – WATER QUALITY-BASED EFFLUENT LIMITATIONS FOR BACTERIA

Section NR 102.04(5), Wis. Adm. Code, says that all surface waters shall be suitable for supporting recreational use and shall meet E. coli criteria during the recreation season. Section NR 102.04(5)(b), Wis. Adm. Code, allows the Department to make exceptions when it determines, in accordance with s. NR 210.06(3), Wis. Adm. Code, that wastewater disinfection is not required to meet E. coli limits and protect the recreational use. Section NR 210.06(3), Wis. Adm. Code, tasks the Department with determining the need for disinfection using a site-specific analysis based on potential risk to human or animal health. It sets out the factors that must be considered in determining the necessity to disinfect municipal wastewater or to change the length of the disinfection season.

Potter had previously been exempted from disinfection based on the limited aquatic life or limited forage fish classification of the receiving water. Section NR 210.06(3)(g), Wis. Adm. Code, states that disinfection decisions may be made based on the hydrologic classifications listed in s. NR 104.02(1), Wis. Adm. Code (not on the water quality classifications - i.e., limited forage fish, limited aquatic life - that are defined in s. NR 104.02(3), Wis. Adm. Code). The hydrologic classification for the unnamed tributary is listed in ch. NR 104, Wis. Adm. Code, as continuous. Continuous streams have a higher likelihood of providing opportunities for full contact recreational activities. Therefore, disinfection should not be exempted based solely on this hydrological classification.

The Department has considered the information required by s. NR 210.06(3), Wis. Adm. Code, and has determined that the discharge cannot meet bacteria limits without disinfection. Section NR 210.06(2)(a)1, Wis. Adm. Code, includes two limits which must be included in permits for facilities which are required to disinfect:

1. The geometric mean of *E. coli* bacteria in effluent samples collected in any calendar month may not exceed 126 counts/100 mL.
2. No more than 10 percent of *E. coli* bacteria samples collected in any calendar month may exceed 410 counts/100 mL.

**These limits are required during May through September.** The permit will include a compliance schedule to meet these limits.

## PART 6 – PHOSPHORUS

### Technology-Based Effluent Limit

Subchapter II of Chapter NR 217, Wis. Adm. Code, requires municipal wastewater treatment facilities that discharge greater than 150 pounds of Total Phosphorus per month to comply with a monthly average limit of 1.0 mg/L, or an approved alternative concentration limit.

Because Potter does not currently have an existing technology-based limit, the need for this limit in the reissued permit is evaluated. The data demonstrates that the annual monthly average phosphorus loading is less than 150 lbs/month, which is the threshold for municipalities in accordance to s. NR 217.04(1)(a)1, Wis. Adm. Code, and therefore no technology-based limit is required.

### Annual Average Mass Total Phosphorus Loading

Attachment #1

| Month | Monthly Avg. mg/L | Total Flow MG/month | Total Phosphorus lb./mo. |
|---|---|---|---|
| Apr 2023 | 1.08 | 1.52 | 13.7 |
| May 2023 | 1.08 | 0.98 | 8.8 |
| Jun 2023 | 2.34 | 0.72 | 14.0 |
| July 2023 | 1.86 | 0.69 | 10.7 |
| Aug 2023 | 3.35 | 0.62 | 17.4 |
| Sept 2023 | 3.92 | 0.42 | 13.7 |
| Oct 2023 | 1.40 | 0.71 | 8.33 |
| Nov 2023 | 2.13 | 0.66 | 11.7 |
| Dce 2023 | 2.70 | 0.78 | 17.5 |
| Jan 2024 | 2.19 | 0.84 | 15.4 |
| Feb 2024 | 1.61 | 1.14 | 15.3 |
| Mar 2023 | 1.87 | 1.21 | 18.9 |
| Average | | | 13.8 |

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

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

**Northeast Lakeshore Basin TMDL**
Total phosphorus (TP) effluent limits in lbs/day are calculated as recommended in the *TMDL Development and Implementation Guidance: Integrating the WPDES and Impaired Waters Programs* (April 2020) and are based on the annual phosphorus wasteload allocation (WLA) given in pounds per year. This WLA found in Appendix K of the *Total Maximum Daily Loads for Total Phosphorus and Total Suspended Solids in the Northeast Lakeshore Region* report are expressed as maximum annual loads (lbs/year). Potter has an annual WLA of 66 lbs/year.

For the reasons explained in the April 30, 2012 paper entitled *Justification for Use of Monthly, Growing Season and Annual Average Periods for Expression of WPDES Permit Limits for Phosphorus Discharges in Wisconsin*, WDNR has determined that the phosphorus WQBELs set equal to WLAs would not be consistent with the assumptions and requirements of the TMDL. Therefore, limits given to facilities included in the Northeast Lakeshore Basin TMDL are given monthly average mass limits and, if the equivalent effluent concentration is less than or equal to 0.3 mg/L, six-month average mass limits are also included. The following equation shows the calculation of equivalent effluent concentration:

$$\text{TP Equivalent Effluent Concentration} = \text{WLA} \div (365\ \text{days/yr} * \text{Flow Rate} * \text{Conversion Factor})$$
$$= 66\ \text{lbs/yr} \div (365\ \text{days/yr} * 0.04\ \text{MGD} * 8.34)$$
$$= 0.54\ \text{mg/L}$$

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

$$\text{TP Monthly Average Permit Limit} = \text{WLA} \div 365\ \text{days/yr} * \text{multiplier}$$
$$= (66\ \text{lbs/yr} \div 365\ \text{days/yr}) * 1.9$$
$$= 0.34\ \text{lbs/day}$$

The multiplier used in the six-month average calculation was determined according to the implementation

guidance. A coefficient of variation was calculated, based on phosphorus mass monitoring data, to be 0.67. This is the standard deviation divided by the mean of mass data. However, it is believed that the optimization of the wastewater treatment system to achieve the WLA-derived permit limits will reduce effluent variability. Thus, the maximum anticipated coefficient of variation expected by the facility is 0.6. This value, along with monitoring frequency, is used to select the multiplier. The current permit specifies phosphorus monitoring as weekly; if a different monitoring frequency is used, the stated limits should be reevaluated.

A monthly average mass effluent limit is recommended for this discharge. The limits are equivalent to a concentration of 1.0 mg/L at the facility design flow of 0.04 MGD.

The TMDL establishes TP wasteload allocations to reduce the loading in the entire watershed including WLAs to meet water quality standards for tributaries in the Northeast Lakeshore Basin. Therefore, WLA-based WQBELs are protective of immediate receiving waters and TP WQBELs derived according to s. NR 217.13, Wis. Adm. Code are not required.

