

Chloride Pollutant Minimization Plan for Stepan Company

November 11th, 2022

Prepared by Stepan Company



Stepan Company is a member of the
Lower Des Plaines Watershed Group



1.0 Introduction to Chloride Issue in CAWS/LDPR

This Pollutant Minimization Plan (PMP) has been prepared by Stepan Company to reduce the environmental impacts from the organization's chloride related operations. Stepan Company is a discharger covered under the Time Limited Water Quality Standard for Chloride for the Chicago Area Waterways System and Lower Des Plaines River watersheds. This PMP has been prepared to meet the requirements laid out in the Time Limited Water Quality Standard (TLWQS) for Chloride. The term of this PMP covers the first 5-years of the TLWQS period and will be updated following the re-evaluations at Years 4 ½, 9 ½, and 14 ½.

Chloride is a permanent pollutant. It does not degrade over time and continues to accumulate in the environment. Proactive measures to reduce the amount of chloride discharged can help reduce the impacts from chloride on receiving waterways and the environment. Chloride impacts aquatic life, vegetation, and infrastructure. As the chloride concentrations increase and our waters become saltier, aquatic and plant biodiversity decreases and native species are overtaken by salt tolerant invasive species.

Chlorides are commonly found in road salt, fertilizers, water softeners, dust suppressants, and certain industrial processes. Chloride-based deicers, like rock salt, are used on parking lots, sidewalks, and roads to provide safe surfaces to the public during the winter months. These deicers are one of most common sources of chloride in the Chicago region.

The water quality standard for chloride for the Chicago Area Waterway System (CAWS) was updated as part of the rulemaking process related to changing the designated use of the CAWS. The chloride standard was updated from 1,500 mg/L during the winter and 500 mg/L during the summer to 500 mg/L all year round. The change in the chloride water quality standard took effect in 2018. Because portions of the CAWS were not going to meet this new standard due to the need to maintain public safety on roads, highways, sidewalks and parking lots during the winter months, a joint submittal and supporting individual petitions were submitted between 2015 and 2018 to the Illinois Pollution Control Board for a variance from the chloride standard. The joint petition laid out best management practices that can be achieved by the petitioners to reduce their chloride use while maintaining public safety during winter storms. In addition to the CAWS, portions of the Lower Des Plaines River watershed were included as it receives water from the CAWS.

On November 4, 2021, the IPCB issued an Opinion and Order for a Time Limited Water Quality Standard (TLWQS) for Chloride for portions of the CAWS and Lower Des Plaines River watersheds. The TLWQS for Chloride watersheds are defined in the Opinion and Order as the Des Plaines River watershed from the Kankakee River to the Will County Line (except for the DuPage River watershed) and the CAWS watershed (except the North Branch Chicago River watershed upstream of the North Shore Channel and those portions of the watershed located in Indiana). This is a watershed-based approach to reduce the chloride concentrations in the CAWS and Lower Des Plaines River. The TLWQS for Chloride requires all dischargers covered under the TLWQS for Chloride to create PMPs and implement specific best management practices based on their operations to reduce their chloride discharges.

2.0 Organization Info, Facilities' Specific Info

2.1 Facility overviews/descriptions

Agency Name: Stepan Company		
Facility Name: Stepan Company Millsdale Plant		Permit Number: ILG103
Facility Address: 22500 Stepan Dr.		
City: Elwood	State: IL	Zip Code: 60421

The Stepan Elwood, IL facility (Millsdale Plant) is located in the Northeast corner of Section 11, Channahon Township, Will County, Illinois. The Millsdale Plant is approximately 1.5 miles East of Interstate 55 and 1.5 miles North of Arsenal Road on Stepan Drive, and 0.1-mile East of the Des Plaines River. The Millsdale Plant produces a variety of specialty and organic chemicals. The specialty chemicals for the most part are surfactants, which fall under the USEPA guidelines for soaps and detergents. The organic chemicals include phthalic anhydride, polyester polyols, and quaternary amines products.

