



Massachusetts Water Resources Authority

Presentation to a joint meeting of

WAC, WSCAC and the Advisory Board

Challenges Ahead

**Frederick A. Laskey
Executive Director**

September 17, 2009



Completion of the CSO Program



South Boston CSO Storage Tunnel

- Tunnel mining completed in August 2008, project substantially complete





South Boston CSO Storage Tunnel

- Work on the CSO and stormwater diversion chambers and related piping was completed this spring





South Boston CSO Storage Tunnel: Pump Station, Force Main

- Awarded March 2009





South Boston CSO Storage Tunnel: Ventilation Building

- Award expected October 2009





Morrissey Boulevard Stormdrain

- Work performed by BWSC
- Completed in July





East Boston Branch Sewer Interceptor Relief





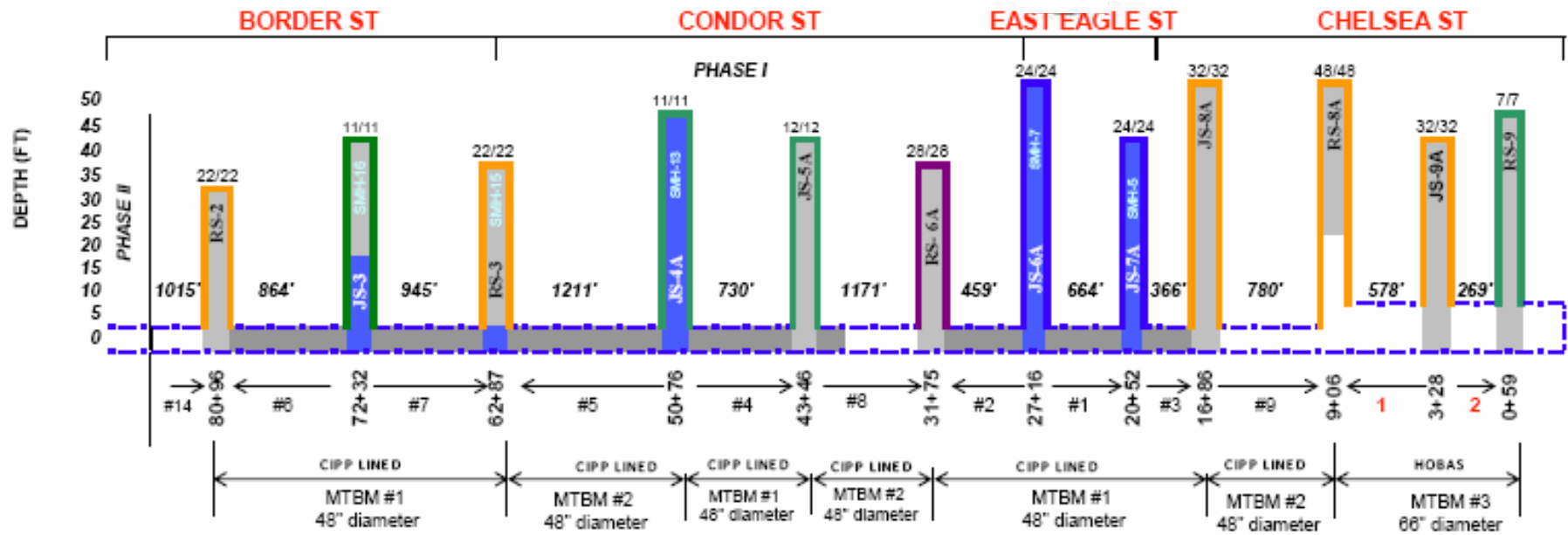
East Boston Branch Sewer Interceptor Relief

- Work 60% complete





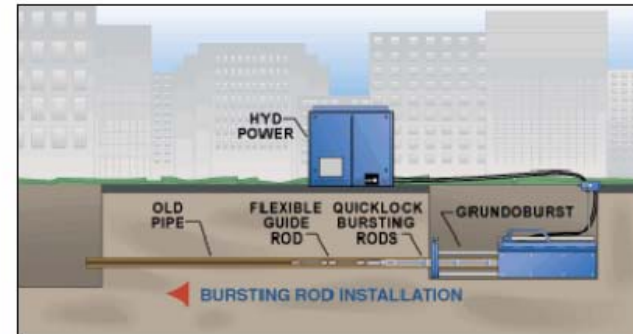
East Boston Branch Sewer Interceptor Relief



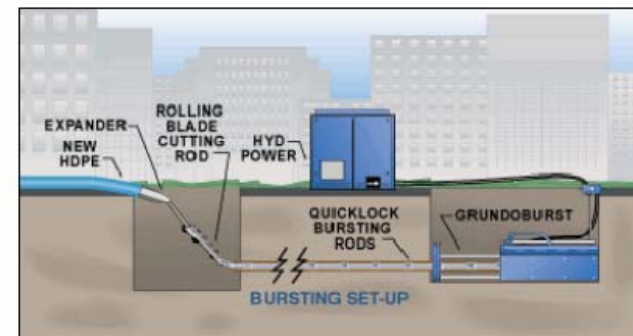


East Boston Branch Sewer Interceptor Relief

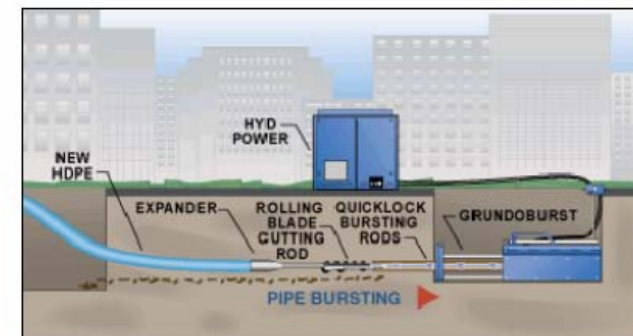
- Pipebursting contract awarded April 2009



Pipe Bursting Static/Hydraulic (step 1)



Pipe Bursting Static/Hydraulic (step 2)



Pipe Bursting Static/Hydraulic (step 3)