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

**Effluent Data**
The following table summarizes effluent total phosphorus monitoring data from 01/01/2019 – 03/05/2024.

**Total Phosphorus Effluent Data**

| | **Phosphorus mg/L** | **Phosphorus lbs/day** |
|---|---|---|
| 1-day $P_{99}$ | 6.14 | 1.54 |
| 4-day $P_{99}$ | 3.82 | 0.91 |
| 30-day $P_{99}$ | 2.65 | 0.59 |
| Mean | 2.11 | 0.45 |
| Std | 1.17 | 0.30 |
| Sample size | 123 | 123 |
| Range | 0.132 - 5.49 | 0.023 – 2.47 |

**A compliance schedule may be included in the reissued permit to meet the TMDL-based limit of 0.34 lbs/day as a monthly average.** The current monthly average concentration limit of 2.8 mg/L is recommended to continue in the reissued permit for antibacksliding purposes per s. NR 207.12, Wis. Adm. Code.

## PART 7 – TOTAL SUSPENDED SOLIDS

Total Suspended Solids (TSS) effluent limits in lbs/day are calculated as recommended in the *TMDL Development and Implementation Guidance: Integrating the WPDES and Impaired Waters Programs (*April 2020). This WLAs found in Appendix I of the *Total Maximum Daily Loads for Total Phosphorus and Total Suspended Solids in the Northeast Lakeshore Region* report are expressed as maximum annual loads (lbs/year). The annual WLA for Potter is 1,617 lbs/year.

Revisions to chs. NR 106 and 205, Wis. Adm. Code align Wisconsin water quality-based effluent limits with 40 CFR 122.45(d), which requires WPDES permits to contain the following concentration limits, whenever practicable and necessary to protect water quality:

- Weekly average and monthly average limitations for continuous discharges subject to ch. NR 210.
- Daily maximum and monthly average limitations for all other discharges.

Potter is a municipal treatment facility and is therefore subject to weekly average and monthly average TSS limits derived from TSS annual WLAs.

TSS Monthly Average Permit Limit = WLA ÷ 365 days/yr * multiplier
= (1,617 lbs/yr ÷ 365 days/yr) * 1.90
= 8.4 lbs/day

TSS Weekly Average Permit Limit = WLA ÷ 365 days/yr * multiplier
= (1,617 lbs/yr ÷ 365 days/yr) * 3.11
= 14 lbs/day

The multiplier used in the weekly average and monthly average calculation was determined according to implementation guidance. A coefficient of variation was calculated, based on TSS mass monitoring data, to be 2.0. This is the standard deviation divided by the mean of mass data. However, it is believed that the optimization of the wastewater treatment system to achieve the WLA-derived permit limits will reduce effluent variability. Thus, the maximum anticipated coefficient of variation expected by the facility is 0.6. This value, along with monitoring frequency, is used to select the multiplier. The current permit specifies TSS monitoring as weekly; if a different monitoring frequency is used, the stated limits should be reevaluated.

Weekly average and monthly average mass effluent limits are recommended for this discharge. The limits are equivalent to concentrations of 41 mg/L and 25 mg/L, respectively, at the facility design flow of 0.04 MGD.

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

## Effluent Data

The following table summarizes effluent total suspended solids monitoring data from 01/01/2019 – 03/26/2024.

**Total Suspended Solids Effluent Data**

| | **TSS mg/L** | **TSS lbs/day** |
|---|---|---|
| 1-day $P_{99}$ | 22 | 12 |
| 4-day $P_{99}$ | 13 | 6.7 |
| 30-day $P_{99}$ | 7.7 | 3.0 |
| Mean* | 5.5 | 1.4 |

Attachment #1

| | TSS mg/L | TSS lbs/day |
|---|---|---|
| Std | 4.4 | 2.9 |
| Sample size | 259 | 259 |
| Range | <2 – 33 | 0 – 41 |

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

**Potter can currently meet the TMDL-based TSS mass limits and a compliance schedule is not needed.**

## PART 8 – WATER QUALITY-BASED EFFLUENT LIMITATIONS FOR THERMAL

**LAL discharge**

Surface water quality standards for temperature took effect on October 1, 2010. These regulations are detailed in Chapters NR 102 (Subchapter II – Water Quality Standards for Temperature) and NR 106 (Subchapter V – Effluent Limitations for Temperature) of the Wisconsin Administrative Code. The daily maximum effluent temperature limitation shall be 86 °F for discharges to surface waters classified as Limited Aquatic Life according to s. NR 104.02(3)(b)1, Wis. Adm. Code, except for those classified as wastewater effluent channels and wetlands regulated under ch. NR 103 and described in s. NR 106.55(2), Wis. Adm. Code, which has a daily maximum effluent temperature limitation of 120 °F. The 86 °F limit applies because the hydrologic classification is not listed as a wastewater effluent channel in ch. NR 104, Wis. Adm. Code.

In accordance with s. NR 106.53(2)(b), Wis. Adm. Code, the highest daily maximum flow rate for a calendar month is used to determine the acute (daily maximum) effluent limitation. In accordance with s. NR 106.53(2)(c), Wis. Adm. Code, the highest 7-day rolling average flow rate for a calendar month is used to determine the sub-lethal (weekly average) effluent limitation. These values were based off actual flow reported from 01/01/2019 – 03/31/2024.

The table below summarizes the maximum temperatures reported during monitoring from 2014.

**Monthly Temperature Effluent Data & Limits**

| Month | Representative Highest Monthly Effluent Temperature | | Calculated Effluent Limit Limited Aquatic Life | |
|---|---|---|---|---|
| | Weekly Average Effluent Limitation (°F) | Weekly Average Effluent Limitation (°F) | Weekly Average Effluent Limitation (°F) | Daily Maximum Effluent Limitation (°F) |
| JAN | 47 | 50 | - | 86 |
| FEB | 50 | 52 | - | 86 |
| MAR | 49 | 51 | - | 86 |
| APR | 55 | 56 | - | 86 |
| MAY | 55 | 58 | - | 86 |
| JUN | 61 | 63 | - | 86 |

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| Month | Representative Highest Monthly Effluent Temperature | | Calculated Effluent Limit Limited Aquatic Life | |
|---|---|---|---|---|
| | Weekly Average Effluent Limitation (°F) | Weekly Average Effluent Limitation (°F) | Weekly Average Effluent Limitation (°F) | Daily Maximum Effluent Limitation (°F) |
| JUL | 62 | 64 | - | 86 |
| AUG | 65 | 66 | - | 86 |
| SEP | 62 | 64 | - | 86 |
| OCT | 60 | 61 | - | 86 |
| NOV | 57 | 58 | - | 86 |
| DEC | 54 | 55 | - | 86 |

**Reasonable Potential**
Permit limits for temperature are recommended based on the procedures in s. NR 106.56, Wis. Adm. Code.

