**New Hampshire Small MS4**

**Salt Reduction Plan Template**

**Appendix H**

**##MUNICIPALITY**

**Revised in May 2023 (Year 5)**

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# **Instructions:**

**Important Note (May 2023): This template was updated in Year 5 to now include guidance and resources for Section 3: Actions or Enhanced BMPs for Privately Maintained Facilities that Drain to the MS4.**

**GENERAL DOCUMENT INSTRUCTIONS:**

**This document contains template language that can be used for development of a Salt Reduction Plan. Additional information is provided throughout the document to assist the permittee or user of the document to use the template and develop plans including:**

**Document INSTRUCTIONS (listed in red font)**

**Document NOTES (listed in purple font)**

**BACKGROUND INFORMATION (listed in orange font)**

**Please note that the permittee or user of this document should delete these inserted sections upon completion of the plan template.**

**Language highlighted in yellow requires custom input and should be filled in by the permittee / user.**

**NOTES:**

1. This template has been prepared for permittees with chloride impaired waterbodies (Appendix H), however, any permittee can use this template in place of their Winter Road Maintenance Plan.
2. This template document is intended for permittees that discharge to waterbodies that meet one of the following categories:

* Waterbodies listed as impaired due to chloride in categories 5; or
* Waterbodies listed on the most recent EPA approved New Hampshire Clean Water Act section 303(d) list or New Hampshire Integrated Report under Clean Water Act section 305(b) and are listed as 4B.

1. If a waterbody is listed as 4A that means it has a TMDL. To view approved TMDLs visit the [EPA website](https://www.epa.gov/tmdl/region-1-approved-tmdls-state#tmdl-nh.).

This template does not meet the requirements of Appendix F and is not to be used in place of a TMDL.

**BACKGROUND INFORMATION:**

The permittee has until the end of permit year 3 (June 30, 2021) to complete their Salt Reduction Plan. The permittee then has until the end of permit year 5 (June 30, 2023) to fully implement their Salt Reduction Plan.

Maps of all waterbodies that have chloride impairments have been created by the New Hampshire Department of Environmental Services. These maps include all roads that are within 500 feet of the impaired waterbody. The roads listed within the maps can be used to create low salt or no salt zones. To view the maps go to the Winter Maintenance Page on the [NH MS4 Website](https://www.nhms4.des.nh.gov/nh-resources/winter-maintenance).

The following waterbodies have been identified as having chloride impairments and the towns in which they are located are required to prepare a Salt Reduction Plan. Please note that this list is only up-to-date as of the 2018 New Hampshire 303(d) list. Permittee’s may be added or removed from this list with the release of newer New Hampshire 303(d) lists.

**Chloride impairments based on the 2012 – 2018 water quality assessments**

* Bedford
  + MCQUADE BROOK (NHRIV700060905-12)
  + MCQUESTEN BROOK (NHRIV700060803-16)
* Derry
  + BEAVER BROOK (NHRIV700061203-09)
  + BEAVER BROOK (NHRIV700061203-11)
* Dover
  + BERRY BROOK (NHRIV600030608-15)
  + INDIAN BROOK (NHRIV600030608-06)
* Durham
  + COLLEGE BROOK (NHRIV600030902-09)
  + RESERVOIR BROOK (NHRIV600030902-10)
* Exeter
  + PARKMAN BROOK (NHRIV600030806-04)
* Goffstown
  + CATAMOUNT BROOK (NHRIV700060607-20)
* Greenland
  + PICKERING BROOK (NHRIV600030904-06)
* Hooksett
  + DORRS POND INLET BROOK (NHRIV700060802-13)
* Londonderry
  + BEAVER BROOK (NHRIV700061203-11)
  + LITTLE COHAS BROOK - UNNAMED BROOK (NHRIV700060804-05)
  + SOUTH PERIMETER BROOK (NHRIV700060804-12)
* Manchester
  + BAKER BROOK (NHRIV700060803-08)
  + DORRS POND (NHLAK700060802-01)
  + DORRS POND-E INLET (NHRIV700060802-16)
  + DORRS POND INLET BROOK (NHRIV700060802-13)
  + HUMPHREY BROOK (NHRIV700060803-15)
  + LITTLE COHAS BROOK - UNNAMED BROOK (NHRIV700060804-05)
  + MCQUESTEN BROOK (NHRIV700060803-16)
  + NUTT POND (NHLAK700060803-01)
  + RAYS BROOK (NHRIV700060802-15)
  + SOUTH PERIMETER BROOK (NHRIV700060804-12)
  + STEVENS POND (NHLAK700060803-02)
* Nashua
  + NASHUA RIVER - NASHUA CANAL DIKE (NHIMP700040402-03)
* Portsmouth
  + BORTHWICK AVE TRIBUTARY (NHRIV600031001-09)
  + LOWER HODGSON BROOK (NHRIV600031001-04)
  + NEWFILEDS DITCH (NHRIV600031001-10)
  + PICKERING BROOK (NHRIV600030904-06)
  + SAGAMORE CREEK (NHRIV600031001-03)
  + UPPER HODGSON BROOK (NHRIV600031001-05)
* Rye
  + EEL POND (NHLAK600031002-01)
* Salem
  + POLICY BROOK (NHRIV700061102-17)
  + UNNAMED BROOK - TO HARRIS BROOK (NHRIV700061102-21)
* Seabrook
  + CAINS BROOK - NOYES POND (NHIMP600031004-06)
* Stratham
  + PARKMAN BROOK (NHRIV600030806-04)
* Windham**\***
  + CONNIES BROOK (NHRIV700061204-06)

**\***Added to the impairment list in 2018

The following list of permittees have both chloride impaired waters and chloride TMDLs. Because these four towns have both chloride impaired waters and chloride TMDLs, they must meet the requirements in both appendix H (page 10) and appendix F (page 1) respectively.

