





***Maximo Upgrade Project
Contract 7287, Amendment 2***

January 17, 2018



Contract 7287 Scope, Schedule and Budget

- Upgrading Maximo to the latest software version
- Installing additional add-on modules such as Spatial Asset Management and Maximo Anywhere
- Incorporating a variety of disparate MWRA asset databases
- Replacing the existing MIS helpdesk with IBM Control Desk
- Schedule was 26 months from NTP
- Cost not to exceed \$2,625,904



Accomplishments and Benefits To Date

- Core Asset & Maintenance Management Module Upgrade Substantially Complete 1/30/2017
 - Start Center Configurations
 - VMM – Scheduling of Pool Vehicles
 - Laboratory Asset Tracking
 - Property Pass
 - Tool Tracking
- Spatial Asset Management and Maximo Anywhere Implementation Substantially Complete 5/1/2017
- Interface Enhancements (Lawson, PI, Fuel Master, Gas Boy, GIS) Substantially Complete 5/1/2017
- IBM Control Desk (ICD)
 - Discovered Installation Sequencing Issues, MWRA Demand for Corrective Action 8/2/2017
 - Completed testing of ICD Module 1/8/2018
 - In progress installing ICD Module on Production Environment 1/22/2018

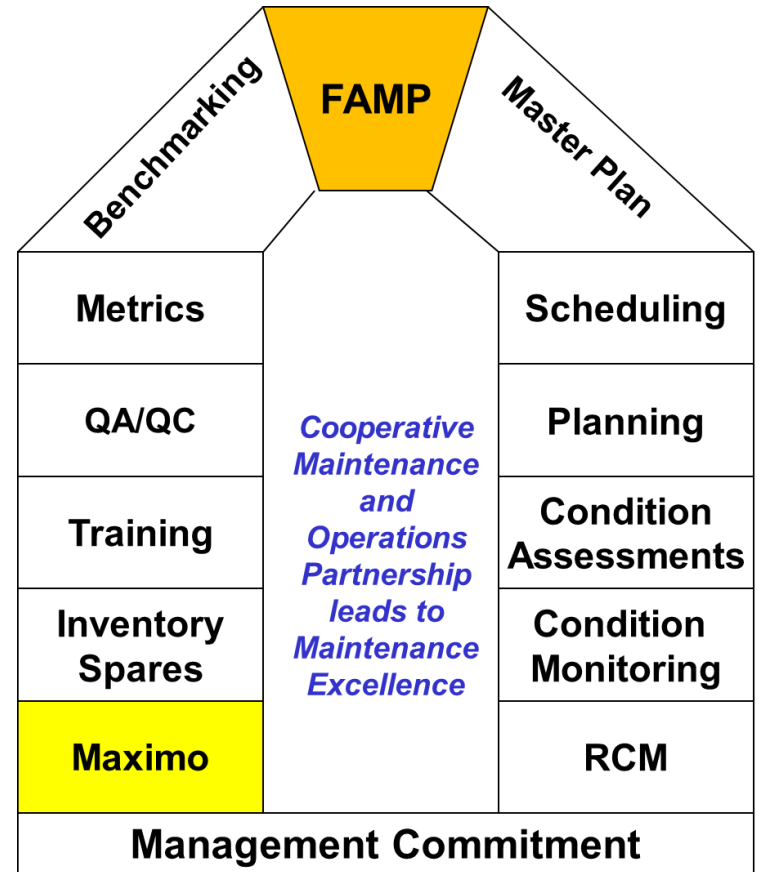


Facility Asset Management Program (FAMP)

Manages Life Cycle and maintenance activities for 139,000+ Assets throughout MWRA:

- Process approximately 66,000 Work Orders annually
- Tracks Total Asset Life Cycle costs (acquisition to disposition) with total value of Assets in excess of \$5 billion
- Ensure reliable plant operation
- Cost effectively replace components at the appropriate time
- Preserve value of ratepayer investment
- Prolong asset life cycle
- Control large budget spending spikes

Foundational Component of FAMP





Start Centers

- Graphical Start Centers Display:
 - Configured toward the User's job function
 - Are configurable by the User
 - PM/PdM Completion Rates
 - Open Service Requests and Work Orders
 - Quick links to favorite Applications

The screenshot displays a user interface for 'Mike Wilson' with a navigation sidebar on the left and a main content area. The sidebar includes categories like 'Go To Applications', 'My Recent Applications', and various functional areas such as Administration, Assets, Change, Contracts, Financial, Integration, Inventory, IT Infrastructure, Planning, Planning and Scheduling, Preventive Maintenance, Purchasing, Reference Applications, Release, Security, Self Service, Service Desk, Service Level, System Configuration, Task Management, and Work Orders.

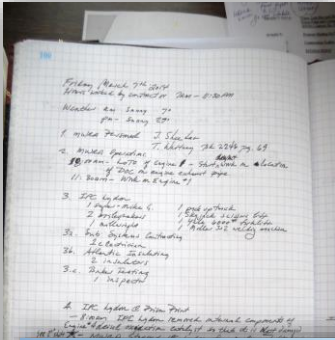
The main content area is titled 'Welcome, Mike Wilson' and contains several widgets:

- Administration:** A 'Result Set' table with columns 'Description' and 'Start Date'. It lists tasks like 'Disable Windows account', 'Disable Email account', 'Provide Report on Condition for Supervisor', 'Issue PC', 'Secure Room for Required Number Attendees', 'Disable Network account', 'Test electrical system, replace external switches', and 'Replace battery and clean spreading terminals'.
- Bulletin Board:** A message stating 'There are currently no bulletin board messages to view.'
- Inbox / Assignments:** A message stating 'No Assignments found for Mike Wilson.'
- KPI List:** A table with columns 'Status', 'KPI', 'Actual', 'Target', and 'Variance'. It shows 'Work Orders Overdue' with 433 actual, 16 target, and 418 variance, and 'Actual Labour Hours As A Percentage Of Estimated Costs (%)' with 1.07 actual, 90 target, and -88.93 variance.
- KPI Graph:** A gauge chart titled 'Open Work Orders Waiting Approval' with a scale from 0 to 200. The needle is at approximately 154. A table next to it shows 'Open Work Orders Waiting Approval' with 154 actual, 25 target, and 129 variance.
- Blocked Users:** A message stating 'No Data Found.'
- Quick Insert:** Links for 'New Asset', 'New CI', and 'New Classification'.
- Favorite Applications:** Links for 'Users', 'Application Designer', 'Purchase Orders', and 'Work Order Tracking'.
- Result Set:** A message stating 'This portfolio has not been set up. To set up, select the edit icon in the portfolio header.'



Maximo Anywhere

- Asset Audit application
 - Perform Asset/Tool Audits
- Work Execution application
 - Enter Labor Actuals and Failure Reporting

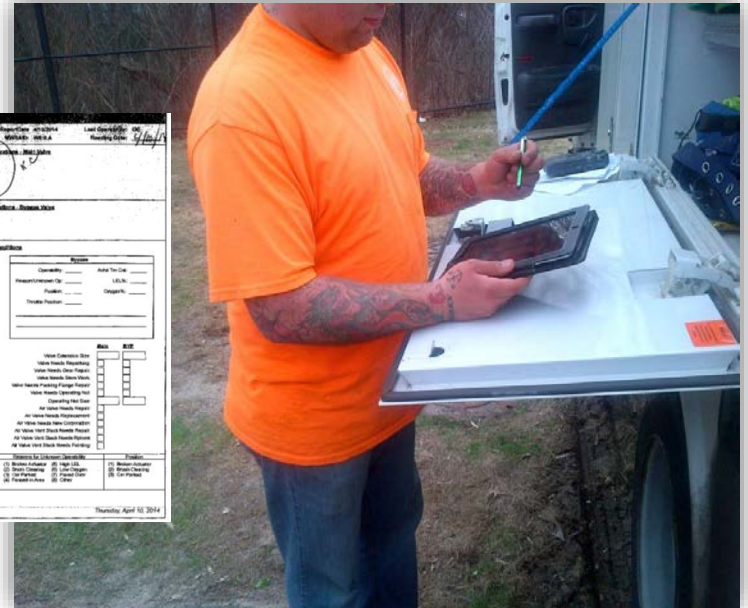


Asset ID	Asset Name	Asset Type	Asset Location	Asset Status
10000000000000000000	10000000000000000000	10000000000000000000	10000000000000000000	10000000000000000000

Work Condition	Asset	Asset
Asset ID	Asset Name	Asset Type
Asset Location	Asset Status	Asset Condition

Work Condition	Asset	Asset
Asset ID	Asset Name	Asset Type
Asset Location	Asset Status	Asset Condition

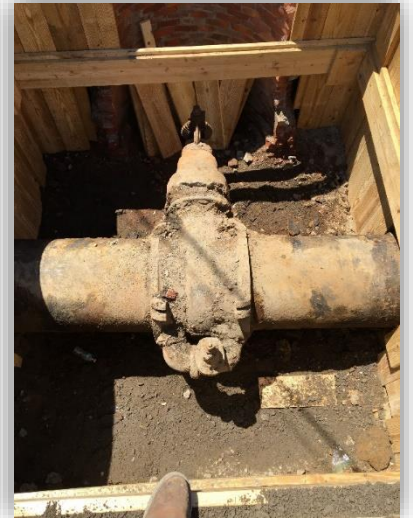
Work Condition	Asset	Asset
Asset ID	Asset Name	Asset Type
Asset Location	Asset Status	Asset Condition





GIS Integration

- Asset Location Program
- SSO Field Data Collection
- Cathodic Protection
- Meters
- Valves





Spatial Asset Management

- One or more map “layers” can be displayed within Maximo with the ability to zoom in or out to display:
 - Work Orders current and/or historical
 - Assets Active, Abandoned in-place, Decommissioned, Type, etc.
- Data allows MWRA to find “hot spots” with high failure rates assisting with developing CEB and CIP Asset replacement budgets

The screenshot displays the Maximo Spatial Asset Management interface. At the top, there are tabs for Specifications, History, Work, Work Zones, Service Address, and Map. The Map tab is active, showing a map of a water network. The Location field contains '55503' and the Asset field contains '8 INCH GATE/BOV'. The map shows several water lines, including 'Sec. Walnut St. Line' and 'Sec. Walnut St. Line', and a 'Brookline Reservoir'. A popup window titled 'Blowoff Valves' is open, displaying the following data:

```
OBJECTID = 884
FACILITYID = WCL-3-A
PIPESECTION = WCL
MAXIMOID = WCL:3.A
DETRECID = WCL-3
SUBTYPEDESC = BlowOff
WS_STATUS = Online
PRESSUREZONE = SHS
DETRECLINK = \\chelsea21\GISWeb\WebMaps\
STREET = Lee St
TOWN = BROOKLINE
CONTRACT = 6285
WS_SOURCE = 5
```

