# Town of Londonderry, NH

# Salt Reduction Plan For:

# Beaver Brook Watershed
# Within the Boundaries of the Town of Londonderry

Approved by Town Council: *2/14/2011*
Revision 1: *(July 26, 2019 – updated data on page 32 of 38)*
Revision 2: *(July 26, 2022 – updated data on page 32 of 38)*

**Legal Notices:**

These are General guidelines used by the Londonderry, NH Public Works and Engineering Department. Each decision to apply de-icing, anti-icing, and pre-treatment materials is made in accordance with the Town of Londonderry's Winter Maintenance Snow and Ice Control Policy and based on particular weather conditions, past experience, and the availability of resources and therefore may not adhere strictly to this plan.

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## 1.0 Introduction

Beaver Brook has been identified as impaired by the New Hampshire Department of Environmental Services (NHDES) and the US Environmental Protection Agency (EPA) for chloride concentrations that exceed state water quality standards. NH DES has completed a Total Maximum Daily Load (TMDL) analysis to quantify pollutant reductions needed to meet the state water quality standards for chlorides.

In order to meet water quality standards, significant reductions from current chloride loading are required. The Town of Londonderry has agreed to work towards the reduction of the amount of chlorides applied during snow and ice removal operations while maintaining the town's roadway system in accordance of the Town's Winter Maintenance Snow and Ice Control Policy (see Appendix A). See Appendix B for a copy of the approved Municipal Resolution stating same. This salt reduction plan will serve as a scope of work for implementation of salt reduction efforts..

Beaver Brook is a 4.86 mile stream segment located in Auburn, Chester, Derry, and Londonderry, NH. The associated watershed is 30.33 square miles and is located in the vicinity of the I-93 Corridor from Massachusetts to Manchester. (See figure 1).

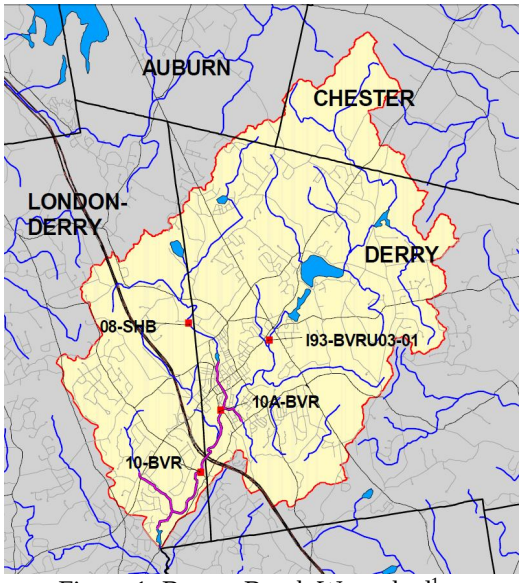

Figure 1: Beaver Brook Watershed[1]

[1] Photo Credit: NHDES TMDL 2008

The Town of Londonderry currently maintains total of 184.39 miles of public roads[2], and 25.753 acres (1,078,247sq ft) of parking lots throughout the town.
Londonderry is responsible for winter maintenance of 77.91 lane miles[3] (38.955 road miles) of town owned roads within the Beaver Brook watershed. Londonderry also maintains 2 municipal parking lots[3] (2.395 Acres = 105,072 Sq. Ft.) within the Beaver Brook watershed.

Within the Beaver Brook watershed New Hampshire Department of Transportation (NHDOT) is responsible for winter maintenance operations on a segment of I-93, section of Rte 102, section of Rte 28, small sections of Rte 128, Peabody Row as well as state parking lot at Exit 4 (including driveway).

Roadways and parking lots which are not maintained by Town of Londonderry or NHDOT are classified as private. These paved surfaces are maintained each winter season by a private snow and ice removal company hired by the respective land owners. Within the watershed and within the municipal boundaries of Londonderry there are 16.084 lane miles[2] (8.042 road miles) of private roads, 141.91 acres of parking lots[4], and 7.25 miles of parking lot driveways[3].

The goal for the Salt Reduction Plan (SRP) is to provide procedural framework for the Town of Londonderry to continuously strive to improve winter maintenance operations while effectively and efficiently using road salt during snow and ice removal operations. New practices, mechanical upgrades, outreach and awareness activities contained within this plan are intended to reduce the amount of road salt applied thus working towards decreasing chloride loading to the watershed and meeting the required TMDL.

## 2.0 Plan Development

Londonderry will provide winter maintenance to town roadways, parking lots and sidewalks in accordance with Londonderry's Winter Maintenance Snow and Ice Control Policy (see Appendix A) while striving to minimize adverse impacts to the environment. These efforts will be met by:

- Adhering to the procedures contained within this SRP
- Committing to ongoing winter maintenance staff training and education
- Reporting fiscal year salt use data to the NH DES
- Re-evaluating the effectiveness of the SRP as needed to incorporate new technologies or changes in procedures.

The SRP is meant to be dynamic to allow the municipality to evaluate and phase-in any changes, new approaches and technologies in winter maintenance activities in a fiscally sound manner.

To reduce the financial burden on municipal tax payers the town will participate in the I-93 Watersheds municipal salt reduction program developed in 2008 by the NHDOT in cooperation with the FHWA. The program will administer a reimbursement process to assist towns with

[2] Source: NHDOT 2010 Road Centerline File
[3] Source: NHDOT 2010 Road Centerline File
[4] Plymouth State University Parking Lot Study

implementing TMDL load reductions. This SRP has been prepared in partial fulfillment of program requirements to address chloride load reductions to meet TMDL.

## 3.0 Winter Maintenance Overview

Documenting the current winter maintenance program in Londonderry is essential to understanding mechanisms in which actions for chloride reduction can take place. The summary below provides detail on paved surface maintained, material usage, application rates. The major activities related to winter maintenance are:

**Table 1: Winter Maintenance Activities**

| | |
|---|---|
| Snow Plowing | Snow Storage |
| Salt/Sand Spreading | Sidewalk Plowing & De-icing |
| Salt & Sand Storage | Drainage Clearing |
| Snow & Ice Removal | |

The Town of Londonderry currently maintains total of 184.39 miles of public roads[5], and 25.753 acres (1,078,247sq ft) of parking lots throughout the town. The table below details municipally maintained parking lots town wide which are maintained accordingly to Town's Winter Maintenance Snow and Ice Control Policy.

**Table 2: Town Maintained Parking Lots**

| Facility | Area of Parking (Square Ft) | | Total |
|---|---|---|---|
| | Paved | Gravel | |
| High School | 236,328 | 67,933 | 304,260 |
| Matthew Thornton School | 112,282 | | 112,282 |
| Middle School | 175,209 | | 175,209 |
| Nelson Field[6] | 90,712 | | 90,712 |
| North School | 95,676 | | 95,676 |
| Senior Center | 91,527 | | 91,527 |
| South School[6] | 14,360 | | 14,360 |
| Town Hall | 123,056 | | 123,056 |
| South Fire | 92,390 | | 92,390 |
| Central Fire | 28,134 | | 28,134 |
| **Total** | **1,078,247** | **67,933** | **1,146,180** |

Londonderry roads have been classified as collector and local roads based on the average daily traffic. As a general guideline (as per the Town's Winter Maintenance Snow and Ice Control Policy), heavily traveled roadways are given first priority. The Town attempts to maintain other town roadways during a snowstorm. Sometimes, however, conditions or other factors dictate that snow removal on other town roads is not necessarily shoulder-to-shoulder. Appendix C contains a plow route map.

