



Guide to Salt Management for Homeowners:



Deicing and Water Softeners



as of 20 October 2022

Homeowner Tips for Deicing & Traction

- * Use a brine or dust lightly with deicer just as it starts to snow or just before to keep the snow and ice from sticking.
- * Shovel or plow before applying another thin layer of deicer again. Shovel and plow first. The more you remove, the less salt you will need. More salt is not more effective, just more expensive and more damaging.
- * If you have to use the sodium chloride form of salt, apply it only if the temperature will remain above 15° F. It is ineffective below 15° F.
- * Follow the product instructions for amount to apply. Don't over apply; more is not better.
- * Rinse pets' paws before entering the house or keep a water pan for rinsing salt to protect their feet and your floors.
- * Sweep or scoop up any deicer remaining on pavement after the snow or ice is melted, and keep it to use again.

- * Store your salt / deicers in an impervious container in a dry area to protect from exposure and leakage.


Tip: To reduce negative impacts of salt products on trees and plants, plant salt-tolerant species:

- * Plant salt tolerant trees, plants, and shrubs in areas where salt is applied or higher rates of it.
- * Plant salt tolerant species to create natural buffer zones to reduce threat of contaminated


runoff into waterways, wildlife habitat, and drinking water supplies.

- * Install porous pavers on your driveway and walkways (77% annual reduction in salt use) to reduce salt reaching plants.

Check out these resources for more information on salt-tolerant plants:

- <https://grownative.org/salt-tolerant-native-plants/>
- <https://norfolkbotanicalgarden.org/salt-tolerant-plants-by-les/>
- <http://raingardenalliance.org/> 

Don't...

- * ... over apply.
- * ... apply deicer on top of several inches of snow, as it is ineffective. Shovel first then apply.
- * ... apply sodium chloride rock salt if the temperature is below 15° F.
- * ... forget to clean it up after the snow is clear.
- * ... use fertilizer as a deicer. 

Think Twice on How You Deice



Shovel & Plow First



Spread Early



Spread Sparingly



Sweep & Keep



Consider Alternatives

More About Homeowner Salt Management

Deicers are used to help keep people safer on roads, sidewalks, and parking lots during wintery weather. They reduce slippery conditions that could lead to falls and vehicle accidents. However, "since 1975, road salt use in the US has doubled. This rise parallels an increase in roads and other pavement requiring winter maintenance. In addition to being used on paved roads, road salt [deicers] is applied to parking lots, sidewalks, driveways, and service roads. There is a growing scientific understanding of where this salt ends up and how it is harmful to ecosystems." (*Cary Institute*)

How does salt work on roads?

Salt lowers the temperature at which water freezes. Road salt is used on roads, driveways, and sidewalks during snowy or icy weather to keep snow and water from freezing. If applied on top of snow and ice, the sun and car tires driving over it initially melt it to a slush then keep it from refreezing. This is less effective when temperatures dip to 15° F or below.

Different Types of Salt

- **"Rock salt** (sodium chloride) is the most commonly used but contains cyanide, as an anti-caking agent that can be toxic to underwater [aquatic] life, and is the most harmful for plants. Carroll County uses a water solution of 23% sodium chloride to make the brine sprayed on roads prior to a storm.
- **Calcium chloride** is considered a better choice than rock salt, because it does not contain cyanide, however, it can also harm plants. Calcium chloride costs about three times more than rock salt, but you only need to use about one-third as much.
- **Magnesium chloride** is considered the least toxic deicing salt because it contains less chloride than either rock salt or calcium chloride, making it safer for plants and animals." ([Watershed-friendly Deicing, PennState Extension](#))
- **Calcium magnesium acetate** (CMA) is considered the less damaging to concrete, is only effective down to 25° F, and can also harm plants. ([University of Maryland Extension Service](#))



Alternatives to Salt for Traction

Note: Only salt & salt mixtures melt ice. Alternatives just provide traction for safety.

