Connecticut Department of Energy and Environmental Protection

Connecticut Department of
ENERGY &
ENVIRONMENTAL
PROTECTION

Overview of DEEP's Road Salt Investigations

CEHA Fall Chloride Workshop
The Dr. Katherine A. Kelley State Public Health Laboratory
November 14, 2018

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Overview

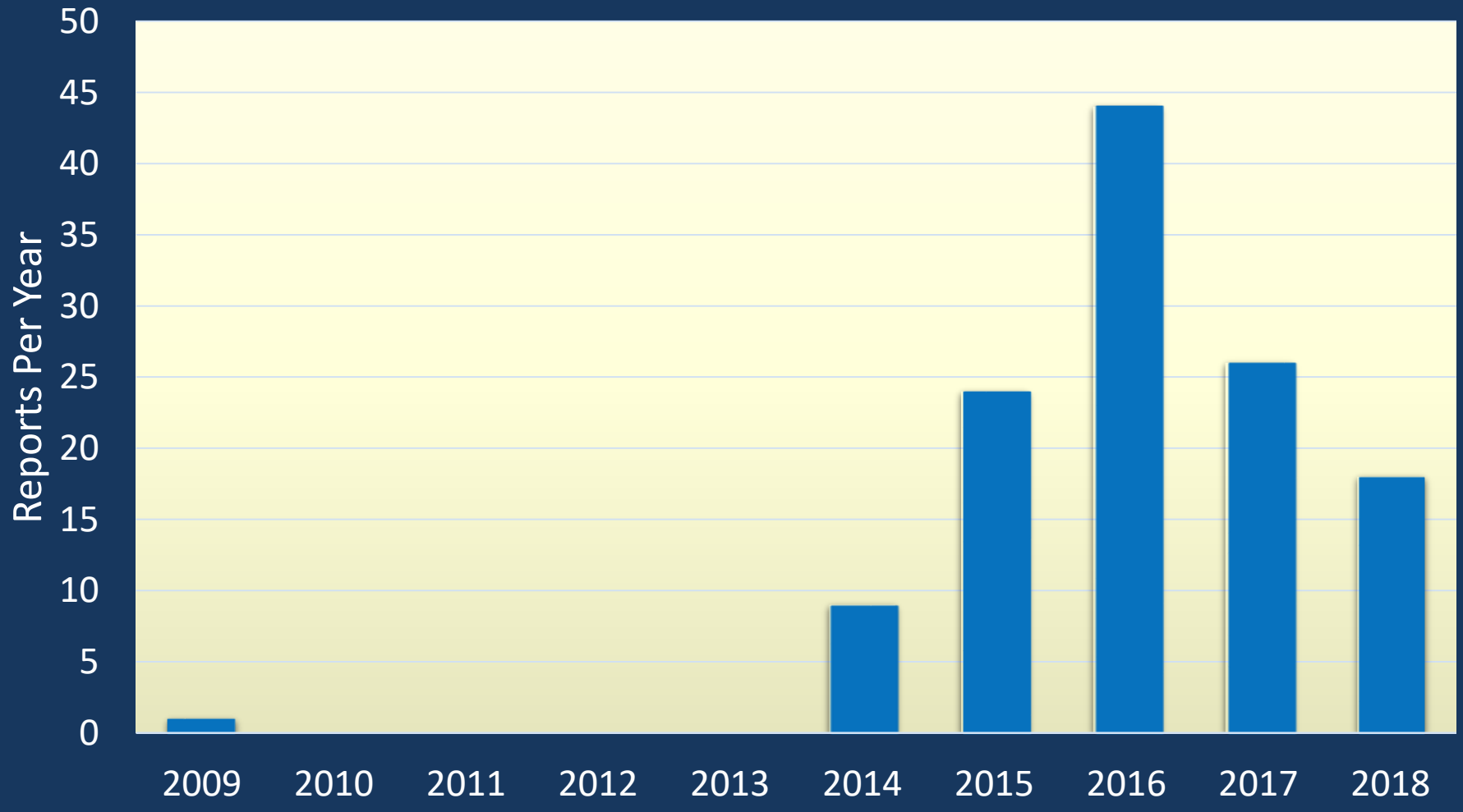
1. Sodium & Chloride Complaints/Background Information
2. Sources of Sodium & Chloride
3. Road Salt - Common Links
4. DEEP's Potable Water Program
5. Water Quality Concerns
6. Strategy for Addressing Road Salt Impacted Wells

