SOP 18: Winter Road Maintenance

Introduction

Winter road maintenance includes snow removal and the use of salt, sand, or deicers to ensure safe winter driving conditions. Proper maintenance procedures and use and storage of materials can help reduce the discharge of pollutants, such as sand and salt, from the MS4 and to receiving waters. The goal of this written Standard Operating Procedure (SOP) is to provide guidance to municipal employees on the use and storage of salt and sand, minimizing the use of salt, evaluating opportunities for use of alternative materials, and ensuring that snow disposal activities to not result in disposal of snow into surface waters. If services are contracted, this SOP should be provided to the contractor. The contract should specify that the contractor is responsible for compliance with all applicable laws.

The Town of Palmer performs a variety of maintenance activities to ensure safe winter driving conditions on its roads and parking lots.

Procedures

The Town of Palmer will implement the following winter maintenance procedures to reduce the discharge of pollutants from the MS4:

Equipment and Maintenance

- Calibrate equipment to reduce and optimize salt use and ensure deicing agents are being used efficiently. Provide employee training on proper calibration procedures.
- Do not overfill trucks with deicing materials as it may lead to spills.
- Encourage the use of automated application equipment like zero velocity spreaders.
- When possible, retrofit vehicles to include equipment such as on-board application regulators, temperature sensors for air and pavement, and anti-icing and pre-wetting equipment.
- Wash equipment using proper procedures to prevent pollutants from entering the stormwater system. Dry cleanup procedures should be used when possible. Vehicles dirtied from salt or sand application should be washed according to procedures in SOP 21: Operations and Maintenance of Municipal Vehicles and Equipment.
- Regularly inspect and maintain equipment to reduce the potential for leaks. See SOP 21: Operations and Maintenance of Municipal Vehicles and Equipment for more information.

Anti-icing and Deicing

- Minimize the use and optimize the application of sodium chloride and other salt[1] (while maintaining public safety) and consider opportunities for use of alternative materials.
- Optimize sand and/or chemical application rates through the use, where practicable, of automated application equipment (e.g., zero velocity spreaders), anti-icing and pre-wetting techniques, implementation of pavement management systems, and alternate chemicals.
- Remove as much snow as possible using mechanical means like plowing, blowing, or shoveling before deicing to reduce the need for road salt or other deicing chemicals.

[1] For purposes of the MS4 Permit, salt means any chloride-containing material used to treat paved surfaces for deicing, including sodium chloride, calcium chloride, magnesium chloride, and brine solutions.

- When possible, use anti-icing practices to prevent ice formation and reduce the need for deicers.
- Apply anti-icing agents 1-2 hours before winter weather events to ensure optimal performance (can be applied up to 24 prior).
- Only apply road salt when the pavement temperature is above 15° F.
- When using deicers, use pre-wetting agents (e.g., salt brine) to help them work more efficiently and to reduce road salt scatter and bounce.
- Salt brine solution used for anti-icing and pre-wetting can be stored for up to a year –concentration should be tested before use. If temperatures fall below 0° F, use a circulator pump to prevent the brine from freezing.
- Use alternative deicing materials instead of sodium chloride as appropriate (e.g., calcium magnesium acetate, magnesium chloride, or calcium chloride).
- Avoid mixing road salt and sand. Doing so makes both the salt and sand work less efficiently and leads to over-application.
- Only apply enough deicer so that plows can remove the snow and ice. Adjust the application rate of deicers based on the type of storm, type of agent used, and anti-icing and pre-wetting techniques used.
- Perform unloading/loading of trucks on impervious surfaces whenever possible. These areas should be frequently cleaned and swept to reduce the tracking and runoff of salt and to capture any spills.
- Track the amount of deicer used and maintain records of the application of sand, anti-icing and/or de-icing chemicals to document the reduction of chemicals to meet established goals.

Storage of Deicing Materials

- Prevent exposure of deicing product (salt, sand, or alternative products) storage piles to precipitation by enclosing or covering the storage piles. Implement good housekeeping, diversions, containment or other measures to minimize exposure resulting from adding to or removing materials from the pile. Store piles in such a manner as not to impact surface water resources, groundwater resources, recharge areas, and wells.
- Store materials under covered or enclosed areas and on impervious surfaces.
- Ensure that there are adequate drainage controls in storage areas to prevent runoff from entering the stormwater system.
- Follow appropriate loading and unloading procedures. If there are spills when loading or unloading materials, follow the protocol outlined in SOP 4: Spill Response and Cleanup.
- Frequently sweep near the storage/loading areas to reduce the amount of salt, sand, or other materials that is tracked out.
- For liquid deicing chemicals, provide secondary storage containment.
- Do not store road salt near drinking water supplies, surface water resources, groundwater resources, recharge areas, and wells. Follow proper storage guidelines from MassDEP (https://www.mass.gov/guides/guidelines-on-road-salt-storage).
- In accordance with the requirements for municipalities discharging to chloride impaired waters, the Town of Palmer will develop a Salt Reduction Plan to reduce the use of salt on all municipal roads, parking lots, and facilities (both municipally and privately owned facilities that discharge to the stormwater system). This plan must be completed within three years of the effective date of the MS4 Permit and must be fully implemented five years after the effective date of the permit.