The Layers panel on the right side of the map shows the following layers:

- Layers
- Water Maximo Layers
 - Water Work Orders
 - Other
 - Waiting
 - Waiting Material
 - Manger Appr
 - In Progress
 - APRR
 - Finished
 - Comp
 - Hold
 - Valves
 - Air Release Valves
 - Blowoff Valves
 - Control Valves
 - Water Reference



Contract 7287 Amendment 1

- 180 Day Extension of Time to correct installation Sequencing of add on Modules
 - Total Resources Management acknowledged responsibility
 - Additional time was required to properly sequence and install Control Desk, migrate data and redeploy the add-on modules to production
- Amendment 1 also authorized the reallocation of \$109,222.56 of the unexpended funds to the allowance for Special Support Services which provides for enhancements and additional features not included in the original scope
- In September 2017, the Executive Director approved Amendment 1, under delegated authority, to extend Contract 7287 180 days, to February 3, 2018, with no increase in contract price
- The work to correct the installation sequencing and redeploy the upgraded system has taken longer than anticipated and is scheduled to be complete as of January 22, 2018



This Amendment

- Staff request that Contract 7287 be amended to extend the term 328 days, from February 4, 2018 to December 28, 2018 with no increase in contract price:
 - ICD Configuration, Testing and Implementation (140 days)
 - Special Support Services Tasks (98 days)
 - 90 Day Warranty Period



Contract Summary

	<u>AMOUNT</u>	<u>TIME</u>	<u>DATED</u>
Original Contract	\$2,625,904	792 Days	06/08/2015
Amendment 1*	\$0	180 Days	09/08/2017
Proposed Amendment 2	<u>\$0</u>	<u>328 Days</u>	Pending
Adjusted Contract	\$2,625,904	1,300 Days	

* Approved under delegated authority



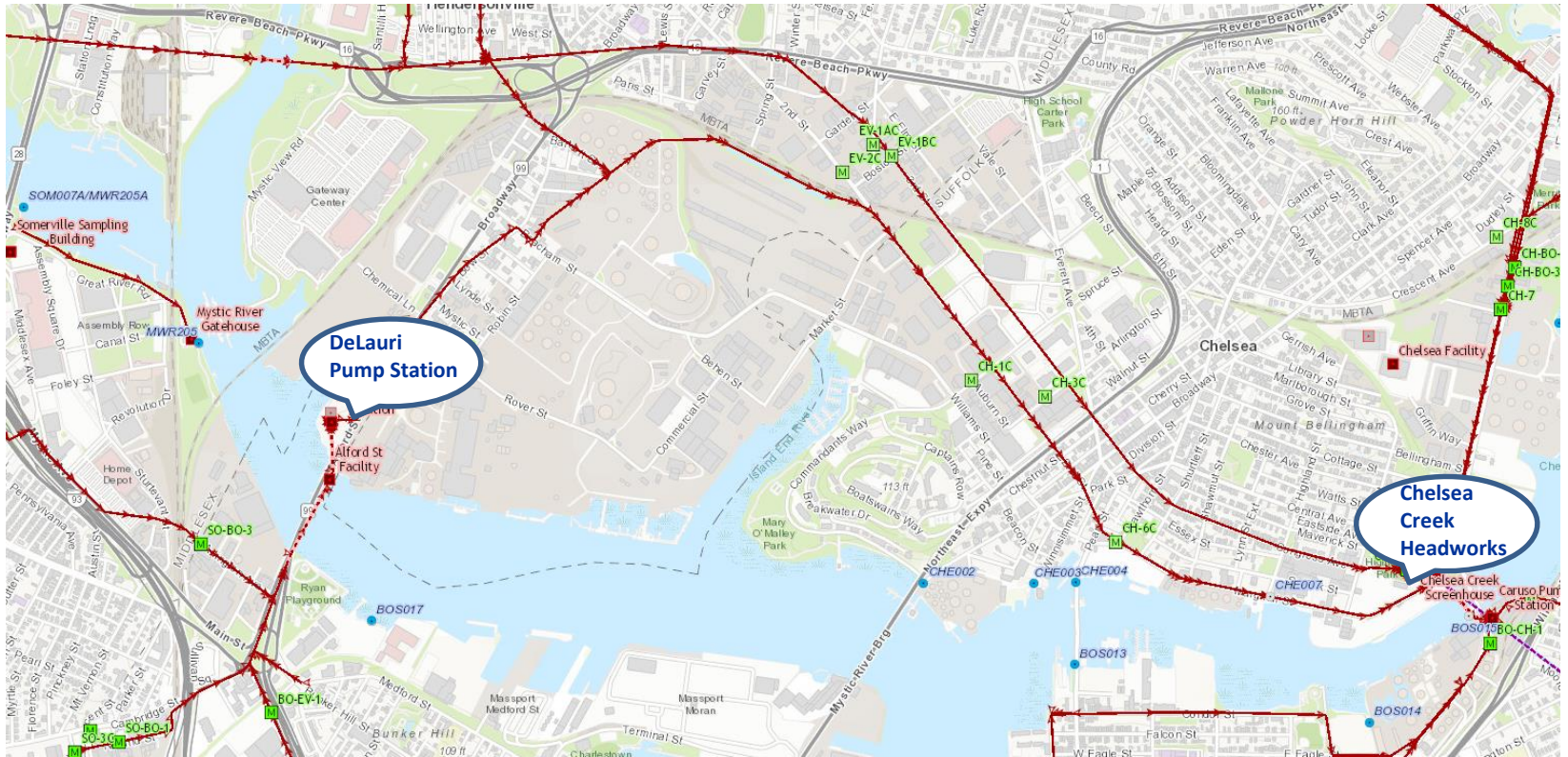


***DeLauri Pump Station Screens and Security
Upgrades, Contract 7361***

January 17, 2018



DeLauri Pump Station – System Map





Pump Station Overview

60" Ø Influent Sewer

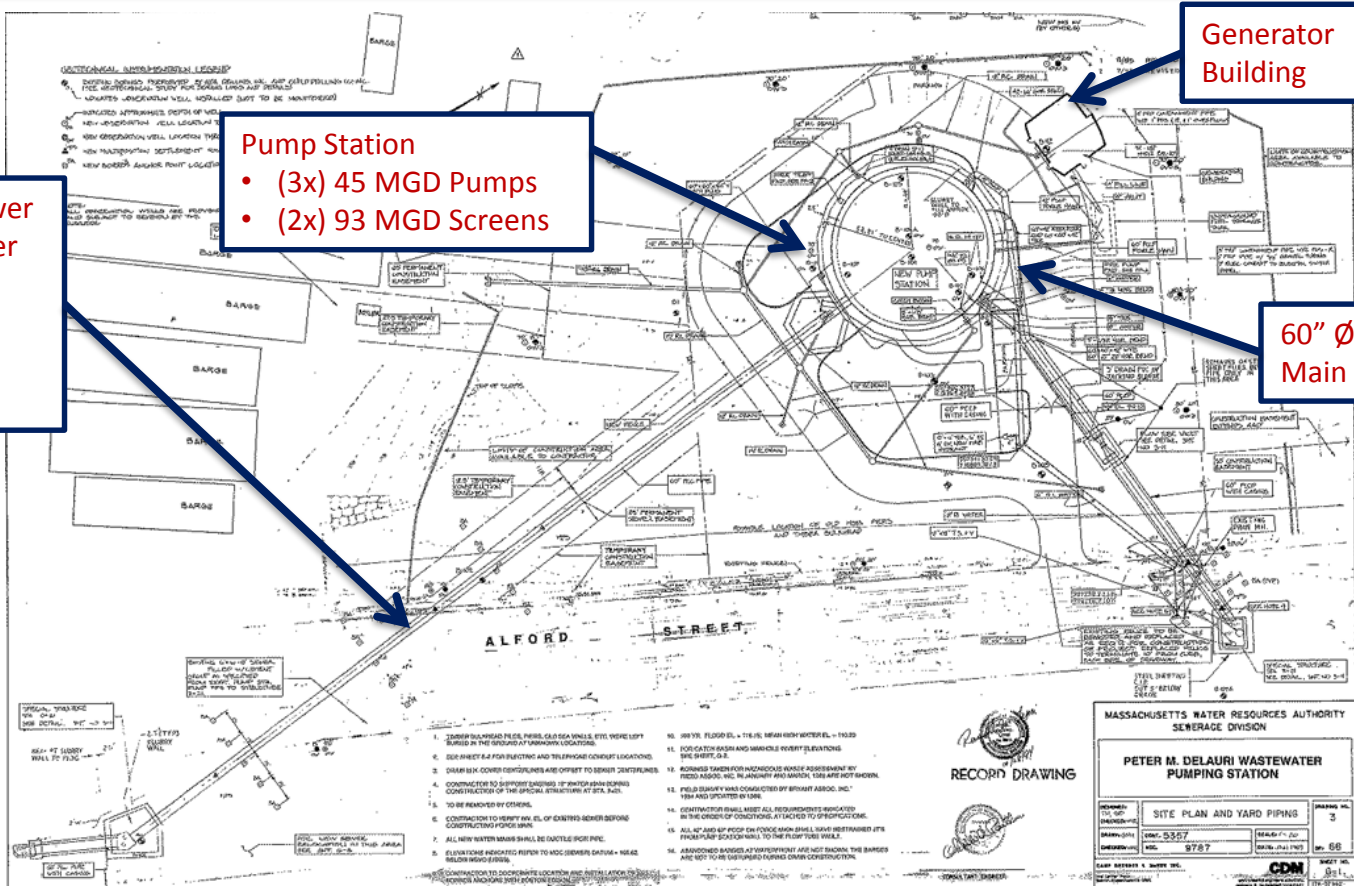
- Combined sewer flows from Cambridge, Boston and Somerville