- An acute limit for temperature is recommended for each month in which the representative daily maximum effluent temperature for that month exceeds the acute WQBEL. The representative daily maximum effluent temperature is the greater of the following:
  (a) The highest recorded representative daily maximum effluent temperature
  (b) The projected 99th percentile of all representative daily maximum effluent temperatures
- A sub−lethal limitation for temperature is recommended for each month in which the representative weekly average effluent temperature for that month exceeds the weekly average WQBEL. The representative weekly average effluent temperature is the greater of the following:
  (a) The highest weekly average effluent temperature for the month.
  (b) The projected 99th percentile of all representative weekly average effluent temperatures for the month

Based on the available effluent data no effluent limits are recommended for temperature. The complete thermal table used for the limit calculation is attached. **Monitoring only is recommended in the reissued permit** due to the limited available data.

## PART 9 – WHOLE EFFLUENT TOXICITY (WET)

WET testing is used to measure, predict, and control the discharge of toxic materials that may be harmful to aquatic life. In WET tests, organisms are exposed to a series of effluent concentrations for a given time and effects are recorded. Decisions below related to the selection of representative data and the need for WET limits were made according to ss. NR 106.08 and 106.09, Wis. Adm. Code. WET monitoring frequency and toxicity reduction evaluation (TRE) recommendations were made using the best professional judgment of staff familiar with the discharge after consideration of the guidance in the *Whole Effluent Toxicity (WET) Program Guidance Document (2022).*

- Acute tests predict the concentration that causes lethality of aquatic organisms during a 48 to 96-hour

exposure. To assure that a discharge is not acutely toxic to organisms in the receiving water, WET tests must produce a statistically valid $LC_{50}$ (Lethal Concentration to 50% of the test organisms) greater than 100% effluent, according to s. NR 106.09(2)(b), Wis. Adm Code.

- Chronic tests predict the concentration that interferes with the growth or reproduction of test organisms during a seven-day exposure. To assure that a discharge is not chronically toxic to organisms in the receiving water, WET tests must produce a statistically valid $IC_{25}$ (Inhibition Concentration) greater than the instream waste concentration (IWC), according to s. NR 106.09(3)(b), Wis. Adm Code. The IWC is an estimate of the proportion of effluent to total volume of water (receiving water + effluent). The IWC of **34%** shown in the WET Checklist summary below was calculated according to the following equation, as specified in s. NR 106.03(6), Wis. Adm Code:

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

Where:

$Q_e$ = annual average flow = 0.040 MGD = 0.062 cfs
f = fraction of the $Q_e$ withdrawn from the receiving water = 0
$Q_s$ = ¼ of the 7-$Q_{10}$ = 0.49 cfs ÷ 4 = 0.1225 cfs

- According to the *State of Wisconsin Aquatic Life Toxicity Testing Methods Manual* (s. NR 219.04, Table A, Wis. Adm. Code), a synthetic (standard) laboratory water may be used as the dilution water and primary control in acute WET tests, unless the use of different dilution water is approved by the Department prior to use. The primary control water must be specified in the WPDES permit.
- According to the *State of Wisconsin Aquatic Life Toxicity Testing Methods Manual* (s. NR 219.04, Table A, Wis. Adm. Code), receiving water must be used as the dilution water and primary control in chronic WET tests, unless the use of different dilution water is approved by the Department prior to use. The dilution water used in WET tests conducted on Outfall 001 shall be a grab sample collected from the receiving water location, upstream and out of the influence of the mixing zone and any other known discharge. The specific receiving water location must be specified in the WPDES permit.
- Shown below is a tabulation of all available WET data for Outfall 001. Efforts are made to ensure that decisions about WET monitoring and limits are made based on representative data, as specified in s. NR 106.08(3), Wis. Adm Code. Data which is not believed to be representative of the discharge was not included in reasonable potential calculations. The table below differentiates between tests used and not used when making WET determinations.

**WET Data History**

| Date Test Initiated | Acute Results $LC_{50}$ % | | | | Chronic Results $IC_{25}$ % | | | | | Footnotes or Comments |
|---|---|---|---|---|---|---|---|---|---|---|
| | *C. dubia* | Fathead minnow | Pass or Fail? | Used in RP? | *C. dubia* | Fathead Minnow | Algae ($IC_{50}$) | Pass or Fail? | Use in RP? | |
| 07/08/2004 | >100 | >100 | Pass | Yes | >100 | >100 | >100 | Pass | Yes | |
| 02/12/2008 | >100 | >100 | Pass | Yes | >100 | >100 | >100 | Pass | Yes | |
| 02/05/2013 | | | | | >100 | >100 | >100 | Pass | Yes | |
| 07/31/2018 | >100 | >100 | Pass | Yes | 66.9 | >100 | 84.4 | Fail | Yes | 1 |
| 10/30/2018 | | | | | 82.6 | >100 | >100 | Fail | Yes | 1 |
| 10/27/2020 | | | | | >100 | >100 | | Pass | Yes | |

Footnotes:

1. These tests woulc not have been failures with the updated IWC.

- According to s. NR 106.08, Wis. Adm. Code, WET reasonable potential is determined by multiplying the highest toxicity value that has been measured in the effluent by a safety factor, to predict the likelihood (95% probability) of toxicity occurring in the effluent above the applicable WET limit. The safety factor used in the equation changes based on the number of toxicity detects in the dataset. The fewer detects present, the higher the safety factor, because there is more uncertainty surrounding the predicted value. **WET limits must be given, according to s. NR 106.08(6), Wis. Adm. Code, whenever the applicable Reasonable Potential equation results in a value greater than 1.0.**

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

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

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

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

**Chronic WET Limit Parameters**

| **TUc** (maximum) $100/IC_{25}$ | **B** (multiplication factor from s. NR 106.08(6)(c), Wis. Adm. Code, Table 4) | IWC |
|---|---|---|
| 100/66.9= 1.49 | 3.8 Based on 2 detects | 34% |

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

Therefore, reasonable potential is shown for chronic WET limits using the procedures in s. NR 106.08(6) and representative data from 07/08/2004 – 10/27/2020.

Expression of WET limits
Chronic WET limit = [100/IWC] $TU_c$ = 2.9 $TU_c$ expressed as a monthly average

The WET checklist was developed to help DNR staff make recommendations regarding WET limits, monitoring, and other related permit conditions. The checklist indicates whether acute and chronic WET limits are needed, based on requirements specified in s. NR 106.08, Wis. Adm. Code. The checklist steps the user through a series of questions, assesses points based on the potential for effluent toxicity, and suggests monitoring frequencies based on points accumulated during the checklist analysis. As toxicity potential increases, more points accumulate, and more monitoring is recommended to ensure that toxicity is not occurring. A summary of the WET checklist analysis completed for this permittee is shown in the table below. Staff recommendations based on best professional judgment are provided below the summary table. For guidance related to reasonable potential and the WET checklist, see Chapter 1.3 of the WET Guidance Document: https://dnr.wisconsin.gov/topic/Wastewater/WET.html.