* DERRY
  + BEAVER BROOK (NHRIV700061203-16)
* LONDONDERRY
  + BEAVER BROOK (NHRIV700061203-16)
* SALEM
  + POLICY BROOK - PORCUPINE BROOK (NHRIV700061102-18)
* WINDHAM
  + DINSMORE BROOK (NHRIV700061204-01)
  + POLICY BROOK - PORCUPINE BROOK (NHRIV700061102-18)
  + UNNAMED BROOK TO WESTERN EMBAYMENT (NHRIV700061102-23)

# **Historic winter road maintenance activities:**

**INSTRUCTIONS:**

**This part of the plan is optional and intended to document procedures that you have been previously employing.** Briefly describe the permittee’s historic winter road maintenance activities and means taken to reduce salt usage(i.e., use of salt, sand, and/or alternative methods and materials, snow storage and disposal). This should include any type of BMPs, plans or activities that were already in place before adopting these Winter Road Maintenance Procedures. This should include if the permittee uses its own equipment and staff or if work is contracted out, or a combination of both. Place anything in this section that you feel the Environmental Protection Agency (EPA) should know about your historic salt usage if they were to audit this plan.

# **Section 1: Introduction:**

**INSTRUCTIONS:**

Fill in the name of the Municipality and review the Salt Reduction Method options listed under Section 2 of this Template and choose the BMPs for each section that you as an entity are currently using or plan to use after implementing your Salt Reduction Plan. List salt reduction methods in bulleted form below.

This document addresses permit requirements set forth in Appendix H Section IV of the NH Small MS4 General Permit based on one of the following permittee categories:

1. Permittees with discharges to waterbodies that are water quality limited due to chloride in categories 5; or
2. Permittees with discharges to waterbodies that are on the most recent EPA approved New Hampshire Clean Water Act section 303(d) list or New Hampshire Integrated Report under Clean Water Act section 305(b) and are listed as 4B, have to complete this section of Appendix H.

The purpose of this template is to be used as a guide by a permittee’s upper management to help create a plan to reduce salt usage within their MS4 boundaries. By reducing salt usage this will then help to decrease the amount of chloride entering into the chloride impaired waterbodies within the permittee’s MS4 boundaries. This template contains many Best Management Practices (BMPs) that can be implemented to reduce the amount of salt used and meet the requirements of the Small MS4 General Permit. Once this plan is complete, it should be kept in the permittee’s SWPPP. Please note, this plan does not need to be turned into the EPA but could be used if the permittee is selected for an MS4 audit.

This Salt Reduction Plan features BMPs to help reduce the amount of chloride discharging to the impaired waterbodies.

The **##MUNICIPALITY** performs a variety of maintenance activities to ensure safe winter driving conditions on its roads and parking lots as well as activates to limit the amount of snow and/or deicing chemicals entering surface waters. These are described in detail under Section 2 of this document.

The **##MUNICIPALITY** also requires that private property owners track salt usage and develop plans to limit salt application. These are described in Section 3 of this document.

**Section 2: Actions or Enhanced BMPs for Municipally Maintained Surfaces**

**INSTRUCTIONS:**

Review the options listed under this section of the Salt Reduction Template and choose the BMPs for each section that you as the Municipality are currently using or plan to use for implementation of the required Salt Reduction Plan.

There are bulleted BMPs or action items listed under each option and some or all of these action items can be selected for that option based on what the municipality chooses to do.

**NOTES:**

1. The BMP examples in this section are just a few of the many different BMPs that can be used to reduce salt use and runoff.
2. At the end of each action item is a short explanation of the BMPs and a link that leads to more information about the subject including the different options available.
3. Permittees are encouraged to use other BMPs as well that are not located on this list.
4. Sections that have mandatory requirements will be marked with a bold note at the beginning of the instructions section.

This section applies directly to municipally owned and maintained surfaces. This section provides information on how the amount of salt used will be tracked and also includes the different BMPs that will be used as part of this Salt Reduction Plan.

# **Section 2.1: Salt Tracking**

**INSTRUCTIONS:**

**This section is required.** Maintain the language below on how you plan to track annual salt usage for the Municipality.

**BACKGROUND INFORMATION:**

Permit Language (Page 10, section IV.3.A.i.i): *Tracking of the amount of salt applied to all municipally owned and maintained surfaces and reporting of salt use using the UNH Technology Transfer Center* [*online tool*](http://www.roadsalt.unh.edu/Salt/) *beginning in the year 2 annual report.*

The **##MUNICIPALITY** will track all salt applied to all municipally owned and maintained surfaces. Salt use will be reported using the New Hampshire Salt Management System [online tool](http://www.roadsalt.unh.edu/Salt/) beginning in their year 2 annual report.