Pump Station

- (3x) 45 MGD Pumps
- (2x) 93 MGD Screens

Generator Building

60" Ø Sewer Force Main



1. UNDER THE PUMPING PIPES, THERE IS A SEA WALL. ELEVATION IS 10.00.
2. SEE SHEET 1-4 FOR CONTRACT AND TELEPHONE CONDUIT LOCATIONS.
3. SEE SHEET 1-5 FOR CONTRACT AND TELEPHONE CONDUIT LOCATIONS.
4. CONTRACTOR TO SUPPORT BARRIERS OF PUMPING STATION BARRIERS CONSTRUCTED BY THE SPECIAL STRUCTURES AT SEA WALL.
5. TO BE REACHED BY CRANE.
6. CONTRACTOR TO VERIFY AND ELEV. OF EXISTING BARRIER BEFORE CONSTRUCTION OF PUMPING STATION.
7. ALL NEW EXISTING BARRIERS SHALL BE EXISTING FOR PUMP.
8. ELEVATIONS INDICATED REFER TO MDC BARRIER DATUM + NEAR BARRIER BARRIERS.
9. CONTRACTOR TO COORDINATE LOCATION AND BARRIERS WITH OTHER CONTRACTORS AND AGENCIES.
10. SEE SHEET 1-4 FOR CONTRACT AND TELEPHONE CONDUIT LOCATIONS.
11. POSITION FOR BARRIERS AND BARRIERS PUMPING STATION.
12. BARRIERS TAKEN FOR HYDRAULIC MODEL ASSESSMENT BY TROD ASSOC. INC. IN AUGUST 2008. SEE SHEET 1-5 FOR BARRIERS.
13. PUMP BARRIERS WERE CONDUCTED BY BIRDAUT ASSOC. INC. FROM AND LOCATED BY 10/08.
14. CONTRACTOR SHALL VERIFY ALL REQUIREMENTS INDICATED IN THE ORDER OF CONDITIONS, AS LACED TO SPECIFICATIONS.
15. ALL 42" AND 48" PUMP ON FORCE MAIN SHALL BE OBTAINED ITS FROM THE BARRIERS TO THE PUMPING STATION.
16. APPROVED BARRIERS AT PUMPING STATION ARE NOT TO BE BARRIERS ARE NOT TO BE BARRIERS DURING OTHER CONSTRUCTION.

MASSACHUSETTS WATER RESOURCES AUTHORITY
SEWERAGE DIVISION

PETER M. DELAURI WASTEWATER PUMPING STATION

SITE PLAN AND YARD PIPING

PROJECT NO.	5557	SHEET NO.	3
CONTRACT NO.	9787	DATE	08/11/08
CDM		CDM	



Scope of Work Included in Contract 7361

- **Replace Catenary Bar Screens at Inlet Channel**
 - Removal and Installation of Catenary Bar Screens, Electrical Conduit, Control and Instrumentation
 - Concrete Repair Work
 - Start-up and Testing
- **Security Upgrades**
 - Card Readers (All Doors Used to Enter Pump Station and Generator Building)
 - Door Switches (All Roll-Up Doors)
 - Motion Detectors (Throughout)
 - Conduit and Ductbank Installation
 - Start-up and Testing

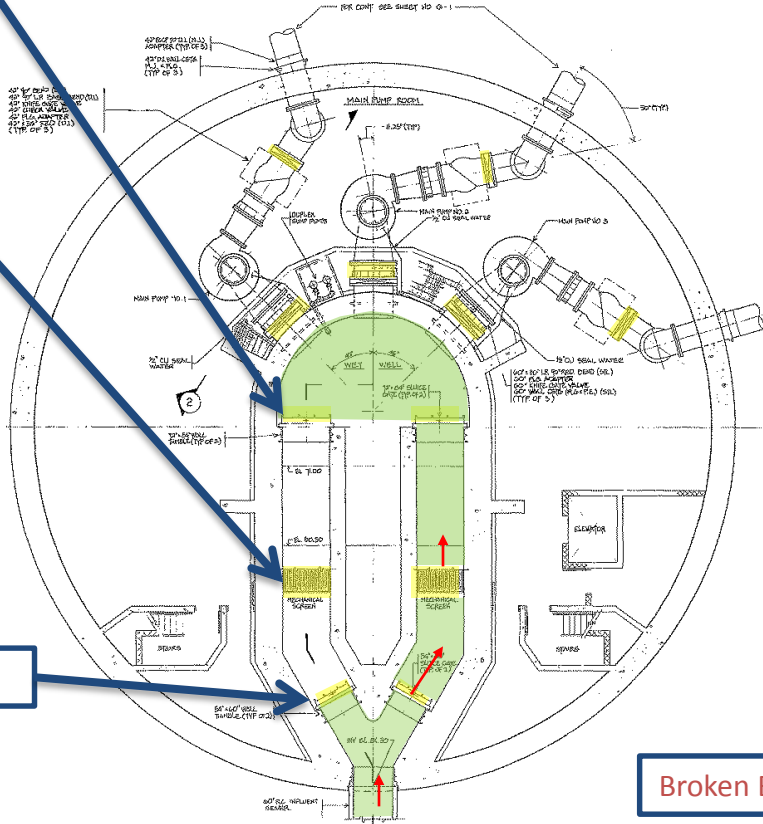


Replace Catenary Bar Screens

Sluice Gate Closed

Channel Dry for Bar Screen Replacement

Sluice Gate Closed



Damaged Bar Screens



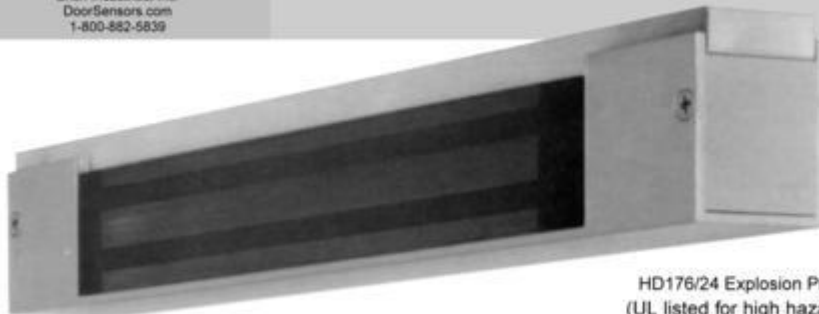
Broken Bar Screens



Security System Upgrades



Erich Industries, Inc.
DoorSensors.com
1-800-882-5839



HD176/24 Explosion Proof Maglock
(UL listed for high hazard locations)



Contract 7361 DeLauri Pump Station Upgrades - Procurement

- Bids Opened December 27, 2017
- Two Bids Were Received
- Lowest Responsible Bidder: Daniel O'Connell's Sons, Inc. **\$1,330,000**

Bidder	Bid Price
Daniel O'Connell's Sons, Inc.	\$1,330,000
<i>Engineer's Estimate</i>	<i>\$1,430,000</i>
WES Construction Corp.	\$2,123,000





