

COPY

ORDINANCE NO. 1581

**AN ORDINANCE REGULATING THE STORAGE AND HANDLING
OF DEICING MATERIALS IN THE CITY OF CREST HILL**

WHEREAS, the removal of snow and ice from roadways is essential to both public safety and to the local economy and that in order to protect the public safety, during winter storm events, the use of pavement deicing chemicals is a widely accepted means of keeping roadways passable; and

WHEREAS, pavement deicing is typically accomplished through the use of road salts which can be corrosive to vehicles, roadway surfaces, and bridges and has been found to have adverse effects on the ground water and to environmentally sensitive areas; and

WHEREAS, the restoration of ground water quality and ecosystems in such areas can be very difficult and costly, if not impossible to rehabilitate, once the events of contamination occur; and

WHEREAS, proper utilization and management of deicing materials is critical to ensure that the environmental impacts of related practices are reduced to the maximum extent possible; and

WHEREAS, negative environmental impacts may occur when salt is not properly stored or transported, and there is precipitation from storm events causing salt-laden runoff resulting in the disbursement of chloride and sodium ions causing a negative impact on the adjacent environment and water resources; and

WHEREAS, a primary source of salt entering the ground water is salt spillage that is either plowed or washed from maintenance yard, unloading, and loading areas and that it is necessary to regulate all persons engaged in such businesses in order that they comply with the specifications contained herein regulating the storing and use of bulk deicing materials on their property and elsewhere in order to reduce the costly impacts of such use to the surrounding vegetation, service water and ground water; and

WHEREAS, the Mayor and members of the City Council believe that it is in the best interest of the City of Crest Hill ("Crest Hill") to regulate and require the permitting of such business under the terms and provisions as established herein.

NOW THEREFORE, BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF CREST HILL, WILL COUNTY, ILLINOIS, AS FOLLOWS:

SECTION 1: The preamble of this Resolution is declared to be true and correct and is incorporated by reference herein.

SECTION 2: No person shall engage in the operation of a business for the private operation of a snowplowing service or the storage of salt or other deicing materials, or to assist others in the same for the purpose of alleviating ice and snow from private roadways, parking areas and sidewalks and on commercial, industrial, institutional, office, multi-family and private single family residential dwellings without being in compliance with the terms and provisions of this ordinance.

SECTION 3: Storage. The following sections apply to all indoor and outdoor facilities, (temporary and permanent) including salt piles, salt bag storage, sand piles and other storage of deicing materials:

a. Bulk storage, as regulated by this Ordinance, is defined as storage of any material used for deicing and/or traction during winter conditions that is more than 5 tons in solid form (or 1,000 gallons in liquid form). Commercially bagged salt or salt used for manufacturing is specifically excluded from this definition.

b. Storage of bulk deicing materials as an accessory use shall only be permitted in zoning districts B-2, B-3, M-1 and M-2. Storage of deicing materials shall not be permitted in any other zoning districts.

c. Indoor operations for the storage of deicing materials shall be provided wherever possible in order to prevent such materials from being affected by rain, snow and melt water.

d. Deicing materials, subject to the regulation of this ordinance, shall not be utilized for any purpose other than as discussed herein.

e. Although not a primary consideration, aesthetics should be considered in the design of storage facilities, especially when the location of such storage facilities is in close proximity to residential buildings or is highly visible to members of the general public. The location of the storage facilities shall be reviewed by the Building Commissioner, or his designee, prior to the commencement of the operation of such storage facilities and in conformity with this ordinance.

3.1. Facility Location. The following factors shall be considered by the Building Commissioner in determining whether such storage facility shall be approved:

a. The facility shall be in close proximity to the area in which the deicing materials are to be used, if practical.

b. Each facility shall be located outside of floodplains and away from lakes, rivers, streams, ditches, storm drains, manholes, catch basins, wetlands and agricultural properties and any other areas likely absorb runoff as determined by the Building Commissioner. A facility shall not be located in close proximity to surface water features, water supplies, wells or drywells.

c. A facility shall be located on impermeable surfaces on top of relatively improved impermeable soil.

d. The property slope shall be away from the facility's salt/sand storage area. The applicant shall identify the highest point on the property where the material will be stored. In the event that the applicant deems the highest point on the property as impractical or unreasonable for storage, he shall submit an explanation and documentation of the proposed location along with the permit application to the Building Commissioner for approval.

e. Salt vulnerable/intolerant natural areas should be avoided as storage facilities to the extent possible. Where they can not be avoided, specific measures should be instituted to protect vulnerable areas. Salt vulnerable/intolerable natural areas include, but are not limited to:

(i) areas with salt sensitive vegetation and agricultural operations;

(ii) areas with a source of drinking water (surface water and ground water);

(iii) areas with bodies of water with low dilution, low volume or salt sensitive species;

(iv) areas associated with ground water recharge zones or shallow water table, with medium to high permeable soils.

3.2 Base/Pad/Floor Specifications:

a. The base upon which deicing material is stored shall be constructed of low permeability waterproof materials capable of containing deicing agents (bituminous or high quality concrete; air-entrained and sealed). Materials must be capable of preventing leachate from entering adjacent soil, surface water or ground water.

b. The base shall slope between two (2%) percent and five (5%) percent to allow moisture to drain into the collection sump or run-off pond.

c. The base shall be inspected annually by the owner for cracks and repaired/resealed as required. The city may inspect the facilities periodically to ensure compliance.

d. In salt vulnerable/tolerate natural areas, a plastic liner must be installed beneath the storage and loading area to insure spilled salt does not migrate to nearby ground water.

e. Storage area should be bordered by a barrier on at least three (3) sides to insure the pile is contained and less likely to be impacted by surface runoff. The barrier shall be curb, concrete blocks with a liner, a double row of concrete blocks staggered to minimize gaps or other items as deemed appropriate.

3.3 Cover/roof Specifications:

a. All salt, sand and other deicing materials shall be covered at all times to prevent dispersion by runoff and to control wind dispersal.

b. When not using a permanent roof, a waterproof impermeable, flexible cover must be placed over all storage piles (to protect against precipitation and surface water runoff). The cover must prevent runoff and leachate from being generated by the outdoor storage piles. The cover must be secured to prevent removal by wind or other storm events. Piles must be formed in a conical shape and coverage as necessary to prevent leaching.

c. Any roof leaks, tears or damage should be temporarily repaired during winter to reduce the entrance of precipitation. Permanent repairs shall be completed prior to the next winter season.

3.4 Site Drainage.

a. In order to drain runoff away from storage facilities and to provide for the interception and management of salt impacted drainage, the site shall be graded to direct surface drainage away from the storage facilities and loading areas and to the extent possible, away from any ground water or salt vulnerable areas. In no case shall the surface drainage be allowed to flow through the base of the storage piles.

b. Drainage may be accomplished through the use of tile, ditches or pipes to a collection area, preferably a specially designed catch basin, sump area, holding tank or runoff storage pond with a liner if possible or a Best Management Practice ("BMP") with a controlled restrictor to control or restrict discharge downstream. This drainage area should be designed such that salt laden runoff is not directed to storm sewers, into salt vulnerable water courses, or directly to the ground through poorly sealed sumps.

c. Salt-laden water should be collected and properly managed. All residues left on the floor of the facility at the end of the season shall be rinsed into the drain where it will travel to the designated holding facility. When appropriate, the interception areas shall be emptied and material disposed of according to applicable federal, state and local regulations.

d. Snow plowed from the site shall be directed in such a manner that the melt water will drain away from the salt storage facilities and loading areas and to the extent possible, away from any ground water or salt vulnerable areas.

3.5 Liquid Chemicals.

a. Owners or applicants applying for an accessory use in which liquid chemicals are a component should provide information to the Building Commissioner at the time of the submission of an accessory use application regarding siting and containment requirements for storage facilities.

b. Determine the freezing point of the liquid chemical, which will determine whether it can be stored outside or if it must be stored inside.

c. All tanks containing liquid chemicals must be labeled indicating the contents thereof.

d. Where practical, provide the design plan for secondary containment through double-walled tanks or containment dikes.

e. Periodic inspection by the owner or designee of tanks, pumps, pipes and hoses is required so that any leaks should be repaired immediately.

