

April 22, 2019

# Water Quality and HAA5



Public Information Session

# Introductions

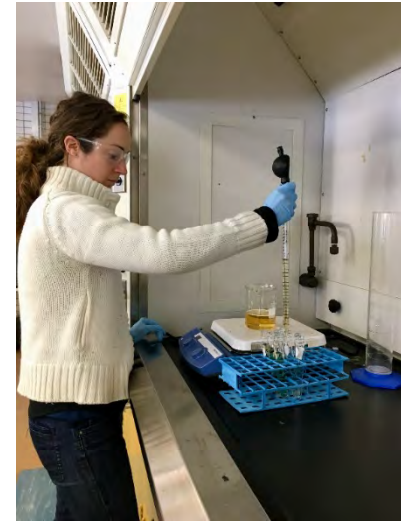
- **Joshua Schimmel, Executive Director**
- **James Laurila, Director of Water Operations**
- **Sue Tower, Laboratory and Regulatory Manager**
- **Jaimye Bartak, Communications Manager**



# Who We Are

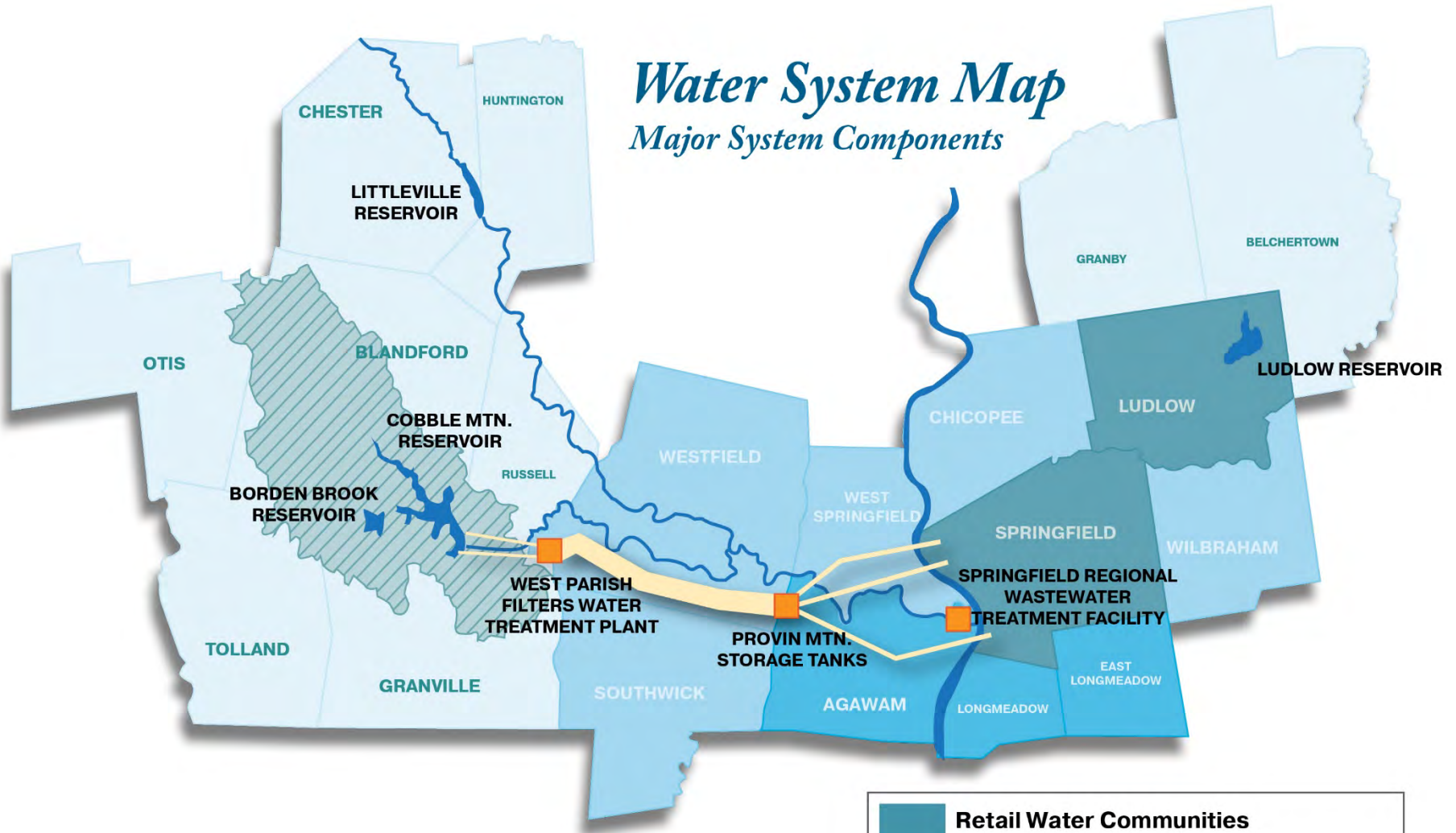
We Serve 250,000 Customers in the Lower Pioneer Valley

