

# **Capital Improvement Program**

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**Proposed  
FISCAL YEAR 2008**



**MASSACHUSETTS WATER RESOURCES AUTHORITY**

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**together with the participation of MWRA staff.**

\* Ian A. Bowles, newly appointed Chair in January 2007



January 2007

Katherine Haynes Dunphy, Chairwoman  
MWRA Advisory Board  
11 Beacon Street  
Boston, MA 02108

Dear Chairwoman Dunphy:

This letter transmits to the Advisory Board the MWRA's Proposed Capital Improvement Program for Fiscal Year 2008. The MWRA's Board of Directors approved the transmittal of the Proposed Capital Improvement Program (CIP) at its December 13, 2006 meeting.

The Proposed FY08 CIP embodies two major additions: the implementation schedules and budgets for the highest priority Master Plan projects and a proposed second five-year spending cap for the Authority.

The Proposed FY08 CIP recommended for transmittal to the Advisory Board projects total spending, including contingency and inflation to FY08 dollars, of \$944.8 million for fiscal years 2004-2008, \$970.0 million for fiscal years 2009-2013 and net projected spending of \$819.6 million for fiscal years 2014 and beyond which is primarily driven by spending on new projects from the Master Plan. The total contract spending in the Proposed FY08 CIP is \$4.7 billion (in FY08 dollars), including contingency, of which \$2.5 billion has been spent through FY06.

The Proposed FY08 CIP represents updated spending and schedules for projects contained in the FY07 CIP and new spending on 67 water and wastewater system projects from the Master Plan. These additional projects and subphases represent those capital initiatives outside of the FY07 CIP that staff recommend as most essential to assure reliable service to MWRA's customers. The Proposed FY08 CIP increased \$1.0 billion above the Final FY07 CIP approved by the Board in June 2006 with the majority of the increased spending occurring beyond FY13. Total MWRA Budget, excluding contingency, increased by \$969.3 million of which approximately \$955.2 million represent new project and new subphase spending in all major program categories.

The Proposed FY08 CIP document provides an overview of the MWRA's capital program including projected expenditures by program area, highlights changes within the first 5-year cap period (FY04-08) and recommends spending thresholds for the next 5-year cap period (FY09-13). The document also includes detailed descriptions by project and outlines each phase.

Additional project information and a copy of this document are available on-line at [www.mwra.state.ma.us](http://www.mwra.state.ma.us). Questions or comments on this document should be directed to the MWRA Budget Department.

Thank you for your continued support. We look forward to working closely with the Advisory Board during your review and to receiving your official comments and recommendations on the Proposed FY08 CIP.

Sincerely,

Frederick A. Laskey  
Executive Director

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## **Proposed FY08 Capital Improvement Program**

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### **Background**

MWRA was created by the Massachusetts legislature in 1985 and since that time has invested over \$6.6 billion to modernize and improve the wastewater and waterworks systems serving its member communities. Of the total expenditures to date, nearly three-fourths have supported improvements to the wastewater treatment, interceptor, pumping, and combined sewer overflow systems. The remaining fourth has supported waterworks treatment, transmission, distribution, and water supply protection improvements. The Proposed FY08 Capital Improvement Program (CIP) budget totals \$4.7 billion with projected spending of \$170.4 million for FY07 and \$245.8 million for FY08.

MWRA's sewage treatment system has undergone a nearly complete transformation under the federally mandated, 16-year, \$3.8 billion Boston Harbor Project. Now complete, the project included: a new Deer Island Treatment Plant with primary and secondary treatment capabilities; a new 5-mile Inter-Island Tunnel and remote headworks that combined two separate sewer systems into one; a sludge-to-fertilizer facility; and a 9.5-mile Effluent Outfall Tunnel to discharge treated wastewater away from shallow Boston Harbor waters into deeper waters and the stronger currents of Massachusetts Bay.

MWRA's Integrated Water Supply Improvement Program is a 10-year, \$1.7 billion series of projects that consists of aggressive watershed protection, modernized water treatment facilities and distribution system improvements including construction of covered storage facilities and pipeline rehabilitation projects. This program includes the \$437 million John J. Carroll Water Treatment Plant, a state-of-the-art ozonation facility with capacity to treat 405 mgd of drinking water, which was placed into service in 2005 pursuant to the Safe Drinking Water Act (SDWA). The plant treats water delivered from the Wachusett Reservoir with ozonation and chloramination. The program also includes the \$698 million MetroWest Water Supply Tunnel, placed into service in 2003, which provides critical redundancy to the water transmission system.

With the completion of Deer Island and the winding down of the Water Supply Improvement Program, the MWRA now spends a proportionately large part of its CIP budget on the Combined Sewer Overflow ("CSO") projects mandated by state and federal agencies. The CSO program encompasses 35 projects with a total budget of \$803 million with spending of \$350.4 million through FY06. In 1987, MWRA entered a stipulation in the Federal District Court Order in the Boston Harbor Case by which it accepted responsibility for developing and implementing a long-term CSO control plan for all combined sewer overflows hydraulically connected to MWRA's system, including the outfalls owned and operated by the communities of Boston, Cambridge, Chelsea, Somerville, and a small section of Brookline.

In April 2006, the Federal District Court approved a joint motion filed by the Department of Justice and the MWRA which reflected changes to the MWRA's CSO Control Plan agreed to by the EPA, DEP and MWRA on the appropriate level of CSO control and recommended plans for the Charles River, the Alewife Brook/Upper Mystic River, and East Boston on its overall CSO Control Plan. With this agreement, the MWRA now has an approved CSO Control Plan for receiving waters where CSO outfalls connected to its system discharge. The Federal District Court subsequently issued

Schedule Seven in the court order for the Boston Harbor Case, which includes additional milestones related to this comprehensive agreement.

As the MWRA matures as an agency, a greater proportion of its capital budget will be designated for asset protection and maintenance initiatives, absent new regulatory mandates, to preserve these operating assets. The design of this long-term strategy for capital work is identified in the Authority’s recently completed Master Plan.

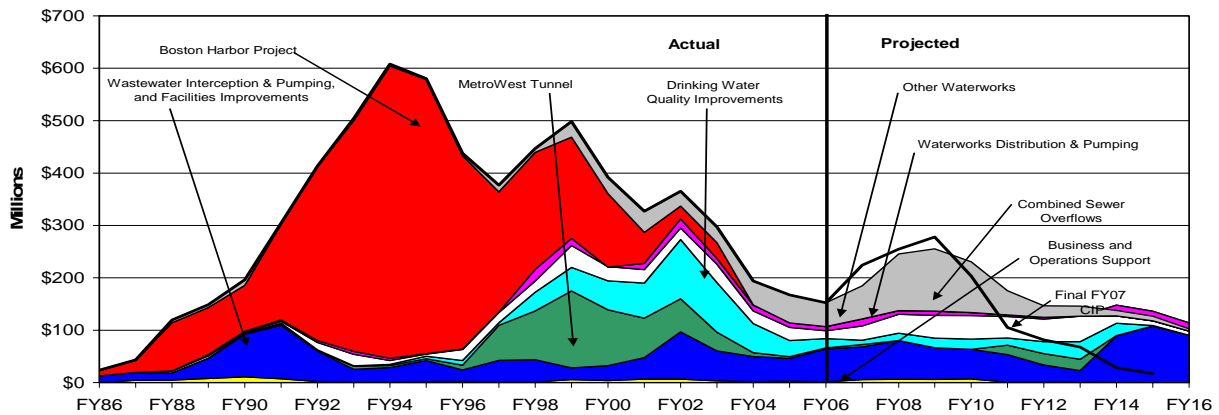
**Master Plan and the Proposed FY08 CIP Process**

In October and November of 2006, the MWRA presented to the Board of Directors highlights of the Master Plan identifying over \$3.1 billion in system needs over the FY07-48 timeframe. The Master Plan identified approximately \$2.0 billion in wastewater needs and \$1.1 billion in waterworks needs. It is important to note that much of the future spending outlined in the Master Plan is for the repair or replacement of existing infrastructure, although water system redundancy is also a major theme.

An evaluation process, driven by the prioritization of projects developed during Master Planning, MWRA’s capacity to deliver capital projects, and achieving sustainable and predictable rates, was conducted to determine which projects would be incorporated into the Proposed FY08 CIP and the next five-year cap period. The projects contained in the Proposed FY08 CIP and their resulting schedules reflect these primary considerations. As a result, 67 projects or new subphases with a contract value of \$952.2 million were added during this budget cycle.

The graph below highlights major capital improvement spending, both completed (actual) and remaining (projected).

**MWRA CAPITAL PROGRAM FY86-16**



**PROPOSED  
FY08 CAPITAL IMPROVEMENT PROGRAM  
Actual and Projected Expenditures**

Expended To-Date	Projected Expenditures
\$6.6 B	\$2.2 B

## Spending Cap Overview

In June 2003, the Board of Directors adopted the Final FY04 CIP, which established a capital spending cap of \$1.1 billion for FY04-08 and allowed annual spending to be plus or minus 20% from the initial budget amounts as long as the five-year total is not exceeded. As seen in Table 1, for the 5-year cap period FY04-08, the Proposed FY08 CIP complies with both the total spending cap of \$1.1 billion and the annual spending limits.

The Proposed FY08 CIP FY04-08 spending cap forecast of \$935.5 million (adjusted for contingency and CVA project spending) is well below the original FY04 cap limit of \$1.1 billion. Additionally, planned spending for all years within the cap period meet the 20% change limit. (Please note that based on actual contract awards and certain schedule shifts to-date, the FY07 budget is currently projected to be 28% below the FY04 Baseline cap.) The lower than cap spending reflected in the Proposed FY08 budget has occurred mainly due to shifts in project spending (both planned and unplanned), adjustment to spending forecasts, and some project deletions.

**Table 1**

Proposed FY08 CIP							
	FY04 Actual	FY05 Actual	FY06 Actual	FY07	FY08	Total FY04-08	Total FY09-13
Projected Expenditures <sup>1</sup>	\$194.0	\$167.7	\$152.3	\$170.4	\$223.6	\$908.1	\$886.2
Contingency	0.0	0.0	0.0	14.7	22.1	36.8	83.8
Inflation on Unawarded Construction	0.0	0.0	0.0	0.0	0.0	0.0	32.0
Less: Chicopee Valley Aqueduct Projects	(0.4)	(0.5)	(2.4)	(5.3)	(0.7)	(9.3)	(8.3)
<b>Proposed FY08 CIP FY04-08 CAP</b>	<b>\$193.6</b>	<b>\$167.2</b>	<b>\$150.0</b>	<b>\$179.7</b>	<b>\$245.0</b>	<b>\$935.5</b>	<b>\$993.7</b>
<b>FY04 Baseline Cap</b>	<b>\$250.9</b>	<b>\$203.5</b>	<b>\$215.2</b>	<b>\$250.1</b>	<b>\$214.8</b>	<b>\$1,134.5</b>	<b>\$528.8</b>
<b>Change (FY04 Baseline to Proposed FY08)</b>							
<b>FY04-08 CAP (\$ Change)</b>	<b>-\$57.4</b>	<b>-\$36.3</b>	<b>-\$65.2</b>	<b>-\$70.3</b>	<b>\$30.2</b>	<b>-\$199.0</b>	<b>\$464.8</b>
<b>FY04-08 CAP (% Change)</b>	<b>-22.9%</b>	<b>-17.9%</b>	<b>-30.3%</b>	<b>-28.1%</b>	<b>14.1%</b>	<b>-17.5%</b>	<b>87.9%</b>
Final FY07 CIP							
<b>FY07 FY04-08 CAP</b>	<b>\$193.6</b>	<b>\$167.2</b>	<b>\$145.3</b>	<b>\$219.3</b>	<b>\$254.8</b>	<b>\$980.2</b>	<b>\$761.3</b>
<b>Change (FY07 Final Cap to Proposed FY08)</b>							
<b>FY04-08 CAP (\$ Change)</b>	<b>\$0.0</b>	<b>\$0.0</b>	<b>\$4.7</b>	<b>-\$39.6</b>	<b>-\$9.8</b>	<b>-\$44.7</b>	<b>\$232.4</b>
<b>FY04-08 CAP (% Change)</b>	<b>0.0%</b>	<b>0.0%</b>	<b>3.2%</b>	<b>-18.1%</b>	<b>-3.8%</b>	<b>-4.6%</b>	<b>30.5%</b>

<sup>1</sup>Includes \$4.5 million credit to BHP in FY05.

### Cap Change from Final FY07

The Proposed FY08 CIP cap spending of \$935.5 million for FY04-08 is \$44.7 million below the five-year estimate from the Final FY07 CIP budget and \$199 million below the original FY04 cap baseline. The Proposed FY08 CIP spending of \$993.7 million for FY09-13 is \$232.4 million greater than the Final FY07 CIP and \$464.8 million above the original FY04 five-year projection for the FY09-13 period. Consistent with the Final FY07 CIP, projected underspending of \$199 million in the FY04-08 period continues to be shifted into the FY09-13 period. This shift primarily reflects actual, rather than anticipated project schedules. The proposed cap for FY09-13 is \$1.0 billion, \$471 million above the FY09-13 forecast in the Final FY04 budget. This increase reflects both the shift of spending from the earlier 5-year period, updated project cost projections and the inclusion of new projects from the Master Plan.



**Table 2**

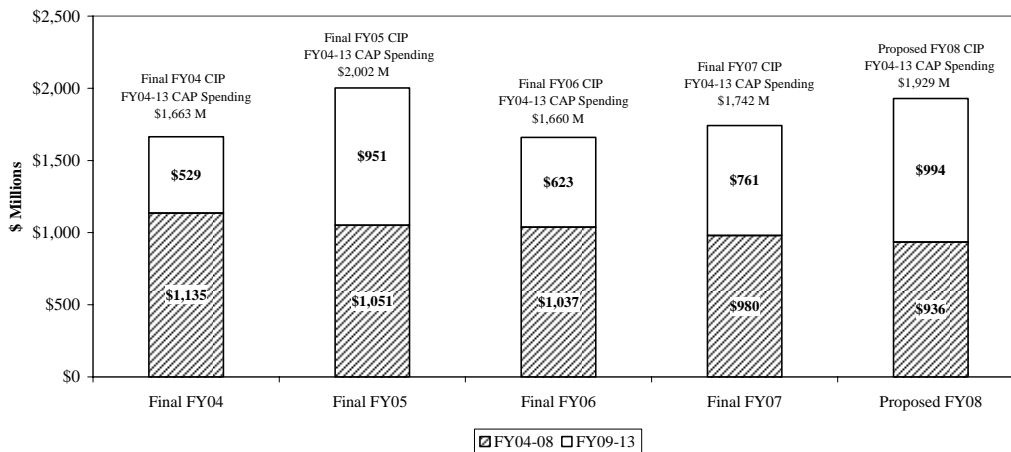
Proposed FY08 CIP						
	FY09	FY10	FY11	FY12	FY13	Total FY09-13
<b>Proposed FY08 CIP FY09-13 CAP</b>	<b>\$257.2</b>	<b>\$235.5</b>	<b>\$180.9</b>	<b>\$158.1</b>	<b>\$162.0</b>	<b>\$993.7</b>
<b>FY04 Baseline</b>	<b>\$242.1</b>	<b>\$159.9</b>	<b>\$65.8</b>	<b>\$27.2</b>	<b>\$33.9</b>	<b>\$528.8</b>
<b>Change (FY04 Baseline to Proposed FY08)</b>						
<b>Proposed FY09-13 CAP (\$ Change)</b>	<b>\$15.0</b>	<b>\$75.6</b>	<b>\$115.2</b>	<b>\$130.9</b>	<b>\$128.1</b>	<b>\$464.8</b>
<b>Proposed FY09-13 CAP (% Change)</b>	<b>6.2%</b>	<b>47.3%</b>	<b>175.1%</b>	<b>481.8%</b>	<b>378.4%</b>	<b>87.9%</b>

Final FY07 CIP						
	FY09	FY10	FY11	FY12	FY13	Total FY09-13
<b>Final FY07 FY09-13 Spending</b>	<b>\$282.1</b>	<b>\$211.0</b>	<b>\$107.5</b>	<b>\$86.8</b>	<b>\$73.9</b>	<b>\$761.3</b>
<b>Change FY07 Final to Proposed FY08</b>						
<b>Proposed FY09-13 CAP (\$ Change)</b>	<b>-\$25.0</b>	<b>\$24.5</b>	<b>\$73.4</b>	<b>\$71.3</b>	<b>\$88.1</b>	<b>\$232.4</b>
<b>Proposed FY09-13 CAP (% Change)</b>	<b>-8.9%</b>	<b>11.6%</b>	<b>68.3%</b>	<b>82.2%</b>	<b>119.3%</b>	<b>30.5%</b>

Projected spending based on the Proposed FY08 CIP for the 10-year period encompassing FY04-13 is estimated to be \$1.929 billion. The table below provides a summary by budget cycle of the planned spending.

