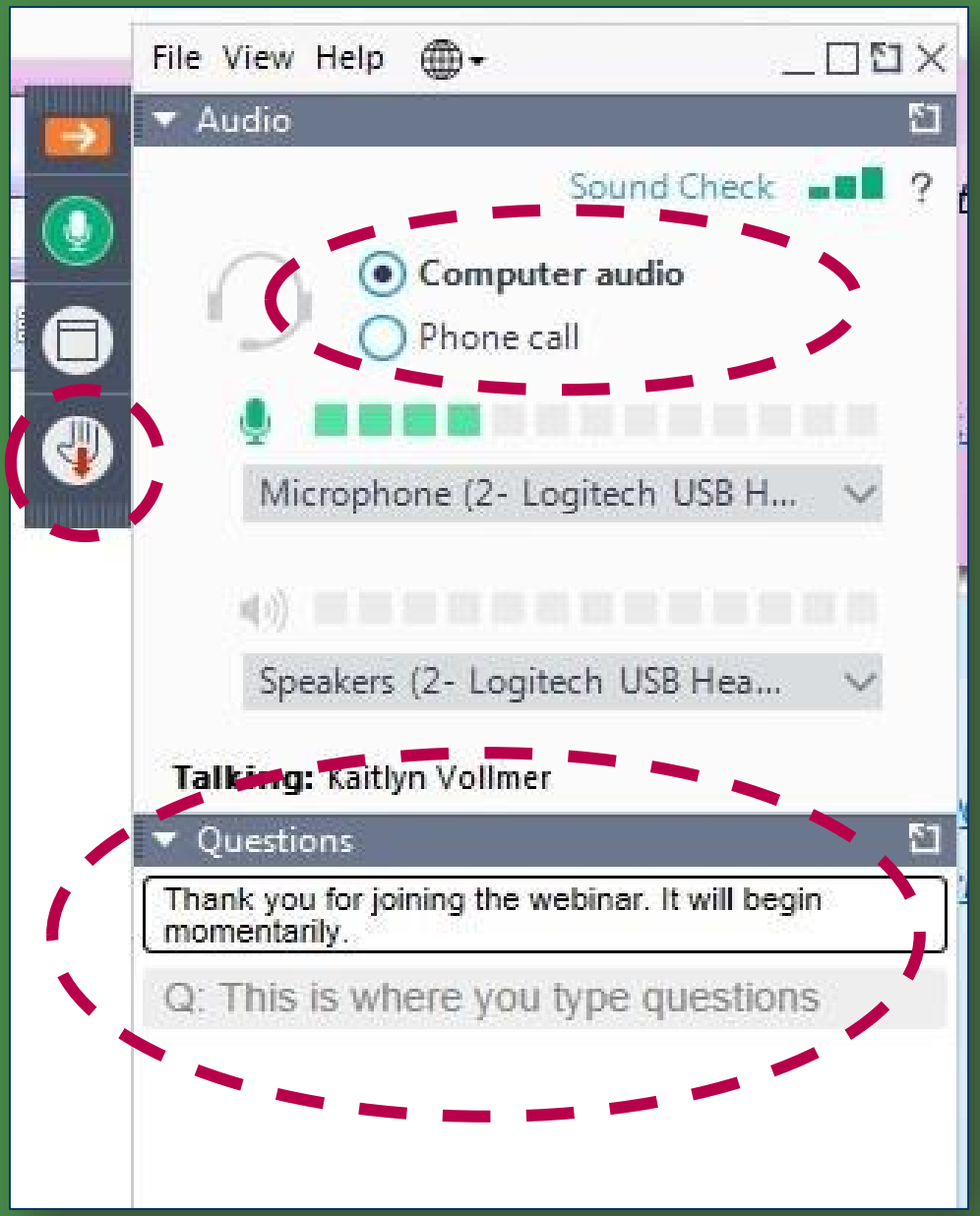
Winter Best Practices to Reduce Road Salt Impacts

December 12, 2023

New Action Webinar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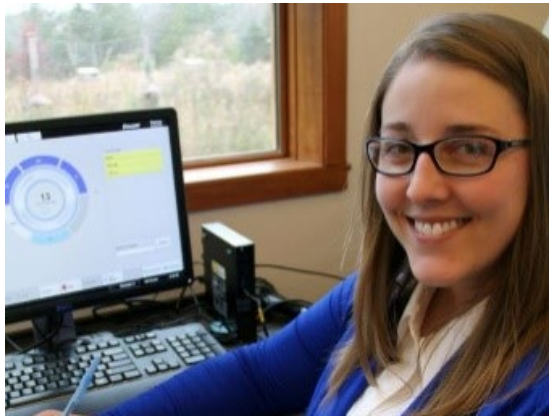
Talking: Kaitlyn Vollmer
Questions
Thank you for joining the webinar. It will begin momentarily.
Q: This is where you type questions

Webinar Speakers

Maureen Jones

Anne Heasly



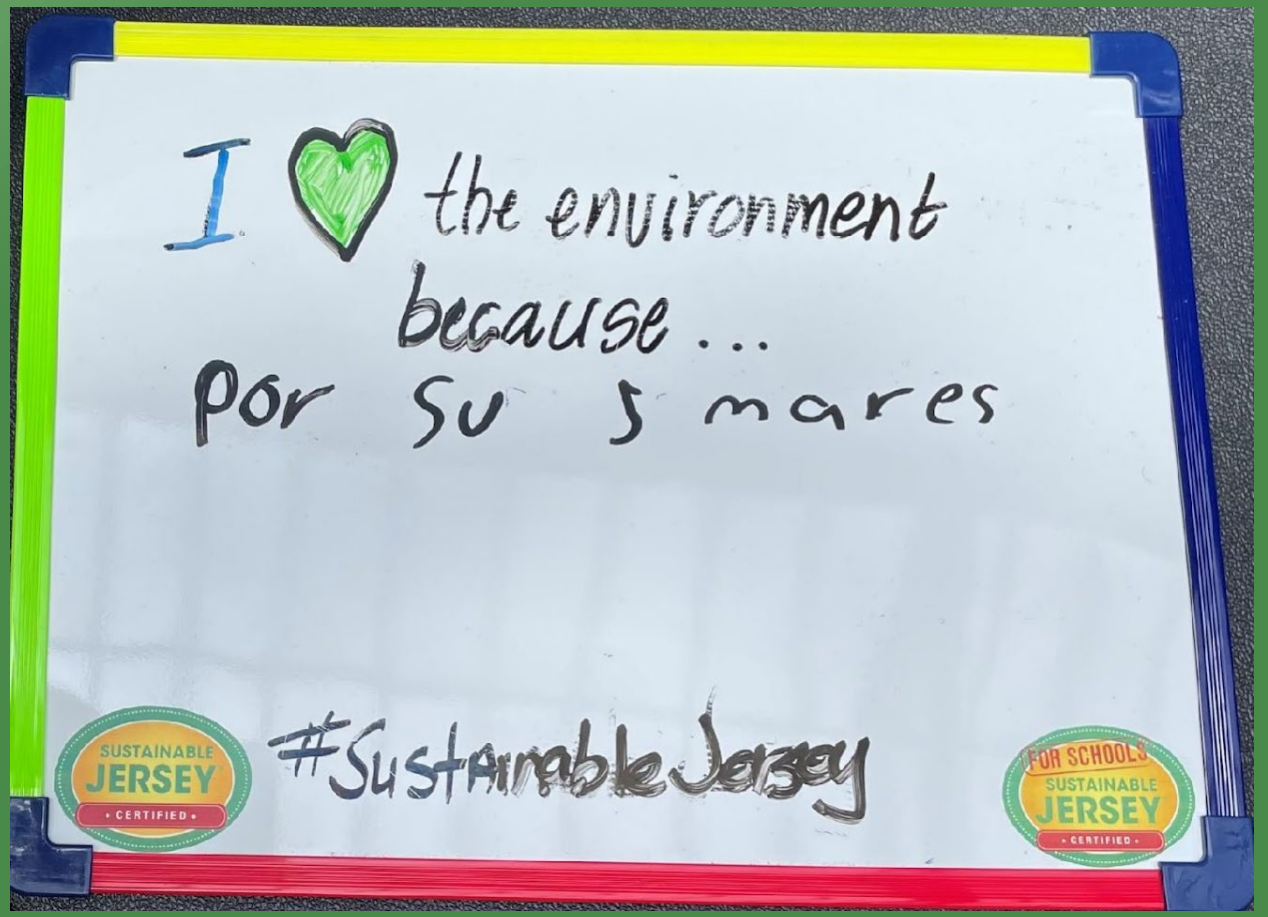
Erin Stretz

Debbie Kratzer

Winter Best Practices

1. Overview
2. Why and citizen engagement
3. Inventory, training and BMPs
4. Funding & upcoming opportunities
5. Questions and answers

What can municipalities do to better manage road salt?



7 year-old respondent

NJDEP Earth Day 50th Celebration – April 2022

New & Updated Actions Released!