[5] Source: NHDOT 2010 Road Centerline File
[6] Within the Beaver Brook Watershed

Materials used in winter maintenance vary annually and are a function of winter weather severity. The table below provides an overview of average material usage. A detailed 10 year average is provided within Appendix D. The 10 year average is used to evaluate salt usage to normalize the effects of more and less severe winters. NHDOT analysis has found that a 10 year average is approximately equal to the Weather Severity Index (WSI) normalized average.

**Table 3: Annual Town Wide Material Usage Summary**

| **Material** | **2008/2009** | | **10 Year Average** | |
|---|---|---|---|---|
| **Solids** | | | | |
| Rock Salt (NaCl) | 3918 | Tons | 4,143.8 | Tons |
| Sand | 4734 | Tons | 4,262.0 | Tons |

The town wide salt application rates are currently set at approximately 300 lb/lane mile.

## 4.0 Proposed Best Management Practices (BMPs)

### 4.1 Equipment Upgrade Pilot: Prewetting, Ground Speed Oriented Spreaders & Pavement Temperature Sensors.

**Pre-TMDL:** Currently the Town of Londonderry is not using prewetting, or ground speed oriented spreaders. The town does apply chemical (straight salt and sand/salt mix)/prior to and during storm events to reduce the potential for ice/pavement bonding. The Town has documented salt reductions in other areas of the town by using an underbelly (dump/spreader combination) discharge spreaders, and intends to implement this technology coupled with salt prewetting systems, and ground speed oriented spreaders to achieve even greater reductions. For comparison, provided in Appendix E are selected sheets showing salt usage using an underbelly discharge, and traditional rear discharge spreader units. It should be noted that these trucks each have approximately 20 mile routes.

**Post-TMDL:** Londonderry did not adopt prewetting or ground speed oriented spreaders after the TMDL reports were published.

**Proposed BMP:** The town will purchase a new 6 wheel dump truck with underbelly (dump/spreader combination) discharge spreader also to be equipped with a sprayer to prewet salt and a ground speed oriented spreader. Londonderry will conduct a prewetting pilot to evaluate its use for salt reduction on municipally maintained roads within the watershed. This will give the town the ability to evaluate effectiveness and refine application rates and usage on a limited scale to determine if prewetting is appropriate for a wider usage. The DOT recommended application rates in conjunction with prevailing industry documentation will be used as a baseline for evaluation. The trial will primarily be focused on one of four plow routes of municipally maintained roads within the Beaver Brook watershed. In addition to the prewetting equipment the truck will be equipped with a pavement temperature sensor with in cab readout. In addition the town will continue to maintain a log of salt usage for routes within the watershed to tabulate salt usage and determine achieved reductions.

Londonderry will conduct field trials with this equipment throughout the winter season. During the trials each element will be evaluated for salt reduction, ease of use, reliability, lifecycle costs, and driver adoption.

**Equipment/Materials Needs:** To facilitate the pilot Londonderry is anticipating purchasing of Salt Brine from NHDOT at a price to be determined prior to the winter season. The town will work with NHDOT to ensure that brine can be purchased on a schedule which will not present a burden to either organization. Londonderry will also take advantage of NHDOT's knowledge base relative to application rates and best practices to aid in the success of the trial.

A new underbelly discharge 6-wheeled dump truck will be purchased to be used as a platform for new equipment. New prewetting, and groundspeed oriented spreading equipment will be purchased to be installed on the new 6-wheeled dump trucks. This new equipment will include:

- New 6 wheel dump truck: 6 wheel dump capable of underbelly discharge spreading. Specifications will be similar to existing Londonderry trucks.

- **Spreader Control Unit:** Controller with the ability to calibrate and accurately dispense material regardless of vehicle speed. The controller will include the ability to control pre-wetting equipment, ground speed oriented spreaders, and temperature sensor data. The unit will allow management to set application rates which will automatically change with vehicle speed and ground temperature. Prescribed application rates may only be changed with an administrative password. Londonderry may not use the full capacity of the control units in the first winter season, however it will be advantageous for future funding rounds to have this equipment in place to receive potential new equipment upgrades.

- **Brine Tanks & Sprayers:** Truck mounted brine tanks, pumps, and sprayers with the ability to be calibrated and operate with the spreader control unit. Units may vary as appropriate to fit truck configuration (i.e. saddle tanks, top mounted tanks, etc.).

- **In-Cab Air/Pavement Temperature Sensor:** Unit will provide air and pavement temperature readings on an in-cab display and integrate into the spreader control unit.

- **Electronically Controllable Hydraulic Valves:** Necessary to allow the controller to adjust auger and spinner speeds.

**Estimated Reduction:** The first year reductions estimated in table 4 below are conservatively estimated at 5%. These reductions are only resulting from equipment upgrades. Londonderry acknowledges that these reductions alone are insufficient to meet TMDL requirements.

**Table 4: Pre-Wetting Pilot Estimated Reductions**

| Watershed | Existing Imports[7] | Estimated Reduction | Estimated Reduction | Estimated Reduced Imports | TMDL Allocation |
|---|---|---|---|---|---|
| | *Tons/Year* | *Percent* | *Tons/Year* | *Tons/Year* | *Tons/Year* |
| **Beaver Brook** | 854.47 | 5% | 42.72 | 811.74 | 719.4 |

## 4.2 Calibration Procedures

**Pre-TMDL:** Londonderry periodically performs calibrations of municipal spreaders.

**Post-TMDL:** Londonderry did not modify its calibration procedures or schedule post-TMDL.

**Proposed BMP:** Londonderry will calibrate each spreader unit prior to the winter season using manufacturer information. Calibrated settings will be logged in a master sheet, and stored inside the vehicle. Prior to each storm each truck will be checked to verify that settings are calibrated to dispense the proper amount of chemical. Each unit will be re-calibrated at least once during the season, and hydraulically controlled units will be re-calibrated whenever the hydraulic system is altered or maintained.

Properly calibrated equipment will ensure that each spreader is dispensing the appropriate amount of material for each storm. It is anticipated that this practice will reduce waste and improve efficiency of chemical dispensation.

**Equipment/Materials Needs:** The town will not require any additional equipment or materials to perform calibrations.

**Estimated Reduction:** The reductions estimated in table 5 below are conservatively estimated at 1%. These reductions are only resulting from calibration procedures. Londonderry acknowledges that these reductions alone are insufficient to meet TMDL requirements.

**Table 5: Equipment Calibration Estimated Reductions**

| Watershed | Existing Imports | Estimated Reduction | Estimated Reduction | Estimated Reduced Imports | TMDL Allocation |
|---|---|---|---|---|---|
| | *Tons/Year* | *Percent* | *Tons/Year* | *Tons/Year* | *Tons/Year* |
| **Beaver Brook** | 854.47 | 1% | 8.54 | 845.92 | 719.4 |

[7] Per 10 year average

## 4.3 Public/Private Sector Outreach Program & Training

**Pre-TMDL:** Prior to the TMDL completion Londonderry had not actively encouraged local contractors to reduce their chloride usage.

**Post-TMDL:** Subsequent to the TMDL Londonderry did not actively encourage local contractors to reduce their chloride usage.

**Proposed BMP:** Londonderry will require that all town staff and private contractors hired by the town attend salt reduction trainings. Londonderry will engage in a public outreach program including sending mailers to local business owners encouraging them to require their winter maintenance contractors to attend salt reduction training. A website and local Access TV program will be created to educate homeowners and homeowner associations town-wide about proper salt use. The town will post informational brochures and best management practices information on town websites and in town hall. The town may also investigate other avenues such as posting winter driving tips in the town high school, and speaking to new drivers about safe winter driving. The town will also communicate with the local bus company. In addition the town will communicate with the private contractors who the town is aware of and encourage them to attend training. Londonderry strongly supports HB 1676 requiring the certification of private sector salt applicators.

