TCMA Chloride Project
IPC meeting #3

September 30, 2014
9:00am -12:00pm

Mississippi WMO office, Minneapolis

2522 Marshall Street NE
Minneapolis, Minnesota 55418-3329

Agenda

- 8:45 – Sign-in, coffee, bagels
- 9:00 – Welcome & Meeting Goals & Format (Brooke Asleson, MPCA)
- 9:10 – Project Introduction & Overview (Brooke Asleson, MPCA)
- 9:20 – Review draft Chloride Management Plan (Brooke Asleson, MPCA)
- 9:40 – Overview of the draft Chloride TMDL (Hans Holmberg, LimnoTech)
- 10:10 – Winter Maintenance Assessment tool update (Connie Fortin, Fortin Consulting)
- 10:25 – Break
- 10:30 – Implementation Discussion Overview (Rick Patraw, MPCA)
- 10:40 – Small Group Discussion: Break in to small groups
- 11:40 – Small Group Report Out: Share key discussion item
- 11:55 – Wrap-up

Visit the project website for additional information: http://www.pca.state.mn.us/r0pgb86

Twin Cities Metro Area Chloride Project

IMPLEMENTATION PLAN COMMITTEE MEETING #3

SEPTEMBER 30, 2014

Minnesota Pollution Control Agency

Meeting Goals & Format

Goal for Today's Meeting

- *Update on the TCMA Chloride project progress*
- *Present the draft Chloride Management Plan & TMDL*
- *Discuss the various elements of the plan before it is rolled out for stakeholder comments*
- *Discuss how we can collaboratively be successful in implementing the plan*

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Project Update

Water Quality Concerns

- Chloride is toxic to aquatic life
  - 230mg/L Chronic, 860 mg/L Acute
- Chloride is a permanent pollutant, once in our waters there is no feasible way to remove it
- Road salt (75%) and water softening salt (25%) are the main sources of Chloride in Twin Cities Metropolitan Area (TCMA)
- University of Minnesota study found that 78% of the chloride used is being retained in the TCMA

Public Safety Concerns:
Road Salt

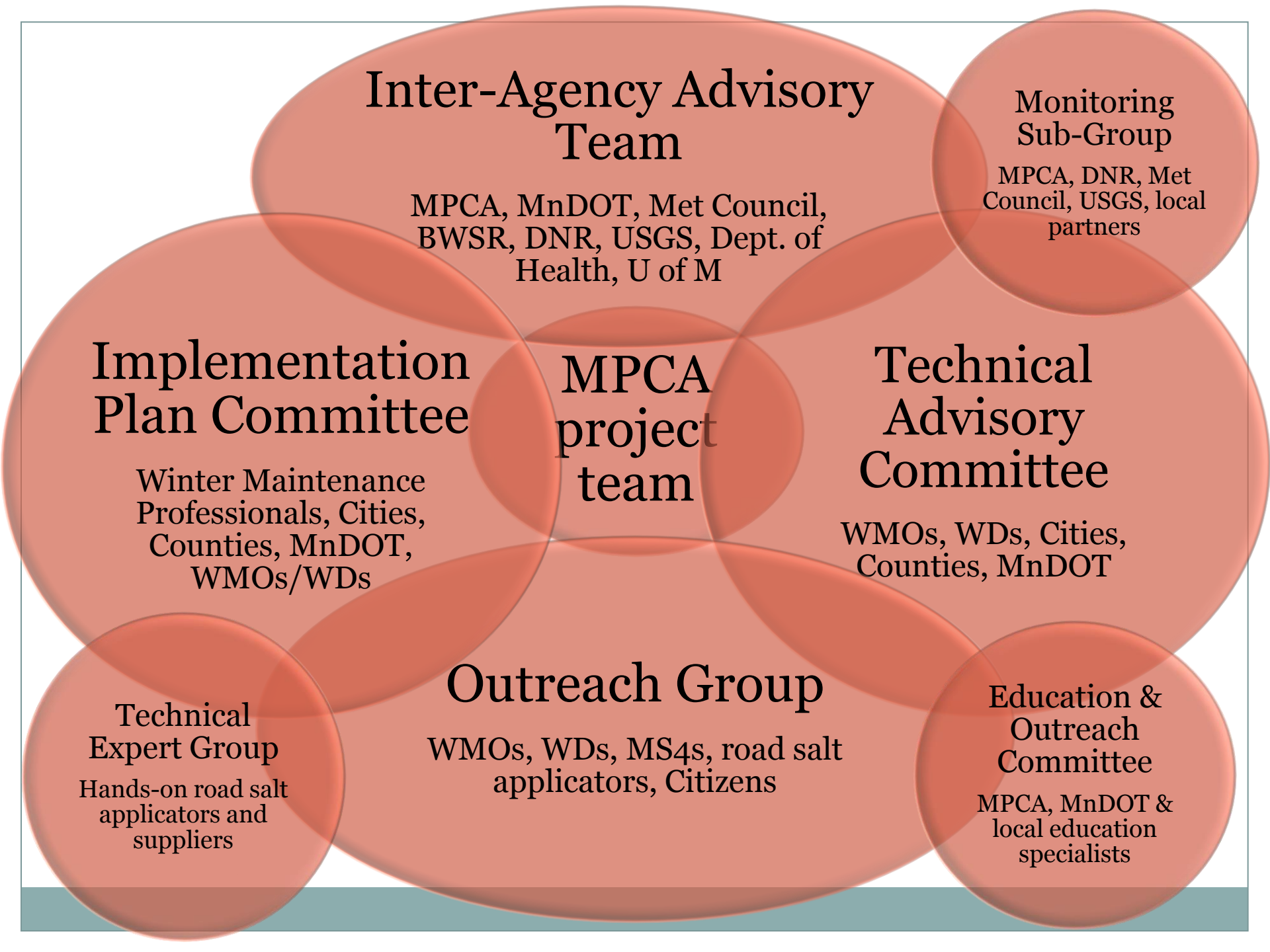
- 365,000* tons of road salt are applied in TCMA each year
  **this is an estimate based on purchasing records*
- We need safe roads, parking lots and sidewalks in winter months
- Currently no alternative de-icer without negative impacts to the environment
- Applied at all levels; State, County, City, Businesses/Schools/Churches and Homeowners
- Private applicators up against fear of slip & fall lawsuits – default is to apply more product
- Public expectations are difficult to meet
- Challenging winter conditions

Public Concerns:
Water Softening

- The public desires soft water (minimal hardness levels)
- Individual water softeners are used in many households without much thought given to amount of salt used
- Treatment to remove chloride from wastewater effluent is costly

TCMA Chloride Management Plan

- Develop Chloride Management Plan for the 7-county metro *(project began 2010, draft plan Oct. 2014)*:
  - Create shared vision & develop partnerships
  - Evaluate existing water quality conditions
  - Identify sources of chloride in TCMA
  - Set realistic goals to protect all surface waters
  - Complete Chloride TMDLs for all impaired waters
  - Layout flexible implementation strategies that will help achieve water quality goals
  - Provide resources to assist with implementation and tracking progress


Inter-Agency Advisory Team
MPCA, MnDOT, Met Council, BWSR, DNR, USGS, Dept. of Health, U of M
Monitoring Sub-Group
MPCA, DNR, Met Council, USGS, local partners
Implementation Plan Committee
Winter Maintenance Professionals, Cities, Counties, MnDOT, WMOs/WDs
MPCA project team
Technical Advisory Committee
WMOs, WDs, Cities, Counties, MnDOT
Outreach Group
WMOs, WDs, MS4s, road salt applicators, Citizens
Technical Expert Group
Hands-on road salt applicators and suppliers
Education & Outreach Committee
MPCA, MnDOT & local education specialists

Stakeholder Meeting

Notes

Minutes

Presentations

Tips | Environmental concerns | Education/Resources | Training | TCMA Chloride Project | Meetings

All meeting information, including agendas, minutes, presentations, and electronic handouts can be found in PDF documents below. This document is bookmarked for ease in searching for specific meeting details.

Technical Advisory Committee meetings

- July 1, 2014, 1:00-3:30 pm
- April 23, 2014, 1:00-3:30 pm
- December 12, 2013, 1:00-3:30pm
- March 27, 2013, 9:30-12:00 pm
- January 15, 2013, 9:30-11:30 am
- October 12, 2011, 12-2:30 pm
- September 8, 2010, 1-3 pm
- TAC meeting information (wq-iw11-06r)

Inter-Agency Advisory Team meetings

- January 16, 2014
- November 16, 2010
- March 17, 2010
- IAT meeting information (wq-iw11-06h)

Monitoring Sub-Committee meetings

- February 26, 2013, 1-3 pm
- October 6, 2011, 9-11 am
- March 3, 2011, 9-10:30 am
- October 14, 2010, 1-2:30 pm

Education and Outreach Committee meetings

- March 11, 2014, 10-12 pm
- April 12, 2012, 9-12 pm
- December 7, 2011, 1:30-4 pm
- October 6, 2011, 1-3 pm
- EOC meeting information (wq-iw11-06y)

Implementation Plan Committee meetings

- May 9, 2013, 8:45-12:30 pm
- July 10, 2012, 8:30-1:00 pm
- IPC meeting information (wq-iw11-06z)

Outreach Group meetings

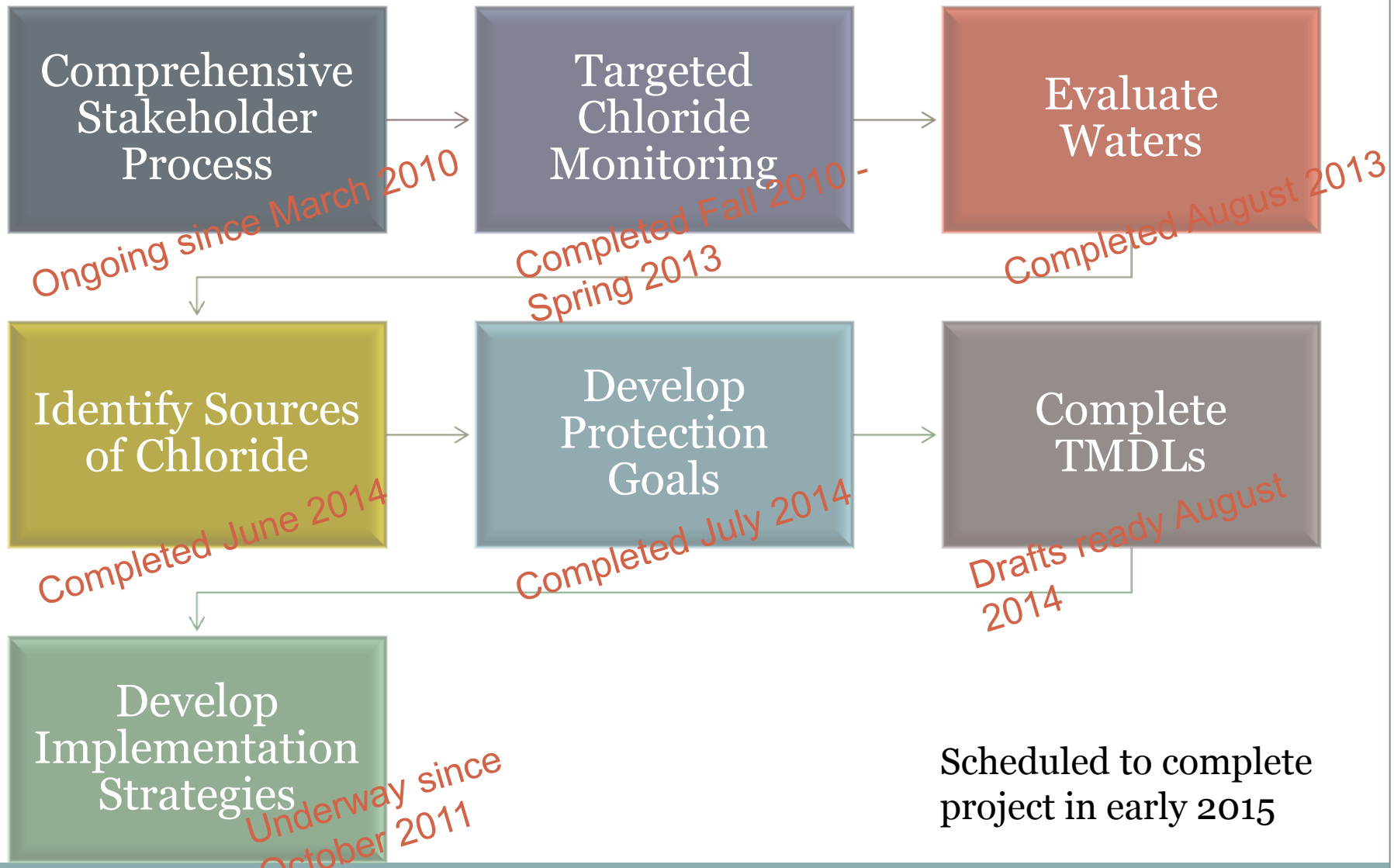
- Sand Creek Community Meeting: July 30, 2014, 1:00-3:00 pm

Outreach & General Communications

- MPCA Road Salt & Water Quality Website
- October 2011 - Poster at WRC
- August 2012 - Salt Dilemma Display created
- Jan. 2013 - EPA's Stormwater Pollution Prevention Webinar Series: Road Salt Pollution Prevention Strategies
- Numerous press releases and media interviews since 2010
- Road Salt Symposium annually since 2010
- Various public meetings since 2010

TCMA Chloride Project: Timeline

Began process in 2010



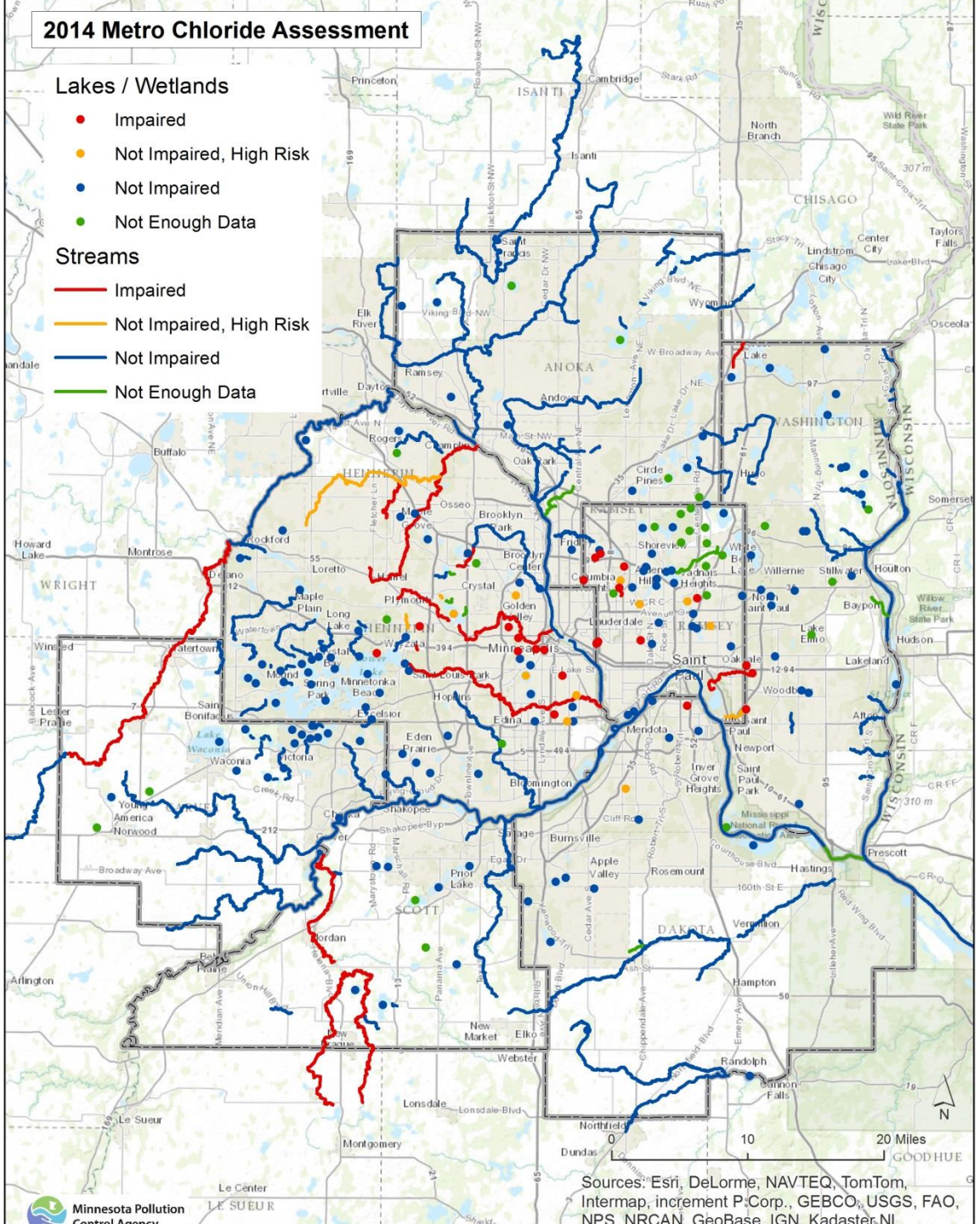
Scheduled to complete project in early 2015

TCMA Water Quality Conditions

- 38 lakes, streams & wetlands on DRAFT 303(d) list for chloride in the TCMA (roughly 10% assessed)
- 40 waters determined to be "High Risk"
  - *Defined as having values within 10% of the standard or at least one exceedance of the standard*
- Groundwater levels of chloride in the TCMA are increasing - 30% of wells above the standard
  - *Impact on baseflow levels of chloride is important*
- USGS groundwater data also shows Significant increase in chloride since 1996 in Upper Mississippi River Basin

Mo[illegible] Map

htt[illegible]


2014 Metro Chloride Assessment
Lakes / Wetlands
Impaired
Not Impaired, High Risk
Not Impaired
Not Enough Data
Streams
Impaired
Not Impaired, High Risk
Not Impaired
Not Enough Data
0
10
20 Miles
N
Sources: Esri, DeLorme, NAVTEQ, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL
Minnesota Pollution Control Agency

TCMA Chloride Management Plan

Goal of the CMP

Purpose

- Inform an understanding of the impacts of chloride on TCMA water quality
- Develop an appreciation of the competing demands of level of service and reduced salt usage
- Set performance-based goals for restoration and protection
- Inform and guide implementation of improved winter maintenance practices and policy needs
- Demonstrate the success and economic benefits of improved practices

Scope

- Status and trends of chloride levels in lakes, streams and groundwater
- Sources of chloride
- Restoration and protection goals
- Implementation strategies to reduce chloride impacts
- Continued monitoring, tracking and adaptive management

Audience

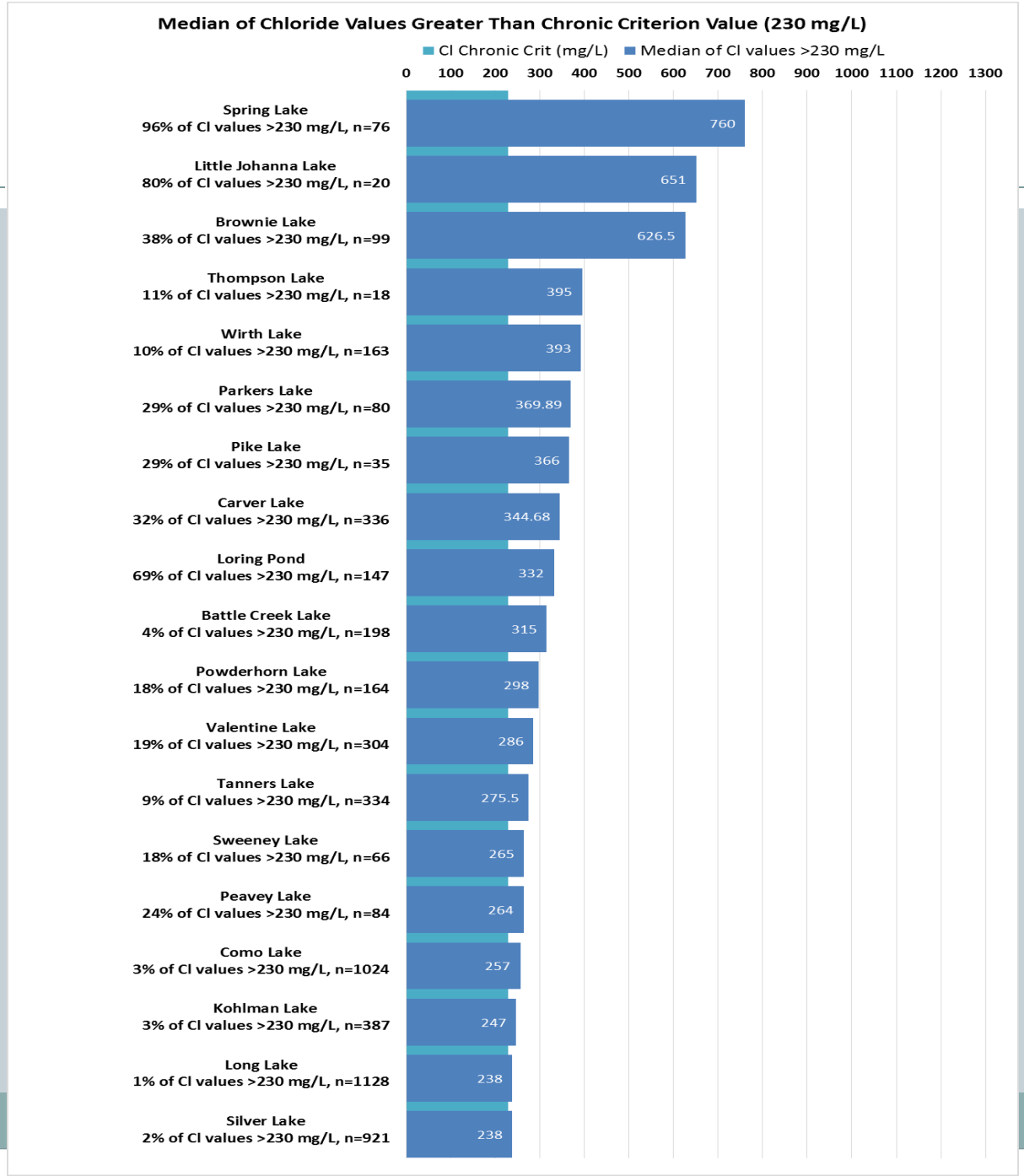
- Local working groups (local governments, watershed management groups, etc.)
- Winter maintenance groups (MnDOT, local governments, private applicators, commercial property owners, residents, etc.)
- State agencies (MPCA, MnDOT, DNR, BWSR, etc.)

Outline of the CMP

- 1. Background and Description
- 2. TCMA Chloride Conditions
  - Water quality conditions, trends, sources and TMDL summary
- 3. Prioritizing and Implementing Restoration & Protection
  - Discuss Winter Maintenance Assessment tool, Implementation strategies, Education resources, prioritizing efforts, funding opportunities
  - Case studies
- 4. Monitoring and Tracking
  - Recommendations for continued monitoring, Tracking implementation efforts,

Seasonal Chloride Trends

- Lakes = chloride is highest in Jan. – May
- Streams = chloride is highest Dec. – April
- Streams influenced by wastewater treatment plant discharges = chloride is highest during low flow conditions


Median of Chloride Values Greater Than Chronic Criterion Value (230 mg/L)
Cl Chronic Crit (mg/L)
Median of Cl values >230 mg/L
0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300
Spring Lake
96% of Cl values >230 mg/L, n=76
760
Little Johanna Lake
80% of Cl values >230 mg/L, n=20
651
Brownie Lake
38% of Cl values >230 mg/L, n=99
626.5
Thompson Lake
11% of Cl values >230 mg/L, n=18
395
Wirth Lake
10% of Cl values >230 mg/L, n=163
393
Parkers Lake
29% of Cl values >230 mg/L, n=80
369.89
Pike Lake
29% of Cl values >230 mg/L, n=35
366
Carver Lake
32% of Cl values >230 mg/L, n=336
344.68
Loring Pond
69% of Cl values >230 mg/L, n=147
332
Battle Creek Lake
4% of Cl values >230 mg/L, n=198
315
Powderhorn Lake
18% of Cl values >230 mg/L, n=164
298
Valentine Lake
19% of Cl values >230 mg/L, n=304
286
Tanners Lake
9% of Cl values >230 mg/L, n=334
275.5
Sweeney Lake
18% of Cl values >230 mg/L, n=66
265
Peavey Lake
24% of Cl values >230 mg/L, n=84
264
Como Lake
3% of Cl values >230 mg/L, n=1024
257
Kohlman Lake
3% of Cl values >230 mg/L, n=387
247
Long Lake
1% of Cl values >230 mg/L, n=1128
238
Silver Lake
2% of Cl values >230 mg/L, n=921
238

Sources

- Researched existing studies and information
- Refined estimate of private Parking Lot & Sidewalk application rates for MN (6.4 tons/acre/year)
- Identified all permitted entities with potential chloride discharges
  - MS4s, WWTPs (water softening), Industrial dischargers
- Others potential sources:
  - Septic Systems
  - Fertilizers (literature values)
  - Natural Background (minimal in TCMA)

Impaired waters

Waterbody name	Water type	WID	Chloride Impaired or High Risk	Year added to 303(d) list
Bass Creek	Stream	07010206-784	Impaired	2002
Bassett Creek	Stream	07010206-538	Impaired	2010
Battle Creek	Stream	07010206-592	Impaired	2010
Battle Creek Lake	Lake	82-0091-00	Impaired	2014
Brownie Lake	Lake	27-0038-00	Impaired	2014
Carver Lake	Lake	82-0166-00	Impaired	2014
Como Lake	Lake	62-0055-00	Impaired	2014
Crow River, South Fork	Stream	07010205-508	Impaired	2010
Diamond Lake	Wetland	27-0022-00	Impaired	2014
Elm Creek	Stream	07010206-508	Impaired	2014
Judicial Ditch 2	Stream	07030005-525	Impaired	2012
Kasota Pond North	Wetland	62-0280-00	Impaired	2014
Kasota Pond West	Wetland	62-0281-00	Impaired	2014
Kohlman Lake	Lake	62-0006-00	Impaired	2014
Little Johanna Lake	Lake	62-0058-00	Impaired	2014
Long Lake South	Lake	62-0067-02	Impaired	2014
Loring Lake (South Bay)	Lake	27-0655-02	Impaired	2014
Mallard Marsh	Wetland	62-0259-00	Impaired	2014
Minnehaha Creek	Stream	07010206-539	Impaired	2008
Parkers Lake	Lake	27-0107-00	Impaired	2014
Peavey Lake	Lake	27-0138-00	Impaired	2014
Pike Lake	Lake	62-0069-00	Impaired	2014
Plymouth Creek	Stream	07010206-526	Impaired	2014
Powderhorn Lake	Lake	27-0014-00	Impaired	2014
Raven Creek	Stream	07020012-716	Impaired	2010
Raven Creek East Branch	Stream	07020012-543	Impaired	2010
Rush Creek, South Fork	Stream	07010206-732	Impaired	2014
Sand Creek	Stream	07020012-662	Impaired	2014
Sand Creek South	Stream	07020012-513	Impaired	2010
Silver Lake	Lake	62-0083-00	Impaired	2014
Spring Lake	Lake	27-0654-00	Impaired	2014
Sweeney Lake	Lake	27-0035-01	Impaired	2014
Tanners Lake	Lake	82-0115-00	Impaired	2014
Thompson Lake	Lake	19-0048-00	Impaired	2014
Unnamed Creek	Stream	07010206-718	Impaired	2014
Unnamed Creek	Stream	07010206-745	Impaired	2010
Unnamed Creek (County Ditch 4)	Stream	07010206-909	Impaired	2014
Valentine Lake	Lake	62-0071-00	Impaired	2014

High Risk waters

Waterbody name	Water type	WID	Chloride Impaired or High Risk
Beaver Lake	Lake	62-0016-00	High Risk
Bennett Lake	Lake	62-0048-00	High Risk
Bevens Creek	Stream	07020012-718	High Risk
Bluff Creek	Stream	07020012-710	High Risk
Calhoun Lake	Lake	27-0031-00	High Risk
Centerville Lake	Lake	02-0006-00	High Risk
Classen Lake Creek	Stream	07010206-703	High Risk
Clearwater Creek	Stream	07010206-519	High Risk
County Ditch 17 (Spring Brook)	Stream	07010206-557	High Risk
Credit River	Stream	07020012-517	High Risk
Crosby Lake	Lake	62-0047-00	High Risk
Crystal Lake	Lake	27-0034-00	High Risk
Diamond Creek	Stream	07010206-525	High Risk
Dutch Lake Outlet	Stream	07010206-678	High Risk
Fish Creek	Stream	07010206-606	High Risk
Fish Lake	Lake	19-0057-00	High Risk
Gervais Lake	Lake	62-0007-00	High Risk
Hiawatha Lake	Lake	27-0018-00	High Risk
Johanna Lake	Lake	62-0078-00	High Risk
Keller Lake (Main)	Lake	62-0010-02	High Risk
Lake Of The Isles	Lake	27-0040-00	High Risk
McCarron Lake	Lake	62-0054-00	High Risk
Medicine Lake	Lake	27-0104-00	High Risk
Minnesota River	Stream	07020012-505	High Risk
Painter Creek	Stream	07010206-700	High Risk
Rush Creek	Stream	07010206-528	High Risk
Ryan Lake	Lake	27-0058-00	High Risk
Taft Lake	Lake	27-0683-00	High Risk
Unnamed Creek	Stream	07010206-704	High Risk
Unnamed Creek	Stream	07010206-740	High Risk
Unnamed Creek (Pleasure Ck)	Stream	07010206-594	High Risk
Unnamed Lake	Lake	62-0278-00	High Risk
Unnamed Stream (Perro Ck)	Stream	07030005-612	High Risk
Unnamed Stream (Sand Ck)	Stream	07010206-744	High Risk
Unnamed Stream (Trib To Long Lk) (Furgala Creek)	Stream	07030005-765	High Risk
Unnamed Stream In Plymouth	Stream	07010206-738	High Risk
Unnamed Stream Receiving Wtr From Medicine Lk	Stream	07010206-785	High Risk
Unnamed Trib To County Ditch 17	Stream	07010206-904	High Risk
Vermillion River	Stream	07040001-507	High Risk
Wabasso Lake	Lake	62-0082-00	High Risk
Wakefield Lake	Lake	62-0011-00	High Risk
Wirth Lake	Lake	27-0037-00	High Risk

Protection & Restoration Strategy

- Same BMPs for protection as for impaired waters
- Prevention is the only option for reducing salt loadings
- Primary objective is to get all winter maintenance programs performing at a level that is using minimal amount of salt
- Set water quality goals for point sources to work towards meeting
- Allow flexibility in implementation

Protection & Restoration Goals

- Performance based approach vs. numeric goals
- Applied to both protection and restoration goals
- Objective is to make continued progress towards chloride reductions
- Winter Maintenance Assessment tool allows for charting individual paths
- Set interim milestones to ensure progress:
  - Goal 1 to assess current winter maintenance operations & develop plan specific to your organization
  - Goal 2 may be to achieve a 50% improvement in BMPs

Performance Based Approach - TMDLs

- Establish equitable wasteload and load allocations
- Focus less on specific numbers to meet, more on making progress with BMPs
  - Need specific number to meet TMDL requirements
  - Measure progress by degree of implementation and trends in ambient monitoring
    - Not by accounting for salt applied and comparing to individual numeric targets
- Allows for flexibility in implementation

Implementation Strategies

- Winter Maintenance Assessment tool intended for local use to develop detailed, customized plan
- Summary of the BMP questions will be in appendix
- Focus of the strategy in the CMP will be considering big picture strategies for everyone
- Non-traditional options for low salt winter maintenance
- BMPs for chloride use within traditional framework

Implementation Strategies: Non-traditional options

- Adopting a lower level of service
- Alternative types of pavement
- Tire strategies
- Non-chloride deicers

Implementation Strategies: Traditional

- Shift from granular to liquids
- Improved physical snow removal
- Lessen ice/snow bond with pavement
- Training for maintenance professionals
- Increase knowledge of salt related water quality issues for public and elected officials

Appendices

- TCMA Chloride TMDL
- Watershed modeling details
- Winter Maintenance Assessment tool description

- Any other information that might be helpful here?

Timeline & Next Steps

- Draft Chloride Management Plan and Draft TMDL review by MPCA – October 2014
- Unofficial review by Stakeholders – November 2014
- Submit draft TMDL to EPA for review
- Public Notice process
- Final approval of TMDL by EPA

Questions

Brooke Asleson

Watershed Project Manager

651/757-2205

brooke.asleson@state.mn.us

Twin Cities Metro Chloride Project

IPC Meeting

Draft Chloride TMDL Overview

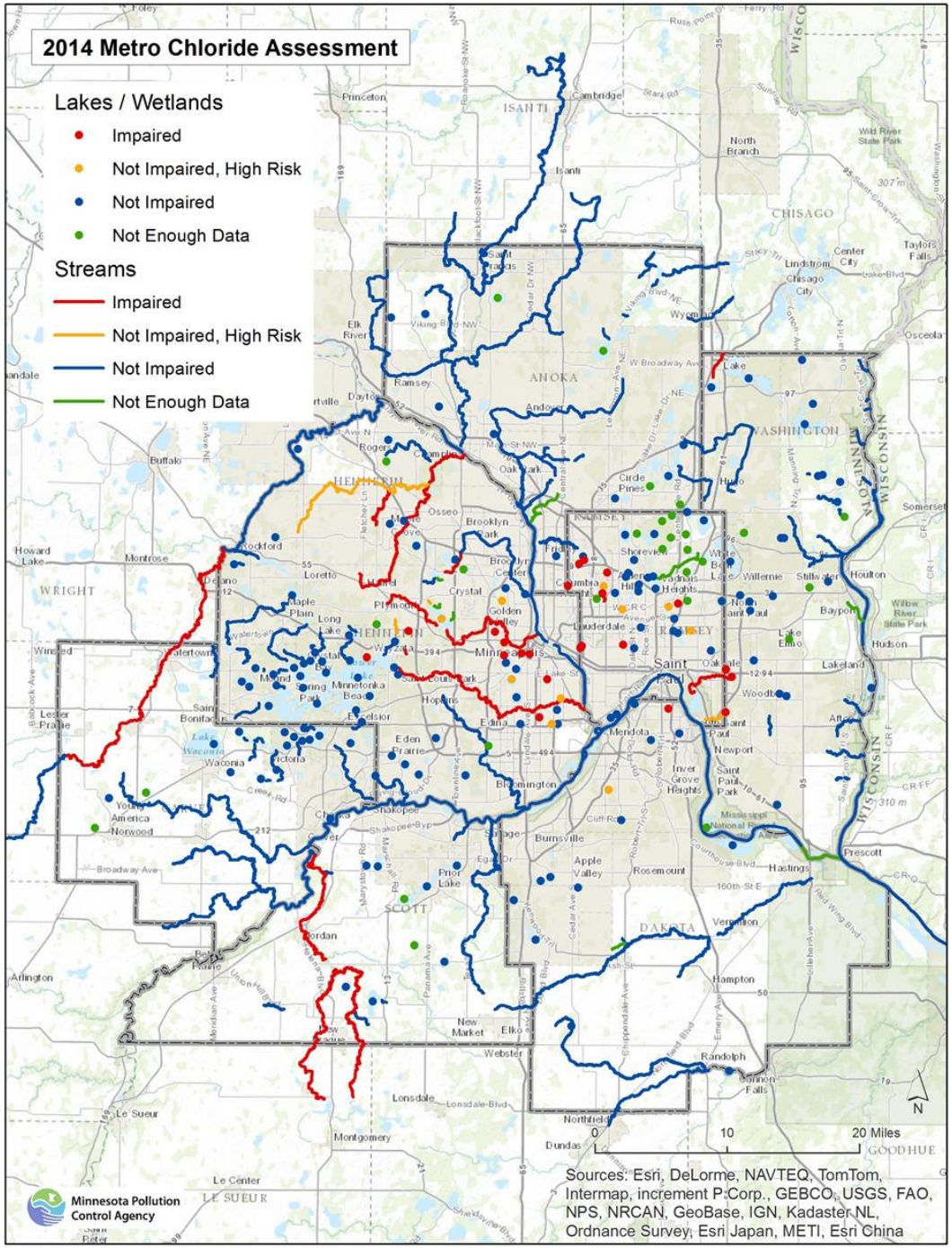
September 30, 2014

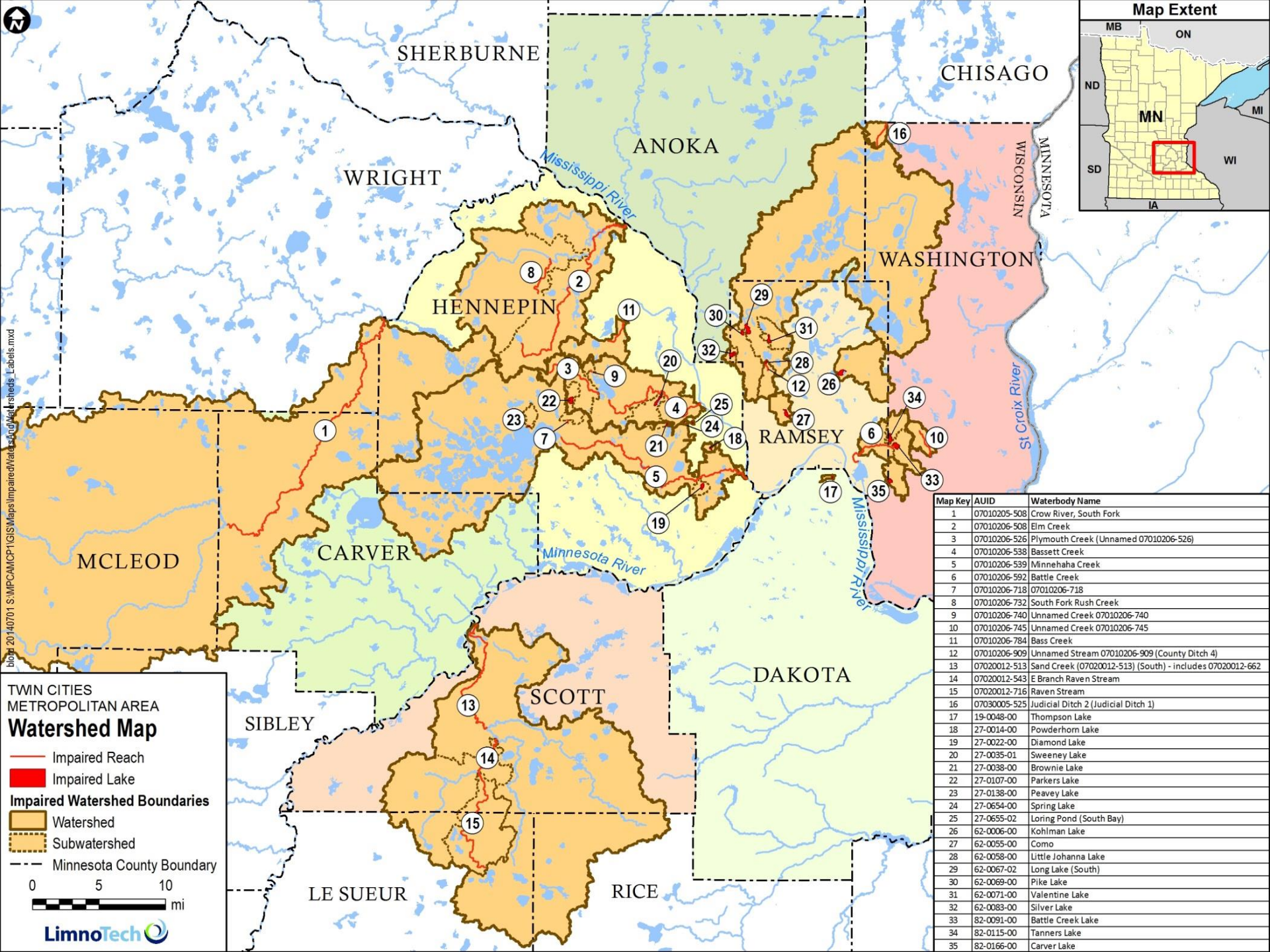
LimnoTech

Water Environment | Scientists Engineers

Impaired Waters

- 38 impaired waterbodies
- 23 lakes and wetlands
- 15 streams reaches

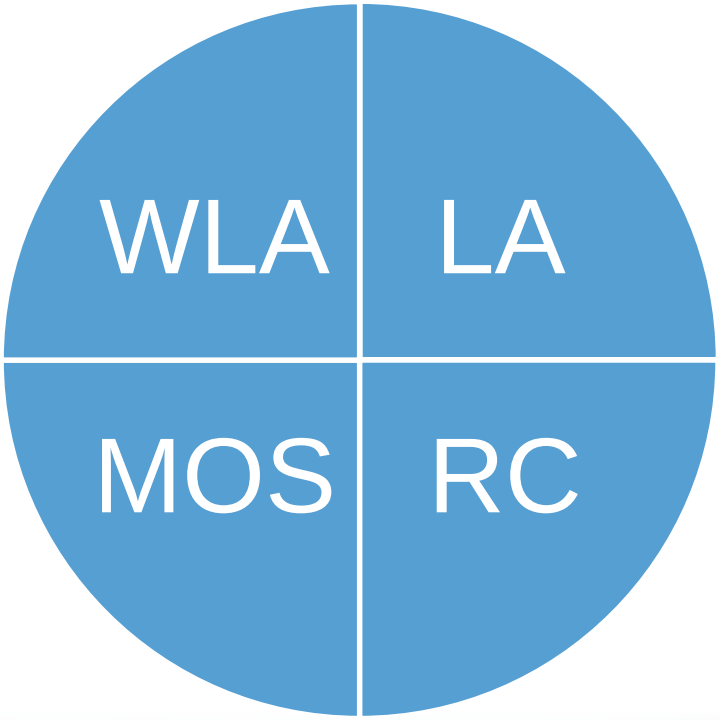




Map Key	AUID	Waterbody Name
1	07010205-508	Crow River, South Fork
2	07010206-508	Elm Creek
3	07010206-526	Plymouth Creek (Unnamed 07010206-526)
4	07010206-538	Bassett Creek
5	07010206-539	Minnehaha Creek
6	07010206-592	Battle Creek
7	07010206-718	07010206-718
8	07010206-732	South Fork Rush Creek
9	07010206-740	Unnamed Creek 07010206-740
10	07010206-745	Unnamed Creek 07010206-745
11	07010206-784	Bass Creek
12	07010206-909	Unnamed Stream 07010206-909 (County Ditch 4)
13	07020012-513	Sand Creek (07020012-513) (South) - includes 07020012-662
14	07020012-543	E Branch Raven Stream
15	07020012-716	Raven Stream
16	07030005-525	Judicial Ditch 2 (Judicial Ditch 1)
17	19-0048-00	Thompson Lake
18	27-0014-00	Powderhorn Lake
19	27-0022-00	Diamond Lake
20	27-0035-01	Sweeney Lake
21	27-0038-00	Brownie Lake
22	27-0107-00	Parkers Lake
23	27-0138-00	Peavey Lake
24	27-0654-00	Spring Lake
25	27-0655-02	Loring Pond (South Bay)
26	62-0006-00	Kohlman Lake
27	62-0055-00	Como
28	62-0058-00	Little Johanna Lake
29	62-0067-02	Long Lake (South)
30	62-0069-00	Pike Lake
31	62-0071-00	Valentine Lake
32	62-0083-00	Silver Lake
33	82-0091-00	Battle Creek Lake
34	82-0115-00	Tanners Lake
35	82-0166-00	Carver Lake

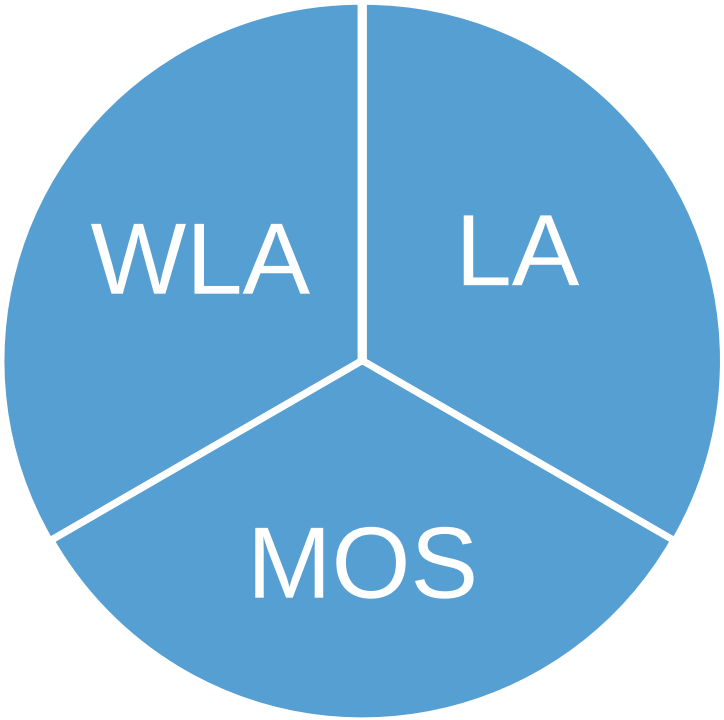
How much salt can our lakes and streams handle???

