Delegated Authority Report

January 16, 2019

Valves

Horizontal Valve

Vertical Valve


WATER RESOURCES AUTHORITY
MASSACHUSETTS

Update on 2018 Water and Wastewater Master Plan

January 16, 2019

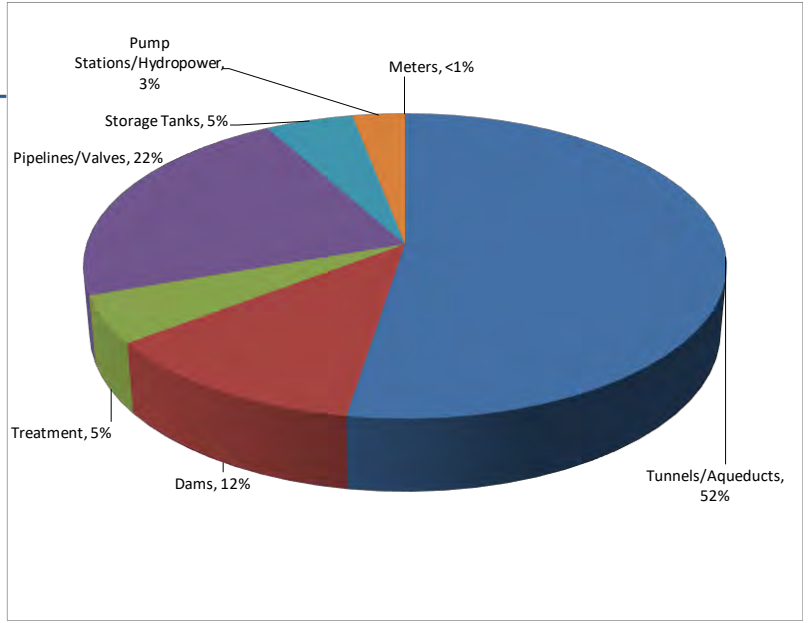
Background – 33 Years of MWRA Capital Investment

FY86-18 $8.3 Billion Capital Spending

- 70% on Wastewater - $5.8 Billion
- 28% on Waterworks - $2.3 Billion
- 2% on Business and Operations Support - $200 Million

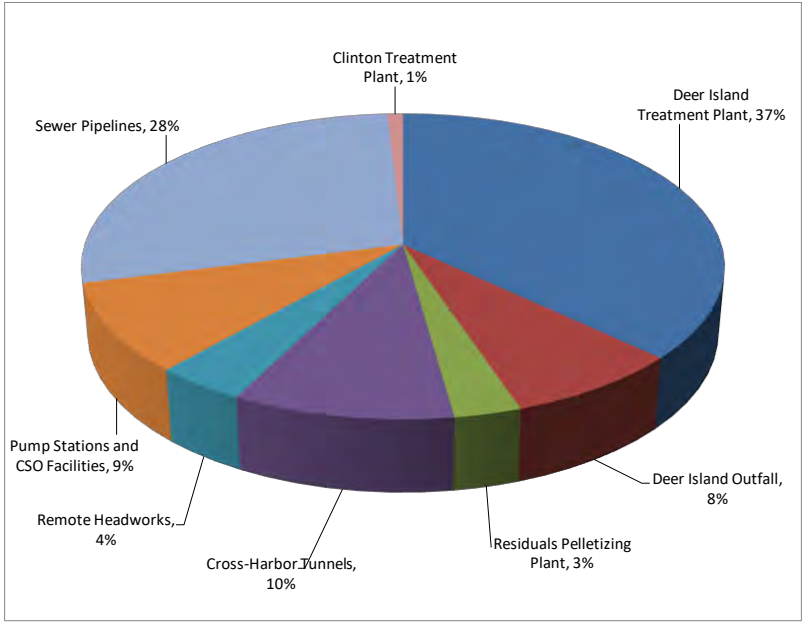
Water System Infrastructure Replacement Asset Value

Asset Class	Replacement Asset Value	% of Total
Tunnels/Aqueducts	$3,492 million	52%
Dams	$830 million	12%
Treatment	$297 million	5%
Pipelines/Valves	$1,465 million	22%
Storage Tanks	$347 million	5%
Pump Stations/Hydropower	$217 million	3%
Meters	$25 million	<1%
TOTAL	**$6,671 million**	**100%**



Wastewater System Infrastructure Replacement Asset Value

Asset Class	Replacement Asset Value	% of Total
Deer Island Treatment Plant	$2,500 Million	37%
Deer Island Outfall	$530 Million	8%
Residuals Pelletizing Plant	$200 Million	3%
Cross-Harbor Tunnels	$660 Million	10%
Remote Headworks	$270 Million	4%
Pump Stations and CSO Facilities	$640 Million	9%
Sewer Pipelines	$1,900 Million	28%
Clinton Treatment Plant	$60 Million	1%
TOTAL	**$6,760 Million**	**100%**



Overview of MWRA Master Planning

- 40-Year Master Plan Updates Planned Every 5 Years
  - 2006 (FY07-48) and 2013 (FY14-53)
- 2018 Master Plan Includes All Projects **PROGRAMMED** in FY19 CIP
- Master Plan Also Includes Additional Projects **RECOMMENDED** (System Needs) in 40-Year Planning Period (FY19 through FY58)
- Focus on Next Two CIP Cap Periods – FY19-23 and FY24-28
- Draft Master Plan Used to Help Guide FY19-23 CIP Cap Discussions

Master Plan vs Business Plan

Master Plan

- Detailed listing, explanation and prioritization of all short and long-term projects that impact capital needs over a 40-year period
- Used by Staff and Advisory Board to develop capital investment priorities during development of annual CIP and to help project long-term rates

Business Plan

- Concise listing of MWRA goals over a short (5-year) period
- Used to engage Board of Directors and outside agencies in discussion of MWRA's goals and plan to meet them

Water System Goals

Goal 1: Provide reliable water delivery

Goal 2: Deliver high quality water

Goal 3: Assure an adequate supply of water

Goal 4: Manage the system efficiently and effectively.

Wastewater System Goals

Goal 1: Provide reliable and safe sewer service

Goal 2: Provide environmentally sound wastewater collection and treatment, pretreatment, residual disposal, and combined sewer overflow control

Goal 3: Assure appropriate future wastewater collection and treatment capacity

Goal 4: Manage regional sewer service efficiently and cost-effectively

What the 2018 Master Plan Includes

- FY 19-23 CIP (5 year) Cap is $984.8M
- FY19 Approved (one year) CIP Spending is $122.9M
- (Excluding Community Grant/Loan Programs)
- **System Needs Identified in 2018 Master Plan = $5.7 Billion**

	FY19-23 5 years	**FY24-28** 5 years	**FY29-38** 10 years	**FY39-58** 20 years	**Total** 40 years
Water	$353M	$935M	$975M	$319M	$2.6B
Wastewater	$654M	$1,139M	$456M	$921M	$3.2B
Total	$1,007M	$2,073M	$1,431M	$1,240M	$5.7B
5 Year Average	$1,007M	$2,073M	$715M	$310M	$719M

MWRA Water System Overview

- 102 miles of active transmission mains and tunnels
- 43 miles of standby transmission facilities
- Water treatment capacity 405 MGD
- 284 miles of distribution mains
- 5,597 valves
- 287 MG of covered storage
- 13 pump stations (includes Wachusett Aqueduct Pumping Station)

Water System Master Plan Themes

2006

- Redundancy
  - Initiate Planning Efforts
  - Continue Work on NIH/SEH and Lynnfield Projects
  - Complete Blue Hills
- Continue Pipeline Rehabilitation
- Identify Asset Protection Needs

2013

- Redundancy
  - Implementation Underway
  - Transmission System
  - Distribution System
  - Storage
- Continue Pipeline Rehabilitation
- Increase Asset Protection Funding

Water System Master Plan Themes

2013

- Redundancy
  - Implementation Underway
  - Transmission System
  - Distribution System Storage
- Continue Pipeline Rehabilitation
- Increase Asset Protection Funding

2018

- Redundancy
  - Implementation Underway
  - WAPS Nearing Completion
  - Metropolitan Tunnels
  - Spot Pond Storage/PS
  - Distribution Storage in Future
- Continue Pipeline Rehabilitation
- Continue Asset Protection Funding

2018 Master Plan Assumptions - WATER

- Safe Yield Sufficient for Future Needs
- No New Regulations Anticipated in Future
- Climate Change Impacts on Yield Insignificant

Major 2018 Master Plan Recommendations - WATER

- Redundancy and Storage Projects approximately $1.72 billion in FY19-58

- Existing and Recommended Projects include:
  - Wachusett Aqueduct Pump Station
  - Metropolitan Tunnels Redundancy Program
  - Interim Improvements Program
  - Southern Extra High
  - Northern Intermediate High
  - Section 75 Extension
  - NEH Looping/Additional Storage
  - Parallel Line to Meters 55/68

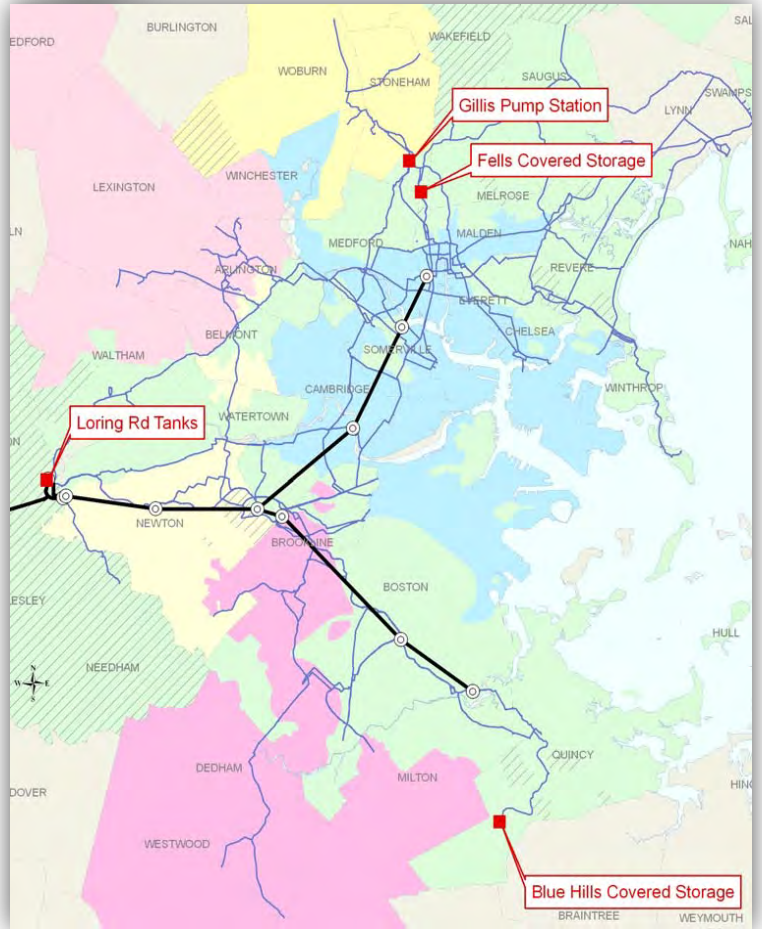
Major 2018 Master Plan Recommendations - WATER

- Quabbin Tunnel Inspection Included in CIP
- Inspection of Cosgrove Tunnel and Metropolitan Tunnel System Recommended in Master Plan
- $65 Million Recommended for Design/Rehabilitation of Metropolitan Tunnels

Transmission Redundancy Updates Since 2013 Master Plan

- Construction of the Wachusett Aqueduct Pump Station Nearing Completion
- Will Provide Redundancy for Cosgrove Tunnel

Metropolitan Tunnels Redundancy

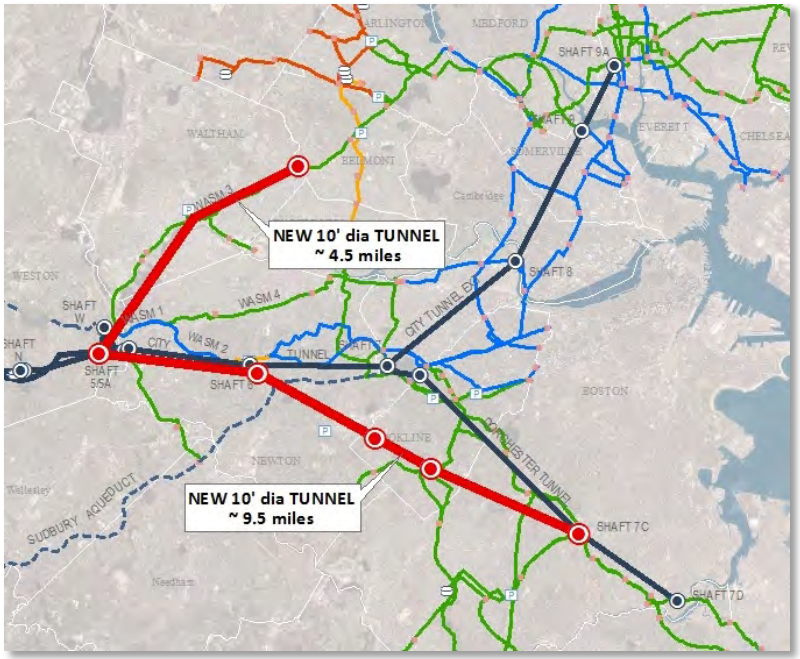


Redundancy Issue:

- Failure of Deep Rock Tunnels Unlikely
- Failure of Surface Connection Valves and Piping Possible
- Failure of Surface Connection at Shaft Can Require Isolation of Large Portion of Tunnel System
- Old Isolation Valves at 3 Key Shafts Must Be Taken Out of Service for Maintenance.

