Boil Order Response

Rye Water District

November 6, 2022

Overview

- Introduction
- System Summary
- Boil Order Timeline and Corrective Action
- Investigation Efforts
- Chlorination
- Q & A

Introduction

- We are presenting a lot of background information necessary to understand Rye Water and the current situation.
- Today's discussion focuses on the response to bacterial contamination in RWD.
- PFAS will be addressed in a future meeting.
- Coakley Landfill meeting on 11/14

The Rye Water District

Rye Water District Office

RWD Commissioners

- Art Ditto
- Ralph Hickson
- Scott Marion

RWD Staff

- Business administrator
- Superintendent
- Lead Operator
- Operator

Boil Order Response Team

RWD Commissioners

RWD Staff

NHDES Staff

Town of Rye Leadership Team

Rye Police Department

Rye Fire Department

Rye Public Works Department

Rye Volunteers, Lions Club

Mutual Aid

Portsmouth Water Works

Aquarion

Consultants

John Guilfoil Public Relations

Wright-Pierce

Vendor Support

New England Backflow, Inc

Electrical Installations, Inc

BAU and Hopkins

F.W. Webb

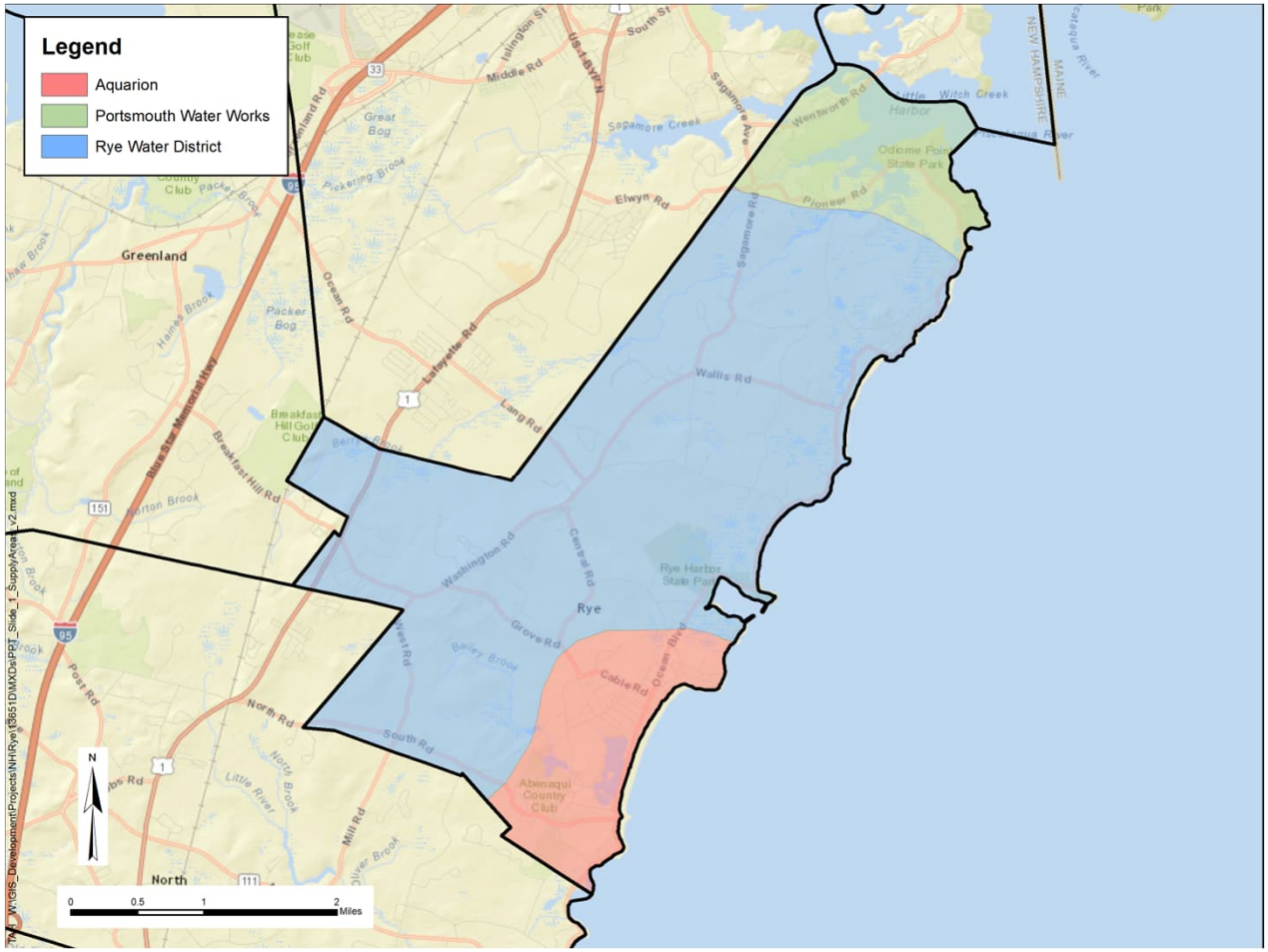
Seacoast Analytical

Underwater Solution

Harcross

Rye Water District Service Area

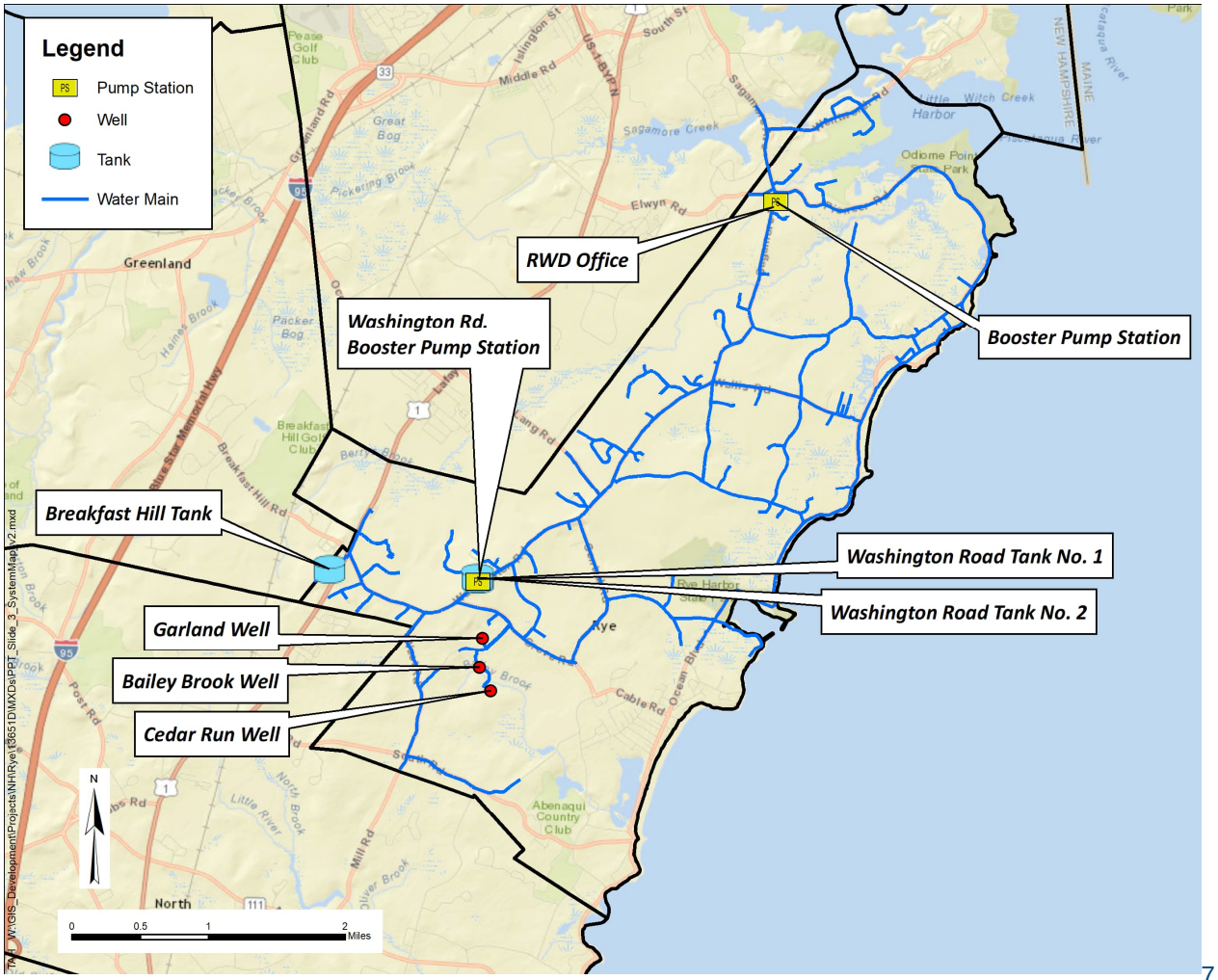
- Public water in Rye is supplied by:
  - Rye Water District (RWD)
  - Portsmouth Water Works
  - Aquarion (Hampton)
- RWD served connections
  - ~1702 service connections
  - ~4300 people