Cottage Farm Connection and Inflow Controls

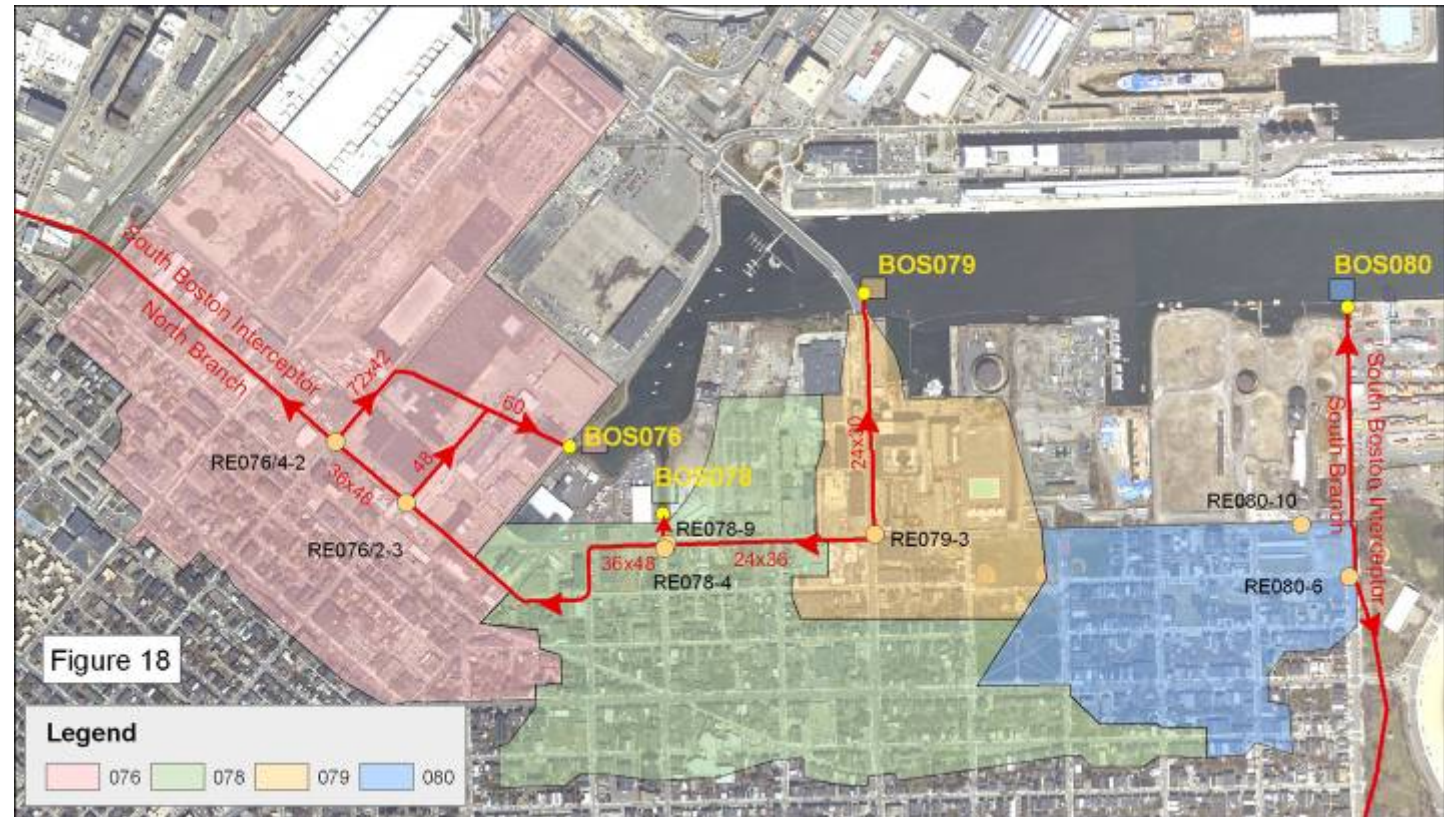
- Work is substantially complete





Reserved Channel Sewer Separation, Contract 2

- Awarded April 2009





Brookline Sewer Separation, Contract 2

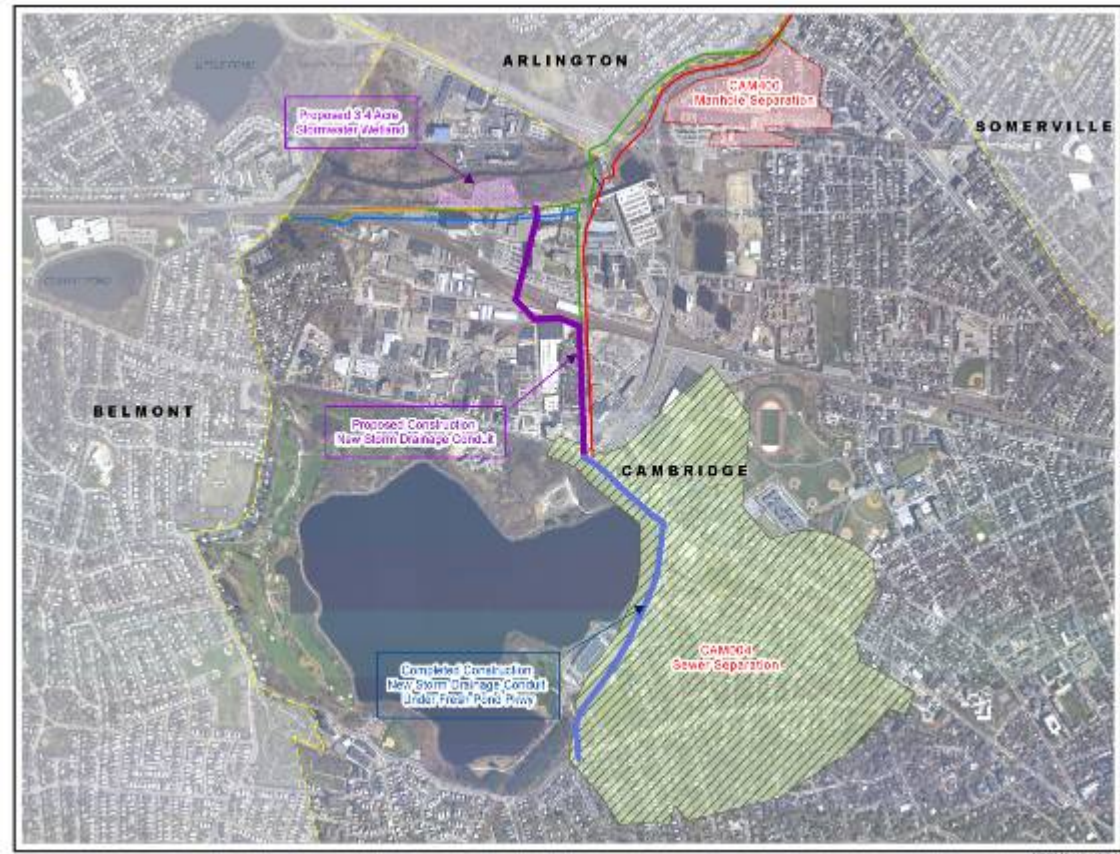
- Award expected January 2010





Alewife Brook CSO Control: Cambridge Contract 12

- Award expected July 2010





Deer Island Asset Protection



Deer Island Plant Optimization and Asset Protection

- To protect the investment of MWRA's ratepayers in the Deer Island treatment facilities, a number of contracts were awarded in FY2009:
 - Concrete/Steel Restoration and Coating, July 2008
 - Roof Replacement Phase I, December 2008
 - Primary and Secondary Clarifier Rehabilitation, January 2009
 - Heat Loop Construction 3, April 2009
 - Switchgear Automation, May 2009
 - Electrical Equipment Maintenance, May 2009



Deer Island Plant Optimization and Asset Protection

- Projects in FY2010:
 - DSL Pump Replacement Phase I, September 2009 - \$1.3 million
 - Digester Sludge Pump Overflow Piping and Valve Replacement Phase I, March 2010 - \$7.0 million
 - Clinton Digester Rehabilitation, January 2010 - \$1.0 million
 - Clinton Aeration System, March 2010 - \$750,000
 - New Back Pressure Steam Turbine, April 2010 - \$2.5 million
 - Electrical Upgrade 4, February 2010 - \$5.0 million
 - NMPS VFD Replacement, May 2010 - \$40 million
 - Gravity Thickener Rehab Phase I, December 2010 - \$1.0 million



Deer Island Digester Piping Replacement





Deer Island Primary and Secondary Clarifier Rehabilitation





Sludge Pump Replacements





Water System Upgrades



Section 97A, Revere





Section 97A, Revere

- This pipeline serves East Boston (including Logan Airport)