**MWRA Capital Spending Comparison**  
FY04-08 and FY09-13



**Outstanding Debt and Rates Management**

The \$6.6 billion spent on MWRA’s modernization efforts has relied heavily on debt financing. Total debt as of December 2006 reached \$5.7 billion consisting of senior and subordinated debt, but excluding tax-exempt commercial paper. The Authority is significantly leveraged with long-term debt representing 70.5% of total assets, but the stability and predictability of operating cashflows can support a leveraged capital structure. The MWRA enjoys strong senior debt ratings of Aa2, AA, and AA from Moody’s, S&P, and Fitch, respectively. Additionally, the average maturity of MWRA’s outstanding debt is significantly shorter than the remaining useful life of the assets being financed.

As a result of the Authority’s on-going capital improvement program, debt service as a percent of total expenses has increased steadily from 36% in 1990 to 58% in the FY07 Current Expense Budget. Much of this debt service is for completed projects, primarily the Boston Harbor Projects

and Integrated Water Supply Improvement Program. MWRA's capital spending, from its inception, has been dominated by projects mandated by court order or regulatory requirements, which in total have accounted for 80% of capital spending to date.

The Authority has actively managed its debt structure to take advantage of favorable interest rates. Tools used by the MWRA to lower borrowing costs and manage rates include maximizing use of subsidized State Revolving Fund debt, issuance of variable rate debt, current and advanced refundings of outstanding debt, the use of surplus revenues to defease debt, and swap agreements. The MWRA also uses tax exempt commercial paper to minimize the financing cost of construction in process.

As part of its ongoing rate management initiatives in FY07, the MWRA, working with the Advisory Board, restructured approximately \$675 million in long-term borrowings to level out debt service and generate rate relief for member communities. This initiative is designed to smooth debt service in years 2007 through 2017. The restructuring generates both net present value savings and significant rate relief. Additionally, the restructuring also commenced the modernization of the MWRA's bond resolution which is designed to make debt service reserves available in the future to pay off debt. To become effective, the amended resolution must be incorporated into two-thirds of MWRA's outstanding debt which is expected to occur in 8 to 10 years as MWRA issues new debt and refunds existing debt.

### **FY08 Capital Highlights**

The Proposed FY08 CIP, including contingency and inflation to December 2007 dollars, is \$930.2 million for fiscal years 2004-2008, \$970.0 million for fiscal years 2009-2013 and net projected spending for fiscal years 2014 and beyond of \$819.6 million, primarily driven by new projects from the Master Plan. A number of the Master Plan projects incorporated into the Proposed FY08 include spending long into the future - well beyond FY17. The estimated spending for FY14-18 will grow in future budget cycles as additional Master Plan projects are incorporated. The total contract spending in the Proposed FY08 CIP is \$4.7 billion (in FY08 dollars), including contingency, of which \$2.5 billion has been spent through FY06.

**Table 3**

Program	Total Contract	Spending Thru FY06	Remaining Balance	FY04	FY05	FY06	FY07	FY08	FY04-08	FY09-13	Beyond FY13*
<b>Wastewater System Improvements</b>	<b>\$2,198.6</b>	<b>\$951.9</b>	<b>\$1,246.7</b>	<b>\$92.2</b>	<b>\$88.6</b>	<b>\$102.3</b>	<b>\$99.3</b>	<b>\$155.0</b>	<b>\$537.4</b>	<b>\$454.2</b>	<b>\$538.2</b>
Interception & Pumping	676.7	429.1	247.6	31.9	21.8	32.9	31.5	35.4	153.5	44.7	136.0
Treatment	419.3	35.6	383.7	4.0	9.2	12.2	8.6	21.3	55.3	109.4	244.5
Residuals	212.1	63.8	148.3	8.9	-1.7	0.0	0.0	0.5	7.7	6.5	141.3
CSO	803.6	350.4	453.1	45.9	53.7	45.5	57.5	97.1	299.7	276.4	22.1
Other Wastewater	86.9	73.0	13.9	1.5	10.1	11.6	1.8	0.7	25.7	17.1	-5.7
<b>Waterworks System Improvements</b>	<b>2,271.9</b>	<b>1,500.5</b>	<b>771.5</b>	<b>100.1</b>	<b>76.3</b>	<b>48.5</b>	<b>65.6</b>	<b>62.6</b>	<b>353.0</b>	<b>415.2</b>	<b>228.1</b>
Drinking Water Quality Improvements	640.1	490.2	149.9	55.7	30.6	17.6	7.5	13.0	124.5	99.6	29.7
Transmission	972.7	644.2	328.5	9.2	7.4	8.2	19.8	9.6	54.1	94.9	204.3
Distribution & Pumping	629.1	262.6	366.5	23.8	25.5	14.7	24.6	33.1	121.7	200.9	107.8
Other Waterworks	30.0	103.5	-73.5	11.3	12.9	8.0	13.6	6.9	52.7	19.7	-113.7
<b>Business &amp; Operations Support</b>	<b>68.1</b>	<b>36.8</b>	<b>31.3</b>	<b>1.8</b>	<b>2.8</b>	<b>1.6</b>	<b>5.5</b>	<b>6.0</b>	<b>17.7</b>	<b>16.9</b>	<b>3.0</b>
<b>Total MWRA</b>	<b>4,538.6</b>	<b>2,489.1</b>	<b>2,049.5</b>	<b>194.0</b>	<b>167.7</b>	<b>152.3</b>	<b>170.4</b>	<b>223.6</b>	<b>908.1</b>	<b>886.2</b>	<b>769.3</b>
Contingency	156.2		156.2					22.1	22.1	83.8	50.3
<b>Total MWRA w/Contingency</b>	<b>\$4,694.8</b>	<b>\$2,489.1</b>	<b>\$2,205.7</b>	<b>\$194.0</b>	<b>\$167.7</b>	<b>\$152.3</b>	<b>\$170.4</b>	<b>\$245.8</b>	<b>\$930.2</b>	<b>\$970.0</b>	<b>\$819.6</b>

## Highlights of Project Changes from the Final FY07 CIP to the Proposed FY08 CIP

The Proposed FY08 CIP represents updated spending and schedules for projects contained in the FY07 CIP and new spending on 67 water and wastewater projects and subphases from the Master Plan. These additional projects and subphases represent those capital initiatives outside of the FY07 CIP that staff recommend as most essential to assure reliable service to MWRA's customers. The Proposed FY08 CIP increased \$1.0 billion above the Final FY07 CIP approved by the Board in June 2006 with the majority of the increased spending occurring beyond FY13. The total MWRA Proposed FY08 CIP budget, excluding contingency, increased by \$969.3 million - with new project spending from the Master Plan representing approximately \$952.2 million of the increase spending. The Proposed FY08 CIP reflects moderate to major changes in planned spending for all of the main program categories as a result of new projects from the Master Plan and the normal adjustments for updated schedules and awarded contract amounts.

**Table 4**

Program	Final FY07 CIP	Proposed FY08 CIP	\$ Chge.	% Chge.	FY09-13 \$ Chge.	Beyond FY13 \$ Chge.
<b>Wastewater System Improvements</b>	\$1,618.9	\$2,198.6	\$579.7	35.8%	\$82.0	\$510.1
<b>Waterworks System Improvements</b>	1,889.9	2,271.9	382.0	20.2%	121.0	282.8
<b>Business &amp; Operations Support</b>	60.5	68.1	7.6	12.6%	9.0	3.0
<b>Total MWRA</b>	3,569.3	4,538.6	969.3	27.2%	212.0	795.9
Contingency	113.5	156.2	42.7	37.6%	21.6	41.2
<b>Total MWRA w/Contingency</b>	\$3,682.8	\$4,694.8	\$1,012.0	27.5%	\$233.6	\$837.1

## Highlights of New Capital Projects Added to the Proposed FY08 CIP by Priority

The proposed budget reflects new initiatives estimated at \$952.2 million of which 18.5% or \$176 million is projected to be expended within the FY09-13 period. These new initiatives, representing the highest rated projects from the Master Plan, were evaluated in conjunction with existing FY07 CIP projects and ultimately integrated into the Proposed FY08. A sampling of new projects with the top priority ratings are highlighted below:

- \$100 million for Wachusett Aqueduct Pressurization: This project is intended to increase the capacity of the Wachusett Aqueduct to meet peak system demand and is recommended to allow for the shut down and repair of the Cosgrove Tunnel. Design costs have been budgeted in the latter part of the FY09-13 timeframe and construction is planned during FY14-16.
- \$100 million for Long-Term Redundancy. A new study of long-term water transmission redundancy alternatives for the City Tunnel and its extensions will be initiated. This study will address the eastern part of the system from Shaft 5 (at the Weston / Newton line) eastward. It will consider long-term use of the Sudbury Aqueduct (pressurization), tunnel loop alternatives and other possible solutions. All spending is beyond the FY09-13 timeframe.

- \$80 million for West Roxbury Tunnel Corrosion Rehabilitation. This project involves the reevaluation, design, and construction of structural repairs to 12,000 feet of MWRA sewer Sections 637, located in West Roxbury. Initial work is expected to start in FY11 with \$5 million in projected expenditures within the FY09-13 cap period. The remaining \$75 million is projected to be spent beyond the FY09-13 timeframe.
- \$70 million for Deer Island Equipment Replacement Projection: Staff recommends \$2.0 million per year for additional equipment replacement given that no funding had been added to this subphase since its inception. \$10 million is projected to be spent during FY09-13. The remaining \$60 million is budgeted in FY14 and beyond.
- \$41 million for Southern Extra High (SEH) Redundancy and Storage: This project will provide redundancy to Sections 77 and 88, which are currently single spine mains serving Canton, Norwood, Stoughton and Dedham-Westwood, through the construction of a redundant pipeline comprised of approximately 30,000 linear feet of 36-inch main. The project will also look at available community storage as this service area continues to have a storage shortfall. This project includes design and construction for additional storage with the location and volume to be determined by the Concept Study. Planned spending for the entire project includes \$25.5 million in FY09-13 and \$9.9 million in FY14. The design for the rehabilitation of Section 77 and 88 will begin in July 2018.
- \$39 million for Low Storage Near Spot Pond: Environmental Review Consultant Owners Representative and Design Build. This project will construct a new 20 MG storage facility to meet a one-day supply goal. This project is expected to begin in FY09 with construction expected to begin in late FY13 or early FY14. Planned spending includes \$16.7 million in FY09-13 and \$22.5 million in FY14-15.
- \$148 million for Residuals Asset Protection consisting of 13 individual contracts to maintain and improve the operations and infrastructure of the sludge-to-fertilizer plant. Planned spending includes \$0.5 million in FY08, \$6.5 million in FY09-13 and the balance of \$141.3 for FY14 and beyond.
- \$35 million for Headworks Facility Plan Upgrades for North System Headworks. This project includes future rehabilitation, replacement and upgrades (design and construction) of projects recommended in the Headworks Condition Assessment / Facilities Plan. Recommendations for upgrades to the Chelsea Creek, Columbus Park and Ward Street Headworks are expected to be prioritized and spread over the 20-year planning period from FY09 through FY28. Design and construction project costs are estimated at a total of \$40 million, with \$5 million in the existing FY07 CIP (screens project) and \$35 million in new future recommendations. Projected spending of \$10 million is scheduled in FY10-13 and the remaining \$25 million is projected to be spent in FY14 – beyond.

## **Capital Budget Spending Cap**

Beginning in June 2003 for the period FY04 through FY08, the Board will establish a five-year capital budget spending cap and annual spending limits for each year of the cap period. Spending for any year in the cap period may, with Board approval, vary within plus or minus 20% of the annual cap, as long as total spending for the five-year period does not exceed the total five-year cap. Before the end of each five-year cap period, the Board will adopt a cap for the next five-year period and annual spending limits for each year in the period.

## **Contingency**

There are costs associated with the Proposed FY08 CIP that are difficult to predict with any degree of certainty. These costs include legal fees, claims settlements, acquisition of land, and a variety of study, design, and construction change orders and contract amendments. MWRA uses a contingency budget to cover these costs in the event they exceed the approved budget. The contingency budget is calculated as a percentage of expected capital expenditure cash outlays (15% for tunnel construction and approximately 10% for all other projects).

The total contingency budget for the ten-year CIP is \$156.2 million. The contingency budget remaining within the FY04-08 period is \$22.1 million and the contingency planned beyond FY08 is \$134.1 million.

## **Project Budget Summaries and Detail of Changes**

Information on individual project budgets and detail of changes is provided in the supplemental appendices, attached to this document.

# **Capital Improvement Program**

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## **PROPOSED FISCAL YEAR 2008 APPENDICES**



**MASSACHUSETTS WATER RESOURCES AUTHORITY**

# APPENDIX 1

## Project Budget Summaries and Detail of Changes

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**Project Budget Summaries and Detail of Changes**  
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## S. 104 Braintree-Weymouth Relief Facilities

### Project Purpose and Benefits

- ☑ *Contributes to improved public health*
- ☑ *Provides environmental benefits*
- ☑ *Fulfills a regulatory requirement*
- ☑ *Extends current asset life*
- ☑ *Improves system operability and reliability*

*In accordance with a DEP administrative consent order, construction of relief facilities and the resulting reduction in community infiltration and inflow will provide capacity for peak sewage flow from Braintree, Hingham, Holbrook, Randolph, Weymouth, and sections of Quincy. This project will reduce surcharging in Braintree and Weymouth, and reduce frequent overflows into the Weymouth Fore River during wet weather.*

### Project History and Background

The Braintree-Weymouth interceptor system and pump station serves Braintree, Hingham, Holbrook, Randolph, Weymouth, and sections of Quincy. Because of population increases, the sewerage system cannot handle the volume of sewage received. Sewage overflows are severe and frequent along the Weymouth Fore River during wet weather.

Interim rehabilitation work was required to ensure continued operation of the existing Braintree-Weymouth Pump Station during the long-term design and construction period. After initially proceeding with a dual track design approach for part of this project, MWRA decided to construct a deep rock tunnel rather than a marine pipeline from the new pump station to the Nut Island shaft of the Inter-Island Tunnel to Deer Island. Construction of the Emergency Mill Cove Siphon was completed in June 1998. Construction of the deep rock tunnel was completed in September 2003, and the North Weymouth Relief Intercept was completed in June 2002. The Intermediate Pump Station and sludge pumping facilities at Deer Island were completed in April 2005. The Fore River Siphons construction contract was completed in May 2005. Construction of the Replacement Pump Station began in January 2005 and will be completed in March 2008.

### Scope

Sub-phase	Scope
Design 1/CS/RI – Tunnel & IPS	Design of the tunnel and IPS. Includes completion of design modifications for sludge pumping facilities at Deer Island and residuals filtrate facilities at Fore River.
Sediment Tests	Tests required as part of the evaluation of marine pipeline option.
Design 2/CS/RI – Surface	Design of remaining construction including siphons and replacement pump station.
Tunnel Construction & Rescue	Construction of a 2.9-mile, 12-foot diameter tunnel beginning at the Nut Island shaft of the Inter-Island Tunnel and ending at the Fore River Staging Area. Two 14-inch sludge pipelines within the tunnel will convey Deer Island sludge from the Inter-Island Tunnel to the pelletizing plant. 0.4 miles of twin 12-inch pipelines within the tunnel will convey filtrate from the pelletizing plant to the Intermediate Pump Station. 2.5 miles of 42-inch force main will carry flows and filtrate to the Inter-Island Tunnel. Also includes a MOA with Quincy, Braintree, and Weymouth for tunnel rescue and fire support services.
Intermediate Pump Station Construction	Construction of a 45-mgd pump station and headworks in North Weymouth. Also includes modifications to the sludge pumping facilities at Deer Island and the filtrate facilities at Fore River.

Sub-phase	Scope
No. Weymouth Relief Interceptor Construction	Construction of 2,000 linear feet of 60-inch gravity sewer running from the Intermediate Pump Station and along the Exelon Energy site.
Fore River Siphons Construction	Construction of 36-inch, 3,900-foot long twin siphons beneath the Fore River from the Idlewell section of Weymouth to the southeast corner of the Exelon Energy site in North Weymouth. Constructing 1,000 linear feet of 36-inch to 54-inch new sewers in Idlewell.
B-W Replacement Pump Station	Construction of a new 28-mgd Braintree-Weymouth Pump Station which will handle flows from Hingham, Weymouth, and portions of Quincy.
Rehab Section 624	Rehabilitation of 2,000 feet of Section 624 in North Weymouth.
Mill Cove Siphon Construction	Installation of 1,700 linear feet of 42-inch siphon pipe between Newell Playground and Aspinwall Street in North Weymouth to act as second barrel of existing Mill Cove Siphon.
Construction – Rehab	Interim rehabilitation of the existing Braintree-Weymouth Pump Station.
Community Tech Assistance	Technical assistance for the Town of Weymouth for hydraulic modeling of its sewer system, leak detection for the water system, and mitigation.
Geotechnical Consultant	Consulting services related to the tunnel shaft excavation.
Communication System	Radio systems for the intermediate and replacement pump stations.

