



# DRINKING WATER UPDATE

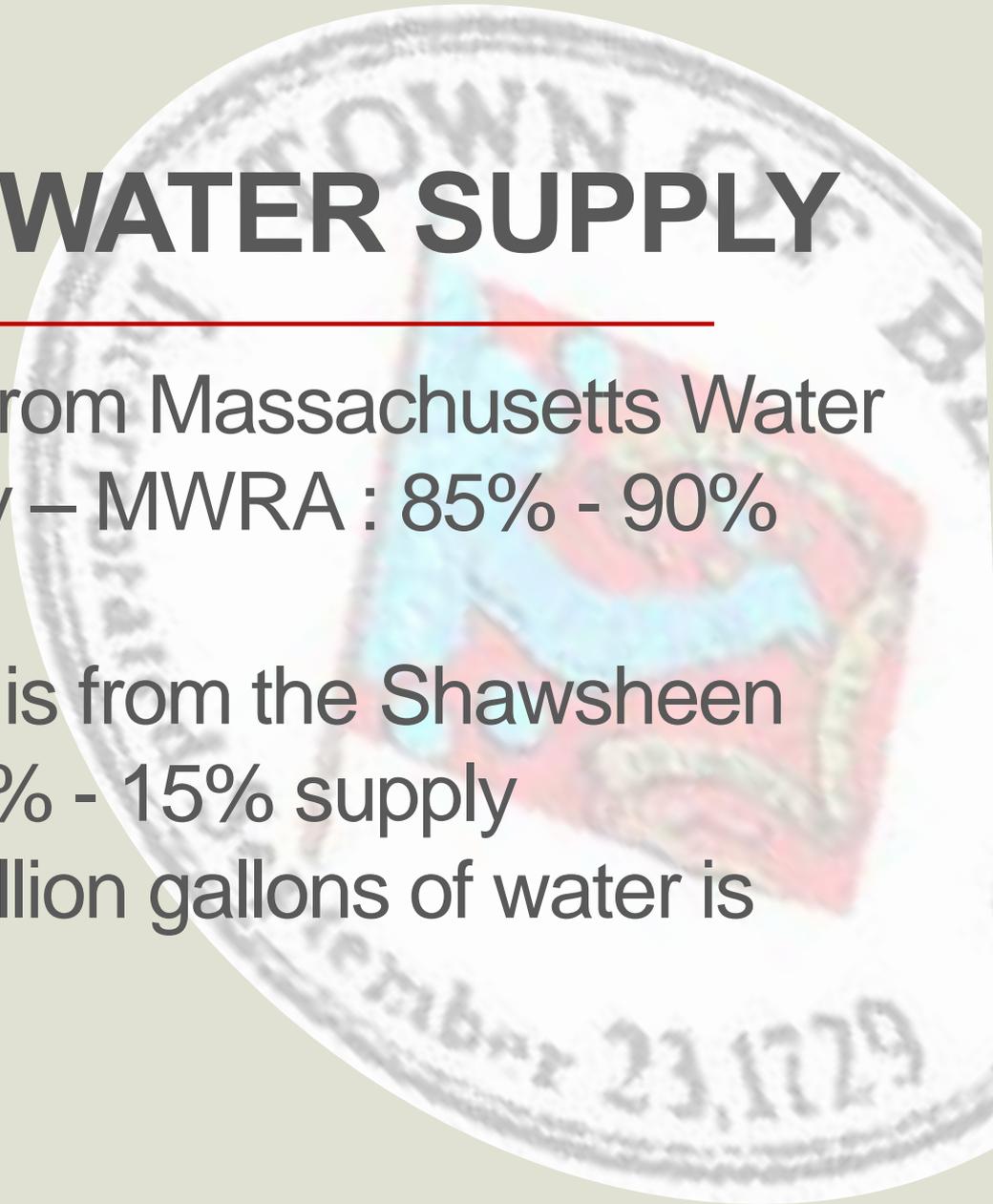
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BEDFORD PUBLIC WORKS

# BEDFORD'S WATER SUPPLY

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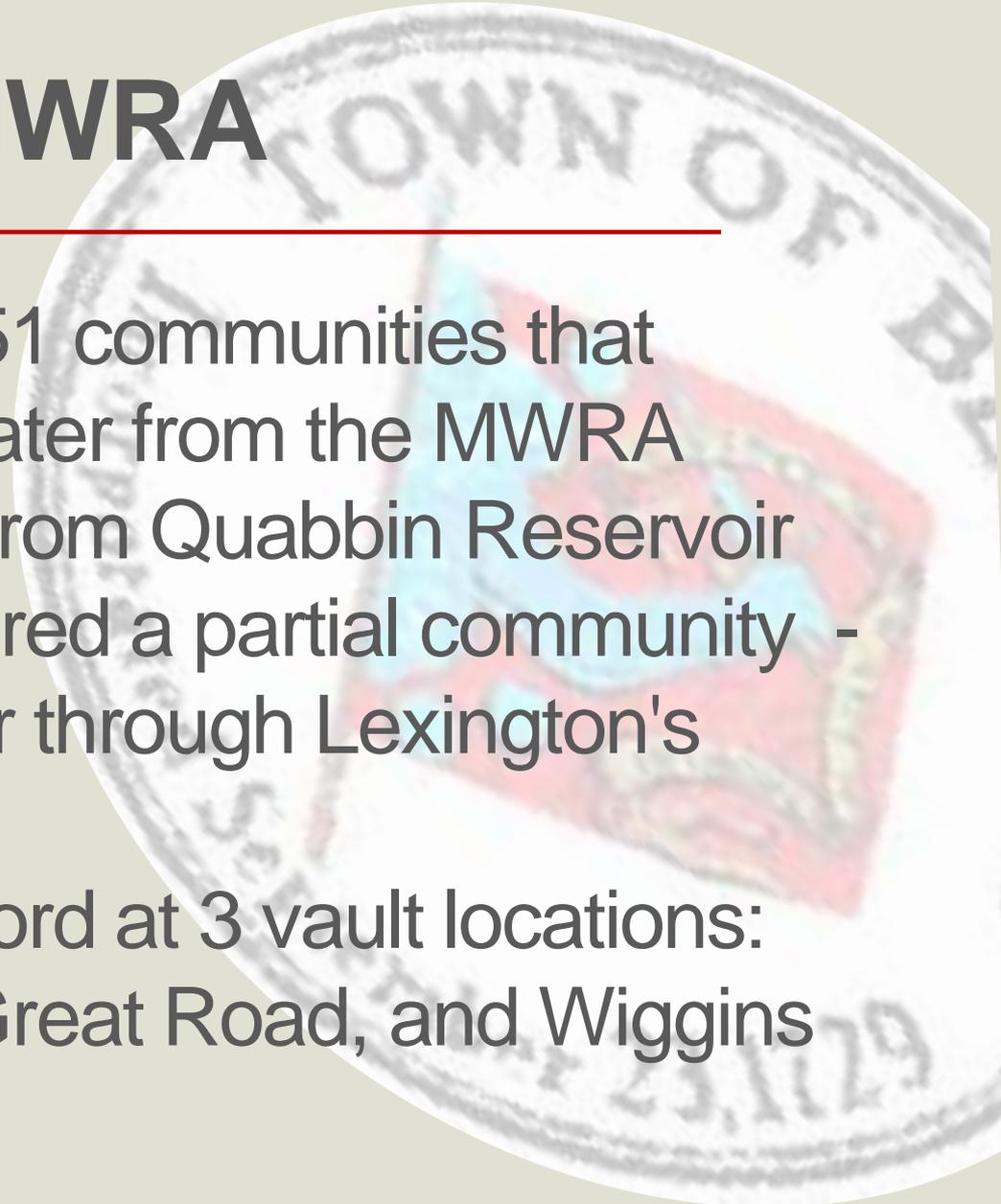
- ❖ Primary source is from Massachusetts Water Resource Authority – MWRA : 85% - 90% supply
- ❖ Secondary source is from the Shawsheen Road Wellfield: 10% - 15% supply
- ❖ On average 1.2 million gallons of water is used each day



