



Regional Municipality of Halton
City of Burlington **Town of Halton Hills**
Town of Milton **Town of Oakville**



***SALT
MANAGEMENT
PLAN
SUMMARY***

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SALT MANAGEMENT PLAN SUMMARY

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1.0 INTRODUCTION

1.1 Overview

Within the Region of Halton there are five Road Authorities responsible for the winter maintenance of the Regional, City and Town roads: the Regional Municipality of Halton; City of Burlington; Town of Halton Hills; Town of Milton; and Town of Oakville. There are approximately 750 kilometers of Regional roads and 2750 kilometers of Town and City roads within the framework of a classification system. The combined road systems provide for the safe, efficient and affordable means of surface transportation for road users. People rely on the roadway network throughout the year for transport to the workplace, to recreation and leisure facilities, for the transport of goods and services, and for emergency and security services.

Snow and ice conditions on the road system have a dramatic impact on public safety, roadway capacity, travel time and economic costs. User safety remains the most important priority within winter maintenance operations, practices and strategies contained in this Salt Management Plan.

Although there is ongoing research into the use of alternatives to road salt in winter maintenance, salt continues to be a cost-effective de-icer. However, due to the adverse effects that salt has on the environment, the Salt Management Plan strives to minimize the amount of salt entering the environment by including best salt management practices, and using new technologies to ensure its most effective use over the road system. At the same time, the Road Authorities will continue to search out and encourage the use of viable and cost-effective new technologies and chemicals to reduce the environmental impacts of winter maintenance activities.

In 2001, Environment Canada released an assessment report stating that road salts are entering the environment in large amounts and are posing a risk to plants, animals, birds, fish, lake and stream ecosystems and groundwater. Based on the assessment, Environment Canada is considering declaring road salt to be “toxic” under the Canadian Environment Protection Act (CEPA). The “toxic” designation only means that it is harmful to the environment if used in excessive amounts. Environment Canada has stated that they will not ban road salts, but rather will encourage users to develop their own salt management strategy. ***It must be noted that Health Canada stated that road salts are not harmful to humans.***

Environment Canada has two years, from December 1, 2001, to develop control measures for the use of salt and will then provide users with another 18 months to initiate necessary operational changes. Environment Canada has encouraged provincial and municipal salt users to develop their own Salt Management Plans.

Given the environmental concerns regarding road salt, the five Road Authorities have developed this Salt Management Plan. This will address growing concerns about the effect road salt is having on our natural environment and at the same time continue to provide for road safety by better managing our use of salt.

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1.2 Purpose of the Salt Management Plan

The Salt Management Plan is intended to set out a policy and procedural framework for ensuring that the Regional Municipality of Halton, City of Burlington, Town of Halton Hills, Town of Milton and Town of Oakville continuously improve the management of road salt used in their winter maintenance operations. The Plan demonstrates the five Road Authorities commitment to reducing the environmental effects of excessive salt use, consistent with Environment Canada’s stated objections.

Any modifications to winter maintenance activities must be carried out in a way that provides roadway safety and user mobility consistent with the weather conditions experienced during the snow and ice control season.

The Plan is dynamic – allowing the five Road Authorities to phase in new approaches and technologies in a way that is responsive to Regional and municipal fiscal demands and the need to ensure that roadway safety is not compromised.

1.3 Format of the Salt Management Plan

This document is a summary of the full Salt Management Plan. The Salt Management Plan information is organized into the following chapters.

Chapter 2.0 of the Plan presents the Policy Direction approved by the Regional and Municipal Councils.

Chapter 3.0 of the Plan presents the Winter Maintenance Policies that are relevant to salt management.

Chapter 4.0 of the Plan presents the summaries of Operational Practices and Strategies for Snow and Ice Control as they relate to the effective management of road salt. This chapter is presented as a series of sub-section that can be modified as new policies, procedures and practices are introduced and refined.

Chapter 5.0 of the Plan presents the approach to monitoring the implementation of the Plan and to maintaining and updating the Plan.

1.4 Responsibility

Effective road salt management is the responsibility of everyone within the Regional Municipality of Halton involved in winter road maintenance. Cooperation from all Regional, City and Town staff, from senior levels to the operator, is required to ensure road safety is maintained while the Plan is implemented, monitored and updated.