#### Expenditure Forecast (in \$000s) and Project Status

Total Budget	Payments thru FY06	Remaining Balance	FY07 Projected	FY08	FY04-08	FY09-13	Beyond FY13
\$221,199	\$200,870	\$20,329	\$4,475	\$10,550	\$61,123	\$5,303	\$0

Project Status 11/06	91.8%	Status as % is approximation based on project budget and expenditures. Work that is substantially complete includes the deep rock tunnel, N Weymouth Interceptor, Intermediate Pump Station and the Fore River Siphons contract. Work continues on the Replacement Pump Station.
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#### Changes to Project Scope, Budget, and Schedule

Project Cost			Scheduled Completion Date			FY04-08 Spending		
FY07	PFY08	Chge.	FY07	PFY08	Chge.	FY07	PFY08	Chge.
\$215,234	\$221,199	\$5,965	Sep-07	Jun-13	70 mos.	\$60,462	\$61,123	\$661

#### Explanation of Changes

- Increase in Project Cost due to the addition of Rehab Section 624. Also, expected change orders for the Replacement Pump Station including jet grouting and vertical toe pins and expected time extension.
- Completion date and spending shifted due to changes above.

#### CEB Impact

- The start-up of the Replacement Pump Station will result in increased operating costs of \$440,000 as of FY09 to run the facility.

# S. 131 Upper Neponset Valley Sewer System

## Project Purpose and Benefits

- Contributes to improved public health*
- Provides environmental benefits*
- Improves system operability and reliability*

*The Upper Neponset Valley Sewer is hydraulically deficient resulting in frequent community system back-ups and interceptor overflows during wet weather to adjacent residential areas and water bodies in Brookline, Boston, Newton, and Dedham. Construction of a new replacement interceptor will reduce chronic wastewater overflows and surcharging during wet weather and improve service and water quality.*

## Project History and Background

The Upper Neponset Valley Sewer (UNVS), constructed between 1896 and 1902, extends approximately four miles through West Roxbury and Newton, and receives wastewater from West Roxbury, Brookline, Newton, and a small portion of Dedham. Based on the results of the 1994 Combined Sewer Overflow Master Plan, work on Section 530 in Newton and West Roxbury has been added to this project because the hydraulic improvements are needed in this section.

The 1984 Wellesley Extension Sewer Facilities Plan/Environmental Impact document estimated that the UNVS overflowed an average of six to ten times per year with occurrences lasting as long as ten days. The Facilities Plan/EIR indicated that installation of a new interceptor would be the most cost-effective solution to these problems. With the increased capacity of the new interceptor, chronic wastewater overflows during wet weather will be reduced, improving water quality. The project will increase the hydraulic capacity in the Upper Neponset Valley Sewer by 8 mgd, through the construction of replacement sewers, to the level of service provided to all MWRA sewer member communities. The project will eliminate surcharging and overflows during the one-year, six-hour DEP designated design storm, with no increase in downstream overflows. It will also reduce overflows for 5-year and above storms. The project includes design and construction of sections 685 and 686 replacement sewers for sections 526 to 529. This construction contract was awarded in March 2005 and is scheduled to be completed in April 2008. The project also includes design and construction of Section 687 to replace Section 530 which was awarded in October 2006.

## Scope

Sub-phase	Scope
Designs/CS/RI	Completion of design and provision of construction services during the construction phases.
Resident engineering & inspection	Resident engineering and inspection during construction of the two contracts
Boston Paving	Payment to the City of Boston for paving work on city streets.
Replacement Sewer Sections 685-686 construction	Installation of 16,500 feet of new sewers within public roadways to reduce overflows to adjacent residential areas and water bodies in West Roxbury.
Replacement Section 687 construction	Installation of 8,400 feet of new sewers to reduce overflows to adjacent residential areas and water bodies in West Roxbury and Newton

**Expenditure Forecast (in \$000s) and Project Status**

Total Budget	Payments thru FY06	Remaining Balance	FY07 Projected	FY08	FY04-08	FY09-13	Beyond FY13
\$53,955	\$22,961	\$30,995	\$17,928	\$12,646	\$51,851	\$421	\$0

Project Status 11/06	59.7%	Status as % is approximation based on project budget and expenditures. Construction on Sections 685 and 686 began in April 2005. Section 687 was awarded in October 2006.
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**Changes to Project Scope, Budget, and Schedule**

Project Cost			Scheduled Completion Date			FY04-08 Spending		
FY07	PFY08	Chge.	FY07	PFY08	Chge.	FY07	PFY08	Chge.
\$56,080	\$53,955	(\$2,124)	Apr-08	Apr-08	None	\$53,844	\$51,851	(\$1,993)

**Explanation of Changes**

- Decrease in project cost and spending due to actual award for Replacement Sewer Section 687 was less than budget. Also, credit change order on Sections 685-686 for deleting jacking and redesign. These decreases were partially offset by an amendment for engineering services during construction, noise reports, redesign, and reallocation.

**CEB Impact**

None identified at this time.

# S. 127 Cummingsville Replacement Sewer

## Project Purpose and Benefits

- ☑ *Contributes to improved public health*
- ☑ *Provides environmental benefits*
- ☑ *Extends current asset life*
- ☑ *Improves system operability and reliability*

*Capacity deficiencies in the MWRA system may be associated with overflows of local sewers upstream from the Cummingsville Branch System. Sewer moratoriums are in effect in the upstream communities of Woburn and Burlington. Construction of a replacement sewer and rehabilitation of existing sewers will provide additional capacity to ensure adequate and reliable wastewater service for upstream communities.*

## Project History and Background

The Cummingsville Branch Sewer System is located in the Town of Winchester and receives wastewater from sections of Winchester and Woburn and all of Burlington. The Cummingsville Branch Sewer System consists of the Cummingsville Branch Sewer, constructed around 1894, and the Cummingsville Branch Relief Sewer, constructed in 1952. The existing system consists of 9,475 linear feet of 15- to 30-inch pipeline and has a capacity of 13 mgd.

In 1995, MWRA published the Cummingsville Branch Sewers Facilities Plan recommending construction of the Cummingsville Branch Replacement Sewer to add a total of 8 mgd of capacity to the system. The facilities plan also recommended the rehabilitation of Section 86 to ensure its continued service.

In June 1999, MWRA filed a Notice of Project Change in accordance with the Massachusetts Environmental Policy Act at the Executive Office of Environmental Affairs, to change the alignment to avoid construction in parkland. The Secretary’s Certification of November 1999 found no further Massachusetts Environmental Policy Act review was required. In December 1999, the Town of Winchester filed a lawsuit against MWRA and the Executive Office of Environmental Affairs to require preparation of an Environmental Impact Report and cessation of project advancement pending completion of environmental review. The Town’s concerns related to the potential effects of the project on pre-existing surcharge and/or overflow problems in the Town.

On September 18, 2002, the Board of Directors approved a Settlement Agreement between the Town of Winchester, MWRA and the Secretary of the Office of Environmental Affairs, which provided closure to the litigation matter. In consideration of the mutual promises contained in the Agreement, MWRA agreed to design and construct a modification of the Section 113 downstream siphon chamber to provide 30-foot wide (above elevation 115) river access across the Aberjona River to alleviate the historical constriction that the Town asserts results in chronic flooding. The construction contract for the Cummingsville Branch Replacement Sewer was awarded in March 2005 and was substantially complete in May 2006.

## Scope

Sub-phase	Scope
Facility Plan/EIR	Evaluation of potential adverse impacts associated with additional flows downstream and recommendations for improvements to the system.
Design/CS/RI	Design and construction services during the construction phase.
Construction (new sewer) and Rehab (existing sewers)	Replacement of the Section 47 sewer with a new 4,850 linear feet, 36-inch gravity line and cleaning and repair of the existing 5,000 linear feet Section 86 sewer.
Siphon Modifications	Construction of new downstream chamber for section 113 siphon in Winchester, and new permanent access roads to the upstream and downstream chambers.

**Expenditure Forecast (in \$000s) and Project Status**

<b>Total Budget</b>	<b>Payments thru FY06</b>	<b>Remaining Balance</b>	<b>FY07 Projected</b>	<b>FY08</b>	<b>FY04-08</b>	<b>FY09-13</b>	<b>Beyond FY13</b>
\$9,379	\$7,354	\$2,025	\$847	\$1,047	\$7,977	\$130	\$0

Project Status 11/06	79.3%	Status as % is approximation based on project budget and expenditures. Facilities planning complete. Construction of the Cummingsville Branch Replacement Sewer reached substantial completion in May 2006. Construction of Siphon modifications is expected to begin in February 2007.
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**Changes to Project Scope, Budget, and Schedule**

<b>Project Cost</b>			<b>Scheduled Completion Date</b>			<b>FY04-08 Spending</b>		
<b>FY07</b>	<b>PFY08</b>	<b>Chge.</b>	<b>FY07</b>	<b>PFY08</b>	<b>Chge.</b>	<b>FY07</b>	<b>PFY08</b>	<b>Chge.</b>
\$9,440	\$9,379	(\$61)	Sep-07	Sep-07	None	\$8,168	\$7,977	(\$191)

**Explanation of Changes**

- Project cost decreased primarily due to balancing credit change order.
- Spending shifted out to reflect one year warranty period for design services after completion of construction.

**CEB Impact**

None identified at this time.

## S. 132 Corrosion and Odor Control

### Project Purpose and Benefits

- Contributes to improved public health*
- Provides environmental benefits*
- Extends current asset life*
- Improves system operability and reliability*

*High sulfide levels in the Framingham Extension System cause corrosion and odors in that system and downstream in the Wellesley Extension Sewer System and West Roxbury Tunnel. A study has identified the causes of corrosion and odors and recommended corrective measures. Completion of corrosion control measures will extend the useful life of these assets and minimize the impact on the existing wastewater conveyance infrastructure. Improved odor control will mitigate the impact on surrounding areas.*

### Project History and Background

Hydrogen sulfide produces sewer odors and is highly corrosive of pipes and pump stations. Collapses in the Framingham Extension Sewer (FES) have alerted MWRA to problems in that area. Odor complaints have been received from residents abutting both the FES and the Wellesley Extension Sewer (WES) systems resulting in legal claims totaling several hundred thousand dollars. Severe corrosion has occurred in the West Roxbury Tunnel. This situation has prompted MWRA to add odor control chemicals at various points in the local systems and FES to try to reduce the hydrogen sulfide levels. The results have been mixed; not all of the chemicals were effective even over the short term, and none completely eliminated hydrogen sulfide.

While MWRA attempts to minimize odor and corrosion impacts through chemical intervention and sealing locations where odors escape, a more permanent solution is being sought. MWRA awarded a Planning/Study contract in January 1997. The consultant completed inspections in Ashland, Framingham, and Natick and drafted a report identifying, locating, and categorizing the sources and the extent of odor and corrosion problems. The Odor and Corrosion report indicated that significant levels of sulfides are discharged into the FES from Ashland and Framingham. These sulfide levels increase as the wastewater flows through the FES/FERS system. The report recommends a combination of MWRA and community actions, such as modifications to industrial discharge limits and municipal permits, chemical addition at community pump stations and the FES, and air treatment. The final planning/inspection report was completed in December 1998.

Interim Corrosion Control commenced in July 2000. The design for the modifications to the FERS pump station, FES Tunnel, and air treatment systems started in August 2002 and continued until June 2005.

### Scope

Sub-phase	Scope
Planning	Identification of causes and sources of odors; collection of local sewer system information in Ashland, Natick, and Framingham; recommendations for long-term corrective measures.
Design/CS/RI	Design, construction services, and resident inspection for FERS Pump Station, FES tunnel, and air treatment systems. By June 2005, the FERS Pump Station achieved 50% Design status, the FES tunnel achieved 30% Design status and the air treatment systems achieved 100% Design status.
FES Tunnel Rehab Design and Construction	Rehabilitation of the FES Tunnel.
Interim Corrosion Control	Implementation of chemical addition program at the FERS Pump Station. The program includes the addition of potassium permanganate, and monitoring of the wastewater flows and hydrogen sulfide levels downstream.



**Expenditure Forecast (in \$000s) and Project Status**

<b>Total Budget</b>	<b>Payments thru FY06</b>	<b>Remaining Balance</b>	<b>FY07 Projected</b>	<b>FY08</b>	<b>FY04-08</b>	<b>FY09-13</b>	<b>Beyond FY13</b>
\$11,503	\$3,003	\$8,500	\$0	\$0	\$1,315	\$0	\$8,500

Project Status 11/06	26.1%	Status as % is approximation based on project budget and expenditures.
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**Changes to Project Scope, Budget, and Schedule**

<b>Project Cost</b>			<b>Scheduled Completion Date</b>			<b>FY04-08 Spending</b>		
<b>FY07</b>	<b>PFY08</b>	<b>Chge.</b>	<b>FY07</b>	<b>PFY08</b>	<b>Chge.</b>	<b>FY07</b>	<b>PFY08</b>	<b>Chge.</b>
\$3,003	\$11,503	\$8,500	Jun-05	Jun-17	144 mos.	\$1,315	\$1,315	\$0

**Explanation of Changes**

- Budget increased as a result of FES Tunnel Rehab Design and Construction added.

**CEB Impact**

- MWRA's CEB will continue to include cost for chemical treatment to control odors and corrosion in this part of the sewerage system.

# S. 136 West Roxbury Tunnel

## Project Purpose and Benefits

- Contributes to improved public health
- Provides environmental benefit
- Extends current asset life
- Improves system operability and reliability

Investigation and rehabilitation of the West Roxbury Tunnel sewer. This sewer, built in 1964, transports flows from the Wellesley Extension Relief Sewer System through the West Roxbury portion of Boston to the High Level Sewer. A structural failure could result in surcharging and overflows.

## Project History and Background

During construction of the Wellesley Extension Replacement Sewer and inspection of the tunnel in 1999, visual observations indicated that severe corrosion due to hydrogen sulfide had occurred in a portion of the sewer directly upstream of the West Roxbury Tunnel (WRT), and the tunnel entrance structure had lost cement lining, exposing the reinforcing steel. Manholes and other structures had been affected more severely.

A structural failure of the WRT would affect the tributary communities of Ashland, Brookline, Dedham, Framingham, Natick, Needham, Newton, Wellesley, and the Hyde Park and West Roxbury portions of Boston. Local failure of the tunnel could result in the discharge of 53 to 128 mgd of raw sewage into the Charles River until emergency repairs could be made, back-up of sewage into local residences and businesses, and the interruption of service to as many as 125,000 people. Section 138, immediately upstream of the tunnel, crosses beneath the VFW Parkway. Structural failure beneath this major transportation corridor would result in a severe public safety hazard.

Design for structural repairs to Section 138 and the West Portal of the tunnel was completed in June 2001. Construction of these repairs, Contract 6569, repairs to Sections 137 & 1387, including the slipline of Section 138, were completed in June 2002.

## Scope

Sub-phase	Scope
Inspection	Inspection of Section 137 of the West Roxbury Tunnel, which includes 12,500 linear feet of 84-inch reinforced and unreinforced concrete tunnel.
Design/CS/RI	Design, construction services, resident inspection for corrective actions to repair/rehabilitate 1,000 feet of Section 138 and the West Portal, and a conceptual design report for the rehabilitation of the tunnel.
Construction	Rehabilitation of 1,000 feet of Section 138 and the West Portal.
Tunnel Design & Construction	Design and construction to rehab 12,000 feet of deteriorated tunnel caused by high levels of hydrogen sulfide and sewer turbulence.

## Expenditure Forecast (in \$000s) and Project Status

Total Budget	Payments thru FY06	Remaining Balance	FY07 Projected	FY08	FY04-08	FY09-13	Beyond FY13
\$88,881	\$8,880	\$80,001	\$1	\$0	(\$16)	\$5,000	\$75,000

Project Status 11/06	10%	Status as % is approximation based on project budget and expenditures.
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**Changes to Project Scope, Budget, and Schedule**

Project Cost			Scheduled Completion Date			FY04-08 Spending		
FY07	PFY08	Chge.	FY07	PFY08	Chge.	FY07	PFY08	Chge.
\$8,881	\$88,881	\$80,000	Jun-02	Jun-18	192 mos.	(\$16)	(\$16)	\$0

**Explanation of Changes**

- Budget increased as a result of West Roxbury Tunnel Rehab Design and Construction added.

