

Webster Water System

Board of Selectmen Public Hearing on Water Quality

October 13, 2015

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Overview

- **Introduction**
- **Water Quality issues**
 - Causes
 - Symptoms
 - Solution
- **The Plan for improving water quality**
 - Near Term / Long Term
 - Steps Taken
 - Next Steps

Introduction

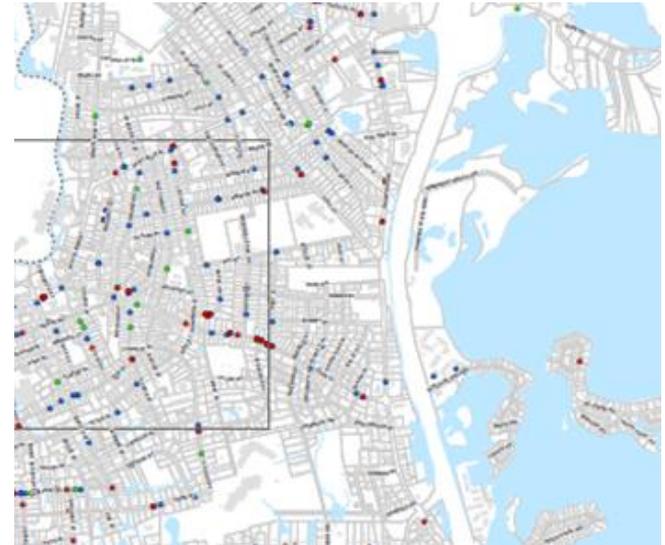
Progress since last summer

- Flushed the entire system ... Three times
- Taken Station No. 1 partially off line, currently constructing improvements to allow limited use
- Issued RFP for water SCADA system, opening this week
- Issued RFP Bids for Ice Pigging, opening this week
- Budgeted several phases of water system improvements
 - » Including a new water filtration plant

Introduction

■ What happens when you call the water department?

- Every call is logged and mapped
- Operating conditions are evaluated
- Hydrants are flushed



WEBSTER WATER DEPARTMENT					
DIRTY WATER LOG 2015					
Date		Location	Time of Day	Day of Week	
8/11/2015	August	11 Goddard St.	2:15 PM	Tuesday	Caused by flushing Beacon Park
8/11/2015	August	46 Prospect St.	2:40 PM	Tuesday	Caused by flushing Beacon Park
8/11/2015	August	11 East Main St.	2:55 PM	Tuesday	Caused by flushing Beacon Park
8/11/2015	August	6 Crosby St.	3:05 PM	Tuesday	Caused by flushing Beacon Park
8/11/2015	August	14 Foster St.	2:50 PM	Tuesday	Caused by flushing Beacon Park
8/11/2015	August	683 School St.	3:05 PM	Tuesday	Caused by flushing Beacon Park
8/11/2015	August	25 Maple St.	3:10 PM	Tuesday	Caused by flushing Beacon Park
8/11/2015	August	15 Pepka Dr.	5:30 PM	Tuesday	Caused by flushing Beacon Park
8/11/2015	August	28 Third St.	5:30 PM	Tuesday	Caused by flushing Beacon Park
8/14/2015	August	108 Lake St.	9:00 AM	Friday	
8/14/2015	August	89 Lake St.	2:10 PM	Friday	
8/18/2015	August	46 Park Ave.	7:45 AM	Tuesday	
8/18/2015	August	18 Klebart Ave	10:15 AM	Tuesday	
8/19/2015	August	Day St. (end)	2:00 PM	Wednesday	
8/19/2015	August	23 Grenier Ave	4:49 PM	Wednesday	
8/19/2015	August	58 Grenier Ave	7:47 PM	Wednesday	
8/20/2015	August	7 Eastern Ave		Thursday	
8/20/2015	August	27 Bates Grove Rd		Thursday	
8/20/2015	August	21 Fifth Ave.		Thursday	
8/20/2015	August	Nelson St. (2 calls)		Thursday	
8/21/2015	August	14 Pepka Dr	9:15 AM	Friday	

Water Quality Issues

■ What is the problem?