***Prison Point CSO Facility Improvements
Design, Construction Administration and
Resident Engineering Services***

Contract 7359, Amendment 1

January 17, 2018



Prison Point CSO Facility



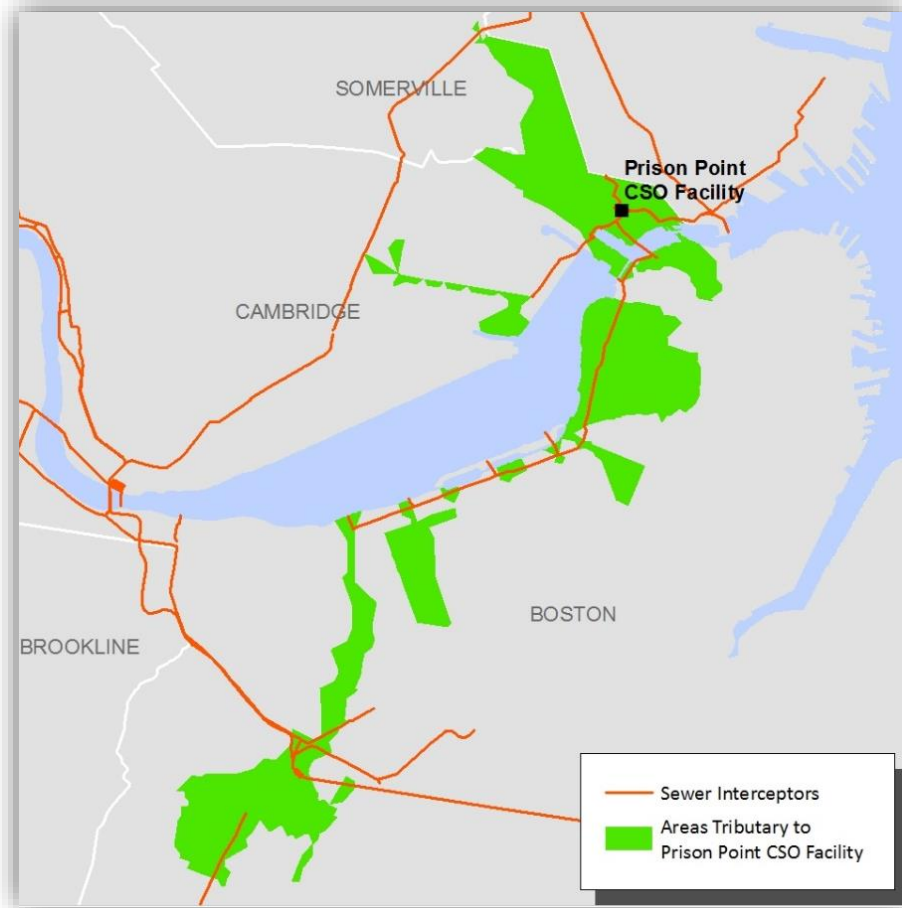
Main Building



Chemical Building

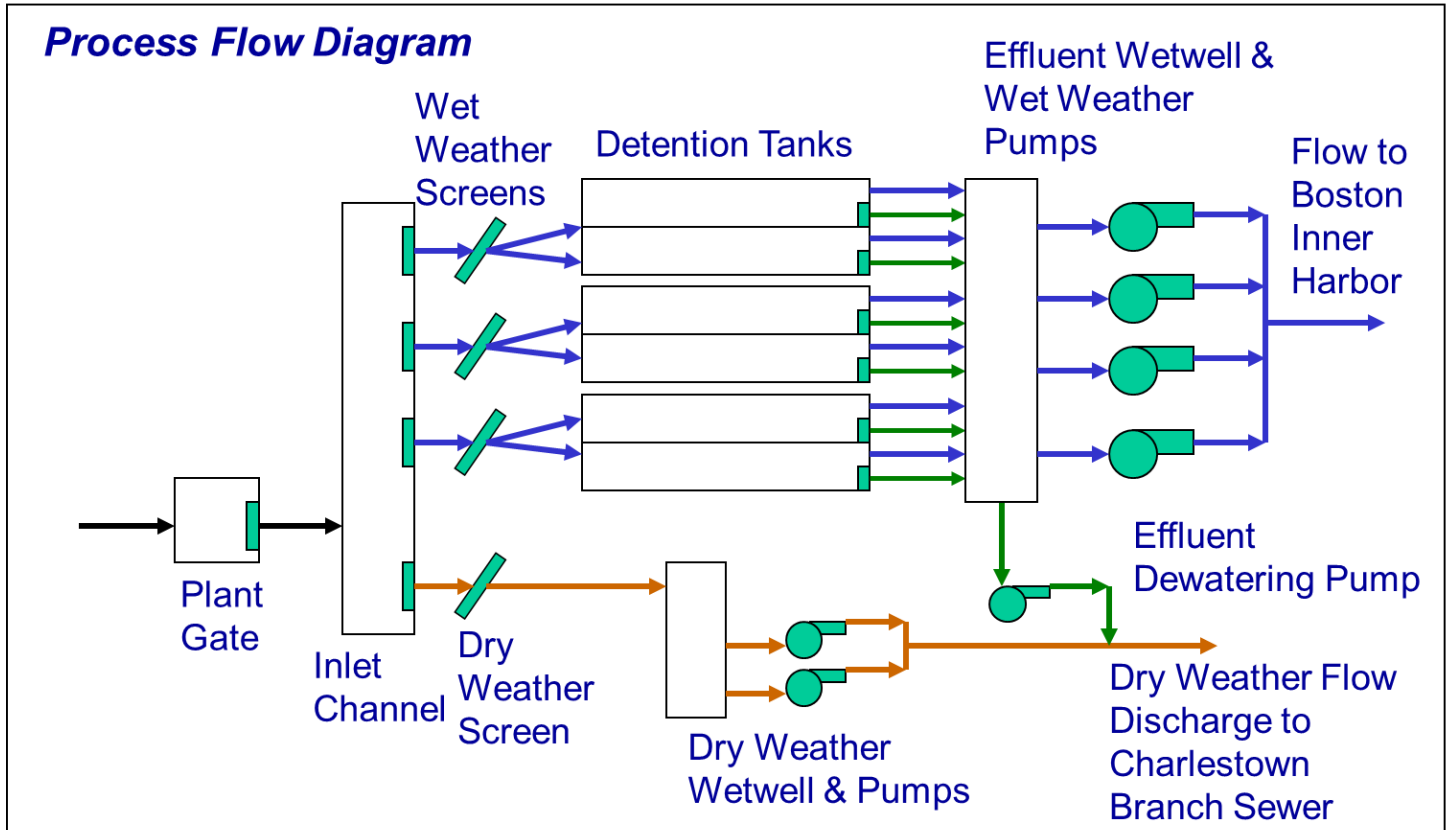


Prison Point CSO Facility Tributary Area





Prison Point CSO Facility Process Flow Diagram





Scope of Services Includes:



Mechanical Bar Screens to be Replaced



Replacement of Conveyor System



Scope of Services Includes:



Dry Weather and Dewatering Pumps
to be Replaced



Replacement of Leaking
Chemical Tanks



Amendment 1 Work Includes:



Storm Pump Engine to be Replaced



Relocation of Electrical Room



Amendment 1 Work Includes:



Interior Lining of Wet Weather Discharge Piping



Replacement of Lightning Protection on
Chemical Building



Amendment 1 Work Includes:



Generator to be Replaced



Amendment 1 – Engineering Work Summary

Time extension of three months for the following additional work:

Two Additional Diesel Engines for Storm Pumps	\$105,000
Automatic Transfer Switch and Standby Generator	\$45,100
Lining of Discharge Pipe	\$45,000
Final Design of Electrical Room	\$28,064
MA Building Code 9th Edition Review	\$23,500
Lightning Protection	\$19,900
Project Administration	\$16,500
Bidding Services	\$13,000
Construction Administration and Resident Engineering Services	\$6,125
Escalation	
Total	\$302,189





***Alewife Brook Pump Station Rehabilitation
Design, Construction Administration and
Resident Engineering Services
Contract 7034, Amendment 4***

January 17, 2018

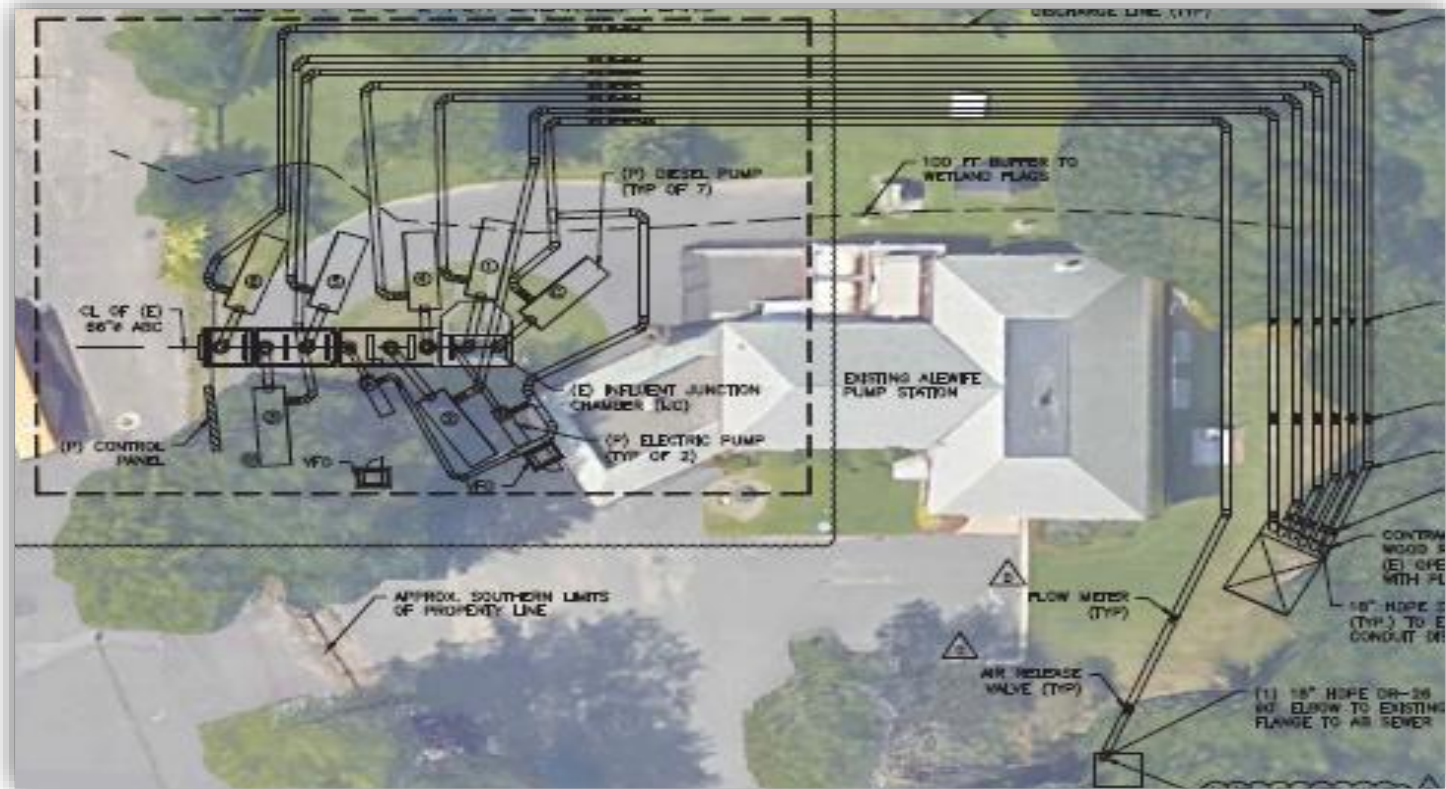


Alewife Brook Pump Station





Bypass Pumping Arrangement



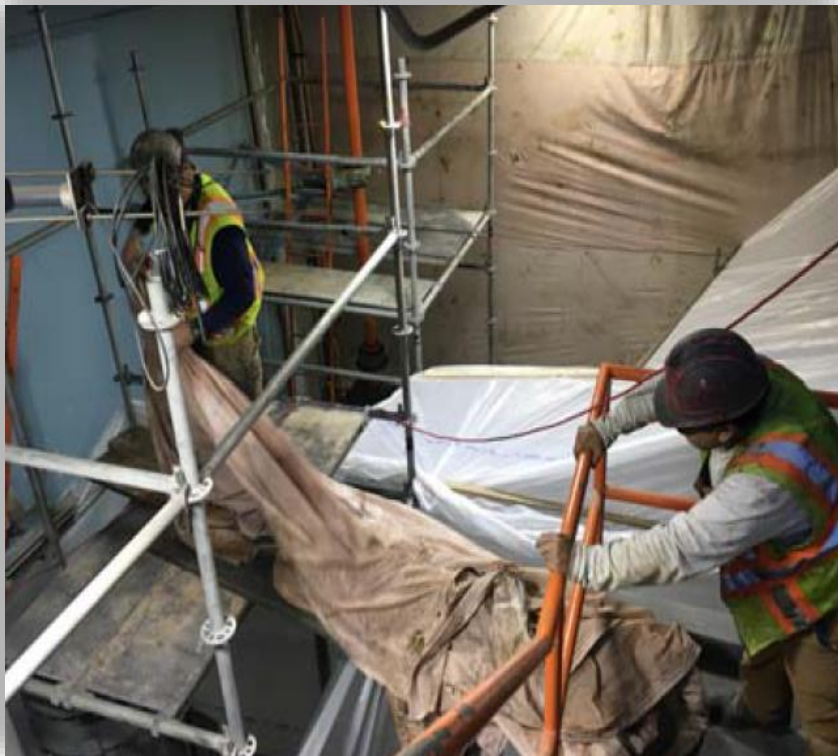


Extension of Bypass Chamber and Demolition of Boilers





PCB Abatement





Demolition of Screens





Connecting Screen Room to Hatch Area





Proposed Amendment 4

Additional Time

- Extension of 194 days to align with construction contract

Additional Budget

• Indirect Cost Rates Changes and Labor Escalation	125,949.78
• Contract Admin, Onsite Inspections + Reporting	39,545.79
• Hazardous Materials Oversight	20,000.00
• Shop Test Witnessing	<u>10,000.00</u>
	\$195,495.57