Winter Best Practices to Reduce Road Salt Impacts *added*
& Municipal Water Story *updated*

Learn more on the Program Updates page
https://www.sustainablejersey.com/actions/program-updates/

New Jersey Salt Watch

Monitoring the Impacts of Road Salt

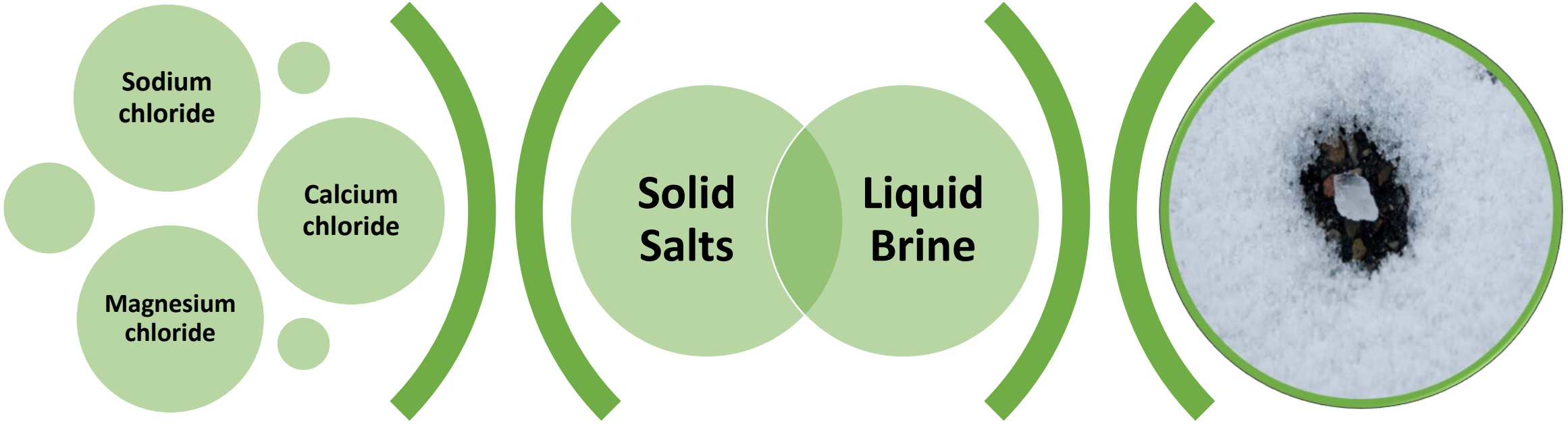
With your Help!

Erin Stretz
Assistant Director of Science
NJ Watershed Watch Network Coordinator

The Watershed Institute

Sustainable Jersey Webinar
December 14, 2023

What is Road Salt anyway?



Types of Road Salt

Application Methods

How it Works

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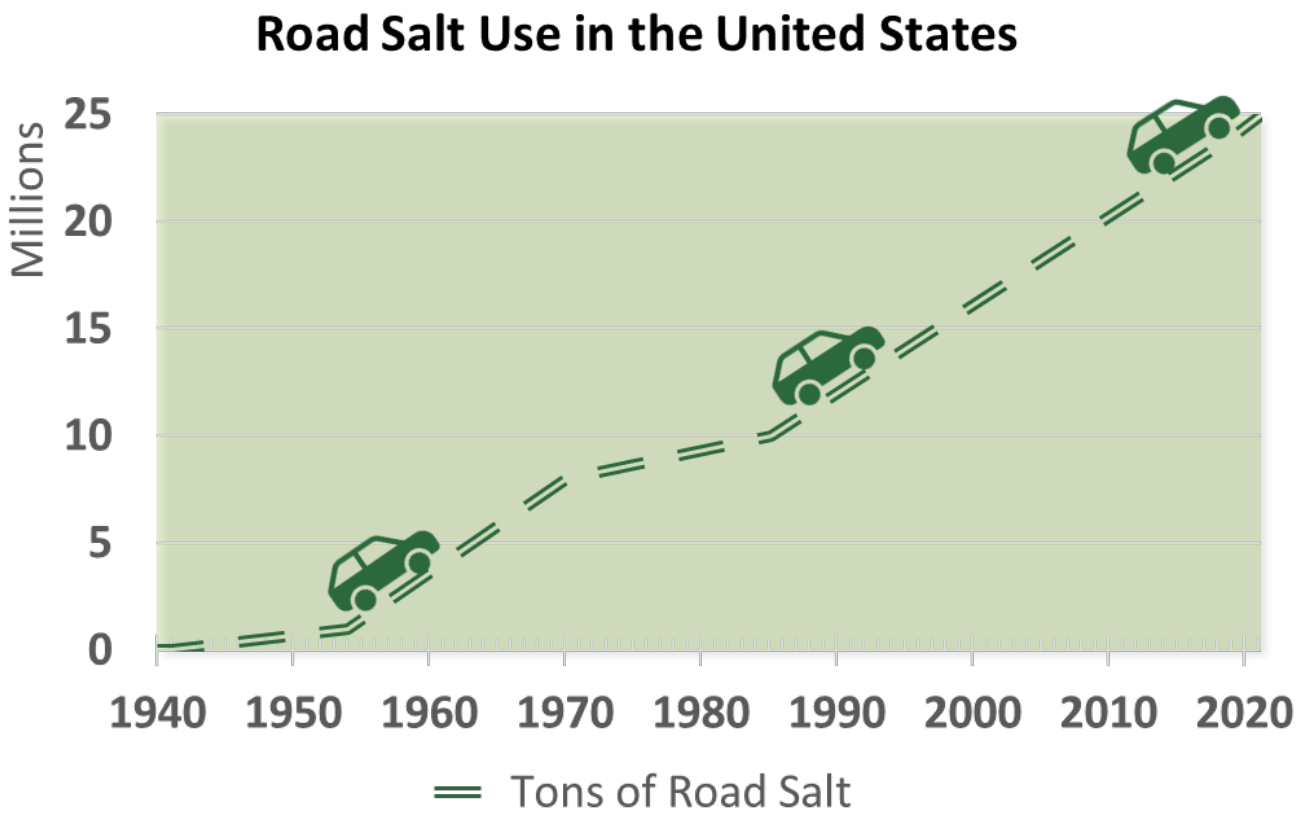
How We Use Road Salt



Emergencies

Shipping

Commuting

Pizza

Source: Road Salt Use in the United States, https://www.sciencedaily.com/releases/2021/12/211209124519.htm

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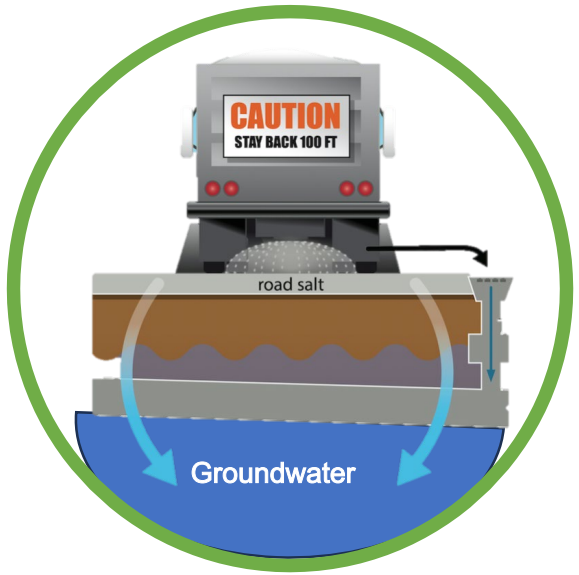
Where does Road Salt end up?

Plants and Soils

Groundwater



Streams and Lakes

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Salt and Freshwater Life

LETHAL EFFECTS

Above 860 mg/l chloride

- Salt can reach toxic levels and result in **acute mortality**

Fish kill in Lake Varuna, Gaithersburg, MD due to high chloride, Source: Karl Van Neste / Muddy Branch Alliance

SOME NON-LETHAL EFFECTS

Above 50 mg/l chloride

- Rainbow trout hatchlings **30% smaller** in salty water (Hintz & Relyea, 2017)
- Riparian wood frogs birth **more males than females** (Lambert, Stoler, Smylie, Relyea & Skelly, 2016)

Photo: Hintz & Relyea (2017)

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Salt and Lake Stratification

Salty Water is Denser than Freshwater

- Saltier water sinks to the bottom of a lake, where it is too heavy to mix with the oxygenated freshwater on top
- This prevents seasonal mixing so the water at the bottom of the lake loses dissolved oxygen (DO)

- Low DO conditions can leach nutrients from sediment at the bottom of the lake
- Nutrients feed bacteria and algal blooms, which consume even more DO

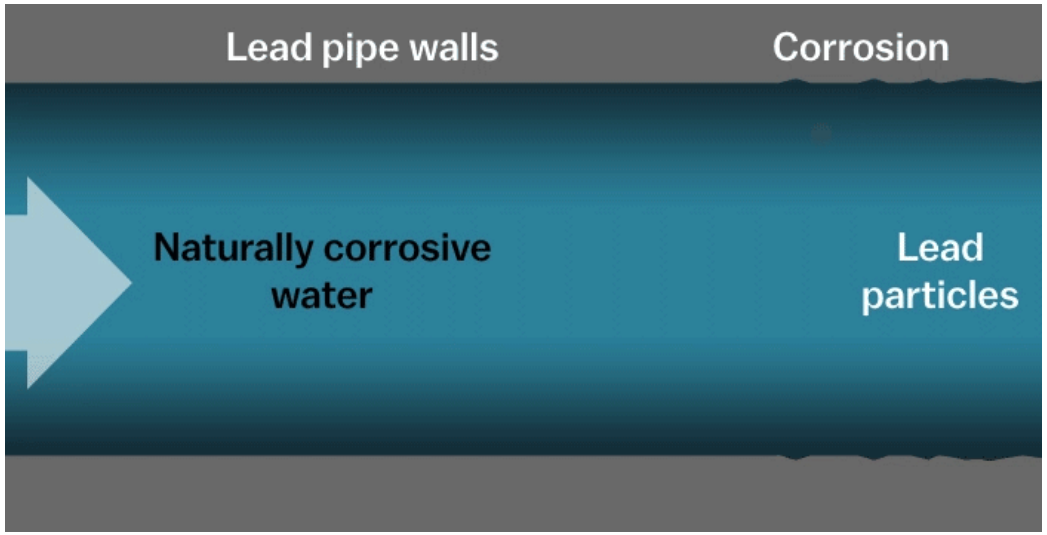
Photo Source: NJDEP

Salt Contaminates Drinking Water

and can leach lead from drinking water infrastructure

- **Salt doesn't "go away"** and is not removed by traditional water treatment plants

- **Salt is corrosive** and can leach lead and copper from pipes (see Flint, MI)



Graphic: Vox Visual Guide to Lead Poisoning

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Help us to monitor the impacts of **Road Salt** with your participation in

New Jersey Salt Watch

A crowdsourced community-based water monitoring program hosted by the New Jersey Watershed Watch Network

NEW JERSEY
WATERSHED WATCH
NETWORK

+5 points toward Sustainable Jersey action!

