

Implementation of Sustainable Winter Management (SWiM®) in the Long Creek Watershed

Commission to Study Unmanaged Storm Water Pollution
September 23, 2026





High concentrations have been shown to cause acute and or chronic adverse impacts on organisms in, on or using the surface waters.

Why are chlorides a problem?



Chronic: 230ppm

Criteria Continuous Concentration (“CCC”):

The CCC, or “chronic” criterion, is the four-day average concentration that should not be exceeded more than once every three years on the average.

LCWMD uses the Criteria Continuous Concentration (“CCC”) and Criteria Maximum Concentration (“CMC”) as comparative criteria for contaminant concentrations established by U.S. EPA and incorporated by Maine DEP into Chapter 584, *Surface Water Quality Criteria for Toxic Pollutants*.

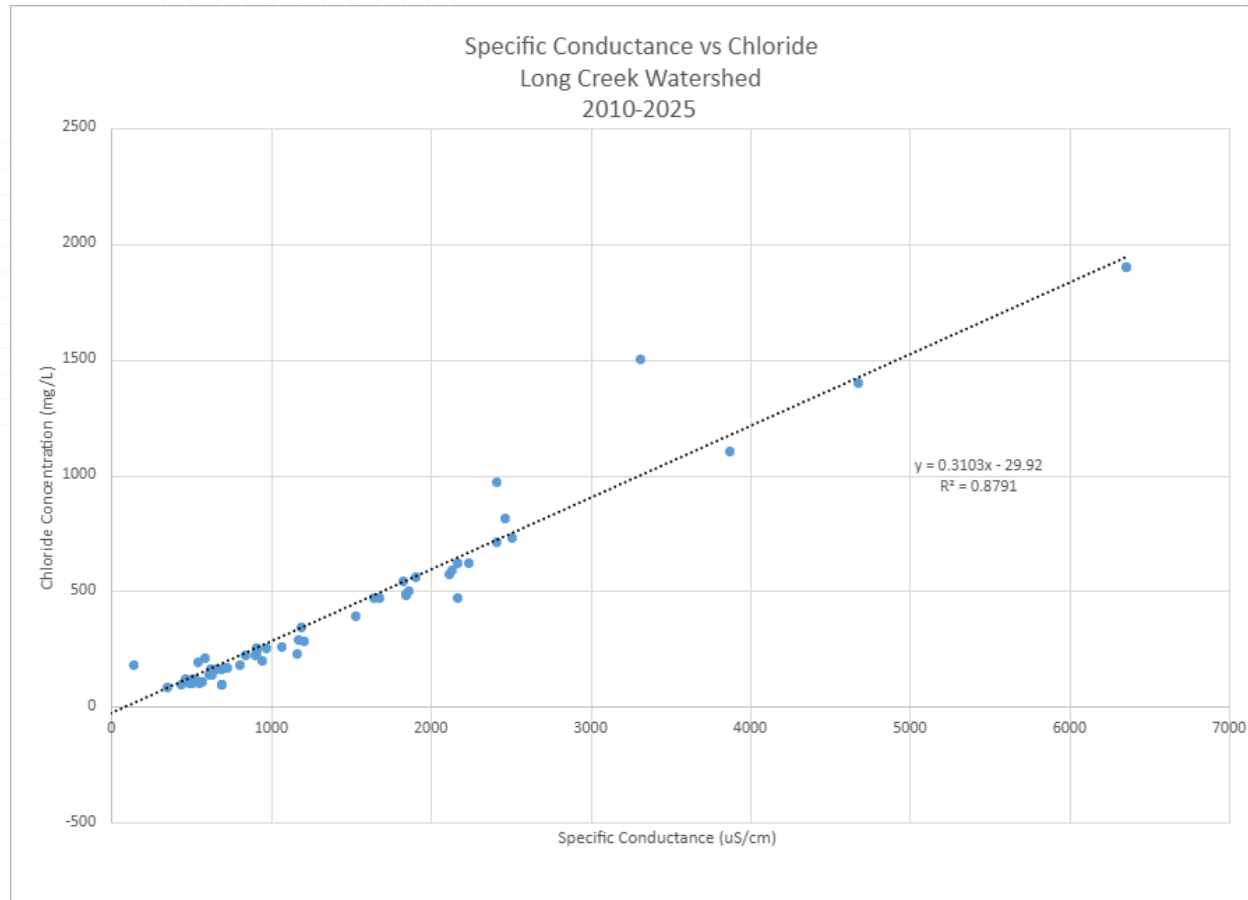
Acute: 860ppm

Criteria Maximum Concentration (“CMC”):