# **Section 2.2: BMPs for Salt Reduction**

**INSTRUCTIONS:**

For each section, select the activities related to salt reduction below that pertain to your entity, and remove the activities that don’t apply. Add any additional activities not listed that the entity uses, or plans to use in the future.

**NOTES:**

The listed BMPs in the following sections are all optional. A permittee should select the pertinent BMPs for their entity and remove those that do not apply. Sections that have mandatory requirements will be marked with a bold note at the beginning of the instructions section.

**BACKGROUND INFORMATION f**or sections 2.2.1 through 2.2.4.D:

Permit Language (Page 10 - 11, section IV.3.a.i.ii): Planned activities for salt reduction on municipally owned and maintained surfaces, which may include but are not limited to:

* *Operational changes such as pre-wetting, pre-treating the salt stockpile, increasing plowing prior to de-icing, monitoring of road surface temperature, etc.;*
* *Implementation of new or modified equipment providing pre-wetting capability, better calibration rates, or other capability for minimizing salt use;*
* *Training for municipal staff and/or contractors engaged in winter maintenance activities;*
* *Adoption of guidelines for application rates for roads and parking lots. See following examples:*
* *(see NHDES, Chloride Reduction Implementation Plan for Dinsmore Brook, App. J and K (February 2011), http://des.nh.gov/organization/commissioner/pip/publications/wd/docum*[*ents/wd-11-13.pdf*](http://des.nh.gov/organization/commissioner/pip/publications/wd/documents/wd-11-13.pdf)*;*
* *Winter Parking Lot and Sidewalk Maintenance Manual (Revised edition June 2008)* [*http://www.pca.state.mn.us/publications/parkinglotmanual.pdf;*](http://www.pca.state.mn.us/publications/parkinglotmanual.pdf)
* *The application guidelines on page 17 of Minnesota Snow and Ice Control: Field Handbook for Snow Operators (September 2012)* [*http://www.mnltap.umn.edu/publications/handbooks/documents/snowice .pdf*](http://www.mnltap.umn.edu/publications/handbooks/documents/snowice.pdf) *for examples);*
* *Regular calibration of spreading equipment;*
* *Designation of no-salt and/or low salt zones;*
* *Public education regarding impacts of salt use, methods to reduce salt use on private property, modifications to driving behavior in winter weather, etc.; and*
* *Measures to prevent exposure of salt stockpiles (if any) to precipitation and runoff;*

This section describes BMPs to help to reduce the amount of chloride discharged to impaired waterbodies.

The **##MUNICIPALITY** currently uses a number of activities related to winter maintenance and salt reduction which include the BMPs and actions items listed under the following sections.

## **Section 2.2.1 Operational BMPs:**

### **Pre-wetting and Pre-Treating the Salt Pile**

The **##MUNICIPALITY** currently does the following:

* Pre-wetting agents (e.g., salt brine) are used on salt piles to help them work more efficiently and to reduce road salt scatter and bounce.

Pre-wetting is a term referring to a liquid deicer that is applied to a solid-based deicer in order to create a quicker reaction time for the solid deicer to begin melting snow and ice. Salt doesn’t work until it is in solution, so it is recommended that all dry salt be pre-wetted regardless of the temperature. By introducing moisture into salt prior to application, the results are a quicker melting action, reduced bounce and scatter of material, and a reduced application rate. With a quicker melting action, the application rate of pre-wet salt can be decreased by approximately 20 percent over dry salt, which saves money, increases level of service, and reduces chloride in the environment.

**BACKGROUND INFORMATION:**

More information about pre-wetting and pre-treating can be found in the [Pre-Wetting NH Best Management Practices handout](https://www.nhms4.des.nh.gov/sites/g/files/ehbemt636/files/documents/2022-09/prewetting.pdf) on the Winter Maintenance page located on the NH MS4 Website.

### **Increasing Plowing Prior to De-Icing**

The **##MUNICIPALITY** currently does the following:

* As much snow as possible is removed using mechanical means like plowing, blowing, or shoveling before deicing agents are applied to reduce the need for road salt or other deicing chemicals.

Proper plowing of the road is essential to controlling the amount of deicer used. Snow plowing needs to remove as much snow as possible prior to the application of deicers. Snow and ice that is left on the pavement will only work to dilute the deicer that has been applied and decrease the effectiveness. Applying more deicer will have little benefit if the snow is not adhering to the pavement surface, when plowing is the appropriate operation. Therefor it is best to remove as much snow as possible from the roads and parking lots before applying deicers.

### **Roadway Anti-icing (Pre-treatment)**

The **##MUNICIPALITY** currently does the following:

* Designated roadway surfaces are pre-treated with anti-icing agents, such as brine, prior to precipitation to prevent the formation of bonded snow and ice to the roadway surface.

Anti-icing is a proactive approach to roadway winter maintenance and can be the first of a series of practices to manage roadways during a snow / ice storm. It differs from deicing procedures because brine is applied to the roadways before precipitation begins. The intent is to apply freezing point depressants before the storm to prevent the bond from forming between the roadway surface and snow or ice. Low sodium chloride brine is the most effective choice for ant-icing.

