

## SALT MANAGEMENT PLAN

### 1.0 Introduction

#### 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) within one year after its publication (i.e. by April, 2005). The implementation of the SMP is to begin in the financial period or fiscal year immediately following the preparation of the plan.

Wellington County and its member municipalities meet the criteria\* listed in the Code of Practice for the Environmental Management of Road Salts. In general, the maintenance of Wellington County's roadways during the winter season is both challenging and costly. Area municipal staff currently utilize salt and/or a salt/sand mix as their main tool in maintaining a safe and efficient roadway system during the winter season, whereas the County staff use a liquid de-icer (made from a combination of refined corn, magnesium chloride and water) in addition to a salt and salt/sand mix. An efficient winter maintenance plan has many benefits to the community, these include:

- lower accident rates;
- lower associated insurance and liability claims;
- time savings from faster travel;

\* The Town of Minto and Township of Mapleton and Wellington North reported salt usage of less than 500 tonnes per year, but each municipality contains areas of potential vulnerability to road salts.

- fuel savings from better traction and less congestion;
- reduced productivity losses due to late days and absenteeism;
- avoidance of lost sales due to inaccessibility or unavailability;
- reduced cost of commodities by reducing the transportation costs;
- ensures that emergency and security services can operate efficiently and effectively; and
- ensures the mobility of residents to engage in social activities.

These benefits have been shown to have benefit/cost ratios of 2:1 to 18:1. In other words, two dollars to eighteen dollars in benefits are derived from each dollar spent on winter maintenance activities.

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 material used.

The SMP is considered to be a “living” document. Once developed, the road authorities will be required to undertake a formal annual review with the goal of improving their winter maintenance operations. This review will also require that 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.

### **1.1 Purpose of the Document**

This SMP is intended to set out a policy and procedural framework for ensuring that Wellington County and its member municipalities continuously improve 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 County and the member municipalities 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 County and area municipal 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 to be endorsed by the “highest level of government”. Therefore the Councils of:

Wellington County;  
Town of Erin;  
Town of Minto;  
Township of Centre Wellington;  
Township of Guelph-Eramosa;  
Township of Mapleton;  
Township of Puslinch; and  
Township of Wellington North.

will be requested to endorse this plan.

## **1.2 Legislation**

The minimum standards for winter maintenance are mandated under provincial legislation. The standards set within Wellington County are currently at the same level or higher than the minimum standards specified in the Ontario Regulation 239/02 of the Municipal Act, 2001. The municipalities are also 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 Plan follow the best management practices that have been set out by the Transportation Association of Canada.

## **2.0 Salt Management Policy**

### **2.1 Vision, Mission, Mandate**

**Vision:** The County of Wellington and its member municipalities will be recognized as leaders in improving winter maintenance operations while reducing environmental impacts and ensuring public safety.

**Mission:** The County and member municipal public works staff will optimize the use of de-icers on all County and area roads while striving to minimize salt impacts to the environment.

**Mandate:** The County and member municipal public works staff will provide safe winter conditions for vehicular and pedestrian movements as required by the level of service policies and funding established by County, Town and Township Council.

## **2.2 Policy Statement**

The County of Wellington and its member municipalities will provide efficient and effective winter maintenance to ensure the safety of users of the county wide 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 Salt Management Plan;
- reviewing and upgrading the Salt Management Plan on an annual basis to incorporate new technologies and new developments;
- commit to ongoing winter maintenance staff training and education; and
- monitor on an annual basis, the present conditions of the winter maintenance program, as well as the effectiveness of the Salt Management Plan.

## **2.3 Application**

The SMP is to be endorsed by County Council, Town Council of Erin and Minto, and Township Council of Centre Wellington, Guelph-Eramosa, Mapleton, Puslinch and Wellington North. The SMP, as adopted, will apply to all employees within the County, and member municipalities who are involved in winter maintenance operations.

## **2.4 Principles**

To allow for the continued progression of the Salt Management Plan 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, where applicable.

## **2.5 Township of Wellington North**

The Township of Wellington North is responsible for the maintenance and construction of 331 km of road of which 123km are paved, 13km are surface treated and 195km are gravel.

The Township has adopted as policy the Minimum Maintenance Standards for Municipal Highways, Ontario Regulation 239/02 made under the Municipal Act,

2002. For winter operations, these regulations specify both patrol frequency and the clearance of ice and snow.

During the 2003 – 2004 winter season, the Township reported a usage of 4,571 tonnes of sand, 426 tonnes of salt and 62,122 liters of Sol-Nat for pre-wetting.

**2.5.1 Winter Patrol**

The Township employs 4 road patrollers to provide road condition information during the winter season. These individuals are responsible to call out the winter maintenance operators to ensure that the roads are cleared in a timely fashion while remaining in compliance with the Provincial Maintenance Standards as illustrated in Table 3.49.

