Southeastern Wisconsin

Regional Planning Commission

Chloride Impact Study

TAC Meeting – Review of Technical Report No. 67

Legal and Policy Considerations for the Management of Chloride

November 10, 2023

Worldox Number 270491

Meeting Agenda and Speakers

- Review of Summary Notes from TAC meeting on June 28, 2023
- Review of preliminary draft chapters for *SEWRPC Technical Report No. 67, Legal and Policy Considerations for the Management of Chloride*
- Next Steps

Today's Speakers:

- Laura Herrick, Chief Environmental Engineer
- Aaron Owens, Senior Planner
- Prof. Dave Strifling, J.D., P.E.
- Margaux Serrano (J.D. expected 2024)

Review of TAC Summary Notes

June 28, 2023

www.sewrpc.org/chloridestudy

Meeting Materials

Table 4.1
Summary of Data Adjustments

Site ID	Site Name	Adjustment Start (CDT)[a]	Adjustment End (CDT)[a]	Specific Conductance Difference[b] (µS/cm)	Adjustment Span (days)	Percent of Total Record Adjusted[c]
3	Mukwonago River at Mukwonago	2019-03-14 12:00:00	2019-04-09 10:50:00	86	26.0	3.4
4	Sugar Creek	2018-10-01 00:00:00	2018-10-19 11:00:00	122	18.5	7.4
		2019-03-12 18:00:00	2019-04-10 11:10:00	80	28.7	
		2019-09-10 07:00:00	2019-09-19 10:20:00	169	9.1	
8	Pewaukee River	2019-05-23 15:55:00	2020-05-12 11:10:00	262	354.8	46.6
9	Oak Creek	2020-08-02 15:20:00	2020-10-08 15:55:00	397	67.0	7.6
10	Pike River	2018-10-30 18:05:00	2018-11-12 13:10:00	127	12.8	7.9
		2019-04-15 12:30:00	2019-06-11 11:55:00	109	57.0	
11	Bark River Upstream	2019-03-13 12:40:00	2019-04-09 13:55:00	134	27.1	10.3
		2019-04-22 23:20:00	2019-06-13 11:50:00	107	51.5	
13	Ulao Creek	2020-03-28 22:20:00	2020-04-07 09:55:00	435	9.5	3.6
		2020-05-17 09:35:00	2020-06-15 13:35:00	185	29.2	
14	Sauk Creek	2019-06-12 19:40:00	2019-06-14 13:00:00	180	1.7	11.4
		2019-09-13 17:35:00	2019-09-20 14:10:00	170	6.9	
		2020-07-09 20:25:00	2020-10-09 09:20:00	104	91.5	
15	Kilbourn Road Ditch	2018-10-10 17:00:00	2018-12-12 13:00:00	103	62.8	14.2
		2019-03-14 04:45:00	2019-04-15 11:25:00	344	32.3	
		2020-09-08 16:20:00	2020-10-08 11:45:00	290	29.8	
16	Jackson Creek	2018-10-06 01:35:00	2018-10-12 12:00:00	72	6.4	0.8
18	Oconomowoc River Upstream	2019-02-01 01:30:00	2019-04-09 14:25:00	101	67.5	17.2
		2020-03-09 16:55:00	2020-05-12 10:15:00	185	63.7	
20	Oconomowoc River Downstream	2020-03-08 23:25:00	2020-07-16 12:40:00	203	129.6	17.0
21	East Branch Milwaukee River	2019-03-17 07:15:00	2019-06-03 11:25:00	119	78.2	10.3
23	Milwaukee River Downstream of Newburg	2019-03-13 17:00:00	2019-04-08 12:00:00	59	25.8	3.4
25	Root River Canal	2018-10-01 00:20:00	2018-10-24 14:50:00	376	23.6	3.9
		2018-12-01 18:00:00	2018-12-12 13:35:00	121	10.8	
28	East Branch Rock River	2018-10-30 16:30:00	2018-12-07 11:50:00	135	37.8	11.9
		2019-07-20 12:25:00	2019-09-11 11:25:00	97	53.0	
30	Des Plaines River	2019-10-27 06:20:00	2019-11-20 11:40:00	235	24.2	2.7
32	Turtle Creek	2018-12-21 00:35:00	2019-04-12 11:55:00	248	112.5	19.5
		2020-03-09 14:40:00	2020-04-14 11:20:00	162	35.9	
33	Pebble Brook	2020-06-22 21:45:00	2020-10-07 10:35:00	131	106.5	14.0

Table continued on next page.

Southeastern Wisconsin

Regional Planning Commission

Chloride Impact Study for the Southeastern Wisconsin Region

TAC Meeting – Review of Technical Report No. 67

Legal and Policy Considerations for the Management of Chloride

Prof. David A. Strifling, J.D., P.E.

