



Salt Management Plan

Updated September 2021

PREAMBLE

The transportation system of any community is relied upon by all of its members, to provide access to homes and businesses, for the transportation of goods and services and for emergency services. The safety, reliability and affordability of a transportation system is a reflection of the quality of life sustained in that community.

In Canada, the winter season brings inclement weather conditions that threaten the ability to maintain the transportation system that so many depend on in their daily lives. In order to maintain the system, we must use chemical deicers to ensure that public safety is reasonably ensured when snow and ice conditions negatively impact road conditions.

In December of 2001, the Federal Ministers of the Environment and Health published in the *Canada Gazette, Part 1*, a statement of their intention to recommend that road salts be added to *Schedule 1 of the Canada Environmental Protection Act, 1999*, as a substance on the *Priority Substances List* and, pursuant to the Act, notified of the intention to issue *Codes of Practice* respecting pollution prevention and other procedures respecting the release limits for environmental control relating to works and operations. In doing so, the Ministers effectively designated road salts as toxic to the environment.

In establishing the *Code of Practice for the Environmental Management of Road Salts*, organizations involved in the application of road salts as part of their winter maintenance programs became subject to the rules and regulations of the *Canada Environmental Protection Act* with the particular requirement to prepare, implement and file a *Salt Management Plan* that would include statements and proof of implementation of best management practices to protect the environment from the negative impacts of road salts.

The Code applies specifically to:

- Organizations that use more than 500 tonnes of road salts per year (5 year rolling average); and
- Organizations that have vulnerable areas in their territory.

The County of Northumberland falls within both of these criteria, using more than 500 tonnes of road salt per year combined with having vulnerable areas in our territory. As such, we are subject to the *Code of Practice for the Environmental Management of Road Salts* and must file annually a *Salt Management Plan*.

In consideration of the requirement file a *Salt Management Plan*, this document has been prepared to permit the County to comply with the *Code of Practice*. It must be recognized that this *Plan* will be subject to change, updating and continuous improvement to be modified to reflect organizational changes, technological changes and new operational procedures and best practices as they become available.

1.0 County of Northumberland – Salt Management Policy

1.1. Mandate

The County of Northumberland will be recognized as a leader in using de-icers in an environmentally sensitive manner while providing for a safe and passable transportation system as required by level of service policies established by Council in consideration of severe weather conditions experienced during the winter season, while striving to minimize the impact of salt to the environment and with consideration for best management practices and emerging technologies intended to support an efficient and effective winter control program.

1.2. County Council Resolution

Whereas the Council of the Corporation of the County of Northumberland is committed to ensuring that the transportation system is maintained in accordance with the approved service level policy while remaining committed to reducing the impacts that de-icing chemicals, such as salt, have on the environment, and;

Whereas the Canadian Environmental Protection Act, 1999, identifies road salt on the Priority Substances List as a substance that, under conditions, may have an immediate or long term harmful effect on the environment, and;

Whereas the Canadian Environmental Protection Act, 1999, establishes the “Code of Practice for the Environmental Management of Road Salts”, and;

Whereas the Code applies to organizations that use more than 500 tonnes of road salts per year and organizations that have vulnerable areas in their territory;

Now therefore be it resolved that the Council of the Corporation of the County of Northumberland endorses the Salt Management Plan as a mechanism to reducing salt use while maintaining driver safety as the most important priority.

Passed this date April 20, 2005.

Resolution No. CC 108:04:05

2.0 Current Winter Maintenance Program

2.1 The System Maintained

The major activities related to winter maintenance are:

- anti - icing
- snow plowing
- salt / sand spreading
- salt and sand storage
- snow removal/disposal
- snow storage
- effective fleet and equipment maintenance
- weather forecasting / monitoring
- winter patrol
- staff training

The County of Northumberland is responsible for winter maintenance on:

Road Type	Total Length
Paved roads	397 km
Surface treated roads	107 km
Unpaved roads	0 km
Sidewalks	0 km
Paths and Trails	94.21 km (Bicycle Trail)

County roads have been classified (Class 1-6) per Reg. 239/02 which is based on the posted/regulated speed and annual average daily traffic (AADT) in order that Level of Service and/or Minimum Maintenance Standards can be set for each classification of road. Road classifications are defined in the County's "Winter Control Quality Standard", Policy No. WC 04-01.