Transmission Redundancy Updates Since 2013 Master Plan

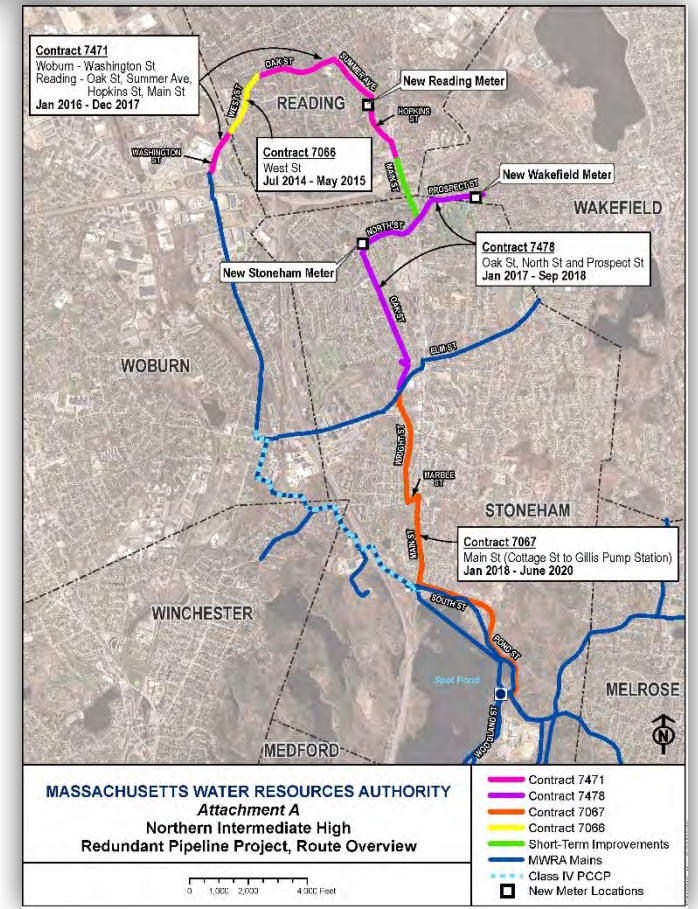
- Metropolitan Tunnel Redundancy Program Starting Up
  - New Tunnel Redundancy Department Formed
  - Procurement Underway for Program Support Services Contract
  - Future Contract for Preliminary Design/MEPA Review Planned for FY20

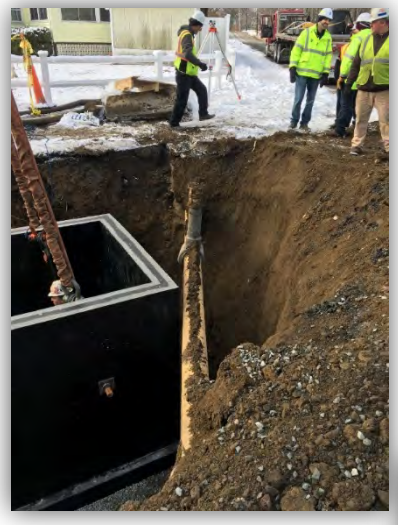


Transmission Redundancy Updates Since 2013 Master Plan

- Interim Improvements Program Implemented to Mitigate Risks During Planning and Construction of Proposed Redundant Tunnel
  - Tops of Shafts Improvements - Design Underway
    (structural reinforcing to extend useful life)
  - Chestnut Hill Emergency Pump Station Improvements – Designer Being Procured
    (new pump controls and isolation valves for more reliability)
  - WASM 3 Rehabilitation - Design Underway
  - Low Service PRV Improvements – Design Underway
    (increase capacity of Low Service system to enhance emergency response)
  - Commonwealth Ave Pump Station Improvements – Construction Contract Being Awarded
    (redundant connection to Low Service system)

NIH Redundancy Underway





Total Construction Cost
$55,700,000

Southern Extra High Redundancy Underway

Total Anticipated Construction Cost: $50 million

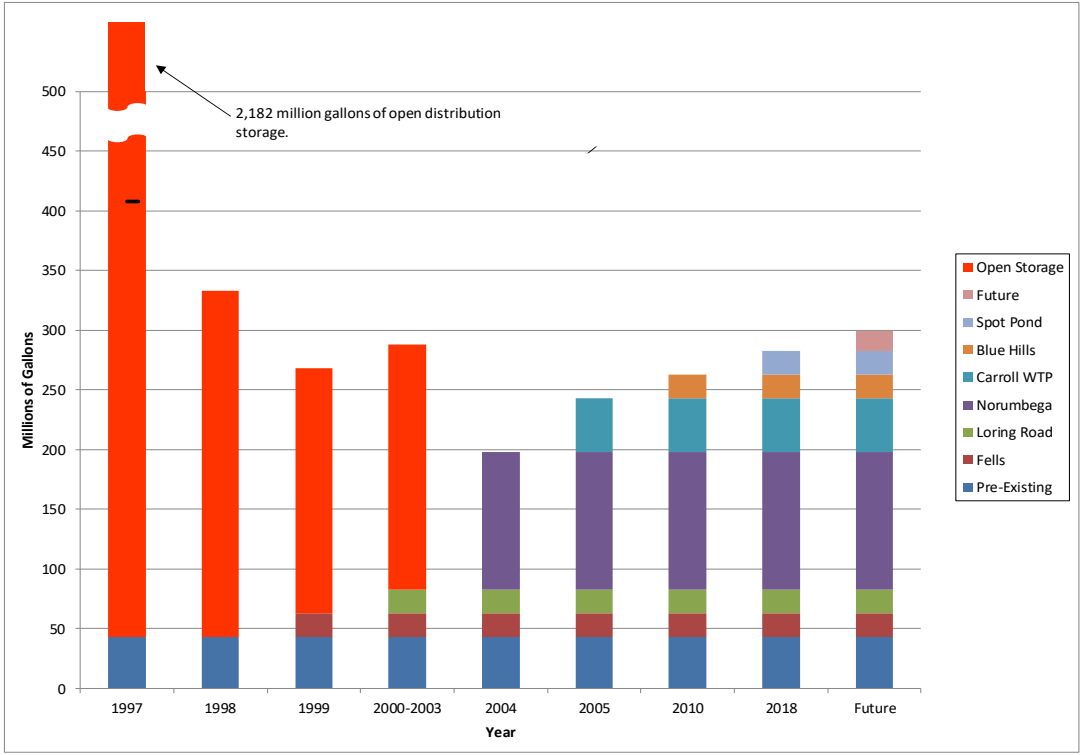
MWRA Metropolitan Area Storage Capacity Over Time

System-Wide Evaluation Completed in 1993

- DEP Guidelines and Ten State Standards require at least 1 day of storage
- Industry Practice: Most similar systems have 1 maximum day or more of storage

Future Localized Storage Needs

- Northern Intermediate High
- Southern Extra High
- Northern Extra High



Spot Pond Covered Storage Facility and Pump Station

Metropolitan Pipeline Rehabilitation

Existing and Recommended Metropolitan System Pipeline Expenditures Total $321M (excludes WASM3 work) in FY19-58

- Lining of Older Unlined Cast-Iron Mains to Preserve Water Quality
- Expanded Metropolitan Area Cathodic Protection Program ($56M in FY19)
- Replacement/Rehabilitation of Steel Pipes
- Pipeline Study Recommended in FY25 to Assess Need for Further Rehabilitation

Asset Protection - Pump Stations, Valves, Storage, Dams, Buildings and Support Systems

Existing and Recommended Asset Protection Projects total $361 million in FY19-58 for:

- Equipment
- Valves
- Pump Stations
- Storage Facilities
- Treatment Facilities
- Transmission Buildings
- Dams
- Ancillary Support Systems

Asset Protection - Water Treatment

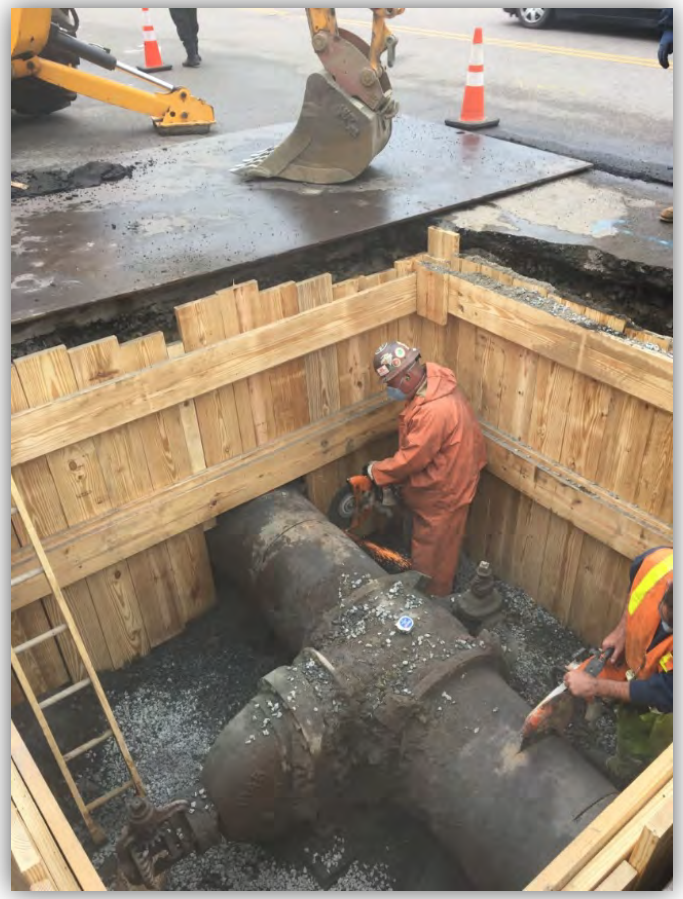
Age and Condition:

- Carroll Water Treatment Plant Electrical and Mechanical Systems Likely to Require Replacement/Upgrades

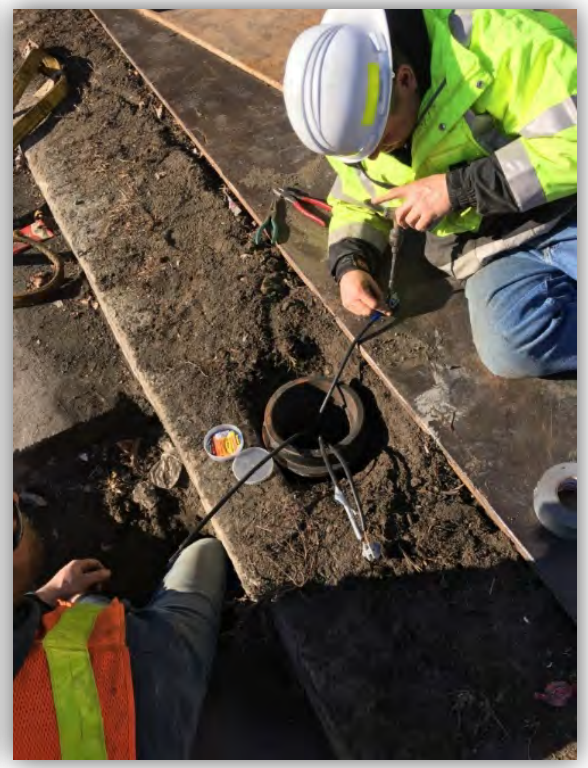
Asset Protection Projects:

- Existing Carroll Plant Projects Total $41M in FY19 CIP
- Additional $30M Recommended in FY29-58

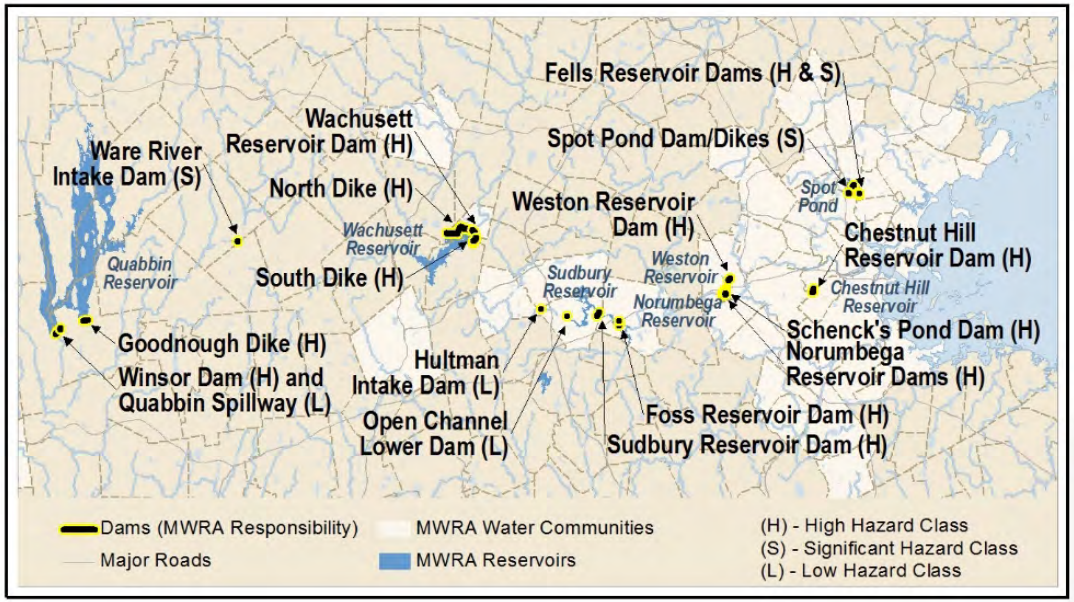
Section 65, Medford, Valve Replacement



Cathodic Protection Work, Section 57, Revere Beach Parkway



Water System Dams Asset Protection



- Significant Improvements Achieved
- $10M Recommended in FY19-58

Community Financial Assistance - Water Loans

- Over 6,612 Miles of Community-Owned Water Pipe
- Approximately 1,800 miles (27%) Remain Unlined
- $400M Distributed Since July 2000
- Two Additional Phases of Funds Recommended in FY29-48

Water System Master Plan - Summary

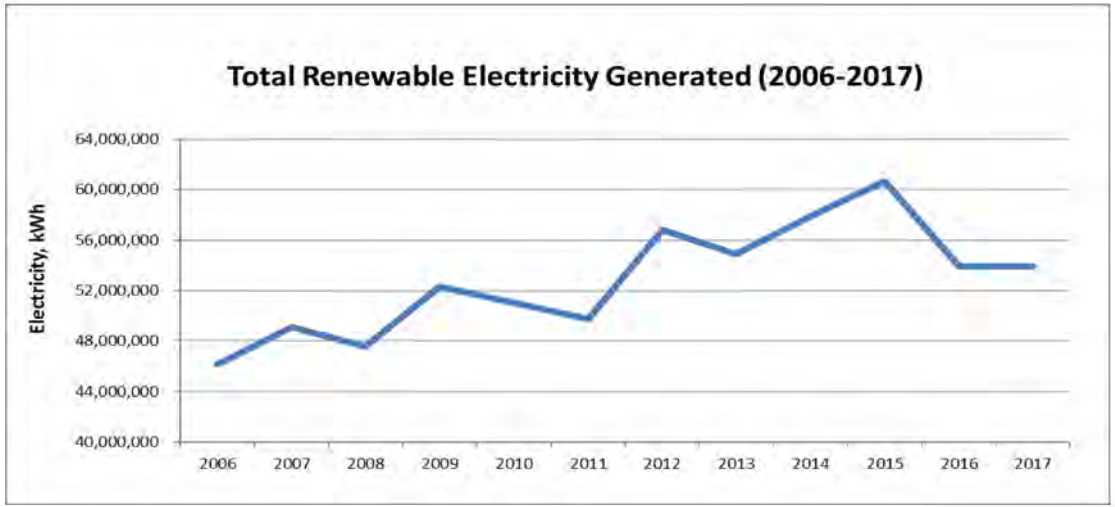
Existing Projects and New Recommendations*

