

Salt Management Plan

Township of Georgian Bluffs

October 2021



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Salt Management Plan

1.0 Introduction

1.1 Overview

In response to concerns over the impacts of road salt on the environment, Environment Canada published in April 2004 the Code of Practice for the Environmental Management of Road Salts in the Canada Gazette stating that road salts are on the Priority Substance List compiled under the Canadian Environmental Protection Act, 1999. The Code of Practice was developed by Environment Canada through a multi-stakeholder consultation and includes practices relating to:

- Salt storage;
- Snow disposal; and
- Salt application with all the environmental impacts considered.

This code applies to organizations that:

- Use more than 500 tonnes of road salts per year (five-year rolling average); and
- Have vulnerable areas that could be potentially impacted by road salts.

Any organization which meets the criteria listed in the code is required to prepare a Salt Management Plan (SMP) and file an annual report with Environment Canada by June 30th each year. The implementation of the SMP is to begin in the financial period of fiscal year immediately following the preparation of the plan.

Since the Township of Georgian Bluffs meets the criteria listed in the Code of Practice for the Environmental Management of Road Salts the Township has developed this plan to outline their strategies to manage salt use. The maintenance of the Township's roadways during the winter season is both challenging and costly due to the large area, variety of road types, and diverse topography. Municipal staff currently utilize a salt/sand mix as their main tool in maintaining a safe and efficient roadway systems during the winter season. An efficient winter maintenance plan has many benefits to the community, including but not limited to:

- Providing efficient effective transportation routes for emergency services, residents of all mobility levels, and commuters;
- Lower automobile collision rates;
- Lower associated insurance and liability claims;
- Saving time and fuel from faster travel, better traction, and reduced congestion;
- Minimize productivity losses due to late days and absenteeism;
- Avoidance of lost sales due to inaccessibility or unavailability; and
- Lower the cost of commodities by reducing the transportation costs.

These benefits have also shown to have benefit/cost ratios¹ between 2:1 and 18:1. For every dollar spent on winter maintenance activities two to eighteen dollars are derived in benefits.

An effective winter maintenance plan must include methods to provide safe roadway conditions and to ensure that the right amount of salt is used in the right place at the right time. Reduction of salt usage may also be achieved through improved training, new techniques, new technologies, as well as improvements in the type of anti-icing/de-icing materials used.

The SMP is considered to be a “living” document. Once developed, the Township of Georgian Bluffs will be required to undertake a formal annual review with the goal of improving their winter maintenance operations. This review will also require new technologies be investigated where appropriate, trial/pilots can be conducted and monitored to determine the cost/effectiveness of incorporating new developments into the capital and current budget planning.

1.2 The Purpose of the Document

This SMP is intended to set out a policy and procedural framework for ensuring that the Township of Georgian Bluffs continuously improves on the effective delivery of winter maintenance services and the management of road salt used in winter maintenance operations, as outlined in the Code of Practice for the Environmental Management of Road Salts.

The SMP is meant to be dynamic to allow the Township to evaluate and phase in any changes, new approaches and technologies in winter maintenance activities in a fiscally sound manner. At the same time any modifications to Georgian Bluffs’ winter maintenance activities must ensure that roadway safety is not compromised.

As specified in the Code of Practice for the Environmental Management of Road Salts, the SMP is endorsed by the “highest level of government”. Therefore, Township Council will be requested to endorse this plan.

1.3 Legislation

The minimum standards for winter maintenance are mandated under provincial legislation. The standards set within the Township of Georgian Bluffs are currently at the same level or higher than the minimum standards specified in the Ontario Regulation 239/02 of the Municipal Act, 2001. As well, the Town is mandated under provincial legislation to maintain public roads in a good state of repair.

The Code of Practice for the Environmental Management of Road Salts, under the Canadian Environmental Protection Act, 1999 recommends that the Salt Management

¹ TAC Road Salt (NaCl) Management Guide, Transportation Association of Canada, December 1999.

Plan follow the best management practices that have been set out by the Transportation Association of Canada. This Code of Practice was prompted by subsection 54 (1) of the Act which allows the Ministry of the Environment to issue codes of practice respecting pollution prevention or specifying procedures, practices or release limits for environmental control relating to works, undertakings and activities during any phase of their development and operation.