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2.0 POLICY CONTEXT

2.1 Vision and Goals

In 1995 the Regional Municipality of Halton adopted an Official Plan including a vision and a series of goals. Following is an excerpt from the Planning Vision of the Regional Official Plan:

“Planning decisions in Halton will be made based on a proper balance among the following factors: protecting the natural environment, enhancing its economic competitiveness, and fostering a healthy, equitable society. The overall goal is to enhance the quality of life for all people of Halton.”

The City of Burlington, Town of Halton Hills, Town of Milton and Town of Oakville have each adopted their own Official Plans that conform with and expand on the Regional Official Plan. They have also developed their own visions and goals similar to the ones stated in the Regional Official Plan.

This Salt Management Plan supports the individual Official Plans, visions and goals of the Region and four Municipalities.

2.2 Corporate Environmental Policy

The Regional Official Plan has, as part of its Healthy Communities Policies, an Environmental Quality goal. The goal is “to achieve a high-quality environment, for this and future generations, that will sustain life, maintain health and improve the quality of living.”

2.3 Road Maintenance Policy

The Regional Official Plan has, as part of its Healthy Communities Policies, a Transportation goal. The goal is “to provide a safe, convenient, affordable, efficient and energy-conserving transportation system in Halton, while minimizing the impact on the environment.”

2.4 Salt Management Policy

Within the context of the overall Regional and Municipal policies, the following are the five Road Authorities policies on the use and management of road salt.

- To comply with all applicable federal and provincial legislation regarding the storage and use of snow and ice control products.
- To use road salt in an environmentally responsible manner, and minimize the negative environmental effects of handling, storage and application of salt on the environment.
- In providing the stated Level of Service, the five Road Authorities will conserve the use of salt by utilizing the most cost-effective technologies and practices.

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2.5 Implementation

The Salt Management Plan is activity based and follows an Environmental Management System framework. It includes the following elements:

- Periodic review and analysis of industry practices
- Implementation and documentation of the Plan
- Education and training of staff
- Monitoring and analysis of operations
- Management review and revisions
- Environmental review
- Policy and practices revision

The implementation and improvement of the Salt Management Plan will promote the continuous development of practices and procedures to improve winter maintenance activities and procedures while striving to reduce the effects of road salt on our environment. The Plan is a dynamic document. It will be reviewed and refined on an on-going basis and embraced at all levels of the five organizations. All personnel are responsible for ensuring that the Plan is implemented, monitored, improved and updated.

Managers are encouraged to negotiate adoption of the policies and procedures in the Plan by other parties involved in snow and ice control activities including:

- employees of the Region of Halton, City of Burlington and Towns of Halton Hills, Milton and Oakville;
- private operators; and
- general contractors.

3.0 WINTER MAINTENANCE STANDARDS

3.1 Introduction

This chapter documents the five Road Authorities snow and ice control standards. The four municipalities are each responsible for maintaining their own Municipal Roads and are contracted by the Region to maintain the Regional Roads within their jurisdiction.

The major activities related to winter maintenance are:

- salt and sand storage;
- salt spreading;
- blended sand spreading;
- snow plowing; and
- snow removal and disposal.

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3.2 Level of Service Policies

For the purposes of road patrolling, snow plowing, sanding, snow and ice control and snow removal and disposal, all Regional, City and Town roads have been classified. The Region has five classes of roads within its road network based on posted speed and traffic volumes. The four municipalities have also classified the roads within their networks based on similar criteria.

The five Road Authorities each have based their own Level of Service standards on their road network classifications. The Region’s Level of Service (LOS) Standards are contained in their Performance and Maintenance Standards that are currently under review. Each of the four municipalities has their own Level of Service standards as well.

The winter control Level of Service standards are designed to meet the needs of the community from the perspective of driver safety and the provision of emergency service. These LOS standards are driven by both the technical requirements of winter operations and the need to address the socio-economic concerns of a large urban municipality.

3.3 Equipment

The four municipalities each maintain a variety of equipment including plows, spreaders and combination units. The newer equipment has been purchased with electronic controllers and more recently pre-wetting capabilities. An anti-icing pilot project has also been initiated.

3.4 Snow and Ice Control Materials

3.4.1 Salt

The four Municipalities bulk purchase and use the same provincial standard grade of road salt. The Town of Oakville is also using provincial standard grade road salt pre-treated (sweetened) with MgCl₂ liquid. All salt is stored indoors on impermeable floors.

