

April 9, 2019

Drinking Water and HAA5 - UPDATE



Springfield City Council
Health and Human Services Committee

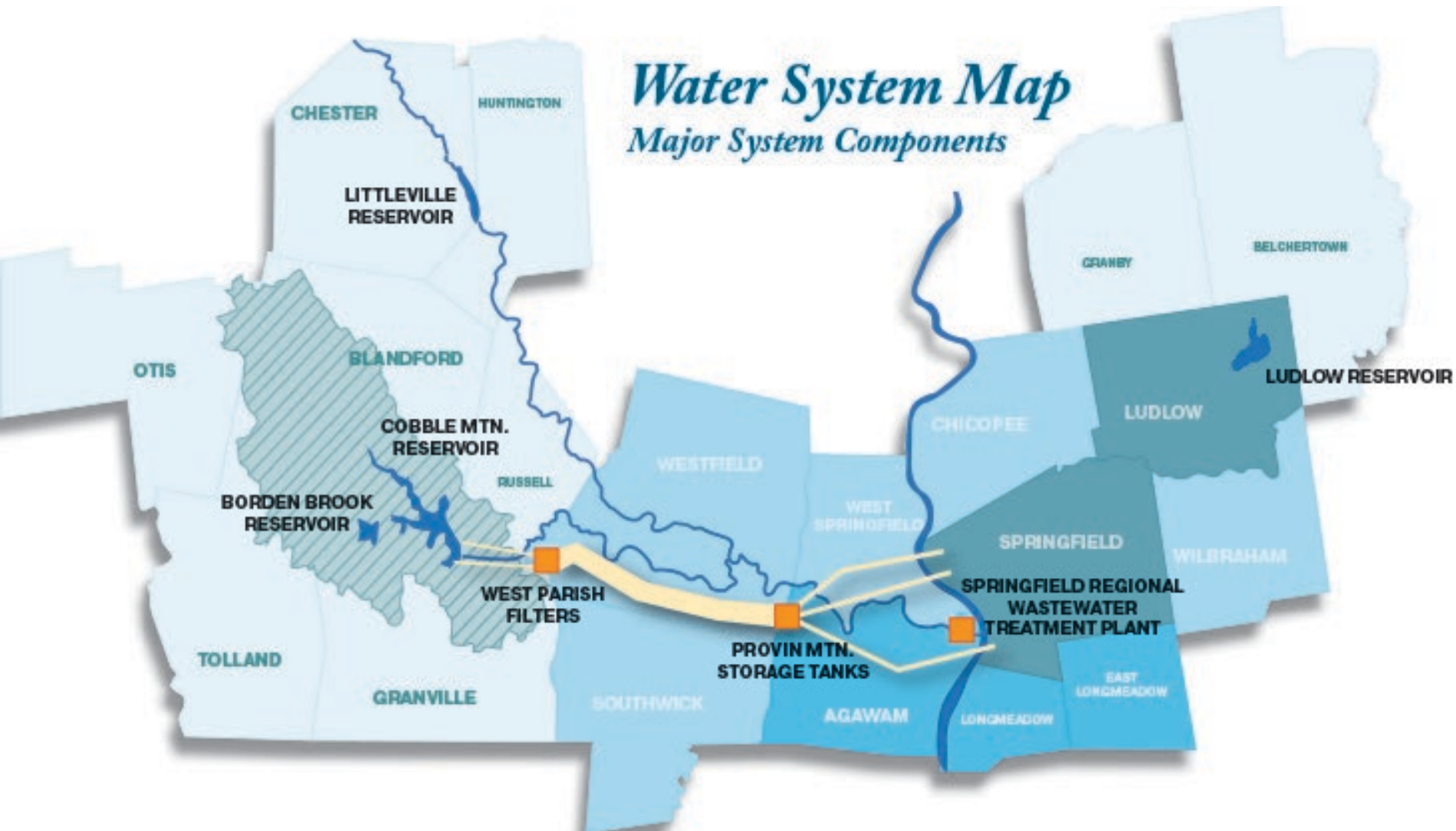
Introductions

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



Drinking Water Operations

Retail, Wholesale, and Peak/Emergency



Public Notification for HAA5

Issued April 5, 2019

- Public notification required within 30 days of receiving results
- Public notification (PN) included in April bills of all retail customers, also:
 - News release
 - Hard copies sent to public buildings (libraries, city hall)
 - Updated information on website
 - Public information session: April 22, 6 PM, City Hall Rm. 220
- PN required for exceedance of Maximum Contaminant Level (MCL) of haloacetic acid (HAA5)



