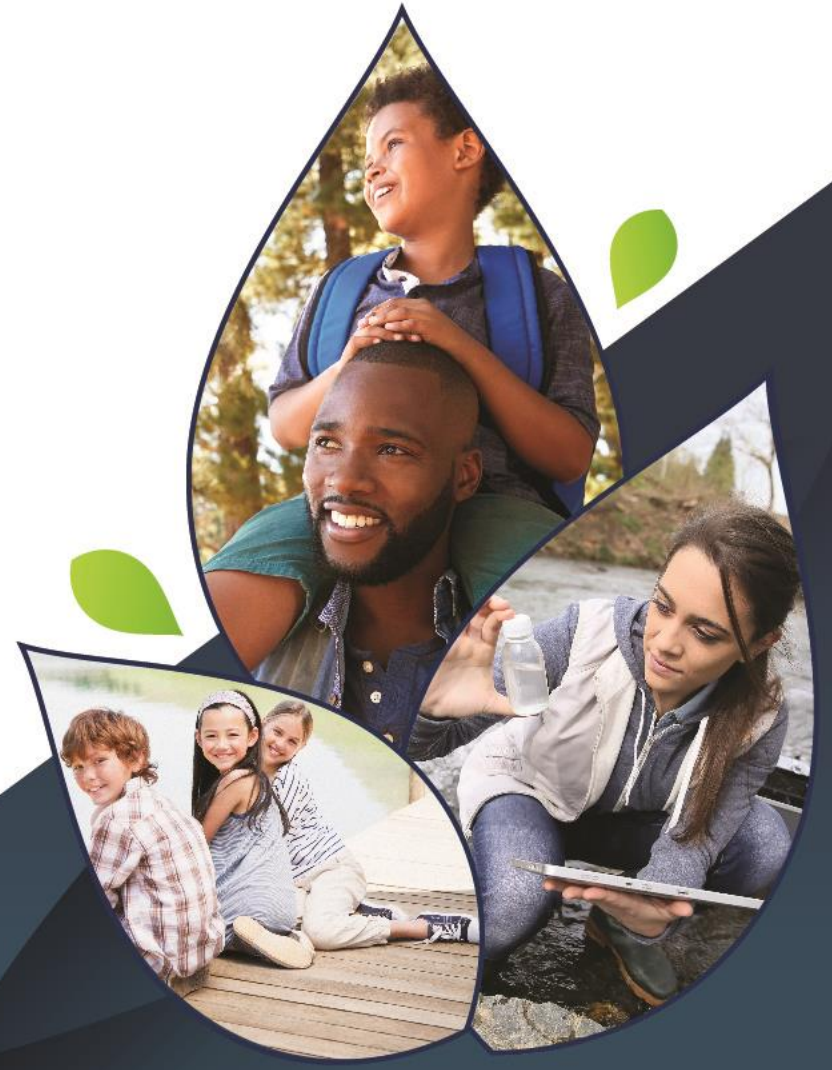
Chloride in the Lake Simcoe Watershed

Presented to: Township of King

June 17, 2025

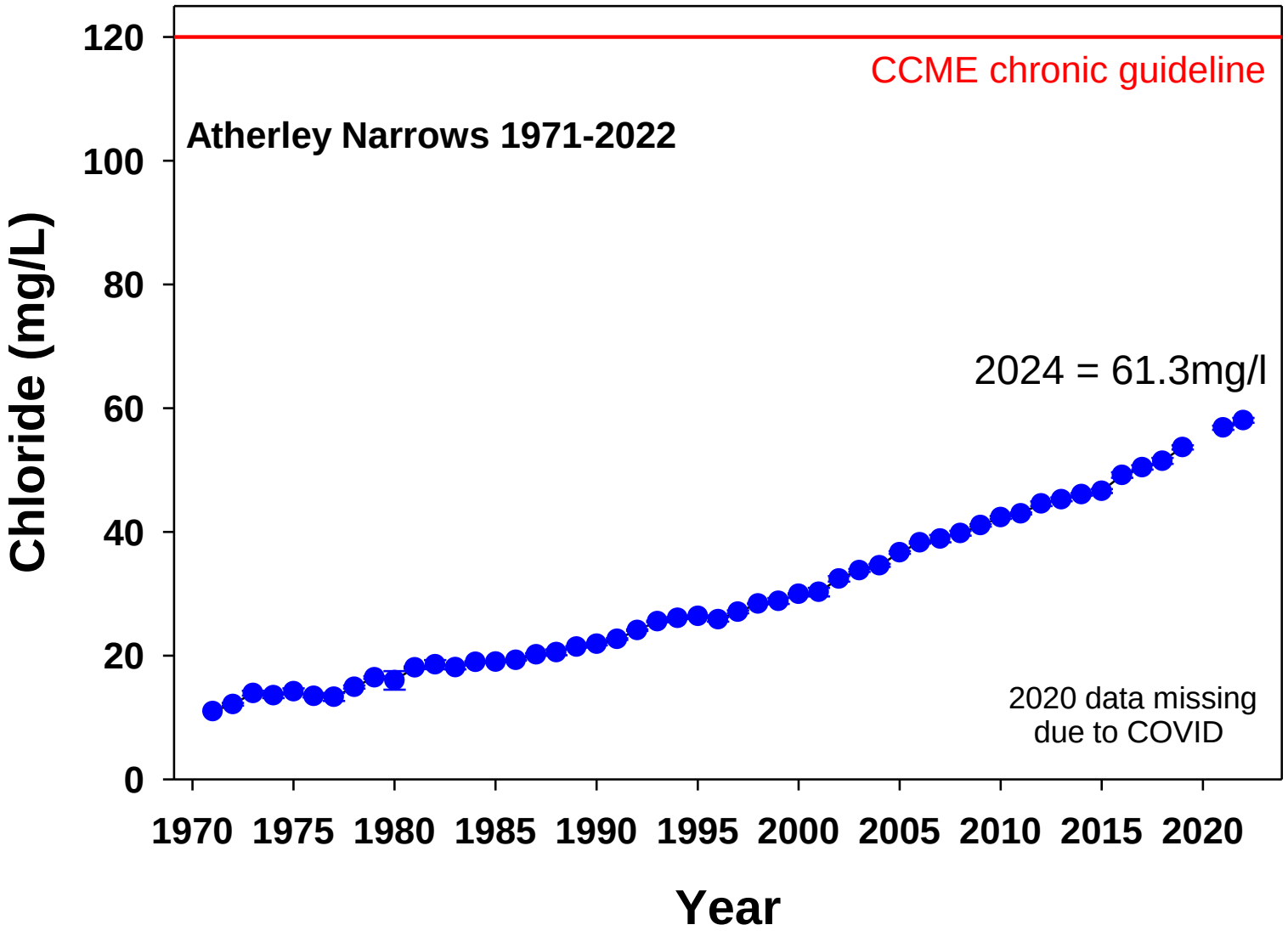
David Lembcke
Director, Watershed Science and Monitoring