2.0 Salt Management Policy

2.1 Vision, Mission, Mandate

- Vision: The Township of Georgian Bluffs will be recognized as a leader in improving winter maintenance operations while reducing environmental impacts and ensuring public safety.
- Mission: The Township of Georgian Bluffs Operations Department will continue to optimize the use of deicers on all Town Roads while striving to minimize salt impacts to the environment.
- Mandate: The Township of Georgian Bluffs Operations Department will provide safe winter traveling surface conditions for vehicular and pedestrian movements as required by the level of service policies and funding established by Council.

2.2 Policy Statement

The Township of Georgian Bluffs will provide efficient and effective winter maintenance to ensure the safety of users of the road network in keeping with applicable Provincial Legislation and accepted standards while striving to minimize adverse impacts to the environment. These commitments will be met by:

- Adhering to the procedures contained within the SMP;
- Monitoring, reviewing, and upgrading the SMP on an annual basis to incorporate new technologies and/or new developments and to ensure the effectiveness of the Plan;
- Committing to ongoing winter maintenance staff training and education; and
- Council allocating sufficient financial resources.

2.3 Application

The SMP is to be endorsed by the Township Council of Georgian Bluffs, and the SMP, as adopted, will apply to all Georgian Bluffs Operations Department employees who are involved in winter maintenance operations.

2.4 Principles

To allow for the continued progression of the SMP several principles will be set in place to guide decision making. These include:

- Implementation and documentation of the plan;
- Education and training of staff;
- Monitoring and analysis;
- Yearly management review; and
- Practices and policy revision.

3.0 Current Weather Maintenance Program and Policies

3.1 Introduction

This chapter is intended to provide a brief overview of the present activities, conditions, and policies currently in place for the Township of Georgian Bluffs as it relates to winter maintenance. The major activities related to winter maintenance are:

- Snow Plowing
- Salt/Sand Application
- Salt/Sand Storage
- Snow Removal
- Snow Storage
- Sidewalk Plowing & De-icing.

3.2 Township of Georgian Bluffs Program and Policies

Overall, the Township is responsible for the maintenance and construction of some 754 lane km of road which is 202 lane km are paved; 318 lane km are surface treated; and 234 lane km is gravel. In turn, the Township roads have been classified (Class 1, 2, 3, 4, 5 and 6) based on the posted/regulated speed and annual average daily traffic (ADT) in order that levels of service and maintenance standards can be clearly defined and accepted by the community at large.

Within these classifications:

- Class 1, 2, and 3 roadways are considered as an arterial in nature;
- Class 4 roadway is considered as a collector in nature; and
- Class 5 and 6 roadways are considered local streets.

Table 3.1 provides a breakdown of the road system by urban/rural and class of road.

Road Class	Lane Km of Roadway		
	Rural	Urban	Total
1	0.00	0.00	0.00
2	0.00	0.00	0.00
3	0.00	0.00	0.00
4	729.20	24.80	754.00
5	0.00	0.00	0.00
6	0.00	0.00	0.00

Table 3.1: Road Classification, Township of Georgian Bluffs

In compliance with the applicable law, the Township is utilizing the Minimum Maintenance Standards for Municipal Highways (Ontario Regulation 239/02 made under the Municipal Act). Staffs have established winter level of service and maintenance guidelines that have been accepted by the community at large.

For winter operations, these regulations specify for each class of highway:

- Patrol frequency; and
- Clearance of snow/ice.

In addition, Township staff provides winter maintenance services for some 12.0km of sidewalks and paths within the communities of:

- Cobble Beach;
- Shallow Lake; and
- Springmount (Sunset Strip).

Also, approximately 4 community and Township Hall parking lot, are maintained and cleaned of ice and snow during the winter season.

3.3 Winter Patrol

Commencing on November 1st, winter maintenance operations and patrol coverage are maintained around the clock 7 days a week until April 30th each year. As well, the Road Supervisors and alternates will remain on call with a protocol in place to mobilize staff in response to storm and weather conditions.

Table 3.2 outlines the minimum patrol frequency established for each class of highway within Regulation 239/02.

Routine Patrolling Frequency	
Class of Highway	Patrolling Frequency
1	Three times every 7 days
2	Two times every 7 days
3	Once every 7 days
4	Once every 14 days
5	Once every 30 days

Table 3.2 Routine Patrolling Frequency

At the present time Township staff covers all roads at least once within a 1 to 2-week time period. To supplement the Township patrol, Grey County staff also provides patrol coverage on all county roads within Georgian Bluffs and maintain contact with Township staff to advise changing weather and/or pavement conditions.