TMDL = WLA + LA + MOS + RC

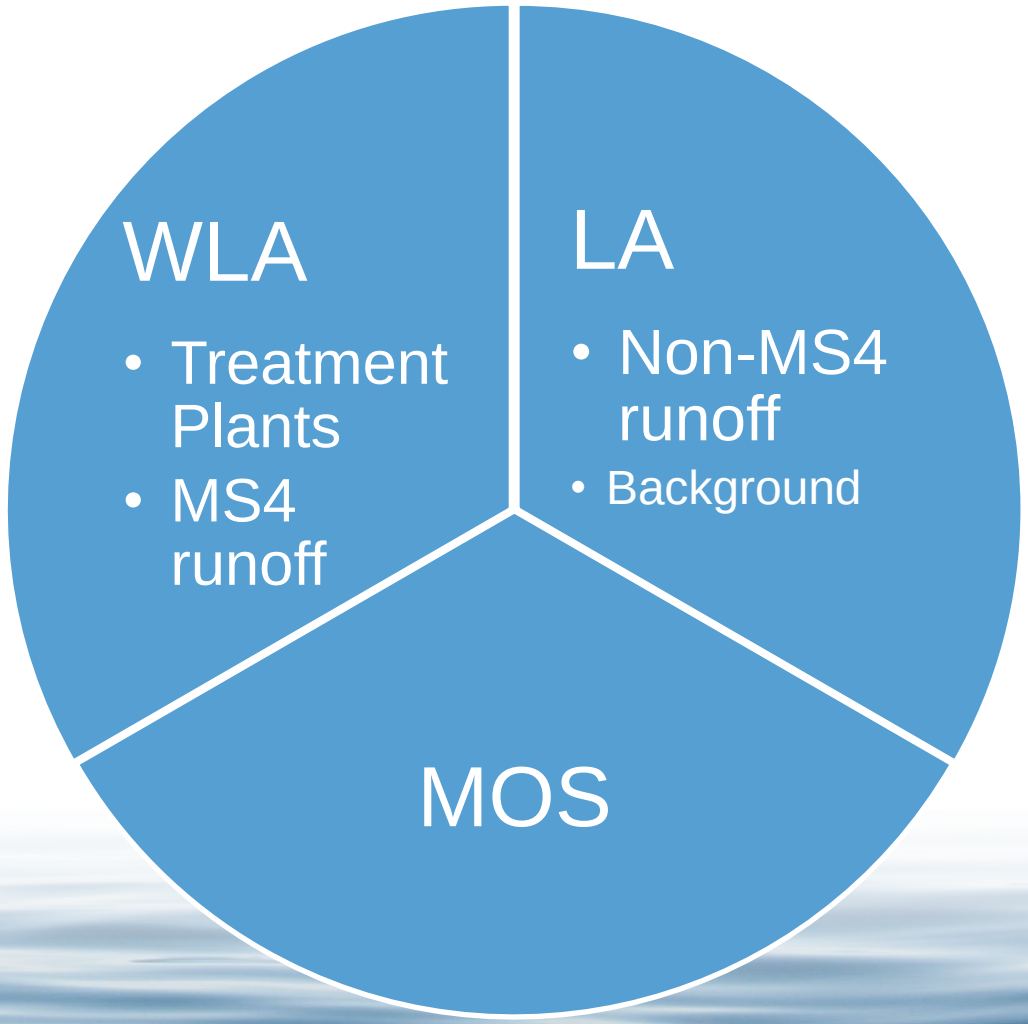


How much salt can our lakes and streams handle???

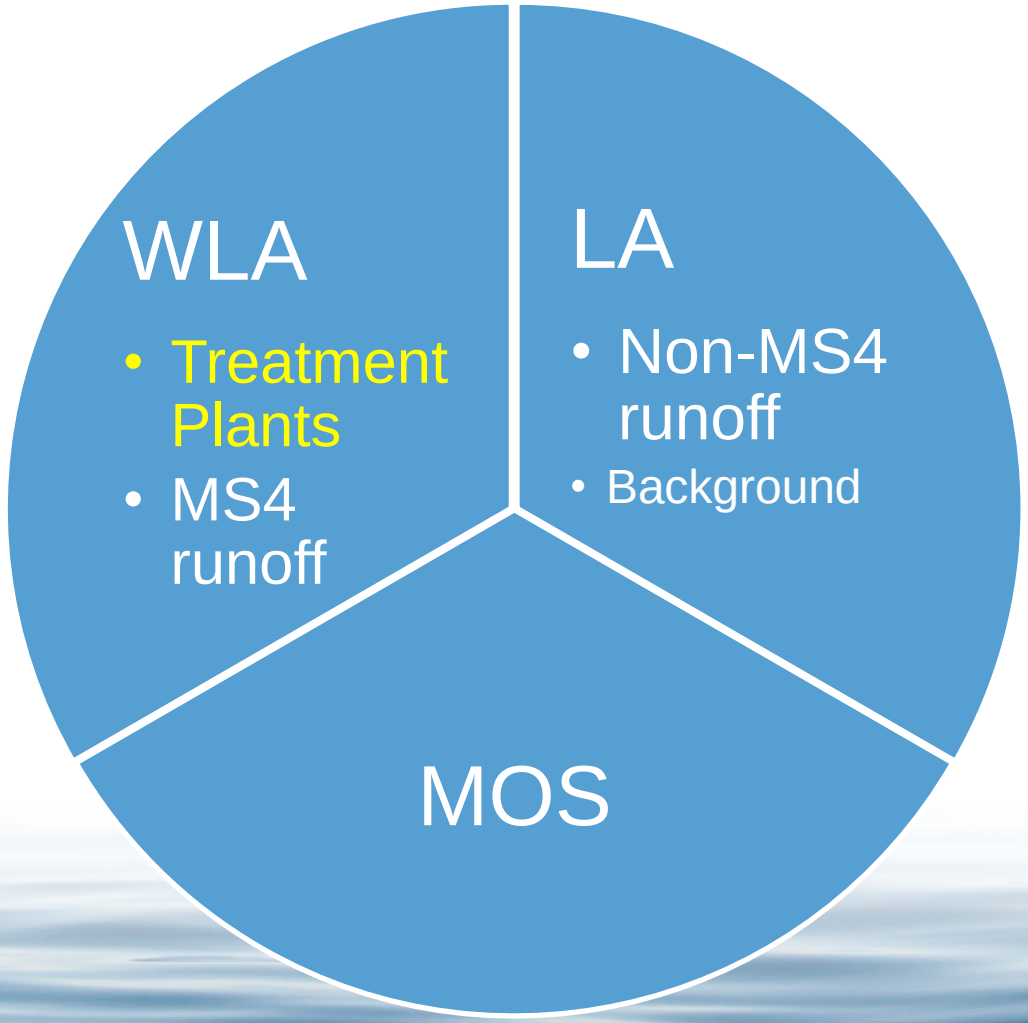
TMDL = WLA + LA + MOS



TMDL = WLA + LA + MOS



TMDL = WLA + LA + MOS

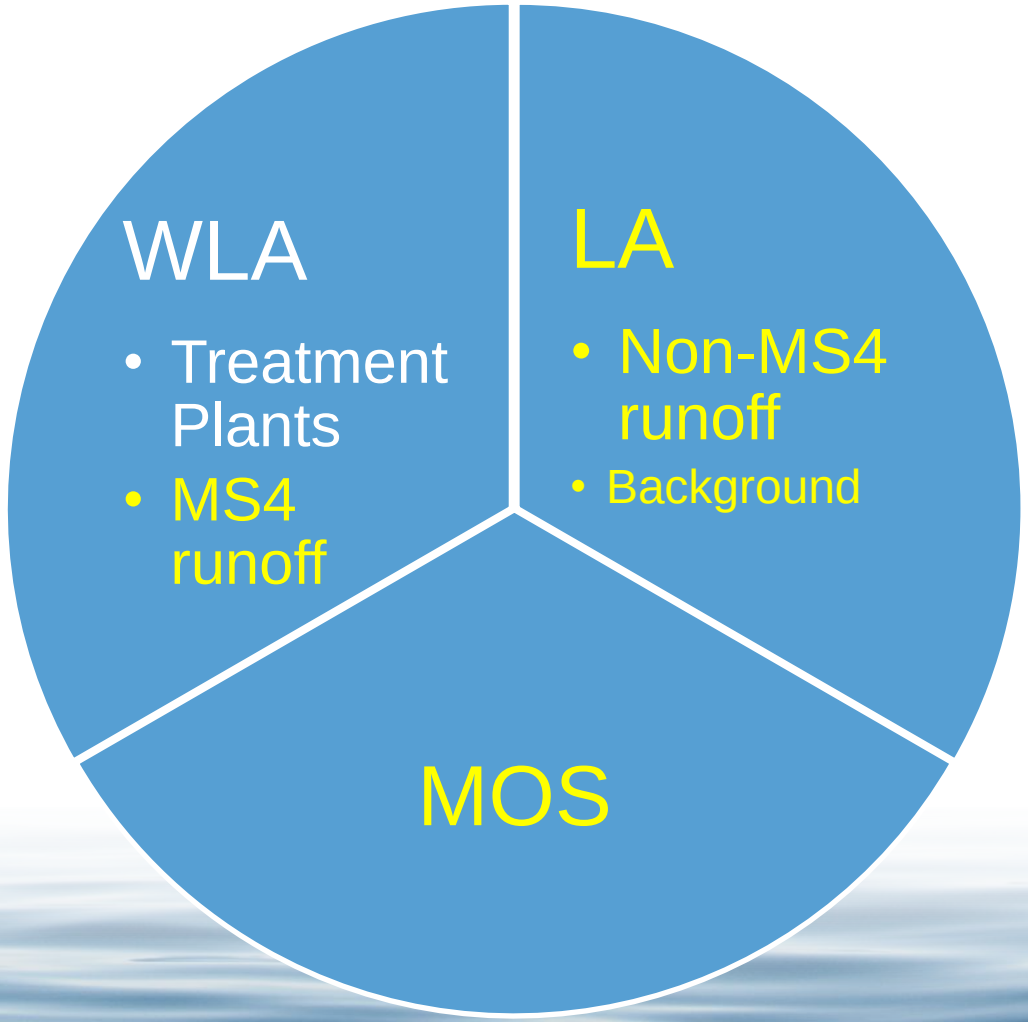


Treatment Plant WLAs

$$WLA_{TP} = \text{Design flow} * \text{Water Quality Criterion}$$

$$= Q_{design} * 230 \text{ mg/L}$$

Runoff Load

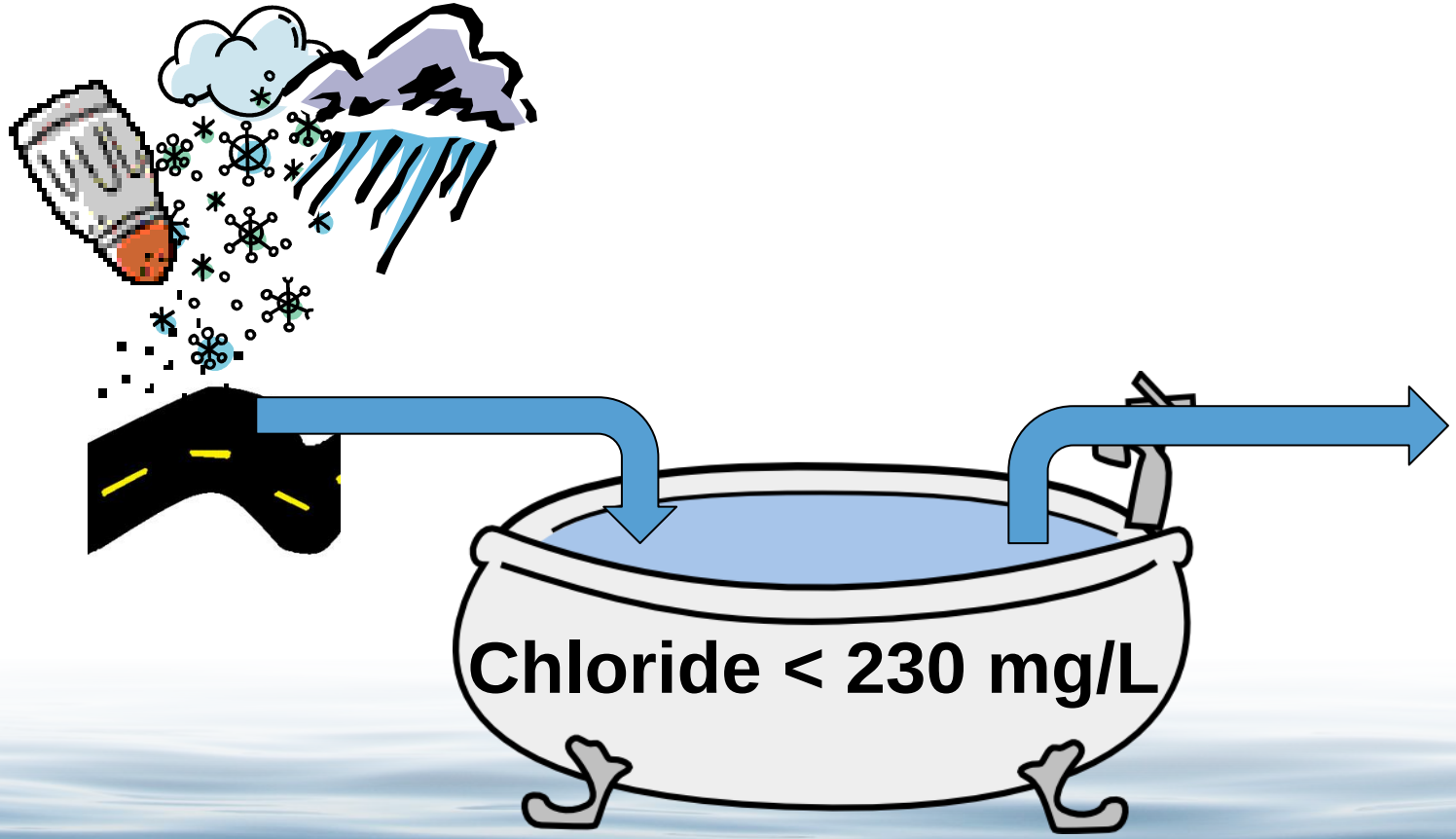

WLA
• Treatment Plants
• MS4 runoff
LA
• Non-MS4 runoff
• Background
MOS

Runoff Load

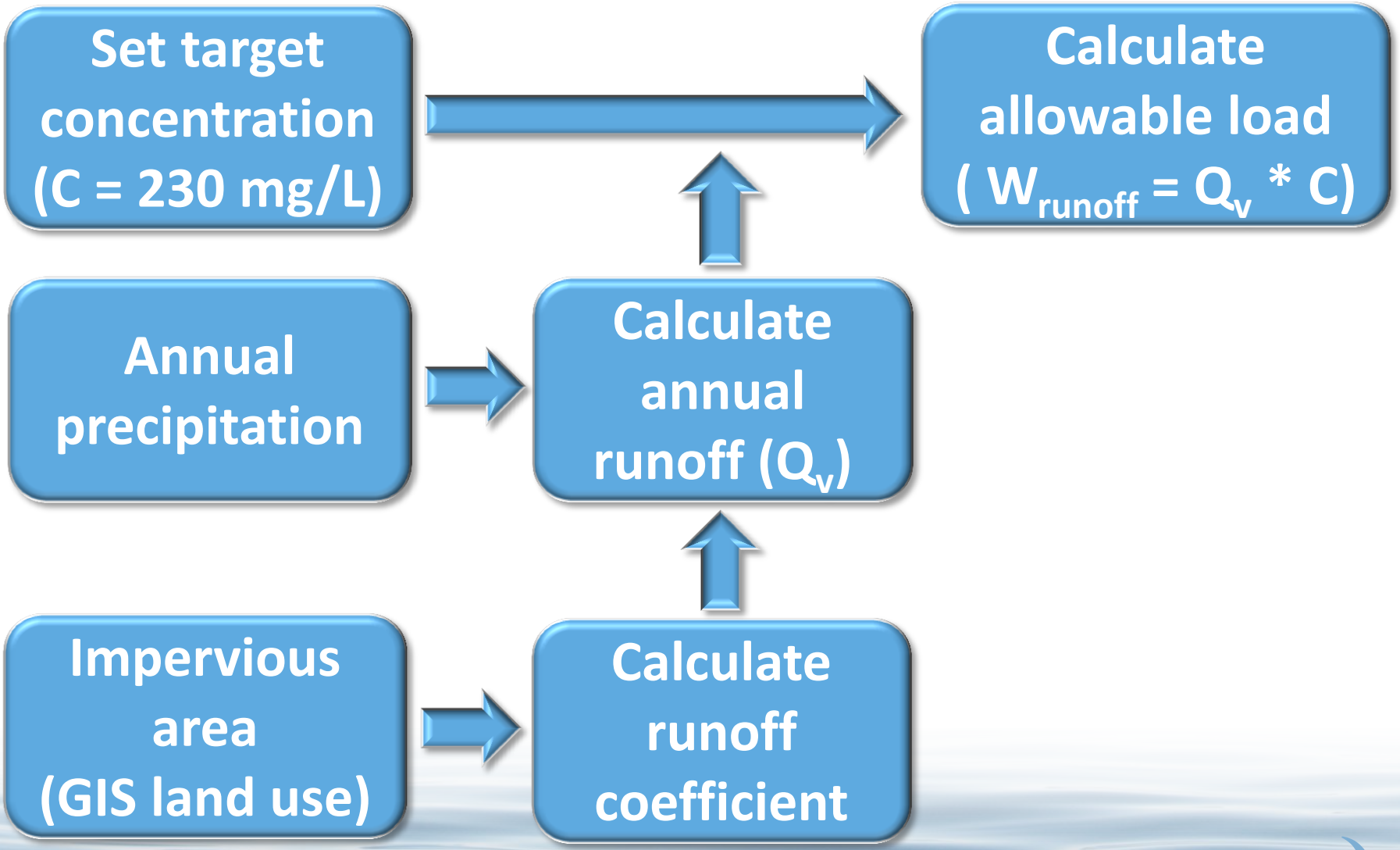
$$\text{Runoff load} = WLA_{MS4} + LA + MOS$$

$$\text{Runoff load} = WLA_{MS4} + LA_{non\text{-}MS4} + LA_{background} + MOS$$

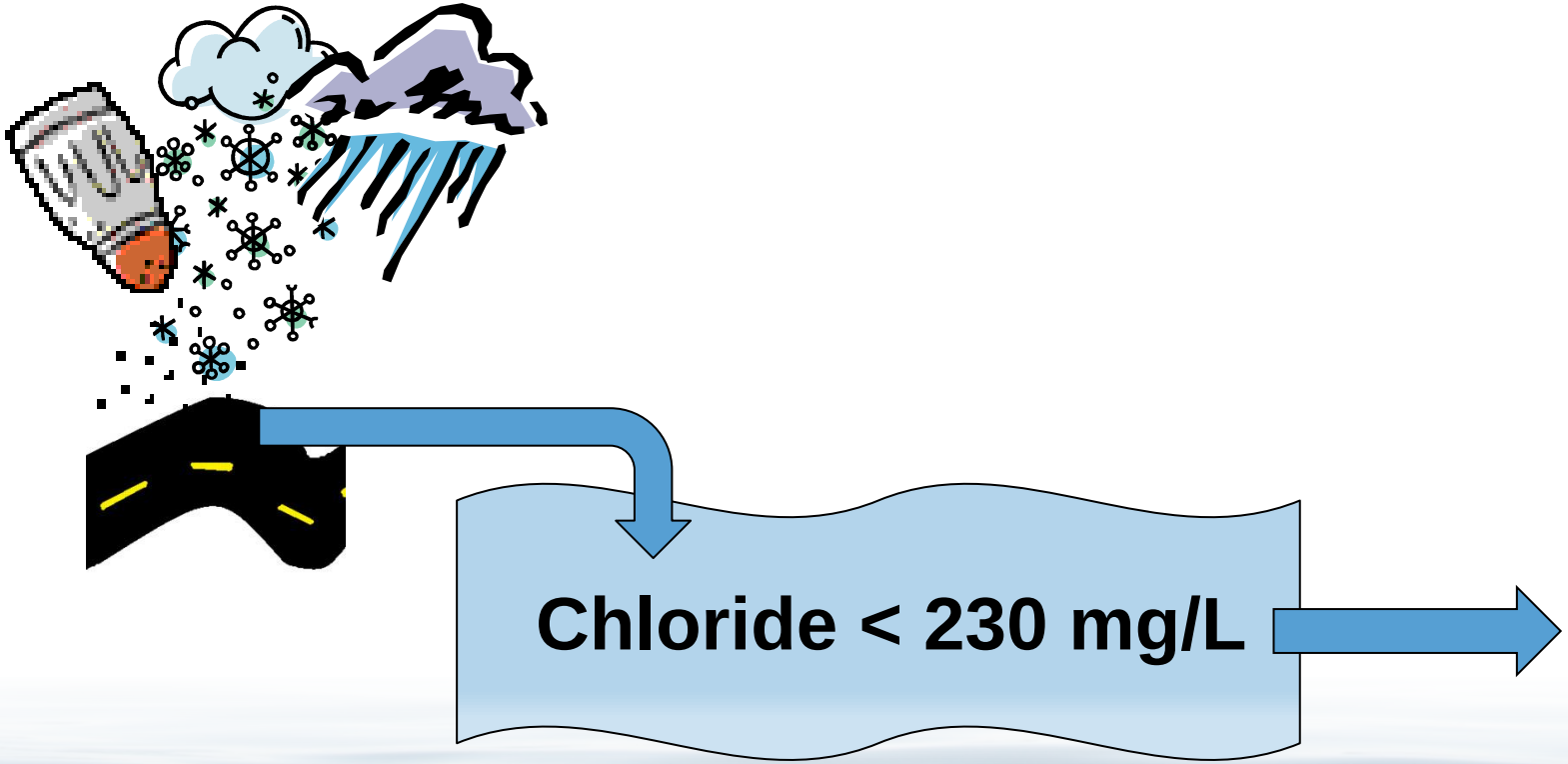
Lakes – Annual Runoff Load



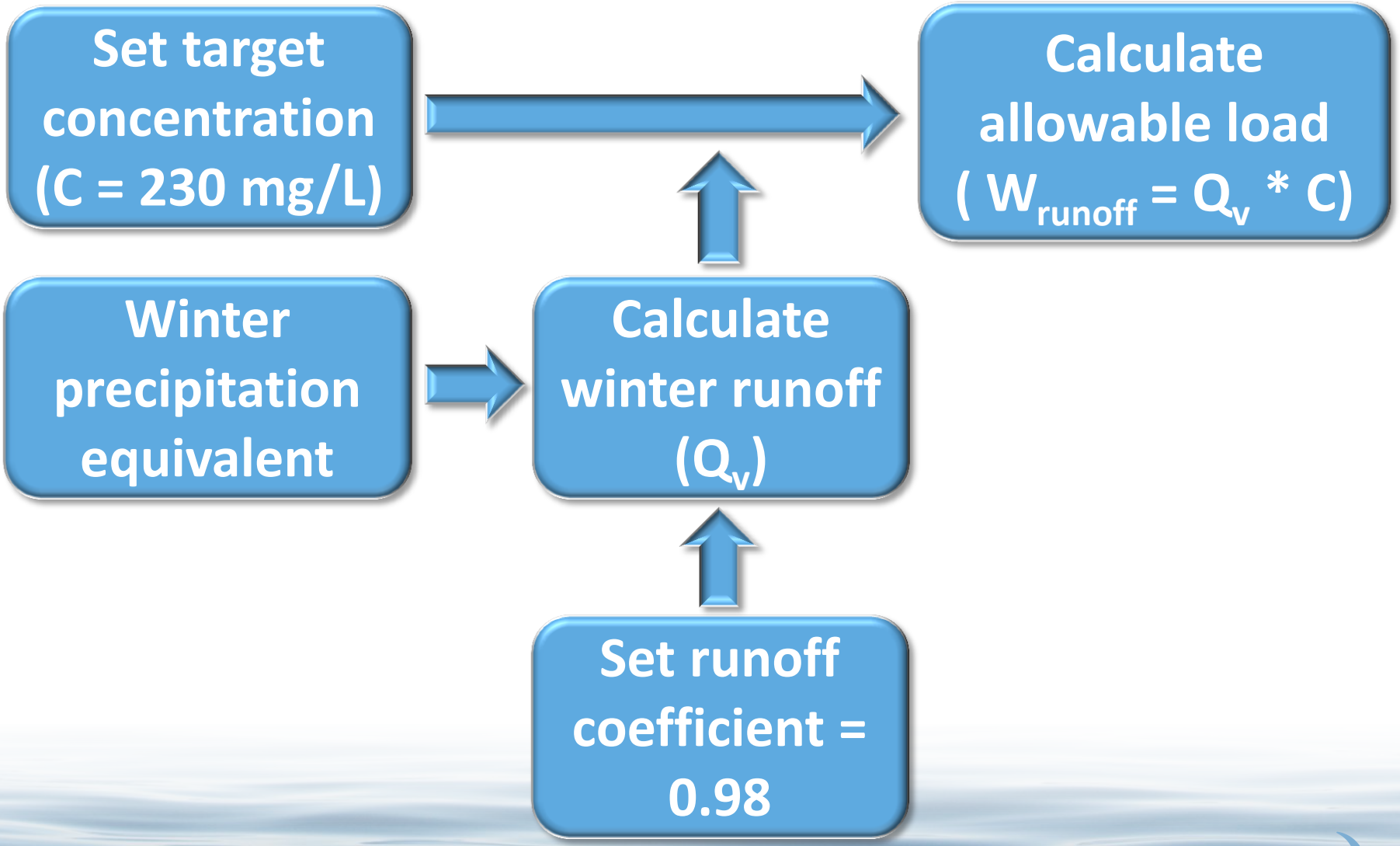
Lakes – Annual Runoff Load



Streams – Seasonal Runoff Load



Streams – Seasonal Runoff Load



Runoff Load

$$\text{Runoff load} = WLA_{MS4} + LA + MOS$$

$$\text{Runoff load} = WLA_{MS4} + LA_{non\text{-}MS4} + LA_{background} + MOS$$

$$MOS = 10\% \text{ of Runoff Load}$$

$$(1\text{-}0.1) * \text{Runoff Load} = WLA_{MS4} + LA_{non\text{-}MS4} + LA_{background}$$

Natural Background Load

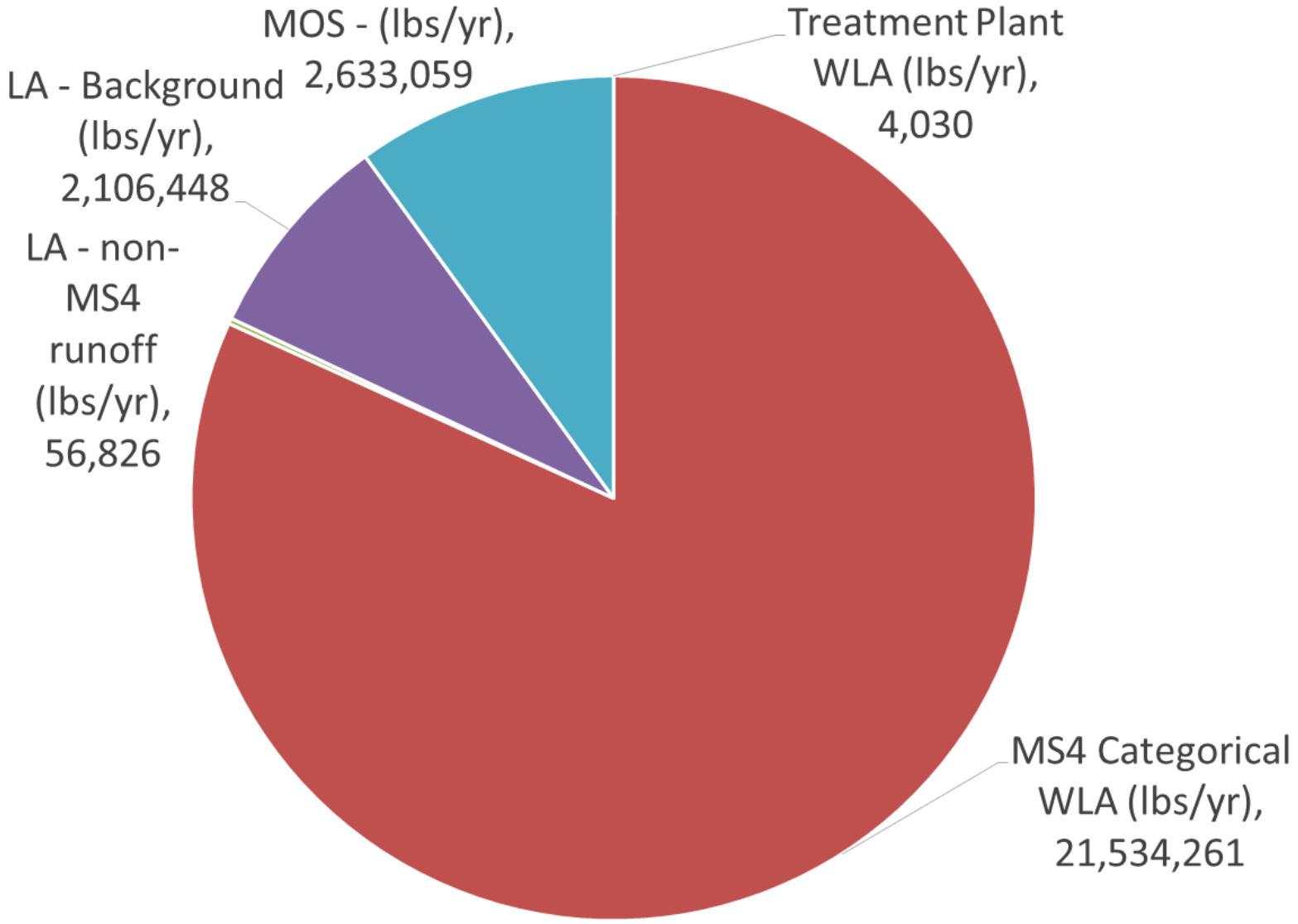
- Natural Background = 18.4 mg/L (Novotny, 2008)
  - 8% of runoff load: 0.08 * Runoff Load

$$(1 - 0.1 - 0.08) * \text{Runoff Load} = WLA_{MS4} + LA_{non\text{-}MS4}$$

$$(0.82) * \text{Runoff Load} = WLA_{MS4} + LA_{non\text{-}MS4}$$

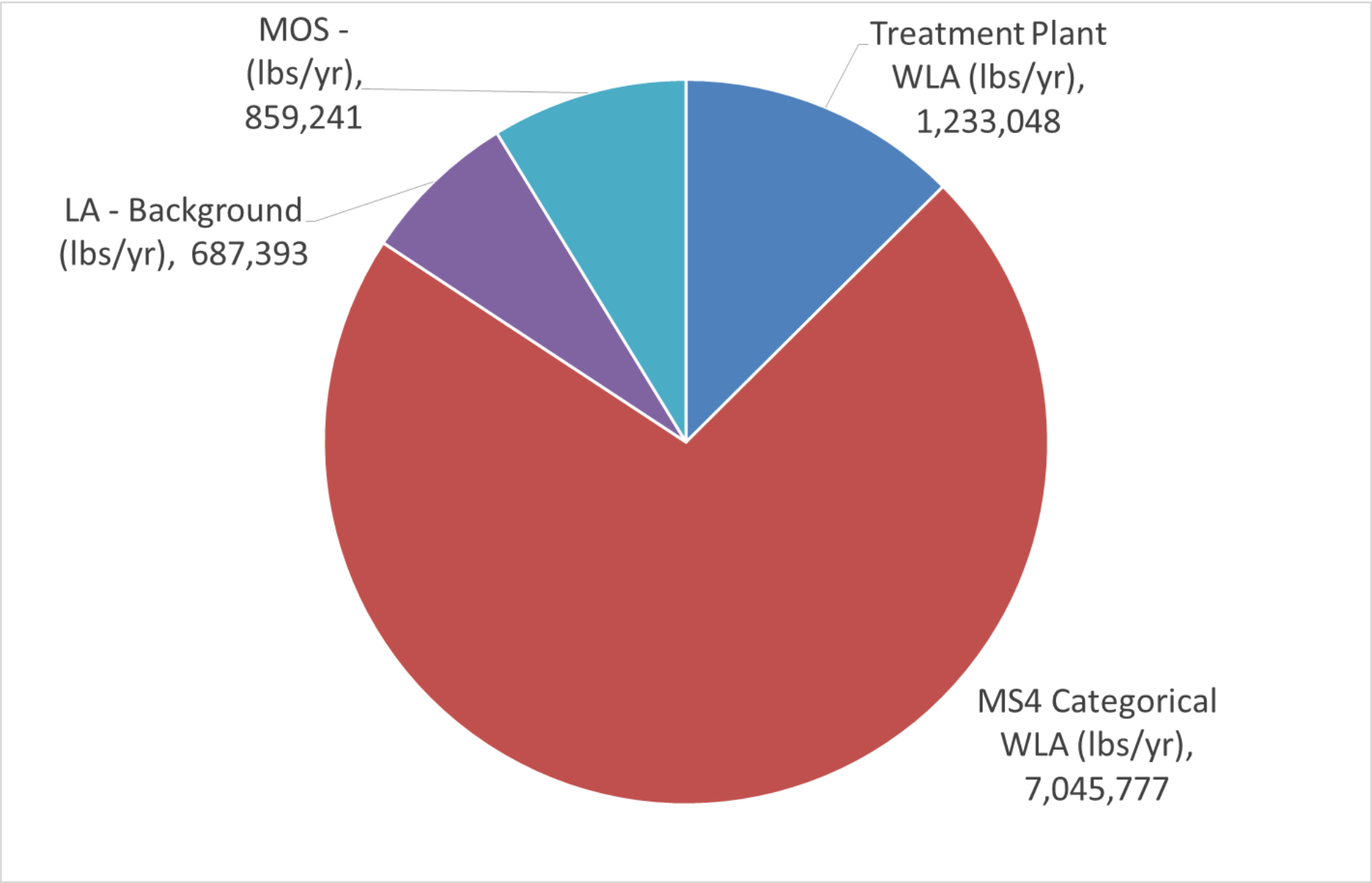
Lake	WBID	Watershed Area (ac)	TMDL (lbs/yr)	Treatment Plant WLA (lbs/yr)	MS4 Categorical WLA (lbs/yr)	LA - non-MS4 runoff (lbs/yr)	LA - Background (lbs/yr)	MOS - (lbs/yr)
Battle Creek Lake	82-0091-00	4,326	2,153,698		1,766,033		172,296	215,370
Brownie Lake	27-0038-00	391	263,812		216,326		21,105	26,381
Carver Lake	82-0166-00	2,242	1,071,124		878,321		85,690	107,112
Como	62-0055-00	1,850	994,078		815,144		79,526	99,408
Kohlman Lake	62-0006-00	7,533	4,839,183	1,050,484	3,106,733		303,096	378,870
Little Johanna Lake	62-0058-00	1,703	1,224,243		1,003,879		97,939	122,424
Long Lake (South)	62-0067-02	114,785	26,334,624	4,030	21,534,261	56,826	2,106,448	2,633,059
Loring Pond (South Bay)	27-0655-02	34	9,764		8,007		781	976
Parkers Lake	27-0107-00	1,064	1,431,262	787,163	528,161		51,528	64,410
Peavey Lake	27-0138-00	776	205,995	3,692	165,889		16,184	20,230
Pike Lake	62-0069-00	5,735	3,591,268	1,059	2,943,971		287,217	359,021
Powderhorn Lake	27-0014-00	332	218,587		179,242		17,487	21,859
Silver Lake	62-0083-00	655	370,011		303,409		29,601	37,001
Spring Lake	27-0654-00	76	44,264		36,296		3,541	4,426
Sweeney Lake	27-0035-01	2,439	1,456,271		1,194,142		116,502	145,627
Tanners Lake	82-0115-00	1,732	826,520		677,746		66,122	82,652
Thompson Lake	19-0048-00	178	134,340		110,159		10,747	13,434
Valentine Lake	62-0071-00	2,404	1,165,072		955,359		93,206	116,507
Diamond Lake (wetland)	27-0022-00	744	486,017		398,534		38,881	48,602

Long Lake TMDL = 26,334,624 lbs/yr

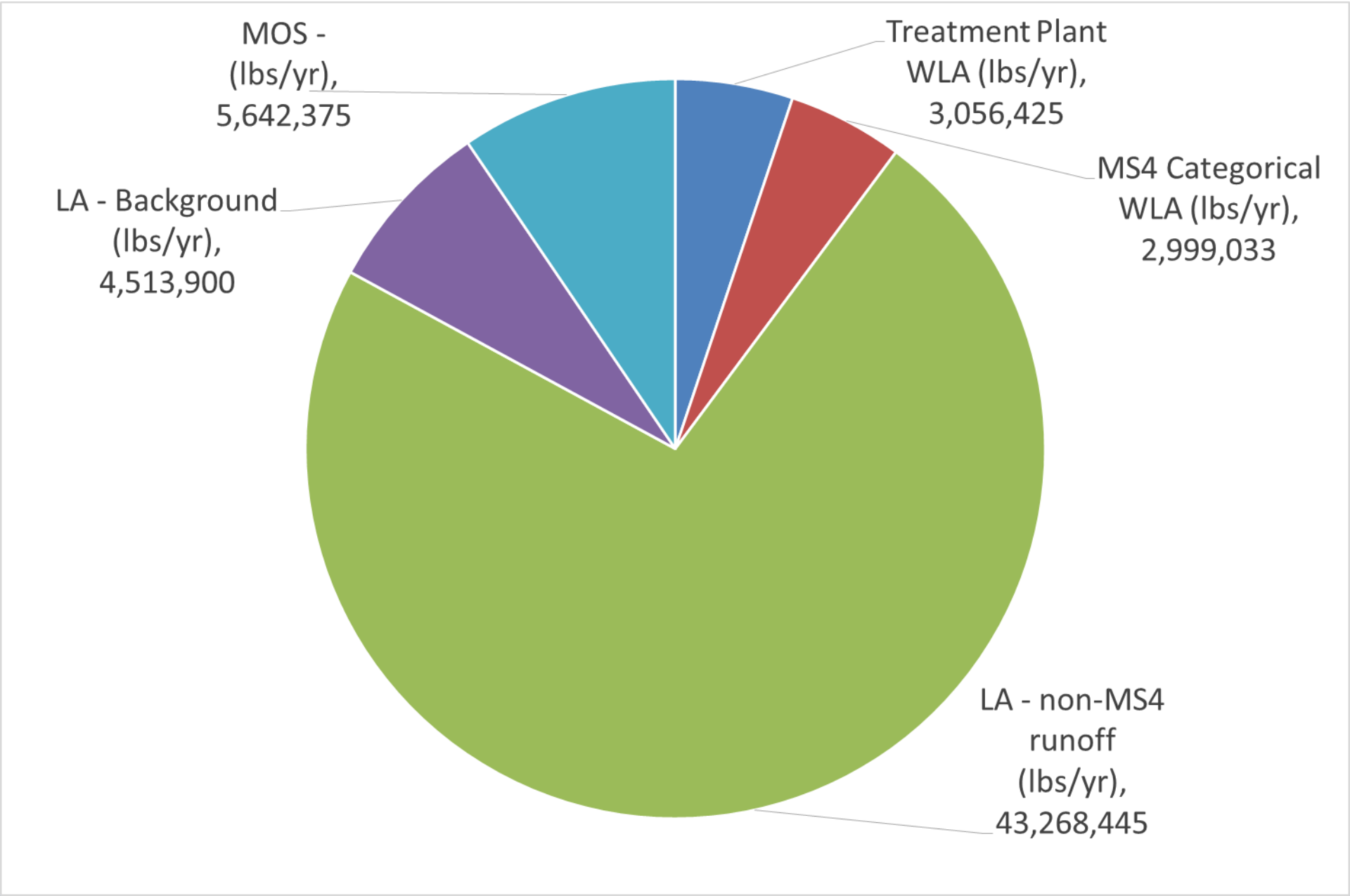


Stream	WBID	Watershed Area (ac)	TMDL (lbs/yr)	Treatment Plant WLA (lbs/yr)	MS4 Categorical WLA (lbs/yr)	LA - non-MS4 runoff (lbs/yr)	LA - Background (lbs/yr)	MOS - (lbs/yr)
Bass Creek	07010206-784	5,434	1,749,200	2,801	1,432,047		139,712	174,640
Bassett Creek	07010206-538	26,738	9,825,459	1,233,048	7,045,777		687,393	859,241
Battle Creek	07010206-592	7,246	2,328,720		1,909,551		186,298	232,872
Elm Creek	07010206-508	66,382	21,332,409		17,386,888	105,688	1,706,593	2,133,241
Judicial Ditch 2/1	07030005-525	1,587	510,115		418,294		40,809	51,011
Minnehaha Creek	07010206-539	109,151	36,334,160	1,257,406	28,762,938		2,806,140	3,507,675
Plymouth Creek (Unnamed)	07010206-526	6,447	2,071,958		1,699,006		165,757	207,196
South Fork Rush Creek	07010206-732	13,844	4,449,058	0	3,646,696	1,532	355,925	444,906
Unnamed (County Ditch 4)	07010206-909	1,627	522,817		428,710		41,825	52,282
Unnamed Creek	07010206-718	793	254,852		208,979		20,388	25,485
E Branch Raven Stream	07020012-543	14,751	6,025,349	1,284,983	442,093	3,445,007	379,229	474,037
Raven Stream	07020012-716	42,750	13,738,210		442,771	10,822,561	1,099,057	1,373,821
Sand Creek	07020012-513	175,578	59,480,179	3,056,425	2,999,033	43,268,445	4,513,900	5,642,375
Crow River, South Fork	07010205-508	818,087	276,434,171	13,533,363	11,307,746	204,270,917	21,032,065	26,290,081

Bassett Creek TMDL = 9,825,459 lbs/yr



Sand Creek TMDL = 59,480,179 lbs/yr



Discussion

What's New with Winter Maintenance Training and Tool ?