**CEB Impacts**

None identified at this time.

## S. 137 Wastewater Central Monitoring

### Project Purpose and Benefits

- Extends current asset life.
- Results in a net reduction in operating costs
- Improves system operability and reliability

*To study, define, design, and implement a centralized monitoring and control system most appropriate for MWRA's wastewater transport system. Through facility automation and remote monitoring and control, SCADA implementation will result in cost savings and improve wastewater system operation and maintenance.*

### Project History and Background

MWRA has already made substantial progress towards increased automation and central monitoring and control of its water and wastewater systems and facilities. Substantial investments have been made in implementing such systems for the Deer Island Treatment Plant and Nut Island Headworks, and SCADA implementation is ongoing within the water conveyance system. The recommended wastewater SCADA system and associated business practices will support a single philosophy for central monitoring and control of all MWRA facilities and systems.

The SCADA Master Plan, which was completed in July 1999, recommended expansion of the automated control concepts developed for water system operation and identified long-term savings related to staffing reductions and optimization of operations and maintenance. Following the master planning recommendations, a detailed scope of services was prepared to procure professional services contract to provide design, integration, training, construction administration and resident inspection services for various SCADA improvements. Camp Dresser & McKee, Inc. (CDM) was awarded this contract in June 2002. CDM has since been working to design and procure three construction packages for SCADA implementation. The construction effort on the first and most complex of three construction packages began in March 2006. This construction addresses SCADA needs at most pumping and CSO facilities, as well as establishing overall data communications improvements. The second construction package will provide for SCADA needs at the remote headworks facilities, taking into consideration future CIP improvements at the older headworks facilities. The primary goal of the third construction package will be to improve MWRA's ability to continuously monitor wastewater flows and levels throughout the collection system that are impacted by facility operations or are prone to flooding. The third package will also provide improvements to newer facilities, ensuring consistent data collection from all wastewater facilities.

### Scope

Sub-phase	Scope
Planning	Development of a plan for a monitoring and control system for the MWRA wastewater transport system.
Design and Integration Services	Includes design, integration (PLC programming, operator graphics development, MIS/CMMS data transfer), and development and implementation of training. Also covers preparation of documentation and manuals for automating equipment and systems and for remote monitoring and control of the wastewater transport systems and facilities. Includes construction administration, engineering services during and after construction, and resident inspection.
Construction 1 (CP1)	Construction and installation of SCADA equipment and systems at seven pumping facilities, three CSOs and one screen house. Also covers Operation Control Center improvements. Facilities include Alewife, Caruso, Hingham, New Neponset, Hayes, Delauri, Houghs Neck, Chelsea Screen House, Cottage Farm, Prison Point, and Somerville Marginal. This construction package will also include the major components of the SCADA communications infrastructure (microwave radios, routers, etc.).
Construction 2 (CP2)	Construction and installation of SCADA instrumentation and control equipment at the three older headworks facilities and Nut Island Headworks. OCC improvements will also be made to support these additional facilities.

Construction 3 (CP3)	Construction of permanent power at up to 35 interceptor monitoring locations and minor instrumentation and control improvements at newly commissioned pumping facilities (IPS, Quincy, and Squantum). Also includes, construction and installation of SCADA equipment and systems at the Arthur Street Pump Station.
Equipment Prepurchase	Purchase SCADA system components including computer hardware to ensure consistency with MWRA MIS infrastructure through existing Commonwealth of MA blanket contracts and low cost small quantity system components (ex. fuel tank monitoring units and interfaces, Prison Point Flow meter, CSU/DSUs) to ensure consistency and/or compatibility with installed systems.
Technical Assistance	Technical assistance work to support all subphases.

#### Expenditure Forecast (in \$000s) and Project Status

Total Budget	Payments thru FY06	Remaining Balance	FY07 Projected	FY08	FY04-08	FY09-13	Beyond FY13
\$20,277	\$3,877	\$16,400	\$6,440	\$6,909	\$16,314	\$3,051	\$0

Project Status 11/06	24.1%	Status as % is approximation based on project budget and expenditures. The Planning phase is complete and Design and Integration contract is in process. Construction 1 contract was awarded in March 2006.
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#### Changes to Project Scope, Budget, and Schedule

Project Cost			Scheduled Completion Date			FY04-08 Spending		
FY07	PFY08	Chge.	FY07	PFY08	Chge.	FY07	PFY08	Chge.
\$19,935	\$20,277	\$342	Jul-08	Jul-09	12 mos.	\$18,396	\$16,314	(\$2,082)

#### Explanation of Changes

- Budget increased due to expected change orders including generator at Chelsea Screen House, seal water issues, custom cabinets, VFD Caruso existing cabinets, strobes and lights at Prison Point, antenna at DITP, and Verizon conduit issue.
- Schedule and spending shifted due to revised schedules as a result of ongoing work for CP1.

#### CEB Impact

- The FY07 CEB already reflects staffing reductions in preparation for implementation of remote monitoring. Future operating budgets will reflect any further optimization of chemicals and utility usage as a result of SCADA implementation.

## S. 139 South System Relief

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### **Project Purpose and Benefits**

- Contributes to improved public health*
- Provides environmental benefits*
- Extends current asset life*
- Improves system operability and reliability*

*To protect public health and property from sanitary system overflows and back-ups into homes and businesses during extreme wet weather events. Completion of the project will also extend the useful life of system assets and potentially avoid extraordinary costs resulting from system failures.*

### **Project History and Background**

#### Archdale Road Diversion Structure

On October 20, 1996 a 100-year rainstorm caused the MWRA High Level Sewer (HLS) (Section 70) to overflow in the area of Archdale Road in Boston. Following this overflow event, MWRA established a task force to recommend action to mitigate and/or prevent future overflows. The task force developed an emergency response plan and examined several relief alternatives. The first component of the recommended relief plan consisted of construction of a diversion structure that includes two 30-inch by 60-inch sluice gates connecting the HLS to BWSC's Stony Brook drainage conduit. The diversion structure is located at the end of Bradeen Street in Roslindale. If, based on monitoring results, it appears that the High Level Sewer is about to overflow in the Archdale Road area due to an extraordinary storm event, the overflow volume is diverted to the Stony Brook Conduit through the sluice gates. This eliminates the need to deploy large emergency response crews to build temporary sandbag dikes. Construction of the diversion structure was completed in August 1999.

#### High Level Sewer Repair

Subsequent to the October 1996 storm, MWRA initiated some short-term modifications to the sewer system to reduce overflows. However, during a June 1998 storm, these modifications actually pressurized the HLS. As a result, MWRA began an emergency evaluation of the HLS in June 1998 to analyze its hydraulic capacity and structural integrity. The evaluation, which was completed in January 1999, discovered cracking at a 77-degree bend in the sewer in the Archdale Road area that required immediate attention. Inspection also indicated that approximately 40 feet of the HLS, located in the Arnold Arboretum, needed repair. A construction contract notice to proceed was issued in June 1999 and construction was completed in October 1999.

#### Outfall 023 Cleaning and Structural Improvements

Following the October 1996 storm, the City of Boston engaged a consultant to review the events and recommend remedial actions to prevent future flooding under similar conditions. One recommendation was to clean sediment and debris from the Stony Brook Conduit. BWSC has cleaned the upstream portion of the conduit and MWRA has cleaned the outfall from the MDC gatehouse at Charlesgate to the Charles River. This part of the project also covers structural repairs to Outfall 023 with work scheduled to commence in July 2007.

#### Milton Financial Assistance

Two residential areas in the Town of Milton have experienced sewage backups into homes during wet weather events and periods of prolonged wet weather. One area affected is a direct tributary of MWRA's High Level Sewer and the other is a tributary to MWRA's New Neponset Valley Sewer. In September 1999, MWRA and Milton entered into a financial assistance agreement to fund design and construction of new sewers, rehabilitation of an existing pump station, and construction of a new pump station to mitigate downstream impacts from high flow conditions in the improved High Level Sewer.

Pump Station Feasibility

MWRA considered investigating the feasibility of constructing a small pump station to convey wastewater from a small area of Quincy away from the Braintree Howard Street Pump Station. The flow would be rerouted back to the Quincy collection system. The City of Quincy would own and operate the pump station. Upon further evaluation, MWRA has decided to delete this project and instead, will continue an MOU with Braintree to pay the town annually for use of 25 percent capacity of Braintree’s Howard Street Pump Station.

**Scope**

Sub-phase	Scope
Archdale Des/CS/RI and Construction	Design, construction services, and resident inspection for the Archdale Road Diversion Structure. Construction of an underground diversion structure that houses two 30-inch by 60-inch horizontal sluice gates on the sidewall of the HLS. This structure controls flow into BWSC’s Stony Brook Conduit.
Sections 70 and 71 HLS Evaluation/ Construction	Initial evaluation and construction of recommended improvements.
Construction and Improvements for Outfall 023	Removal and disposal of sediment and debris from Outfall 023 as well as continuation of structural improvements.
Milton Financial Assistance	Payment to the Town of Milton for local projects to mitigate downstream impacts from high flow conditions.

**Expenditure Forecast (in \$000s) and Project Status**

Total Budget	Payments thru FY06	Remaining Balance	FY07 Projected	FY08	FY04-08	FY09-13	Beyond FY13
\$4,945	\$3,440	\$1,505	\$4	\$189	\$193	\$1,313	\$0

Project Status 11/06	69.6%	Status as % is approximation based on project budget and expenditures. All sub-phases are complete except for Outfall 023 Structural Improvements which is scheduled to begin in January 2008.
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**Changes to Project Scope, Budget, and Schedule**

Project Cost			Scheduled Completion Date			FY04-08 Spending		
FY07	PFY08	Chge.	FY07	PFY08	Chge.	FY07	PFY08	Chge.
\$4,945	\$4,945	\$0	Jun-09	Dec-09	6 mos.	\$805	\$193	(\$613)

**Explanation of Changes**

- Schedule shift due to project priorities and staffing.

**CEB Impact**

No additional impacts identified.

## S. 141 Wastewater Process Optimization

### Project Purpose and Benefits

- Contributes to improved public health*
- Provides environmental benefits*
- Extends current asset life*
- Improves system operability and reliability*

*To optimize wastewater system operating procedures and make system improvements and modifications to ensure maximum wastewater treatment, minimum operating and maintenance costs, and extension of the useful life of system assets.*

### Project History and Background

This project was established to support MWRA Business Plan strategies, which recommend the development of a wastewater process optimization plan, central monitoring facilities for the sewerage system, rehabilitation of wastewater interceptors, and the utilization of automation and new technology to increase efficiency.

The completed planning phase included the development of an updated hydrologic and hydraulic model (InfoWorks CS) and the evaluation of optimization alternatives under typical and extreme storm events. MWRA has evaluated several of the alternatives and is using hydraulic information gained during this phase to develop facility control logic under the Wastewater Transport SCADA Implementation Project. Two alternatives, which include pipeline modifications, will be taken further as defined below. The model developed under this project continues to be used by MWRA staff for in-house system evaluation and NPDES reporting requirements and by outside consultants to support CSO-related projects.

### Scope

Sub-phase	Scope
Planning	Evaluate collection system and facility modification alternatives to maximize wastewater treatment and minimize operating and maintenance costs.
Somerville Sewer	Design and construct a connection between the upstream end of the Somerville Medford Branch Sewer and the North Metropolitan Relief Sewer to reduce surcharge and divert flow away from the Cambridge Branch Sewer and Delauri Pump Station.
Siphon Planning	Further evaluate the benefits of constructing a redundant siphon crossing the Mystic River from the Cambridge Branch Sewer to the Delauri Pump Station.

### Expenditure Forecast (in \$000s) and Project Status

Total Budget	Payments thru FY06	Remaining Balance	FY07 Projected	FY08	FY04-08	FY09-13	Beyond FY13
\$2,272	\$930	\$1,342	\$24	\$0	\$230	\$1,318	\$0

Project Status 11/06	40.9%	Status as % is approximation based on project budget and expenditures. The Notice-to-Proceed for the Somerville Sewer Design is scheduled for October 2008.
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**Changes to Project Scope, Budget, and Schedule**

Project Cost			Scheduled Completion Date			FY04-08 Spending		
FY07	PFY08	Chge.	FY07	PFY08	Chge.	FY07	PFY08	Chge.
\$2,240	\$2,272	\$32	Aug-11	Aug-11	None	\$230	\$230	\$0

**Explanation of Changes**

- Inflation adjustment on unawarded contracts due to new ENR index.

**CEB Impact**

None identified at this time.

## S. 142 Wastewater Metering System Equipment Replacement

### Project Purpose and Benefits

- Extends current asset life
- Improves system operability and reliability.

To improve the accuracy of meter data used to determine wholesale wastewater charges. This will be accomplished by replacing the existing wastewater metering system, including hardware and software utilizing the latest available technology. This technology will reduce confined space entries, making the metering system safer and less costly to maintain. This project will be coordinated with and support SCADA implementation for the wastewater system. Meter replacement is expected to be completed in FY06.

### Project History and Background

Installation of MWRA's wastewater metering system began in 1989 and was completed in 1994. Individual meters in 43 customer communities receive routine maintenance on a continuous basis. This initial system is now more than ten years old and has become difficult to maintain due to limited availability of replacement parts. The original meters now require significant rehabilitation and many have been rebuilt from replacement parts. Also, meter technology has continued to advance so the current system is obsolete.

### Scope

Sub-phase	Scope
Planning	Development of a long-term plan to upgrade or replace the existing wastewater metering system (hardware, software, telemetry) is complete.
Equipment Purchase/Installation	Purchase and installation of equipment is complete.
Permanent Site Improvements Design and Constr	Supply of power and enhanced wireless communications to approximately half of the 218 permanent wastewater metering sites. The data from these key sites will be used to optimize MWRA operation and maintenance activities during normal and wet weather conditions.

### Expenditure Forecast (in \$000s) and Project Status

Total Budget	Payments thru FY06	Remaining Balance	FY07 Projected	FY08	FY04-08	FY09-13	Beyond FY13
\$26,578	\$4,959	\$21,620	\$145	\$140	\$5,243	\$135	\$21,200

Project Status 11/06	18.8%	Status as % is approximation based on project budget and expenditures. The purchase and installation of new meters is complete.
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### Changes to Project Scope, Budget, and Schedule

Project Cost			Scheduled Completion Date			FY04-08 Spending		
FY07	PFY08	Chge.	FY07	PFY08	Chge.	FY07	PFY08	Chge.
\$6,578	\$26,578	\$20,000	Jan-16	Jan-48	384 mos.	\$5,257	\$5,243	(\$13)

**Explanation of Changes**

- Budget increased and schedule changed due to the addition of Wastewater Metering Asset Protection phase.

**CEB Impact**

Potential cost savings associated with this project have not yet been quantified.

## S. 145 Interception and Pumping Facility Asset Protection

### Project Purpose and Benefits

- Extends current asset life
- Improves system operability and reliability

*To protect the investment of MWRA ratepayers by ensuring timely replacement of equipment and systems.*

### Project History and Background

This project was developed to ensure that MWRA maintains ongoing service while optimizing operations in its wastewater facilities. This project, in its current form, addresses immediate critical facility and equipment issues. This project will eventually include five areas:

1. Equipment replacement (pumps, HVAC equipment, blowers, etc.).
2. Architectural projects (concrete corrosion, etc.).
3. Utilities projects (water, sewer, drainage, electrical wiring, heating system, etc.).
4. Support Projects (process control system upgrades, etc.).
5. Specialty Projects (instrumentation upgrades, fuel storage tanks, etc.).

While the current schedule indicates a completion date of 2011 for construction, the Interception and Pumping Asset Protection project will be ongoing throughout the useful life of the facilities.

### Scope

Sub-phase	Scope
Rehab of Section 93A Lexington	Rehabilitation of 4,000 linear feet of pipeline in Lexington (Section 93A). Completed in April 2004.
Sections 80 and 83	Evaluation of the condition of Sections 80 and 83 and design and construct repairs to damaged portions. TV inspection revealed numerous cracks and holes, which impair the structural integrity of the pipe. Contract awarded December 2006.
Section 160	Rehabilitation of 11,000 linear feet of Section 160 of the Mystic Valley Sewer in Winchester due to extensive deterioration of the brick and concrete sewer. Notice-to-proceed anticipated for Q4 2006.
93A Force Main Replacement	Replacement of 1,100 feet of 24-inch ductile iron force main due to extensive corrosion from hydrogen sulfide. Substantial completion anticipated in January 2007.
Mill Brook Valley Sewer Sec 79 & 92	Rehabilitation of a portion of Section 79 pipeline in Arlington. Under MOU trust agreement, MWRA to absorb 50% of total cost of rehabilitation.
Interceptor Renewal #1 Design & Construction	#1 – Rehabilitation of Charlestown/Dorchester Sections 31, 32 and Sections 240, 242. New project added.
Prison Point HVAC Upgrades, Design & Construction	The HVAC system improvements include the replacement of a boiler that has been in operation at Prison Point since 1981 with a more energy efficient unit. The remaining components of the HVAC system, ductwork, air handling equipment, dampers, louvers, and odor control are in need of upgrade. The existing equipment will be evaluated as part of the design effort. An assessment will be performed to develop the scope of the project and more accurately estimate the cost of construction. The conversion of the control system for the HVAC to electronic digital control was completed in FY05/FY06 under the CEB. The diesel engine fuel system modifications at this facility will be completed under the SCADA contract and will include the fuel oil delivery feed to the system boiler.