Changing Expectations…

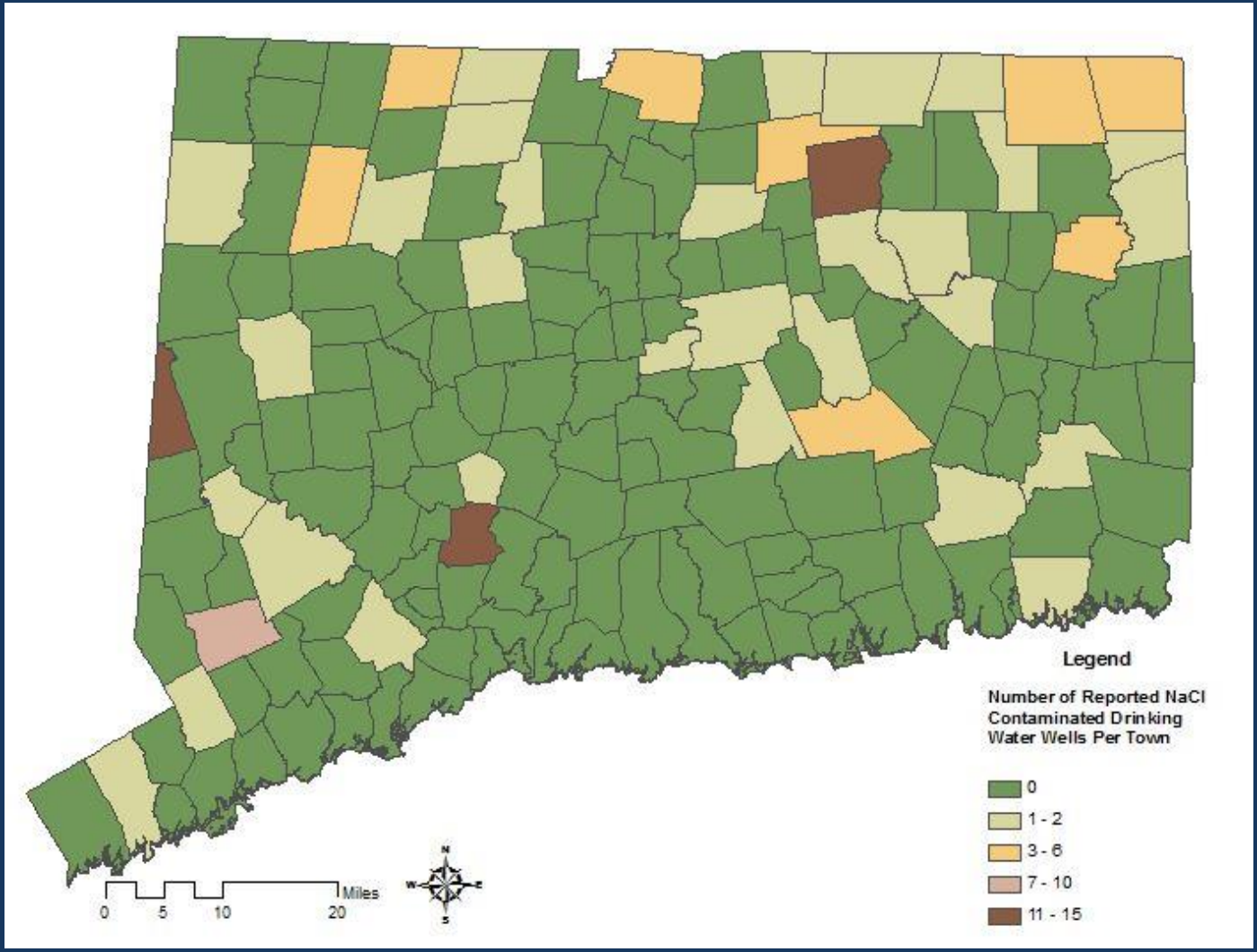
Sodium & Chloride Impacts to Private Wells

- 2014 - increase in complaints relating to elevated sodium and chloride in private wells
- 120+ impacted wells identified within past 5 years attributed to road salt pollution
- Typical concentrations in private drinking water wells
  - Sodium = 300+ mg/L (100 mg/L Guidance)
  - Chloride = 600+ mg/L (250 mg/L MCL)

NaCl Contaminated Drinking Water Well Complaints Per Year



Road Salt Impacts



Sources of Sodium and Chloride

- Natural salt deposits: not common in CT
- Seawater: brackish water, salt-water intrusion
- Salt water pool backwash
- Agricultural, industrial chemicals, landfill leachate
- Water softeners: add salt to water supply, brine backwash
- Road Salt: storage, handling, application