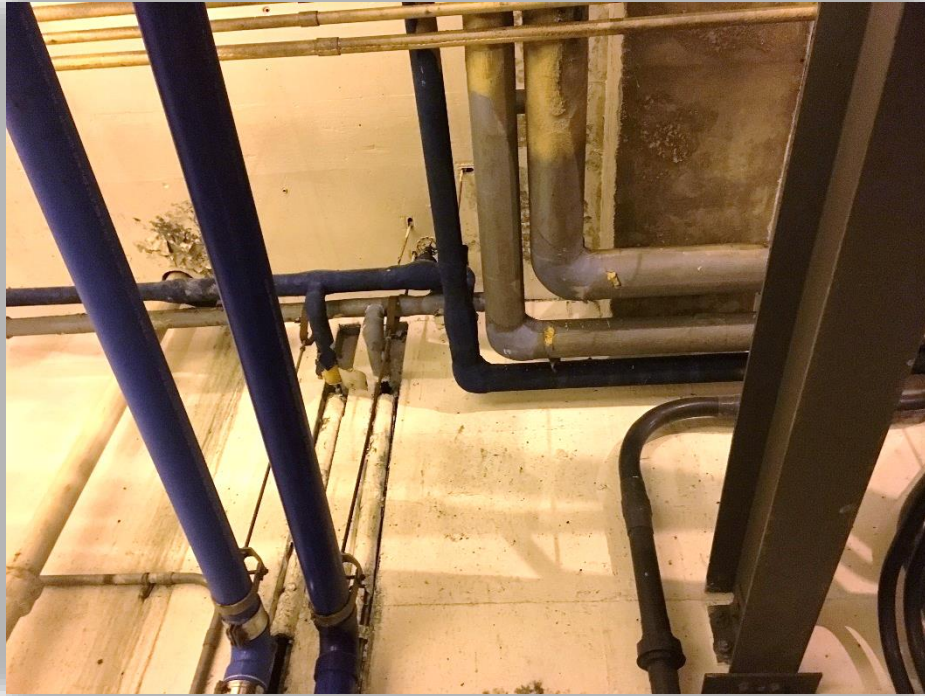


***Chelsea Creek Headworks Upgrade
Contract 7161 - Change Order 7***

January 17, 2018



Chelsea Headworks Upgrade: Corroded Plumbing Systems





Chelsea Headworks Upgrade: Corroded Plumbing Systems





Chelsea Headworks Upgrade: Plumbing Code Issues





Chelsea Headworks Upgrade: Asbestos Tar Paper Abatement





Chelsea Creek Headworks: Exterior Brick and Panel Removal





Chelsea Headworks Upgrade: Channel 1 Demolition





Chelsea Headworks Upgrade: New Electrical Service





Chelsea Headworks Upgrade: HVAC and Temporary Ventilation





Chelsea Headworks Upgrade: Floor Coatings





Chelsea Headworks Upgrade: Pile Driving





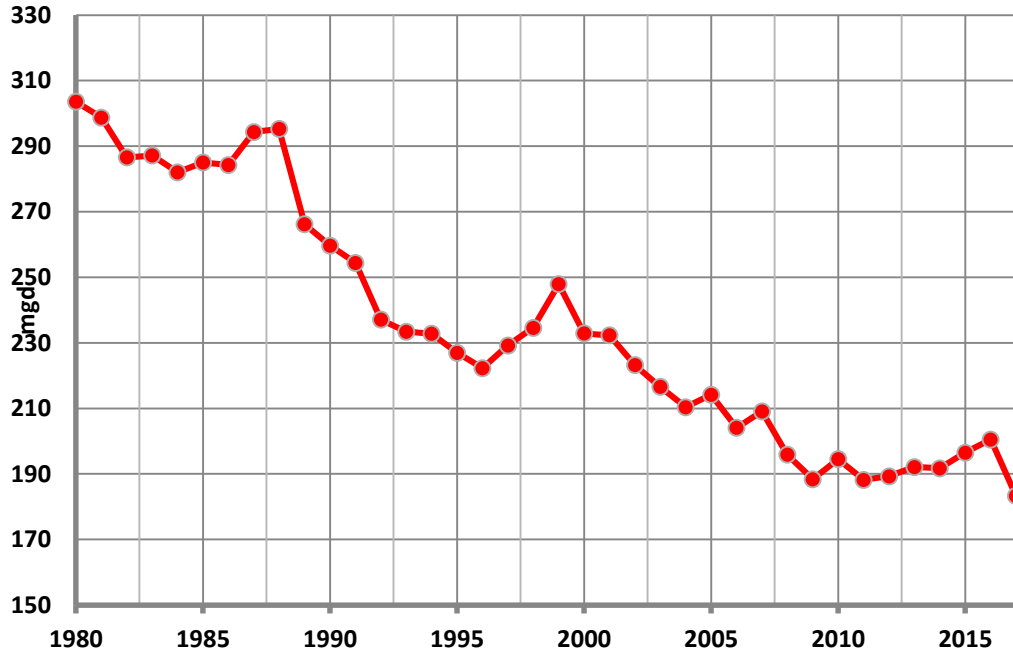


***Report on 2017 Water Use Trends and
Reservoir Status***

January 17, 2018



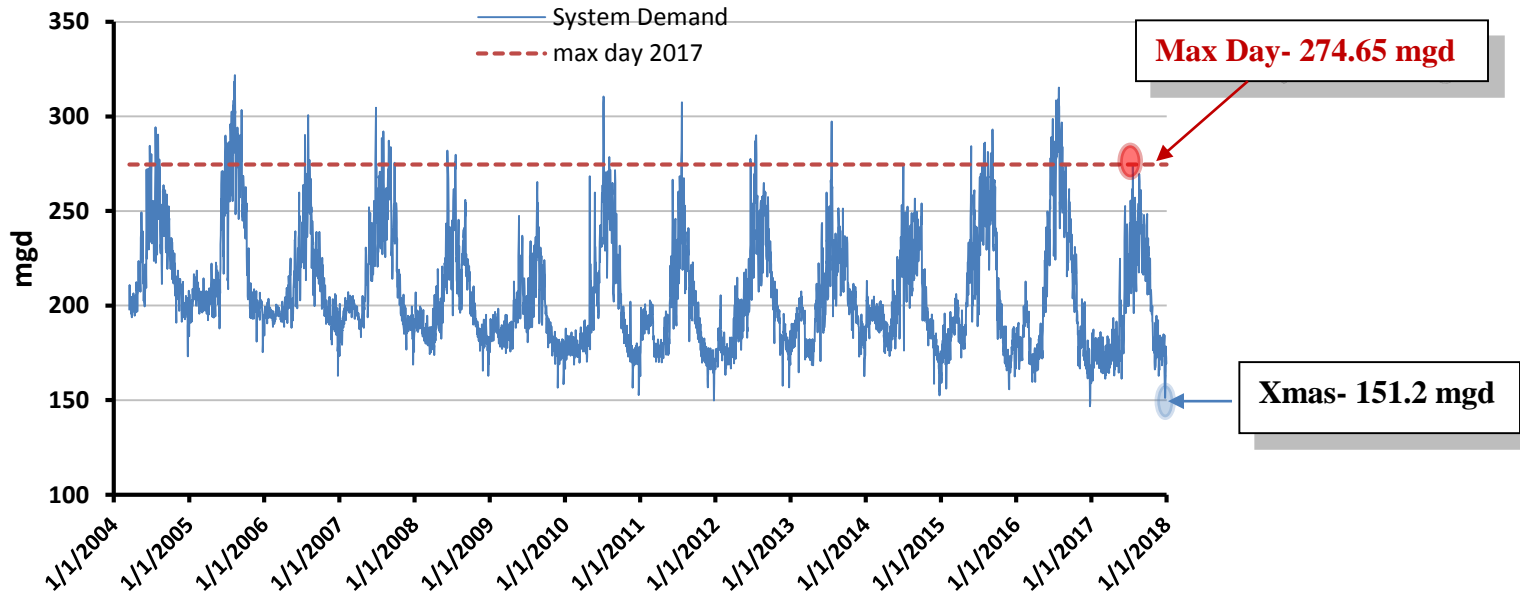
Total Consumption by MWRA Communities (1980 to 2017)