Getting Started with NJ Salt Watch

1. Choose freshwater stream or lake site to monitor
2. Sign up for your free Salt Watch test kit at www.njwatershedwatch.org/saltwatch
3. Receive your Salt Watch test kit in the mail
4. Return to your site(s) 4-6 times before the end of April to conduct a chloride test with your test strips
   - Preferably before and after a winter storm event!
5. Upload data to Clean Water Hub after each visit

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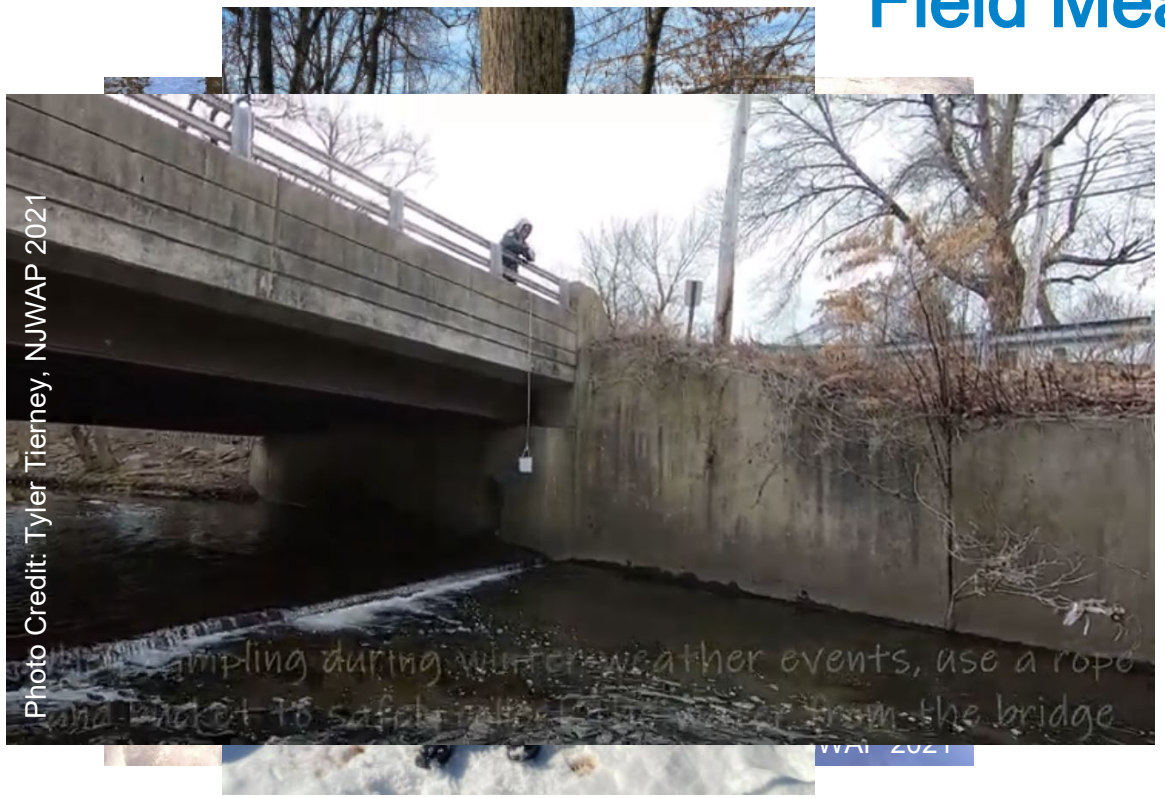
NJ Salt Watch Chloride Testing

Field Measurements



Rinse sampling container and collect a water sample.

Dip the chloride test strip into the water until the top strip turns black.

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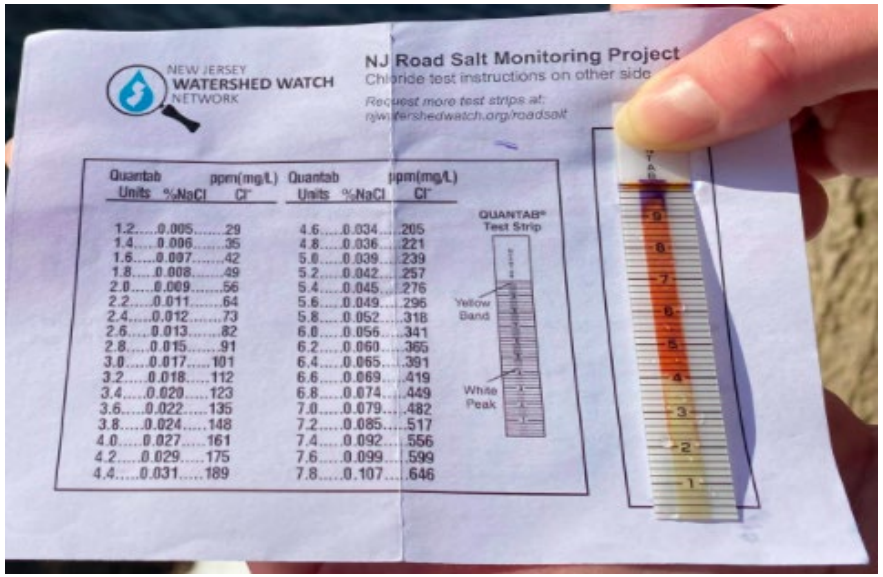
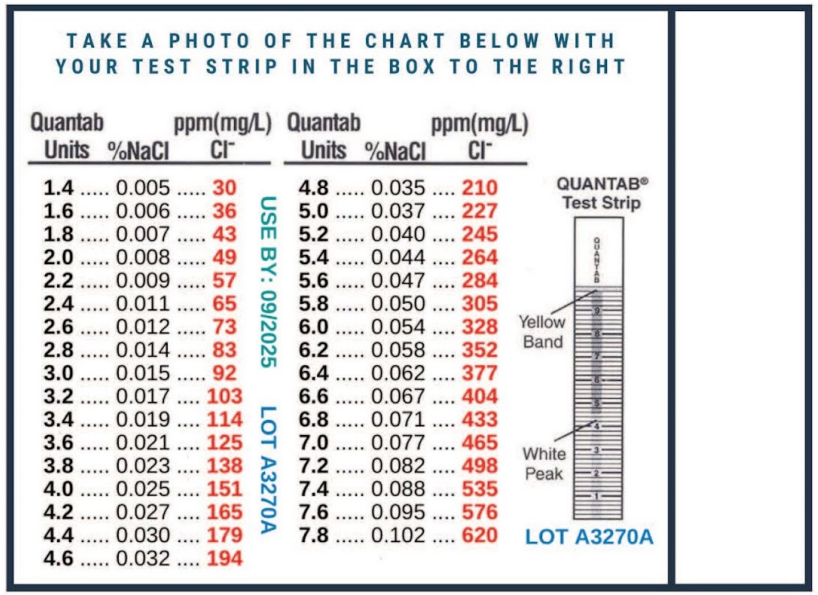
NJ Salt Watch Chloride Testing

Reading Test Strips with Calibration Tables



Compare result to the calibration table to find the chloride measurement.



Confirm the lot number and expiration date.

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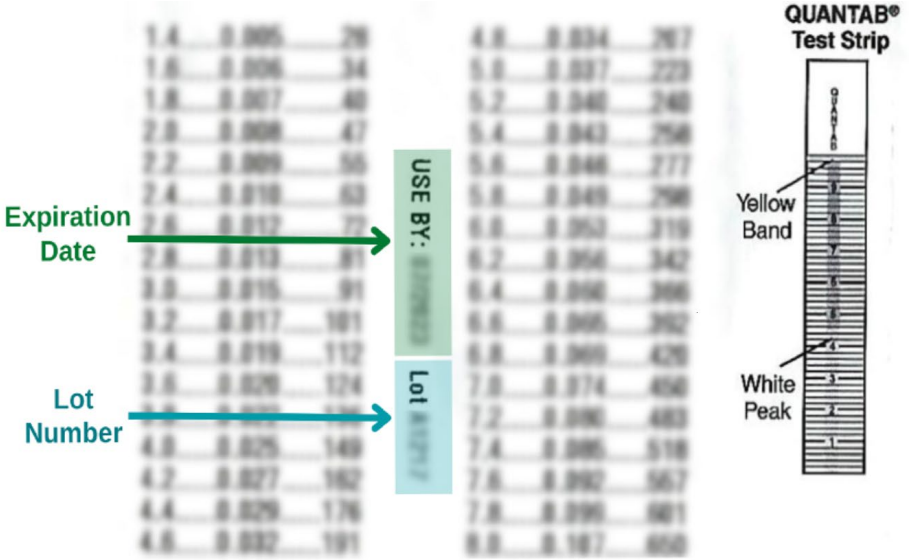
NJ Salt Watch Chloride Testing

Submitting your Data to Clean Water Hub

1. **Sign up for an account with the Clean Water Hub** at www.cleanwaterhub.org/saltwatch
2. Set up your monitoring sites
   - Provide Site Name, Waterbody Name, Site Description, Latitude/Longitude
3. Submit Salt Watch data
   - Including Date, Recent Precipitation, Test Strip Reading, Chloride concentration, Test strip expiration date and lot number

