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Village of Carol Stream
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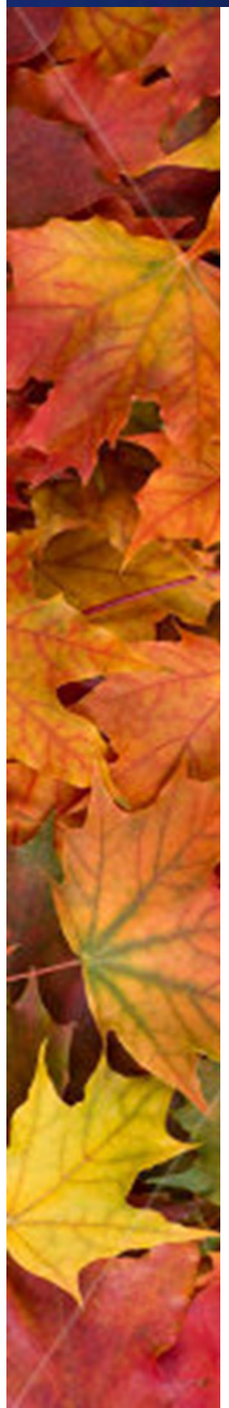


**Fall 2014**

## Letter from the President

Dear Readers,

Recently the ***State of Illinois released a new draft stormwater permit*** (also known as an ILR40 or MS4 permit) for review. The proposed changes are notable not only because of the extra obligations they place on permittees, but also because they show the way the State is moving on stormwater management. New requirements include tarping uncovered salt stockpiles as well as monitoring pollutants in stormwater runoff four times every year. The DRSCW provided comments to the State with regard to the salt storage requirement language and propose that individual MS4 permit holders be allowed to fulfill monitoring requirements as part of a comprehensive watershed-based program. While most municipal salt storage will already comply with the new requirements, MS4 authorities may want to consider extending these requirements to private storage facilities.

Monitoring data collected under the new permit is nearly certainly a precursor to more regulations on salt use and storage. To that end, the DRSCW's Chloride Committee is researching existing municipal codes and intents to create a model ordinance. ***Phosphorous and nitrogen, both produced by decaying organic matter, must also be monitored.*** The article *Evaluation of Leaf Collection Programs as a Means to Reduce Phosphorus Loads from Urban Basins* provides a review of some ongoing research that may provide municipalities guidance on efficient ways to reduce such pollutants.

In the past two months, two important DRSCW priorities were advanced in cooperation with DuPage County. DuPage County Stormwater Management recognized an opportunity to direct Section 319 funds remaining from their West Branch DuPage River restoration activities to the Fawell dam retrofit project – a DRSCW priority project. The DRSCW provided the necessary match 40% allowing the site survey work to be completed. The dam is a barrier to fish passage and the DRSCW predicts that the nine fish species found only downstream will move up into the upstream 27 miles of West Branch DuPage River if the barrier can be modified. This project will help improve regional water resource quality and ***we thank DuPage County Stormwater Management*** for thinking and acting quickly on this forward-thinking strategy to leverage funds.

Public works departments are preparing for another winter season. Last winter stretched, and in some cases depleted, salt stores. Suggestions for relatively inexpensive methods every agency can incorporate to improve salt efficiency are provided on pages 2 and 3. For the third year, DuPage County Division of Transportation hosted the DRSCW's chloride reduction workshops to help public and private agencies improve their snow and ice management programs while reducing the amount of salt they use. Chloride, found in road salt, negatively impacts fish and bugs, kills roadside plants, corrodes infrastructure, contaminates drinking water and because they persist, must be managed from a source-reduction approach. These workshops help address the ***chloride Total Maximum Daily Load (TMDL)*** in our watersheds and ***we thank DuPage County Division of Transportation***, a recognized leader in the chloride management, for their assistance with the workshops.