Margaux Serrano (J.D. expected 2024)

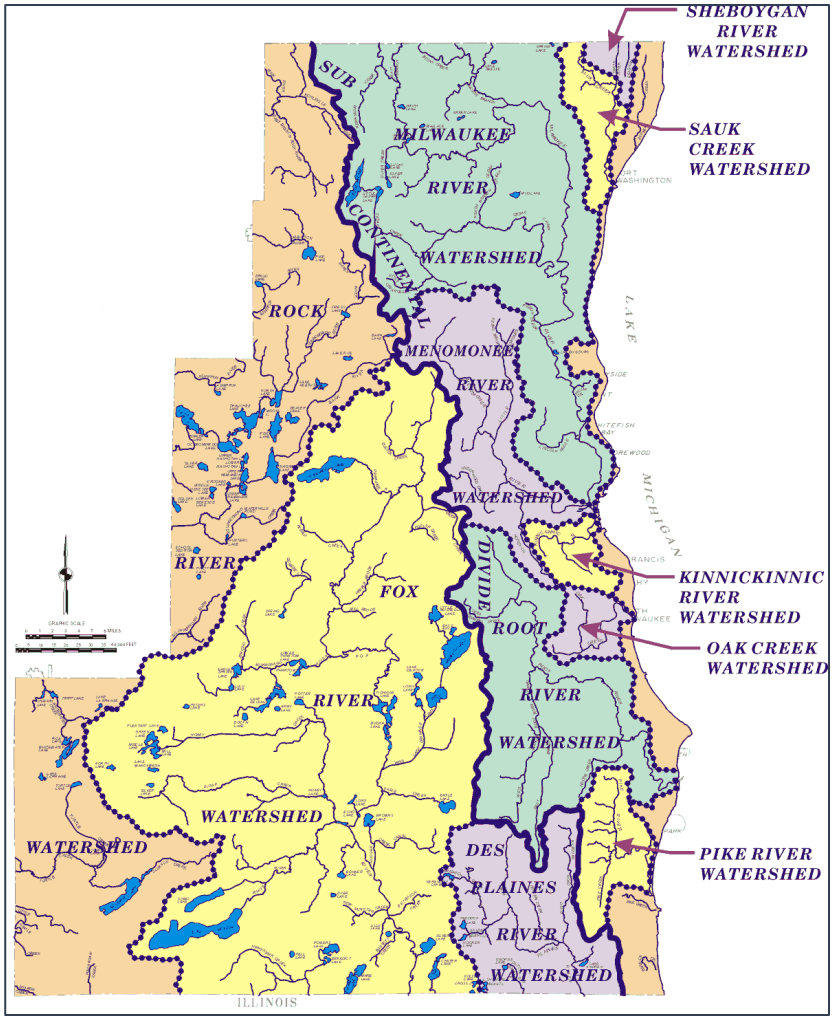
Marquette University Water Law and Policy Initiative

Outline

- Introduction
- Chapter 1 – Sources of Chloride to the Environment
- Chapter 2 – Legal and Policy Strategies to Control Chloride Discharges
- Next Steps

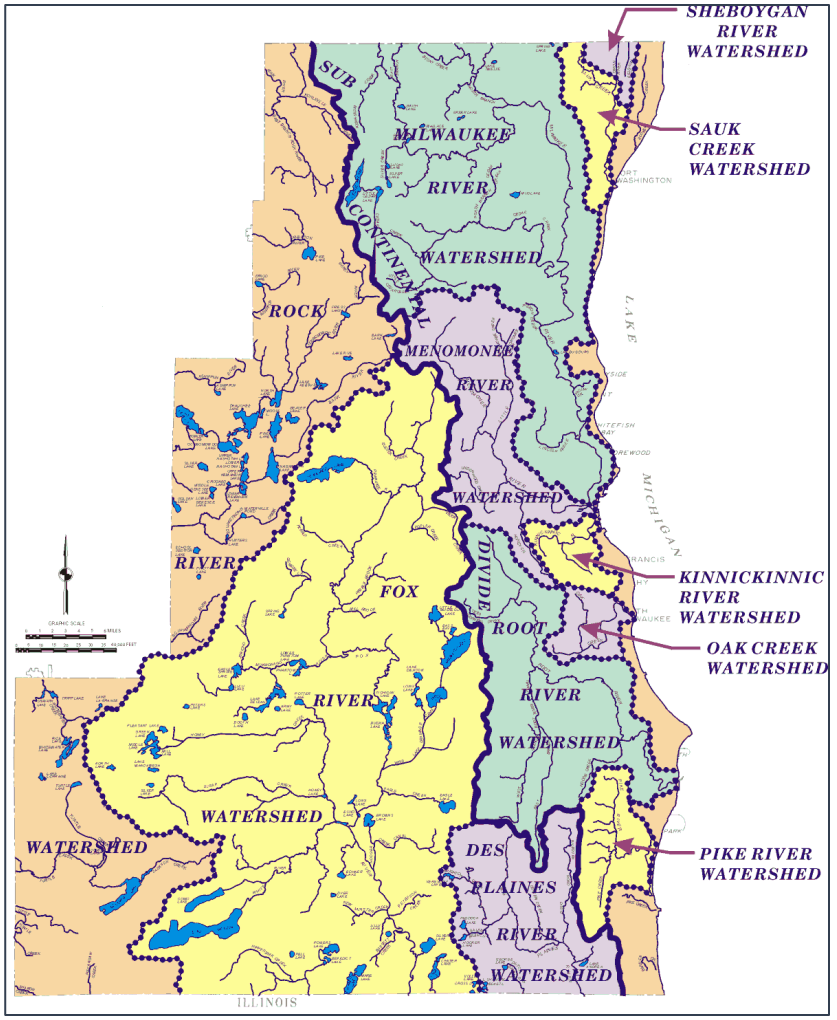
Introduction

- Describes the purpose of TR-67 and provides an overview of the subject matter
- Places TR-67 in the context of the objectives of the Chloride Impact Study
- Presents the organization of TR-67