# MWRA

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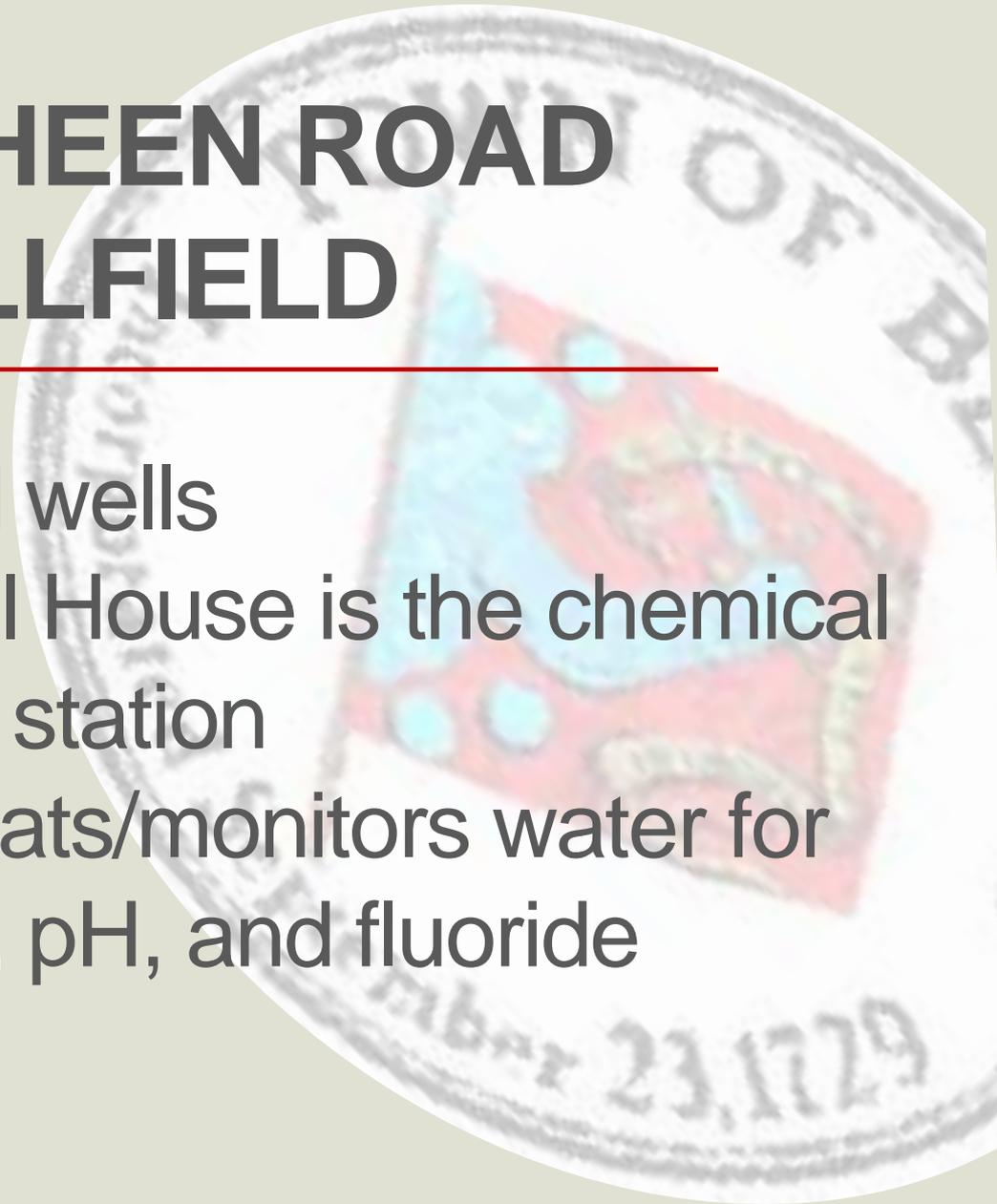
- ❖ Bedford is one of 51 communities that receive drinking water from the MWRA
- ❖ Supply originates from Quabbin Reservoir
- ❖ Bedford is considered a partial community - it receives its water through Lexington's system
- ❖ Water enters Bedford at 3 vault locations: Page Road, The Great Road, and Wiggins Avenue