Rye Water District Current Water Supply

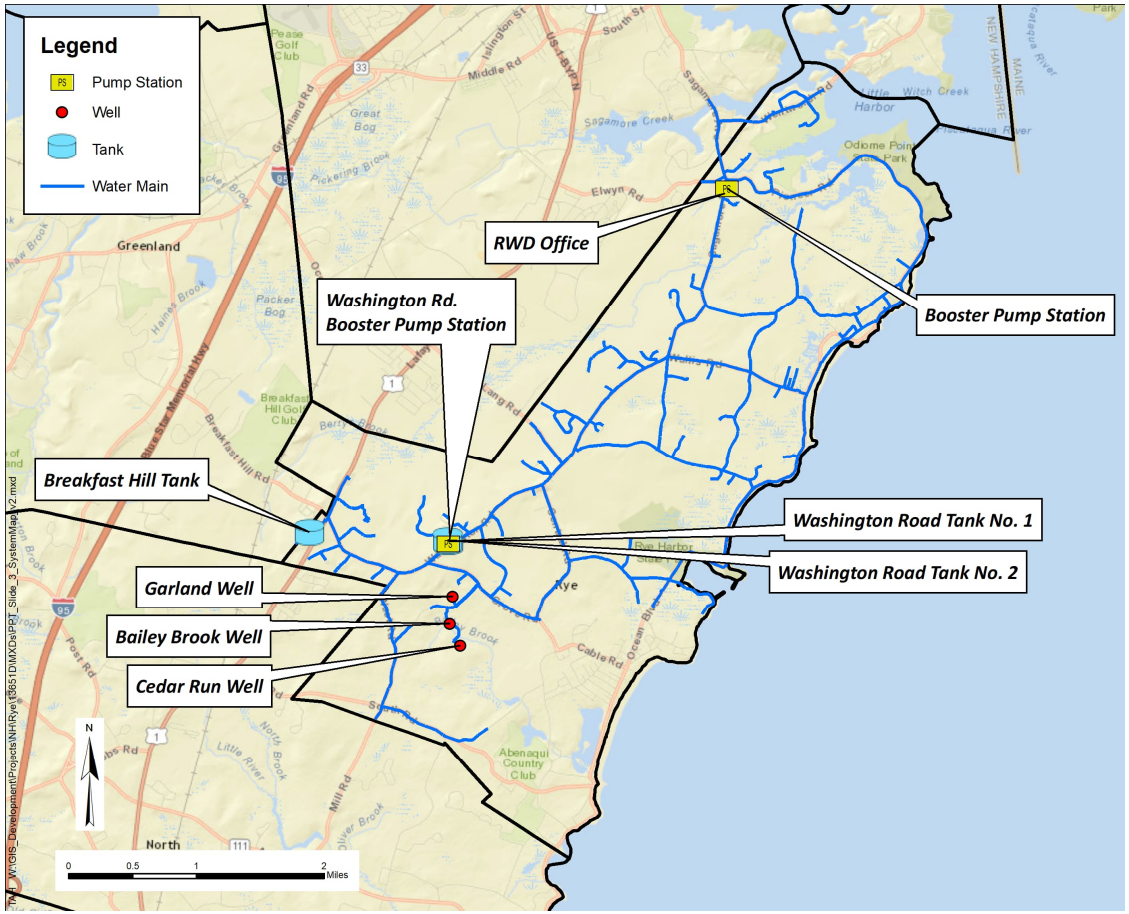
- Three wells make up the current supply
- Cedar Run Well
- Bailey Brook Well
- Garland Well