- Level I training
- Level II training
- Computer tool WMAt

MPCA: Level I Winter Maintenance Training

- Training classes are now and free!
- Started in 2006
- www.pca.state.mn.us/programs/roadsalt.html
  - Winter maintenance of Roads
  - Winter maintenance of Parking lots
  - Over 5,000 people have passed the certification test

Old but good news

Minnesota Pollution Control Agency
520 Lafayette Road
St Paul, MN 55155-4194

Road Salt Training Schedule - 2014/2015

(Attendees Must Register with Event Contact in order to attend)

Note: 1. Classes highlighted in yellow are out of state. 2. **Parking Lot Training** is focused on parking lot and sidewalk winter maintenance, Road Maintenance Training is focused on maintenance of city, county and state roads.

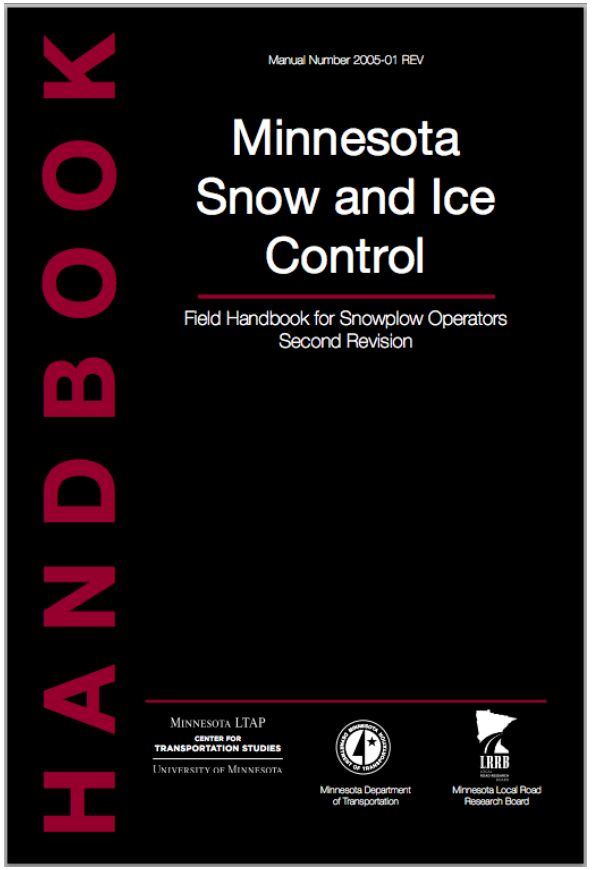
Training Type	Event Location	City, State	Date	Time	Fee	Contact	Contact Email
Parking Lot	Freshwater Society	Mankato, MN	Thursday, 18 September, 2014	8:00-1:30	no	Jeanne Prok	email Jeanne@freshwater.org or call 952 471-9773
Parking Lot	Vermillion River Watershed	Apple Valley, MN	Wednesday, 1 October 2014	8:30-2:00	no	Paula Leipold	Email water@co.dakota.mn.us or call 952-891-7000
Parking Lot	Prescription Landscape	Eagan, MN	Wednesday, 8 October 2014		full	n/a	n/a
Roads	Nine Mile Creek WD and Riley-Purgatory WD	Minnetonka, MN	Tuesday, 21 October 2014	9:00-2:00	no	Erica Sniegowski	(952) 358-2276 or esniegowski@ninemilecreek.org
Parking Lot	Nine Mile Creek WD and Riley-Purgatory WD	Eden Prairie, MN	Thursday, 23 October 2014	9:00-2:00	no	Erica Sniegowski	(952) 358-2276 or esniegowski@ninemilecreek.org
Parking Lot	RSPT, City of Duluth	Hermantown, MN	Tuesday, 28 October 2014	9:00-2:30	tbd	Adam Fulton	Email afulton@hermantownmn.com or call 218-729-3618
Parking Lot	Minnehaha Creek WD	Minnetonka, MN	Wednesday, 5 November, 2014	9:00-2:00	tbd	Mollie Thompson	email mthompson@minnehahacreek.org or call (952) 641.4507
Parking Lot	Mississippi Watershed Mangement Organization	Minneapolis, MN	Tuesday, 9 December 2014	9:00-2:00	no	Nancy Mulhern	Email nancy@fortinconsulting.com or call 763-478-3606
Parking Lot	Nine Mile Creek WD and Riley-Purgatory WD	Eden Prairie, MN	Thursday, 11 December 2014	9:00-2:00	no	Erica Sniegowski	(952) 358-2276 or esniegowski@ninemilecreek.org
Parking Lot	Mississippi Watershed Mangement Organization	Minneapolis, MN	Thursday, 15 January 2015	8:00-1:00	no	Nancy Mulhern	Email nancy@fortinconsulting.com or call 763-478-3606

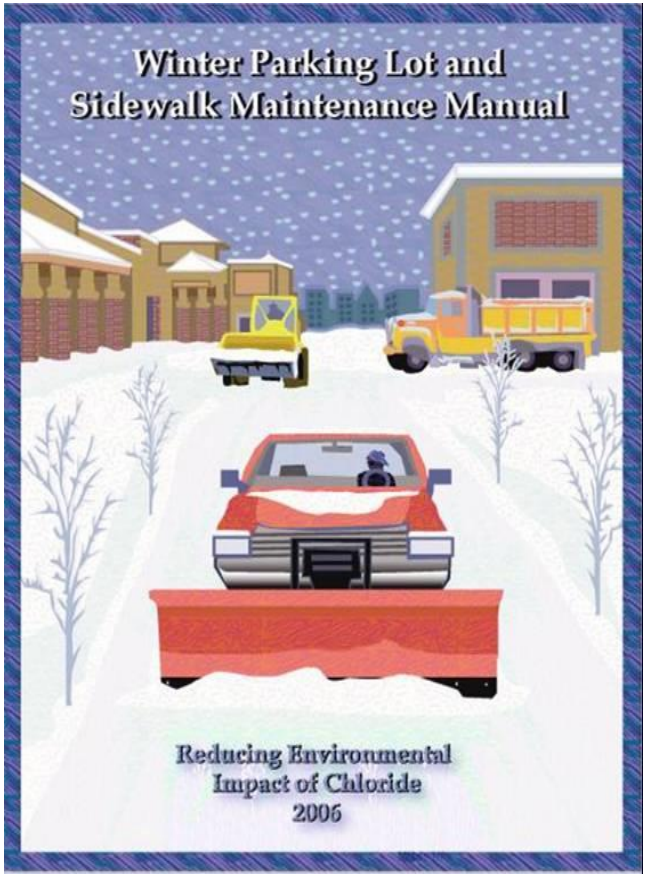
* Priority will be given to those that live or work in the Mississippi Watershed Management Organization's boundaries.

Nov 10 – Rochester

Nov 20 - Shoreview

To print out a copy of the *Manuals* go to:

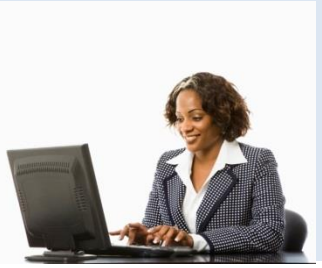




www.pca.state.mn.us/programs/roadsalt.html

Winter Maintenance Assessment Tool
WMAt

Vision



To develop the logic for a computer based tool that help winter maintenance organizations:

- Document their current practices
- Chart a path towards salt reduction
- Develop a strategy unique to their operation

Why this is a useful approach

- It looks at small areas of winter maintenance
- Provides insight into current operations
- Shows user recommended practices (learning tool)
- Allows a flexible approach
- **Allows you to chart your future!**

Target Audience:

Winter maintenance supervisors

Twin Cities Metro Area

Stakeholder Process 2011-2014

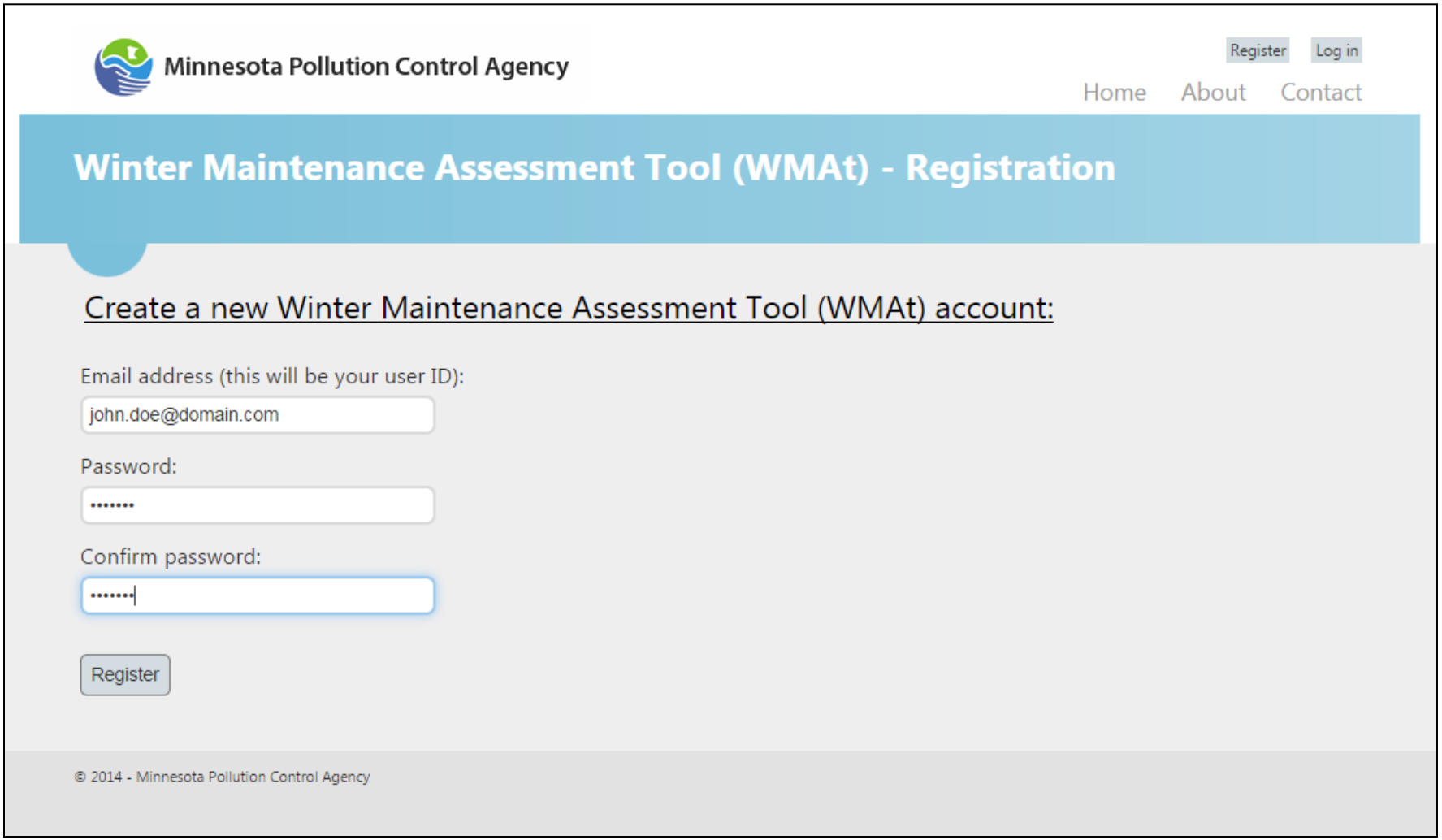
- Road Salt Symposium survey
- Literature Searches
- Phone calls, phone interviews with members of the advisory team and industry experts
- Email correspondence with members of the advisory team and industry experts
- The implementation plan committee input
- Test of questions on industry pro's

The technical expert team has been formed that reflects maintenance leaders in Minnesota. These leaders represent winter maintenance of high speed roads, low speed roads, parking lots, sidewalks, deicer sales and equipment. This team has reviewed all of the logic in the questions, input screens and reports. The members are:

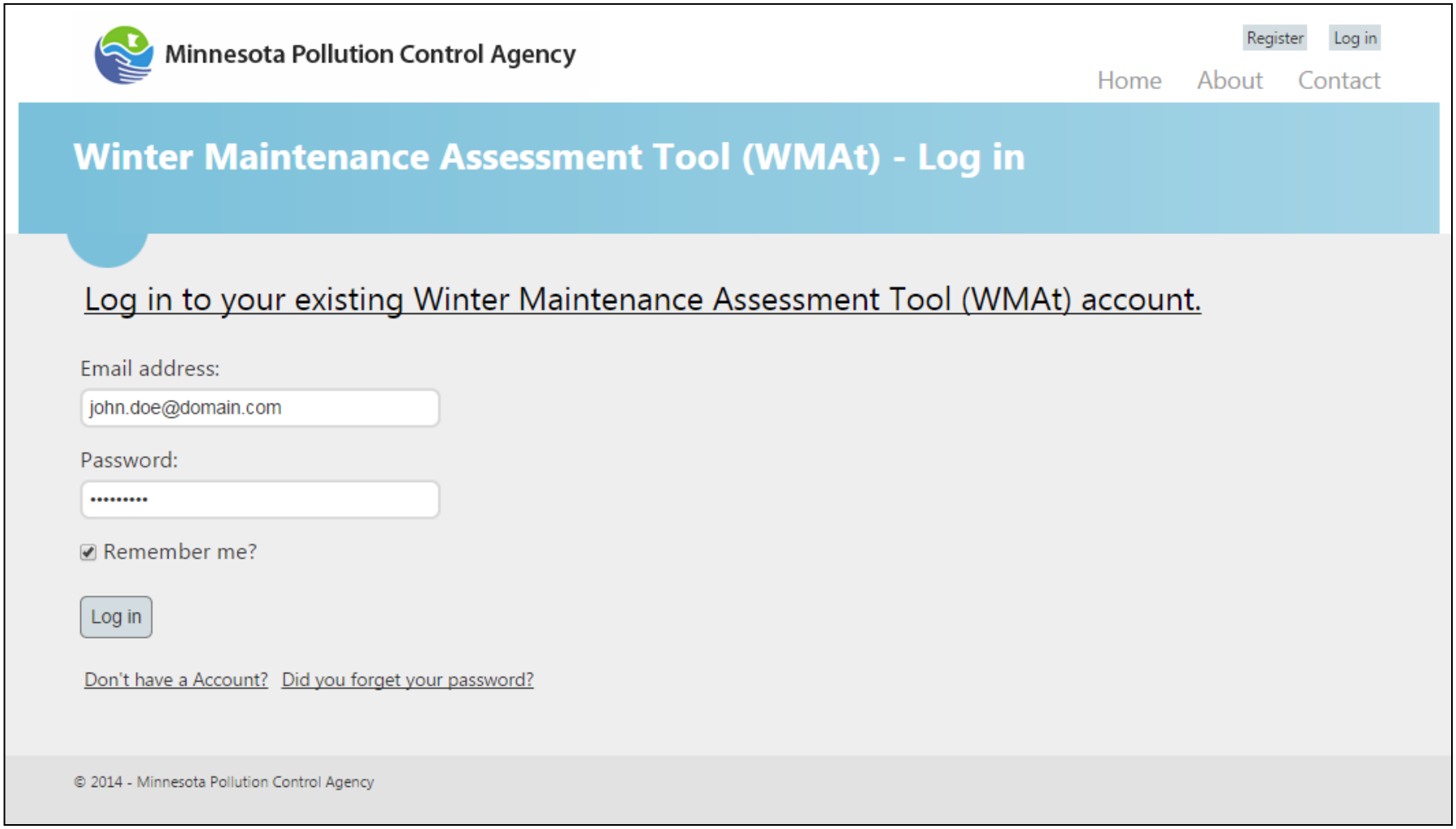
- Tom Broadbent - EnviroTech Services
- Bob Vasek-MnDOT
- Mike Greten -Dakota County
- Mike Scherber-Hennepin County
- Craig Eldred -City of Waconia
- Ryan Foudray - Prescription Landscape
- Joe Wiita-Scott County
- Brian Brown-Three Rivers Park District
- Kevin Nelson-City of St. Paul
- Mike Kennedy-City of Minneapolis
- Matt Morriem-City of St.Paul
- Jeff Warner-Force America
- Mark Fischbach-MnDOT

How to use the tool

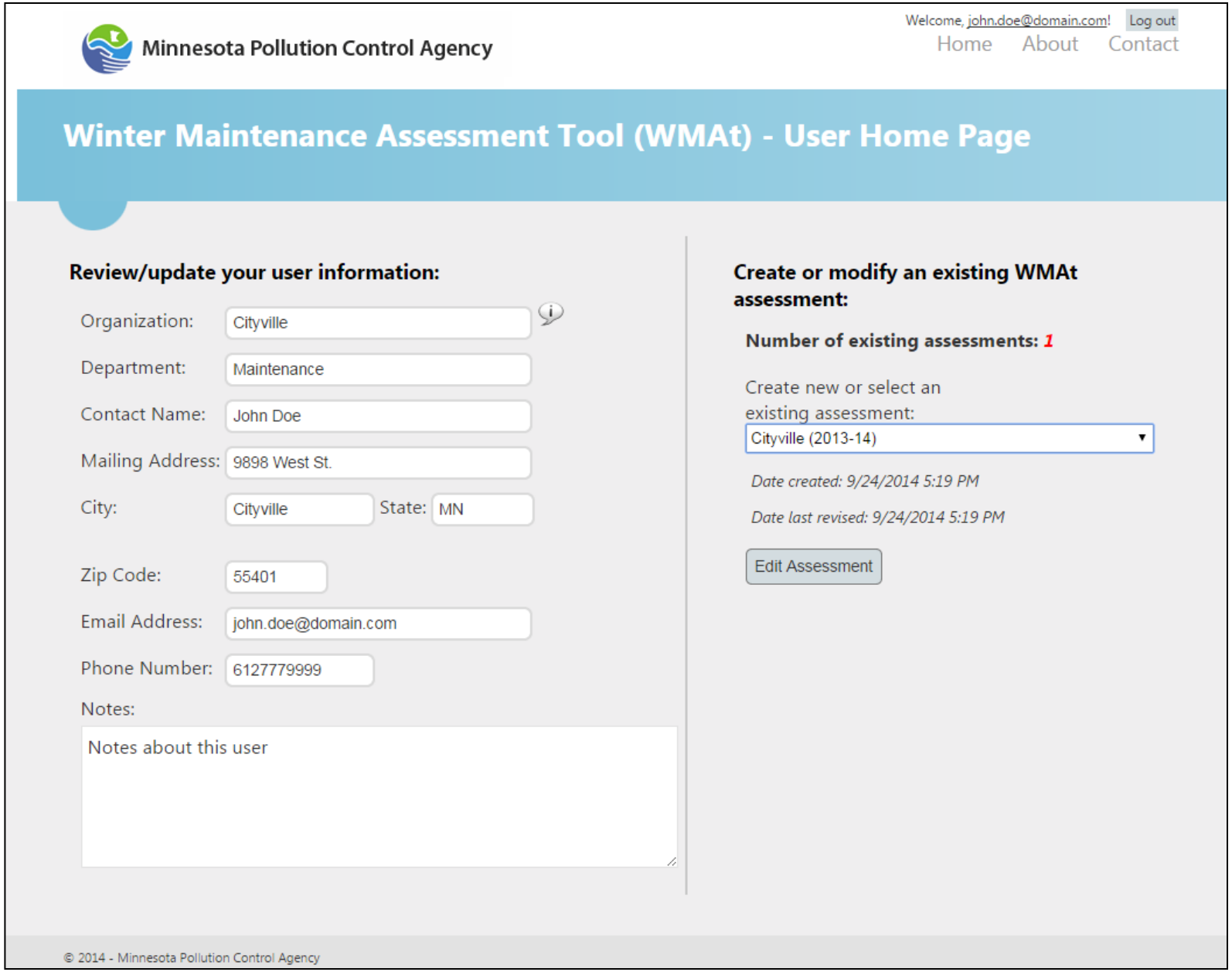
New User Registration Screen

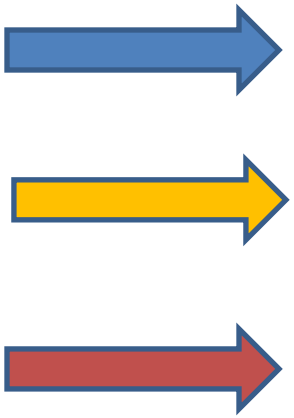


User Login Screen



User Information Screen





Provide information for your new assessment:

Assessment Location: Cityville

Assessment Description: Assessment #1

Assessment Type(s):
- [x] Best management practices (BMPs)
- [x] Salt savings calculations

Time Period(s) to Assess:
- [ ] 'Past' winter season: 2004-05
- [x] 'Current' winter season: 2013-14
- [x] 'Future' winter season: 2018-19

Surface Type(s) to Evaluate:
- [x] High Speed Roads
- [x] Low Speed Roads
- [x] Parking Lots
- [x] Sidewalks / trails

Notes:

This assessment will evaluate improvements to salt management through the future adoption of "best management practices", and also estimate the salt savings resulting from those improved practices.

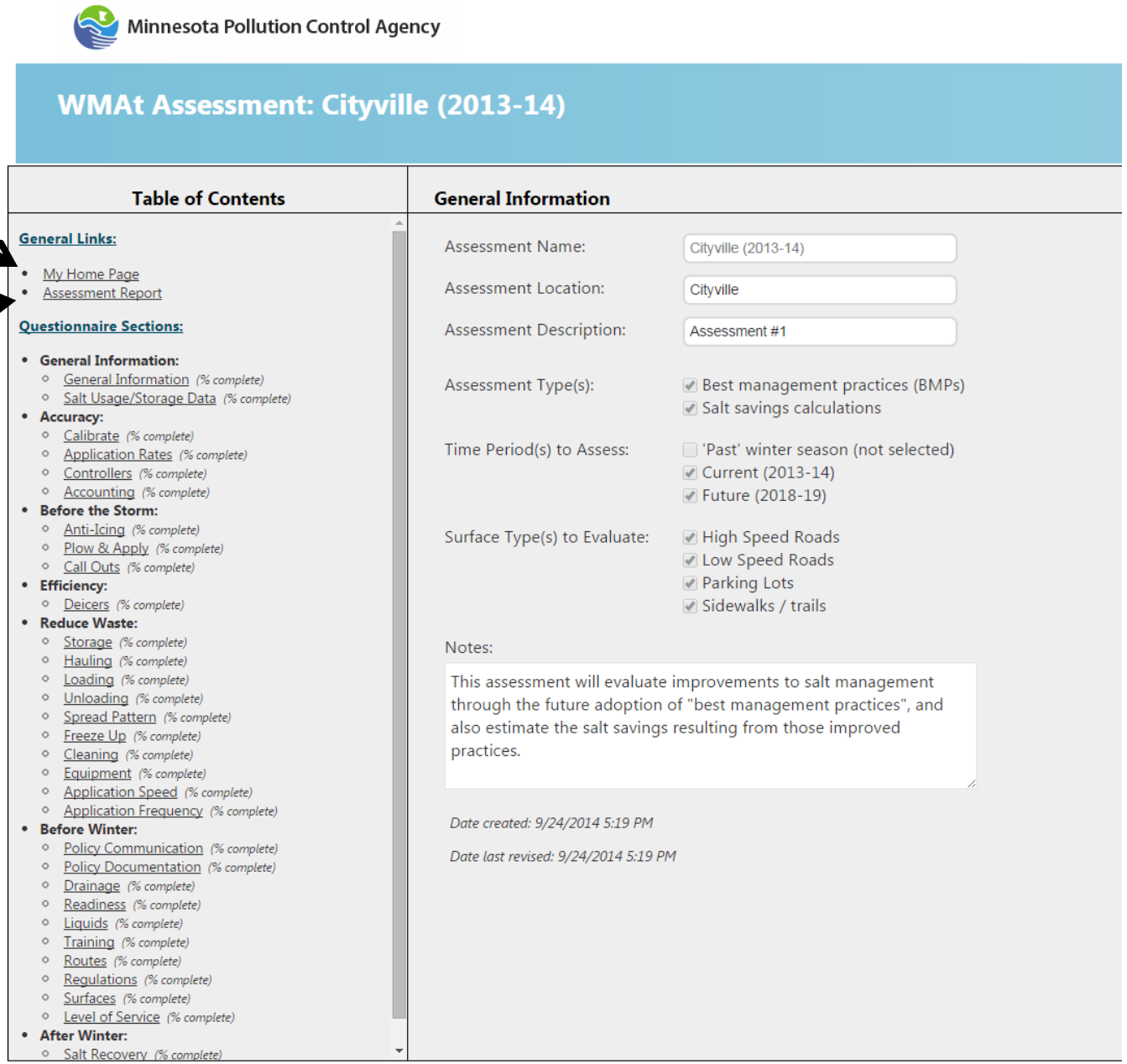
Create Assessment

Completing an Assessment

Link to User's Home Page

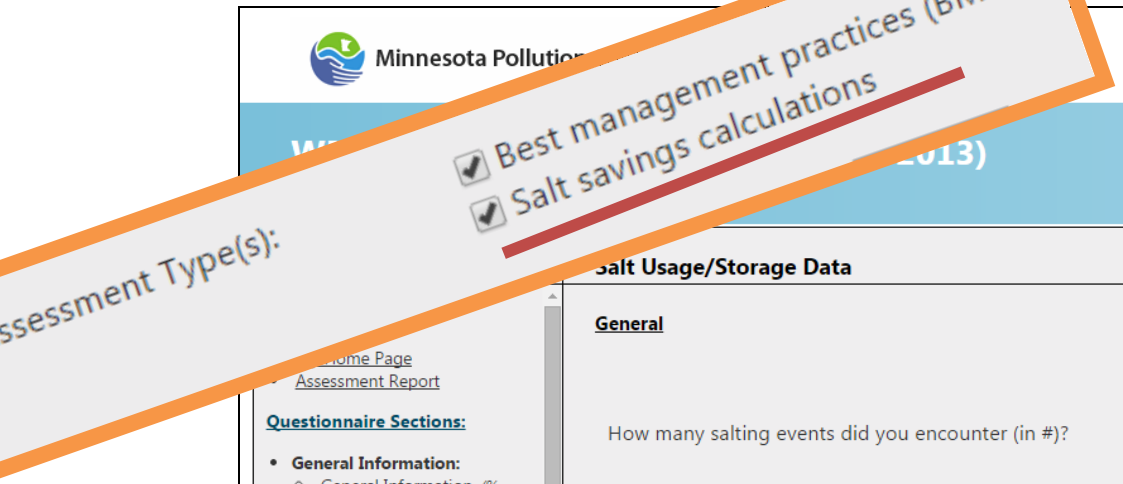
Report Link

Questionnaire Sections
(each section has multiple questions)



Did you pick Salt Savings mode?

Then you need to give us some numbers…



Minnesota Pollution

Welcome, tredder75@gmail.com! Log out

Home About Contact

Salt Usage/Storage Data

- Home Page
- Assessment Report

Questionnaire Sections:

- **General Information:**
  - General Information *(% complete)*
  - Salt Usage/Storage Data *(% complete)*
- **Accuracy:**
  - Calibrate *(% complete)*
  - Application Rates *(% complete)*
  - Controllers *(% complete)*
  - Accounting *(% complete)*
- **Before the Storm:**
  - Anti-Icing *(% complete)*
  - Plow & Apply *(% complete)*
  - Call Outs *(% complete)*
- **Efficiency:**
  - Deicers *(% complete)*
- **Reduce Waste:**
  - Storage *(% complete)*
  - Hauling *(% complete)*
  - Loading *(% complete)*
  - Unloading *(% complete)*
  - Spread Pattern *(% complete)*
  - Freeze Up *(% complete)*
  - Cleaning *(% complete)*
  - Equipment *(% complete)*
  - Application Speed *(% complete)*

General

	Current (2012-13)	Future (2016-17)
How many salting events did you encounter (in #)?		

How much salt did you purchase?

	Current (2012-13)	Future (2016-17)
How much bulk salt did you purchase (in tons)?		
How much salt/sand mix did you purchase (in tons)?		

How much salt did you store?

	Current (2012-13)	Future (2016-17)
How much bulk salt was stored over the winter (in tons)?		
How much bulk salt remained after the winter (in tons)?		
How much salt/sand mix was stored over the winter (in tons)?		
How much salt/sand mix remained after the winter (in tons)?		

Question #5

Minnesota Pollution Control Agency

WMAt Assessment: Cityville (2013-14)

Table of Contents

General Links:

- My Home Page
- Assessment Report

Questionnaire Sections:

- **General Information:**
  - General Information *(% complete)*
  - Salt Usage/Storage Data *(% complete)*
- **Accuracy:**
  - Calibrate *(% complete)*
  - Application Rates *(% complete)*
  - Controllers *(% complete)*
  - Accounting *(% complete)*
- **Before the Storm:**
  - Anti-Icing *(% complete)*
  - Plow & Apply *(% complete)*
  - Call Outs *(% complete)*
- **Efficiency:**
  - Deicers *(% complete)*

Accuracy: Controllers

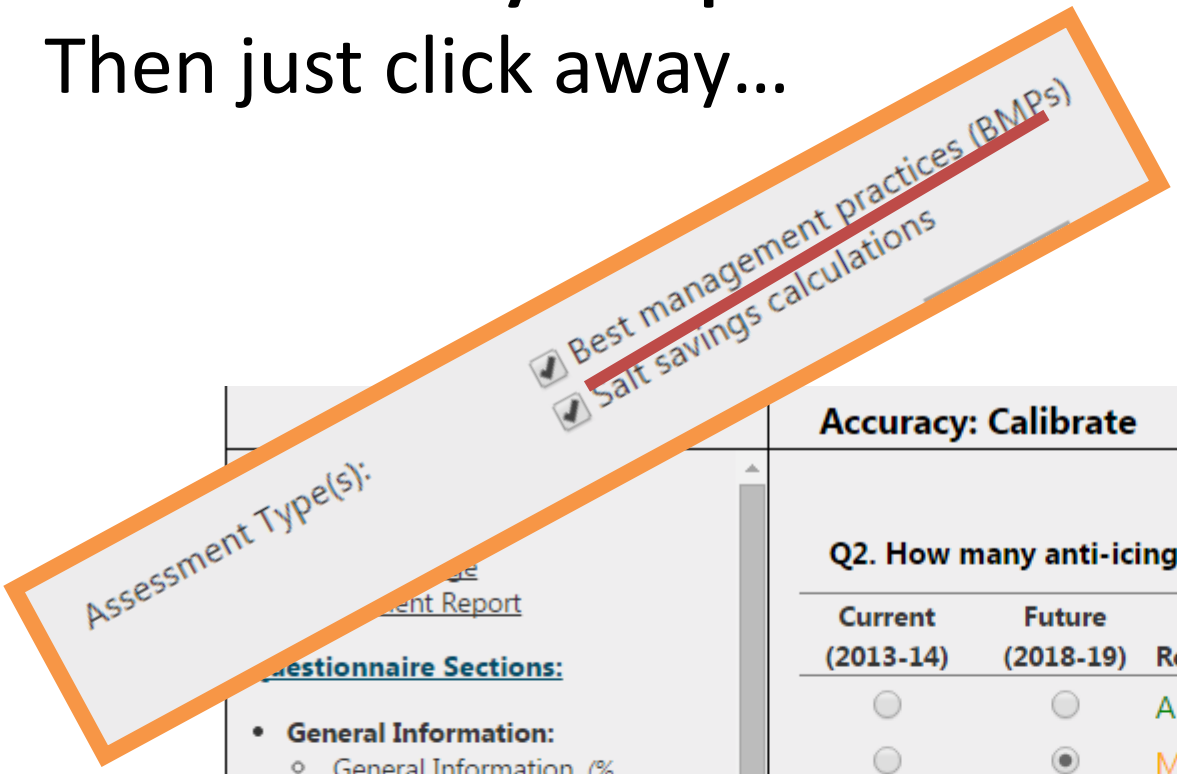
Q5. How many of each type of spreader controls do you have? (active fleet only)

Current (2013-14)	Future (2018-19)	Response	# of spreader controls (current)	# of spreader controls (future)
○	◉	Electronic controls (MDSS)		25
◉	○	Electronic controls (closed loop)	20	
○	○	Manual		

View Comments | Submit a Comment

Did you pick BMP mode?

Then just click away…



ent Report

estionnaire Sections:

- **General Information:**
  - General Information *(% complete)*
  - Salt Usage/Storage Data *(% complete)*
- **Accuracy:**
  - Calibrate *(% complete)*
  - Application Rates *(% complete)*
  - Controllers *(% complete)*
  - Accounting *(% complete)*
- **Before the Storm:**
  - Anti-Icing *(% complete)*
  - Plow & Apply *(% complete)*
  - Call Outs *(% complete)*
- **Efficiency:**
  - Deicers *(% complete)*

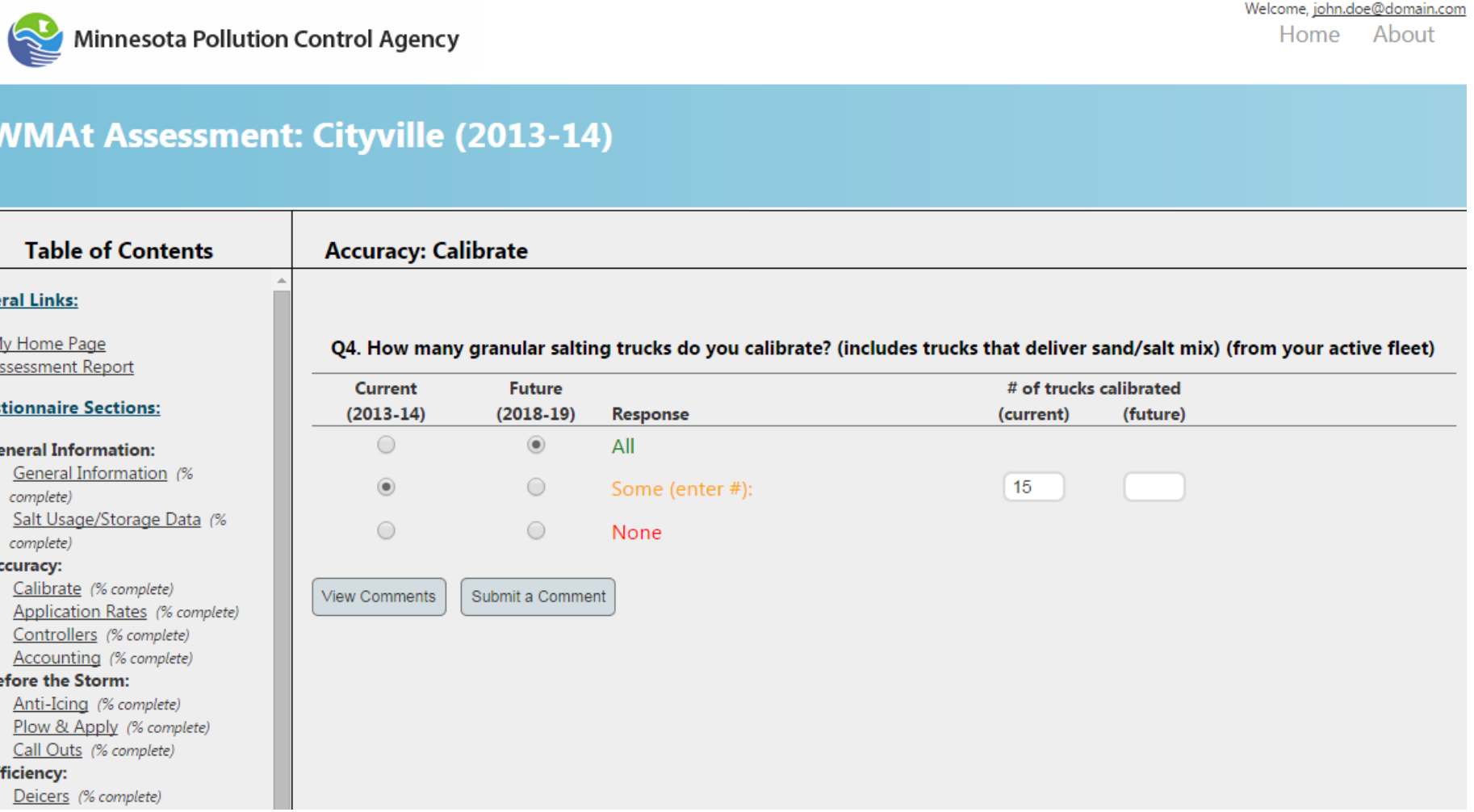
Accuracy: Calibrate

Q2. How many anti-icing systems (liquid only spreaders) do you calibrate?