- **Established in 1996** out of Springfield DPW
- **250 Employees** stationed in Westfield, Agawam, Springfield, and Ludlow
- **Stewards** of the largest water and wastewater system in Western Massachusetts



# Water System Map

## Major System Components



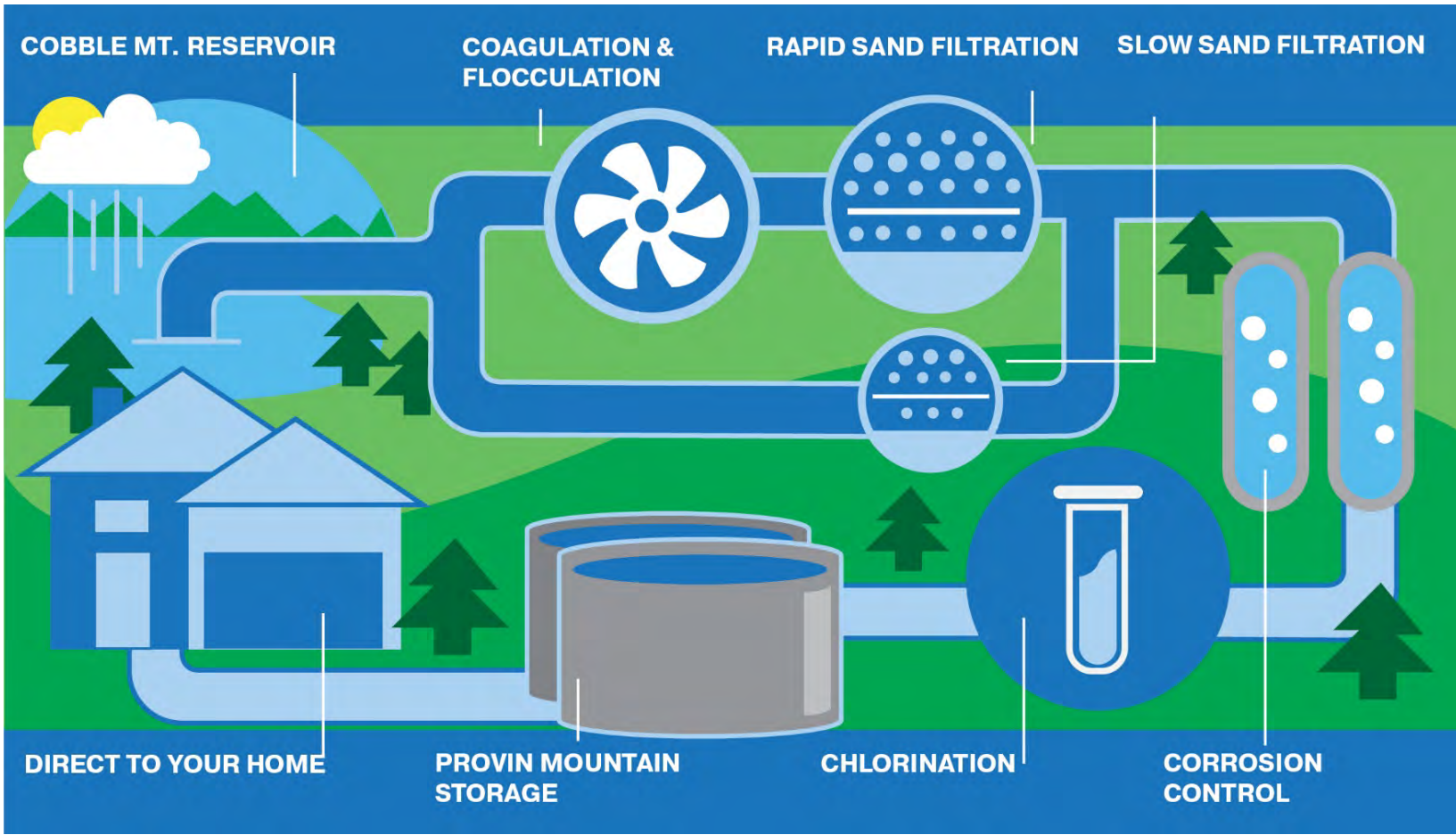
|  |   |
|--|---|
|  | <b>Retail Water Communities</b>         |
|  | <b>Wholesale Water Communities</b>      |
|  | <b>Peak Emergency Water Communities</b> |