* Sand

- *Pros:* adds traction
- *Cons:* clogs storm drains, fills ponds, and adds sediment to streams; can track in house

* Cinders

- *Pros:* adds traction
- *Cons:* messy; difficult to clean up; abrasive to pavement; dusty; clogs storm drains; can track in house

* Adding commercial-grade, biodegradable substances, such as beet juice, pickle juice, molasses

- *Pros:* slow formation of ice; aid traction; less salt washes away due to additional stickiness; safer for pets; brine mixtures can be applied ahead of projected snow or ice
- *Cons:* messy; could be expensive in large quantities

* Bird seed (on sidewalks)

- *Pros:* doesn't harm plants and waterways
- *Cons:* could grow weeds later if not eaten by birds/animals

* Kitty Litter

- *Pros:* pet friendly; works at any temperature
- *Cons:* absorbs moisture so still needs to be cleaned up; messy; expensive for large areas

* Wood Ash

- *Pros:* adds traction (primary); melts snow by dark colors absorbing sunlight (secondary)
- *Cons:* slow to be effective; messy; needs to be sunny; can damage soil if too much used

Note: Except for brines and other liquids intended to be applied ahead of projected snow or ice, salt alternatives are more effective if the snow is removed prior to spreading it. If you purchase a **snowblower**, consider an **electric** model as they generate less air and noise pollution.

- *Pros:* clears snow more thoroughly; could be easier than shoveling for certain people
- *Cons:* high upfront cost; air pollution with gas blower; could be more difficult for certain people to start/use



Chloride Impacts in Carroll County

The [Maryland Geological Survey](#) (MGS) is studying the impacts of deicing salts (chloride) on surface and groundwater. According to the MGS, increases in chloride in Maryland streams over time has affected streams, including those that are a source to public water supply reservoirs, such as Liberty Reservoir.

Carroll County data on salt or chlorides is generally limited to municipal test sites and site-specific studies. Carroll County Land & Resource Management staff have investigated the source of elevated chloride in well water at several different domestic wells. The investigation typically includes a site visit, interview, review of hydrogeologic information, chloride source inventory, and other available data. Sometimes the source may be road salt, but several of these site-specific investigations have identified water softener systems as the source of the chloride. However, other common sources are roadway deicers, residential deicers, commercial parking lots, and septic discharge (with softeners).

Chloride enters surface water quickly via stormwater runoff. Groundwater is impacted more slowly but also will eventually impact surface water also.



Potential Harmful Effects of Salt Deicers

- * Contaminates drinking water reservoirs and wells by infiltrating nearby surface and groundwater
 - ↳ High sodium in drinking water affects people with high blood pressure and low-salt diets
- * Can kill or endanger wildlife
 - ↳ Toxic to some fish, bugs, and amphibians or can harm ability to reproduce
 - ↳ Deer lick road salt, increasing chances of vehicle collisions with deer
 - ↳ Kills zooplankton, which impacts the food chain
- * Increases soil erosion
- * Damages private and public property
 - ↳ Corrosive to plumbing, vehicles, roads, and bridges
- * Irritates dogs' and cats' feet by causing burns and inflammation, which are worsened by licking
- * Kills roadside and driveway plants and grass
 - ↳ Don't get nutrients they need
 - ↳ Reduces species diversity in wetlands
 - ↳ Chloride moves with water, and process to treat and remove from water is expensive



<https://www2.minneapolismn.gov/government/programs-initiatives/environmental-programs/salt/>

Salt-Based Water Softeners Can Harm Water Quality

Water softeners are used to reduce the hardness of water by removing calcium, magnesium, and other minerals. Water softeners are salt based. They benefit pipes and appliances by reducing build up of minerals. However, salt-based water softeners also have disadvantages, one being negative consequences for water quality. The chloride they produce is discharged into septic systems and/or dry wells (which can seep into and pollute groundwater) or public sewer systems, which is discharged into streams after the wastewater treatment process. At this point, it contributes to the same harmful effects as road salt.

Today, there are water conditioning systems which do not produce chloride discharge, such as reverse osmosis (RO) and electrochemical systems. RO softens water by removing calcium and magnesium but wears the membrane faster. Take care choosing a system, as the use of electrochemical systems could result in the need to remove other minerals.

Additionally, the recent introduction of high-efficiency, demand-initiated water softener equipment has reduced salt consumption and water waste as much as 50% (e.g. Water Efficient Technology). They cost a little more up front but reduce salt costs and generate less chloride over their lifespan.

If your water softener system is 10 or more years old, you should upgrade it.