Current (2013-14)	Future (2018-19)	Response
○	○	All
○	◉	More than half
◉	○	Less than half
○	○	Don't have any

View Comments | Submit a Comment

Question #4


Minnesota Pollution Control Agency
Welcome, john.doe@domain.com
Home
About
WMAt Assessment: Cityville (2013-14)
Table of Contents
General Links:
My Home Page
Assessment Report
Questionnaire Sections:
General Information:
General Information (% complete)
Salt Usage/Storage Data (% complete)
Accuracy:
Calibrate (% complete)
Application Rates (% complete)
Controllers (% complete)
Accounting (% complete)
Before the Storm:
Anti-Icing (% complete)
Plow & Apply (% complete)
Call Outs (% complete)
Efficiency:
Deicers (% complete)
Accuracy: Calibrate
Q4. How many granular salting trucks do you calibrate? (includes trucks that deliver sand/salt mix) (from your active fleet)
Current (2013-14)
Future (2018-19)
Response
# of trucks calibrated (current)
(future)
All
Some (enter #):
15
None
View Comments
Submit a Comment

Question #8

WMAt Assessment: Cityville (2013-14)

Table of Contents

General Links:

- My Home Page
- Assessment Report

Questionnaire Sections:

- **General Information:**
  - General Information *(% complete)*
  - Salt Usage/Storage Data *(% complete)*
- **Accuracy:**
  - Calibrate *(% complete)*
  - Application Rates *(% complete)*
  - Controllers *(% complete)*
  - Accounting *(% complete)*
- **Before the Storm:**
  - Anti-Icing *(% complete)*
  - Plow & Apply *(% complete)*
  - Call Outs *(% complete)*
- **Efficiency:**
  - Deicers *(% complete)*

Accuracy: Calibrate

Q8. What % of your fleet is set up for liquids (of the trucks that apply salt)?

Current (2013-14)	Future (2018-19)	Response
○	◉	80-100%
◉	○	50-79%
○	○	0-49%

View Comments | Submit a Comment

Question #12

Minnesota Pollution Control Agency

WMAt Assessment: Cityville (2013-14)

Table of Contents

General Links:

- My Home Page
- Assessment Report

Questionnaire Sections:

- **General Information:**
  - General Information *(% complete)*
  - Salt Usage/Storage Data *(% complete)*
- **Accuracy:**
  - Calibrate *(% complete)*
  - Application Rates *(% complete)*
  - Controllers *(% complete)*
  - Accounting *(% complete)*
- **Before the Storm:**
  - Anti-Icing *(% complete)*
  - Plow & Apply *(% complete)*
  - Call Outs *(% complete)*
- **Efficiency:**
  - Deicers *(% complete)*

Accuracy: Calibrate

Q12. What materials do you calibrate for?

Current (2013-14)	Future (2018-19)	Response
○	◉	For every product used
○	○	For most commonly used product(s)
◉	○	Don't calibrate

View Comments | Submit a Comment

Question #23

Minnesota Pollution Control Agency

WMAt Assessment: Cityville (2013-14)

Table of Contents

General Links:

- My Home Page
- Assessment Report

Questionnaire Sections:

- **General Information:**
  - General Information *(% complete)*
  - Salt Usage/Storage Data *(% complete)*
- **Accuracy:**
  - Calibrate *(% complete)*
  - Application Rates *(% complete)*
  - Controllers *(% complete)*
  - Accounting *(% complete)*
- **Before the Storm:**
  - Anti-Icing *(% complete)*
  - Plow & Apply *(% complete)*
  - Call Outs *(% complete)*
- **Efficiency:**
  - Deicers *(% complete)*
- **Reduce Waste:**
  - Storage *(% complete)*
  - Hauling *(% complete)*
  - Loading *(% complete)*
  - Unloading *(% complete)*
  - Spread Pattern *(% complete)*
  - Freeze Up *(% complete)*
  - Cleaning *(% complete)*
  - Equipment *(% complete)*
  - Application Speed *(% complete)*
  - Application Frequency *(% complete)*

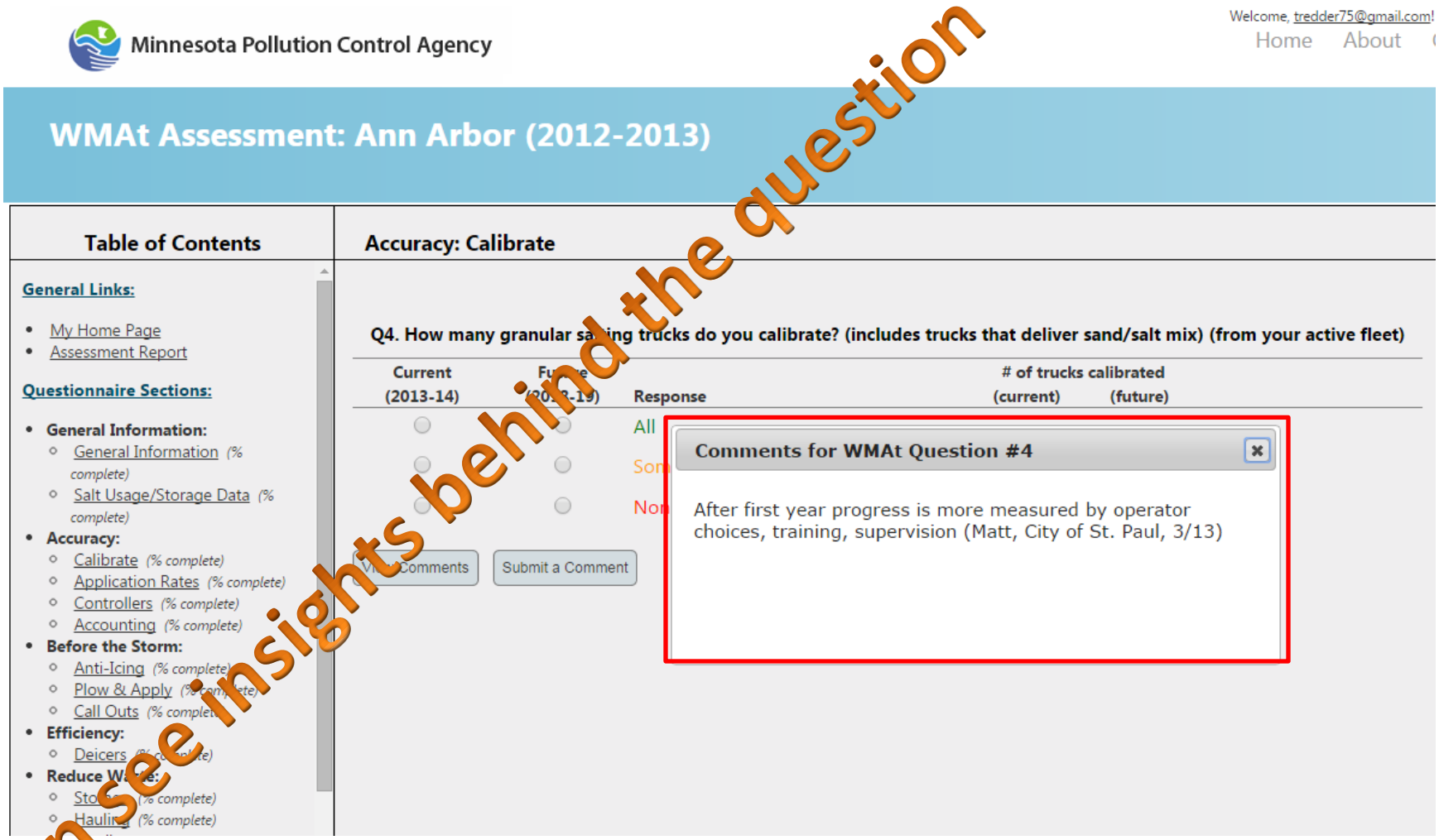
Accuracy: Application Rates

Q23. Who determines (granular and/or liquid) application rates?

Current (2013-14)	Future (2018-19)	Response
○	○	MDSS preprogramed system with rates similar to MN field handbook for snowplow operators. Truck suggests the rates.
○	○	We use MN field handbook for snowplow operators
○	○	We use MN parking lot and sidewalk manual application rate chart
○	◉	We make our own application rate chart. The rates are comparable to the MN field handbook for snowplow operators or the MN parking lot and sidewalk manual
○	○	We make our own application rate chart. The rates are higher than MN filed handbook for snowplow operators or the MN parking lot and sidewalk manual but much less than we used to use
○	○	MDSS preprogrammed system with rates higher than MN field handbook for snowplow operators
◉	○	We make our own application rate chart. The rates are higher than MN field handbook for snowplow operators
○	○	Application rate charts are not used

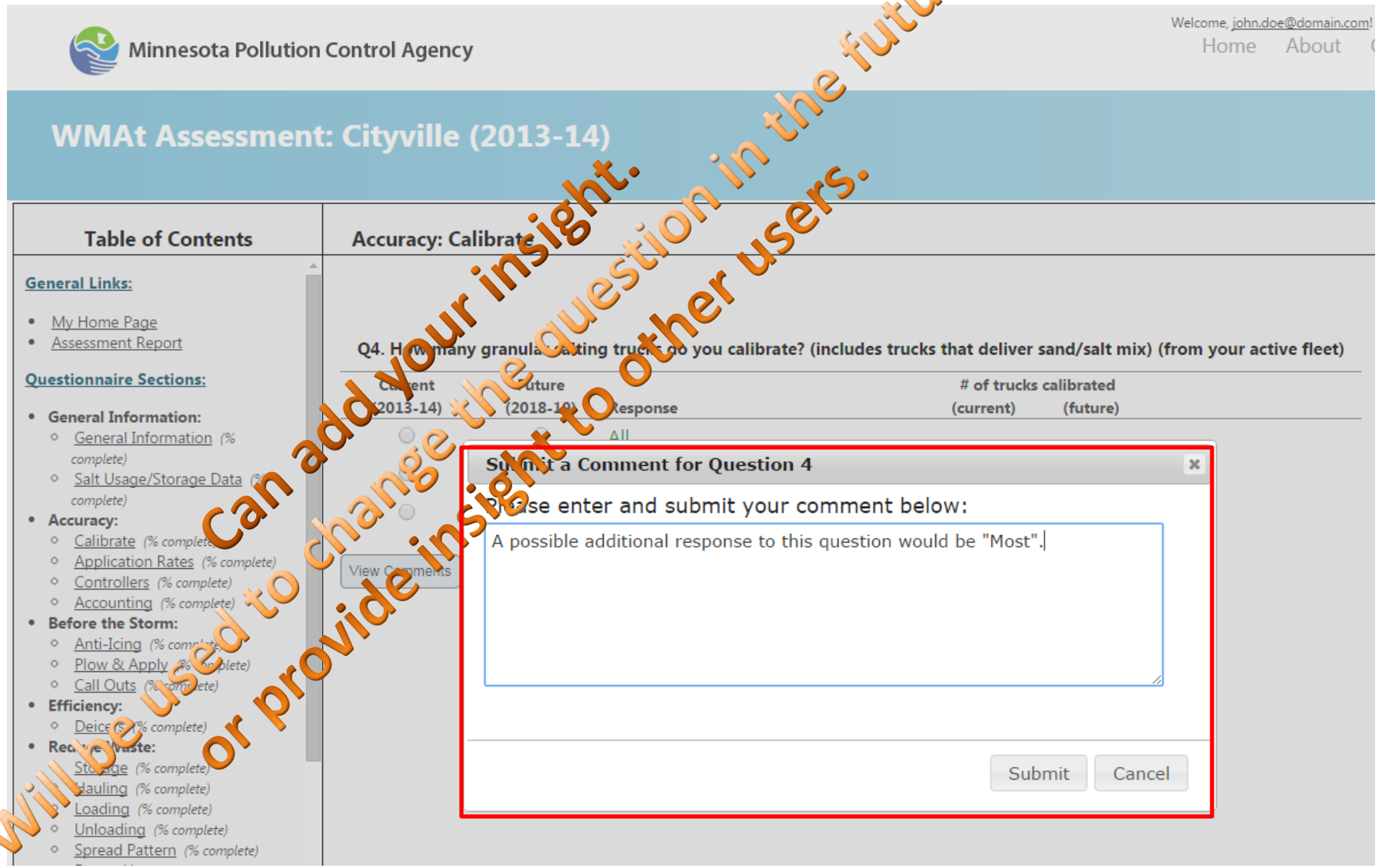
View Comments | Submit a Comment

View Existing Comments (by question)



Can see insights behind the question

User Comment Submittal (by question)

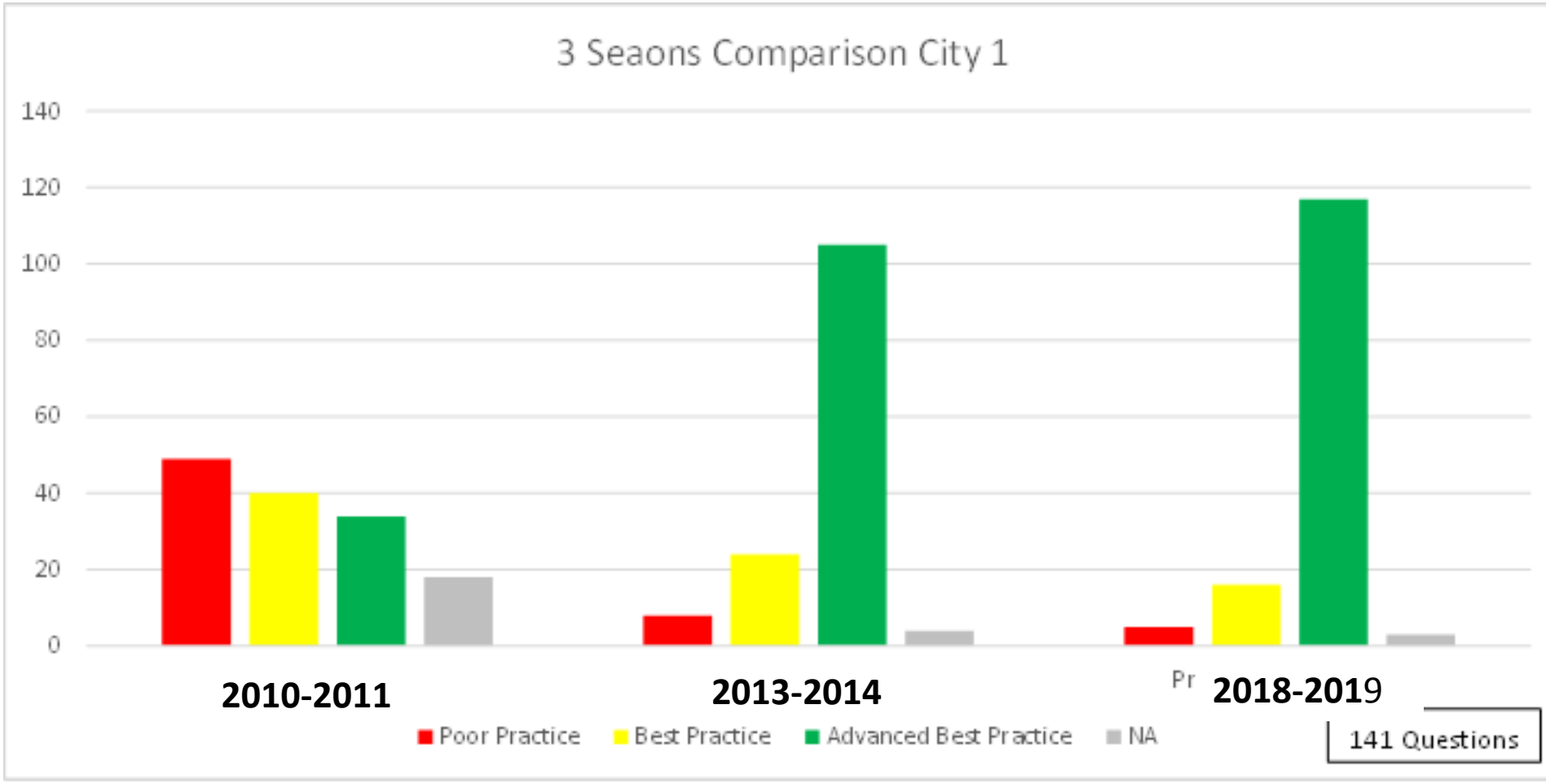


Can add your insight.
Will be used to change the question in the future
or provide insight to other users.

Reports

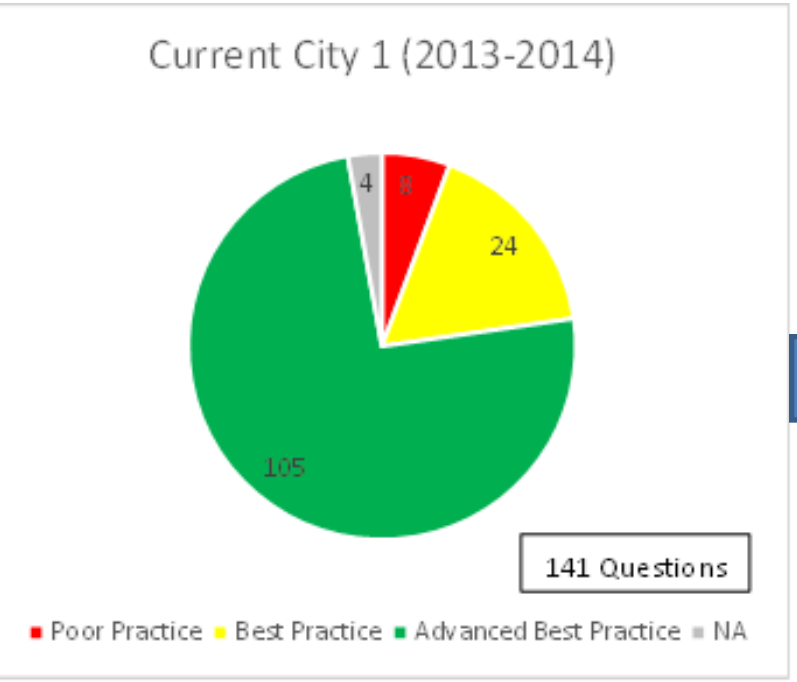
City #1

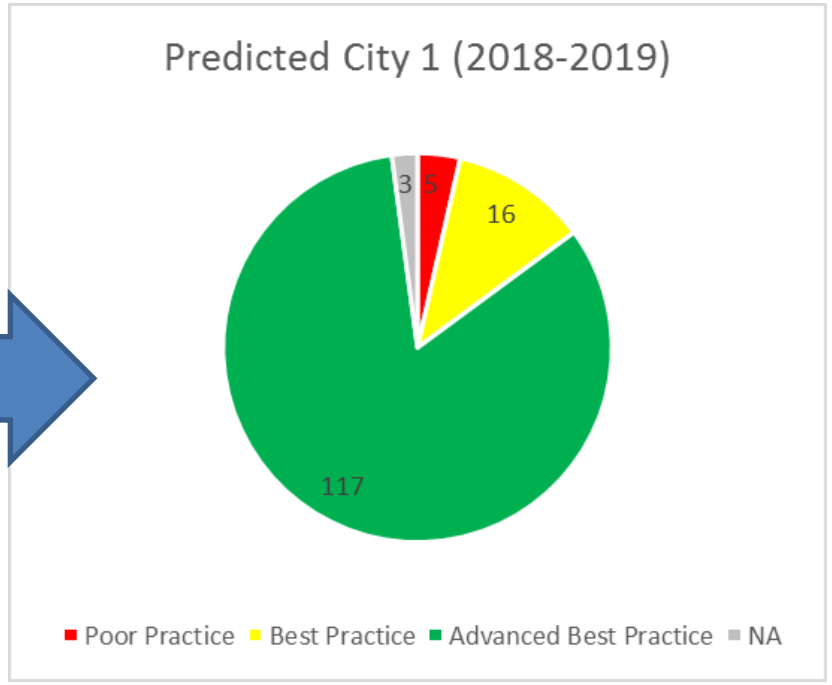
Draft


3 Seaons Comparison City 1
140
120
100
80
60
40
20
0
2010-2011
2013-2014
Pr
2018-2019
Poor Practice
Best Practice
Advanced Best Practice
NA
141 Questions

Draft


Past City 1 (2010-2011)
18
42
34
40
141 Questions
Poor Practice
Best Practice
Advanced Best Practice
NA


Current City 1 (2013-2014)
4
8
24
105
141 Questions
Poor Practice
Best Practice
Advanced Best Practice
NA


Predicted City 1 (2018-2019)
3
5
16
117
Poor Practice
Best Practice
Advanced Best Practice
NA

Past Winter Maintenance Practices

City 2 Winter of 2008-2009

Draft

For maintenance of: Low Speed Roads

Summary:
46 Poor Practices
18 Best Practices
61 Advanced Best Practices

Entry # 114
Joe Smith
8-18-2013
763-444-5555
joe@roundville.gov

NOTES: We do both streets and parks.

Legend:
- Poor Practice
- Best Practice
- Advanced Best Practice

ADVANCED BEST PRACTICES

23. Who determines application rates? We make our own application rate chart. The rates are comparable to the MN field handbook for snowplow operators or the MN parking lot and sidewalk manual
36. How do you treat frost? Anti-ice to prevent frost
42. Roads: what do you do with a 2 inch snow? Remove it, salt only if necessary
47. How do you plow and apply salt? Plow 2 lanes then apply salt to middle
49. How do you manage routes that overlap? Avoid plowing or salting on other peoples routes unless requested
52. How effective are you are removing slush before salting? High
55. How effective are you at removing a 2 inch snow fall before salting? High
56. How effective are you at removing wet heavy snow before salting? High
57. Do you have good equipment for effective removal? Yes
60. Is your response to snow events the same during weekday hours and weekend/evening

Draft

BEST PRACTICES

11. Do your operators know how to read your application rate charts? No, supervisors read charts and assign rates
38. Do you have any automated anti-icing systems built into your pavement surfaces? No
41. Roads: what do you do with a light snow? No plow, salt if needed
50. When we have compaction, our "primary tool" is to? Scrape it, then salt
53. How effective are you at removing compacted snow and ice before salting? Medium
58. Once snow removal is started, when does it stop? Snow removal during shifts, breaks without snow removal
70. When pavement temperatures are below 15 degrees, how often do you use granular salt? Some of the time
75. Do you prevent moisture from entering salt sheds? OK quality buildings or a mix of good and bad buildings
82. Do you receive salt shipments indoors or outdoors? Receive shipments outdoors, move them indoors with good clean up
99. How often do you wash your trucks? After the storm
105. Where do you place the salt? Spread pattern in center
115. Do you primarily use a vbox or dump truck? Dump truck
116. How do your trucks dispense salt? Auger
127. How long after the storm until you apply salt? Apply deicer immediately if we have a deicer that works for the pavement temperature
156. How well do operators work together within your organization? Ok
166. How fast do you need melted surfaces? Faster than in the past, use same amount of salt
172. How do you dispose of truck wash water? Dispose of wash water in sanitary sewer (goes to treatment plant
173. Where does your storage runoff water go? Collect runoff, bring to sanitary sewer

POOR PRACTICES

1. How often do you calibrate spreaders? Never
2. How many anti-icing systems (liquid only spreaders) do you calibrate? Don't have any
3. How many liquid prewet systems do you calibrate? Don't have any
4. How many granular salting trucks do you calibrate? None
5. Which is your primary type of spreader controls (active fleet only)? Manual

8. What % of your fleet is set up for liquids (of the trucks that apply salt)? 0-49%
9. Where are your manual spreader control calibration charts? Not with the equipment
10. for manual spreader controls: do your operators know how to read calibration card? No
12. What materials do you calibrate for? Don't calibrate
26. Are your application rates based on pavement temperatures? No
27. Do most of your operators follow application rate recommendations? No
28. How do you select your application rate? Supervisor in charge: generally disregards charts and makes own decisions.
29. Manual controllers: when salting at different speeds how often does your crew change spreader settings: Rarely
32. How accurate are our salt use numbers? Low – estimate at end of year
34. Where do you anti-ice? None of the areas we salt
35. When do you anti-ice? Never
40. What do you do with slush? Ignore it
59. Do we have the ability to do as much physical removal as needed to avoid over applying salt? No
65. What method do you primarily use for deicing (not anti-icing)? Dry salt
66. Are you using liquids for deicing? No
68. We understand the practical pavement temperature range of our deicers? No
69. We select appropriate material for pavement temperature? Don't adjust our product selection based on pavement temperatures
86. Are your trucks tarped during application? No
88. Where is the loading area for trucks? Outdoors
96. Which tools/equipment do you use to unload? None
98. How often is the outdoor loading area swept back into the pile? Rarely
117. What is the lowest application rate, most of your trucks can deliver with an even spread pattern? More than 200 lbs per lane mile (or 500 lbs per acre)

City of Roundville Salt saving potential for one year based Winter of 2011-2012 and predicted changes

For maintenance of: High speed roads, low speed roads

Draft

2011-2012 Information

5000 tons salt stored
4000 tons salt/sand stored
salt/sand 30/70 mix
1000 gallons brine stored

2000 tons salt used
1500 tons salt/sand used
500 gallons brine used

$70.00 per Ton of salt
$1.00 per gallon of brine

80% salt used on low speed roads
20% salt used on high speed roads

Prediction based on changes

Total = 234.6 tons of salt likely to be saved

Reduction Potential = 11.7%

Had these changes been made for the winter of 2011-2012**, Roundville would have saved $16,422** in salt purchases and used only 1,765.4 tons of salt

Entry # 114
Joe Smith
8-18-2013
763-444-5555
joe@roundville.gov

Salt Savings Potential for One Year

City of Roundville Parks Department 6-0[illegible]-2011

List of predicted changes

Draft

BEFORE WINTER:

0% reduction potential

DURING WINTER:

0% reduction potential

ACCURACY DURING THE STORM:

10% Reduction Potential

*0 Ground Speed Controllers with MDSS>10 Ground speed controllers with MDSS>10% Salt Savings on salt applied salt

EFFECTIVENESS DURING THE STORM

0% reduction potential

REDUCE WASTE DURING THE STORM:

22.05% reduction potential

Bulk salt pile uncovered > Bulk salt pile indoors > Salt Savings 17% of salt in storage

Salt/sand pile uncovered> Bulk salt pile indoors > Salt Savings 17% of salt in sand pile

Receive shipments outdoor with good clean up > Receive shipments indoors > Salt savings .05% of salt ordered

Use up all salt at end of winter > give away salt at end of winter> 5% of total salt purchased

RECOVERY OF SALT:

0% reduction potential

Legend:

- Poor Practice
- Best Practice
- Advanced Best Practice

MPCA: Level 2 Winter Maintenance Training

New news!

- Coming soon
- Will give users classroom training on how to use the WMAt
- Will likely provide advanced training on other winter maintenance issues
- Will be selecting advisory team to guide training contents….any volunteers?

Questions?

Connie Fortin
connie@fortinconsulting.com
763-478-3606

TCMA Chloride Project

Implementation Plan Committee Meeting #3

Attendees: Andy Ronchak, Barb Loida, Becky Houdek, Bob Vasek, Brad Wozney, Cliff Aichinger, Derek Asche, Douglas Lauer, Elise Doucette, Emily Resseger, Eric Korte, Erica Sniegowski, Jeanne Prok, John Erdmann, Josh Stock, Kari Oquist, Udai Singh, Kevin Bigalke, Lois Eberhart, Mark Maloney, Marni Karnowski, Mary Hammes, Matthew Morreim, Michael Scherber, Rachael Crabb, Rick Patraw, Ryan Anderson, Tanya Maurice, Alicia Uzarek, Forrest Kelley, Justin Valenty, Stephanie Johnson, Hans Holmberg, Jeremy Walgrave, Connie Fortin, Rachel Olmanson, Brooke Asleson

September 30, 2014, 9 am- 12 pm, Mississippi Watershed Management Organization (MWMO) Office

- **Introductions/Goals for meeting**- *Brooke Asleson, MPCA*
    1. Update on the TCMA Chloride project
    2. Present draft Chloride Management Plan and TMDL
    3. Discuss various elements of plan
    4. Discuss how we can be successful in implementing the plan to reduce the amount of chloride entering our lakes, rivers, streams, wetlands, and groundwater

- **Presentation**: Project introduction and overview, review draft Chloride Management Plan- *Brooke Asleson, MPCA*

  Overview
    - Chloride is a toxic, permanent pollutant, 78% of the chloride used in the TCMA is being retained here. Chloride is unique in that we also need to be aware of public safety concerns. The public has high expectations for winter driving conditions and we have challenging winter conditions.
    - It's estimated that road salt (75%) and water softening salt (25%) are the main sources of chloride in the TCMA as a whole.
    - Water softening salt is a concern specifically in the Sand Creek watershed and the South Fork Crow River watershed, where high chloride concentrations in streams are driven more by wastewater effluent. There are three WWTP in the Sand Creek watershed that have effluent limits above the chloride standard. We are in the process of trying to understand the best options for how WWTPs can meet the chloride standard. Treatment to remove chloride from wastewater effluent would be expensive and individual water softeners are used in many households.
    - The purpose of the Chloride Management Plan (CMP) it to set realistic goals, address and complete TMDLs for all impairments, and lay out flexible implementation strategies.
    - The project began in 2010 and has involved many different stakeholder groups that have met throughout the duration of the project. The project included an Inter-Agency Advisory Team, Implementation Plan Committee, Technical Expert Group, Outreach Group, Technical Advisory Committee, Education and Outreach Committee, Monitoring Sub-Group, and the MPCA project team. All meeting dates and notes are on the Road Salt and Water Quality website.
    - We have incorporated Education and Outreach activities throughout the project including the creation of the Road Salt Display, which is available for anybody to use for any events/trainings, we have presented at the Road Salt Symposium each year since 2010, and other meetings and events, and we have also created numerous press releases and done media interviews.
    - 38 lakes, streams, and wetlands have been identified as impaired and 40 waters are considered High Risk in the TCMA. High risk waters are defined as waterbodies that have chloride concentrations within 10% of the 230 mg/L standard, if trends continue in these High Risk waters they may exceed the standard in the next few years.
    - Concentrations of chloride in groundwater are also increasing. The MPCA groundwater study found that 30% of wells in the TCMA are exceeding the EPA standard. A USGS study has found that chloride has significantly increased in wells since 1996 in the Upper Mississippi River Basin.

- An interactive map has been created that includes all the waterbodies assessed, and includes which waterbodies are impaired, high risk, or non-impaired for chloride. The map is available on the Road Salt and Water Quality website.

Chloride Management Plan

- The purpose of the CMP is to understand how chloride impacts water resources, and to inform and guide implementation. We are looking at all sources of chloride, including water softening. There are 4 major sections of the plan (1) background, (2) conditions, (3) prioritizing and implementation, (4) monitoring and tracking.
- From the study, we have found that lakes have highest concentrations from Jan. – May and streams have highest concentrations from Dec. – April. Streams that receive high chloride effluent from WWTPs tend to have the highest chloride concentrations during low flow conditions.
- We analyzed all impaired lakes and determined what percentage of the time chloride exceedances occurred. This information could help prioritize lakes; other data analyses like this will be in the plan and will hopefully help locals make informed decisions.
- We have also refined the estimated salt contribution in the TCMA from private applicators. We have also identified permitted discharges that could be possibly discharging chloride. There could be contributions of chloride from other sources including, septics, fertilizer (literature values), and natural background conditions. Natural background conditions are dependent on geological features, for example, SE MN has much high natural background conditions than the TCMA.
- **Question:** How were the percent contributions from each source derived? **Brooke:** This will depend on the watershed and the percentage of impervious surfaces, there's not a good way to break down the percentages for each source for every individual watershed. **Hans:** We haven't quantified surface area for parking lots and sidewalks for each watershed, but this is the rate that is typically found.
- **Question:** Is there a report available of how you came up with the number for private applicators? **Brooke:** Yes, we have a technical memo from Fortin Consulting that we will post on the Road Salt and Water Quality website and that will be referenced in the CMP.
- **Question:** What will happen if the chloride standard is changed to a higher concentration? **Brooke:** This is the EPA standard. The EPA has been doing more research to look into the current standard. They may change standard, but it likely will not change significantly. There is a chance that a handful of listings would come off the impaired waters list.
- **Question:** How were the High Risk waters determined? **Brooke:** If chloride concentrations were within 10% of the standard waterbodies were determined to be High Risk. These waters will not require TMDLs and there will not be any regulatory requirements associated with them.
- The same BMPs will be recommended for both the restoration and protection strategies. The BMPs are focusing on prevention; the primary objective is to get all winter maintenance activities up to a high performance level. We will also work on setting water quality goals for point sources to work towards. The key is flexibility in implementation using a performance based approach, rather than numeric goals.
- The Winter Maintenance Assessment Tool (WMAt) will help winter maintenance professionals make informed decisions. We will include a summary of all the questions that are included in the WMAt and a description of the tool in the CMP. The implementation strategies will be higher level in the plan and will include traditional and non-traditional BMPs.
- Non-traditional strategies will include suggestions to consider that we are not currently implementing such as adopting a lower level of service, alternative types of pavement, heated roads/sidewalks, tire strategies, non-chloride deicers. These strategies could be an effective way to reduce chloride but have not yet really been integrating into current thinking.
- Traditional strategies will include, a shift from granular to liquids, improve physical removal of snow, training for maintenance professionals, and increase knowledge of issues for public and elected officials. These are practices and concepts that are more likely to have support as we are already implementing in this way.
- We will begin the internal review of the CMP over the next month or two, and will send it out to all stakeholders, likely in November, and then it will go on public notice after revisions have been made.

- **Question:** What do you see in terms of the MPCAs role from here on out for education and outreach? **Brooke:** We are working on this issue internally and considering options. Our hope is to be able to increase in our efforts to assist stakeholders with chloride reductions.

- **Presentation:** Overview of the draft Chloride TMDL- *Hans Holmberg, LimnoTech*
  - The TMDL is not the most important part of the CMP. The state is required to prepare TMDLs for impaired waters, but there are many other reasons to reduce chloride, such as cost savings.
  - For the TMDL we are setting the Reserve Capacity (RC) to zero, since the Twin Cities is fairly developed. The wasteload allocation (WLA) includes permitted entities (NPDES). The load allocation (LA) includes non-permitted entities.
  - For treatment plants the WLA allowable load is equal to flow*conc. For the runoff load we are using runoff coefficients. For lakes we are using the annual runoff volume, averaged over the year and for streams we are using seasonal runoff, frozen conditions. We also took into consideration background conditions.
  - **Question:** Does natural background include groundwater contributions? **Hans:** No, we are setting groundwater aside, it is difficult to determine groundwater inputs, and the assumption is that improved winter maintenance activities will also influence groundwater. **Question:** Are the natural background conditions from the soil? **Brooke:** It is based on the natural geology of the area.
  - **Question:** What years of precipitation were used to develop the TMDL? **Hans:** We used the most recent 30 years.
  - The MS4s will have a categorical WLA, there is only one lake in the study that has a non-MS4 component to the TMDL, Long Lake. WWTPs and Industrial dischargers will have an individual WLA.
  - **Question:** Why isn't there an internal loading component to the TMDL? **Brooke:** With other pollutants such as nutrients, phosphorus is released from the sediments and curly leaf pondweed creating a internal addition of phosphorus, this is not the case with chloride. With chloride it stays disassociated in water, and it doesn't attach to other particles. **Hans:** The assumption is that it is a steady-state model; there is no internal loading component.
  - **Question:** If there aren't any percent reductions, how can we judge when we've done enough? **Hans:** Continue to monitor and see if there are improvements. **Brooke:** We are using performance-based goals. The goal is to have all winter maintenance operations performing at a certain level and showing progress. After BMPs are implemented, we will monitor water quality to determine if it is improving, if not, we will re-evaluate. As of now there is not enough research to determine the percent reduction that would be achieved for specific road salt BMPs. **Hans:** There are not specific numeric requirements, but the goal is to make progress.
  - **Question:** What will happen with chloride TMDLs that have already been completed: Nine Mile and Shingle Creek? **Brooke:** For now they will be left alone since they've already been approved by the EPA. The cities impacted by those TMDLs can still use the WMAt to show progress. Public safety is still the primary concern; the goal is to use the least amount of salt possible that is reasonable to maintain safety.
  - **Comment**: The MPCA should assess the chloride standard to determine if it is appropriate. **Brooke:** The goal is to bring winter maintenance activities up to a standard and come back and monitor in 10 years to see if progress is being made. The current standard is designed to protect aquatic life; the goal of this project is to protect aquatic life and maintain public safety.
  - **Comment:** Could we try to quantify the reductions that we would see if BMPs are implemented and if they will get us anywhere near where we need to be. **Brooke:** In general, if everyone were to follow LTAP recommendations for application rates, we could meet the TMDL. **Hans:** We are assessing based on the 230 mg/L standard and moving ahead; the goal is to implement BMPs, monitor, and determine if progress is being made.

- **Presentation:** Winter Maintenance Assessment Tool (WMAt) update**-** *Connie Fortin, Fortin Consulting*
  - There are three tools that the MPCA has developed to offer assistance: Level 1 training (still available, free), Level 2 training, and a computer tool (WMAt).

- The WMAt is being developed to help winter maintenance organizations assess their activities and determine areas where they could make improvements to chart a path towards salt reductions, and develop a strategy that is unique to their operation. The tool allows you to document your practices in your organization, and provides high level ideas. The target audience for WMAt is winter maintenance supervisors in the TCMA.
- The development of the questions used in the tool involved a stakeholder process from 2011-2014. A Technical Expert team was formed to review all the questions, input screens, and reports.
- Currently the questions have been sent to LimnoTech and they are working on developing the tool. We will be able to incorporate new questions later on, and there will be opportunities for users to add comments and ideas for additional questions, or modification of questions/responses.
- **Question:** Is there a way for users to get definitions of terms? **Connie:** Yes.
- We will build the database based on knowledge from users, users will be able to enter comments and we can use those comments/suggestions to improve the tool. We have limited knowledge and world view, we should be able to improve the tool by getting expertise from the industry.
- **Question:** Are all responses/comments going to MCPA, and who will review the comments? **Brooke:** We are not sure at this time. **Connie:** Using the tool is still going to be optional, not mandatory. **Hans:** The responses will be stored in a database on a server, but you would be the only one able to access your information on the server. **Brooke:** The database will be maintained by MPCA. We will keep it up and running and maintained, it was suggested at previous meetings that state maintain the database. We will have to determine who can respond and review the comments.
- **Question:** Can we print if off the report for our next use? **Brooke**: Yes, the intent is to print, and you will have the option to share with MPCA. You can use this report as a way to show progress, but you are not going to be required to submit it. **Question:** How long will it take to fill out? **Connie:** It will depend on what mode you pick; in the tests we did there were about 200 questions.
- The tool will generate a report and graphs to use for analyzing the data.
- The Level 2 Training will show people how to use tool and walk through it in the classroom.
- **Question:** When will the tool be available? **Connie:** The Technical Expert team will likely test out the tool in Feb. /March, we will work out the bugs and test it out again. The Level 2 training would follow soon after that.

- **Implementation Discussion Overview:** *Rick Patraw, MPCA*
  - MPCA wants to focus on prevention and assistance, and provide training opportunities for winter maintenance professionals. We are working on budgeting for chloride reduction initiatives for fiscal year 16 and 17. Decisions have not yet been made on how much money will be available. The MPCA internally is supporting chloride reduction initiatives; we are here to help and want to hear what it will take for you to be successful. We want to work collaboratively across lines to reduce salt; we are dedicated and committed to this topic.

Small Group Discussion:

1) What stands out for you (excites, interests you) when you hear about the Chloride Management Plan and the Winter Maintenance Assessment tool?
2) What are some potential obstacles that may prevent your organization from successfully reducing salt usage? How could they be addressed?
3) How can we collectively ensure accountability for reducing salt usage in the TCMA? Is there a benefit in creating a Chloride Implementation Steering Committee that could meet regularly to track progress, discuss lessons learned and give each other support?
4) What next steps would you suggest? How do we achieve these goals?

Facilitator: Marni Karnowski, MPCA

1. The tool will allow Cities to take some simple steps that will make a big difference in reducing salt. The reports that the tool will generate will be very useful to winter maintenance professionals. It will be important to reach out to private applicators to attend the Level 1 and 2 trainings.