3.4 Level of Service

The target timeframe to restore a hard surface roadway to bare pavement will vary depending on the winter traffic, volume, highway type, and surrounding landscape. Some highways that are sheltered from wind and sun, with low volumes of traffic, may remain snow packed longer than others, however winter road maintenance is still completed on these roads to ensure compliance with Ontario Standards.

Bare pavement standard target by highway class:

Highway Class	Vehicles per day	Bare Pavement Standard
Freeway/Urban Highway (Class 1)	More than 10,000	Bare pavement within eight hours of the end of a winter storm.
Major Highway (Class 2)	2,001-10,000	Bare pavement within 16 hours of the end of a winter storm.
Intermediate Highway (Class 3)	1,0001-2,000	Bare pavement within 24 hours of the end of a winter storm.
Minor Highway (Class 4)	501-1,000	Centre bare pavement within 24 hours of the end of a winter storm; fully bare pavement when conditions permit. (Centre bare means a 2.5m strip in the middle of the road.)
Local Highway (Class 5)	Fewer than 500	Snow packed driving surface within 24 hours of the end of a winter storm. Excess snow is plowed off and sand is applied where required to improve friction.

Table 3.3 was created referencing bare pavement standards from (Ontario Ministry of Transportation, 2019)

These Levels of Service are intended to meet the roadway needs of residential, commercial, and commuter traffic at an economic cost under most road and weather conditions.

While this section's Levels of Service are for Georgian Bluffs roads, it is acknowledged that conditions may occur which temporarily prevent achieving the Levels of Service assigned. In such cases, attempts should be made to keep roadways open by utilizing all resources available at maximum efficiency.

Salt should never be applied to snow packed gravel surface roadways or surface treated roads. This is because salt aids thawing of the snowpack during sunny periods, this increases the occurrence and severity of potholes in the snow pack and the gravel surface of the roadway.

3.5 Material Usage

In 2020-2021, the stockpiles at the yards contained winter sand with three (3) percent salt was mixed into the sand to prevent it from freezing while it is stored in the outside elements.

The use of calcium chloride for dust control during the summer months only is a function of the number of gravel roads and general weather conditions. Liquids are not used during the winter months.

Table 3.4 portrays the chloride material usage over the past 4-year period

Winter Season	Salt Tonnes	Sand Tonnes	Liquid Liters
2020 - 2021	480	16000	0
2019 - 2020	420	14000	0
2018 - 2019	360	12000	0
2017 - 2018	340	11500	0

Table 3.4 Material Usage

3.6 Equipment

For winter maintenance the Township's fleet consists of:

- 2 Tractors with plow blades;
- 3 Backhoe;
- 2 Graders;
- 3 Tandem combination spreader/plow/wing units; and
- 5 Single Axle combination spreader/plow units

This equipment is garaged at all the Township Operations Yards.

Prior to each winter season the fleet undergoes a preseason mechanical review to determine road worthiness; the appropriate winter equipment is installed, and safety checked.

The Township has also equipped vehicles with spreader controllers, air and pavement temperature sensors, and automatic vehicle location devices to maximize route and material application efficiency.

The tandem combination spreader/plow/wing units and the single axle combinations spreader/plow units are equipped with PolarFlex carbide blades and Highware Blades which maximizes snow removal efficiency while still ensuring the protect the wearing surface of the roadway.

All spreader units are tested and calibrated prior to each winter season and are tested periodically to ensure the right amounts of material are being applied.

3.7 Yard Facilities

The Township currently has 3 yards:

- Derby Yard, Sideroad 3;
- Sarawak Yard, East Linton Sideroad; and
- Keppel Yard, Grey Road 17.

Georgian Bluffs owns three storage facilities and Grey County shares the maintenance cost on Keppel and Sarawak.

All of these structures are designed to contain a sand/salt mix material, with some capacity to store small amounts of straight salt.

3.8 Snow Removal and Disposal

The removal of snow from Township roadways and facilities is undertaken when the accumulation of snow impacts public safety, emergency access routes, street parking in commercial areas, vehicular and pedestrian traffic, and/or parking lot capacity. As well, cul-de-sacs having little or no capacity to store snow are candidates for snow removal.

Over the course of a normal winter some 100 truckloads of snow are hauled to the Township closed landfill in Hepworth.

3.9 Weather Monitoring and Communications

To supplement the Township Road patrol information, staff interfaces with emergency service providers and County patrollers who monitor county roads within Georgian Bluffs. Staff are emailed 4 times per day from the County's weather monitoring contractor with hourly and daily weather coverage. Staff also accesses the Weather Network website for event and forecast weather information. Weather forecasts are posted, as updates are received, at each yard so that staff who do not have access to the electronic copies are kept informed of the changes in the weather.