**Equipment/Materials Needs:** Stationary supplies, and postage.

**Estimated Reduction:** The goal of the outreach program is to increase awareness and encourage private sector applicators to become trained and implement best practices. Outreach to new drivers and local bus companies is the first step in changing driver expectation within town and could result in less salt use in the long term. Training of town operators will encourage participation in salt reduction efforts. Londonderry is unable to quantify actual reductions possible because it has no control over the actual behaviour of private contractors or citizens expectations.

## 4.4 Upgraded Weather Monitoring System

**Pre-TMDL:** Londonderry has used DTN Meteorlogix to determine current and future weather conditions.

**Post-TMDL:** The town has not changed its weather monitoring practices subsequent to the TMDL reports.

**Proposed BMP:** Londonderry will upgrade a contract with a meteorological service to obtain custom storm forecasts for the community, with a dedicated weather workstation for viewing and printing weather reports for use during winter storm events. It is anticipated that this more accurate information will result in more efficient salt use and applications at key points during the storm.

**Equipment/Materials Needs:** The town will require a new computer work station and peripherals including: monitor, keyboard, mouse and printer for the weather terminal as well as a subscription to a custom meteorological service.

**Estimated Reduction:** The goal of the improved weather monitoring is to time chloride applications for maximum efficiency. While it is difficult to quantify reductions based on improved weather monitoring, Londonderry anticipates at least several storms each season during which improved weather monitoring will result in less chloride use.

### 4.5 BMP Overview Matrix

The town intends to continually improve salt reductions through ongoing training and experience and take advantage of annual federal funding opportunities through the I-93 salt reduction program with the ultimate goal of meeting TMDL allocations. The Town's reduction goals are: 6% for year 1, 12% for year 2 and 18% for year 3.

**Table 6: BMP Reduction Overview Matrix for Year 1**

| BMP | Watersheds | Reduction | |
|---|---|---|---|
| **4.1 Equipment Upgrade Pilot** | Beaver Brook | 42.72 | Tons/Yr |
| **4.2 Improved Calibrations** | Beaver Brook | 8.54 | Tons/Yr |
| **4.3 Private Sector Outreach** | Beaver Brook | 0.0 | Tons/Yr |
| **4.4 Improved Weather System** | Beaver Brook | 0.0 | Tons/Yr |
| **Total Estimated Reduction:** | | **51.26** | **Tons/Yr** |
| **Total Estimated Salt Imports After Improvements:** | | **803.21** | **Tons/Yr** |
| **TMDL Allocation:** | | **719.40** | **Tons/Yr** |

## 5.0 Implementation Cost & Timeline

Table 7 includes the equipment costs which is Londonderry's best estimate at this time. Costs may change due to factors beyond the town's control. The table below summarizes BMP and the associated estimated costs. It should be noted that matching funds will be compliant with 49 CFR18.24 and 49 CFR19.23.

**Table7: Estimated Cost Table**

| BMP | Equipment | Estimated Cost |
|---|---|---|
| **4.1 Equipment Upgrade Pilot** | New 6-Wheeled Dump | $120,000.00 |
| | Spreader Control Unit | $3,500.00 |
| | Air/Ground Temp. Sensors | $800.00 |
| | Electronic Hydraulic Valves | $1,500.00 |
| | Prewetting Equipment[8] | $5,000.00 |
| | Equipment Installations | $1,500.00 |
| Purchase Brine | *No Equipment Required* | $4,000.00 |
| | | |
| **4.2 Improved Calibrations** | *No Equipment Required* | $0.00 |
| | | |
| **4.3 Private Sector Outreach** | Stationary & Printing | $700.00 |
| | Postage | $500.00 |
| | Work Time ($35/hr) | 100 Hrs = $3,500.00 |
| | | |
| **4.4 Public Sector Outreach** | Work Time ($35/hr) | 70 Hrs = $2,450.00 |
| | | |
| **4.4 Improved Weather Monitoring** | Weather Workstation Computer[9] | $1,500.00 |
| | Weather Monitoring Service | $1,200.00 |
| | | |
| | | |
| | **Total Project Cost:** | **$140,200.00** |
| | **Total Federal:** | **$112,160.00** |
| | **Total Municipal Match (20%):** | **$28,040.00** |
| Note: Highlight Denotes | **Total Soft Match-Match:** | **$5,950.00** |
| Municipal Soft Match | **80% of Soft Match** | **$4,760.00** |
| | **Municipal Match Due:** | **$23,280.00** |

[8] Including v-box tanks/frame mounted tanks, pumps, hoses, sprayers and cab mounted on-off switch)
[9] Including: 20" Monitor, Printer, Keyboard, Mouse, and computer.

**Table 8: Project Timeline**

| Time Period | Action |
|---|---|
| July 2010 – August 2010 | Municipal Plan Review |
| September 2010 – December 2010 | Municipal Budgeting |
| March 2011 | Town Meeting (Budget Approval) |
| April 2011-June 2011 | Bid document Prep & Bidding |
| June 2011 – September 2011 | Outreach Program |
| September 2011 | Equipment Install & Training |
| Winter Season 2011-2012 | Salt Reduction Opps. & Documentation |
| April 2012 – May 2012 | Data Processing & Evaluation |
| February 2012 – May 2012 | Plan Preparation for Funding Round 2 |
| June 30, 2012 | Submit Plan for funding Round 2 |

## 6.0 Salt Usage Evaluation & Monitoring

Londonderry is committed to a multi-year program of salt reduction with the eventual goal of meeting TMDL requirements. It is anticipated that salt usage data will be monitored and compiled throughout the winter and be analyzed during the spring. Data will be provided to state agencies on an annual basis, and will be used in future salt reduction plans. Salt usage data will be provided in the total annual usage format on town letterhead and substantiated with all the required information (invoices/cancelled checks / po's, etc).

TMDL compliance will be measured using a 10 year average and confidence intervals per DES document dated, April 15, 2010, included in Appendix F.

## 7.0 Summary

The Town of Londonderry commits to providing a written report and oral presentation to the salt reduction workgroup. The town is committing to the efforts of reducing its chloride imports into the Beaver Brook Watershed by implementing the BMP's contained herein. This first phase includes implementation of three operational improvements (4.1 Equipment Upgrade Pilot, 4.2 Improved Calibrations and 4.4 Improved Weather Monitoring), and a private sector outreach and training program.

It should be noted that at this time sector allocation meetings have not taken place. This document may be modified to reflect changes in Londonderry's final salt allocation subsequent to a sector allocation meeting.

# APPENDIX A

TOWN OF LONDONERRY
WINTER MAINTENANCE
SNOW & ICE CONTROL POLICY

# TOWN OF LONDONDERRY
# DEPARTMENT OF PUBLIC WORKS
# WINTER MAINTENANCE
# SNOW AND ICE CONTROL POLICY

**NOVEMBER 2003**

Janusz Czyzowski, P.E.
Director Public Works & Engineering

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# INTRODUCTION

As individuals living in New Hampshire know quite well, each storm situation varies and presents a unique set of circumstances. Each storm, therefore, presents different and unique challenges to the individuals employed by the Town who are charged with the responsibility of meeting the Town's winter maintenance obligations. In meeting these obligations, the individual judgment by those performing the required tasks is an essential component both in conducting and timing all necessary remedial work to overcome ice and snow hazards. This document constitutes a winter maintenance policy for the Town which is intended to provide general guidelines that are strictly advisory in nature. The provisions herein should not be understood or interpreted as restricting the essential freedom of judgment which must be exercised by the Highway Foreman, the Public Works Director, the Town Manager, or other individuals empowered to implement this policy or perform the winter maintenance obligations herein addressed.