Section 53, Revere



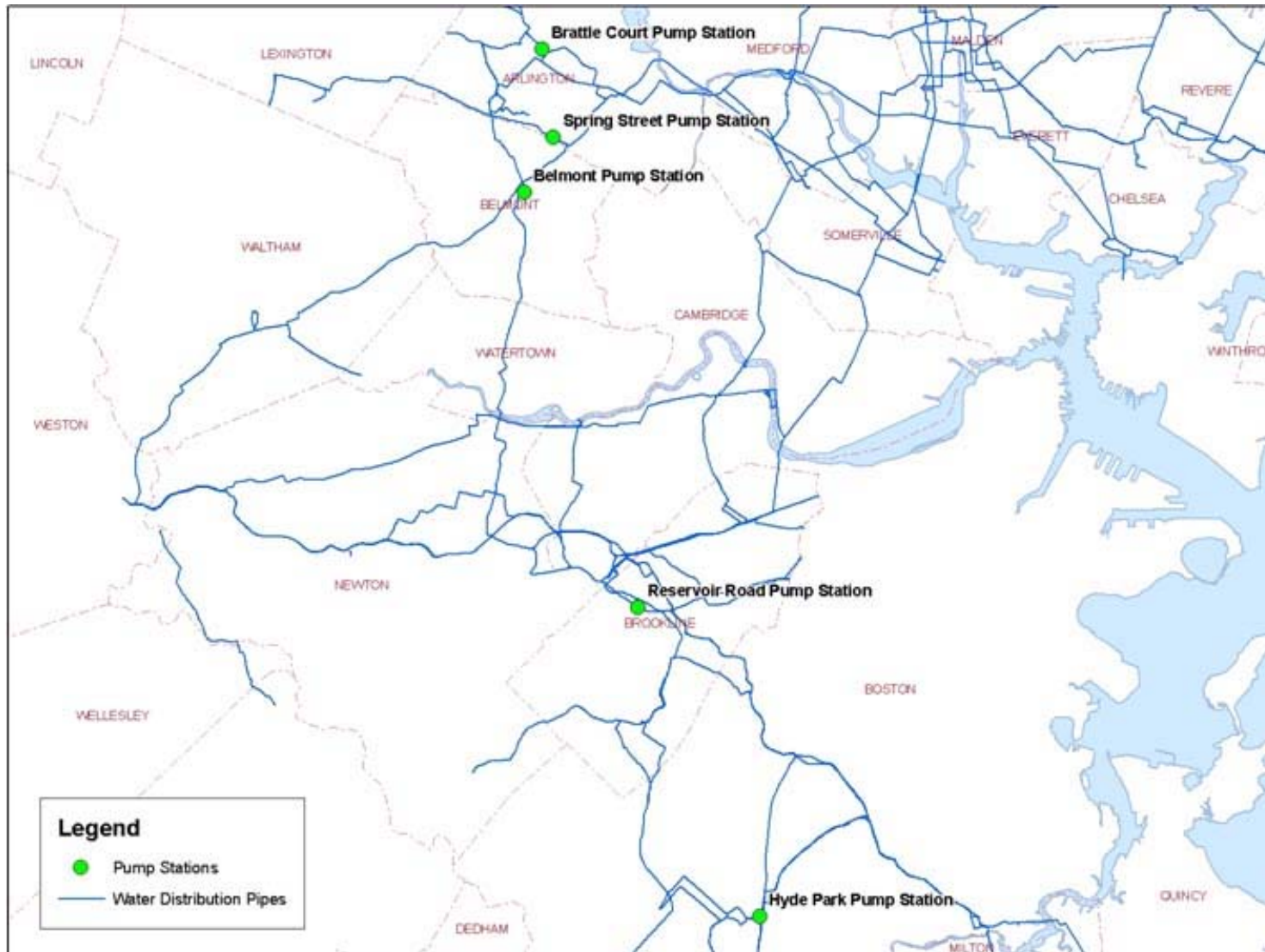


Section 53, Revere

- This pipeline serves
 - Winthrop
 - Revere
 - Lynn (GE)
 - Marblehead



Rehabilitation of Other Pump Stations





Rehabilitation of Other Pump Stations

- These pump stations serve:

Northern Intermediate High

Stoneham
Wakefield
Woburn
Winchester

Southern High

Boston
Brookline
Quincy
Milton
Watertown

Northern High

Medford
Malden
Saugus
Lynnfield
Peabody
Marblehead
Swampscott
Lynn GE
Nahant
Revere
Winthrop
Chelsea
Everett
Somerville
Deer Island
Boston



Blue Hills Covered Storage Facility

- Two new 10 million gallon tanks on-line August 2009





Blue Hills Covered Storage Facility

- The new Blue Hills Tanks serve:
 - Quincy
 - Milton
 - Brookline
 - Boston
 - Roxbury
 - West Roxbury
 - Jamaica Plain
 - Roslindale
 - Mattapan
 - Hyde Park



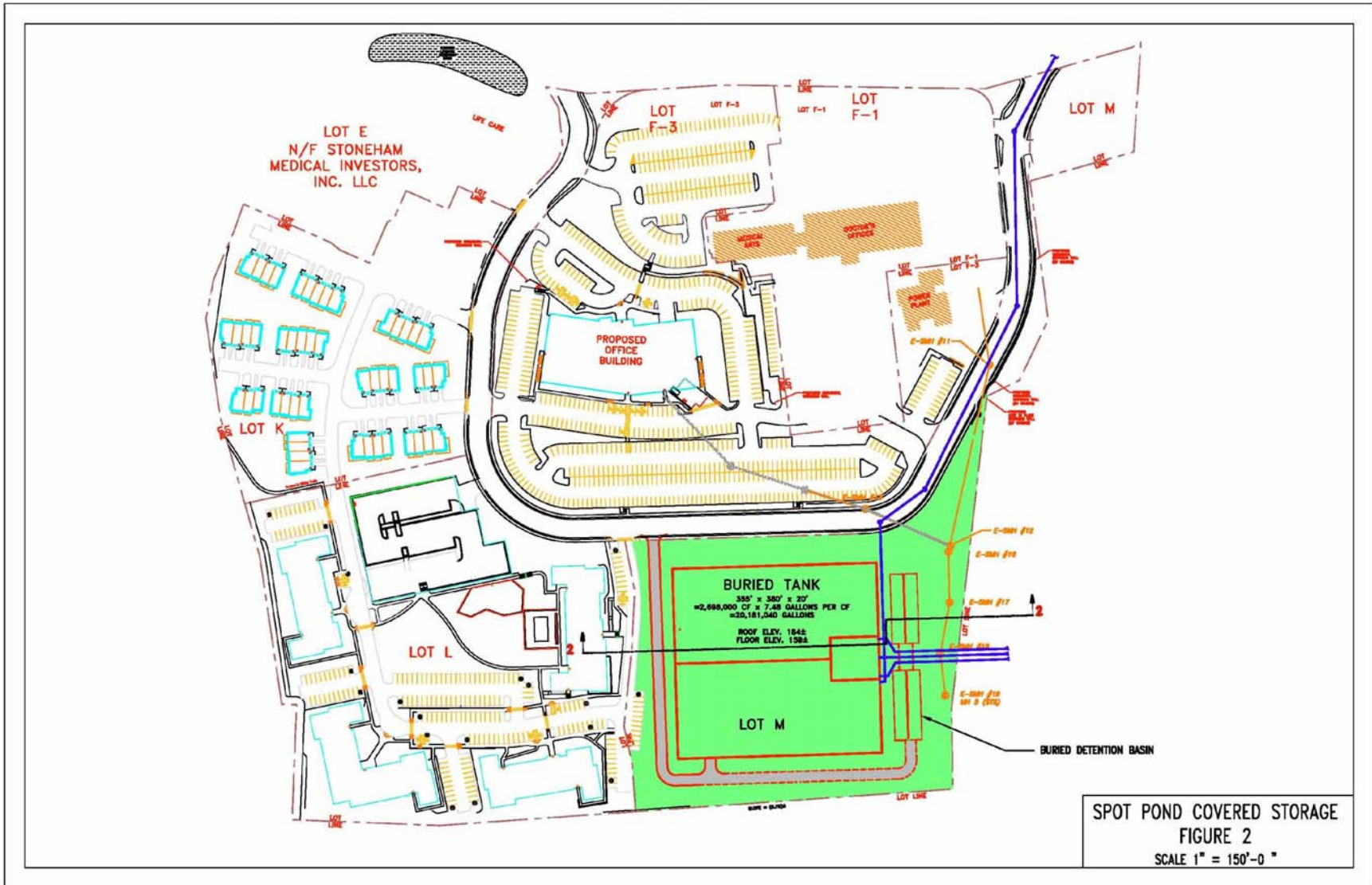
New Connecting Mains: Sections 18, 50 and 51