Infra-red thermometers (IRT's) mounted on all of the winter maintenance fleet are capable of measuring pavement temperatures which further improves the storm response capabilities. All winter maintenance vehicles are equipped with two-way radios and staff is responsible for reporting changing weather and/or road conditions. External communication with the general public ranges from media press releases to responding to individual inquires through the Township's customer service centre.

3.10 Training and Documentation

The Operations Department provides training for the Township's maintenance staff annually. Each year the Director of Operations together with the key staff within the Department assesses the needs and available resources required for the winter maintenance staff training programs. All current winter maintenance staff have successfully completed training modules to effectively deal with ice/snow control. The Township continues to update their training modules to ensure that all winter road maintenance staff are current with the Regulatory requirements and industry best practices. Training is completed in both a classroom setting as well as hands on practical training.

Prior to each winter season, senior staff convene a full day winter focus session with staff to review the goals and objectives for the upcoming winter season, reinforce procedures and protocols, discuss equipment, material and timing requirements, assignment of tasks and schedules, health and safety issues, and clarify questions or any areas of concern. During the winter season daily meetings are held with the operators at the start of each shift to review operations, areas of concern, upcoming forecasted weather events, and compliance issues. All hazards, areas of concern, and equipment notes are tracked in the Township's electronic asset and work order management system, hard copy tracking forms, as well as on white boards in the office of each yard to provide operators with the most up to date information possible. In addition, operator training courses and external winter maintenance seminars for supervisors and staff have been provided in the past.

Key staff maintains documentation on:

- Vehicle call numbers by staff;
- Employee/yard/key contacts;
- Sidewalk and walkway winter maintenance route inventory;
- Roadway snow plow routes; and
- Parking lot inventory.

On a daily basis, winter response details are summarized on a Daily Activity Sheet that supervisors, patrollers, and operators are required to complete and hand in. Township staff also retains records for the purchase of salt, and winter sand. Staff utilized the download capabilities of the electronic controller on their spreaders to obtain detailed spread data by routes and winter events.

Staff have developed winter patrol routes which ensure that all areas are patrolled in a timely manner. These patrol routes are a series of representation roads and areas of winter concern. These routes are patrolled in addition to the daily patrols completed by staff. This is to ensure that the most area is covered in the shortest amount of time during a winter weather event to relay up to date road condition information to supervisory staff.

4.0 Salt Management Plan

4.1 Overview

This chapter will present the elements of the SMP for the Township of Georgian Bluffs. The plan will outline the steps required to effectively manage road salt for winter maintenance activities within the Township, and will cover the following areas:

- Winter maintenance policies;
- Optimization of Winter Maintenance and Patrol Routes
- Equipment upgrading, calibration and washing;
- Materials ordering, delivery, storage, handling, and record keeping;
- Weather forecasting;
- Storm response;
- Snow removal and disposal;
- Snow and ice control training;
- Technology review;
- Communications strategy; and
- Environmentally sensitive areas.

These plans are not meant to be a comprehensive consideration of every possible best management practice, yet rather a listing of improvements that are seen to be beneficial and feasible considering current conditions. Each element within the plan will cover:

- The activity intent and current situation;
- The goals;
- The timetable for achieving the stated goals;
- The environmental impacts; and
- Performance measures.

The following provides the elements of the SMP pertaining to the Township of Georgian Bluffs:

4.2 Winter Maintenance Policies

General	<ul style="list-style-type: none">• It is intended that the various policies relating to the winter maintenance program be reviewed on an annual basis to determine whether any revisions are required or warranted.• Staff has established the level of service and maintenance operating guidelines in accordance with Minimum Maintenance Standard for Municipal Highways. Which have been accepted by the community; Council has also adopted a level of service policy for the winter maintenance of Township sidewalks and paths.
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	<ul style="list-style-type: none"> • Staff will continue to work in compliance with the Minimum Maintenance Standards for Municipal Highways.
Goal/Timetable	<ul style="list-style-type: none"> • Winter maintenance operating guidelines will be reviewed annually and updated as needed. If changes are required, Council endorsement is to be obtained.
Environmental Impacts	<ul style="list-style-type: none"> • Winter maintenance operating guidelines outline controls to be implemented to manage and prevent negative environmental impacts. Some examples would be a containment site for salt and salt brine storage facilities; another would be researching and testing more environmentally friendly alternatives to the deicer that the Township currently uses. Winter maintenance operating procedures are the foundation for program delivery and can have a significant impact on the environment.
Performance Measure	<ul style="list-style-type: none"> • Updating SMP annually; • # of Standard operating guidelines for winter maintenance reviewed annually; and • # of training sessions to staff on operating procedures guidelines.

