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: Pump Station, Force Main
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

- Work 60% complete
East Boston Branch Sewer Interceptor Relief
East Boston Branch Sewer Interceptor Relief

- Pipebursting contract awarded
  April 2009
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
• Award expected July 2010
Deer Island 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
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

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

<table>
<thead>
<tr>
<th>Disinfection Agent</th>
<th>Target Pathogen</th>
<th>Inactivation Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ozone</td>
<td><em>Giardia, Virus</em></td>
<td>3-log (<em>Giardia</em>) 4-log (virus)</td>
</tr>
<tr>
<td>Ultraviolet</td>
<td><em>Cryptosporidium</em></td>
<td>2-log (w/ provision for 3-log)</td>
</tr>
<tr>
<td>Chlorine</td>
<td>Total Coliform</td>
<td></td>
</tr>
<tr>
<td>Chloramine</td>
<td>Secondary Disinfectant</td>
<td></td>
</tr>
</tbody>
</table>
UV Disinfection

UV Light damages DNA and prevents replication

From NASA
Transmission Distribution
Redundancy
Recommended Plan-Northern Intermediate High

Proposed FY09 CIP
- $6.8M Design & Construct NIH Improvements
- $42.2M in FY09-12 for redundant pipeline
- $7.2M in FY14-17 for Section 89/29 rehabilitation
- $17M in FY09-12 for two 3.4 MG tanks (includes design, site work and piping)
- $10.2M in FY14-18 for Gillis Pump Station Redundancy

Northern Intermediate High
- Stoneham
- Wakefield
- Woburn
- Winchester
Northern Intermediate High
Short Term Improvements Design

Reading/Stoneham Interconnection Pipe
(2,200 ft, 36-in diameter)

Gillis Pump Station
VFD Conversion and Surge Relief
Southern Extra High Redundancy Alternatives

- Boston
- Milton
- Canton
- Norwood
- Brookline
- Newton
Advantages

– Replace existing 60” WASM 3 with 72” (only 12” of additional pipe dia.)
– No new pumping station required
– 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

Total Cost: $284,267,000
Net Impact to CIP: $42,587,000
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

Total Cost: $264,828,000
Net Impact to CIP: $15,189,000
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
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-permitees
- Stepped-up enforcement for communities
**Drinking Water Quality Continues to be Excellent**

### Confirmed Total Coliform (TCR) Sample Results System-Wide

<table>
<thead>
<tr>
<th></th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
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<tbody>
<tr>
<td>June</td>
<td>2 of 1602</td>
<td>2 of 1574</td>
<td>1 of 1637</td>
<td>2 of 1725</td>
<td></td>
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<tr>
<td>July</td>
<td>2 of 1640</td>
<td>1 of 1734</td>
<td>0 of 1765</td>
<td>0 of 1663</td>
<td></td>
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<tr>
<td>August</td>
<td>3 of 1724</td>
<td>2 of 1775</td>
<td>0 of 1662</td>
<td>1 of 1566</td>
<td>0 of 1655</td>
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<tr>
<td>September</td>
<td>0 of 1577</td>
<td>1 of 1585</td>
<td>0 of 1559</td>
<td>0 of 1698</td>
<td>1 of 316**</td>
</tr>
</tbody>
</table>