# I. RESOURCES AVAILABLE

The Town of Londonderry has the following resources available to it in its winter operations:

**A. Weather Information**

Local Radio: WZID 95.7 FM
Local T.V.: WMUR Ch. 9
Cable T.V.: Weather Channel
Weather Services: Meteorlogix

**B. Personnel**

Personnel available to the Town varies depending upon many economic, political, social, and health related factors. At present, the Town D.P.W. Highway Division has five truck driver/laborers, two equipment operator/mechanics, two equipment operators/truck drivers, one assistant foreman and one foreman available for storm responses. In addition, depending upon need five independent contractors with equipment and two temporary drivers without equipment are called upon to assist the Town personnel with winter maintenance operations.

**C. Equipment**

Equipment available to the Town varies depending upon many economic, political, social, and mechanical related factors. At present, the Town has the following equipment available:

9 International 6 Wheelers (with plows & spreaders)
1 Back-Ho
2 Pick-Ups (with plows)
3 1-Ton Pick Up Trucks (with plows & spreaders)
2 Loader
1 Grader

### D. Materials

Sand is purchased by the Town on an annual basis and stockpiled at the Town Garage. The amount of sand used for winter varies from year to year. The amount the Town budgets for sand each year varies depending upon economic, political, and other factors. At present the Town budgets for 4,500 tons of sand per year.

Sodium Chloride (Salt) is purchased from three suppliers. The Town strives, as is possible, to keep the salt shed as close to full as possible. The salt stock is replenished after each storm when possible. The amount the Town budgets for salt each year varies depending upon economic, political, and other factors. The amount of salt used per year varies from year to year. The Town budgets for 3,700 tons of salt per year.

## II. OPERATIONS

### A. General

Winter weather in northern New England is difficult to predict. There are many variables affecting winter maintenance operations such as type of precipitation, air temperature and pavement temperature, traffic, wind, time of day, and day of week.

The Londonderry Public Works Department has the responsibility for maintaining approximately 175 miles of Town roadways. The Public Works Department's snow removal and ice control policy is based on many years of experience with due consideration for the many competing social, economic, and political considerations that are a necessary component of the Public Works Department's ability to perform snow removal and ice control. This policy expressly recognizes that it is impossible to provide bare pavement throughout the Town on all Town roads during a winter storm.

Traffic volume and speed are two of several major factors affecting the level of winter maintenance service. Heavily traveled roadways are given first priority. The Town attempts to maintain other Town roadways during a storm. Sometimes, however, conditions or other factors dictate that snow removal on other Town roads is not necessarily shoulder-to-shoulder.

It is impractical to develop specific rules on winter maintenance operations. Due to numerous variables involved in winter storms, the judgment of the Highway Foreman, the Public Works Director, or other individual specifically so empowered governs the quantities and types of material used to control snow and ice. In general, the purpose of using salt is to reduce adherence of snow to the pavement, keep snow in a "mealy" condition and thereby permit nearly full removal by plowing, and, prevent the formation of ice or snow ice (hard pack). Salt is not intended to eliminate the need for snowplowing

The Public Works Director under the general direction of the Town Manager has direct responsibility for daily operation of the Department. The Highway Foreman supervises the day-to-day operations of the Highway Division.

**B. Communications:**

The following provides a guideline for the normal manner in which communication is to take place within the Town regarding its winter maintenance obligations. This section, however, is not intended nor should it be construed to be the exclusive manner in which communication must take place. This policy recognizes that each given circumstance warrants discretionary decisions by the individuals empowered with the responsibility for the Town's winter maintenance policy and therefore authorizes these individuals to exercise discretion in determining, based upon the circumstances, the best method for communicating to ensure that winter maintenance obligations are met.

1. ***Prior to Storm***

The Director and Highway Foreman communicate prior to the storm to determine the level of readiness and probable initiation of snow and ice control operations. The Director and Highway Foreman utilize the various weather forecasting sources available.

2. ***Onset of Storm:***

Police Department calls Highway Foreman to inform him that roadway conditions are requiring initiation of snow and/or ice control operation. Highway Foreman then calls in the response team as required according to procedures. If the storm begins during the regular work hours, the Highway Foreman may not wait for the Police Department to request the initiation of snow and ice control operation.

3. ***During Storm Operations***

Radio communication is maintained with all response vehicles. Requests and special instructions for service are taken via telephone or radio at the Highway garage or D.P.W. Requests are relayed to the Highway Foreman who dispatches personnel and equipment when they become available or immediately if it is

deemed to be an emergency. The Highway Foreman or designee will determine the extent of the emergency.

Telephone and radio communications with the Highway Foreman, the Director, School Administrators, Bus Managers, Police Department, and Fire Department continue on an as needed basis during the storm.

Any problems with communications or communications equipment may be noted in the log.

*4. Wrap Up After The Storm*

At the end of the snow/ice operations the Highway Foreman notifies the Police Department that operations are ended and ask to monitor any potential weather related problems, i.e., drifting snow, icing conditions, etc.

Following the storm, generally on Monday of next week the storm log is delivered by the Highway Foreman to the D.P.W. secretary for the director's review and filing.

**C. Applications**

*1. Application of Materials*

The use of salt, sand or salt-sand mixtures is a discretionary decision that is dependent upon many factors including not only the conditions of the roadway and the weather conditions, but also anticipated changes in these conditions and fiscal constraints experienced by the Public Works Department. The decision also depends upon the effects of peak traffic periods, approaching nightfall, daybreak, predicted temperature changes, and the anticipated time for the end of the storm. All of these factors, and more, are considered and evaluated prior to selecting the proper materials or rate of application.

Adverse roadway conditions existing during periods of low temperatures, which are predicted to rise would generally be treated in accordance with the recommendations for the higher temperature. If the time of day and weather forecast is such that a drop in temperature may reasonably be expected, treatment would generally be for the lower temperature. Generally, neither salt nor sand should be used at low temperatures if the pavement is dry and snow is blowing off the pavement. However, changing circumstances may warrant such an application.

Salt is the chemical of choice for most storm situations. Salt is used to prevent snow and ice build-up on the pavement and to aid removal of any build-up that occurs. Salt is most effective for melting purposes at temperatures above 20

degrees Fahrenheit becoming slower acting at temperatures below 20 degrees Fahrenheit.

Approximately 300 lbs. per lane mile of salt is applied during initial salt application. However, the actual amount applied during a particular application is left to the discretion of the individual performing the application.

Salt is generally applied to the middle 1/3 of pavement width and on high side of super-elevated curves. Spread width may be increased or decreased at the discretion of the individual applying the substance and depending upon the action of traffic. Salt is applied early in the storm so that brine develops on the pavement and prevents build-up of packed snow. If snow continues and accumulates on the pavement plowing should follow. At the end of the storm when all roadways have been plowed, an additional treatment of salt and/or sand may be applied if deemed necessary.

There are many additional circumstances which, in the discretion of the individuals applying the materials, may necessitate modification to these treatments. Some circumstances are:

- Rising or falling temperatures
- When pavement is cold and dry and dry snow is falling, salt may not be applied. Plowing and treatment of icy spots, if they develop is recommended.
- In low temperatures or on very lightly traveled roadways the effectiveness of salt is reduced and sand or salt/sand mixture may be needed for traction.

***2. Spreading Practices***

Timing of the initial application during each storm is very important. Generally, spreading should be delayed until there is sufficient accumulation on the pavement to hold and contain the material. However, each circumstance is unique and the decision regarding the timing of the application is left to the discretion of the individuals charged with the responsibility for implementing the winter maintenance policy.

Portions of the town are peculiar due to various physical conditions and will require a greater application rate or an additional application during some storms. However, these areas should be judged and treated separately and not used as a barometer to evaluate and subsequently direct complete applications over the entire town. In order to conduct efficient operation, when possible periodic observation of the pavement surface conditions may be performed.

