

Annual Report for Year 2 (2023-2024) of the Time Limited Water  
Quality Standard for Chloride

March 31<sup>st</sup>, 2024

Prepared by Stepan Company



Stepan Company is a member of the  
Chicago Area Waterways Chloride  
Workgroup



## **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, Facility Information

|  |                 |                          |
|--|-----------------|--------------------------|
| Agency Name: Stepan Company                      |                 |                          |
| Facility Name: Stepan Company Millsdale Facility |                 | Permit Number: ILG103035 |
| Facility Address: 22500 Stepan Drive             |                 |                          |
| City: Elwood                                     | State: Illinois | 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. Organic chemicals include phthalic anhydride, polyester polyols, and quaternary amines products.

### 2.1 Level of Service for Winter Maintenance Activities

Stepan Company utilizes a contractor for the snow and ice removal on all main roads and major sidewalks. Each production area is responsible for the removal of snow and ice within their areas. All service is completed on request or during winter weather events.

## 3.0 Best Management Practices

Details regarding Stepan Company's implementation of the best management practices (BMPs) identified as part of the TLWQS for Chloride are included below.

### Workgroup BMP

| BMP  | Agency Description of Current Implementation or Status Update to the Plan to Implement the BMP  |
|--|---|
| 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. | 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

| BMP   | Agency Description of Current Implementation or Status Update to the Plan to Implement the BMP   |
|---|--|
| 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. | Salt stored by Stepan Company is stored within the main warehouse building. 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. |

|  |   |
|--|---|
| <p>Cover salt piles at all times except when in active use, unless stored indoors.</p>   |   |
| <p>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.</p>   | <p>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> |
| <p>Good housekeeping practices must be implemented at the site, including:</p> <ul style="list-style-type: none"> <li>• cleanup of salt at the end of each day or conclusion of a storm event;</li> <li>• tarping of trucks for transportation of bulk chloride;</li> <li>• maintaining the pad and equipment;</li> <li>• good practices during loading and unloading;</li> <li>• cleanup of loading and spreading equipment after each snow/ice event;</li> <li>• a written inspection program for storage facility, structures and work area;</li> <li>• removing surplus materials from the site when winter activity finished where applicable;</li> <li>• annual inspection and repairs completed when practical;</li> <li>• evaluate the opportunity to reduce or reuse the wash water.</li> </ul> | <p>A policy is written and all internal and external personal that are responsible for snow and ice removal are trained on the policy.</p>              |

**Winter Maintenance Operations BMPs**

| <b>BMP</b>  | <b>Agency Description of Current Implementation or Status Update to the Plan to Implement the BMP</b>                               |
|---|---|
| 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.   | Contractors' equipment is calibrated annually. Stepan company acquired new equipment that can be calibrated.                        |
| 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.  | A policy is written and all internal and external personal that are responsible for snow and Ice removal are trained on the policy. |
| Use equipment to measure the pavement temperature unless such equipment has already been installed on road salt spreading vehicles.   | Contractors' equipment utilizes equipment for measuring temperature.  |
| Develop and implement a protocol to vary the salt application rate based on pavement temperature, existing weather conditions, and forecasted weather conditions.   | Contractor utilizes a protocol to vary salt.  |
| Track and record salt quantity used and storm conditions from each call-out.  | Contractors will weigh equipment before and after each call out. Stepan warehouse will track salt purchased each year.              |
| 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.   | A written plan is being created.  |
| 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. | Training was completed November 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.   | Stepan Company continues to work with Stepan staff and externally contractor to follow the plan that comply with all BMPs. |
| 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.  | Stepan Company has complied all current data into the current report.  |
| 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. | Stepan company has acquired new equipment that complies with all BMPs.   |

### 3.1 Analysis of BMPs Implemented

Stepan Company has implemented the Best management practices required by the permit. An analysis of the BMPs has shown more consistency with the application of de-icing salt within the winter months.

### 3.2 Analysis of Alternative Treatments or New Technology

No applicable alternative treatments of new technologies have been identified.

### 4.0 Deicing/Anti-Icing Agents Used

| Material or Product | Dry, Pre-Wet/Pretreated, or Liquid | Lane Miles Treated with the Product | Parking Lot and Sidewalk Area Treated with the Product | Total Amount Used 2023-2024 (Year 2) | Total Amount Used Over First 5 Year Term |
|---------------------|------------------------------------|-------------------------------------|--|--------------------------------------|--|
| Midwest Ice Melt    | Dry                                | N/A                                 | ~ 340 sqft   | 11                                   | 11                                       |
| SnowSlicer          | Dry                                | ~ 4                                 | ~ 120K sqft  | 74                                   | 74                                       |

### 4.1 Application Rates

Stepan Company applies enough deicer to the areas of need

**4.1.1 Application Rate Analysis**

An appropriate amount of deicer is applied to allow for a safe work environment.