3.4.2 Abrasives

A mixture of sand and a chemical to prevent freezing of the sand is used to improve traction. Sand is mixed with salt at the yards at a rate of 3% to 11% salt by volume, or with other chemicals at the rate recommended by the supplier, to prevent freezing of the pile. All blended sand is stored inside on impermeable floors.

3.4.3 Brine

The Road Authorities have introduced the use of liquids for pre-wetting salt and anti-icing using new pre-wetting units. The five Road Authorities are committed to ensuring on-board pre-wetting capabilities on the entire fleet. An anti-icing pilot project has been initiated. All liquids are stored in poly tanks with Oakville producing their own brine in-house.

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3.5 Storm Response

The four municipalities rely primarily on Environment Canada’s public weather forecasts and RADAR. Burlington also receives forecasts from World Weatherwatch. RWIS forecasts and information have recently become available through the Region from the RWIS site on Dundas St. at the 407ETR. Nine IRT’s, both truck-mounted and handheld, are used by the municipal road patrollers. Some drift control measures are undertaken each year but the amount is in decline.

3.6 Training

Each municipality trains it’s own staff each fall. The Town of Halton Hills requires its staff to take and pass a written exam.

3.7 Snow Removal, Storage and Disposal

The four municipalities currently remove snow from specific areas within their jurisdictions and dispose of it at five existing snow disposal sites. Halton Hills recently completed the installation of an engineered snow disposal site beside their maintenance yard.

3.8 Technology Transfer Review

Regional and Municipal staff regularly attend various conferences including the OGRA Snow and Ice Colloquium, the APWA Snow and Public Works Conferences and regional and provincial committees and working groups.

3.9 Communications

The Municipalities use a variety of methods to inform the public about their winter maintenance activities including: web pages, hotlines and flyers. Each fall Milton hosts an Open House to educate the public.

3.10 Vulnerable Areas

The five Road Authorities are monitoring discussions at the federal level. The Region has developed Criteria for Designating Environmentally Sensitive Areas and has an Aquifer Management Plan to protect groundwater resources.

3.11 Record Keeping

The Municipalities keep operator logs and track solid material purchases and bulk usage. Data from the electronic controllers is not used at this time. Liquid material usage is not tracked. Regional and Municipal patrollers record some storm information. Historical RWIS data is available from Environment Canada.

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3.12 Monitoring Program

No monitoring programs are in place and no yard assessments have been conducted recently.

3.13 Emergency Response Program

Roadway Emergency Response programs exist for all Municipal and Regional Roads. No maintenance yard response programs exist.

4.0 SALT MANGEMENT PLAN GOALS

4.1 Introduction

This chapter of the Plan presents the goals for each of the key operational practices and strategies related to the effective management of road salt during winter maintenance activities. Some of the goals are general and apply to all five Road Authorities and some are specific to the Region or one Municipality. All goals recognize that the Plan is dynamic and will take time to implement.

4.2 Summary of the Salt Management Goals

The following table summarizes the Salt Management goals for each of the key operational practices and strategies identified in the Salt Management Plan.

Salt Management Goals for the Key Operational Practices and Strategies	
LOS	
➤	Review the LOS policy in light of other similar road authorities and the minimum maintenance standard annually.
➤	Revise the LOS policy if required
➤	Obtain management endorsement of the revised LOS Policy
➤	Implement the revised policy
➤	Review routes after changing LOS policy
➤	Train and inform staff, management and the public on the intentions and expectations in service delivery.
➤	Monitor and report on compliance with the LOS policy annually.
Fleet Allocation/Optimization	
➤	As new technologies are implemented or LOS is changed, affected spreader and plow routes will be reviewed