When possible and at the discretion of the individual responsible for performing the task, the width of material spread (throw plus roll) may be restricted to increase the concentration of the salt where it is needed and therefore increase the effectiveness of the application. Spreading operations should be conducted at

lower speeds. Air turbulence created at high speeds makes it difficult to retain all the material discharged within the desired width. Spinner and belt speeds and spread pattern may be adjusted to obtain the correct spread rate and to retain the material within the required width.

### 3. ***Plowing Operations:***

Each storm presents unique circumstances dictating different decisions regarding the initiation of plowing operations. Generally, however, plowing begins after two inches of snow has fallen and continues until the storm has ended. In some cases, at the discretion of the individuals empowered with the responsibility for implementing this policy, plowing may be suspended in order to allow drivers to rest and/or sleep. Widening and intersection sight distance clearing is performed at the discretion of the individuals implementing this policy with due consideration for the many factors that must be considered. If possible, it generally occurs following the storm during daylight hours when best visibility exists.

For light accumulation snowfalls, snow squalls, and so-called "Alberta Clippers" of short duration, plowing may begin immediately and may include simultaneous salting and/or sanding to provide desired results quickly and efficiently.

Truck mounted front plows and in some cases wing plows are utilized for, among other things, to clear roadways of snow and frozen precipitant. Storm intensity generally measured in inches per hour varies considerably in New Hampshire but average major snowstorms are approximately one inch per hour. This one-inch per hour intensity rate and the allowable snow accumulation is one consideration used in planning the availability of equipment necessary for snowplow operations. The planned allowable snow accumulation of most roads in town is 4 inches with a maximum allowable accumulation in non-emergency situations of 8 inches and a planned plowing frequency of 3 ½ hours. These above mentioned figures are only an approximation and are based on an average of 1" per hour under optimum conditions (i.e., no traffic tie-ups due to accidents or stuck vehicles and no equipment breakdowns). The maximum allowable depth of snow that a motorist may encounter on highway pavements does not include blizzard conditions, heavy wind, drifting conditions, or other emergency conditions.

Frozen precipitation, including sleet and the build up of ice caused by freezing rain or special situations are not subject to the procedures indicated above. When a changeover from snow or sleet to freezing rain is predicted or anticipated, the individuals implementing this policy exercise discretion in deciding whether to leave the snow and ice on the pavement as it may capture the freezing rain and thereby prevent a glare ice situation.

## D. Storm Log

Maintaining records is a desirable objective. When possible, beginning with the arrival of the Highway Foreman or responding supervisor at the town garage, a storm log may be initiated and kept throughout the storm event in which, if possible, notes may be maintained regarding communications, conditions and major events.

At a minimum, when possible, the following information may be noted on the log:

a. Approximate time each piece of equipment and personnel begin and end operation.
b. Weather conditions, total snow accumulations and maximum and minimum temperature.
c. Any reported major problems from drivers or operators including equipment failure.
d. Approximate time equipment is down and time that equipment is back in service.
e. Report on accidents and special situations, especially Police calls.
f. Approximate amount of salt and sand used.
g. Communication with town or school officials regarding road conditions or other storm related matters.
h. Other situations that occur which, at the discretion of the individual maintaining the log, is potentially significant

## E. Response Teams

Department responses will vary with the conditions encountered, personnel, who are available for work. The time of day and day of week, the temperature, overall road conditions, preceding weather, anticipated weather, etc.

The Department response teams are as follows:

1. ***Spot Salting*** – Depending upon the circumstances two to three men may be called. The Highway Foreman or another individual specifically empowered to do so will determine whether additional help is needed to cover the icy spots and if contractors need to be called to assist with the operation.

2. ***Ice/Snow Winter Storms*** – The Highway Foreman or another individual specifically empowered to do so will contact the Town's personnel and contractors to start salting and plowing operations.

## F. Blowing and Drifting Snow

Quite often after a cold, dry snowstorm blowing and drifting snow will begin to drift across roadways creating hazardous travel conditions. If identified, the Police Department or other individuals who observe this condition may, depending upon the circumstances, call and request the Highway Foreman to improve the conditions. The Highway Foreman or other individual specifically empowered to do so will determine an appropriate response to the situation identified including, but not limited to, the pieces of road equipment, personnel, and materials that need to be utilized to address the situation.

## G. Post Storm Operations

At an appropriate time following the completion of winter maintenance obligations, additional activities may take place to ensure readiness for subsequent winter operations which may include, but need not be limited to, the following:

1. Equipment inspected using preventative maintenance techniques and repair as necessary.
2. Materials, especially salt, may be reordered in order to insure adequate stockpile.
3. Depending upon available resources and at the discretion of the individuals implementing this policy, plow routes may be checked for problems, especially for snow piles created by driveway contractors.
4. Depending upon available resources and at the discretion of the individuals implementing this policy, following a major storm the snow on the sides of roads may be pushed further off the road.
5. Depending upon available resources and at the discretion of the individuals implementing this policy, the height of snow banks may be decreased.

## H. Towing

Often during snow removal operations, stranded or parked vehicles will be encountered on Town roads. When such a vehicle is on a Town roadway or right-of-way it may be towed under the Town's winter parking ban/ordinance. Generally, the procedures for having a car such as one so identified towed are as follows:

- Operating personnel call the garage base station that notifies the Londonderry Police Department and requests removal of the vehicle.

- Persons contacting the Public Works Department to retrieve their car after a storm are referred to the Londonderry Police Department.

## I. Sidewalks

Sidewalk snow clearance will be conducted after the needs to maintain roadways have been satisfied and will depend upon the availability of resources.

## J. Schools, Police Department, Fire Department and Library

The Highway Division is not responsible for clearing snow and providing winter treatment to the Town's school access roads and parking lots.

The school superintendent or designated official representative shall contact the Police Department and Highway Foreman to determine the condition of the Town's roads in order to make decision regarding the use of school buses. The school representative(s) shall make the decision to cancel or postpone school for that day.

The Highway Division is not responsible for clearing snow or providing winter treatment to the Police Department, Fire Department and Town Library parking areas.

The Highway Division will maintain only Day Boulevard and the secondary access road to the Police Department.

## K. Parking

The Town has enacted a winter parking ban effective from November 1st to April 1st of each year. This ban prohibits parking on the Town's roads or right-of-way (ROW) between the hours of 12 midnight and 8 a.m. or at any other time in such a manner as to impede snow removal operations. The Town has the right to tow or ticket violators. The purpose of this winter parking ban is to allow winter maintenance crews unobstructed snow removal and ice control routes, as much as possible, to maintain to maximum effectiveness of their efforts.

## L. Fire Hydrants

The Highway Division is not responsible for the clearing of snow from around fire hydrants. This responsibility belongs to the utility companies.

## M. Damage to Private Property

In implementing this winter maintenance policy, the Town is not responsible and assumes no liability for damage to private property that is located within the public right-of-way. (RSA 231:92) The right-of-way (ROW) is often 50' wide and, in most cases, extends 10 to 20 feet from either side of the paved or gravel road.

In the event damage occurs to personal property during the Town's implementation of this winter maintenance policy, the Town may only be responsible to repair or replace the damaged personal property if the personal property was damaged through actual contact with the Town's snow removal equipment at a time when the personal property was located completely upon private property. The Town will not repair or replace private property which is damaged when the private property is within the town's right of way or which is damaged not by the Town's equipment, but by snow, ice, or other material removed from the Town's right of way.