3.6 Snow Piles.

a. Snow shall be located downslope from salt and sand storage to prevent the snow melt from flowing through salt and sand storage areas and carrying it to the nearest draining system.

b. Owners of accessory use permits for such facilities shall not push snow into lakes, ponds, wetlands, rivers or other natural areas to reduce chemical contamination and increase the amount of solids that can be recovered after the melt.

SECTION 4: Bulk Deicing Chemical Storage. Designs of storage structures include domes, rectangular sheds, barns, high-arch structures and elevated silos. In addition to the criteria established in all sections of this Deicing Materials Ordinance, the following factors should be taken into consideration when storing pavement deicing chemicals indoors in bulk (whether they are existing or new facilities).

4.1 Facilities Specifications.

a. Prevailing winter wind direction (north-northwest) should be considered when positioning new buildings and doors with regard to sheltering loading operations, minimizing snow drifting around doorways, and keeping precipitation out of the storage area.

b. Door Location and Size:

(i) the entrance to the structure should have a door, curtain or other mechanism to prevent precipitation from entering the structure.

(ii) to the extent possible, the opening should be high enough to allow a transport trailer to end dump inside the structure.

c. Special equipment, such as a conveyor system, can be used in order to maximize storage due to its top-loading capacity. Such equipment is recommended to improve traffic flow by separating loading/unloading operations which can reduce the amount of salt waste from

unloading operations. The area where extra equipment is utilized for operations relating to deicing materials is subject to all other requirements in this ordinance.

d. Structured floors, loading pads and base pad inside the facility shall comply with Section 3.2. In addition:

- (i) Floor and base pad should be sloped away from the center of the storage area for drainage purposes;
- (ii) Floor material should be sealed to minimize infiltration.

e. Roof and exterior of the storage structure:

- (i) shall be constructed of materials which prevent precipitation and moisture from entering the building;
- (ii) shall be constructed of non-corrosive materials which will not interact with deicing agents placed in the facility;
- (iii) shall be free of gaps that would allow salt or salt impacted drainage to escape.
- (iv) shall be constructed to prevent dissolved deicing agents from entering soil, surface water or ground water.

SECTION 5: Handling. Those persons owning accessory use permits must establish procedures and processes to minimize spillage and to clean up spilled salt in order to reduce costly losses and impacts to the surrounding vegetation, surface water and ground water.

5.1 Facility Maintenance.

a. All areas surrounding the storage facility (including the loading/unloading pad) shall be routinely inspected by accessory use owner to determine whether there is a release of the deicing agents. Spilled and scattered materials shall be swept up and returned to the facility in a timely manner.

b. Following the completion of a storm event, storage facilities shall be inspected and remedied, if necessary, as soon as possible.

c. The integrity of the storage facility and loading pad shall be maintained.

5.2 Loading and Unloading.

a. Where practical to do so, spreaders should be loaded inside the storage structure. If inside loading is impossible, care should be taken to minimize spillage of salt on to the loading

pad, and shall utilize other systems as may be needed to recover salt spills that occur during loading.

b. Promptly clean-up all spills and scattered salt and other materials after loading and unloading. The loading areas shall be swept back into piles in order to reduce leaching.

5.3 Pavement Deicing Transport Vehicles. Vehicles used for transporting deicing materials shall comply with the following standards:

a. Loading and Hauling:

- (i) set up and load on a level surface;
- (ii) loading areas shall be kept clear and smooth;
- (iii) do not overload vehicles, avoid spillage on units;
- (iv) remove loose materials from the exterior of the vehicle, fill in side gaps, tailgates or equipment with spill shields in order to prevent materials from escaping and spilling out of the vehicle.

b. Washing:

- (i) prior to washing, the trucks/spreaders shall be swept to remove residual solids, thereby minimizing the amount of dissolved salt and solids in the wash water;
- (ii) all trucks/spreaders shall be washed at a location where the wash water can be properly diluted, disposed and stored for reuse. Wash water may only be disposed of in accordance with the Clean Water Act, as amended.

5.4 Drainage:

a. In order to prevent toxicity to aquatic life in receiving waters, no accessory use owner shall unfreeze or melt open frozen storm drains with high doses of salt. Other methods shall be utilized in order to open such drains.

b. Procedures shall be utilized in order to capture any solids before they enter the storm drain systems.

SECTION 6: Permit Required. A permit is required for bulk storage of deicing materials by commercial entities within the City of Crest Hill.

a. No person or business shall store bulk pavement deicing materials without first having obtained a Deicing Storage Permit from the Building Department. State, county and other governmental agencies are exempt from this ordinance.

b. An application for a Deicing Storage Permit shall be made by the owner of the property or his authorized agent to the office of the Building Commissioner on a form furnished for that purpose (a copy of the approved form is attached hereto as Exhibit "A"). Each application shall be complete and accompanied by a filing fee of three hundred (\$300.00) dollars. Each permit is valid for a three (3) year period. If the applicant terminates the permit within the three (3) year period, no refund will be issued to applicant.

c. Prior to issuance of an approved Deicing Storage Permit, the property owner shall reimburse the City for any and all consultant fees incurred for the review of the application and inspection of the facilities, which invoice shall reflect fees paid on an hourly basis, in an amount not to exceed one thousand (\$1,000.00) dollars per application.

d. Annual renewal of the Deicing Storage Permit is required. The form utilized for such purpose shall be a copy of the approved form attached hereto as Exhibit "A." There is no fee for the annual renewal for the Permit.

e. The Building Department may waive specific requirements for the content of submissions upon a finding that the information submitted is sufficient to show that the work will comply with the objectives and principles of this ordinance.

f. Each application for a Deicing Storage Permit will be reviewed within thirty (30) days by the office of the Building Commissioner.

6.1 Submittal Requirements: Each application for a Deicing Storage Permit shall be accompanied by the following information:

a. A vicinity map in sufficient detail to enable easy location in the field of the site for which the permit is sought, including the boundary line of the premises for which the permit is sought and the approximate location(s) of storage.

b. A development plan of the storage facility showing existing topography of the site, particularly in the vicinity of the storage area, and in sufficient detail to verify the proper location of the facility. Such development plan shall include flow arrows to designate the direction of runoff.

c. The location of existing buildings, structures, utilities, lakes, streams, floodplains, wetlands, and depressions, drainage facilities, vegetative cover, paved areas, and other significant natural or manmade features on the site and adjacent land.

d. A general description of the predominate soil types on the site, their location and their limitations for the proposed use.

e. The proposed storage facility and interception facility's location, size, configuration and orientation.

f. Cut sheets, details and/or specifications for materials for the storage facilities, including roofs, covers, barriers, walls, interception facilities and other items required in this ordinance.

g. These submissions shall be prepared in accordance with the requirements of this ordinance and the standards set forth by the Illinois Environmental Protection Agency.

SECTION 7: Violation and Penalties.

a. No person shall construct or enlarge any deicing storage facilities, or cause the same to be constructed or operated, contrary to or in violation to the terms of this Ordinance. Any person violating any of the provisions of this Ordinance shall be deemed guilty of a misdemeanor, and each day during which any violation of any of the provisions of this Ordinance is committed, continued or permitted shall constitute a separate offense. Upon conviction for any such violation, such person, partnership, corporation or other entity shall be punished by a fine of not more than seven hundred and fifty dollars (\$750.00) for each offense.

b. In addition to the penalties authorized by this Section:

- (i) any person, partnership or corporation convicted of violating any of the provisions of this ordinance shall be required to restore the site to the condition existing prior to the commission of the violation, or to bear the expense of such restoration.
- (ii) any person, partnership, corporation or other entity convicted of violating any of the provisions of this ordinance shall restore any and all downstream impacted properties to the condition existing prior to the commission of the violation, or to bear such expense of such restoration.

SECTION 8: Severability. If any Section, paragraph, clause or provision of this ordinance is held invalid, the invalidity of such section, paragraph, clause or provision shall not affect any other provision of this ordinance.

SECTION 9: Repealer. All ordinances, resolutions or orders or parts thereof, which conflict with the provisions of this ordinance, are to the extent of such conflict hereby repealed.

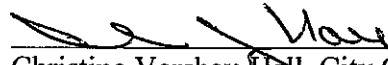
SECTION 10: Effective Date. This ordinance shall be in full force and effect from and after its passage, approval and publication in pamphlet form in the manner provided by law.