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Salt Management Goals for the Key Operational Practices and Strategies
<p>Electronic Spreader Controls</p> <ul style="list-style-type: none"> ➤ 100% of equipment used to spread sand and salt shall have groundspeed regulated electronic controllers with printout or download capability by: <ul style="list-style-type: none"> - achieved (Burlington), - 2008 (Halton Hills), - 2008 (Milton), and - achieved (Oakville). ➤ Develop and implement a record-keeping program that uses the data supplied by electronic controllers by 2005. ➤ Develop an Implementation Plan to have GPS tracking and record-keeping capabilities (GPS/AVL) on all winter maintenance vehicles by 2005 (Region).
<p>Pre-wetting and Anti-icing Equipment</p> <ul style="list-style-type: none"> ➤ Assess and review the results of the pre-wetting and anti-icing experience to-date (in-house and other jurisdictions). ➤ Develop pre-wetting pilot projects to introduce and assess various technologies and strategies. ➤ Develop a pre-wetting guideline that addresses preferred application rates and expected performance on the road. ➤ Ensure that all new spreader equipment has pre-wetting capabilities. ➤ 100% of spreaders will have pre-wetting capabilities by: <ul style="list-style-type: none"> - 2003 (Burlington), - 2010 (Halton Hills), - 2013 (Milton w/ 50% by 2008), and - 2010 (Oakville) ➤ Identify areas that have a liquid anti-icing priority and integrate this into the equipment plan. ➤ Develop a liquid anti-icing pilot project to introduce and assess various technologies and strategies by 2004 (Burlington). ➤ Provide training in liquid use and handling annually. ➤ Evaluate the merits of alternative liquids and identify the most cost-effective long-term supply of the chosen liquid (e.g. in-house production and storage of salt brine vs importing of proprietary liquids). ➤ Install a Fixed Automated Spray Technology (FAST) system on the Sixteen Mile Creek Bridge (Dundas Street) by 2005-06 (Region).



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Salt Management Goals for the Key Operational Practices and Strategies
<p>Spreader Calibration</p> <ul style="list-style-type: none"> ➤ A calibration procedure (for both in-house and contractor units) will be developed and implemented by Fall 2003. ➤ Contractor calibrations should be verified to ensure calibration is adequate and standard procedures have been followed. ➤ All spreaders that can be calibrated will be properly calibrated prior to each season. ➤ All beats will be benchmarked (determine the quantity of material applied at a given calibration) to ensure that the correct amount of material is being applied. Information directly from the electronic controllers and eventually the GPS/AVL system will be compared to the benchmark to check unit calibrations. Equipment will be recalibrated as required. ➤ Equipment will be recalibrated after any repair that affects the material delivery system. ➤ A calibration history for all spreaders will be maintained and reviewed annually.
<p>Equipment Washing</p> <ul style="list-style-type: none"> ➤ Investigate options for managing washwater at maintenance facilities ➤ Develop a strategy to manage washwater and cleanout materials from retention ponds and oil/grit separators by 2005.
<p>Material Ordering and Delivery</p> <ul style="list-style-type: none"> ➤ Specify and enforce brine quality standards. ➤ Cover all salt as soon as possible following delivery.
<p>Material Application Rates</p> <ul style="list-style-type: none"> ➤ Develop standardized application rates for each municipality and all materials, which are related to pavement temperatures and precipitation type by Fall 2004.
<p>Sand/Salt Blends</p> <ul style="list-style-type: none"> ➤ To reduce the amount of salt in sand/salt blends to 3 to 5% by volume where possible.
<p>Salt Storage / Handling</p> <ul style="list-style-type: none"> ➤ 100% of salt shall be stored inside buildings on impermeable floors. ➤ All new storage facilities will be designed in accordance with the principles set out in TAC's Salt Management Synthesis of Best Practices for Design of Road Maintenance Yards.
<p>Blended Sand Storage / Handling</p> <ul style="list-style-type: none"> ➤ 100% of sand/salt blends shall be stored inside buildings on impermeable floors.
<p>Good Housekeeping Practices</p> <ul style="list-style-type: none"> ➤ Finalize and implement a Good Housekeeping Policy by 2003. ➤ Provide annual training on good housekeeping practices by fall of each year.