Introduction

- Purpose and overview of TR-67
  - Propose and examine a menu of legal and policy options to control chloride pollution of surface water and groundwater
  - To inform the legal analysis, briefly catalog sources of chloride in the environment, and risks to human health and natural resources associated with excess chloride in water resources

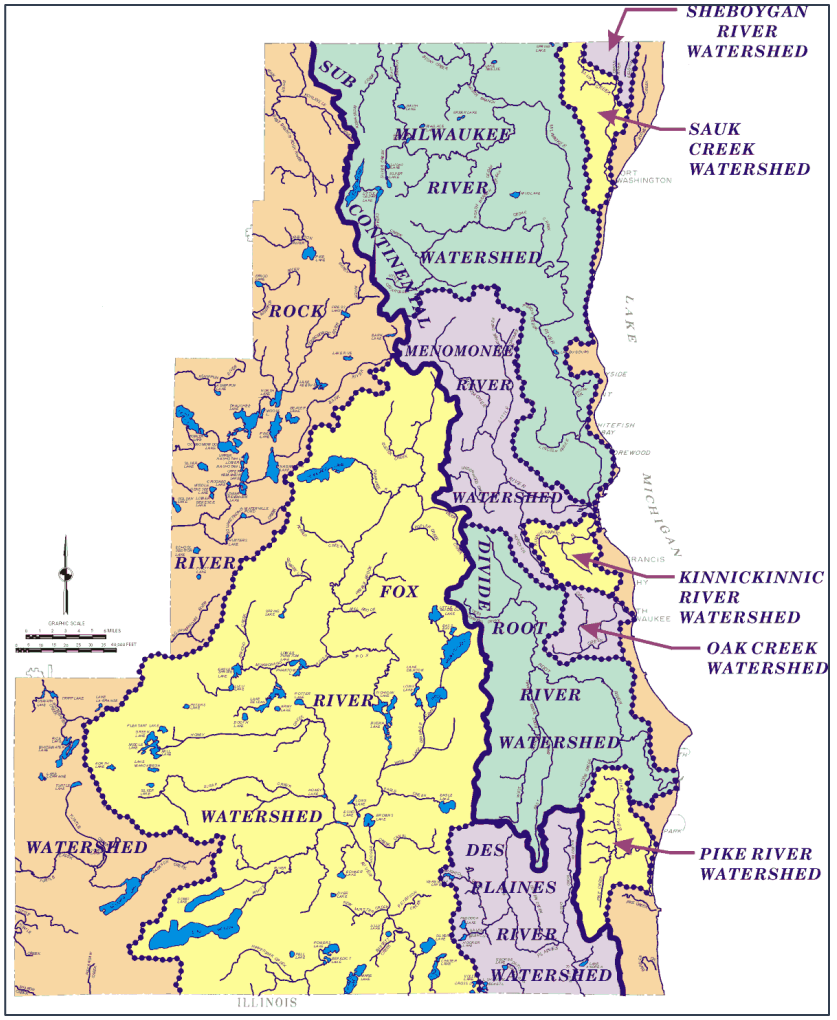


Introduction

- Context in the overall Chloride Impact study
  - PR-57, A Chloride Impact Study for Southeastern Wisconsin
  - TR-61, Field Monitoring and Data Collection for the Chloride Impact Study
  - TR-62, Impacts of Chloride on the Natural and Built Environment
  - TR-63, Chloride Conditions and Trends in Southeastern Wisconsin
  - TR-64, Regression Analysis of Specific Conductance and Chloride Concentrations
  - TR-65, Mass Balance Analysis for Chloride in Southeastern Wisconsin
  - TR-66, State of the Art for Chloride Management
  - **TR-67, Legal and Policy Considerations for the Management of Chloride**

Introduction

- Organization of TR-67
  - Introduction
  - Chapter 1 – Sources of Chloride to the Environment
  - Chapter 2 – Legal and Policy Strategies to Control Chloride Discharges
  - Conclusion