- The plan will include the following for municipally maintained surfaces and facilities:
    - Starting the year the Salt Reduction Plan is completed, the Town of Palmer will track the type of salt and amount used on all municipal roads, parking lots, and other surfaces.
    - The Salt Reduction Plan may include the following::
        - Operational changes to deicing procedures, which may include: pre-wetting, pre-treating the salt stockpile, increased plowing before deicing, monitoring road surface temperatures, etc.
        - The use of new or retrofitted equipment that includes pre-wetting capabilities, better calibration rates, or other capabilities that minimize salt use.
        - Proper training for employees or contractors engaged in winter maintenance activities
        - Regular calibration of spreading equipment.
        - Designation of no-salt and/or low-salt zones.
        - Measures to prevent exposures of salt stockpiles to precipitation and runoff (when applicable).
        - An estimate of total tonnage of salt reduction expected by each activity.
        - Adoption of guidelines for application rates for roads and parking lots (see *Winter Parking Lot and Sidewalk Maintenance Manual (Revised edition June 2008)* http://www.pca.state.mn.us/publications/parkinglotmanual.pdf and the application guidelines on page 17 of *Minnesota Snow and Ice Control: Field Handbook for Snow Operators (September 2012)* http://www.mnltap.umn.edu/publications/handbooks/documents/snowice.pdf
    - For privately owned facilities within the regulated MS4 area that discharge to the storm system:
        - The Town of Palmer will establish an ordinance, bylaw, or other regulatory mechanism requiring measures to prevent exposure of any salt stockpiles to precipitation and runoff at all commercial and industrial properties.
    - The completed Salt Reduction Plan will be submitted to USEPA along with the annual report following the Salt Reduction Plan's completion. Each subsequent annual report should include an update on the Plan's implementation progress and any updates to the Plan deemed necessary by the municipality, as well as the types and amount of salt applied to all municipally owned and maintained surfaces.
    - The Town of Palmer will follow proper snow storage and disposal protocol outlined by MassDEP to ensure that snow that has been potentially contaminated by road salt or other chlorides does not enter the MS4.

Snow Storage and Disposal

- Snow should not be pushed or dumped into waterbodies or wetlands, into stormwater drainage swales or ditches, or on top of catch basins.
- Snow should not be stored near drinking water areas, waterbodies, or wetlands.
- Avoid storing snow in areas that are unstable, areas of potential erosion, or high points where snow may melt and collect debris as runoff before it enters the stormwater system.
- Consider sun exposure when storing snow. Snow in areas with higher sun exposure will melt faster but may require deicers if the snowmelt refreezes.
- Consider practices such as living snow fences to contain snow piles and reduce snow drifting.

- The MS4 Permit prohibits snow disposal into waters of the United States. Snow disposal and storage activities, including selection of appropriate snow disposal sites, will adhere to the MassDEP Snow Disposal Guidance, Guideline No. BWR G2015-01 (http://www.mass.gov/eea/agencies/massdep/water/regulations/snow-disposal-guidance.html).
- The Town of Palmer currently disposes of snow in several locations compliance with Mass DEP and MS4 regulations. The following areas are prohibited for snow disposal:
    1. Zone II or Interim Wellhead Protection Area (IWPA) of a public water supply well or within 75 feet of a private well, where road salt may contaminate water supplies. Only snow from within the Zone II or IWPA should be disposed of within this resource area so as not to increase the potential for pollution of water supplies.
    2. The dumping of snow into any waterbody, including rivers, the ocean, reservoirs, ponds, or wetlands. In addition to water quality impacts and flooding, snow disposed of in open water can cause navigational hazards when it freezes into ice blocks.
    3. Areas designated by MassDEP as high and medium-yield aquifers where it may contaminate groundwater.
    4. Sanitary landfills and gravel pits. Snow meltwater will create more contaminated leachate in landfills posing a greater risk to groundwater, and in gravel pits, there is little opportunity for pollutants to be filtered out of the meltwater because groundwater is close to the land surface.
    5. On top of storm drain catch basins or in stormwater drainage swales or ditches. Snow combined with sand and debris may block a storm drainage system, causing localized flooding. A high volume of sand, sediment, and litter released from melting snow also may be quickly transported through the system into surface water.

Reporting

The Town of Palmer will document and include the following information in its annual report:

- Road miles treated
- Type and amount of deicer used
- Equipment calibration records
- Employee training dates

Employee Training

- Employees who perform winter road maintenance are trained once per year on these procedures and the proper operation of related equipment.
- Employees are also trained on stormwater pollution prevention, illicit discharge detection and elimination (IDDE) procedures, and spill and response procedures.
- If services are contracted, the contractor should be given a copy of this and any applicable SOPs to ensure compliance with MS4 regulations.

Related Standard Operating Procedures

1. SOP 4: Spill Response and Cleanup
2. SOP 21: Operations and Maintenance of Municipal Vehicles and Equipment