EPA's Review of Wisconsin Department of Natural Resources' Request for Approval of a Variance from Chloride Water Quality Standard For the Town of Norway Sanitary District #1 Under Section 303(c) of the Clean Water Act, WQSTS # WI2015-621

Date:

I. Summary

A. Date received by EPA: February 20, 2015

B. Submittal History:

On February 13, 2015, Wisconsin Department of Natural Resources (WDNR) submitted a request to the U.S. Environmental Protection Agency for approval of a chloride water quality standard (WQS) variance for discharge by the Town of Norway Sanitary District #1, Wisconsin Pollution Discharge Elimination System (WPDES) Permit Number WI-0031470-7.

C. Documents included in the submittal:

- Transmittal letter from WDNR to EPA, dated February 13, 2015 and received on February 20, 2015;
- Certification statement for Approval of a Variance to Water Quality Standards, Town of Norway Sanitary District #1 WPDES Permit No. WI-0031470-7, dated February 16, 2015;
- Facility Specific Standard Variance Data Sheet, dated February 3, 2015; and
- Graphs of trends for chloride mass and chloride concentration, 2005-2014.

D. Other supporting documents provided by WDNR:

- Village of Cedar Grove Chloride Variance Application, signed September 18, 2014;
- Chloride Progress Report;
- Water Quality Based Effluent Limitations memorandum, dated January 22, 2014;
- Public Re-Notice of Intent to Reissue the permit, December 29, 2014;
- WPDES Permit;
- Permit Fact Sheet, dated December 19, 2014;
- Municipal Preliminary Screener Calculation for Use of RO in Wisconsin – Norway TN Sanitary District 1;
- Map – Norway SD #1 Outfall;
- Substantial Compliance Determination, November 10, 2014; and
- Notice of Final Determination to Reissue.

E. Description of Action:

WDNR proposes to grant the Norway Town Sanitary District #1 (Norway) wastewater treatment facility (WWTF) a variance from Wisconsin's water quality criterion for chloride to protect aquatic life. As provided in Wisconsin Administrative Code NR 105, the applicable chronic

aquatic life water quality criterion for chloride is 395 mg/L. WDNR determined that the Norway WWTF needs a water quality based effluent limit (WQBEL) of 395 mg/L to attain the water quality criterion (WDNR 2014). Since the WWTF will be unable to meet that limit, the Norway Town Sanitary District #1 applied to WDNR for a chloride variance, per NR 106.83(2)(b). In response to the variance application, WDNR determined that the Norway WWTF is unable to meet the weekly average WQBEL and has established an interim limit of 680 mg/L as a weekly average. WDNR also established a weekly average target value of 600 mg/L.

F. Basis of Action:

WDNR has determined that a WQBEL is needed for the Norway Town Sanitary District #1 WWTF to protect aquatic life, based on the 4-day 99th percentile (4-day P99) of chloride data from Norway Town Sanitary District #1. Wisconsin Administrative Code NR 106.05(4) specifies that a WQBEL for a toxicant applies if the 4-day P99 is greater than the chronic toxicity criterion (CTC). The chloride 4-day P99, from chloride data collected January 2012 – August 2014, was determined to be 668 mg/L which is greater than the 395 mg/L CTC for chloride. Therefore WDNR determined a weekly average WQBEL was needed for the Norway Town Sanitary District #1 WWTF and that WQBEL was calculated to be 395 mg/L in accordance with NR 106.05(5).

In response to the Norway Town Sanitary District #1 application for a chloride variance, WDNR considered that NR 106.82 and NR 106.83 provide that a weekly average interim chloride limit should be set to less than the upper 99% of the 4-day average of representative data, or no greater than 105% of the highest weekly average of the data. The 4-day P99 is 668 mg/L and the 105% of the highest weekly average is 724 mg/L. The chloride variance limit was continued at 680 mg/L equivalent to the previous permit limit. WDNR justified maintaining the interim limit because chloride mass levels have exhibited a downward trend in the effluent but reductions in infiltration and inflow into the collection system have resulted in less "clear water" to reduce the effluent chloride concentration. (WDNR 2014)

The Norway WWTF is an extended aeration, activated sludge facility primarily serving residential customers. Progress has been made in reducing the chloride mass levels in the WWTF effluent during the previous permit period but Norway Town Sanitary District #1 is still unable to comply with the chloride limits that are necessary to attain water quality standards because of the cost to remove chloride (WDNR 2015a).