**BACKGROUND INFORMATION:**

More information about anti-icing can be found on the [Anti-Icing NH Best Management Practices handout](https://www.nhms4.des.nh.gov/sites/g/files/ehbemt636/files/documents/2022-09/anti-icing.pdf) on the Winter Maintenance page located on the NH MS4 Website.

### **Monitoring of Road Surface Temperatures**

The **##MUNICIPALITY** currently does the following:

* Road surface temperatures are monitored during storm events to find the correct treatment options for those certain circumstances.
* Road salt is only applied when pavement temperatures are above 15° F.
* The NH Road Salt Application Rates for Deicing Roads and Parking Lots charts (located on the webpage linked in the background information section below) is referenced during each storm event to find the appropriate treatment options.

The two most critical factors that can produce winter road hazards are pavement temperature and the dew point/precipitation rate. Pavement temperature, not air temperature, is the deciding factor for treatment type and duration. The pavement temperature directly effects the formation, development, and breaking of a bond between fallen or compacted precipitation and the road surface. The pavement temperature also determines the effectiveness of any applied chemicals.

**BACKGROUND INFORMATION:**

More information about road surface temperatures can be found in the Green SnowPro Manual on the Winter Maintenance page located on the NH MS4 Website.

## **Section 2.2.2 Equipment BMPs / Modifications:**

### **Automated Pre-Wetting Equipment Systems**

The **##MUNICIPALITY** will ensure that:

* Pre-wetting systems are installed on **all or X** municipally owned salting trucks to pre-treat the de-icing agents before it is dispensed onto roads and parking lots.
* Pre-wetting systems are installed on **all or X** contracted salting trucks to pre-treat the de-icing agents before it is dispensed onto roads and parking lots.

Pre-wetting is a term referring to a liquid deicer that is applied to a solid-based deicer in order to create a quicker reaction time for the solid deicer to begin melting snow and ice. Salt doesn’t work until it is in solution, so it is recommended that all dry salt be pre-wetted regardless of the temperature. By introducing moisture into salt prior to application, the results are a quicker melting action, reduced bounce and scatter of material, and a reduced application rate. With a quicker melting action, the application rate of pre-wet salt can be decreased by approximately 20 percent over dry salt, which saves money, increases level of service, and reduces chloride in the environment. Pre-wetting systems or automated systems can help improve the pre-wetting operations during a storm.

**BACKGROUND INFORMATION:**

More information about pre-wetting can be found on the [Pre-wetting Best Management Practice handout](https://www.nhms4.des.nh.gov/sites/g/files/ehbemt636/files/documents/2022-09/prewetting.pdf) on the Winter Maintenance page located on the NH MS4 Website.

### **Routine Calibration Rates & Adjustments**

The **##MUNICIPALITY** currently does the following:

* Equipment is calibrated **each storm/weekly/monthly/yearly** to reduce and optimize salt use and ensure deicing agents are being used efficiently.
* A calibration chart is maintained for each truck. (Calibration charts can be found on the webpage linked in the background information section below)
* Recalibration is completed if any service is done on a truck or the type of deicing chemical being dispensed from the truck is changed.

The goal of calibrating is to know how much material you are putting down on a roadway or parking lot for every setting on your truck that you use. Calibrating your equipment is the first step to reducing salt use.

During winter operations, changes may occur in mechanical linkages, hydraulic systems and other components. Yearly calibration of equipment allows for better control of application rates for various gate heights/openings. Gate heights or gate openings should be adjusted to spread the desired chemical application rate for each set of unique conditions. Recalibration should be done if any changes are made to the equipment or if a different deicing material is used.

**BACKGROUND INFORMATION:**

More information about calibrations can be found on the [Pony Motor-Run Spreader Calibration Best Management Practices handout](https://www.nhms4.des.nh.gov/sites/g/files/ehbemt636/files/documents/2022-09/calibration.pdf) on the Winter Maintenance page located on the NH MS4 Website.

### **Equipment Cleaning & Maintenance**

The **##MUNICIPALITY** currently does the following:

* Equipment is washed using proper procedures stated in the permittee’s SWMP under MCM #6 to prevent pollutants from entering the stormwater system. Dry cleanup procedures are used when possible.
* Designated wash areas contain wash-water controls or treatment and ensure that all washing activities only occur in those locations.
* Equipment is regularly inspected and maintain to reduce the potential for leaks.

During winter operations, proper equipment cleaning and maintenance can help ensure equipment and machinery functions properly and maintains calibration measures for longer periods of time. This may require washing equipment on a more routine basis which can produce wash-water or runoff with higher levels of chloride or sand. For this reason, washing and maintenance procedures should be completed following carefully planned procedures and in proper locations.

## **Section 2.2.3 Facility Modifications and Good Housekeeping BMPs:**

### **Snow Storage**

The **##MUNICIPALITY** will ensure that:

* Snow is not pushed or dumped into waterbodies or wetlands, into stormwater drainage

swales or ditches, or on top of catch basins.

* Snow is not stored near drinking water areas, waterbodies, or wetlands.
* Snow storage is not located in areas that are unstable, areas of potential erosion, or high points where snow may melt and collect debris as runoff before it enters the stormwater system.

Proper snow storage and good housekeeping can help reduce runoff and direct snowmelt from reaching nearby waterbodies and resources, which can minimize chloride loadings.