Additional Resources:

- **Chloride and water quality.** In-depth information on chloride and water quality in Minnesota. Includes policy proposal from the Chloride Working Group. <https://www.pca.state.mn.us/water/chloride-101>
- **Home water softening: Frequently asked questions.** Collaboration between MDH and MPCA to show advantages and disadvantages of residential water softeners. <https://www.health.state.mn.us/communities/environment/water/factsheet/softening.html>
- **Residential water softening.** Information on how in-home water softening is affecting Minnesota's lakes and streams and resources for evaluating residential softening (Water Resources Center, University of Minnesota) <https://www.wrc.umn.edu/residentialsoftening>
- **Water softener facts.** Canadian government website contains useful information on how water softeners work, what to look for when shopping for one, water softener alternatives, and more. (Region of Waterloo and City of Guelph) <http://watersoftenerfacts.ca/>
- **Water hardness fact sheet.** Brief, informative overview of water hardness and water softeners (Washington County Department of Public Health and Environment) <https://www.co.washington.mn.us/DocumentCenter/View/739>
- **Effects of chloride from wastewater on environment.** Center for Small Towns, University of Minnesota, Morris. 2013 report discusses the links between home water softeners and chloride pollution in the Pomme de Terre River watershed. <http://environment.umn.edu/wp-content/uploads/2016/03/MS-0008-12-Final-Addendum.pdf>

Additional Online Resources

(To access, use hyperlinks on EAC website @ www.carrollcountymd.gov/government/boards-commissions/environmental-advisory-council/other-eac-publications-topics/)

Carroll County

❄️ Carroll DPW Bureau of Roads Operations

- [Clearing the Way Through Carroll County Efficiently](#) (best way to clear your driveway)
- [Snow-Ice Removal Guidelines](#)
- [Salt Management Plan](#)

Maryland—State

❄️ Maryland Department of the Environment (MDE)

- [Nonpoint Source Program](#)
- [Winter Salts Information Page](#)
- [Winter Salts Story Map](#)
- [Statewide Winter Salts Efforts](#)
- [Winter Weather—Chemical Deicers and the Chesapeake Bay](#)

❄️ Maryland Department of Transportation (MDOT)

- [Seasonal Salt Reduction Techniques Flyer](#)

❄️ State Highway Administration (SHA)

- [Maryland Statewide Salt Management Plan 2021/2022](#)
- [STORM \(Statewide Transportation Operations Response Map\) App](#)

Federal

❄️ US EPA

- [Winter is Coming! And with it, tons of salt on our roads.](#)

❄️ United States Geological Survey (USGS)

- [USGS 2009-5086: Chloride in Groundwater and Surface Water in Areas Underlain by the Glacial Aquifer System, Northern United States](#)
- [USGS 2015-1080: Methods for evaluating potential sources of chloride in surface waters and groundwaters of the conterminous United States](#)

Other Maryland Counties

❄️ Montgomery County

- [Winter Salt Management](#)
- [Tips & Best Practices for Residents, Businesses, & Property Managers](#)
- [Tips & Best Practices for Snow Removal Professionals](#)

Other States & Organizations

❄️ Alliance for the Chesapeake Bay. [Winter Deicing](#)

❄️ Cary Institute. *ROAD SALT The Problem, The Solution, and How to Get There.* www.caryinstitute.org/road-salt-report

❄️ I Am Groundwater. [I'm What You Drink and I'm Worth Protecting](#)

❄️ Minnesota: [Salt Wise](#)

❄️ PennState Extension. [Watershed-friendly Deicing.](#)

❄️ Salt Smart Collaborative. [How Does Salt Melt Snow & Ice?](#)

❄️ Scientific American. [Salt Doesn't Melt Ice - Here's How It Makes Winter Streets Safer](#)

❄️ WSSW Water. [Be Salt Wise in Winter](#) ❄️



Salt Management on Carroll County Roads



❄️ Visit the Department of Public Works (DPW) "**Snow Removal**" webpage!

<https://www.carrollcountymd.gov/government/directory/public-works/roads-operations/snow-removal/>

❄️ Watch DPW's **Winter Weather Driving Tips** on YouTube!

https://youtu.be/kCq_dBTWlzM

❄️ **Carroll County Salt Management Plan:** The plan provides a framework for local agencies to deliver safe, efficient roadway systems during winter storms in a cost effective and environmentally sound manner.

https://www.carrollcountymd.gov/media/11202/carrollcountysaltmanagementplan_february-10_2020_production_final.pdf ❄️

To report a problem with roads...

SEE CLICK REPORT is an easy way for anyone

to report non-emergency issues to Carroll County, Maryland while on-the-go. Use this efficient tool to report concerns such as potholes, damaged street signs, graffiti, street maintenance, street light issues, damaged trees, park maintenance, snow removal issues, and more. Using your phone's GPS, you can help identify the exact location of the problem, and with the use of its camera, you can attach a picture, as well. You'll be able to track your issue from the time it is reported until it is resolved. SEE CLICK REPORT makes it easier than ever to report a problem. Download the app today! ❄️



Prepared by Carroll County Environmental Advisory Council (EAC)

CarrollCountyMD.gov/EAC EAC@CarrollCountyMD.gov 410-386-2949