- Iron (Fe) and Manganese (Mn)
- First and second most common elements in the earth's crust
- Classified as 'secondary' water quality parameters

■ How chemical addition exacerbates the problem

- **Disinfection:** Chlorine is added to safeguard against bacteria. Chlorine is an Oxidant, it causes Manganese to come out of solution
- **pH adjustment:** Old homes have lead and copper in their piping and plumbing fixtures, New England groundwater is acidic and will leach lead and copper out of plumbing. The pH is adjusted (raised) to prevent this.

Water Quality Issues

■ It's in the water

- The Town has three water supplies
 - » Station 1 – Partially off line due to Fe & Mn
 - » Station 2 – Permanently off line due to Fe & Mn
 - » Station 3 – Currently in service but getting worse

Water Quality Issues

- **Station 3 – Webster’s primary water supply**
 - One pump
 - One pipe
 - One generator
 - No redundancy



Water Quality Issues

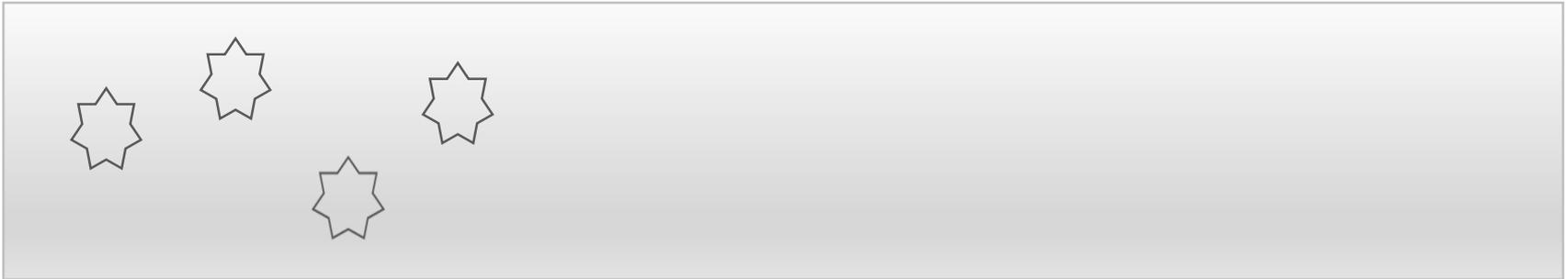
■ It's also in the pipes

- Iron and Manganese have built up in the water pipes over the last several years/ decades.
- There are 70 miles of water pipe in Webster
- Half of these pipes are unlined cast iron
- Unlined cast iron pipes are subject to tuberculation which reduces hydraulic capacity and makes it harder to clean them



Water Quality Issues

- **Why Manganese is a such a problem**
 - Normally Manganese is in soluble form and you wouldn't know it was there

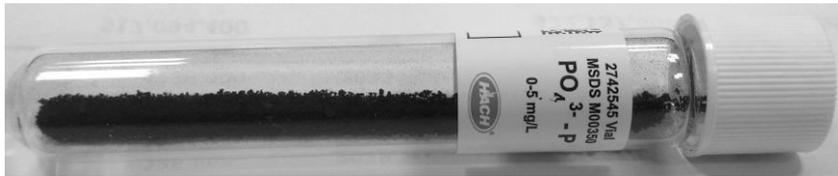


Water Quality Issues

- However, under certain conditions it turns into insoluble form and comes out of solution.