Haloacetic Acids (HAA5)

What They Are

- Dissolved Natural Organic Matter (NOM) enters reservoir water through rain/snow runoff from the surrounding forest
- Formed when disinfectants (chlorine) react with NOM
- Regulation of HAA5 began in 1998, updated regulations implemented in 2012



HAA5 and Public Health

Why They Are Regulated

- *Not an immediate or short-term health hazard or emergency*
- Regulatory limit for HAA5 based on a running annual average
- Regulated due to potential long-term health risks if consumed at levels above regulatory limits for many years (*decades or a lifetime*)
- More HAA5 and health information:

MassDEP

<https://www.mass.gov/service-details/haa5-in-drinking-water-information-for-consumers>

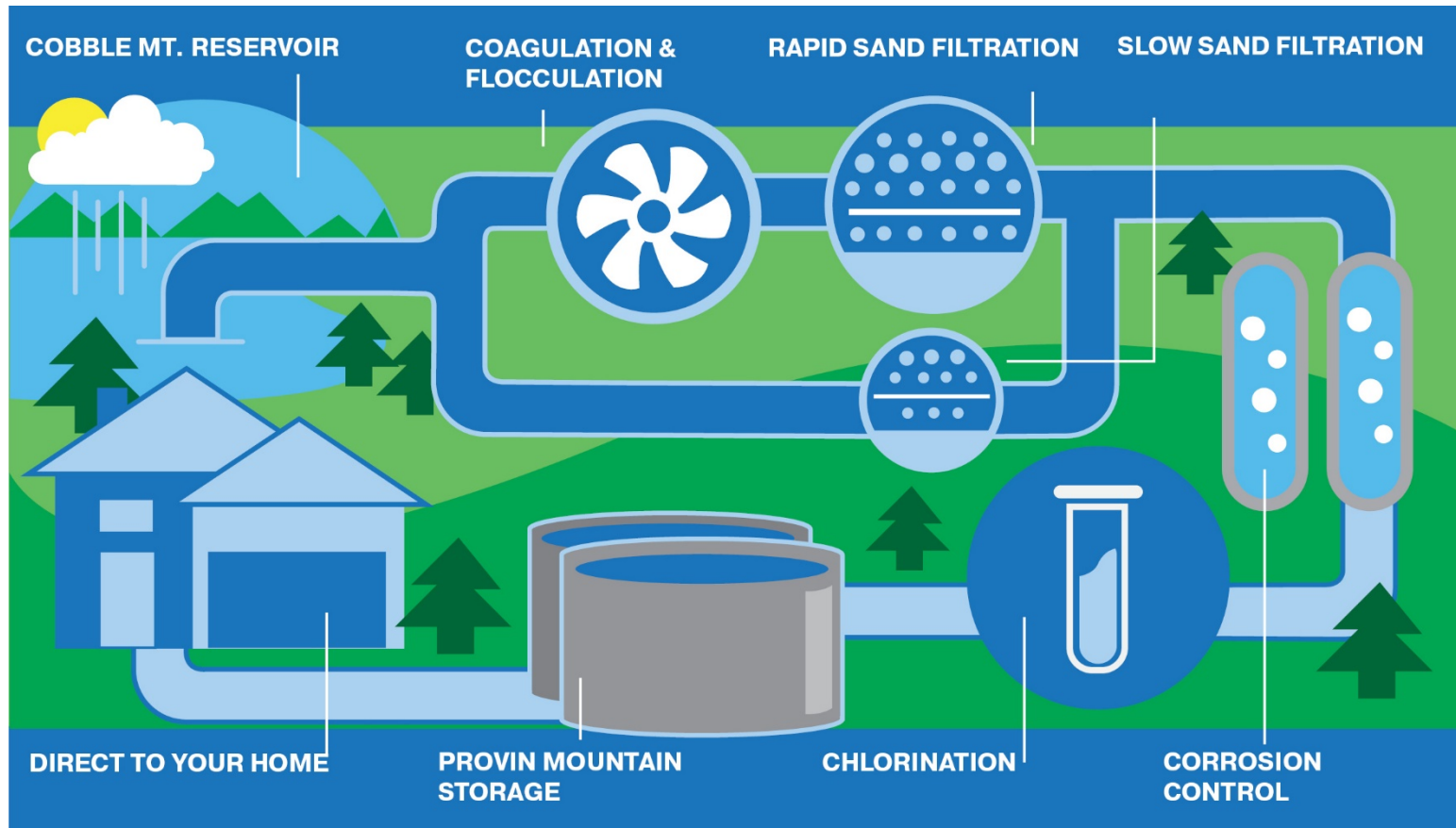
EPA

<https://www.epa.gov/dwreginfo/stage-1-and-stage-2-disinfectants-and-disinfection-byproducts-rules>



Drinking Water Treatment Overview

West Parish Filters Water Treatment Plant, Westfield



Current Regulatory Situation

- Locational Running Annual Average (LRAA) exceeded MCL of 60 parts per billion (ppb) at 5 locations in Springfield
 - 1400 State Street, Springfield: 65.7 ppb
 - 833 Page Boulevard, Springfield: 63.6 ppb
 - 322 Main Street, Springfield: 62.9 ppb
 - North Main Fire Station, Springfield: 65.8 ppb
 - 1043 Sumner Avenue, Springfield: 63.2 ppb