# SHAWSHEEN ROAD WELLFIELD

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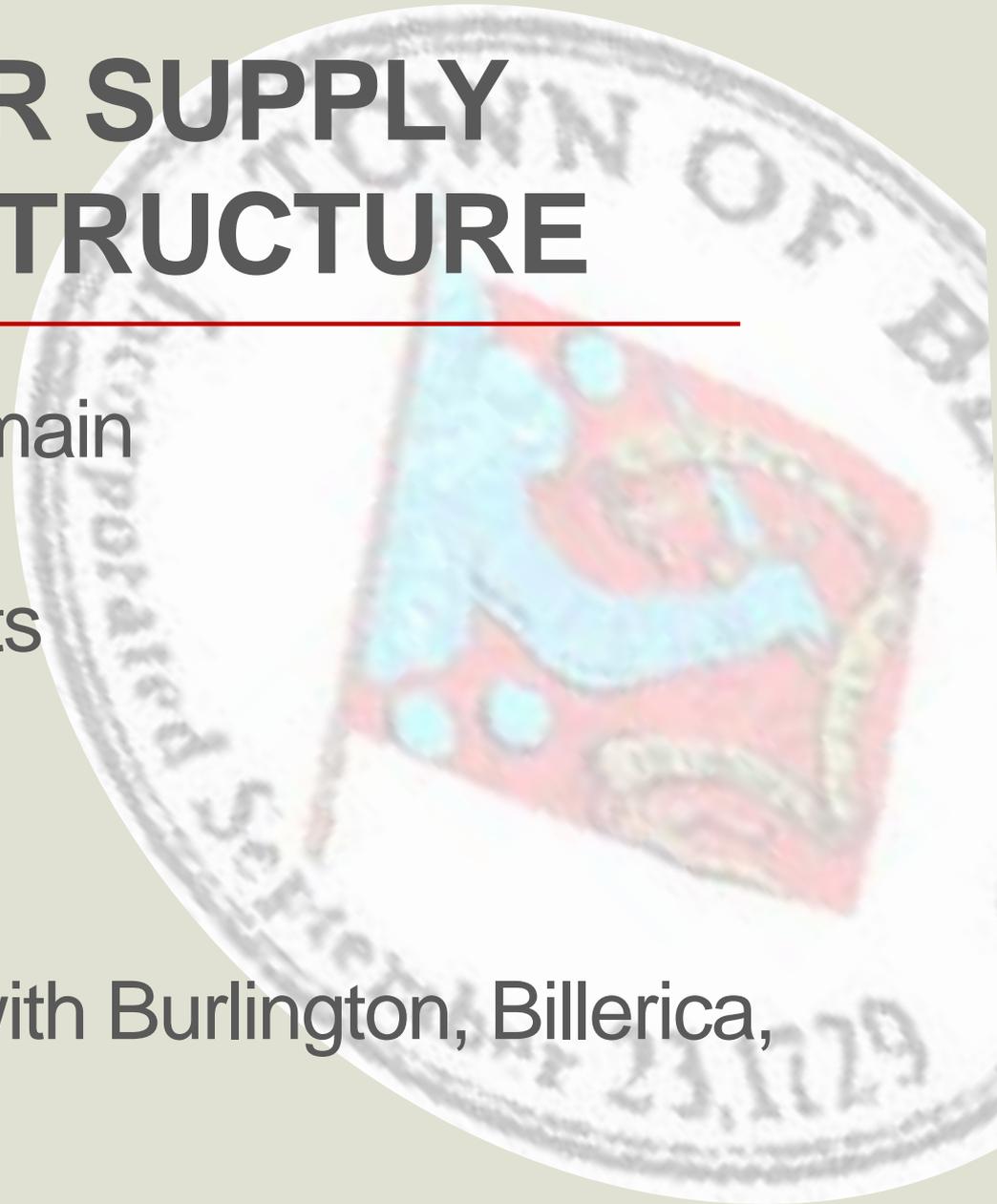
- ❖ 3 Gravel packed wells
- ❖ Shawsheen Well House is the chemical feed and control station
- ❖ Public Works treats/monitors water for free chlorination, pH, and fluoride



# WATER SUPPLY INFRASTRUCTURE

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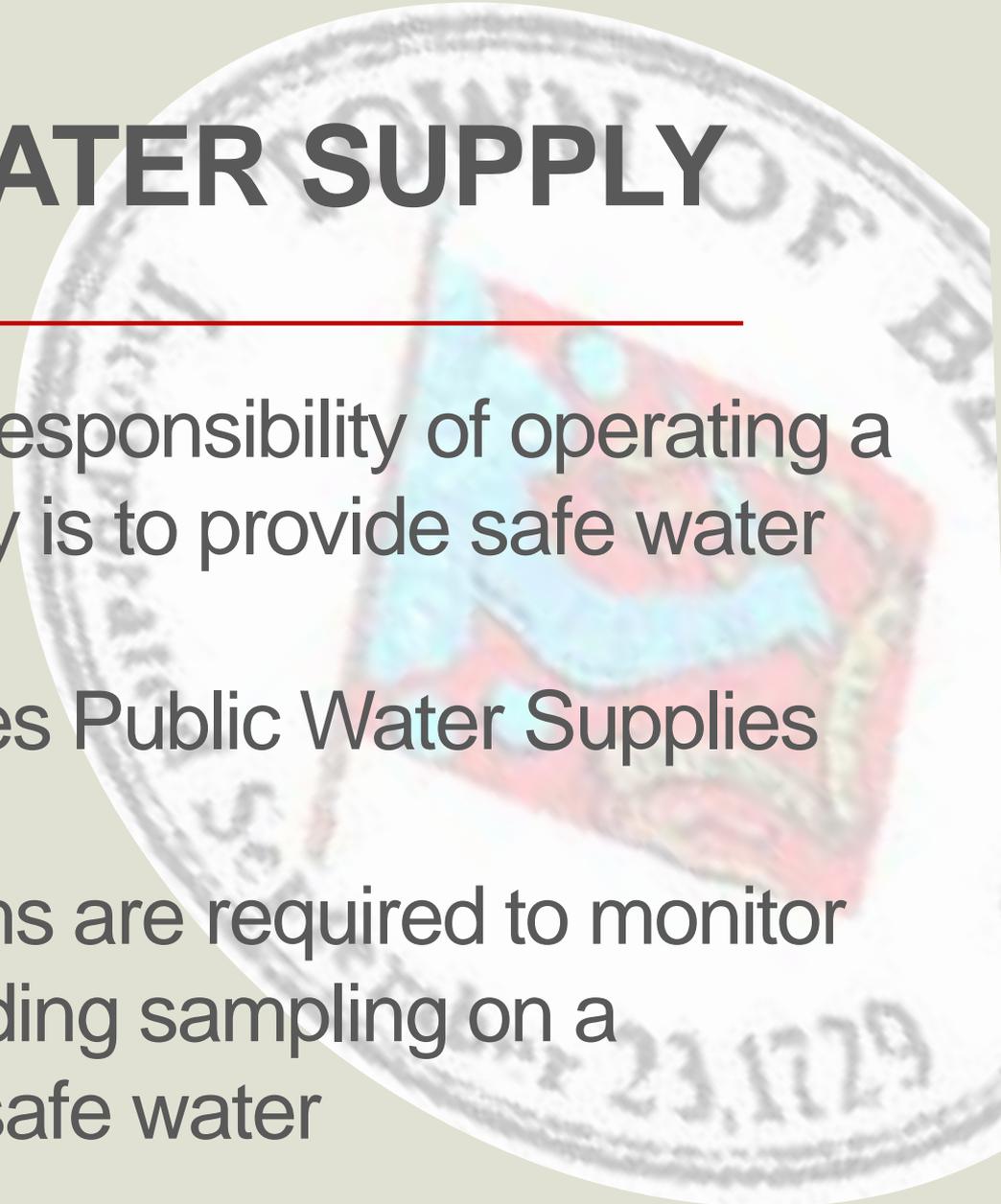
- ❖ 85 miles of water main
- ❖ 3 Standpipes
- ❖ 3 Subsurface vaults
- ❖ 3 Wells
- ❖ 800 fire hydrants
- ❖ SCADA
- ❖ Interconnections with Burlington, Billerica, and Concord