<b>TABLE 3.49 ROUTINE PATROLLING FREQUENCY</b>	
<b>Class of Highway</b>	<b>Patrolling Frequency</b>
4	Once every 14 days
5	Once every 30 days

The individuals assigned to the patrol function are all familiar with local conditions within their area and prepare a road condition log of road and weather conditions as well as any action taken during the shift. On Township roadways, each road is covered 3 times every 7 days. Typically, the patrol shifts cover the 3:00am to 4:00pm period, Monday to Friday. On weekends, the road patrol is undertaken by the Foremen at times and intervals as appropriate and depending upon weather conditions.

Depending on weather conditions, the Township establishes a winter patrol schedule from mid November to the beginning of April.

**2.5.2 Level of Service**

In accordance with the Ontario Regulation 239/02, the Township provides a level of service for clearing snow accumulation and for treating icy roadway as illustrated in Table 3.50 and 3.51.

<b>TABLE 3.50 SNOW ACCUMULATION</b>		
<b>Class of Highway</b>	<b>Depth</b>	<b>Time</b>
4	8 cm	16 hours
5	10 cm	24 hours

TABLE 3.51 ICY ROADWAYS	
Class of Highway	Time
4	12 hours
5	16 hours

Overall, the Township’s goal is to strive to maintain centre bare pavement during the winter season.

### 2.5.3 Application Rates

Staff currently apply sand at the rate of 350kg per 2 lane km to 450kg per 2 lane km onto all Township roadways. The Roads Foreman and Operators are allowed latitude in adjusting the application rates depending upon road and weather conditions. Overall, the application rates currently in use have been established through past experience.

As seen from Table 3.52, over the past 3 year period the salt usage has been gradually reduced. Currently the salt/sand mix contains 5 percent salt, whereas prior to the 2003/2004 winter season, the Township blended a 10 percent mix.

TABLE 3.52 SALT/SAND USAGE TOWNSHIP OF WELLINGTON NORTH		
Winter	Sand Tonnes	Salt Tonnes
2001 - 2002	4703	803
2002 – 2003	3973	656
2003 – 2004*	4571	426

\* Note: Used 62,122 litres of Sol-Nat for pre-wetting

### 2.5.4 Equipment

For winter maintenance, the Township’s fleet consists of:

- 4 patrol vehicles;
- 8 combination plow/spreader units
- 5 graders;
- 2 backhoe/loaders and 2 loaders;
- 5 tractors/sidewalk maintainers;
- 1 dump truck for snow removal; and
- 1 utility single axle vehicle.

As well, the Township hires additional equipment and operators as required for snow removal operations and plowing.

Table 3.53 provides an inventory of the Township's winter maintenance fleet. Prior to the winter season the fleet undergoes a pre-season mechanical review to determine road-worthiness. The appropriate winter equipment is installed and safety checked. The three Dickey-John units are calibrated by the equipment supplier while the manual spreader controls are not calibrated at this time.

TABLE 3.53 WINTER FLEET AUDIT TOWNSHIP OF WELLINTON NORTH														
LOCATION		SALT/SANDER FLEET AUDIT								LOADERS	GRADERS	SIDEWALK MAINTAINER	BACKHOES	
		Patrol Vehicle	Tandem	Triaxle	Single Axle	Electronic Controllers	AT'S	IRT's	Spinners					
									Single					Dual
Arthur	#41	Yes				No	No							
	#42				Yes	Yes	No	No	Yes					
	#43									Yes			Yes	
	#44				Yes									
	#45										Yes			
	#46											Yes	Yes	
	#47											Yes	Yes	
Mount Forest	# 11	Yes				No	No							
	#12				Yes	No	No	No	Yes					
	#13				Yes									
	#14									Yes			Yes	
	#15											Yes		
	#16											Yes		
	#17											Yes	Yes	
West Luther	# 31	Yes					Yes	No						
	#32		Yes			Yes	No	No	Yes					
	#33		Yes			No	No	No	Yes					
	#34		Yes			Yes	No	No	Yes					
	#35										Yes			
	#36										Yes			
	#37									Yes				
	#21	Yes					Yes	No						
	#22		Yes			Yes	No	No	Yes					
	#23		Yes			No	No	No	Yes					
	#24										Yes			
	#25										Yes			
	#26									Yes				
	#27		Yes			Yes	No	No	Yes					



TABLE 3.54 FACILITY AUDIT, TOWNSHIP OF WELLINGTON NORTH													
PATROL YARD	SITE DRAINAGE ISSUES				SALT STORAGE REVIEW								
LOCATION	Vehicle Washing On-site	Washing Inside/ Outside	Oil/Water Separator	Drainage	Sand/Salt/ Storage		Salt Structure Type	Floor Impervious	Loading Inside	Door/ Overhang	Lighting	Ventilation	Paved Loading Pad
					Sand	Salt							
Arthur*	Yes	Outside	No	Surface run off	No	No							
Mount Forest	Yes	Outside	No	Surface run off	Yes	Yes	Shed	Yes	No	Yes	Yes	No	Yes
West Luther	Yes	Outside	No	Surface run off	Yes	Yes	Shed	Yes	No	Yes	Yes	No	Yes**
Arthur Township	Yes	Mainly outside	Yes	Surface run off	Yes	Yes	2 Sheds	Yes	No	Yes	Yes	No	Yes

\* Note: Township obtains material from MTO Yard to service the Arthur maintenance area.