PASSED THIS 17th DAY OF October, 2011.

AYES: 6 Dyke, Vershay, Gazal, Oberlin, Sternisha and Convery

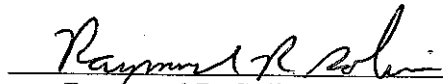
NAYS: 0

ABSENT: 2 Lelis and Inman



Christine Vershay-Hall, City Clerk

APPROVED THIS 17th DAY OF October, 2011.



Raymond R. Soliman, Mayor

ATTEST:



Christine Vershay-Hall, City Clerk

NJDEP De-Icing Storage Material Storage Requirements and Policy

The NJDEP (Department) has recently modified its interpretation of the NJPDES permit requirement regarding de-icing material storage structures in response to comments from permittees across the State and broadened what would be accepted as a “permanent structure” to allow other environmentally appropriate and cost effective alternatives. First, let’s review what the NJPDES Tier A Stormwater General Permit (permit) requires. The permit states that **“Regulated entities must construct a permanent structure (a permanent building or permanent structure that is anchored to a permanent foundation with an impermeable floor, and that is completely roofed and walled) for the storage of salt, and other de-icing materials.”**

A number of municipalities requested that the Department make a determination whether fabric frame structures meet NJPDES Municipal Stormwater Permit requirements for de-icing material storage. After a thorough assessment of these fabric frame structures the Department determined that they provide the same level of protection that a traditional de-icing structure would provide. Therefore the Department made a policy decision to allow the use of these fabric frame structures as long as they meet the following specifications:

1. structure must be designed to withstand at least 110 mph winds;
2. structure must be covered by a PVC or other similar fire rated material with a minimum twenty (20) year warranty;
3. concrete blocks, jersey barriers or other similar material must be placed around the interior of the structure to protect the side walls during loading and unloading de-icing materials;
4. the design must prevent stormwater run-on and run through;
5. structure must be erected on an impermeable slab;
6. structure cannot be open sided; and
7. must have a roll up door or other means of sealing the access way from wind driven rainfall.

In addition, the Department continues to receive numerous questions regarding whether de-icing material storage structures are required to have doors and what is an appropriate door for a de-icing structure? Originally, our position was that the definition of a permanent structure which includes the phrase "...that is completely roofed and walled..." inferred that a door was required. However, after listening to concerns from municipalities and our own staff, the Department agreed that the permit was not clear on this issue. So instead of requiring a door on a de-icing structure the

Department now strongly recommends that all structures be designed with or retrofitted to have a door or other means of sealing the access way or entrance from wind-driven rainfall.

Lastly the Department wants to stress that even the best de-icing structure is only as good as the house keeping practices implemented by the public works staff. If the municipality allows de-icing material to spill out of the structure or fails to sweep, using dry cleaning methods, after loading and unloading then they defeat the purpose of the structure and not protecting water quality. It is important to remember that Attachment D of the permit requires certain good housekeeping practices for salt and de-icing material handling and that these practices must be implemented at all times.

Specific questions can be directed to the NJDEP, Bureau of Nonpoint Pollution Control at (609) 633 -7021.



The Official Website of the Executive Office of Energy and Environmental Affairs

Energy and Environmental Affairs

Home MassDEP Water Resources Laws & Rules Guidelines On Deicing Chemical (Road Salt) Storage

Guidelines On Deicing Chemical (Road Salt) Storage

Effective Date: December 19, 1997

Guideline No. DWSG97-1

Applicability: Applies to all parties storing road salt or other chemical deicing agents.

Supersedes: Fact Sheet: DEICING CHEMICAL (ROAD SALT) STORAGE (January 1996)

Approved by: Arleen O'Donnell, Asst. Commissioner for Resource Protection

PURPOSE: To summarize salt storage prohibition standards around drinking water supplies and current salt storage practices.

APPLICABILITY: These guidelines are issued on behalf of the Bureau of Resource Protection's Drinking Water Program. They apply to all parties storing road salt or other chemical deicing agents.

I. The Road Salt Problem:

Historically, there have been incidents in Massachusetts where improperly stored road salt has polluted public and private drinking water supplies. Recognizing the problem, state and local governments have taken steps in recent years to remediate impacted water supplies and to protect water supplies from future contamination. As a result of properly designing storage sheds, new incidents are uncommon. These guidelines summarize salt storage prohibition standards around drinking water supplies and current salt storage practices.

II. Salt Pile Restrictions in Water Supply Protection Areas:

Uncovered storage of salt is forbidden by Massachusetts General Law Chapter 85, section 7A in areas that would threaten water supplies. The Drinking Water Regulations, 310 CMR 22.21(2)(b), also restrict deicing chemical storage within wellhead protection areas (Zone I and Zone II) for public water supply wells, as follows: "storage of sodium chloride, chemically treated abrasives or other chemicals used for the removal of ice and snow on roads [are prohibited], unless such storage is within a structure designed to prevent the generation and escape of contaminated runoff or leachate." For drinking water reservoirs, 310 CMR 22.20C prohibits, through local bylaw, uncovered or uncontained storage of road or parking lot de-icing and sanding materials within Zone A at new reservoirs and at those reservoirs increasing their withdrawals under MGL Chapter 21G, the Water Management Act.

For people on a low-sodium diet, 20 mg/L of sodium in drinking water is consistent with the bottled water regulations' meaning of "sodium free." At 20 mg/L, sodium contributes 10% or less to the sodium level in people on a sodium-restricted diet. For more information contact: Catherine Sarafinas at 617-556-1070 or catherine.sarafinas@state.ma.us, or Suzanne Robert at 617-292-5620 or suzanne.robert@state.ma.us.

III. Salt Storage Best Management Practices (BMP):

Components of an "environment-friendly" roadway deicing salt storage facility include:

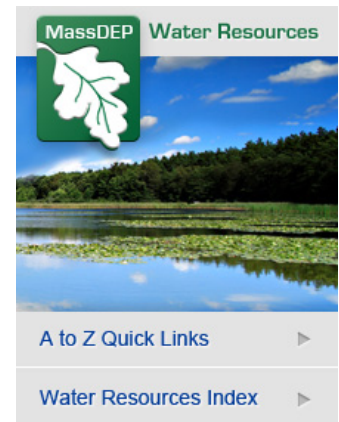
- the right site = a flat site;
- adequate space for salt piles;
- storage on a pad (impervious/paved area);
- storage under a roof; and
- runoff collection/containment.

For more information, see The Salt Storage Handbook, 6th ed. Virginia: Salt Institute, 2006 (phone 703-549-4648 or <http://www.saltinstitute.org/research/safe-and-sustainable-snowfighting/>).

IV. Salt Storage Practices of the Massachusetts Highway Department:

The Massachusetts Highway Department (MHD) has 216 permanent salt storage sheds at 109 locations in the state. On leased land and state land under arteries and ramps, where the MHD cannot build sheds, salt piles are stored under impermeable material. This accounts for an additional 15 sites. The MHD also administers a program to assist municipalities with the construction of salt storage sheds. Of 351 communities, 201 municipalities have used state funds for salt storage facilities.

For more information about MHD's salt storage facilities, contact Paul Brown at the Massachusetts Highway Department, 10 Park Plaza, Boston, MA 02116 (phone 617-973-7792).



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**STATE OVERSIGHT OF
ROAD SALT STORAGE IN
MIDWESTERN AND NORTHEASTERN U.S.**

**OWRC / SCCGW
SALT STORAGE WORKGROUP**

February 12, 2013

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STATE OVERSIGHT OF ROAD SALT STORAGE IN MIDWESTERN AND NORTHERN U.S.

Purpose

To review and summarize the means by which Ohio and other northern states employ rules and guidance to oversee salt storage.

Background

Many Ohio organizations, including highway agencies, counties, cities, townships, distributors, and snow removal companies, stockpile salt to be spread on roads, walkways, and parking lots to melt ice and snow. This storage is beneficial and necessary to ensure the safety and mobility of Ohio citizens, as well as the unimpeded mobility of goods and services; however, if not stored properly, the salt can contaminate water resources, and the owner or operator can be held liable for damages.