- Cleaning and cement-mortar-lining of approximately 15,000 feet of 16-, 20- and 48-inch cast-iron pipe
- Serves Medford and Somerville





Low Service Storage at Spot Pond





Low Service Storage at Spot Pond

- The Low Service Storage would serve:
 - Cambridge
 - Charlestown
 - Chelsea
 - East Boston
 - Everett
 - Malden
 - Somerville



Low Service Storage at Spot Pond

- In an emergency, Low Service Storage would serve:

Northern Intermediate High

Stoneham
Wakefield
Woburn
Winchester

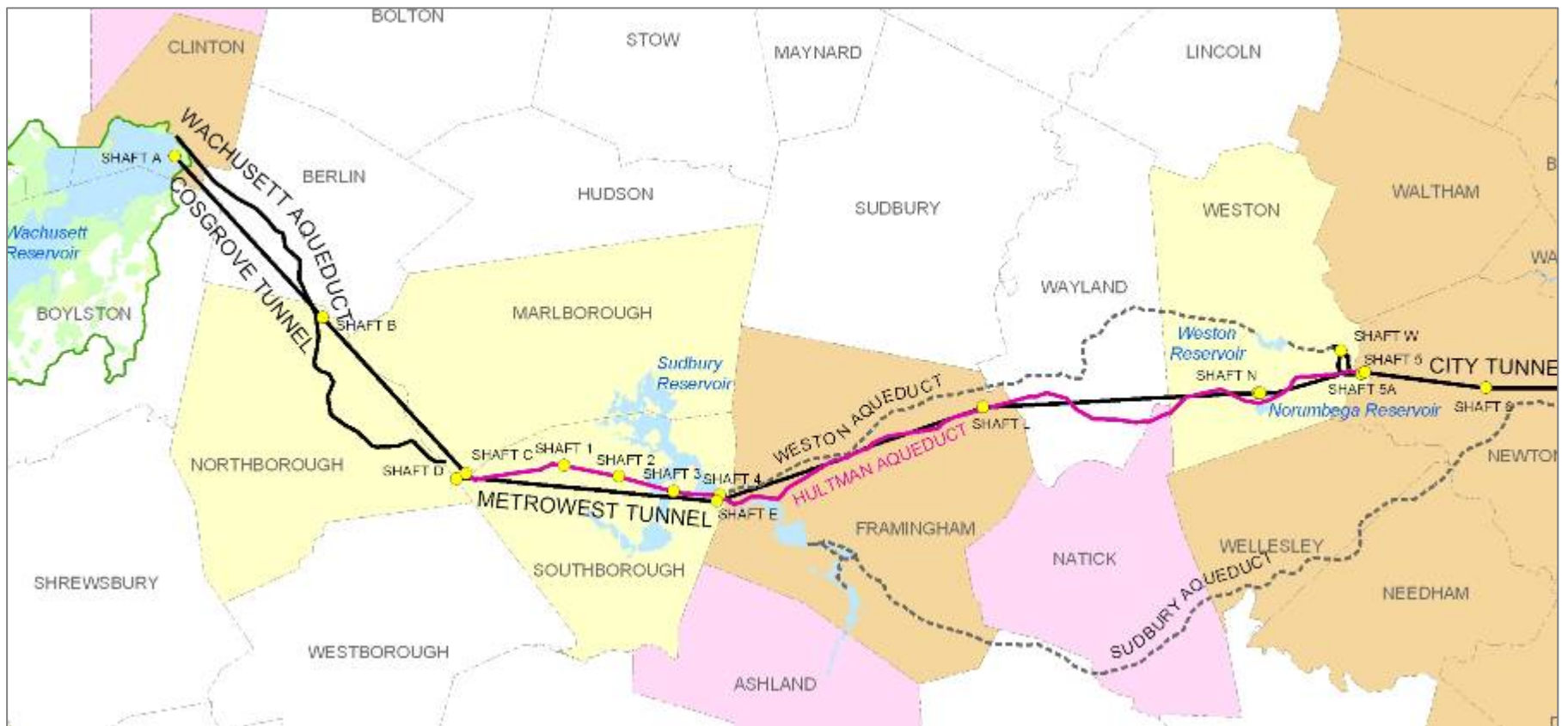
Northern High

Medford
Malden
Saugus
Lynnfield
Peabody
Marblehead
Swampscott
Lynn GE
Nahant
Revere
Winthrop
Chelsea
Everett
Somerville
Deer Island
Boston



Lower Hultman Aqueduct Interconnections and Rehabilitation

- Awarded July 2009
- Serves 44 communities





Lower Hultman Aqueduct Interconnections and Rehabilitation





UV Disinfection at Carroll Treatment Plant

- Unfiltered systems must have two primary disinfectants, one of which must achieve *Cryptosporidium* inactivation
- UV is a cost effective method to comply with LT2ESWTR