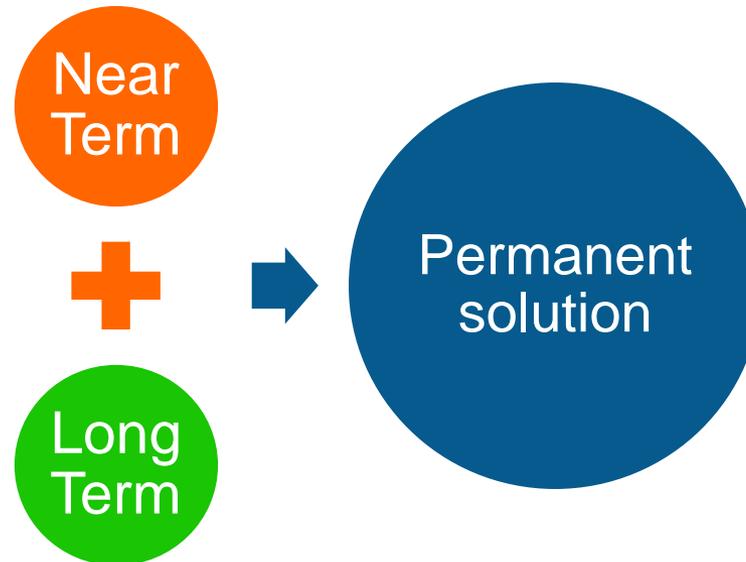
- Then you see it.



Water Quality Issues

■ How do we fix this?

- First we need to remove it from the *source water*
- Then we need get it out of the pipes

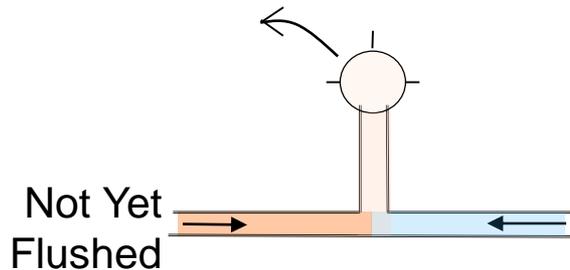


Cleaning the pipes: Flushing

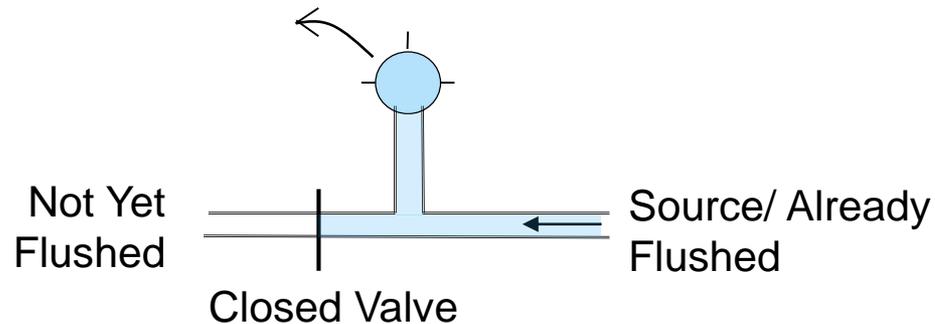
■ Cleaning the pipes

- Currently using Unidirectional Flushing (UDF)