WINTER SALT WATCH



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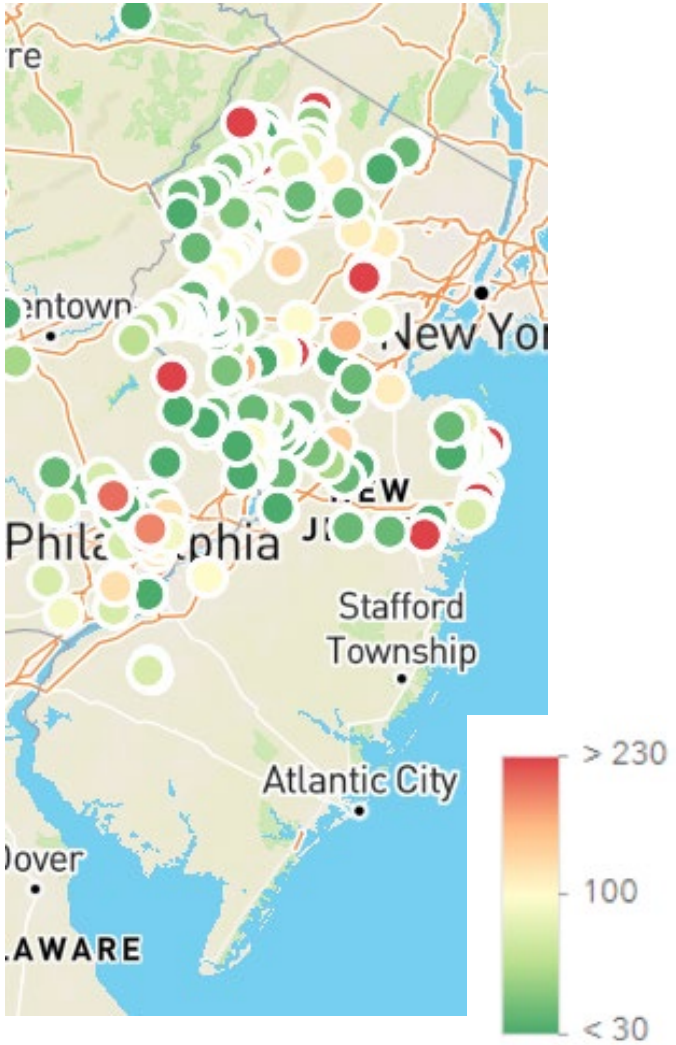
What Happens with the Data

- Our New Jersey data is combined with a national data set in the Clean Water Hub
- We're assessing how well New Jersey subwatersheds meet water quality standards
- **Municipalities, like yours, will share your data with your community!**

+5 points toward Sustainable Jersey action!

Clean Water Hub Data Map
2023 in New Jersey, so far



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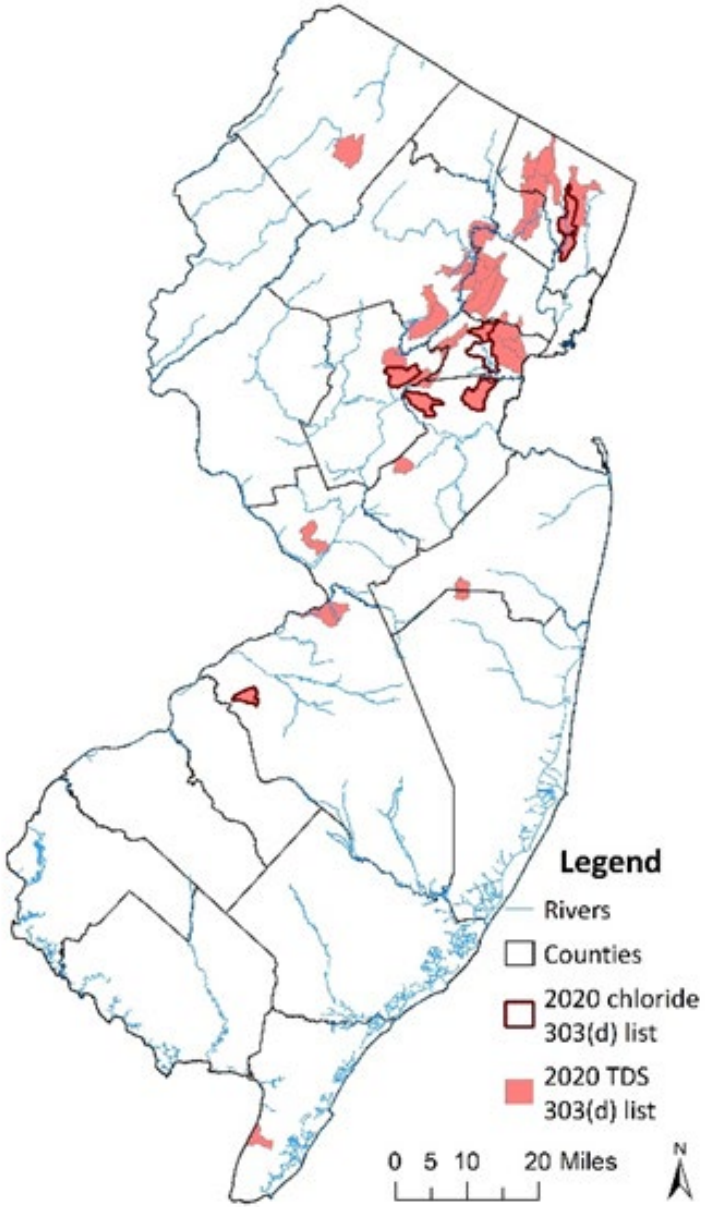
Outline

1. Background
2. Requirements: MS4
3. How to Complete the Action
   - Who should lead
   - What to do
   - Submission Spreadsheet

Winter Best Practices to Reduce Road Salt Impacts

Deborah Kratzer
Environmental Specialist at New Jersey Department of Environmental Protection, in the Division of Water Monitoring, Standards and Pesticide Control

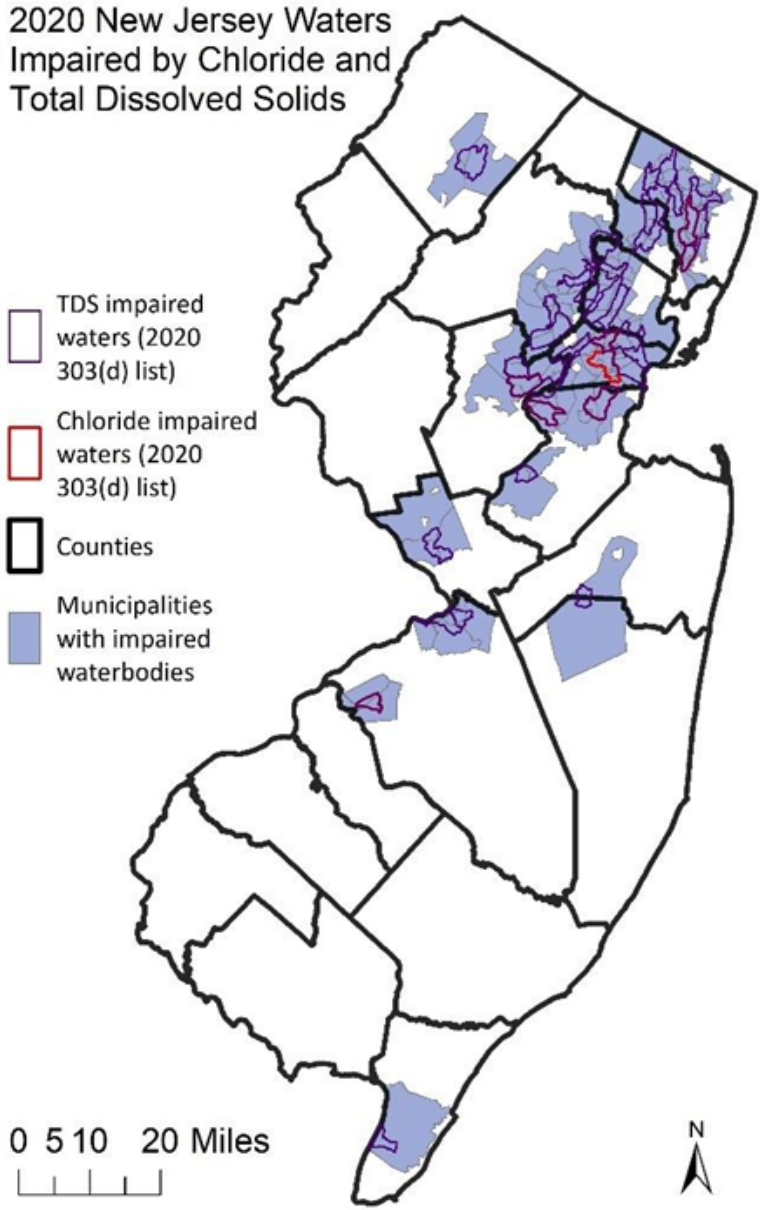
Background: Surface Water Quality Impairments



- NJDEP is required by the Clean Water Act to assess water quality every 2 years
- Exceedances of chloride and TDS standards for aquatic life and public water supply beginning in 2002
- Increasing # exceedances over time
- Most occurring in winter months
- 2020 303(d) list of impaired water bodies
  - 39 subwatersheds are impaired for TDS
  - 8 subwatersheds are impaired for chloride