**WET Checklist Summary**

| | **Acute** | **Chronic** |
|---|---|---|
| **AMZ/IWC** | Not Applicable. | IWC = 34%. |

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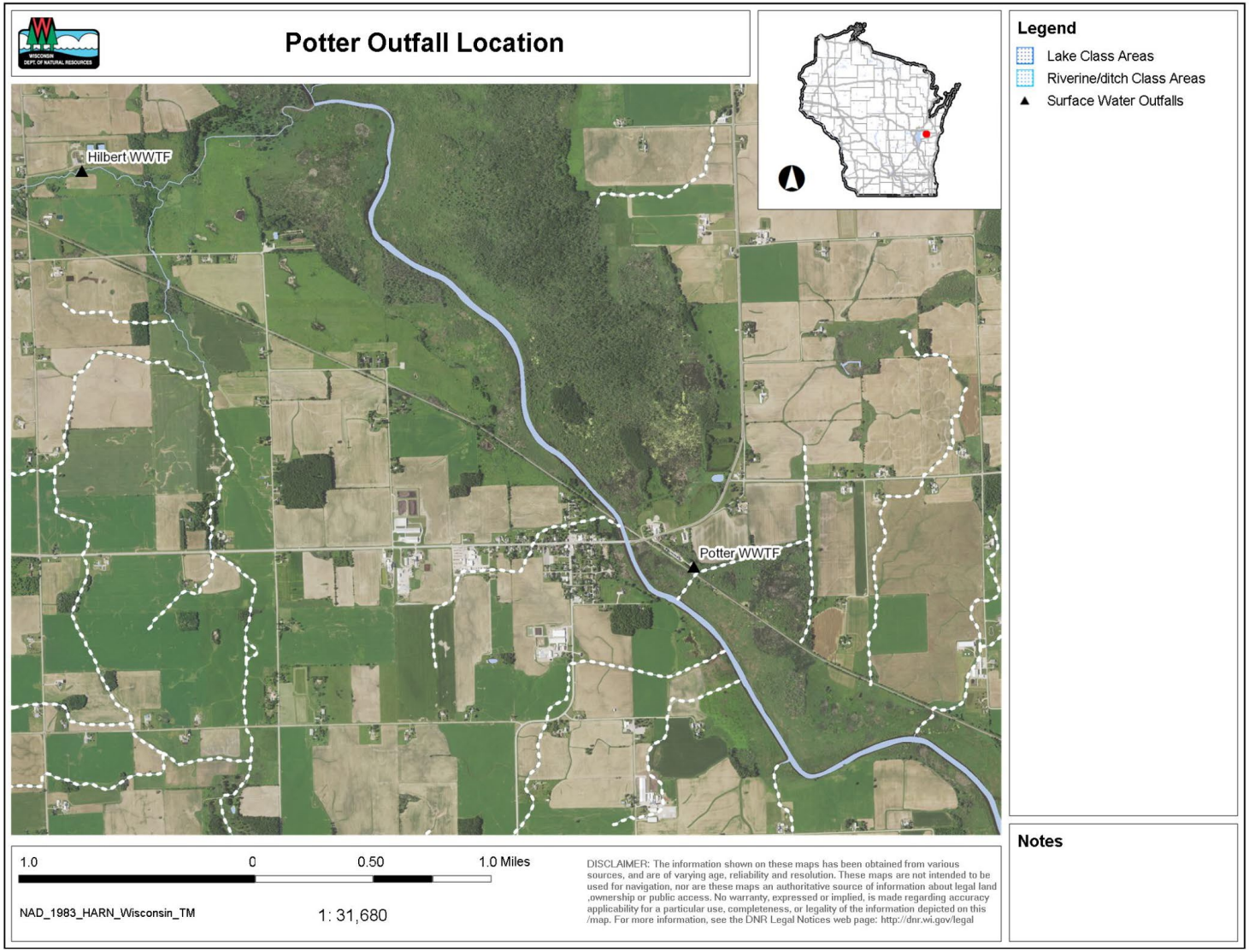
| | Acute | Chronic |
|---|---|---|
| | **0 Points** | **0 Points** |
| **Historical Data** | 3 tests used to calculate RP.<br>No tests failed.<br><br>**0 Points** | 6 tests used to calculate RP.<br>2 tests failed.<br><br>**0 Points** |
| **Effluent Variability** | History of chloride violations.<br><br>**5 Points** | Same as Acute.<br><br>**5 Points** |
| **Receiving Water Classification** | Less than 4 miles to a warmwater sport fish.<br><br>**5 Points** | Same as Acute.<br><br>**5 Points** |
| **Chemical-Specific Data** | No reasonable potential for limits forsubstances based on ATC; Ammonia nitrogen limit carried over from the current permit. Nickel, zinc, chloride, and ammonia detected. Additional Compounds of Concern: None.<br><br>**3 Points** | Reasonable potential for limits for chloride based on CTC; Ammonia nitrogen limit carried over from the current permit. Nickel, zinc, and ammonia detected. Additional Compounds of Concern: None.<br><br>**8 Points** |
| **Additives** | No additives used.<br><br>**0 Points** | No additives used.<br><br>**0 Points** |
| **Discharge Category** | 0 Industrial Contributors.<br><br>**0 Points** | Same as Acute.<br><br>**0 Points** |
| **Wastewater Treatment** | Secondary or better.<br><br>**0 Points** | Same as Acute.<br><br>**0 Points** |
| **Downstream Impacts** | No impacts known.<br><br>**0 Points** | Same as Acute.<br><br>**0 Points** |
| **Total Checklist Points:** | **13 Points** | **18 Points** |
| **Recommended Monitoring Frequency (from Checklist):** | No tests recommended. | 1x yearly |
| **Limit Required?** | No | Yes<br>Limit = 2.9 $TU_c$ |
| **TRE Recommended? (from Checklist)** | No | Yes |

- After consideration of the guidance provided in the Department's WET Program Guidance Document (2022) and other information described above, no acute and annual chronic WET tests are recommended in the reissued permit. Tests should be done in rotating quarters to collect seasonal information about this discharge. WET testing should continue after the permit expiration date (until the permit is reissued).
- According to the requirements specified in s. NR 106.08, Wis. Adm. Code, a chronic WET limit is required. The chronic WET limit shall be expressed as 2.9 TUc as a monthly average in the effluent limits table of the permit.
- A minimum of annual chronic monitoring is required because a chronic WET limit is required. Federal regulations in 40 CFR Part 122.44(i) require that monitoring occur at least once per year when a limit is

present.