Wisconsin statutes at s. 283.15 authorize WDNR to grant variances from water quality standards, if, among other things, it is demonstrated that, "The standard, as applied to the permittee, will cause substantial and widespread adverse social and economic impacts in the area where the permittee is located." (s. 283.15(4)(f)) Following EPA's draft interim economic guidance (EPA 1995), WDNR evaluated information from the Norway Town Sanitary District #1's variance application, along with supplemental economic information, to determine whether the additional cost of providing wastewater treatment to remove chlorides from the effluent will result in substantial and widespread impacts on the Norway Town Sanitary District #1. The Municipal Preliminary Screener calculation for Norway Town Sanitary District #1 shows that the total pollution control cost per household for chloride removal would be 9.75% of the median

household income (WDNR 2011). Based on this analysis, WDNR has concluded that complying with the chloride criteria at the end of pipe would cause substantial and widespread adverse social and economic impacts and thus the variance for the Norway Town Sanitary District #1 is consistent with Wisconsin's statutes at s. 283.15. (WDNR 2015b)

II. Areas Affected and Environmental Impacts

A. Area Affected:

The Norway Town Sanitary District #1 WWTF discharges to Waubeesee Lake Drainage Canal in Racine County, Wisconsin. Waubeesee Lake Drainage Canal is classified as warm water sport fish. (WDNR 2014 & 2015a) Waubeesee Lake Drainage Canal joins Wind Lake Drainage Canal after 1 mile which then flows into the SE Fox River 6 miles further downstream. The Norway Town Sanitary District #1's WWTF has an annual average design flow of 1.6 million gallons per day (MGD). Waubeesee Lake Drainage Canal has an estimated annual 7Q10 flow near zero at the point of discharge from the WWTF. Seven miles downstream in the Fox River the 7Q10 is 39 cfs. Since Norway's design flow of 1.6 MGD equals 2.5 cfs there is a 15:1 dilution in the Fox River. With an ambient concentration of 190 mg/L chloride in the Fox River at 39 cfs, the addition of 680 mg/L at 2.5 cfs from the discharge results in a chloride concentration below the 395 chronic chloride criterion when the discharge joins the Fox River. (WDNR 2015a)

B. Environmental Impacts:

1. Aquatic Life

The requested variance would relieve Norway Town Sanitary District #1 from complying with the WQBEL needed to attain Wisconsin's chronic chloride criterion for the protection of aquatic life. Consequently, it is possible that aquatic organisms sensitive to chloride may be adversely affected within the immediate area of the discharge.

WDNR evaluated the aquatic life impacts related to the weekly average variance/interim limit of 680 mg/L that will replace the 398 mg/L water quality based limit (WDNR 2015a). Based on available data for the 13 genera in the Great Lakes and Upper Mississippi toxicity database that is used by WDNR, the genus mean chronic values for *Ceriodaphnia* (417 mg/L), for *Daphnia* (637 mg/L), and for *Physa* (663 mg/L) are exceeded by the interim limit for chloride. Thus species of the genera *Ceriodaphnia*, *Daphnia*, and *Physa* may be adversely impacted by the 680 mg/L interim limit for chloride but the remaining 10 genera or 77% of the 13 genera are protected by the interim limit.

2. Human Health

The variance will have no effect on human health. Wisconsin has not determined a need for chloride water quality criteria to protect human health. The receiving water is not used as a public water supply within the area affected by the variance (WDNR 2015a & 2015b).