**BACKGROUND INFORMATION:**

More information about snow storage can be found on the [Snow Disposal Guidelines Fact Sheet](https://www.des.nh.gov/sites/g/files/ehbemt341/files/documents/2020-01/wmb-3.pdf) on the Winter Maintenance page located on the NH MS4 Website.

### **Salt Stockpile BMPs & Protection from Precipitation and Runoff:**

The **##MUNICIPALITY** will ensure that:

* Deicing product(s) (salt, sand, or alternative products) storage piles are located under cover or enclosed areas and on impervious surfaces.
* Deicing product(s) (salt, sand, or alternative products) storage piles are stored in areas that will not impact surface water resources, groundwater resources, recharge areas, and wells.
* The deicing product(s) (salt, sand, or alternative products) storage areas have adequate drainage controls to prevent runoff from entering the stormwater system.
* Appropriate loading and unloading procedures are used, such as not overfill trucks with deicing materials, to reduce the chances of spills.
* The unloading/loading of trucks is performed on impervious surfaces whenever possible.
* Storage/loading areas are frequently swept to reduce the amount of salt, sand, or other

materials that are tracked out.

* Liquid deicing chemicals have secondary storage containment.

In addition to managing how salt is applied to parking lots and roadways, it is also important to manage how dry salt, pre-wet salt, salt brine, salt/sand mixtures, and snow piles are stored and handled.

Chloride storage facilities can contribute to both surface and ground water contamination. The location of a storage facility should not be in an area that is environmentally sensitive. Avoid areas where there are wells, reservoirs, or within the footprint of stratified drift aquifers. Ideally deicing material storage facilities should be completely enclosed, with storage and working areas on impervious surfaces such as asphalt or coated concrete. Buildings should have concrete foundations and can be designed using dome, barn, or fabric style structures.

**BACKGROUND INFORMATION:**

More information about salt storage can be found on the [Storage and Management of Deicing Materials Fact Sheet](https://www.des.nh.gov/sites/g/files/ehbemt341/files/documents/2020-01/dwgb-22-30.pdf) on the Winter Maintenance page located on the NH MS4 Website.

## **Section 2.2.4 Training, Outreach & Regulations**

### **Training and Certifications**

The **##MUNICIPALITY** currently does the following:

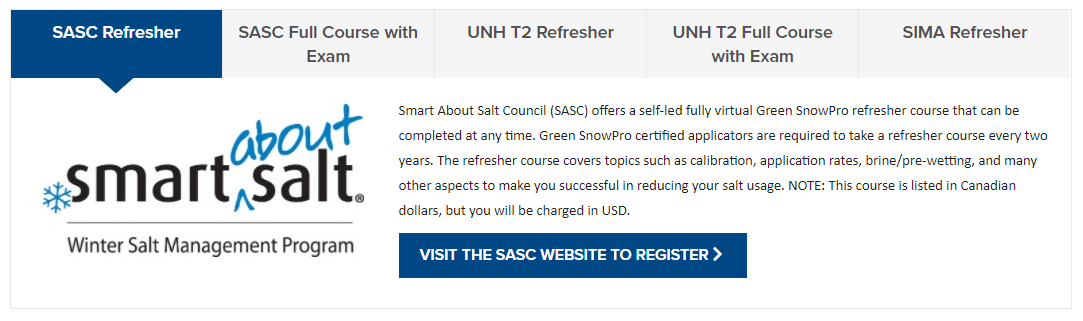
* Training is provided to municipal personnel through the Green SnowPro certification program that is managed by NHDES to improve efficiency in salt use.
* Additional or independent in-house training is provided to municipal personnel to improve efficiency in salt use.

The Green SnowPro certification is a program managed by NHDES to improve efficiency in salt use, such that the least amount of salt is used to ensure safe conditions on surfaces traveled by pedestrians and vehicles in winter conditions; reduce the amount of salt used by commercial applicators, as measured in tons of salt per acre per year, over time while maintaining safe conditions for pedestrians and vehicles in winter conditions; and establish a voluntary system for commercial salt applicators to track their salt use and provide information annually to the salt accounting system.

Training municipal personnel on best winter maintenance and salt reduction practices is the most effective practice you can employ to ensure your team is successful in reducing salt usage. There are a variety of viable options for training your team. Training is offered through the Green SnowPro Program and incorporates both a full course and a refresher course. The full course is a 4-hour course with an exam. The refresher course is 2 hours, and reviews basic practices, with a focus on certain aspects of salt reduction such as brine, calibration, and application rates.

**BACKGROUND INFORMATION:**

Training courses are available through the services of several entities that work with the New Hampshire Department of Environmental Services (NHDES) and are experts within the industry. These include: UNH T2, Axiomatic, the Smart About Salt Council (SASC), and Snow and Ice Management Association (SIMA). Both SASC and UNH T2 offer online courses for your convenience. All courses can be found on the [NHDES Green Snow Pro Program website](http://des.nhdoit.acsitefactory.com/land/roads/road-salt-reduction/green-snowpro-certification) (Look for this image)



Currently municipalities and other governing bodies are unable to be certified under this Program. During the 2020 New Hampshire legislation period, the NHDES proposed a bill to create and implement a municipal salt reduction and certification program. The legislation has been delayed until the 2021 session as a result of the COVID-19 pandemic.