- RWD has been a non-disinfected (unchlorinated) water system



Rye Water District Supply History

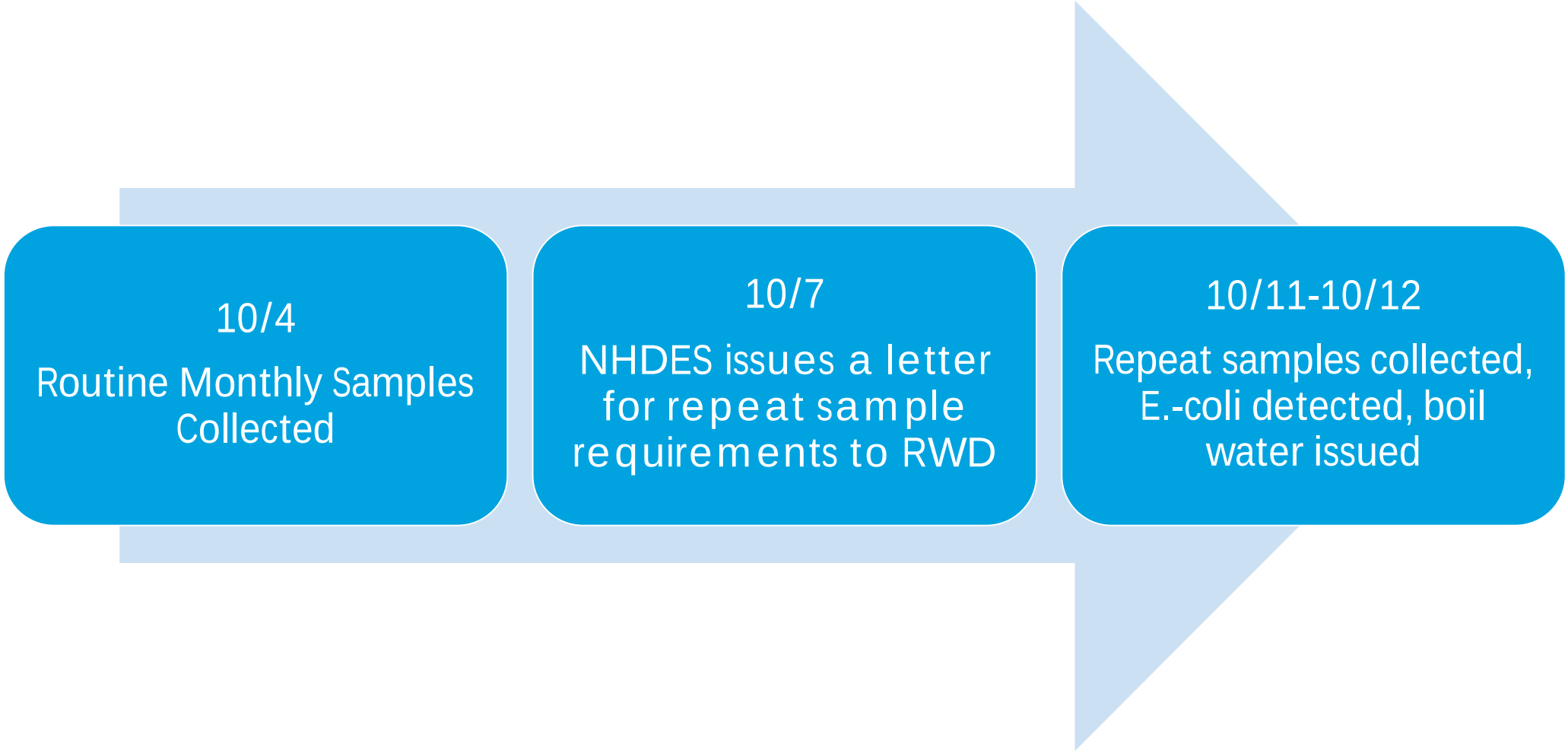
- RWD transitioned from Portsmouth water supply to its own supply in 1977 after installing Garland Well.
  - Bailey Brook installed in 1986
  - Cedar Run installed in 2004
- Groundwater sources do not require disinfection.
- RWD has never had a boil order before.
- RWD has previously maintained compliance with all NHDES and EPA regulations.
- Processes and procedures are adjusted as necessary to maintain compliance.



