



Tennessee Department of Transportation

TO: TDOT Garage Managers and Regional Environmental Coordinators

FROM: Ronnie Bowers

SUBJECT: Salt Handling and Storage Practices

DATE: April 1, 2003

TDOT facilities have made notable progress toward achieving full compliance with environmental regulations. As we prepare for the thunderstorms of spring and summer and start preparing for next winter, it is important to reemphasize proper salt storage and handling controls. The quantity of salt handled at a TDOT garage is by far the largest of all potentially polluting materials typically stored at any of our facilities. Salt released to the environment can have very detrimental environmental effects. Rain will reduce a salt pile at the rate of about ¼ % per annual inch of precipitation. In an area with 40 inches of precipitation each year, a salt pile left exposed for half a year will lose 5% of its volume. An exposed salt pile of 500 tons (≅ 450 cubic yards) would lose 25 tons under these conditions, not counting losses due to wind. The dissipation of 25 tons of salt would not only be a financial loss of almost \$1,000, but also the 25 tons of salt carried off the 500-ton salt pile would be sufficient to **pollute almost 15 million gallons of water** to the 250 milligrams per liter chloride maximum recommended by the U.S. Public Health Service for drinking water supplies.

Good salt handling practice requires methods that meet both functional and environmental requirements in the most economic manner. Some basic principles of salt handling operations include:

- Keep the salt dry. Keep salt under cover at all times;
- Handle salt as little as possible - when salt is handled, large particles break down to finer particles which tend to settle out, blow off, and wash away;
- Shield truck-loading operations from prevailing wind and weather (indoors whenever possible);
- Keep the area clean - immediately after any handling operation, sweep off salt collected on loaders, conveyors, truck bodies, etc. Then clean up any salt lying on the pad and get it back under cover.
- Have floor and paving sloped to drain any water out of the storage shed and away from the salt pile;
- Have sufficient paved pad around the exterior to allow free movement of trucks and loaders;
- Have adequate ventilation, particularly for indoor loading and unloading operations; and

- Have ample lighting both indoor and out-of-doors to permit safe operations.

Trucks and spreaders should be loaded inside the storage shelter to limit the area of possible spills and reduce exposure to rain and wind. The salt storage areas should not be overfilled such that salt spills out beyond the edge of the overhead cover. At least five (5) feet should be left free of salt at the front of the storage building to allow trucks and equipment to be at least partially under the shelter during loading operations. If the orientation of the storage shelter does not provide protection from the prevailing winds, consideration should be given to construction of a high fence or planting of trees to provide a wind break. The opening of the storage shelter should have doors, if possible. If the construction of doors is not practical, the opening could be covered with plastic sheeting or tarps hung from the roof to provide some protection from the wind. The plastic could be pulled to the side and tied off during loading and unloading operations.

If the pavement in front of the storage area does not slope sufficiently to keep water away from the salt, consideration should be given to construction of an asphalt berm across the access area to the pile. The berm should be of sufficient height (at least 8 to 12 inches at its peak) to ensure that stormwater from the surrounding yard cannot flow into the salt storage area. The slope of the berm should be sufficiently flat (at least 3:1 in each direction) to allow vehicles and equipment to cross it, and to prevent the blade of the loaders from easily damaging it. The berm should not be extended outside the covered area so that the amount of rainwater trapped by the berm is limited. Any material spilled during loading would be within the area protected from stormwater run-on and would not be transported away from the storage area.

Trucks should be cleaned of loose salt before leaving the loading area - catwalks, top edges and ledges of the body tanks, roof, and fenders. The salt should be brushed off with a broom or shovel. No water should be used for vehicle cleaning outside of a dedicated vehicle washpad. Spilled material should be placed on the face of the pile so that it is loaded onto the next truck. This is important in shelters and on/around loading docks to keep piles and lumps from restricting the wheel movement of the trucks and loader. In open loading areas, cleanup is important to minimize the amount of salt that gets wet. Wet spills should be scooped into a heap at the base of the pile to go out on the next truck. If the loader operator has to wait for another truck, he should put his machine under the shelter to keep it from getting wet.

The central aim of these precautions is to prevent the loss of salt and damage to equipment and the environment. Salt lying loose around the work area is liable to be blown about by winds. It lodges in crevices in equipment and increases corrosion. It may spread to nearby lands and buildings, causing pollution. A messy pad area makes the operation appear suspect as a source of pollution, even if this suspicion is unjustified.

The Office of Environmental Compliance will continue to assist facility managers in addressing and apply proper controls to better manage TDOT salt supplies. In closing, an excellent reference on salt storage has been produced by the U.S. EPA entitled: *Manual for Deicing Chemicals: Storage and Handling*". It can be found in three sections at the following websites:

<http://www.epa.gov/ednrmrl/repository/epa-670%20%202-74-033/00020006-1.pdf>

<http://www.epa.gov/ednrmrl/repository/epa-670%20%202-74-033/00020006-2.pdf>

<http://www.epa.gov/ednrmrl/repository/epa-670%20%202-74-033/00020006-3.pdf>