A winter maintenance personnel training log template can be found on the [NH MS4 Website](https://www.nhms4.des.nh.gov).

### 

### **Adoption of Guidelines for Application Rates for Roads and Parking Lots:**

**INSTRUCTIONS:**

If the permittee chooses to use this BMP, the user can insert a chart from the webpage linked in the background information section below to provide details of intended application rates. This chart is optional.

The **##MUNICIPALITY** currently does the following:

* Guidelines have been adopted within the operation plan to apply enough deicer so that plows can remove the snow and ice. The application rate of deicers will be adjusted based on the type of storm, type of agent used, and anti-icing and pre-wetting techniques used.
* Guidelines have been adopted within the operation plan to pre-treat roads before storm events to help prevent ice from forming and to make plowing easier.

The goal of winter operations is to maintain the specified level of service and safety to the public while using the minimum practical amount of deicer. Spreading rates and timing of application are decisions that need to be made based on variables in weather conditions. By adopting NHDES’s application rates you can save money on salt usage and also help to reduce the amount of chloride ending up in your MS4’s impaired waterbodies. See the application rate charts on the webpage linked in the background information section below for the current salt application rate depending on the different factors of the weather event which include; the pavement temperature, weather condition and type of salt being used.

**BACKGROUND INFORMATION:**

More in about salt application rates can be found on the [NH MS4 Website](https://www.nhms4.des.nh.gov).

### 

### **Designation of Low Salt and/or No Salt Zones:**

**INSTRUCTIONS:**

If the permittee chooses to use this BMP, they have two options on how to approach it. These are provided in the document notes section below. Once an option is chosen, list the low salt and no salt areas below.

The permittee should insert a list of streets or designated zones under each of the following categories and may include methods to manage salt usage in those areas.

**NOTES:**

If the permittee chooses to use this BMP, they have the following two options:

* **Option 1:**

If the permittee already has designated areas of low salt and/or no salt zones, then provide details on where those areas are.

* + **Option 2:**

If the permittee doesn’t have designated areas of low salt and/or no salt zones, use the maps of all the waterbodies that are water quality limited for chloride, located on the [NH MS4 Website](https://www.nhms4.des.nh.gov), as a starting point. Look at the maps and look closely at the roads that are within the 500-foot buffer. Then designate the whole road or just those sections of the road as low salt and/or no salt zones.

The **##MUNICIPALITY** will ensure that roads within 500 feet of waterbodies that are water quality limited for chloride will be designated as low salt or no salt zones to reduce chloride loadings.

These areas and any additional areas include the following:

The **##MUNICIPALITY** has the following **streets or zones designated** as low salt areas:

* + **A Street**
  + **Designated Area B**

The **##MUNICIPALITY** has the following **streets or zones designated** as no salt areas:

* + **C Street**
  + **Designated Area D**

**BACKGROUND INFORMATION:**

500 feet was chosen as the distance for the low salt or no salt zones by Patrick Santoso from the University of New Hampshire. 500 feet was decided upon because NHDES guidelines state that salt and salt brine should be stored at least 500 feet away from Class 2 waterbodies.

### 

### **Public Education:**

**INSTRUCTIONS:**

If the permittee chooses to use this BMP, the user should select from the list below or add custom topics that are covered to the list. The user can also insert additional examples or links to educational materials that are used. Educational material examples can be found on the webpage located in the background information section below. This additional information is optional.

The ##MUNICIPALITY provides public education covering the following outreach topics:

* + - Impacts of salt use;
    - Methods to reduce salt use on private property;
    - Modifications to driving behavior in winter weather;
    - Any other educational information about salt/ winter maintenance;

Educating the public can also be a good way to help reduce the amount of chloride that ends up in the permittee’s waterbodies. By educating the public on various chloride/winter related issues, they can reduce their salt use as well.

**BACKGROUND INFORMATION:**

Educational material examples and resources can be found on the [NH MS4 Website](https://www.nhms4.des.nh.gov).

# **Section 2.3: Estimate of Annual Salt Usage Reductions**

**INSTRUCTIONS:**

**This section is required.**

Use the blank table provided below to provide an estimate on the amount of salt that the corresponding BMP will save from being used. Reduction estimates listed under the data table provided in the background information section below can be used to make a list of all the BMPs that your entity is planning to use from Section 2.2 and the corresponding salt reduction. If alternate methods for reduction estimation are used or if other BMPs are chosen, the user should reference a specific source or method of reduction estimation.

At the bottom of the table in the “Estimated Salt Reduction Total” column is a spot to put the total amount of salt that is expected to be reduced from all of your chosen BMPs.