Potter Outfall Location
Hilbert WWTF
Potter WWTF
Legend
Lake Class Areas
Riverine/ditch Class Areas
Surface Water Outfalls
Notes
1.0
0
0.50
1.0 Miles
NAD_1983_HARN_Wisconsin_TM
1: 31,680
DISCLAIMER: The information shown on these maps has been obtained from various sources, and are of varying age, reliability and resolution. These maps are not intended to be used for navigation, nor are these maps an authoritative source of information about legal land ,ownership or public access. No warranty, expressed or implied, is made regarding accuracy applicability for a particular use, completeness, or legality of the information depicted on this /map. For more information, see the DNR Legal Notices web page: http://dnr.wi.gov/legal

# Facility Specific Chloride Variance Data Sheet

**Directions: Please complete this form electronically. Record information in the space provided. Select checkboxes by double clicking on them. Do not delete or alter any fields. For citations, include page number and section if applicable. Please ensure that all data requested are included and as complete as possible. Attach additional sheets if needed.**

## Section I: General Information

**A. Name of Permittee:** Village of Potter

**B. Facility Name:** Potter Wastewater Treatment Facility

**C. Submitted by:** Wisconsin Department of Natural Resources

**D. State:** Wisconsin **Substance:** Chloride **Date completed:** October 14, 2024

**E. Permit #:** WI-0029025-10-0 **WQSTS #:** (EPA USE ONLY)

**F. Duration of Variance** **Start Date:** April 1, 2025 **End Date:** March 31, 2030

**G. Date of Variance Application:** July 1, 2022

**H. Is this permit a:**
☐ **First time submittal for variance**
☒ **Renewal of a previous submittal for variance** *(Complete Section IX)*

**I. Description of proposed variance:**

The Village of Potter Wastewater Treatment Facility (WWTF) discharges to an unnamed tributary to the North Branch of the Manitowoc River in Calumet County. The Village of Potter seeks a variance to the water quality standards for chloride for its WWTF.

The Department concludes that the Village of Potter has met the requirements of s. NR 106.83(2), Wisconsin Administrative Code, and s. 283.15, Wisconsin Statutes. The Department further concludes that requiring the Village of Potter to meet the water quality standard for chloride would result in substantial and widespread adverse social and economic impacts in its service area. Furthermore, the Department concludes that there is no feasible pollutant control technology that can be applied to achieve compliance with the chloride water quality-based effluent limit (WQBEL). The Department therefore proposes that this permit include a discharger-specific variance to the chloride water quality standard for aquatic life.

The proposed variance for chloride, from the chronic WQBEL of 395 mg/L, to an interim limit of 450 mg/L, is expressed as a weekly average limit. The Department concludes that the interim limit reflects the greatest pollutant reduction achievable by the permittee with the pollutant control technologies currently applied in the permittee's WWTF. The permit requires the permittee to implement Source Reduction Measures (SRMs). The Department considers the highest attainable condition (HAC) of the receiving water to be the interim limit – applied for the term of the variance – combined with the permittee's implementation of SRMs. The term of the proposed variance is five years, concurrent with the term of the proposed WPDES permit. The underlying designated uses and criteria of Wisconsin's chloride water quality standards (WQS) will be retained, and all other applicable WQS will remain in effect with adoption of the proposed variance.

This is the renewal of a previous submittal to EPA for a chloride variance for this permittee. The previous permit for this facility contained an interim chloride limit, target value and requirements to implement source reduction measures, in accordance with s. NR 106.83(2), Wis. Adm. Code.

**Citation:** An interim chloride effluent limitation under s. NR 106.83(2), Wis. Adm. Code represents a variance to water quality standards authorized by s. 283.15, Wis. Stats., and 40 CFR §131.14.

**J. List of all who assisted in the compilation of data for this form**

| Name | Email | Phone | Contribution |
|---|---|---|---|
| Sarah Donoughe | Sarah.Donoughe@Wisconsin.gov | 920-366-6076 | Permit Drafter |
| Trevor Moen | Trevor.Moen@Wisconsin.gov | 920-410-5192 | Compliance Engineer |
| Nicole Krueger | Nicole.Krueger@Wisconsin.gov | 414-897-5750 | Parts II D-H and J |

## Section II: Criteria and Variance Information

**A. Water Quality Standard from which variance is sought:** Chloride

**B. List other criteria likely to be affected by variance:** None

**C. Source of Substance:** Regeneration wastewater from multiple point-of-use water softeners, domestic sewage, road salt that flows into approximately three manholes during the winter, as well as snow melt and wash water from snowplow vehicles inside a shop

**D. Ambient Substance Concentration:** 0 mg/L ☐ **Measured** ☒ **Estimated** ☐ **Default** ☐ **Unknown**

**E. If measured or estimated, what was the basis? Include citation.** The background 7Q10 is 0 cfs, so it is estimated that the background chloride concentration is 0 mg/L.

**F. Average effluent discharge rate:** 0.040 MGD (annual average design flow) **Maximum effluent discharge rate:** 0.23 MGD (peak daily)

**G. Effluent Substance Concentration:** 1-day P99 = 687 mg/L; 4-day P99 = 530 mg/L; 30-day P99 = 445 mg/L ☒ **Measured** ☐ **Estimated** ☐ **Default** ☐ **Unknown**

**H. If measured or estimated, what was the basis? Include Citation.** Permit-required monitoring from 01/01/2019 – 03/13/2024.

**I. Type of HAC:**
☐ **Type 1: HAC reflects waterbody/receiving water conditions**
☐ **Type 2: HAC reflects achievable effluent conditions**
☒ **Type 3: HAC reflects current effluent conditions**

**J. Statement of HAC:** The Department has determined the highest attainable condition of the receiving water is achieved through the application of the variance limit in the permit, combined with a permit requirement that the permittee implement its Chloride SRM plan. Thus, the HAC at commencement of this variance is 450 mg/L, which reflects the greatest chloride reduction achievable with the current treatment processes, in conjunction with the implementation of the permittee's Chloride SRM plan. The current effluent condition is reflective of on-site optimization measures that have already occurred. This HAC determination is based on the economic feasibility of available compliance options for the Village of Potter WWTF at this time (see Economic Section below). The permittee may seek to renew this variance in the subsequent reissuance of this permit; the Department will reevaluate the HAC in its review of such a request. A subsequent HAC cannot be defined as less stringent than this HAC.

**K. Variance Limit:** 450 mg/L

**L. Level currently achievable (LCA):** 530 mg/L

**M. What data were used to calculate the LCA, and how was the LCA derived? (***Immediate compliance with LCA is required.)*
530 mg/L is the 4-day P99 from the current permit term.

**N. Explain the basis used to determine the variance limit (which must be ≤ LCA). Include citation.**
The variance limit is equal to the 4-day P99 from the previous permit term and is the current variance limit. The limit is established in accordance with s. 283.15 (5), Wis. Stats. and ch. NR 106 Subchapter II, Wis. Adm. Code.