2017 --
183.3 mgd

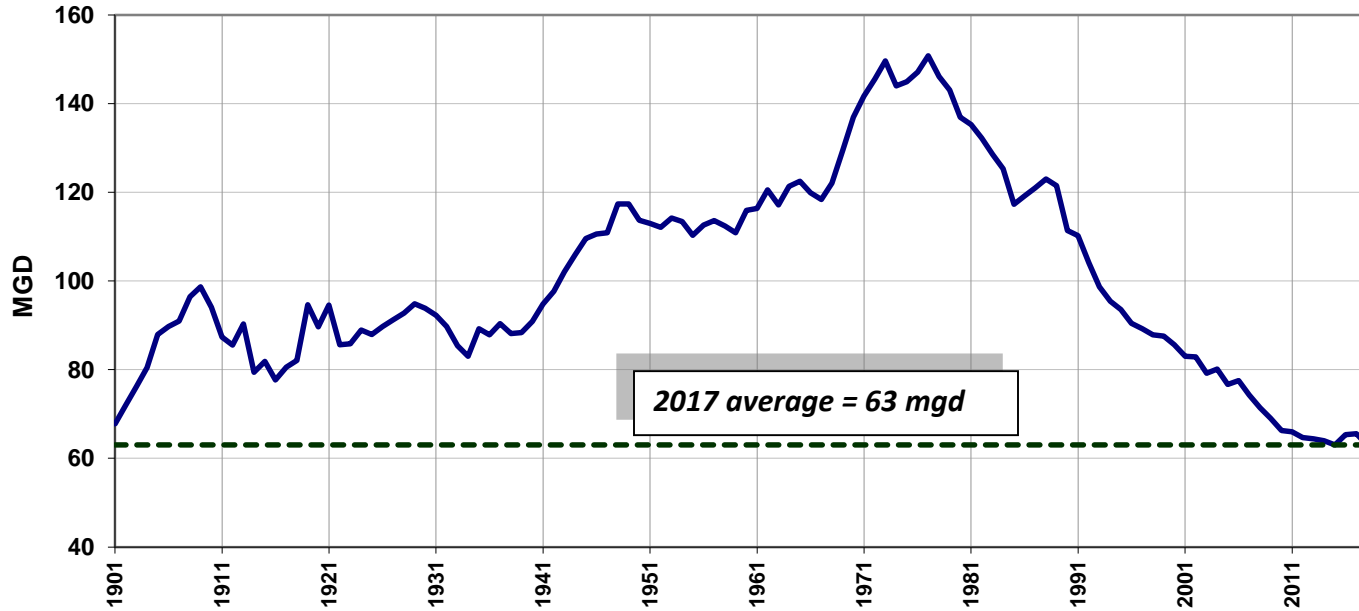


Daily System Demand



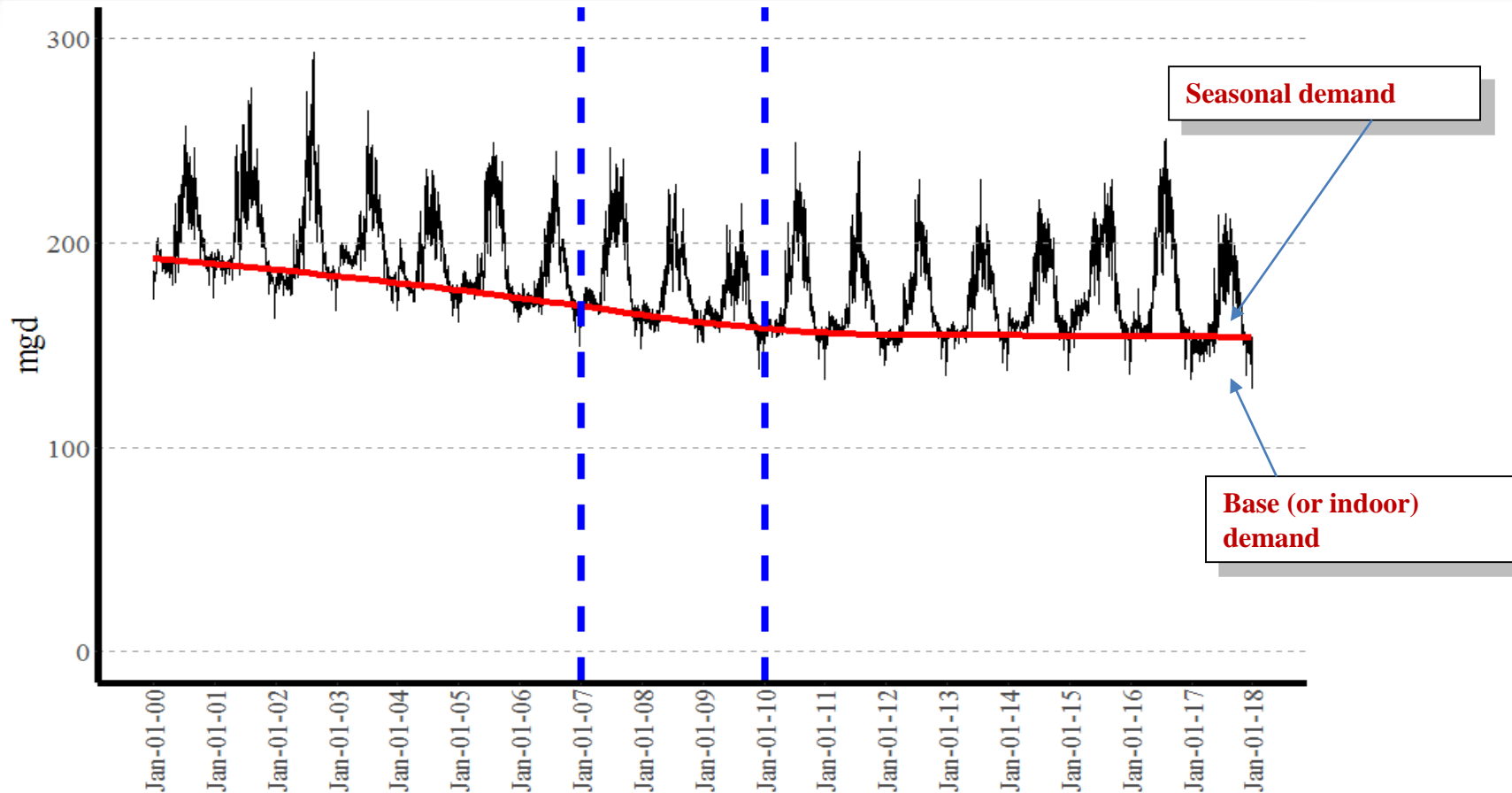


Boston Water Use (1900 to 2017)



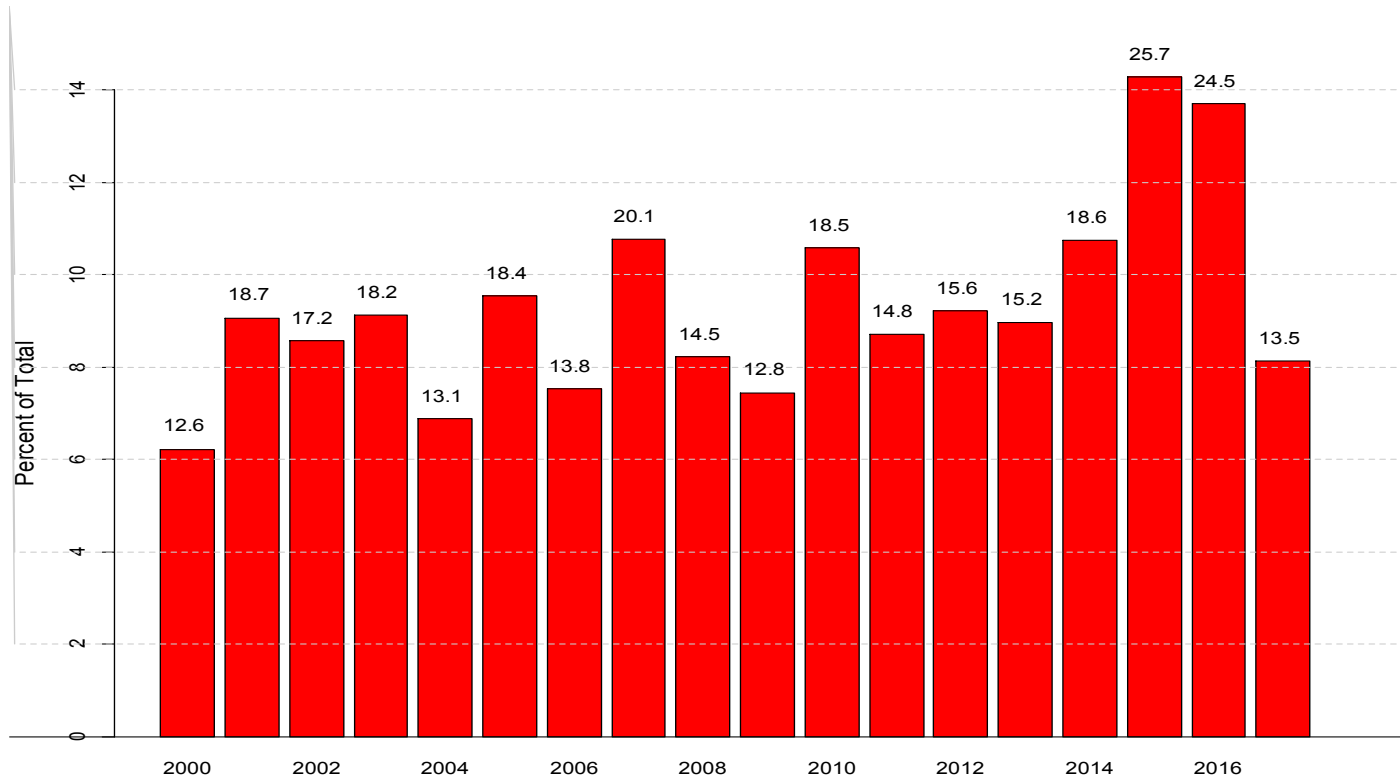


Fully Supplied Communities Demand (2000 to 2017)