\*\* Note: The existing paved loading pad area is very limited.

**2.5.5 Yard Facilities**

From Table 3.54, the Township operates four maintenance yards with salt/sand storage at the Mount Forest, West Luther and Arthur Township yards.

**2.5.6 Snow Removal and Disposal**

At the present time, the Township removes snow from the main business districts, municipal parking lots and some boulevards and cul de saes when the accumulations impede vehicular and pedestrian traffic. The snow is stored at two locations (Table 3.55). In the spring, all litter and debris is collected for disposal.

Approximately, 480 loads of snow are trucked to the Mount Forest site while 300 loads of snow are stored at Arthur.

Location	Ground Conditions		Run Off		Surrounding Land Use			
	Paved	Unpaved	Controlled	Uncontrolled	East	West	North	South
Arthur		Native Soil	Bermed on North Side		Rail Lands	Industrial	Agriculture	
Mount Forest		Native Soil	Town Storm Sewer		Industrial/Commercial			

**2.5.7 Weather Monitoring and Communications**

To supplement the Township’s road patrol information, staff obtain weather reports from World Weather Watch four times daily. All winter maintenance personnel are equipped with two way radios and are responsible for reporting changing weather conditions and/or road conditions.

The Roads Foremen typically call out the operators and mobilize equipment for storm response.

**2.5.8 Training and Documentation**

The Township currently provides some staff training for winter maintenance personnel; however, there is no formal ongoing annual winter training program in place. Staff attend the County Road Supervisors Association meetings to discuss such issues as new equipment, material trends in winter maintenance, regulatory changes and common issues relating to winter storm management.

Prior to the winter season, staff meet to discuss the strategy for winter maintenance, to go over the spreading/plow responsibilities and review the safety issues. In the spring following the winter season, staff typically meet to discuss the successes and failures of the past winter maintenance campaign and to provide input and suggestions for improvement.

The Township retains records for the purchase of salt and sand for use in winter operations. No formal records are kept for application rates/route/storm. Figures 15 and 16 portray a sample of the winter patrol records and operator logs which Township staff are expected to collect.

Figure 15

**TOWNSHIP OF WELLINGTON NORTH**

**Daily Winter Road Report**

Date: Jan. 7/03

LOCATION:  Arthur Twp.  West Luther Twp.  Mt. Forest  Arthur Village


WEATHER		TEMPERATURE (C degrees)		ROAD CONDITIONS	
SNOW	<input checked="" type="checkbox"/>	- 40 to - 30		LOOSE SNOW 0 - 5 cm	<input checked="" type="checkbox"/>
RAIN		- 30 to - 20		5 - 10 cm	
FREEZING RAIN		- 10 to 0	<input checked="" type="checkbox"/>	10 - 20 cm	
HIGH WINDS		0 to 10		WET	
CLEAR	<input checked="" type="checkbox"/>	+ 10 to + 20		DRY	
VISIBILITY - good		+ 20 to + 30		ICE PATCHES	<input checked="" type="checkbox"/>
- poor		FALLING		SNOW PACKED	<input checked="" type="checkbox"/>
FOG		RISING		SLUSH	

OPERATIONS		MACHINERY		WEATHER CHECK AND PATROL	
PLOW		<u>PREWES</u>		CHECKED WEATHER AT 3:00 AM	<input checked="" type="checkbox"/>
REGULAR SAND				PATROLLED AT 4:00 AM	<input checked="" type="checkbox"/>
SPICED SAND	<input checked="" type="checkbox"/>			PATROLLED AT 5:00 AM	
INTERSECTIONS				PATROLLED AT 6:00 AM	
HILLS & CURVES				PATROLLED AFTER 12 NOON	
FULL SANDING	<input checked="" type="checkbox"/>	<u>INT. D.T. #12</u>		EXTRA PATROL	
ICE BLADING					

SIDEWALKS					
OPERATION		EQUIPMENT		CATEGORY	
<u>Blow Snow</u>		<u>KUBOTA 3060</u>		BASIC	<input checked="" type="checkbox"/>
		<u>" L3450</u>		EXTRA	