Chapter NR 106, Subchapter VII, Wis. Adm. Code, allows for a variance; the imposition of a less restrictive interim limit; a compliance schedule that stresses source reduction and public education; and allowance for a target value or limit to be a goal for reduction.

**O. Select all factors applicable as the basis for the variance provided under 40 CFR 131.10(g). Summarize justification below:** ☐ **1** ☐ **2** ☐ **3** ☐ **4** ☐ **5** ☒ **6**

The use of a reverse osmosis system was evaluated. The cost of the system was estimated to an average cost per household that would result in a MHI of 2.99%. Upgrading to a public water supply with a centralized lime softening treatment system was evaluated. The cost of the system was estimated to an average cost per household that would result in a MHI of 10.23%. Without a variance, meeting the water quality standard of 395 mg/L would result in substantial and widespread economic and social impacts.

## Section III: Location Information

**A. Counties in which water quality is potentially impacted:** Calumet; Manitowoc

**B. Receiving waterbody at discharge point:** Unnamed Tributary to the North Branch of the Manitowoc River

**C. Flows into which stream/river?** North Branch Manitowoc River **How many miles downstream?** <0.5 mi

**D. Coordinates of discharge point (UTM or Lat/Long):** 44º 7' 7" N Latitude, 88º 5' 19" W Longitude

**E. What is the distance from the point of discharge to the point downstream where the concentration of the substance falls to less than or equal to the chronic criterion of the substance for aquatic life protection?**
Approximately 11 miles downstream of Potter, in the Manitowoc River, the instream chloride concentration is assumed to be less than 395 mg/L.

**F. Provide the equation used to calculate that distance** *(Include definitions of all variables, identify the values used for the clarification, and include citation):*
A mass balance equation is used to solve for the stream flow needed to result in an instream concentration of less than or equal to the chronic toxicity criteria of 395 mg/L.

(interim limit in mg/L x effluent design flow in cfs) + (background concentration in mg/L x background stream flow in cfs)) / (effluent design flow in cfs + background stream flow in cfs) ≤ 395 mg/L

Using all design flows and interim limits for Potter and the listed permittees in Section H below in the mass balance equation, the stream flow needs to be at least 3.4 cfs for the instream concentration to be below the chronic toxicity criteria. At approximately 11 miles downstream of Potter, where the effluent from St. Nazianz reaches the Manitowoc River, the 7Q10 is 9.3 cfs. Therefore, it is assumed that the instream chloride concentration is below 395 mg/L at this point.

**G. What are the designated uses associated with the direct receiving waterbody, and the designated uses for any downstream waterbodies until the water quality standard is met?**
The immediate receiving water is classified as a Limited Aquatic Life (LAL) community. The North Branch of the Manitowoc River, approximately 0.2 miles downstream, is classified as a Warm Water Sport Fish (WWSF) community, non-public water supply.

**H. Identify all other variance permittees for the same substance which discharge to the same stream, river, or waterbody in a location where the effects of the combined variances would have an additive effect on the waterbody:** The flow-weighted effluent chloride concentration based on all of these facilities including Potter (using the current annual average design flow, so a total flow of 3.467 MGD) is 466 mg/L.

| Permit Number | Facility Name | Facility Location | Variance Limit [mg/L] |
|---|---|---|---|
| WI-0022195 | St. Nazianz (design flow = 0.20 MGD) | St. Nazianz | Current = 490 |
| WI-0022799 | Chilton (design flow = 1.189 MGD) | Chilton | Current = 670<br>Proposed = 560 |
| WI-0020893 | New Holstein (design flow = 1.33 MGD) | New Holstein | Current = 480<br>Proposed = 420 |
| WI-0020443 | Brillion (design flow = 0.708 MGD | Brillion | Current = 1,100 |

**I. Please attach a map, photographs, or a simple schematic showing the location of the discharge point as well as all variances for the substance currently draining to this waterbody on a separate sheet**
See attached map (Current Outfall Variances August 2024).

**J. Is the receiving waterbody on the CWA 303(d) list? If yes, please list the impairments below.** ☐ **Yes** ☒ **No** ☐ **Unknown**
The receiving water is not on the 303(d) list (Impaired Waters List), but the North Branch of the Manitowoc River and the Manitowoc River (downstream) are included on that list for degraded habitat and low dissolved

oxygen impairments caused by excessive levels of sediment and phosphorus. The Manitowoc River is also listed as impaired for contaminated sediment and fish tissue caused by PCBs.

***K.*** **Please list any contributors to the POTW in the following categories:**
***May need to contact facility for this information***

| | |
|---|---|
| Food processors (cheese, vegetables, meat, pickles, soy sauce, etc.) | None |
| Metal Plating/Metal Finishing | None |
| Car Washes | None |
| Municipal Maintenance Sheds (salt storage, truck washing, etc.) | One for the Town of Rantoul snowplow vehicles. Please note that the drain in the area that houses vehicles used for snowplowing and de-icing is not connected to the sanitary sewer system. |
| Laundromats | None |
| Other presumed commercial or industrial chloride contributors to the POTW | One bar with a demand-initiated regeneration softener |

**L. If the POTW does not have a DNR-approved pretreatment program, is a sewer use ordinance enacted to address the chloride contributions from the industrial and commercial users? If so, please describe.**
Yes, a sewer use ordinance was enacted in 2015 that requires new and replacement water softeners to have demand initiated regeneration controls and to achieve 3350 grains hardness removed per pound of salt. (Note that there are no major industrial dischargers.)

## Section IV: Pretreatment (complete this section only for POTWs with DNR-Approved Pretreatment Programs. See w:\Variances\Templates and Guidance\Pretreatment Programs.docx)

**A. Are there any industrial users contributing chloride to the POTW? If so, please list.**
N/A

**B. Are all industrial users in compliance with local pretreatment limits for chloride? If not, please include a list of industrial users that are not complying with local limits and include any relevant correspondence between the POTW and the industry (NOVs, industrial SRM updates and timeframe, etc)**
N/A

**C. When were local pretreatment limits for chloride last calculated?**
N/A

**D. Please provide information on specific SRM activities that will be implemented during the permit term to reduce the industry's discharge of the variance pollutant to the POTW**
N/A

## Section V: Public Notice

**A. Has a public notice been given for this proposed variance?** ☒ **Yes** ☐ **No**
**B. If yes, was a public hearing held as well?** ☒ **Yes** ☐ **No** ☐ **N/A**
**C. What type of notice was given?**
☒ **Notice of variance included in notice for permit** ☐ **Separate notice of variance**
**D. Date of public notice:** October 24, 2024 **Date of hearing:** December 9, 2024
**E. Were comments received from the public in regards to this notice or hearing?** *(If yes, see notice of final determination)* ☐ **Yes** ☐ **No**

## Section VI: Human Health

**A. Is the receiving water designated as a Public Water Supply?** ☐ **Yes** ☒ **No**
**B. Applicable criteria affected by variance:** No human health criteria for chloride.
**C. Identify any expected impacts that the variance may have upon human health, and include any citations:**

None.