Conventional Flushing



Unidirectional Flushing



Cleaning the pipes: Ice Pigging

■ Cleaning the pipes

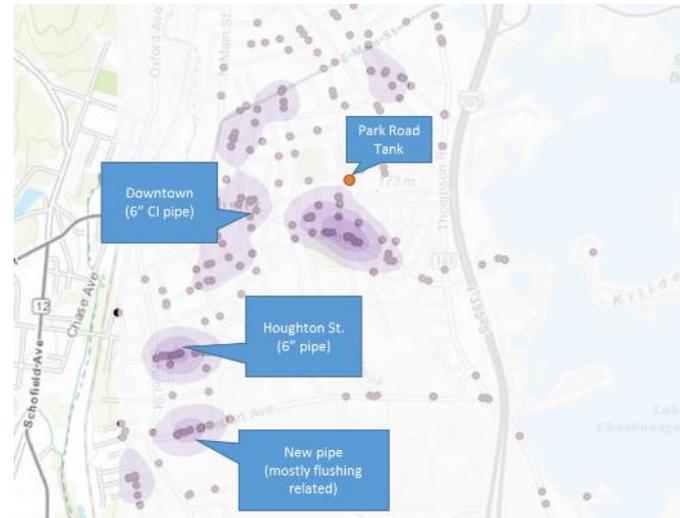
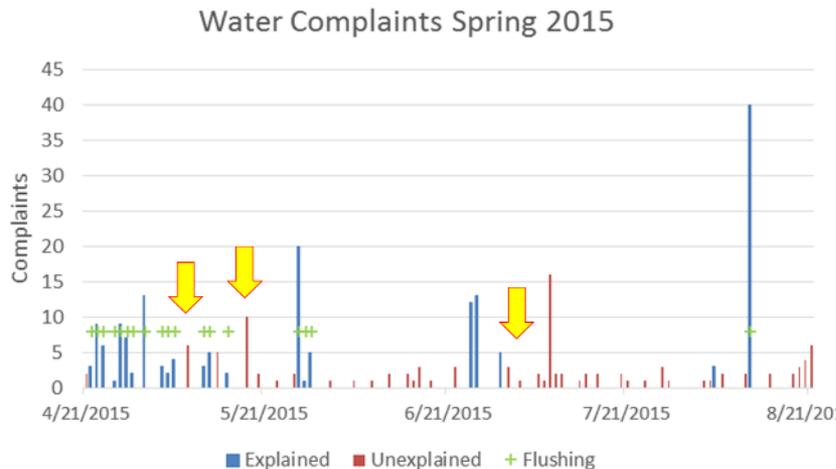
- Next step is to use a more aggressive method called Pigging
- Pigging is a physical means of cleaning pipes
- We are using the newest type called ice pigging



Cleaning the pipes: Ice Pigging

■ Ice Pigging Program

- Town has authorized \$100K for Ice Pigging in this fiscal year
- This will be an annual program
- We open bids this month



Cleaning the pipes: Cleaning and Lining

■ Cleaning and Lining Program

- Town has budgeted \$200K for phase 1
- This will be a multi-phase program
- Trenchless rehabilitation method, restores pipe to like new condition
- Pipes are mechanically cleaned, all valves and hydrants are replaced and a new lining is installed
 - » Cement mortar
 - » Cured in place

Cleaning the source water

- Iron and Manganese must be removed from the source water to prevent future build up
- Filtration is the only way to accomplish this
- Plant provides much needed redundancy