2.2 Level of Service Policy

The County of Northumberland document entitled "Winter Control Quality Standard" is the policy and procedure document approved by County Council that defines the standard that is to be achieved on County roads in the defined winter period of November 1st to April 1st. From October 1 to April 30, the standard is to monitor the weather, both current and forecast to occur in the next 24 hours, once every shift or three times per calendar day, whichever is more frequent, at intervals determined by the municipality.

Policy No. WC 04-01 includes information concerning the following items:

- Road classifications
- Quality standard to be achieved
- Preseason preparation
- Snow dump locations
- Snow Removal locations
- Application rates of sand, salt and anti-icing brine
- Activities, such as: prior to a storm event, during a storm event, after a storm event and between storm events

2.3 Winter Patrol

The County of Northumberland carries out winter patrol 24 hours per day/7 days per week (when required). Effective November 14th, 2021, until April 30th, 2022, Northumberland County will operate under two Patrol Areas during both day and night shift on a trial basis. There will be a rotating schedule for the Construction/Maintenance Supervisors with two Supervisors working the day shift and one Supervisor working the night shift. There will continue to be two night patrollers, one for each patrol area. Supervisors and patrollers will be using radio equipped trucks and cellular phones.

In each of the patrol areas, the Supervisors and patrollers provide road condition inspection during the winter season. They are responsible for mobilizing winter maintenance operators to ensure that the roads are cleared in a timely fashion while remaining in compliance with established service standards. Each of the Supervisors are familiar with local conditions in their patrol area and prepare a condition log of road and weather conditions as well as any actions taken during the shift.

On weekends and statutory holidays, the Supervisor on-call completes a representative patrol route each day, prepares a condition log of road and weather conditions and any actions taken.

2.4 Staffing and Hours of Work

The County of Northumberland document entitled “Winter Maintenance Operations Booklet” provides a list of the equipment and routes assigned to each operator. The County is divided into 2 patrol areas for day and night shifts under the assigned responsibility of rotating Supervisors.

The County of Northumberland adheres to the hours of work as set out in the Highway Traffic Act, O. Reg. 4/93. When the driver has completed 13 hours driving time in his/her 14 hour on-duty time, he/she then is sent home for the 10 hour off-duty period before driving the next shift. Hours of work are tracked on a daily basis and can be forecasted utilizing an estimating spreadsheet and weather condition forecasts to ensure that the maximum permitted hours of driving may not be compromised. In the event that hours are projected to exceed the maximum allowable, staff are ordered to stand down from on-duty time.

2.5 Winter Materials Used Annually

Solids

Material	2020/2021	5 Year Average
Rock Salt (NaCl)	2,746.9 tonnes	1,751 tonnes
Sand	13,049.73 tonnes	27,142 tonnes

Liquids

Material	2020/2021	5 Year Average
Salt Brine (NaCl)	0 litres	137,102 litres
Calcium Chloride (CaCl ₂)	0 litres	0 litres
Magnesium Chloride (MgCl ₂)	74,647 litres	35,899 litres

Pre-treated Material

Material	2020/2021	5 Year Average
Pre-treated sand	0 tonnes	0 tonnes
Pre-treated salt	2,356.5 tonnes	5,133 tonnes

2.6 Application Rates

The County of Northumberland document entitled “Winter Maintenance Operations Booklet” provides the application rates approved for County roads.

Solids

Highway Class	Spreading Rates for Salt (per 2 lane kilometer)	Spreading Rates for Sand (per 2 lane kilometer)
Class 1	n/a	n/a
Class 2	130 kg/km	600 kg/km
Class 3	130 kg/km	600 kg/km
Class 4	130 kg/km	600 kg/km

Liquids

Highway Class	Spreading Rates for Magnesium Chloride (MgCl ₂)
Class 2, 3 and 4	25L per lane km

2.7 Equipment - Winter Maintenance Fleet

The County of Northumberland document entitled “Winter Maintenance Operations Booklet” provides an inventory of municipal equipment used for winter maintenance.

2.8 Yard Facilities

The County of Northumberland document entitled “Winter Maintenance Operations Booklet” provides the list of patrol yards from which the winter maintenance operations are conducted.

2.9 Snow Removal and Disposal

The County of Northumberland document entitled “Winter Control Quality Standard” provides the list of snow removal and disposal locations.

2.10 Weather Monitoring

Weather monitoring is conducted in accordance with the “Winter Control Quality Standard”.

2.11 Internal Communications

Communications equipment is detailed in the document entitled “Winter Control Quality Standard”.