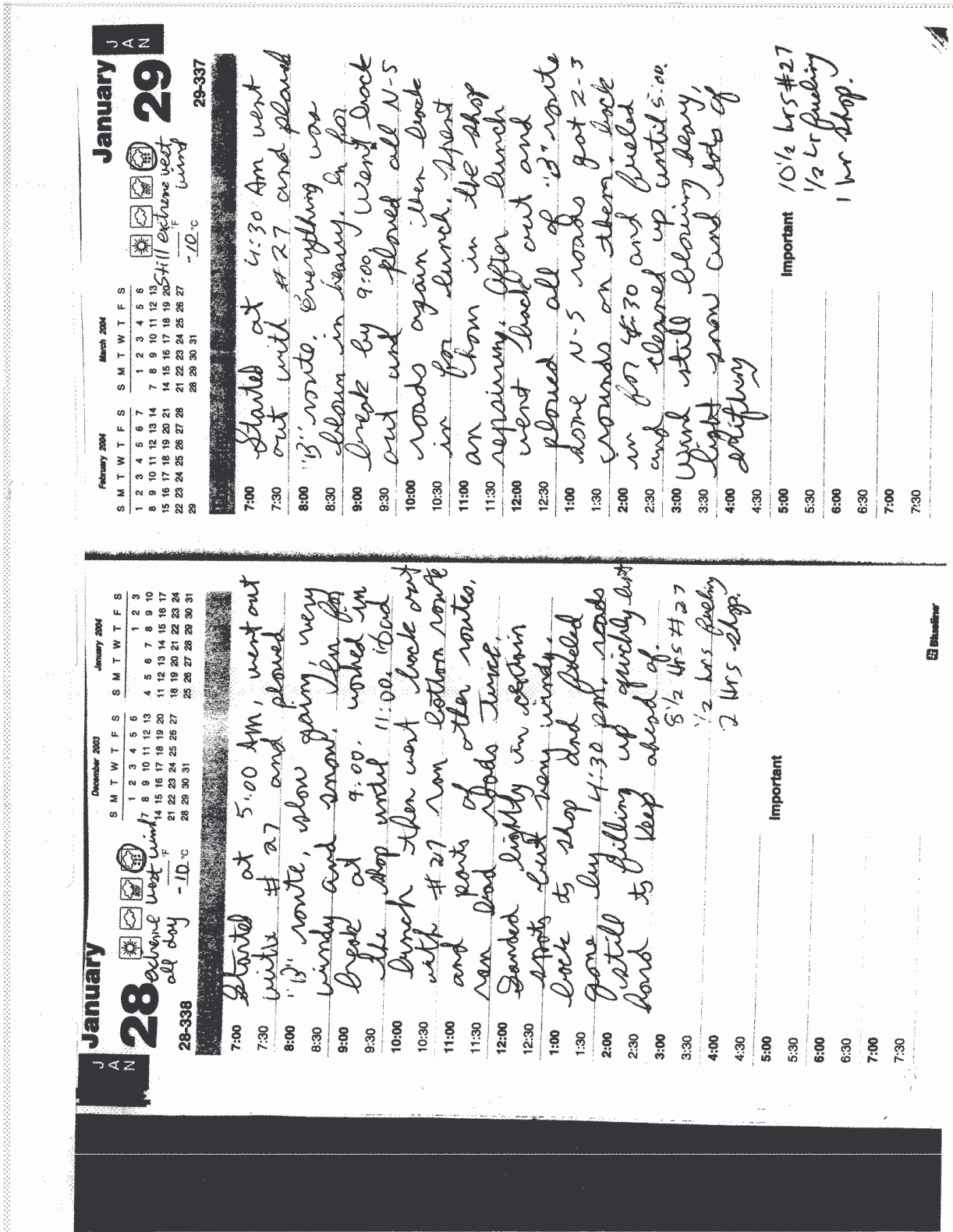
NOTES - Remarks:

<u>PREWES plowed ALL STS &amp; PARKING LOTS</u>
<u>SANDED ALL STS</u>

Signature: 

\\Nserver1\public\Works Dept\Daily Winter Road Report.doc  
/6

Figure 16



### **3.0 Salt Management Plans**

#### **3.1 Overview**

This chapter will present the elements of the SMP for Wellington County and each of its member municipalities. The plan will outline the steps required to effectively manage road salt for winter maintenance activities within Wellington County, and will cover the following areas:

- winter maintenance policies;
- 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, but rather a listing of improvements that are seen to be beneficial and feasible considering current conditions. At the same time, it should be recognized that many of the plan elements will require the support of council to assure that appropriate capital/current funds are provided for implementation. Each element within the plan will cover:

- the activity intent and current situation;
- the goals;
- the timetable for achieving the stated goals;
- the responsibility for implementation;
- the environmental impacts; and
- performance measures.

#### **3.2 Wellington County**

### 3.3 Township of Wellington North

The following provides the elements of the SMP pertaining to the Township of Wellington North:

#### 3.3.1 Winter Maintenance Policies

**General:** 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.

Currently, Township Council has adopted the Minimum Maintenance Standards for Municipal Highways, Ontario Regulation 239/02.

**Goal/Timetable:** • Winter maintenance policies will be reviewed annually and updated as needed. If changes are required, Council endorsement is to be obtained.

**Responsibility:** Public Works Superintendent.

**Environmental Impacts:** Winter maintenance policies form the foundation for program delivery and can have a significant impact on the environment.