The CMC, or “acute” criterion, is the one-hour average concentration that should not be exceeded more than once every three years on the average.



Specific Conductance – Chloride Correlation



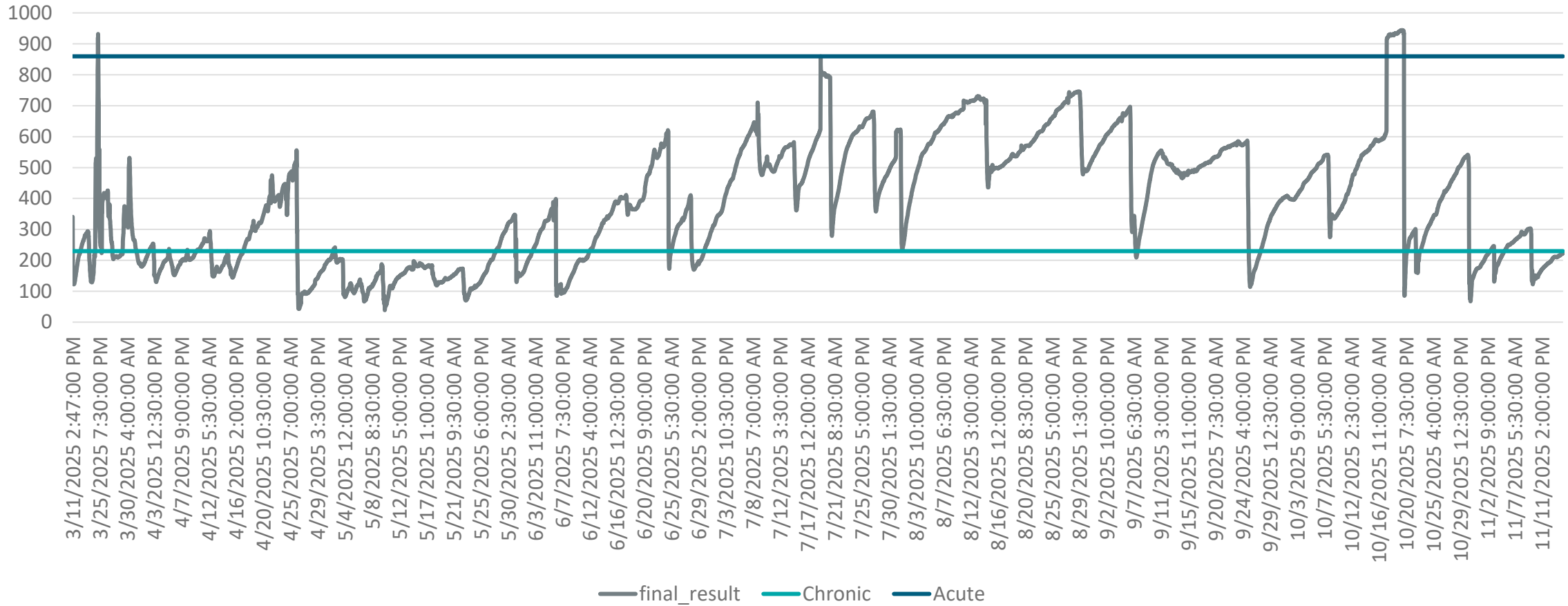
“Calculated Chloride”