2. Public expectations for clear roads, sidewalks, and parking lots are high, as well as the expectations for soft water. Education will be important in order to change/lower expectations. The costs for upgrades and storage will be expensive. The nature of chloride as a pollutant, and the lack of treatment options, specifically for water softener issues will be difficult to overcome.
3. Reports could be submitted to MPCA. Communities could have an approved private applicator list. Not sure if a Steering Committee would ensure accountability, it will be difficult to ensure accountability for private applicators, regulatory vs voluntary.
4. Credit could be given to those implementing the best BMPs. Should continue to research the impacts of chloride on aquatic life and water quality and find out the true environmental costs.

Facilitator: Hans Holmberg, LimnoTech & Brooke Asleson, MPCA

1. Need to build trusting relationships for increased implementation, need to make sure that public officials are on board with reducing salt usage. Credibility is crucial to supporting needed changes
2. The public has high expectations, want us to continue maintaining the current level of service. Need to increase public awareness of environmental concerns regarding chloride. Implementing preventative BMPs will be expensive, need to provide funding opportunities and incentives. Cost would be a burden for local units of government. Public support is crucial so that elected officials have the backing they need to address the level of service expectations.
3. Need to create incentives. Education is important, winter maintenance professionals and politicians need to understand the impacts of chloride to water quality. Need to creatively involve and engage private applicators in the solution. Also, need to address some "social norms", the desire to provide safe parking lots and sidewalks.
4. Steering committee for implementation would be useful and cohorts for private applicators (similar to farmer-led councils).
5. There is some desire for specific targets to reach, but hard to establish what that target is. Therefore, need to move toward the best possible practices.
6. Chloride isn't the only water quality issue that needs to be addressed in the TCMA. Where will it fall with respect to the others? Education is needed to make sure it doesn't fall off the priority list.

Facilitator: Connie Fortin, Fortin Consulting & Rick Patraw, MPCA

1. The tool is exciting; it's not generic or broad-brush. The tool provides lots of practicality, and justification for funding, etc. The tool also provides transparency, and it will provide ideas for every agency/practitioner, predictor of savings potential will be useful. The education resources/tools are also exciting.
2. Equipment is expensive, will have to wait to purchase equipment, but could use tool to weigh relevant priority, Liability lawsuits are an obstacle. Need to educate City leaders. Staff can educate, NEMO is a resource, level of service: educate to overcome
3. Continue having the Road Salt Symposium each year. Continue to do research on BMP effectiveness. Evaluate success and challenges, do research on alternative products. MPCA could provide a newsletter with items of interest like monitoring, training, and new research
4. Reach out to the private sector. Could tour innovative/successful operations. Reach out to outdoor enthusiasts like Trout Unlimited and Outdoor news, this audience could include some of the private applicators as well.

Facilitator: Rachel Olmanson, MPCA

1. Tool is very detailed, will be useful to make changes. The tool will generate ideas of what practices need to be improved/change in order to reduce salt. Like the idea of the tool being continuously updated to incorporate comments/suggestions of the user. The CMP will help cities, WDs, and WMOs apply for grants.
2. The political climate will be an obstacle, and meeting public expectations. The message needs to be the same that both the politicians and winter maintenance crews are giving. It will be important for the public to hear the message from different groups. The cities could set up specific rules, or winter maintenance guidelines, etc. and stick to them. Education will be important to help modify the public expectations. Speed limits that could be changed based on the road conditions may help modify public expectations.
3. Ramsey Washington-Metro Watershed District already has a public works group that comes together to share ideas, other groups could come to this group. Public works supervisors are the key audience.

4. Cities need to start using tool. Continued education about the impacts of road salt to water quality is important. A large social media campaign could be implemented.

Facilitator: Andy Ronchak, MPCA & Jeremy Walgrave, LimnoTech

1. The ability to provide comments and info back into the tool is valuable. The salt savings component could be a helpful tool in terms of justifying BMPs through salt cost savings. The tool can bring more uniformity amongst the winter maintenance industry.
2. It is important that leadership has buy-in and is engaged to make changes. Public expectation is a challenge in terms of changing practices and level-of-service.
3. Anti-icing and brine is not the "silver bullet" – rock salt is still needed for winter maintenance.
4. Concern expressed over whether the tool was going to be used because the MPCA will have access to the information, and how the MPCA might use that information.

TCMA Chloride Project
Implementation Plan Committee Meeting #2

Meeting Agenda
May 9, 2013
8:30 a.m. – 12:30 p.m.
Mississippi WMO office, Minneapolis

1. Welcome and Introductions – Barb, MPCA
2. TCMA Project Overview – Barb, MPCA
3. Monitoring and Modeling – Hans, LimnoTech
4. BMP Tool (Winter Maintenance) – Connie (Fortin Consulting)
5. Breakout Session – either Connie (BMP Tool) of Hans/Jeremy (Protection/Implementation)
6. Alternate to other Breakout Session
7. Wrap-Up

Twin Cities Metro Area Chloride Project:
Implementation Plan Committee Meeting #2

May 9th, 2013

Minnesota Pollution Control Agency
Barb Peichel

Minnesota Pollution Control Agency

Welcome and Introductions

Agenda

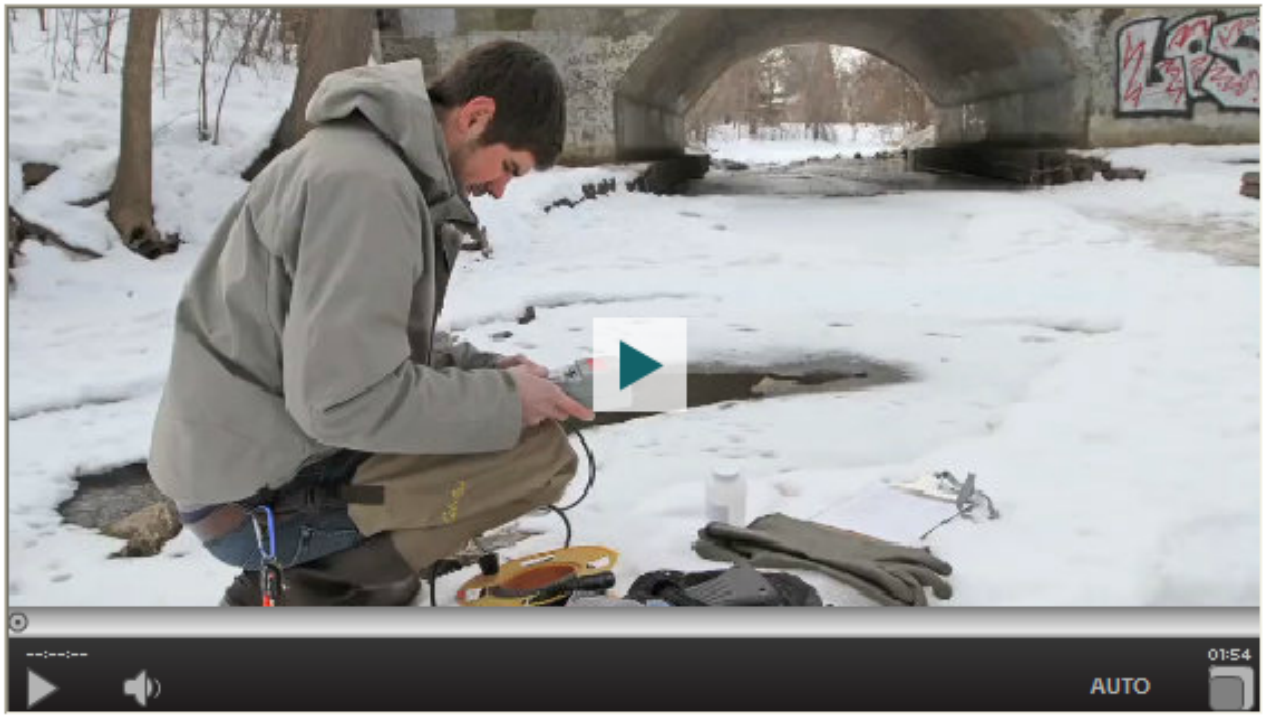
- 8:45 - Welcome and Introductions – Barb (MPCA)
- 9:00
  - TCMA Project Overview - Barb (MPCA)
  - Monitoring & Modeling – Hans (LimnoTech)
  - BMP Tool (Winter Maintenance) – Connie (Fortin Consulting)
- 10:00 - Break
- 10:15 - Breakout Session – either Connie (BMP Tool) or Hans/Jeremy (Protection/Implementation)
- 11:00 - Alternate to other Breakout Session
- 11:45 - Wrap-up
- 12:00 - Lunch

In the News

Search is on for the road salt that's polluting Minnehaha Creek

Article by: TOM MEERSMAN , Star Tribune | Updated: March 6, 2013 - 7:08 AM

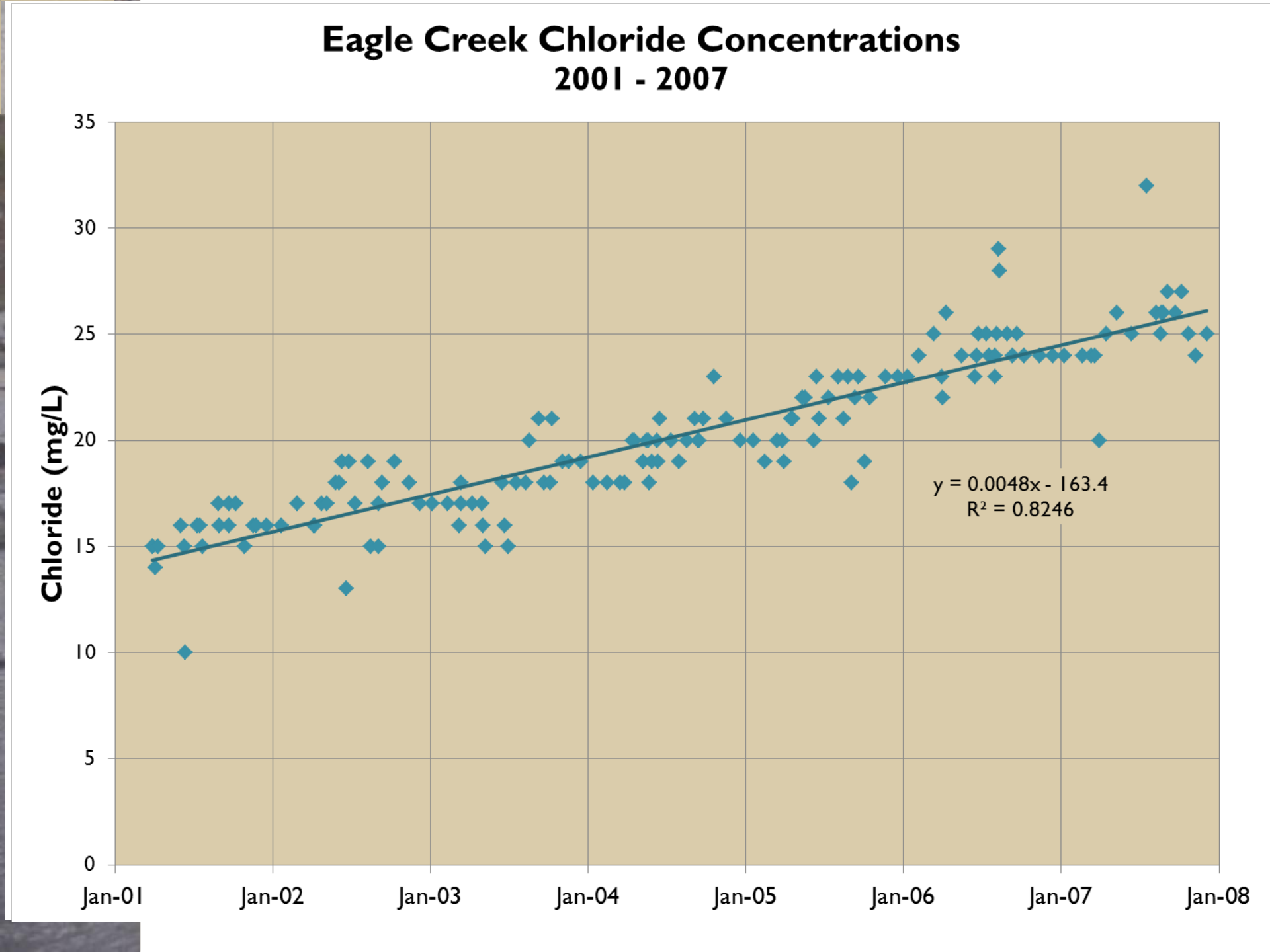
A salt-free diet may be impossible for the creek, but less chloride would make for a healthier habitat.



8 comments | resize text | print | buy reprints Recommend 42 Tweet 16 share +

Environmental Issues

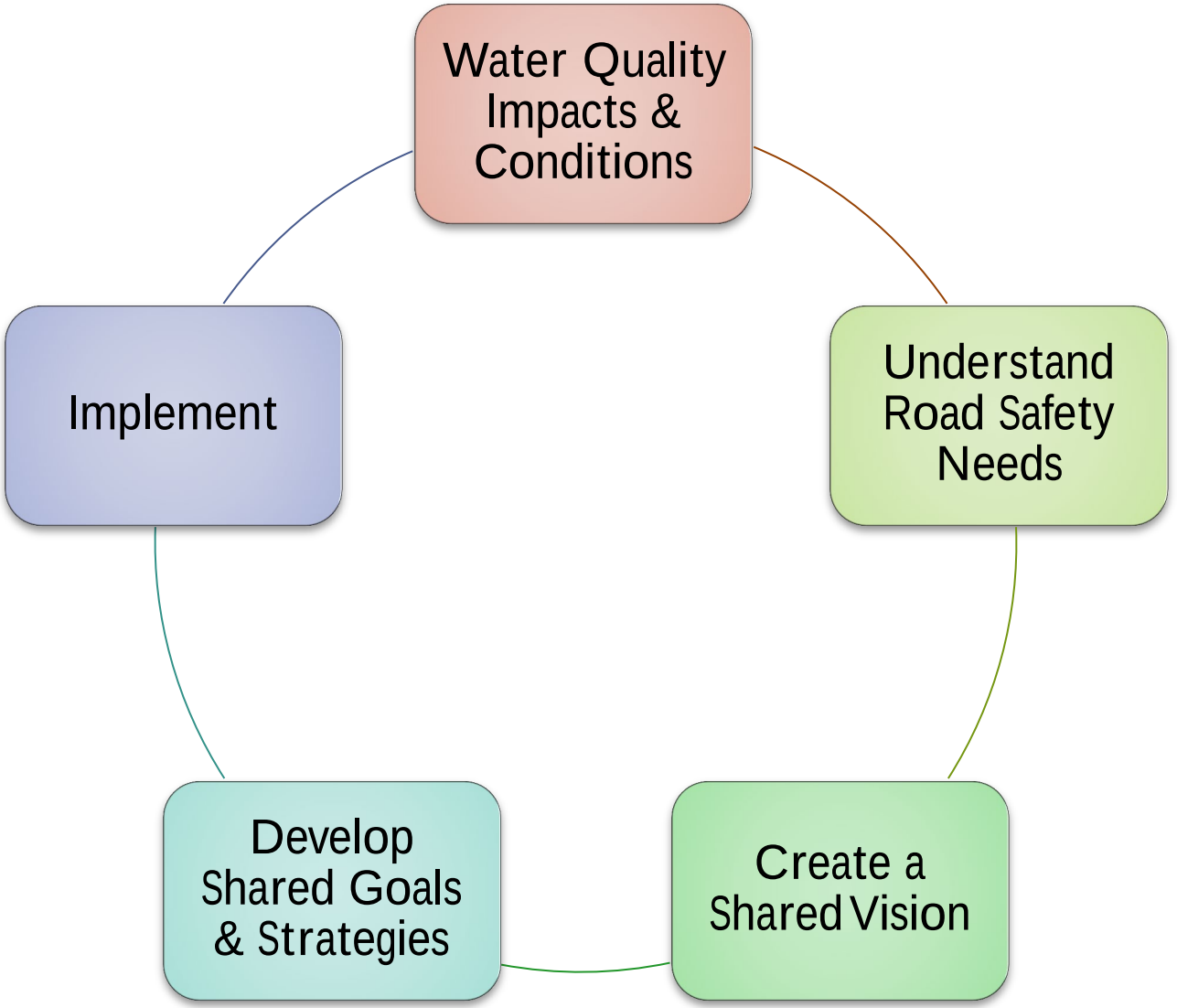
- Chloride is toxic to aquatic life and once in our waters there is no feasible way to remove it
- Road Salt primary source of Chloride in Twin Cities Metropolitan Area (TCMA)
- University of Minnesota study found that 78% of the chloride applied is being retained in the TCMA
- We are seeing increasing trends in our waters


Eagle Creek Chloride Concentrations
2001 - 2007
Chloride (mg/L)
35
30
25
20
15
10
5
0
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
y = 0.0048x - 163.4
R² = 0.8246

Management Issue

- The Public expects & needs safe roads, parking lots and sidewalks
- There is not safe alternative (yet….)
- Applied at all levels; State, County, City, Businesses and Homeowners (not regulated)
- Private applicators up against fear of slip & fall lawsuits – default is to apply more product
- Economic issues - product is costly, damage to infrastructure significant

Goals & Shared Vision
(Safe Roads + Clean Water)



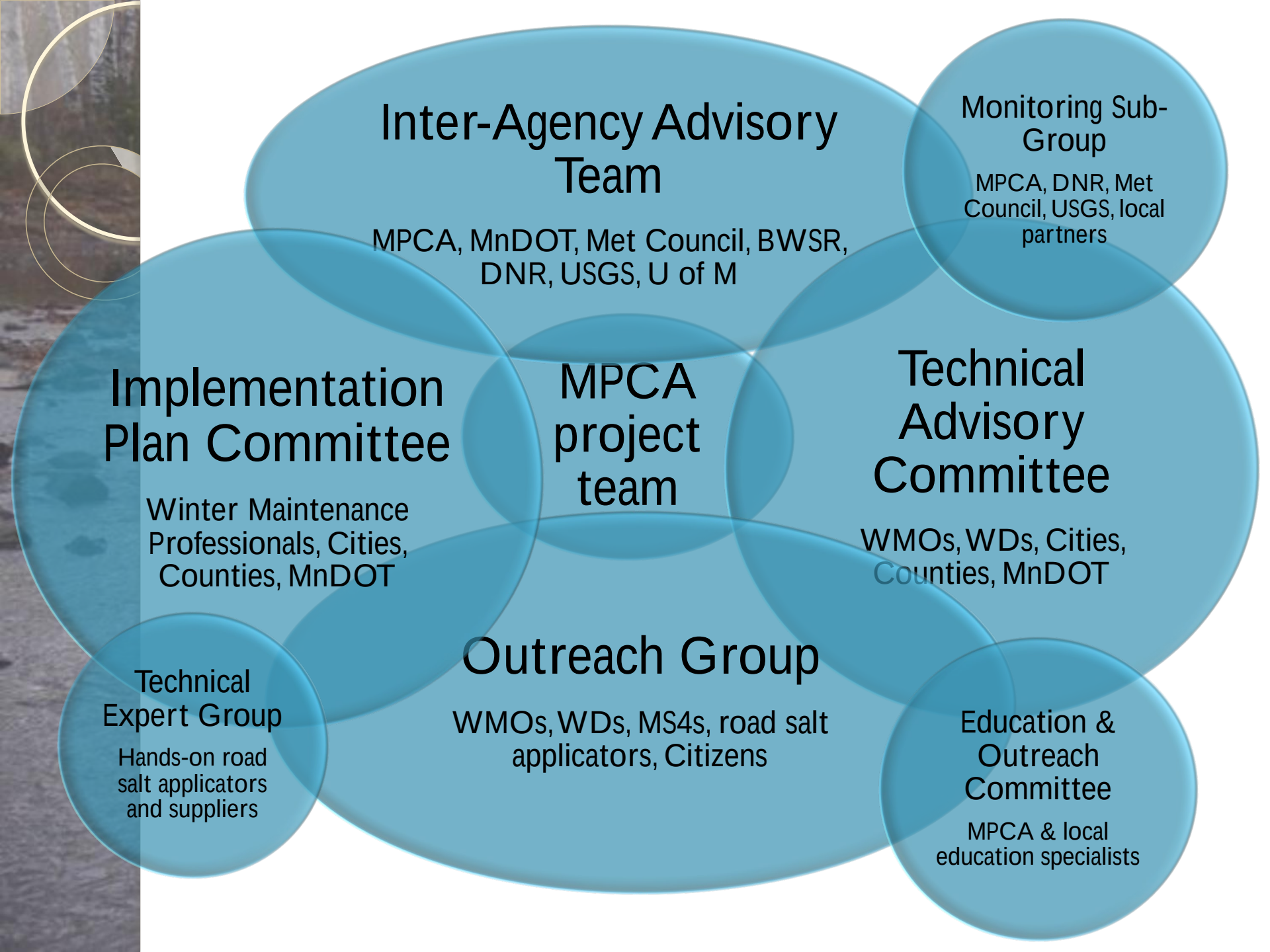
TCMA Chloride Management Plan

- Assist local partners to better manage the balance between the clean water and road safety

How?

- Develop Chloride Management Plan for the 7-county metro:
  - Complete Chloride TMDLs for all impaired waters
  - Set goals to protect the remaining surface waters
  - Layout implementation strategies to achieve water quality goals

This is a partnership process driven by the stakeholders

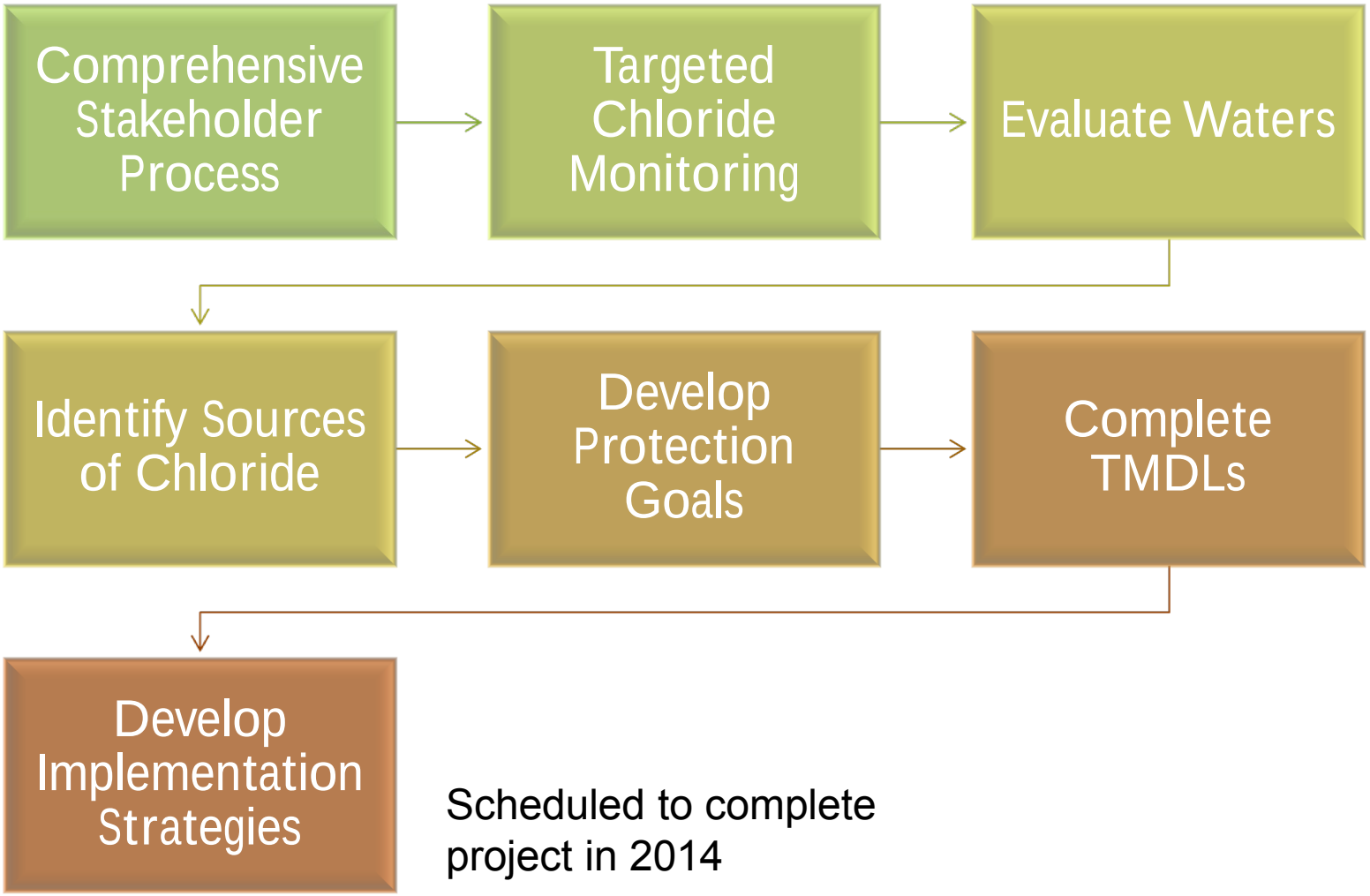

Inter-Agency Advisory Team
MPCA, MnDOT, Met Council, BWSR, DNR, USGS, U of M
Monitoring Sub-Group
MPCA, DNR, Met Council, USGS, local partners
Implementation Plan Committee
Winter Maintenance Professionals, Cities, Counties, MnDOT
MPCA project team
Technical Advisory Committee
WMOs, WDs, Cities, Counties, MnDOT
Outreach Group
WMOs, WDs, MS4s, road salt applicators, Citizens
Technical Expert Group
Hands-on road salt applicators and suppliers
Education & Outreach Committee
MPCA & local education specialists

IPC - Your Role

- Expertise in winter maintenance/water resource management/education
- Years of experience and knowledge
- Ability to execute the plan
- Are leaders in these activities
- Share the message of our Shared Vision

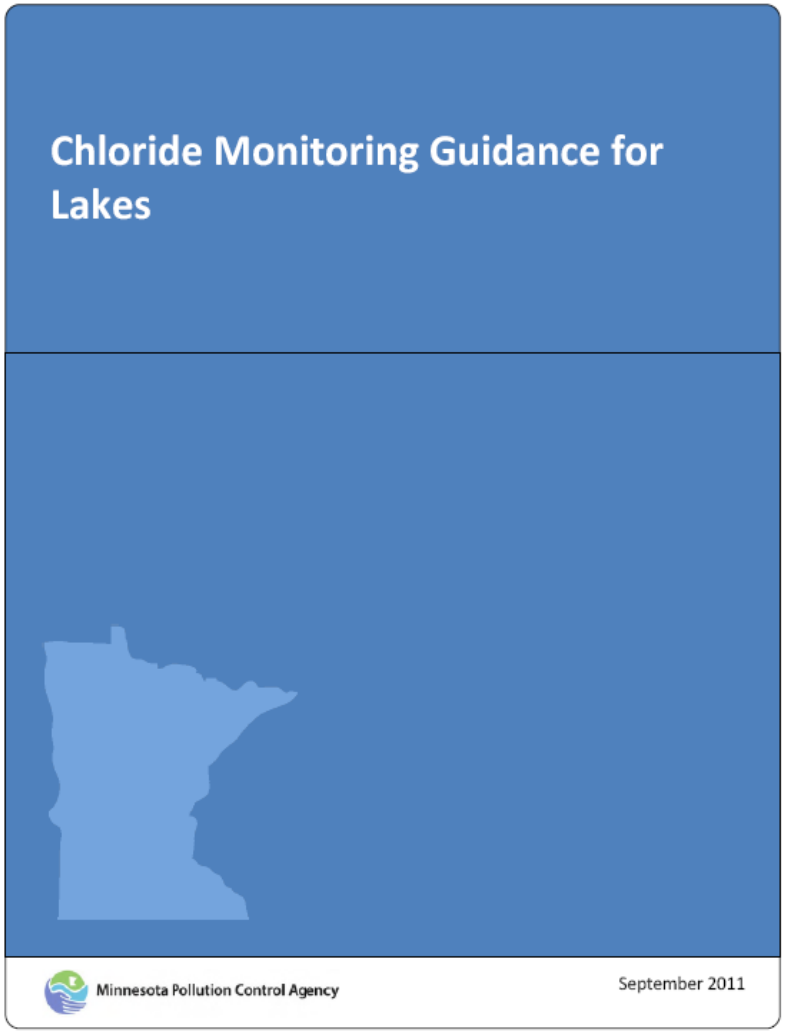
TCMA Chloride Project: Activities

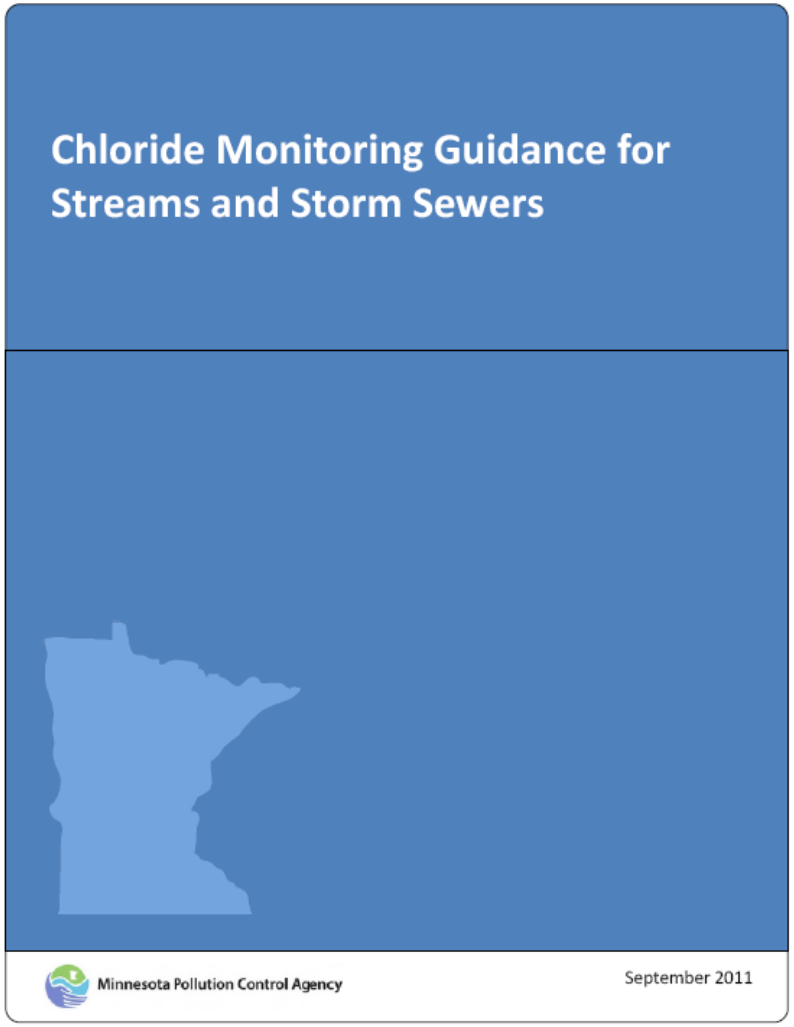
Began process in 2010



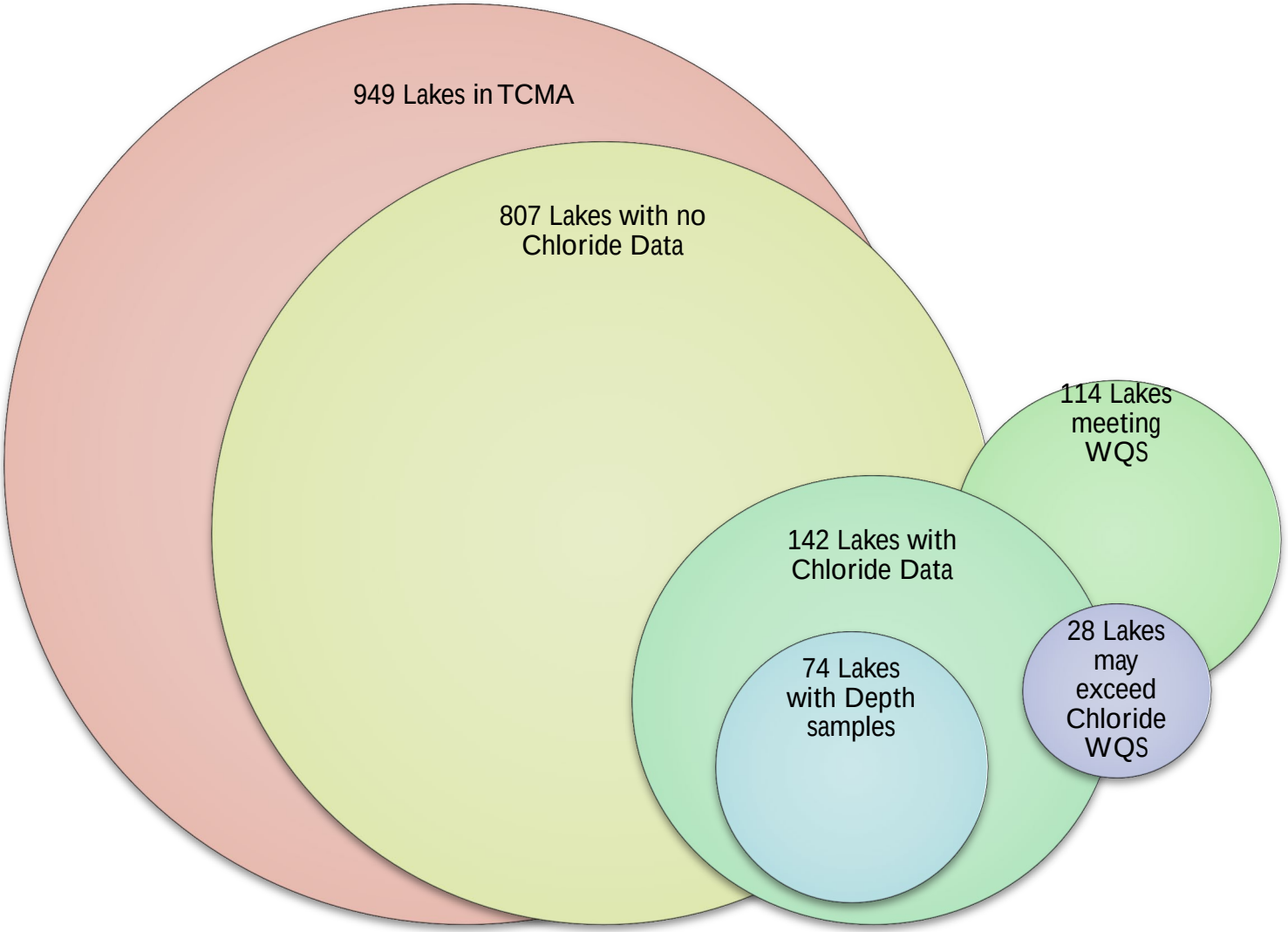
Scheduled to complete project in 2014

Resources: Monitoring Guidance





TCMA Lake Data



Implementation Strategies

- Comprehensive strategies that will be developed with stakeholders
- Will be a holistic approach, will include ways to reduce all sources of chloride
- In addition to the Winter Maintenance BMP Assessment Tool will incorporate additional options for reducing chloride:
  - Potential ordinances
  - Resident education programs
  - Incentive programs for private industry

Resources: Road Salt and Water Quality Press Releases

- You Tube video: **Chloride and Our Water - Monitoring the Mix**

  http://www.youtube.com/watch?v=ZRSO3VLDkgM

News you can use: Put Minnesota waters on low-salt diet

Feel free to use this press release in your newsletters and on your websites:

For years doctors have told people to stick to a low-salt diet. According to the MPCA, our waters should follow the same advice.

When snow and ice start to accumulate on Minnesota roads, parking lots and sidewalks, one of the more common reactions is to apply salt, which contains chloride, a water pollutant. When snow and ice melt, most of the salt goes with it, washing into our lakes, streams and rivers. Once in the water, there's no way to remove the chloride, and it becomes a permanent pollutant.

According to Brooke Asleson, MPCA project manager for the Twin Cities Metro Area chloride project, "Salt is a real threat to water quality. It only takes one teaspoon of road salt to permanently pollute five gallons of water. We are trying to spread the word that less is more when it comes to applying road salt because at high concentrations, chloride can harm the fish and plant life in our waters."

There are many ways to reduce salt use while maintaining high safety standards:

- **Shovel. The more snow and ice you remove manually, the less salt you will have to use and the more effective it can be. Break up ice with an ice scraper and decide whether application of a de-icer or sand is even necessary to maintain traction.**
- **More salt does not mean more melting. Use less than four pounds of salt per 1,000 square feet (an average parking space is about 150 square feet). One pound of salt is approximately a heaping 12-ounce coffee mug.**
- **15 degrees is too cold for most salt to work. Most salts stop working around this temperature. Instead, use sand for traction.**
- **Sweep up extra salt. If salt or sand is visible on dry pavement, it is no longer doing any work and will be washed away.**

To learn more about what you can to reduce chloride in our waters, or to read more about MPCA's role on this issue, visit the agency's road salt and water quality webpage.

Resources: MPCA Website

http://www.pca.state.mn.us/r0pgb86

Road salt and water quality

MPCA recommends a low-salt diet for Minnesota waters. Doctors tell us to stick to a low-salt diet. Our lakes and streams should follow the same advice. When winter comes and snow and and ice build up on Minnesota roads, parking lots, and sidewalks, one of the most common reactions is to apply salt, which contains chloride, a water pollutant.

Salt pollutes. When snow and ice melts, the salt goes with it, washing into our lakes, streams, wetlands, and groundwater. It takes only 1 teaspoon of road salt to permanently pollute 5 gallons of water. Once in the water, there is no way to remove the chloride, and at high concentrations, chloride can harm fish and plant life. Less is more when it comes to applying road salt.

NEW REPORT

- The MPCA and several local partners are sampling Twin Cities lakes, streams, and storm sewers for chloride. The study will help us to better manage the Twin Cities' water resources with respect to chloride while balancing our need for road safety. Learn more about this effort: Twin Cities Metropolitan Area Chloride Monitoring (wq-iw11-06x)

In the news

- Check out this WCCO radio interview/article dated March 25, 2011: Road Salt: Essential For Winter Roads, Toxic For Lakes
- StarTribune article, March 23, 2011: Road salt turning Twin Cities lakes into dead seas
- KAALTV segment on the Dangerous Side Effects of Road Salt.
- Twin Cities DAILY PLANET article dated December 26, 2010: Hold the Salt
- Ice management article: Ahead of the pack
- StarTribune article, January 2, 2010: State's roads aim for low-salt diet
- Environmental Science and Technology journal. A Fresh Look at Road Salt: Aquatic Toxicity and Water-Quality Impacts on Local, Regional, and National Scales: free download.

Overview | Environmental concerns | Training/resources | Activities | Contacts

Tips

Follow these simple tips to protect our clean water! There are many ways to reduce salt use while maintaining high safety standards.

- **Shovel.** The more snow and ice you remove manually, the less salt you will have to use and the more effective it can be. Whether you use a shovel, snow blower, snow plow, or ice scraper, get out there as early as you can and keep up with the storm. You may even decide that salt isn't needed.
- **15°F is too cold for salt.** Most salts stop working at this temperature. Use sand instead for traction, but remember that sand does not melt ice. Use the reference table below to apply the correct product for the conditions.
- **Slow down.** Drive for the conditions and make sure to give plow drivers plenty of space to do their work.

