

A photograph of the Chicago skyline, featuring several skyscrapers and a bridge over a river. The bridge is a large, dark metal structure with a complex lattice of beams. The river is in the foreground, and the buildings are in the background. The sky is overcast. The text is overlaid on the image in a large, bold, yellow font.

Working Together to Comply with the Clean Water Act in the CAWS

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De-icing, Chlorides, and Water

- Sodium, chloride, and impurities in road salt make their way into our environment
 - Runoff from rain, melting snow and ice
 - Splash and spray by vehicles
- Road salt “travels”
 - Onto vegetation
 - Into the soil and groundwater
 - Through storm drains
 - Into surface waters

Aquatic Life Impacts

Chloride in surface waters can be toxic to many forms of aquatic life, including fish, macroinvertebrates, insects, and amphibians



<http://www.boois.com>

EPA cares about road salt?

- **Detrimental effects on aquatic life set the Clean Water Act into action**
- **Clean Water Act's goal is to restore and maintain the chemical, physical, and biological integrity of the nation's waters**
- **“Wherever attainable, achieve a level of water quality that provides for the protection and propagation of fish, shellfish, and wildlife and for recreation in and on the water”**

The Clean Water Act in Action...

- The Clean Water Act instructs EPA and states to develop water quality standards necessary to protect water uses
 - Aquatic life, recreation, human health
- EPA published, in 1988, guidance to protect aquatic life from the detrimental effects of chloride (road salt)
 - Acute: 860 mg/L
 - Chronic: 230 mg/L

Clean Water Act Action in Illinois

- Illinois recently set new long-term goals (or designated uses) and updated its criteria for the Chicago Area Waterway System (CAWS)
- Numeric criteria were adopted that express the level of water quality necessary to protect the new uses
 - Dissolved oxygen, pH, temperature
 - Toxics like ammonia and metals

Clean Water Act Action in Illinois



<https://www.google.com/#q=pictures+of+piles+of+paper>

Clean Water Act Action in Illinois

- Illinois Pollution Control Board determined that Illinois' water quality criteria for chloride in place for other waters is necessary for the CAWS and Lower Des Plaines River
 - Chloride criterion = 500mg/L
- However, stakeholders noted that the CAWS are not currently meeting the new aquatic life criteria for chloride due to road salt runoff

“Houston, we have a problem!”



<https://www.google.com/#q=picture+of+snowy+car+crash>

Clean Water Act Balancing Act

- When a water is not meeting water quality standards, variances can be developed
 - Regulatory process to set interim goals
 - Participation and input from stakeholders
 - Must be consistent with state requirements
 - Defined “end date” (i.e., 5 years)
 - Demonstrate that implementation of the standard would lead to “arbitrary and unreasonable hardship” to the requestor
 - Includes measures that requestor will do during variance to improve water quality

Clean Water Act Balancing Act

- Variances must be consistent with federal requirements by demonstrating that:
 - Human caused conditions or sources of pollution that can't be remedied ... prevent attainment of the use, or controls ... would result in substantial and widespread economic and social impacts
 - “Highest attainable” water quality during the variance period and measures necessary to achieve highest attainable use during term of variance are expressed in NPDES permits

Road Salt Balancing Act

- **Goal: Improve water quality using a variance:**
 - Adopted by Pollution Control Board,
 - Approved by U.S. EPA,
 - Incorporated by Illinois EPA into individual and general NPDES permits for treatment plants and MS4s,
 - Implemented by permit holders including dischargers and communities,
 - **Affected by all winter salt users in the watershed**

Road Salt Balancing Act

- Steps in developing a chloride variance:
 - Understand current water conditions
 - Document current road deicing activities
 - **Develop pollutant minimization plan identifying opportunities to reduce road salt runoff while maintaining public safety**
 - **Implement the plan**
 - Document progress in order to help determine if additional variance is needed

Ensuring Public Safety



Ensuring Public Safety



http://asset-exports-from-us.com/road_salt
<http://calfish.ucdavis.edu/species/?ds=241&uid=47>

Is this just a Chicago thing?

- **Increased focus on impacts of road deicing**
 - **New England (i.e., New Hampshire)**
 - **Twin Cities (MN), Madison/Milwaukee (WI)**
 - **DuPage and Salt Creek Watershed (IL)**
 - **McHenry and Lake County (IL)**
- **Impacts other than aquatic life:**
 - **Vegetation and invasive species**
 - **Groundwater/drinking water contamination**
 - **Corrosion of infrastructure, vehicles, and equipment (~\$20 billion/year)**

The Milwaukee Metro Area

- Three watersheds all experienced increased chloride concentrations from 1980 to 2010 during winter, spring, summer, and fall.
- Concentrations of chloride greater than EPA criteria during winter at all urban streams studied, with some lingering summer effects



USGS Study – Southeast WI

- During winter, **100 percent** of the streams monitored had chloride levels that exceeded USEPA's chronic water quality criteria in one or more samples.
 - Chloride levels higher than 10,000 mg/L
 - In Milwaukee, more than half of the samples had chloride concentrations greater than USEPA's acute criterion.
 - Samples from 7 of 13 streams collected during 2007 were toxic to aquatic life in laboratory bioassay tests.

