Drinking Water and HAA5 - UPDATE
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

Water System Map
Major System Components

- Littleville Reservoir
- Cobble Mt. Reservoir
- Borden Brook Reservoir
- West Parish Filters
- Provin Mt. Storage Tanks
- Springfield Regional Wastewater Treatment Plant
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**
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

<table>
<thead>
<tr>
<th>Sample Location</th>
<th>Q1 (Jan - Mar)</th>
<th>Q2 (Apr - Jun)</th>
<th>Q3 (Jul - Sep)</th>
<th>Q4 (Oct - Dec)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Date</td>
<td>Date</td>
<td>Date</td>
<td>Date</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>OEL</th>
<th>LRAA</th>
</tr>
</thead>
<tbody>
<tr>
<td>64.9</td>
<td>59.6</td>
</tr>
<tr>
<td>67.0</td>
<td>65.7</td>
</tr>
<tr>
<td>65.0</td>
<td>63.6</td>
</tr>
<tr>
<td>67.6</td>
<td>62.9</td>
</tr>
<tr>
<td>71.6</td>
<td>65.8</td>
</tr>
<tr>
<td>64.3</td>
<td>58.5</td>
</tr>
<tr>
<td>67.6</td>
<td>63.2</td>
</tr>
<tr>
<td>63.3</td>
<td>59.0</td>
</tr>
</tbody>
</table>

MCL = 60 (ppb)  Was OEL exceeded? YES  Was MCL exceeded?: YES
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
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 Floatation (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