Sodium & Chloride Impacts to Private Wells

Sources of Road Salt pollution:

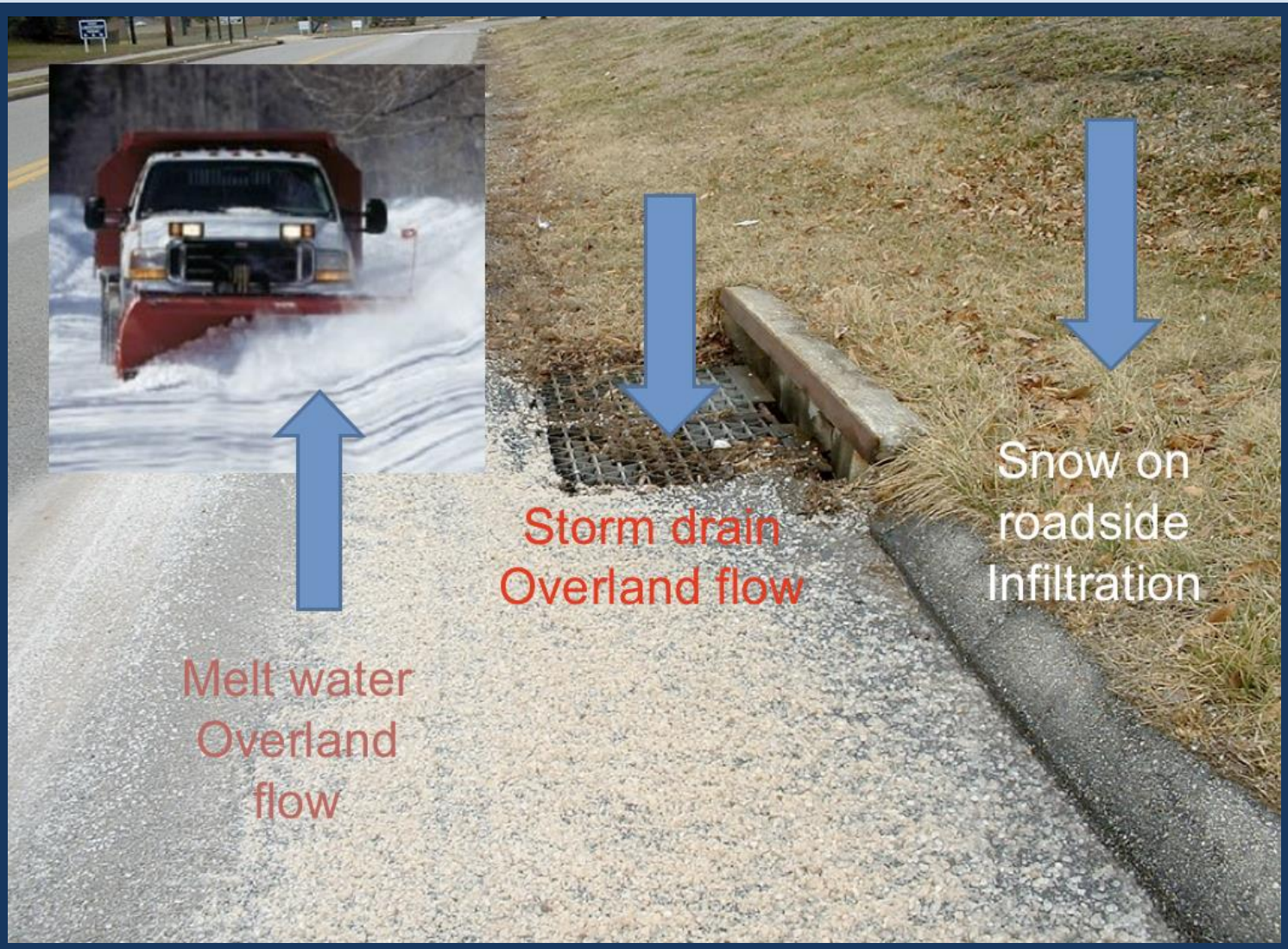
- Road application/run off
  - Most common cause
  - Drainage towards well
  - Infiltration/groundwater recharge in the vicinity
- Parking lots – high application rate
- Salt storage facility – storage and handling
- Plow contractor – washing trucks
- Plowing/placing snow on or near wellhead
  - Pushing snow off pavement/over curbing

How Much Is Too Much?

Too much?

Too Much???

Where Does All That Salt Go?