## Section VII: Aquatic Life and Environmental Impact

**A. Aquatic life use designation of receiving water:** Limited aquatic life community

**B. Applicable criteria affected by variance:** The chronic toxicity criterion for chloride is 395 mg/L for all designations per ch. NR 105, Wis. Adm. Code.

**C. Identify any environmental impacts to aquatic life expected to occur with this variance, and include any citations:**
None.

**D. List any Endangered or Threatened species known or likely to occur within the affected area, and include any citations:**
There are no Endangered or Threatened species known that would affect the water quality criterion, as the chronic toxicity criterion for chloride is more stringent than all genus mean chronic values for organisms with chloride toxicity data. As a result, no endangered species with data would need more protection than already provided by the existing criterion.

**Citation:** U.S. Fish & Wildlife Service – Environmental Conservation Online System (http://www.fws.gov/endangered/) and National Heritage Index (http://dnr.wi.gov/topic/nhi/)

## Section VIII: Economic Impact and Feasibility

**A. Describe the permittee's current pollutant control technology in the treatment process:**
Treatment processes include preliminary treatment using static fine screen; secondary treatment using activated sludge technology; final clarification, sludge stabilization and thickening using aerobic digestion. None of these wastewater treatment processes remove chloride.

**B. What modifications would be necessary to comply with the current limits? Include any citations.**
Upgrades to the wastewater treatment facility would include installing a reverse osmosis (RO) to comply with the chloride WQBELs of 395 mg/L.

**C. How long would it take to implement these changes?**
It would not be economically feasible for the Village of Potter to install reverse osmosis treatment at the WWTF. Obtaining the funds to install reverse osmosis would be the limiting factor.

**D. Estimate the capital cost** *(Citation)***:** $45,000 for RO treatment (source: WDNR Form 3400-193 Chloride Variance Application from permittee)

**E. Estimate additional O & M cost** *(Citation)***:** $14,600/yr for RO treatment (source: WDNR Form 3400-193 Chloride Variance Application from permittee)

**F. Estimate the impact of treatment on the effluent substance concentration, and include any citations:**
Reverse osmosis systems can be operated to achieve levels of chloride below the water quality standard of 395 mg/L. However, it is not economically feasible for the Village of Potter at this time.

**G. Identify any expected environmental impacts that would result from further treatment, and include any citations:**
End-of-pipe RO wastewater treatment technology for chloride produces concentrated brine that can be as much or more of an environmental liability than the untreated effluent. Since the concentrated brine cannot be further treated, the only recourse for the disposal of the brine is transfer to another community, which is often not feasible. Appropriate chloride source reduction activities are preferable environmentally to effluent end-of-pipe treatment in most cases, since the end product of treatment (production of a concentrated brine) does not remove the load of chloride from the environment.

There would be some impacts based on disposal of brine from RO. These include air pollution impacts from trucking brine and increased chloride impacts at the point where brine is discharged.

**H. Is it technically and economically feasible for this permittee to modify the treatment process to reduce the level of the substance in the discharge?** ☐ Yes ☒ No ☐ Unknown

Reverse Osmosis (RO) treatment of the Potter WWTF effluent to meet the WQBEL is technically feasible. However, it is not economically feasible. See WDNR variance application and screening tool for costs of RO. Use of RO was evaluated. The resulting total cost for sewer user rates was estimated to result in an average cost to households that would be 2.99% of the MHI. An increase of this magnitude would cause substantial and widespread adverse social and economic impacts in the area where the discharge is located.

**I. If treatment is possible, is it possible to comply with the limits on the substance?** ☒ Yes ☐ No ☐ Unknown

**J. If yes, what prevents this from being done? Include any citations.**

The cost of adding RO to the existing treatment plant's treatment train would cause substantial and widespread adverse social and economic impacts in the area where the discharge is located. Implementation of the SRMs in the proposed permit is preferable economically and environmentally to installing RO.

**K. List any alternatives to current practices that have been considered, and why they have been rejected as a course of action, including any citations:**

Alternative water supply sources were considered since water softening was determined to be a primary source of chloride. The City of Manitowoc draws its water from the relatively 'softer' Lake Michigan; however, it is approximately 23 miles from Potter to Manitowoc. In projects in which one municipality has supplied water to another, the Department has witnessed costs in the range of $1 million per mile to install the pipeline between the two municipalities. Capital costs in that range exceed those estimated for the addition of RO treatment at the WWTF, thus this option would not be considered to be economically feasible.

An alternative to the current practice of having the Village's residents provide their own water softening has been identified as a potential practice for consideration. Specifically, that alternative involves installing a centralized municipal water system that includes lime softening. The technical and economic feasibility of that alternative is not known, but is required to be investigated by the Village of Potter as a condition of approval of this variance.

The Department has also considered other wastewater treatment options, including hauling or piping wastewater to another POTW. In this situation piping wastewater to another POTW was considered to the City of Manitowoc, approximately 23 miles away. The cost of installing a wastewater pipeline over that distance would be comparable to that identified above for a water pipeline – and that cost would be prohibitive. Hauling wastewater from the Village of Potter to another POTW for treatment – approximately 40,000 gal/day – was deemed to be practicably unfeasible.

See guidance document Justification for Variances to Water Quality Standards for Chloride in Wisconsin (07/09/2010 DRAFT).

## Section IX: Compliance with Water Quality Standards

**A. Describe all activities that have been, and are being, conducted to reduce the discharge of the substance into the receiving stream. This may include existing treatments and controls, consumer education, promising centralized or remote treatment technologies, planned research, etc. Include any citations.**

As part of implementing the chloride source reduction measures (SRMs) as required per s. NR 106.83(2), Wis. Adm. Code, the permittee conducted the following activities:

1. SRMs Targeting Water Softeners
    a. Educated softener owners of the impact of chloride on water quality; provide information about increasing softener efficiency and reducing the use of softened water.
    b. Implement the ordinance adopted in 2015 that requires the use of demand initiated regeneration and a high salt efficiency standard for new and replacement softeners.

c. Evaluated the feasibility, in terms of both the technical and economic aspects, of installing a municipal water system with lime softening technology, and submit those findings in the final chloride report.
d. Conducted a water softener survey to develop an inventory of point-of-use softeners in the service area.

2. SRMs Targeting Industrial, Commercial and Municipal Sources
   a. Worked with commercial contributors to prevent increases in the amount of chloride discharged, and seek reductions from those sources.
   b. Reached out to municipal/county facilities in the service are that may be housing vehicles used for snow plowing and road deicing/ anti-icing to reduce/eliminate the discharge of chloride to the sanitary sewer system.
3. SRMs Targeting I/I
   a. Performed annual manhole inspection and sealed deficient manholes by removing the Cretex chimney seals and flex sealing the manholes.

