Facility Specific Standard 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: Norway TN Sanitary District 1

B. Facility Name: Norway TN Sanitary District 1

C. Submitted by: Wisconsin Department of Natural Resources

D. State: Wisconsin **Substance:** Chloride **Date completed:** February 3, 2015

E. Permit #: WI-0031470-07-0 **WQSTS #:** (EPA USE ONLY)

F. Duration of Variance **Start Date:** April 01, 2015 **End Date:** March 31, 2020

G. Date of Variance Application: September 18, 2014

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 proposed weekly average interim limit is 680 mg/L

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

Name	Email	Phone	Contribution
Timothy Thompson	Timothy.Thompson@wisconsin.gov	(414)263-8525	EPA Datasheet
Jackie Fratrick (ret.)	Retired	Retired	Chloride Limit Calculation
Jim Schmidt	Jamesw.schmidt@wisconsin.gov	608-267-7658	Environmental Analysis portions of datasheet

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, since chloride was the only substance for which a variance was requested.

C. Source of Substance: Primarily from water softeners and winter salt application.

D. Ambient Substance Concentration: Assumed zero ☐ **Measured** ☐ **Estimated** ☐ **Default** ☒ **Unknown**

If measured or estimated, what was the basis? Include citation. With limited dilution from the receiving water the ambient concentration has minor impact on the calculated limit.

E. Average effluent discharge rate: 1.6 MGD annual avg design) **Max effluent discharge rate:** 5.7 MGD (peak dly design flow)

F. Effluent Substance Concentration: Peak weekly = 750 mg/L, Peak daily = 770 mg/L ☒ **Measured** ☐ **Estimated** ☐ **Default** ☐ **Unknown**

H. If measured or estimated, what was the basis? Include Citation. Effluent data from Jan 2012 through Aug 2014

I. Level currently achievable (LCA): 724 mg/L

J. Variance Limit: 680 mg/L

K. What data were used to calculate the LCA, and how was the LCA derived? (*Immediate compliance with LCA is required.)*
The LCA of 724 mg/L is 105% of the highest value reported.

L. Explain the basis used to determine the variance limit (which must be ≤ LCA). Include citation.
The variance limit is determined by calculating the 4-day P99 of submitted chloride data (NR 106.82(9)(a)). Note that the condition above is satisfied (680 mg/L < 750 mg/L).

M. 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

Without the variance, meeting the WQBEL would result in substantial and widespread economic and social impact.

Section III: Location Information

A. Counties in which water quality is potentially impacted: Racine County

B. Receiving waterbody at discharge point: Waubeesee Lake Drainage Canal

C. Flows into which stream/river? Wind lake drainage Canal, to the SE Fox (IL) River **How many miles downstream?** 1 mile to canal, another 6 miles to Fox River

D. Coordinates of discharge point (UTM or Lat/Long): Lat. 42.809/Long. -88.161

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?

7 miles. Given the lack of substantial background flow in the drainage canal, it is assumed the chloride levels will fall below the criterion after the canal reaches the Fox River where the 7Q10 low flow is 39 cfs.

F. Provide the equation used to calculate that distance *(Include definitions of all variables, identify the values used for the clarification, and include citation):*

Assumption is made because 7Q10 of the canal is close to zero, but is 39 cfs in the Fox River seven miles downstream. Since Norway's design flow is only 1.6 MGD (2.5 cfs), there is over 15:1 dilution with the Fox River flow. Ambient concentrations in the Fox River are approximately 190 mg/L near Waukesha but only about 25 mg/L in large tributaries such as the Mukwonago River, so it is assumed the Waukesha concentration is influence by upstream point sources such as Brookfield and Waukesha. Even if chloride was 190 mg/L in the Fox River, 190 mg/L at 39 cfs mixed with 680 mg/L at 2.5 cfs is only about 220 mg/L, which is well below the 395 mg/L chronic toxicity criterion. As a result, compliance with the criterion with a discharge at the variance limit is assumed by the time the effluent reaches the Fox River.

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?

Warm Water Sport Fish

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: None, there are no other point source surface water discharges on the same stream in this vicinity with specific WPDES permits.

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 Drafter

J. Is the receiving waterbody on the CWA 303(d) list? If yes, please list the impairments below. ☐ Yes ☒ No ☐ Unknown

However, the Fox (IL) River, downstream of the Waubeesee and Wind Lake Drainage Canals, is known to exceed the applicable phosphorus standard for the reaches up-and downstream of the confluence of the Waubeesee/Wind Lake Canal system. There is no listed impairment for chloride

K. Please list any contributors to the POTW in the following categories:

Food processors (cheese, vegetables, meat, pickles, soy sauce, etc.)	None
Metal Plating/Metal Finishing	None
Car Washes	One car wash with 3 manual bays and 1 automatic bay
Municipal Maintenance Sheds (salt storage, truck washing, etc.)	None **
Laundromats	None
Other presumed commercial or industrial chloride contributors to the POTW	None

****** Road salting is done by outside contractors hired by the sanitary district. The contractors bring the salt and use their equipment. There is no salt storage or truck washing at the sanitary district.

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: November 14, 2014 (Re-noticed - December 29, 2014 **Date of hearing:** N/A

E. Were comments received from the public in regards to this notice or hearing? *(If yes, please attach on a separate sheet)* ☒ **Yes** ☐ **No**

Section VI: Human Health

A. Is the receiving water designated as a Public Water Supply? Drafter ☐ **Yes** ☒ **No**

B. Applicable criteria affected by variance: No human health criteria are available for chloride in Wisconsin waters.

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: Warmwater sport fish community

B. Applicable criteria affected by variance: Chronic toxicity criterion for chloride is 395 mg/L from NR 105, applicable in all Wisconsin waters regardless of use designation.