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Salt Management Goals for the Key Operational Practices and Strategies
<p>Weather Forecasting</p> <ul style="list-style-type: none"> ➤ Investigate the usefulness of dedicated weather forecasts, RWIS forecasts and Doppler RADAR and determine the merits of use for the Municipalities by Fall 2004. ➤ Provide annual training in the understanding and use of weather information.
<p>RWIS</p> <ul style="list-style-type: none"> ➤ Plan and install 2 RWIS sites by 2006. ➤ Make the RWIS information from the Regional RWIS sites and the relevant MTO and 407ETR RWIS sites available to winter maintenance staff as part of a Regional RWIS website. ➤ Provide annual training in use of RWIS information and forecasts.
<p>IRT's</p> <ul style="list-style-type: none"> ➤ Every winter patrol/supervisor truck will have a truck mounted IRT installed by 2006. ➤ Provide annual training in use of IRT's.
<p>Snow and Ice Event Response</p> <ul style="list-style-type: none"> ➤ Investigate the merits of a storm response guide for the Region. ➤ Support the development of Halton Hills Storm Response Summary. ➤ Each municipality carry out post storm analysis. ➤ Develop a consistent event response form by 2003 including a definition of an "event". ➤ Each road authority will complete the form at the end of each event.
<p>Winter Road Patrol</p> <ul style="list-style-type: none"> ➤ To develop a Winter Road Patrol Guideline for Regional Roads by 2004. ➤ To train winter road patrollers/supervisors on the Guidelines.
<p>Drift Control</p> <ul style="list-style-type: none"> ➤ Drift control measures will be undertaken on an as needed basis, determined by each Municipality.
<p>Training</p> <ul style="list-style-type: none"> ➤ Incorporate salt management principles into training programs in accordance with TAC's Salt Management Synthesis of Best Practices for Training. ➤ Present the training in the fall of each year to Managers, Supervisors and Operators. ➤ Contractor staff are to be included training sessions and properly trained
<p>Snow Removal and Disposal Guideline</p> <ul style="list-style-type: none"> ➤ To assess snow disposal sites and determine required improvements by 2005.
<p>Snow Removal and Disposal Criteria</p> <ul style="list-style-type: none"> ➤ Use TAC's Salt Management Synthesis of Best Practices for Snow Storage and Disposal Sites as a guide for the selection of new disposal sites.



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Salt Management Goals for the Key Operational Practices and Strategies
Snow Disposal Site Monitoring and Maintenance
<ul style="list-style-type: none"> ➤ To establish a pilot monitoring program at a selected snow disposal site as part of the site assessment program.
Technology Transfer Review
<ul style="list-style-type: none"> ➤ To ensure the latest technologies are studied, reviewed, tested and adopted as appropriate. ➤ To participate in other conferences and forums geared to development of Road Salt Best Management Practices.
Communications
<ul style="list-style-type: none"> ➤ Inform the Regional and Municipal Councils, public and local regulatory agencies about the actions being taken by the Municipalities to manage road salt use, and the winter maintenance program annually, through a brochure or website. ➤ Notify Environment Canada of upon completion and updating of the Salt Management Plan.
Vulnerable Areas
<ul style="list-style-type: none"> ➤ Monitor Environment Canada’s approach to addressing vulnerable areas. ➤ Work with other agencies (Conservation Authority, Niagara Escarpment Commission, MNR, MOE) to identify vulnerable areas. ➤ Identify strategies to reduce salt impacts to salt vulnerable areas.
Material Usage Record Keeping
<ul style="list-style-type: none"> ➤ Salt and sand delivery records and end-of-season residual will be logged to allow for year-end reconciliation of bulk material use. ➤ Record-keeping training will be provided annually. ➤ Once a GPS/AVL system is implemented material usage will be monitored at the beat level.
Storm Response Record Keeping
<ul style="list-style-type: none"> ➤ To develop a standard methodology to report/summarize storm or “event” responses. ➤ To train all supervisors and operators in proper record keeping by October of each year.
Monitoring Program
<ul style="list-style-type: none"> ➤ Monitor developments on the National level with respect to monitoring requirements for salt management plans. ➤ Conduct yard assessment studies at 6 yards by 2004. ➤ Conduct a yard assessment study at 1 yard by 2006.
Emergency Response Program
<ul style="list-style-type: none"> ➤ Include a spill response section in the Good Housekeeping Policy.



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4.3 Conclusion

The five Road Authorities are committed to ensuring that the Regional and Municipal roads are safe and properly maintained in accordance with their level of service policies. While doing so, the five Road Authorities have committed to reducing the environmental impacts of snow and ice control chemicals such as salt.

The five Road Authorities have developed the Salt Management Plan to identify how they will implement a managed salt strategy over the next decade. They will continue to monitor improvements in snow and ice control practices and revise the Plan as improved Best Management Practices become available.

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