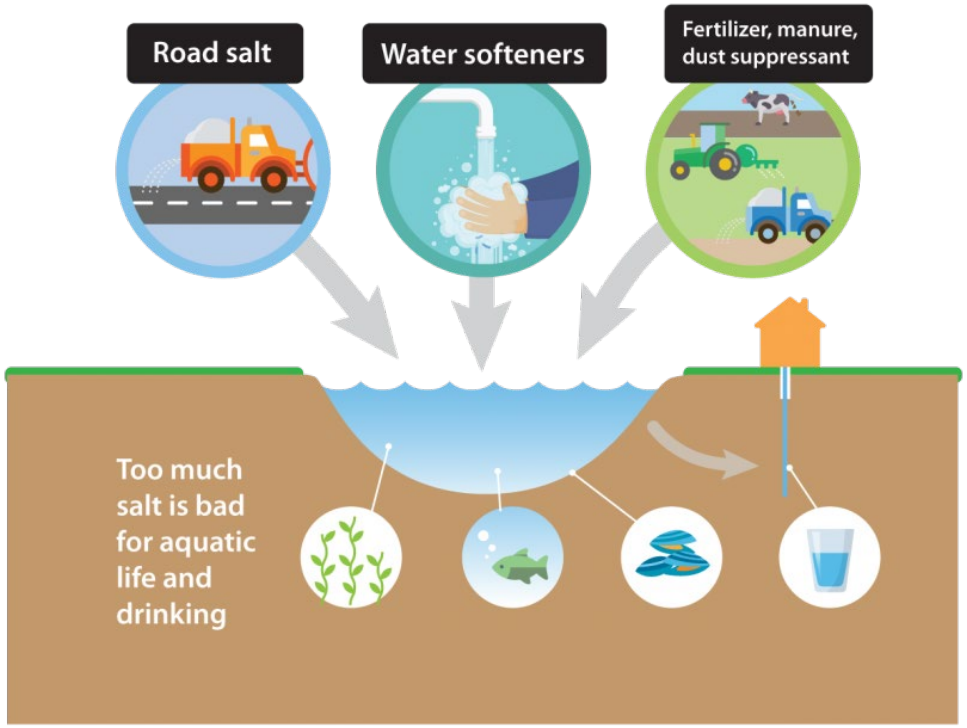


Outline

- Introduction
- Chapter 1 – Sources of Chloride to the Environment
- Chapter 2 – Legal and Policy Strategies to Control Chloride Discharges
- Next Steps

Sources of Chloride to the Environment

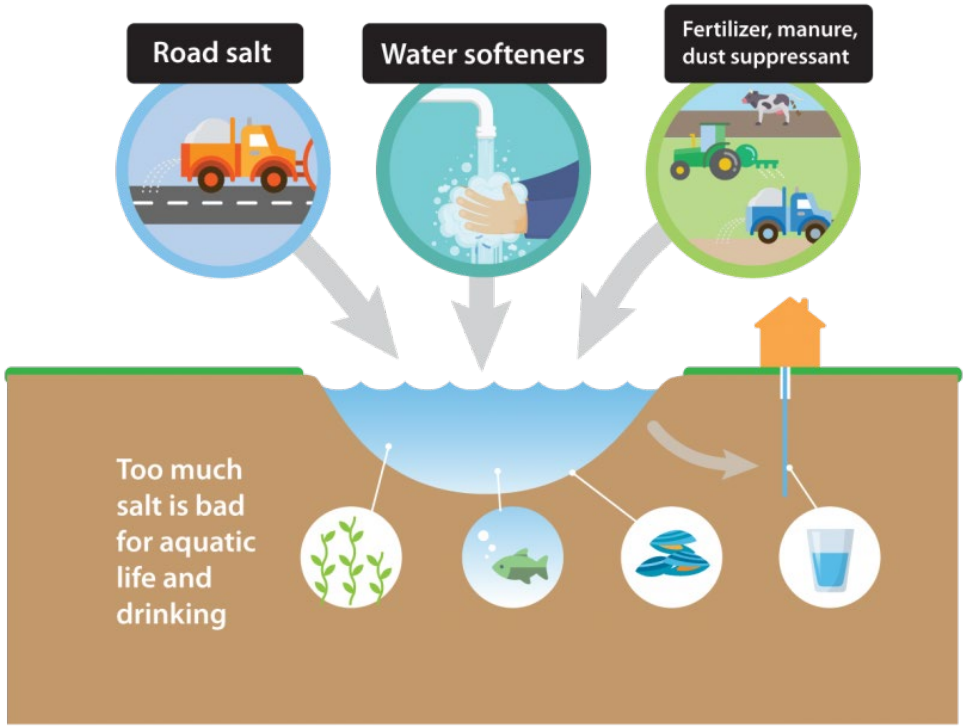
- Generally defer to TR-62 (*Impacts of Chloride on the Natural and Built Environment),* TR-63 (*Chloride Conditions and Trends in Southeastern Wisconsin*), and TR-65 (*Mass Balance Analysis for Chloride in Southeastern Wisconsin*)
- Slightly different presentation to inform the legal analysis



https://www.pca.state.mn.us/water/chloride-101

Sources of Chloride to the Environment

- Public and Private Snow and Ice Removal
  - Highly important from a public safety perspective
  - Most significant source in many areas
  - Consider storage, transportation, application
  - Private component is important consideration (up to half of application)
  - Liability concerns (slip and fall)
- Water Softening
  - Affected by softener efficiency, age, type of regeneration, salt dosage, reserve capacity
  - Reviewed a variety of systems/tactics
- Agricultural Uses
  - Feed additive
  - Pesticides
  - Fertilizers (K-Cl)