	FY19-23 5 years	FY24-28 5 years	FY29-38 10 years	FY39-58 20 years	Total 40 years
Water Projects Programmed in FY19 CIP	$345M	$916M	$915M	$53M	$2,229M
Projects Recommended in Master Plan	$8M	$19M	$60M	$266M	$352M
Total	**$353M**	**$935M**	**$975M**	**$254M**	**$2,581M**

Total Water Needs Identified in Master Plan: $2.58 Billion

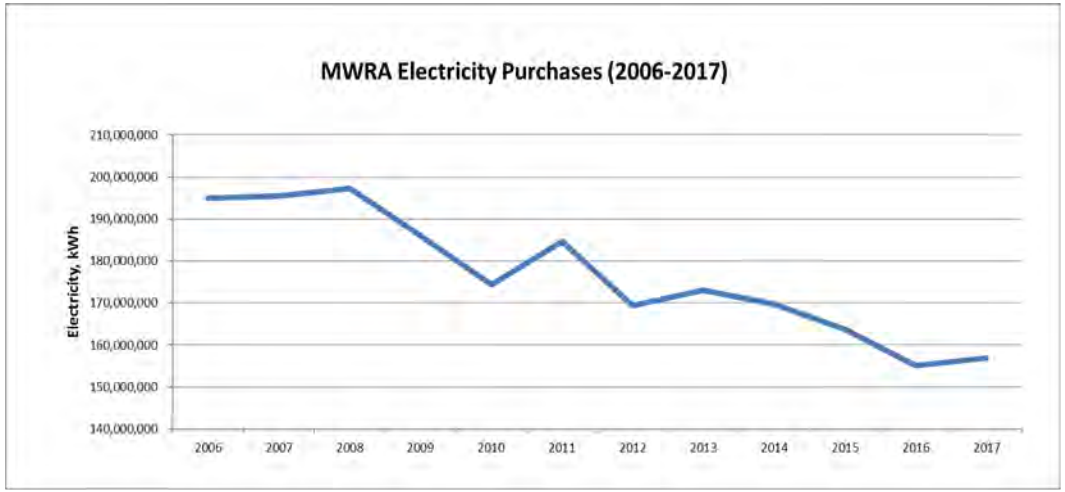
*Local Water System Assistance Program funds not included in calculations

Renewable Energy Generation at MWRA



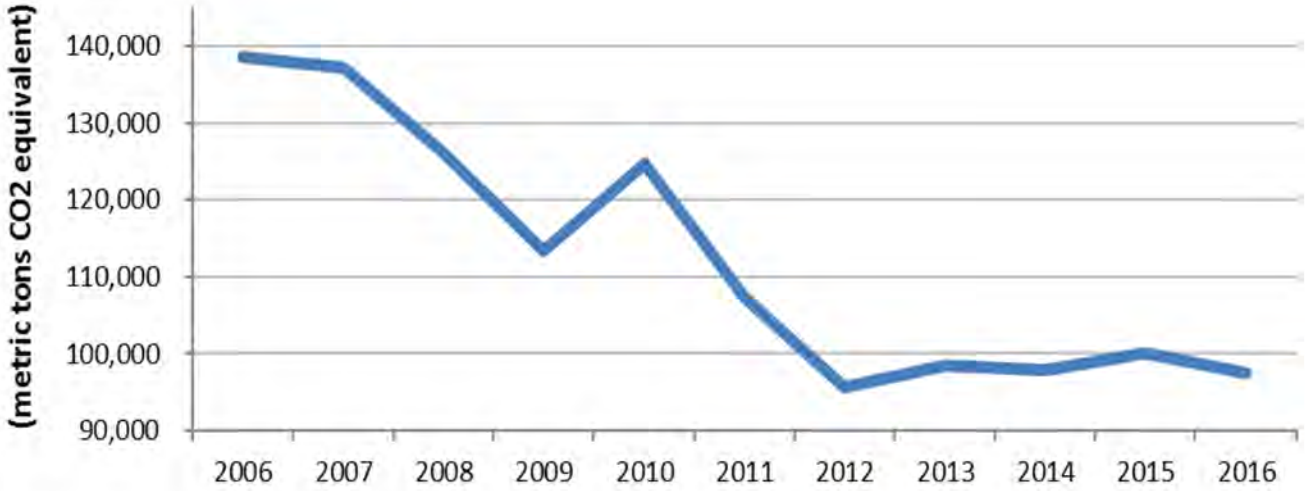
16.8% Increase in Renewable Energy Generation

Energy Efficiency at MWRA



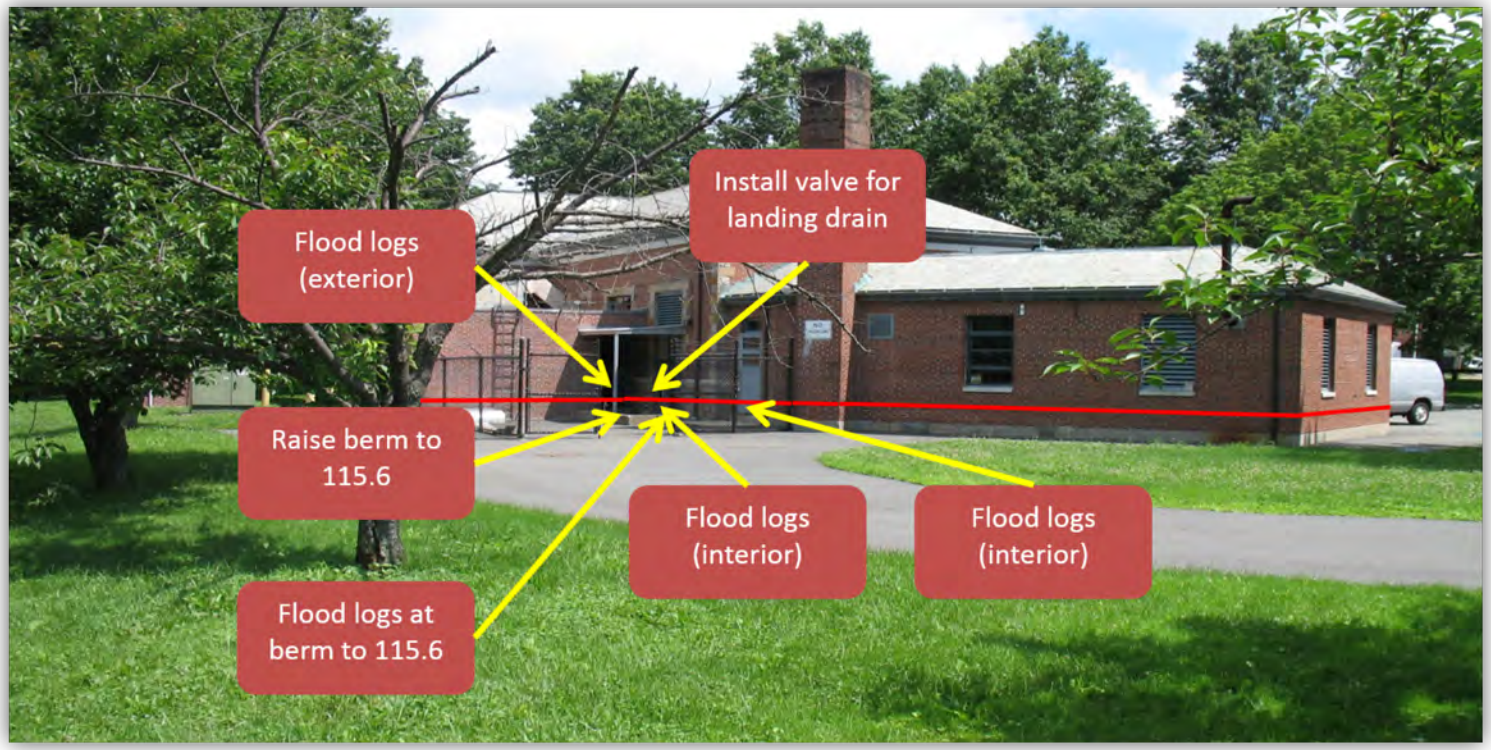
19.5% Decrease in Energy Usage

Greenhouse Gas Emissions Reductions 2006-2016



32.1% Decrease in Greenhouse Gas Emissions

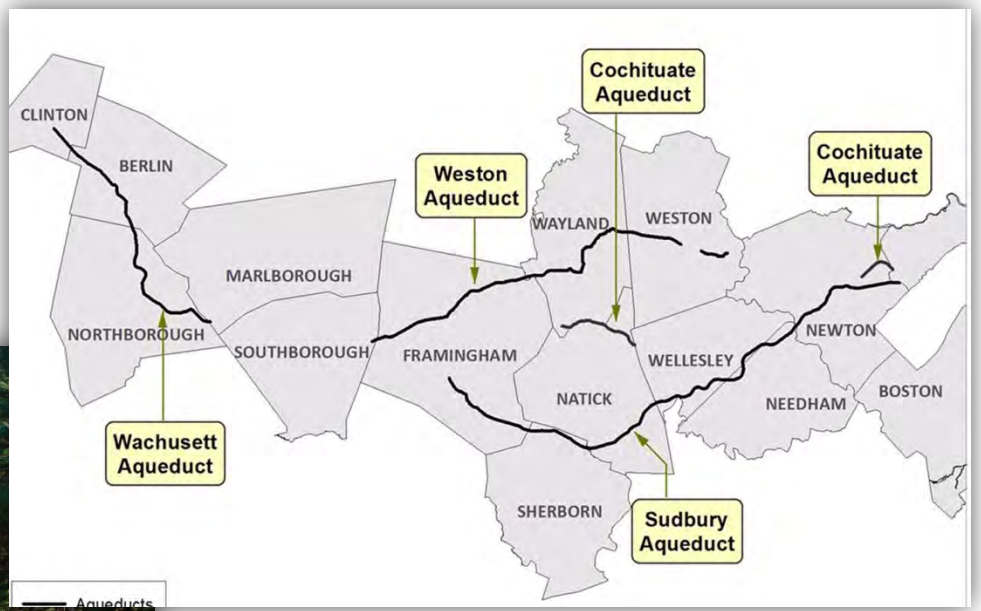
Sea Level Rise Adaptation



Alewife Brook Pump Station

Public Access

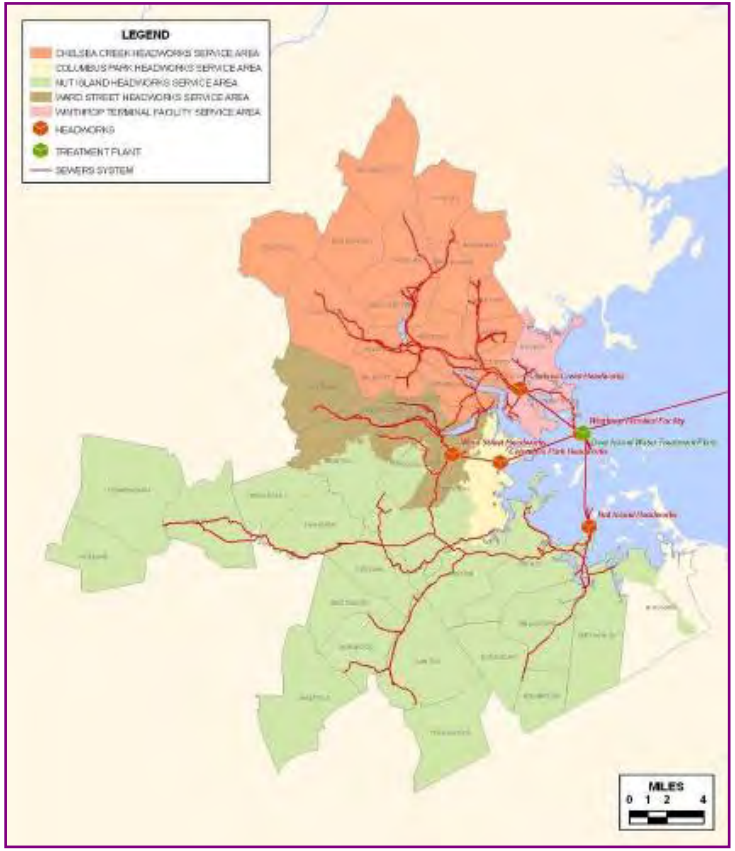
Aqueduct Trails



Alewife Stormwater Wetland

MWRA Wastewater System Overview

- Deer Island Treatment Plant
  - 360 Million Gal/Day Average
  - 1,270 Million Gal/Day Peak
  - 9.4 Mile Outfall Tunnel
- Clinton Treatment Plant
- Residuals Plant - Beneficial Reuse
- 19 miles of Cross-Harbor Tunnels
- 4 Remote Headworks
- 20 Pump Stations and CSO Facilities
- 226 miles of Gravity Sewers
- 29 miles of Force Mains, Siphons, and CSO/Emergency Outfalls



Wastewater System Master Plan Themes

2006

- Deer Island Asset Protection
  - Identify Increasing Needs as Plant Ages
- Residuals Facilities
  - Develop Long-Term Facilities Plan
- Remote Headworks
  - Develop Rehabilitation Plan for Older Headworks
- Interceptor Renewal Asset Protection
  - Develop Methodology to Identify Needs
- CSO Control Plan
  - Major Expenditures Required
- Long-Term Regulatory Changes
  - No Significant Spending Planned

2013

- Deer Island Asset Protection
  - Continued Long-Term Investments
- Residuals Facilities
  - Determine Timing of Replacement Needs
- Remote Headworks
  - Determine Timing of Design/Construction Projects
- Interceptor Renewal Asset Protection
  - Reassessment and Timing of Rehabilitation Projects
- CSO Control Plan
  - Ramping Down Expenditures ($49M Remaining in CIP)
  - Planning for 3 Year Performance Assessment
- Long-Term Regulatory Changes
  - No Significant Spending Planned

Wastewater System Master Plan Themes

2013

- Deer Island Asset Protection
  - Continued Long-Term Investments
- Residuals Facilities
  - Determine Timing of Replacement Needs
- Remote Headworks
  - Determine Timing of Design/Construction Projects
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  - Reassessment and Timing of Rehabilitation Projects
- CSO Control Plan
  - Ramping Down Expenditures ($49M Remaining in CIP)
  - Planning for 3 Year Performance Assessment
- Long-Term Regulatory Changes
  - No Significant Spending Planned

2018

- Deer Island Asset Protection
  - Continued Long-Term Investments
  - Complete Marine Cable Project (CEB Impact)
- Residuals Facilities
  - Major Upgrades Planned FY24-32
- Remote Headworks
  - Phase 1 Upgrades (Chelsea Creek HW) in Construction
  - Phase 2 Upgrades (Ward St & Columbus Pk HW) Planned FY24-28
- Interceptor Renewal Asset Protection
  - First Few Projects Ongoing through FY24
  - Planning for Additional Reinvestments FY24-38
- CSO Control Plan
  - Ongoing 3 Year Performance Assessment Will Complete $900M Program
- Long-Term Regulatory Changes
  - Continue to monitor Emerging Contaminants
  - No Significant Spending Planned