Bill Thompson
Manager, Watershed Plans and Strategies



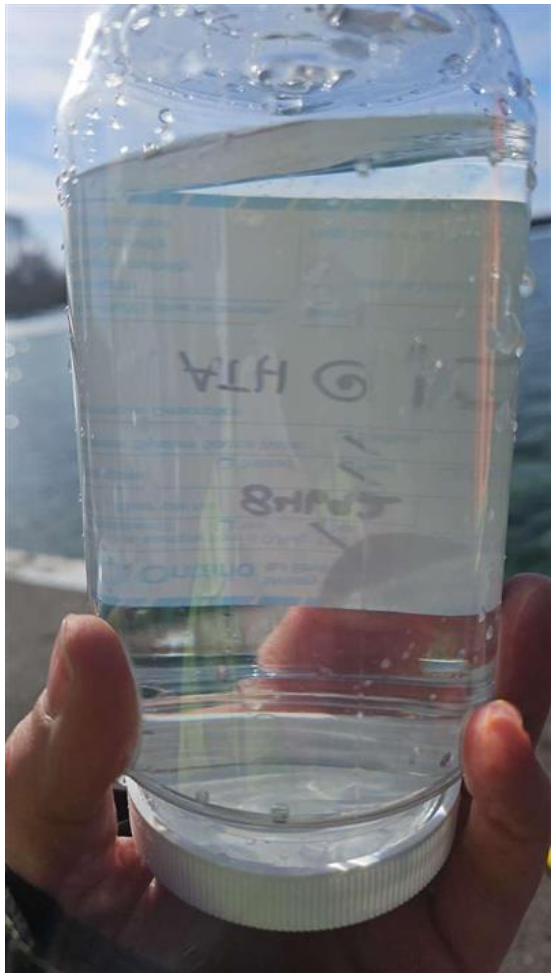
Lake Simcoe Region conservation authority

Winter Salt Concentration in Lake Simcoe



Most recent sample result:

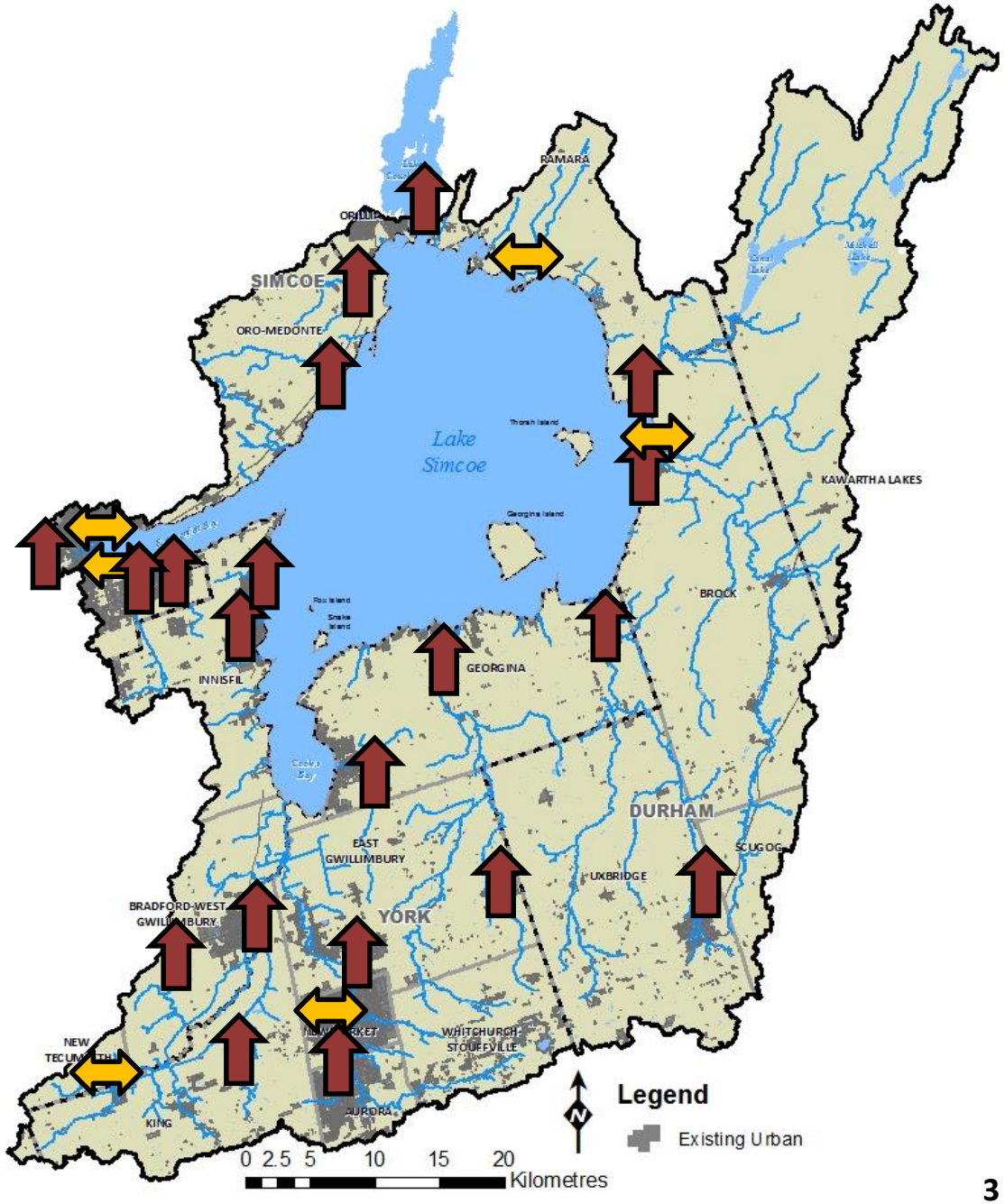
64.2mg/l March 20th 2025



Tributaries – Chloride trends

26 water quality stations

- Short term (2014-2023)
  - 0 declining trend
  - 6 no trend
  - 20 increasing trend
- Long term trends (Full record for each station)
  - 0 declining trend
  - 3 no trend
  - 23 increasing trend



Tributaries – Chloride Guideline Exceedances (Jan 2014- Dec 2023)

Guidelines:

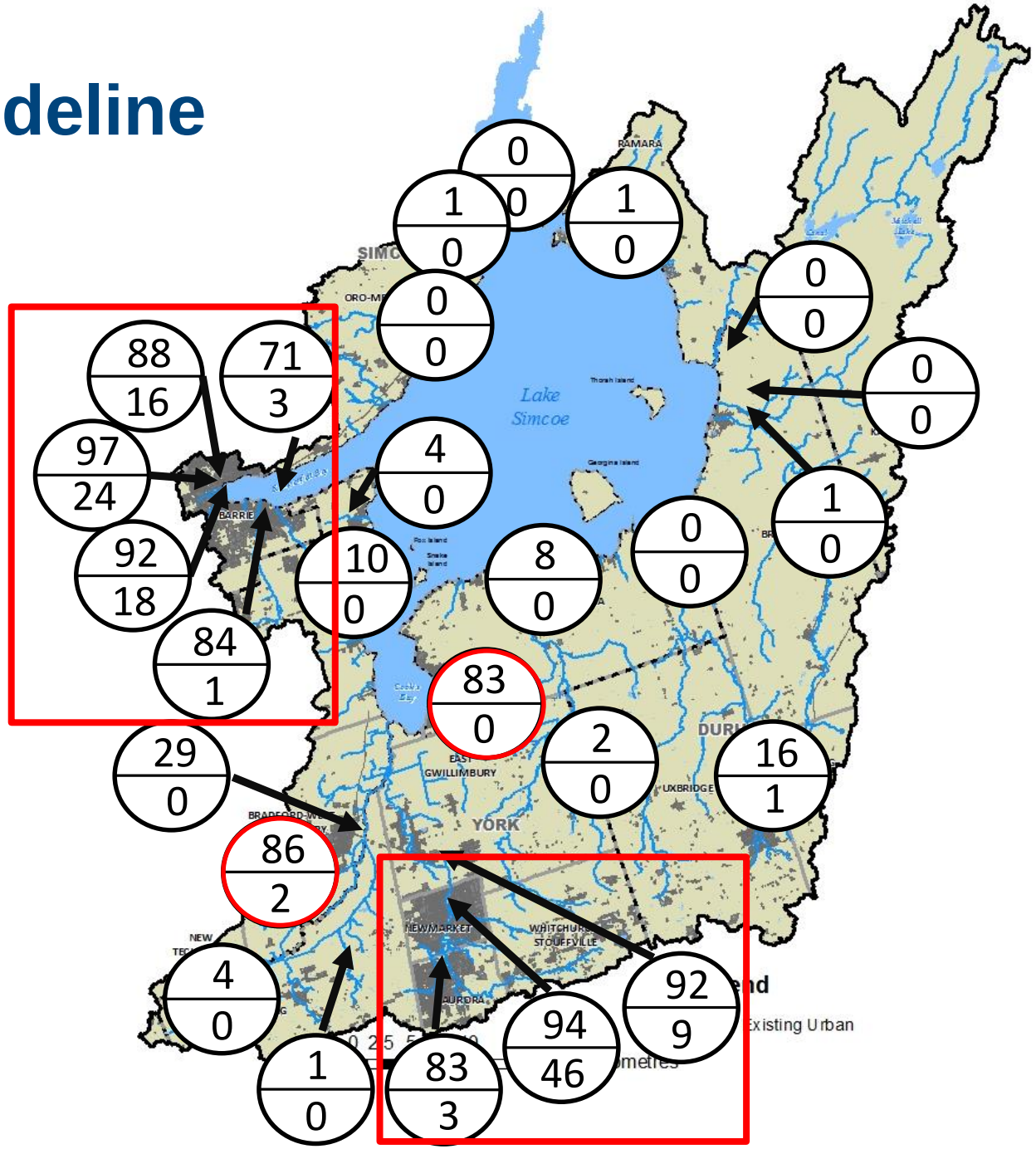
Chronic = 120 mg/L

Acute = 640 mg/L

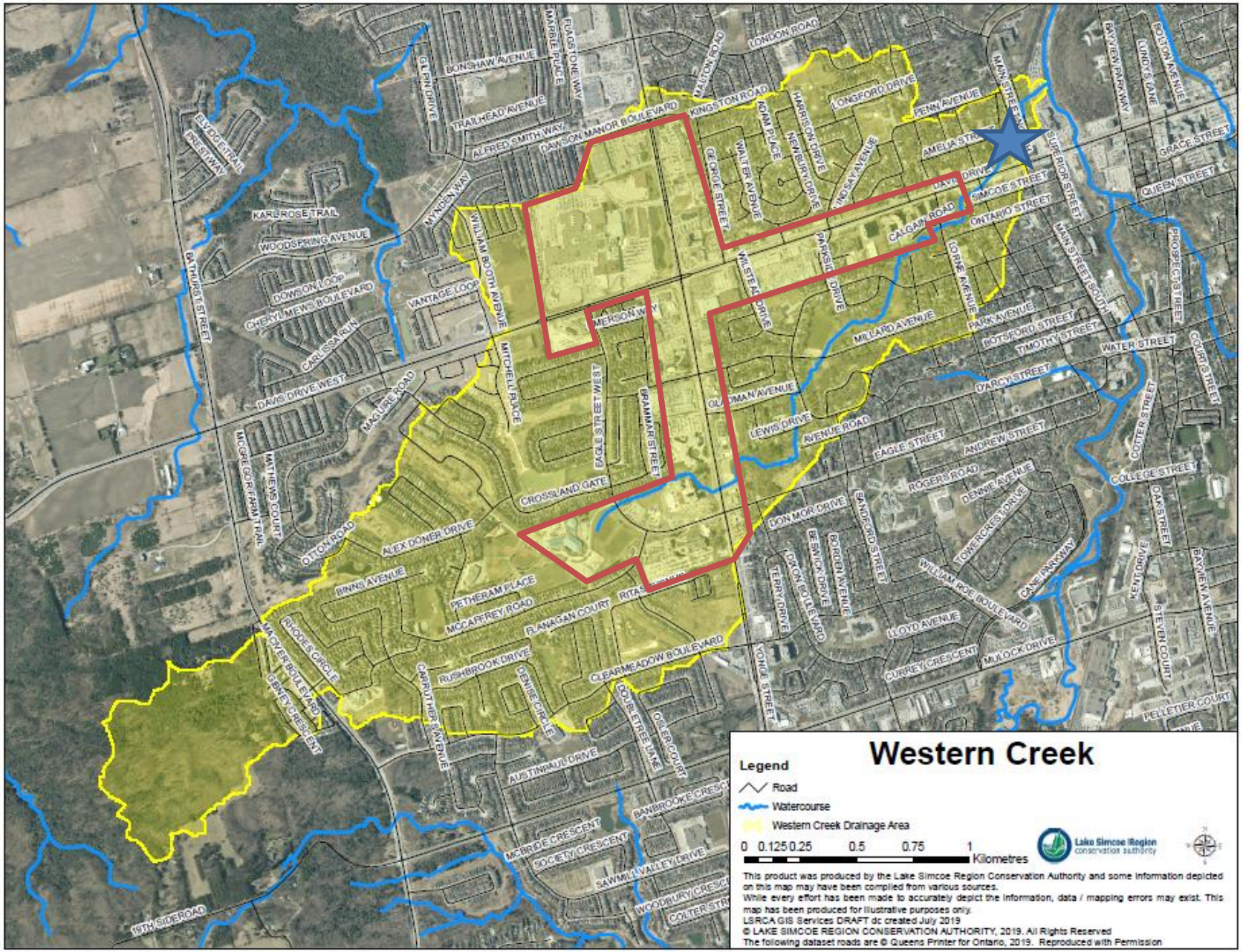
% exceed chronic

75
39

% exceed acute

