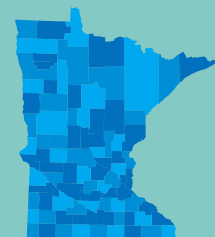


March 6, 2025

5-Year Chloride Highest Attainable Condition Review for Alexandria Lake Area Sanitary District (ALASD) WWTF (Permit No. MN0040738) Chloride Variance



Executive Summary

The Alexandria Lake Area Sanitary District (ALASD) Wastewater Treatment Facility (WWTF) is a Class A facility which continuously discharges treated effluent to Lake Winona (WID 21-0081-00), which is a Class 2Bg, 3C, 4A, 4B, 5, and 6 water.

During the permitting process in November 2020, the District applied for, and was granted, an 8-year variance from the chloride water quality standard for Class 2B waters ([Minn. R. Ch. 7050.0222, subp. 4](#)). This variance grants ALASD WWTF an interim chloride effluent limit and requires chloride minimization efforts to maintain eligibility and to achieve the highest attainable condition (HAC) throughout the term of the variance.

The currently applicable permit, which authorizes the first five years of the variance, is effective from November 15, 2020, through October 31, 2025. Throughout the first five years of the variance term, the City must comply with an interim limit of 839 mg/L (Daily Maximum).

On November 14, 2024, ALASD provided a written request for reevaluation containing an “Eligibility Tool”, which calculates the cost of installing three treatment alternatives to reduce chloride, and a “Chloride Variance Request” form. These two documents are considered a formal request for a reevaluation of the terms of the variance and the highest attainable condition (HAC) by the Minnesota Pollution Control Agency (MPCA).

MPCA determined Alexandria Lake Area Sanitation District’s chloride variance will be extended to its completion date on November 14, 2028. The extension is conditioned on an updated pollutant management plan and the implementation of the **updated highest attainable condition limit of 805 mg/L** (calendar month average).

Demonstration of Need

In the variance issued in November of 2020, MPCA determined the ALASD WWTF was eligible for a variance under Factor 6 of Minn. R. 7050.0190, because compliance with the water quality-based effluent limits (WQBELs) would result in substantial and widespread social and economic impacts for the community. The determination was based on costs of 4.4% of the Median Household Income (MHI) for a lime-softening plant and removal of all point-of-entry ion exchange water softeners, 4.0% of MHI for a reverse osmosis drinking water system and removal of all point-of-entry ion exchange water softeners, and a cost of 2.5% of MHI for end of pipe reverse osmosis and crystallization at the end of the wastewater treatment train.

For ALASD the costs to implement treatment have slightly increased in the 5 years since the variance was granted, and the estimated costs for the installation of any alternative are still above 2% of MHI and are not affordable at this time. Table 1 below outlines the changes in relative costs following the reevaluation.

Table 1: Updated estimated costs in percentage of MHI.

Alternative	2019 Estimated Cost MHI	2024 Estimated Cost MHI
Percent MHI to Install Centralized Lime Softening	4.4%	4.4%

Percent MHI to Install Centralized Reverse Osmosis	4.0%	4.1%
Percent MHI to Install Reverse Osmosis and Crystallization	2.5%	3.7%

HAC: Interim Limit

Minn. R 7050.0190 and federal rules at 40 CFR 131.14 require variances with terms longer than 5 years to reevaluate the HAC at an interval of no longer than every 5 years. To reevaluate the HAC, MPCA reviewed both the numeric interim limit and the chloride minimization plan.

In the variance issued in November of 2020, the interim limit (and HAC) was determined to be 839 mg/L (daily maximum) based on the maximum measured effluent value at the discharge point SD 001 during their review term. Since the determination of this limit, MPCA has updated its method of calculating the HAC based on the 99th percentile, using a log-normal distribution of results, and an assumption of two or four samples per month from a period of record of the previous five years. Following the updated method, the interim limit is expressed as a monthly average. Using the updated criteria (data from February 2020 through January 2025) and an assumption of 4 samples per month to reevaluate the HAC, MPCA determined a HAC of 805 mg/L (monthly average). Since the updated HAC is less than the previous HAC, MPCA selects this new interim limit of 805 mg/L (monthly average). Table 2 below outlines the results of the HAC determination.

Table 2: Summary of relevant interim limits

Selected New Calculated Interim Limit (Calendar Month Average)	Previous Interim Limit (Daily Max)
805 mg/L	839 mg/L

HAC: Pollutant Management Plan

ALASD has been working on chloride reduction since 2010 and submitted a Chloride Management Plan in 2014. Activities carried out by ALASD before the submission of the chloride minimization plan required by this variance include a survey of drinking water sources in their expansive collection system, residential softener surveys, the construction of a chloride loading model and ambient sampling in their immediate receiving lake (Lake Winona) and its downstream sister lakes.

The chloride minimization plan required as a portion of the variance issued in November of 2020 was submitted May 11, 2021. This plan identified the following major activities for ALASD to implement:

- 1) Meet with Citizen’s Advisory Council to align chloride reductions across several municipalities whose wastewater is treated by ALASD and other stakeholders.
- 2) Continued chloride education events for residential customers will be planned and implemented.
- 3) Review grant funding opportunities.
- 4) Evaluate alternatives to industrial water treatment systems to reduce chloride discharges from industrial and/or commercial sources with high chloride levels.
- 5) Per the ALASD NPDES permit, within three years this chloride minimization plan, research nonpoint source discharges of chloride such as road salt application and the use of de-icing products on

ALASD property. Review MPCA's Smart Salting Assessment tool (www.wintermaintenancetool.com) with LGUs. This web-based tool will help winter maintenance organizations assess operations, identify opportunities to reduce salt using proven best management practices (BMPs), and track progress. Along with this tool are Smart Salting training opportunities.

- 6) Identification and Quantification of Chloride Sources; and Reporting on Effluent Chloride levels.

Throughout the previous permit term, ALASD has made good faith efforts to carry out the tasks identified in their chloride minimization plan. They have applied Smart Salting training to their salt application on roads and have obtained Smart Salting certifications. They have applied for, and received, grant funding for softener optimization and renewal for commercial properties. They have carried out robust collection system sampling and lake monitoring. There have been consistent public outreach efforts throughout the term of the variance thus far informing the community about chloride, softeners, and the variance itself. The new HAC indicates ALASD's efforts have resulted in a decrease of chloride discharged from the WWTF.

HAC: Specific Actions in Next Five-Year Cycle

Given their efforts and results, MPCA extends the variance to its termination in 2028. The permittee must submit an updated pollutant minimization plan as a condition of the extension outlining efforts to be undertaken until 2028 to reduce chloride concentrations in their effluent.