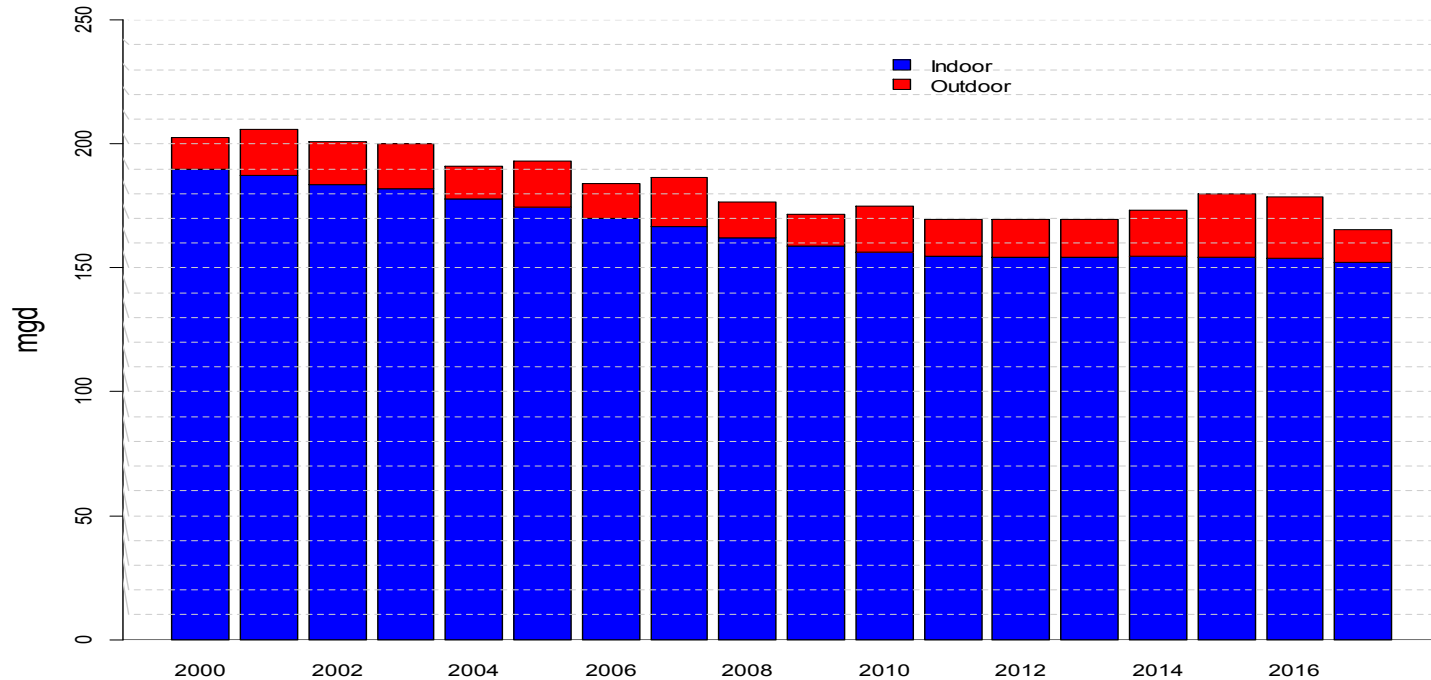


Fully Supplied Communities Annual Base and Outdoor Demand



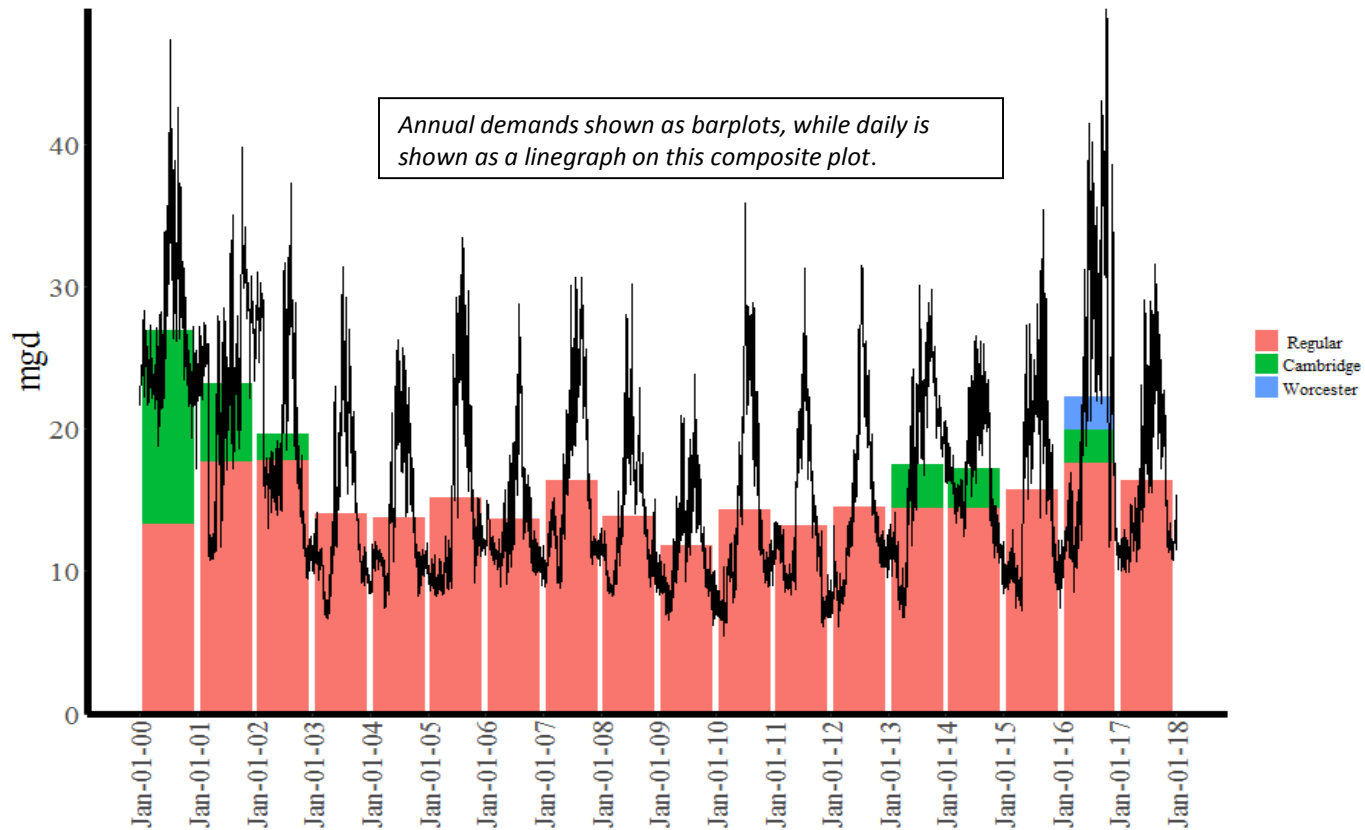


Fully Supplied Communities (Annual Base and Outdoor Use)