Where Does All That Salt Go?

How Road Salt gets into Drinking Water Wells

Common links between Road Salt application and elevated sodium/chloride levels in wells:

- Shallow depth to bedrock
- Road drainage: open drainage, catch basins, drainage ditches/easements, outfalls
- Well location
- Disposal/stockpiling of snow: plowed off road, salt spray, snow placed in front yards
- Poor well construction: shallow/dug wells, damaged casing, well sealed below ground

Well Water Quality Concerns

Elevated Sodium and Chloride in Drinking Water supplies can cause:

- Health-related:
  - Increased sodium intake (salt-restricted diets)
  - Leaching of lead and copper from plumbing
  - Mobilization of naturally-occurring manganese
- Corrosivity:
  - Leads to premature failure of plumbing & appliances

DEEP's Potable Water Program

CT's Potable Water Law – Connecticut General Statutes Section 22a-471

- DEEP investigates complaints regarding potential impacts to drinking water wells as the result of man-made sources of pollution
  - Naturally-occurring contaminants not addressed*
- 22a-471 requires the Responsible Party to provide a short-term supply of drinking water and evaluate long-term solution for safe supply of drinking water

DEEP's Potable Water Program

2013 Amendments to 22a-471

- DEEP no longer has the authority to provide short-term supply of drinking water

- Funding eliminated for short-term supply of drinking water (bottled water/filters)

DEEP's Potable Water Program

DEEP's Investigation

- Limited resources - relying on well owners to test their wells
- Well water sampling, data analysis
- Well-head inspection, water treatment system use
- File Review: well completion reports, well water quality reports

DEEP's Potable Water Program

- Geologic mapping data
  - Aerial Photography/Streetside Imagery
  - Bedrock/Lithogeochemical maps
  - Topography/Surficial Geology/Soils
- Further testing (if necessary)
  - Additional Well Water testing
  - Shallow Groundwater/Soil testing
  - Snowpack samples
- Work with local and state Health Departments

Strategy for Addressing Road Salt Impacted Wells

Solutions for wells impacted by Road Salt application:

Short-term:

- Providing bottled water
- Roadway drainage improvements
- Road salt application BMPs
- Source removal
- On-going monitoring of well water quality

Strategy for Addressing Road Salt Impacted Wells

Long-term Options:

- Installing a Secondary Well Seal (Jaswell seal)

  Pros:

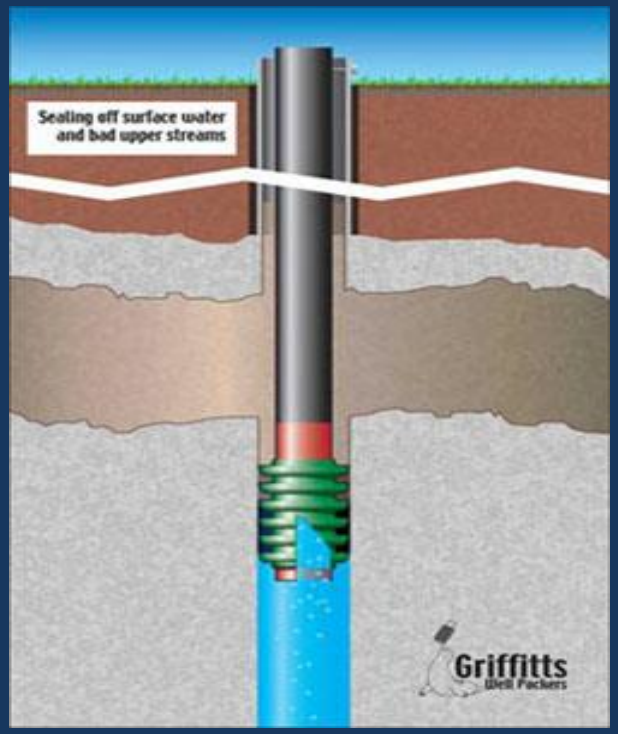
  - Sealing off a leaking well casing seal
  - Sealing off a particular zone/fractures contributing to poor water quality
  - Relatively inexpensive to install

  Cons:

  - Reduced storage and yield
  - Can be difficult to ensure a tight seal

Strategy for Addressing Road Salt Impacted Wells

Secondary well seal – Jaswell Seal



Strategy for Addressing Road Salt Impacted Wells

Long-term Options:

- Drilling a new well – well siting limitations
- Connecting to public water (if available – permanent solution)
- Community well
- POU or POE treatment:
  - Reverse Osmosis

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