C. Identify any environmental impacts to aquatic life expected to occur with this variance, and include any citations:
Estimated instream concentration at the outfall is equal to the proposed interim limit since the 7Q10 at the outfall is zero. Interim limit = 680 mg/L, which exceeds the 395 mg/L criterion. The proposed interim limit exceeds the genus mean chronic values for *Ceriodaphnia* (417 mg/L), *Daphni*a (637 mg/L) and *Physa* (663 mg/L), although the latter two values are very close to the interim limit.

D. List any Endangered or Threatened species known or likely to occur within the affected area, and include any citations: None 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. What modifications would be necessary to comply with the current limits? Include any citations.
Installation of Reverse Osmosis (RO) will be needed to comply with the WQBEL of 395 mg/L (CTC based).

B. How long would it take to implement these changes?
Changes could be made quickly, but would cause substantial and widespread adverse social and economic impacts.

C. Estimate the capital cost *(Citation)***:** $1,800,000.00 (Chloride Variance Application)

D. Estimate additional O & M cost *(Citation)***:** $584,000.00 (Chloride Variance Application)

E. Estimate the impact of treatment on the effluent substance concentration, and include any citations:
Treatment with RO may reduce chloride to the WQBEL 395 mg/L.

F. Identify any expected environmental impacts that would result from further treatment, and include any citations:
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.

G. Is it technically and economically feasible for this permittee to modify the treatment process to reduce the level of the substance in the discharge? *(Provide the basis for this conclusion, including citations. If treatment is technically infeasible, provide an analysis of the factors that demonstrates technical infeasibility. If treatment is economically infeasible, provide an analysis of the economic cost to ratepayers that demonstrate economic infeasibility. Attach additional sheets if necessary.)*

☐ **Yes** ☒ **No** ☐ **Unknown**

It is not economically feasible for this permittee to modify the treatment process because of the limited funds available to them.

H. If treatment is possible, is it possible to comply with the limits on the substance?

☒ **Yes** ☐ **No** ☐ **Unknown**

I. If yes, what prevents this from being done? Include any citations.
End of pipe Reverse Osmosis (RO) treatment could reduce effluent chloride concentrations to chronic toxicity criterion However, attaining the applicable water quality standards specified in chs. NR 102 to 105 may cause substantial and widespread adverse social and economic impacts in the area where the discharger is located.

J. List any alternatives to current practices that have been considered, and why they have been rejected as a course of action, including any citations:
Reverse Osmosis (RO) – not economically feasible.

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 ore remote treatment technologies, planned research, etc. Include any citations.

Norway SD is a small community with no industry and no hauled waste accepted. Every resident has a private well and due to high water hardness, all customers have water softeners. The entire SD is built around four lakes and sewer lines are laid in the ground water, resulting in infiltration problem. As a result of this situation, the main sources of chloride at the plant are water softener backwash and winter road salt along with groundwater salt migrating into the sewer system. Hence chloride reduction activities since 2001 have focused on:

- Conducting public information on the need for water softener efficiency.
  … constantly publish articles in the Norway News to educate residents on the need to maintain water softeners and limit use of salt for melting winter snow and ice.
  … include letters in building permits for new homes regarding the need to use the most efficient softeners
- Aggressive sewer system maintenance and I&I reduction.
  … rebuilding and sealing manholes
  … televising and lining sewer mains

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) 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. *Although the Department of Commerce revised the plumbing code to require DIR softeners for both new and construction replacements in 2009 [Admin Rule at Comm 82.40(8)(j)], requiring DIR softeners in a revised SUO will provide additional enforcement mechanism.*

3) 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. *In order to reduce baseline chloride levels at the plant.*

4) 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. In order to reduce baseline chloride levels at the plant.*

5). 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. *Over the years, Norway S.D. has worked on tracking sources of I/I in the collection system and addressing the problem. Continuation of these efforts and timely implementation of necessary measures to address faulty sewer pipes, failing manhole covers, and bad lateral connections in all areas of the collection system will serve to keep plant clear water to the minimum and reduce baseline chloride load.*

6) Continue to educate the public about softener efficiency and chloride reductions. *Over the years, Norway S.D. has worked hard on educating the public about chloride and softener efficiency through articles in the Norway News. Continuation of this effort will serve to reduce baseline chloride levels.*

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

A. Date of previous submittal:		**Date of EPA Approval:**	N/A
B. Previous Permit #:	WI-0031470-06-0	**Previous WQSTS #:**	(EPA USE ONLY)
C. Effluent substance concentration:	668 mg/L (4-day P99)	**Variance Limit:**	680 mg/L
D. Target Value(s):	600 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
Maintain compliance with variance limit of 680 mg/L	Partial. Most of the time.
Educate homeowners on the impact of chloride from residential softeners; discuss options available for increasing softener salt efficiency, and request voluntary reductions. Distribute information on the efficient use of home softeners. This effort can be made more effective through mailings with sewer bills and advertisement in local newspapers.	☒ **Yes** ☐ **No**
Identify areas in the collection system that may be experiencing high infiltration and inflow (I/I). Implement measures to address potential I/I problems	☒ **Yes** ☐ **No**