Sub-phase	Scope
Remote Headworks Heating System Upgrades	Existing boilers at each of the remote headworks require significant maintenance and consume substantial fuel. A preliminary design report was completed and alternative energy-saving systems are recommended to replace the existing heating systems. The contract to replace the existing heating system at the Chelsea Creek Headworks was awarded in April 2005 and completed in May 2006. The remaining systems at Ward Street and Columbus Park will be reviewed under the Headworks Condition Assessment Facilities Plan for recommended replacement.
Remote Headworks Screen Replacement	The three Headworks, Chelsea Creek, Ward Street, and Columbus Park have screens that are experiencing a high rate of operational and maintenance failures. There are 12 climber-type screens installed in 1985 that are at the end of their useful lives. This project will include design and installation of a new state-of-the-art screening system. An in-depth mechanical assessment was completed to address immediate operations and maintenance needs until the screens are replaced under this CIP. The screens will be further evaluated for replacement alternatives under the Headworks Condition Assessment Facilities Plan.
Headworks Condition Assessment and Facilities Plan	A Facilities Plan will be performed to identify the operational needs of the three remote headworks facilities to recommend equipment replacement and upgrades for further design and construction. The Facilities Plan will include a Condition Assessment of all equipment and non-equipment assets to establish a basis for adding process improvements or upgrades to meet business goals and objectives. An RFQ/P process will be used to procure engineering consultant services.
Hingham Pump Station Isolation Gate Construction	The Hingham Pump Station was built without an influent gate. The station services the Town of Hingham and presently has no direct means to isolate the flow to this station. Presently, labor intensive and inefficient means using stop logs, sand bags, sewer plugs and pumps are required to isolate and divert flow. An isolation gate will allow work in the wetwell and on grinders and other related station equipment. This project will include the design and installation of a mechanical means, such as sluice gates in a diversion chamber, to isolate the station and bypass flow if required. This will allow maintenance to take place in the station without interruption of service.
Alewife Brook Pump and Screen Replacement Design and Construction	The Alewife Brook Pump Station was built in 1951 and the pumps are original equipment. They are discharging with less efficiency and the check valves are leaking. Staff has replaced rotating parts on the pumps over the past several years and it is difficult to maintain proper tolerances for internal pump components due to the age and wear of the pumps. The replacement is intended to increase pump reliability and efficiency at this facility and will include replacing the larger pumps and motors, check valves, and VFDs. The fourth pump, the smallest one, will be replaced under the SCADA contract. Alewife Brook Pump Station has two climber screens currently in need of replacement. The screens jam and do not capture screenings on a regular basis thus causing constant, intensive labor to clean the screens. This project will also include an evaluation of screens vs. grinders to improve operations of the pump station.
Caruso Pump Station Generator Replacement	The Caruso Pump Station generator, which is currently 13 years old, is one of a few existing generators of this type made by Wakesha. The manufacturer is no longer making spare parts and there is only a limited quantity of available spare parts at this time, which may not be readily available in the future. This project is to replace the generator, due to obsolescence, with a newer model with readily available parts to ensure reliable back-up power at this facility.

Sub-phase	Scope
Chelsea Screenhouse Sluice Gate Engineering Study	The Chelsea Screenhouse has seven hydraulic gates used to control flow within the facility, and direct flow to either the Caruso Pump Station or the Chelsea Headworks. These gates are critical to the operation of the facility. One gate was replaced in 2001, and developed an operational problem, that caused it to jam and bind. Consequently, this gate was repaired. All of the facility gates because of their depth and difficult accessibility are difficult to maintain. This project is a condition assessment of all seven gates in the facility and will include recommendations to improve maintenance, make necessary repairs, or even replace units.
Prison Point & Cottage Farm Washdown System Piping Design and Construction	At both the Prison Point and Cottage Farm CSO Facilities the piping system that provides water for washing down the detention tanks, wet wells and screen room areas after storm activations is made of PVC and cast iron. The glued joints in the plastic pipe are problematic, when the water pressure causes a break or even leaks. The PVC pipe and associated hangers & hardware are twenty years old in some instances. The replacement of these systems should include upgrading existing materials, connections, and installing necessary pressure controls.
Framingham Pump Station Sluice Gates Condition Assessment	There are three 48-inch sluice gates at the Framingham Pump Station that control flow into the station and the Framingham Extension Sewer. The sluice gates have been in operation 5-6 years. Gate No. 3 has experienced operational problems due to premature corrosion resulting from exposure to high levels of hydrogen sulfide in the influent. The No. 3 gate is scheduled for replacement in FY07 under the CEB. An inspection and condition assessment of the other two influent gates as well as the gate connecting the two wet wells is needed to determine the extent of corrosion and overall condition. The assessment will determine remaining useful life and provide recommendations for repair or replacement with more appropriate materials.
Caruso Pump Station Shaft Replacement Construction	Caruso Pump Station has seven pumps that are fourteen years old, four 21 MGD pumps and three 50 MGD pumps. The vertical shafts of the four 21 MGD rated pumps are worn from use and corrosion. Of these four pumps, one was outfitted with a mechanical seal. The four (21 MGD) pumps are used 24 hours/day, 7 days/week and it is recommended that they have mechanical seals installed to replace the conventional pump packing. This project is to replace all worn, corroded shafts and sleeves and install mechanical seals to reduce operational & maintenance costs.
Nut Island Headworks Fire Alarm/Wire Conduit	Replace deteriorated portions of the fire alarm and wiring conduit at Nut Island Headworks. New project added.
Headworks Facility Upgrades Design & Construction	Future rehabilitation, replacement and upgrades (design and construction) of projects recommended in the Headworks Condition Assessment / Facilities Plan. These recommendations for upgrades to the Chelsea Creek, Columbus Park and Ward Street Headworks are expected to be prioritized and spread over the 20-year planning period from FY09 through FY28. The recommendations from the Headworks Condition Assessment / Facilities Plan are expected to incorporate previous CIP project recommendations for headworks improvements (including odor control system replacement; grit collection system replacement; grit and screenings ejection system replacement; and Columbus Park Headworks HVAC/heating system).
Pump Station/CSO Condition Assessment	This project would provide professional engineering services (via an RFQ/P process) including facilities planning, design review, inventory, evaluation, identification and prioritization of rehabilitation/replacement projects and operational processes for ten older pump stations and CSO facilities. The ten older pump station and CSO facilities to be included in the condition assessment/facilities plan are: Alewife Brook, Caruso, Chelsea Screen House, DeLauri, Hayes, Hingham, Prison Point, Wiggins - Castle Island Terminal, Cottage Farm, and Somerville Marginal.

Sub-phase	Scope
Alewife Brook Pump Station Additional Work	Existing upgrades to the Alewife Brook Pump Station being implemented under the asset protection project are projected to require an additional design and construction.

#### Expenditure Forecast (in \$000s) and Project Status

Total Budget	Payments thru FY06	Remaining Balance	FY07 Projected	FY08	FY04-08	FY09-13	Beyond FY13
\$63,141	\$3,303	\$59,839	\$1,631	\$3,898	\$8,831	\$28,059	\$26,250

Project Status 11/06	5.7%	Status as % is approximation based on project budget and expenditures. The Headworks Condition Assessment and Facilities Plan will start in spring 2007. This phase will result in prioritized recommendations for upgrade and replacement projects for all the headworks facilities. The Remote Headworks Heating System Upgrade work at the Chelsea Creek Headworks was completed in May 2006. Section 93A Force Main Replacement construction began in May 2006.
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#### Changes to Project Scope, Budget, and Schedule

Project Cost			Scheduled Completion Date			FY04-08 Spending		
FY07	PFY08	Chge.	FY07	PFY08	Chge.	FY07	PFY08	Chge.
\$18,846	\$63,141	\$44,295	Oct-11	Jun-28	200 mos.	\$11,231	\$8,831	(\$2,399)

#### Explanation of Changes

- Budget increase is primarily due to new subphases added including Interceptor Renewal #1, Nut Island Headworks Fire Alarm/Wire, Headworks Facility Upgrades, Pump Station/CSO Condition Assessment, Alewife Brook PS Additional Work. Also, revised cost estimates for Alewife Brook PS Screen Replacement.
- Schedule shifted due to the new projects above.

#### CEB Impact

CEB impacts for this project have not yet been identified.

## S. 146 Deer Island Cross Harbor Tunnel

### Project Purpose and Benefits

- Contributes to improved public health*
- Provides environmental benefits*
- Extends current asset life*
- Results in a net reduction in operating costs*
- Improves system operability and reliability*

### Project History and Background

The MWRA sewer system includes three deep rock tunnels that carry wastewater from the headworks to the DITP. The MWRA currently does not have the technology and capability of inspecting deep rock tunnels.

### Scope

Sub-phase	Scope
Tunnel Shaft Repairs Design & Construction	The MWRA sewer system includes three deep rock tunnels that carry wastewater from the headworks to the DITP. The MWRA currently does not have the technology and capability of inspecting deep rock tunnels. This subphase includes inspection, design, and construction of repairs.

### Expenditure Forecast (in \$000s) and Project Status

Total Budget	Payments thru FY06	Remaining Balance	FY07 Projected	FY08	FY04-08	FY09-13	Beyond FY13
\$5,000	\$0	\$5,000	\$0	\$0	\$0	\$0	\$5,000

Project Status 11/06	0.0%	Status as % is approximation based on project budget and expenditures.
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### Changes to Project Scope, Budget, and Schedule

Project Cost			Scheduled Completion Date			FY04-08 Spending		
FY07	PFY08	Chge.	FY07	PFY08	Chge.	FY07	PFY08	Chge.
\$0	\$5,000	\$5,000	n/a	Jun-17	n/a	\$0	\$0	\$0

### Explanation of Changes

- New Project

### CEB Impact

- No additional impacts expected at this time.



## S. 200 Deer Island Plant Optimization

### *Project Purpose and Benefits*

- Extends current asset life
- Results in a net reduction in operating costs
- Improves system operability and reliability

*This series of projects addresses the need for capital investment to optimize plant operations after initial start-up. The projects provide for design, construction, support, and services during construction, for work at the Deer Island Treatment Plant necessary for safe, efficient start-up and/or to optimize the operational functionality in various areas of the facility.*

### **Project History and Background**

The Deer Island Treatment Plant consists of an extensive infrastructure of facilities and utility services. Due to the size, scope, and complexity of the Deer Island facility, it was inevitable that unanticipated repairs and/or modifications to various structures and utilities would be necessary following substantial completion of the plant. Contracts under this program are to support these modifications. The projects required to address routine plant operations and maintenance needs are under the S.206-Deer Island Treatment Plant Asset Protection project series. Once Ancillary Modifications 4 is completed under this program, the As-Needed Technical Design phases may potentially be moved into the DITP Asset Protection Program, allowing this project series to be closed out.

**Scope** - New subphases added to the Proposed FY08 CIP are noted in **Bold**. Those with an asterisk were added based on the Master Plan data.

<b>Sub-phase</b>	<b>Scope</b>
Supplementary Modification Package	Installation of safety railings, primary access hatches, scum screen bypass, and access platforms at the Deer Island grit facility (completed in March 2000).
As-Needed Design Phases 1 through 5, and Long-Term As-Needed Design	On-going technical design services and/or construction support to supplement existing engineering resources for specialized or complex engineering issues. Typically, two contracts are issued in tandem and run for two years each. These design phases are currently scheduled to end in 2013.
<b>Deer Island As-Needed Technical Design*</b>	Added in FY08 as part of the Master Plan effort, this subphase will be used to continue the technical design services and/or construction support in the same fashion as the contracts listed above. Covering the period from FY13 through FY48 at \$750,000 annually for two contracts, the total estimated project cost is \$26.45 million.
BHP Site Completion	Final landscaping and installation of public safety, education, and orientation signage. Completed in December 2004.
<i>Ancillary Modifications:</i>	
Design and Construction 1	Replaced catenary screens and extended the garage to enclose the grit hoppers at the Winthrop Terminal Facility; replaced primary scum screens in Residuals, valves and gas meters at digester modules; corrosion repair; replaced sumps at North Main Pump; and telescoping valve work in digester module 3. Substantially complete March 2006.
Design and Construction 2-2	Design and construction for installation of Variable Frequency Drives (VFDs) and DC chokes at the South System Pump Station.
Design and Construction 3-1	Improved the secondary clarifier scum removal; installed clarifier access manholes; corrected sludge manifold vibrations; replaced clarifier intermediate hatches; and other secondary clarifier improvements. Completed construction in November 2004.
Preliminary Design, Final Design, and Construction 4	Expanded the project scope to include a Preliminary Design phase in FY07. For design and construction of modifications to the cryogenics facility and plant-wide odor control systems, including the digester gas systems and wet scrubber improvements.

**Expenditure Forecast (in \$000s) and Project Status**

<b>Total Budget</b>	<b>Payments Through FY06</b>	<b>Remaining Balance</b>	<b>FY07 Projected</b>	<b>FY08</b>	<b>FY04-08</b>	<b>FY09-13</b>	<b>Beyond FY13</b>
\$70,427	\$27,868	\$42,559	\$4,140	\$2,381	\$26,106	\$9,788	\$26,250

Project Status 11/06	41.9%	Status as % is an approximation based on project budget and expenditures. Several previously completed phases for this project are included in the Completed Project list. Contracts in process include Ancillary Modifications 2-2, As-Needed Design 4-1 and 4-2. Ancillary Modifications Construction 1 was completed in March 2006, but the design phase continues until April 2007 to cover the warranty period. Expect to award the next series of As-Needed Design contracts, phases 5-1 and 5-2, by March 2007. The CEMS Modifications project was dropped in FY08 based on a reassessment of the project needs by the Project Manager.
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**Changes to Project Scope, Budget, and Schedule**

<b>Project Cost</b>			<b>Scheduled Completion Date</b>			<b>FY04-08 Spending</b>		
<b>FY07</b>	<b>PFY08</b>	<b>Change</b>	<b>FY07</b>	<b>PFY08</b>	<b>Change</b>	<b>FY07</b>	<b>PFY08</b>	<b>Change</b>
\$43,196	\$70,427	\$27,230	Mar-13	Mar-14	12 mos.	\$26,472	\$26,106	(\$366)

**Explanation of Changes**

- The majority of the budget increase (\$26.45M) is due to the addition of the DI As-Needed Technical Design phases as part of the Master Plan process, with project funding extended through FY48. Revised cost estimates As-Needed Design Phases (5-1, 5-2, and Long-Term As-Needed Technical Design) resulted in an additional \$1M increase. Minor increases in Ancillary Modifications Design and Construction 4 due entirely to inflation were offset by the elimination of the CEMS modifications project (\$310,500).

**CEB Impact**

- The As-Needed Design and Ancillary Modifications phases are intended to improve the operational functionality of various areas of the plant, potentially reducing maintenance costs and utility expenses. The actual cost benefits have not been quantified. Any budgetary impacts will be absorbed within the existing budget projections.

## S. 206 Deer Island Treatment Plant Asset Protection

### *Project Purpose and Benefits*

- ☑ *Contributes to improved public health*
- ☑ *Fulfills a regulatory requirement*
- ☑ *Extends current asset life*
- ☑ *Improves system operability and reliability*

*To protect the investment of MWRA ratepayers in the Deer Island treatment facility by ensuring timely replacement of DI's systems, which contain more than 60,000 pieces of equipment with an approximate value of \$1 billion. Based on the Master Plan developed in 2006 (and subsequent updates), MWRA expects to sequentially replace equipment and structures in the facility as they reach the end of their useful life.*

*Construction of the Deer Island Treatment Plant (DITP) was one of the largest wastewater projects ever undertaken in the United States. DITP construction was a 12-year, \$3.5 billion effort (not including the cost of off-island residuals facilities) started in 1988. MWRA commenced primary disinfection at the new plant in 1995 and secondary disinfection in July 1997. With the completion of the Effluent Outfall Tunnel in September 2000 the plant now discharges treated effluent 9.5 miles offshore in Massachusetts Bay through a series of 55 diffusers spaced along the last 1.5 miles of the tunnel.*

### **Project History and Background**

The Deer Island Treatment Plant Asset Protection program was formerly titled "Facilities Asset Management Program" (FAMP). Since the Facilities Asset Management Program was expanded to include other Operations units throughout MWRA, this Deer Island project was renamed. An initial component of the program, Inventory and Evaluation phases 1 and 2 (previously a part of this project), were placed under the Capital Maintenance Planning and Development project in the *Business Operations and Support* capital budget in a prior budget cycle.