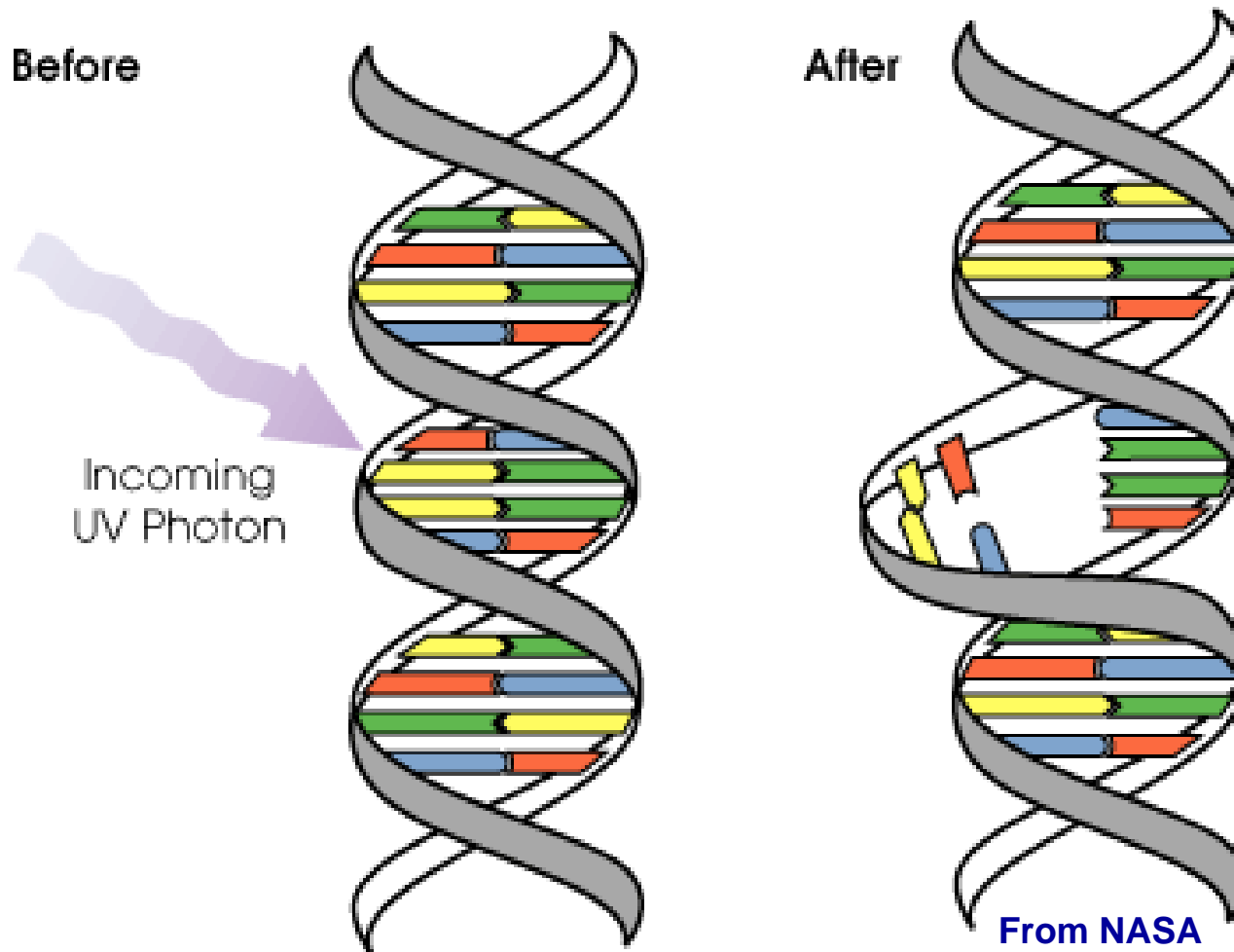


Disinfection Strategy

| Disinfection Agent | Target Pathogen | Inactivation Level |
|---------------------------|-----------------------------------|-------------------------------------------------|
| Ozone | <i>Giardia, Virus</i> | 3-log (<i>Giardia</i>) 4-log (virus) |
| Ultraviolet | <i>Cryptosporidium</i> | 2-log (w/ provision for 3-log) |
| Chlorine | Total Coliform | |
| Chloramine | Secondary Disinfectant | |



UV Light damages DNA and prevents replication





Transmission Distribution Redundancy



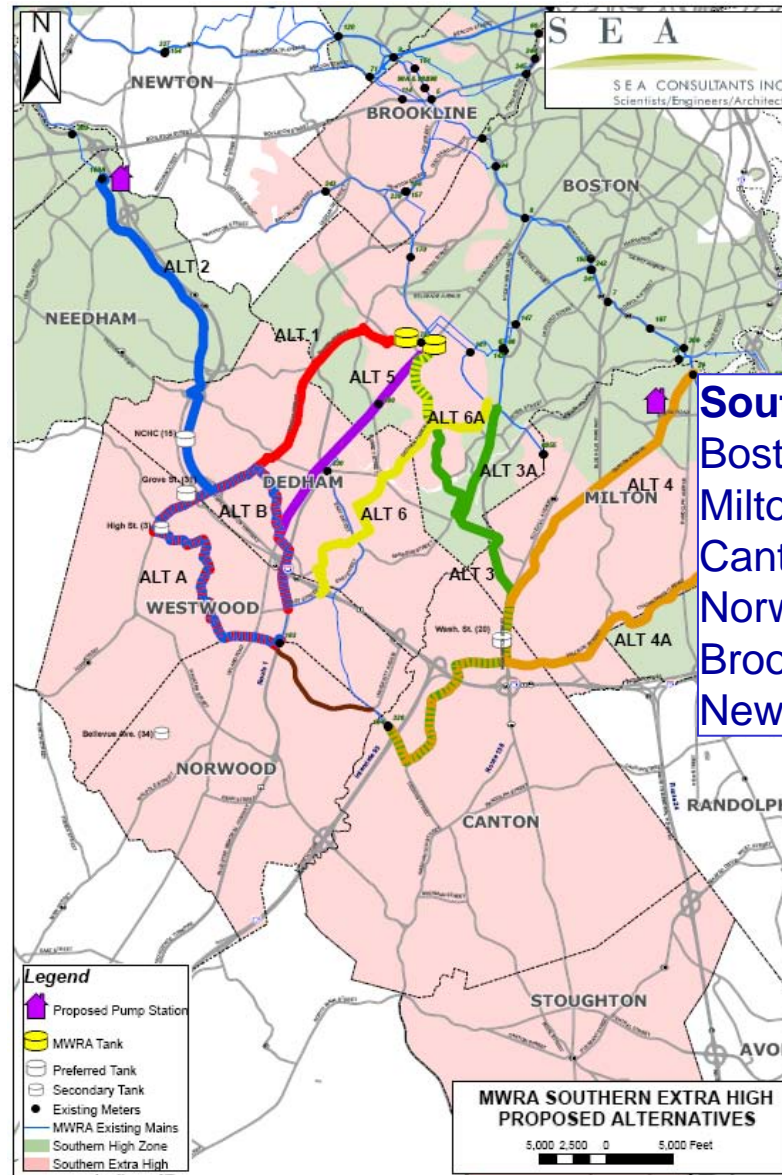
Recommended Plan-Northern Intermediate High



Northern Intermediate High
Stoneham
Wakefield
Woburn
Winchester



Southern Extra High Redundancy Alternatives



Southern Extra High
Boston
Milton
Canton
Norwood
Brookline
Newton



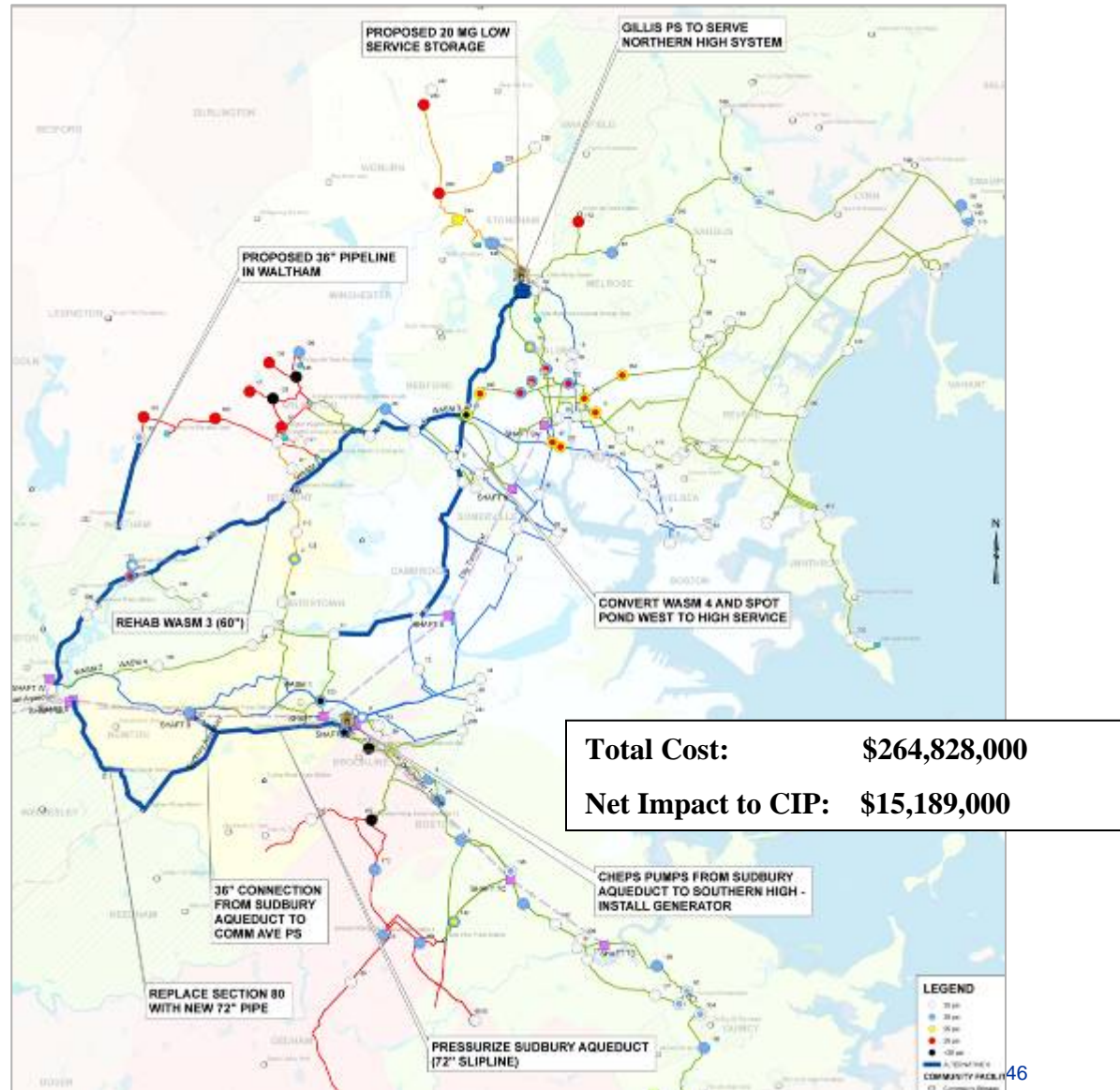
Transmission Redundancy Study: Section 80/Sudbury Aqueduct – 72" Alternative

