

**SUMMARY NOTES OF THE APRIL 8, 2026, MEETING OF THE
TECHNICAL ADVISORY COMMITTEE FOR
A CHLORIDE IMPACT STUDY FOR THE SOUTHEASTERN WISCONSIN REGION**

INTRODUCTION

The April 8, 2026, meeting of the Technical Advisory Committee (TAC) for *A Chloride Impact Study for the Southeastern Wisconsin Region* was convened online at 10:03 a.m. The meeting was called to order by Committee Secretary Ms. Laura Herrick, Chief Environmental Engineer with the Southeastern Wisconsin Regional Planning Commission. Attendance was taken using the online software.

Members Present

- Laura K. Herrick, Secretary Chief Environmental Engineer, SEWRPC
- Cody Churchill..... Winter Maintenance Engineer, Wisconsin Department of Transportation
- Craig Helker..... Water Resources Biologist – Southern District, WDNR
- Kevin J. Kirsch..... Water Resource Engineer, Wisconsin Department of Natural Resources
- Matthew T. Magruder Environmental Research Manager,
Milwaukee Metropolitan Sewerage District
- Max Marechal City Engineer, Engineering Department, City of West Bend
- Neal T. O’Reilly..... Director, Department of Conservation and Environmental Science,
University of Wisconsin Milwaukee
- Charles Paradis..... Assistant Professor, Department of Geosciences,
University of Wisconsin Milwaukee
- Kurt Sprangers Engineer in Charge, Environmental Engineering Section,
Department of Public Works, City of Milwaukee
- David Strifling Director, Water Law and Policy Initiative, Marquette University Law School

Guests Present

- Mitchell Olds Water Resources Specialist, Milwaukee Metropolitan Sewerage District
- Brooke Robinson Wastewater Specialists-Advanced, WDNR

Staff Present

- Thomas M. Slawski Chief Biologist, SEWRPC
- Karin M. Hollister..... Principal Engineer, SEWRPC
- Aaron W. Owens..... Principal Planner, SEWRPC
- James M. Mahoney Engineer, SEWRPC
- Collin A. Klaubauf..... Engineer, SEWRPC
- Emily E. Porter..... Planner, SEWRPC

Ms. Herrick welcomed the attendees to the 11th TAC meeting for the *Chloride Impact Study* (Study). Ms. Herrick introduced the agenda for the meeting to review Chapter 2 of SEWRPC Technical Report No. 66, *State of the Art for Chloride Management* and provided an update on the progress of the Study thus far.

[Secretary’s Note: The agenda for this meeting is attached herein as Exhibit A.]

REVIEW OF THE SUMMARY NOTES FROM THE FEBRUARY 25, 2026, TECHNICAL ADVISORY COMMITTEE MEETING

Ms. Herrick asked the TAC for any comments or edits for the Summary Notes from the February 25, 2026, TAC meeting. The previous meeting reviewed Chapters 4 (Private Water Softening) and 5 (Other Chloride Sources) of SEWRPC Technical Report No. 66, *State of the Art for Chloride Management*. TAC members offered no questions or comments on the Summary Notes.

REVIEW OF SEWRPC TECHNICAL REPORT NO. 66 CHAPTER 2, *WINTER MAINTENANCE PRACTICES*

2.2 PUBLIC WINTER MAINTENANCE POLICIES AND PRACTICES

To frame the necessity for transitioning toward state-of-the-art practices in winter maintenance operations, Mr. Owens began his presentation with a summary of the sources of chloride loading as set forth in Technical Report No. 65 (TR-65). Figure 4.1 from that Report showed that winter maintenance salting was the primary source of chloride to the environment in the Region. Mr. Kirsch asked whether this study considered how changes in chloride loading from one source may impact the amount of chloride loading from other sources. For instance, he asked whether a reduction in roadway winter salt application may reduce chloride loading from wastewater treatment plants due to reduced inflow and infiltration (I & I). Mr. Owens replied that the development of a chloride budget for TR-65 was a high-level look at quantifying major sources and did not account for finer scale interactions such as I & I. Ms. Hollister, who was lead author of TR-65, agreed that the analysis did not quantify the various chloride sources to wastewater treatment plants, so it would be difficult to determine how decreasing one source would affect another. But she noted that the City of Waukesha wastewater treatment plant quantified the various sources of chloride to the plant, and I & I was a fairly significant source at over 25 percent. It should be noted that the study quantifying I & I at the Waukesha wastewater treatment plant took place prior to the City's conversion to Lake Michigan drinking water.