# PUBLIC WATER SUPPLY

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- ❖ The fundamental responsibility of operating a public water supply is to provide safe water to its customers
- ❖ MassDEP regulates Public Water Supplies (PWS)
- ❖ Distribution systems are required to monitor water quality including sampling on a monthly basis for safe water



# WATER SAMPLING

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- ❖ Water samples are taken twice a month and sent to the MWRA lab for testing of coliform
- ❖ There are 10 sampling sites throughout the Town
- ❖ Samples are also taken from each well
- ❖ If a sample tests positive it must be resampled at that site as well as the designated upstream and downstream location
- ❖ Positive samples are immediately tested further for E. coli

# Town of Bedford Coliform Sampling Plan

Routine, Upstream Repeat, and Downstream Repeat Sample Sites

## Lane School (# 009)

SITE	DSP CODE	ADDRESS	OWNER
PRIMARY	008	88 BARNSTON AVENUE	LANE SCHOOL
UR	1a	1 BERNARD LANE	LANE RESIDENCE
RR - WATER ONLY	008	88 BARNSTON AVENUE	LANE SCHOOL
DR	1b	42 BARNSTON AVENUE	CHAMBERLAIN RESIDENCE
RR - SECEPT WATER	1c	OUTSIDE SAMPLE LOCATION	LANE SCHOOL, SUMMERS

## Pine Hill Road Standpipe (# 015)

SITE	DSP CODE	ADDRESS	OWNER
PRIMARY	010	70 PINE HILL ROAD	PINE HILL ROAD STANDPIPE
UR	15a	88 PINE HILL ROAD	COOPER RESIDENCE
NO	010	70 PINE HILL ROAD	PINE HILL ROAD STANDPIPE
DR	15b	88 PINE HILL ROAD	CHAMBERLAIN RESIDENCE

## Town Hall (# 005)

SITE	DSP CODE	ADDRESS	OWNER
PRIMARY	005	12 MUDJON HWY	TOWN HALL
UR	7a	7 MUDJON HWY	LIBRARY
NO	005	12 MUDJON HWY	TOWN HALL
DR	7b	12 MUDJON HWY	TOWN CENTER

## Middle School (# 004)

SITE	DSP CODE	ADDRESS	OWNER
PRIMARY	004	88 MCMANON ROAD	MIDDLE SCHOOL
UR	1a	10 MCMANON ROAD	DAVIES RESIDENCE
RR - WATER ONLY	004	88 MCMANON ROAD	MIDDLE SCHOOL
DR	1b	10 MCMANON ROAD	O'NEILL VEST
RR - SECEPT WATER	1c	OUTSIDE SAMPLE LOCATION	MIDDLE SCHOOL, SUMMERS

## Davis School (# 001)

SITE	DSP CODE	ADDRESS	OWNER
PRIMARY	001	410 DAVIS ROAD	DAVIS SCHOOL
UR	7a	418 DAVIS ROAD	BACKMAN RESIDENCE
RR - WATER ONLY	001	410 DAVIS ROAD	DAVIS SCHOOL
DR	7b	402 DAVIS ROAD	CHAMBERLAIN RESIDENCE
RR - SECEPT WATER	7c	OUTSIDE SAMPLE LOCATION	DAVIS SCHOOL, SUMMERS

## Chip-In Farm (# 002)

SITE	DSP CODE	ADDRESS	OWNER
PRIMARY	002	201 HARTWELL ROAD	CHIP-IN FARM
UR	2a	223 HARTWELL ROAD	WATER TREATMENT PLANT
NO	002	201 HARTWELL ROAD	CHIP-IN FARM
DR	2b	88 HARTWELL ROAD	COLLIER RESIDENCE

## 7 Noreen Drive (# 010)

SITE	DSP CODE	ADDRESS	OWNER
PRIMARY	010	7 NOREEN DRIVE	ADAMTS RESIDENCE
UR	15a	11 NOREEN DRIVE	BOLIC RESIDENCE
NO	010	7 NOREEN DRIVE	ADAMTS RESIDENCE
DR	15b	3 NOREEN DRIVE	MOULTRY RESIDENCE

## Crosby Drive Standpipe (# 014)

SITE	DSP CODE	ADDRESS	OWNER
PRIMARY	014	38 CROSBY DRIVE	CROSBY DRIVE STANDPIPE
UR	16a	48 CROSBY DRIVE	PULLIN BACKWOODS LLC INC
NO	014	38 CROSBY DRIVE	CROSBY DRIVE STANDPIPE
DR	16b	32 CROSBY DRIVE	KEEF MANAGEMENT

## Mitre Corp (# 008)

SITE	DSP CODE	ADDRESS	OWNER
PRIMARY	008	30 WOODBERRY TURNPIKE	MITRE CORP
UR	1a	44 WOODBERRY TURNPIKE	ARVA BEDFORD LLC
NO	008	30 WOODBERRY TURNPIKE	MITRE CORP
DR	1b	10 BUNTING ROAD	GMT REALTY PARTNERSHIP

## Page Road Sewer Station (# 007)

SITE	DSP CODE	ADDRESS	OWNER
PRIMARY	007	88 PAGE ROAD	PAGE ROAD SEWER STATION
UR	7a	83 PAGE ROAD	PATTERSON RESIDENCE
NO	007	88 PAGE ROAD	PAGE ROAD SEWER STATION
DR	7b	84 PAGE ROAD	CLARKENT RESIDENCE

## Reeves Road Standpipe (# 013)

SITE	DSP CODE	ADDRESS	OWNER
PRIMARY	013	8 REEVES ROAD	REEVES ROAD STANDPIPE
UR	15a	2 REEVES ROAD	PULLIN RESIDENCE
NO	013	8 REEVES ROAD	REEVES ROAD STANDPIPE
DR	15b	11 REEVES ROAD	ARMSTRONG RESIDENCE

## Water Supply Wells, Shawshen GWTP (# 011 and #012)

SITE	DSP CODE	ADDRESS	OWNER
PRIMARY	011	80 130 SHAWSHEN ROAD	RAW WATER PRIOR TO TREATMENT
PRIMARY	012	81 SHAWSHEN ROAD	SOOTHY (1.5m) 100 TAP

ANY POSITIVE COLIFORM TEST REQUIRES RE-SAMPLING OF THE ORIGINAL SITE

## Public Works Garage (# 006)

SITE	DSP CODE	ADDRESS	OWNER
PRIMARY	006	314 GREAT ROAD	PUBLIC WORKS GARAGE
UR	8a	308 GREAT ROAD	CLARK COLLETTE
NO	006	314 GREAT ROAD	PUBLIC WORKS GARAGE
DR	8b	308 GREAT ROAD	MCDONALDS

## South Road Vault (# 003)

SITE	DSP CODE	ADDRESS	OWNER
PRIMARY	003	388 SOUTH ROAD	SOUTH ROAD VAULT
UR	2a	381 SOUTH ROAD	ANDERSON RESIDENCE
NO	003	388 SOUTH ROAD	SOUTH ROAD VAULT
DR	2b	388 SOUTH ROAD	PAGE CHAP TRAILER SITE