## IV. PUBLIC INFORMATION

Town residents are advised prior to each winter season of the Town's winter policies by public notification in the newspaper and on the Town website as follows:

**TOWN OF LONDONDERRY**
**NOTICE FROM THE DEPARTMENT OF PUBLIC WORKS**

The Department wishes to remind residents of the snow ordinance regarding parking and the placement of snow on the streets The Winter Parking Ban is in effect from November 1 to April 1. During that time, no person shall park any motor vehicle on any public road or right-of-way between 12:00 midnight and 8:00 A.M. or at any other time in such a manner as to impede snow removal operations. Any vehicle parked in violation will be towed by the Police Department. Any vehicles so towed shall be stored and released to the owner only upon payment of the cost of towing. No person is allowed to place any snow or ice upon the surface of the traveled portion of any Town maintained portion of road or highway. Blowing, shoveling, or plowing snow into the street, creates a very dangerous situation that can cause swerving and accidents. Any person violating this ordinance may be subject to a penalty as specified in Town's snow ordinance.

**Location of mailboxes:** Mail and newspaper boxes are allowed, at the owner's risk, in the Town's right-of-way. Claims for damages or other liabilities resulting from their installation are the responsibility of the owner. The following are suggestions for reducing the possibility of damage: the mailbox should be installed in such a manner that no part of the mailbox is within three feet of the edge of pavement. Installations should be sufficiently sturdy to withstand the weight of heavy snow resulting from plowing operations. The Town does not repair or replace mailboxes damaged during snow removal operations.

Generally, the Town has a 50 foot right-of- way, which extends 13 feet from the edge of pavement. Residents are asked not to reconstruct road shoulders and swales or place any structures and landscape items within the Town Right-of-Way. Stakes, delineators or rocks create a road hazard and should be removed.

The Town is not liable for damages that may occur to objects placed within its right-of-way.

**Cleaning of Driveway Culverts:** Londonderry homeowners may not be aware that they are responsible for their driveway culvert. In order for the culvert to remain clean at all times, we ask that residents periodically check their culvert and free it from debris. This will go a long way toward alleviating erosion, ice build up and drainage problems in the future.

# APPENDIX B

RESOLUTION 2008-18 RELATING TO MUNICIPAL
APPLICATION OF ROAD SALT

# RESOLUTION 2008-18

A Resolution Relative to the
Relating to Municipal Application of Road Salt

First Reading: 10/06/08
Second Reading: Waived
Adopted: 10/06/08

*WHEREAS* Beaver Brook, Dinsmore Brook, and Policy Brook do not meet water quality standards for chloride; and

*WHEREAS* the Total Maximum Daily Load (TMDL) studies show that municipal road salt application must be reduced to meet water quality standards, and

*WHEREAS* the I-93 corridor municipalities, private transportation facility managers, and the Department of Transportation are working together as the I-93 Salt Reduction Work Group to collectively reduce road salt application in impaired watersheds;

*NOW THEREFORE BE IT RESOLVED* by the Londonderry Town Council that the Town commits to reduce municipal application of road salt and to work with the New Hampshire Department of Transportation, the New Hampshire Department of Environmental Services and private salt applicators to reduce chloride loading to impaired watersheds in the I-93 corridor.

This Resolution does not bind the Town to any specific salt reduction technique.

Marty Bove, Chairman
Town Council

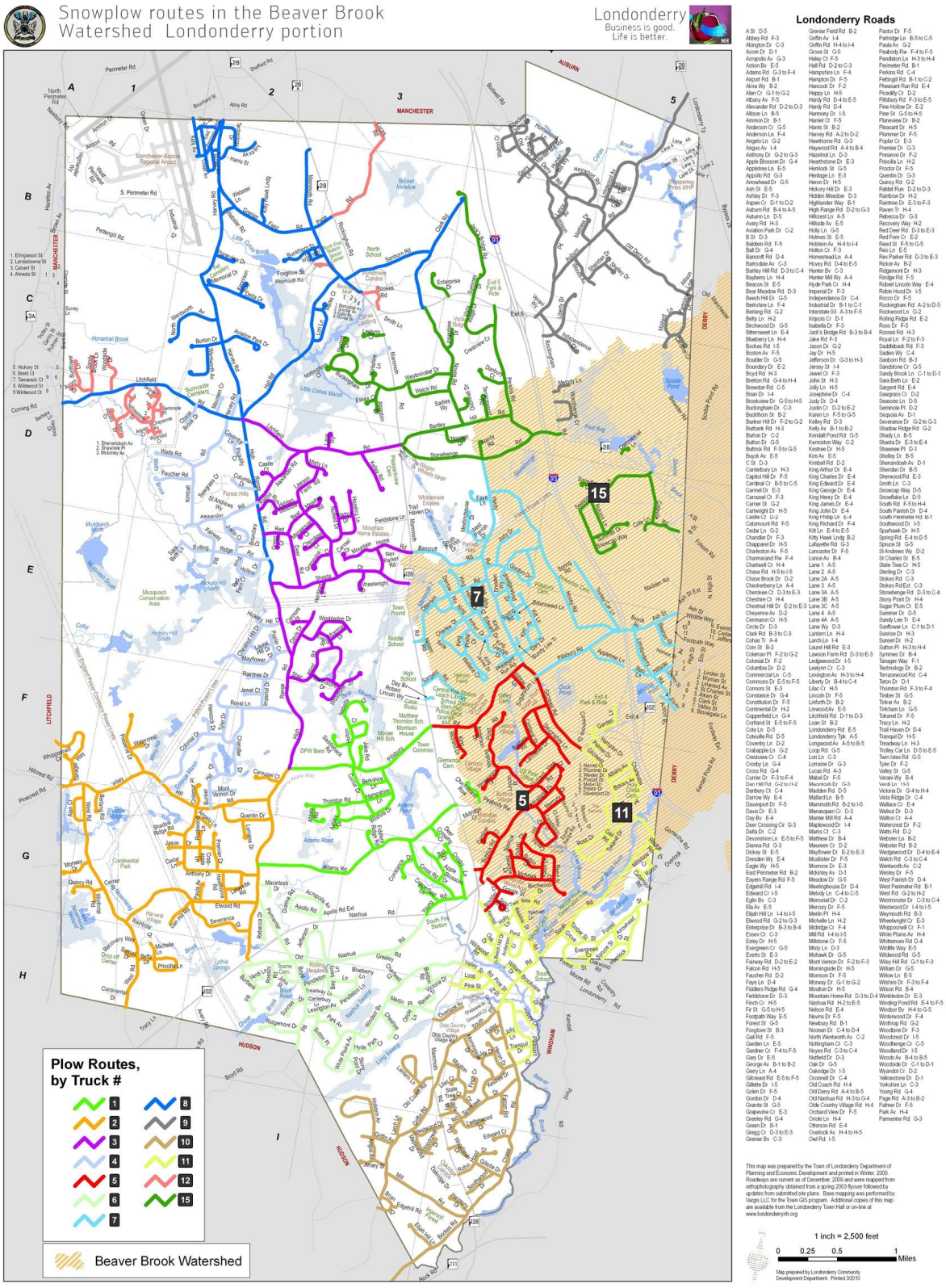
( TOWN SEAL )

Marguerite A. Seymour
Town Clerk/Tax Collector

*A TRUE COPY ATTEST:*
*10/06/08*

# APPENDIX C

SNOW PLOW ROUTES




## Londonderry Roads



This map was prepared by the Town of Londonderry Department of Planning and Economic Development and printed in Winter, 2009. Roadways are current as of December, 2009 and were mapped from orthophotography obtained from a spring 2003 flyover followed by updates from submitted site plans. Base mapping was performed by Vargis LLC for the Town GIS program. Additional copies of this map are available from the Londonderry Town Hall or on-line at www.londonderrynh.org