At an expansive and complex facility like the Deer Island Treatment Plant, unanticipated equipment and system failures have the potential to cause operational and maintenance crises. It is prudent industry practice to take a proactive approach by establishing programs to anticipate when equipment and systems are near the end of their reliable service lives, and then overhaul, upgrade, or replace the equipment, systems, and structures as needed. This project has been further defined to encompass five major functional categories:

1. Equipment Replacement (chains, pumps, motors, control systems, discrete process equipment, etc.).
2. Architectural projects (expansion joint replacements, concrete corrosion, etc.).
3. Utilities projects (water, sewer, drainage, piping, electrical wiring, heating systems, etc.).
4. Support projects (Technical Information Center projects, security projects, etc.).
5. Specialty projects (laboratory modifications, chemicals and fuels storage tanks, etc.).

**Scope** - New subphases added to the Proposed FY08 CIP are noted in **Bold**. Those with an asterisk were added (or increased) based on the Master Plan data.

<b>Sub-phase</b> <i>Equipment Replacement:</i>	<b>Scope</b>
<b>Equipment Replacement Projection*</b>	The long-term projected cost placeholder for unanticipated replacements. Funds needed for new projects identified during each CIP development phase were typically deducted from this total and then shown under new sub-phases. Completion of the Master Plan in 2006 resulted in the addition of many new project phases to the Proposed FY08 CIP, which depleted the remainder of the initial funding for this subphase; therefore, additional funding was added in the amount of \$2M per year, for FY09 through FY44.

<b>Sub-phase</b> <i>Equipment Replacement:</i>	<b>Scope</b>
Equipment Condition Monitoring	Installation of temperature & vibration-monitoring equipment in NMPS and WTF. Completed in January 2005.
Primary Clarifier Rehab Construction	New in FY07 (the “Clarifier Chain Replacement” subphase was renamed, and that scope of work is included). Replace chains and sprockets, chain drives, tip tubes, hose bibs, repair wall expansion joints, add more drop boxes, etc.
CEMS Equipment Replacement	Replaced the data collection computers, upgraded the software, and added PLCs to the Continuous Emissions Monitoring Systems on the two high-pressure Zurn boilers. Substantially completed by March 2006.
Pump Packing Replacement	On-going replacement of pump packing seals with mechanical seals for the North Main Pump Station, South System Pump Station, and Winthrop Terminal Facility pumps. Scheduled for completion by mid-FY08
LOCAT Scrubber Replacement Construction	Replace the Thermal Plant’s high-maintenance digester gas wet scrubber system with a dry scrubber system.
Digester Chiller Replacement	Replaced the refrigeration-based digester gas chiller with a chilled water system that performs better at low operational loads. Completed in May 2006.
Dystor Tank Membrane Replacement	Emergency replacement of a torn gas membrane on one digester storage tank, and preventive replacement on the second. Completed both by October 2005.
<b>Dystor Membrane Replacements*</b>	Periodic future replacement of the two gas & sludge storage tank membranes, added in FY08 as part of the Master Plan. Last completed in 2005 and required every ten years (2015, 2025, 2035, etc.).
Grit Blower Replacement Construction	Replace a high-maintenance grit blower with a dedicated air-handling/compressor system for improved grit handling.
Thickened Primary Sludge Pump Replacement	Design and construction to replace the thickened primary sludge pumps in order to reduce water use and maintenance costs.
<b>Digested Sludge Pump Replacement Design &amp; Construction*</b>	The existing digested sludge pumps (Abel pumps) have frequent operating problems and require a lot of maintenance. Included per the Master Plan, this provides for replacement in FY10 & FY30, at \$2.0 million for each cycle.
Centrifuge Back-drive Replacements	Replace the centrifuge back-drives, which have become obsolete.
<b>Grit &amp; Odor Control Air Handlers Replacement*</b>	Replace the air handlers in grit and odor control facility due to deterioration. Included in the Master Plan, with \$2M in FY08-10, then every 15 years.
<b>Fire Alarm System Replacement – Design &amp; Construction</b>	Identified as a needed project in FY08, and not initially included in the Master Plan. Scope includes replacing the fire alarm monitoring & control systems due to obsolescence. Design in FY08/09, replace in FY10/11 and then every fifteen to twenty years. Estimated cost for the first cycle is \$1.7M.
<b>HVAC Control System Replacement – Design &amp; Construction</b>	Also identified as a needed project in FY08, and not initially included in the Master Plan. Scope includes replacing two different HVAC control systems in two buildings (due to obsolescence) with one manufacturer’s system to reduce replacement parts stock. Design in FY08, replace in FY09/10 and then every fifteen to twenty years. Estimated cost is \$1M for first replacement cycle.
<b>Centrifuge Replacements – Design &amp; Construction*</b>	Replace the existing centrifuges when the scrolls or bowls are too worn to repair, or the units experience catastrophic failure. Units have a 20-30year life but have been exposed to a lot of grit. Units started up in 1996. Included in the Master Plan; replace four centrifuges every ten years beginning in 2014.
<b>Cryogenics Plant Equipment Replacement – Design &amp; Construction*</b>	Design and construction to replace pumps, valves, motors, sensors, switches, programmable controllers, and other obsolete equipment as needed. Added in FY08 per Master Planning. Scheduled for \$2M in FY14, with additional rehab and upgrade work occurring every 10 years.

<b>Sub-phase</b> <i>Equipment Replacement:</i>	<b>Scope</b>
<b>South System Pump Station Pump Lube System Replacement*</b>	Change the pump lubrication system from using grease to one that uses oil. (Only requires routine maintenance after installation, not replacement). Included in the Master Plan at \$1.7 million, scheduled to occur in FY08-09.

<b>Sub-phase</b> <i>Architectural:</i>	<b>Scope</b>
Study/Concept Design- Concrete Repairs	Study to be followed by conceptual design (if needed) for installation of a protective coating on concrete below the water line in the secondary clarifiers and disinfection basins.
Expansion Joint Repairs	Continuing program to periodically replace failed expansion joints in the concrete clarifier decks and/or various retaining walls.
<b>Barge Berth and Facility Replacement*</b>	Major rehabs of the barge berth & pier facilities due to damage and/or normal wear. In the Master Plan at \$1.0 million for FY11 and each 20 year cycle.

<b>Sub-phase</b> <i>Utilities:</i>	<b>Scope</b>
Outfall Modifications	Inspection of the old outfall tunnels (decommissioned after startup of the new outfall tunnel). Inspection completed in July 2002.
Electrical Equipment Upgrades	On-going program to replace transformers and bus ducts at the end of their useful lives.
VFD Replacements	On-going program to replace obsolete variable frequency drives in the North Main Pump Station, South System Pump Station, Winthrop Terminal Facility, and throughout the plant.
Power System Improvement Design and Construction	Design and implement modifications to DI's electrical system as recommended in consultant report after FY04 power outage.
DI Electrical Modifications	New for FY07. Modifications to DI's electrical system recommended after the October 2005 power outage.
Switchgear Replacements	On-going program to sequentially replace obsolete electrical switchgear.
PICS Replacement	Replacement or upgrade of components of the Process Information Control System including keypads, consoles, and software due to obsolescence.
<b>PICS Distributed Processing Units (DPU) Replacement*</b>	Replacement of the system "backbone", the 26 distributed processing unit (DPU) cabinets & internal components. Included in the Master Plan at \$4M for 2015, then every 20 years.
Sodium Hypochlorite Pipe Replacement	Replacement of ½ mile of PVC piping that transports sodium hypochlorite from the barge to the storage tanks with a better-suited pipe. This project will address issues with leaks, corrosion, and health and safety hazards.
Pipeline Replacement Design and Construction	Planned periodic replacement of the various chemical pipelines in the odor control and disinfection facilities due to deterioration from corrosion.
Heat Loop Pipe Replacement Construction	Sequential replacement projects for DITP heat loop piping. Involves rerouting portions of the piping to reduce the corrosion from groundwater contact and to improve pipe accessibility. Also includes periodic valve replacements.
Fuel Transfer Pipe Replacement	Replace the diesel fuel pipeline from the barge area to the fuel storage tanks in the Thermal Power Plant.
North Main Pump Station Motor Control Center Design and Construction	Sequential replacement of the motor control center equipment in the Pump Station since the components are becoming obsolete and unreliable. Includes replacing cracked end rings in the NMPS motors.

<b>Sub-phase</b> <i>Utilities:</i>	<b>Scope</b>
DI Wind Power Construction	Previously a zero-funded placeholder for wind power turbines, to be constructed contingent upon obtaining applicable regulatory permits and approvals. Funding added in FY08.
<b>CTG Rebuilds*</b>	Rebuilds of the combustion turbines in the Thermal Power Plant. Included in the Master Plan at \$2M for 2015, then every 15 years.
<b>Leak Protection System Upgrade*</b>	Leak detection system in fuel lines needs upgrade due to frequent failures. Included in the Master Plan at \$300k for 2011, then every 15 years.

<b>Sub-phase</b> <i>Support:</i>	<b>Scope</b>
DISC Application	Hardware, software, and contract services to implement a Deer Island plant-wide computerized database of all plant systems (electrical, gas, water, etc).
Document Format Conversion	Conversion of Deer Island construction documents into electronic format and completion of document-reference database.

<b>Sub-phase</b> <i>Specialties:</i>	<b>Scope</b>
Sodium Hypochlorite Tank Liner Removal	Remove the failed lining in one of the four tanks. Work completed in September 2006.
Hypochlorite Tanks 1&3 Reline	Renamed the “Sodium Hypo Tank Repair 1” subphase during the Proposed FY08 CIP cycle, to include the repair and relining of an additional tank.
<b>Hypochlorite Tanks 2&amp;4 Reline*</b>	Added in FY08 and included in the Master Plan at \$1.25M for FY08-09, based on experience with tanks 1 & 3 above.
<b>Future Sodium Hypo Tank Rehabilitation*</b>	Stripping and relining the four sodium hypo tanks every 10 years. Included in the Master Plan at \$2.5M for 2017, then every 10 years.
Metals Lab Fume Hood Replacement	Replace the metals lab fume hood. Scope not included in other lab projects.
<b>Central Lab Fume Hood Replacements</b>	Continued replacements of fume hoods in the Central Lab at Deer Island. Not initially included in the Master Plan; added per Lab Director’s request in FY08. Scheduled for FY09 and then every fifteen years at \$270k per cycle.
Metals Lab Modification Construction	Metals lab improvements; replacement of metal fixtures that may contaminate metals samples; installation of filtered air supply; and reconfiguration of the workspace to put team members together.
Lab Sample Area Modifications Design and Construction	Design and construction of improvements at the Central Lab at Deer Island. Improvements include changes in the physical layout to improve workflow and to capture fumes from sample containers and bottle-wash process.
<b>Laboratory As-needed Technical Design</b>	Not initially included in the Master Plan; added per Lab Director’s request in FY08. Technical design services & construction support at \$100k annually from FY09 through FY48 for a total estimated project cost of \$4 million.
Primary Clarifier & Gravity Thickener Rehab - Design	New for FY07. Select a Consultant to design both the Primary Clarifier Rehab and the Gravity Thickener Improvement projects (see note below).
Gravity Thickener Improvements - Construction	Install catwalks, remove concrete blocks in the effluent channel, and make roofing modifications for the sludge thickeners to improve staff access and operating efficiency of the thickeners. For the Proposed FY08 cycle, this subphase is being eliminated and the scope is being included in the Primary Clarifier Rehab work.

**Expenditure Forecast (in \$000s) and Project Status**

Total Budget	Payments thru FY06	Remaining Balance	FY07 Projected	FY08	FY04-08	FY09-13	Beyond FY13
\$348,285	\$7,733	\$340,552	\$4,324	\$18,615	\$28,801	\$99,394	\$218,219

Project Status 11/06	2.6%	Status as % is approximation based on project budget and expenditures. Several previously completed phases for this project are included in the Completed Project list. Contracts in process include Pump Packing Replacement, Electrical Equipment Upgrade Construction 2, and Miscellaneous VFD Replacements. Expect to award contracts for DI Electrical Modifications, Heat Loop Pipe Replacement 2, Sodium Hypochlorite Tank 1& 3 Repairs, Metals Lab Modification - Construction, Clinton Soda Ash Replacement, and Clinton Standby Generator by Q3 of FY07.
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**Changes to Project Scope, Budget, and Schedule**

Project Cost			Scheduled Completion Date			FY04-08 Spending		
FY07	PFY08	Change	FY07	PFY08	Change	FY07	PFY08	Change
\$98,332	\$348,285	\$249,953	Jun-16	Jun-48	384 mos.	\$25,559	\$28,801	\$3,243

**Explanation of Changes**

- The majority of the project cost increase and schedule shift is due to the addition of the projects highlighted above as part of the Master Plan process (approximately \$242M) with the repeated project cycles extended through FY48.
- Other existing project cost increases and new projects not initially identified in the Master Plan (HVAC Controls System and Fire System Replacements) added \$9.5M. New project additions and increases were offset by a reduction of \$18.5M from the original 'Equipment Replacement Projection' placeholder. Staff also made an additional \$5M in other project cuts, including a \$2.3M reduction in the cost estimate for the TPS pumps replacement.
- A small portion of the cost increase is due to inflation adjustments on existing projects.
- Major project cost increases resulted from the added \$7M in funding for "Wind Power"; the NMPS VFD project increased \$7.25M due to the need to include replacement of the motors due to cracked end rings and a \$3.6M cost increase in Electrical Equipment Upgrade 3 due to adding replacement of primary clarifier conduits to the scope of work.
- The \$3.2M change in FY04-08 spending is due in part to funding the Wind Power project, with \$2M scheduled for expenditure during FY08; and Electrical Equipment Upgrade 3, which has \$1.5M more scheduled for expenditure in FY08 than was expected in the Final FY07 CIP.

**CEB Impact**

- The majority of the projects are required to replace obsolete equipment and systems. Some of the projects are expected to result in decreased maintenance and/or operating costs (such as the SSPS lube system replacement and the HVAC control system replacement), however the potential benefits are not quantified at this time. The Wind Power project is anticipated to result in electrical cost savings to offset construction expenses, but the calculations will be contingent upon the number of turbines permitted, and the power generation capacity per turbine. Any identifiable impacts will be absorbed within the existing CEB projections.

## S. 210 Clinton Wastewater Treatment Plant

### Project Purpose and Benefits

- Contributes to improved public health*
- Provides environmental benefits*
- Extends current asset life*
- Improves system operability and reliability*

### Project History and Background

The Clinton Wastewater Treatment Plant is less than 15 years old and is generally in good condition. Some minor equipment rehabilitation and replacement projects are recommended, however, significant reinvestment is not required in the short-term. Operability of mechanical equipment and maintenance of electric/standby power systems are key elements to minimize risk of component failure. Malfunction of mechanical equipment may impact wastewater treatment, particularly during large storm events that stress the hydraulic capacity of the facility. Key decision making to minimize risks includes the cost/benefit of when to replace aging equipment and which/how many spare parts to pre-purchase. Other CLTP uncertainties include technology upgrades to meet future regulatory requirements.

### Scope

Sub-phase	Scope
Clinton Soda Ash Replacement	Added in Final FY06 cycle. Replace the obsolete soda ash delivery system required for pH control in the activated sludge process.
Clinton Perm Standby Generator	New for FY07. Install a permanent standby generator at the Clinton Wastewater Treatment Plant.

### Expenditure Forecast (in \$000s) and Project Status

Total Budget	Payments thru FY06	Remaining Balance	FY07 Projected	FY08	FY04-08	FY09-13	Beyond FY13
\$633	\$0	\$633	\$115	\$269	\$384	\$250	\$0

Project Status 11/06	0.0%	Status as % is approximation based on project budget and expenditures.
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### Changes to Project Scope, Budget, and Schedule

Project Cost			Scheduled Completion Date			FY04-08 Spending		
FY07	PFY08	Change	FY07	PFY08	Change	FY07	PFY08	Change
\$547	\$633	\$86	Dec-07	Dec-08	12 mos.	\$547	\$384	(\$163)



**Explanation of Changes**

- Established as a separate project instead of subphases under the Deer Island Treatment Plant Asset Protection project.
- Cost increased based on 90% design estimate.
- Schedule and spending shift due to need for two site visits and several addenda.

**CEB Impact**

- No additional impacts expected at this time.