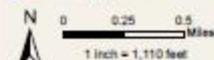
Page Road Vault

Great Road Vault

Wiggins Avenue Vault

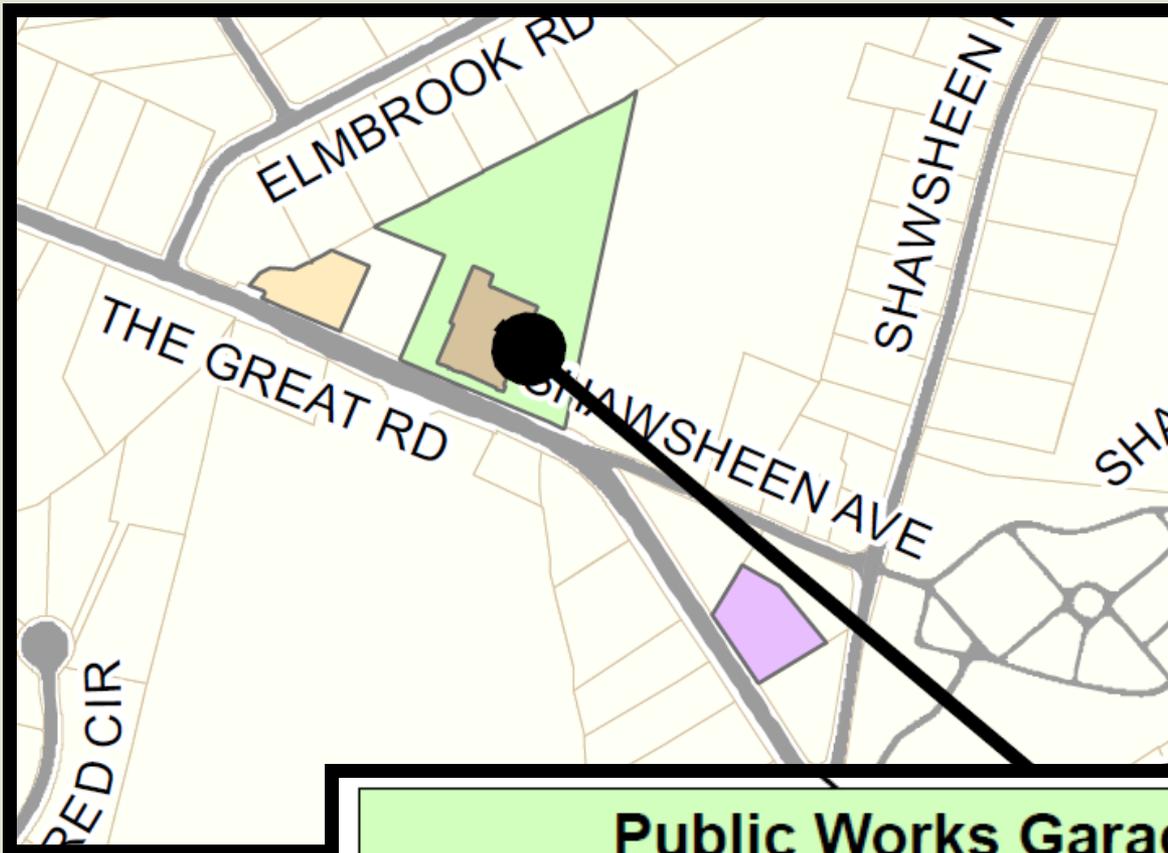
### Legend

- Primary Sample Site
- Upstream Repeat Sample Site
- Downstream Repeat Sample Site
- Discontinued Sample Site
- Building
- Road
- Water Supply Point



Map by Bedford Public Works

Revised:  
August 2008  
October 2010  
October 2011  
May 2014  
June 2014



Public Works Garage (# 006)			
SITE	DEP CODE	ADDRESS	OWNER
PRIMARY	006	314 GREAT ROAD	PUBLIC WORKS GARAGE
UR	6a	306 GREAT ROAD	DUNKIN DONUTS
RO	006	314 GREAT ROAD	PUBLIC WORKS GARAGE
DR	6b	346 GREAT ROAD	MCDONALDS

# TOTAL COLIFORM RULE

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- ❖ Drinking water regulation put into effect in 1990 to test for total coliform in public water supplies
- ❖ Samples taken proportional to the number of people served
- ❖ No more than 5% of the samples can test positive in a month
- ❖ A Notice of Noncompliance will be issued to the PWS

# COLIFORM

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*Coliforms are bacteria which are naturally present in the environment and are used as an indicator that other, potentially-harmful, bacteria may be present.*

# What happens if coliform is detected?

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- ❖ DEP is notified immediately by staff
- ❖ New samples must be taken at the positive site as well as upstream and downstream within 24 hours
- ❖ Sampling continues until all results come back clear
- ❖ If 2 or more samples in any month are positive DEP issues a NON to the Town

# What happens with the NON?

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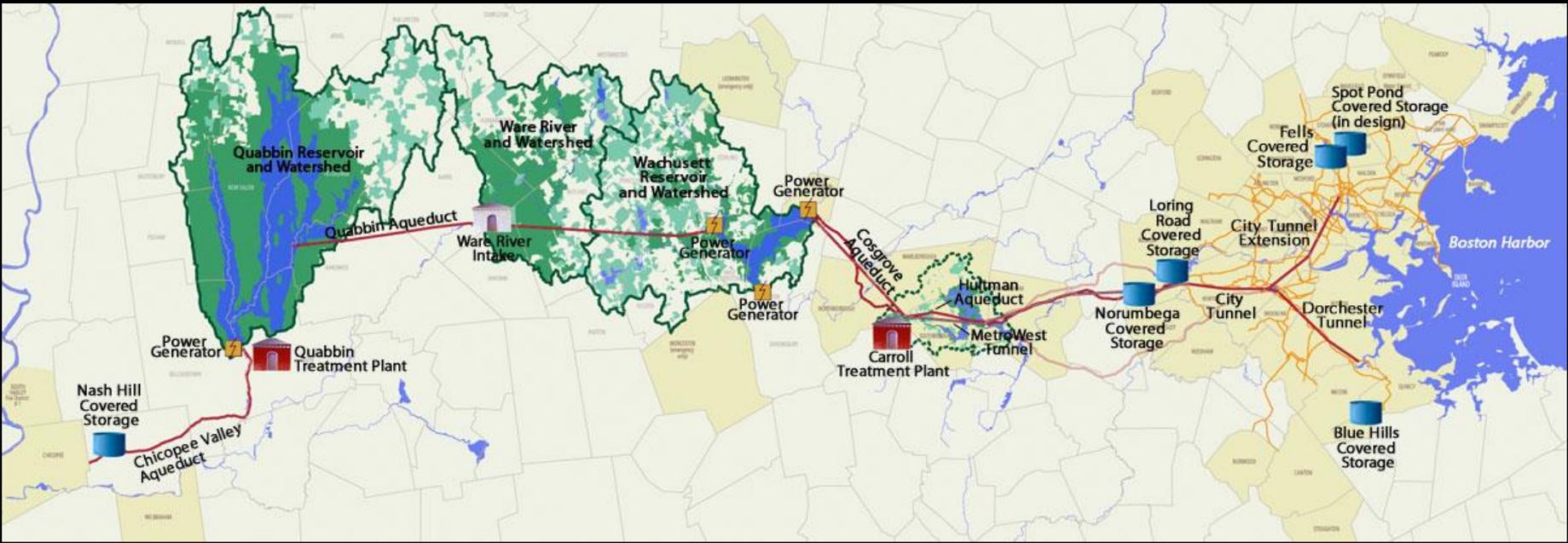
- ❖ The public is issued a notice regarding information about the violation
- ❖ The notice and information is regulated and approved by DEP
- ❖ The Town explains to the public what happened and what was done

