

SALT'S LASTING IMPACT

Education, proper science key to reducing chemical usage

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Contributor

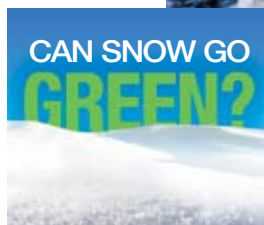
What does fishing, swimming, the finest beer and snowplowing have in common? The answer, of course, is you.

Those of you who are snow fighters rank as the most important people in creating safe roads, parking lots and sidewalks. But you are also the most important people in protecting our lakes, rivers and drinking water. Those whose jobs touch the surface of the earth, like snow and ice management professionals, determine what ends up in our lakes and rivers since all land, including every road, parking lot and sidewalk, drain to a lake or river somewhere.

To protect our lakes and rivers, we have to be careful about what we spread over the earth's surface. This is where snow and ice management professionals come in to play and why it is so important to understand how salt, one of our most cherished deicers, affects our water.

Environmental impact

The U.S. government has limits for how much salt (actually chloride) can be found in our lakes or rivers. The limit is in place to protect aquatic life. The chloride standard is 230 mg/l, or about one teaspoon of salt in a five gallon bucket of water. If we exceed those concentrations, aquatic life is impacted, the water body is put on the impaired waters list and someone will have to fix the problem.



I live near Shingle Creek, the first creek in Minnesota to show excess chlorides. A study was

done to determine the source of the problem (road salt) and to determine the reduction needed. A 71% reduction in the use of salt is now recommended (for city, state, county, private and homeowner application) in order to reduce the chloride concentrations in Shingle Creek.

Sodium chloride is the most common deicer used in the industry; and chlorides are causing us a big pain in the lake these days. One teaspoon of salt isn't much, yet it contaminates five gallons of water virtually forever. Using this ratio of salt to water, one tandem load of salt will contaminate eight million gallons of water. It gets more startling when we stop to realize that chlorides don't go away. Once salt is applied, it dissolves, heads downhill

and joins all of the other salt we have applied in previous years—in the bottom of our lakes, wetlands and groundwater. Unfortunately, we don't have a practical way to remove chlorides from our water.

The environmental community is just starting to realize the full impact of chlorides on our water. As we become more aware and concerned, we turn to the group that can help us solve this problem—the winter maintenance professionals. We must find ways to reduce the amount of chlorides we apply to parking lots, sidewalks, driveways and roads.

Can we reduce the amount of salt we apply and still have safe driving and walking surfaces? There are many ways to reduce our chloride use without sacrificing safety. Can we do winter maintenance exactly the same? Probably not.

To reduce the use of chlorides, most organizations will have to change some

DEICER DILEMMA: THERE'S NO SILVER BULLET

aspect of their maintenance operations, but change can be on your side. The University of Minnesota was one of the first groups to attend the new Minnesota Pollution Control Agencies' (MPCA) "Winter Parking Lot and Sidewalk Maintenance: Reducing Environmental Impacts of Chlorides" training class. After the class, the university was motivated to change its program. In one season (winter 2006-07), they accomplished amazing results. According to James Weber, in the university's facility management department: "Last year we implemented many changes in our snow removal program; two key areas were employee training and calibration of equipment. By increasing awareness of proper application rates, we were able to significantly decrease the amount of deicing chemical we used."

Here are his results:

Total Materials Reduced: 985 tons

Total Material Savings: \$65,071

Material Handling Equipment

Investment: \$10,000

Net Total Savings: \$55,071

Start making a difference

So how can you reduce chlorides? To start with, how about applying one teaspoon less of salt each time you go out? That saves five gallons of water from being harmed. The key is to determine ways to reduce your application rates. Below are suggestions from the new Minnesota training manual "Winter Parking Lot and Sidewalk Maintenance: Reducing Environmental Impacts of Chlorides:"

- Calibrate your sander/spreader so you know how much you are applying at each setting and for each type of material.

- Post the calibration results in the truck's cab.

- Print out the application rate table from the manual. The application rates are only guidelines. Adjust your operations gradually toward the recommended rates.

- Purchase a temperature sensor gun and know the pavement temperatures.

- Based on pavement temperature and the type of material, look up the recom-

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The truth is inescapable—in the snow and ice management industry, use of chemicals that ultimately impact the environment in some way is unavoidable. Also unavoidable—salt will always be king. However, as more clients focus on environmental friendliness, they may seek alternatives to the traditional solutions. As a savvy business person, it is your responsibility to not only educate yourself about the possibilities, but also to educate your clients. They may say they want to be environmentally friendly, but will another product work as well and will they be willing to pay a premium for what today are often higher-priced alternatives?