Advantages

- Rehab WASM 3 in CIP (no additional impact)
- No new pumping station required
- Replace Section 80 with 72", rehab of Section 80 is in the CIP (marginal additional cost)
- Maximizes use of existing infrastructure (Low Service System)
- 36" Pipeline in Waltham replaces WASM 4 to WASM 3 connecting main

Disadvantages

- CHEPS requires full capacity generator, may be difficult to install





Operations and Maintenance



Deer Island Plant Continues to Perform Well

- Deer Island is also on track to receive the National Association of Clean Water Agencies' "Gold Award" for a second straight year





Request for Permit Modifications

- In April 2009, MWRA sought approval from EPA for interim modifications to its Ambient Monitoring Plan that will:
 - significantly reduce the scope and cost of the monitoring and
 - save an estimated \$1.3 million annually. MWRA staff believe that the science justifies these changes, and that
 - comply with NPDES permit and Contingency Plan requirements
- Although EPA rejected our request for an interim modification, they indicated that they will consider our proposed changes as part of the permit's full review process
- OMSAP currently reviewing



New NPDES Permit

- Negotiations finally starting
- Community co-permittees
- Stepped-up enforcement for communities



Drinking Water Quality Continues to be Excellent

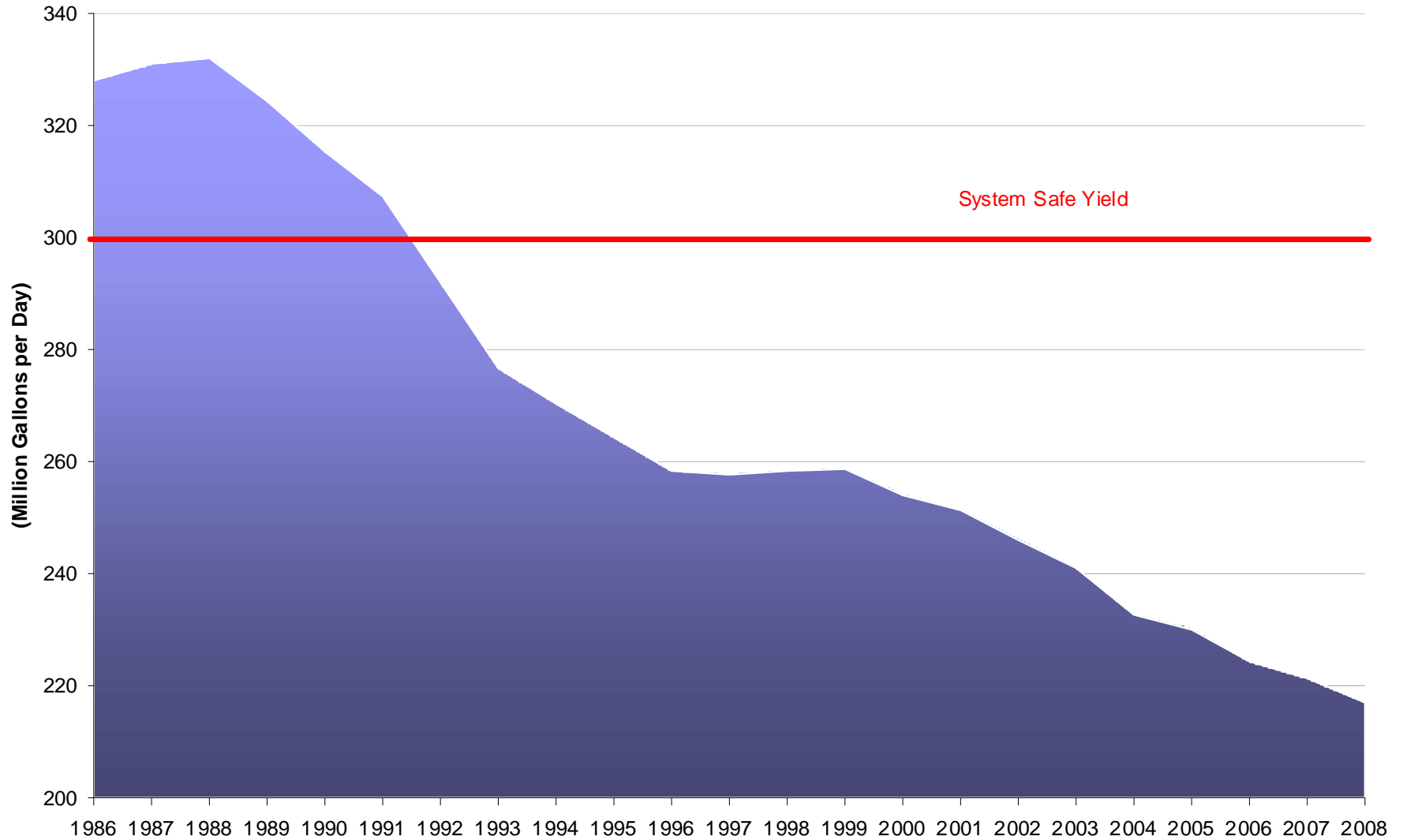
Confirmed Total Coliform (TCR) Sample Results System-Wide

| | 2005 | 2006 | 2007 | 2008 | 2009 |
|-----------|-----------|-----------|-----------|-----------|------------|
| June | | 2 of 1602 | 2 of 1574 | 1 of 1637 | 2 of 1725 |
| July | | 2 of 1640 | 1 of 1734 | 0 of 1765 | 0 of 1663 |
| August | 3 of 1724 | 2 of 1775 | 0 of 1662 | 1 of 1566 | 0 of 1655 |
| September | 0 of 1577 | 1 of 1585 | 0 of 1559 | 0 of 1698 | 1 of 316** |

***Sample results through September 4, 2009*



Water Demand Continues to Drop





Framingham Wells Project

- If Framingham reduces its demand, other communities' shares increase by 2.2%
- Canton also looking to reduce demand by about .5 mgd