Regular Monitoring and Testing

- The Rye Water District staff conducts regular monitoring and testing of a range of chemical and potential contaminants.
- This includes monthly sampling and testing for bacterial contamination focused on:
- Total Coliform Bacteria (TC): Coliforms represent a broad category of bacteria that are always present in the digestive tracts of animals, including humans, and are found in their wastes. They are also found in plant and soil materials.
- *Escherichia coli* (E. coli) are bacteria found in the environment, foods, and intestines of people and animals. *E. coli* are a large and diverse group of bacteria. Although most strains of *E. coli* are harmless, others can make you sick. Some kinds of *E. coli* can cause diarrhea, while others cause urinary tract infections, respiratory illness and pneumonia, and other illnesses.

Events Leading up to Boil Order



Boil Water Timeline

10/12-10/17

Flushing of system and continued monitoring

10/17-10/18

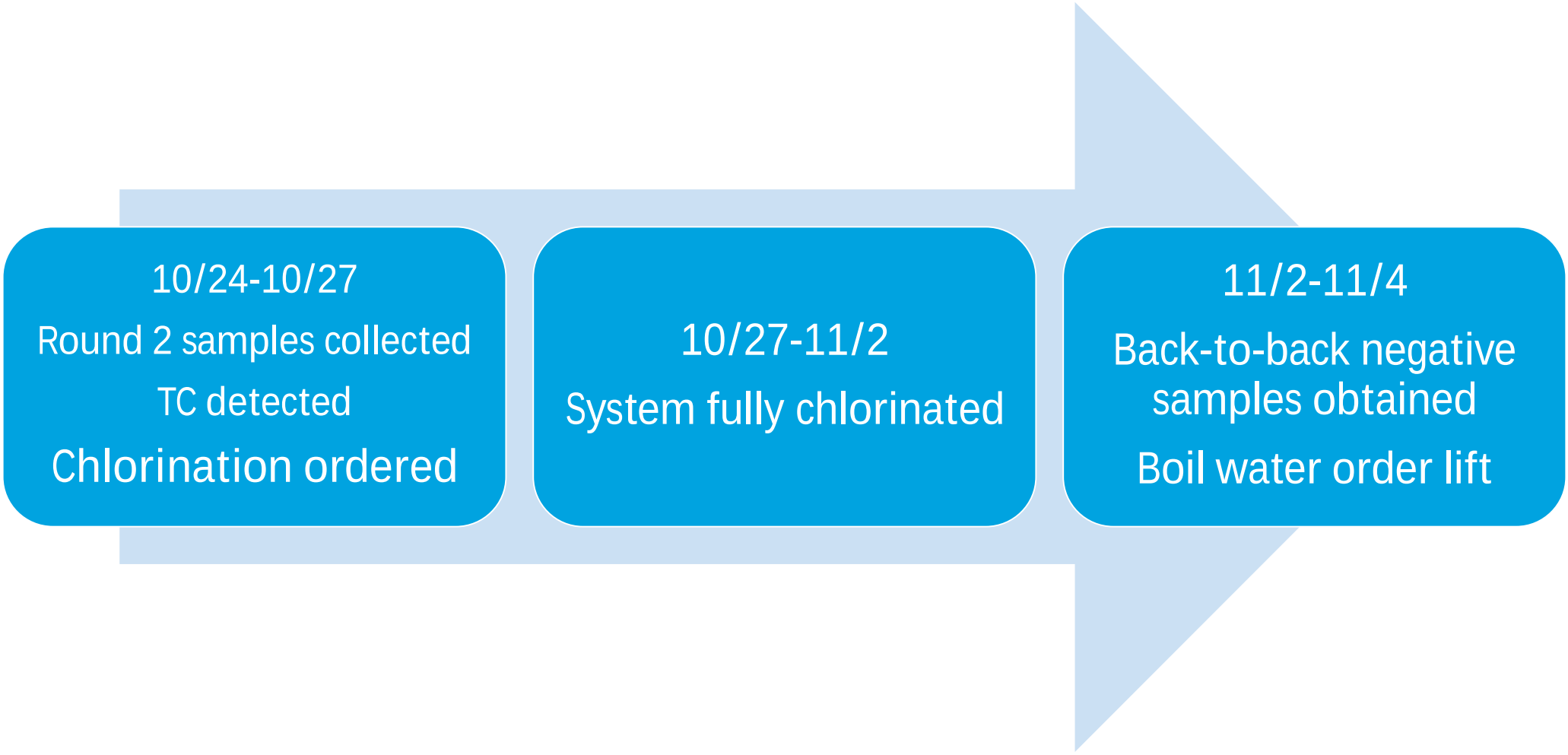
TC & E-coli positive

Bottled water distribution starts

10/18-10/23

Chlorinate and flush distribution system

Boil Water Timeline



Contamination Source Investigation

- Review current response actions
- Evaluate potential sources of contamination
  - Wells
  - RWD Facilities
  - Tanks
  - Distribution System
  - Cross Connections
    - High hazard – institutional, Commercial, Irrigation system
    - Low hazard - Residential

Contamination Source Investigation

RWD/NHDES contamination investigation begins 10/12

RWD conducts Level 1 and level 2 assessments.