4.3 Optimization of Winter Maintenance and Patrol Routes

General	<ul style="list-style-type: none"> • As the development of the Township increases the winter road maintenance and patrol routes will be modified to ensure maximum efficiency for snow and ice removal and monitoring.
Goal/Timetable	<ul style="list-style-type: none"> • Updating maintenance and patrol routes prior to November 1st each year.
Environmental Impacts	<ul style="list-style-type: none"> • Minimizing the fuel used by equipment and lowers the emissions from equipment.
Performance Measure	<ul style="list-style-type: none"> • Maximizing the number of kilometers covered in the shortest amount of time ensuring that areas of concern are also included in the routes for both patrolling and maintenance.

4.4 Equipment Calibration

General	<ul style="list-style-type: none">• Properly calibrating equipment is important to the effective placement of deicer material on Township roadways.• The spreaders are being calibrated and the spreader routes are benchmarked.• The Ontario Good Roads Association's (OGRA) Good Practices for Winter Maintenance in Salt Vulnerable Areas are being reviewed to determine how best to apply them to the existing and updated maintenance routes.
Goal/Timetable	<ul style="list-style-type: none">• All spreaders are to be calibrated and all routes benchmarked each year (i.e. calculate the theoretical material spread /km). During the winter season as the equipment comes in for maintenance the spreader units are to be checked and recalibrated as needed. As a minimum the calibration setting should be rechecked mid-winter.• All spreader operators to understand the reasons for the calibrations and how to operate the equipment correctly.• Reviews of spreader rates and material application practices completed at annual winter operations meeting.
Environmental Impacts	<ul style="list-style-type: none">• Effective equipment calibration and maintenance will ensure that the proper volume of de-icing salts is spread onto the roadway, reducing the usage of road salt.
Performance Measure	<ul style="list-style-type: none">• Spreaders calibrated by November 1st of each year.• Routes benchmarked by November 1st of each year.• Number of spreaders checked/recalibrated each year.• Comparisons are to be developed over the winter season:<ul style="list-style-type: none">○ Material spread rates across routes, across vehicle units and across operators; of each spread and vehicle unit; and of actual spread ratio performance against industry spread rates.

4.5 Equipment Washing

General	<ul style="list-style-type: none">• Reduce the amount of chlorides, oil, grease, and grit that is discharged into the environment.• All the equipment is washed inside.
Goal/Timetable	<ul style="list-style-type: none">• All equipment washing will be brought inside to minimize any discharge into the environment.

	<ul style="list-style-type: none"> • Obtain proper curtains to minimize contaminants being released into the environment. • At the conclusion of each storm cycle, all vehicles involved in winter maintenance activities are to be washed and placed in readiness for the next storm event.
Environmental Impacts	<ul style="list-style-type: none"> • The treatment of wash water by removing chlorides, and oil/grease to suitable levels prior to discharge into the natural environment.
Performance Measure	<ul style="list-style-type: none"> • Percentage of vehicles washed indoors and passed through oil/water separator before being placed in readiness for the next shift.

4.6 Material Ordering, Delivery, Storage, and Handling

General	<ul style="list-style-type: none"> • Maintain best practices and procedures in the ordering, delivery of deicer materials, handling, and storage of winter maintenance materials. • In the fall season salt and winter sand is delivered and stockpiled at the three Operations Yards. • The salt and winter sand are stored in permanent structures at the three Operations Yards. • Paved loading pads are used for delivery and loading/unloading the spreaders. • The loading pads however are not graded inwards, therefore not preventing any water from leaving the inside storage areas. • The inside storage areas are an impervious surface. • The structures are inspected each spring to identify and repair any deficiencies to the floor or exterior areas of the structures. • Repairs to the structures are scheduled and completed prior to the start of the following winter season. • Three (3) percent salt is mixed with sand for use on Township roads. • The mixing of materials occurs on paved surfaces at the Yards; all materials are transferred into a covered structure within 24 hours.
Goal/Timetable	<ul style="list-style-type: none"> • Tracking of inventory for materials on site, materials being taken to apply on roads, and materials being returned to the stock pile.