C. HAA5 COMPLIANCE

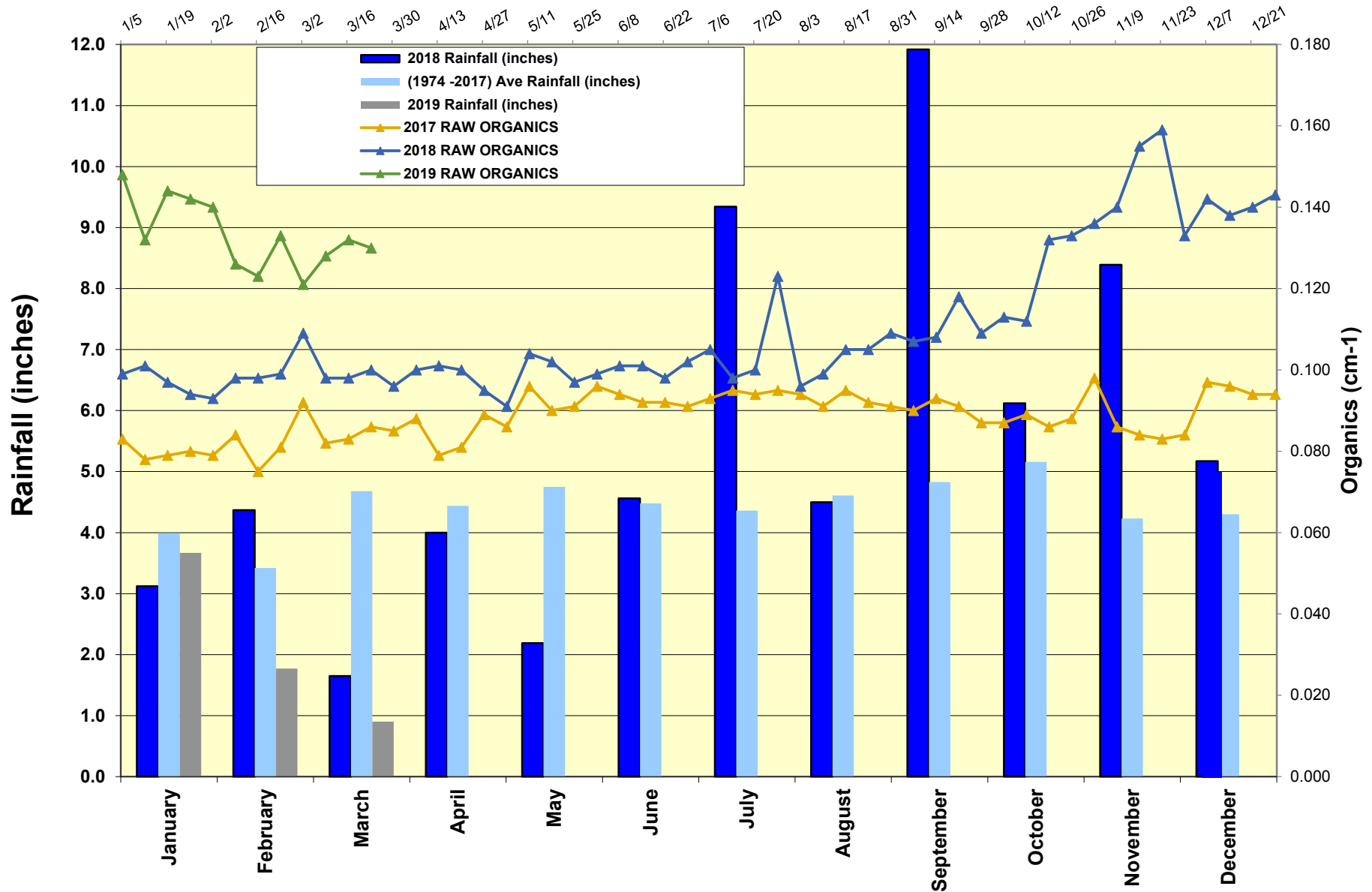
Sample Location	Q1 (Jan - Mar)		Q2 (Apr - Jun)		Q3 (Jul - Sep)		Q4 (Oct - Dec)		OEL ¹ Q1	LRAA
	Date	ppb	Date	ppb	Date	ppb	Date	ppb		
10081- Chapin St Pump Station	3/6/2019	57.3	6/5/2018	36.0	9/4/2018	63.0	12/6/2018	82.0	64.9	59.6
10082 -1400 State St Vibra/PV Hospital	3/6/2019	54.9	6/5/2018	50.0	9/4/2018	65.0	12/6/2018	93.0	67.0	65.7
10074 - 833 Page Blvd	3/6/2019	55.4	6/5/2018	50.0	9/4/2018	60.0	12/6/2018	89.0	65.0	63.6
10087- 322 Main Street	3/6/2019	64.7	6/5/2018	46.0	9/4/2018	57.0	12/6/2018	84.0	67.6	62.9
10083- North Main Fire Station	3/6/2019	68.2	6/5/2018	45.0	9/4/2018	60.0	12/6/2018	90.0	71.6	65.8
10085 - Center Street Fire Station	3/6/2019	70.0	6/5/2018	47.0	9/4/2018	49.0	12/31/2018	68.0	64.3	58.5
10086 - 1043 Sumner Ave	3/6/2019	66.6	6/5/2018	49.0	9/4/2018	57.0	12/6/2018	80.0	67.6	63.2
10075- Catalina Pump Station	3/6/2019	67.1	6/5/2018	50.0	9/4/2018	51.0	12/31/2018	68.0	63.3	59.0
	MCL = 60 (ppb)		Was OEL exceeded?¹			YES	Was MCL exceeded?:			YES

4th and 1st Quarter Water Quality Issues

- **Record rainfall in 2018**
 - Brought record Natural Organic Matter (NOM) into raw water
- **Reduced Rapid Sand Filter (RSF) run times**
 - Caused by high NOM
- **Increase in Slow Sand Filter (SSF) production**
 - Due to reduced RSF run times
 - SSF removes less NOM than RSF
- **Higher chlorine demand**
 - More chlorine needed to maintain system residual due to higher NOM