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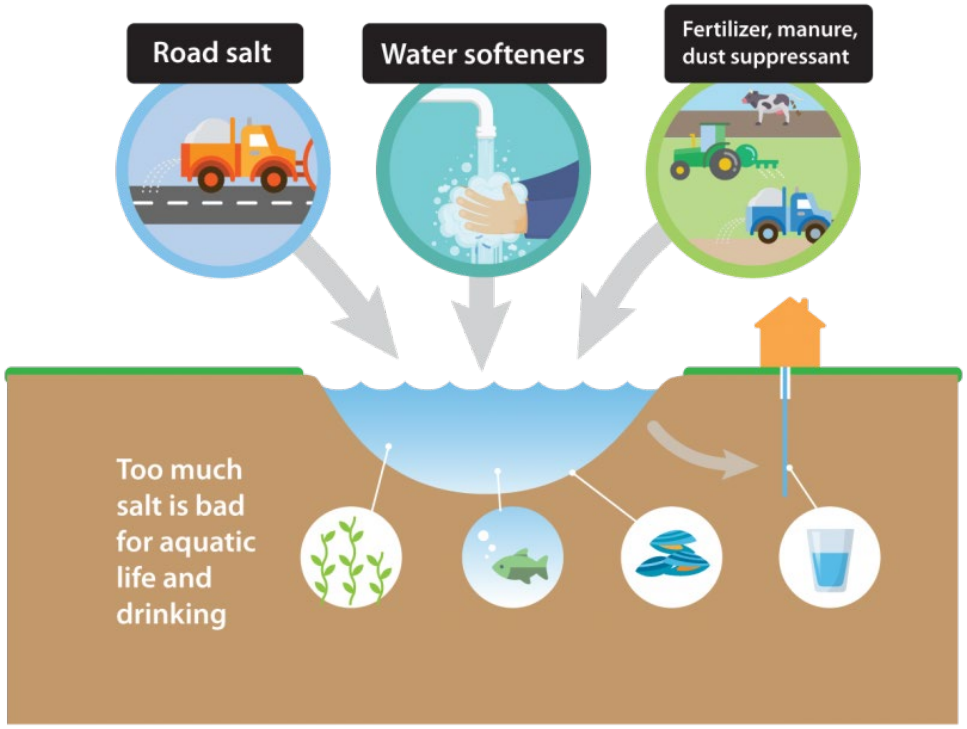
Sources of Chloride to the Environment

- Wastewater Treatment Facilities
  - Chloride enters the waste stream through water softeners, food, beverages, cleaning products
  - Chloride often passes through treatment facilities and septic systems (very high capital costs to remove)
  - Enters water bodies and groundwater as treated effluent
- Food Processing
  - Example: cheesemaking process
- Other Industrial Sources
  - Examples: oil and gas, steel production, leather tanning



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The Difficult Translation Between Science and Policy

- Many studies have demonstrated elevated chloride concentrations in waterways
- Few efforts made to establish policies to control application
- Contrary drivers:
  - Public safety concerns
  - Public perceptions and “availability bias”
  - Inaccurate weather forecasts
  - Affordability and effectiveness of salt
- Liability concerns
  - “Slip and fall” cases rank highly on list of concerns, especially on private property

The Difficult Translation Between Science and Policy

- Overuse of salt has been the “safe strategy,” but that may be changing
- Recent reports of citizen-initiated suits against municipalities and private property owners for over-application of salt and the resulting harms
  - Citizen lawsuit alleging property damage and health impacts near GM’s Milford Proving Grounds (Brighton, MI)
  - Hundreds of thousands of tons of salt applied over decades
  - Settled out of court

Responsive Policy Options

- Limiting liability
- Informational strategies
- Direct regulatory strategies
- Chloride alternatives
- Water quality trading
- Integrated watershed management
- Economic measures and assistance

Limiting liability

- Fear of slip-and-fall liability drives overuse; must address this directly
- Example: New Hampshire program provides snow- and ice-related liability waiver to certified parties after training on best practices
- Multiple levels of certification options
  - Individual
  - Organizational
- Periodic recertification required

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

NEW HAMPSHIRE CERTIFIED GREEN SnowPro

Limiting liability

- Advantages: forces efficiency while balancing environmental, safety, and liability concerns; cost reduction due to decreased salt usage; marketing advantages; potential insurance benefits
- Challenges: maintaining funding, voluntary nature of program, difficulty of initial passage, and potential for legal challenge; contractors don't like additional obligations to file reports of amount applied

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

NEW HAMPSHIRE CERTIFIED GREEN SnowPro

Limiting liability

- Waiver does not apply if contractor acted with “gross negligence” or “reckless disregard”
- So far, legal challenges have been unsuccessful

Limiting liability

- Results: salt use decreasing by average 30%, per annual report, with corresponding cost savings; and intensive monitoring in chloride-impaired watersheds shows environmental improvements
- Hundreds of participants certified
- Replicate elsewhere? Need “champions” (early adopters) and liability waiver

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

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Limiting liability

- Wisconsin bill in the works
- Senate Bill 52/Assembly Bill 61
  - Passage recommended by Senate Committee on Natural Resources and Energy (May 30, 2023)
  - Fiscal estimate (June 29, 2023)
  - Passage recommended by Assembly Committee on Regulatory Licensing (October 19, 2023)

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

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Direct regulatory strategies

- Direct regulation possible by environmental and transportation agencies
- Possibilities:
  - Regulations issued pursuant to Clean Water Act or state agencies' general authority over state waters
  - Mandated or incentivized best management practices
  - Municipal ordinances

Direct regulatory strategies

- Direct regulation
  - Water quality standards for chloride have been issued under CWA
    - Chronic: 395 mg/L
    - Acute: 757 mg/L
  - TMDLs for chloride
  - Corresponding chloride discharge limits (or variances) have been imposed in NPDES permits