**Performance Measure:** A Council approved winter maintenance policy.

#### 3.3.2 Equipment Upgrading

**General:** It is intended that the winter maintenance fleet be capable of delivering appropriate levels of de-icing materials within a full range of climatic conditions.

Currently, all 5 out of the 8 spreader units are equipped with electronic controllers to monitor the volume and location of material spread, but the Township does not utilize the data retrieval capabilities at this time. The lack of IRT's on the patrol and spreader units reduces the likelihood that operators will spread the proper volume of de-icing material for the climatic and pavement conditions.

The Township staff currently uses pre-wetting in their current winter operations by injecting a

prewetting chemical into the material stockpile at a specific dosage.

- Goal/Timetable:**
- As the spreader fleet comes up for replacement within the Township's vehicle replacement program, the spreader units are to be equipped with prewetting capability and electronic controllers.
  - IRT's are to be installed on the Township's four winter patrol vehicles prior to the 2005 – 2006 winter season.
  - Between 2006 – 2009, the spreader fleet is to be equipped with IRT's.

**Responsibility:** Public Works Superintendent.

**Environmental Impacts:** Equipment upgrades will improve the capability of placing the right amount of salt in the right place at the right time and allow for an increased level of data collection leading to more effective analysis of salt use.

**Performance Measure:** Percentage of equipment with electronic spreader controls, IRT's, and pre-wet capabilities.

### 3.3.3 Equipment Calibration

**General:** Properly calibrated equipment is one of the keys to the effective placement of de-icer material on Township roadways.

Currently, the spreaders are not being calibrated and the spreader routes have not been benchmarked. The spreading of material is left to operator experience and past practices.

- Goal/Timetable:**
- Prior to the 2005 - 2006 winter season and each year thereafter, all spreaders will be calibrated and all routes benchmarked. During the winter season the equipment will be checked and recalibrated as needed.

**Responsibility:** Public Works Superintendent, Roads Foreman.



<b>Environmental Impacts:</b>	Proper equipment calibration and maintenance will ensure that the proper volume of de-icing and anti-icing salts can be spread onto the roadway.
<b>Performance Measure:</b>	Spreaders calibrated by November 1 of each year. Routes benchmarked by November 1 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"><li>• of material spread rates across routes, across vehicle units and across operators;</li><li>• of each route and vehicle unit; and</li><li>• of actual spread ratio performance against industry spread rates.</li></ul>

### 3.3.4 Equipment Washing

<b>General:</b>	It is intended to reduce the amount of chlorides, oil grease and grit that is discharged back into the environment.  At the present time, the equipment is typically washed outside. Only the Arthur Township Yard has an oil/water-separator.
<b>Goal/Timetable:</b>	<ul style="list-style-type: none"><li>• Prior to the 2007 – 2008 winter season, oil/water separators are to be installed at the Arthur, Mount Forest and West Luther Yards.</li><li>• Following the installation of oil/water separators in all yards, the vehicles are to be washed indoors to minimize any discharge back to the environment.</li></ul>
<b>Responsibility:</b>	Public Works Superintendent, Foremen, Operators.
<b>Environmental Impacts:</b>	Vehicle wash water contains salts, oil, grease and dirt and can have an adverse affect on the environment if allowed to be discharged into the soils below and adjacent to the yard.
<b>Performance Measure:</b>	Percentage of vehicles washed indoors and passed through oil/water separator before being placed in readiness for the next shift.

### 3.3.4 Material Ordering and Delivery

**General:** It is intended to maintain best practices and procedures in the ordering and delivery of de-icer materials.

In the fall season, salt and winter sand is delivered and stockpiled on the loading pads. However, it should be noted that the loading pad area at the West Luther yard is very limited. Over a 24 hour winter sand is mixed with salt (5 percent) and all material conveyed to indoor storage. The loading pad is not thoroughly swept and cleaned following the transfer of material to indoor storage.

- Goal/Timetable:**
- To minimize salt loss to the environment, the following measures are to be taken each year:
    - (a) ensure that the deliveries of salt and sand are covered with a waterproof tarpaulin and deliveries occur in good weather; and
    - (b) ensure that the loading pads are swept clean following the transfer of material to indoor storage.
  - All deliveries are to be recorded on approved forms to summarize:
    - (a) weather conditions;
    - (B) required tarping;
    - (c) transfer of material indoors within 24 hours;
    - (d) loading pad cleaned; and
    - (e) weigh ticket with truck number and net weight.
  - The initial stockpiling at each yard should be completed prior to November 1<sup>st</sup> of each year. During the initial stockpiling a sample to ascertain the material gradation and moisture content should be completed and appropriate action taken should the samples fail.
  - Prior to the 2006 – 2007 winter season the paved loading pad area at the West Luther yard is to be expanded to adequately contain the salt/sand deliveries.