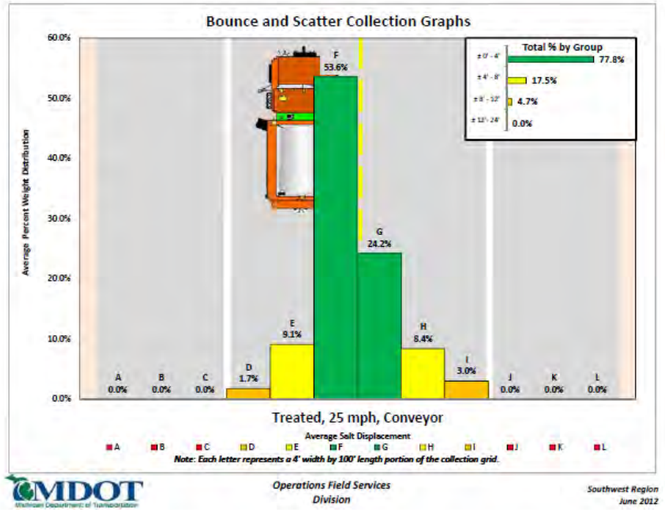
Please continue to educate your constituents on the environmental consequences of using Coal Tar (CT)-based sealcoats. We have learned such sealcoats contain very high levels of cancer causing polycyclic aromatic hydrocarbons (PAHs) that wear off and are tracked into homes or washed into detention basins and streams. CT based sealcoats are available commercially but a number of major chains including Ace Hardware, The Home Depot, Lowes Home Improvement and Menards no longer sell them. Instead, they sell ***asphalt-based sealcoats, which contain about 1/1000th of the PAHs*** found in CT-based sealcoats. CAS#8052-42-4 is the most common asphalt-based sealcoat.

The DRSCW continues working with State and Federal governments to implement new NPDES Phase I (wastewater) permits that reflect local priorities issued to members, especially regarding our projects initiative and the implementation of nutrient standards. We will update you as this critical item proceeds.

*David Gorman, President*

## How much salt did you throw away last winter?

With member communities reporting twice the expenditure of resources during the winter of 2013-14 compared to an average year, the focus for many is on replenishing depleted salt stockpiles. However, such efforts are facing tough economic headwinds with market prices up to $150/ton and many suppliers reporting no inventory.




It is a good time to pause and think about the flip side of salt supply, efficiency of use. A community with storage of 600 tons who ***improves their efficiency by 25% has effectively created an additional 150 tons of salt in storage***. Is your community making the most efficient use of its salt? The answer in most instances is no. There are a few basic operational steps to ensure that your community is getting more out of every ton of salt it applies to the road.

In 2012, Michigan DOT carried out a bounce and scatter study examining the distribution of dry road salt and treated (wet) salt from a Y-chute and a rear cross conveyor at increments of 10 mph. The study's objective was to identify the combination of application equipment, vehicle speed and salt product needed to maximize the amount of salt that stays in the travel lane during application (defined as approximately four feet on either side of the roadway center line, or point of impact). Three additional 4 foot zones were set out on either side of the travel lane. The score attached to salt arriving in these zones was halved until it reached zero in the final zone, which started 16 feet away from the point of impact. Salt in the final zone was considered in the gutter, or 100% wasted.

The study concluded that ***speed was the most significant variable affecting the percentage of salt that remained in the target area.*** The percentage of dry salt ending up in the wasted zone went from 0% to 13% when speed increased from 25 to 35 mph and increased to 26% at 45 mph. The amount of salt in the travel lane at 25 mph was double that found in the 35 mph tests. The second most important variable was the use of treated salt. Salt in the study was treated by adding a liquid deicer to a stockpile of untreated salt at a rate of 8 gallons per ton. At 25 mph, 0% of the treated salt ended up in the gutter compared to 5% of the untreated salt. Again the amount retained in the travelling lane was increased, here by 10%.

Vehicles using a conveyor at 35 mph to apply dry salt would result in 25% of the applied salt ending up in the gutter, whereas the same vehicle operating at 25 mph with treated salt would place none in the gutter. The smallest difference was found in the choice of equipment, however, the conveyor system was consistently more effective at getting salt into the target zone. The study concluded that ***salt should be applied at 25 mph whenever possible and that "All salt applied ……should be treated with a liquid deicer***, using one of the common prewetting strategies." Find the study at http://www.drscw.org/chlorides/MDOT%20Final_ReportNov2012_404228_7.pdf.

## Low Cost Ways to Reduce Salt Use

Managing snow and ice has become increasingly data driven and today's operators are called on to match blends of ice melting chemicals for various surfaces in fluctuating weather conditions. In addition to having accurate weather forecasts, two critical pieces of information needed to optimize salt use are the type and quality of product you apply and the actual application rates of the equipment you deploy. Pavement temperature can, and often does, differ significantly from air temperature. The ***pavement temperature and weather forecast will dictate your application rate*** based on how salt and/or your blended product will behave when it makes contact with the road, parking surface or sidewalk. Pavement temperature sensors that provide both air and surface temperatures are available for a reasonable cost and are the single best piece of equipment for optimizing salt use. Another useful tool is a pavement temperature forecast from a meteorological consultant.

The second component necessary to optimize your snowfighting operations is knowing at what rate each piece of equipment used will apply different products. Identical equipment set to the same rate can apply widely different amounts of product (granular salt and liquids). It is ***critical that the application rate of the equipment at each setting is measured and documented***, a process called calibration. This should be done on new vehicles, after major service or repairs, and repeated each fall. You can accurately determine how much of the product you need and that the right amount of product is actually being applied only by knowing the pavement temperature and operating calibrated equipment.