2.2 Chloride Sources

Stepan company Millsdale plant uses various type of chemicals in their chemical manufacturing process within these processes only brine is used that contains chloride. Brine is typically used in softener regen to soften the well water used throughout the facility. During winter months, the facility hires an external contractor to maintain the parking lots and main roads. Operations is instructed to maintain their operation areas. The salt used for operational winter maintenance is stored within the area in covered plastic drums.

3.0 Chloride Monitoring Data

Chloride monitoring data will be collected for the CAWS and Lower Des Plaines River watersheds per the IPCB order. The data will be maintained by the workgroups. Chloride data for the CAWS will be collected by MWRD for the CAWS watershed and provided to the workgroups as part of the annual reporting as required by the IPCB order. The Lower Des Plaines Watershed Group also maintains a USGS monitoring station in the Des Plaines River at Channahon, IL that collects continuous conductivity data to estimate chloride concentrations. Stepan Company Millsdale Plant will be collecting Chloride monitoring data from Outfall 001 per requirements of NPDES permit IL1002453.

4.0 Chloride Reduction BMPs for POTWs, MS4s, CSOs, Industrial Sources, IDOT/Tollway

As part of the Chloride TLWQS, specific BMPs were identified for POTWs, MS4s, CSOs, Industrial Sources, and IDOT/Tollway to reduce the chloride impact on the watershed. These BMPs will be implemented over the 15-year term and additional BMPs evaluated at 5-year intervals during the 15-year term. Further details about winter maintenance practices currently being implemented by Stepan Company are included in the snow and ice plan. The BMPs identified are outlined below:

Workgroup BMP

Variance BMP	Currently Implementing	Will Implement (Target Year)	Agency Description of Current Implementation
The permittee must participate in a Chlorides workgroup for the CAWS or LDPR, depending on the watershed within which the facility’s discharge is located.	X		Stepan Company has been a member of the Lower Des Plaines Watershed Group since 2018 Stepan company attends staff meeting and workgroup meetings.

Salt Storage and Handling BMPs

Variance BMP	Currently Implementing	Will Implement (Target Year)	Agency Description of Current Implementation
Store all salt on an impermeable pad that must be constructed to ensure that minimal stormwater is coming into contact with salt unless the salt is stored in a container that ensures stormwater does not come into contact with the salt.	X		All salt stored by Stepan Company is stored in a plastic drum that are sealed unless salt is being actively removed or added to prevent contact with stormwater.
Cover salt piles at all times except when in active use, unless stored indoors.	X		Stepan Company does not typically have salt piles, but in the event, there is a salt pile it will be stored on the Non-hazardous waste pad which is covered.
For working areas, provide berms and or sufficient slope to allow snow melt and stormwater to drain away from the area. If snow melt and stormwater cannot be drained away from the working area, channeling water to a collection point such as a sump, holding tank or lined basin for collection, discharge at a later time, use for prewetting, and use for make-up water for brine must be considered.	X		Stepan Company Millsdale Plant is designed to allow Stormwater or snow melt to easy drain away from process areas into the correct sewer system.
<p>Good housekeeping practices must be implemented at the site, including:</p> <ul style="list-style-type: none"> • cleanup of salt at the end of each day or conclusion of a storm event; • tarping of trucks for transportation of bulk chloride; • maintaining the pad and equipment; • good practices during loading and unloading; • cleanup of loading and spreading equipment after each snow/ice event; • a written inspection program for storage facility, structures and work area; • removing surplus materials from the site when winter 		2023	

<p>activity finished where applicable;</p> <ul style="list-style-type: none"> • annual inspection and repairs completed when practical; • evaluate the opportunity to reduce or reuse the wash water. 			
---	--	--	--