III. CWA Sections 101(a)(2)/303(c)(2)/118(c)(2)/40 CFR 131 and 132 Review

A. EPA's authority under section 303(c)(2) of the CWA:

Water quality standards requirements of CWA Sections 101(a)(2) and 303(c)(2) are implemented through federal regulations contained in 40 CFR 131; water quality standards requirements of CWA Section 118, specific to waters of the Great Lakes System, are implemented through federal regulations contained in 40 CFR 132. Federal regulations at 40 CFR 131.21 require EPA to review and approve or disapprove state-adopted water quality standards. In making this determination, EPA must consider the following requirements of 40 CFR 131.5:

- whether state-adopted uses are consistent with CWA requirements;
- whether the state has adopted criteria protective of the designated uses;
- whether the state has followed legal procedures for revising its standards;
- whether state standards are based on appropriate technical and scientific data and analyses; and
- whether the state's submission includes certain basic elements as specified in 40 CFR 131.6.

Section 101(a)(2) of the CWA specifies that designated uses "provide for the protection and propagation of fish, shellfish, and wildlife and provide for recreation in and on the water." Section 303(c)(2) of the CWA requires that standards shall protect the public health and shall take into consideration their use and value for public water supplies, propagation of fish and wildlife, recreational, agricultural, industrial, and navigational purposes.

EPA is required to review and approve new and revised water quality standards submitted by States and Tribes. The following actions are possible.

- **Approval.** Where EPA has concluded that the new or revised water quality standards are consistent with the CWA and federal regulations and that they will have no effect on listed species, or are otherwise not subject to ESA consultation.
- **Approval subject to ESA consultation.** Where EPA has concluded that the new or revised water quality standards are consistent with the CWA and federal regulations and that they may affect listed species (including beneficial effects), but that consultation is not concluded.
- **Disapproval.** Where EPA has concluded that the new or revised water quality standards are not consistent with the CWA or federal regulations.
- **No EPA action.** Where EPA has concluded that certain new or revised water quality standards are not revisions to the state's or tribe's WQS and therefore are not required to be reviewed under Section 303(c) of the CWA.

Consistent with Federal regulations at 40 CFR 131.21, new or revised water quality standards do not become effective for CWA purposes until they are approved by EPA.

B. Public Participation, Comments, and Issues Raised on WDNR's Permit Modification with Chloride Variance for the Norway Town Sanitary District #1, Wisconsin:

WDNR notified the public about the proposed WPDES permit modification, including a variance from the WQBEL for chloride, by issuance of a public notice on November 14, 2014. Based on comments and additional information provided by the Sanitary District, WDNR made revisions and re-noticed the proposed permit on December 29, 2014.

Norway Town Sanitary District #1 commented on the proposed permit noticed on November 14th, that the cost of a centralized softening system would result in substantial adverse economic and social impacts to the community and requested the provision, that the District should evaluate a centralized softening system to replace individual softeners, be removed from the permit. WDNR agreed to remove the provision in revising the proposed permit since it is already known that the centralized softening is not a financially viable option.

EPA noted to WDNR that there was an inconsistency in the chloride target value given in the original fact sheet, 500 mg/L vs. 600 mg/L in the draft permit. WDNR made the correction in the re-notice of the permit.

C. EPA's Review of WDNR's Final Rules:

1. Review of Submittal for Completeness

Regulatory Requirement:	**Wisconsin Variance Submittal for the Norway Town Sanitary District #1**
Use designations consistent with the provisions of section 101(a)(2) and 303(c)(2) of the Act **(40 CFR 131.6(a))**	The designated use for Waubeesee Lake Drainage Canal is warm water sport fish.
Methods used and analyses conducted to support WQS revisions **(40 CFR 131.6(b))**	Documents submitted by Wisconsin in support of this variance and considered by EPA in reviewing this submittal are identified above under "Submittal History".
Water quality criteria sufficient to protect the designated uses of Wisconsin surface waters **(40 CFR 131.6(c))**	Under the conditions of the variance, the interim chloride discharge limit is 680 mg/L as a weekly average. A target value is set at 600 mg/L. Without the variance, the water quality based permit limit of 395 mg/L, weekly average, would apply. Wisconsin's criteria to protect aquatic life are 757 mg/L (acute) and 395 mg/L (chronic).
An antidegradation policy consistent with section 131.12 **(40 CFR 131.6(d))**	Not applicable. This variance does not affect Wisconsin's existing antidegradation policy.
Certification by the State Attorney General or other appropriate legal authority within the State that the WQS were duly adopted pursuant to State law. **(40 CFR 131.6(e))**	WDNR's Chief Legal Counsel certified the variance in a letter to Tinka Hyde, dated February 16, 2015.