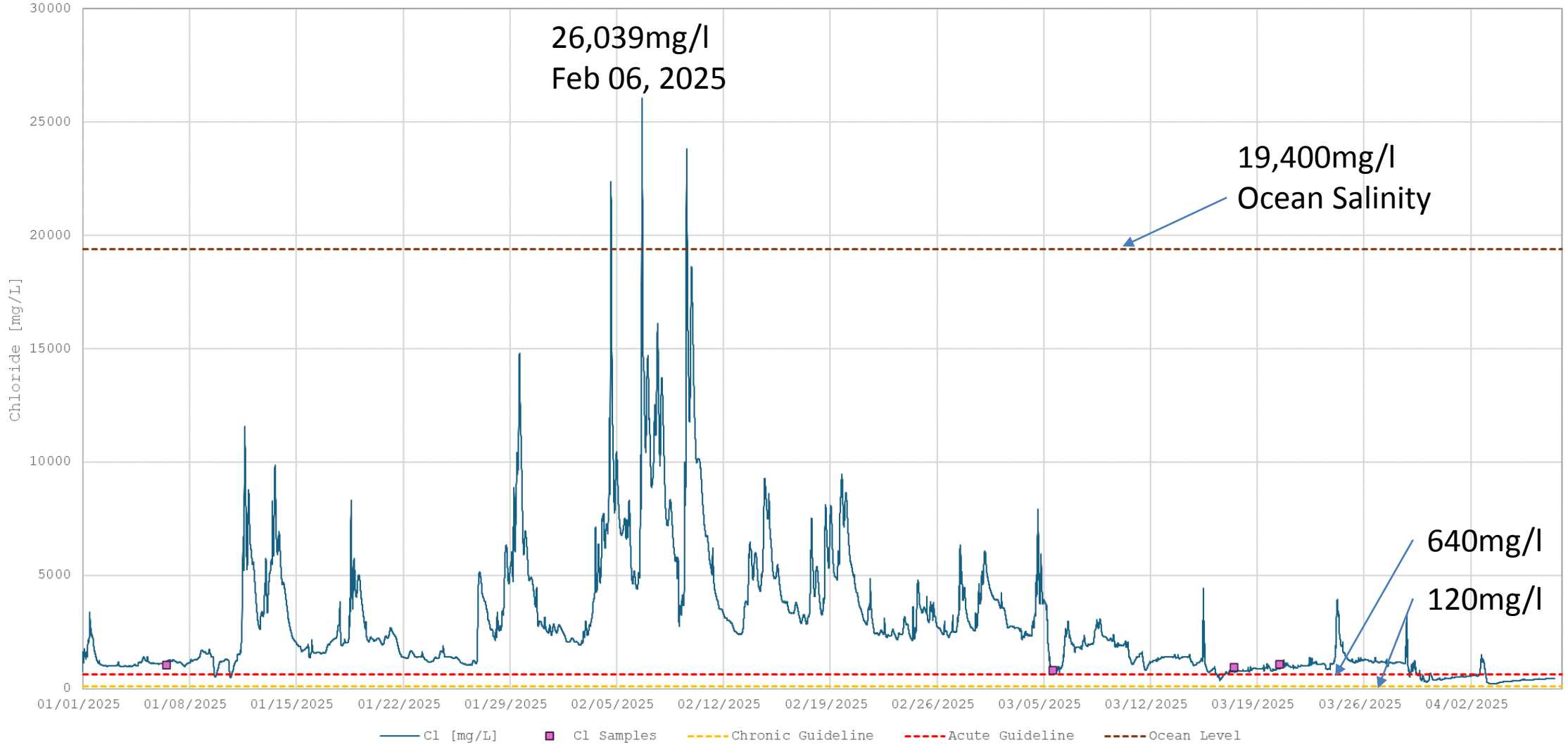


Continuous Chloride Monitoring in Western Creek



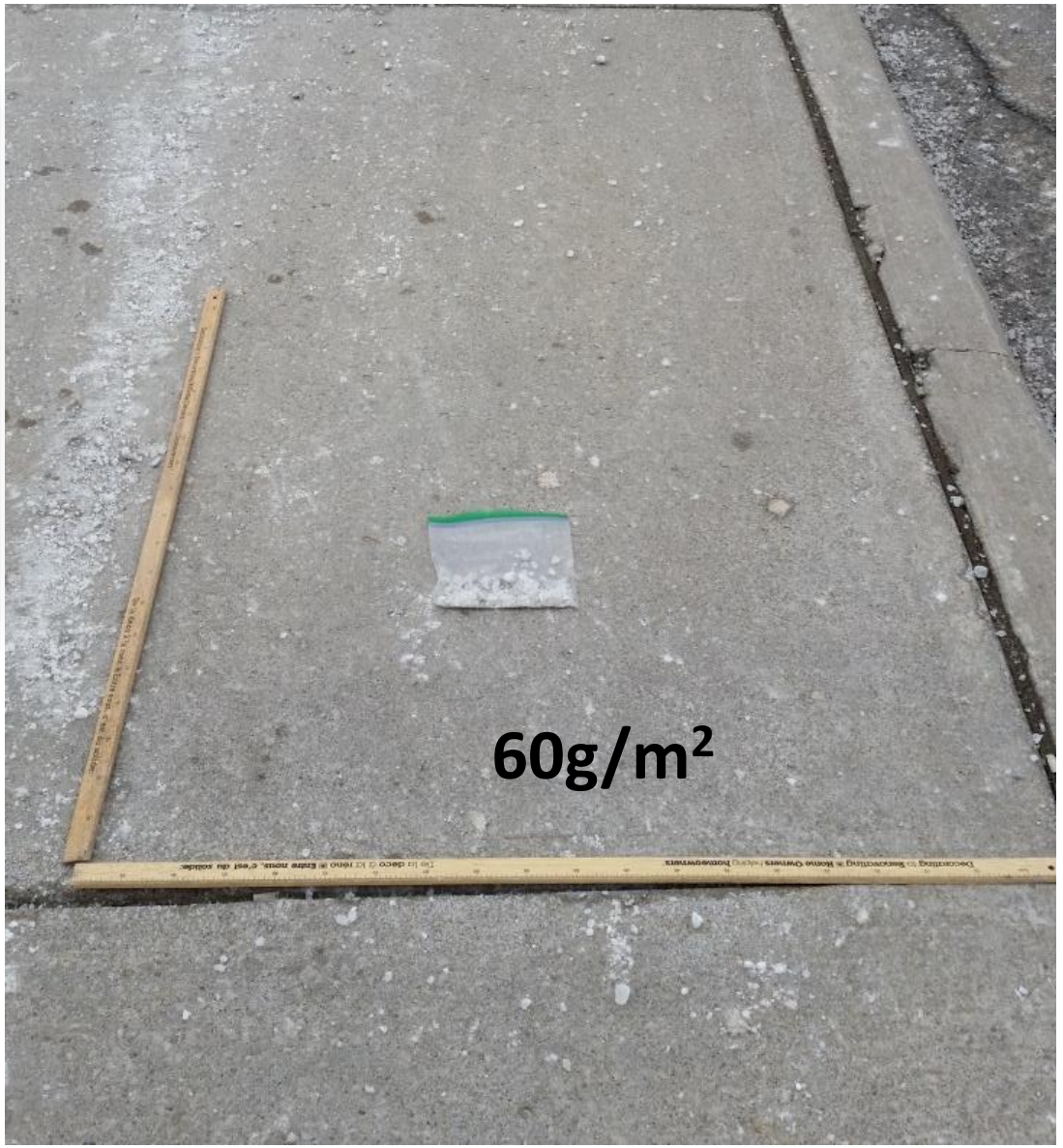
Continuous Chloride Concentrations in Western Creek