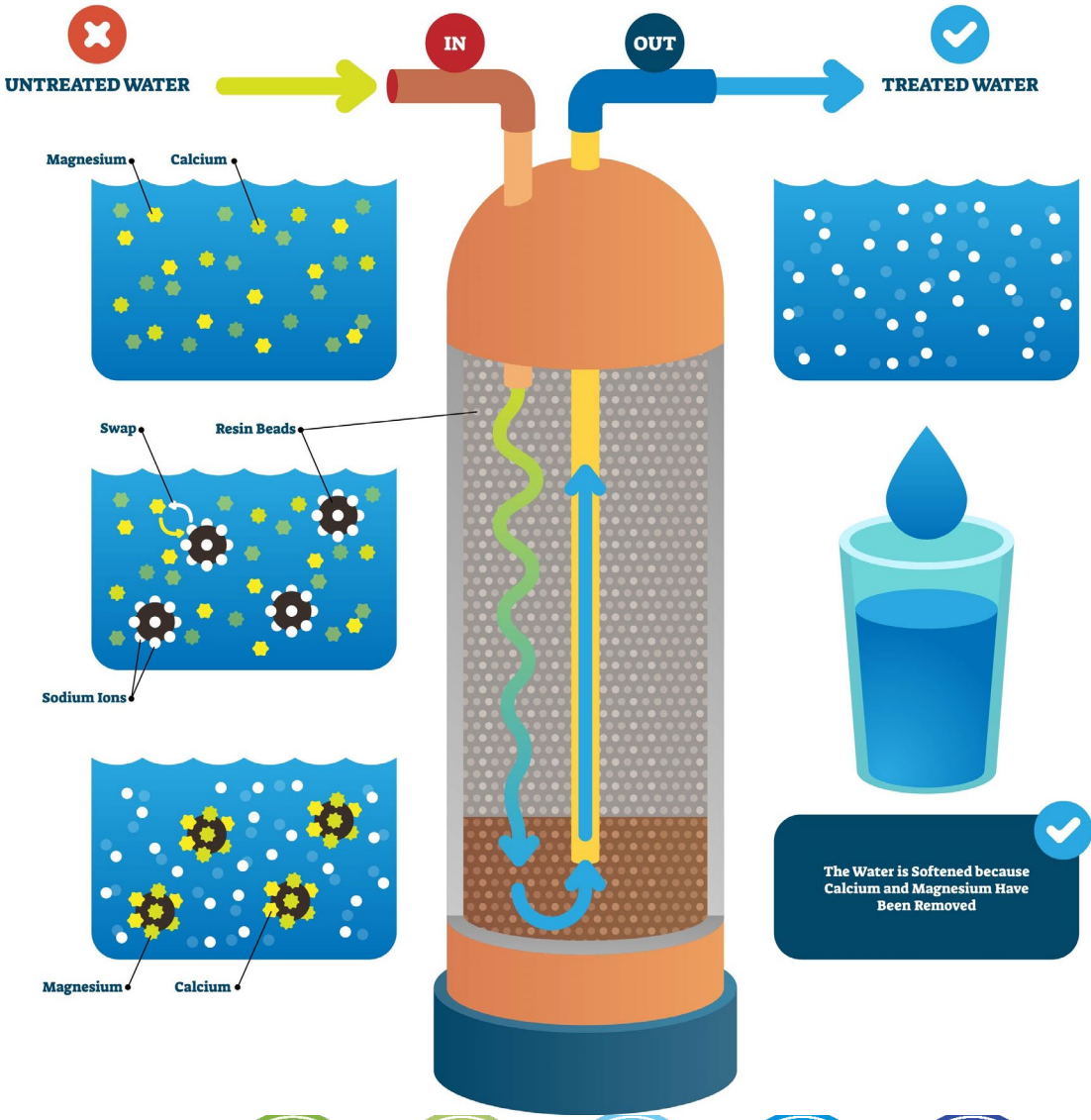
Direct regulatory strategies

- Other possible subject matters for regulation:
  - Salt application (rare)
  - Salt storage (more common)
  - Reporting requirements
- Guidance often varies widely between states

Deicing application guidance, 24 degrees and light snow	
Minnesota	80-120 lb/lane mile, depending on conditions
New Hampshire	250 lb/lane mile
Wisconsin	100-300 lb/lane mile

Direct regulatory strategies

- Mandated or incentivized best management practices
- Possibilities
  - Efficient use of water softeners
    - Higher efficiency softening
    - On-demand softening
  - Uniform spreading rates, timing, and equipment (limit on salt application per lane mile)



Direct regulatory strategies

- Level of Service considerations (addressed in Salt Management Plans)
  - Route optimization
    - Some areas receive more treatment than others
  - Targeted use
    - Intersections/hills
  - Use of alternative deicing chemicals
  - Road/Weather Information Systems
  - Anti-icing/pretreatment methods

Direct regulatory strategies

- Municipal ordinances and initiatives
- Example: City of Madison
  - Property owners limited to use of “reasonable quantities” of salt or other melting agents to the “extent necessary” to allow safe travel
  - Timing restricted to “when ice is present or imminently likely” to form
  - Must be removed promptly following ice melt
  - Relatively minimal fines for noncompliance