| | FY10 Water Assessment | | | |
|----------------------|-----------------------|------------------|-------------------|---------------|
| | Actual | Flow Adjusted | Impact | |
| ARLINGTON | \$3,893,299 | \$3,979,878 | \$86,579 | 2.2% |
| BELMONT | 2,094,622 | 2,141,203 | 46,581 | 2.2% |
| BOSTON (BWSC) | 66,256,569 | 67,729,169 | 1,472,600 | 2.2% |
| BROOKLINE | 5,216,987 | 5,333,003 | 116,016 | 2.2% |
| CANTON | 2,316,722 | 2,368,241 | 51,519 | 2.2% |
| CHELSEA | 2,978,069 | 3,044,295 | 66,226 | 2.2% |
| DEDHAM-WESTWOOD W.D. | 7,234 | 7,395 | 161 | 2.2% |
| EVERETT | 4,552,198 | 4,653,526 | 101,328 | 2.2% |
| FRAMINGHAM | 6,531,365 | 2,694,694 | -3,836,671 | -58.7% |
| LEOMINSTER | 0 | 0 | 0 | 0.0% |
| LEXINGTON | 4,482,551 | 4,582,235 | 99,684 | 2.2% |
| LYNN (LWSC) | 159,682 | 163,234 | 3,552 | 2.2% |
| LYNNFIELD W.D. | 456,370 | 466,519 | 10,149 | 2.2% |
| MALDEN | 5,658,857 | 5,784,699 | 125,842 | 2.2% |
| MARBLEHEAD | 1,768,433 | 1,807,760 | 39,327 | 2.2% |
| MARLBOROUGH | 2,901,191 | 2,965,710 | 64,519 | 2.2% |
| MEDFORD | 4,761,277 | 4,867,159 | 105,882 | 2.2% |
| MELROSE | 2,048,045 | 2,093,590 | 45,545 | 2.2% |
| MILTON | 2,122,571 | 2,169,774 | 47,203 | 2.2% |
| NAHANT | 340,192 | 347,758 | 7,566 | 2.2% |
| NEEDHAM | 427,332 | 436,838 | 9,506 | 2.2% |
| NEWTON | 8,662,740 | 8,855,383 | 192,643 | 2.2% |
| NORTHBOROUGH | 823,787 | 842,106 | 18,319 | 2.2% |
| NORWOOD | 3,017,939 | 3,085,053 | 67,114 | 2.2% |
| PEABODY | 312,793 | 319,750 | 6,957 | 2.2% |
| QUINCY | 9,360,041 | 9,568,191 | 208,150 | 2.2% |
| READING | 1,737,501 | 1,776,139 | 38,638 | 2.2% |
| REVERE | 4,039,752 | 4,129,588 | 89,836 | 2.2% |
| SAUGUS | 2,700,713 | 2,760,773 | 60,060 | 2.2% |
| SOMERVILLE | 5,889,612 | 6,020,586 | 130,974 | 2.2% |
| SOUTHBOROUGH | 666,245 | 681,061 | 14,816 | 2.2% |
| STONEHAM | 2,673,786 | 2,733,246 | 59,460 | 2.2% |
| STOUGHTON | 485,781 | 496,584 | 10,803 | 2.2% |
| SWAMPSCOTT | 1,380,309 | 1,411,005 | 30,696 | 2.2% |
| WAKEFIELD | 1,408,297 | 1,439,615 | 31,318 | 2.2% |
| WALTHAM | 7,149,732 | 7,308,729 | 158,997 | 2.2% |
| WATERTOWN | 2,807,488 | 2,869,921 | 62,433 | 2.2% |
| WELLESLEY | 831,203 | 849,687 | 18,484 | 2.2% |
| WESTON | 1,438,311 | 1,470,297 | 31,986 | 2.2% |
| WINCHESTER | 812,945 | 831,024 | 18,079 | 2.2% |
| WINTHROP | 1,247,329 | 1,275,067 | 27,738 | 2.2% |
| WOBURN | 2,670,355 | 2,729,740 | 59,385 | 2.2% |



Flaggers/Details?