2018 Master Plan Assumptions - Wastewater

- Over 90% of Wastewater CIP Expenditures for Rehabilitation/Replacement
- No New Member Communities Anticipated
- Population Growth Expected to be Modest – No Impact to Flows/Loads
- No Significant Funds for Regulatory Changes
- Flood Mitigation for Storm Surge/Sea Level Rise To Be Addressed During Facility Upgrades Where Needed

Deer Island Wastewater Treatment Plant

- $2.5 Billion Replacement Asset Value
- $530M Additional Replacement Asset Value for 9.5-mile Outfall Tunnel
- Treatment Capacity
  - Maximum
    - 1.27 Billion Gal/Day
  - Average Daily Flow
    - 360 Million Gal/Day
- 70,000 Pieces of Equipment
- Significant Asset Protection Needs for Maintenance, Repair, and Replacement of Aging Plant
  - $660M Programmed in CIP and $40M Recommended FY19-28
  - $44M Programmed in CIP and $639M Recommended FY29-58

Deer Island Energy Improvements

- Combined Heat and Power (CHP) Project to Optimize Use of Methane Gas and Overall Efficiency Programmed in FY19 CIP at $90M in FY19-29

- Hydroturbine Generator (HTG) Replacement Programmed in FY19 CIP at $11M in FY20-26

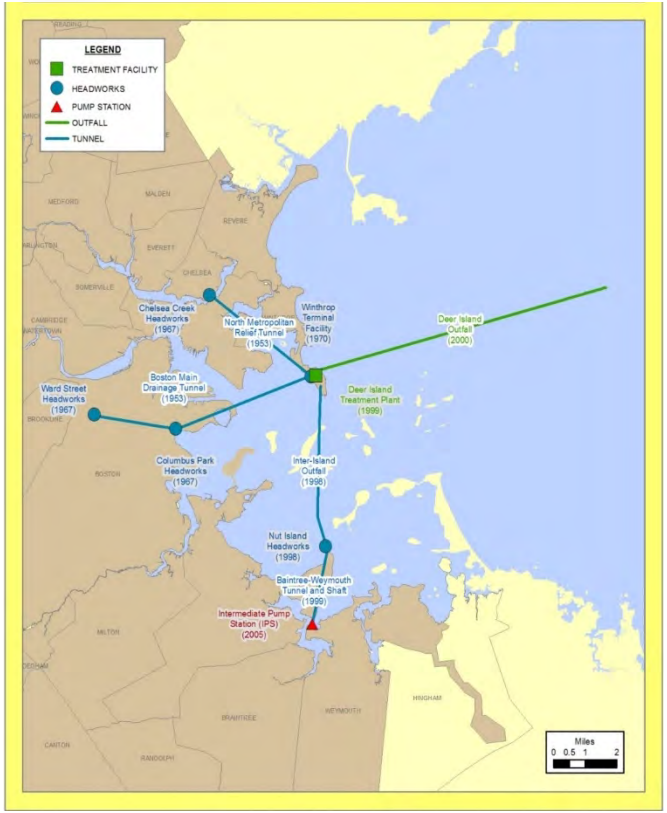
Deer Island Energy Improvements

- 62% of Total Power Needs Met with Green Sources
- Once Combined Heat and Power Improvements Implemented, up to 90% of Total Power Needs will be Met with Green Sources

Residuals Processing Facility

- $200M Replacement Asset Value
- Contract Operation – NEFCo through 2020
- Full responsibility for O&M ($15M annually)
- Beneficial Reuse of Pellets is Expected to Continue
- Residuals facility will need large-scale equipment replacement in next 10 to 15 years.
  - $103M Programmed in CIP FY19-32
  - $81M Recommended in CIP FY39-58

Cross-Harbor Tunnels

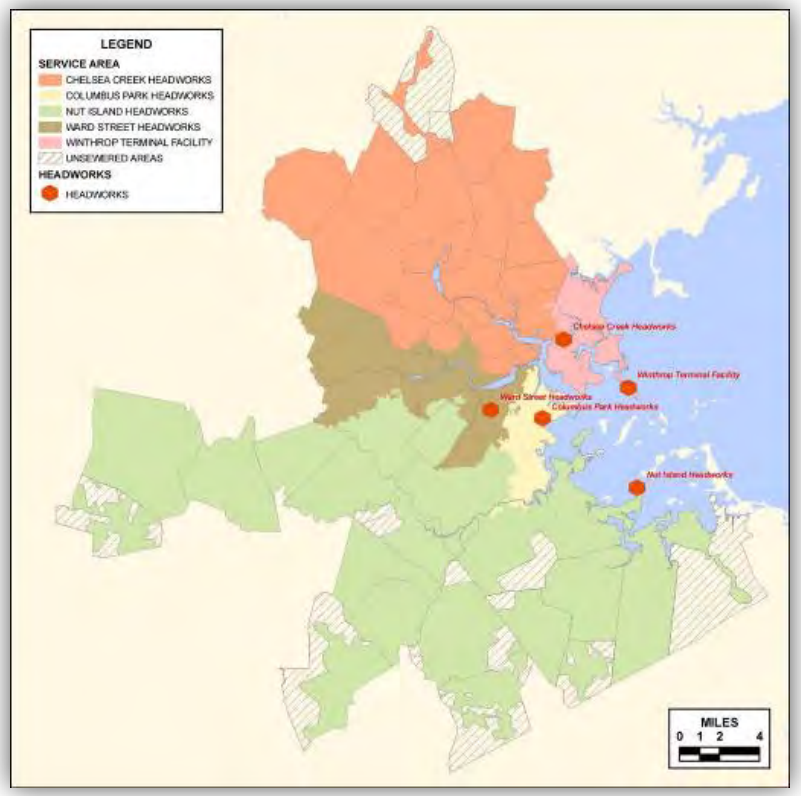


- $660M Replacement Asset Value
- 19 miles – 11.5 & 10 foot diameter
- 100-120 foot deep shafts
- 2 Older Tunnels – 1953
  - Midway through 100+ year useful life
  - $5M Inspection Programmed in CIP FY24-28
  - $10M Shaft Repairs Programmed in CIP FY19-27
- Inter-Island Tunnel – 1998
  - Inspect with other tunnels to provide baseline
- $50M Recommended for Future Inspection/Cleaning/Repair of Tunnels in FY46-50

Cross-Harbor Tunnels

Tunnel Shaft Repairs Needed due to H_2S Corrosion

Remote Headworks



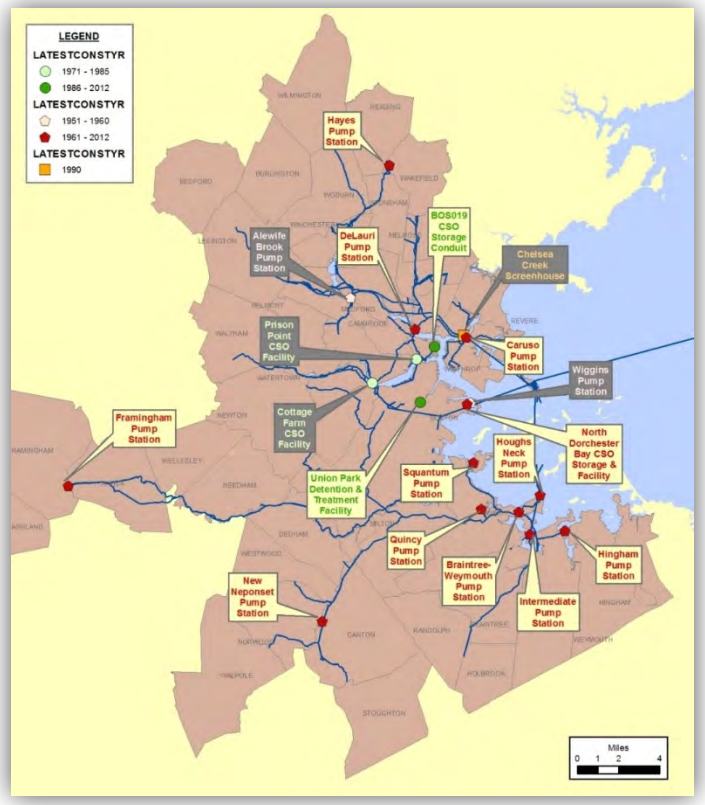
- $270M Replacement Asset Value

Chelsea Creek	1967
Columbus Park	1967
Ward Street	1967
Nut Island	1998

- Headworks Require Significant Reinvestment
- Chelsea Creek HW Upgrade $54M Programmed in CIP FY19-22
- Columbus Park/Ward Street HW Upgrades $126M Programmed in CIP FY20-28
- Nut Island Headworks Odor Control and HVAC Improvements $42M Programmed in CIP FY19-22
- Nut Island Headworks Mechanical and Electrical Upgrades $25M Programmed in CIP FY24-29

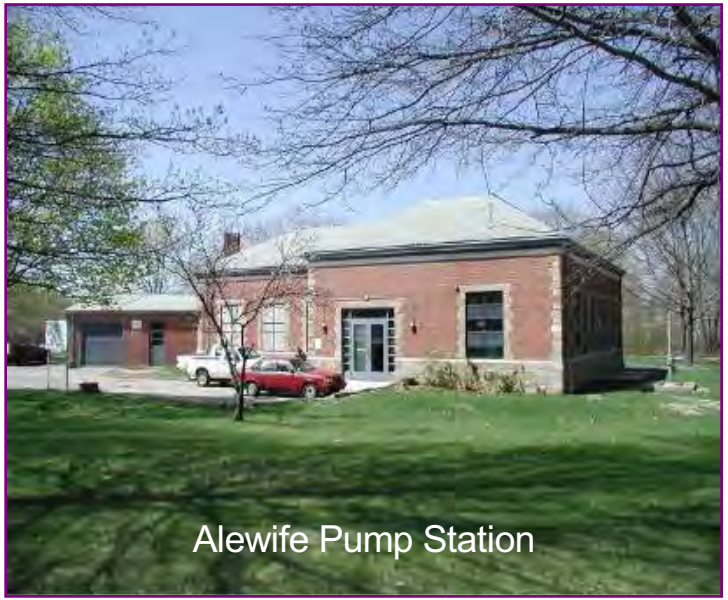
Chelsea Creek Headworks Upgrade

20 Pump Stations and CSO Facilities



- $640M Replacement Asset Value
- Average Age 27 years - Good to Excellent Condition
- 15 of 20 Facilities Built by MWRA, 1987-2011
- 5 of 20 Facilities Pre-MWRA, 1951-1980

20 Pump Stations and CSO Facilities



Alewife Pump Station

Key Elements to Minimize Risk of Failure

- Operability of Mechanical Equipment
- Maintenance of Electric/Standby Power

- $73M Programmed in CIP FY19-28 for Pump Station/CSO Facility Rehabilitations
  - Alewife PS (in construction)
  - Castle Island PS
  - Cottage Farm CSO
  - Prison Point CSO
  - Preliminary Design for Next 5 Older Facilities
- $90M Recommended for FY24-28 for Rehabilitation of Next 5 Older Facilities
- $100M Recommended for Future Pump Station and CSO Facilities Upgrades FY29-58

Alewife Brook Pump Station Rehabilitation

CSO Control Program

- $900M Total Program Cost
- $2.5M Programmed in CIP for 3-Year CSO Control Performance Assessment
- No Additional CSO Control Program funds recommended
- Future CSO Facility costs are integrated with future pump station upgrades

Collection System Sewers

Sewer Rehabilitation Needed to Address Pipeline Defects

- $1.9 Billion Replacement Asset Value
- 226 Miles of Gravity Sewers
- 29 Miles of Force Mains, Siphons and CSO/Emergency Outfalls
- 4,000 Manholes and Structures

Interceptor Renewal

- $120M Programmed in CIP in FY19-38 for First 6 of 12 Interceptor Renewal Projects
- $5M Programmed in CIP in FY19-23 to begin Siphon Structure Rehabilitation
- $295M Recommended for Remaining 6 of 12 Interceptor Renewal Projects FY24-58

Typical Sewer Rehabilitation
Using Cured-In-Place-Pipe

Wastewater Metering and SCADA

- Wastewater Metering and Supervisory Control and Data Acquisition (SCADA) for Monitoring and Controlling Facilities
  - $23M for Metering System Upgrades Programmed in CIP in FY19-31 and $20M Recommended in FY39-58
  - For SCADA Equipment, $7.7M Programmed in CIP in FY19-28 and $10M Recommended in FY39-58

Community I/I Financial Assistance

- Over 5,300 Miles of Community-Owned Sewer Pipes
- 43 Communities – 556 Local Projects Funded
- $370M Distributed through December 2018 in grants and loans
- $200M Programmed in CIP in FY19-40
- Two Additional $100M Funding Rounds Recommended for FY24-40

What the Wastewater System Master Plan Includes

Existing Projects and New Recommendations

	FY19-23 5 years	FY24-28 5 years	FY29-38 10 years	FY39-58 20 years	Total 40 years
Wastewater Projects Programmed in FY19 CIP	$644M	$841M	$63M	$(13)M	$1,535M
Projects Recommended in Master Plan	$10M	$298M	$393M	$934M	$1,635M
Total	**$654M**	**$1,139M**	**$456M**	**$921M**	**$3,170M**

Total Wastewater Needs Identified in Master Plan: $3.17 Billion

Future Challenges

- Preserving Institutional Knowledge
- Regulatory Decisions and/or Changes
- Monitoring Climate Change and Adaptation Strategies
- Energy Pricing