Recently, several salt storage piles in Ohio have been identified as the source of high chlorides in public or private ground water supplies. In response, the Ohio Water Resources Council (OWRC) established a State Coordinating Committee on Ground Water (SCCGW) workgroup to:

- Develop guidance on how to best site, design, and operate a road salt storage pile to prevent contamination of water resources. The workgroup provided a final draft document, *Recommendations for Salt Storage: Guidance for Protecting Ohio's Water Resources*, to the OWRC on October 5, 2012.
- Review and summarize the means by which Ohio and other northern states employ rules and guidance to oversee salt storage. This document provides the draft summary.

The brine that is created when rainfall or melted snow runs off of a salt pile is considered by Ohio and other states to be contaminated storm water that is subject to storm water permitting requirements. Consequently, every state likely employs its storm water program to some degree to oversee road salt storage. Elements of storm water program oversight typically include:

- **Municipal Separate Storm Sewer System Permit (MS4):** For salt piles in designated urban areas, best management practices can be required, but there are no specific siting or design criteria.
- **Industrial Multi-Sector General Storm Water Permit:** For salt stored at an industrial site, this would require that salt be properly covered/enclosed.
- **Discretionary Authority:** A National Pollutant Discharge Elimination System (NPDES) permit can be required for any salt storage site, regardless of location, if a storm water program is aware of pollution. For a new site, a permit-to-install (PTI) can be required to ensure adequate protection of water quality resources. When complaint investigations or routine audits for existing facilities indicate impacts to water resources due to poor management practices, programs can take action to address any problems identified.

- **Characterization and Abatement of Unpermitted Discharges:** characterization and abatement of an unpermitted discharge from a salt facility can be required under state law. For example, in Ohio, ORC 6111 prohibits unauthorized discharge of pollutants to waters of the state, including runoff from salt storage, and grants the Director of Ohio EPA authority to require abatement/characterization.

This document summarizes how states either 1) clarify this basic approach, or 2) establish specific requirements through other programs.

The basic approach is all that is used in seven of the reviewed states (Ohio, Vermont, Minnesota, Indiana, Pennsylvania, New Jersey, and New Hampshire). State clarification is described in the section below and summarized in Table 1.

Nine states (New York, Illinois, Connecticut, Massachusetts, West Virginia, Kentucky, Michigan, Wisconsin, and Maine) employ other regulatory programs to oversee salt storage to some degree. In some of the states, these programs supplement the basic approach; however, states with comprehensive salt storage rules may not have a need for storm water program oversight. See the following sections and Table 2 for descriptions and a summary of the use of other programs. Additionally, two of the nine states have also clarified aspects of storm water program oversight of salt storage.

Oversight Limited to Storm Water Program/Response to Unpermitted Discharges

Ohio

The draft OWRC document, *Recommendations for Salt Storage: Guidance for Protecting Ohio's Water Resources*, states that Ohio EPA's Division of Surface Water (DSW) will require permit-to-install (PTI) for all new outdoor storage (i.e., without permanent cover) that is in place for more than seven days.

Vermont

The Vermont Storm Water Program (Vermont Dept. of Environmental Conservation-Watershed Management Division) has ordered owners/operators of state-owned salt storage facilities to cover their salt and place it on an impervious pad. No such directive has been issued for county, municipal or private facilities.

Minnesota

The Minnesota Pollution Control Agency encourages all public and private entities storing salt to follow the Salt Institute's (<http://www.saltinstitute.org/>) recommended BMPs. Minnesota has tried to establish requirements for salt storage in the past; however, those efforts were met with significant "pushback" from industry and cities and were never completed.

[Chapter 7](#) of the Minnesota Storm Water Manual has a section dealing with salt piles (Protecting Water Quality in Urban Areas, Best Management Practices When Dealing with Storm Water Runoff from Urban, Suburban and Developing Areas). Guidance for salt storage/maintenance is also provided in [Winter Parking Lot and Sidewalk Maintenance Manual](#) (See Appendix A for details).

Indiana

The Indiana Ground Water Quality Standards (327 IAC 2-11-2 (e) and (f)) allow the Dept. of Environmental Management to act immediately when particular concentrations are exceeded in drinking water wells, including 250 mg/L for chloride and 500 mg/L for TDS. Indiana can also act when a non-drinking water well is rendered unusable.

Pennsylvania

The Pennsylvania Dept. of Environmental Protection has established requirements for exposed salt storage piles under its NPDES Industrial General Permit:

- For piles less than 3,000 tons, the applicable recommendations and BMPs from the Salt Institute's *Salt Storage Handbook* must be incorporated. At a minimum, these piles must be covered by a permanent structure and on an impermeable base.
- For piles greater than 3,000 tons, the applicable recommendations and BMPs from the Salt Institute's *Voluntary Salt Storage Guidelines for Distribution Stockpiles* must be incorporated. At a minimum, these piles must be covered at all times with canvas, polyethylene or other synthetic material, except when receiving salt, building the stockpile, or loading out to customers, and then only the working face may be exposed. These piles must be on an impermeable base.

New Jersey

MS-4 program requirements have been established for Tier A municipalities (generally located within the more densely populated regions or along the coast), but not for commercial facilities. The Dept. of Environmental Protection (DEP) has begun to address this discrepancy by focusing on five large commercial salt piles that have been largely unregulated in the past. The DEP is working with industry to develop protective permit requirements for the five sites. A key issue is cover- how should a requirement to keep a tarp on the piles be developed to reflect that piles need to be uncovered to some degree when salt is being added or removed?

Tier A municipalities must construct a permanent structure that is completely roofed and walled and anchored to a permanent foundation with an impermeable floor. The criteria for determining if a fabric-framed structure can be considered to be "permanent", housekeeping requirements, and recommendations for siting and other issues are provided in Appendix B.

New Hampshire

New Hampshire has rules that prohibit any discharge of non-domestic wastewater containing regulated contaminants above ambient ground water standards. Owners/operators of deicing material facilities that cause brine to infiltrate into the ground or ground water must register with New Hampshire's Dept. of Environmental Services (DES) under the Groundwater Discharge Permit and Registration Rules (Env-Wq 402). In some instances, a permit is required.

The approach is considered to be reactionary rather than preventative, as the requirements do not apply until there is evidence of a discharge to ground water; however, there is a level of awareness that contamination could lead to significant costs for environmental remediation and facility upgrades, which encourages implementation of best management practices. If there are sensitive receptors nearby, drinking water or ground water monitoring may be required.

New Hampshire has issued a four-page fact sheet addressing storage and management of deicing materials (WD-DWGB-22-30). Topics covered include siting, building design and construction, housekeeping, and storm water collection.

Water Supply Protection Rules

New York

In limited areas, New York's regulations addressing various point and non-point sources in specific municipal water supply watersheds (such as NYC's reservoirs) may require structural cover for salt storage, though details are not provided. The NY water regulations may enable the state to require structural cover in specific cases if a site is determined to be the cause of ground water or drinking water standard violations.

The New York Dept. of Environmental Conservation contact (Kevin Roberts) believes that this approach keeps the cost of storage structures lower than if they were universally mandated, and allows municipalities to use the latest approaches that might not have been considered if regulations had been adopted with design details.

Illinois

Illinois has rules for protection of ground water around potable water supplies (35 Ill. Adm. Code 615 and 616; 415 ILCS 5 Sec. 14.2). The rules address siting and operation for certain types of facilities, including deicing agent storage when the amount is greater than 25 tons.

De-icing agent storage is prohibited within 200' of all potable wells except community supply wells that draw from an unconfined aquifer. In this case, the setback is 400'. The prohibition can be waived for community public supply wells by the State Pollution Control Board with input from the Illinois EPA, and for non-community wells, by the well owner. Illinois EPA can veto a waiver for a non-community public or private well.

Outside of 200' and 400', storage is not prohibited; however, it could still be regulated. All of the design, operating, and monitoring requirements (see Appendix C) apply if a new facility is within 1000' of a community well and the community has shown that the radius of influence exceeds 200-400'. They also apply if a facility is located within 2500 feet of a community well that is within 1000' of a public waterway.

With one exception, all of the basic design, operating, and monitoring requirements (see Appendix C) apply if a new potable well is installed such that an existing indoor facility comes to be located in an expanded setback as described above. The exception is that requirements related to the loading pad do not apply.