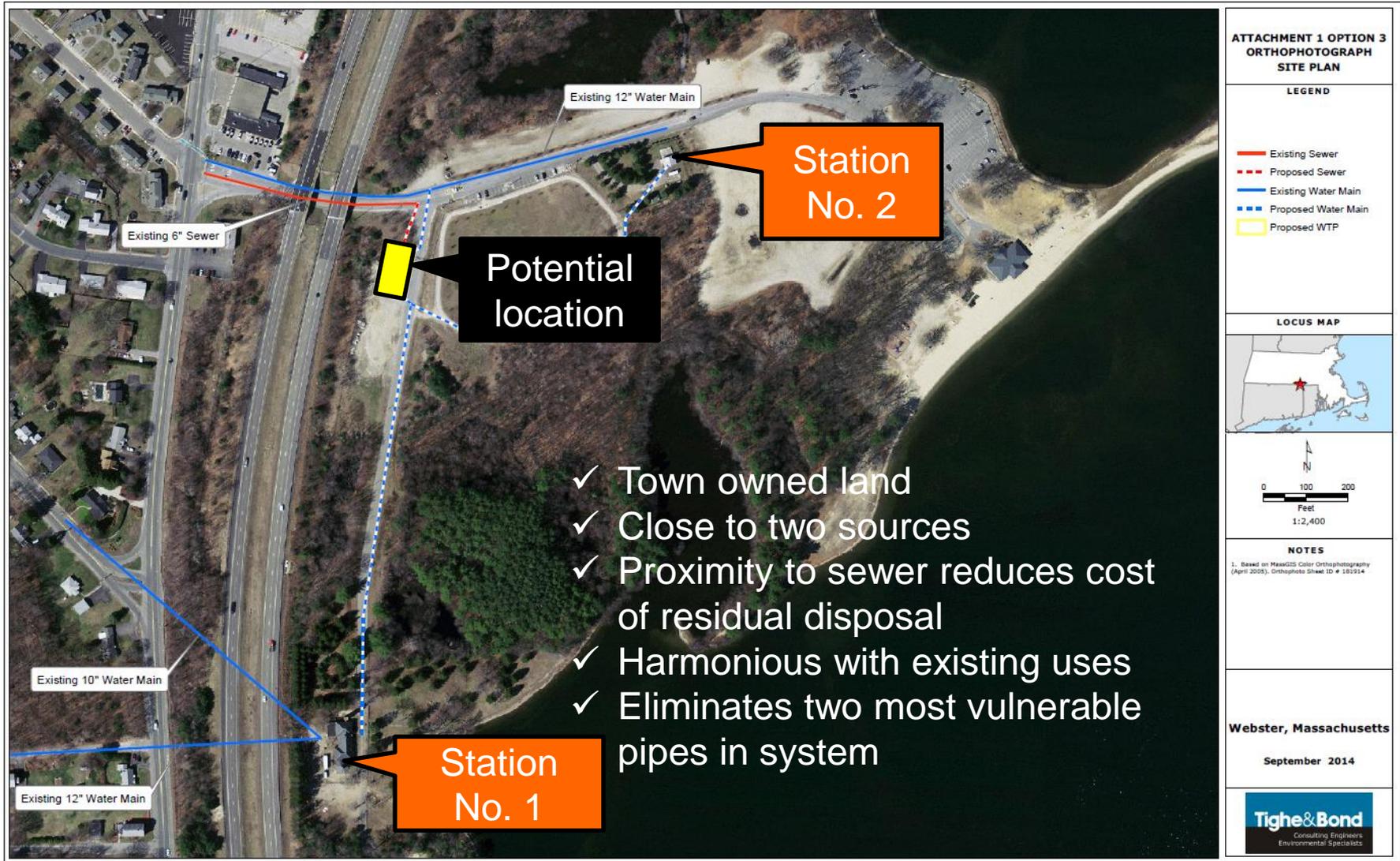
Filtration Plant Overview

- **The filtration plant will serve both Station No. 1 and Station No. 2**
 - This will more than double redundancy of water supply
 - » New plant will feature built in redundancy
 - This will remove the Iron and Manganese
- **Uses proven technology**
 - Greensand filters will be used to remove the Iron and Manganese
 - This technology has been used in the US since the 1950's
 - It is well known to water operators and the regulators, it is proven, efficient and reliable

Water Treatment Plant Approach

- **Construction will be submitted for State Revolving Fund (SRF)**
 - This replaced the old construction grants program as part of the Clean Water Act
 - This is a construction loan program
 - » With below market interest rates
 - » Webster may be eligible for principal forgiveness
- **Streamlining the Schedule**
 - Preliminary siting analysis already completed
 - Design will be submitted ahead of the standard schedule
 - » This will put us ahead of all the other projects