WATER RESOURCES AUTHORITY
MASSACHUSETTS


WATER RESOURCES AUTHORITY
MASSACHUSETTS

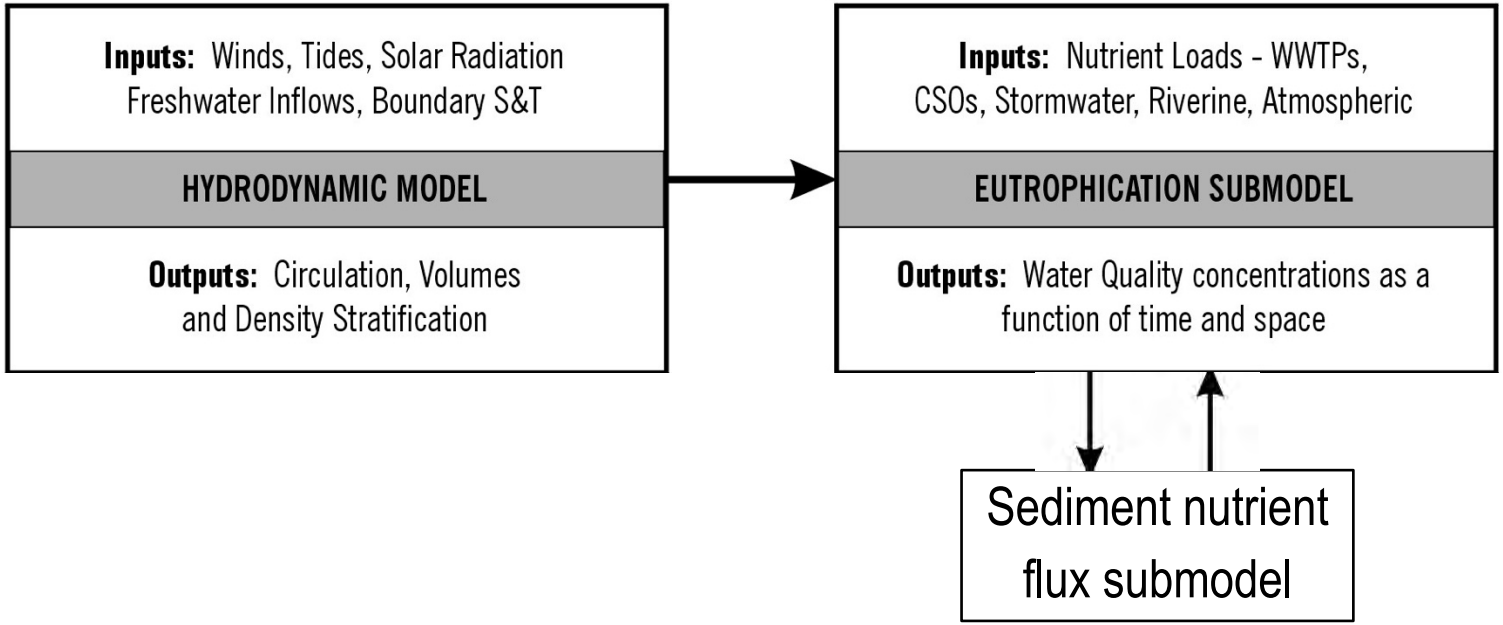
Modeling of Massachusetts Bay Water Quality Contract 7412

January 16, 2019

Context

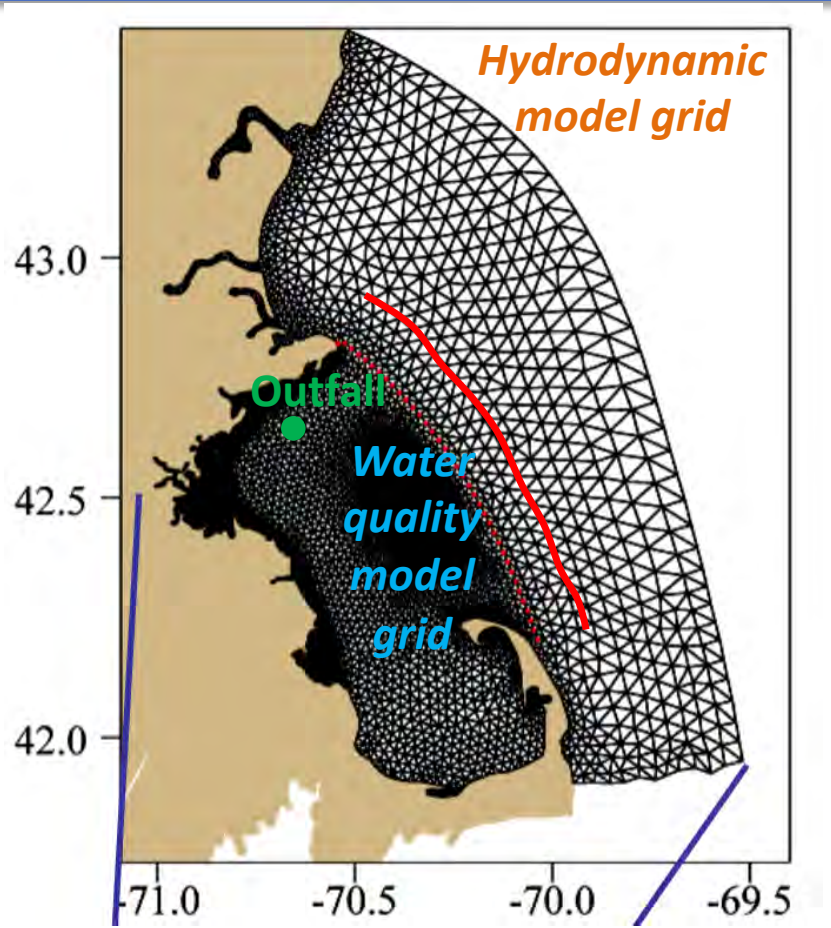
- Model developed in mid-1990s
- Annual runs required in NPDES permit
- Recent (2006-2016) simulations conducted by UMass Dartmouth
- Contract 7412 will develop a replacement model wholly-owned by MWRA

Components of the Model



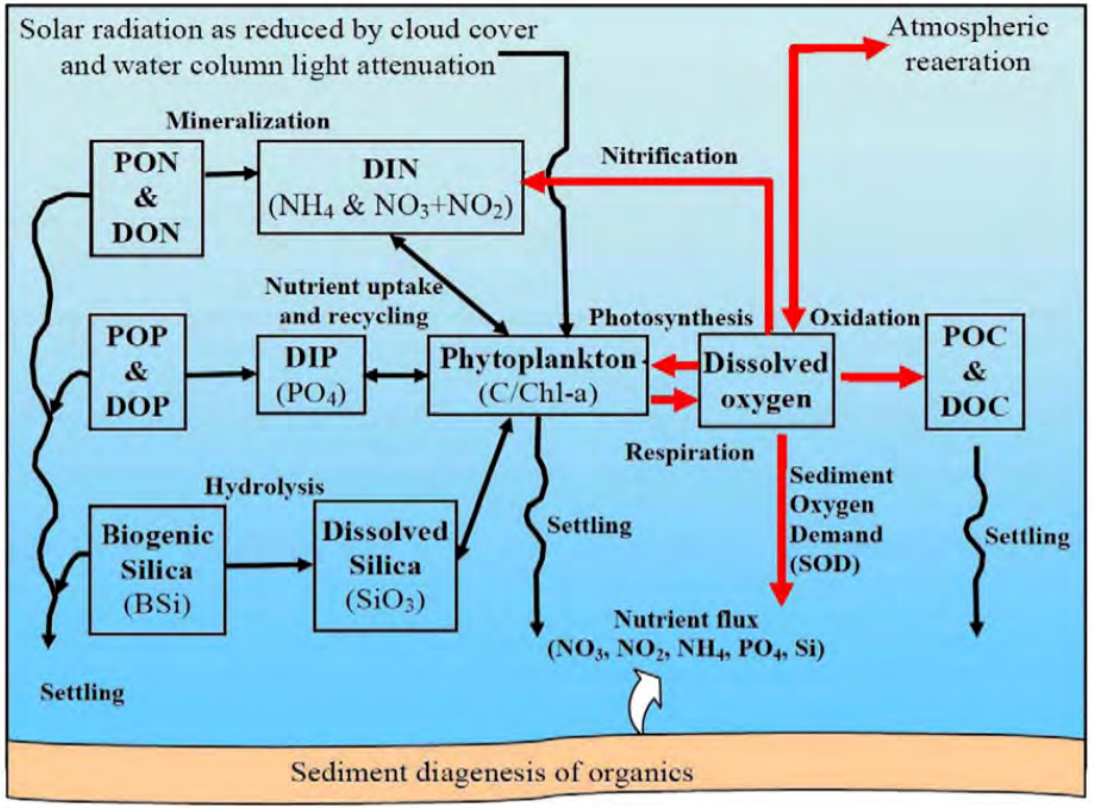
Hydrodynamic Grid

- Simulations focus on Mass. Bay near outfall
- Water quality model grid spans Mass. Bay
- Hydrodynamic grids extend farther offshore



Water quality (eutrophication) Submodel

- Complex interactions among many different processes
- e.g. Light, air-sea exchange, nutrients, algae, decay, oxygen, sediments



Contract 7412

- Scope includes:
  - Install modeling software on MWRA system
  - Develop model and simulate 4 years
  - Provide detailed operation instructions and training

Firms	Cost
Staff Estimate	*$512,000*
Deltares USA, Inc.	$711,525*
HDR, Inc.	$834,281
Geosyntec Consultants, Inc.	$852,295
RPS Group, Inc.	$899,186*
DHI Water & Environment, Inc.	$2,099,402

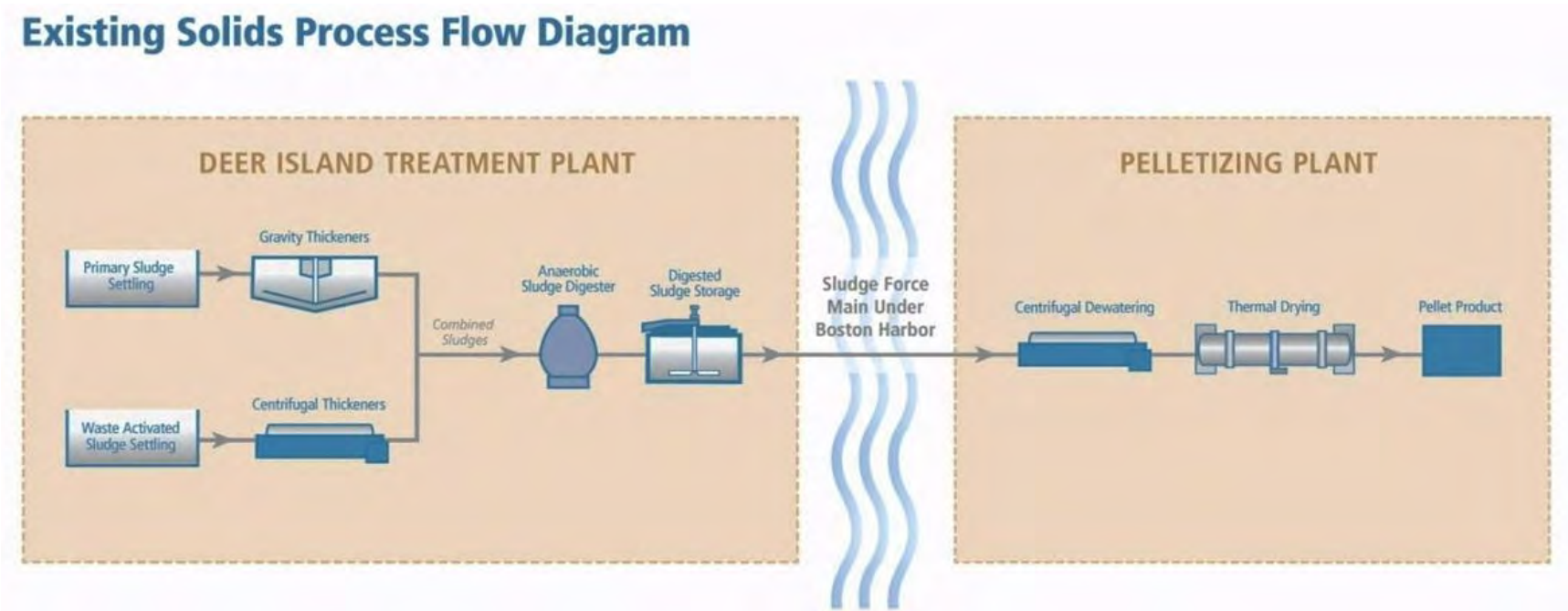
**Amount was adjusted to reflect total cost to MWRA*


WATER RESOURCES AUTHORITY
MASSACHUSETTS

Operations & Maintenance of the Fore River Pelletizing Plant Contract S345, Amendment 2

January 16, 2019

MWRA Sewage Treatment Processes



MWRA Pellet Plant Located in Quincy

- Located in Fore River Shipyard
- Designed, constructed and owned by MWRA
  - Total cost - $133 Million
- Operated and maintained by Contractor
  - Contract 1: 1991* – 2001 Competitive Bid – NEFCo
  - Contract 2: 2001 – 2015 Competitive Bid – NEFCo
    - Amendment 1: 2016-2020 Extension by Board Approval Mar 2015

* Last year of sludge disposal into Boston Harbor

MWRA Pellet Plant

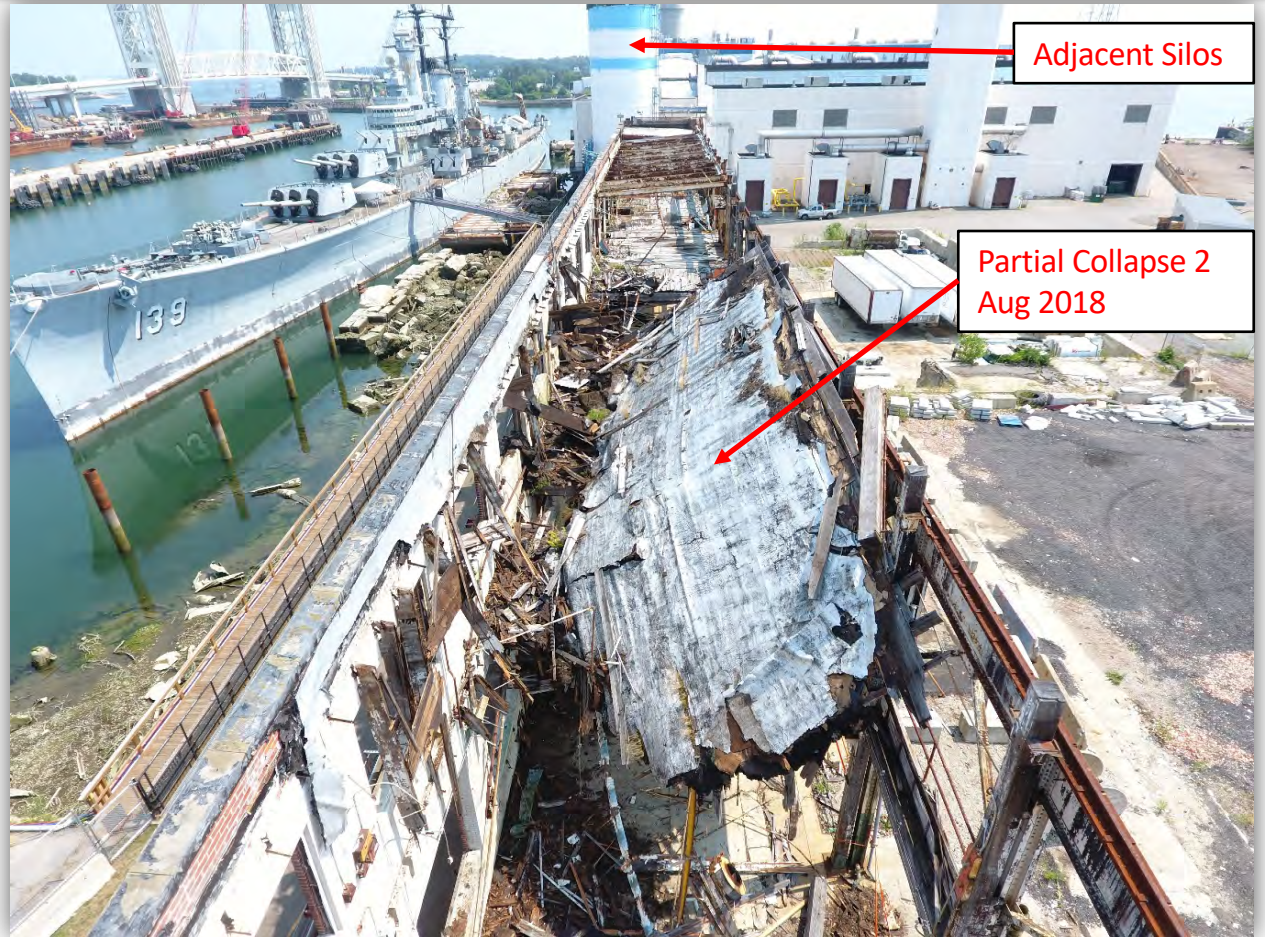
- Process liquid sludge from DITP
  - 105 dry tons sludge daily
- Markets & distributes 31,000 tons pellets annually as Class A EQ Fertilizer

