

## **Winter Weather, Chemical Deicers and the Chesapeake Bay**



The onslaught of winter can bring significant snow and ice to Maryland and make travel conditions treacherous. Ensuring mobility and safety during inclement weather is a priority for local governments, businesses, and homeowners. As snow piles up, the first line of defense should simply be to shovel sidewalks and plow streets to keep them clear and prevent ice from forming. When ice does form, salt (sodium chloride) is the most commonly used deicer. Because it is readily available, effective, and inexpensive, salt will probably always be a popular choice for melting snow and ice. However, because of the adverse effects that salt can have on the environment, numerous other deicing products have been tested and used in recent years.

### **Salt and the Environment**

**Soil:** Excess salt can saturate and destroy a soil's natural structure and result in more erosion and sediment transport to the Chesapeake Bay.

**Vegetation:** High concentrations of salt can damage and kill vegetation. Healthy vegetation is a vital buffer between land and water, reducing nutrient exports to the Bay.

**Wildlife:** Salt poses the greatest danger to fresh water ecosystems and fish. Studies in New York have shown that as salt concentrations increase in a stream, bio-diversity decreases.

**Humans:** Excess salt can seep into groundwater and runoff into reservoirs affecting the taste of drinking water. Additionally, sodium chloride can exacerbate hypertension.

**Corrosion:** Salt is corrosive and can damage exposed rebar, bridges, and automobiles. Additionally, by increasing the freeze/thaw cycle, salt can prematurely age cement and asphalt.

### **Exploring Alternatives to Salt**

There are many alternatives to salt including potassium chloride, calcium chloride and magnesium chloride, corn processing byproducts, and calcium magnesium acetate (CMA). Most can be found in your local hardware store under various trade names – check labels for chemical content. While these alternatives can be spread in a dry form or sprayed as a liquid, their real advantage is as a catalyst to regular salt. They tend to increase the efficiency of salt thereby reducing the amount that needs to be applied. When over applied, all chloride compounds can be harmful to the environment. Non-chloride corn byproducts recycled from mills and breweries have been shown to be effective deicers as well. While they are often advertised as organic or natural, they can have extremely high phosphorus content, a major Chesapeake Bay pollutant. Numerous studies have shown calcium magnesium acetate (CMA) to be the most

environmentally benign deicer. Many northern states use CMA on roads in sensitive areas (wetlands, endangered species' habitat, drinking water supply, etc.). A couple of disadvantages with CMA however, is that it does not work well below 23° Fahrenheit and it is the most expensive deicer. Because all deicers can be harmful to the environment when applied in excess, the best strategy is to reduce the use of these chemicals as much as possible.

## **Best Management Practices for Ice Control**

Outlined below are some sensible management strategies that can provide effective ice control and prevent excess runoff of chemicals to Maryland's streams, rivers and the Chesapeake Bay.

- ◆ Avoid use of salt by clearing walkways of snow before it turns to ice and consider that salt and deicers are not effective when more than 3 inches have accumulated.
- ◆ Consider the temperature. Salt and CMA have a much slower effect on melting snow and ice at temperatures below 25 degrees Fahrenheit.
- ◆ Track winter weather and only use salt and deicers when a storm is imminent. If a winter storm does not occur, sweep up any unused material, store, and reuse for the next big storm.
- ◆ Apply deicing products discriminately, focusing on high-use and graded areas where traction is critical and apply the least amount necessary to get the job done. This will save money in product costs and will also help minimize property damage to paved surfaces, vehicles, and vegetation.
- ◆ Routinely calibrate truck spreaders and train operators on proper application procedures.
- ◆ Reduce salt and other chemicals by adding sand for traction. Some local highway departments in Maryland use 80 percent salt and 20 percent sand for main arteries and a 20 percent salt, 80 percent sand mix for smaller residential roads.
- ◆ Become familiar with various deicing products and wetting agents such as magnesium chloride and calcium chloride (see above), which can improve the effectiveness of salt and reduce the amount needed.
- ◆ Winter weather is difficult to predict and there are many variables affecting winter maintenance operations such as the type of precipitation, air and pavement temperature, traffic, wind, time of day, day of week, and the availability of maintenance personnel. If, however, you observe ongoing issues of ineffective ice management or examples of poor application, such as excess piles of road salt left to disperse, share your concerns with the property manager of your residence or business, or with your local or state government.
- ◆ Plant native vegetation that is salt tolerant in stormwater drainage swales and ponds that may receive salt-laden runoff. Not only will these native species have a greater chance for survival, but they will continue to act as an effective buffer for the Chesapeake Bay. (Recommended trees and bushes: high bush blueberry, bayberry, green ash, black locust, sycamore, sweet gum, pin oak, hemlock and bald cypress)
- ◆ Store salt and other products on an impervious surface to prevent ground contamination and in a dry, covered area to prevent stormwater runoff.

For more information on winter weather maintenance and stormwater management, please call the Maryland Department of the Environment Water Management Administration at (410) 537-3543.