Mr. Owens next introduced the subject of public winter maintenance policies and public expectations. He explained the concepts of "bare pavement" policy versus "passable roadways" policy along with tiered levels of service as it pertains to concentrating initial winter maintenance priorities on major roadways and emergency routes. He also highlighted the importance of public education and management of public expectations in terms of level of service for road maintenance during winter storms. He noted the significance of municipalities and counties having a well-defined policy document and specialized salt management plan to serve as guidance for winter maintenance work. Mr. Kirsch asked if municipalities currently have portions of their road system where they do not use chemical treatments. Mr. Owens replied that some communities do have tiered levels of service where snow removal from residential connector roads may take longer and that expectations for some of these roads should be that there will be some compacted snow remaining. However, Mr. Owens noted that he was not aware of any communities in the Region that have designated roads where no salt is applied, but this is not confirmed for all communities in the Region. He further indicated that when developing alternative scenarios as part of Planning Report No. 57 (PR-57), reduction or elimination of chemical application for certain situations such as the one Mr. Kirsch described may be explored. Mr. Kirsch also commented that adjusting driving behavior will be tough, and Mr. Owens agreed, noting that as one of the major hurdles to chloride reduction efforts.

Next Mr. Owens presented options for physical winter maintenance operations, beginning with mechanical snow and ice removal as the primary, most cost-effective, and most environmentally sustainable winter maintenance method. He then moved on to an overview of the use of snow and ice control materials as part of winter maintenance operations. He first summarized the principles of chemical melting, describing the

science behind how chemical deicing materials work. Mr. Owens then reviewed the most common deicing and anti-icing chemical agents, describing general characteristics, benefits, and detriments for sodium chloride, magnesium chloride, calcium chloride, acetates, formates, and bio-based additives. He also presented three common liquid brine blends that are often used for winter road maintenance and their respective characteristics and best uses.

Mr. Owens next presented application methods for chemical treatment of winter roads. He outlined the benefits of using anti-icing/pre-treatment materials before a winter weather event as a proactive strategy that aims to prevent the bond between snow or ice and the pavement, noting this can save energy, improve efficiency, and reduce the volume of chemicals needed to treat roads. This can be accomplished by applying anti-icing materials by truck, using modern application and spreading equipment. He also described Fixed Automated Spray Technology (FAST) systems, a state-of-the-art anti-icing application method using permanently installed nozzles and pavement sensors to automatically spray chemical agents onto bridge decks based on real-time road data. Mr. Owens next described deicing operations, presenting the fundamentals behind deicing practices and considerations for applications of dry rock salt and pre-wetted rock salt, “shake and bake” application methods, and direct liquid applications. He also presented considerations pertaining to deicing and anti-icing application rates and the importance of several variables including material type and method, pavement temperatures and trends, storm intensity, and cycle times. Mr. Owens indicated that the Chapter included a table for general guidance on application rates and several additional tables are included in an appendix, providing more specific guidelines based on specific road and weather conditions.

Mr. Owens next presented winter maintenance equipment and technology alternatives, indicating that time limitations would only allow him to review a few of the technologies described in the draft Chapter. He explained the functionality of monitoring and sensing technology systems, highlighting Maintenance and Decision Support Systems (MDSS), Road Weather Information Systems (RWIS), in-road pavement sensors, and mobile infrared sensors mounted on plow trucks. He explained that data from these systems can improve winter maintenance safety and efficiency while reducing costs and environmental impacts. Mr. Owens also described different snowplow configurations and advanced plow blade technologies and their respective uses and benefits.

Mr. Owens noted that the draft Chapter included descriptions of application systems for dry granular rock salt, pre-wetted salt, and direct liquid applications and he summarized the use and benefits of electronic spreader controller technology. Next, he provided an overview of equipment calibration and precision, explaining the importance of routine application equipment calibration to ensure efficient salt usage. He provided an example of one municipality’s successes after implementing a rigorous calibration program, greatly reducing salt usage which led to large annual cost savings.