January 2025 to April 2025

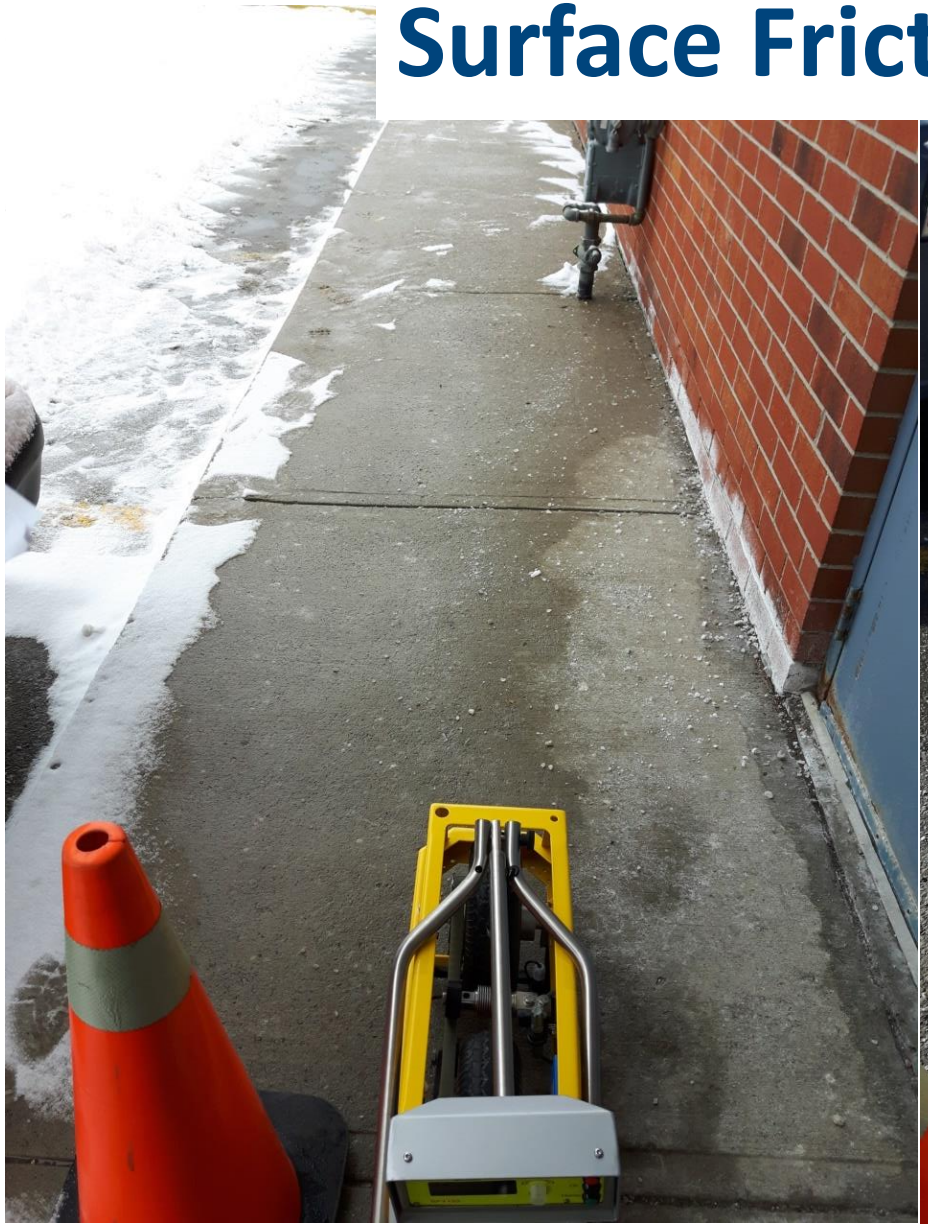


Testing Salt Application Rates in Parking Lots

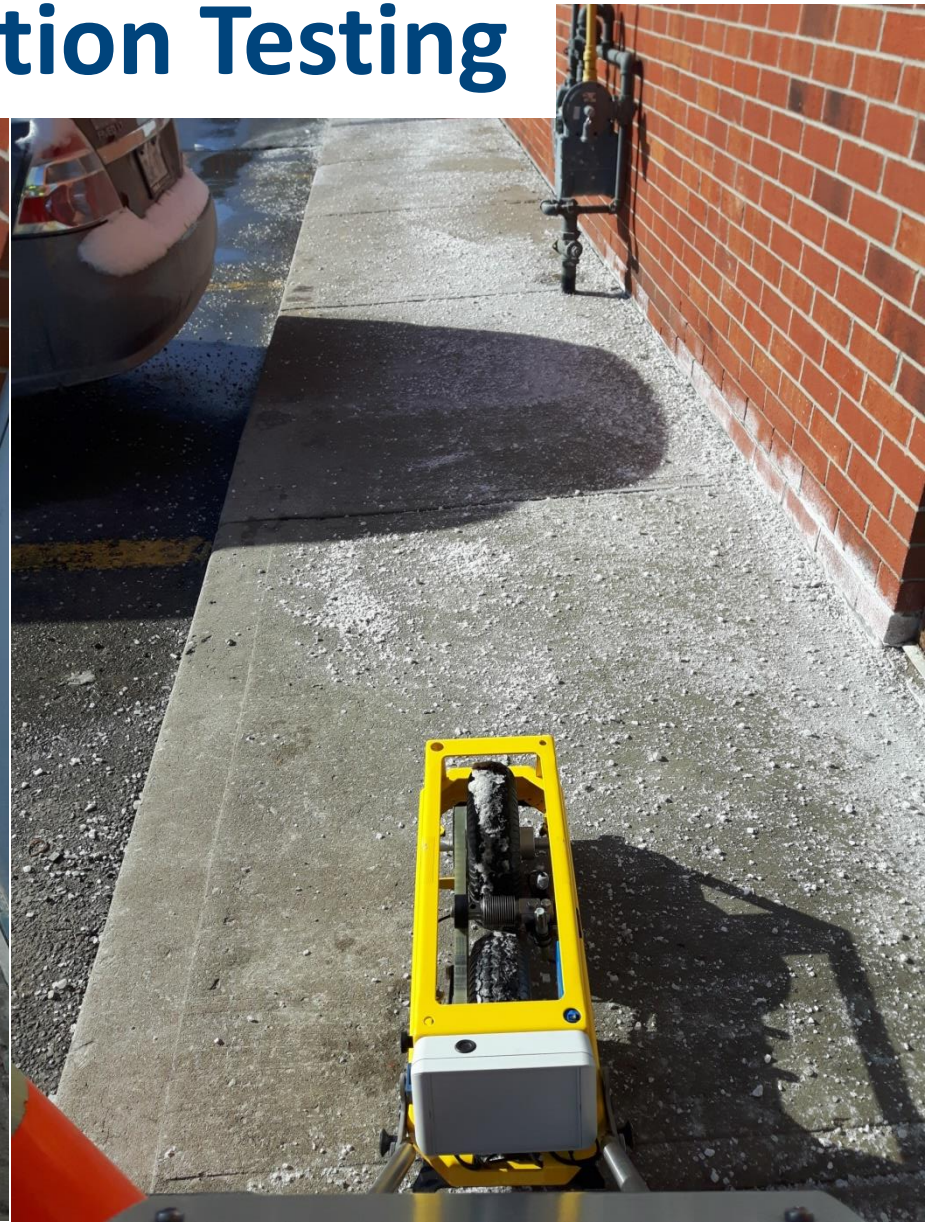
The Myth: More Salt = More Safety



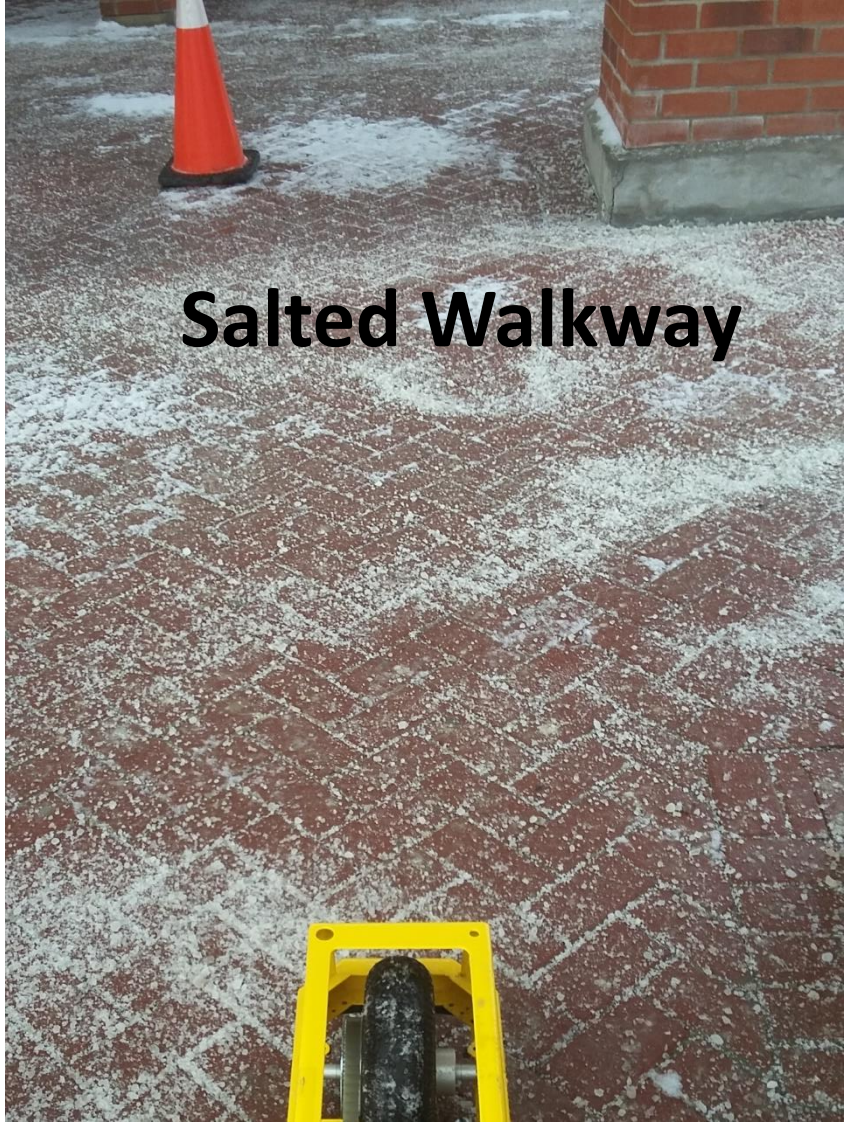