**BACKGROUND INFORMATION:**

Permit Language (Page 11, section IV.3.A.i.iii*): An estimate of the total tonnage of salt reduction expected by each activity;*

The following chart provided by SBSC can be used for reference to provide estimates for salt reduction or other references/reduction estimate methods can be used:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **BMP** | **Municipal Recommendations** | **Reduction of Salt**  **% Per Storm** | **Estimated Cost** | **Estimated Annual Savings (Assumed usage: 4,000 ton annually @$80/ton)** |
| **Spreader Calibration** | Calibrate all spreaders minimally annually to ensure accurate | 5-30% (dependent on existing usage) | 2 Staff @ 1hr/spreader ($200/ spreader)  For 10 trucks $2,000 | At 5% savings $16,000  At 30% savings $96,000 |
| **Adapt Rates to Pavement Temperatures** | Utilize Lower application rates at warmer pavement temperatures. | 5-10% (dependent on existing usage) | Hand Held Temp. $100/per  $1,000 for 10 staff  Truck Mounted $500/Per  $5,000 for 10 trucks | At 5% savings $16,000  At 10% Savings $32,000 |
| **Pre-Treated Salt** | Utilize pre-treated salt | 20% Reduction | $10 additional cost per ton  for 4,000 tons $40,000 | at 20% savings $64,000 |
| **Ground-Speed Controls** | Equip trucks with ground speed controllers[[1]](#footnote-1)[1] | 5% Reduction | $700 per spreader  For 10 Trucks $7,000 | At 5% savings $16,000 |
| **Anti-Icing[[2]](#footnote-2)[2]** | Utilize Anti-Icing in advance of Storms | 20% Reduction | $20,000 Brine Maker  $15,000 Storage Tanks  $150,000 Tanker Truck  $185,000 Total Investment | At 20% Savings $64,000 (breakeven in ~3 years)  At 10% Savings $32,000 (breakeven in ~6 years) |

The **##MUNICIPALITY** has estimated anticipated salt reduction based on the BMPs listed in this Salt Reduction Plan and these estimates are summarized and totaled in the table below:

**Estimated Salt Reduction Table**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **BMP or Activity** | **Estimated Loading**  **per storm**  **(tons)** | **Estimated % Reduction per storm** | **Estimated Reduction per storm**  **(tons)** | **Estimated Storms**  **per year**  **(#)** | **Estimated Salt Reduction Total**  **per year per BMP**  **(tons)** |
|  |  |  |  |  |  |
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|  |  |  |  |  |  |
|  |  |  |  |  |  |
| **Estimated Salt Reduction Total:** | |  | | | |

# **Section 2.4: Schedule of Planned Activities / BMPs**

**INSTRUCTIONS:**

**This section is required.**

Use the blank table provided below to make a list of all the BMPs and activities that your entity is planning to use from Section 2.2. List the date(s) the BMP or activity is planned to be implemented. As the BMPs and activities are completed throughout the coming years, put the date they are completed in the last row.

**BACKGROUND INFORMATION:**

Permit Language (Page 11, section IV.3.A.i.iv): *A schedule for implementation of planned activities including immediate implementation of operational and training measures, continued annual progress on other measures, and full implementation of the Plan by the end of the permit term.*

The **##MUNICIPALITY** has developed a schedule for implantation of this Salt Reduction Plan based on the BMPs listed above. The anticipated schedule with milestone tracking dates is summarized in the table below:

**Schedule of Planned Activities Table**

|  |  |  |
| --- | --- | --- |
| **BMP or Activity** | **Date(s)**  **Implemented:** | **Date(s) Completed:** |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
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|  |  |  |

# **Section 3: Actions or Enhanced BMPs for Privately Maintained Facilities that Drain to the MS4**

**INSTRUCTIONS:**

Review the options for the sections below and choose actions or BMPs for each section that you as the permittee have completed or plan to complete by the end of Year 5.

# 

# **Section 3.1: Identification of Private Parking Lots**

**INSTRUCTIONS:**

**This section is required.**

*Choose one of the following options:*

*Attach the Appendix H: Private Parking Lots with 10 or More Parking Spaces spreadsheet, under “Chloride” on the permittee’s* [*Permittee-Specific Resources*](https://www.nhms4.des.nh.gov/nh-resources/permittee-specific-resources) *page on the NH MS4 website, to this Plan as Attachment A.*

***OR***

*Attach the list of private parking lots with 10 or more parking spaces draining to the MS4 that the permittee created to this Plan as Attachment A.*

**BACKGROUND INFORMATION:**

Permit Language (Page 11, section IV.3.b.i): *Identification of private parking lots with 10 or more parking spaces draining to the MS4;*

**##MUNICIPALITY** has identified and compiled a list of private parking lots with 10 or more parking spaces draining to the designed MS4 area. This list of private parking lots can be found in Attachment A of this plan.

The list of private parking lots with 10 or more parking spaces draining to the designed MS4 area was prepared by a collaborative effort between the UNH Stormwater Center and New Hampshire Department of Environmental Services. For all of **##MUNICIPALITY's** private parcels containing buildings, if known, the building area was removed from the parcel's total impervious cover. The remaining impervious area was then considered to be paved impervious cover, such as parking lots and driveways. It was then estimated that a typical parking lot containing 10 parking spaces had an approximate area of 185 m2. Based on this calculation, only parcels with a minimum of 185 m2 of impervious cover were included in **##MUNICIPALITY's** list.

**OR**

**##MUNICIPALITY’s** list of private parking lots with 10 or more parking spaces draining to the designed MS4 area was created by ##enter how permittee created the list.

