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# SaMS

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## A Summary of the Salt Management Strategy Toolkit

**I**n Northern Virginia, there is a growing body of evidence documenting increasing salt levels in local waterways. One source of salt is the type used to melt snow and ice in the winter. The application of winter salt has increased throughout the United States since the 1930s and has skyrocketed in recent decades. Recognizing that the clear benefits of winter salt use come with unintended negative impacts, a broad and diverse group of stakeholders in Northern Virginia came together to develop a **Salt Management Strategy (SaMS)** in order to strike a balance and proactively address this issue. The SaMS Toolkit is the result of this effort, and is the guiding resource for SaMS implementation. It contains a breadth of resources and recommendations that promote various practices (or actions) that all audiences can use. Because the SaMS Toolkit contains information for so many different audiences, this summary document was developed to serve as an easy guide to help find the sections of the Toolkit that are most relevant to them.

# PURPOSE AND INTENT OF SaMS

Salt used to melt snow and ice can help provide safe passage for pedestrians, cyclists and drivers. However, salt use can harm water quality (especially our drinking water), impact plants and animals, and damage infrastructure and vehicles. **The SaMS Toolkit** provides a balance between the benefits and the negative impacts of salt use with practices that can minimize the consequences of salt use. The Toolkit includes these practices in a variety of resources and recommendations that organizations and individuals can use. Each resource and recommendation addresses the SaMS Goals that were developed by a diverse Stakeholder Advisory Committee (SAC). Everyone who uses public roads, parking lots and sidewalks contributes to the need for and is affected by salt use. Because all of us have a role to play in addressing the challenges caused by salt use, the SaMS Toolkit has multiple parts.

The document is called the “SaMS Toolkit” since it is intended to be a resource from which readers can pick and choose the practices that work best for them and their situation. All practices and recommendations have the common objective of improving the efficiency of winter salt use, so that only the amount needed to achieve the snow and ice management goal is used, and excessive use is avoided. Because of the variety of audiences the Toolkit addresses, and because of differences among organizations within the same audience, no recommendation is expected to be used by everyone.

It is important to stress that the Toolkit is a voluntary, non-regulatory resource developed by a diverse stakeholder body to address an emerging and complicated societal issue.

**The SaMS Toolkit does not establish or identify any regulatory requirements. It is intended to provide guidance and could be changed in the future.**

The SaMS Toolkit is designed to direct readers to the resources or recommendations that are the most applicable and may work best for them. Sections 1 through 11 have summary-level information to help audiences identify the resources or recommendations that will work best for them. Sections 1 and 2 provide relevant context and purpose information, Sections 3 through 8 include and explain the majority of the recommendations, and the final sections discuss implementation and ongoing efforts to improve winter salt management in the future. The appendices contain the fully described resources and recommendations.

The Toolkit is the product of a stakeholder-driven effort to strike a balance between the benefits and consequences of winter salt use. The stakeholder organizations that comprised the SaMS SAC developed and approved the contents of this document with the expectation that it will evolve over time through stakeholder-driven adaptive management and a continual improvement process.

# AUDIENCE CONSIDERATIONS

The SaMS Toolkit was designed with the following audiences in mind:

Winter  
Maintenance  
Professionals

Researchers  
&  
Water  
Monitoring  
Groups

Elected  
Officials  
&  
Local  
Leaders

Businesses,  
HOAs  
&  
Other Groups  
Contracting  
Services

Drinking  
Water  
Providers

Governments,  
Commissions  
&  
Councils

Non  
governmental  
Organizations

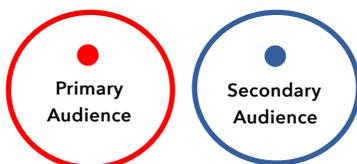
General  
Public

**E**veryone from winter maintenance professionals to the general public can find something of use in this document. Given the breadth of audiences the Toolkit is intended for, some of the technical information in several sections is not useful to all audiences. This short document is designed to summarize the SaMS Toolkit and provide a roadmap to assist the various audiences who use it. Specifically, each section is summarized below, with notes about the applicable audiences for each section. In most cases, this is broken down into primary audiences and secondary audiences. The primary audiences are the readers for whom the section was expressly written, while the secondary audiences are other readers who will also benefit from a basic understanding of the section. Although the Toolkit is designed so readers do not need to read it in its entirety, something can be learned from each part of this Toolkit and everyone is encouraged to read each section of the main body.