If a new potable well is installed such that an existing outdoor facility comes to be located in an expanded setback, there are requirements for a pad, covering the salt with a tarp, pile management, housekeeping, and storm water control (see Appendix C).

Connecticut

Connecticut has clarified aspects of its storm water program regarding salt storage and also employs an aquifer protection program to protect ground water resources from various sources, including salt storage.

According to Ranelli (OLR Research Report, 2000) almost all facilities that store salt must have a general permit for water discharge. Under the *General Permit for the Discharge of Storm Water Associated with Industrial Activities* (effective October 1, 2011), permittees must ensure that storage piles of deicing materials (including pure salt, salt alternatives or either of these mixed with other materials) meet these requirements:

- For piles in place for more than 180 days per year, storage must be in a permanent, roofed structure by October 1, 2013.
- For piles in place for less than 180 days, a waterproof cover may be used to prevent exposure to precipitation (except for exposure necessary to add or remove materials).
- In areas with a groundwater classification of GA (existing private supply or potential private or public supply) or GAA (public supply), an impervious liner shall be employed.

Deicing agent storage is one of a number of activities subject to Connecticut's Aquifer Protection Area Program. When agents are stored in an aquifer protection area for a public water system that draws from sand and gravel deposits and supplies more than 1000 people, the storage must be registered and permitted, and best management practices must be followed. The requirements do not apply when the deicing agent is stored in weather-tight, waterproof structures for retail sale or use on parking areas or access roads to parking areas. Consequently, businesses that store deicing agents in small household size quantities for retail sale are not regulated by the Program. Additionally, businesses that use, but do not sell, deicing agents on parking areas or access roads to parking areas for their own use are also not regulated. These businesses must comply with storage of deicing agents in weather-tight, waterproof structures so as to prevent infiltration to groundwater.

Connecticut has guidance for salt storage facility siting, design, and operation (See Appendix D).

Connecticut law requires the Department of Energy and Environmental Protection (DEEP), in consultation with the Departments of Transportation and Public Health, to adopt regulations regarding the storage and application of road salt to minimize the contamination of water supplies. The law has been in effect since 1985, but to date, the DEEP has not adopted the regulations.

Massachusetts

In Massachusetts, deicer storage is regulated by both law (General Law Chapter 85, Section 7A) and rule (drinking water regulations, 310 CMR 22.20 and 22.21). Two departments, the Massachusetts Highway Department (MassHighway) and the Massachusetts Department of Environmental Protection (DEP), are involved. Key aspects include:

- Storage is forbidden by law in a manner or place that would subject a water supply or ground water supply to the risk of contamination and within 200 yards of an established

river or estuary unless stored in solid frame storage shed (with exceptions for water-dependent marine cargo facilities).

- Storage is prohibited by drinking water rule within source water protection Zones I and II¹ of public water supply wells unless it is within a structure designed to prevent the generation and escape of contaminated runoff or leachate.
- Uncovered or uncontained storage is prohibited by drinking water rule through local bylaw within Zone A at new reservoirs and at reservoirs increasing their withdrawals.²
- Anyone using more than one ton of deicing chemicals a year must, by law, report annually to the DEP on the amount used and the amounts currently stored.
- MassHighway has a Salt Remediation Program under the Hazardous Materials Investigations Unit that responds to private and public water supply salt complaints. If a resident on a private well is on a documented sodium-restricted diet of less than 1,000 mg/l day and the sodium in the drinking water exceeds 20 mg/l, MassHighway will investigate. DEP gets involved in investigation and remediation when a public water supply Zone I or II contains elevated sodium, defined as greater than 20 mg/l. Source removal is the main goal, sometimes accompanied by limited soil removal and ground water monitoring.
- In the past, MassHighway has administered a program to assist municipalities with the construction of storage sheds. In 1990s, through a Transportation Bond Bill, MassHighway reimbursed 31 municipalities with \$100,000 for constructing proper facilities. Reportedly, 201 of 351 Massachusetts communities have used state funds to construct storage facilities.
- The state refers to the Salt Institute's *Salt Storage Handbook* for BMPs.

Ground Water Protection Rules

West Virginia

West Virginia has clarified aspects of its storm water program regarding salt storage and also employs a ground water protection program to protect against salt storage impacts.

The WV Dept. of Environmental Protection regulates salt piles through its storm water program as follows:

- Municipal: MS4 General Permit
- Highway Garage: Highway Garage General Permit

¹ Zone I varies according to pumping rate but default radii are generally 100-400 feet; Zone II is the primary recharge area to a well under the most severe pumping and recharge conditions that can be realistically anticipated, i.e., 180 days of pumping at approved yield, with no recharge from precipitation.

² Zone A is the area within 400 feet of the streambank on the mainstem (200 feet on tributaries) of a Class A stream (Class A waters are waters designated as a source of public water supply, and must meet specific water quality criteria). It also includes area around a reservoir, up to the bank

- Private (less than 50,000 tons): Multi-sector General Permit (Sector U)
- Private (greater than 50,000 tons): Individual Permit

There are specific conditions written into Sector U for salt piles:

- Cover at all times except when salt is being added or removed.
- Store on an impervious pad.
- Liners for retention ponds and diversion ditch must meet 10-7.
- Monitor storm water semi-annually for total suspended solids, chloride, cyanide, and total iron.

The terms of the Multi-Sector Storm Water General Permit require storm water pollution prevention and ground water protection plans. Specific contents are detailed in the permit and guidance.

Ground water protection plans are required ([47CSR58](#)) for all facilities having the potential to impact ground water. The plans cover all processes and materials that “may reasonably be expected” to affect ground water quality. Structures and practices must be in place to prevent ground water contamination including, at minimum, quarterly inspections and maintenance, and usually spill cleanup procedures. Ground water monitoring may be required if there is potential for contamination.

West Virginia does not have siting criteria but requires that issues such as sensitive waters be detailed and addressed within the storm water and ground water plans.

Kentucky

Kentucky 401 KAR 5:037 requires anyone engaged in activities that have the potential to pollute ground water to prepare and implement a ground water protection plan. Storing or related handling of deicing materials is one of a number of activities covered. An exemption is available if there is no reasonable potential to degrade the ground water considering the hydrogeologic sensitivity, the quantities and properties of the material, the uses of the material, and current and potential ground water use. The requirements also do not apply to retail marketing or normal use of products packaged for personal use or activities conducted entirely in enclosed buildings with a sufficiently impervious floor with either no floor drains or with all drains connected to an on-site, permitted disposal or treatment system.

Salt Storage Rules

Michigan

Salt is considered a polluting material under the Michigan Dept. of Environmental Quality (DEQ)-Water Quality Bureau’s Part 5 rules for spillage of oil and other polluting materials. Two documents have been produced that specify the requirements and provide guidance at the same time: *Guide to Salt Storage Requirements for Small Commercial Snow Removal Services* and *Salt and Brine Storage Guidance for Road Agency Maintenance and Other Facilities*. Key aspects of the rules/guidance are:

- The rules apply when greater than five tons of salt or sand/salt mixture (>1% salt) is stored.

- Pollution Incident Protection Plans (PIPPs) are required.
- Salt spills greater than 50 lbs. must be reported.
- Storage facilities are not to be within 50' of surface water or in a 100-year floodplain unless they are constructed to be effective during a 100-year flood.
- Storage and handling areas must be designed and operated to prevent unauthorized releases of salt or salt-contaminated storm water to water resources or public sewer systems.
- Salt must be stored in an enclosed building or covered with a waterproof tarp at road agency maintenance facilities. This is only recommended for small commercial snow removal facilities.
- Impervious surfaces ($< 1 \times 10^{-7}$ cm/sec for road agency maintenance facilities) are recommended for all salt storage and handling. For road agency maintenance facilities, the pad must slope and be curbed to direct salt-contaminated runoff to an appropriate collection area to prevent it from reaching ground or surface water.
- Recommendations on housekeeping, self-inspection, etc. are provided for small commercial snow removal companies.
- Options are provided for dealing with uncontaminated and contaminated storm water runoff. For small commercial snow removal services, "contamination" is defined by contact with salt. For road agency maintenance facilities, 10,000 mg/L chloride is the cutoff.