	<ul style="list-style-type: none"> • Complete tracking of material with every delivery from suppliers as well as during and after every winter weather event using operators, material tracking and equipment timesheets. • Minimize salt loss to the environment by taking the following measures: <ul style="list-style-type: none"> ○ Deliveries of salt and sand are covered with a waterproof tarp and occur in good weather. ○ Loading pads are swept clean following the transfer of the materials to storage. ○ All deliveries are to be recorded. ○ The initial stockpiling at each yard should be completed prior to October 31st of each year. During the initial stockpiling a sample to ascertain the material gradation and moisture content shall be completed and appropriate action taken should the samples fail. ○ Loading and unloading spreaders occurs on impervious surfaces. Any material spilled on the impervious surface is collected and conveyed back into the storage area. ○ Spreaders are not loaded beyond their capacity. ○ No frozen chunks of material are placed in the spreaders while loading; any frozen chunks are to be placed in a corner of the storage area and allowed to thaw and dry prior to placing the material back in the stockpile. ○ Review area lighting daily and report any issues to Supervisor. ○ Document the inspection and repair of storage structures and report any issues to Supervisor. ○ When replacing a storage, a storage structure or adding a new structure the TAC Code of Practice for Design and Operation of Road Maintenance Yards shall be followed. • Grading and paving of the yard is required to improve drainage and direct overland run off to areas of runoff collection. • Review designs for secondary containment of the salt brine tanks as well as for drainage tanks for the salt storage areas.
Environmental Impacts	<ul style="list-style-type: none"> • Reducing amounts of salt being delivered and stored onsite. • Lowering the possibility of accidental material release into the environments surrounding the stockpile locations.

	<ul style="list-style-type: none"> • Improve housekeeping practices relating to the delivery, storage, and handling of salt will decrease the loss to the environment.
Performance Measure	<ul style="list-style-type: none"> • Tracking amount of inventory delivered and comparing it to the amount of material applied to roads and sidewalks. • Percentage of deliveries tarped/ordered in good weather. • Percentage of material put into inside storage within 24 hours. • Percentage of liquid material placed in containment tanks without incident. • Percentage of material deliveries passing gradation and moisture contents. • Loading pad thoroughly cleaned following transfer of material to storage. • Review compliance through a yard inspection following each winter.

4.7 Material Record Keeping

General	<ul style="list-style-type: none"> • Retain an accurate record of the amount of material used by route, vehicle, and storm event. • Material usage by route, vehicle, and storm summaries are reported by daily Operator logs. Material usage is rationalized by comparing the amount of material ordered with the residual inventory. • Staff have a process for downloading data from the electronic controllers; currently creating process to review and analyze data collected.
Goal/Timetable	<ul style="list-style-type: none"> • The material tracking system by vehicle, route, and storm. This information has been compared to the benchmark information collected in past years. By providing an accurate records of material usage, staff are able to ensure the amount of material to be spread is appropriate for varying climatic and road conditions. • Staff continue to experiment with spread rates taking into consideration the OGRA Good Practices for Winter Maintenance in Salt Vulnerable Areas on vehicles equipped with prewet capability with the goal of reducing the amount of material spread. • On a seasonal basis the amount of material used versus the amount stored is to be reconciled with the deliveries and the daily usage records.

	<ul style="list-style-type: none"> • Staffs are to download data from the electronic controllers to assist in maintaining material records.
Environmental Impacts	<ul style="list-style-type: none"> • Accurate measurements, monitoring, and record keeping of salt use allows the Township to track the effectiveness of salt management programs and overall environmental performance to assist in identifying continual improvement strategies.
Performance Measure	<ul style="list-style-type: none"> • Records of material usage by winter event, route, and vehicle together with a year-end material reconciliation.

4.8 Weather Forecasting

General	<ul style="list-style-type: none"> • Provide timely and accurate weather information to assist in decision making. • Staff have access to various meteorological sources (Section 3.9). In addition to the weather forecast data, the Township's supervisory and patrol fleet are equipped with IRT's to measure pavement and air temperatures.
Goal/Timetable	<ul style="list-style-type: none"> • Continue to utilize the pavement and air temperature data from the IRT's to assist in decision making of when to apply material. • Continue to use meteorological services to obtain accurate weather forecasting information four (4) times daily through the winter season. • Ensure that the weather forecast data is made available to the appropriate supervisory staff and after-hours patrol staff. • Explore opportunities and options with the County in providing enhanced forecasted and real time weather and pavement information on Township Roads.
Environmental Impacts	<ul style="list-style-type: none"> • The effective use of de-icing material is dependent on accurate weather information and informed decision making. Inaccurate weather information and/or misinformed decision making can result in untimely and/or unnecessary use of salt.
Performance Measure	<ul style="list-style-type: none"> • Delivery of clear, accurate weather forecast at least 4 times daily between October and April each year.