- “Calculated Chloride” is used as a surrogate for chloride grab sample laboratory results
- Specific conductance is closely correlated chloride concentrations
- Specific conductance is measured with in-stream meters
- Chloride grab samples are analyzed in a lab
- Specific conductance data is more frequent and less expensive
- Sixteen years of grab samples and sondes data – correlation refined annually
- “Chronic” standard of 230ppm equates to specific conductance of ~850 uS/cm
- “Acute” standard of 860ppm equates to specific conductance of ~3070 uS/cm

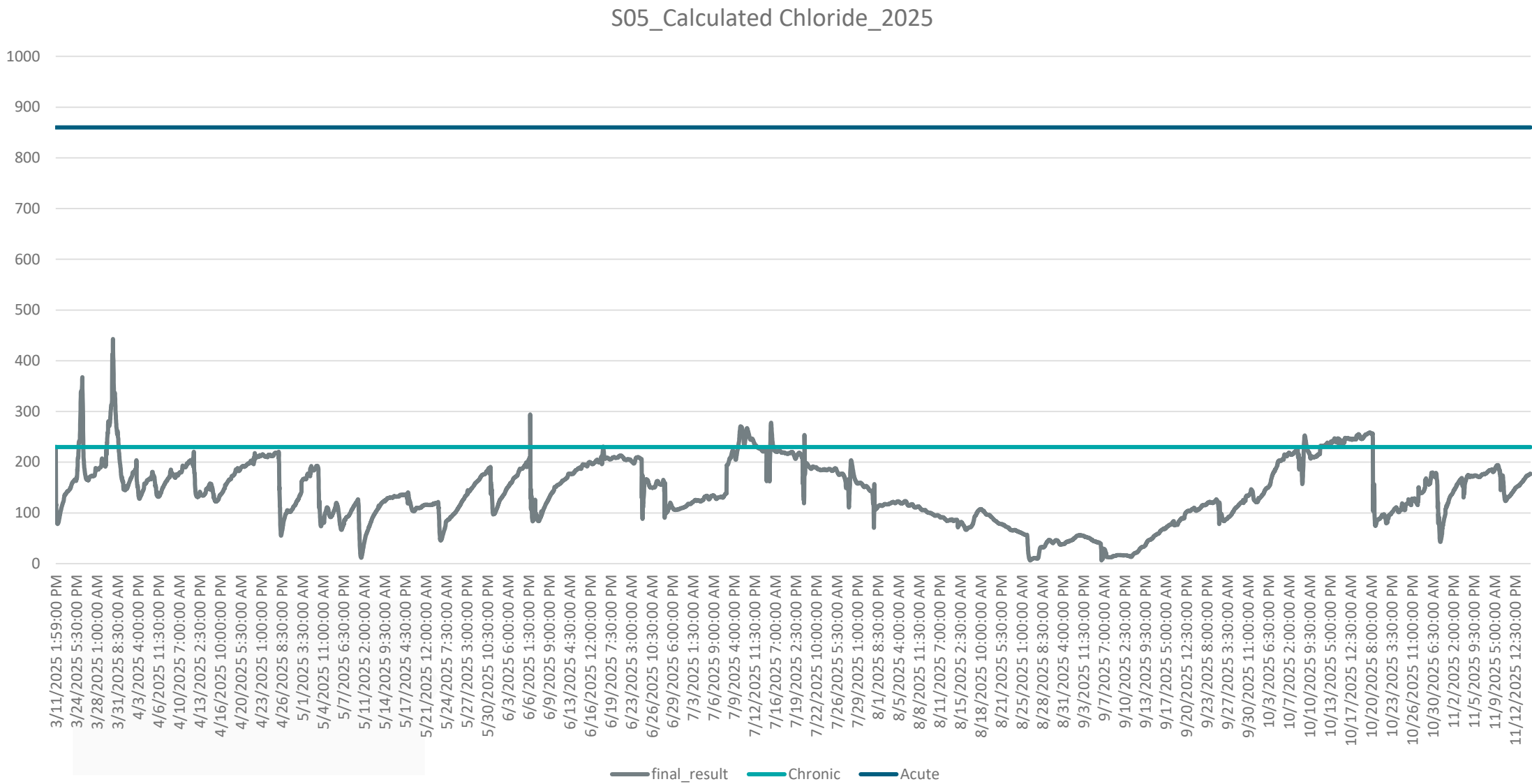


“Upper Watershed”- Thomas Drive, Westbrook

S07_Calculated Chloride_2025

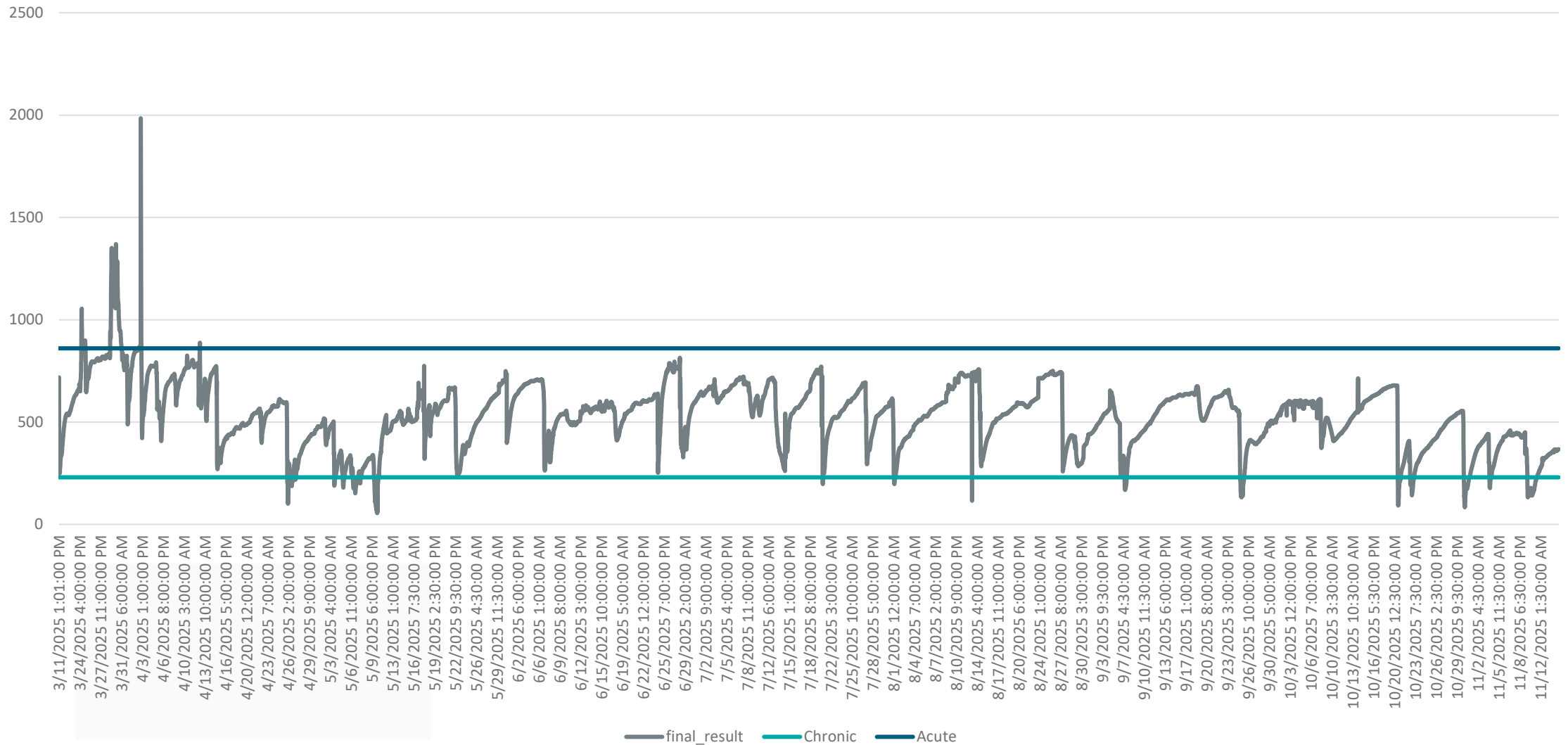


“Middle Watershed” – MTA Crosby Yard



“Lower Watershed” – Gorham Road Above Clarks Pond

S01_Calculated Chloride_2025



SWiM® Process

Discovery Season "0"