<b>Responsibility:</b>	Public Works Superintendent for ensuring that the ordering and delivery practices are complied with and the paved loading pad area expanded at the West Luther yard.  Forman for ensuring that the ordering and delivery practices are implemented.
<b>Environmental Impacts:</b>	Improper housekeeping practices relating to the delivery and handling of salt can increase loss to the environment. Excessive moisture in the de-icing material may make this material unusable for use during the winter season.
<b>Performance Measure:</b>	Percentage of deliveries tarped/ordered in good weather;  Percentage of material put into inside storage;  Loading pad thoroughly cleaned following transfer of material to storage; and  Audit compliance of housekeeping practices through periodic yard inspection.

### **3.3.5 Materials Storage and Handling**

<b>General:</b>	It is intended to maintain best practices and procedures for the storage and handling of winter maintenance materials.  The Township currently stores salt and sand in sheds at the West Luther and Arthur Township yards. Paved loading pads are used for delivery and loading/unloading the spreaders.  The inside storage area has an impervious pad. The sheds are inspected each spring to identify and repair any deficiencies to the floor or exterior areas of the structure. Repairs to the structures are normally scheduled and completed prior to the following winter season.  The sheds have doors to minimize precipitation entering the structure and proper lighting.
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- Goal/Timetable:**
- To improve storage and handling of sand and salt, the following measures are to be followed each year:
    - (a) when loading/unloading spreaders outside the storage structure, the loading is to occur on the impervious loading pad; any material spilled during loading/unloading spreader equipment should be collected and conveyed back to the storage structure as soon as possible;
    - (b) spreaders should not be loaded beyond their capacity to avoid spillage during operations;
    - (c) ensure no frozen blocks of material are placed in the spreaders when loading. Any frozen blocks should be pushed into a corner of the storage structure and allowed to thaw and dry prior to introducing this material to the stockpile;
    - (d) check the lighting at the entrance and inside the storage structure weekly to ensure that the lighting is functional;
    - (e) ensure proper ventilation for the removal of noxious fumes and moisture;
    - (f) document the inspection and repair of the storage structures; and
    - (g) when replacing a storage structure or adding a new structure the TAC Code of Practice for Design and Operation of Road Maintenance Yards should be followed;
  - On a seasonal basis the amount of material used versus amount stored is to be reconciled with the deliveries and the daily usage records.

**Responsibility:** Foremen to ensure the guidelines for “good house keeping practices” are implemented.

Operators to ensure that the guidelines for “good house keeping practices” are followed.

**Environmental Impacts:** Improper housekeeping practices related to the storage and handling of salt can increase the potential for loss to the environment.

**Performance Measure:** Audit compliance through periodic yard inspection.

### 3.3.6 Material Record Keeping

**General:** It is intended to retain an accurate record of the amount of material used by routes by vehicle and by storm event.

At the present time, material usage by route, vehicle or storm is not collected. Typically, material usage is rationalized by comparing the amount of material ordered with the residual inventory.

- Goal/Timetable:**
- For the 2005 – 2006 winter season, a material tracking system is to be implemented to track material usage by vehicle, route and storm and be capable of comparing usage to benchmarked rates. By providing an accurate record of material usage by route and vehicle and by storm, the Township will be able to fine tune the amount of material to be spread for varying climatic and pavement conditions. The immediate goal will be to compare usage with benchmarked routes and to rationalize the amount of material ordered with the residual inventory.
  - With the existing electronic controllers and as new electronic controllers are introduced into the spreader fleet, the data from the electronic controllers is to be downloaded on a regular basis for analysis.

**Responsibility:** Public Works Superintendent for the design and implementation of a material tracking system.

Foreman for ensuring that the necessary equipment is operating properly to measure the amount of material placed on roads, and for summarizing the data.

Operators for completing and returning a daily sanding, salting and plowing log on the end of each day.

**Environmental Considerations:** Effective salt management requires an accurate accounting of usage by storm, route and vehicle.

**Performance Measure:** Record of material usage by storm, route and vehicle together with a year end material reconciliation.

### 3.3.7 Weather Forecasting

**General:** The intent is to provide timely and accurate weather information to assist in decision making.

Currently, daily patrols determine if plows and sanders are to be deployed or to remain out. This is accomplished by visual inspection and reports from World Weather Watch.

**Goal/Timetable:**

- Prior to the 2005 – 2006 winter season, develop a strategic plan in cooperation with the other local area municipalities and the County to explore options in providing enhanced forecasted and real time weather and pavement information on a County wide basis.
- The use of the IRT's on all patrol vehicles by the 2005 – 2006 winter season will further enhance the decision making ability by integrating weather information with pavement temperatures.

**Responsibility:** Public Works Superintendent and representatives of the local area municipalities and the County for developing a strategic plan to explore an enhanced County wide weather forecasting program.

**Environmental Impacts:** The effective use of de-icing material is dependant on accurate weather information and informed decision making. Inaccurate weather information and/or poor decision making can result in untimely use of salt.