**Sample results through September 4, 2009**
Water Demand Continues to Drop

System Safe Yield

(Million Gallons per Day)
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

<table>
<thead>
<tr>
<th>Community</th>
<th>Actual Flow</th>
<th>Flow Adjusted</th>
<th>Impact</th>
<th>Impact %</th>
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</thead>
<tbody>
<tr>
<td>ARLINGTON</td>
<td>$3,893,299</td>
<td>$3,979,878</td>
<td>$86,579</td>
<td>2.2%</td>
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<tr>
<td>BELMONT</td>
<td>2,094,622</td>
<td>2,141,203</td>
<td>46,581</td>
<td>2.2%</td>
</tr>
<tr>
<td>BOSTON (BWSC)</td>
<td>66,256,569</td>
<td>67,729,169</td>
<td>1,472,600</td>
<td>2.2%</td>
</tr>
<tr>
<td>BROOKLINE</td>
<td>5,216,987</td>
<td>5,333,003</td>
<td>116,016</td>
<td>2.2%</td>
</tr>
<tr>
<td>CANTON</td>
<td>2,316,722</td>
<td>2,368,241</td>
<td>51,519</td>
<td>2.2%</td>
</tr>
<tr>
<td>CHELSEA</td>
<td>2,978,069</td>
<td>3,044,295</td>
<td>66,226</td>
<td>2.2%</td>
</tr>
<tr>
<td>DEDHAM-WESTWOOD W.D.</td>
<td>7,234</td>
<td>7,395</td>
<td>161</td>
<td>2.2%</td>
</tr>
<tr>
<td>EVERETT</td>
<td>4,552,198</td>
<td>4,653,526</td>
<td>101,328</td>
<td>2.2%</td>
</tr>
<tr>
<td>FRAMINGHAM</td>
<td>6,531,365</td>
<td>2,694,694</td>
<td>-3,836,671</td>
<td>-58.7%</td>
</tr>
<tr>
<td>LEOMINSTER</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.0%</td>
</tr>
<tr>
<td>LEXINGTON</td>
<td>4,482,551</td>
<td>4,582,236</td>
<td>99,684</td>
<td>2.2%</td>
</tr>
<tr>
<td>LYNN (LWSC)</td>
<td>159,682</td>
<td>163,234</td>
<td>3,552</td>
<td>2.2%</td>
</tr>
<tr>
<td>LYNNFIELD W.D.</td>
<td>456,370</td>
<td>465,519</td>
<td>10,149</td>
<td>2.2%</td>
</tr>
<tr>
<td>MALDEN</td>
<td>5,658,857</td>
<td>5,784,699</td>
<td>125,842</td>
<td>2.2%</td>
</tr>
<tr>
<td>MARBLEHEAD</td>
<td>1,768,433</td>
<td>1,807,760</td>
<td>39,327</td>
<td>2.2%</td>
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<tr>
<td>MARLBOROUGH</td>
<td>2,901,191</td>
<td>2,965,710</td>
<td>64,519</td>
<td>2.2%</td>
</tr>
<tr>
<td>MEDFORD</td>
<td>4,761,277</td>
<td>4,867,159</td>
<td>105,882</td>
<td>2.2%</td>
</tr>
<tr>
<td>MELROSE</td>
<td>2,048,045</td>
<td>2,093,590</td>
<td>45,545</td>
<td>2.2%</td>
</tr>
<tr>
<td>MILTON</td>
<td>2,122,571</td>
<td>2,169,774</td>
<td>47,203</td>
<td>2.2%</td>
</tr>
<tr>
<td>NAHANT</td>
<td>340,192</td>
<td>347,758</td>
<td>7,566</td>
<td>2.2%</td>
</tr>
<tr>
<td>NEEDHAM</td>
<td>427,332</td>
<td>436,838</td>
<td>9,506</td>
<td>2.2%</td>
</tr>
<tr>
<td>NEWTON</td>
<td>8,662,740</td>
<td>8,855,383</td>
<td>192,643</td>
<td>2.2%</td>
</tr>
<tr>
<td>NORTHBOROUGH</td>
<td>823,787</td>
<td>842,106</td>
<td>18,319</td>
<td>2.2%</td>
</tr>
<tr>
<td>NORWOOD</td>
<td>3,017,939</td>