- Broad Stakeholder Engagements
- Identify Current State
- Introduce Requirements
- Observe Constraints / Opportunities
- Planning and Onboarding

Data Collection Season 1

- Measure Salt application outputs and Levels of Service (LOS)
- Perform 2 calibration trainings and verifications
- Monitor Level of Service/Performance
- Review results and develop needs assessment
- Identify certification standards met and to be met season 2

Intervention Season 2

- Materials
- Equipment
- Methodologies
- Verify SWiM certification qualification

Continuous Improvement Seasons 3,4...

- Incremental operational and strategic changes
- Data driven metrics to evaluate effectiveness
- Path to self improvement
- Verify if re-certification standards being met (annually)



Discovery

Why do we need this? What's the process?

- First, we need to answer the question “how is snow being managed now?”
- Current contract structure?
- Need to develop relationships, rapport, TRUST

What is involved? How it works...

- Understand Pain points (introduction meetings and follow ups)
- Implement requirements (i.e. Measuring – the 1st policy to implement)
- Identify Constraints / Opportunities
- Develop a planning and onboarding process (each project is unique)

What to Expect – Outcome(s) (Year 0,1,2,3...)

- Starting at Year “0” – focused on fact finding + touch a few properties as base line vs intervention
- Year “0” Coming up with a plan – rather than diving straight into data collection
- Year “1”
- Year “2”...”3”...



Data Collection

Why do we need this?

- Set a baseline
- Set up equipment and data collection SOPs for future years

What is involved?

- Setting up cameras/ weather monitoring stations (mini RWIS)
- Setting up salt trackers in trucks
- Training staff (mostly answering questions about what this is all about)
- One season of supervised data collection

Results

- Ground reality of application rates and maintenance strategies
- Current LOS
- Set the stage for intervention