2.12 External Communications & Public Education

Communications with the public are provided through various mechanisms:

- Public meetings with County Council attended by the media
- Publish “Winter Maintenance Operations Booklet” and distribute to all affected agencies
- County website notices
- Periodic announcements in newspaper
- Social media posts

2.13 Training

The County of Northumberland maintains a minimum level of training related to winter control operations, dependent of the job classification of the individual staff member.

Job Class	Training	Frequency
Road Operations	Northumberland Road Builders Association meetings	Quarterly
	RWIS - Weather Forecasting	Once
	Intermunicipal Public Works Committee	Quarterly
	Proper use of infra-red thermometers	Once
	Interpretation of weather and pavement conditions	Once
	Ontario Good Roads Association	On-going

Job Class	Training	Frequency
Road Supervisor	Northumberland Road Builders Association meetings	Quarterly
	Salt Smart – T.A.C. Train-the-Trainer	Once
	RWIS - Weather Forecasting	Once
	Proper use of infra-red thermometers	Once
	Interpretation of weather and pavement conditions	Once
	Combination Plow Training	Once
	Ontario Good Roads Association	On-going
	Patroller Course	Once

Job Class	Training	Frequency
Operator	Driver training updating	As needed
	Bi-annual staff meeting – fall & spring session	Bi-annually
	Annual updating of winter maintenance routes	Annually
	Winter road patrol sheets - Proper record keeping	Annually
	Proper use of infra-red thermometers	Once
	Combination Plow Training	Once
	Ontario Good Roads Association	On-going
	Patroller Course	Once

2.14 Record Keeping & Reporting

The following is a list of all records and reports maintained throughout the designated winter period of November 1st through to March 30th:

- Salt/sand and salt brine inventory. This is an inventory record of salt materials delivered to the works yards, that includes the date of delivery, the supplier's name, the quantity etc.
- Road Patrol. These are daily records of road conditions, as observed & documented by the Supervisor or Patroller.
- GPS/AVL vehicle reports. These are reports generated by GPS/AVL units, installed on vehicles, detailing the date, time, speed, trip length etc.
- Dickey-John, Ace & Cirus Spreaders. This is continuous reporting of the application of materials on roadways, from the units installed on the trucks.
- Daily Activity Reports. These are daily records of Operator activities performed throughout the shift.

2.15 Response Procedure to Uncontrolled Salt Releases

If salt spills while spreading or controls have become misadjusted to cause an overabundance of salt being placed, the operator shall notify the supervisor immediately, with the location and the amount of the spill.

The supervisor shall determine, based on the location, the size of the spill and timing (i.e. during the storm or at night, etc.), how and when to respond. The supervisor shall dispatch required resources to clean up the spill at the earliest practicable time.

The clean-up may range from hand sweeping to loader to mechanical sweeper. Every effort will be made to limit salt runoff from these spills from entering environmentally sensitive areas.

3.0 Looking to the Future: Continuous Improvement Practices and Strategies

The current winter maintenance policies and practices form the baseline or benchmark upon which improvements can be made to manage the use of road salt more effectively and in turn its impact on the environment.

3.1 Activities and Goals to Salt Reduction

The County of Northumberland has prepared a multi-year work plan to improve the management of road salt and its winter maintenance policies, practices, and procedures.

The following table is intended to provide an assessment and priority ranking of potential initiatives for salt management improvement.

This is reflective of the status of the County of Northumberland since March 2005.

Item	Activity	Goal	Status / Implementation Timing
1	Minimum Maintenance Standards for Municipal Highways O. Reg. 239/02	O. Reg. 239/02 Minimum Maintenance Standards for Municipal Highways defines the objectives to be achieved, relative to the public transportation system, in the delivery of the winter maintenance program, while considering variables such as weather conditions, availability	Currently implemented
2	Weather Forecasting	Provide access to weather information and training on interpreting weather information for all staff with decision making authority; snow and ice control will be	Currently implemented
3	Advanced Weather Reporting Systems	On an annual basis, supervisory staff will review and update all providers of advanced weather reporting systems, along with appropriate training on the	Currently implemented
4	Pavement Temperature Sensors	Fit all patrol vehicles with pavement temperature sensors to assist with determining the effectiveness of de-icers.	Currently implemented. 3 Supervisor vehicles, 2-night patrol vehicles, and 1 spare vehicle
5	Storm Response	Document all actions and measures taken by all resources in responding to the	Currently implemented
6	Communications & Public Education	Provide Information to the public on the policies and practices of the operations in maintenance programs during the winter months, through various mediums such as press releases, handouts,	Currently implemented
7	General Technology Advancements	Review and keep abreast of changing technology.	Currently implemented