Wisconsin

The Wisconsin Dept. of Transportation (WDOT) – Bureau of Highway Maintenance regulates salt storage. The purpose of the rules (Trans 277, Wisconsin Administrative Code) is to prevent contamination of water resources. Key provisions include:

- The rules apply to salt or sand/salt mixtures greater than 1,000 lbs.
- Storage is prohibited within 50' feet of a lake or stream. Setbacks of 250' and 1200' apply for private and municipal wells, respectively, per well rules.
- Storage must be on an impermeable pad designed to prevent run-on from contacting salt
- The materials must be stored in a structure with roof and walls sufficient to prevent precipitation from contacting salt and wind from carrying salt into waters of the state. However, a pile is exempt if it is covered by a tarp that meets specifications, the pile is open only at the working face to the minimum dimensions reasonably necessary, and the pile is open only when salt is being removed. Outdoor piles of mixed sand/salt with sand comprising 95% or greater by weight need be covered only April 1 – October 1.

- Discharge to waters of the state must be prevented through containment of precipitation reasonably expected to contact salt. A permit is required for any discharge to surrounding terrain, a sewer system, or surface water.
- All facilities must be registered, including name, contact information, facility location, and storage capacity.
- Any allegations of contamination and changes in facility status, ownership, etc. must be reported. The DOT annually updates salt storage facility records and assists the DNR's Source Water Protection Program in locating facilities for GIS mapping.
- Records of maximum and minimum salt quantities, facility changes, and complaints received concerning contamination must be kept.
- The DOT inspects annually (subcontracted to a private company), within 30 days when contamination is known or suspected, and when operations are discontinued. If repairs or changes are needed, the DOT sends a letter to the DNR describing the infractions and also forwards a copy to the owner's/operator's insurance company.
- The DOT issues compliance directives when rules are not met or special orders for further investigation or remedial action in the event of contamination. The DOT has no "big stick" to force entities to follow the rules, but if contamination results, then the penalties and fees associated with Wisconsin's water quality laws apply. The DOT believes that this, in conjunction with the insurance company letters noted above, results in about 98% compliance.

Maine

The Maine Sand and Salt Pile Program is a cooperative effort of the Dept. of Transportation (DOT) and Dept. of Environmental Protection (DEP). The DEP is responsible for environmental and siting issues, including new sand/salt pile registration, while DOT handles facility construction and municipal or county funding issues.

All sand/salt piles registered with the DEP have been given a project priority number between 1 (immediate and substantial impact on local drinking water supplies) and 5 (minimal impact on local drinking and surface water). Criteria for establishing project priority number are listed in Appendix E.

Project priority number determines applicability of the siting and operation rules and is also used by the DOT in the allocation of funds for the construction of public (state, county or municipal) storage facilities. The amount of funding depends on the number of winter miles maintained. Cost-share ranges from 25% to a maximum of 100%, with the typical being between 40% and 70%.

Key aspects of the program include:

- Sand/salt piles that are less than 100 cubic yards in size are exempt from registration, and siting and operational requirements.
- Owners/operators of Priority 1, 2 or 3 sand/salt piles were required to construct a storage facility by October 1, 2003. Towns are eligible for funding for the construction of

a municipal storage facility for these piles, but not for Priority 4 and 5 piles. Owners/operators of State, federal, and private Priority 4 and 5 sand/salt piles must comply (municipal and county Priority 4s and 5s are exempt) with the DEP Rules Chapter 574, "Siting and Operation of Road Salt and Sand-Salt Storage Areas". The requirements, which also apply to and new facilities and Priority 1, 2, and 3 facilities without a constructed facility, are listed in Appendix E.

If a well has been contaminated by a private sand/salt pile, owners are directed to the civil courts for remedy. If a well has been contaminated by a public sand/salt pile, 23 M.R.S.A. §3659 (Protection of Private Water Supplies) requires homeowners to apply to the political subdivision for a determination of the cause and an assessment of damages. The subdivision has 90 days to respond. The town, county, or state may offer to replace the water supply or pay a designated sum of money. If agreement cannot be reached on the cause or a settlement, an action may be filed in Superior Court within one year of receiving the first written response from the political subdivision.

Summary

The brine that is created when rainfall or melted snow runs off of a salt pile is considered by Ohio and other states to be contaminated storm water that is subject to storm water permitting requirements. Consequently, every state likely employs its storm water program to some degree to oversee road salt storage. Elements of storm water program oversight typically include the MS-4 Program, the Industrial Multi-Sector General Storm Water Permit, and discretionary authority to require PTIs or characterization and abatement of unpermitted discharges.

This basic approach is all that is used in seven of the 16 reviewed states (Ohio, Vermont, Minnesota, Indiana, Pennsylvania, New Jersey, and New Hampshire). However, nine states (New York, Illinois, Connecticut, Massachusetts, West Virginia, Kentucky, Michigan, Wisconsin, and Maine) employ other regulatory programs to oversee salt storage to some degree. See Table 2 for descriptions and a summary of the use of other programs.

Table 1. States Whose Oversight of Salt Storage is Limited to their Storm Water Programs and Responding to Unauthorized Discharges	
STATE	KEY PROVISIONS
Ohio	Will require PTI for all new outdoor storage that is in place for more than seven days.
Vermont	Has ordered owners/operators of state-owned facilities to cover their salt and place it on an impervious pad.
Minnesota	The Winter Parking Lot and Sidewalk Maintenance and the Minnesota Storm Water manuals have sections dealing with salt storage.
Indiana	Ground water quality standards allow the State to act immediately when water wells are contaminated.
Pennsylvania	NPDES Industrial General Permit requires a structure for salt storage less than 3,000 tons but allows for cover by a tarp for storage greater than 3,000 tons.
New Jersey	MS-4 program requires Tier A municipalities to storage salt in a permanent structure. The State is currently negotiating with the salt industry to develop permit requirements for five large commercial piles that have been largely unregulated to date.
New Hampshire	The State requires a ground water discharge permit for any salt storage facility that contaminates ground water.

Table 2. States that Employ Other Programs to Supplement (or Replace) Storm Water Program Oversight

STATE	STORM WATER PROGRAM	OTHER PROGRAMS
New York	No clarification of basic approach.	Regulations addressing various point and non-point sources in specific municipal water supply watersheds may require structural cover for salt storage.
Illinois	No clarification of basic approach.	Rules for protection of ground water around potable water supplies cover siting, design, and operation of salt storage when the amount is greater than 25 tons.
Connecticut	Under the General Industrial Permit, salt piles in place for more than 180 days per year must be in a permanent, roofed structure by October 1, 2013. A waterproof tarp is allowed for piles in place for less than 180 days. Also, an impervious liner is required in areas with a ground water classification of existing or potential public or private supply.	The Aquifer Protection Area Program requires registration, permitting, and BMPs when salt is stored in a protection area for a public water system that serves more than 1,000 people and draws from sand and gravel deposits.
Massachusetts	No clarification of basic approach.	Drinking water rules address siting and design of facilities within source water protection Zones I and II and Zone A at reservoirs increasing withdrawals. Also, General Law prohibits storage that would subject a water supply to risk of contamination and within 200 yards of a river or estuary unless it is in a structure. The State also has a Salt Remediation Program that responds to water supply complaints related to salt storage.
West Virginia	Municipal: MS4 General Permit Highway Garage: Highway Garage General Permit Private (< 50,000 tons): Multi-Sector General Permit Private (> 50,000 tons): Individual Permit	Ground water protection rules require protection plans for salt storage facilities.
Kentucky	No clarification of basic approach.	Ground water protection rules require protection plans for salt storage facilities.
Michigan	No clarification of basic approach.	Salt storage is subject to Part 5 rules for spillage of oil and other polluting materials. The requirements apply when greater than five tons of sand/salt mixture is stored and address siting design and operation. Spills greater than 50 lbs. must be reported.
Wisconsin	No clarification of basic approach.	Salt storage rules apply to sand/salt mixtures greater than 1/2 ton and address siting, design, and operation. The rules require facilities to be registered. Any allegations of contamination must be reported. The DOT inspects facilities annually.
Maine	No clarification of basic approach.	Salt storage rules require registration. All sand/salt piles are prioritized to determine applicability of rules and for public facilities, eligibility for construction funding. The rules apply to sand/salt piles greater than 100 cubic yards in size and address siting, design, and operation.