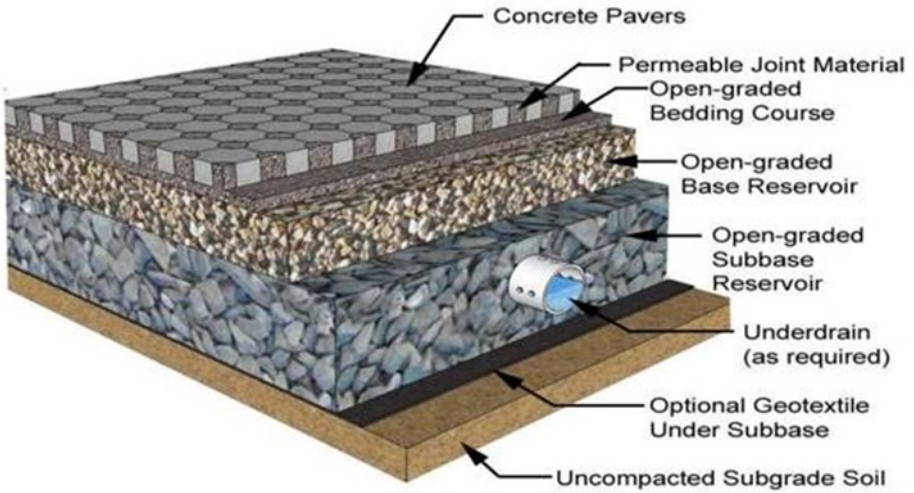
Informational strategies

- Role of transparency and increased public awareness of the issue
- Encourage optimal use of chlorides
- Emphasize actual data showing widespread overuse, and consequences to public health and environmental resources
- Strategies for the public-at-large (SaltWise)
  - Attempts to educate the public about deicer usage levels and effects on human health and the environment
- Strategies for chloride users
  - Optimize private water softener usage
  - Replace older or inefficient softeners

Informational strategies

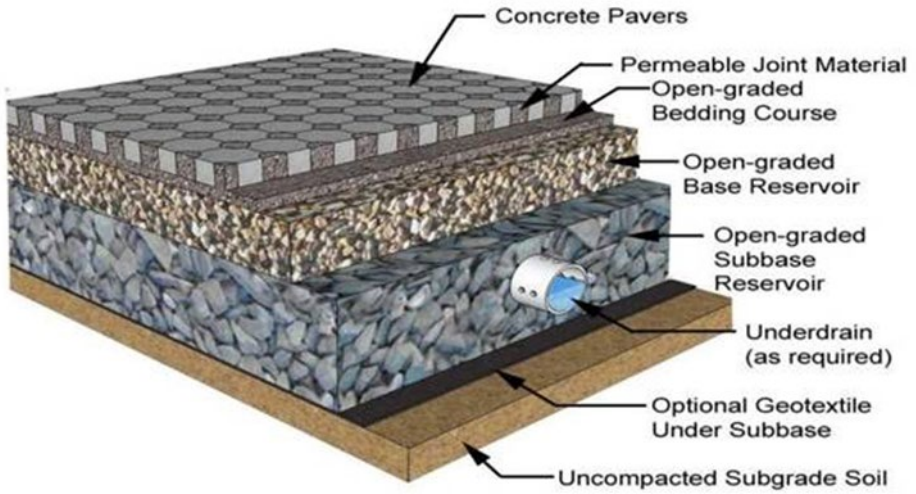
Chloride alternatives

- Green infrastructure - reduces and treats storm water at its source while delivering environmental, social, and economic benefits
  - Permeable pavements, bioswales, and related technologies can reduce pollutant loads by over 90%
  - Resulting cost savings of 15-80% (reduces cost for “gray” infrastructure and road salt application)



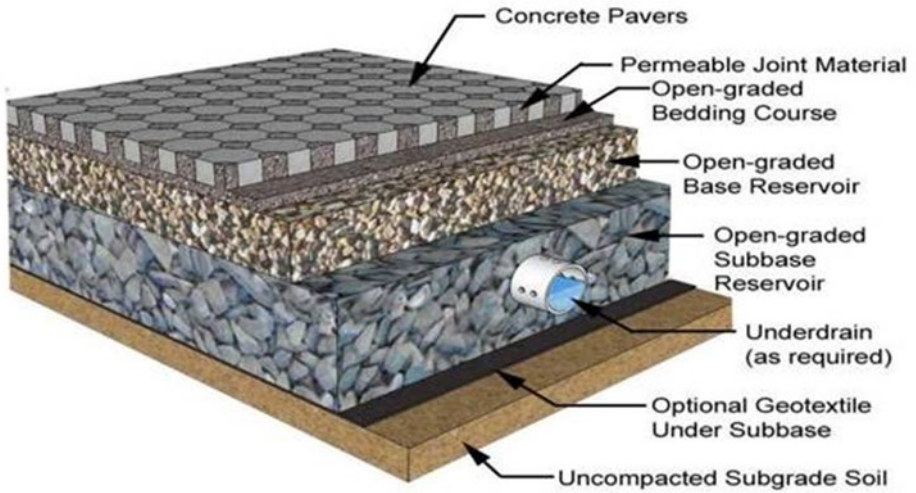
Chloride alternatives

- More on green infrastructure –
  - Only effective to the extent it reduces chloride application requirements
  - Otherwise, chloride will just be redirected to groundwater (and eventually will reach surface water)



Chloride alternatives

- More on green infrastructure –
  - NH study finds permeable pavement reduces salt application requirements by 75% because water does not pool on the surface
  - Challenges include associated costs, public resistance, and potential to transfer chloride to groundwater