Item	Activity	Goal	Status / Implementation Timing
8	Anti-icing & pre-wetting equipment	Review and keep abreast of changing technology.	Currently implemented. Do not currently use pre-wetting equipment.
9	GPS /AVL Automatic Vehicle Locators	Provide all vehicles with an automatic vehicle locator recorder to assist with tracking	Currently implemented
10	Material Delivery	Monitor deliveries to reduce the loss of salt during delivery	Currently implemented
11	Material Storage	Monitor existing storage facilities to determine the potential extent of contamination from salt infiltration to assess impacts on the grounds and	New storage facility constructed in 2016; salt shed in Plainville with 300 tonne capacity.
12	Sand/Salt Blends	As defined in the “Winter Maintenance Operations	Currently implemented
13	Equipment Purchasing Standards	Consult with equipment operators of winter plowing equipment as part of the tender specification	Currently implemented
14	Good Housekeeping Practices	Follow practices to ensure improvements to salt management practices at storage facilities.	Conduct annual meeting with staff during which practices are reviewed and updated.
15	Equipment Washing	Conduct all vehicle washing indoors and pass wash water through oil/water separators before being discharged.	Construction of a new bay at our Morganston Depot & Cobourg Depot.
16	Electronic Spreader Controls	Equip all newly acquired winter roads plowing equipment with electronic spreader controls through attrition.	All new equipment is equipped with controls (100% for 2017/2018 season)
17	Material Use Record Keeping	Document the material use by each vehicle for each storm and occasionally compared to confirm the spreader calibration. Use AVL and	Currently implemented

Item	Activity	Goal	Status / Implementation Timing
18	Spreader Calibration	The Fleet manager and contractor will calibrate all spreader controls prior to the commencement of the winter maintenance season to ensure consistency of reporting with	Currently implemented
19	Contracted Services	Contractors engaged to provide winter maintenance services will be instructed in the current policies of the operations and will be required to have all roads plowing equipment fitted with	Contractors are only utilized on as-needed basis and are provided policies
20	Winter Patrol	Manager reviews procedures with staff in order to define general parameters for patrol staff to consider in the decision-making process to be	Currently implemented
21	Training	Maintain all training and records of training in personnel files in the	Currently implemented
22	Snow Removal Procedure	As defined in the "Winter Maintenance Operations	Currently implemented
23	Snow Disposal Procedure	As defined in the "Winter Maintenance Operations	Currently implemented

3.2 Current Maintenance Practices As Measured Against Best Management Practices

The following provides an assessment of current practices against recommended best management practices, including those contained in the TAC Synthesis of Best Practices.

Situational Analysis On Road Use:

The type and amount of chloride freeze point depressant used, including all sources of solids, liquids and abrasive mixes are listed below:

- Salt (sodium chloride) approximately 2,746.9 tonnes used annually (2020/2021)
- Treated Salt approximately 2,356.5 tonnes used annually (2020/2021)
- Magnesium Chloride anti-icing solution (MgCl₂) approximately 74,647 litres (2020/2021)

The type and amount of non-chloride freeze point depressant used, including all sources of solids, liquids, and abrasive mixes are listed below:

- Sand approximately 13,049.73 tonnes used annually (2020/2021)

The current application rate for each type of material is listed below:

- Salt - 130kg per 2 lane/km
- Sand - 600kg per 2 lane/km
- Magnesium Chloride (MgCl₂) - 25L per 2 lane/km

The percentage of fleet with pre-wetting

0%

The percentage of fleet with liquid only applications, Anti-Ice Units (2)

10%

The percentage of fleet with electronic spreader controls

100%

The number of road weather information systems (RWIS) installations

0%

The number of surface temperature measuring devices (hand-held/vehicle mounted)

10

The use of dedicated pavement and/or atmospheric forecasting

0

Salt Vulnerable Areas:

Examples of Possible Salt Vulnerable Areas are listed below:

- Groundwater recharge areas
- Areas with exposed or shallow water tables with medium to high permeability soils
- Sources of drinking water
- Salt-sensitive wetlands
- Small ponds and lakes
- Rivers with low flows
- Salt-sensitive agricultural area
- Salt-sensitive habitats for species at risk

Locations of salt vulnerable areas are to be determined through consultation with area municipalities and Conservation Authorities.