# **Section 3.2: Requirements for Private Parking Lots**

**INSTRUCTIONS:**

**This section is required.**

*Adopt or start the process to adopt regulations that require private parking lot and street owners and operators to use commercial salt applicators trained and certified in accordance with Env-Wq 2203 (which is to be Green SnowPro certified) and to also report their annual salt usage to either the New Hampshire Green SnowPro Program or directly to the permittee. Example regulation language is below:*

*Snow and ice removal shall be performed by a contractor certified by the New Hampshire Green SnowPro Program following best management practices for the application of deicing materials.*

***AND***

*Reference the Appendix H: Private Parking Lots with 10 or More Parking Spaces spreadsheet, under “Chloride” on the permittee’s* [*Permittee-Specific Resources*](https://www.nhms4.des.nh.gov/nh-resources/permittee-specific-resources) *page on the NH MS4 website, to determine the addresses of the private parking lots with 10 or more parking spaces draining to the permittees MS4 area. Using the addresses provided in this spreadsheet, send these private parking lots and streets a copy of both the* [*Winter Maintenance Outreach Letter*](https://www.nhms4.des.nh.gov/sites/g/files/ehbemt636/files/documents/2022-06/ms4-chloride-outreach-letter.docx) *and* [*Winter Maintenance Outreach Brochure*](https://www.nhms4.des.nh.gov/sites/g/files/ehbemt636/files/documents/2022-06/ms4-chloride-brochure.docx)*, located on the Winter Maintenance page of the NH MS4 website.*

**BACKGROUND INFORMATION:**

Permit Language (Page 11, section IV.3.b.ii): *Requirements for private parking lot owners and operators and private street owners and operators (1) that any commercial salt applicators used for applications of salt to their parking lots or streets be trained and certified in accordance with Env-Wq 2203, and (2) to report annual salt usage within the municipal boundaries using the* [*UNH Technology Transfer Center online tool*](http://www.roadsalt.unh.edu/Salt/) *or report salt usage directly to the permittee, in which case this information should be reported on the permittees annual report.*

In **##Year ##MUNICIPALITY** adopted regulations requiring private parking lot and street owners and operators to use commercial salt applicators trained and certified in accordance with Env-WQ 2203. Private parking lot and street owners and operators are required to either report their annual salt usage to the New Hampshire Green SnowPro Program directly or supply their annual salt usage to **##MUNICIPALITY** so it can then be reported in **##MUNICIPALITY’s** annual report.

**OR**

**##MUNICIPALITY** plans to adopt regulations in **##Year** requiring private parking lot and street owners and operators to use commercial salt applicators trained and certified in accordance with Env-WQ 2203. Private parking lot and street owners and operators will be required to either report their annual salt usage to the New Hampshire Green SnowPro Program directly or supply their annual salt usage to **##MUNICIPALITY** so it can be reported in **##MUNICIPALITY’s** annual report.

**##MUNICIPALITY** sent an outreach letter and brochure to the owners and operators of private parking lots with 10 or more parking spaces draining to the designed MS4 area which were identified in Part 3.1 of this Plan. The outreach materials informed the owners and operators that they are required to use commercial salt applicators trained and certified in accordance with Env-Wq 2203 and that they are required to either report their annual salt usage to the New Hampshire Green SnowPro Program directly or supply their annual salt usage to **##MUNICIPALITY**. The letter and brochure contained links to where additional information could be found out about the New Hampshire Green SnowPro program, including a database that includes all currently certified Green SnowPro contractors.

# **Section 3.3: New Development and Redevelopment**

**INSTRUCTIONS:**

**This section is required.**

*Adopt or start the process to adopt regulations that require new development and redevelopment projects to take steps to minimize salt usage and track and report the amounts of salt used to the New Hampshire Green SnowPro Program. Example regulation language is below:*

*In urbanized areas that are subject to the EPA MS4 Stormwater Permit, any new*

*developments and redevelopment projects shall submit a description of measures that will*

*be used to minimize salt usage, that any commercial salt applicators used for applications of salt*

*to their parking lots or streets be trained and certified in accordance with Env-Wq 2203 and track*

*and report amounts of salt applied using the UNH Technology Transfer Center online tool*

*(http://www.roadsalt.unh.edu/Salt/) in accordance with Appendix H of the NH MS4 Permit.*

**BACKGROUND INFORMATION:**

*Permit Language (Page 11, section IV.3.b.iii): Requirements for new development and redevelopment to minimize salt usage, and to track and report amounts used using the* [*UNH Technology Transfer Center online tool*](http://www.roadsalt.unh.edu/Salt/)*.*

In **##Year ##MUNICIPALITY** adopted regulations requiring new development and redevelopment projects to take steps to minimize salt usage and track and report the amounts of salt used to the New Hampshire Green SnowPro Program.

**OR**

**##MUNICIPALITY** plans to adopt regulations in **##Year** requiring new development and redevelopment projects to take steps to minimize salt usage and track and report the amounts of salt used to the New Hampshire Green SnowPro Program.

# **Attachment A**

# **List of Private Parking Lots with 10 or More Parking Spaces**

1. **[1]** Depending on age and equipment not all trucks can be equipped with ground-speed controllers. [↑](#footnote-ref-1)
2. **[2]** Estimated annual savings do not account for reduced staff time due to less application of de-icing chemicals outside of normal operating hours. Material cost of brine is considered in the % reduction of salt used. [↑](#footnote-ref-2)