THANK YOU for being part of the solution!

http://www.pca.state.mn.us/r0pgb86

Twin Cities Metro Area Chloride Project:
Implementation Plan Committee Meeting #2

WRAP-UP

NEXT STEPS

Minnesota Pollution Control Agency
Barb Peichel

Minnesota Pollution Control Agency

Twin Cities Metro Chloride Project

Implementation Plan Committee (IPC) Meeting #2

May 9, 2013

LimnoTech
Water Environment | Scientists Engineers

Project Overview - LimnoTech

Water Quality Data Compilation

Categorize Waters

Develop Targets

Source Identification

Modeling and Analysis

Write Management, **Implementation,** and Monitoring Plans

Monitoring & Water Quality Data

- Monitoring Sub-Group (MSG) formed for project
- Includes 74 Lakes, 27 Streams & 8 Stormsewers
- Fall 2010 – Spring of 2013
- Involves several local partners:
  - Capitol Region WD, City of Prior Lake, DNR, Met Council, Minnehaha Creek WD, Minneapolis Parks and Recreation Board, MPCA, Mississippi WMO, Ramsey County Environmental Services, Ramsey-Washington Metro WD, Rice Creek WD, Three Rivers Park District, USGS

Water Quality Criteria

- Chloride criteria driven by toxicity to aquatic species
  - Acute criterion (max exposure) = 860 mg/L
  - Chronic criterion (4-day exposure) = 230 mg/L

Categorize Waters – Preliminary Evaluation Lakes – Exceeding Criteria or High Risk

WBID	Waterbody Name	Category
62-0048-00	BENNETT	Exceeds WQS
27-0038-00	BROWNIE	Exceeds WQS
27-0031-00	CALHOUN	Exceeds WQS
82-0166-00	CARVER	Exceeds WQS
02-0006-00	CENTERVILLE	Exceeds WQS
62-0055-00	COMO	Exceeds WQS
27-0022-00	DIAMOND	Exceeds WQS
27-0018-00	HIAWATHA	Exceeds WQS
62-0006-00	KOHLMAN	Exceeds WQS
27-0040-00	LAKE OF THE ISLES	Exceeds WQS
62-0058-00	LITTLE JOHANNA	Exceeds WQS
62-0067-00	LONG	Exceeds WQS
27-0655-02	LORING (S. BAY)	Exceeds WQS
62-0054-00	McCARRON	Exceeds WQS
27-0104-00	MEDICINE	Exceeds WQS
27-0107-00	PARKERS	Exceeds WQS
27-0138-00	PEAVEY	Exceeds WQS
62-0069-00	PIKE	Exceeds WQS
27-0014-00	POWDERHORN	Exceeds WQS
62-0083-00	SILVER	Exceeds WQS
27-0654-00	SPRING	Exceeds WQS
27-0035-01	SWEENEY-TWIN (SWEENEY BAY)	Exceeds WQS
27-0683-00	TAFT	Exceeds WQS
82-0115-00	TANNERS	Exceeds WQS
19-0048-00	THOMPSON	Exceeds WQS
62-0071-00	VALENTINE	Exceeds WQS
62-0011-00	WAKEFIELD	Exceeds WQS
27-0037-00	WIRTH	Exceeds WQS
82-0091-00	BATTLE CREEK	High Risk
62-0016-00	BEAVER	High Risk
62-0078-00	JOHANNA	High Risk
62-0010-02	KELLER (MAIN)	High Risk
62-0082-00	WABASSO	High Risk

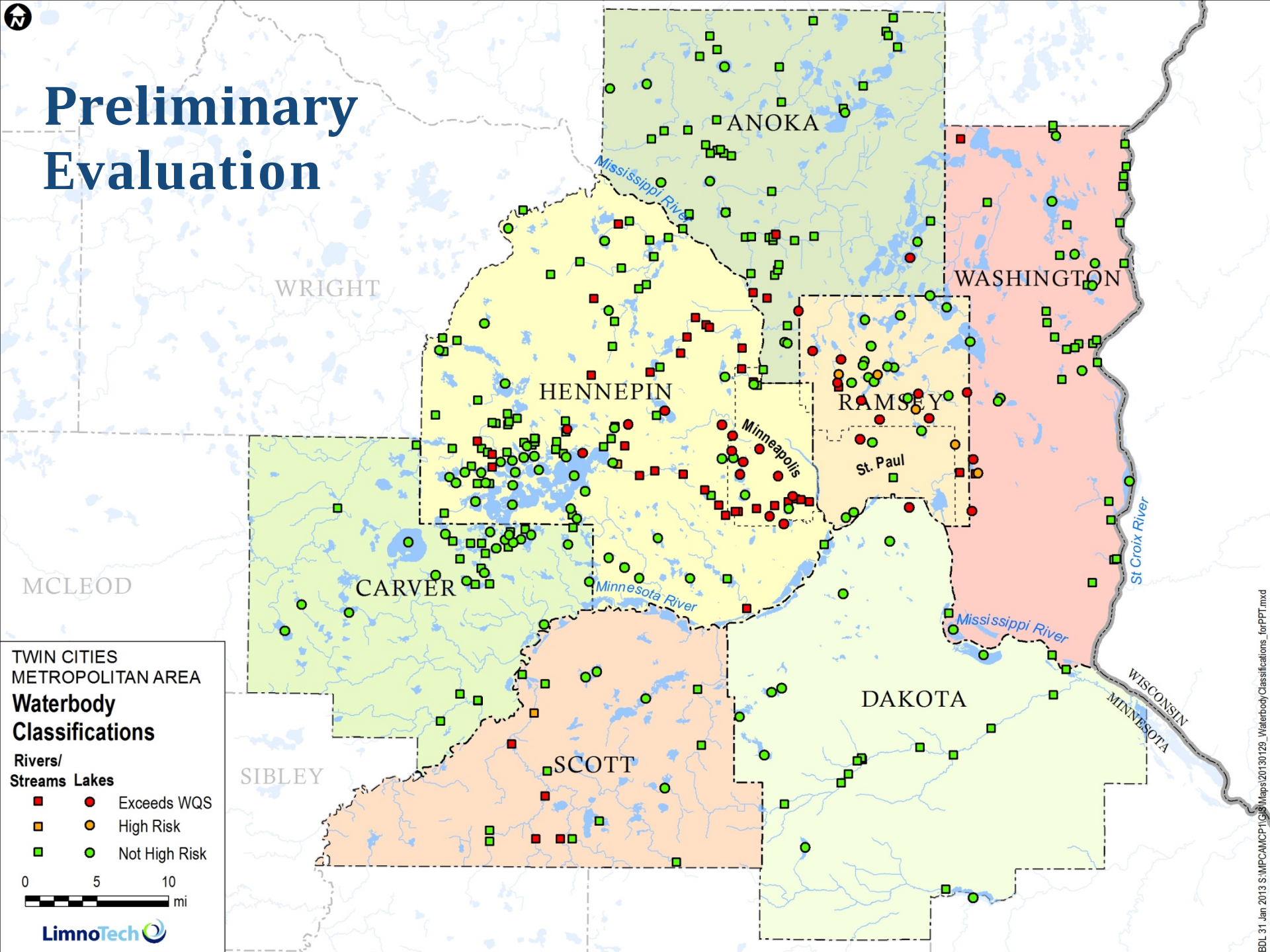
- 28 lakes exceeding criteria
- 5 lakes at “high risk”
- No lakes on the 2012 303(d) list

Categorize Waters – Preliminary Evaluation Streams – Exceeding Criteria or High Risk

WBID	Waterbody Name	Category
07010206-784	Bass Creek	Exceeds WQS
07010206-538	Bassett Creek	Exceeds WQS
07010206-592	Battle Creek	Exceeds WQS
07020012-710	Bluff Creek	Exceeds WQS
07010206-909	County Ditch 4	Exceeds WQS
07020012-517	Credit River	Exceeds WQS
07010206-525	Diamond Creek	Exceeds WQS
07010206-678	Dutch Lake Outlet	Exceeds WQS
07020012-543	E Branch Raven Stream	Exceeds WQS
07010206-508	Elm Creek	Exceeds WQS
07010206-704	Gleason Lake Inlet (North)	Exceeds WQS
07010206-718	Gleason Lake Inlet (Southeast)	Exceeds WQS
07010206-539	Minnehaha Creek	Exceeds WQS
07020012-518	Nine Mile Creek	Exceeds WQS
07010206-700	Painter Creek	Exceeds WQS
07010206-594	Pleasure Creek	Exceeds WQS
07020012-716	Raven Stream	Exceeds WQS
07010206-528	Rush Creek	Exceeds WQS
07020012-662	Sand Creek	Exceeds WQS
07010206-737	Sand Creek	Exceeds WQS
07010206-506	Shingle Creek	Exceeds WQS
07030005-525	Sunrise River	Exceeds WQS
07010206-904	Tributary to County Ditch 17	Exceeds WQS
-	Willow Creek	Exceeds WQS

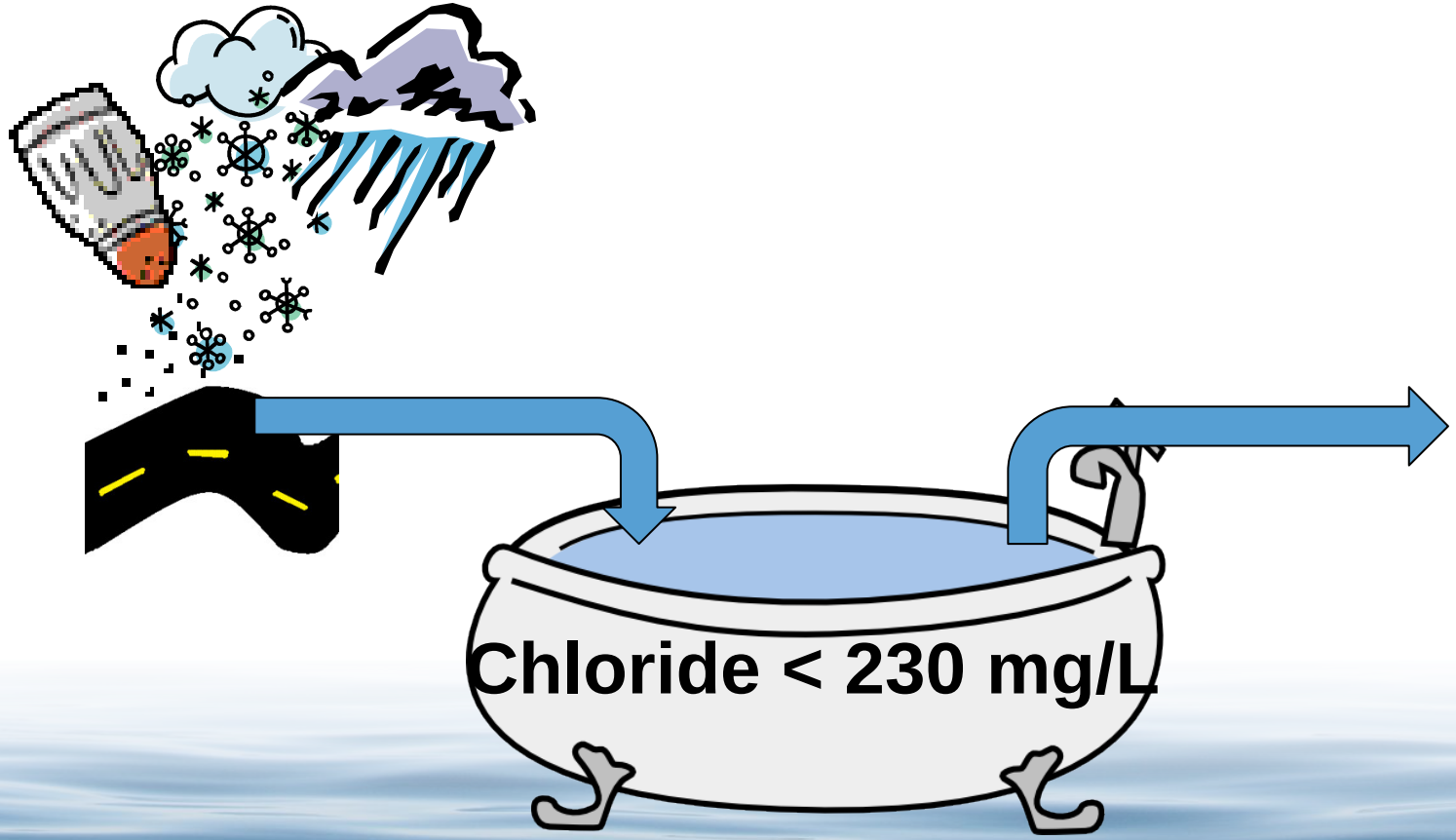
- 23 streams exceed criteria
- 10 streams on the 2012 303(d) list

Preliminary Evaluation

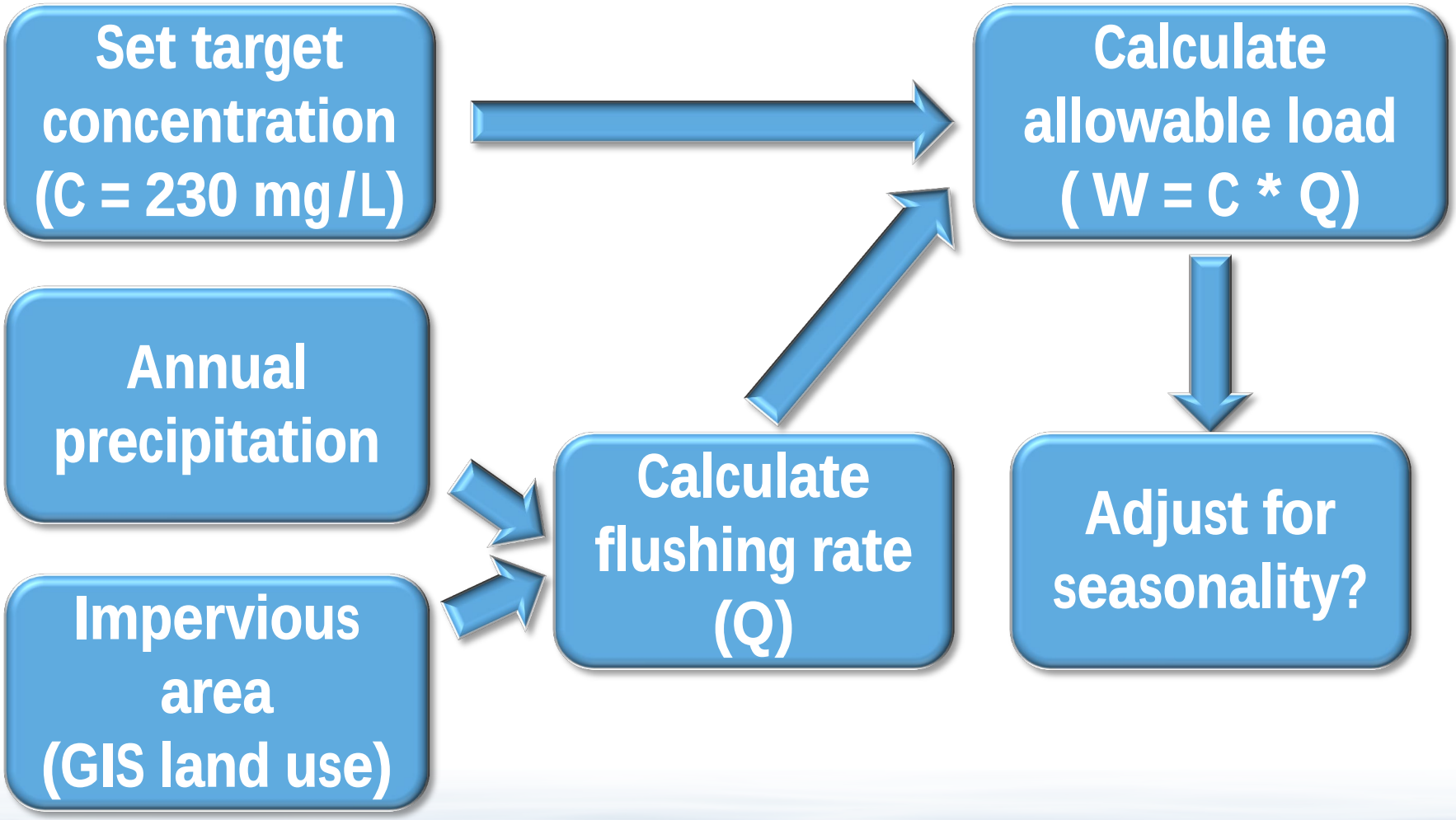


Modeling

- Modeling Objective
  - Establish the TMDL: Determine how much chloride can get into lakes and streams and still be protective of water quality standards



Modeling - What the process looks like…



Summary of Existing Stream TMDLs

Stream	Observed Peak Cl Conc. (mg/L)	Existing tons Cl applied per yr	Watershed Area (mi^2)	Baseline Application Rate (tons/mi^2/yr)	Required % Reduction (including MOS)	Allowable Load (tons/mi^2/yr)
Nine Mile Creek	605	6,357	44.5	143	62%	41
Shingle Creek	821	6,449	44.5	145	71%	55

From TMDL to Implementation

- TMDL = How much chloride can enter water body?
- Allocation = How much chloride from each source?
  - Road applicators
    - Consider high speed vs low speed roads
  - Private applicators (commercial/parking lots)
  - Homeowners
  - Point sources (industrial discharges)
  - Other non-point sources (agriculture)
- Implementation = How can chloride be reduced to meet TMDL?

TMDL versus Protection

- TMDL established for impaired waters
  - Regulatory requirement
- Protection goal established for unimpaired waters
  - Voluntary target

Project Timeline

- Monitoring – last round of samples after ice out Spring 2013
- MPCA Special Assessment – Summer 2013
- Modeling to set TMDLs – anticipated completion Fall 2013
- Develop TCMA Chloride Management Plan – Summer 2013 – Fall 2014
- Develop Implementation Plan – Summer 2013 – Fall 2014
- Develop Long-term Monitoring Plan – Summer 2013 – Fall 2014
- Stakeholder Involvement – on-going through Fall 2014

Twin Cities Metro Chloride Project

IPC Meeting:
Develop Protection Targets and Implementation Strategy

May 9, 2013

LimnoTech
Water Environment | Scientists Engineers

Goals – IPC Breakout

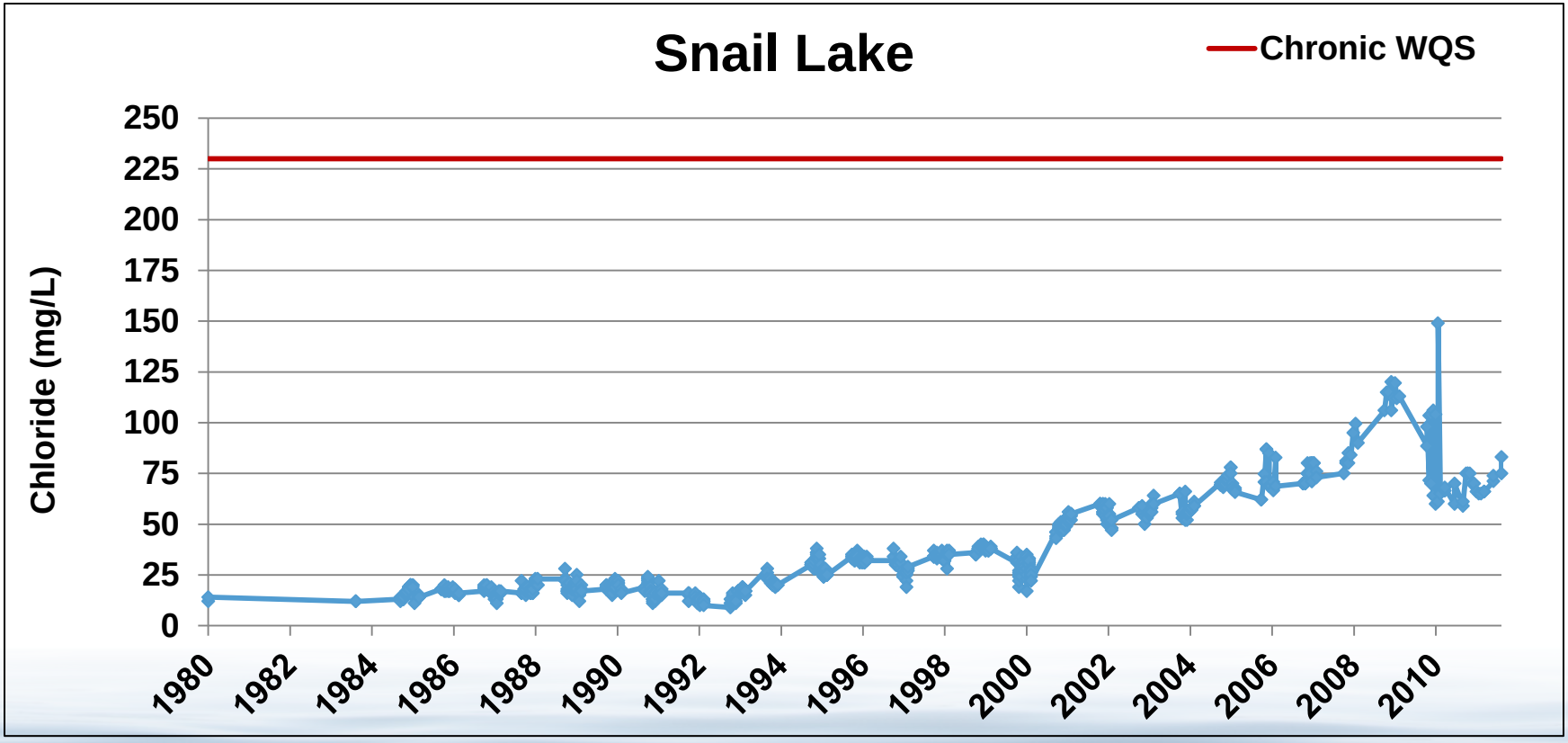
- Protection Targets – **Voluntary**
- Implementation Strategy

Overview

- Management Plan
  - Summarize the problem
    - Impaired waters
    - Need for protection
  - TMDLs for each impaired water
    - Allowable load
    - Source allocations
  - Protection target for unimpaired waters
  - General implementation strategies
    - Adaptive management
- Implementation Plan
  - Specific actions for reducing chloride
- Monitoring Plan

Why have a Protection Strategy?

- Some waterbodies are approaching impairment
- Monitoring indicating increasing chloride concentrations

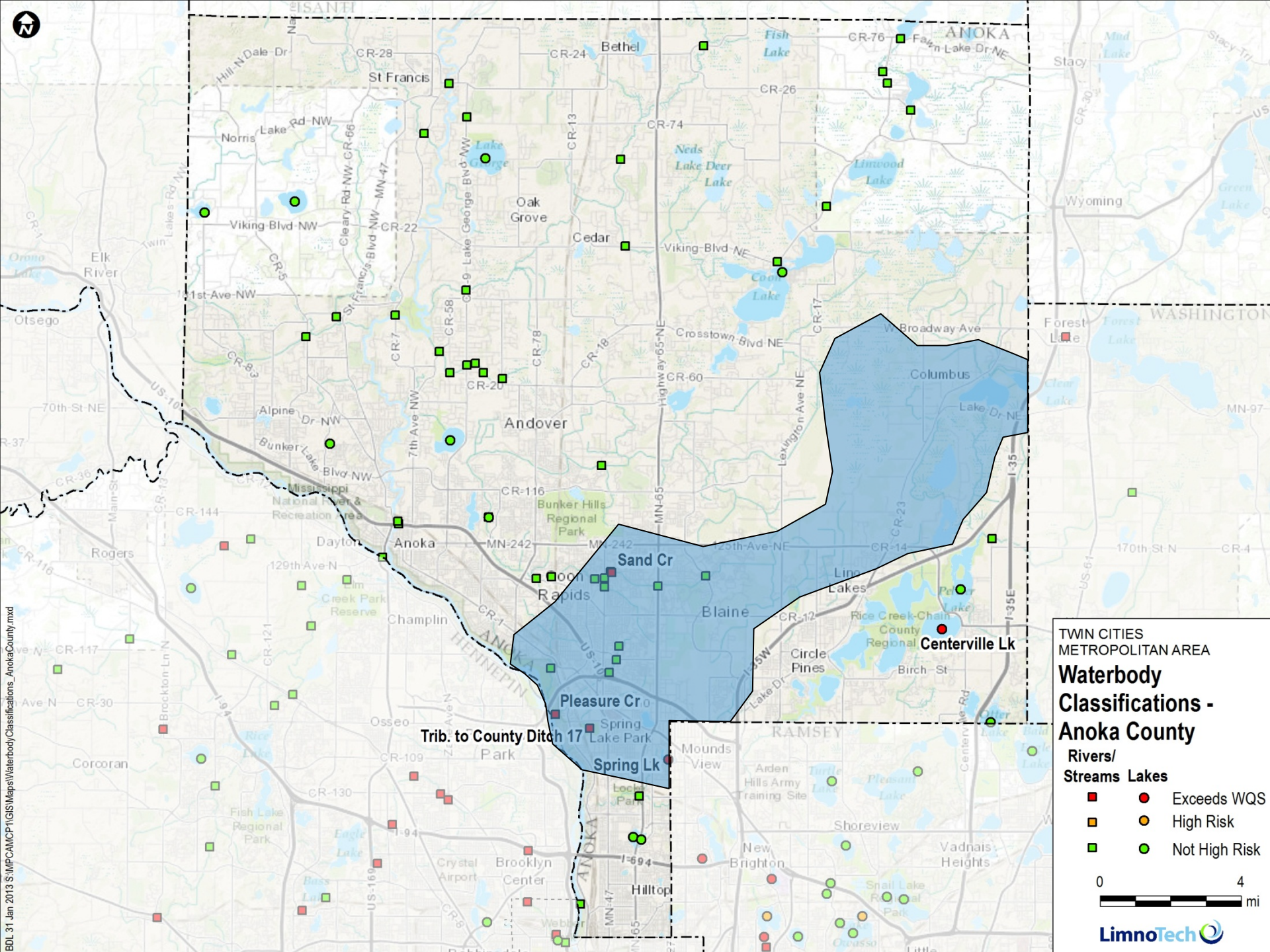


Protection Targets

- Voluntary
  - Applies to unimpaired waters
- Numeric
  - Existing criteria
  - % of criteria
  - % change in concentration from existing conditions
  - Maximum load over an area
  - % reduction from current application rates
- Level of Performance
  - Best Management Practices

Implementation Strategy

- Individual watershed approach versus regional approach – What makes sense?


Sand Cr
Pleasure Cr
Trib. to County Ditch 17
Spring Lk
Centerville Lk
Andover
Anoka
Blaine
Coon Rapids
Columbus
Oak Grove
Cedar
Champlin
Brooklyn Center
Hilltop
New Brighton
Mounds View
Shoreview
Circle Pines
Lino Lakes
Wyoming
Stacy
Elk River
Otsego
Rogers
Corcoran
St Francis
Bethel
Norris
Alpine
Dayton
Osseo
Spring Lake Park
Arden Hills Army Training Site
Vadnais Heights
Snail Lake Regional Park
Fish Lake Regional Park
Rice Creek Chain of Lakes Regional Park
Bunker Hills Regional Park
Mississippi National River & Recreation Area
Elm Creek Park Reserve
Crystal Airport
ANOKA
HENNEPIN
RAMSEY
WASHINGTON
Viking Blvd NW
Viking Blvd NE
Crosstown Blvd NE
W Broadway Ave
Bunker Lake Blvd NW
Lake Dr NE
129th Ave NE
125th Ave NE
Lexington Ave NE
7th Ave NW
Highway 65 NE
Hill-N-Dale Dr
Lake Rd NW
Cleary Rd NW
St Francis Blvd NW
Lake George Blvd NW
Fawn Lake Dr NE
Neds Lake
Deer Lake
Linwood Lake
Coon Lake
Fish Lake
Mud Lake
Forest Lake
Clear Lake
Green Lake
Orono Lake
Twin Lakes
Lake George
CR-28
CR-24
CR-26
CR-74
CR-76
CR-22
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CR-60
CR-144
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CR-18
CR-78
CR-58
CR-7
CR-9
CR-13
CR-66
CR-47
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CR-121
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Lake Terr
Lake Pkwy
Lake Sq
Lake Plz
Lake Mall
Lake Walk
Lake Path
Lake Bridge
Lake Dam
Lake Park
Lake Reserve
Lake Preserve
Lake Conservation Area
Lake Wildlife Management Area
Lake Scientific and Natural Area
Lake Forest Preserve
Lake Nature Center
Lake Arboretum
Lake Botanical Garden
Lake Zoo
Lake Aquarium
Lake Museum
Lake Library
Lake School
Lake College
Lake University
Lake Hospital
Lake Clinic
Lake Medical Center
Lake Health Center
Lake Urgent Care
Lake Pharmacy
Lake Drug Store
Lake Grocery Store
Lake Supermarket
Lake Convenience Store
Lake Gas Station
Lake Auto Repair
Lake Car Wash
Lake Auto Dealership
Lake Motorcycle Dealership
Lake Boat Dealership
Lake RV Dealership
Lake Marina
Lake Boat Launch
Lake Fishing Pier
Lake Swimming Beach
Lake Picnic Area
Lake Campground
Lake Golf Course
Lake Tennis Court
Lake Basketball Court
Lake Baseball Field
Lake Soccer Field
Lake Football Field
Lake Hockey Rink
Lake Skating Rink
Lake Ice Arena
Lake Swimming Pool
Lake Water Park
Lake Amusement Park
Lake Theme Park
Lake Zoo
Lake Aquarium
Lake Museum
Lake Library
Lake School
Lake College
Lake University
Lake Hospital
Lake Clinic
Lake Medical Center
Lake Health Center
Lake Urgent Care
Lake Pharmacy
Lake Drug Store
Lake Grocery Store
Lake Supermarket
Lake Convenience Store
Lake Gas Station
Lake Auto Repair
Lake Car Wash
Lake Auto Dealership
Lake Motorcycle Dealership
Lake Boat Dealership
Lake RV Dealership
Lake Marina
Lake Boat Launch
Lake Fishing Pier
Lake Swimming Beach
Lake Picnic Area
Lake Campground
Lake Golf Course
Lake Tennis Court
Lake Basketball Court
Lake Baseball Field
Lake Soccer Field
Lake Football Field
Lake Hockey Rink
Lake Skating Rink
Lake Ice Arena
Lake Swimming Pool
Lake Water Park
Lake Amusement Park
Lake Theme Park
TWIN CITIES METROPOLITAN AREA
Waterbody Classifications - Anoka County
Rivers/ Streams
Lakes
Exceeds WQS
High Risk
Not High Risk
0
4
mi
LimnoTech
BDL 31 Jan 2013 S:\MPCA\MCP1\GIS\Maps\Waterbody\Classifications_AnokaCounty.mxd

How can Plans be of greatest value to you?

Inform decisions?
Address challenges?

Discussion?

Hans Holmberg, PE
LimnoTech – Twin Cities
hholmberg@limno.com
715-808-0182

WINTER MAINTENANCE ASSESSMENT TOOL

4/9/13

Connie Fortin
connie@fortinconsulting.com

FORTIN CONSULTING, INC.
serving the environment

POSSIBLE REPORTS

Summary of current practices

Summary of predicated changes

Salt Savings potential

Current Winter Maintenance Practices
City of Roundville 6-06-2011

Before Winter

During Winter

Accuracy during the storm

22 manual controlled trucks

40 electronic controlled trucks, closed loop

Effectiveness during the storm

Reduce Waste during the storm:

Salt pile uncovered

Salt/sand pile uncovered

Receive shipments outdoor with good clean up

Never overfill salt buildings

Use up all salt at end of winter

Recovery of Salt

Current Summary:
30 Poor Practices
80 Best Practices
20 Advanced Best Practices

Legend:

- Poor Practice
- Best Practice
- Advanced Best Practice

Predicted Changes in Winter Maintenance Practices

City of Roundville 6-06-2011 to 6-06-2016

Before Winter

During Winter

Accuracy during the storm

Effectiveness during the storm

Reduce Waste during the storm:

Salt pile uncovered - salt pile covered

Use up all salt at end of winter – Save salt for next year

Recovery of Salt

Current Summary:
30 Poor Practices
80 Best Practices
20 Advanced Best Practices

5 Year Prediction:
15 Poor Practices
80 Best Practices
35 Advanced Best Practices

Legend:

- Poor Practice
- Best Practice
- Advanced Best Practice

Salt Savings Potential for One Year
City of Roundville Parks Department 6-06-2011

Total Salt Reduction Potential = 32.05%

2,000 tons to 1,359 tons Salt Savings potential if changes had been made for 2010/2011 winter

With these changes, **last year Roundville would have saved $45,000** in salt purchases (salt $70 per ton)

BEFORE WINTER:
0% reduction potential

DURING WINTER:
0% reduction potential

ACCURACY DURING THE STORM:
10% Reduction Potential
* 0 Ground Speed Controllers with MDSS>10 Ground speed controllers with MDSS>10% Salt Savings on salt applied salt

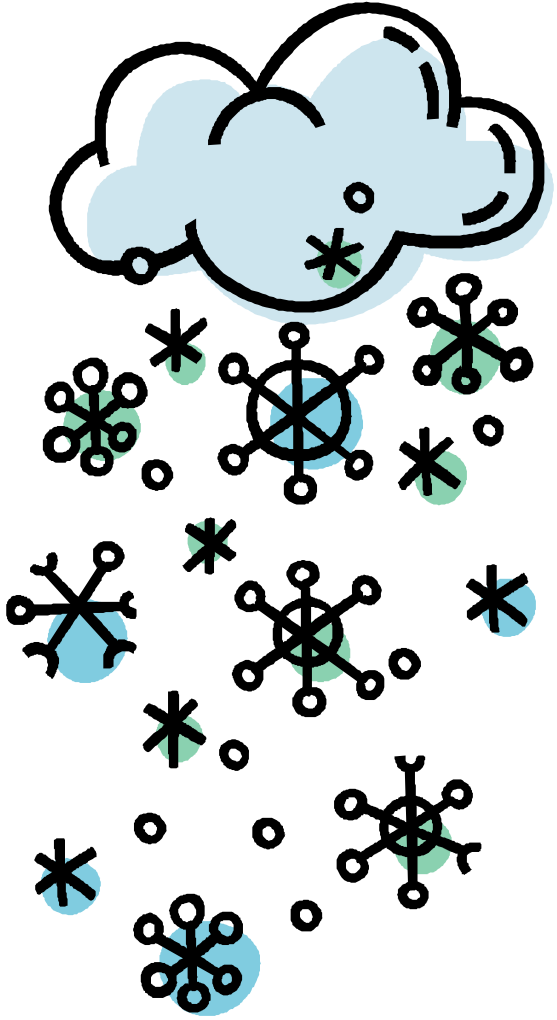
EFFECTIVENESS DURING THE STORM
0% reduction potential

REDUCE WASTE DURING THE STORM:
22.05% reduction potential
Bulk salt pile uncovered > Bulk salt pile indoors > Salt Savings 17% of salt in storage
Salt/sand pile uncovered> Bulk salt pile indoors > Salt Savings 17% of salt in sand pile
Receive shipments outdoor with good clean up > Receive shipments indoors > Salt savings .05% of salt ordered
Use up all salt at end of winter > give away salt at end of winter> 5% of total salt purchased

RECOVERY OF SALT:
0% reduction potential

Legend:

- Poor Practice
- Best Practice
- Advanced Best Practice



Thank you
for your help and input into this process!

Twin Cities Metro Area (TCMA) Chloride Project
Implementation Plan Committee (IPC) - Meeting #2
May 9th 2013 Meeting notes

Attendees: Derek Asche, Marcey Westrick, Bob Fossum, John Scharffbillig, Lois Eberhart, Cliff Aichinger, Mike Kennedy, Connie Fortin, Angie Hong, Nancy Mulhern, Hans Holmberg, Jeremy Walgrave, Kevin Nelson, Joe Wiita, Tom Broadbent, Emily Resseger, Rachael Crabb, Becky Houdek, Andy Ronchak, Mark Fischbach, Doug Lauer, Kari Oquist, Jenny Winkelman, Mike Scherber, Barb Loida, Matt Morreim, Barb Peichel, Jeff Warner, John Erdmann, Claire Bleser, Melissa Bokman, Brian Brown, Jana Larson, Tracy Fredin

Barb Peichel, MPCA – presentation

- Overview of agenda – a couple presentations and then we will split into two groups to discuss the Best Management Practice Tool (Fortin Consulting) and Protection/Implementation (LimnoTech)
- Environmental Issues - chloride is toxic to aquatic life and once in our waters, road salt primary sources, UMN study found that 78% of the chloride applied is being retained in the TCMA, we are seeing increasing trends in our waters (ex. Eagle and Battle Creeks)
- Management Issue – we need safe roads and clean water, chloride applied at all levels (public roads to parking lots to homeowners)
- Assess water quality conditions>understand road safety needs>create a shared vision>develop goals & strategies>implement
- TCMA Chloride Management Plan (CMP) – assist local partners to better manage the balance between clean water and road safety, develop CMP which will complete Total Maximum Daily Load (TMDLs) for impaired waters and set goals for remaining waters, and layout implementation strategies
- Numerous stakeholder teams – role of IPC is to provide expertise in winter maintenance/water resource management/education, experience and knowledge, leaders in these activities
- TCMA Chloride Project Activities – started in 2010 with a stakeholder process, targeted monitoring, and this summer/fall will conduct assessment, scheduled to complete the project in 2014
- Note that we still have many waterbodies in the TCMA with no chloride data
- Implementation strategies will be developed with stakeholders
- Note project web page for more information - http://www.pca.state.mn.us/r0pgb86

Jeremy Walgrave & Hans Holmberg, LimnoTech - presentation

- Compile water quality data, categorize waters, develop targets, source identification, modeling and analysis, implementation and protection
- Monitoring subgroups – effort during 2010-2013 to monitor 74 lakes, 27 streams, and 8 stormsewers involving numerous partners
- Water quality standards – 230 mg/l chronic and 860 mg/l acute
- Preliminary evaluation had 28 lakes exceeding criteria (and 5 lakes as “high risk”) and 23 streams exceeding the criteria (note some of these may only have one exceedances which is not enough to list it as impaired)
- How is the Mississippi River doing? We haven’t looked at the Mississippi River, but will do that during our assessment.
- A lot of exceedances are in the inner core of metro.
- TMDL – how much chloride can get into lakes and streams and still be protective of water quality standards
- Model – set target concentration at water quality standard – annual precipitation, impervious area (GIS land use) and use those to calculate the flushing rate (Q) and then calculate the allowable load (W=C*Q) and adjust for seasonality and allocate and translate to load per lane mile
- Existing stream TMDLs – Nine Mile and Shingle Creeks – existing TMDLs and between 62-71% reduction in chloride is required
- Allocation – how much chloride from each source – private applicators, homeowners, point sources, non-point sources and then implementation – how can chloride be reduced to meet the TMDL

- Modeling will be done for each waterbody that is impaired or on the 303d list (this has regulatory ramifications); however for the waterbodies that are not impaired for chloride – we will be talking about setting protection goals which are voluntary
- Timeline – modeling to set TMDLs (fall 2013), develop TCMA Management Plan and Implementation Plan (summer 2013-fall 2014); long-term monitoring plan (summer 2013-fall 2014), stakeholder involvement (ongoing through fall 2014)
- Question – how about water softeners? This is an issue from sanitary sewers to wastewater treatment plans in the Metro. Outstate Minnesota may be more of an issue.
- Question - How will you estimate chloride loading? Didn't capture answer…
- Question – There are large areas in Metro where people have septic systems so will have to determine how big of a source that is.
- Comment – looks as if Credit River may be impaired so need to update map.

Connie Fortin, Fortin Consulting - presentation

- Developing a Best Management Practice (BMP) winter maintenance assessment tool to help folks understand what they do for winter maintenance and figure out the path forward
- It will be a computer based tool – asks questions about your winter maintenance operations – current practices (green), predicted changes (yellow), and salt savings potential (red)
- Gives an itemized report – poor practices, best practices, advanced best practices
- May give a salt savings prediction for some BMPs
- Example – how do you cover your salt pile? Red is color coded (uncovered) and green is best (stored indoors) – are you planning to change your practice? Yes, in 5 years we budgeted to make a certain change. The unknown part is if there is a documented salt savings for these practices since this doesn't have a lot of research associated with it. Another example question is – do you receive your shipments indoors or outdoors?
- Expert technical team is helping to develop this tool and has reviewed most of the questions
- Tool could have 3 possible reports – list of current practices (category of before winter, during winter, etc.) and could say 30 are good practices and 80 are poor practices; could estimate change; could try to estimate percent savings-could be 32% (but again it is hard to get at these numbers) and how much money we could save
- Where do we use salt and where do we lose salt; could lose some in salt storage; salt returned to shed - but not all trucks the same size so we can't estimate the same loss, right?
- Tool will help folks decide that without so much work, these are some corrections we can make
- MN Pollution Control Agency (MPCA) will hire an IT person to help develop the web-based part and do a test section of 20 questions. It will change over time. Not sure when the tool would be ready to use.
- Think about "I'm a maintenance supervisor, how would this useful?" Or I look at reports and "is this too cumbersome or is this the data I want to see?"
- Yellow report group: want a bar graph, use graphics, use cumulative approach
- Want an overall score vs. total incorporation of BMP goals, standard rates of application for each event
- Should have a universal application rate agreement
- A continuous progression versus goals
- Are we going to be compared to others in our area? Could be anonymous, on-line aggregation of data.
- Audience for salt savings (red) should be municipal leaders, state leaders

Connie Fortin, Fortin Consulting – break-out session

- Connie passed out a handout that lists questions from the draft tool – all questions would appear in the tool. Gray-coded questions are the ones we will try to have a calculation behind – (salt savings) and white-coded questions are other BMPs (that we probably can't calculate salt savings)
- Note there are different sections – storage, loading, unloading, spread pattern, etc.