# QUICK VIEW

## AUDIENCES BY SECTION

AUDIENCE	SECTIONS OF THE SAMS TOOLKIT										
	1	2	3	4	5	6	7	8	9	10	11
Winter Maintenance Professionals	●	●	●	●					●	●	●
Businesses	●	●	●	●					●	●	●
Other Groups, Contracting Services	●	●	●	●					●	●	●
Non-govt Organizations	●	●	●		●	●			●	●	●
Researchers	●	●	●	●			●		●	●	●
Water Monitoring Groups	●	●	●				●		●	●	●
Elected Officials & Local Leaders	●	●	●	●	●	●	●	●	●	●	●
HOAs	●	●	●	●	●	●			●	●	●
Drinking Water Providers	●	●	●	●	●	●	●	●	●	●	●
Commissions & Councils	●	●	●	●	●	●	●	●	●	●	●
Governments	●	●	●	●	●	●	●	●	●	●	●
General Public	●	●	●		●	●			●	●	●





# SUMMARY

SaMS Toolkit Contents

# SECTION 1

## WHY IT MATTERS

### APPLICABLE AUDIENCES



## What is covered in this section:

- **A summary of the proven impacts of salts**, which includes impacts to surface water, groundwater, soils, plants, aquatic life, terrestrial life, infrastructure, property, and drinking water systems and their customers. This information is a summary of the more detailed information found in Appendix A.
- **A summary of the economic benefits and costs of improved salt management.** This information is a summary of the more detailed information found in Appendix A.
- **A summary of the Accotink Creek Chloride Total Maximum Daily Load**, which was the project that identified the need for a regional SaMS.
- **A brief description of the Northern Virginia region addressed by SaMS**, which includes information on jurisdictions, population, land use, sources of salt application (the analysis of which is in Appendix Q), trends in freshwater salinization, and the region's drinking water systems.

# SECTION 2

## HOW SAMS IS ADDRESSING THE ISSUE

### APPLICABLE AUDIENCES

#### PRIMARY



#### SECONDARY



### What is covered in this section:

- **The purpose and scope of SaMS and how it will evolve and improve into the future.** This covers the SaMS goals and objectives, the voluntary approach, and the continual improvement process that is built into the strategy.
- **The intensive stakeholder involvement process** used in the development of SaMS.

# SECTION 3

## PLANNING & APPLICATION PRACTICES

### APPLICABLE AUDIENCES

#### PRIMARY



#### SECONDARY



## What is covered in this section:

- **The different types of winter maintenance professionals**, which include transportation versus property maintenance, private sector versus public sector, and the three tiers of winter maintenance audiences that include decision makers, supervisors, and applicators.
- **Summary information on improving operational practices.** This includes a table summarizing the relative costs and cost savings of all of the Best Management Practices provided in Appendix B, in addition to a summary of the process outlined in Appendix C, which provides a continual improvement process for implementing winter maintenance best management practices in phases.
- **A discussion of deicing products**, which covers how deicers work, the traditionally used deicers, an introduction to alternative products that are covered further in Appendix E, an overview of the process recommended for piloting new deicers and mixtures that is also included in Appendix E, and future recommendations for research on products.
- **A brief discussion of application rates**, including a summary of the application rate evaluation process that is discussed further in Appendix D.
- **A brief overview of certification and training programs.** Although no certification and training programs are specifically recommended, this section introduces the resource contained in Appendix F, which provides a summary of ten programs, with detailed information on the five programs that could be administered in Virginia by interested winter maintenance organizations.
- **A summary of recommendations to revisit in the future** as SaMS is implemented and updated.

# SECTION 4

## TRACKING & REPORTING

### APPLICABLE AUDIENCES

#### PRIMARY



#### SECONDARY



### What is covered in this section:

- ◆ **Background information on the Salt Use Tracking and Best Management Practice Implementation Tracking forms** included in Appendix J that are flexible to suit any scale of reporting or type and size of winter maintenance organization.
- ◆ **Information on the various levels of detail that an organization can use to track salt use** and helpful concepts to consider when tracking that information.
- ◆ **Links between the BMP Implementation tracking form and recommendations from Section 3 Planning and Application Practices.**
- ◆ **A discussion of the importance of consistency in winter maintenance tracking of salt and BMP use** and future plans to consider regional analyses of this information to track progress and facilitate peer learning.

# SECTION 5

## BEST PRACTICES FOR THE GENERAL PUBLIC

### APPLICABLE AUDIENCES

#### PRIMARY



#### SECONDARY



## What is covered in this section:

- **Best practices anyone can use at their own** residence that either does not use salt or that promotes efficient and effective salt application.
- **Ideas to inspire changes anyone can affect in their communities and neighborhoods** through promoting the use of winter maintenance best practices.
- **Recommendations for drivers during and soon after winter storms** to allow the professionals to use best practices and be efficient with their salt use.
- **Information on how to report winter salt concerns** such as inappropriate storage and spills.