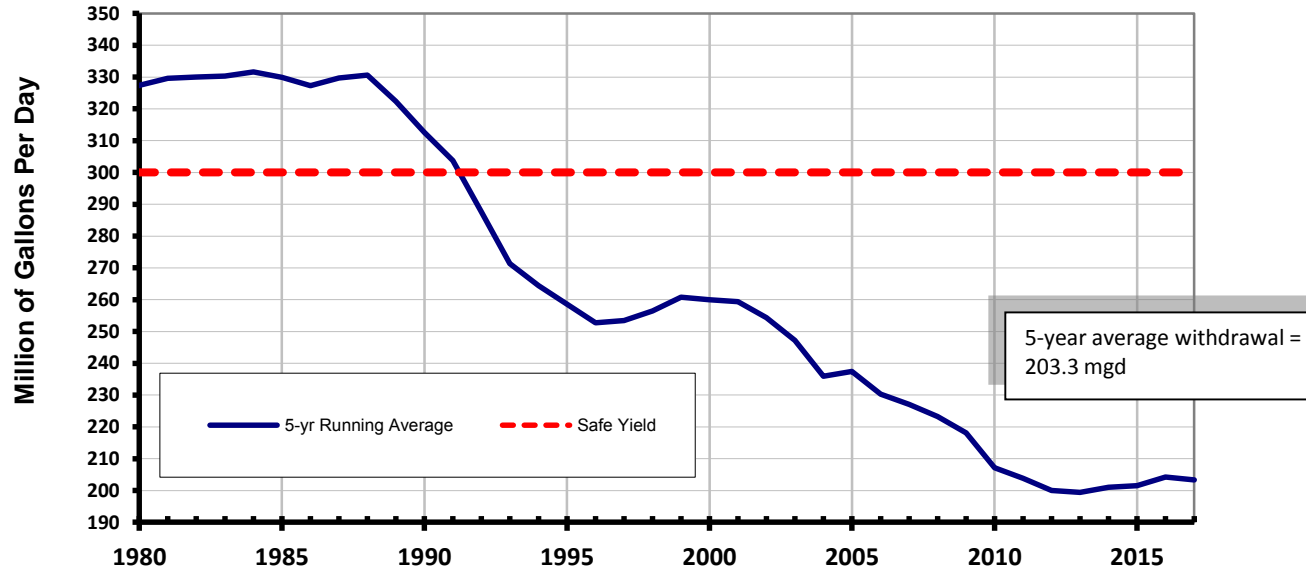


Partially Supplied Communities



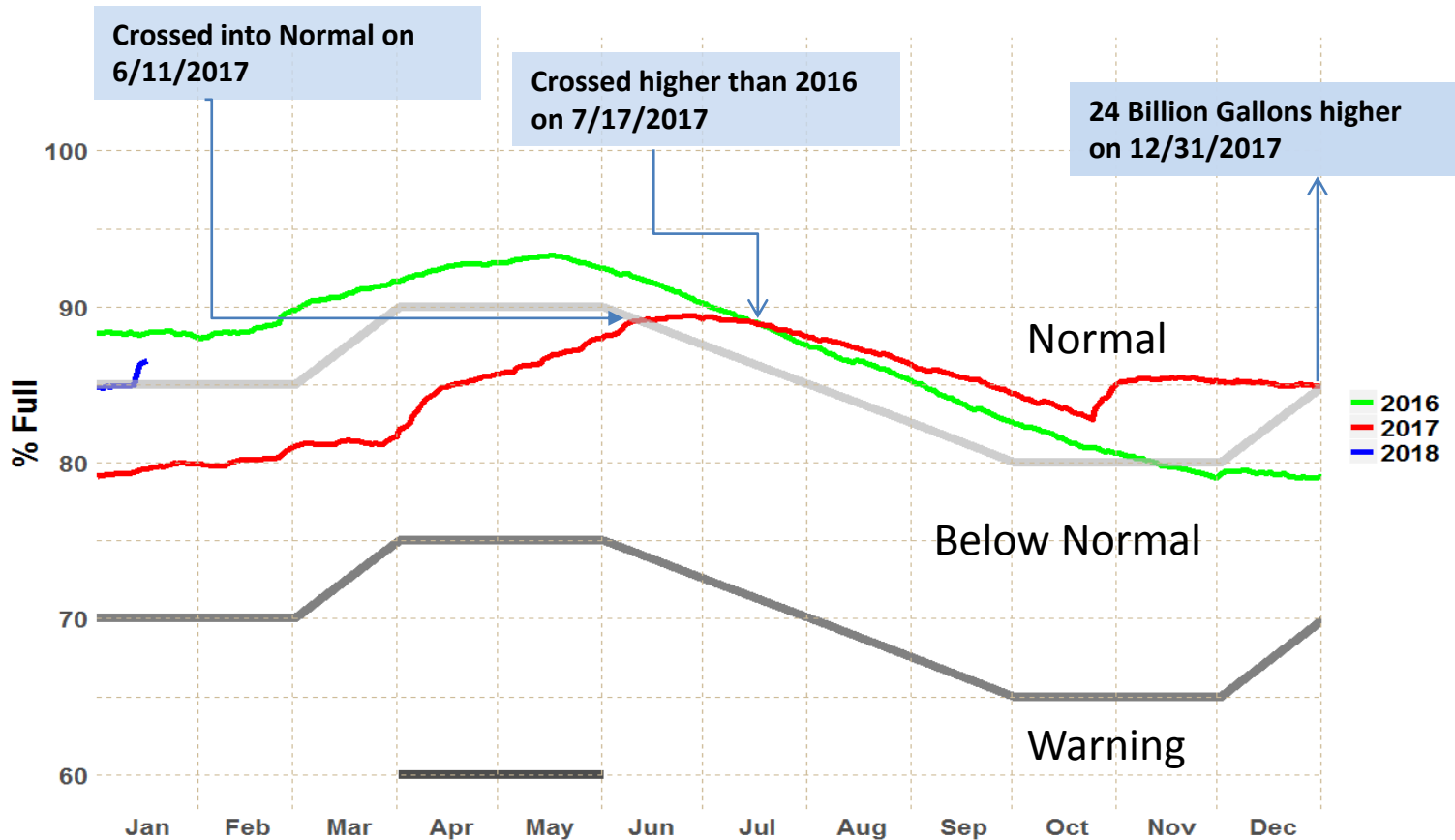


Reservoir Withdrawals – 5 Year Running Average





Quabbin Reservoir Volume







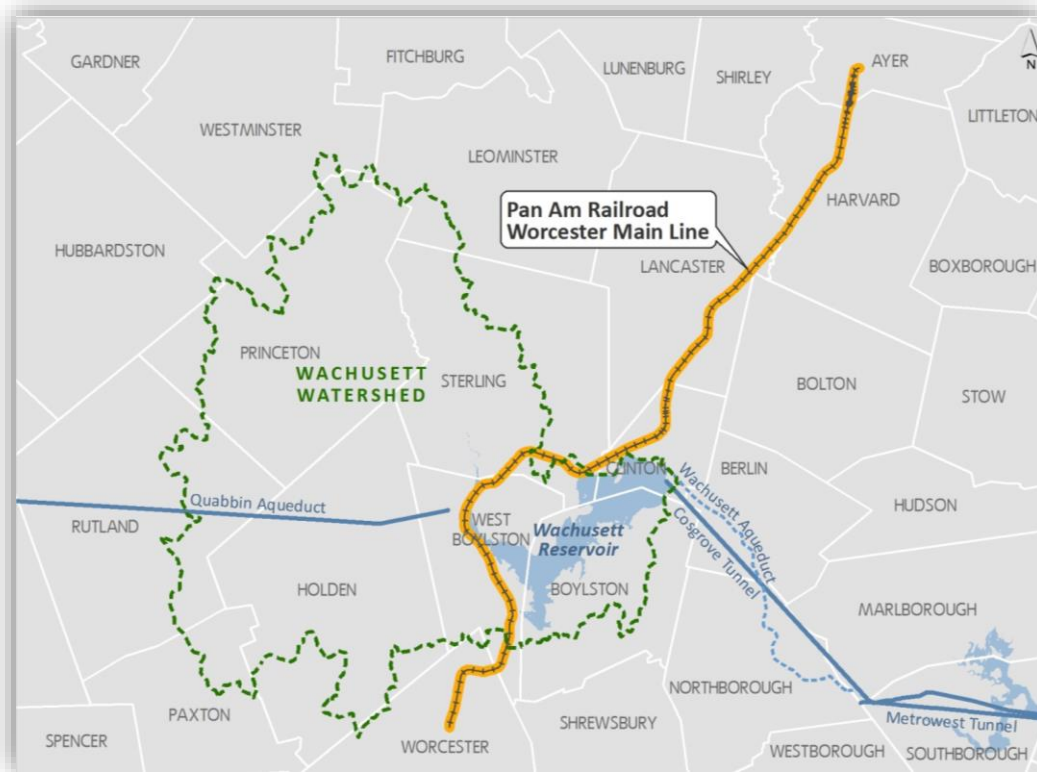
Wachusett Reservoir Railroad

January 17, 2018



PanAm Worcester Mainline

- 23.7 miles of track which runs from Ayer to Worcester





Tracks Located Near/Over Wachusett Reservoir





Condition of Tracks within the Wachusett Watershed

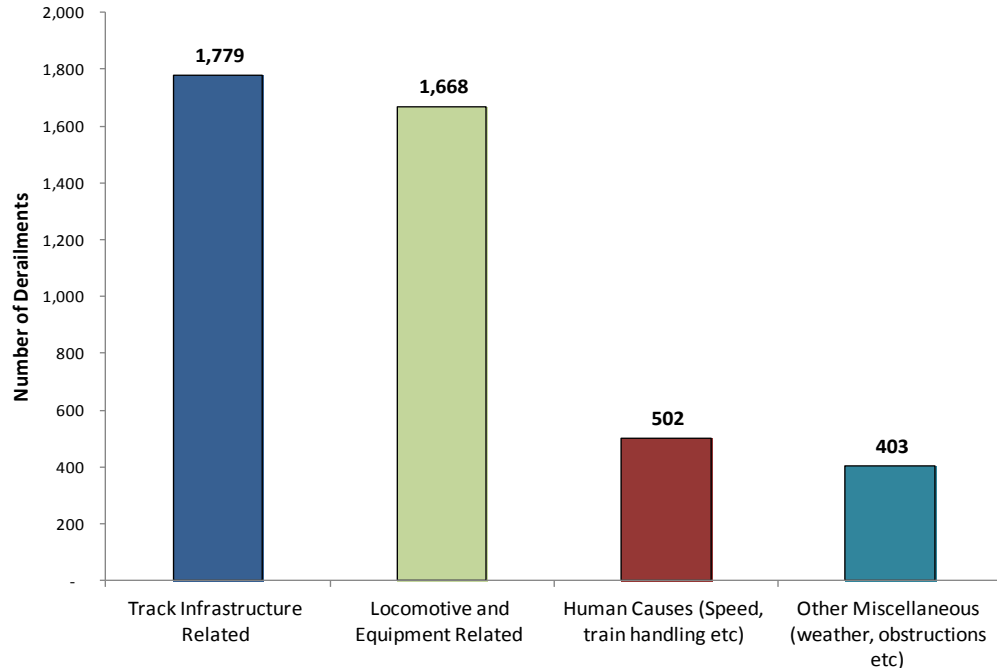
- Tracks maintained to Federal Railroad Administration Class I standards





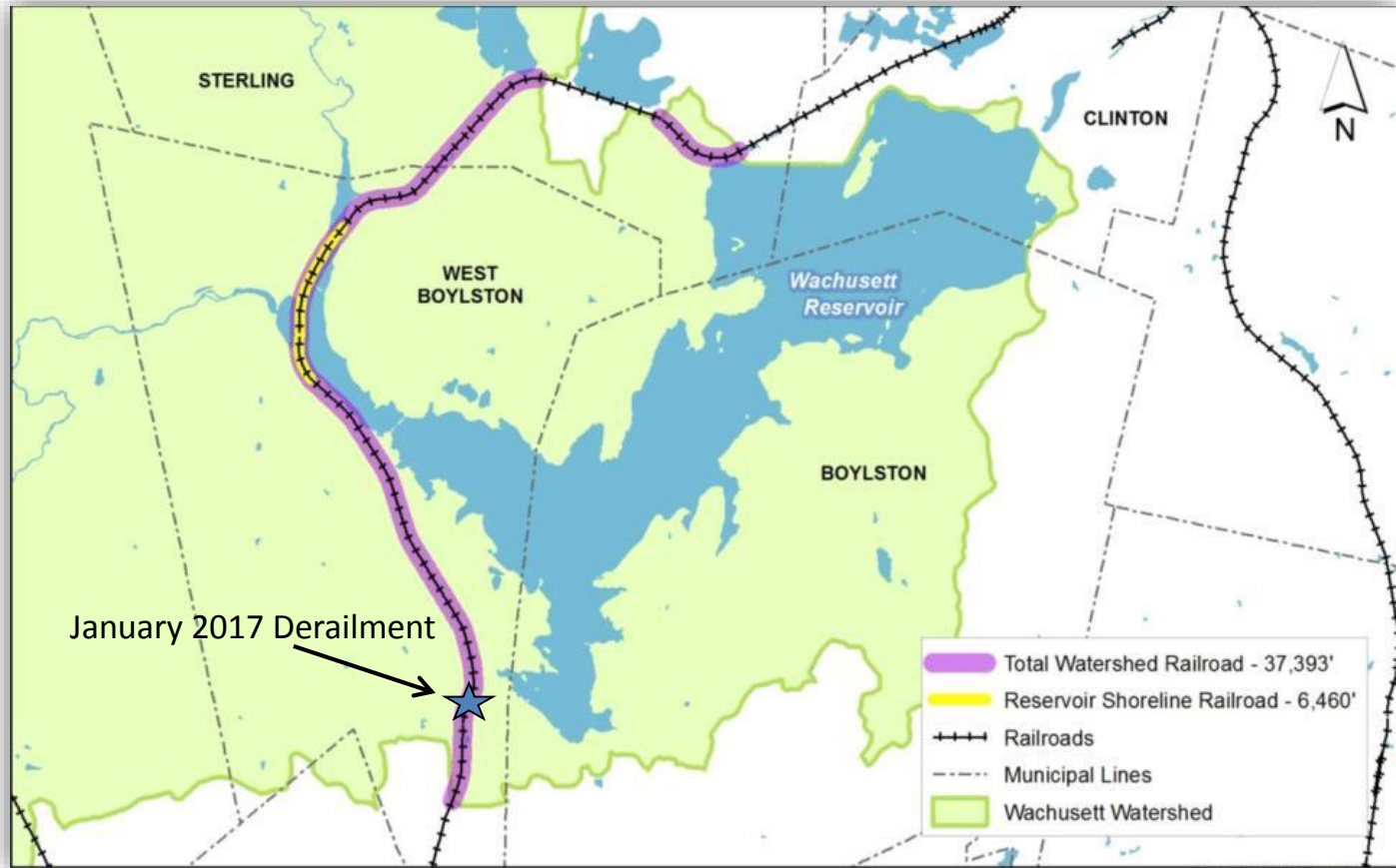
Causes of Derailments

- Breakdown of 4,352 derailments reported to the Federal Railroad Administration reported in the Journal of the Transportation Research Board





January 2017 Derailment within the Wachusett Watershed





January 2017 Derailment within the Wachusett Watershed





January 2017 Derailment within the Wachusett Watershed





Proposed Improvements to the Track within the Watershed

- Estimated cost to improve the condition of the track in the watershed from its current condition to FRA Class IV

	MassDOT	PanAm
Improvement	Estimated Cost	Estimated Cost
Track Improvement 7.6 Miles (136 lb Rail and new ties)	\$13,857,588	\$ 7,053,950
Drainage and Tree/Brush Removal	\$1,490,000	\$ 1,938,750
Train and Track Condition Monitors	\$2,550,000	\$ 1,520,276
Grade Crossing Improvements (6 crossings)	\$1,427,199	\$ 1,535,408
Estimated Cost before Contingency	\$19,324,787	\$ 12,048,384
Contingency	\$3,557,040	\$ 2,409,677
Total Estimated Cost for Improvements	\$22,881,827	\$ 14,458,061

* Based on cost estimate provided to MassDOT from Jacobs Engineering Group June 2015. PanAm estimate based on numbers as of January 2016.

- Improvements to the two 3-mile approach zones could range from \$6 to \$8 million.
- MWRA would require PanAm to maintain the tracks to the higher track standard.
- After improvements track speed within the watershed would be restricted to 10 mph.



Protecting MWRA's Potential Investment

- MWRA's section includes the 7.6 miles in the watershed and two 3-mile approach zones on either side of the reservoir

			Cost per Mile	
		Miles	\$ 375,000	\$ 350,000
MBTA/MassDOT	Non- Watershed Tracks	10.1	\$ 3,787,500	\$ 3,535,000
MWRA	Watershed/Approaches	13.6	\$ 5,100,000	\$ 4,760,000
Total		23.7	\$ 8,887,500	\$ 8,295,000

- Best mechanism to protect MWRA's potential investment in the track structure
 - Ownership of the line by MWRA, MassDOT or MBTA
 - Formal agreement with PanAm