MWRA Pellet Plant Layout

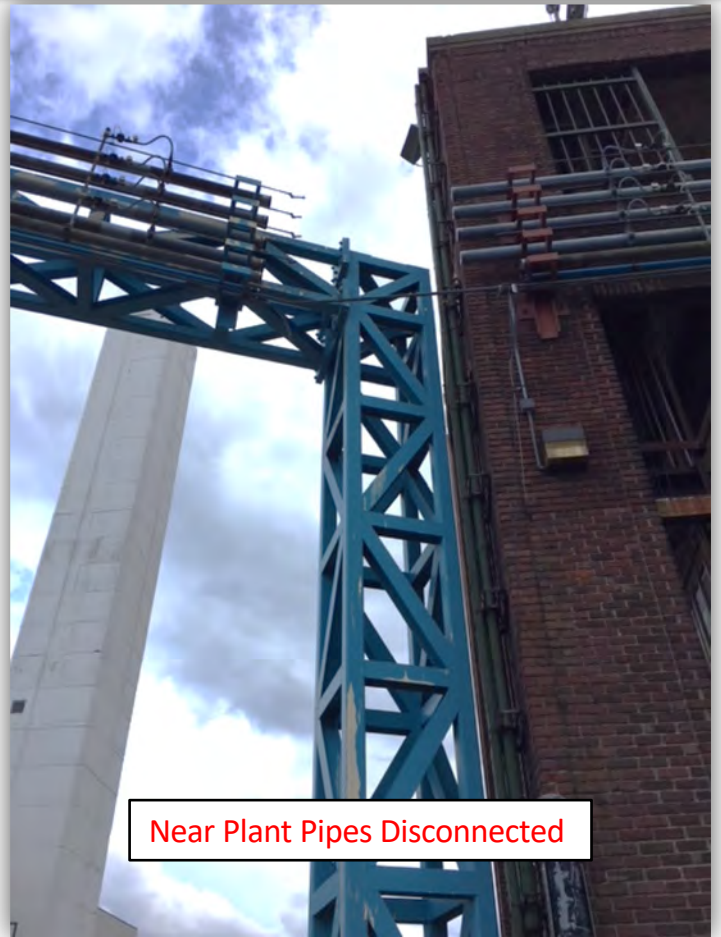
Building 11 Partial Collapse -

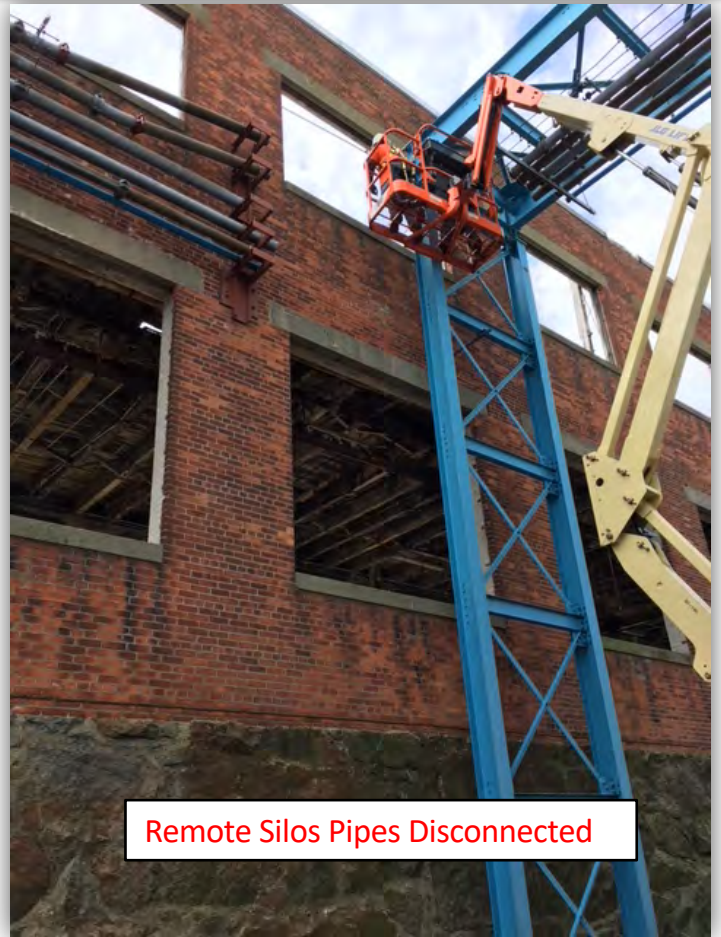
- Partial Roof Collapse
  - Late 2016
- March Fourth (Owner) Plans partial demo
- MWRA starts planning to move transfer lines off building 11.

Building 11 – Second Partial Collapse



Building 11 Demolition Preparation: MWRA Steps





Building 11 Demolition – September 2018

Post Demolition – Building 11

NEFCo Claim – Amendment 2

- NEFCo uses silos to store pellets when demand is low

- Loss of Remote Silos:
  - Seasonally forced to move product at higher costs

- Total Cost impact:
  - Fall 2018: (claim limited, September through December)
    $52,680
  - Anticipated expenses through Dec 2020:
    not to exceed $440,000


WATER RESOURCES AUTHORITY
MASSACHUSETTS

Report on 2018 Water Use Trends and Reservoir Status

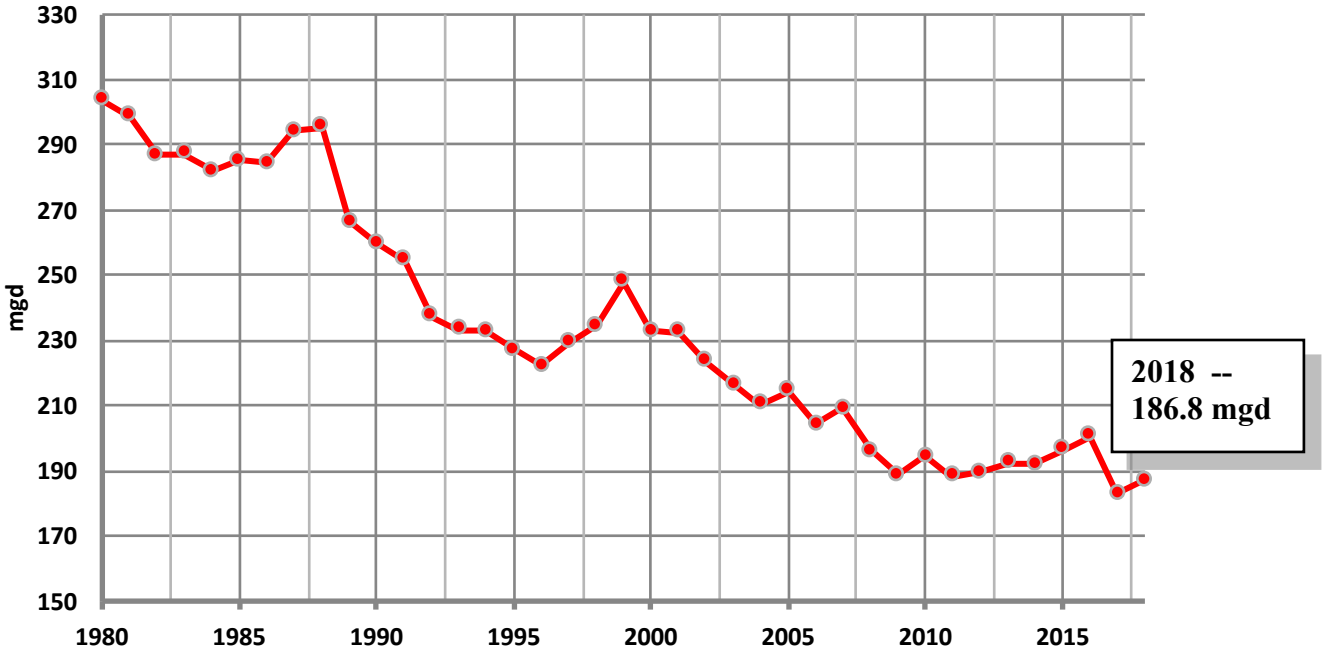
January 16, 2019

From Drought to Surplus

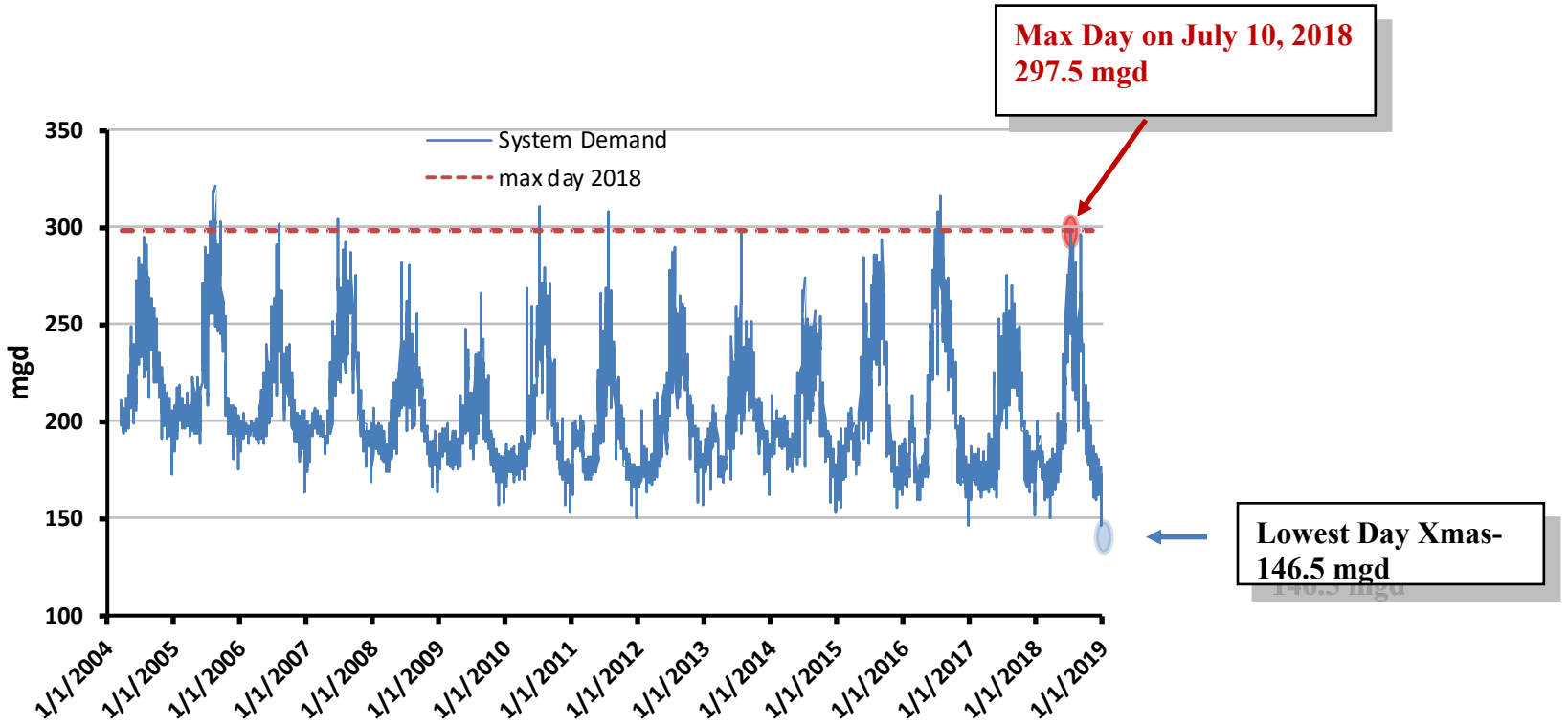
Quinnapoxet Reservoir, September 7, 2016

Quabbin Spillway, December 31, 2018

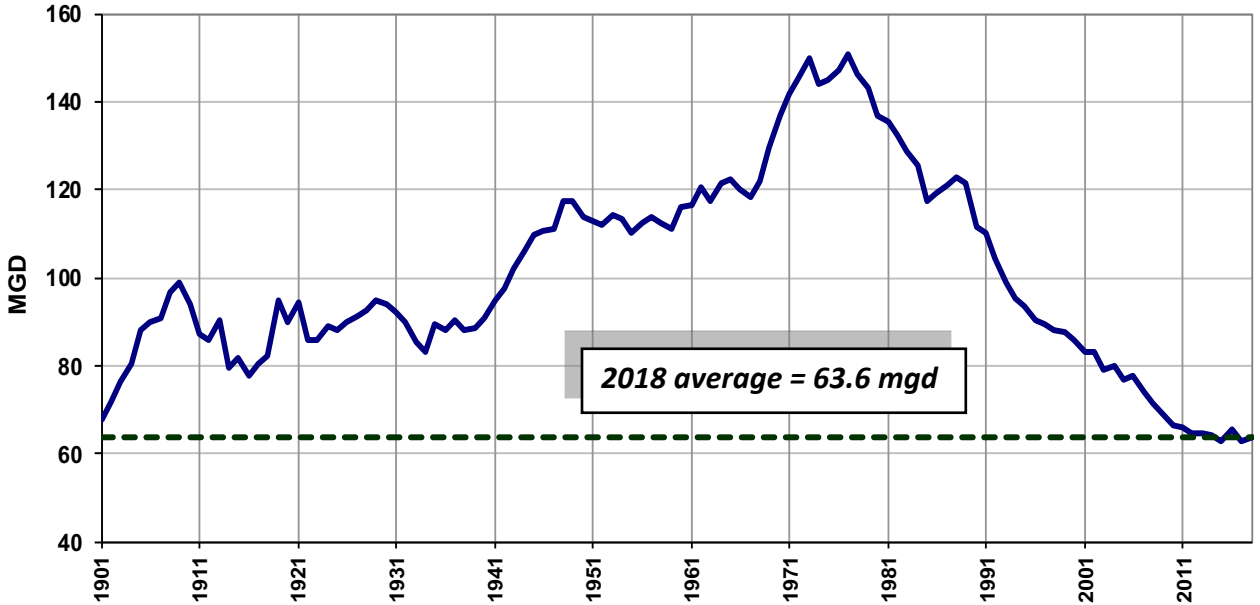
Total Consumption by MWRA Communities (1980 to 2018)