## S. 271 Residuals Asset Protection

### Project Purpose and Benefits

- Contributes to improved public health*
- Provides environmental benefits*
- Extends current asset life*
- Results in a net reduction in operating costs*
- Improves system operability and reliability*

### Project History and Background

Residuals Asset Protection consisting of 13 individual contracts to maintain and improve the operations and infrastructure of the residuals plant. MWRA's Biosolids Processing Facility was built in 1991 and expanded in 2001. In 2015, the facility equipment will be an average of 20 years old. The facility is currently in good condition, but significant reinvestment is anticipated in the FY14-18 timeframe. For residuals facilities, operability of mechanical equipment and maintenance of electric/standby power systems are key elements to minimize risk of component failure. Key decision making to minimize risks includes the cost/benefit of when to replace aging equipment and which/how many spare parts to pre-purchase. The residuals pelletizing process is energy intensive; future uncertainties include long-term energy costs and supply.

Under the terms of the NEFCO contract, they are responsible for all facility operation and maintenance including any necessary capital improvements until 2015. They are obligated to turn the facility back over to the MWRA in an operable condition. The Asset Protection phase is being proposed to allow a dual track planning approach addressing: 1) the existing facility capital improvement needs beyond the year 2015 if the agency continues with pelletization and (2) the option of assessing alternative technologies prior to the current contract expiration date-culminating in a decision point sometime in FY09-10.

A comprehensive Residuals Condition Assessment/Facility Plan project is recommended for the FY09-10 timeframe. This project will review the adequacy of existing facility components and processes and provide replacement recommendations based upon the latest/alternative technology. Information developed by this project will be used by MWRA to produce a prioritized list of recommended design/construction projects that will be scheduled over an 8 year period (FY11-18). Scheduling of upgrade projects will be based on equipment failure risk, construction sequencing to maintain facility operations, and capital expenditure planning.

For residuals processing and disposal facilities, \$180.32 million in projects is identified in the 40 year master plan timeframe (FY07-48). There are no projects currently programmed in the FY07 CIP. Eighteen projects (\$180.32 million) are recommended for inclusion in the FY08 CIP.

### Scope

Sub-phase	Scope
Residuals Plant System Reliability	A project to design and construct improvements to the plant infrastructure is recommended. The study phase is included in the FY07 CEB. This project will address issues identified during the study.
Residuals Plant Pellet Plant Upgrade Des/Con	A project to design and implement all required equipment replacements at the end of the contract is recommended. The project is estimated at \$8 million, with a duration of 7 years.
Condition Assessment	A project to evaluate the condition of the entire facility at the mid-point of the current operating contract; also assess various residuals processing technology options and regulatory changes.

<b>Sub-phase</b>	<b>Scope</b>
Six Rotary Dryer Replacement Des/Con	A project to replace 6 rotary sludge dryers at the end of their expected useful lives (15 years) is recommended. The project is estimated at \$20 million with a duration of 3-years beginning in FY14. For master planning, staff anticipate the dryers will need to be replaced again in FY29 and FY44.
Six Air Scrubber Replacement Des/Con	A project to replace 6 air scrubbers/packed towers is recommended. The project is estimated at \$3 million with a duration of 2-years beginning in FY16. For master planning, staff anticipate replacing the air scrubbers/packed towers again in FY31 and FY46.
Plant MCC Des/Con	A project to replace the main control console (MCC) equipment is recommended. The project is estimated at \$1.5 million with a duration of 2-years beginning in FY17. For master planning, staff anticipate replacing the MCC equipment again, as new technology emerges, in FY32 and FY47.
FRSA Pier Rehab Des/Con	Study, design and rehabilitation (or demolition) of piers at the Final Biosolids Processing Facility is recommended at an estimated cost of \$700,000. MWRA does not own Pier 2; however, it may need to be demolished at some point.
Rehab Rail System Des/Con	A project to rehabilitate portions of the rail system is recommended. The project is estimated at \$1 million with a duration of 2-years beginning in FY17. For master planning, staff anticipate other portions of the rail system may need to be replaced periodically and have included funds for projects in FY32 and FY47 for that purpose.
Replace 9 Pellet Storage Silos Des/Con	A project to replace 9 pellet storage silos at the end of their expected useful lives (15 years) is recommended. The project is estimated at \$2 million with a duration of 2-years beginning in FY16. For master planning, staff anticipate replacing the silos again in FY31 and FY46.
Sludge Conveyor Replacement Des/Con	A project to replace the sludge feed conveyors and weigh scales (from the centrifuges to the rotary dryers) is recommended. The project is estimated at \$1 million with a duration of 1-year beginning in FY15. For master planning, staff anticipate the conveyors and weigh scales will need to be replaced again in FY30 and FY45.
Upgrade Pumping System Des/Con	A project to replace/rehabilitate sludge, centrate, and chemical pumps is recommended. The project is estimated at \$2 million with a duration of 2-years beginning in FY15. For master planning, staff anticipate the pumps will need to be replaced again in FY30 and FY45.
Replace 12 Centrifuges Des/Con	A project to replace 12 centrifuges at the end of their expected useful lives (18 years) is recommended. The project is estimated at \$18 million with a duration of 2-years beginning in FY15. For master planning, staff anticipate the centrifuges will need to be replaced again in FY33.
Utility Upgrades Des/Con	A project to upgrade the water, sewer, electrical, and telephone systems is recommended. The project is estimated at \$2 million with a duration of 2-years beginning in FY17. For master planning, staff anticipate periodic upgrades and have included funds in FY32 and FY47 for that purpose.
Odor Control System Upgrades Des/Con	A project to replace the pipelines and odor control equipment for the sludge storage tanks is recommended. The project is estimated at \$500,000 with a duration of 1-year beginning in FY18. For master planning, staff anticipate periodic rehabilitation and have projected expenditures in FY33 and FY48.

**Expenditure Forecast (in \$000s) and Project Status**

<b>Total Budget</b>	<b>Payments thru FY06</b>	<b>Remaining Balance</b>	<b>FY07 Projected</b>	<b>FY08</b>	<b>FY04-08</b>	<b>FY09-13</b>	<b>Beyond FY13</b>
\$148,320	\$0	\$148,320	\$0	\$495	\$495	\$6,492	\$141,333

Project Status 11/06	0.0%	Status as % is approximation based on project budget and expenditures. Residuals Plant Reliability is expected to begin in July 2007.
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**Changes to Project Scope, Budget, and Schedule**

<b>Project Cost</b>			<b>Scheduled Completion Date</b>			<b>FY04-08 Spending</b>		
<b>FY07</b>	<b>PFY08</b>	<b>Chge.</b>	<b>FY07</b>	<b>PFY08</b>	<b>Chge.</b>	<b>FY07</b>	<b>PFY08</b>	<b>Chge.</b>
\$0	\$148,320	\$148,320		Jun-48	n/a	\$0	\$495	\$495

**Explanation of Changes**

- New Project added.

**CEB Impact**

- No additional impacts expected at this time.

# **Introduction to Combined Sewer Overflow (CSO) Program**

In 1987, MWRA entered a stipulation in the Federal District Court Order in the Boston Harbor Case by which it accepted responsibility for developing and implementing a long-term CSO control plan for all combined sewer overflows hydraulically connected to MWRA's system, including the outfalls owned and operated by the communities of Boston (BWSC), Cambridge, Chelsea and Somerville (the "CSO communities"). MWRA conducted site-specific and watershed based planning to meet short-term control requirements pursuant to federal regulations (including EPA Nine Minimum Controls) and to develop a long-term control plan to bring the Boston area CSOs into compliance with the Federal Clean Water Act and State Water Quality Standards. MWRA developed these plans in conformance with federal and state CSO policies and associated guidance documents, which evolved during the nearly 20-year planning period.

EPA's National CSO Policy (effective April 1994) requires CSO permittees to develop and implement a series of system optimization and reporting measures intended to minimize and quantify CSO discharges in the short term, using detailed system characterization, easily implemented and less expensive system improvements, and optimized operations and maintenance. In compliance with the policy, MWRA submitted its Nine Minimum Controls compliance documentation by January 1, 1997. While most of the reported compliance measures involve operations, maintenance and regulatory functions of MWRA that are funded through the Current Expense Budget, system characterization and hydraulic optimization measures described below were funded through the CIP.

The National Policy also requires permittees to develop and implement a long-term control plan in accordance with the provisions of the policy. In the CIP, MWRA undertook two major planning efforts: one in the period 1986 through 1990, which produced the 1990 CSO Facilities Plan primarily in accordance with the EPA CSO Strategy of 1989, and a second and final planning effort in 1992-1997 (with modifications made through April 2006), which produced a revised plan for CSO control that conformed to the 1994 Policy.

MWRA's CSO planning efforts were primarily conducted under the System Master Planning phase of the CIP and produced the following components of a broad plan to control CSO discharges and meet water quality standards:

- Through extensive inspections, system monitoring and modeling, MWRA developed a detailed, field-calibrated assessment of its planned collection and treatment system performance in advance of developing a long-term CSO control plan. The performance assessment incorporated major capital investments in the sewer system already underway or planned by MWRA, including upgrades to the transport system, pumping stations, headworks and Deer Island treatment plant. Together with MWRA's and the CSO communities' efforts in the late 1980s and the 1990s to operate and maintain their respective systems more efficiently, these improvements were shown to effectively maximize the system's capacity to control wet weather flows and markedly reduce CSO discharges system-wide. In the period 1988 through 1992, total annual CSO discharge predicted for a typical rainfall year dropped from 3.3 billion gallons to 1.5 billion gallons, with approximately 51% of the remaining discharge treated at five MWRA CSO screening and disinfection facilities. The Charles River especially benefited from these improvements.
- In 1993-1994, MWRA presented a System Optimization Plan ("SOP"), which recommended approximately 160 low cost, easily implemented system modifications to maximize wet weather storage and conveyance. The SOP projects, which were fully implemented by MWRA and the CSO communities by 1997, further reduced CSO discharge, by about 20 percent.
- MWRA recommended a large set of projects covering a range of control technologies to achieve site-specific CSO control goals based on site-specific and watershed-based assessments of receiving water impacts and uses. MWRA recommended a conceptual plan of these improvements in 1994 and refined the recommendations in a facilities plan and environmental impact report it issued in 1997. The long-term plan received federal and state approvals in early 1998, allowing MWRA to move the projects into design and construction.
- As MWRA proceeded with implementation of the projects, it evaluated and recommended several adjustments and additions to the long-term plan in the period 1998 through 2006. These adjustments and additions responded to regulatory inquiries seeking higher levels of control (Charles River) or to new information that raised concerns about construction requirements, cost or CSO control performance (North Dorchester Bay, Reserved Channel, East Boston, and Alewife Brook). A final, comprehensive long-term plan was approved by EPA and

DEP and accepted by the Federal Court in April 2006. MWRA predicts that the long-term plan will further reduce total annual CSO discharge in a typical rainfall year to 0.5 million gallons (resulting in an 85% reduction from the 1998 level), with 94% of the remaining discharge to be treated at four MWRA screening and disinfection facilities.

On April 27, 2006, Federal District Judge Richard Stern approved a joint motion of the U.S. Department of Justice (DOJ), EPA and MWRA that provides a comprehensive resolution of outstanding issues related to MWRA's CSO program. Under the motion, MWRA will implement its previously recommended plans for Alewife Brook/Upper Mystic River and East Boston. MWRA will also undertake limited additional work to further reduce CSO discharges to the Charles River from its Cottage Farm CSO Facility, which was the subject of discussions between EPA and MWRA and related investigations by MWRA since MWRA first issued its long-term control plan in 1997. The estimated cost of the additional Charles River work is approximately \$20 million, and it is expected to reduce CSO discharges from Cottage Farm to 2 activations and 6.3 million gallons in a typical year, from the previous goal of 6 activations and 23.6 million gallons. The scope, milestones and performance goals of other CSO projects remain unchanged.

The Federal Court ordered schedule contained three unmet milestones related to completion of the CSO control plans for Alewife Brook/Upper Mystic River, East Boston, and region-wide floatables control and outfall closings. The accepted joint motion and the Schedule Seven it created revises these milestones and adds milestones for the revised Charles River CSO control plan. The revised milestones extend the completion date for the Alewife Brook/Upper Mystic River CSO control plan from January 2000 to January 2013 and the completion date for the East Boston CSO control plan from September 2005 to June 2010. The recommended CSO control plan for the Charles River would be completed by July 2013.

In exchange for agreeing to implement its revised long-term control plan, MWRA will be issued a series of five (5), three-year water quality variances for the Charles River and Alewife Brook/Upper Mystic River through 2020. As they relate to MWRA, the terms and conditions of all the variances will be limited to the requirements of the Court Order (i.e. that MWRA's responsibility is to implement the long-term control plan contained in the revised Schedule Seven). Finally, along with the joint motion, EPA, DOJ and MWRA filed a second stipulation on responsibility and legal liability for combined sewer overflow control. This stipulation replaces the stipulation entered in 1987 which established MWRA's responsibility to develop and implement a region-wide CSO long-term control plan. The second stipulation states that, once MWRA has implemented the recommended plan and demonstrated that it meets the specified goals for activation frequency and discharge volumes, each CSO community will be solely responsible for the CSO outfalls it owns and operates. These important conditions provide much greater certainty to the MWRA and its ratepayers relative to the scope and cost of the CSO program through 2020. The elements of the final long-term CSO control plan are presented in Table 1.

**Table 1**

Receiving Water	CSO Discharge Goals (typical rainfall year)		Projects	MWRA Prop FY08 Capital Budget (\$ million)
	Activations	Volume (million gallons)		
Alewife Brook	7	7.29	<ul style="list-style-type: none"> <li>• Cambridge/Alewife Sewer Separation (incl. CAM004 and CAM400 sewer separation)</li> <li>• MWR003 Gate and Rindge Ave, Siphon Relief</li> <li>• Interceptor Connection Upgrades and Floatables Control</li> </ul>	55.6
Mystic River	1 and 39 treated @ Somerville Marginal	0.02 64.1	<ul style="list-style-type: none"> <li>• Somerville Marginal Facility Upgrade</li> <li>• Somerville Baffle Manhole Separation</li> <li>• Hydraulic Relief at BOS017</li> </ul>	5.1

Charles River (including Stony Brook and Back Bay Fens)	3 and 2 treated @ Cottage Farm	6.8 6.3	<ul style="list-style-type: none"> <li>• Cottage Farm Facility Upgrade</li> <li>• Stony Brook Sewer Separation</li> <li>• Hydraulic Relief at CAM005</li> <li>• Cottage Farm Brookline Connection and Inflow Controls</li> <li>• Charles River Interceptor Gate Controls</li> <li>• Brookline Sewer Separation</li> <li>• Bulfinch Sewer Separation</li> <li>• MWRA Outfall Closings and Floatables Control</li> <li>• Cambridge Floatables Control</li> </ul>	73.2
Inner Harbor (including Chelsea Creek)	6 and 30 treated @ Prison Point	10.2 335.0	<ul style="list-style-type: none"> <li>• Prison Point Facility Upgrade</li> <li>• Prison Point Facility Optimization</li> <li>• Chelsea Trunk Sewer Replacement</li> <li>• Chelsea Branch Sewer Relief</li> <li>• CHE008 Outfall Repairs</li> <li>• BOS019 Storage Conduit</li> <li>• East Boston Branch Sewer Relief</li> <li>• BWSC Floatables Control</li> </ul>	122.7
Constitution Beach	Eliminated		<ul style="list-style-type: none"> <li>• Constitution Beach Sewer Separation</li> </ul>	3.8
Fort Point Channel	2 and 17 treated @ Union Park	2.5 71.4	<ul style="list-style-type: none"> <li>• Union Park Detention/Treatment Facility</li> <li>• BOS072-073 Sewer Separation and System Optimization</li> </ul>	57.9
Reserved Channel	3	1.5	<ul style="list-style-type: none"> <li>• Reserved Channel Sewer Separation</li> </ul>	59.2
North Dorchester Bay	Eliminated		<ul style="list-style-type: none"> <li>• N. Dorchester Bay Storage Tunnel and Related Facilities</li> <li>• Pleasure Bay Storm Drain Improvements</li> <li>• Morrissey Blvd Storm Drain</li> </ul>	247.0
South Dorchester Bay	Eliminated		<ul style="list-style-type: none"> <li>• Fox Point Facility Upgrade (interim improvement)</li> <li>• Commercial Pt. Facility Upgrade (interim improvement)</li> <li>• South Dorchester Bay Sewer Separation</li> </ul>	126.2
Neponset River	Eliminated		<ul style="list-style-type: none"> <li>• Neponset River Sewer Separation</li> </ul>	2.7
Regional			Planning, Technical Support and Land Acquisition	50.2
<b>TOTAL</b>		<b>505.1</b>		<b>803.6</b>

The CSO project schedules in Schedule Seven are aggressive and reflect project-specific design, permitting and construction requirements. The program continues to face cost and schedule challenges, including the general uncertainty associated with construction of large tunnels, such as the North Dorchester Bay storage tunnel, and the difficulty in obtaining the necessary wetlands permits to construct a stormwater detention basin that is critical to the implementation of the Alewife Brook CSO plan. Notwithstanding these challenges, MWRA, working in cooperation with the Boston Water and Sewer Commission (BWSC), the Town of Brookline and the City of Cambridge, will continue to manage the CSO program with the goal of controlling project costs and improving upon established schedules where possible.