- Wellhead protection area assessment
- District facilities assessment
- Distribution system assessment

Well sources

Sampled multiple times - no E. Coli present

Breakfast Hill Tank

Isolated – exterior/interior inspections of the tank

Washington Rd Tanks

Exterior/interior inspections of the tank

RWD engages WP to assist with contamination source investigation 10/27

Breakfast Hill Tank

Contamination Source Investigation

Breakfast Hill Tank will be disinfected per AWWA C-652-11 protocols prior to bringing it back online.

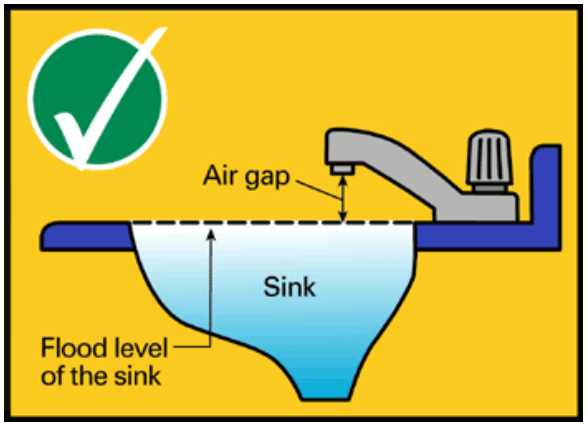
New England Backflow engaged to perform water service cross-connection surveys and backflow device testing.

Washington Road Tank

Contamination Source Investigation

Cross connections

- A point in a plumbing system where non-potable water may come into contact with potable water
  - Garden hose in a bucket of water
  - Submerged outlet of an irrigation system
  - Piped connection of public water to an industrial process
- Backflow types
  - Backsiphonage – Low pressure in the system draws water into the distribution system
  - Backpressure – High pressure on the customer side pushes water into the distribution system
- Cross connections should be eliminated where possible
- Backflow Prevention Devices protect against instances where cross-connection is necessary

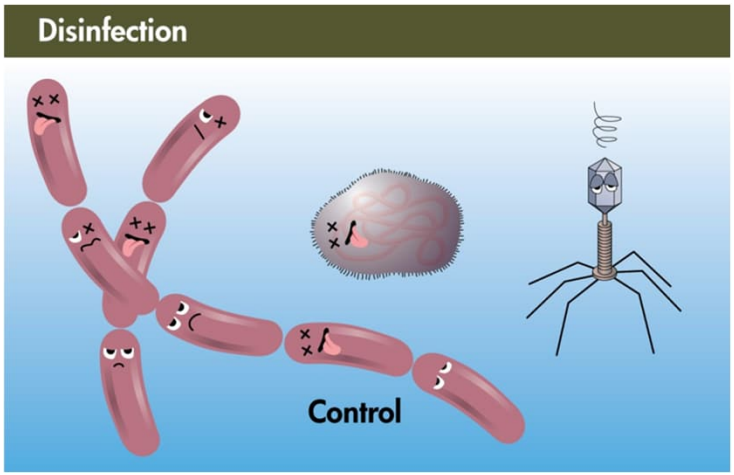


Source: Winnipeg Water Department

Contamination Source Investigation

- Cross-connection examples
  - Irrigation system
  - Improperly installed boiler
  - Private well connected to a home that is on a public water system
  - Faucet hose in a kitchen sink
  - Toilet tank refill line that sits below the water line