Surface Friction Testing



Mu = 0.63



Mu = 0.26

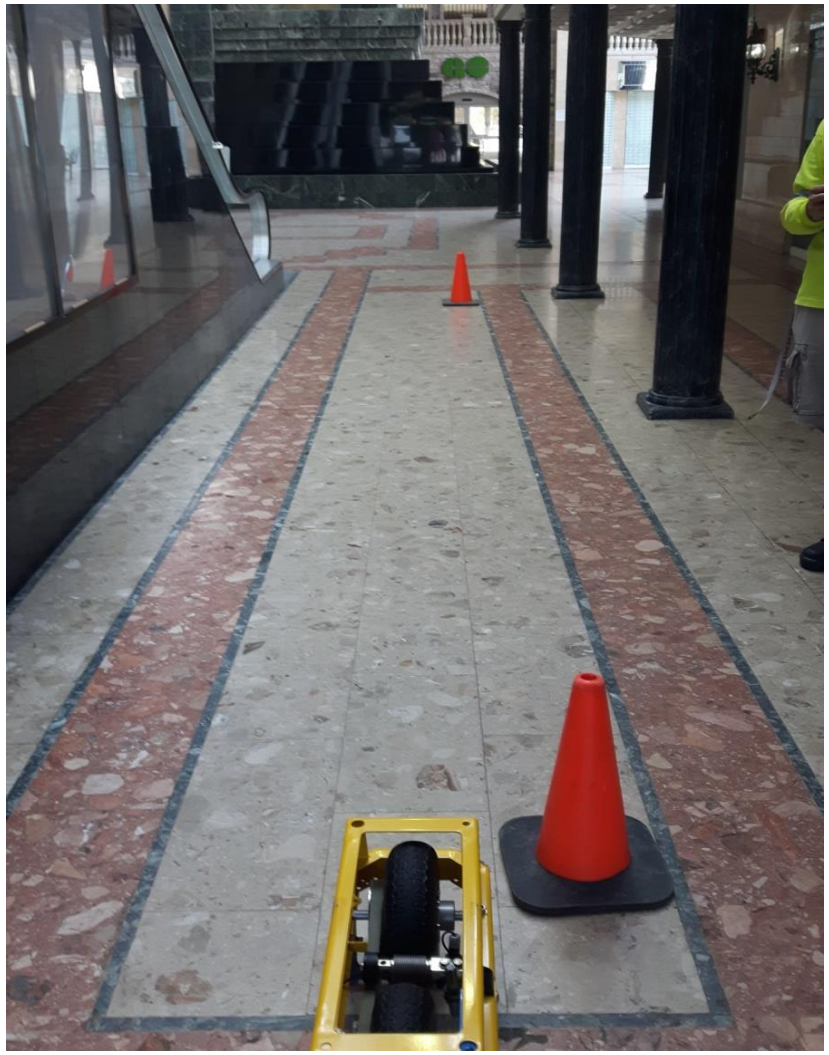


Mu = 0.22

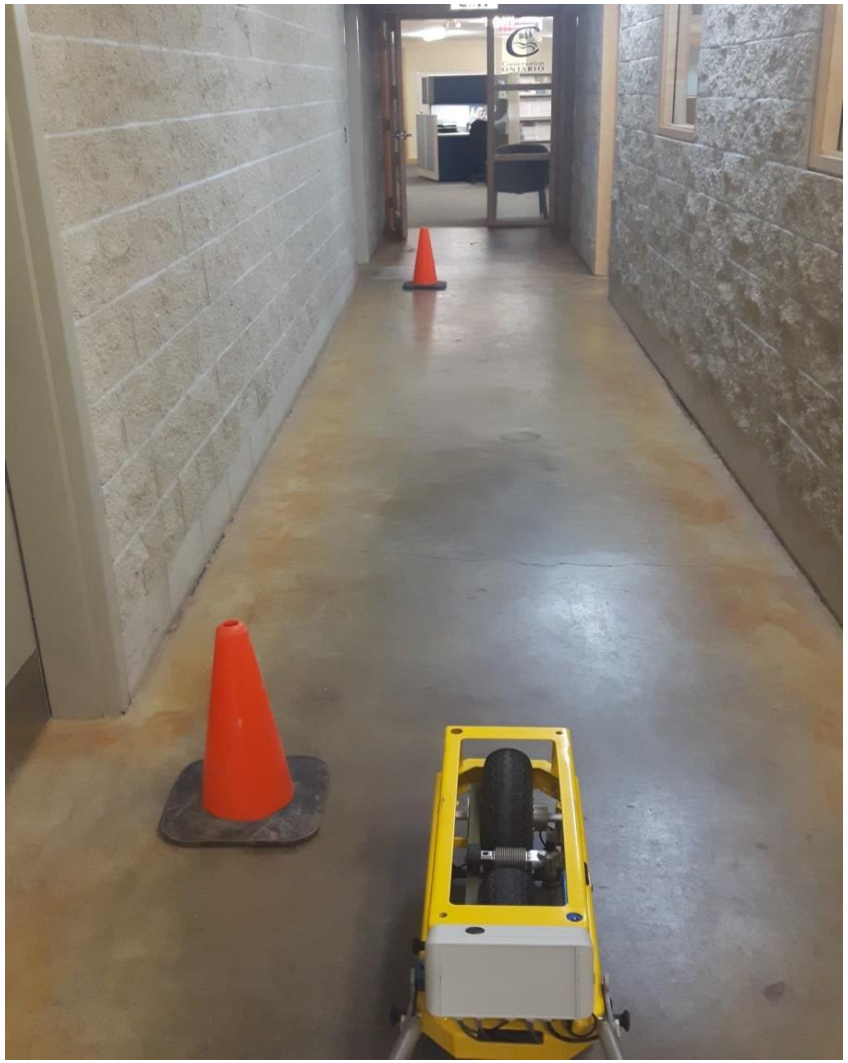
Application Rate = 969g/m2

Mu = 0.21