Appendix A – Minnesota

[Chapter 7](#) of the Minnesota Storm Water Manual has a section dealing with salt piles ([Protecting Water Quality in Urban Areas, Best Management Practices When Dealing with Storm Water Runoff from Urban, Suburban and Developing Areas, March 1, 2000](#)). To prevent brine from entering surface or ground water, the following practices should be used to minimize the opportunity for water to contact salt.

- Salt piles should be on impervious surfaces.
- All salt piles should be covered with polyethylene if they are not in a shed. Cover outside sand/salt piles with tarps and use diversion berms to minimize run-on.
- All sand/salt piles should be moved to areas not subject to flooding and placed in salt sheds or covered during the nonfreezing spring and summer months.
- Any runoff from stockpiles should be contained for disposal or added back to a winter sand pile.
- Wash water from trucks used for salting and sanding is very high in chlorides. To avoid groundwater contamination, this water should not be discharged to septic system drainfields. Wash water should be contained for disposal, or discharged into sanitary sewers. Earthen basins are generally ineffective in storing salt brine runoff unless they are sealed and do not have a discharge.

Guidance for salt storage/ maintenance is also provided in a Minnesota document entitled [Winter Parking Lot and Sidewalk Maintenance Manual](#) *June 2006. Revised 2010*

- Store salt where it is protected from rain, snow and melt water.
- Store on an impervious surface.
- Cover all piles, ideally indoors.
- Sweep loading areas back into the pile to reduce leaching.
- Contoured pads (bowl-like) for pretreated salts, reduces runoff from the pile.
- Store away from lakes, rivers, ditches, storm drains and wetland edges.

Appendix B- New Jersey

A Tier A municipality's fabric-framed structure is considered to be "permanent" if:

- It is designed to withstand at least 110 mph winds
- It is covered by a PVC or other similar fire-rated material with at least a 20-year warranty.
- Appropriate materials are placed around the interior to protect the side walls during loading and unloading.
- The design prevents storm water run-on and run through.
- It is on an impermeable slab.
- The structure is not open-sided; it must have a roll up door or other means of sealing the access from wind-driven rainfall.

The housekeeping practices are required for Tier A municipality de-icing storage facilities are:

- Prevent/minimize the spillage during loading and unloading.
- Remove of spilled materials using dry cleaning methods followed by reuse or proper disposal.
- Regular sweeping of storage and loading/unloading areas.
- Minimize tracking of materials from storage and loading/unloading areas.
- Minimize the distance that materials are transported during loading/unloading.

The following is not required for Tier A municipal de-icing storage facilities, but should be considered when siting a new permanent structure:

- Locate at least 200 hundred feet from streams, wells, reservoirs and ground water sources.
- Avoid wellhead protection areas.
- Top elevation of the pad and access way should be higher than the 100-year storm level.
- Divert storm water away from storage area.
- Place wind barriers to reduce the possibility of windblown particles entering nearby areas.
- The storage structure should have a paved, impermeable access way.
- Work with neighboring municipalities, public complexes, and/or highway agencies to construct joint use facilities.

Appendix C- Illinois

The basic design, operation, and monitoring requirements for deicing agent storage that are located within the applicable distances of water supplies are:

- Bituminous or concrete storage and loading pads.
- Roof and walls capable of protecting and containing the de-icing agents.
- Loading pad curbing/roof with diversion of runoff away from the loading pad.
- Routine inspection of the surrounding area to identify any releases, with clean-up as necessary.
- Routine maintenance of the facility and loading pad.
- A ground water monitoring program that leads to corrective action if necessary.

If a new potable well is installed such that an existing outdoor facility comes to be located in an expanded setback, there requirements are:

- Piles on a paved pad, covered by a tarp, and re-shaped (conical) as often as necessary to prevent leaching.
- Direction of surface drainage to prevent flow through the base of the pile.
- Storage where drainage will not enter water supplies, farm lands or streams.
- Design and operation of the pile to control wind dispersal by means other than wetting.
- Daily inspection of the surrounding area to identify any releases, with clean-up as necessary.

Appendix D- Connecticut

Per Connecticut guidance, in order to prevent a new salt storage facility from becoming a source of pollution, it should not be located in any of the following:

- Within a 100-year flood plain
- Within 250 feet of a well that is utilized for potable water
- Within an Aquifer Protection Area
- Where adjacent surface water bodies are tributary to public water supply reservoirs, unless it is not feasible to locate the facility in a less sensitive area
- In areas where the groundwater has been classified as GAA or GA, unless it is not feasible to locate the facility in a less sensitive area.

Also,

- Salt should be stored on an impervious surface under a roof.
- Mixtures of salt and sand should also be stored on an impervious surface under a roof, or kept covered by a waterproof material such as polyethylene.
- It is preferable to discharge storm water runoff to surface waters rather than to groundwater resources that are host to potable water wells.
- Runoff to the facility from rainfall should be diverted around the facility by berms, swales, or drains.
- Obtain necessary general permits for storm water discharges.

Appendix E- Maine

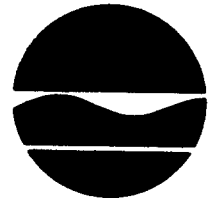
Project priority number under the Maine Sand and Salt Pile Program is based on:

- Ground water monitoring data from nearby wells, or, if no wells, the presence or absence of a public water system;
- Extent of visible damage to trees or wetlands;
- Whether the pile is located in an area zoned for commercial, industrial or similar use, or, in the absence of zoning, the likelihood that new houses with wells will be built near the sand/salt pile;
- Distance to the nearest public water supply well or intake; and
- Whether the pile is located over a significant sand and gravel aquifer.

The Maine requirements (DEP Rules Chapter 574, "Siting and Operation of Road Salt and Sand-Salt Storage Areas") for State, federal, and private Priority 4 and 5 sand/salt piles, which also apply to and new facilities and Priority 1, 2, and 3 facilities without a constructed facility, are:

- Maintain at least 300' separation from any well that does not serve the storage area; avoid locating over source water protection areas and significant sand and gravel aquifers (delineated by Dept. of Conservation as the primary recharge area for a sand and gravel aquifer capable of yielding more than 10 gpm).
- All storage, mixing, and loading must be on an asphalt pad that is at least 3' thick, and there can be no migration off of the pad.
- Run-on must be controlled.
- Cover is either by a building or a well-secured, durable, waterproof product (e.g., tarp or asphalt treated sand). Salt must be completely protected at all times from rain and snow and rainfall except for a working face at times of access and for not more than 72 hours following the last access. The salt must be covered by May 31 of each year and not rebuilt until Sept. 1.
- Spills during mixing, loading, and unloading must be cleaned up as soon as practicable.
- Owners/operators must have a written O&M plan.

York State Department of Environmental Conservation
61f Road, Albany, New York 12233



Thomas C. Jorling
Commissioner

January 26, 1989

MEMORANDUM

TO: Regional Water Engineers, Bureau Directors, Section Chiefs

FROM: Daniel Barolo

SUBJECT: Division of Water Technical and Operational Guidance Series (5.1.7)
Storage and Use of Highway Salt and Salt/Sand Mixtures
(Originator: Philip DeGaetano)

PURPOSE

To provide guidance for preventing water quality problems resulting from highway salting and storage of salt and salt/sand mixtures.

DISCUSSION

The policy of maintaining "bare pavement" for public safety during the winter is now considered standard practice in most areas. As in other northern areas with severe winter climates, this is accomplished through the use of deicing salts (NaCl, CaCl₂) and salt/sand mixtures.

The surface water and groundwater quality standard (drinking water classes) for chloride is 250 ppm (mg/l), based primarily on taste. No standard has been set for either sodium or calcium. Other constituents sometimes added to road salt (as anti-caking agents or to lower the temperature at which deicing salt continues to act effectively) may also be of concern. For example, the groundwater quality standard for cyanide of 0.2 mg/l is known to have been exceeded in at least one instance in wells adjacent to a road salt pile, apparently from compounds (e.g. ferric ferrocyanide, sodium ferrocyanide) used to minimize caking. In carrying out field investigations of specific problems it is important to identify and consider any additives typically contained in the salt stored or used at that particular location.