Description of winter maintenance practices in the vicinity of salt vulnerable areas are sanding, salting and use of salt brine.

Number and capacity of County Operated storage sites:

Yard Location	Type of Building	Capacity within Building
Plainville Yard	Dome	4000 tonnes - sand
Plainville Yard	Covered Shed	280 tonnes – salt
Veronica Street	Dome	4000 tonnes - sand
Veronica Street	Covered Shed	280 tonnes – salt
Morganston Depot	Dome	9000 tonnes - sand
Morganston Depot	Covered Shed	280 tonnes – salt
Campbellford (Trent Hills)	Dome	4000 tonnes - sand
Roseneath	Dome	4000 tonnes - sand
Roseneath	Covered Shed	200 tonnes – salt
Brighton (MTO)	Dome	4000 tonnes – sand/salt mix
Grafton (MTO)	Covered Shed	1000 tonnes – sand/salt mix
Port Hope (MTO)	Covered Shed	800 tonnes – sand/salt mix
Canton (MTO)	Dome	6000 tonnes – sand/salt mix

The percentage of sand/salt piles covered and type of cover (permanent)	100%
The percentage of indoor loading	25%
Management of drainage from sand/salt mix piles	0%
Levels of environmental indicators (e.g.) chloride levels	not available
The percentage of salt in winter sand	15%
Treated salt in winter sand	10%
The percentage of sites with wash water treatment	100%
The existence of good housekeeping practices	Yes

Snow Disposal Sites

Number and capacity of disposal sites (permanent and/or temporary)

Location of Site	Available Capacity
Plainville Yard, County Road 18	Approximately 1000 cubic metres
Weatherson Pit, County Road 29	Unlimited
Packards Pit, County Road 21	Approximately 1000 cubic metres
Roseneath, County Road 45	Approximately 1000 cubic metres
Trent Hills Public Works Yard	Approximately 2000 cubic metres

The percentage of disposal sites with water management systems 0%

Conformance with existing environmental standards for snow disposal sites Yes

Training

Existence of a good housekeeping practices Yes

Percentage and frequency of staff receiving training in best salt management practices broken down into categories (i.e.) managers, supervisors and operators:

Position Title	% of Staff Trained	Frequency of Training
1 Operations Manager	100	Annually
3 Road Supervisors	0	Annually
20 Frontline Staff	50	Annually

Documentation (Policies, Procedures & Guidelines)

- Level of Service for each roadway type True
- Salt and sand application rates True
- Managed sand and salt storage True
- Good Housekeeping practices for maintenance yards consistent with TAC's Design and Operation of Road Maintenance Yards Synthesis of Best Practices True
- Equipment calibration and recalibration True
- Training True
- Snow disposal True

- Incorporation of salt management consideration
Into road design and construction True
- Salt vulnerable areas False

3.3 Documentation of Policies and Procedures

The County of Northumberland has in place the following documents:

- Winter Control Quality Standards
- Winter Maintenance Operations Booklet
- Complete Documentation of Sand & Salt Usage

3.4 Monitoring of the Effectiveness of the Plan

Within the **Code of Practice for the Environmental Management of Road Salts**, Annex C: Monitoring and Measuring Progress is included in order to establish a common approach to monitoring and measuring the progress of an organization in the use of road salt, implementation of best management practices and the concentration of road salt in the environment.

Environment Canada has developed a template Annual Report Form of the basic information to be collected and reported. The County of Northumberland will utilize this template form for the purpose of providing consistency of information reporting to the federal agency.

3.5 Yearly Review of the Plan

Annually and prior to **September 30th** of the calendar year, the Director of Transportation, Waste and Facilities shall call a meeting of all staff involved in the management, supervision and monitoring of the winter control program in order to review the previous year's Salt Management Plan, to consider any organizational changes that may be required, to discuss technological changes and to implement new operational procedures and best practices as identified in the previous operating year.

Staff required to attend this mandatory meeting shall consist of:

- 1 Director
- 1 Road Operations Manager
- 3 Road Supervisors
- 1 Fleet Supervisor
- 1 Administrative Clerk

3.6 Implementation of Corrective Actions to Operations

Upon completion of the yearly review of the plan in conjunction with the Director of Transportation and Waste, all management and supervisory staff involved in the delivery of the winter control program shall ensure that the Salt Management Plan is updated and published to reflect successes, failures and changes to the organization.

The Roads Operations Manager shall be responsible for implementing the corrective actions identified in the annual review meeting. The Salt Management Plan shall also be updated and public.