Source: https://www.state.nj.us/dep/wms/bears/assessment.htm

Background: Surface Water Quality Impairments

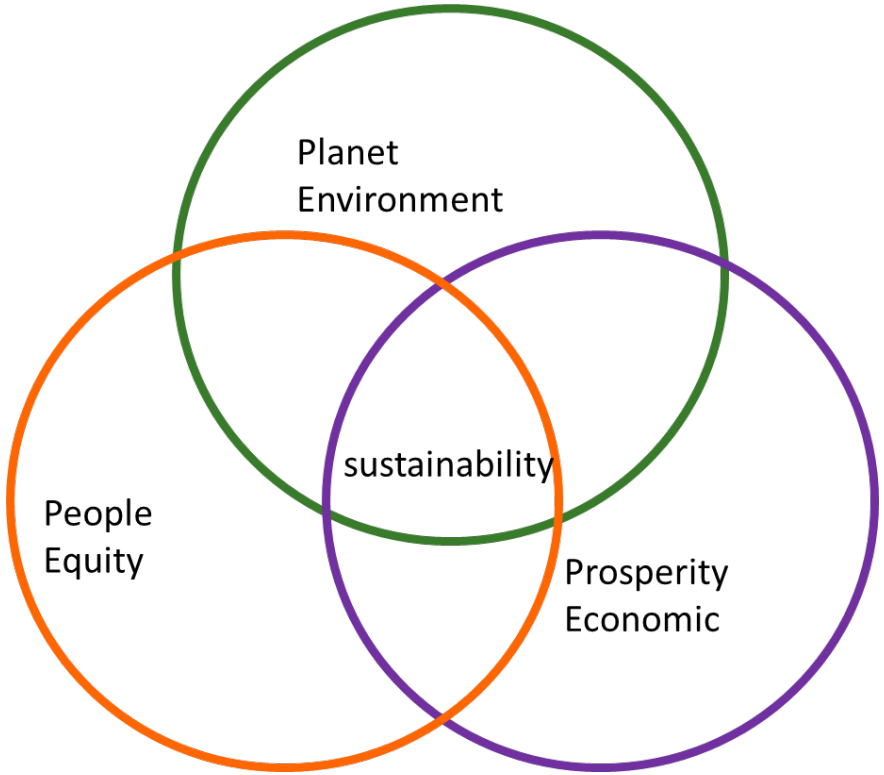


- 129 municipalities at least partially contain an impaired waterbody
- Many other water bodies show an increasing trend toward higher levels of TDS and/or chloride, even when data doesn't show that standards are being exceeded.

Source: https://www.state.nj.us/dep/wms/bears/assessment.htm

Background: Is our road salt use sustainable?

People/Equity
Benefits
·Avoided accidents (traffic & falls) ·Allows emergency services, commerce, and work ·Convenience (service improvement)
Costs
·Human health ·Social inequality ·Water treatment



Planet/Environment
Benefits
·Fewer accidents = less fluid leakage and fewer car repairs needed
Costs
·Greenhouse gas emissions ·Water and air pollution ·Soil and vegetation deterioration ·Wildlife habitat degradation ·Energy usage ·Liquid effluent ·Solid waste disposal ·Toxics mobilization

Prosperity/Economic
Benefits
·Jobs
Costs
·Mining & manufacture ·Storage & transporting salt ·Implementation (spreading deicer)(Labor, materials, equipment/vehicles) ·Corrosion of infrastructure & vehicles

Background: Definitions of Snow and Ice Control Practices

- **Anti-icing**
  - *BEFORE A STORM*
  - proactive applications of a chemical freezing-point depressant
  - prevents the bond between surfaces and snow and ice
  - usually liquid brine, most efficient, and is well suited to busy roads
  - anti-icing with solid or pre-wetted materials ok for low speed limits and low use
  - Disadvantage: initial expense of new equipment
- **Deicing**
  - *DURING or AFTER A STORM*
  - frequently leads to a compacted snow layer (pack) that is tightly bonded to the pavement
  - suitable for lower priority service levels that preclude preventive operations
  - Disadvantages: less effective, less safety, requires *much more* salt than anti-icing
- **Mechanical Removal**
  - plowing, shoveling, blowing
  - doesn't use any chemicals

Source: Minnesota Snow and Ice Control Handbook for Snowplow Operators

Requirements: Overview of NJDEP Regulations Related to Road Salt

Municipal Stormwater Regulation Program

- *https://dep.nj.gov/njpdes-stormwater/municipal-stormwater-regulation-program/*
- Good housekeeping
  - Flows from washing equipment and vehicles used in the application of salt and de-icing materials
  - Salt Handling
  - Bulk Liquid Storage
- Salt Storage
  - Permanent storage with roof, walls, floor
  - Privately-Owned Salt Storage Ordinance
- Street sweeping
- Cleaning up excess salt 72 hours after storms
- Annual Employee Training

Emergency Snow Removal and Disposal Policy

- Example: Snow or melted snow may not be dumped or discharged in waterbodies, wetlands, near a public water supply well or reservoir, in sanitary landfills, or on top of stormwater basins or swales.

Picture taken in August

Picture taken days after snow fell

How to Complete the Action: Who should lead and be involved with this action?

May include individuals representing some or all of the following:

- Green Team
- Municipal government representative
- Facilities/Maintenance Manager
- Department of Public Works (required)
- Environmental Commission
- Environmental Department
- Engineering Department
- Planning Department
- Road Salt Manager (likely already in the DPW)
- Stormwater Manager
- Health Department
- Police Dept.
- State and County DOTs

How to Complete the Action: What to Do

Activity	What to Do	Points
Participate in New Jersey Salt Watch Study	Monitor for one winter season. Present results and analysis on road salt reduction with community members.	5
Workforce Training	Ensure municipal staff involved in road salt application receive best management practices training.	5
Create and submit road salt inventory	Monitor for one winter season. Present results and analysis on road salt reduction with community members	10
Implement a Winter Road Maintenance Best Management Practice (BMP)	Refer to Resource 2 for list of BMPs.	5
	Maximum Awarded for this Action:	15

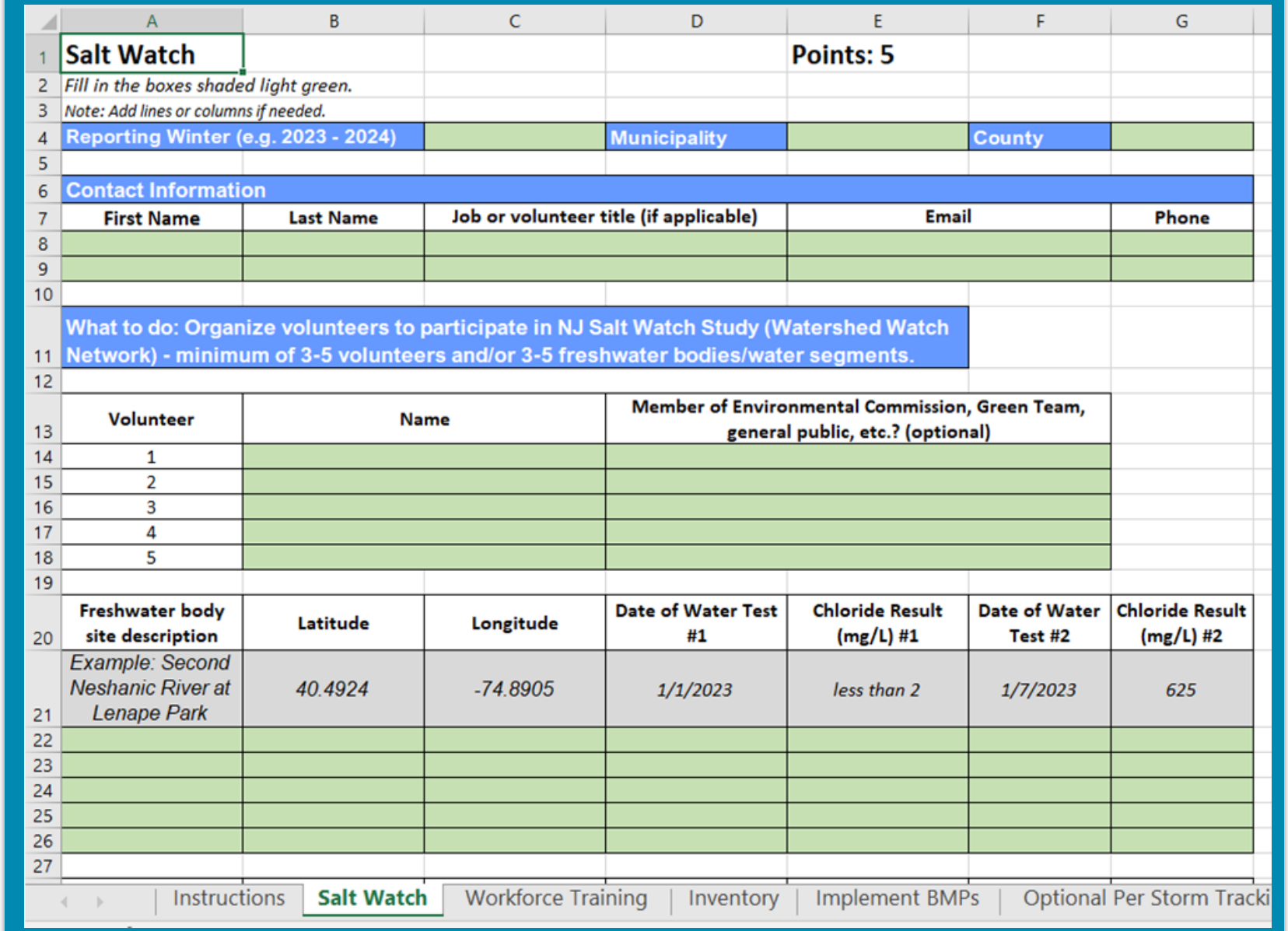
How to Document: NJ Salt Watch (5 points)

Fill out spreadsheet

- Salt Watch tab
- Fill in applicable green spaces
- Who participated
- Location(s) and results
- Brief narrative describing how results were shared

Refer to:

- Salt Watch – NJ Watershed Watch Network
- Resource 1: Education and Outreach Resources
- Resource 3: Action Submission Spreadsheet



	A	B	C	D	E	F	G
1	Salt Watch				Points: 5		
2	*Fill in the boxes shaded light green.*						
3	*Note: Add lines or columns if needed.*						
4	Reporting Winter (e.g. 2023 - 2024)			Municipality		County	
5							
6	Contact Information						
7	First Name	Last Name	Job or volunteer title (if applicable)		Email		Phone
8							
9							
10							
11	What to do: Organize volunteers to participate in NJ Salt Watch Study (Watershed Watch Network) - minimum of 3-5 volunteers and/or 3-5 freshwater bodies/water segments.						
12							
13	Volunteer	Name		Member of Environmental Commission, Green Team, general public, etc.? (optional)			
14	1						
15	2						
16	3						
17	4						
18	5						
19							
20	Freshwater body site description	Latitude	Longitude	Date of Water Test #1	Chloride Result (mg/L) #1	Date of Water Test #2	Chloride Result (mg/L) #2
21	*Example: Second Neshanic River at Lenape Park*	*40.4924*	*-74.8905*	*1/1/2023*	*less than 2*	*1/7/2023*	*625*
22							
23							
24							
25							
26							
27							

Instructions | Salt Watch | Workforce Training | Inventory | Implement BMPs | Optional Per Storm Tracki

How to Complete the Action: Workforce Training (5 points)

Ensure municipal staff involved in road salt application receive best management practices training.