# What causes coliform in the distribution system?

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- ❖ Many things
- ❖ Temperature
- ❖ Water age
- ❖ Tuberculated pipes
- ❖ Low chlorine residuals
- ❖ Biofilm

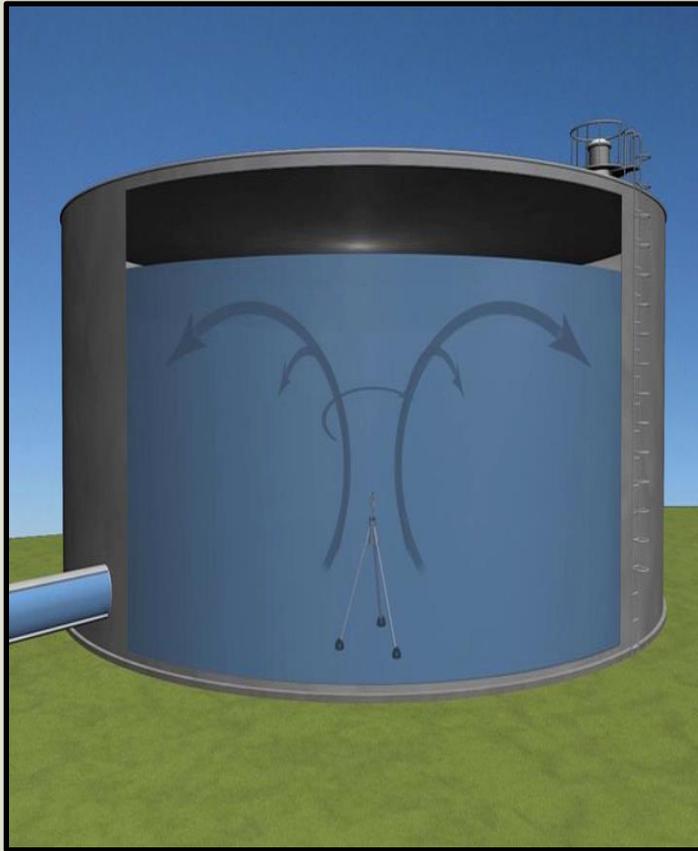
# Temperature & Age



# Tuberculated Pipes

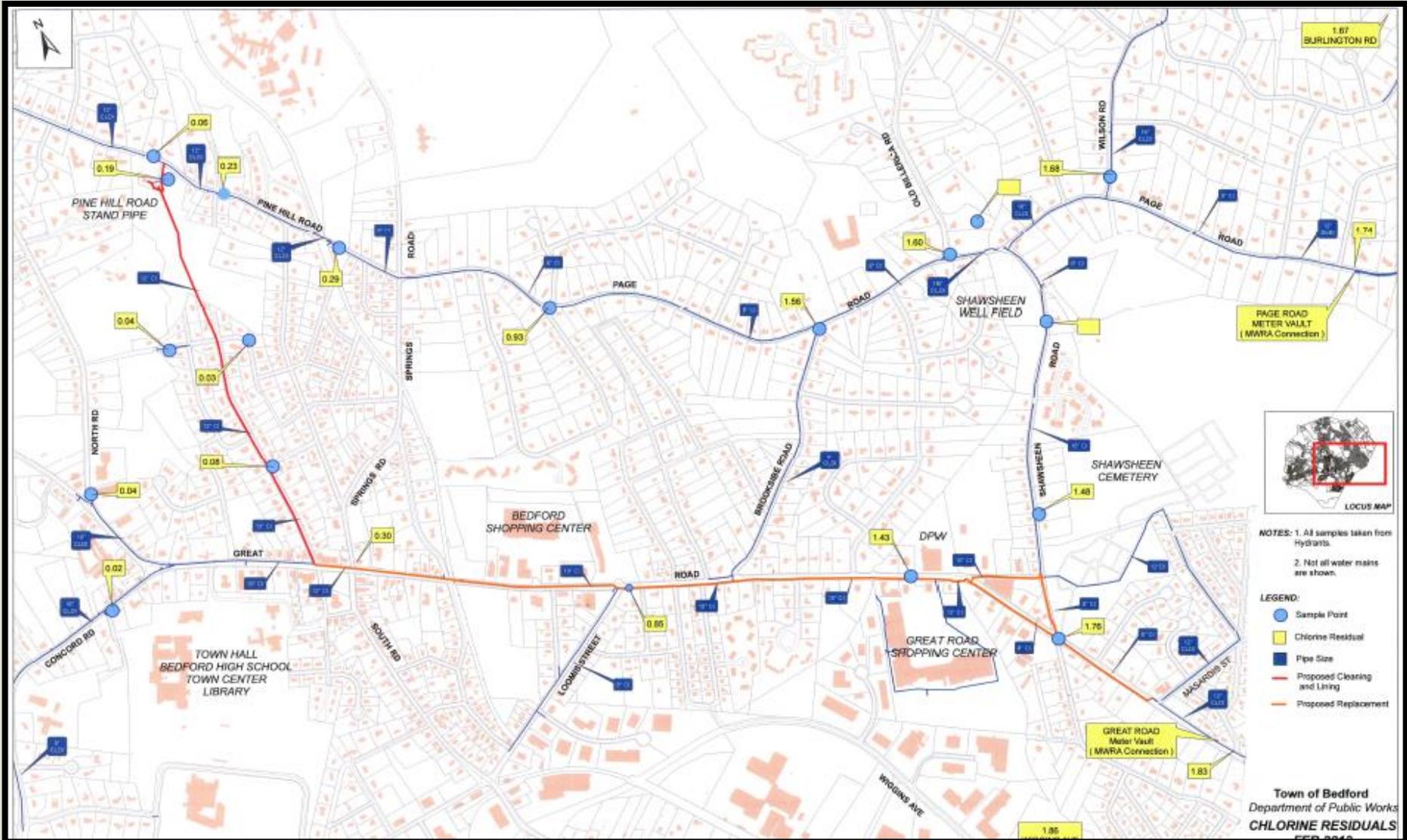


# Chlorine Residuals



- ❖ Pine Hill Tank
- ❖ Crosby Drive Tank
- ❖ Chlorine ports
- ❖ Internal Mixers
- ❖ Regulates temperature of water