# Drinking Water Treatment Overview

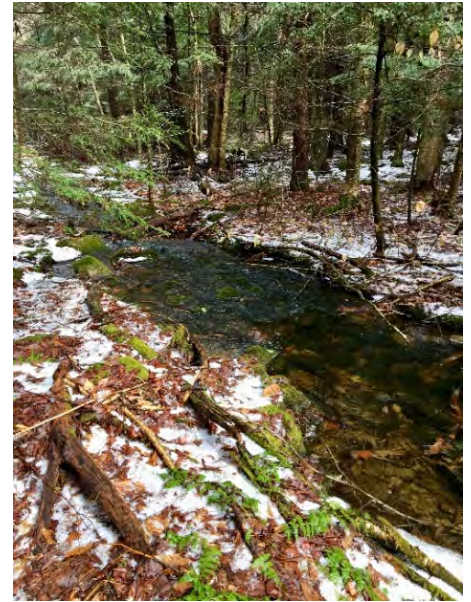
West Parish Filters Water Treatment Plant, Westfield



# Haloacetic Acids (HAA5)

## What They Are

- By-product of the disinfection (chlorination) process
- Regulation of HAA5 began in 1998, updated regulations implemented in 2012
- **Regulatory limit based on potential health risks following *many decades or a lifetime of consumption* at elevated levels**
- **No need to boil water or drink bottled water, can use/consume water as normal**



# HAA5

## How Does HAA5 Form?

Unusually heavy rainfall carries additional organic material from the forest into the reservoir.

Filters remove most of the organic material but some excess remains.

When chlorine is added to filtered water it reacts with the remaining organics, forming HAA5.

Therefore, in months with high levels of organics in the raw water, there may be elevated HAA5 in the distribution system.



More information: [waterandsewer.org/haa5-frequently-asked-questions/](http://waterandsewer.org/haa5-frequently-asked-questions/)





# Haloacetic Acids (HAA5)

## Regulatory Compliance

- Quarterly sampling at 8 sites
- Regulatory limit is reported as an *average* of the last year's results (**limit = 60 parts per billion**)
- **December 2018:** Reported exceedance of regulatory limit at 3 sample sites
- **March 2019:** Reported exceedance of regulatory limit at 5 sample sites
- Public notification issued within 30 days of receiving results