- Part of the handout is green – this is what you are currently doing – for example, 30 are poor practices, 80 best practices, 20 advanced best practices
- Part of the handout is yellow – this is what you said you will be doing
- These are have multiple choice answers so we can compare results
- Each of the small groups is going to give feedback on one of the three reports handed out
- Group 3 (salt savings potential for one year and potential costs savings) - hard to understand this; how can we even begin to estimate costs; like the idea of questions, but there are so many variables; as long as this is just a tool to get some rough ideas than it is okay; some savings might be negated by investment costs and every winter is different and every city is different (levels of service and environment); checklist of best practices – will it dummy down the information since it is trying to apply to everyone? I don't think so because you can all use the tool any way you want (may not answer every question); it is more important that we have to have a strong internal policy and follow state guidelines (200 lbs salt/lane mile); would help us understand what the biggest bang for the buck to get most reductions; what does "0% reduction potential" mean? Need to reword this so it is more intuitive – need glossary or definition of terms on the report – what does "before storm" mean; add headings – current practices versus practice in 5 years; maybe categories aren't useful at all in reports – get rid of headings (before storm, etc.) in the report and just give outputs overall; are the categories helpful to you in the report? Can't tell because they aren't defined; do we just need a brochure of these best practices and then people can cherry pick the ones that work for them; can't distinguish numbers because a lot of people are trying multiple things; could use results in some way to go in front of city councils or county boards; should be "salt reduction" instead of "salt savings" but it would be nice to have cost information too
- Group 1 (report 1 – green) – just lists how you are doing today; is report really that useful; has to go back into the questions; but it is good to have a snapshot or cover sheet for rest of survey; are these the right categories – maybe the 22 question categories; needs to be easy to read and graphical (pie charts, etc.); need to reference the question number so can go back there to get more information; could be searchable by subsection or could get a report just on storage (depends on interest); maybe have a customized report
- Group 2 (yellow one about predicted changes) - some people are color blind to say 1, 2, 3 too; need to match colors with keys; can it be reversed in case they need to go from advanced practice to less-advanced practice; what is benefit of the report-is it just for the maintenance folks or higher for manager; what is baseline – what would be average performing organization; we do measure ourselves against our peers but don't want to be used to show some folks are doing poorly
- Questions are great – typical, better, best – maybe that is enough; reporting should be more – here are the 80 things you can do – which one has the best return on investment – which tools are most cost effective – what can I really accomplish; calculations might be more distracting right now and full of a lot of error
- Little savings add up to big savings
- Range may be better or go from low, moderate, or large salt reduction
- If there is not a cost savings, some cities can't do it. But saving costs may not be the goal.
- Michigan did study on speed (reduced) – going under 30 mph
- Need a pie chart showing the red, yellow, green and then click on it to get a list; list items in order of biggest salt savings to smallest when you get detailed list; click on something else to get comments or advice about how to improve in this area or include list of resources, contacts, stories of how others changed.
- Report 2 - goal to see areas where change is predicted – suggestions are to get rid of yellow and green color in summary boxes; add 1 year and 5 year report; make a bar chart with all questions and color of answer.
- Report 3 - pie chart to show high level; have some small summary text; allow users to click on chart to see details
- Questions for tool – suggestions- allow user to input 1 year, or five year or both predicted changes; make it Wikipedia or "Saltipedia" so that users can contribute insight into the questions that other users can read.
- Tool features – suggestions - ability to save data entered so next year they don't have to start from scratch, they can just update its ability to just do part of the tool; for example just want to look at storage, could run the storage section; would like costs integrated (for example, the cost to tarp a truck is $3,000 so they can consider investment vs. salt savings potential)

Jeremy Walgrave & Hans Holmberg, LimnoTech – break-out session

- Protection targets are voluntary and will apply to waters that are not impaired for aquatic life due to chloride
- Implementation strategies – more individual approach or regional
- Overview – CMP will summarize the problem for impaired waters and those needing protection; TMDLs will be calculated for each impaired water; protection target for unimpaired waters; general implementation strategies (adaptive management), implementation plan – specific actions for reducing chloride, monitoring plan
- Why have a protection strategy? Some waterbodies are approaching impairment and monitoring indicating increasing chloride concentration.
- Protection targets could be numeric
    - Numeric
        - Existing criteria (230 mg/l) – but if we are below this target, there may be a desire to maintain levels below the standard (wouldn't it encourage the users go up to this goal?)
        - Percent of criteria – i.e. want to keep it 10% below the criteria – maintain 207 mg/L
        - Percent of change in concentration from existing conditions – i.e. we may want to see a 10% decrease or we don't want to see an increase
        - Maximum load over an area – how much salt is applied in watershed – so many tons per square mile per year
        - % reduction from current application rates - i.e. 10% reduction from existing practices
        - Haven't found these to be satisfying-have talked about these with our Technical Advisory Committee (TAC)
    - Level of Performance
        - Best management practices – i.e. for example, eliminate all poor practices or aim or all best practices
- Maybe protection just applies to those entities that don't have impaired waters
- Today's meeting is to discuss ideas about how we want to structure protection targets
- Implementation Strategy – individual watershed approach versus regional approach – what makes sense?
- Management plan – shouldn't just be something MPCA sits on their shelf so how can this be helpful for you?
- What are your thoughts on protection targets?
- Does it have to be a specific target or could it just be training? All applicators get training – that could be a goal.
- But what if only half of folks in an area are complying with voluntary target? If I do my part will other folks do their part?
- For example, just look at the parking lots and if they aren't buying into cutting back, then why would anyone comply with a voluntary target? There would have to be fines. Keep it off the impaired list could be the reason people want to do practices.
- What about residential level? Apply it to all significant sources? Road authorities, private applicators, homeowners, etc. How do you define significant? Level of effort that you put into it.
- Don't like existing criteria because it gives people permission to apply; however there are pros and cons to all the other options and it would depend on the sector (private industry A invest in equipment but the other ones don't)
- May want to implement a different strategy depending on how the waterbody is responding to existing load.
- Voluntary – why would folks even pay attention to the plan – water quality is one issue and what makes sense for you from a cost perspective
- Targets would be different based on the waterbody – for example if you have a trout stream; also could see different protection goals for streams versus lakes – could get to streams quicker
- Do we need a numeric target? Don't know enough about what practice gets us to a certain level so it doesn't seem practical to pick a number. On the other hand – don't tell us how to get there or what our practices should be, tell us what the target is. Some practices make sense in an urban corridor versus a suburban area.

- For 900 lakes, get this as your target level – harder to do it – I thought this all started so we can just get one plan and one number or if you follow these BMPs, then you don't have to do individual targets for each waterbody. But if you are an entity with a trout stream, maybe you should use advanced practices. Or a lake at 30 mg/l versus 200 mg/l.
- What kind of data is being collected for example for Shingle Creek? Are we seeing improvements? Could highlight that or other changes.
- If we throw out any kind of number, it should be existing conditions – that is hard. Maybe it should be.
- Private will just apply what they want. But have to educate the clients so their contracts change.
- Isn't it cumulative? So if we put a number out there, aren't we just slowing that process? Streams will respond more quickly. Lakes without an outlet wouldn't have flushing. Lakes could reduce chloride levels over time.
- How do you distinguish between those not measured/no data? And those not hitting TMDL requirement? In the presentation, those were treated the same.
- TMDL will go out to public comment, then to EPA for approval.
- Each waterbody will receive a TMDL and the load will be divided between contributors.
- Will you continue to monitor additional water bodies? MPCA did this intensive chloride monitoring between 2010-2013 but could only target some of the existing waterbodies (those that had existing data etc.) with partners. Some partners will continue the monitoring. MPCA will monitor based on the Intensive Watershed Monitoring approach schedule.
- Could use Connie's poor, good, best levels. Could say everyone to achieve best practices in the metro, this would be a regional approach. Need to agree on BMPs. These are the most environmental and economic practices.
- We are doing BMPs as we can, but severity of winter impacts the amount of salt put down. We have to provide safety. Trying to maintain safety within numeric target would be problematic. Could exceed target even with BMPs. Would be possible to normalize application rate to snowfall amount. We should say "salting events" not snowfall. May not be enough snow to plow but still need to salt to prevent ice. If length of event is extended, that also adds to amount of salt put down. Need weather correction factor. This could be built in.
- Having a regional voluntary approach is necessary to protect all those waterbodies not being monitored. But what about accountability? What is the easiest way to measure our protection? Need to look at different characteristics of waterbodies when approaching numeric targets (lakes vs. streams).
- Maybe BMPs is a better approach.
- Prefers the BMP tool that Connie is developing, tool captures management to operators; he feels those who apply would be more in tune with that approach. Metro organizations are trending toward better practices already so they are working in that mode right now, without numeric targets.
- Every public agency wants to put down less salt, private businesses are a "different animal" and while public organizations puts down the most, private and homeowners aren't thinking about BMPs and they need to be addressed.
- Lawsuits and contracts are driving factors in private.
- Likes performance based. Does public agency want a target, an actual number, to guide decision-making?
- Agrees having a goal is important for those not on the impaired waters list. Keeping this in mind when applying near the protected waters. Moving from one watershed to another?
  Why would you want to change rate from one area to another?
- Public organizations want to be efficient, so that will drive decision-making, don't think of watersheds or TMDLs, just want to do the required level of service.
- Be extra careful around particular waterbodies, message for public, focus on local regions where there may be need for "extra care".
- Do agencies have an idea that they need to have no poor practices (red)? Big cities yes, less so for smaller cities maybe.

- Goal is abstract - that is a problem for public; also what is the feedback loop for data? This would be a slower way to manage; BMPs are "on the go". Keeping water clean is a community goal, legislators need to know what is needed, numbers help make the case.
- Using a chart is fine, this is a question in the tool (do you use an application rate guidelines), but there are lots of variables within St. Paul and Minneapolis. Suburban cities have more "buffer" for their roads too.
- We used to just "put on setting 4 and what comes out, comes out." Electronic controllers have changed this.
- Does anyone represent private applicators? Met with private applicators recently. Lawsuits are huge. They will over-salt to prevent that. Do not want to have a second trip, this impacts profitability if they move the application rate back. The private applicators use the old equipment from municipalities, so do not have capacity to use BMPs. Can't afford any more labor cost.
- They look to property management companies, they do not have any winter maintenance concepts, and they write the contracts. Is educating the consumer key? Yes.
- Heard that 20% of salt bought is by private applicators. Can we convert BMPs to private arena?
- Do any municipalities contract with private companies? Smaller cities in Washington County contract out and Minneapolis does in a few areas.
- Ontario - all maintenance for roads is privatized and contract is based on # hours of dry road and there is a penalty for missing this.

Implementation Strategy

- Individual watershed versus regional approach? What makes sense?
- For Sand Creek, we could have a TMDL about what application rates should be in that watershed. But for example, would the county or state really change how much they apply once they cross into another jurisdiction?
- Connie was talking about public outreach. Is anyone talking to legislature? People didn't used to have expectations for bare pavement. Would be nice to standardize people's expectations. Hard to convince people that we aren't clearing as fast as we normally do. Once we bring level of service up hard to get back down. We get more rain and ice events with climate change now.
- Non-degradation – how would it apply? It wouldn't - only for new or expanding discharges and only TSS and TP.
- Would it matter to MnDOT or Country applicators when they cross watershed boundaries, each region might have different targets or no targets - would you still use same BMPs? How much focus in a management plan on different practices in different areas?
- How will MPCA get an accurate number of how much salt is currently applied in each area? Estimated from purchases, some from applicators. TMDL doesn't need current application amount; it sets the rate based on the TMDL target. The entity has to respond on that basis.
- Doesn't make sense to change expectations across watershed lines. Cities are already dealing with multiple watersheds, city-wide is how things are currently done. Unnecessary burden to have to think about different zones, have an overall expectation. Agreed; differences per waterbody may be appropriate for education of private property owners, maybe a tiered approach. Streets and roads should be different than approach for other salting.
- Look at maintenance agreements when new development goes in; some cities do this for large developments. Use this as an approach.
- Certification, give an advantage to bidding in cities to those who are certification.
- New Hampshire law says if there a policy then no lawsuit. Need statewide law like this in Minnesota.
- Have consequences for applications that exceed BMPs. Define it as a "spill"?

TCMA Chloride Project
Implementation Plan Committee Meeting #1

Meeting Agenda
July 10, 2012
9:00 a.m. – 12:30 p.m.
Mississippi WMO office, Minneapolis

1. Welcome and Introductions – Brooke, MPCA
2. TCMA Project Overview – Brooke, MPCA
3. Road Salt Display at the State Fair – Barb, MPCA
4. Breakout Session – either Connie (BMP Tool) or Hans/Jeremy (Protection/Implementation) Next steps for EOC
5. Alternate to other Breakout Session
6. Wrap-Up

Clean Water + Safe Roads: Getting there Together

Implementation Plan Committee meeting #1

July 10, 2012

Minnesota Pollution Control Agency
Brooke Asleson

Minnesota Pollution Control Agency

WHAT'S THE PROBLEM?

Finding a Balance
between
Safe Roads and Clean Water

Environmental Issues

- 365,000* tons of road salt are applied to the TCMA roads each year
- U of M study determined that 78% of the chloride is retained in the TCMA
- The chloride in road salt is toxic to aquatic life
- Once in our waters there is no feasible way to remove it

Management Issue

- The Public expects & needs safe roads, parking lots and sidewalks
- There is not safe alternative (yet….)
- Applied at all levels; State, County, City, Businesses and Homeowners (not regulated)
- Private applicators up against fear of slip & fall lawsuits – default is to apply more product
- Economic issues - product is costly, damage to infrastructure significant

What Will Success Look Like?

How will we get there?

Partnership & **Collaboration**

- Work together to realize shared goals
- Share knowledge
- Learn from each other
- Develop solutions together
- Build consensus
- Execute plan together

What does MPCA have to offer?

- Resources to help you succeed:
  - Environmental expertise
  - Monitoring efforts
  - Funds
  - Understanding of Federal requirements
- Desire to collaborate and find solutions to our common goals

What do you have to offer?

- Expertise in winter maintenance/water resource management/education
- Years of Experience and Knowledge
- Ability to execute the plan
- Be a leader among your industry
- Share the message of our Shared Vision

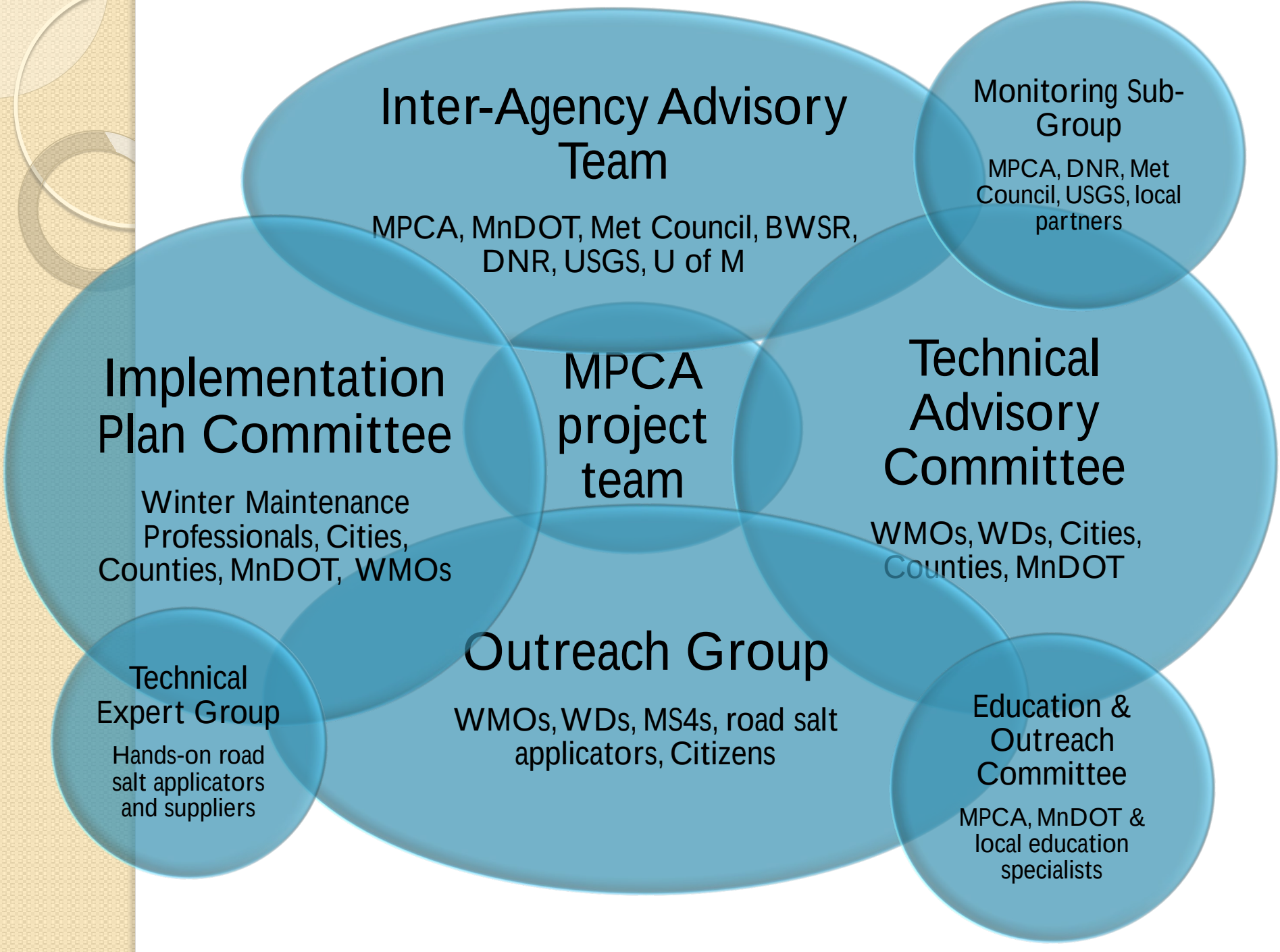
TCMA Chloride Project

- Assist local partners to better manage the balance between the water resources of the TCMA and public safety

How?

- Develop Chloride Management Plan for the 7-county metro:
  - Complete Chloride TMDLs for all impaired waters
  - Set water quality goals to protect the remaining surface waters
  - Layout implementation strategies to achieve water quality goals

Opportunity lies in the process of developing plan


Inter-Agency Advisory Team
MPCA, MnDOT, Met Council, BWSR, DNR, USGS, U of M
Monitoring Sub-Group
MPCA, DNR, Met Council, USGS, local partners
Implementation Plan Committee
Winter Maintenance Professionals, Cities, Counties, MnDOT, WMOs
MPCA project team
Technical Advisory Committee
WMOs, WDs, Cities, Counties, MnDOT
Outreach Group
WMOs, WDs, MS4s, road salt applicators, Citizens
Technical Expert Group
Hands-on road salt applicators and suppliers
Education & Outreach Committee
MPCA, MnDOT & local education specialists

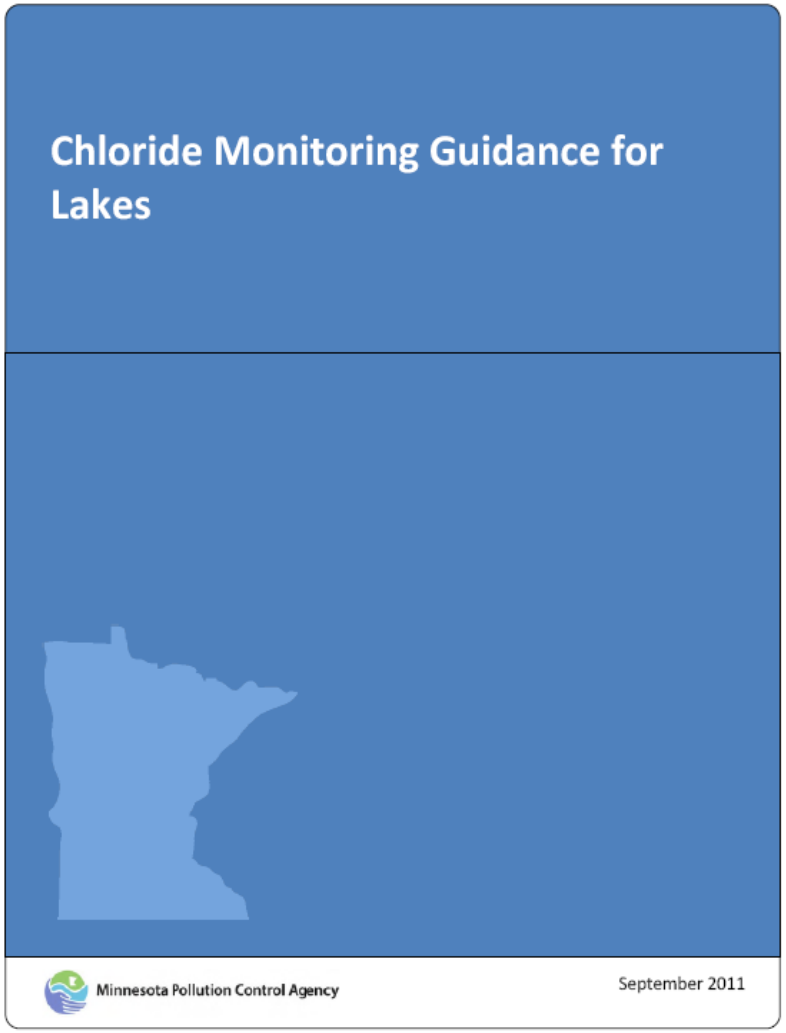
Monitoring Plan

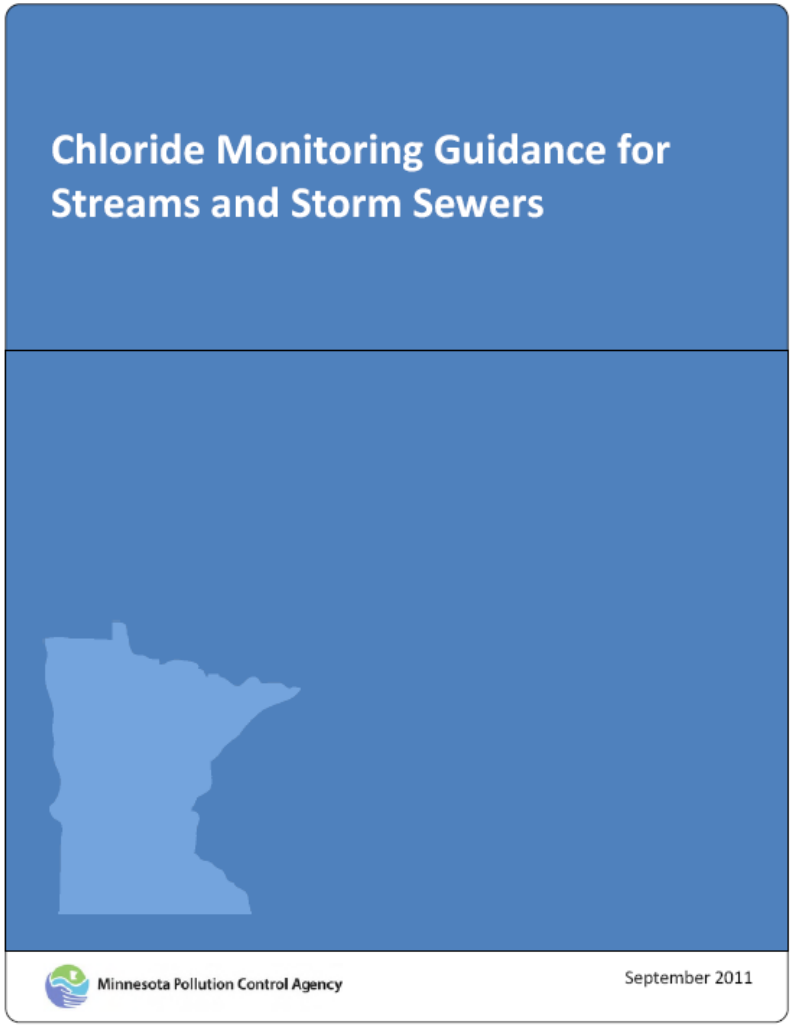
- Fall of 2010 – 2013
- MPCA and local partners are collaboratively sampling
- 74 lakes, 27 streams, and 8 stormsewers

Purpose and Goals

- to assist in developing new monitoring guidance for chloride
- to improve the chloride database for the TCMA
- and to inform the TCMA Chloride Management Plan

Chloride Monitoring Guidance





Understanding Application Rates

- Currently looking to better understand application rates & how to best gather and use that information for the Management Plan
- Looking for your feedback in break out session

Identifying Waters in TCMA

- Gathering list of all waterbodies for the 7-county metro area.
- Currently working on putting together an accurate GIS database that will identify all the waterbodies
- This will allow us to begin categorizing them appropriately for the project

MPCA Chloride/Road Salt Website

www.pca.state.mn.us/oxpg9f1

Road salt and water quality

MPCA recommends a low-salt diet for Minnesota waters. Doctors tell us to stick to a low-salt diet. Our lakes and streams should follow the same advice. When winter comes and snow and and ice build up on Minnesota roads, parking lots, and sidewalks, one of the most common reactions is to apply salt, which contains chloride, a water pollutant.

Salt pollutes. When snow and ice melts, the salt goes with it, washing into our lakes, streams, wetlands, and groundwater. It takes only 1 teaspoon of road salt to permanently pollute 5 gallons of water. Once in the water, there is no way to remove the chloride, and at high concentrations, chloride can harm fish and plant life. Less is more when it comes to applying road salt.

NEW REPORT

- The MPCA and several local partners are sampling Twin Cities lakes, streams, and storm sewers for chloride. The study will help us to better manage the Twin Cities' water resources with respect to chloride while balancing our need for road safety. Learn more about this effort: Twin Cities Metropolitan Area Chloride Monitoring (wq-iw11-06x)

In the news

- Check out this WCCO radio interview/article dated March 25, 2011: Road Salt: Essential For Winter Roads, Toxic For Lakes
- StarTribune article, March 23, 2011: Road salt turning Twin Cities lakes into dead seas
- KAALTV segment on the Dangerous Side Effects of Road Salt.
- Twin Cities DAILY PLANET article dated December 26, 2010: Hold the Salt
- Ice management article: Ahead of the pack
- StarTribune article, January 2, 2010: State's roads aim for low-salt diet
- Environmental Science and Technology journal. A Fresh Look at Road Salt: Aquatic Toxicity and Water-Quality Impacts on Local, Regional, and National Scales: free download.

Overview | Environmental concerns | Training/resources | Activities | Contacts

Tips

Follow these simple tips to protect our clean water! There are many ways to reduce salt use while maintaining high safety standards.

- **Shovel.** The more snow and ice you remove manually, the less salt you will have to use and the more effective it can be. Whether you use a shovel, snow blower, snow plow, or ice scraper, get out there as early as you can and keep up with the storm. You may even decide that salt isn't needed.
- **15°F is too cold for salt.** Most salts stop working at this temperature. Use sand instead for traction, but remember that sand does not melt ice. Use the reference table below to apply the correct product for the conditions.
- **Slow down.** Drive for the conditions and make sure to give plow drivers plenty of space to do their work.

Residential Salt Survey

- Education & Outreach committee assisted in developing and conducting a survey
- Focus was the general public
- Goal was to better understand:
  - How the public make their salt purchases
  - Where they apply it
  - How much they apply
  - If they know how much they should apply
- Results are in and being analyzed

New Road Salt & Water Quality Display

- MPCA is currently working with a contractor to design and create 2 displays
- First use will be for the State Fair
- Being designed to be easily transportable for partners to use at other events
- Main message is how to use less salt
- Looking for volunteers to staff display at the State Fair!

Brooke Asleson
Watershed Project Manager
651/757-2205
Brooke.asleson@state.mn.us

THANK YOU

2012 Eco Experience Partner Volunteer Sign Up

Instructions on how to sign up for shifts at the State Fair's Eco Experience.

Minnesota Pollution Control Agency

volgistics

Overview

Step one.
Fill out the Eco Experience Staff Form:
https://www.volgistics.com/ex/portal.dll/ap?AP=1636466460

*Remember your email address and password, since you will need this information to sign-up for shifts.

Step two. Log in to the Volunteer Information Center:
https://www.volgistics.com/ex/portal.dll/?FROM=57409

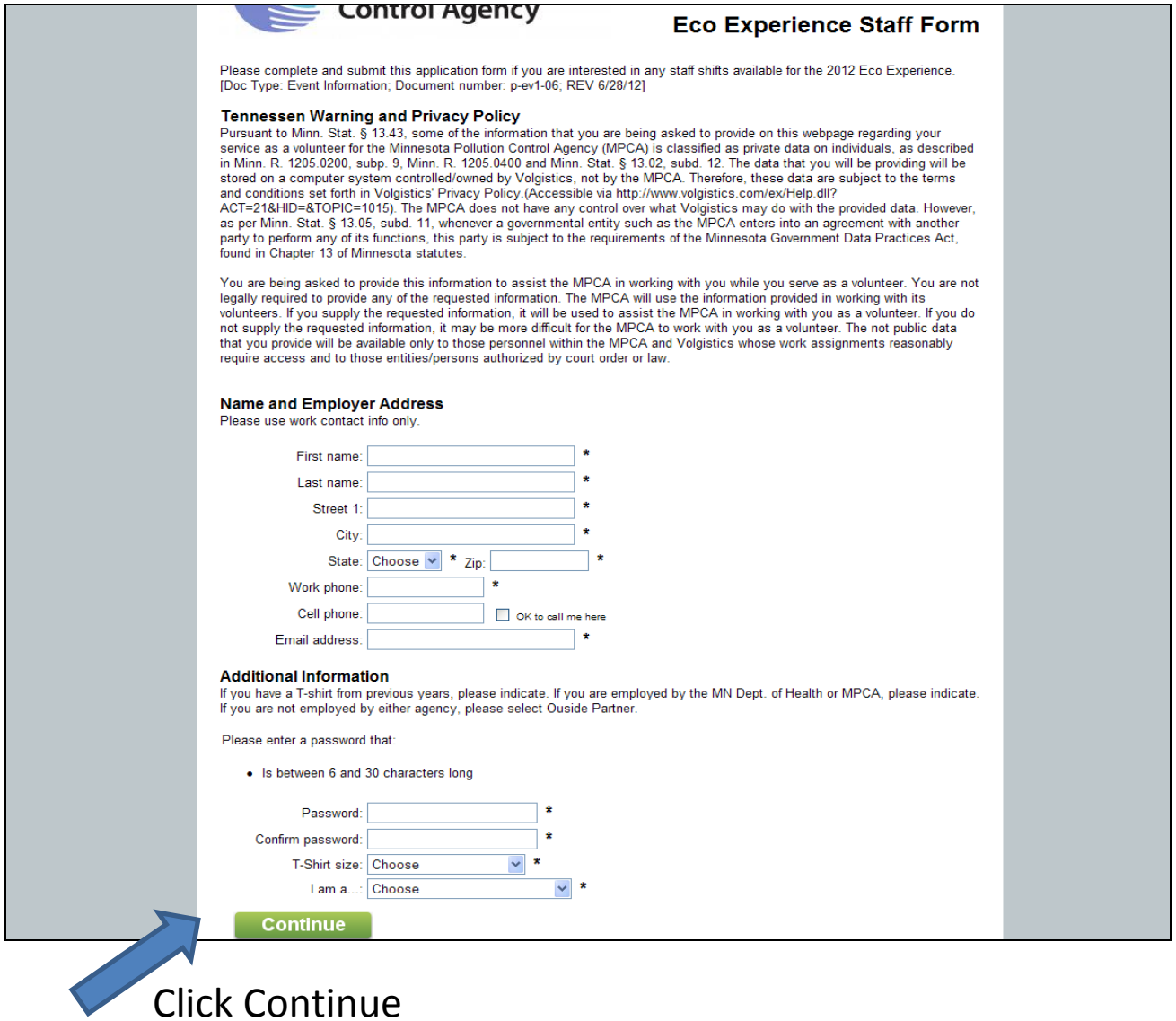
Step three. Sign up for your shift(s).

The next 8 slides will step you through this process.

Eco Experience Staff Form

Find it here: https://www.volgistics.com/ex/portal.dll/ap?AP=1636466460

Fill Out Information



Control Agency

Eco Experience Staff Form

Please complete and submit this application form if you are interested in any staff shifts available for the 2012 Eco Experience.
[Doc Type: Event Information; Document number: p-ev1-06; REV 6/28/12]

Tennessen Warning and Privacy Policy

Pursuant to Minn. Stat. § 13.43, some of the information that you are being asked to provide on this webpage regarding your service as a volunteer for the Minnesota Pollution Control Agency (MPCA) is classified as private data on individuals, as described in Minn. R. 1205.0200, subp. 9, Minn. R. 1205.0400 and Minn. Stat. § 13.02, subd. 12. The data that you will be providing will be stored on a computer system controlled/owned by Volgistics, not by the MPCA. Therefore, these data are subject to the terms and conditions set forth in Volgistics' Privacy Policy.(Accessible via http://www.volgistics.com/ex/Help.dll?ACT=21&HID=&TOPIC=1015). The MPCA does not have any control over what Volgistics may do with the provided data. However, as per Minn. Stat. § 13.05, subd. 11, whenever a governmental entity such as the MPCA enters into an agreement with another party to perform any of its functions, this party is subject to the requirements of the Minnesota Government Data Practices Act, found in Chapter 13 of Minnesota statutes.

You are being asked to provide this information to assist the MPCA in working with you while you serve as a volunteer. You are not legally required to provide any of the requested information. The MPCA will use the information provided in working with its volunteers. If you supply the requested information, it will be used to assist the MPCA in working with you as a volunteer. If you do not supply the requested information, it may be more difficult for the MPCA to work with you as a volunteer. The not public data that you provide will be available only to those personnel within the MPCA and Volgistics whose work assignments reasonably require access and to those entities/persons authorized by court order or law.

Name and Employer Address

Please use work contact info only.

First name: *
Last name: *
Street 1: *
City: *
State: Choose * Zip: *
Work phone: *
Cell phone: OK to call me here
Email address: *

Additional Information

If you have a T-shirt from previous years, please indicate. If you are employed by the MN Dept. of Health or MPCA, please indicate. If you are not employed by either agency, please select Ouside Partner.

Please enter a password that:

- Is between 6 and 30 characters long

Password: *
Confirm password: *
T-Shirt size: Choose *
I am a...: Choose *

Continue

Click Continue

Look for a confirmation email

Minnesota Pollution Control Agency

Eco Experience Staff Form

Thank you

Your application has been submitted. We appreciate your interest in the 2012 Eco Experience. You will receive a confirmation email to the email address provided along with additional information on how to sign-up for shift(s). Remember that your email address serves as your username. Also, the password you submitted on the staff form is used for logging into the Volunteer Information Center.

- Check the email account provided on the 'Eco Experience Staff Form' for a confirmation email

rom: VolunteerMail@volgistics.com on behalf of Minnesota Pollution Control Agency [Kirstin.Taggart@state.mn.us] Sent: Thu 6/28/2012 2:5
o: Taggart, Kirstin (MPCA)
c:
ubject: Eco Experience Staff Form Received

Thank you for your interest in the 2012 Eco Experience at the State Fair.We have received your contact information and request that you now sign-up for a shift(s) by navigating back to the MPCA Intranet webpage (for MPCA employees ONLY) or by selecting the Volunteer Information Center link below.

Directions for signing up:

1) Log in to the Volunteer Information Center at https://www.volgistics.com/ex/portal.dll/?FROM=57409 using your email address and password.

2) Once logged-in to the Volunteer Information Center, click 'Sign-Up.' Use the 'Next' button to navigate to August and September. There you will see 'Help Wanted' images indicating shifts that are open on that particular day. If you click on a 'Help Wanted' image, all of the shifts available within each area of the Eco Experience will be visible.

3) To sign-up for a shift, click 'Schedule Me' next to the date and time you would like to work. After selecting a shift, you will be asked to ensure the shift you would like is correct.

If you have trouble signing up, please:

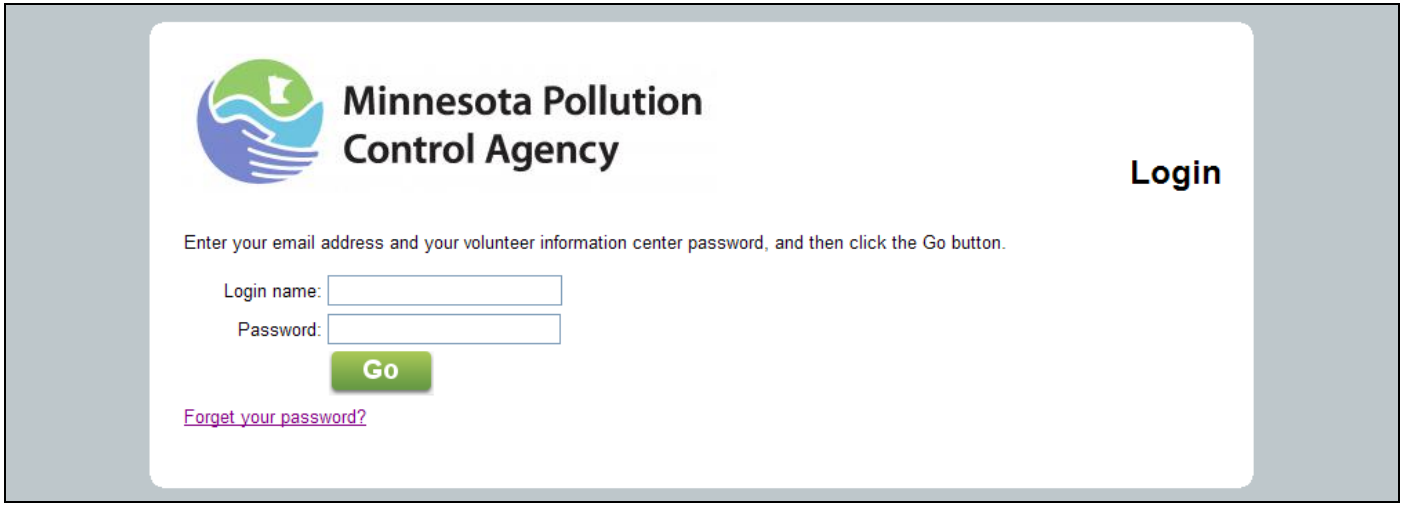
1)Read FAQs on MPCA Intranet Page at http://intraold.pca.state.mn.us/staff/eco-exp.html
2)Stop by the cafeteria on July 11-12 from 11:30 a.m.-1 p.m.
3)Contact Kirstin Taggart at kirstin.taggart@state.mn.us, or ext. 2235

Thank you!

- Click the 'Volunteer Information Center' link

Volunteer Information Center

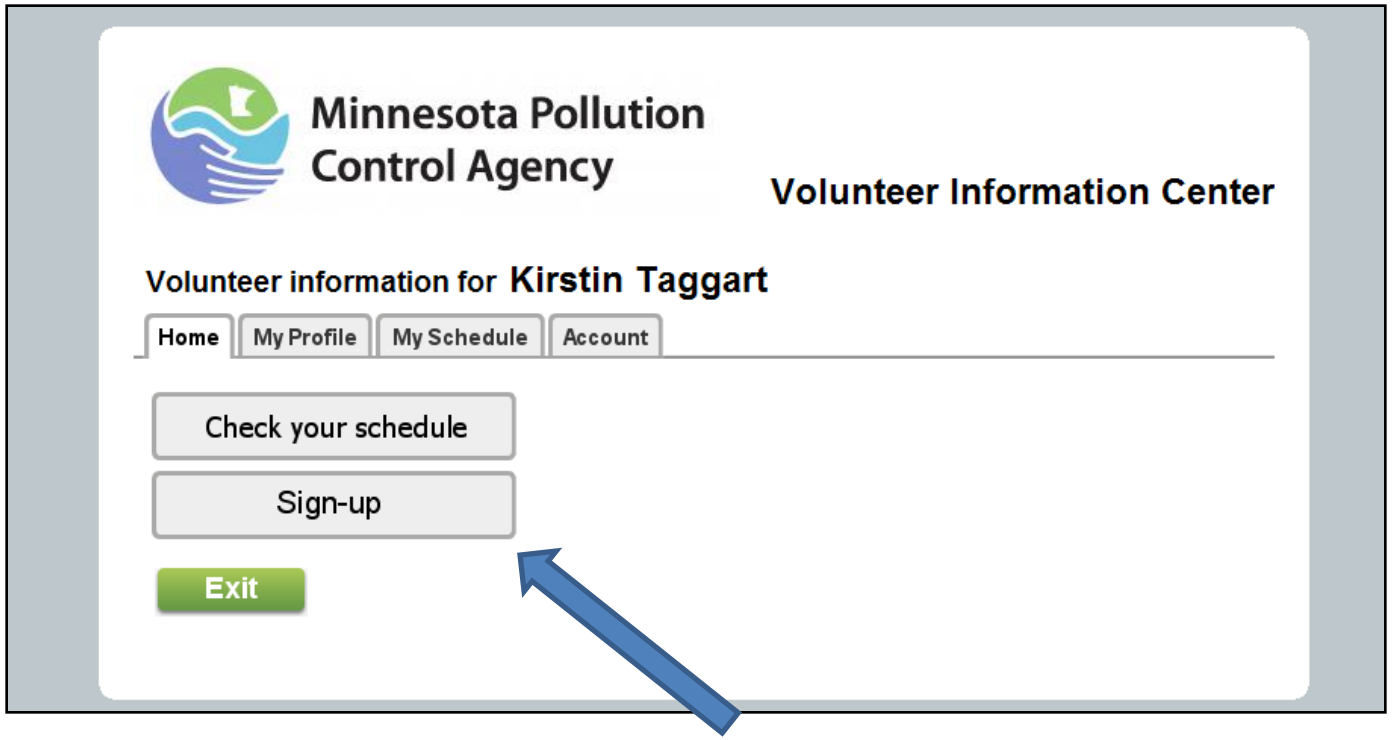
Find it here: https://www.volgistics.com/ex/portal.dll/?FROM=57409



- Log in using the email address and password entered on your Eco Experience Staff Form.