4.9 Storm Response

General	<ul style="list-style-type: none">• Provide criteria and guidelines to standardize staff response for various combinations of precipitation, pavement temperatures, and traffic volumes.• Staff react to visual patrols and weather reports from various sources to initiate the mobilization of the operators for plowing and de-icing actions. General guidelines are available to patrollers and operators for storm response.• The Township of Georgian Bluffs has implemented 24/7 coverage for when winter events occur.
Goal/Timetable	<ul style="list-style-type: none">• A 2 to 5-year goal will be to monitor the records of storm response in relation to the established guidelines to assess any necessary changes.• Understand and document storm response approaches for different storm scenarios and improve upon practices.
Environmental Impacts	<ul style="list-style-type: none">• Snow and ice control decisions that are not consistent with actual road conditions will lead to inefficiencies and inappropriate material usage.
Performance Measure	<ul style="list-style-type: none">• Accurate and complete record of winter event

4.10 Snow Disposal Sites

General	<ul style="list-style-type: none">• Examine the Township's existing snow disposal site to reduce or eliminate the environmental impacts.• Collected snow is stored in the Township of Georgian Bluffs' closed landfill.
Goal/Timetable	<ul style="list-style-type: none">• Monitoring would occur prior to, during, and immediately after the winter season. The results of the monitoring program would be used to initiate the mitigation of any adverse environmental impacts which have been identified.• Each spring, all litter and debris are collected from the snow storage area and disposed of.• Staff are to develop a long-term strategy for snow removal from Township facilities which may include the use of mechanical melters, new storage sites, revised criteria for removal, and site-specific storage design (i.e. ensure storage areas have impervious lines and melt water directed to a collection area prior to its release into a storm water system).

	<ul style="list-style-type: none"> • Best Practices for site operation and record keeping as it related to snow storage areas (Synthesis of Best Practices, Road Salt Management, Transportation Association of Canada) are followed on an annual basis.
Environmental Impacts	<ul style="list-style-type: none"> • Review of the snow disposal site and the disposal operations together with a long-term strategy for snow removal operations can lead to a reduction of environmental impacts.
Performance Measure	<ul style="list-style-type: none"> • Compliance with Ministry of Environment and Climate Change regulations. • Monitoring of the surface water and soil to see if the it complies with the Ministry of Environment and Climate Change's specifications.

4.11 Winter Patrol and Level of Service

General	<ul style="list-style-type: none"> • It is intended that winter road conditions are monitored in an appropriate fashion to be able to react to changing weather and road conditions and to ensure that the levels of service for the monitoring public are maintained. • The Township provides a patrol to inspect and monitor roads conditions in compliance with the Provincial Minimum Maintenance Standards. • It should be noted that in providing 24-hour around the clock winter patrol between November and April each year, staff resources are stretched (in some cases beyond the limit) in dealing with "hot spots" between storms, response to public inquires, and adhering to. County patrol offices offer updates and information on road conditions which help to supplement in between shift changes at the Township. • Winter patrol is completed prior to and throughout the duration of a winter weather event by road supervisors and alternate staff.
Goal/Timetable	<ul style="list-style-type: none"> • The operating procedures are to be reviewed annually to ensure that the guidelines are consistent with the Township's level of service expectations. • Review and update annually patrol routes. • Provide training and retraining to supervisory and patrol staff annually. • Complete winter weather road patrol tracking forms prior to and throughout each winter weather event

	<ul style="list-style-type: none"> Relay information to supervisory staff prior to and throughout winter weather events to ensure they are receiving the most up to date road condition statuses.
Environmental Impacts	<ul style="list-style-type: none"> Accurate interpretation of conditions and appropriate levels of action to provide safe road conditions will result in timely and efficient application of winter de-icing materials, therefore, lowering the amount of salt on the roads.
Performance Measure	<ul style="list-style-type: none"> Percentage of staff trained in snow and ice decision making.