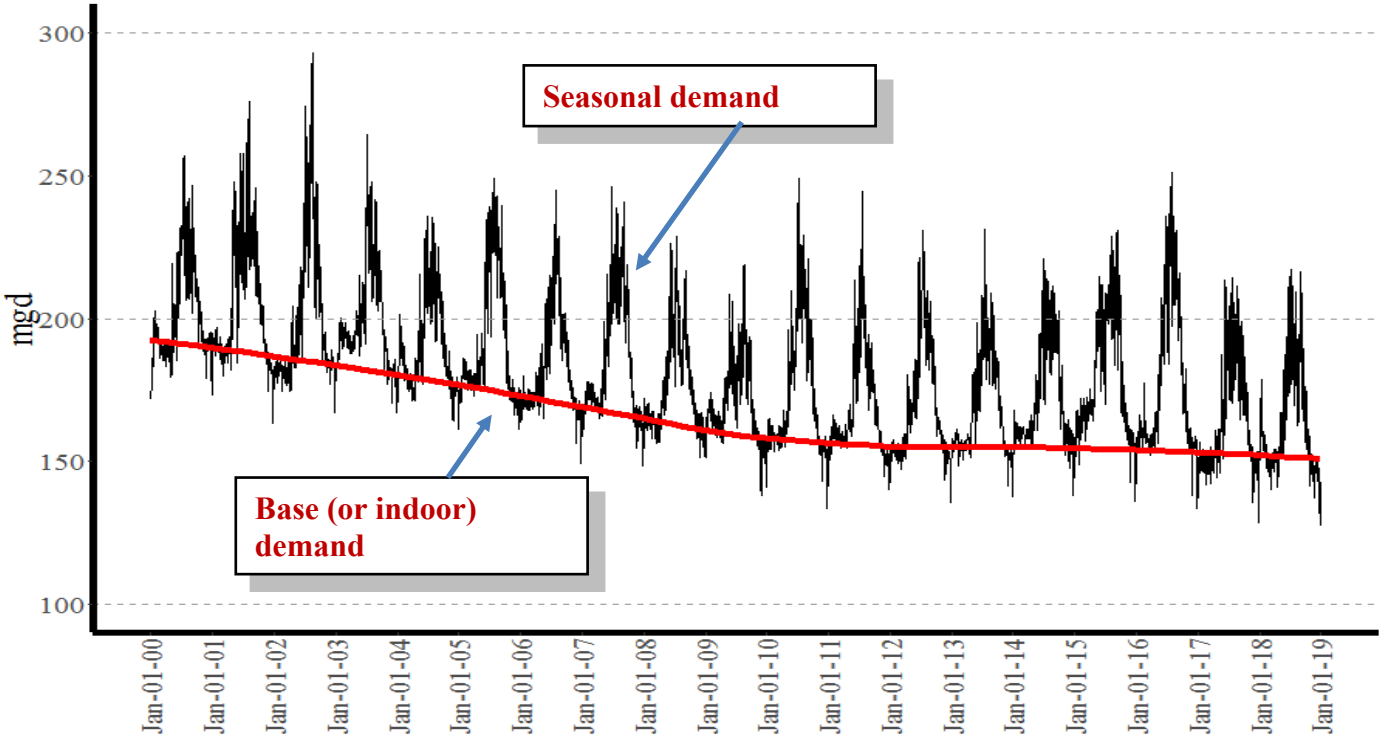
Daily System Demand



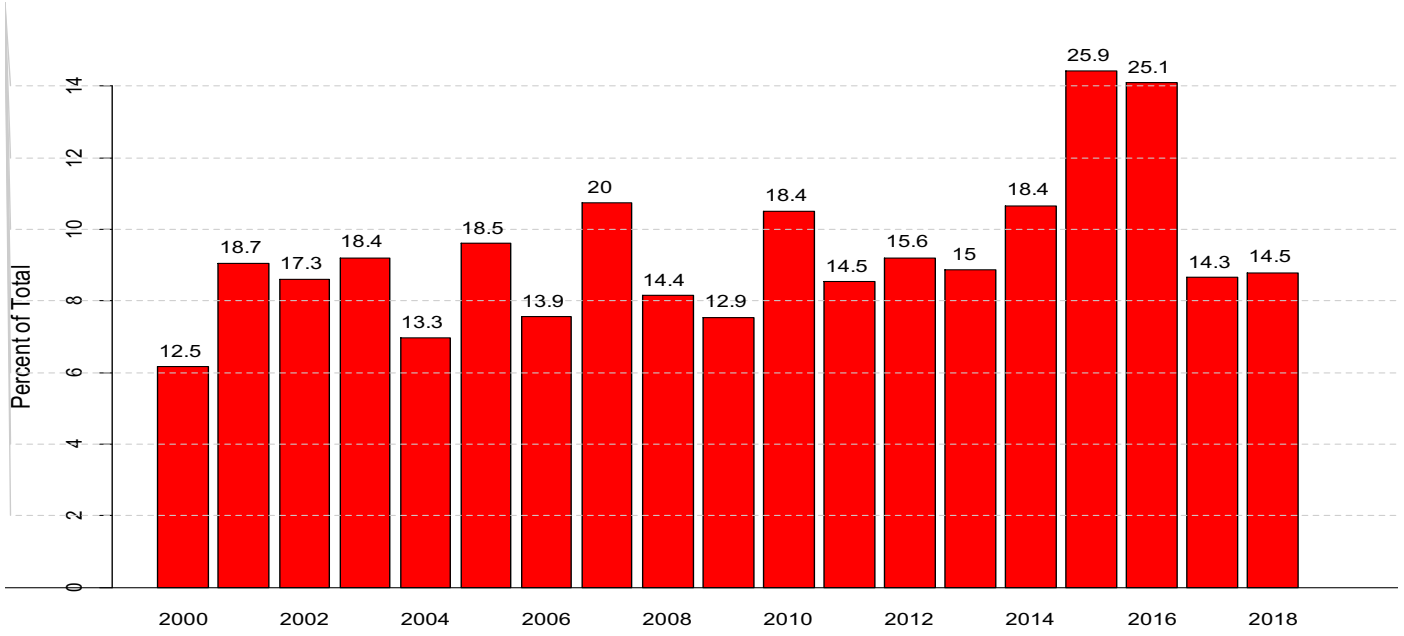
Boston Water Use (1900 to 2018)



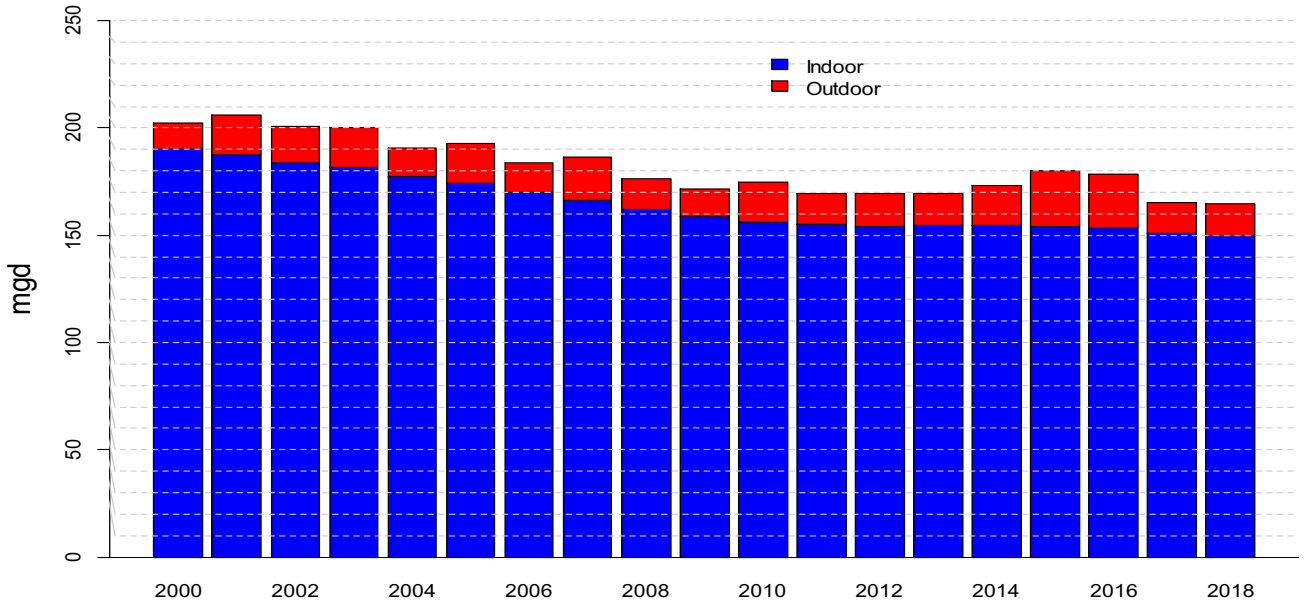
Fully Supplied Communities Demand (2000 to 2018)



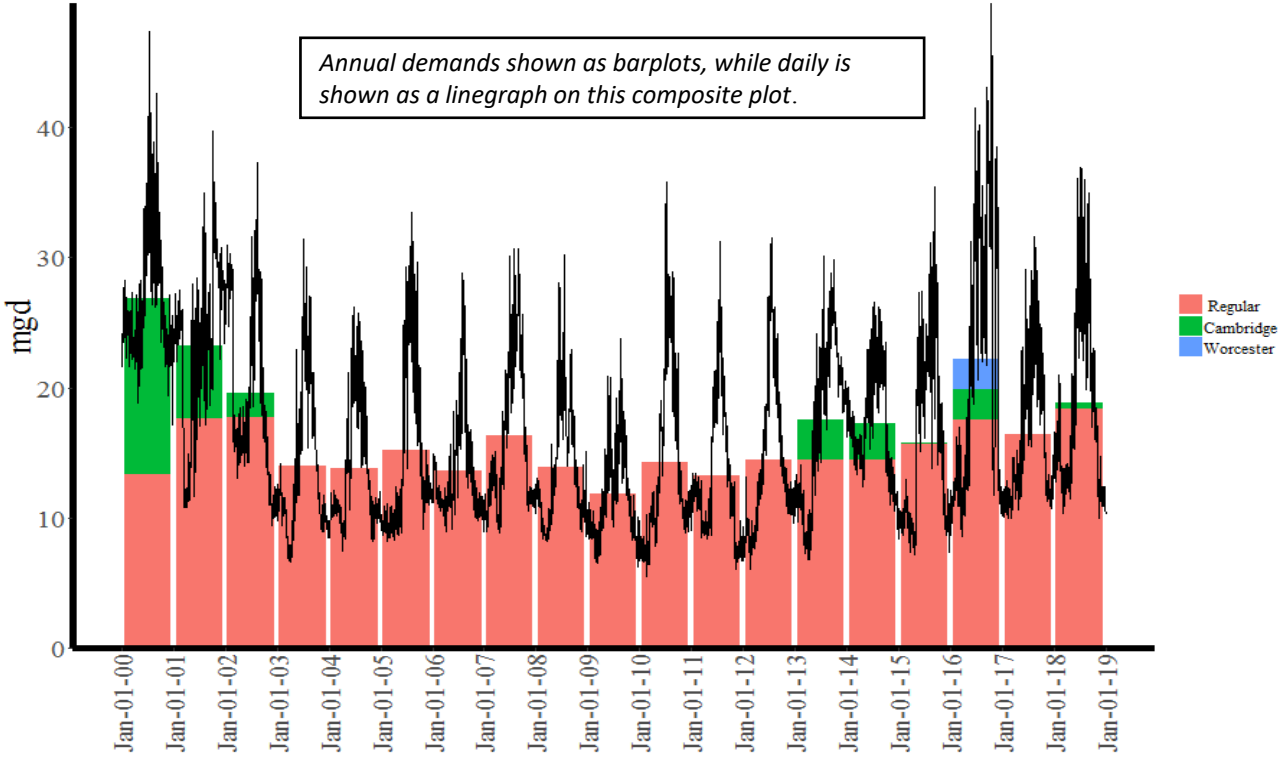
Fully Supplied Communities Seasonal Demand



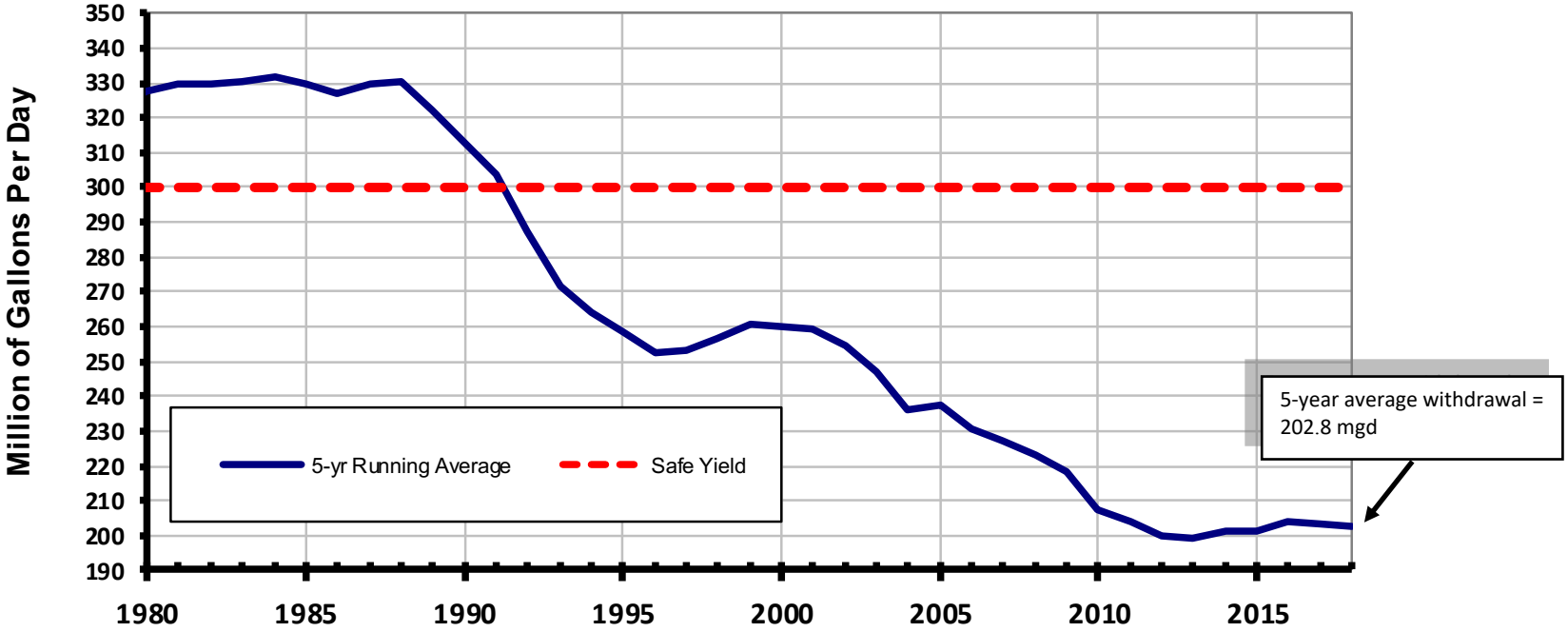
Fully Supplied Communities (Annual Base and Outdoor Use)