1 inch = 2,500 feet

0 0.25 0.5 1 Miles

Map prepared by Londonderry Community Development Department. Printed 3/2010

# APPENDIX D

10 YEAR AVERAGE MATERIAL USAGE

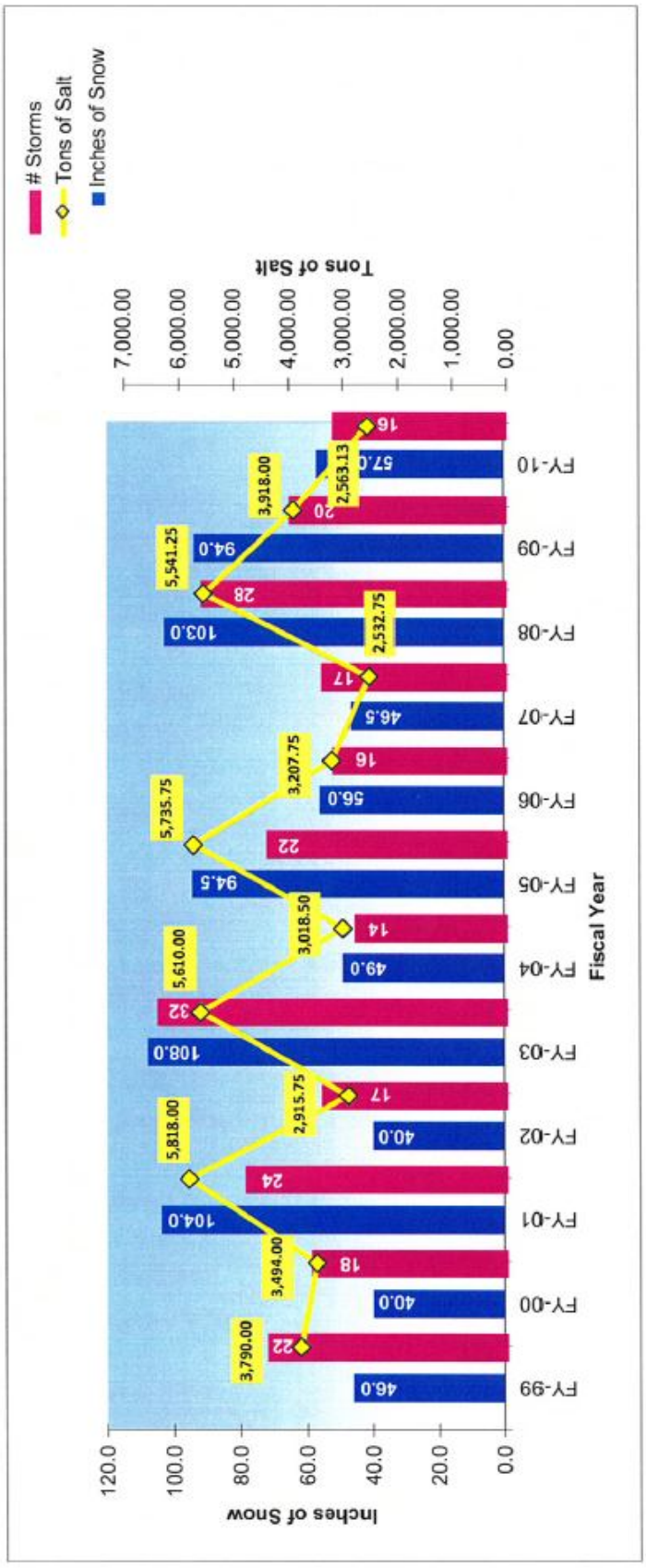
## Total Salt Usage-Town Wide

| Fiscal Year | Salt Tons | # Storms | Inches of Snow | Sand Tons |
|---|---|---|---|---|
| FY-99 | 3,790.00 | 22 | 46.0 | 4,485 |
| FY-00 | 3,494.00 | 18 | 40.0 | 3,442 |
| FY-01 | 5,818.00 | 24 | 104.0 | 5,268 |
| FY-02 | 2,915.75 | 17 | 40.0 | 2,588 |
| FY-03 | 5,610.00 | 32 | 108.0 | 8,429 |
| FY-04 | 3,018.50 | 14 | 49.0 | 3,800 |
| FY-05 | 5,735.75 | 22 | 94.5 | 6,300 |
| FY-06 | 3,207.75 | 16 | 56.0 | 3,300 |
| FY-07 | 2,532.75 | 17 | 46.5 | 1,500 |
| FY-08 | 5,541.25 | 28 | 103.0 | 3,900 |
| FY-09 | 3,918.00 | 20 | 94.0 | 4,734 |
| **Total** | **45,581.75** | **230** | **781** | **47,746** |
| **11 Yr. Average FY-99 to FY-09** | **4,143.80** | **21** | **71** | **4,341** |

| Fiscal Year | Salt Tons | Liquid Gallons | # Storms | Inches of Snow | Sand Tons |
|---|---|---|---|---|---|
| FY-10 | 2,873.25 | | 16 | 57.0 | 2,801 |
| FY-11 | 3,828.38 | | 24 | 85.5 | 3,415 |
| FY-12 | 1,668.75 | | 10 | 35.0 | 1,519 |
| FY-13 | 3,397.50 | | 19 | 82.0 | 2,390 |
| FY-14 | 5,159.75 | | 36 | 95.0 | 3,727 |
| FY-15 | 4,160.38 | | 29 | 121.0 | 3,747 |
| FY-16 | 2,736.88 | 695 | 16 | 37.0 | 1,873 |
| FY-17 | 5,096.81 | 1,746 | 24 | 96.5 | 3,551 |
| FY-18 | 4,571.31 | 2,080 | 22 | 101.8 | 3,316 |
| FY-19 | 4,223.75 | 1,909 | 20 | 54.0 | 3,260 |
| FY-20 | 3,657.19 | 1,113 | 17 | 58.5 | 2,332 |
| FY-21 | 3,230.84 | 983 | 18 | 58.5 | 2,305 |
| FY-22 | 3,733.53 | 0 | 22 | 49.8 | 2,204 |
| **Total** | **48,338.32** | **8,526** | **273** | **932** | **36,440** |
| | **8.10** | **Tons of brine** | | | |
| | **48,346.42** | | | | |
| **13 Yr. Average FY-10 to FY-22** | **3,718.96** | | **21** | **72** | **3121** |

## Salt Use in the Beaver Brook Watershed Area Only

| Fiscal Year | Salt Tons |
|---|---|
| FY-10 | 400.00 |
| FY-11 | 544.50 |
| FY-12 | 483.50 |
| FY-13 | 555.25 |
| FY-14 | 592.88 |
| FY-15 | 440.00 |
| FY-16 | 407.35 |
| FY-17 | 659.17 |
| FY-18 | 687.08 |
| FY-19 | 469.54 |
| FY-20 | 522.27 |
| FY-21 | 473.87 |
| FY-22 | 512.80 |
| **Total** | **6,748.21** |
| **13 Yr. Average FY-10 to FY-22** | **519.09** |


# Storms
Tons of Salt
Inches of Snow
Tons of Salt
7,000.00
6,000.00
5,000.00
4,000.00
3,000.00
2,000.00
1,000.00
0.00
Inches of Snow
120.0
100.0
80.0
60.0
40.0
20.0
0.0
Fiscal Year
FY-99
FY-00
FY-01
FY-02
FY-03
FY-04
FY-05
FY-06
FY-07
FY-08
FY-09
FY-10
46.0
40.0
104.0
40.0
108.0
49.0
94.5
56.0
46.5
103.0
94.0
57.0
22
18
24
17
32
14
22
16
17
28
20
16
3,790.00
3,494.00
5,818.00
2,915.75
5,610.00
3,018.50
5,735.75
3,207.75
2,532.75
5,541.25
3,918.00
2,563.13

# APPENDIX E

STORM REPORTS

(7)