# Chlorine Residual Mapping



# Poor Water Flow



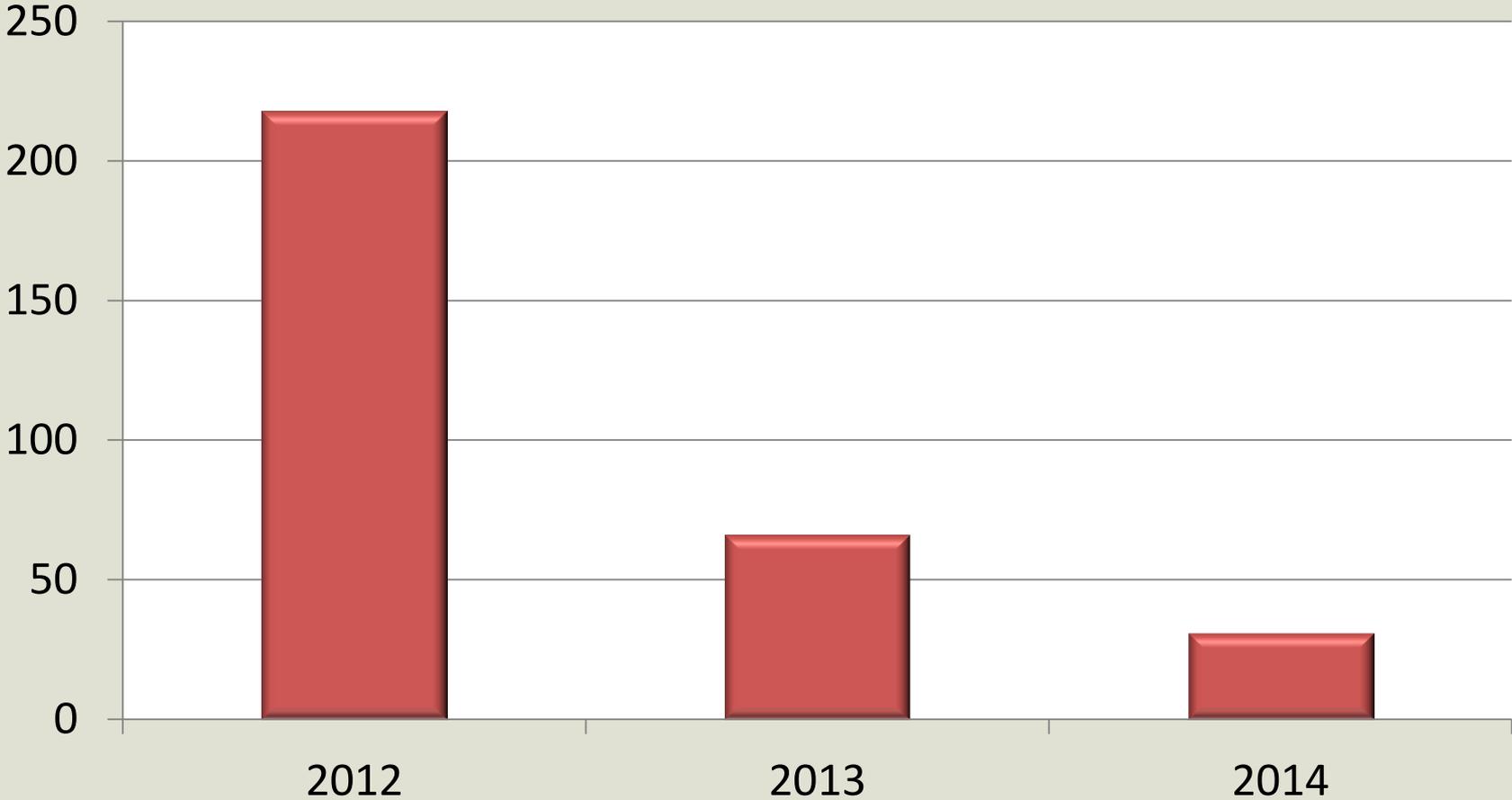
- ❖ Flushing program
- ❖ Some areas of town are flushed regularly throughout summer
- ❖ Reduces age of water
- ❖ Helps maintain chlorine levels

# 2014

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- ❖ 2 NON's – Public Notice
- ❖ 31 Coliform hits
- ❖ No mobile disinfection unit required
- ❖ Cleaned and Lined Shawsheen Road and Page Road water mains
- ❖ Chlorine residuals have improved
- ❖ Flushing has remained steady in the further sections of town

# HISTORICAL COLIFORM HITS





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**MOVING FORWARD**

# Future Goals

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- ❖ To eliminate the occurrence of coliform in the water
- ❖ Maintain chlorine levels throughout the town
- ❖ Reduce the amount of flushing
- ❖ Institute a consistent flow model that will help water move through town
- ❖ Preventative Maintenance program