The principal focus of this memo is prevention of contamination of groundwater. Groundwater quality problems stemming from road salt storage and use are not known to be widespread, but they do occur. Currently, problems

resulting from salt storage occur more often than those resulting from roadway application.

Surface water impacts may also be important in specific local situations. In general, however, chloride levels in surface waters are well below the standard and are not known to cause problems, although inhibition of seasonal lake turnover has been cited as a potential worry. Additives could ultimately be of greater concern than the salt itself in relation to surface waters. At this time, there are no waters on the Priority Water Problem list because of salt storage or application impacts. Ultimately, however, the Division encourages research into alternative compounds which would achieve the same level of public safety at the same time minimizing any environmental impact.

It is important to distinguish storage of salt (e.g. salt piles) from distribution of salt (i.e., spreading). At present, DEC has limited authority to establish preventive regulatory controls for either. However, there are significant differences in the degree of threat each poses to water quality and the types of management which may be appropriate.

GUIDANCE

Salt and Salt/Sand Mixture Storage

The identifiable threat to water quality posed by improper storage is considered more significant than the threat from spreading. Storage typically involves stockpiling large amounts of the material at one defined location where, if it is not properly protected from precipitation and surface runoff, high concentrations of dissolved material leaching from the storage pile can subsequently be transported to underlying groundwater or nearby surface waters.

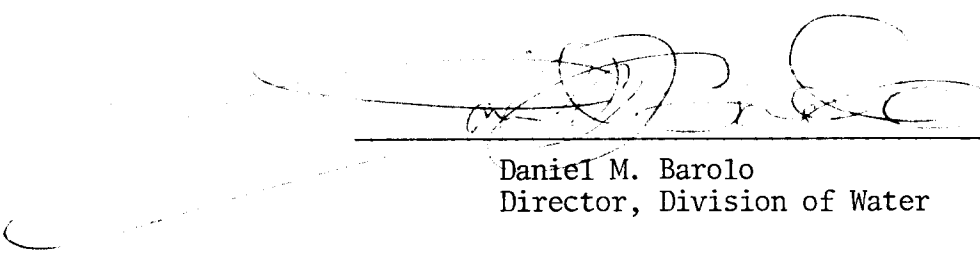
In the absence of legislation to regulate salt storage (including development of a salt storage code), it is the Division's policy to strongly encourage proper storage wherever practical. It is particularly important to promote proper storage when the storage facility in question may threaten an aquifer or a nearby stream, or where drinking water wells are located in the immediate vicinity.

The elements of proper storage and storage facility construction are well known and readily implementable. An outline of these basic elements, plus a bibliography of several available reference documents which describe and illustrate appropriate management practices, is appended.

Salt Spreading

The water quality problems associated with salt spreading are believed less significant than those associated with storage. However, it is known that high chloride concentrations have occurred in some private wells adjacent to highways. In many of these instances, poor well siting and construction practices may be a contributing factor. Regardless, well contamination due to salt spreading can be an issue in some locations.

Reduction of salt application rates to levels below those required to properly melt snow and ice involves a difficult trade-off with highway safety. As a matter of general philosophy, the Division supports and promotes (a) limiting the application of salt to only that needed to do the intended job, and (b) using special care in the vicinity of sensitive ground or surface water resources, particularly where wells are known to be located near the roadway. In practice, the accomplishment of these aims is not amenable to regulation by DEC. DOT and local highway department staff in each locality are in the best position to make the necessary judgements on whether salting can safely be reduced where specific locations involving sensitive water resources are identified. Regional DOW staff should bring such locations to the attention of the appropriate state or local highway agencies. However, the decision on whether salt spreading can be safely reduced rests with the responsible public works agency.



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APPENDIX 1

BASIC ELEMENTS OF SALT & SALT/SAND MIXTURE STORAGE

I. Facility Siting

- a) Avoid locating the facility above aquifers or highly permeable soils.
- b) Maintain a reasonable separation (e.g. several hundred feet or more) from streams, lakes, or ponds.
- c) Do not locate storage facilities within wellhead protection areas for community water supplies or close to existing private water supply wells. Full consideration should be given to relocating existing storage facilities which are located in those areas or using the highest level of storage management (roof, enclosures, pavement and catchment basin).

II. Site Considerations

- a) The storage area should be large enough to hold the maximum amount of chemicals required without overflowing and to permit easy movement of vehicles for loading and unloading.
- b) The storage area (including areas used in loading and unloading) should be paved, or underlain by an in place material having a maximum permeability of no more than 1×10^{-6} cm/sec after installation, and be constructed of material which is not adversely affected by the salt. Materials such as asphalt are much too permeable to be used.
- c) The elevation of the storage area should be sufficiently above the exterior yard area to prevent inflow of rainwater. The site drainage should be designed to prevent runoff from entering the pile.
- d) The stored material should be kept dry and out of the weather, ideally through use of a storage structure (shelter). Temporary covers of a waterproof material are adequate to cover non-working piles however because of problems such as freezing in an open position, tearing or blowing away, they should not be considered as a permanent solution for covering a working pile. Where storage shelters are used, they should be oriented to minimize contact of the material with wind-driven precipitation. Truck loading operations should also be shielded from prevailing winds.
- e) Drain pipes, curbing, and catchment basins to collect brine runoff from the pile should be considered. Disposal of the brine must be accomplished in an acceptable manner such as pickup by a licensed industrial waste transporter or discharge into a municipal sewer system (with approval by the municipality).

- f) Priority attention should be assigned to management of storage facilities in wellhead protection areas first, followed by aquifer areas outside of wellhead areas. Such facilities warrant paved underlayments and roofed enclosures, possibly supplemented by catchment basins.

ATTACHMENT 2

ANNOTATED BIBLIOGRAPHY ROAD SALT

DOCUMENTS USEFUL FOR PROGRAM STAFF

1. "Manual for Deicing Chemicals: Storage and Handling," USEPA, July 1974. Presents practical guidelines for good practice in the storage and handling of deicing chemicals. Covered storage, preferably using permanent structures, is strongly recommended. Provides guidelines for site selection and design. Presents examples of existing facilities representing a range of designs, costs, and storage capabilities. Also provide suggested good housekeeping practices for handling of deicing chemicals at the site.
2. "Highway Salt Management Handbook for Local Government Officials," Cornell Cooperative Extension, 1985. A relatively short (approximately 30 pages) document which focuses primarily on storage site selection and design. Probably most useful for local governments in rural areas.

ADDITIONAL DOCUMENTS

3. "Manual for Deicing Chemicals: Application Practices," USEPA, December 1974. Reviews a variety of aspects of highway operations relating to application of deicing chemicals, but does not appear to provide much in the way of straightforward guidance which is readily usable in the field.
4. "Environmental Impact of Highway Deicing," USEPA, July 1971. A broad scale review of the use of deicing chemicals and the available information their environmental impacts. May be extremely useful as a background document for researching specific issues related to deicing, but does not contain practical guidelines for management practices.
5. "An Economic Analysis of the Environmental Impact of Highway Deicing," USEPA, May 1976. Strictly an analysis of the impacts of deicing chemicals and the associated costs to society. Does not contain material on management practices.
6. "A Search: New Technology for Pavement Snow and Ice Control," USEPA, December 1972. Brief review of some possible alternative methods. Does not offer anything useful for immediate field application.
7. "Highway Deicing: Storage and Application Methods," Westchester County Best Management Practices Manual, 1981. A very useful review and discussion of management techniques and practices covering both storage and application. Although siting and design of storage areas is stressed, the document also contains a good discussion of application aspects including techniques which can be considered to reduce application rates in environmentally sensitive areas.

8. "Road Salt and Water Supplies: Best Management Practices," State of Massachusetts, DEQE, 1981. Comparatively brief (10 page) document which provides an overview of management practices for both storage and application. Little detail on the practices is provided.
9. "Sensible Salting," informational package published by the Salt Institute. Includes the "Salt Storage Handbook," an 18-page booklet devoted primarily to guidelines on storage and handling; and the "Snowfighters Handbook," an 18-page booklet devoted mainly to salting operations including application. Although neither of these is devoted exclusively to the environmental aspects, they do pay considerable attention to the environment including water quality. The information is packaged attractively in a format which should be comprehensible by local officials and appears less biased than might be expected.