Mr. Owens then briefly discussed some broader operational and facility management practices that can contribute to chloride reduction goals, including proper siting of snow storage areas, roadside vegetation management for increased sun exposure, salt take-back programs, and plow truck wash wastewater reclamation and reuse. He also highlighted potential future advancements that could provide additional opportunities for reduced chemical usage including heated pavement, electrically conductive concrete, phase change pavement materials, and solar pavement. Mr. Owens concluded with examples of local success stories of reduction in deicing materials usage and improved efficiency. He encouraged other communities that had success stories to share them with him and indicated that he would include those in the Report.

Mr. O’Reilly asked if there was any information as to whether poor pavement conditions are correlated with higher salt use for communities due to plows not being able to remove snow as effectively. Mr. Owens responded that he had not encountered any studies exploring this subject, but he would investigate. Mr.

Owens also noted that implementation of many of the modern technologies and best management practices described in this Chapter would likely reduce the deterioration of road conditions to some extent. He also noted that the “live edge” plow blades discussed earlier can move vertically to adjust to road unevenness, allowing blades to remove more snow in one pass.

Mr. Kirsch asked if porous pavement could reduce ice buildup. Mr. Owens noted that there was discussion of permeable pavements within the “Potential Future Advancements” section of the Chapter, indicating that some research shows porous asphalts can require up to 77 percent less deicing salt than traditional surfaces and that some permeable pavements require no deicer at all. He indicated that there have been mixed results for winter maintenance of porous pavements reported from communities in the Region, with some indicating they have felt the need to use traditional salt application rates on permeable installations, and others experiencing extensive damage resulting from plowing. Mr. Owens further noted the importance of specific routine maintenance for these surfaces to protect their intended permeable functions. Mr. O’Reilly added that porous paver manufacturers instruct that no deicing materials should be used on these surfaces. Mr. Owens agreed that theoretically these surfaces could reduce or eliminate the need for deicing, noting that more robust practitioner education on care and maintenance appears to be necessary.

2.3 PRIVATE WINTER MAINTENANCE PRACTICES

Mr. Mahoney introduced the topic of private winter maintenance practices. This would include both resident and business owner efforts on their properties, as well as contractor work on private roads and parking lots. He noted that chloride from private practices can be a significant source of chloride loading to the environment. Mr. Mahoney discussed pavement clearance expectations and its connection to over application of salt. He explained that users could adjust their expectation of the degree of snow removal and the timeframe for removal, which could include changing driving behavior during snow events. Mr. Mahoney also discussed that property owners could adjust their expectations for snow removal by hired contractors to allow the use of less salt while maintaining safe conditions.

Mr. Mahoney next presented recommended application rates for private roads and parking lots. He noted that several factors contribute to a recommended application rate for a given set of conditions, and as such there is no one, single recommended application rate. However, he presented average general recommended application rates from the literature for pre-wetted salt, liquid brine, and dry rock salt.

Next Mr. Mahoney highlighted the importance of equipment calibration before discussing slip and fall liability concerns as being a common reason for over application of salt. He discussed a program in New Hampshire that offers slip and fall liability protection when contractors complete a training course to become certified and use best management practices taught in the training course. In 2023 a bill to establish a similar program in Wisconsin did not gain approval by the governor.

Mr. Mahoney next presented an overview of winter maintenance practices on private driveways and sidewalks. He stated that these surfaces can be among the most over-salted, primarily due to individual homeowners doing the majority of the salting. Mr. Mahoney pointed out that most homeowners lack information on recommended salting rates and use of best management deicing practices.

Next Mr. Mahoney presented recommended application rates for private driveways and sidewalks based on a review of the literature. He next presented a case study of a sidewalk salt ordinance that included limits on the amount of salt applied and timing requirements for removal of snow. The ordinance also required sweeping up of excess salt after snow or ice melt.