- If you have forgotten your password, you may click 'Forget your password?' and request it be sent to your email address.

Sign Up for Shifts



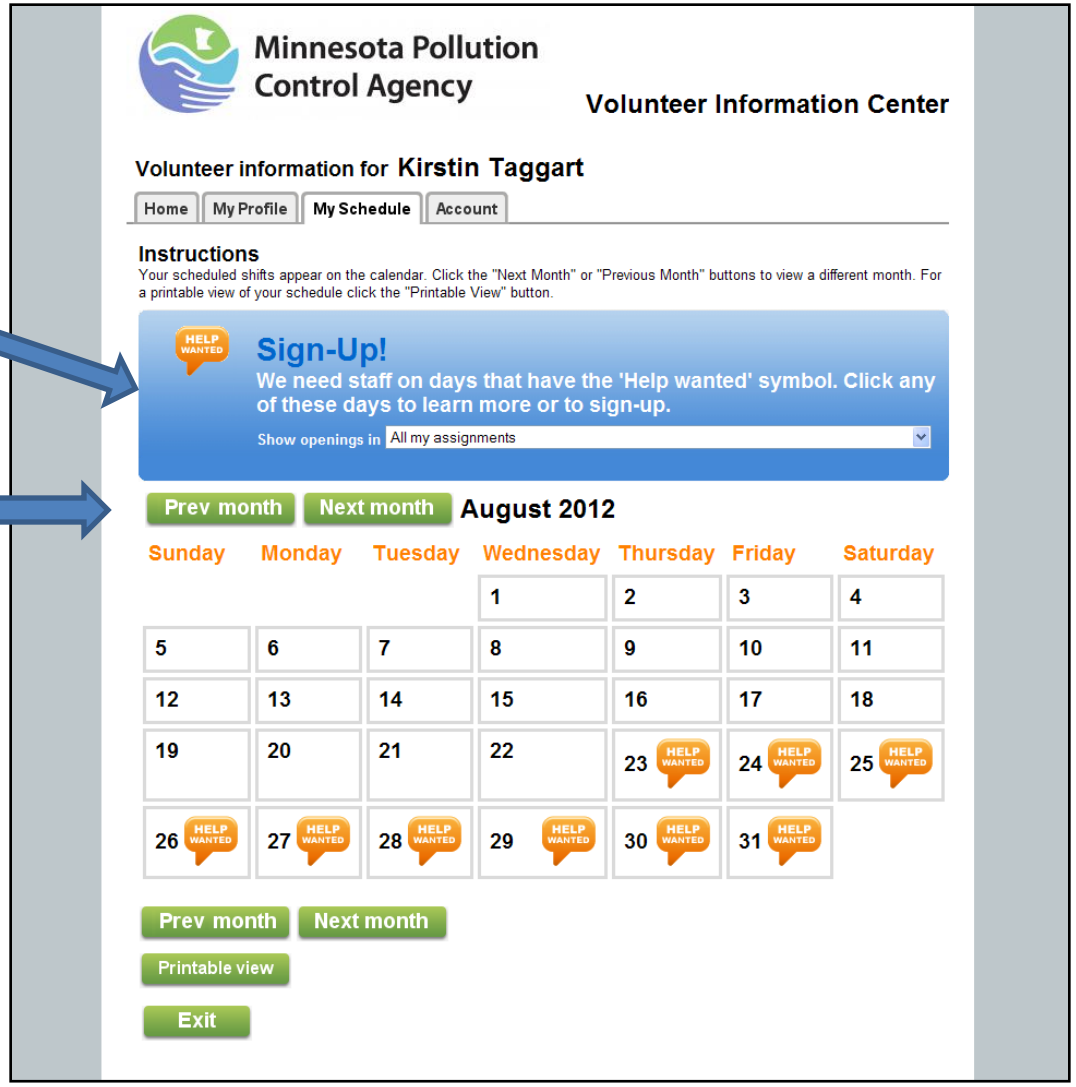
Select ‘Sign-up’

Select Date

- To search for shifts specific to road salt, use the drop down list to select 'Shifts for Water Quality & Road Salt – Water Exhibit'

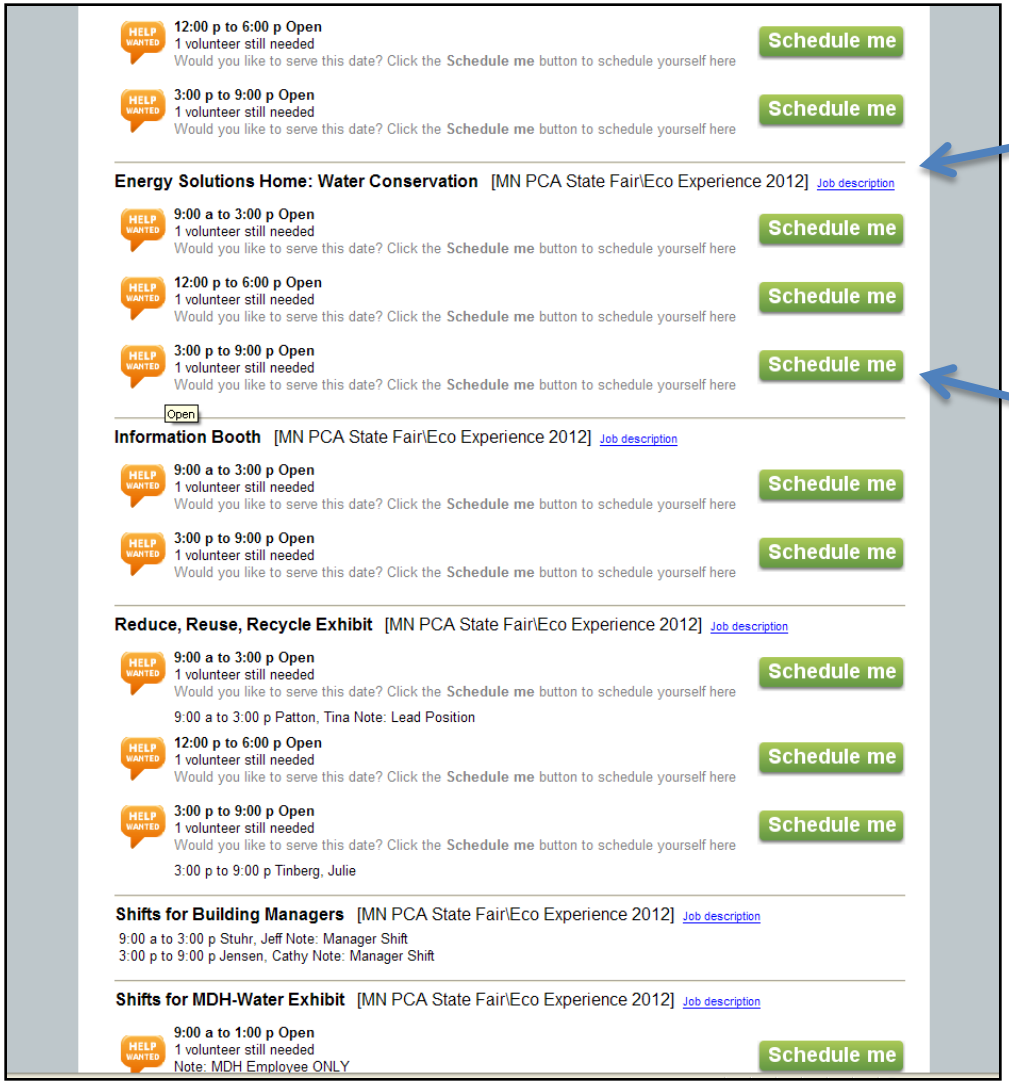
- Advance to proper month using these buttons

- Select date you prefer



*Note: Help Wanted images indicate dates with available shifts that still must be filled

Select ‘Energy Solutions Home: Water Conservation’ Area and Time

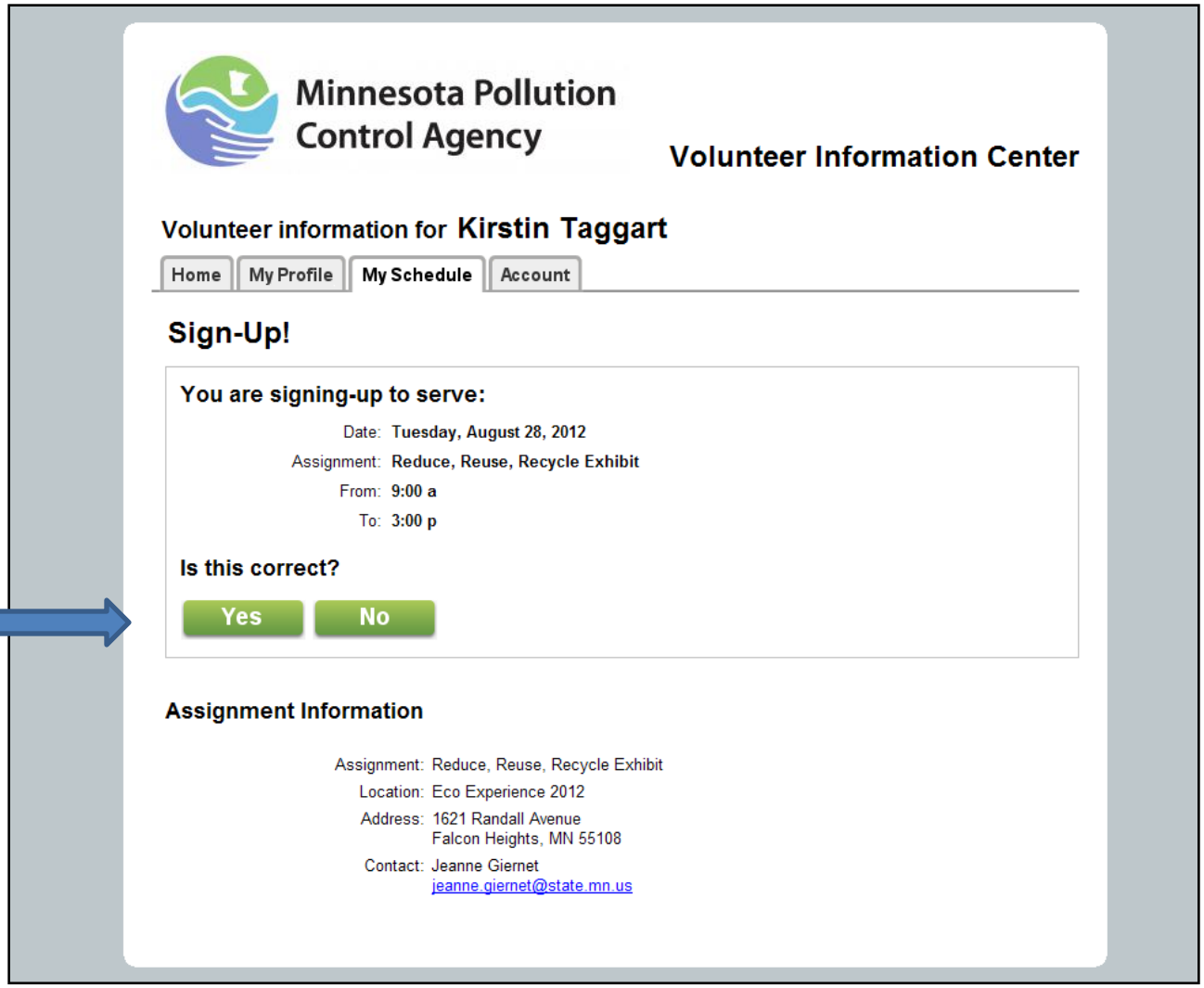


- Locate the ‘Shifts for Water Quality & Road Salt – Water Exhibit’ area and scroll through open shifts.
- Once you find a shift you would like to fill, click ‘Schedule me’ next to the shift

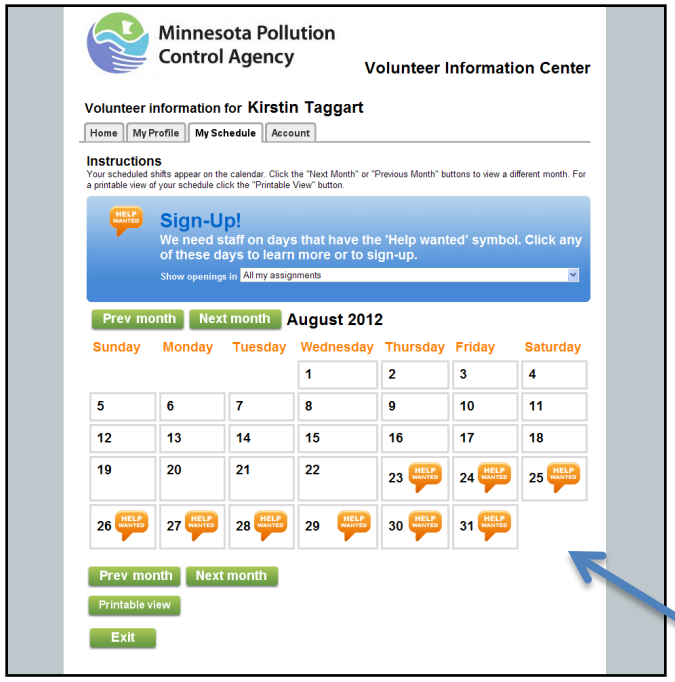
*Note: When shifts begin filling, you will also be able to see the names of others working that day via this screen.

Confirm Shift

After selecting a shift, you will be prompted to confirm whether or not the shift is correct, select Yes or No.



Sign up for more



By clicking 'Continue' on this screen, you will be returned to the Calendar screen, where you can sign up for more shifts, view your schedule or exit.

Goal: Develop and Automate "Operations Assessment and Salt Savings" Tool

TCMA Chloride Project

Fortin Consulting Inc

2011 DRAFT

Enter Organizational Information

- Organization Name: City of White Bear Lake
- Department: Parks Department
- Contact Person: Brad Fortin
- Address: 211 Main Street, White Bear Lake, MN 55444
- Email Brad@WBL.Gov
- Phone 763-111-2222
- Date of Assessment 6-06-2011
- For winter operations 2010 - 2011
- Notes: Park and road depts overlap in many maintenance areas

Last seasons information

- Tons of dry rock salt used: 30,000
- Tons of sand used: 500
- Tons of treated salt used 0
- Tons of bagged material used 1
- Gallons of brine used: 500
- Gallons of liquid that works better than brine used: 0

Select: User type

Low speed road maintenance

High speed road maintenance

Homeowners?

Parking lot maintenance

Sidewalk maintenance

Generic assessment tool?

Each of these areas will expand to reveal detailed maintenance practices

- Before Winter Preventatives
- During Winter Preventatives
- Increase accuracy of winter operations
- Increase effectiveness of winter operations
- Reduce waste
- Recovery of salt

Biggest gains made to changes on outer rings

- Salt Recovery
- Increase accuracy
- Increase effectiveness
- Reduce Waste
- Before Winter Preventatives
- During winter Preventatives

Not all changes are equally weighted in salt savings potential

Reduce Waste Section:
Chart your current and near future practices

Now	Near Future	Practices	Internal Code	internal calculation
		Bulk salt pile uncovered	1	Move from 1 to 2 = 1% reduction
		Bulk salt pile tarped	2	Move from 1 to 3 = 5% reduction
		Bulk salt pile indoors	3	Move from 2 to 3 = 5% reduction

standard best practice

Remedial practice

Advanced best practice

Reduce Waste Section: select your current and near future practices

Now	Near Future	Practices	Internal Code	internal calculation
✓		Salt pile stored on permeable surface (grass, gravel, cracked asphalt…)	1	Move from 1 to 2 = 5% reduction
	✓	Salt pile stored on impermeable surface (sealed asphalt, sealed concrete, storage containers…)	2	Move from 2 to 3 = 2% reduction
		Salt pile stored on impermeable surface with concave base “birdbath shaped floor”	3	Move from 1 to 3 = 7% reduction

standard best practice

Remedial practice

Advanced best practice

Reduce Waste Section:
Chart your current and near future practices

Now	Near Future	Practices	Internal Code	internal calculation
✓	✓	Bulk salt loading area outdoors	1	Move from 1 to 2 = 3% reduction
		Bulk salt loading area indoors	2	

standard best practice

Remedial practice

Advanced best practice

Reduce Waste Section:
Chart your current and near future practices

Now	Near Future	Practices	Internal Code	internal calculation
✓		Bulk salt loading technique: generally overfill truck	1	Move from 1 to 2 = 3% reduction
	✓	Bulk salt loading technique: generally fill or slightly under fill truck	2	

standard best practice

Remedial practice

Advanced best practice

Reduce Waste Section:
Chart your current and near future practices

Now	Near Future	Practices	Internal Code	internal calculation
		Salting truck untarped load	1	Move from 1 to 2 = 3% reduction
		Salting truck tarped load	2	

standard best practice

Advanced best practice

Remedial practice

Reducing Waste Section:
Chart your current and near future practices

Now	Near Future	Practices	Internal Code	internal calculation
		Most salt trucks come back empty	1	Move from 1 to 2 = 3% reduction
		Most salt trucks have extra to return pile	2	

standard best practice

Remedial practice

Advanced best practice

Each of these areas will expand to reveal detailed maintenance practices

- Before Winter Preventatives
- During Winter Preventatives
- Increase accuracy of winter operations
- Increase effectiveness of winter operations
- Reduce waste
- Recovery of salt

Increase Accuracy Section: select your current and near future practices

How many in your fleet have	How many in Near Future	Practices	Internal Code	internal calculation
22	**12**	Manual controls	1	Move from 1 to 2 = 30% reduction per truck
40	**40**	Ground Speed Controls without MDSS	2	Move from 2 to 3 = 53% reduction per truck
0	**10**	Ground Speed Controls with MDSS	3	Move from 1 to 3 = 83% reduction per truck

standard best practice

Remedial practice

Advanced best practice

Reports

- Summary of current practices
- Summary of predicated changes and salt reduction potential

Current Winter Maintenance Practices

City of White Bear Lake
Parks Department
6-06-2011

Before Winter Preventatives

During Winter Preventatives

Increase Accuracy
↓ 22 manual controllers
J 40 Ground Speed Controllers

INCREASE EFFECTIVENESS

REDUCE WASTE:
↓Bulk salt pile tarped
↓ Salt pile stored on permeable surface
↓ Bulk salt loading area outdoors
↓ generally overfill truck
↓ Salting truck untarped load
J Most salt trucks have extra to return pile

Recovery of Salt

Current Summary: 29 Remedial practices
88 Standard best practices
0 Advanced practices

Near Future Prediction: 26 Remedial practices
91 Standard best practices
0 Advanced practices

Legend:

↓ - Remedial Practice

J - Standard Best Practice

« - Advanced Best Practice

Salt Reduction Potential
City of White Bear Lake
Parks Department
6-06-2011

Total Salt Reduction Potential = 25%

31,000 tons to 23,250 tons Reduction Potential if changes had been made for 2010/2011 winter

BEFORE WINTER PREVENTATIVES:
0% reduction potential

DURING WINTER PREVENTATIVES:
0% reduction potential

INCREASE ACCURACY:
12% Reduction Potential
*0 Ground Speed Controllers with MDSS>10 Ground speed controllers with MDSS>Salt reduction 12%

INCREASE EFFECTIVENESS
0% reduction potential

REDUCE WASTE:
13% reduction potential
↓Bulk salt pile tarped > J Bulk salt pile indoors > Salt Reduction 5%
↓ Salt pile stored on permeable surface > J Salt pile stored on impermeable surface = Salt Reduction 5%
↓ generally overfill truck > J generally fill or slightly under fill truck = Salt Reduction 3%

RECOVERY OF SALT:
0% reduction potential

CHLORIDE SUBSTITUTES:
0% reduction potential

Legend:

↓ - Remedial Practice

J - Standard Best Practice

« - Advanced Best Practice

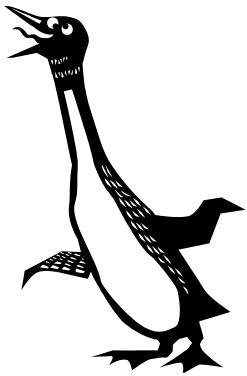
Roughly speaking…

- I have developed 6 major categories of questions
  - 32 sub categories
    - 164 assessment questions
      - 57 questions that have rate reduction potential

Help me refine the assessment questions so they are accurate!

Help me get the right level of difficulty.

- What information do we need to make good assessment and predictions
- where to draw the line between useable and something that will drive us crazy



Help me by sharing your salt reduction experiences

- What practices have you changed and what salt reductions have been achieved because of these changes

What is the best way to get your input?

- In person meeting one on one? Allows chance for discussion and gives me a better understanding of each of your issues/concerns/expertise.
- Send you a list to review? Would be fastest but would you get tired of it after review a page? Lots of pages?
- Have a meeting of just the winter maintenance experts? Go over questions as a group?
- Other ideas?

Your Input is Important

- Fill out your surveys as we discuss these points
- If we have time, let's look at:
  - pavement temp/event chart
  - Feedback loop to MPCA

Could also gather information like this?
Last seasons information

Number of Call outs: 27

Average Pavement Temps during application	# of events	% of salt used
30° é	2	10
15 ° - 29 ° é	17	40
0 ° - 14 ° é	1	20
31 ° - 16 ° ê	4	10
15 ° - 0 ° ê	1	10
Below 0 °	2	10

Reporting to MPCA

- Would be best to automate the Operations Assessment and Salt Savings Tool
- Would be good to put tool on MPCA website
- Would be good to offer training class or webinar on how to use the tool
- Would be ideal to make it easy for an organization to email or upload results to MPCA. Perhaps part of Level II certification???

Twin Cities Metro Area (TCMA) Chloride Project
Implementation Plan Committee Meeting Notes
July 10th, 2012

Attendees

Steve Albrecht, Brooke Asleson, Ross Bitner, Melissa Bokman, Claire Bleser, Kevin Bigalke, Brian Brown, Tara Carson, Lois Eberhart, Craig Eldred, John Erdmann, Connie Fortin, Bob Fossum, Sara Freeman, Mike Kennedy, Dendy Lofton, Mark Maloney, Kevin Nelson, Randy Neprash, Kari Oquist, Barb Peichel, Andy Ronchak, Steve Schilling, Mike Scherber, Bill Utecht, Bob Vasek, Jeremy Walgrave, Anne Weber,
Jenny Winkelman, Joe Wiita

Welcome to the Mississippi Watershed Management Organization (MWMO) - Jenny Winkelman

- We have a new building and will give a tour to folks who want to stay after this meeting. The Mississippi River runs about 15 linear miles through the very urban, 35 square mile watershed. Most of the MWMO's land area is Minneapolis, but it also contains portions of Lauderdale, St. Anthony, St. Paul and the Minneapolis Park and Recreation Board is also a member. More recently the MWMO took on additional land area and now will also include portions of Columbia Heights, Hilltop, and Fridley. Chloride is an issue for us even though there is no reaches of the Mississippi River in the MWMO are listed as impaired for aquatic life due to chloride.

Introduction to TCMA Chloride Project – Brooke Asleson

- Thank you for attending the first Implementation Team meeting for the Twin Cities Metro Area (TCMA) Chloride Project. You have been asked to be on this team because you are the leaders of industry and organizations that are working to reduce chloride into Minnesota Waters. This project is a partnership and focuses on safe roads and protecting water resources. Some of you are new to this project, but others are already serving on other project teams.
- The area for the TCMA Chloride Project is the entire 7-County Metro. This project is important because there is not a feasible way to remove chloride once it is in our waters. We also don't really have a safe alternative to salt applied at all levels (roads, businesses, homes) by both private and public entities. A successful project will include a shared vision of how to move forward to reaching our goals.
- We have a lot to learn from you for this project. MPCA can offer environmental expertise, monitoring, funding, and understanding of federal requirements. You can offer years of expertise in winter maintenance, water resource management, and education.
- The TCMA Chloride Management Plan (Plan) will assist local partners to better manage the balance between water resources and public safety, address chloride Total Maximum Daily Loads (TMDLs) for all impaired waters in 7-County Metro, create water quality goals to protect the remaining surface waters, and layout implementation strategies.
- Stakeholder Groups include the Inter-Agency Advisory Team, MPCA Project Team, Implementation Plan Committee, Outreach Group, Technical Expert Group, Education & Outreach Committee, Technical Advisory Committee, and Monitoring Sub-Group.
- Monitoring has occurred for this project starting in October/November 2010 and will continue through March/April 2013 and is being conducted by MPCA and local partners. The monitoring targets 74 lakes, 26 streams, and 8 stormsewers in the TCMA. The purpose and goals of the monitoring is to assist in developing new monitoring guidance for chloride, improve the chloride database of assessed waterbodies, and inform the Plan.

- We are currently looking to better understand salt application rates and how to best gather and use that information for the Plan. We are also developing a comprehensive list of surface waters in TCMA and noting which of these are impaired for chloride, not impaired for chloride, or have no chloride data.
- We have also recently revamped the MPCA road salt and water quality website so it is more citizen-focused - www.pca.state.mn.us/oxpg9f1. A residential salt survey was also completed with input from the TCMA Education and Outreach Committee asking the general public how they make their salt purchases, where they apply salt, how much they apply, and how they know how much to apply (note that this was a non-random survey).
- We developed a Salt & Water Quality Display as part of the State Fair's Eco Experience. The main message is for people to use less salt. We are hoping other groups will be interested in using this display for the educational efforts. We will send information to you in case you are interested in staffing this display at the State Fair.

Question - Will the display include message about people's expectations about roads since an important message is for folks to drive slow, don't expect bare roads, and be patient. Yes, that will be included.

Breakout Session – (Led by Jeremy Halgrave/Brooke Asleson)

1) What are applicator concerns on the MCP? The direction of the MCP?
2) Concerns about regulation?
3) Concerns on tracking and reporting?
4) Do you have concerns with other applicators within the same watershed?
5) Are there things the State can do to support applicators and/or MS4's
6) Are changes needed outside of the scope of the MCP? Driver expectation management? Snowstorm speed limits?
7) Ideas on a fair approach based on traffic volumes and speeds?
8) How will we reduce/track/report for private properties and applicators?

- We (Limnotech) have been looking at the water quality data to understand the chloride level in various lakes and streams, conducting a source assessment to understand where the chloride is coming from, and using a survey (see questions below) to interview folks to understand application rates/experiences/ equipment. We really want to learn more about sources such as chloride in road application and private industry, what you've seen as far as tracking, and what best management practices to reduce chloride have been successful.

  Survey Questions

  1. What product do you most commonly apply to roads in the winter?
  2. What is your most common road application rate? (how much do you apply in one pass) (lbs / lane mile, other)
  3. In an average winter about how many times would you apply salt to your roads?
  4. How do you track salt usage and application rates?
  5. What percent of your fleet is equipped with: 1) manual controller; 2) ground speed controller; 3) AVL with ground speed controller; 4) MDSS ?
  6. What percent of your fleet is calibrated annually?

7. Does tracking salt usage help with the decision making or management measures related to salt application?
8. What benefits and/or challenges have you found in tracking road salt usage?
9. What percentage of your annual budget is for salt and have you used strategies to reduce salt usage in order to reduce costs?
10. Are you currently studying or supporting efforts to track or manage salt application?
11. Do you have comments, concerns, or potential benefits related to the Metro Chloride Study?
12. How can the State support applicators related to the Metro Chloride Study?

- Nine Mile Watershed District (NMWD) has finalized a chloride TMDL and conducted a source assessment during that and are developing an Implementation Plan.
    - We have been implementing practices to reduce chloride all along focusing on cities and road authorities and then incorporating private applicators. We invited property management, private business, malls, etc. to be a part of the discussion. We learned that there is a disconnect between management companies and people doing the application – some people are only concerned with public and tenant safety and don't care how much they put down.
    - A couple private companies we have worked with (townhome and condos) are becoming more aware and writing better expectations (e.g. chemicals and rates) into their contracts for parking lots, etc. An example is Donaldson Company in Bloomington said that sidewalks and parking lots are cleaner since doing anti-icing. This is typical of office complexes that have contracts for clearing parking lots with one company but sidewalks are their own custodial staff so have to deal with those separately. Donaldson got on board early and are taking advantage of this new market and niche. Reaching private applicators is difficult because they are usually fly-by-night appliers meaning that they may mow lawns in the summer so this isn't their expertise. Much better to target the management companies and make sure their contracts reflect best practices.
    - We've also targeted small site trainings for snow removal companies and have had various levels of attendance. Getting application numbers is very difficult; we just know it is really high because of the liability issue.
    - Bloomington School District has had a couple grants to go to anti-icing on most sidewalks and entrances. They have learned to apply granular salt on curbs and less by entrance doors since people track it in and most slips and falls happen by the curb. They sent all custodial staff to trainings. It is hard to get application numbers and a lot of times they don't know or it would be easier for them to estimate how much they used per storm.
- The University of MN-Duluth (UMD) use a combination of contractors and own staff for snow and ice removal.
    - It is important to get the contractors educated and we specify that they have to go through MN Local Technical Assistance Program (LTAP) training to get their contract and that helped tremendously. We also required that they use specific sanders and spreaders.
    - We haven't been successful at working with upper managers but education is needed.
    - We work with parking on their maintenance procedures such as mixing sand with oil to reduce slipperiness (but want to use chip seal since it works well on old parking lots to restore pavement and we got another 10 years of surface).
    - Preventative maintenance works better if there is employee ownership which has cost University some, but seems worth it. The spreader was casting salt out 40 feet on turf, but we got maintenance on board so they modified the equipment.

- Problem in Northeast Minnesota is that concrete stays 10°F and gets colder in cold weather so there aren't many options and have to sand/grit for traction. We've looked at porous concrete at a couple churches, but haven't heard enough yet about what the outcome is and it is still expensive. Also considered coarser pavement surfaces or micro-surfacing.

- MnDOT has some research projects underway about different surface treatments that could maybe help reduce chloride.
- Bloomington has a park with porous pavement and barely has to plow it in the winter. It was 30% more expensive to put in, but the snow and ice melts off of it faster and the runoff has someplace to go. Ramsey Washington Metro Watershed District's parking lot has had the same experience.
- One big issue is that most contract pay private applicators by the pound of product applied versus the event. UMD does track how much they put down - 10% plus or minus how much we have used. Then if a contractor used too much then we know.
- NMWD - the contracts have started to shift now so not by product, but event/time basis. But have seen more spills that haven't been cleaned up. People are pretty quiet about sharing their contracts or who is doing plowing. Most parking lots are not getting pre-treatment.
- Motivations for private applicators are lacking. Incentives could be a "green" image, contract language could require that people attend trainings (owner, operator, applicator) and if there is a spill that they need to clean it up. Problem also is that there is a lot of turnover with employees so we should work with the clients (i.e. education of property management or condo/townhomes).
- Do any municipalities license chloride application (like tree-cutting)? NMWD looked into it (Lake County, Illinois does a licensure program and it is having some effect). How can we estimate what contribution comes from private application? We used Southdale mall and extrapolated (NMWD) and Fortin is working on MN estimates, but we need a more accurate number. They may be doing twice as much application, but we can't get the data unless we had a city license program or state legislation. We will just have to extrapolate from Nine Mile and Shingle Creek until folks are willing to share their numbers.
- Anti-icing best way to reduce salt use. We need to convince management this will reduce their cost in both labor and product.
- Some folks don't have a big enough operation to mix their own brine. UMD pre-wets all salt ourselves (6 gallon/ton). That is one of the best things to let foot traffic and street traffic spread it.
- We also found a vendor that makes brine (we use calcium chloride with corn since the magnesium chloride was hard on turf, concrete, and equipment).
- MnDOT had a hard time with calcium chloride, but outstate mostly uses it for pre-treatment and as slurry. Mankato –Rochester uses a super saturated product (mostly salt brine and corn syrup).
- UMN uses anti-icing on their sidewalks – 85% brine, 10% geomelt we think. Hennepin County is using magnesium and calcium chloride.
- Two cities do own pre-wetting, but school districts contract out. It may be the bigger private companies could do this, but it is a big commitment to go to pre-wet. They could contract with a supplier or maybe retrofit but don't need to store or mix it. But cost is border line - they could reduce cost but it would be hard to convince them. Maybe they could partner with someone who has the system and just pay per gallon for brine.
- Hennepin County (used to mix by hand) but now uses Minnetonka product since they put in a big system.
- There are other brine makers out there. Most counties and cities have accubrine systems (automated brine makers) and make their own.
- St. Cloud and Duluth were one of first that made their own brines.

- Small contractors could mix up a batch by hand pretty easily. They could wet the salt but what would be the ratio - water/salt ratio could be 2.52 lb of salt to 2 gallons of water?
- Private applicators. Smaller operations are more cut-throat since the economy is hard and they have more contracts than they can handle so people start parking on snow before they can get there. Not getting out there to physically remove it first should be something to write in a contract – that the parking lot needs to be plowed/cleared by 6 a.m.
- Anti-icing is the key because it buys you time for plowing/removal.
- Capitol Region WD – hard to educate property management because of the turnover in ownership.
- Helpful to subscribe to a weather forecasting company because they are 90% correct on precipitation. UMD gets 5 a.m. and 2 p.m. reports. Checks the Road Weather Information System (RWIS) and monitors MnDOT statewide customized forecast for pavement and road temperatures. It would be helpful to implement a system that would put it in the trucks.
- Scott County has 21 plow trucks and has an AVL (Automatic Vehicle Location) system on five units.
- Fleets range in equipment and we are trying to get the average age of the trunks lower and are retrofitting sanders. Last winter pretreated bridges which worked well. Helps to have a snow and salt management plan in place.
- Do application rates vary when the storm hits? No, should be the same. If snow is less than 2 inches, may only use liquid.
- Preventative steps seem to work best.
- Can we sell that there will be a budget savings? Yes, there seems to be quite a few things that organizations can do to maintain the budget and also help the environment.
- Is there a different expectation on the weekends as far as level of service? There is a public expectation that people should still be able to drive 60 miles an hour during a snow storm.
- Many cities compare themselves to each other. It would be good to have a standard level of service, but would need to tailor it (i.e. if you live in a city that has large amount of street parking).
- Level of safety is important and the expectation will vary from road to road. Safety is a great way to get people's attention but harder to measure from area to area.
- NMWD reached out to schools and talked to workers compensation organizations. School districts operate more like a private business and can be behind the times in maintenance. Eden Prairie school district seems to be "on the ball" and Bloomington is looking to get grant money to help. We have also invited school districts to the turf/roads classes.
- We need to focus on roads but also on other organizations (i.e. hotels, business, etc.) so we can find out what the private sector is doing.
- Why should private businesses use less salt? How can we help with incentives? We can educate and help set policies. We really need to get the private sector involved.

Breakout Session – (Led by Connie Fortin)

- We have chloride reduction targets in Nine Mile and Shingle Creek Watersheds and what we need is a guide or assessment tool to help the winter maintenance industry to meet those goals. I am working on a tool to help people look at their current practices and see what other Best Management Practices they could be doing to help reduce chloride. Again, it would be a tool to help winter maintenance staff and supervisors critically look at their own operations and then figure out how to adjust to meet water quality goals.
- The tool could be used on an annual basis so you could enter what happened last winter – tons dry product used/area treated/gallons of brine/etc.

- The tool could be based on user type – sidewalks/parking lots or high speed road maintenance or low speed road maintenance. Do we need different tools for each user type or should we make it more simplified?
- I've come up with six main layers - before winter prevention, during winter prevention (use less salt), increase accuracy, increase effectiveness, reduce waste, and recovery of salt.
- Then, for example, the types of preventative practices would be to heat roads, anti-ice, training, policies, etc.
- Right now on a spreadsheet, for the "reduce waste" section, it could be color coded for standard best practices, advanced best practice, remedial practice.
- We could have some reduction numbers that compares what folks are doing now with the future depending on the practice. For example, if your bulk salt pile is uncovered versus moved indoors, can we come up with a reduction potential? There is not research/data on this, but the maintenance community could come up with our best guess. Another example is to see what people had under their salt pile (grass or sand or asphalt). These are ideas I've come up with so I will need your review on the wording and knowing if I am asking the right questions.
- May want to add cost savings in the future, but this phase is only focused on salt reduction.
- Additional examples are if you are storing salt upstream or downstream of a catch basin, loading it outdoors or indoors, over or under-filling trucks (note that people may not admit to over-filling so need to reword – maybe how much freeboard do you have).
- We could compare the different entities so people could see if their city (for example) is average or ahead or behind other cities or could do a scorecard. It would be better to show entities how they are doing, but not publish anything broadly with this information. But how will you use the information? How will it be updated and how would own/operate this database?
- Another category is "increasing accuracy". This could include whether you are using manual controls vs. ground speed controls with or without Maintenance Decision Support System (MDSS) and how many trucks use each. Does anyone use manual controls anymore? A small percentage maybe. Could we say there is a 50% reduction going from no MDSS to MDSS?
- UMD is selling equipment they don't want but then other people are using less accurate equipment to reduce chloride.
- At the end of entering information into this tool, people could run reports and see how many of their practices were remedial, standard, or advanced and then could maybe run it with existing practices and future practices.
- Seems like this tool would be much better for just a maintenance organization to look at their own practices instead of comparing them with other entities. I agree that this should just be for the internal organization to use only, that it would be an interesting way to think about everything you are doing. Would be hesitant to share with MPCA or show an average overall.
- Would be better to include cost savings in the tool now as that could be incentive. We may not have the budget to do that at this time. We could say someone's salt reduction potential is 25% and they would use x tons less of salt (and that could be converted into cost savings).
- How many waterbodies are being monitored? Need to tie results with water monitoring data too.
- You really need to keep tool results internal so people use the tool honestly and can get real improvement. If it turns into a report card or regulation or we are compared with other entities it will fail. We feel very uncomfortable with sharing results with MPCA and other entities.
- There is also a fairness issue as some cities have larger budgets for upgrading equipment, etc.
- Do like the summary report at the end of exercise as a self-monitoring/self-regulation tool.
- If you did a compare/contracts, it would be hard to figure out how policies (bare-pavement, etc.), service, and culture effected the results. Also comparing across urban versus rural versus suburban is too complex.

- I need you to review this spreadsheet to make sure the questions are right. Right now there are 6 major categories, 32 subcategories, and 164 assessment questions. 57 have rate reduction potential. How much time does it take to answer the questions? That is more important than how many questions you have.
- What is the best way to get your input? Connie needs input from maintenance – one on one or email or put another meeting together? 1 on 1 would be best but send the questions in advance and those that can will respond by email.
- We really need to make the tool also for parking lot/sidewalk folks so they could use it. They need to see that they could save money by reducing salt use. Private applicators have a longer way to go. Maybe build the tool for the roads and then tweak it for private applicators.
- How far out do you know of changes? Varies by city to city. Usually 5 years. Some even have 10 to 15 year plans. Operating tends to be year to year. Maybe add another category that is like a wish list so it would be current, planned, and wish list or something. Or be able to type in the year it could happen.
- Ideally it would be helpful to be able to predict the amount of salt saved from year to year.
- Need to add another column with the cost savings. This could help bring the issue back to the public – why aren't entities doing this if it will save them money? Connie said she is working on the technical aspects not necessary the marketing.
- The techniques are different in each organization so is this all just "guestimating"? The first screen notes that there may be a + or - 10% of error in the numbers.
- What if the city uses liquid and salt and sells it to other partners. Who are those partners? Example schools purchase some of their salt. This tool should be able to be used by all, even schools. How do you get to a school district or private sector?
- There could be a problem with misreporting. Would organizations report their numbers correctly? How do we solve this? At this time we need to assume that they are entering the correct amount.
- Some example questions are:
  - What type of equipment are people using?
  - What is the storage surface like?
  - Where do we load the salt?
  - Deliver salt tarped/untarped?
  - Do you return with an empty load?
- Some of these questions the private sector may not know the answer to these questions.
- What type of savings could we see if update equipment?
- Would there be a training slide to help reach these targets?
- Cities are getting pushed on performance measures so this could help.
- If you don't compare apples to apples then you shouldn't do the comparison. Performance standards vary from city to city. A calculator might not be as valuable as a checklist.
- How do cities judge their own practices? We need to at least hold our level of service constant. We also need to have a metro standard for safety. This is a great communication tool but if there is a safety issue, it can cause major problems.
- Is there an education & outreach section for the tool?
- Who fills out this tool? Should be the maintenance supervisor. This needs to be on their radar and it can help them do their job. Could also help create ownership for the supervisors.
- We need a separate tool for parking lots, trails, and sidewalks.

- Again, tool needs to show people how they can save money and the environment at the same time.
- Connie will send the draft spreadsheet and work on getting your feedback.

Wrap up

- Reminder to grab CD's from MWMO of their new video.
- Connie will meet with the different organization to discuss the tool. She will send out the questions prior to her meeting. After that, we will meet as a group again.
- May meet again in about 6 months. In the meantime, if you have questions/comments, let us know.
- How do we see the TMDLs? We are still in the monitoring phase so haven't started that analysis or drafting that report yet.
- Thank you for attending and thank you to MWMO for hosting the meeting.
- Please let us know what information would be helpful for targeting private applicator information in the Metro.
- Send an email to Brooke/Connie about how to improve future meetings.
- Don't forget to sign up to volunteer at the water quality and road salt display at the state fair.