In-Person

- Rutgers Office of Continuing Professional Education - - Snow and Ice Removal for Municipalities and Public Grounds (typically held early November)
- Rutgers Center for Advanced Infrastructure & Transportation - Training & Events (search snow)
- American Public Works Association (APWA)*
  - APWA North American Snow Conference
  - APWA Resource Center (search on terms such as snow or winter)

Webinars, Videos, and Podcasts

- Minnesota Salt Symposium and Smart Salting Training
- New Hampshire - Green SnowPro Certification
- American Association of State Highway and Transportation Officials (AASHTO)
  - Free online training: http://sicop.transportation.org/category/webinars/
  - Podcast - SICOP Winter Ops: https://sicop.transportation.org/stwo/
- Clear Roads training for snow professionals (videos) https://clearroads.org/videos/

* APWA is members only, but public works employees are often members.

Refer to: Resource 1: Education and Outreach Resources

How to Document: Workforce Training (5 points)

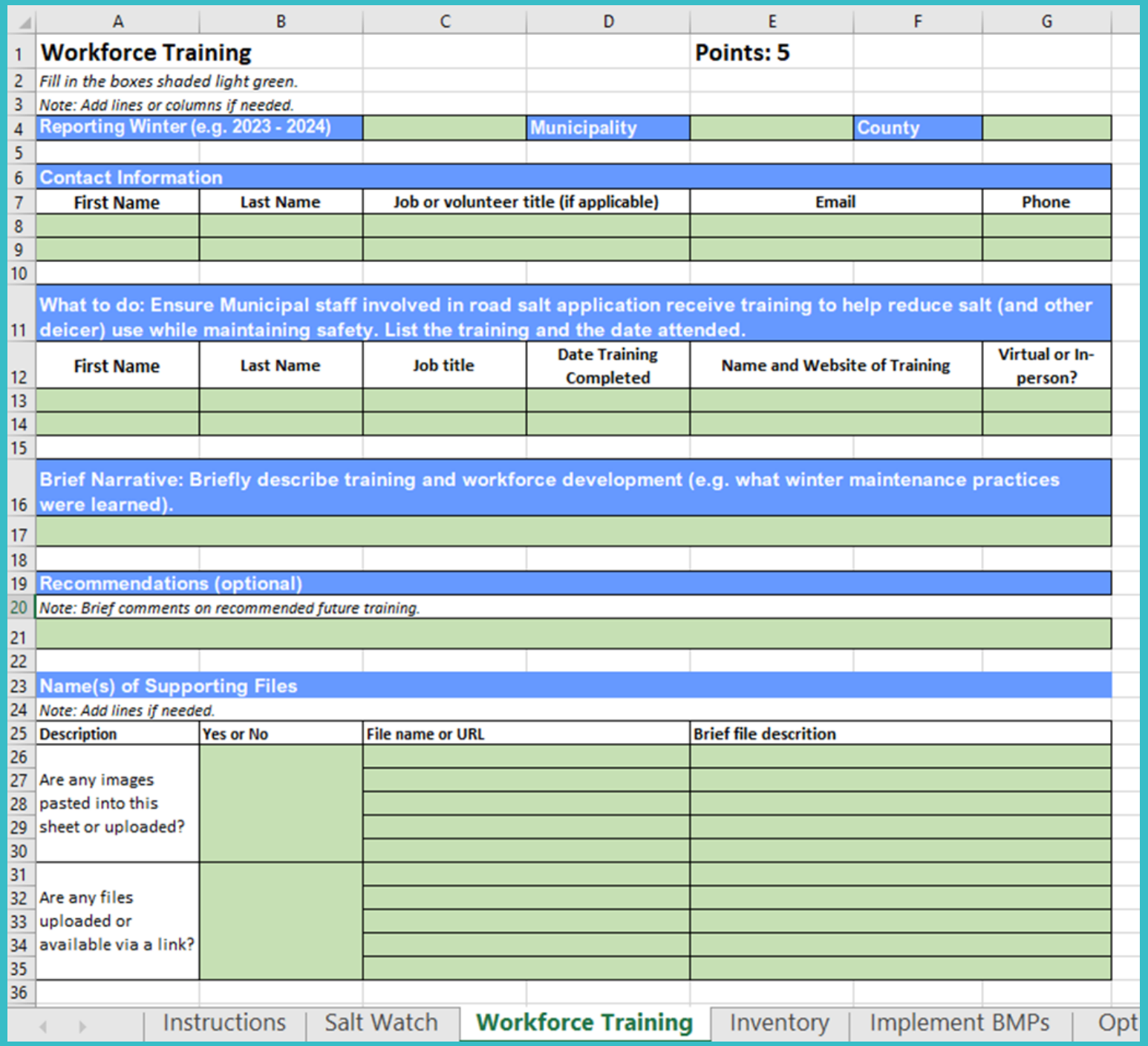
Fill out spreadsheet

- Workforce training tab
- Fill in applicable green spaces
- Who was trained*
- What specific training did they complete

Refer to:

- Resource 1: Education and Outreach Resources
- Resource 3: Action Submission Spreadsheet

*full names not necessary



	A	B	C	D	E	F	G
1	**Workforce Training**				**Points: 5**		
2	*Fill in the boxes shaded light green.*						
3	*Note: Add lines or columns if needed.*						
4	Reporting Winter (e.g. 2023 - 2024)			Municipality		County	
5							
6	Contact Information						
7	First Name	Last Name	Job or volunteer title (if applicable)		Email		Phone
8							
9							
10							
11	What to do: Ensure Municipal staff involved in road salt application receive training to help reduce salt (and other deicer) use while maintaining safety. List the training and the date attended.						
12	First Name	Last Name	Job title	Date Training Completed	Name and Website of Training		Virtual or In-person?
13							
14							
15							
16	Brief Narrative: Briefly describe training and workforce development (e.g. what winter maintenance practices were learned).						
17							
18							
19	Recommendations (optional)						
20	*Note: Brief comments on recommended future training.*						
21							
22							
23	Name(s) of Supporting Files						
24	*Note: Add lines if needed.*						
25	Description	Yes or No	File name or URL		Brief file descrition		
26	Are any images pasted into this sheet or uploaded?						
27							
28							
29							
30							
31	Are any files uploaded or available via a link?						
32							
33							
34							
35							
36							

Instructions | Salt Watch | **Workforce Training** | Inventory | Implement BMPs | Opt

How to Complete the Action: Inventory (10 points)

- 10 points because it's the most important!
- we need information on practices to compare to improvements and to identify effective practices
- First: Affirm compliance with minimum MS4 requirements
- Points for this task are awarded based on answering the questions, not on what the answers are.
- Monitor for at least one winter season.
- Present results and analysis on road salt reduction with community members
- Fill out spreadsheet

Refer to: Resource 3: Action Submission Spreadsheet

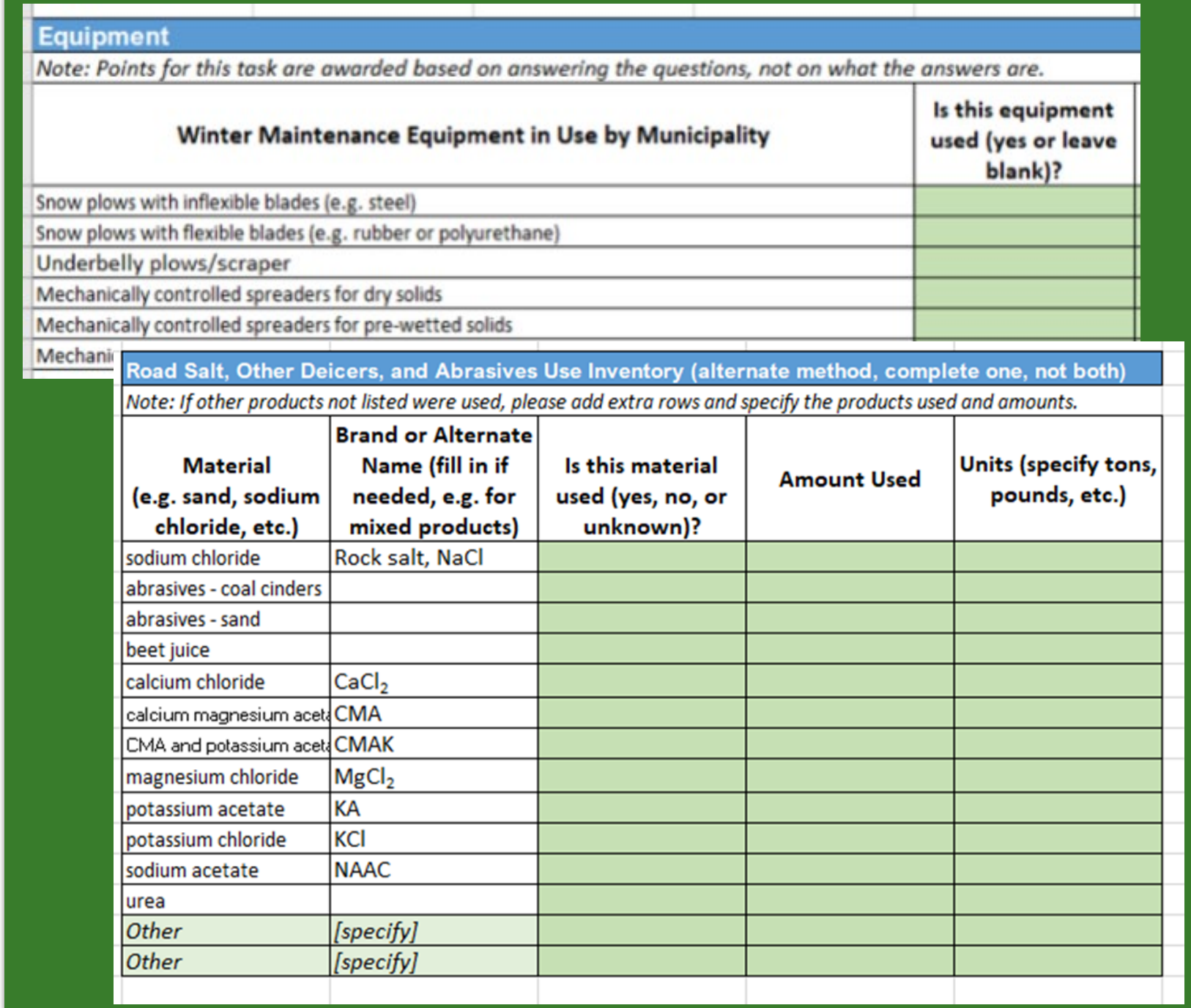
How to Document:
Inventory (10 points)

