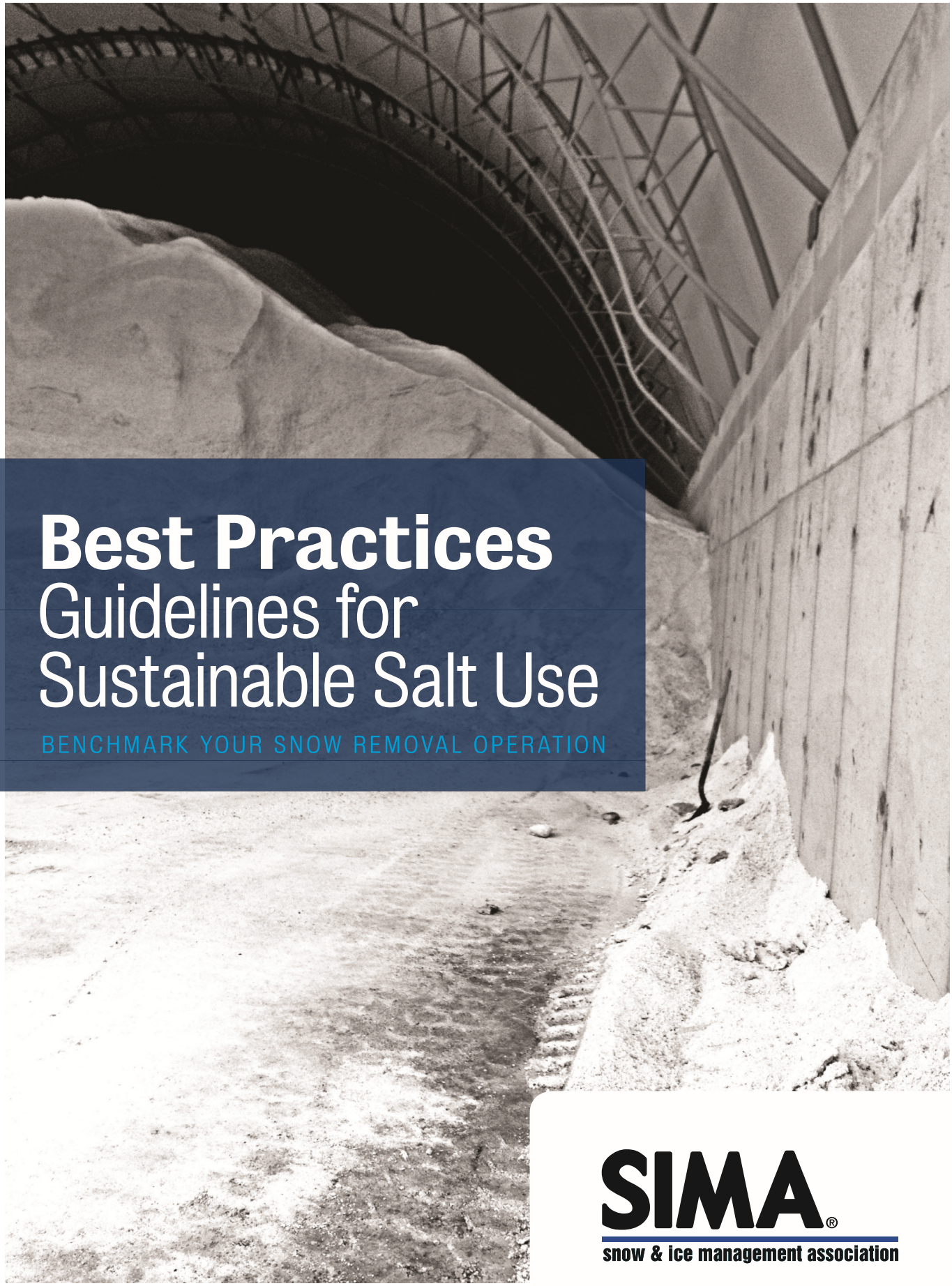

Best Practices
Guidelines for Sustainable Salt Use

BENCHMARK YOUR SNOW REMOVAL OPERATION

SIMA®
snow & ice management association

Goal

The purpose of this guideline is to serve as an informal audit of any site, company, or organization that utilizes salts (Calcium Chloride, Magnesium Chloride, Sodium Chloride, etc.) to deice or anti-ice. It provides a set of policies and activities that when engaged together can reduce salt output, with the goal of increasing the training, knowledge, and skill of the organization. The guideline should be used with additional training, research, and real-world experiences to build a more thoughtful approach to using salts to manage winter events.