Disinfection



Primary Disinfection

- Requirement - 99.99% virus inactivation

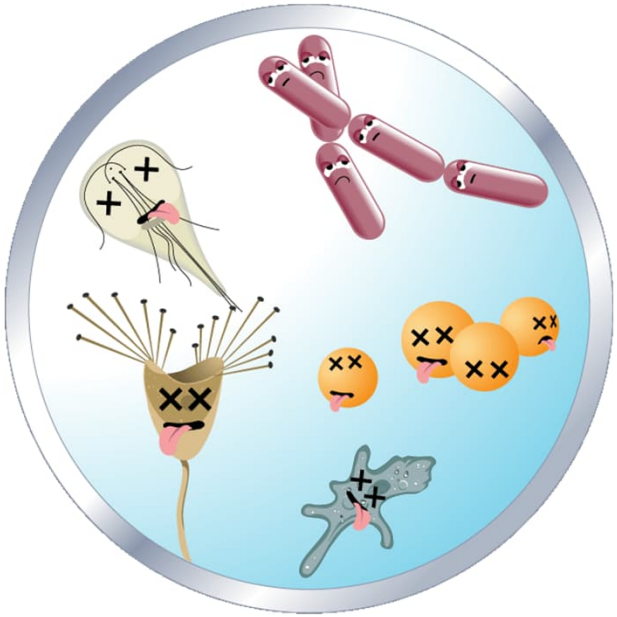
Secondary or “Residual” disinfection

- Prevent distribution system contamination / regrowth

The effectiveness of disinfection in a drinking water system is measured by testing for the presence or absence of coliform bacteria.

Disinfection

- Why Test for Coliform?
  - Coliform bacteria survive better than most pathogenic organisms
  - Easy to test for
  - Test is less expensive than testing for specific pathogens
  - Conservative, simple, inexpensive



- The presence of fecal coliform or E.coli in water samples indicates the possible presence of disease-causing organisms and the need for public notification. (Boil Order)

Chlorination

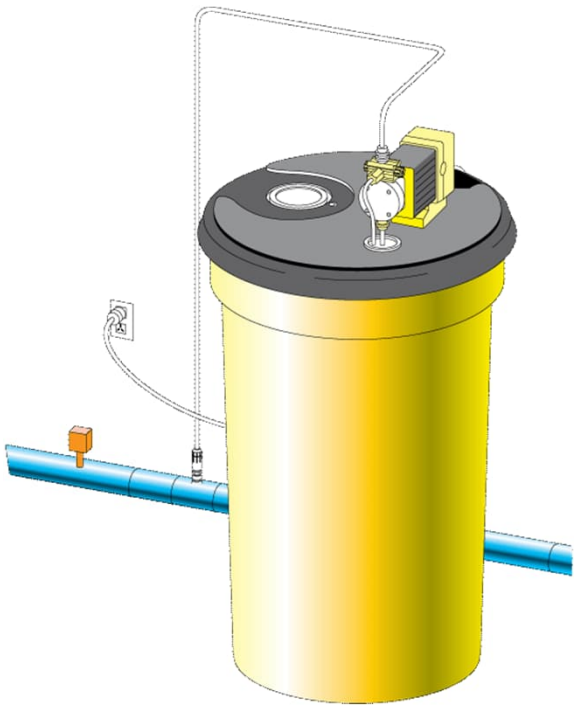
Chlorine is the most common cost-effective means of disinfecting water in the U.S.

Portsmouth, Hampton, Dover, Newmarket, Exeter, Newfields, Kittery, Seabrook and many, many more system all chlorinate.

The addition of a small amount of chlorine is highly effective against bacteria, viruses, and protozoa.

>90% of large community water systems in NH are chlorinated

Chlorination



- Chlorine is the standard for disinfection
- Chemical feed setup is simple and effective.
- RWD has already modified the current well facilities to chlorinate when wells are activated.
- Leaves an easily measurable residual (secondary disinfection)
- Provides a line of defense against pathogens in the distribution system.

What to expect?

- Water may have a chlorine “smell”
- RWD staff will optimize chlorination dose to provide effective disinfection while minimizing taste and odor concerns.
- RWD water treatment process will change to comply with forthcoming regulation changes
- RWD will continue the investigation in an effort to find the source of the contamination
- RWD is committed to reducing the potential for this type of event to occur again.

Questions and Comments

- Limit your question/comment to 3 minutes (shorter is better).
- Ask only one question until everyone who wants to speak has a chance to do so.
- Limit your questions to general questions about the Rye Water District and about the current situation.
- We will NOT respond to questions or comments about PFAS or related issues

THANK YOU