# SECTION 6

## EDUCATION & OUTREACH

### APPLICABLE AUDIENCES

#### PRIMARY



#### SECONDARY



### What is covered in this section:

- ◆ **Guiding principles for developing education and outreach messages or materials** that are consistent with the goals of SaMS. These principles are discussed in greater detail in Appendix I.
- ◆ **The SaMS logo use policy.** Appendix I includes a logo user guide.
- ◆ **A summary of the pilot outreach campaign and its main conclusions,** which can be used to inform future outreach efforts. The full report on the pilot campaign is located in Appendix G.
- ◆ **A summary of the public awareness survey and some primary conclusions,** which can be used to inform outreach efforts. The full survey and results are located in Appendix H
- ◆ **Background information on the education and outreach resources** that can be found in Appendix I.
- ◆ **An overview of recommendations for current and future education and outreach efforts.**

# SECTION 7

## WATER QUALITY MONITORING

### APPLICABLE AUDIENCES

#### PRIMARY



#### SECONDARY



## What is covered in this section:

- **A summary of salt-related water quality trends and the different ways to measure trends,** which are covered in more detail in Appendix K and other references.
- **An overview of the recommended criteria** for a water quality monitoring program, which is covered in more detail in Appendix L.
- **A description of a pilot monitoring program that aims to evaluate the impact of BMP implementation on water quality.** The plan for the program is Appendix M.
- **A discussion of regional models** that can be used to estimate chloride concentrations from low-cost specific conductance data. A more detailed discussion of the models and the rationale behind their selection is covered in Appendix N.
- **An introduction to a conceptual model of salt origin, transport, and fate,** which is contained in Appendix P.
- **An introduction to an inventory of salt-related water quality data and monitoring groups,** which is contained in Appendix O.
- **Recommendations for water quality monitoring partnerships.**

# SECTION 8

## INTER-GOVERNMENTAL COORDINATION

### APPLICABLE AUDIENCES

#### PRIMARY



#### SECONDARY



### What is covered in this section:

- ◆ **Recommendations for enhanced and coordinated communication of winter maintenance plans and Levels of Service.** This includes a discussion of existing forums where opportunities to improve this communication can occur. These existing forums are outlined in Appendix R.
- ◆ **Recommendations for improved coordination among governments and the hosting of an annual post-season forum to share lessons learned.** Included with these recommendations is a discussion of existing forums that can aid in the implementation of SaMS.
- ◆ **Recommended opportunities for pooled funding or sharing services** to provide cost savings and improve coordination and peer learning as SaMS is implemented.
- ◆ **A discussion of possible legislation to explore in the future among non-state government SaMS stakeholders.**

# SECTION 9

## FUTURE RECOMMENDATIONS & RESEARCH NEEDS

### APPLICABLE AUDIENCES

#### PRIMARY



#### SECONDARY



### What is covered in this section:

- A summary of all future recommendations, research needs, and resource updates and plans for timing of this future work.

# SECTION 10

## FUNDING SOURCES & FINANCIAL CONSIDERATION

### APPLICABLE AUDIENCES

#### PRIMARY



#### SECONDARY



### What is covered in this section:

- Summary of funding options and funding groups.

# SECTION 1.1

## IMPLEMENTATION

### APPLICABLE AUDIENCES

#### PRIMARY



#### SECONDARY



### What is covered in this section:

- An overview of the role local government stormwater programs play in the implementation of SaMS.
- A discussion of the need for voluntary SaMS implementation, and the opportunities it provides.
- An outline of the recommended actions and functions necessary for the successful implementation of SaMS. This includes the concept of a “SaMS Implementation Assessment Forum,” which will be the primary forum for revisiting the future recommendations and research needs.

# SaMS

## APPENDICES

- Appendix A. Environmental Impacts and Potential Economic Costs and Benefits of Improved Management Practices
- Appendix B. Menu of Operational Best Management Practices: Pros and Cons
- Appendix C. Planning to Implement Winter Maintenance Best Management Practices in Phases: A Continual Improvement Process
- Appendix D. Application Rate Evaluation Process
- Appendix E. Alternative Deicers
- Appendix F. Evaluation of Winter Service Provider Certification Programs
- Appendix G. Outreach Pilot Outreach Campaign (2019): Communications Plan and Lessons Learned
- Appendix H. Awareness Survey Results Summary
- Appendix I. Education and Outreach Resources
- Appendix J. Salt/BMP Tracking Forms and Instructions
- Appendix K. Regional Long-Term Trends in Specific Conductance
- Appendix L. General Criteria for a Water Quality Monitoring Program
- Appendix M. Pilot Project Approach: Monitoring Water Quality Response to BMP Implementation
- Appendix N. Recommended Regional Models for Predicting Chloride Concentration from Specific Conductance
- Appendix O. Inventory of Existing Salt-related Water Quality Data and Monitoring Groups
- Appendix P. Conceptual Model of Salt Origin, Transport, and Fate
- Appendix Q. SaMS Project Area and Impervious Analysis
- Appendix R. Northern Virginia and D.C. Metro Area Forums Relevant to SaMS Implementation
- Appendix S. Public Participation

Prepared for

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SaMS Stakeholder Advisory Committee



Facilitated by

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Virginia Department of Environmental Quality (DEQ)



Prepared by

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Interstate Commission on the Potomac River Basin (ICPRB)