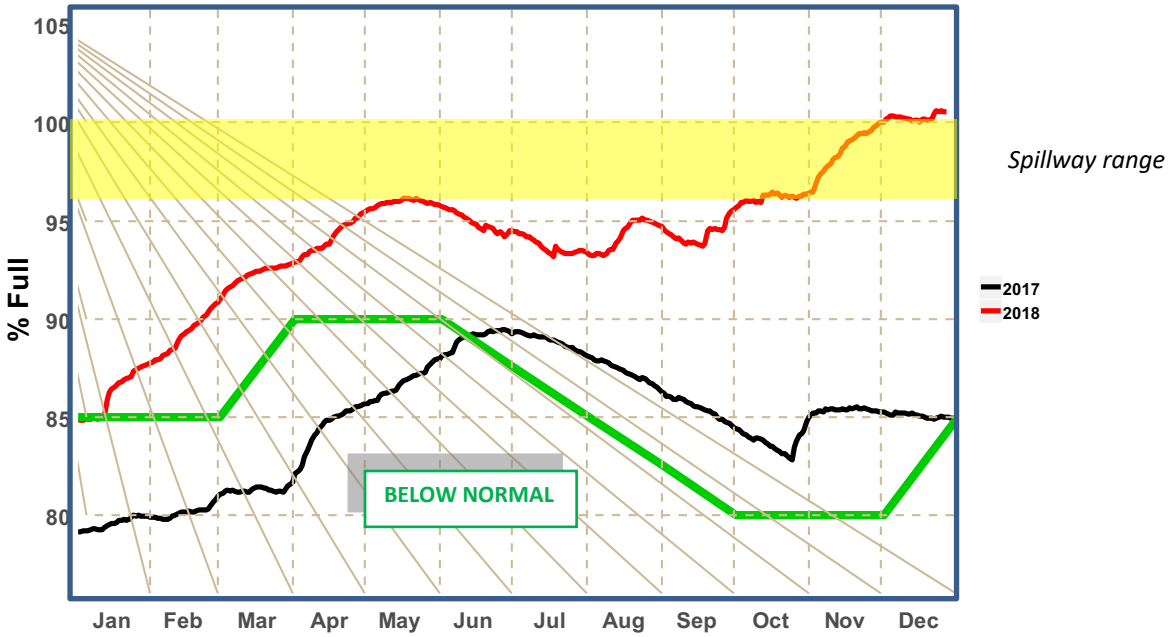
Partially Supplied Communities



Reservoir Withdrawals – 5 Year Running Average



Quabbin Reservoir Volume



Quabbin Spill (BG)	10.8
Wachusett Releases & Spill (BG)	31.8


WATER RESOURCES AUTHORITY
MASSACHUSETTS

Painting of the Deer Island Steel Water Tank Contract 7601

January 16, 2019

Deer Island Treatment Plant

Deer Island Steel Water Storage Tank

Existing Conditions

Bottom of tank fluted column at foundation

Exterior of fluted column

Vertical seams and vent

Painting of Deer Island Steel Water Storage Tank - Procurement

Bidders	Bid Amount
Atlas Painting and Sheeting Co.	$2,590,000
Engineer's Estimate	*$4,045,000*
Amstar of WNY, Inc.	$6,000,000*

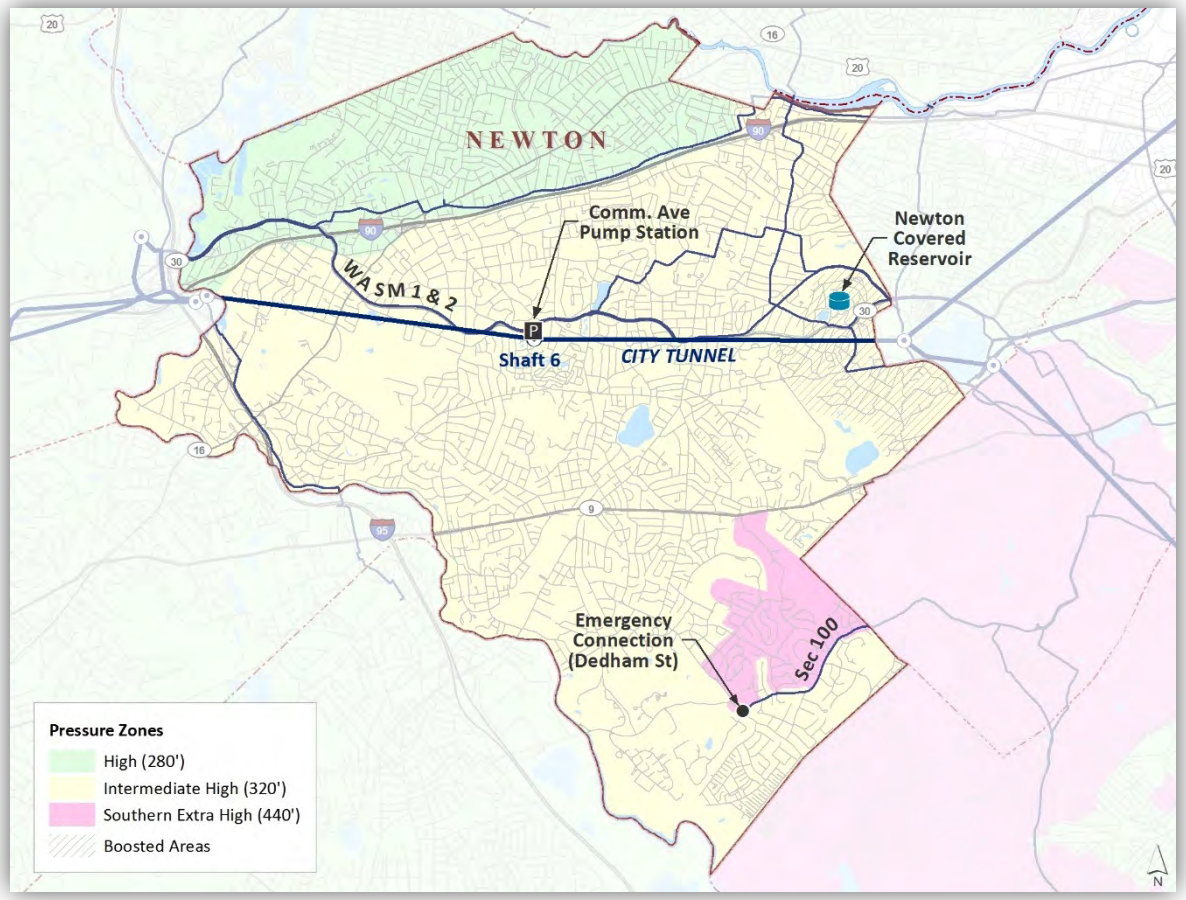
* *Bid disqualified over the DCAMM Approved Single Project Limit*


WATER RESOURCES AUTHORITY
MASSACHUSETTS

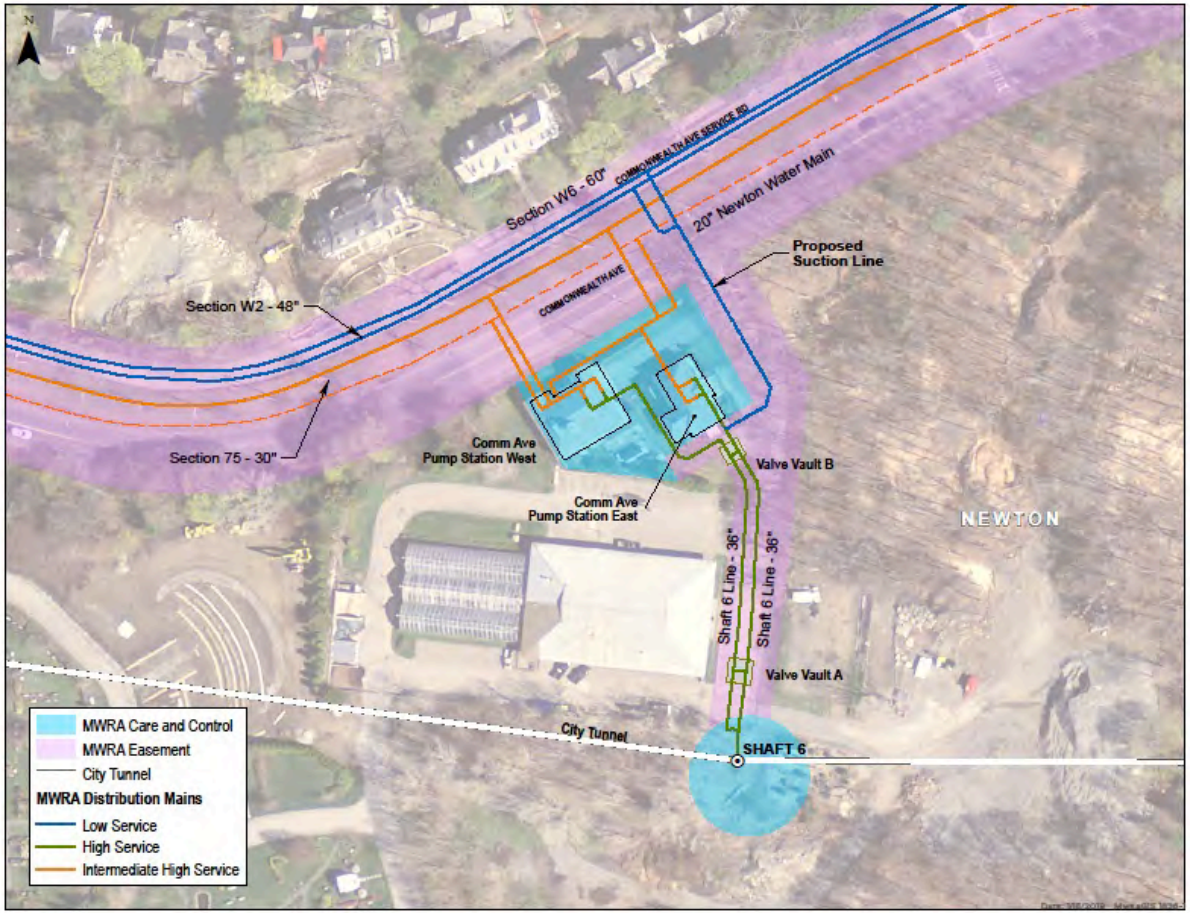
Commonwealth Avenue Pumping Station Improvements Contract 7524

January 16, 2019

Commonwealth Avenue Pumping Station - Location



Commonwealth Avenue Pumping Station – Site Map



Provide Redundant Supply In The Event Of A City Tunnel Failure

- New low service supply to the pumping station
- New Low Service pumps
- Remove one pump and replace with a 2nd Low Service Pump
- SCADA system upgrade
- Building system improvements

Procurement Process

- Eligible for DEP SRF Funding

Bidder	Bid Amount
Engineer's Estimate	*$6,275,000*
WES Construction Corp.	$6,879,000

- Notice To Proceed: February 2019
- Contract Duration: 580 Calendar Days

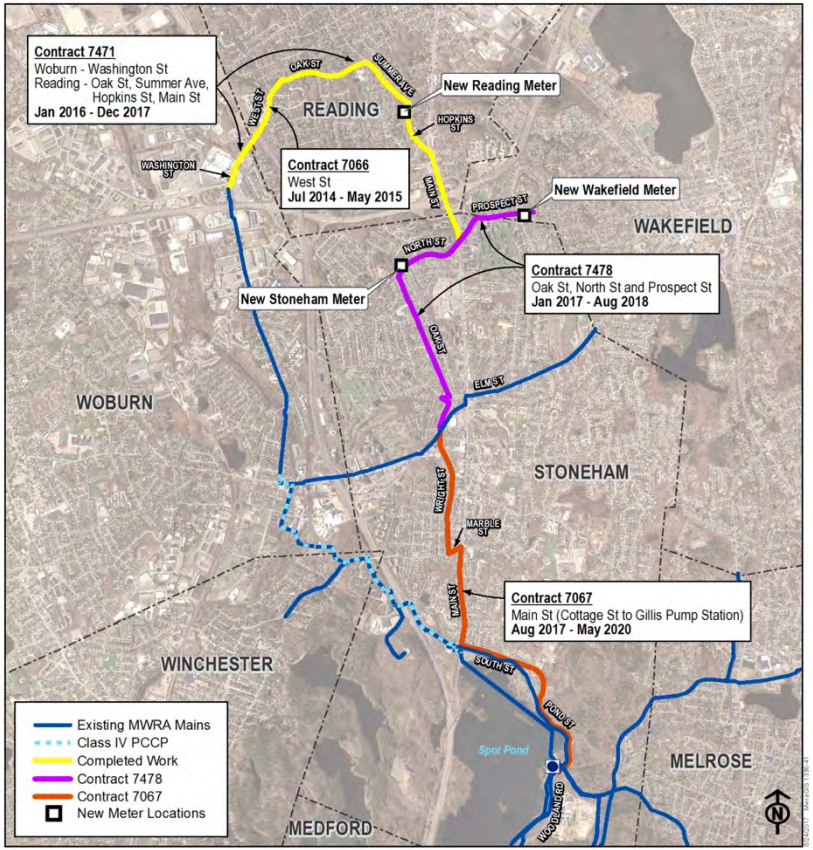

WATER RESOURCES AUTHORITY
MASSACHUSETTS

Northern Intermediate High
Section 110 – Stoneham
Contract 7067, Change Order 5

January 16, 2019

NIH Redundant Pipeline Project

- NIH Phase 1 - $14.4 million, included early contracts at West Street and Route 128/28 (yellow)
- NIH Phase 2 - $18.6 million (pink)
- Phase 1 & 2 activated
- NIH Phase 3 $24.5 million (orange)
- Approximately 60% complete



Installation of 48-inch Water Main on DCR roadway

Large Work Zone For Installation of 48-inch Water Main on Main Street

Montvale Avenue – Detours Around High Traffic Volume Streets in Stoneham

Drain Line at Maple and Wright Streets

- Re-design over or under drain would not work

Gas main installed directly over culvert

New 30-inch PVC drain line


WATER RESOURCES AUTHORITY
MASSACHUSETTS

Deer Island Cross-Harbor Cable