**Performance Measure:** Delivery of clear, accurate weather forecasts 4 times daily between November and April each year.

### 3.3.8 Storm Response

- General:** It is intended to provide criteria and guidelines to standardize staff response for various combinations of precipitation pavement temperature and traffic volumes.
- Currently, staff react to visual patrols and weather reports from various sources (World Weather Watch, emergency services, the general public, etc.) to initiate the mobilization of the operators for plowing and de-icing action. No formal guidelines are presently available to patrollers and operators for storm response.
- Goal/Timetable:**
- Prior to the 2006 – 2007 winter season, formal guidelines for maintenance actions for each type of storm event, for various pavement temperatures and conditions, and for various initial and subsequent operations are to be prepared. [Appendix C provides an example from the Region of York covering weather events of light snowfalls, light snowfalls with periods of moderate or heavy snow, moderate to heavy snow storms, frost or black ice, freezing rain and sleet storms. Appendix D provides an example from the District of Muskoka for centre bare and snow covered roadways.]
- A 2 to 5 year goal will be to monitor the records of storm response in relation to the established guidelines in order to assess any necessary changes.
- Responsibility:** Public Works Superintendent for preparing formal storm response guidelines.
- Foreman and Operators for ensuring the implementation of appropriate storm response treatments.
- Environmental Impacts:** Snow and ice control decisions that are not consistent with actual weather and road conditions will lead to inefficiencies in storm response and inappropriate material usage.

**Performance Measure:** A documented storm response plan  
Accurate and complete record of storm response

### 3.3.9 Snow Disposal Sites

**General:** It is intended to examine the existing snow disposal sites at Arthur and Mount Forest to reduce or eliminate the environmental impacts.

Currently, collected snow is stored in unpaved areas at both snow storage areas. The melt water is somewhat controlled by a north side berm in Arthur and the Town storm sewer in Mount Forest. There has been no benchmark established to determine the levels of salt, oil/grease and sedimentation, to understand the environmental degradation of the site and to assess recommended action.

**Goal/Timetable:**

- In 2005 – 2006, the Arthur and Mount Forest storage areas are to be monitored to determine the levels of salt, oil/grease and sedimentation prior to the 2005/2006 winter season, during the season and after the season.
- The results of the monitoring program are to be used to initiate the mitigation of any adverse environmental impacts before the 2007/2008 winter season.
- Each spring, all litter and debris are to be collected from the snow storage area and disposed of.
- Best Practices for site operation and record keeping as it relates to snow storage areas (Syntheses of Best Practices, Road Salt Management, Transportation Association of Canada) are to be followed on an annual basis.

**Responsibility:** Public Works Superintendent for implementing a monitoring/mitigation program.

Forman for ensuring all litter and debris are collected and disposed of.



**Environmental Impacts** Review of the snow disposal site and the disposal operations can lead to a reduction of environmental impacts.

**Performance Measure:** Compliance with Ministry of Environment regulations.

### 3.3.10 Winter Patrol

**General:** 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 motoring public are maintained.

Currently, the Township provides a patrol to inspect and monitor road conditions in compliance with the Provincial Minimum Maintenance Standards.

**Goal/Timetable:**

- Prior to the 2005 – 2006 winter season a Patrol Policy for Township operations is to be developed and approved by Council (see Appendix A).
- The Patrol Policy is to be reviewed annually to ensure that the guidelines are consistent with the Township’s level of service expectations.

**Responsibility:** Public Works Superintendent for preparing a Patrol Policy for Council approval.

Foreman to ensure that the level of service policies are met.

**Environmental Impacts:** 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.

<b>Performance Measure:</b>	Percentage of staff trained in snow and ice decision making.  Documentation of road and weather conditions and appropriate responses to situations.
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### 3.3.11 Snow and Ice Control Training

**General:** It is intended that all staff involved in snow and ice control and effective salt management are adequately trained.

At the present time there is no formal on going winter training program in place for snow and ice control.

- Goal/Timetable:**
- To ensure that all staff are 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:
    - (a) good housekeeping practices;
    - (b) interpretation of weather and pavement conditions;
    - (c) proper use of infra red thermometers;
    - (d) when and how to apply chemicals including concepts of de-icing;
    - (e) health and safety requirements; and
    - (f) proper record keeping and review.

**Responsibility:** Public Works Superintendent to arrange for the appropriate annual training modules for all staff involved in winter maintenance activities.

**Environmental Impacts:** Thorough understanding of good housekeeping practices, the measures of snow and ice control and the expectations of program delivery will result in a greater probability of success with the salt management plan.

**Performance Measure:** Percentage of staff receiving snow and ice control training.

### 3.3.12 Technology Review

<b>General:</b>	It is intended that existing and new technologies be continually reviewed to determine their applicability in altering current practices.
<b>Goal/Timetable:</b>	<ul style="list-style-type: none"><li>On an annual basis new technologies and proven alternative methods to combat winter storms will be reviewed. Pilot studies incorporating relevant winter maintenance methodologies will be recommended where deemed appropriate.</li></ul>
<b>Responsibility:</b>	Public Works Superintendent to monitor, report on new technologies.
<b>Environmental Impacts:</b>	New techniques, procedures and technologies may provide more effective methods of monitoring and /or reducing the amount of salt entering the environment.
<b>Performance Measure:</b>	Annual report on new developments in snow and ice control.