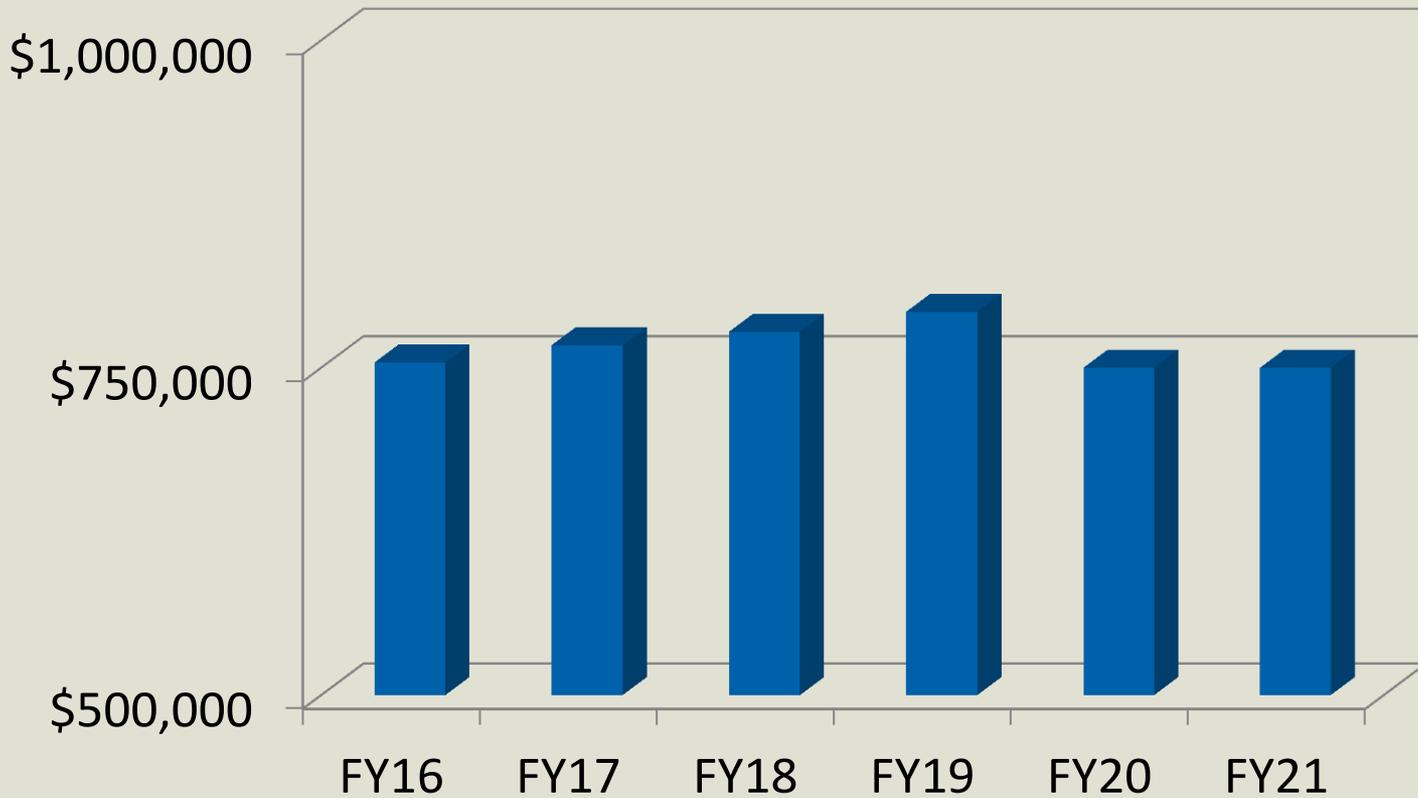
# Future Projects

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- ❖ Cleaning and Lining
- ❖ Water Tank Refurbishment
- ❖ SCADA Upgrades
- ❖ Automatic Flushing
- ❖ Preventative Maintenance program
- ❖ Booster Chloramination

# Six Year Capital Plan

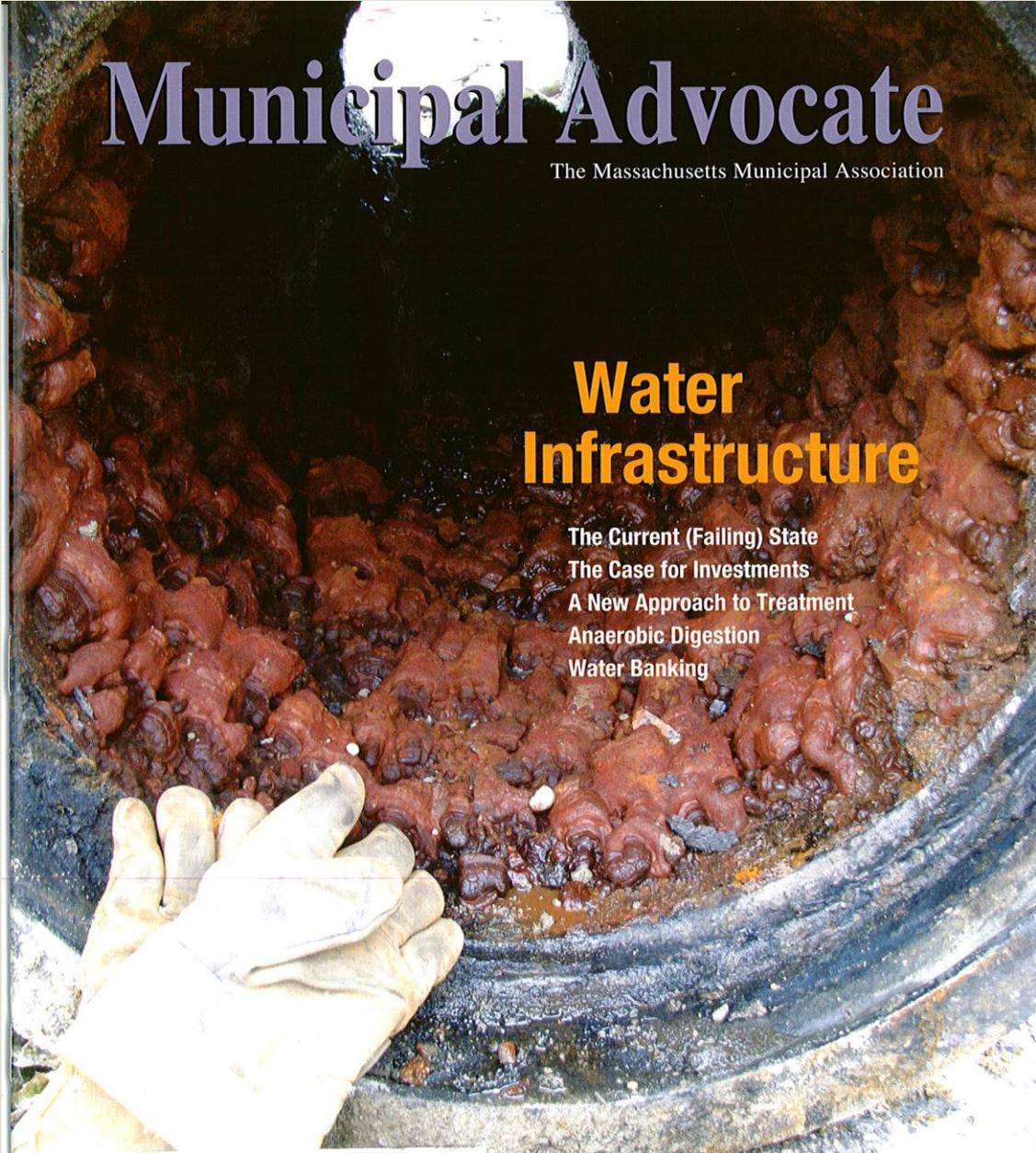
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# Conclusion

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Since experiencing significant issues within its water distribution system, the Town and Public Works has committed to resolve the problems in a responsive manner. With guidance from its water consultant and MassDEP the coliform problem has decreased each year since 2012. It is important to understand that no harmful bacteria was discovered such as E. coli at anytime during this stretch that would result in a boil water order. An accelerated capital plan is in place and will continue to improve the distribution system and provide good quality water to the people of Bedford.



# Municipal Advocate

The Massachusetts Municipal Association

## Water Infrastructure

The Current (Failing) State  
The Case for Investments  
A New Approach to Treatment  
Anaerobic Digestion  
Water Banking