In the area of deicers, since you can't eliminate them from your snow and ice management arsenal, Dale Keep, owner of Ice & Snow Technologies in Walla, Walla, WA, offers these tips and the chart below to help you make the most educated choices for your clients:

- 1. Determine the problem.** Is the client complaining of corrosiveness, residue, or what he believes to be a solution that isn't working properly? Meet with the client to discuss their objectives and their concerns and choose a product

that can meet those goals with minimal environmental impact. Site location must also be taken into account. Are there watersheds, environmentally protected wetlands or other areas nearby that prohibit you from using certain products? Remember, what works for you might not work for someone else.

- 2. Realize there is no perfect product.**

Every deicer will have an impact, whether it's salt, sand, chlorides, phosphates, etc. The key is proper application rates and using the minimum to achieve maximum results.

- 3. Achieve a balance.** Many customers want to be more environmentally friendly; but here's a reality check—are they willing to pay for it? Educate the client about the cost of what you do, which is far different from the price of materials. Consider this simplified example: A client is concerned about the corrosion occurring on a wrought-iron handrail. Your \$10 of salt is causing \$1 worth of corrosion on a \$100 handrail. You can switch and put down \$50 of potassium acetate and have no corrosion. The client must decide whether it's worth the expense.

— Cheryl Higley, Managing Editor

MATERIAL	PRICE	CORROSION POTENTIAL	WATER QUALITY IMPACT	OTHER IMPACTS
ROAD SALT (NaCl)	LOW	Structures: Med to high Vehicles: Med	Medium Medium	Sodium sensitive plants
Calcium Chloride (CaCl ₂)	MED Low	Structures: Med to high Vehicles: Med	Medium	Plants: low
Magnesium Chloride (MgCl ₂)	MED Low	Structures: Med to high Vehicles: Med	Medium	Plants: low
Calcium Magnesium Acetate (CMA)	High	Structures: Very low Vehicles: Very low	Low but potential problems	Plants: low
Potassium Acetate (KA)	High	Structures: Med on Mild steel Vehicles: Med on Mild steel	Low	Plants: low
Sodium Formate	High	Low to Very low	Low	Plants: low
Ag Product Blended With Liquid Potassium Acetate	MED High	Structures = Low Vehicles = Low	Low	Plants: low
Ag Product Blended with liquid chlorides	MED	Structures = Medium to Low Vehicles = Medium to Low	Low	Plants: low
Ag Product Blended with Road Salt	MED Low	Structures = Medium to Low Vehicles = Medium to Low	Low	Plants: Sodium sensitive plants

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mended application rate. Select the correct setting in your truck to apply the proper amount of material.

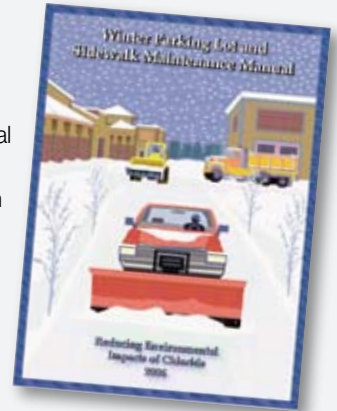
- Drive slow when applying so it does not bounce off the pavement.
- Choose a de-icer that has no chlorides.
- Choose a de-icer that works better than your current de-icer so you can use less (even if it is a chloride-based de-icer).
- Prewet your salt. Applying wet salt allows you to reduce your application rate 30%. Wet salt sticks to the surface and it works faster.
- Apply Sodium Chloride only if pavement temperatures are 15° or warmer.
- Anti-ice. Prevent the bond from forming between pavement and snow. By preventing this bond, we can save 4 to 10 times the de-icer needed to break the bond. Anti-icing is the future for winter maintenance.
- Train yourself and your crew on proper materials and application rates.

MINNESOTA TAKES TRAINING LEAD

The Minnesota Pollution Control Agencies' (MPCA) "Winter Parking Lot and Sidewalk Maintenance: Reducing Environmental Impacts of Chlorides" training class is free and will be held through the winter of 2008-09. The manual is online at www.pca.state.mn.us/programs/roadsalt.html.

This effort is part of a water protection grant given from MPCA to Fortin Consulting Inc. (an environmental consulting firm). Fortin led the research, development and implementation of this initiative with the help of city, county, state and private winter maintenance experts.

"The Minnesota Pollution Control Agency is taking a proactive approach to reducing chlorides. Our new training program has shown very encouraging results. We hope other states take what we have developed and implement it in their area," said MPCA's Andrew Ronchak.



As I've traveled across Minnesota talking to winter maintenance professionals in the private and public sector, my heart has been warmed. I have been encouraged by the remarkable pride and strength of this group of people. I believe that given the information, the full picture, not just part of the picture, the snow and ice pro-

fessionals will lead the charge to bring reform to their industry in order to have satisfied customers, safe winter travel and clean water. **SB**

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