Winter Maintenance Operations BMPs

Variance BMP	Currently Implementing	Will Implement (Target Year)	Agency Description of Current Implementation
Calibrate all salt spreading equipment at least annually before November 30th. Records of the calibration results must be maintained for each piece of spreading equipment.		2023	
Pre-wet road salt before use, either by applying liquids to the salt stockpile, or by applying liquids by way of the spreading equipment as the salt is deposited on the road.		2023	
Use equipment to measure the pavement temperature unless such equipment has already been installed on road salt spreading vehicles.		2023	
Develop and implement a protocol to vary the salt application rate based on pavement temperature, existing weather conditions, and forecasted weather conditions.		2023	
Track and record salt quantity used and storm conditions from each call-out.		2023	
Develop a written plan for implementation of anti-icing, with milestones. The plan should consider increased use of liquids (e.g., carbohydrate products) beginning with critical locations such as bridges over streams.		2024	

Provide employees involved in winter maintenance operations with annual training before November 30th on best management practices in the use of road salt in operations, including the practice of plowing first and applying salt only after snow has been cleared.		2023	
Be responsible for complying with all applicable BMPs even when deicing practices are contracted out and ensure that contractors are properly trained and comply with all applicable BMPs.		2023	
Complete an annual report, as required by paragraph 3(B) of this order, which is standardized in an electronic format and submitted to the IEPA's website and to the watershed group.		2024	
Obtain and put into place equipment necessary to implement all salt spreading/deicing measure specified in this BMP, such as any new or retrofitted salt spreading equipment necessary to allow for pre-wetting and proper rates of application.		2024	

5.0 Plan to Implement BMPs

Stepan Company will implement the following BMPs to take steps towards compliance with chloride standards for the watershed.

BMP: Good housekeeping practices must be implemented at the site, including:

- cleanup of salt at the end of each day or conclusion of a storm event;
- tarping of trucks for transportation of bulk chloride;
- maintaining the pad and equipment;
- good practices during loading and unloading;
- cleanup of loading and spreading equipment after each snow/ice event;
- a written inspection program for storage facility, structures and work area;
- removing surplus materials from the site when winter activity finished where applicable;
- annual inspection and repairs completed when practical;

evaluate the opportunity to reduce or reuse the wash water.

Plan to Implement BMP: Stepan Company will create new work instruction and train all employee on salt spreading techniques and proper house cleaning.

Schedule for Implementation: Work instructions and training will be written by June 1st of 2023 and implemented by November 30th of 2023.

BMP: Calibrate all salt spreading equipment at least annually before November 30th. Records of the calibration results must be maintained for each piece of spreading equipment.

Plan to Implement BMP: Stepan Company will inspect and calibrate on internal equipment and receive all external calibration records.

Schedule for Implementation: Calibrations will occur by November 30th of 2023.

BMP: Pre-wet road salt before use, either by applying liquids to the salt stockpile, or by applying liquids by way of the spreading equipment as the salt is deposited on the road.

Plan to Implement BMP: Stepan company will create work instruction that will instruct how to proper pre-wet salt.

Schedule for Implementation: Work instructions will be written by June 1st of 2023 and implemented by November 30th of 2023.

BMP: Use equipment to measure the pavement temperature unless such equipment has already been installed on road salt spreading vehicles.

Plan to Implement BMP: Stepan Company will require all external contractors to have equipment to measure pavement temperatures.

Schedule for Implementation: Stepan Company will require all external contractors by November 30th, 2023, to have equipment to measure pavement temperatures.

BMP: Develop and implement a protocol to vary the salt application rate based on pavement temperature, existing weather conditions, and forecasted weather conditions.

Plan to Implement BMP: Stepan Company will require that external contractors have a plan to vary the rate of salt application.

Schedule for Implementation: Stepan Company will require that external contractors have a plan to vary the rate of salt application by November 30th of 2023.

BMP: Track and record salt quantity used and storm conditions from each call-out.

Plan to Implement BMP: Stepan Company will create work instructions and inspections that will be conducted prior to and after winter weather events. Stepan Company will require that external contractors provide amount of salt used.

Schedule for Implementation: Work instructions and inspections will be created by June 1st of 2023 and implement by November 30th of 2023. Stepan Company will require that external contractors provide amount of salt used by November 30th of 2023.