See the submitted Annual Chloride Progress Reports for further details.

**B. Describe all actions that the permit requires the permittee to complete during the variance period to ensure reasonable progress towards attainment of the water quality standard. Include any citations.**

1. Inspect Manholes: Inspect 1/5th of manholes every year. Develop a rehabilitation plan for manholes that do not pass inspection.
2. Televise Sewers: Sewers are to be televised once every five years. Develop a rehabilitation plan for sewers that do not pass inspection.
3. Rebate Program: Evaluate the feasibility of implementing a rebate program for residents to install more efficient water softeners by reviewing rebate programs from other communities and evaluating costs for the Village of Potter.
4. Education: Educate softener owners of the impact of chloride on water quality by providing information about increasing softener efficiency and reducing the use of softened water. Send this information (e.g., brochures) to customers and post information on the Village's website.
5. Survey: Conduct a survey to determine water softeners in use in the Village. Provide the survey form with the utility bill. Follow-up with those who do not respond.
6. Ordinance: Adopt and implement an ordinance that requires softeners to be inspected every five years. Notify residents and vendors of the ordinance and track compliance with the ordinance (if implemented).
7. Evaluate Alternatives: Provide an analysis of the feasibility of alternatives to meet the chloride water quality criteria by evaluating the installation of a centralized water system with ion exchange softening and hauling of regeneration wastewater off-site; the purchase of water from a neighboring community; relocating the effluent discharge to a higher flow stream; regionalization with a neighboring WWTF; installation of a chloride treatment system at the Village of Potter WWTF.

**Citation:** Chloride Source Reduction Plan, Village of Potter, 2023-2028

## Section X: Compliance with Previous Permit *(Variance Reissuances Only)*

**A. Date of previous submittal:** November 2, 2017 **Date of EPA Approval:** December 7, 2017

**B. Previous Permit #:** WI-0029025-09-0 **Previous WQSTS #:** (EPA USE ONLY)

**C. Effluent substance concentration:** 4-day $P_{99}$ = 530 mg/L **Variance Limit:** 450 mg/L (weekly average)

**D. Target Value(s):** 405 mg/L **Achieved?** ☐ **Yes** ☐ **No** ☒ **Partial**

**E. For renewals, list previous steps that were to be completed. Show whether these steps have been completed in compliance with the terms of the previous variance permit. Attach additional sheets if necessary.**

| Condition of Previous Variance | Compliance |
|---|---|
| Annual Chloride Progress Report #1 | ☒ **Yes** ☐ **No** |
| Annual Chloride Progress Report #2 | ☒ **Yes** ☐ **No** |
| Annual Chloride Progress Report #3 | ☒ **Yes** ☐ **No** |
| Annual Chloride Progress Report #4 | ☒ **Yes** ☐ **No** |

| | |
|---|---|
| Final Chloride Report | ☒ **Yes** ☐ **No** |
| Annual Chloride Progress Report #6 (*After permit expiration*) | ☒ **Yes** ☐ **No** |
| Annual Chloride Progress Report #7 (*After permit expiration*) | ☒ **Yes** ☐ **No** |
| Educate softener owners of the impact of chloride on water quality; provide information about increasing softener efficiency and reducing the use of softened water. | ☒ **Yes** ☐ **No** |
| Implement the ordinance adopted in 2015 that requires the use of demand initiated regeneration and a high salt efficiency standard for new and replacement softeners. | ☒ **Yes** ☐ **No** |
| Adopt and implement an ordinance that requires softeners to be inspected and tuned-up at time of property transfer. | ☐ **Yes** ☒ **No** |
| Evaluate the feasibility, in terms of both the technical and economic aspects, of installing a municipal water system with lime softening technology, and submit those findings in the final chloride report. | ☒ **Yes** ☐ **No** |
| Work with industrial and commercial contributors to prevent increases in the amount of chloride discharged, and seek reductions from those sources. | ☒ **Yes** ☐ **No** |
| Develop and implement management practices to reduce/eliminate the discharge of chloride to the sanitary sewer system at municipal/county facilities housing vehicles used for snow plowing and road deicing/ anti-icing. | ☒ **Yes** ☐ **No** |

Chloride Source Reduction Plan

Village of Potter

WPDES Permit No. WI-0029025-09

2023 - 2028

**Interim Limit:** **Target Value:**

## Source Reduction Plan

| **Source Reduction Measure** | **Actions** | **Start**<br><br>**Completion/Frequency** |
|---|---|---|
| Inspect Manholes | Inspect 1/5$^{th}$ of manholes every year. Develop rehab plan for manhole that do not pass inspection. | Start: Year 1<br><br>Frequency: Annual, ongoing |
| Televise Sewers | Sewers are televised every 5 years. Develop rehab plan for sewers that do not pass inspection. | Start: Year 1 - 4<br><br>Frequency: Collection system is televised once every 5 years. |
| Evaluate the feasibility of implementing a rebate program for residents to install a more efficient water softener. | Review rebate programs from other communities and evaluate costs for the Village of Potter. Determine if suitable for the Village. | Start: Year 2<br><br>Completion: Year 4 |
| Educate softener owners of the impact of chloride on water quality; provide information about increasing softener efficiency and reducing the use of softened water. | Send information (e.g., brochures) to customers and post information on the Village's web site. | Start: Year 1<br><br>Frequency: Annual, ongoing |
| Conduct survey to determine water softeners in the Village | Provide form with utility bill. Follow-up with those who do not respond. | Start: Year 2<br><br>Completion: Year 3 |

| | | |
|---|---|---|
| Adopt and implement an ordinance that requires softeners be inspected every 5-years. A copy of the inspection program shall be provided to the Village. | The Village will work with their Attorney on evaluating an ordinance and procedures necessary to implement the ordinance. (Note that the Village already has an ordinance requiring DIR softeners.) | Start: Year 3<br><br>Completion: Year 4 |
| | Notify residents and vendors of the ordinance if implemented. | Start: Year 4<br><br>Frequency: Annual, ongoing |
| | Track compliance with the ordinance (if implemented). | Start: Year 4<br><br>Frequency: Annual, ongoing |
| Provide an analysis on the feasibility of alternatives to meet chloride water quality criteria. | Evaluate the following:<br>• Installing a central water system with ion exchange softening and hauling regen wastewater off-site.<br>• Purchasing water from a neighboring community.<br>• Relocating effluent to a higher flow stream.<br>• Regionalization with a neighboring WWTF<br>• Installing chloride treatment system at WWTF. | Start: Year 2<br><br>Completion: Year 4 |