**4.2 Application Practices**

Stepan Company uses the following practices to apply deicing and anti-icing materials:

- Midwest Ice Melt is used for internal use in each area of the facility, the material is currently used as a dry substance.
- SnowSlicer is used by the external contractor for major roads and sidewalks, the material is currently used as a dry substance.

**4.3 Call Outs**

A total of 13.38 inches of snow was reported in Elwood for the 2023-2024 winter. There were 6 freezing rain event(s) and 8 snow event(s) for the 2023-2024 winter. Stepan Company had 14 call outs completed during the 2023-2024 winter..

**4.4 Use of Liquids**

Stepan Company has not begun using liquid anti-icing measures.

**5.0 Training**

Stepan Company completed annual training for 393 employees out of 393 employees who are part of the winter maintenance operations on November 2<sup>nd</sup>, 9<sup>th</sup>, 14<sup>th</sup>, 15<sup>th</sup>, 16<sup>th</sup>, 30<sup>th</sup>. A list of annual training topics by type of employee is included in the table below.

| Role in Winter Operations | Training Topics Covered   |
|---------------------------|---|
| All employees             | Environmental impact of salt, awareness of permit, awareness of workgroup, awareness of BMPs. |

**6.0 Deicing and Snow Removal Equipment and Maintenance**

Stepan Company uses equipment during winter maintenance activities.

| Type of Equipment | Equipment/Vehicle Number | Type of Spreader (mechanically controlled, computer controlled, etc.) | Type of Material Used with Equipment (Dry, Pre-Wet, Liquid) | Any Other Important Equipment Information |
|-------------------|--------------------------|---|---|---|
|-------------------|--------------------------|---|---|---|

|                             |     |                         |     |               |
|-----------------------------|-----|-------------------------|-----|---------------|
| Rock Salt Spreader          | N/A | Mechanically Controlled | Dry | For sidewalks |
| Rock Salt Scope             | N/A | Mechanically Controlled | Dry | For sidewalks |
| <b>Contractor Equipment</b> |     |                         |     |               |
| Swenson Salt spreader       | 18  | Mechanically Controlled | Dry |               |
| Swenson Salt spreader       | 19  | Mechanically Controlled | Dry |               |

### 6.1 Description of Equipment Washing and Wash Water Collection

Stepan Company equipment is washed at the end of the season to the process sewer prior to the Wastewater Treatment Plant. The external contractor equipment is washed offsite.

### 7.0 Material Storage

Stepan Company maintains 2 storage area(s). Information regarding the storage area(s) is included in the following Table.

| Location of Storage Area | Type of Material Stored | Amount of Material Stored | Material stored under permanent cover? | Material stored in a fully enclosed structure? | Material stored on an impervious pad? |
|--------------------------|-------------------------|---------------------------|--|--|---------------------------------------|
| Main Warehouse           | Rock Salt               | 55,150                    | Yes                                    | Yes  | Yes                                   |
| Non-Hazardous Waste Pad  | Rock Salt               | N/A                       | Yes                                    | No   | Yes                                   |

### 8.0 Capital Purchases

Stepan Company currently has no capital purchases necessary for implementations of BMPs.

### 9.0 Environmental Monitoring Data

Chloride monitoring data is collected for the CAWS and Lower Des Plaines River watersheds per the IPCB order. The data is maintained by the workgroups. Chloride data for the CAWS is 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.

Chloride monitoring data reports are posted to <https://www.cawswatershed.org/reports/> and <https://ldpwatersheds.org/about-us/lower-des-plaines-watershed-group/our-work/chloride-tlwqs/>.

#### 9.1 Organization Specific Chloride Monitoring Data



Stepan Company collects chloride monitoring data as part of its NPDES effluent data and the data is included as Appendix 1.

## **9.2 Changes to the Facility's NPDES Treatment Technologies for Chloride**

Stepan Company has currently made no changes to the facility's WWTP for the treatment of Chloride.

## **10.0 Program Evaluation**

Stepan Company has seen a shift in the use of Rock salt in an attempt to manage the usage, while still maintaining a safe work environment.

### **10.1 Proposed Steps for the Coming Year**

Stepan company will continue to work on better management of the chloride. Stepan Company will continue to work on alternative methods of de-icing.

## **11.0 Workgroup Participation**

- Attend bi-monthly membership meetings via Zoom
- Participate in Chloride TLWQS Mentoring Sessions
- Send key staff to Winter Deicing Workshops
- Utilize Seasonal Outreach Materials available on the Member tab of the website and provide input on other outreach needs or formats