Mr. Mahoney next introduced alternatives to chemical deicing, starting with use of timely mechanical removal of snow and ice. He emphasized that timing is important, where removal of snow before it gets

compacted by vehicular or pedestrian traffic is critical. He next presented use of traction enhancement materials on both roadways and walkways. He highlighted the importance of applying these materials on top of snow or ice pack and not on bare pavement, as application on bare pavement can reduce traction. Mr. Mahoney also presented some disadvantages of traction enhancement materials, including negative impacts to porous pavement systems, aquatic ecosystems, and stormwater infrastructure. Mr. Mahoney pointed out that most of the disadvantages of traction materials can be mitigated by sweeping up the materials after the snow and ice melt.

Next Mr. Mahoney presented heated pavement systems, highlighting the two main technologies: hydronic heating and electric coil heating. He noted the importance of having the meltwater flow to landscaped areas, not onto other paved surfaces, which could refreeze and cause safety concerns or require additional salting. Mr. Mahoney next gave an overview of porous pavement as a tool for winter deicing reduction. He emphasized the importance of appropriate design and maintenance to preserve the designed infiltration capacity. He also noted salt and sand should not be used on porous pavement surfaces.

2.4 LOW SALT INFRASTRUCTURE DESIGN¹

Mr. Mahoney concluded the private winter maintenance portion of the chapter with presenting the concept of low salt infrastructure design, which utilizes site design to reduce salting needs in winter. He explained that proper placement of trees, buildings, sidewalks, benches, and other features can improve direct sun exposure to increase melting rates. Next Mr. Mahoney described that the placement of bushes, benches, and similar features should be on the predominant downwind side of walkways in order to facilitate snow deposition away from the pavement. He next presented the consideration of overland drainage paths on parking lots, where snow storage areas should be located at the down-grade side of the pavement to avoid meltwater refreezing on the pavement. Next Mr. Mahoney explained that roof downspouts should discharge into landscaped areas rather than onto paved surfaces. Lastly, he discussed parking lot layout, where configurations with numerous and irregularly-shaped islands and peninsulas can make it difficult for snow plow drivers to effectively remove snow from the lot, potentially increasing the use of salt.

Mr. O'Reilly asked if the use of deicing materials near green infrastructure installations was addressed in this Chapter. He stated he was concerned about green infrastructure being installed but not maintained, resulting in the public thinking the green infrastructure does not work. Mr. Owens responded that this is not specifically addressed in this Chapter, but in TR-62 there is some discussion on salt tolerant plants and the effect of salt on plants. Mr. Owens also commented that this could be included as a recommendation in PR-57.

No additional comments or questions about TR-66 Chapter 2 were provided by the TAC.

NEXT STEPS FOR THE PLAN

Ms. Herrick stated that comments will be taken on the TR-66 Chapter 2 draft text reviewed during this TAC meeting until April 30, 2026. She added that comments can be submitted to her directly via email (lherrick@sewrpc.org).

Ms. Herrick reviewed the next steps for the Study. She stated that the next TAC meeting will be in early summer 2026 and consist of a review of draft chapters of SEWRPC Planning Report No. 57. She indicated that the meeting agendas, presentations, and summary notes along with completed reports and preliminary drafts are posted on the SEWRPC project website at www.sewrpc.org/chloride-study.

¹ *The concept of Low Salt Infrastructure Design is based on the work of Bolton & Menk.*

ADJOURNMENT

There being no further business, the meeting was adjourned by unanimous consent at 11:30 a.m.

Respectfully submitted,

Laura Herrick
Recording Secretary

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4/9/2026, 4/13/2026, 4/20/26

Exhibit A

Southeastern Wisconsin Regional Planning Commission

Notice of Meeting and Agenda

**TECHNICAL ADVISORY COMMITTEE FOR
*A CHLORIDE IMPACT STUDY FOR THE SOUTHEASTERN WISCONSIN REGION***

DATE: Wednesday, April 8, 2026

TIME: 10:00 am to Noon

TEAMS LINK

Join: <https://teams.microsoft.com/meet/29169770101534?p=Mtx7OZEGf3caRFe71A>

Meeting ID: 291 697 701 015 34

Passcode: 3mA3dn2E

AGENDA:

1. Roll call
2. Review of [summary notes](#) from the February 25, 2026, TAC meeting
3. Review of the last chapter of **SEWRPC Technical Report No. 66, State of the Art for Chloride Management**
 - a. Chapter 2 – Winter Maintenance Practices
4. Next steps
5. Adjourn

Laura K. Herrick
Chief Environmental Engineer