A note on application rates: This document does NOT contain recommended application rates. Current research, especially in parking lot/facilities settings, is still being conducted and more information is needed. SIMA encourages organizations to participate in and/or review the following information and programs:

- **Sustainable Salt Initiative**: An ongoing research and salt application technology program from SIMA and Viaesys — www.sima.org/sustainablesalt
- **Snow and Ice Control for Parking Lots, Platforms, and Sidewalks (SICOPS)**: A multi-year research project at the University of Waterloo — www.sicops.ca

CONTENTS

3 Leadership
Understanding the Document
SIMA's Best Practices Commitment

4 Section 1: Purchasing
Section 2: Storage and Transport

5 Section 3: Operations

7 Team of Experts

Methodology

SIMA started this initiative in winter 2015 to create a simple, vetted list of processes, policies and activities that any organization or facility could adopt over time to use salt more efficiently.

Pulling from many internal resources, SIMA created an initial draft and then underwent a review process that included 17 stakeholders, representing snow contractors, facility management, deicing material and equipment suppliers, and municipal. The geographical distribution included reviewers from Canada, the Midwest, the Northeast, and the Mid-Atlantic. SIMA also engaged three subject matter experts in the review process. SIMA received and reviewed more than 125 comments and recommendations from those stakeholders, who had the opportunity to review the final draft before publication.

Leadership

This document is not simply meant to be handed off to the operations staff for implementation. It requires leadership from all levels of an organization. In the guideline, any written policies are noted, and leadership teams responsible should make all efforts to create and implement policies. The policies outlined in the document support the activities and processes that are essential to managing salt efficiently, and can empower operational personnel to be accountable and supported during the process of adopting these guidelines.

Understanding the Document

The guidelines are divided into three major sections: Purchasing, Storage and Transport, and Operations. The Operations section outlines two levels of competency due to the initial operational changes, training, and investments that are typically required to make what will often be a paradigm shift for those managing winter precipitation.

SIMA's Best Practices Commitment

Open Access: The guidelines are available to all industry stakeholders at no cost, regardless of whether they are members of SIMA.

Quality Control & Transparency: The Best Practices are a living document, and suggestions, recommendations, or concerns can be submitted online at www.sima.org/bestpractices. All comments will be reviewed and vetted by a group of stakeholders if needed.

Education: SIMA is spearheading educational partnerships and communication programs to help all parties adopt these best practices.

Comprehensive: The guidelines were reviewed by a large and diverse group of stakeholders and several subject matter experts.

Section 1: Purchasing

- Forecast needed inventory based on total estimated square footage/acres of service area, averaged with a minimum of five years of weather history (and salt use history if available). [Written Policy]
- Establish purchase agreements with multiple suppliers to optimize control of supply and quality and to mitigate risk due to fluctuations in supply availability and cost. [Written Policy]
- Stock the most efficient products to apply/blend when pavement temperatures are below 15° F (the temperature at which NaCl is no longer effective) if applicable to your market. [Written Policy]
- Contract or purchase a minimum of 50% to 75% of estimated deicing material (solids and brines) inventory by the end of summer (preseason ordering). [Written Policy]

Section 2: Storage and Transport

- Keep a minimum of five average events worth of material on hand during the season. [Written Policy]
- Store and cover all bulk salt on an impervious surface to avoid runoff or water entering the storage area. Storage must meet local, state/provincial and federal requirements. Long-term storage of salt brines meeting all local/state/provincial and federal regulations, including secondary containment measures in place. [Written Policy]
- Store site-dedicated salt inventory in self-contained bins (i.e. has a floor and cover) or storage containers, meeting local, state/provincial and federal requirements. [Written Policy]
- Tightly cover bulk material during transport, following all local and state/provincial regulations for securing and covering loads. [Written Policy]
- Monitor salt inventory weekly for quality control (integrity of storage, leaching, etc.), post-storm for inventory management.