Appendix 1: Chloride Concentration Data from Outfall 001

| Date      | Chloride Concentration |
|-----------|------------------------|
| 5/2/2023  | 480 mg/L               |
| 5/3/2023  | 500 mg/L               |
| 5/9/2023  | 520 mg/L               |
| 5/10/2023 | 470 mg/L               |
| 5/11/2023 | 450 mg/L               |
| 5/16/2023 | 460 mg/L               |
| 5/17/2023 | 460 mg/L               |
| 5/23/2023 | 510 mg/L               |
| 5/24/2023 | 520 mg/L               |
| 5/30/2023 | 540 mg/L               |
| 5/31/2023 | 540 mg/L               |
| 6/6/2023  | 550 mg/L               |
| 6/7/2023  | 540 mg/L               |
| 6/13/2023 | 530 mg/L               |
| 6/14/2023 | 550 mg/L               |
| 6/20/2023 | 560 mg/L               |
| 6/21/2023 | 540 mg/L               |
| 6/27/2023 | 500 mg/L               |
| 6/28/2023 | 470 mg/L               |
| 7/5/2023  | 550 mg/L               |
| 7/6/2023  | 540 mg/L               |
| 7/11/2023 | 460 mg/L               |
| 7/12/2023 | 450 mg/L               |
| 7/18/2023 | 460 mg/L               |
| 7/19/2023 | 480 mg/L               |
| 7/25/2023 | 440 mg/L               |
| 7/26/2023 | 460 mg/L               |
| 8/1/2023  | 450 mg/L               |
| 8/3/2023  | 450 mg/L               |
| 8/8/2023  | 450 mg/L               |
| 8/9/2023  | 450 mg/L               |
| 8/15/2023 | 470 mg/L               |
| 8/16/2023 | 460 mg/L               |
| 8/24/2023 | 450 mg/L               |
| 8/25/2023 | 460 mg/L               |
| 8/29/2023 | 500 mg/L               |
| 8/30/2023 | 490 mg/L               |
| 9/5/2023  | 540 mg/L               |
| 9/6/2023  | 570 mg/L               |
| 9/12/2023 | 550 mg/L               |
| 9/13/2023 | 530 mg/L               |
| 9/19/2023 | 510 mg/L               |
| 9/20/2023 | 480 mg/L               |
| 2/21/2024 | 580 mg/L               |
| 2/27/2024 | 530 mg/L               |
| 2/28/2024 | 520 mg/L               |
| 3/5/2024  | 560 mg/L               |
| 3/6/2024  | 540 mg/L               |

| Date       | Chloride Concentration |
|------------|------------------------|
| 9/26/2023  | 800 mg/L               |
| 9/27/2023  | 480 mg/L               |
| 10/3/2023  | 580 mg/L               |
| 10/4/2023  | 600 mg/L               |
| 10/10/2023 | 610 mg/L               |
| 10/11/2023 | 620 mg/L               |
| 10/17/2023 | 570 mg/L               |
| 10/18/2023 | 590 mg/L               |
| 10/24/2023 | 560 mg/L               |
| 10/25/2023 | 580 mg/L               |
| 10/31/2023 | 610 mg/L               |
| 11/1/2023  | 550 mg/L               |
| 11/7/2023  | 630 mg/L               |
| 11/8/2023  | 610 mg/L               |
| 11/14/2023 | 610 mg/L               |
| 11/15/2023 | 620 mg/L               |
| 11/21/2023 | 550 mg/L               |
| 11/22/2023 | 510 mg/L               |
| 11/28/2023 | 520 mg/L               |
| 11/29/2023 | 490 mg/L               |
| 12/5/2023  | 550 mg/L               |
| 12/6/2023  | 540 mg/L               |
| 12/12/2023 | 580 mg/L               |
| 12/13/2023 | 570 mg/L               |
| 12/19/2023 | 600 mg/L               |
| 12/20/2023 | 610 mg/L               |
| 12/27/2023 | 550 mg/L               |
| 12/28/2023 | 490 mg/L               |
| 1/3/2024   | 570 mg/L               |
| 1/4/2024   | 570 mg/L               |
| 1/9/2024   | 630 mg/L               |
| 1/10/2024  | 640 mg/L               |
| 1/16/2024  | 640 mg/L               |
| 1/17/2024  | 640 mg/L               |
| 1/23/2024  | 680 mg/L               |
| 1/24/2024  | 710 mg/L               |
| 1/30/2024  | 810 mg/L               |
| 1/31/2024  | 830 mg/L               |
| 2/6/2024   | 780 mg/L               |
| 2/7/2024   | 750 mg/L               |
| 2/13/2024  | 620 mg/L               |
| 2/14/2024  | 620 mg/L               |
| 2/20/2024  | 560 mg/L               |

Appendix 1: Chloride Concentration Data from Outfall 001

|           |          |
|-----------|----------|
| 3/12/2024 | 420 mg/L |
| 3/13/2024 | 430 mg/L |
| 3/19/2024 | 440 mg/L |
| 3/20/2024 | 470 mg/L |
| 3/26/2024 | 540 mg/L |
| 3/27/2024 | 530 mg/L |
| 4/2/2024  | 490 mg/L |
| 4/3/2024  | 450 mg/L |
| 4/9/2024  | 430 mg/L |
| 4/10/2024 | 420 mg/L |
| 4/17/2024 | 480 mg/L |
| 4/18/2024 | 490 mg/L |
| 4/23/2024 | 540 mg/L |
| 4/24/2024 | 560 mg/L |
| 4/30/2024 | 490 mg/L |