General information which will aid the Agency in determining the adequacy of the scientific basis of the standards which do not include uses specified in section 101(a)(2) of the Act as well as information on general policies applicable to State standards which their application and implementation. **(40 CFR 131.6(f))**	The information submitted by WDNR is described above under "Submittal History" and includes information on the economic and environmental costs. Norway Town Sanitary District #1 operates a wastewater treatment facility with a design flow of 1.6 MGD. As a condition of the variance, Norway Town Sanitary District #1 is required to continue to implement source reduction measures. This variance does not affect any general policies or procedures for the implementation of water quality standards in Wisconsin.

2. EPA action on the final variance submitted by Wisconsin

a. Description of variance:

Wisconsin's administrative rules at Wisconsin Administrative Code s. NR 106.83(2) provide for variances from chloride effluent limitations based in part on "end-of-pipe treatment technology for chloride being prohibitively expensive" to the extent that it "may cause substantial and widespread adverse social and economic impacts". The Norway Town Sanitary District #1 variance is based on substantial and widespread social and economic impacts that would occur if the facility were required to comply with the chloride chronic water quality criterion as provided for in Wisconsin's statutes at s. 283.15. (WDNR 2015b)

The current chloride WQBEL calculated for Norway Town Sanitary District #1 would be 395 mg/L as a weekly average. Under the proposed variance, this limit would be changed to 680 mg/L as a weekly average interim limit. A target value would be 600 mg/L as a weekly average.

As a condition of the variance, the permit specifies Norway Town Sanitary District #1 shall implement the following chloride source reduction measures during the permit term:

1) Amend Norway S.D.'s sewer use ordinance to require high efficiency demand initiated regeneration (DIR) type softeners for both newly installed and replacement softeners for residences and commercial businesses.
2) Evaluate the imposition of installation restrictions so that outside hose bibs for gardening, etc. are on unsoftened water. If restrictions are imposed, new homes and those homes that are replacing water softeners should be required to have plumbing restrictions for hard water by-passes, and the requirement should apply to self-installed equipment as well. Request voluntary support from local water softening businesses and licensed installers in this regard.
3) Evaluate chloride discharges from schools, car washes, hospitals, commercial institutions and any other large water users. Require high chloride contributors to implement measures to ensure implementation of measures to reduce chloride discharge. Strategies may include hiring qualified professionals to inspect, calibrate, and/or replace water softening units. Include discussions on these efforts and proposed follow-up actions in required chloride reports.

4) Continue to identify areas in the collection system that may be experiencing high infiltration and inflow (I/I). Implement and/or require implementation of measures to address potential I/I problems.
5) Continue to educate the public about softener efficiency and chloride reductions. In addition, Norway Town Sanitary District #1 must perform the actions required in the compliance schedule of the permit including annual reporting on progress of chloride source reduction measure implementation and calculated annual mass discharge of chloride from the WWTF.

b. EPA conclusion:

EPA has reviewed the economic data provided in Norway Town Sanitary District #1's application for a variance from Wisconsin's water quality standard for chloride and WDNR's analysis of the impacts of the cost to the Norway Town Sanitary District #1 to remove chloride from the wastewater effluent. Based on this review, EPA concludes that compelling this community to comply with the effluent limits necessary to attain water quality standards would result in substantial and widespread adverse social and economic impacts on this community. The Municipal Preliminary Screener calculation for Norway Town Sanitary District #1 shows that the total pollution control cost per household is 9.75 % of the median household income (WDNR 2011). Therefore, the chloride water quality standards are determined to be unattainable for the duration of the proposed variance and a variance from the water quality standards for chloride is consistent with the CWA and federal regulations.