## Rethinking Winter Roads Policy in Carol Stream

*Todd Hoppenstedt, Superintendent of Operations—Village of Carol Stream*

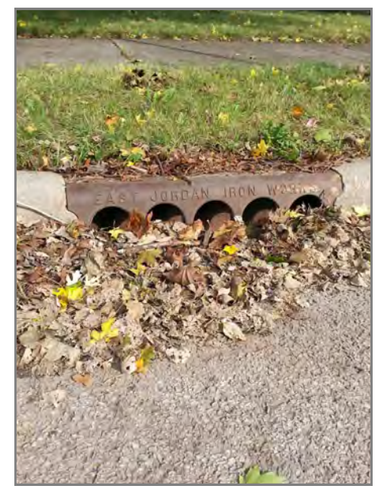
Over the past several years the Carol Stream Public Works Department has made efforts to effectively and efficiently manage salt usage during ice and snow seasons. During the 2013-2014 winter season, we began to ***experiment with new techniques and practices***, as we anxiously watched our stock pile of salt diminish. We heard stories and media reports of a salt shortage developing; some agencies had run out of salt, while others were paying a premium for relatively small amounts of deicing agents.

One of the practices we employed was ***increased anti-icing efforts.*** We increased in-house brine production and began applying it village wide when there was sufficient notice of a storm event. Increasing our pre-wetting practices reduced bounce and scatter of rock salt, and increased its productivity and efficiency at lower temperatures. Lastly, during most storms, we stopped salting cul-de-sacs and courts and limited our secondary streets to one application of salt on our last pass.

These techniques allowed us to ***reduce our use of rock salt (chloride is the active ingredient) on average between 30-50%.*** Besides the operational benefits of implementing best practices, we did not experience a significant increase in complaints or traffic accidents related to our application reduction. Recently, Village staff made a recommendation to our Board that these salt conservation measures be incorporated into the Snow and Ice Plan as policy. The Village Board agreed with staff's recommendation and voted to approve this policy change on September 2, 2014.

## Evaluation of Leaf Collection Programs as a Means to Reduce Phosphorus Loads from Urban Basins

*William Selbig, USGS – Wisconsin Water Science Center*




*Leaves clogging a storm sewer*

Numerous studies have identified a variety of potential sources of nutrients, like phosphorus and nitrogen, in urban settings[1]. However, few studies have quantified the water-quality benefits of removing sources of nutrients, such as organic debris and particulate matter, before they become entrained in stormwater runoff. As the ***regulatory community looks more closely at methods to reduce nutrients*** in waterways, municipalities may experience the added benefit of phosphorus removal by incorporating minor changes to existing leaf collection and street cleaning practices.

The U.S. Geological Survey - Wisconsin Water Science Center is investigating the potential benefits of nutrient reduction in stormwater runoff through leaf collection and street cleaning practices. The four year study will quantify baseline conditions in four residential drainage basins in Madison, Wis. without a leaf management program, then measure changes in nutrient load when city-wide leaf collection operations resume. While the amount of organic debris on streets is highest during fall, water-quality monitoring will continue through spring and summer to further characterize seasonal patterns in nutrient load. Data will be used to determine the value in leaf collection, optimize collection practices, and enhance existing datasets in urban hydrology and water-quality models.

Since the USGS installed storm sewer monitoring stations in the study area in the fall of 2012 a total of 160 water-quality samples have been collected and analyzed for a variety of nutrients including phosphorus and nitrogen. November 2013 marked the conclusion of water quality sampling during phase with no active leaf collection. As expected, preliminary results indicate phosphorus concentrations can be considerably higher in the fall than in spring or summer. Phosphorus was primarily found in its dissolved phase, which is highly mobile during runoff events. Total phosphorus yields were as much as 10 times greater than previous studies conducted in Madison with an active leaf collection program[2].

In the spring of 2014, the city of Madison resumed street cleaning operations in the study basins and will resume their normal leaf collection program through the remainder of 2014. At that point, statistical inferences will be made on the potential for phosphorus and nitrogen reduction as a result of leaf collection practices. Future efforts will examine how modifications to the leaf collection program might optimize phosphorus and other nutrient load reductions in urban runoff. As such, the role of ***leaf removal from city streets could prove to be a critical element to address phosphorus mitigation in the urban environment.***

[1] (Cowen and Lee, 1973; Waschbusch et al., 1999; Beretta et al., 2011; Cheng et al., 2014).
[2] (Selbig, 2007)