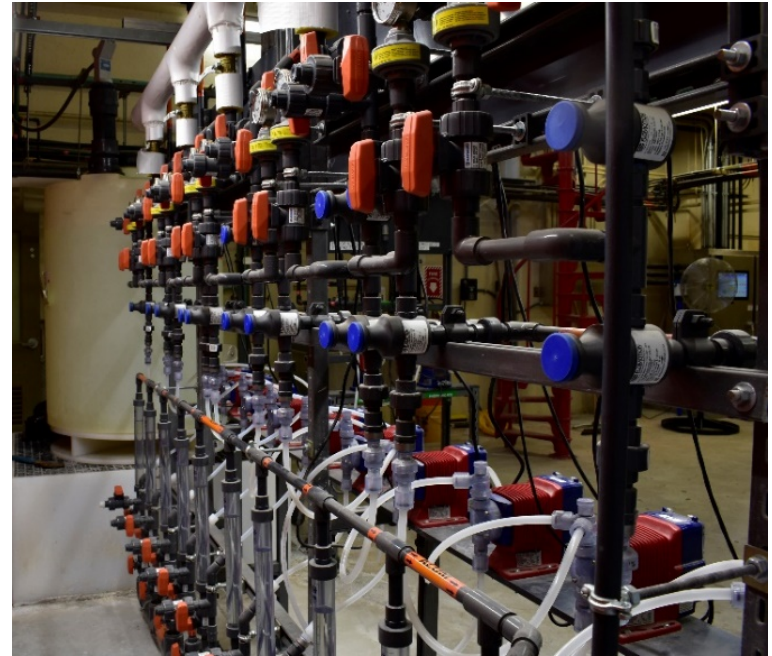
Rainfall (inches) at Borden Brook Reservoir & WPF Raw Water Organics (cm-1)



Short Term Strategies

Optimize System Performance

- **Optimized chlorine dosing**
 - Reviewed daily
- **Coagulant optimization trials**
 - 25% increase in NOM removal
- **Reduce water storage time (age)**
 - Engineering study ongoing: optimization
 - Removing storage tanks
- **Add storage tank mixing:** April 2019
- **Maximize NOM removal**
 - Slow Sand Filter vs. Rapid Sand Filtration
- **Minimize NOM Inputs**
 - Evaluate raw water intake options
- **Flushing – Spring Start**



Long Term Solutions

Comprehensive Plan for WPF

- UMass bench study completed in 2018 for pre-oxidation to remove NOM
 - Pilot treatment Plant – Summer 2019
- Evaluation of:
- pre-oxidation (*to better remove NOM*)
 - clarification option (*to remove suspended particles before filtration*)
 - filtration options (*to better remove NOM*)
 - alternative coagulants (*to remove NOM*)
- Comprehensive facilities plan nearing completion (started FY16)

Evaluation of:

- Safety
- Future regulatory compliance, including for disinfection by-products (such as HAA5)
- Capacity



Long Term Solutions

Project Planning

- **Project 1** (Construction: FY23 – FY25) - \$69M - *Resolves HAA5 issue*
 - 60 MGD Dissolved Air Flootation (DAF) Clarification Process (*removes suspended particles prior to filtration*)
 - Rapid Sand Filter Upgrades (*to more effectively filter out NOM*)
 - New Electrical System (*to support new treatment processes*)
 - New Chemical Storage and Feed Building (*to support new treatment processes*)
- **Project 2** (Construction: FY26 – FY27) - \$23M
 - New control house/valves for 72" raw water main
 - Rehab/replace 42" raw water main
 - New lab and upgrades to existing operations building
- **Project 3** (Construction: ~ FY33) - \$40M
 - Expand DAF capacity, Rapid Sand Filters, Flocculation Tanks
 - Eliminate Slow Sand Filters



Looking Ahead

2019 DBP Sampling Rounds

- June, September, December
- *HAA5 MCL exceedances likely to occur for remainder of 2019*
- PN will be issued each quarter there is an MCL exceedance

More Information

- *Connecting Point* Interview:

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

- 2018 Water Quality Report: waterandsewer.org/waterqualityreport

SWSC & MassDEP Information

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