Wisconsin MS4 Permit

If road salt or other deicers are applied by the permittee, no more shall be applied than necessary to maintain public safety. Information on deicing activities shall be submitted with the MS4 annual report, including information on:

- Contact information for the individual(s) with responsibility for winter roadway maintenance
- Description of the types of deicing products used
- The amount of deicing product used per month
- Description of the type of equipment used
- Snow disposal locations, if applicable
- Anti-icing, equipment calibration, and salt reduction strategies considered

Thank You for Attending!

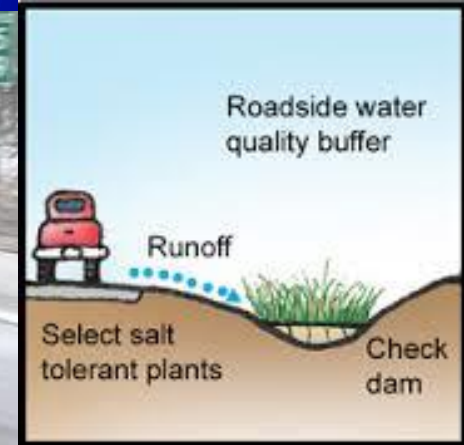
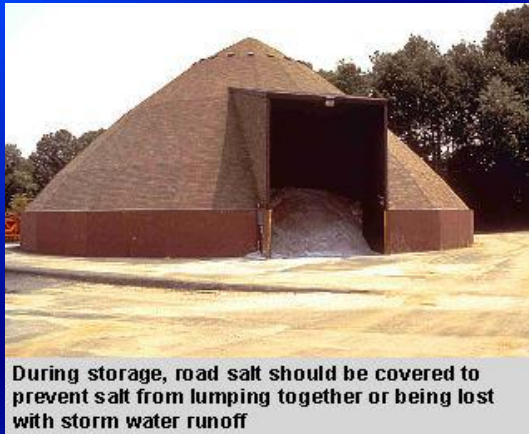
- **Your efforts to protect public safety are key to the well-being of all of us!**
- **Your attendance and involvement in this watershed effort to improve road salt management in Chicagoland is applauded!**
- **EPA looks forward to working with MWRD, Illinois EPA, and YOU to work toward improving water quality in the CAWS!**

Clean Water Act Action in Illinois



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Clean Water Act Action in Illinois



<https://www.google.com/search?q=pictures+of+road+salt+best+management+practices&biw=1300&bih=659&tbm=isch&tbo=u&source=univ&sa=X&sqi=2&ved=0CCMQsARqFQoTCJbMp5jg5cgCFYeqHgodIO0F5w&dpr=0.75>

<https://www.google.com/search?q=elgin+road+salt+pictures+brine&biw=1300&bih=659&tbm=isch&tbo=u&source=univ&sa=X&ved=0CCMQsARqFQoTCKPE78nh5cgCFYNdHgodSmUL6A&dpr=0.75>

References

State Water Quality Standards Regulations at 35 Ill. Admin. Code Sections 301-303:

<http://www.ipcb.state.il.us/SLR/IPCBandIEPAEnvironmentalRegulations-Title35.aspx>

Federal Water Quality Standards Regulations at 40 Code of Fed. Regs.

131.10(g) and 131.14: <http://www.ecfr.gov/cgi-bin/text-idx?SID=454a7b51118b27f20cef29ff071c1440&node=40:22.0.1.1.18&rgn=div5>

DuPage and Salt Creek Watershed Chloride Issues:

<http://drscw.org/wp/chlorides-and-winter-management/>

River Chloride Trends In Snow-affected Urban Watersheds: Increasing Concentrations Outpace Urban Growth Rate And Are Common Among All Seasons. Steven R. Corsi, Laura A. De Cicco, Michelle A. Lutz, Robert M. Hirsch Available at:

<http://wi.water.usgs.gov/non-point/roadsalt/index.html>

CWA tools to restore waters

- If not meeting standards,
 - **Standards incorporate water quality variances**
 - Express the highest attainable water quality
 - Activities necessary to attain improved water quality are included in CWA permits
 - Chicago Area Waterways (anticipated)
 - **Waters are listed as “Impaired Waters”**
 - Total Maximum Daily Load (TMDL) plans developed
 - Load allocations and implementation requirements are reflected in CWA permits
 - Salt Creek and DuPage chloride TMDLs
 - **Goal of both approaches: Restore water quality**