<td>3,085,053</td>
<td>67,114</td>
<td>2.2%</td>
</tr>
<tr>
<td>PEABODY</td>
<td>312,793</td>
<td>319,750</td>
<td>6,957</td>
<td>2.2%</td>
</tr>
<tr>
<td>QUINCY</td>
<td>9,360,041</td>
<td>9,568,191</td>
<td>208,150</td>
<td>2.2%</td>
</tr>
<tr>
<td>READING</td>
<td>1,737,501</td>
<td>1,776,139</td>
<td>38,638</td>
<td>2.2%</td>
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<tr>
<td>REVERE</td>
<td>4,039,752</td>
<td>4,129,588</td>
<td>89,836</td>
<td>2.2%</td>
</tr>
<tr>
<td>SAUGUS</td>
<td>2,700,713</td>
<td>2,760,773</td>
<td>60,060</td>
<td>2.2%</td>
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<tr>
<td>SOMERVILLE</td>
<td>5,889,612</td>
<td>6,020,586</td>
<td>130,974</td>
<td>2.2%</td>
</tr>
<tr>
<td>SOUTHBOROUGH</td>
<td>666,245</td>
<td>681,061</td>
<td>14,816</td>
<td>2.2%</td>
</tr>
<tr>
<td>STONEHAM</td>
<td>2,673,786</td>
<td>2,733,246</td>
<td>59,460</td>
<td>2.2%</td>
</tr>
<tr>
<td>STOUGHTON</td>
<td>485,781</td>
<td>496,584</td>
<td>10,803</td>
<td>2.2%</td>
</tr>
<tr>
<td>SWAMPSCOTT</td>
<td>1,380,309</td>
<td>1,411,005</td>
<td>30,696</td>
<td>2.2%</td>
</tr>
<tr>
<td>WAKEFIELD</td>
<td>1,408,297</td>
<td>1,439,615</td>
<td>31,318</td>
<td>2.2%</td>
</tr>
<tr>
<td>WALTHAM</td>
<td>7,149,732</td>
<td>7,308,729</td>
<td>158,997</td>
<td>2.2%</td>
</tr>
<tr>
<td>WATERTOWN</td>
<td>2,807,488</td>
<td>2,869,921</td>
<td>62,433</td>
<td>2.2%</td>
</tr>
<tr>
<td>WELLESLEY</td>
<td>831,203</td>
<td>849,687</td>
<td>18,484</td>
<td>2.2%</td>
</tr>
<tr>
<td>WESTON</td>
<td>1,438,311</td>
<td>1,470,297</td>
<td>31,986</td>
<td>2.2%</td>
</tr>
<tr>
<td>WINCHESTER</td>
<td>812,945</td>
<td>831,024</td>
<td>18,079</td>
<td>2.2%</td>
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<tr>
<td>WINTHROP</td>
<td>1,247,329</td>
<td>1,275,067</td>
<td>27,738</td>
<td>2.2%</td>
</tr>
<tr>
<td>WOBURN</td>
<td>2,670,355</td>
<td>2,729,740</td>
<td>59,385</td>
<td>2.2%</td>
</tr>
</tbody>
</table>
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
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%

Overtime Spending

FY00 FY01 FY02 FY03 FY04 FY05 FY06 FY07 FY08 FY09 FY10

$ in Millions

$3.0 $3.5 $4.0 $4.5 $5.0

Inflated FY2000 Spending  Actuals
Rates Outlook

<table>
<thead>
<tr>
<th>Fiscal Year</th>
<th>FY10</th>
<th>FY11</th>
<th>FY12</th>
<th>FY13</th>
<th>FY14</th>
<th>FY15</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rate Revenue Requirement (millions)</td>
<td>561.4</td>
<td>597.4</td>
<td>635.7</td>
<td>676.3</td>
<td>713.7</td>
<td>746.3</td>
</tr>
<tr>
<td>Rate Revenue Increase</td>
<td>3.8%</td>
<td>6.4%</td>
<td>6.4%</td>
<td>6.4%</td>
<td>5.5%</td>
<td>4.6%</td>
</tr>
</tbody>
</table>

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