Fill out spreadsheet

- Inventory tab
- Affirm compliance with MS4 requirements
- Answer questions about equipment, chemicals, practices
- waterbody & winter severity information
- brief narrative and recommendations
- Optional: per storm tracking tab

Refer to:

- Resource 3: Action Submission Spreadsheet



Equipment

Note: Points for this task are awarded based on answering the questions, not on what the answers are.

Winter Maintenance Equipment in Use by Municipality	Is this equipment used (yes or leave blank)?
Snow plows with inflexible blades (e.g. steel)	
Snow plows with flexible blades (e.g. rubber or polyurethane)	
Underbelly plows/scraper	
Mechanically controlled spreaders for dry solids	
Mechanically controlled spreaders for pre-wetted solids	
Mechani	

Road Salt, Other Deicers, and Abrasives Use Inventory (alternate method, complete one, not both)

Note: If other products not listed were used, please add extra rows and specify the products used and amounts.

Material (e.g. sand, sodium chloride, etc.)	Brand or Alternate Name (fill in if needed, e.g. for mixed products)	Is this material used (yes, no, or unknown)?	Amount Used	Units (specify tons, pounds, etc.)
sodium chloride	Rock salt, NaCl			
abrasives - coal cinders				
abrasives - sand				
beet juice				
calcium chloride	$CaCl_2$			
calcium magnesium aceta	CMA			
CMA and potassium aceta	CMAK			
magnesium chloride	$MgCl_2$			
potassium acetate	KA			
potassium chloride	KCl			
sodium acetate	NAAC			
urea				
Other	*[specify]*			
Other	*[specify]*			

How to Complete the Action: Implement Winter Maintenance Best Management Practices (5 or 10 points)

A general list of BMPs is provided in Resource 2 - other BMPs may qualify

- Develop a Salt Reduction Plan
- Invest in Alternative Technologies (e.g. brine mixing and application equipment)
- Optimize Salt Application Rates (e.g. calibrate equipment and use automated controls)
- Improve Snow and Ice Removal Operations (e.g. route optimization, install snow fences)
- Minimize salt use in salt-sensitive areas
- Enhance Pre-Storm Planning
- Conduct Monitoring and Evaluation
- Engage and Educate the Community (e.g. outreach)
- Municipal resolution to reduce road salt

Refer to: Resource 2: Best Management Practices

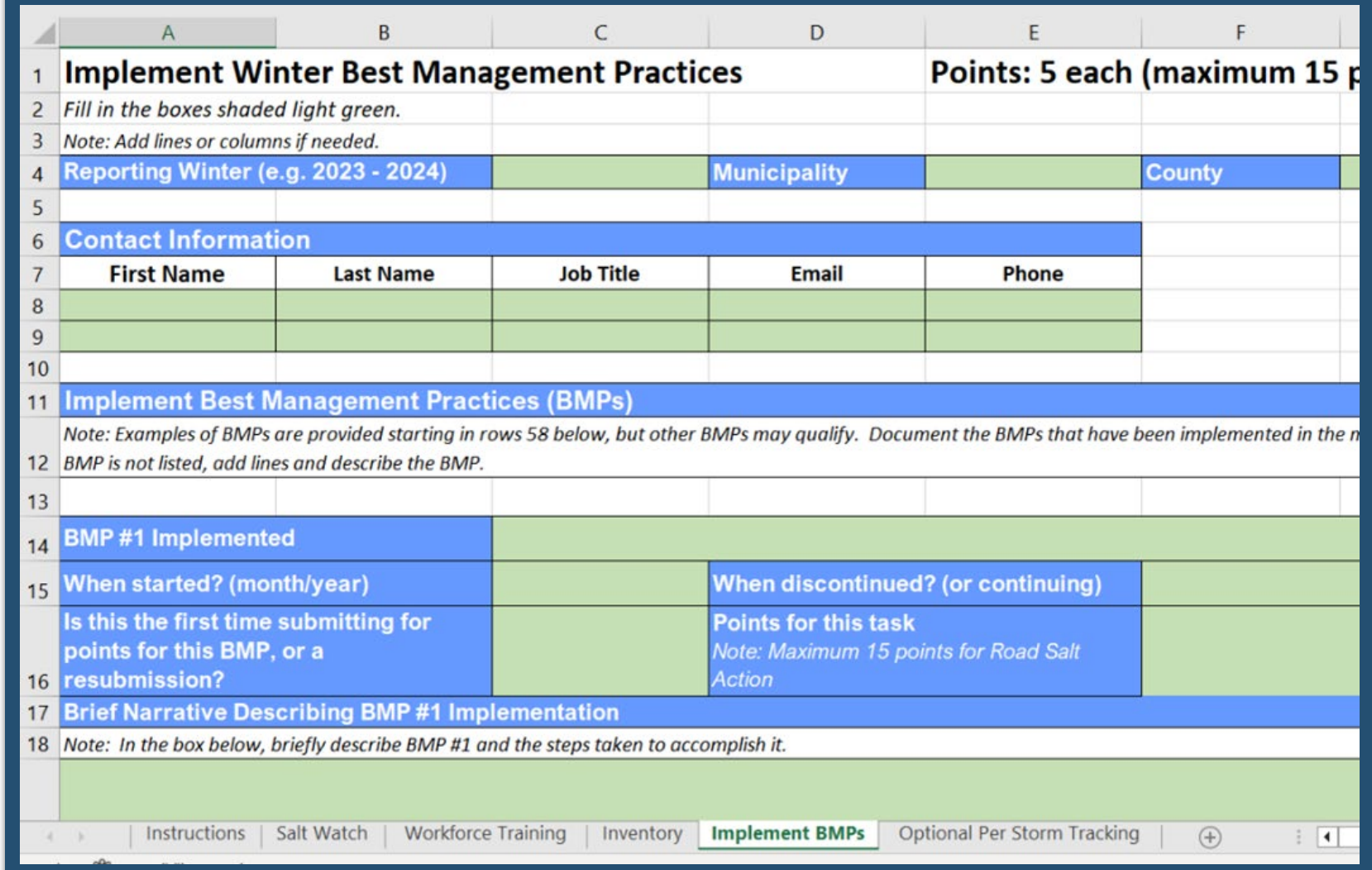
How to Document:
BMPs (5 or 10 points)

Fill out spreadsheet

- Implement BMPs tab
- What BMP was done?
- Brief comments on effectiveness and cost (savings, expenses)
- supporting files

Refer to:

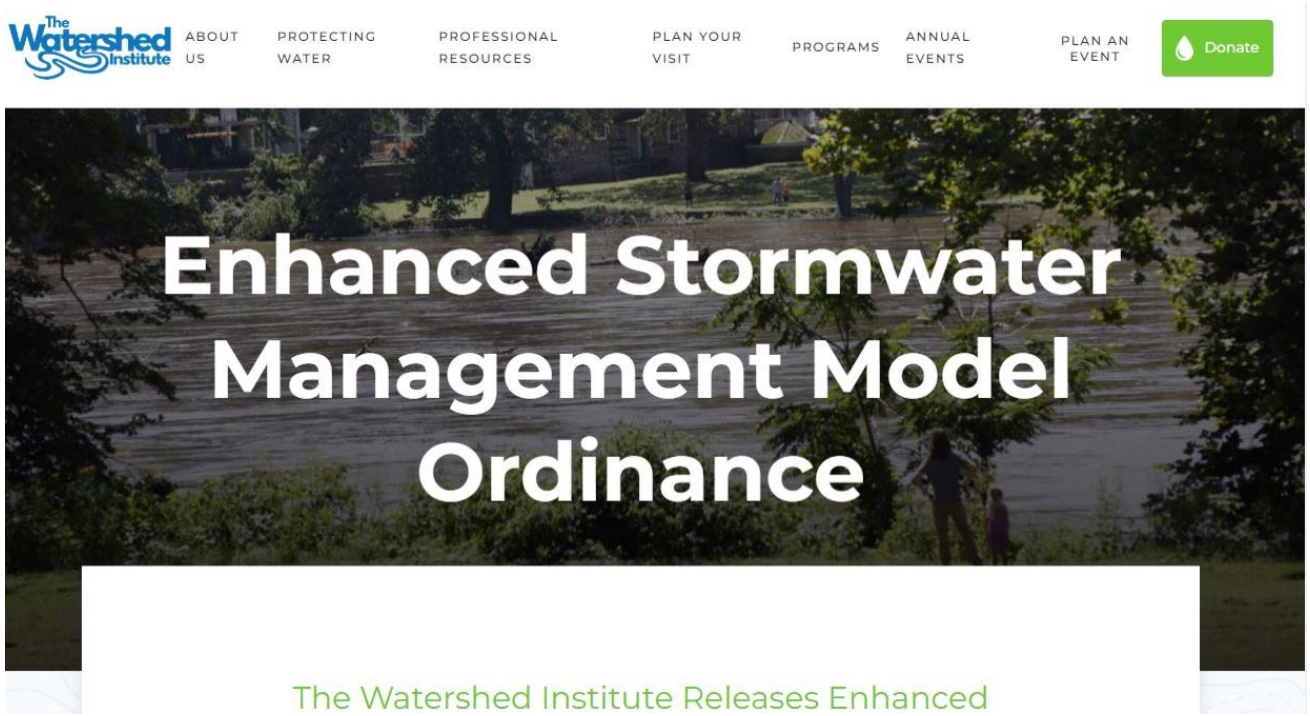
- Resource 2: Best Management Practices
- Resource 3: Action Submission Spreadsheet