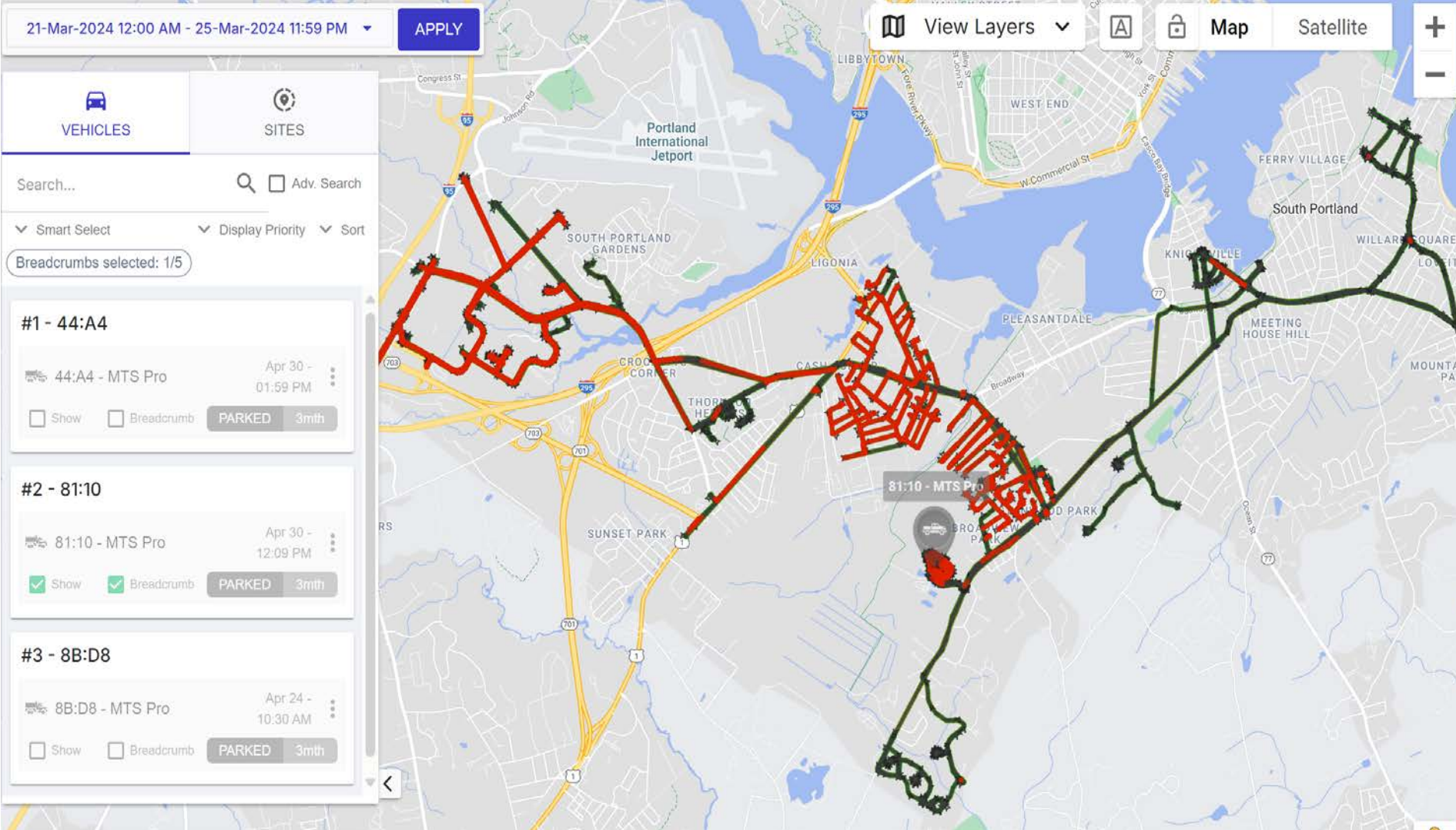
Cost

- About \$7,000 first year startup, with data package



Pre-Season Calibration – “Drop Test”