# Haloacetic Acids (HAA5)

## Latest Sampling Results

| Sample Location                  | June 5, 2018<br>(ppb) | September 4, 2018<br>(ppb) | December 6, 2018<br>(ppb) | March 6, 2019<br>(ppb) | Average     |
|----------------------------------|-----------------------|----------------------------|---------------------------|------------------------|-------------|
| Chapin St. Pump Station (Ludlow) | 36.0                  | 63.0                       | 82.0                      | 57.3                   | <b>59.6</b> |
| 1400 State Street                | 50.0                  | 65.0                       | 93.0                      | 54.9                   | <b>65.7</b> |
| 833 Page Blvd.                   | 50.0                  | 60.0                       | 89.0                      | 55.4                   | <b>63.6</b> |
| 322 Main Street                  | 46.0                  | 57.0                       | 84.0                      | 64.7                   | <b>62.9</b> |
| N. Main Fire Station             | 45.0                  | 60.0                       | 90.0                      | 68.2                   | <b>65.8</b> |
| Center Street Fire Station       | 47.0                  | 49.0                       | 68.0                      | 70.0                   | <b>58.5</b> |
| 1043 Sumner Ave.                 | 49.0                  | 57.0                       | 80.0                      | 66.6                   | <b>63.2</b> |
| Catalina Pump Station            | 50.0                  | 51.0                       | 68.0                      | 67.1                   | <b>59.0</b> |