## Snow Report

| | Date: 1/1-2-3/10 am | pm | Day of Week |
|---|---|---|---|
| Storm Started | | 5:00 | Friday |
| Storm Ended | 11:00 | | Sunday |

| Temperature | Max. | Min. | Depth of Snow |
|---|---|---|---|
| | 32 | 19 | 9" |

Sanding From - While Plowing
312 yds. / 468 ton

Salting From - 9:00pm(1-1)- 12am(1-2) 10am(1-3)- 2pm(1-3)
232½ yds. / 232½ ton

Plowing From - 3:00am-11:00pm(1/2) 4:00am - 4:00pm (1-3)

Personnel Called @ 7:00pm Friday 1/1/2010
Done @ 4:00pm Sunday 1/3/2010

| | Equip. Name & # | Salt Yards | Sand Yards |
|---|---|---|---|
| Russ | Loader & Pick/up # 2 | | |
| Don | 6 Wheeler # 7 | 20 | 30 |
| Paul | Loader & Maint | | |
| Scott | 6 Wheeler # 6* | 15 | 27 |
| Brian H. | 6 Wheeler # 9* | 15 | 36 |
| Bill | 6 Wheeler # 8 | 20 | 24 |
| Brian S. | 6 Wheeler # 15 | 20 | 30 |
| Mark | 6 Wheeler # 10* | 15 | 36 |
| Dan | ????? | | |
| Bob | 6 Wheeler # 11 | 20 | 30 |
| Ken | 6 Wheeler # 5 | 20 | 24 |
| B.Bubelnyk | 44 Hrs. 1 Ton # 4 | 7½ | 9 |
| W.Elwood | 44 Hrs. 1 Ton # 14 | 15 | 12 |
| School - 1 Ton - Chris | | 10 | 6 |
| School - 1 Ton - Paul | | 5 | 6 |

Contractors Called @ 7:00pm Fri 1/1/2010

| | | | | | | |
|---|---|---|---|---|---|---|
| RCI | 6 Wheeler | out @ | 3:00pm | Sun 1/3 = | 44 Hrs. | $3,168 |
| Johnson | 1 Ton | out @ | 3:00pm | Sun 1/3 = | 44 Hrs. | $3,640 |
| D.Grande | 1 Ton | out @ | 3:00pm | Sun 1/3 = | 44 Hrs. | $3,640 |

Material For Contractors 50 yds Salt 42 yds Sand

* Truck dump/spreader combination (underbelly spreader)

(9)

# Snow Report

Date: 1/18/10

| | am | pm | Day of Week |
|---|---|---|---|
| Storm Started | | 7:00 as Rain | Sunday (1-17) |
| Turned to Snow | | around 10:00pm | Sunday (1-17) |
| Storm Ended | | 1:00 | Monday (1-18) |

| Temperature | Max. | Min. | Depth of Snow |
|---|---|---|---|
| | 37 | 29 | 8" |

Sanding From - 4:00am - 4:00pm (While Plowing)
222 yds. / 333 ton

Salting From - 1:00am - 4:00am
117½ yds. / 117½ ton

Plowing From - 1:00am - 4:00pm

Personnel Called @ 12:01am Monday 1/18
Done @ 5:00pm Monday 1/18

| | Equip. Name & # | Salt Yards | Sand Yards |
|---|---|---|---|
| Russ | Loader & Pick/up # 2 | | |
| Don | 6 Wheeler # 7 | 10 | 18 |
| Paul | Loader & Maint | | |
| Scott | 6 Wheeler # 6 * | 7½ | 9 |
| Brian H. | 6 Wheeler # 9 * | 7½ | 27 |
| Bill | 6 Wheeler # 8 | 10 | 24 |
| Brian S. | 6 Wheeler # 15 | 10 | 12 |
| Mark | 6 Wheeler # 10 * | 7½ | 18 |
| Dan | ????? | | |
| Bob | 6 Wheeler # 11 | 10 | 12 |
| Ken | 6 Wheeler # 5 | 10 | 18 |
| B.Bubelnyk | 16 Hrs. 1 Ton # 4 | 5 | 6 |
| W.Elwood | 16 Hrs. 1 Ton # 14 | 7½ | 15 |
| School - 1 Ton - Chris | | 2½ | 6 |
| School - 1 Ton - Paul | | 2½ | 6 |

Contractors Called @ 12:01am Mon 1/18/2010

| | | | | | | |
|---|---|---|---|---|---|---|
| RCI | 6 Wheeler | out | @ 4:00pm | Mon 1/18 | = | 16 Hrs. |
| Johnson | 1 Ton | out | @ 4:00pm | Mon 1/18 | = | 16 Hrs. |
| D.Grande | 1 Ton | out | @ 4:00pm | Mon 1/18 | = | 16 Hrs. |

$1152.00
$960.00
$960.00

Material For Contractors 27½ yds Salt 222 yds Sand

* Truck dump/spreader combination (underbelly spreader)

# APPENDIX F

TMDL IMPLEMENTATION PLAN CONSIDERATIONS

TMDL IMPLEMENTATION PLAN CONSIDERATIONS
Paul M. Currier, DES Watershed Management Bureau April 15, 2010

I. There are Four TMDL watersheds for which salt reduction implementation plans are needed. For DOT, I-93 should get a separate allocation from other DOT roads that includes the planned expansion. There would be a separate allocation for municipal and private salt use for each town in a TMDL watershed

Table 1

| DINSMORE BK. | N. TRIB. CANOBIE LAKE | BEAVER BK | POLICY – PORCUPINE BK |
|---|---|---|---|
| DOT I-93 | DOT I-93 | DOT I-93 | DOT I-93 |
| DOT other roads | DOT other roads | DOT other roads | DOT other roads |
| Windham municipal | Windham municipal | Londonderry muni. | Salem municipal |
| Windham Private | Windham Private | Derry municipal | Windham municipal |
| Windham Future | Windham Future | *Chester&Auburn | Salem private |
| | | Londonderry private | Windham private |
| | | Derry private | Salem future |
| | | Londonderry future | Windham future |
| | | Derry future | |
| 123.1 tons salt/yr | 26.9 tons salt/yr | 5863.4 tons salt/yr | 3,449 tons salt/yr |

II. The measure of salt reduction success should be a rolling 10-year average of salt use. An interim measure of success for any given year would be the year's salt use weighted by the Winter Severity Index for I-93.

II. The starting point for all implementation plans is the "equally shared reduction" scenario presented in the approved TMDLs. The final implementation plans may contain different allocations for sectors, and a future growth allocation. These must be negotiated among DOT and municipalities.

A. Municipalities MAY negotiate on behalf of private sector salt users. Private sector allocations should be different from the initial TMDL allocation ONLY if there is a municipally-based plan for how private salt use will be tracked and a municipal commitment to help implement it.

III. In the absence of negotiated agreement among municipalities and DOT, sector allocations for municipalities and DOT should remain as in the TMDLs.

IV. In the absence of a municipally-based plan for how private salt use will be tracked and a municipal commitment to help implement it, private sector salt allocations should remain as in the TMDLs.

V. In the event that municipal salt reduction plans, DOT salt reduction plans, and discussions and negotiations among DOT, municipalities, and private sector salt users do not result in consensus-based sector allocations and plans for each sector that are expected to meet the overall watershed allocation, DES may either:

A. Prepare and publish an implementation plan, and use state law authorities to implement it as necessary; OR

B. Defer to EPA to implement the needed salt use reductions by using their NPDES permit authority. This might involve NPDES small MS4 stormwater general permits, issuing individual permits, and issuing general stormwater permits to categories of salt users (property owners and municipalities) under residual designation authority.

VI. The best scenario is one in which DOT, DES, and municipalities work together, leverage the FHWA earmark $$, and develop a long-term (probably a decade or more) strategic plan for overall salt use reduction.