### 3.3.13 Communications Strategy

<b>General:</b>	<p>It is intended that an overall communications strategy with respect to the Township's winter maintenance program be effectively communicated to not only staff but also the public.</p> <p>There is no booklet in place describing the Township's winter maintenance program and policies that could be distributed to the general public. As well, Township staff do not currently have written guidelines to follow for winter maintenance responsibilities.</p>
<b>Goal/Timetable:</b>	<ul style="list-style-type: none"><li>Prior to the 2005 – 2006 winter season, a "Winter Maintenance and Control Newsletter" is to be prepared and distributed to the general public and the media to inform residents that road salt is not toxic to humans and to provide information on the specifics of the Township's winter maintenance program.</li></ul>

- The Township web page is to be updated annually to provide fresh information relative to winter operations.
- Prior to 2005 – 2006 winter season, a “Winter Control Handbook” will to be prepared for internal use as a reference guide to provide:
  - (a) contact list;
  - (b) maintenance standards;
  - (c) material application rates;
  - (d) expected load coverage by various sizes of equipment;
  - (e) plow, sander and combination routes;
  - (f) operator and patroller assignments and shift coverage including holiday schedules;
  - (g) guidelines for calibration and benchmarking routes;
  - (h) record keeping requirements;
  - (i) communication strategy with area media, school board transportation agencies and the public;
  - (j) internal and external arrangements with respect to boundary roads and connecting links;
  - (k) arrangements to recharge facilities;
  - (l) loader responsibilities; and
  - (m) pre event planning for possible road closing that may occur due to reduced visibility and drifting snow, and for snow removal operations.

**Responsibility:** Public Works Superintendent.

**Environmental Impacts:** Increased awareness of the role and management of snow and ice control in winter maintenance operations will provide the area residents and staff with a greater understanding of the challenges in combating winter storms.

**Performance Measure:** Distribution of a Winter Maintenance and Control Brochure and Winter Control Handbook document.

Up to date information on winter maintenance operations on the Township web site.

### 3.3.14 Environmentally Sensitive Areas\*

**General:** It is intended to understand the impacts of the winter maintenance practices on environmentally sensitive areas within the County of Wellington.

Currently, the County is undertaking a groundwater management study, the results of which have not been published. The County's Official Plan defines the green lands system which includes:

- wetlands;
- environmentally sensitive areas;
- streams and valley lands;
- ponds, lakes and reservoirs;
- areas of natural and scientific interest;
- woodlands;
- fish, wild life and plant habitat;
- flood plains and hazardous lands; and
- threatened or endangered species.

To date, there has been no information available regarding the impacts of winter maintenance activities on Wellington County's existing environmentally sensitive areas.

- Goal/Timetable:**
- Year 1 – County staff in collaboration with area conservation and local area public works staff will start to identify and rank environmentally sensitive areas within Wellington County as a whole. For the most vulnerable areas (highest ranked), a monitoring program will be developed to explore the level of impact resulting from the County's winter maintenance practices. A suggested starting point would be a review of the County groundwater management study.
  - Year 2 - The areas subjected to monitoring will be reviewed and an appropriate action plan is to be developed where practical. Also in year 2 consideration is to be given to an expansion of the monitoring program to other environmentally sensitive areas.

\* This element is common to the County and each of its member municipalities, and for a successful outcome, it is important to obtain buy in by all municipalities within Wellington County, including the City of Guelph.

Year 3 and beyond – A monitoring program of environmentally sensitive areas is to continue in order to provide a historical record of chloride concentrations as it relates to winter maintenance practices within Wellington County.

**Responsibility:** County Planning and Engineering; area Conservation Authorities and local area Public Works.

**Environmental Impacts:** Environmentally sensitive areas that are impacted by winter maintenance practices may require unique solutions and specific action programs to mitigate the impacts.

**Performance Measure** Identification and ranking of environmentally sensitive areas monitoring test results against current practices and mitigation measures.

#### **4.0 Monitoring and Updating**

The Salt Management Plan is intended as a starting point for municipalities within Wellington County 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 are kept safe.

The Salt Management Plan proposes a number of initial goals and timelines for implementation by Wellington County and its member municipalities. Subject to endorsement by County Council, Town Council of Erin and Minto and Township Council of Centre Wellington, Guelph-Eramora, Mapleton, Puslinch and Wellington North, the plan elements need to be programmed into each municipal capital and operating budget.

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 30, 2005 and every June 30<sup>th</sup> thereafter. Appendix F contains a copy of the "Annual Report Form" that Environment Canada has prepared together with submission information.