BMP: Develop a written plan for implementation of anti-icing, with milestones. The plan should consider increased use of liquids (e.g., carbohydrate products) beginning with critical locations such as bridges over streams

Plan to Implement BMP: Stepan Company will review current anti-icing procedures and discuss internal and external the benefits of different anti-icing procedures.

Schedule for Implementation: A written plan will be created by July 1st of 2024.

BMP: Provide employees involved in winter maintenance operations with annual training before November 30th on best management practices in the use of road salt in operations, including the practice of plowing first and applying salt only after snow has been cleared.

Plan to Implement BMP: Stepan Company will create new work instruction and train all employee on salt spreading techniques and proper house cleaning.

Schedule for Implementation: Work instructions and training will be written by June 1st of 2023 and implemented by November 30th of 2023.

BMP: Be responsible for complying with all applicable BMPs even when deicing practices are contracted out and ensure that contractors are property trained and comply with all applicable BMPs.

Plan to Implement BMP: Proper training will be created and given to effected contractors.

Schedule for Implementation: Proper training will be created by June 1st of 2023 and given to effected contractors by November 30th of 2023.

BMP: Complete an annual report, as required by paragraph 3(B) of this order, which is standardized in an electronic format and submitted to the IEPA’s website and to the watershed group.

Plan to Implement BMP: All applicable data will be complied within an annual report.

Schedule for Implementation: Annual report will be submitted by June 1st, 2024, as stated below.

BMP: Obtain and put into place equipment necessary to implement all salt spreading/deicing measure specified in this BMP, such as any new or retrofitted salt spreading equipment necessary to allow for pre- wetting and proper rates of application.

Plan to Implement BMP: Stepan Company will review all current salt spreading equipment and purchase new equipment biased on review of equipment.

Schedule for Implementation: All current equipment will be reviewed by November 30th of 2023 and new equipment will be purchased by November 30th of 2024.

6.0 Other Chloride TLWQS Required Milestones

Stepan Company will implement these specific milestones (not included in the above BMPs) as outlined by the Chloride TLWQS.

Milestone	Agency Completion Date	Agency Completion Details
6 MONTHS AFTER EFFECTIVE DATE: Petitioner establishes a mechanism for tracking of de-icing salt usage for each facility.	By May 1 of 2023.	Inspections of the Operation areas salt storage before and after snow events will be conducted. External contractors will provide pounds of salt used.

<p>July 1st OF EVERY YEAR (BEGINNING WITH YEAR 2): Discharger must submit an Annual Report for the previous year beginning on May 1 and ending on April 30 of the following year to the Agency and the chlorides workgroup on. The report shall be on salt usage for deicing and steps taken to minimize salt use and makes the report publicly available.</p>	<p>By July 1 of each year, beginning in Year 2 2024.</p>	<p>Stepan Company will submit an annual report to the workgroup and IEPA.</p>
<p>July 1st of YEAR 3, YEAR 8 and YEAR 13: The chlorides workgroup submits a Status Report to the IEPA which includes an analysis on the following: chlorides monitoring data; report on the chloride workgroup’s outreach strategy, which includes outreach efforts to expand coverage of the TLWQS, and outreach and training for nonpoint sources; identification of any new BMPs, treatment technology or salt alternatives; identification of the impediments and potential solutions of those impediments faced by dischargers and those granted coverage under the TLWQS that prevent them from completing the training and making all capital purchases necessary to implement the required BMPs; and identification and description of any assistance (financial, technical, or otherwise) that the chloride workgroup may be able to provide.</p>	<p>By July 1 of year 3 2025, the workgroups will submit a Status Report to the IEPA.</p>	
<p>July 1st OF YEAR 4 ½: Chlorides workgroup submits to the Board its first proposed re-evaluation pleading consistent with the Board’s order granting the TLWQS.</p>	<p>By July 1 of year 4 ½ 2026, the workgroups will submit a re-evaluation to the IEPA and IPCB.</p>	