Filtration plant concept

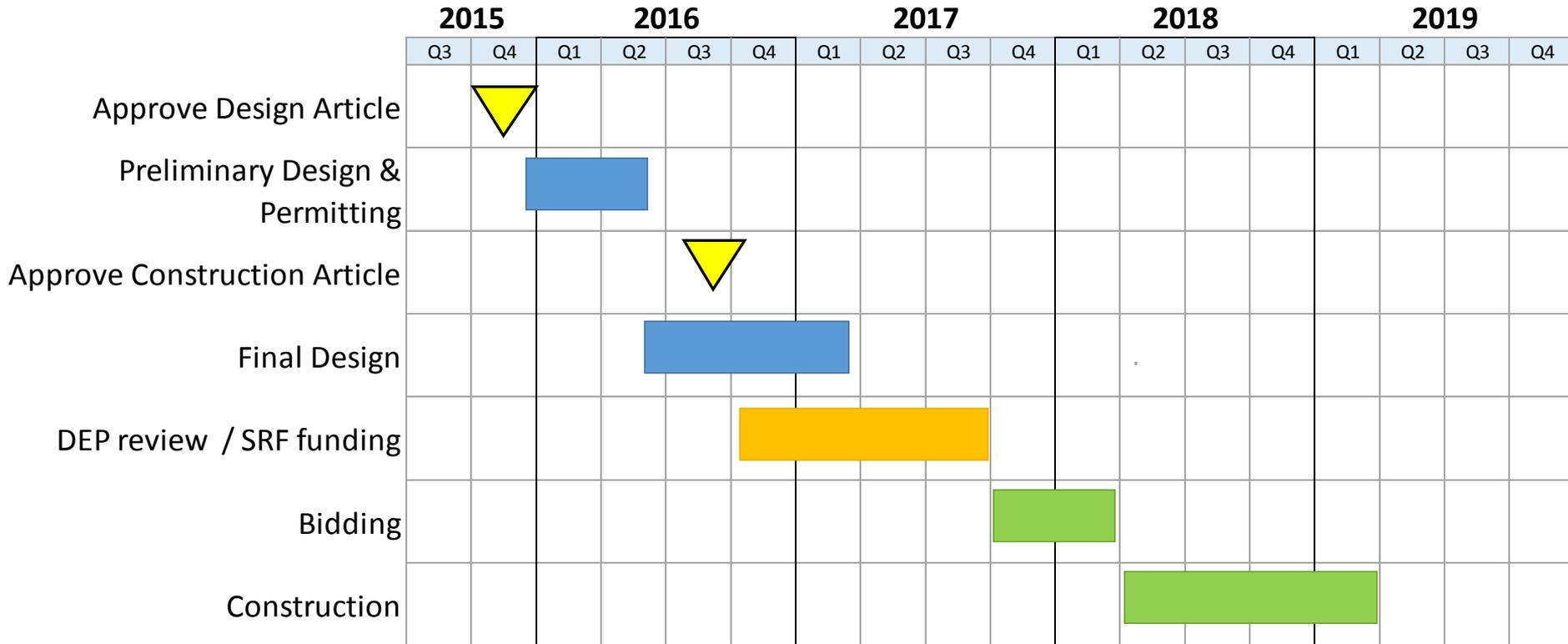


Water Treatment Plant Cost

- **Estimated construction cost \$8M**
- **Design and Piloting \$700K**
 - Budgetary value based upon current information
 - Actual costs will be based upon
 - » Siting and Town input
 - » Permitting Process
 - » Site Conditions
 - » Pilot Results



Filtration Plant Schedule



▲ Town Meeting Action

Questions and Discussion



Rate Impacts

■ Goals

- Expedite filtration plant
- Minimize rate impacts

■ Challenges

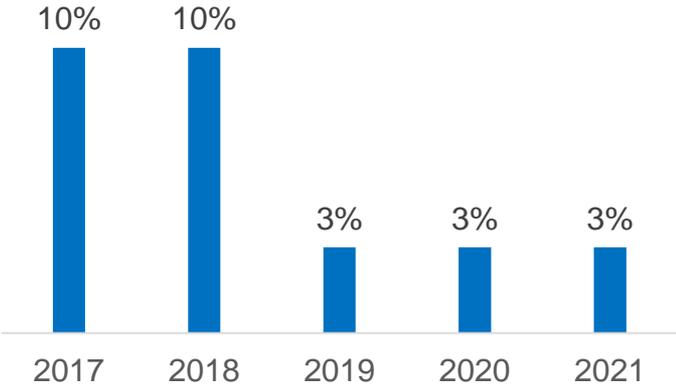
- Debt for filtration plant is more than \$500K per year
- Many other infrastructure needs

■ Solution

- Restructure order of projects, phase implementation

Estimated Rate Impacts

Water Rate Increases



Cumulative Water Bill Impacts (compared to 2016)



Rate Impacts

Webster as compared to other communities

Community	Number of Services	Operating Budget	Avg. Customer Cost	
Southborough	3,177	\$ 1,808,990	\$ 342	
Medway	3,508	\$ 1,884,832	\$ 424	
Webster	5,208	\$ 1,943,890	\$ 327	2016
Bellingham	5,817	\$ 1,959,326	\$ 483	
Northborough	4,185	\$ 1,990,175	\$ 425	

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2017

Rate Impacts

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