Are our winter maintenance expectations reasonable?



Mu = 0.34



Mu = 0.32

But winter maintenance is a necessity

Better winter maintenance practices exist

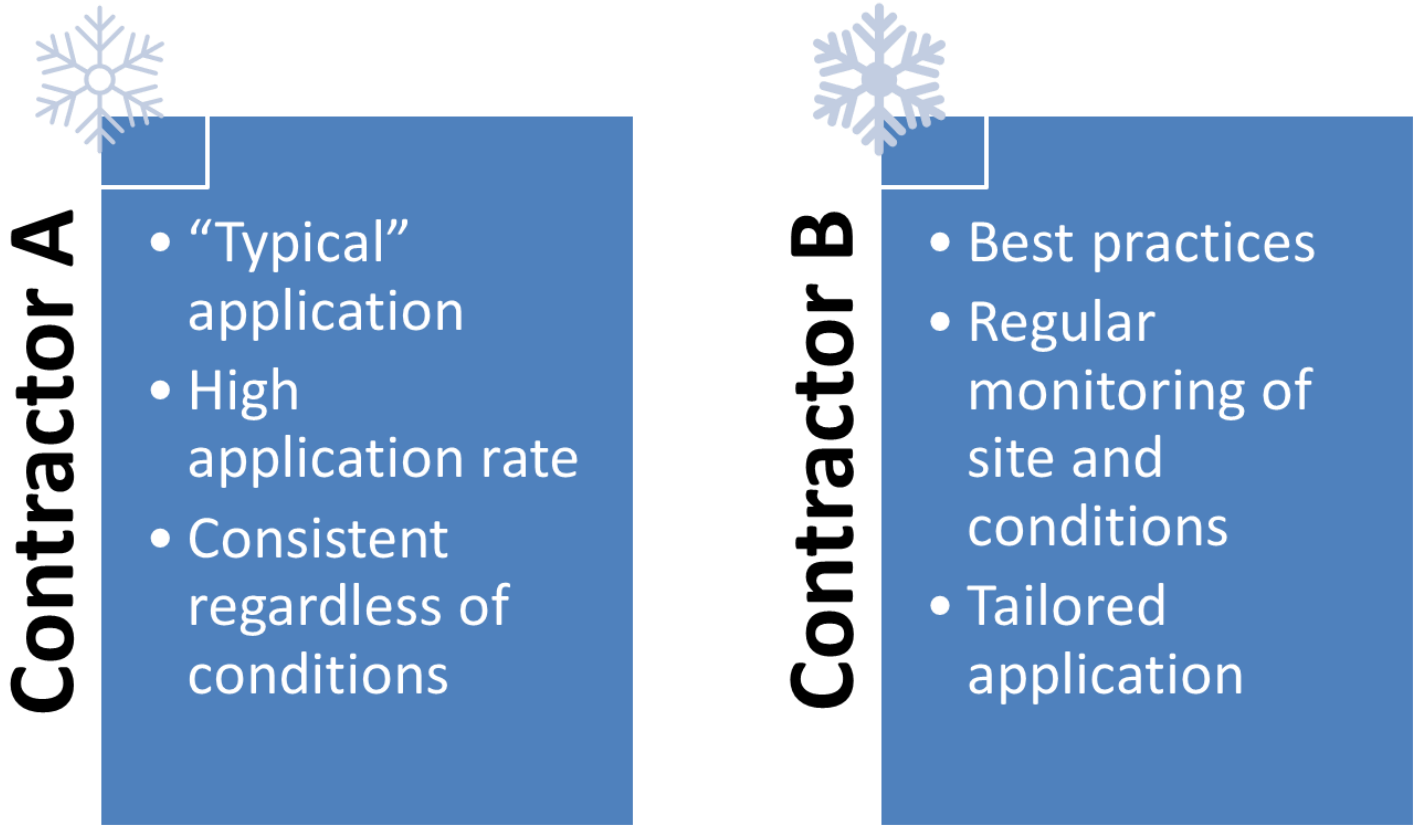
Barriers to adoption do exist as well:

- Concerns about liability
- Concerns about cost
- Concerns about public expectations

Case study: commercial parking lot

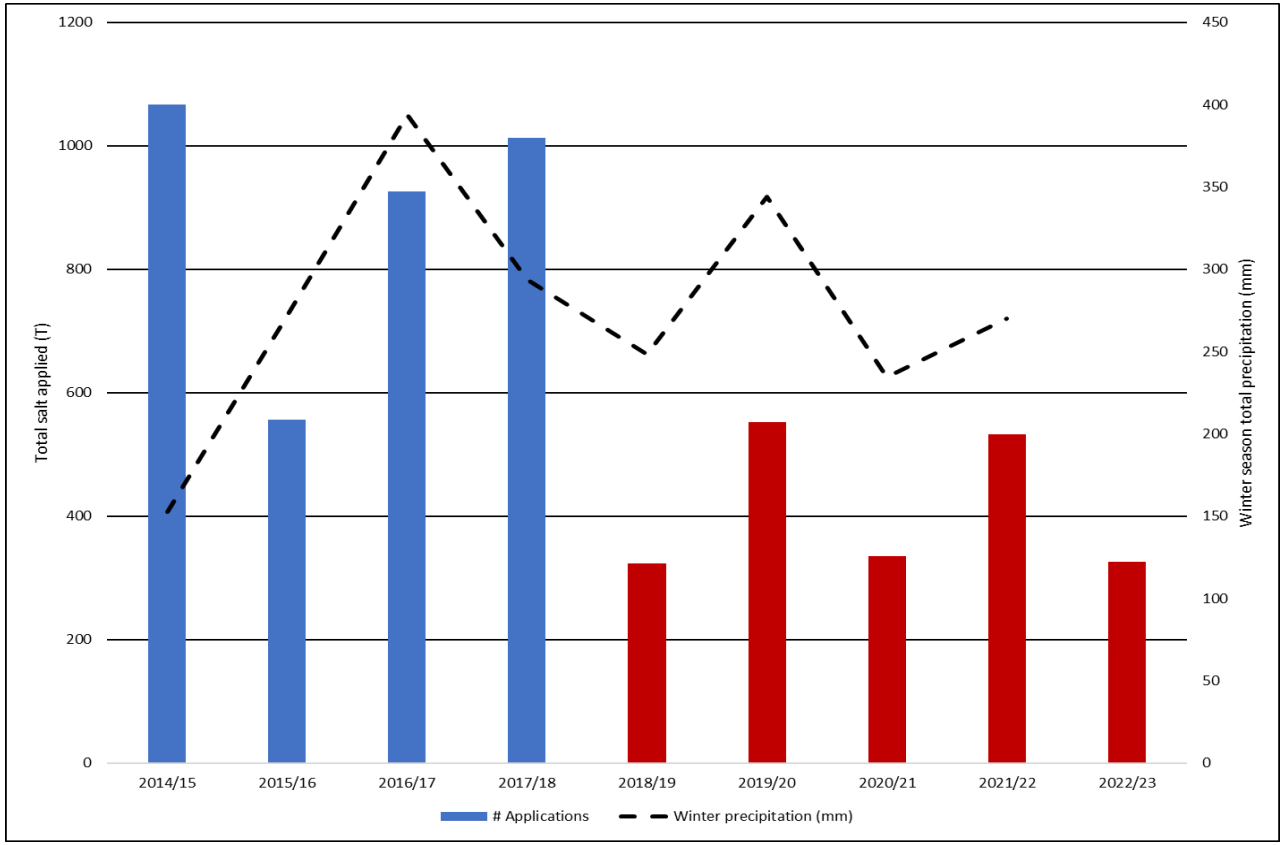
- Large commercial parking lot in the Lake Simcoe watershed
- Two contractors during the study period: Contractor A (2014-2018), and Contractor B (2018-2024)
- Similar equipment
- Primary concerns: safety and liability

Case study: commercial parking lot



Case study: commercial parking lot

- Average applications/season:
  - Contractor A: 66
  - Contractor B: 43
- Average application per event:
  - Contractor A: 12 tonnes
  - Contractor B: 10 tonnes
- Both contractors were claim-free for the duration of the study
- Contractor B realized approx. $40k in material cost savings/year



Bottom line

- It's possible to reduce application rates while maintaining safety
- Significant cost savings can be had by refining practices
- Contractor training is vital
- Good information on current conditions is vital
- Contractors and property managers need to be empowered to make good decisions

Easing adoption of best practices

- The New Hampshire approach
  - Regulation limiting liability
  - Recognition of Best Management Practice guidelines
  - Certification of snow and ice management contractors
  - Public education
- Broad support in Ontario
  - Winter maintenance industry
  - Commercial property owners
  - Water quality groups

How municipalities can help

- Council resolution in support of liability limitation
- Hire trained and certified contractors
- Share weather data, where possible
- Continual improvement in roads management
- Empower staff to make good decisions

Thank you