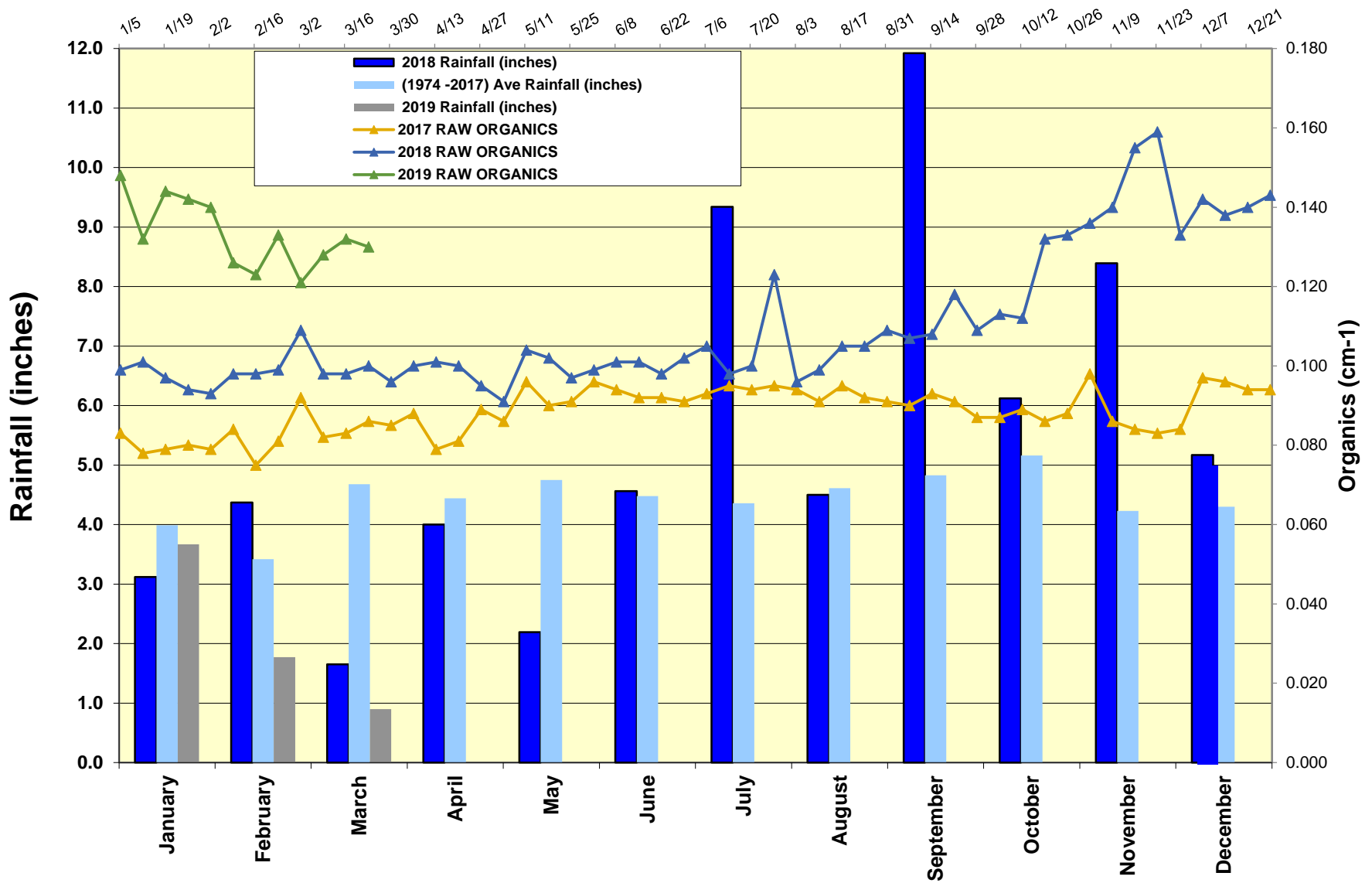
# Water Quality Issues

## Important Factors

- **Record rainfall in 2018**
  - Brought record levels of dissolved natural organic material into the reservoir
- **Slower Filtration Times**
  - Due to higher organics
  - Leads to more reliance on slow sand filters
  - Older technology (slow sand) not as effective at removing organics
- **Higher chlorine demand**
  - More chlorine needed due to higher organics



# Rainfall (inches) at Borden Brook Reservoir & WPF Raw Water Organics (cm-1)



# Short Term Strategies

## Optimize Existing Treatment Processes

- **Review chlorine levels daily**
- **Implement organics removal techniques**
  - Based on recent trials
- **Reduce water storage time (age)**
  - Removing storage tanks and adding mixers
- **Distribution system flushing**
  - Spring 2019





# Long Term Solutions

## Comprehensive Plan for Treatment Upgrades

- Comprehensive plan **started in 2016**
  - Anticipated upgrades would be needed to meet newer HAA5 regulations
- Small-scale study with UMass Engineering completed in 2018
  - Looked at potential treatment processes to add
- Pilot treatment plant to start in 2019
  - Will confirm viability of potential treatment processes on large-scale
    - Pre-oxidation
    - New filtration options
    - Clarification option
    - Alternative coagulants (to help bind and remove organics)



# Long Term Solutions

## Project Implementation Plan

- **Project 1:** 2023 – 2025 – *Resolves HAA5 Issue*
  - New Clarification Process (removes organics prior to filtration)
  - Filter Upgrades (to more effectively filter out organics)
  - New Electrical System (to support new treatment processes)
- **Project 2:** 2026 – 2027
  - Rehabilitate or replace 42” raw water main
  - New lab and upgrades to 1974 operations building
- **Project 3:** ~ 2033 (if demand increases)
  - Expand treatment process capacity
  - Eliminate slow sand filters



# Looking Ahead

## 2019 DBP Sampling Rounds

- June, September, December
- *DBPs likely to remain elevated for remainder of 2019*

## More Information

- *Connecting Point* Interview:

<https://connectingpoint.wgby.org/livestream/?linkId=63514865>

## SWSC & MassDEP Information

- <http://waterandsewer.org/haa5-frequently-asked-questions/>
- <https://www.mass.gov/service-details/haa5-in-drinking-water-information-for-consumers>



# Key Points

## Important Take-Aways

- **Water is safe to drink and use as normal**
- **HAA5 is regulated due to potential health risks after consuming elevated levels over decades or a lifetime**
- **Elevated HAA5 is due to changes in raw water quality**
- **Planning and design for these upgrades had already been underway**