EPA Action: EPA approves the variance from Wisconsin's chloride water quality standard for the Norway Town Sanitary District #1.

IV. Endangered Species Act (ESA) Requirements

As required under Section 7 of the ESA and federal regulations at 50 CRF Part 402, EPA is required to consult with the U.S. Fish and Wildlife Service (FWS) on any action taken by EPA that may affect federally-listed threatened or endangered species or their critical habitat. Actions are considered to have the potential to affect listed species if listed species are present in the action area. The action area for the Norway Town Sanitary District #1's chloride variance is Waubeesee Lake Drainage Canal from the wastewater treatment plant discharge point, continuing downstream to Wind Lake Drainage Canal and then downstream to the Fox River in Racine County, Wisconsin for a total distance of approximately 7 miles.

EPA checked the USFWS-Midwest Region's Section 7 Consultation website (www.fws.gov/midwest/endangered/section7/s7process/index.html) and determined the only federally listed species in Racine County, Wisconsin are the Rufa red knot (*Calidris canutus rufa*) – proposed as threatened, and the northern long-eared bat (*Myotis septentrionalis*) – proposed as endangered (FWS 2014). Since the northern long-eared bat is not aquatic-dependent and the rufa red knot occurs along Lake Michigan and thus outside the action area, neither species will be affected by the action and no further consultation with FWS is needed.

V. Tribal Consultation Requirements

On May 4, 2011, EPA issued the "EPA Policy on Consultation and Coordination with Indian Tribes" to address Executive Order 13175, "Consultation and Coordination with Indian Tribal Governments." The EPA Tribal Consultation Policy states that "EPA's policy is to consult on a government-to-government basis with federally recognized tribes when EPA actions and decisions may affect tribal interests."

EPA mapped the path of the effluent from the point of discharge from Norway Town Sanitary District #1's WWTF in Waubeesee Lake Drainage Canal downstream to Wind Lake Drainage Canal and on to its confluence with the Fox River in Racine County. There are no federally recognized tribes located in the vicinity of the Norway Town Sanitary District #1's WWTF discharge or Waubeesee Lake Drainage Canal or Wind Lake Drainage Canal downstream of the discharge. Therefore, tribal consultation is not required for this chloride variance.

VI. Documents Considered by EPA

U.S. Environmental Protection Agency. 1995. Interim Economic Guidance for Water Quality Standards – Workbook. EPA-823-B-95-002, March 1995, Office of Water.

U.S. Environmental Protection Agency. 2002. Memorandum of Agreement between the Environmental Protection Agency, Fish and Wildlife Service and National Marine Fisheries Service Regarding Enhanced Coordination under the Clean Water Act and Endangered Species Act (66 FR 11202; February 22, 2001). Report No. EPA-823-R-02-003. Office of Water. 24 pp.

U.S. Fish and Wildlife Service. 2014. County Distribution of Wisconsin's Federally Threatened, Endangered, Proposed, and Candidate Species. www.fws.gov/midwest/endangered/lists/wisc-cty.html

WDNR. 2011. Municipal Preliminary Screener Calculation for Use of RO in Wisconsin – for Cedar Grove Wastewater Treatment Facility, WDNR April 2011.

WDNR. 2014. Memorandum from Jackie Fratrick to Timothy Thompson. Subject: Water Quality-Based Effluent Limitations for Norway S.D. #1 (WI-0031470-7), WDNR January 22, 2014.

WDNR. 2015a. Facility Specific Standard Variance Data Sheet – Norway TN Sanitary District 1. February 3, 2015.

WDNR. 2015b. "Background Information Regarding Water Quality Standards Variance", attachment to transmittal letter from Russell A. Rasmussen to Tinka Hyde, February 13, 2015.