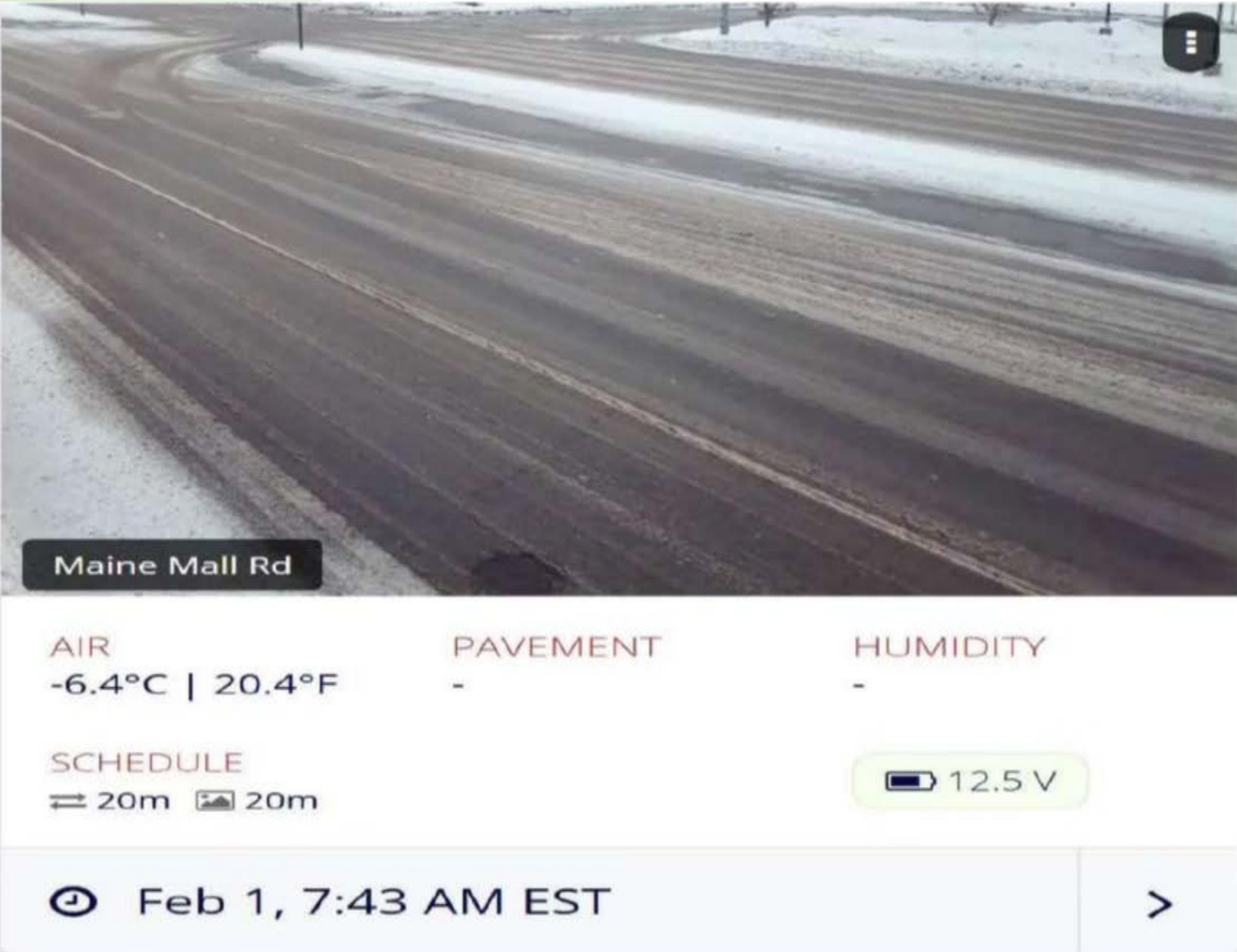




Cellular Enabled GPS/Software Package Calculates:

- lbs/per acre (parking lots)
- lbs/per lane mile (roads)

Road Weather
Information
System (“RWIS”)



Intervention

Why do we need this?:

- Put results from the analysis in action
- Enable data driven optimizations/improvements

What is involved?:

- Working with property owners and service providers
- Show examples of excess salt usage, sub optimal material and equipment choices
- Work together to device a strategy moving forward

Examples:

- Identify operators that are consistently applying more. Provide training
- Calibration training to help standardize salt application
- Correct use of salt brine and other techniques
- Provide training on how service providers can self-assess improvements



Stainless Salt Spreader with Liquid Brine Saddle Tanks



All-in-One Brine Maker



Pre-Storm Treatment vs. Pre-Wet Rock Salt



“Live-Edge” Segmented Plow Blade



**Sidewalk
Plow/Rotary
Broom with
Brining
Capability**



Snow Storage Location



Outdoor Service Company, Inc. | Private Property



PROPERTY MEASUREMENTS

225 Gorham Rd — Parking	152,162 sqft (3.49 ac)
50 Foden Rd — Parking	94,713 sqft (2.17 ac)
Total Treated Area	246,875 sqft / 5.67 ac
Perimeter (combined)	~8,437 ft
Poly Zones (combined)	13 mapped treatment zones

MULTI-SEASON PERFORMANCE HISTORY

	2022-2023	2023-2024	2024-2025	2025-2026
Avg Rate (lbs/acre)	410	206	137	230
Total Lbs Applied	77,471	52,627	102,304	144,878
lbs/acre (season)	15,250	10,359	20,139	28,519
lbs/visit (avg)	537.9	506.0	695.3	515.6
Salting Trips	144	104	147	281
Avg Temp	28.6°F	27.8°F	30.8°F	25.8°F

▼ 50%

BEST RATE REDUCTION
410 → 206 lbs/acre
(2022-23 to 2023-24)

▼ 67%

PROGRAM-WIDE REDUCTION
410 → 137 lbs/acre
(peak to lowest season)

Thank You!

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