FACT Sheet

Environmentally Sound Snow Management and Disposal

What is the best way to protect the environment while managing snow accumulation on streets, highways, and parking lots?

The most environmentally sound manner to deal with accumulated snow is to allow it to slowly melt where it falls. This approach provides replenishment of groundwater and drainage to surface waters at a slow, steady rate.

What is an environmentally acceptable way to deal with snow and satisfy transportation needs?

The standard approach to providing reasonably clear and safe roads before, during and after snowfalls or other freezing precipitation events is to plow the road and then apply road deicing chemicals (typically road salt) to melt the ice and anti-skid materials to provide traction. In some cases, an anti-icing agent may be applied before freezing precipitation starts to fall to prevent ice from forming a strong bond with the road surface.

Environmentally responsible snow management includes the following:

- Controlling the amount of deicing chemicals and anti-skid materials applied to recommended levels.
- Closely monitoring the application of deicers and anti-skid materials on bridges and areas close to streams and other surface waters.
- Avoiding disposal of snow on or near drinking water wells. Chlorides and deicing chemicals can infiltrate to the groundwater.
- Avoiding disposal of snow on top of storm drains or ditches. Snow combined with debris may block storm drainage systems, causing localized flooding.
- Plowing or transporting snow to areas where it can be allowed to melt naturally with minimal impact on water resources. Placing snow at least 100 feet away from surface water is recommended.

Are deicing chemicals and anti-skid agents toxic?

Overwhelmingly, the most-used deicing chemical is sodium chloride (salt). In streams, elevated concentrations of chloride are toxic to fish and aquatic life. Chloride may also damage plants.

Calcium chloride is used to a lesser degree as a prewetting agent and typically at low temperatures (less than 20ºF). Because of its higher cost, calcium magnesium acetate is used less frequently. The limited use of these chemicals makes them of little concern.

Anti-caking agents such as sodium and ferric ferrocyanide are added in small quantities to road salts. They are likely to degrade in sunlight. The released cyanide ion is toxic, but it volatilizes and biodegrades rapidly and is unlikely to persist in water.

Documented cases of contamination of resources from deicing compounds are usually related to improper storage, where large quantities of the chemicals are in contact with the earth or water.

Why can't the snow be dumped into a stream? Doesn't all the snow end up in the water anyway?

Dumping of snow directly into a stream carries with it the shock loading of deicing chemicals and anti-skid agents. The chemicals and any solid debris plowed along with the snow may have toxic effects on aquatic life and other adverse impacts to the waterbody. Allowing a natural melt provides a slow release of the water, dilutes the chemicals, and provides filtration of the solids through the soil.

What about snow on bridges? Can't we plow that into the water?

For all the previously mentioned reasons, pushing the snow at least 100 feet away from surface water is recommended. It can melt with less environmental impact.

If a large amount of snow is piled on land and allowed to melt, won't the chemicals harm the groundwater?

Chloride is very mobile through soils and may infiltrate to groundwater. Although snow usually contains low levels of chloride and other chemicals, it is recommended that large piles of snow not be dumped within 100 feet of public or private drinking water wells.

Won't the soil be adversely impacted by the chemicals?

Sodium can clog the soil. Therefore, it is advisable to store salt piles on impermeable surfaces. However, deicing chemicals are significantly diluted in snow piles and the impacts during melting are much less than the potential impacts of improper storage of salt.

What is the bottom line?

The Department of Environmental Protection recognizes both environmental concerns and the necessity for quickly removing snow and ice from our roads and highways to keep them clear and safe. The following recommendations are intended to minimize environmental harm and to recognize the need for safe driving conditions:

- Be environmentally conscious (and economical) by applying deicing chemicals and anti-skid materials at recommended rates.
- Closely monitor and limit the application of deicing chemicals near all surface waters, groundwater drinking water sources, and other environmentally sensitive areas.
- Plow or transport snow to areas isolated from environmentally sensitive areas, and at least 100 feet from surface waters or groundwater drinking water sources.
- Develop, implement, and maintain a written operation and maintenance (O&M) program for snow and ice management.

Anyone looking for more information on how to improve winter maintenance operations by utilizing best management practices for the use of road salt (chloride-based deicers) and anti-skid materials can reference the Quick Resources Guide for Winter Maintenance BMPs (SPCWater.org).

For more information, visit www.dep.pa.gov.