Section 3: Operations

LEVEL 1

General Policy and Implementation

- Create salt documentation forms that include salt output estimates per application. [Written Policy]
- Train all application equipment (spreaders, sprayers, etc.) operators on company policies and general salt management/ice management techniques. [Written Policy]
- Clear (e.g., plowing, blowing, sweeping, etc.) new snow accumulations prior to any deicing application (i.e., no burning off 2 inches of fresh snow). [Written Policy]
- Verify that any site where salt will be applied is not listed as a salt-sensitive area or zone by local, state/provincial or federal regulations. [Written Policy]
- Locate snow piles in areas that minimize the flow of water that may refreeze (warranting future deicing applications to the refreeze). Document drainage and slope issues on-site through the use of a Site Engineering Plan.
- Do not relocate/dump snow into bodies of water (lakes/ponds, rivers, streams, ocean, wetlands, stormwater management ponds, etc.). [Written Policy]
- Prevent snow & ice from bonding to driving and walking surfaces. Prioritize anti-icing techniques as a standard practice. [Written Policy]
- Spot treat problem areas (e.g., north-facing areas, etc.). [Written Policy]
- Keep salt covered (i.e. tarps, lids, covers) to protect from moisture and potential spillage during applications (sidewalks, lots, roads etc.) and during transport between routed sites.
- Monitor and document any refreeze-related risks caused by damaged or faulty infrastructure (e.g., broken downspout, clogged drain, etc.), to reduce the need for additional deicing applications.
- Manage a defined ice monitoring (aka ice watch) process to ensure proactive and effective spot treatment
- Optimize salt use with techniques such as blending and pretreating, to accelerate deicing and/or lower the effective temperature of the salt.

LEVEL 1

Calibration Policy and Process

1. Standardize spreader/sprayer application rates across equipment types. Calibrate application rates for minimum required salt output based on weather variables (surface temperature, moisture, etc.). [Written Policy]

2. Establish a calibration process for all salt application equipment (solid and liquid) that takes into account flow settings (gates, valve/nozzles, etc.), conveyor/auger and spinner speeds, ground speed, and material (size/density etc.). [Written Policy]

3. Document settings, rates, and maximum salt output per site in all operations manuals and site binders. Incorporate this information into preseason training programs.

4. Calibrate equipment in the preseason, mid-season, and any time changes are made to the equipment (e.g., repair) or a significant change is made to the material (e.g., fines, (size/grade) pretreatment, etc.).

Anti-Icing Policy and Process

1. Define anti-icing process in a snow response plan and implement it as a standard operating procedure. Training should include specific weather scenarios where anti-icing may be ineffective (e.g., heavy rain, temperature, etc.).

2. Use blended or pretreated salt (solid) for pre-storm applications to prevent bonding of snow and ice in acceptable conditions.

LEVEL 2

Documentation and Policy

1. Utilize technology to accurately automate the process of tracking and reporting salt application data; useful for service verification/documentation and internal benchmarking of application rates. [Written Policy]

2. Standardize the process to measure salt output by site, portfolio of sites, and per storm (per site). The goal is to identify potential material waste by benchmarking actual usage vs. inventory, and comparing application rates across operators and equipment types.

Anti-icing Practices

1. Use salt brine (NaCl, MgCL, CaCL, etc.) or other liquid deicer (e.g, Calcium Magnesium Acetate) as an efficiency strategy for direct liquid anti-icing of paved surfaces and for pre-wetting solid salts.

2. Conduct a pre-service audit of salt brine quality, checking for salt concentration accuracy and any agitation/mixing needs.

Stakeholder Review Team

Stakeholder Reviewers

Diana Clonch, DW Clonch LLC – Columbus, OH

Raqib Omer, Viaesys – Waterloo, ON

Connie Fortin, Fortin Consulting – Hamel, MN

Gerry Dubreuil, CSP, R&D Paving – Gilford, NH

James Fee, Road Solutions – Indianapolis, IN

Mark Schlutt, CSP, ASM, MAAC Property Services – Niles, MI

Ken Ruddock, CSP, ULS Maintenance and Landscaping – Rocky View, AB

David Eddy, CSP, Prescription Landscape – St. Paul, MN

Pam Buckley, SnowEx Products – Madison Heights, MI

Colleen Huff, ASM, BSR Services – St. Louis, MO

Nick Pupko, ASM, G.McNeill & Son Contracting Group – Stoughton, MA

David Lint, Enviroscapes – Louisville, OH

Jim Monk, CSP, Markham Property Services Limited – Markham, ON

Doug Knott, CSP, Knotts Land Care LLC – Amherst, NH

Phil Van Straten, DJ's Landscape Management – Grand Rapids, MI

William Akehurst, Akehurst Landscape Services – Joppa, MD

Nate Clemmer, SynaTek – Souderton, PA

Doug McDaniel, Wal-Mart – Bentonville, AR

SIMA Staff

Phill Sexton – Subject Matter Expert
Ellen Lobello – Communications
Cheryl Higley – Editor
Brian Birch – Project Manager
Lisa Lehman – Designer