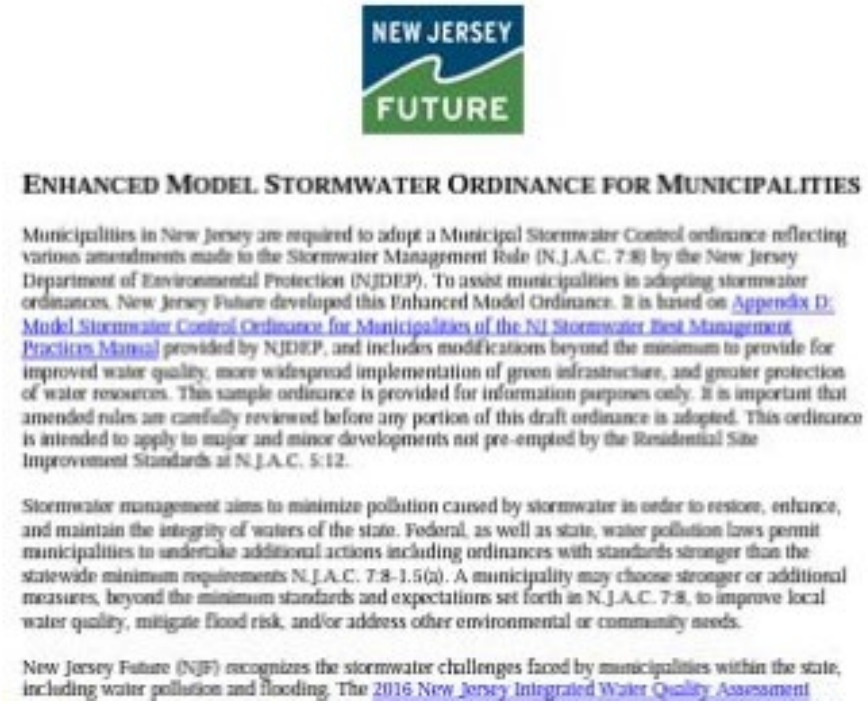
	A	B	C	D	E	F
1	**Implement Winter Best Management Practices**				**Points: 5 each (maximum 15 p**	
2	*Fill in the boxes shaded light green.*					
3	*Note: Add lines or columns if needed.*					
4	**Reporting Winter (e.g. 2023 - 2024)**			**Municipality**		**County**
5						
6	**Contact Information**					
7	**First Name**	**Last Name**	**Job Title**	**Email**	**Phone**	
8						
9						
10						
11	**Implement Best Management Practices (BMPs)**					
12	*Note: Examples of BMPs are provided starting in rows 58 below, but other BMPs may qualify. Document the BMPs that have been implemented in the n* *BMP is not listed, add lines and describe the BMP.*					
13						
14	**BMP #1 Implemented**					
15	**When started? (month/year)**			**When discontinued? (or continuing)**		
16	**Is this the first time submitting for points for this BMP, or a resubmission?**			**Points for this task** *Note: Maximum 15 points for Road Salt Action*		
17	**Brief Narrative Describing BMP #1 Implementation**					
18	*Note: In the box below, briefly describe BMP #1 and the steps taken to accomplish it.*					

Instructions | Salt Watch | Workforce Training | Inventory | **Implement BMPs** | Optional Per Storm Tracking

Enhanced Stormwater Management



https://thewatershed.org/the-watershed-institute-releases-enhanced-stormwater-management-model-ordinance/



https://gitoolkit.njfuture.org

Enhanced Stormwater Management

Webinar - online

Tuesday, February 6, 2024

12:00pm to 1:00pm

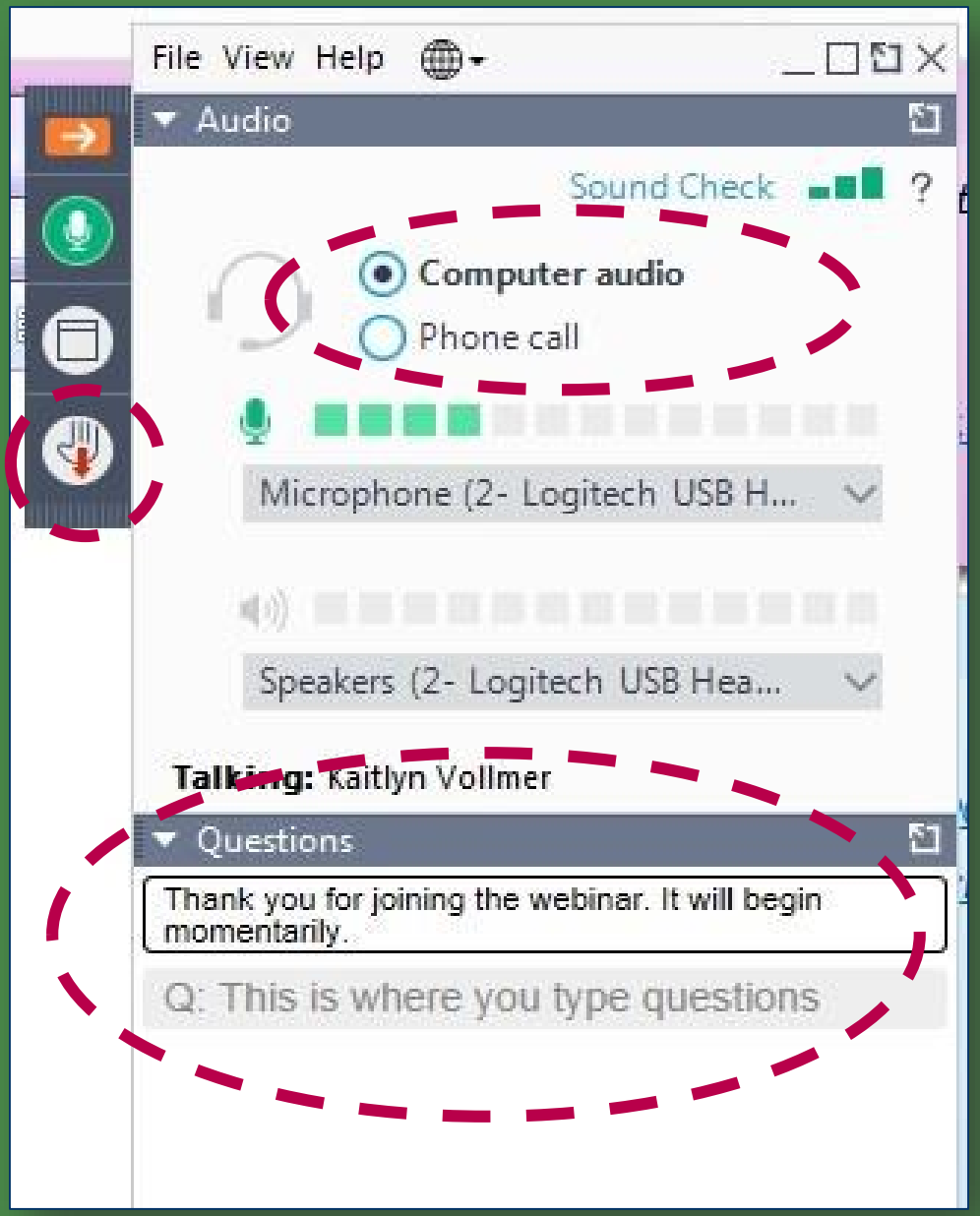
Register: sustainablejersey.com/nc/events/

SUSTAINABLE JERSEY GRANTS PROGRAM

MUNICIPAL GRANTS

CYCLE SPONSOR	PROJECT TYPE	ELIGIBLE APPLICANTS	GRANT AMOUNTS	CYCLE LAUNCHED	FUNDING AVAILABLE
PSEG Foundation	General Sustainability	Munis	$2k, $10k & $20k	Mid-Nov	$200,000
atlantic city electric℠ AN EXELON COMPANY	Env. Stew. and Resiliency	Munis in ACE Territory	$5k	Late April	$50,000

★ **The Sustainable Communities grant cycle funded by Atlantic City Electric is administered by Sustainable Jersey but is NOT considered an official Grants Program cycle, and thus applicants are not subjected to the same eligibility rules.**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Talking: Kaitlyn Vollmer
Questions
Thank you for joining the webinar. It will begin momentarily.
Q: This is where you type questions

Questions & Discussion

- Deborah Kratzer, Environmental Specialist, New Jersey Department of Environmental Protection, Division of Water Monitoring, Standards and Pesticide Control, deborah.kratzer@dep.nj.gov
- Erin Stetz, Assistant Director of Science, The Watershed Institute, estretz@thewatershed.org
- Anne Heasly, Program Manager for Policy and Planning, heaslya@tcnj.edu

Thank You


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