Chloride alternatives

- Use of alternative deicers
  - Most have their own negative environmental impacts
  - Risk vs. Risk analysis
  - Not often used

Water quality trading

- Market-based approach to reduce pollutant transport to receiving waters
- Trading programs generally allow regulated dischargers to meet permitting requirements or WQ standards by purchasing credits from another discharger of the same pollutant in the same watershed
  - Typically, trades occur between a point source facing high compliance costs and a nonpoint source subject to no permitting requirements
- EPA/federal rule forthcoming to clarify the requirements for state programs

Water quality trading

- EPA/federal rule forthcoming to clarify the requirements for state programs
  - Each state operates differently
  - Some have no programs at all
- Wisconsin state program exists
  - DNR has published extensive guidelines
  - Applies to WQBELs, not TBELs
  - Trades must result in improved water quality (achieved by requiring a “trade ratio,” meaning that more than one pound of pollution reduction must be achieved by the credit generator to authorize one pound of pollutant discharged by the credit user)

Water quality trading

- Wisconsin state program
  - Has largely been used to facilitate trades related to phosphorus pollution, but could theoretically be used for chloride
  - Phosphorus trades have largely been between wastewater treatment facilities (as point sources/credit users) and agricultural entities (as nonpoint sources/credit generators)
  - Trades involving chloride would likely involve different partners (wastewater treatment facilities and MS4 permittees) and might generate lower transaction costs

Wisconsin Water Quality Trading Clearinghouse

Integrated watershed management

- Integrated approach to water management that crosses traditional geopolitical and agency boundaries
  - Also sometimes called “one water” approach
  - Precise scope and content remains unclear
- Requires innovative and cooperative governance mechanisms
  - Have to give up some authority to the group
- Examples
  - Information sharing
  - Informal planning
  - Shared management
  - Watershed groups – planning councils or interagency working groups

Integrated watershed management

- Promotes coordinated development and management of water and related resources to maximize economic and social welfare without compromising ecosystem sustainability
- Multiple agencies/jurisdictions work together in a watershed or region to address a broad range of water issues
- Spectrum of approaches including information sharing, informal planning, and shared management

Integrated watershed management

- Advantages: broad, inclusive process is flexible and allows for adaptive management.
  - Involves a diverse set of stakeholders/voices
  - Can complement traditional approaches and provide incentives for compliance.
- Challenges: vagueness, funding, inertia, legal roadblocks

Integrated watershed management

- IWM and chloride reduction efforts
  - Control of nonpoint source pollution
  - Implementation of green infrastructure
  - Evaluation of discharges from a wide range of sources
  - Chloride should be part of the portfolio addressed in any IWM approach

Integrated watershed management

- Chloride-specific IWM example: Chicago Area Waterway System (CAWS) Chloride Initiative
  - Group of sources facing new water quality standard of 500 mg/L
  - Led by Metropolitan Water District of Greater Chicago (MWRD)
  - Includes municipal, industrial, highway, wastewater treatment, and regulatory groups
  - Goal: meet new WQS
  - Develop minimization plan while maintaining public safety

Chicago Area Waterways
CHLORIDE WORKGROUP

Economic measures and assistance

- Supply and demand; cost drives use rates
- Taxes, even to drive better water quality, are politically unpalatable
- Some innovative alternatives exist

Economic measures and assistance

- Possible funding for water quality improvements through Bipartisan Infrastructure Law
  - $50B to expand access to clean drinking water
  - $110B for roads and bridges
  - Possibility that some components of these projects could reduce chloride transport to waterways

Economic measures and assistance

- Possible funding for water quality improvements through Great Lakes Restoration Initiative
  - “Restore and maintain…the Great Lakes Basin Ecosystem”
  - Eligible uses include “reduction of nonpoint source pollution”

Economic measures and assistance

- Possible funding for water quality improvements through the Clean Water Act and the Safe Drinking Water Act
  - CWSRF
  - DWSRF
  - Both have funded some chloride reduction projects in the past

Economic measures and assistance

- Possible funding for water quality improvements through the WisDOT
  - Conversion of trucks to allow brining/prewetting

Economic measures and assistance

- Alternative proposals (Iowa)
  - Minimal increase in state sales tax
  - Apply portion of the proceeds to water infrastructure and related water quality protection measures
  - Tie together water quality and school infrastructure
  - Iowa: would generate about $4.7 billion for water quality improvements between 2017 and 2049
- Alternative: fund water quality programs out of a water metering tax that currently generates about $28 million to state's general fund annually

Conclusion

- Not all policy options will be appropriate in every context
- Policy makers may choose one or more
- Optimization of chloride use carries “triple bottom line” benefits
  - Environment (chloride reduction)
  - Economy (cost savings)
  - Society (public health)

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Contact Information

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Webpage for study

www.sewrpc.org/chloridestudy

Chloride Impact Study – Next Steps

- Comments on TR-67 Draft Chapters are due by November 30, 2023 to Dave

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Chloride Impact Study – Next Steps

- Anticipate next TAC meeting in late January 2024 to review the two remaining draft chapters from TR-62 (Impacts of Chloride) on biological and human impacts
- Meeting agendas, presentations, and summary notes along with draft text are posted on project website

  www.sewrpc.org/chloridestudy

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U.S. Department of Transportation
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Thank You

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