Aquatic Invasive Species: Floating Fragment Barrier





Aquatic Invasive Species: Eurasian Milfoil





Aquatic Invasive Species: Water Chestnut at Sudbury Reservoir





Quabbin Boat Inspection/Decontamination Program





Quabbin Boat Inspection/Decontamination Program



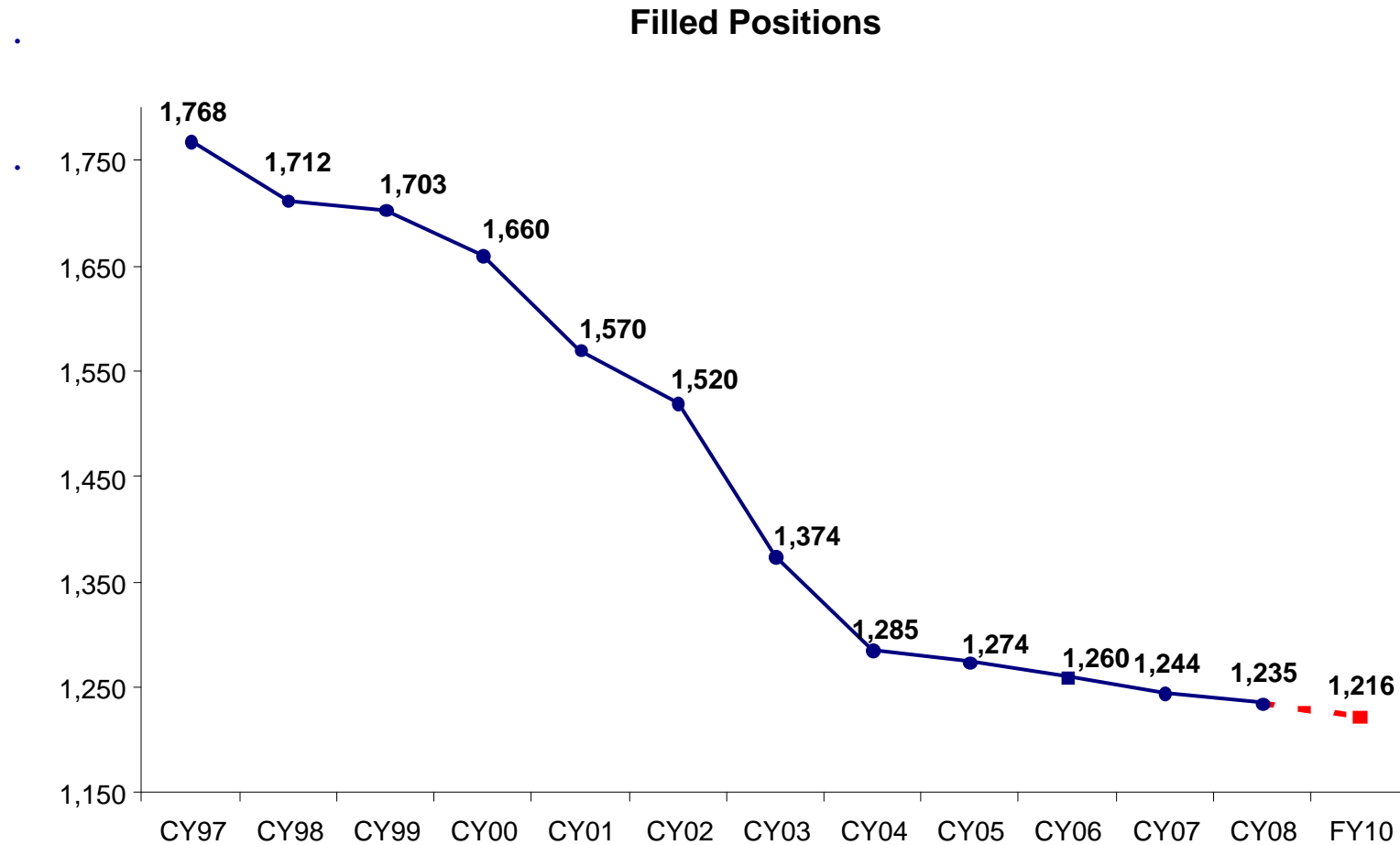


Rates Management



Continued Cost Saving Measures: Personnel Actions

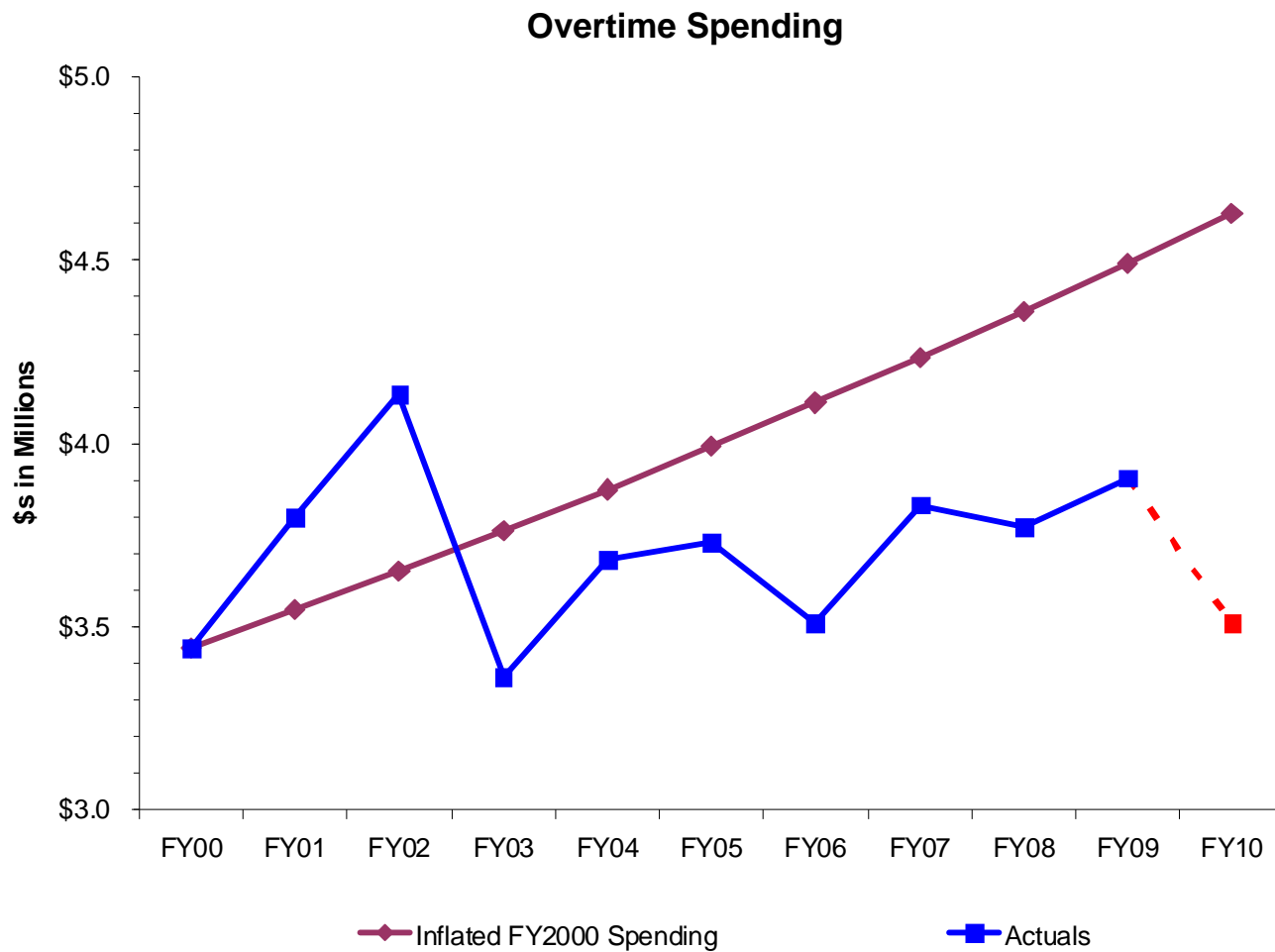
Reduced 17 funded positions in FY10; FY11 staffing target is 1,216





Continued Cost Saving Measures: Overtime

Reduced Overtime budget by \$400,000 or 10%





Rates Outlook

| Fiscal Year | FY10 | FY11 | FY12 | FY13 | FY14 | FY15 |
|--------------------------------------|---------|---------|---------|---------|---------|---------|
| Rate Revenue Requirement (millions) | 561.4 | 597.4 | 635.7 | 676.3 | 713.7 | 746.3 |
| Rate Revenue Increase | 3.8% | 6.4% | 6.4% | 6.4% | 5.5% | 4.6% |
| Average Household Rate | | | | | | |
| Based on Water Use of 61,000 gallons | \$806 | \$845 | \$895 | \$944 | \$1,002 | \$1,052 |
| Based on Water Use of 90,000 gallons | \$1,189 | \$1,246 | \$1,321 | \$1,392 | \$1,478 | \$1,552 |

Out-Year Assumptions

- Annual Debt Service Assistance: \$350,000
- 4.0% inflation rate for direct expenses
- Capital spending based on Final FY10 CIP
- 2.5% inflation rate for capital improvement expenses
- 6.0% out-year fixed rate interest
- 4.0% out-year variable rate interest



Stimulus Funding



Stimulus Funding Announced at Deer Island on June 15th





Stimulus Funding

- **Clean Water (Wastewater) Stimulus Funding Totals \$23.5 Million**
 - MWRA will receive **\$5.5 million** for designated Green Infrastructure projects
 - \$4.75 million in for a 1.5MW wind turbine at DeLauri Pump Station
 - \$.735 million for 180 kW roof mount photovoltaic at Deer Island
 - MWRA has also been allocated an additional **\$18 million** for any of its ARRA eligible clean water projects
- **Drinking Water Stimulus Funding Estimated at \$7.4 Million**
 - MWRA will receive **\$2.6 million** for designated Green Infrastructure projects
 - \$1.53 million for the Loring Road hydroelectric project
 - \$1.05 million for 478kW in ground and roof mount photovoltaic installations at the John J. Carroll Water Treatment Plant
 - MWRA is also anticipating receiving approximately **\$4.8 million** for any of its ARRA eligible drinking water projects



Renewable Energy



Hydroelectric Power Underway at Loring Road Covered Storage, Weston

- Will generate 1.2 million kWh per year





Deer Island Steam Turbine Generator Upgrade Underway

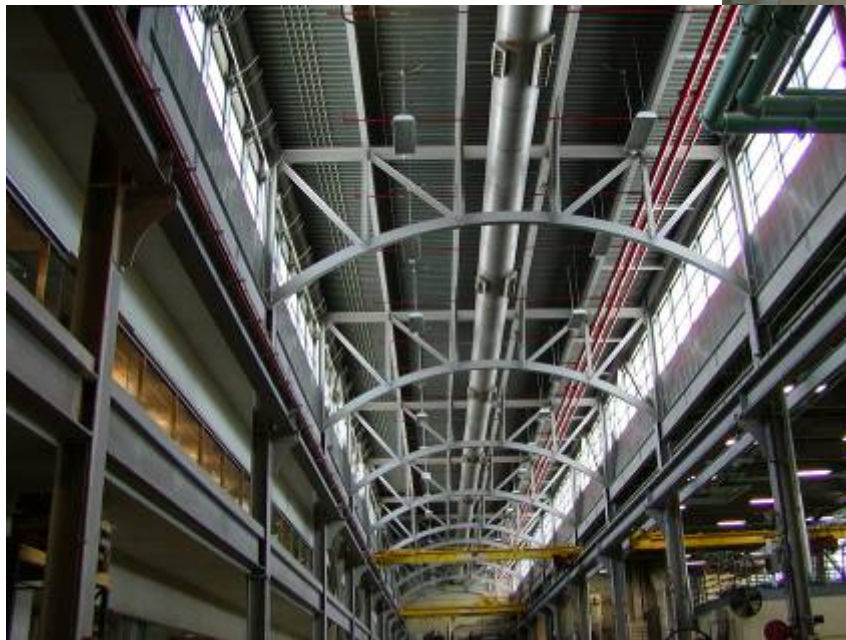
- Will produce an additional 5.5 million kWh per year (on top of current 28 million kWh)





Ongoing Deer Island Lighting Improvements

- Will save \$350,000 per year





Wind Power Proposed at DeLauri Pump Station, Charlestown

- Will generate 3.7 million kWh per year





Wind Power Proposed at Nut Island Headworks, Quincy

- Will generate 3.7 million kWh per year





MWRA Has Erected its First Two Wind Turbines on Deer Island





Governor Patrick on Deer Island in August 2009