4.12 Snow and Ice Control Training

General	<ul style="list-style-type: none"> All staff involved in snow and ice control and effective salt management are adequately trained. Staff receives training on an annual basis which is geared to upcoming winter season, any legislative changes, and hands on training to ensure winter readiness.
Goal/Timetable	<ul style="list-style-type: none"> All staff is trained, and their training is refreshed annually in snow and ice control including salt management practices, training modules are to be provided in the following areas: <ul style="list-style-type: none"> Review of good housekeeping practices; Interpretation of weather and pavement conditions; Proper use of infrared thermometers; When and how to apply chemicals; Understanding of the environmental impacts; Health and safety requirements, environmental concerns; and Proper record keeping and review.
Environmental Impacts	<ul style="list-style-type: none"> Good housekeeping practices, the measures of snow and ice control, proper training in salt management, and the expectations of program delivery will result in a greater probability of success with the salt management plan.
Performance Measure	<ul style="list-style-type: none"> Percentage of staff receiving snow and ice control training.

4.13 Communications Strategy

General	<ul style="list-style-type: none"> A communications strategy with respect to the Township's winter maintenance program is effectively communicated to not only staff but also the public.
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	<ul style="list-style-type: none"> • The Township posts a brief winter road operations message on the time to clear roads following winter events. • Staffs have produced an Operations Manual which provides: <ul style="list-style-type: none"> ○ Key staff contact list with emergency telephone numbers. ○ Sand/salt, plow, and patrol routes.
Goal/Timetable	<ul style="list-style-type: none"> • Develop a Communications Plan for Winter Maintenance by 2024. • Annually inform Council, public, and local regulatory agencies about Georgian Bluffs' Salt Management Plan and current actions. • Notify Environment Canada upon completion of the Salt Management Plan and update them annually on the status of Salt Management activities.
Environmental Impacts	<ul style="list-style-type: none"> • Increased awareness of the role and management of snow and ice control in winter maintenance operations will provide the area residents and staff with greater understanding of the challenges in combating winter storms.
Performance Measure	<ul style="list-style-type: none"> • Annual revision of Winter Maintenance and Control guidelines.

5.0 Monitoring and Updating

The Salt Management Plan is intended as a starting point for the Township of Georgian Bluffs to proceed with the implementation and continuance of best management practices for winter maintenance operations. The long-term goal of this plan is to protect the environment from excessive concentrations of road salts while at the same time, ensure that winter roads and their users are kept safe.

The Salt Management Plan proposes goals and estimated timelines for implementation by Georgian Bluffs. Subject to endorsement and resource allocation by Council, the plan elements are to be programmed into the capital and operating budgets.

As well, in order that Environment Canada is kept abreast with the existence of a Salt Management Plan, its stage of implementation and the use of road salts, each municipality has been requested to submit a report by June 30th, 2004 and every June 30th thereafter.

Glossary of Terms

Anti-icing: means the application of liquid deicers directly to the road surface in advance of a winter event.

Continuous Winter Event Response: is a response to a winter event with full deployment of manpower and equipment that plow/salt/sand the entire system.

De-icing: means the application of solids, liquids, pre-treated material to the road surface after the on-set of the winter event.

Highway: includes a common and public highway, street, avenue, parkway, driveway, square, place, bridge, viaduct or trestle, any part of which is intended for or used by the general public for the passage of vehicles and includes the area between the lateral property lines thereof.

Paved Road: is a road with an asphalt surface, concrete surface, composite pavement, or Portland cement.

Pre-treat: means the application of liquids (calcium chloride, sodium chloride, etc.) to dry sand or salt prior to being loaded for storage or applied to the road surface.

Pre-wetting: means the application of liquids (calcium chloride, sodium chloride, etc.) at the spinner of the truck just prior to application to the road surface.

Surface Treated Road: is a road with bituminous surface treatment comprised of one or two applications of asphalt emulsion and stone chips over a gravel road.

Spot Winter Event Response: is a response to a winter event with only a part deployment of manpower and equipment or with full deployment to only part of the system.

Unpaved Road: is a road where the surface is not paved i.e. gravel is the wearing surface.

Winter Event: is a weather condition affecting roads such as snowfall, wind-blown snow, freezing rain, frost, black ice, etc. to which a winter event response is required.

Winter Event Response: is a series of winter control activities performed in response to a winter event.

Winter Event Response Hours: are the total numbers of person-hours per year (plowing, salting/sanding, winging back, etc.) to respond to winter events.

References

Ontario Good Roads Association (OGRA). (2018, June). *Good Practices for Winter Maintenance*. Retrieved from <https://www.ogra.org/files/Combined%20SVA%20Document.pdf>

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