MWRA commenced implementation of the long-term CSO control plan in 1996. Updated project schedules are presented in Table 2. By December 2006, MWRA and the CSO Communities completed fifteen of the 35 projects in the plan, and an additional eight projects were in construction. With this level of completion, MWRA achieved significant progress in reducing CSO discharges to Boston Harbor and its tributaries. Together with improvements to MWRA's wastewater system, including the upgraded Deer Island Treatment Plant and associated pump stations, the completed CSO projects have reduced the total annual volume of CSO discharge in a typical rainfall year from 3.3 billion gallons in 1988 to 0.8 billion gallons, a 76% reduction. In addition, 64% of the remaining overflow receives treatment at MWRA's five CSO treatment facilities. While 2015 is the end date for the final component of

MWRA's long-term CSO control plan, the bulk of the remaining work is scheduled to be completed well in advance of that date. For example, the North Dorchester Bay CSO project, which is the largest single component of the MWRA's CSO program and comprises over half of the remaining budget to be expended is scheduled for completion by May 2011.

MWRA's capital program includes temporary flow metering and other efforts to gather and evaluate new data to track system performance. The performance of the sewerage system is continuously improving as CSO and non-CSO projects are completed. Updated assessments of the system's hydraulic performance and estimates of CSO discharges using actual field data and model simulations are essential to verify the predicted benefits of the CSO-related improvements, to ensure the system hydraulic model reflects updated conditions, and to provide up-to-date information to support continuing CSO design efforts and long-term goal tracking. MWRA's NPDES permit and the variances for the Charles River and Alewife Brook/Upper Mystic River require MWRA to estimate CSO discharges at each permitted outfall for all storm events on an annual basis. This is accomplished by MWRA staff using the InfoWorks collection system model and data from permanent and temporary meters located in the interceptor system, at CSO treatment facilities and at other CSO outfalls. The Federal Court schedule requires MWRA to conduct a system-wide performance assessment after completing the implementation of the CSO plan in 2015, with an assessment report to be submitted by 2020.

Anticipated operating cost impacts of the CSO program are summarized below and will be further developed as part of the planning and design phases for individual projects.

### Program

Project	Purpose
<b>MWRA Managed</b>	
North Dorchester Bay & Reserved Channel	Eliminate CSO discharges and provide a high level of separate stormwater control to greatly reduce beach closings along North Dorchester Bay in South Boston. The project is court mandated, is in accordance with MWRA's approved CSO control plan and is required to meet DEP water quality standards.
Hydraulic Relief	Eliminate hydraulic restrictions between local and MWRA systems at two locations in Boston and Cambridge to improve collection and conveyance of wet weather flows, thereby reducing CSO discharges into the Mystic and Charles Rivers. The project is court mandated, is in accordance with MWRA's approved long-term CSO plan, and is required to meet DEP water quality standards.
East Boston Branch Sewer Relief	Increase hydraulic capacity and provide long-term structural integrity to MWRA's East Boston Branch Sewer through the replacement or rehabilitation of the existing sewers. Completion of this project will increase wet weather transport capacity and reduce CSO discharges along the East Boston shoreline, minimizing CSO impacts to the Mystic/Chelsea Confluence and Boston Inner Harbor and facilitating the beneficial uses of these receiving water segments. The project is court mandated, is in accordance with MWRA's approved long-term CSO control plan, and is required to meet DEP water quality standards.
BOS019 Storage Conduit	Control CSO discharges at outfall BOS019 by storing most of the overflows and pumping them back into the interceptor system after storms. Outfall BOS019 discharges to the Little Mystic Channel in Charlestown. The project is court mandated, is in accordance with MWRA's approved long-term CSO control plan, and is required to meet DEP water quality standards.
Chelsea Trunk Sewer Relief	Control CSO discharges at outfalls CHE002, CHE003, CHE004, and CHE008 by relieving a local trunk sewer and the MWRA Chelsea Branch Sewer and by repairing outfall CHE008. These outfalls discharge to the Mystic/Chelsea Confluence and Chelsea Creek. The Chelsea Branch Sewer relief project also provides relief to the lower portion of the Revere Extension Sewer to improve service and control surcharging. The project is court mandated, is in accordance with MWRA's approved long-term CSO control plan, and is required to meet DEP water quality standards.



<b>Project</b>	<b>Purpose</b>
Union Park Detention Treatment Facility	Reduce the frequency and impacts of CSO discharges from the BWSC Union Park Pumping Station to CSO outfall BOS070, which discharges into the Fort Point Channel by providing fine screening, disinfection, dechlorination and a level of detention and solids removal. This project is court mandated, is in accordance with MWRA's approved long-term CSO control plan, and is required to meet DEP water quality standards.
Upgrade Existing CSO Facilities and MWRA Floatables Control	Minimize CSO impacts to the Lower Charles River, Upper Inner Harbor, Mystic/Chelsea Confluence, and South Dorchester Bay receiving waters by upgrading five MWRA CSO treatment facilities (Fox Point, Commercial Point, Cottage Farm, Prison Point, and Somerville Marginal), and providing floatables control to MWRA CSO outfalls not associated with treatment facilities (located along the Charles River). These projects are court mandated, are in accordance with MWRA's approved long-term CSO control plan, and are required to meet DEP water quality standards.
MWR003 Gate and Siphon	Minimize CSO discharges to Alewife Brook as part of MWRA's Alewife Brook CSO control plan by providing a control gate at outfall MWR003 and relieving MWRA's Rindge Ave. Siphon. This project is court mandated, is in accordance with MWRA's approved long-term CSO control plan, and is required to meet DEP water quality standards determinations.
Charles River CSO Controls	Bring the MWRA's "Brookline Connection" into service, implement Cottage Farm influent gate controls and other facility inflow controls, and evaluate and implement interceptor optimization measures that may further reduce CSO discharges to the Charles River Basin. This set of projects is court mandated, is in accordance with MWRA's approved long-term CSO control plan, and required to meet DEP water quality standards determinations.
<b>Community Managed</b>	
South Dorchester Bay Sewer Separation (Fox Point)	Eliminate CSO discharges to South Dorchester Bay by separating combined sewer systems in Dorchester. The project is court mandated, is in accordance with MWRA's approved long-term CSO control plan, and is required to meet DEP water quality standards. This project will allow MWRA to decommission the Fox Point CSO Facility.
South Dorchester Bay Sewer Separation (Commercial Point)	Eliminate CSO discharges to South Dorchester Bay by separating combined sewer systems in Dorchester. The project is court mandated, is in accordance with MWRA's approved long-term CSO control plan, and is required to meet DEP water quality standards. This project will allow MWRA to decommission the Commercial Point CSO Facility.
Stony Brook Sewer Separation	Minimize CSO discharges to Stony Brook Conduit and the Back Bay Fens, both of which drain to the Charles River, by separating combined sewer systems in parts of Roxbury and Jamaica Plain. Implementation of this sewer separation project will reduce the number of overflows to the Stony Brook Conduit from as many as 22 to zero in a typical year. This project is court mandated, is in accordance with MWRA's approved long-term CSO control plan, and is required to meet DEP water quality standards.
Neponset River Sewer Separation	Elimination of CSO discharges to the Neponset River and protection of water quality at downstream swimming areas in South Dorchester (primarily Tenean Beach) by separating combined sewer systems in the Neponset section of Dorchester and by permanently closing CSO regulators associated with outfalls BOS093 and BOS095. The project is court mandated, is in accordance with MWRA's approved long-term CSO control plan, and is required to meet DEP water quality standards.
Constitution Beach Sewer Separation	Elimination of CSO discharges at the Constitution Beach CSO Facility, allowing decommissioning of the facility, by separating combined sewer systems in parts of East Boston. The project is court mandated, is in accordance with MWRA's approved long-term CSO control plan, and is required to meet DEP water quality standards.

<b>Project</b>	<b>Purpose</b>
Cambridge CAM002-004 Sewer Separation	Minimize CSO discharges to Alewife Brook by separating combined sewer systems in parts of Cambridge. This project is court mandated, is in accordance with MWRA's approved long term CSO control plan, and is required to meet DEP water quality standards determinations.
BWSC Floatables Control	Limit the discharge of floatable materials from five BWSC combined sewer outfalls. The project is court mandated, is in accordance with MWRA's approved long-term CSO control plan, and is required to meet DEP water quality standards.
Cambridge Floatables Control	Limit the discharge of floatable materials from eight Cambridge CSO outfalls. The project is court mandated, is in accordance with MWRA's approved long-term CSO control plan, and is required to meet DEP water quality standards.
Fort Point Channel Sewer Separation	Minimize CSO discharges to Fort Point Channel by separating sewer systems tributary to outfalls BOS072 and BOS073. Implementation of the recommended sewer separation plan will reduce the number of overflows from these outfalls from as many as 23 to zero in a typical year. This project is court mandated, is in accordance with MWRA's approved long-term CSO control plan, and is required to meet DEP water quality standards.
Morrissey Boulevard Drain	Reroute stormwater away from the BOS087 area and the North Dorchester Bay consolidation storage tunnel to Savin Cove, to increase level of stormwater control along the South Boston beaches.
Reserved Channel Sewer Separation	Minimize CSO discharges to Reserved Channel by separating combined sewer systems in a portion of South Boston. Implementation of the recommended sewer separation plan will reduce the number of overflows to Reserved Channel from as many as 37 to 3 in a typical year. This project is court mandated, is in accordance with MWRA's approved long-term CSO control plan, and is required to meet DEP water quality standards.
Brookline Sewer Separation	Separate several areas of Brookline, totaling 72 acres, where there are remaining combined sewers tributary to MWRA's Charles River Valley Sewer. The project is intended to reduce CSO discharges to the Charles River at the Cottage Farm Facility.
Bulfinch Triangle Sewer Separation	Separate the combined sewers in the area of Boston bounded by North Station, Haymarket Station, North Washington St, and Cambridge St. The project is intended to reduce CSO discharges to the Charles River, reduce overflows to the Prison Point CSO Facility and close outfall BOS049.
<b>CSO Support</b>	
CSO Planning and Support	The goals of the CSO Program are to minimize CSO discharges, greatly reduce beach closings following wet weather events, and maximize the beneficial use of CSO receiving waters. This project includes CSO conceptual planning, system master planning, and facilities planning/environmental review. It also includes directly related watershed planning activities, development of short-term CSO control measures (known as System Optimization Plans or SOPs), various as-needed technical support activities, and acquisition of land and easements required for CSO project implementation.

#### **Expenditure Forecast (in \$000s) and Program Status**

<b>Total Budget</b>	<b>Payments thru FY06</b>	<b>Remaining Balance</b>	<b>FY07 Projected</b>	<b>FY08</b>	<b>FY04-08</b>	<b>FY09-13</b>	<b>Beyond FY13</b>
\$803,551	\$350,411	\$453,140	\$57,494	\$97,130	\$299,695	\$276,409	\$22,107

Program Status 11/06	46.9%	Status as % is approximation based on project budget and expenditures. MWRA and the CSO communities continue to make significant progress towards completing the remaining CSO projects in compliance with Schedule Seven. (See individual project status and background information).
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#### Changes to Program Scope, Budget, and Schedule

Project Cost			Scheduled Completion Date			FY04-08 Spending		
FY07	PFY08	Chge.	FY07	PFY08	Chge.	FY07	PFY08	Chge.
\$811,753	\$803,551	(\$8,202)	Dec-15	Dec-15	None	\$311,917	\$299,695	(\$12,221)

#### Explanation of Changes

- Community Managed +\$18.6M**  
 Project Changes: Morrissey Boulevard Drain +\$13.7M, Reserved Channel Sewer Separation +\$1.7M, Stony Brook Sewer Separation +\$742K, Cambridge Sewer Separation +\$748K, South Dorchester Bay Sewer Separation (Comm. Pt.) +\$722K, South Dorchester Bay Sewer Separation (Fox Pt.) +\$702K.
- MWRA Managed (\$25.6M)**  
 Project Changes: North Dorchester Bay (\$28.7M), East Boston Branch Sewer Relief +\$1.8M, Union Park Detention Treatment Facility+\$665K, Charles River CSO Control +\$460K.
- Planning & Support (\$1.2M)**  
 Project Changes: Land/Easement (\$1.2M)

#### CEB Impact

- Completion and start-up of these projects will result in a total net increase of \$286,000 (in FY08 dollars) by FY12. By year, the CEB impact is as follows:

Fiscal Year	CEB Impact	Explanation
2009	(\$96,500)	Savings from decommissioning of Fox Point and half year of Commercial Point CSO treatment facilities
2010	(\$37,500)	Savings from decommissioning of Commercial Point CSO treatment facility.
2011-12	\$420,000	Estimate \$70,000 in FY11 and \$350,000 in FY12 for operation, maintenance, and odor control for infrastructure associated with North Dorchester Bay project.

# S. 339 North Dorchester Bay CSO Project

## Project Purpose and Benefits

- Contributes to improved public health*
- Provides environmental benefits*
- Fulfills a regulatory requirement*

*The project will eliminate CSO discharges and provide a high level of stormwater control to greatly reduce beach closings along North Dorchester Bay in South Boston. The project is court mandated and is in accordance with revisions to MWRA's approved long-term CSO control plan recommended in the Supplemental Facilities Plan and Environmental Impact Report for North Dorchester Bay and the Reserved Channel filed with MEPA in April 2004. The project is necessary to meet DEP water quality standards, which prohibit CSO discharges to North Dorchester Bay and similar sensitive receiving waters (i.e. where swimming and/or shell fishing occur).*

## Project History and Background

Under MWRA's original (1997) recommended plan for CSO control in South Boston, CSO flows along North Dorchester Bay and the Reserved Channel would be captured by two consolidation conduits (near-surface tunnels). In small storms, the tunnels would hold all CSO and stormwater flows and be dewatered, after each storm, to the South Boston Interceptor for transport to the Columbus Park Headworks and Deer Island. In storms when flows exceed the tunnel storage capacity, the excess flows would be discharged to Reserved Channel through a 600 mgd CSO treatment and pumping facility that MWRA had proposed to construct on vacant land off East First Street, adjacent to the Massachusetts Bay Transportation Authority (MBTA) power plant. This proposed was designated "Site J".

Despite MWRA's belief at the time it filed the related *1999 Notice of Project Change* that the projects could be implemented as outlined in that Notice, opposition by elected officials and some residents to siting the Reserved Channel CSO Facility on Site J intensified. In December 1999, elected officials representing South Boston informed the MWRA's Board of Directors that they would block efforts by MWRA to obtain legislation necessary to build parts of the project on or under designated parkland.

MWRA suspended design work on all elements of the project in January 2000, and was unable to commence construction by September 2000, as required. In April 2001, MWRA filed a Notice of Project Change with MEPA, recommending a reassessment of the project and overall CSO control approach for North Dorchester Bay and Reserved Channel. The reassessment was finalized in April 2004, when MWRA filed the Supplemental Facilities Plan and Environmental Impact Report for North Dorchester Bay and the Reserved Channel (the "SEIR"), recommending a new plan.

The new plan calls for a larger diameter tunnel along the North Dorchester Bay beaches, sized to provide storage of CSO flows up to the 25-year design storm and, together with a recommended storm drain along Morrissey Boulevard, provide a 5-year level of stormwater control for the beaches. The tunnel will be dewatered with a 15 mgd pumping station to be located on Massport's Conley Terminal. At the upstream end of the tunnel, a remote odor control facility to provide tunnel ventilation will be constructed adjacent to CSO outfall BOS087 and the State Police building. Surface piping, diversion chambers and control gates will be constructed at each existing outfall to direct CSO and stormwater flows into the tunnel. The Morrissey Boulevard storm drain (included in the CSO CIP under "Community Managed Projects") will allow large stormwater flows at outfall BOS087 to be redirected away from the tunnel to Savin Cove (South Dorchester Bay) in storms greater than the one-year design storm, to further increase the level of stormwater control afforded by the project to the beaches and to dedicate the tunnel to CSO control in the largest storms. Finally, the North Dorchester Bay plan also includes improvements to the Department of Conservation and Recreation's stormwater system along Pleasure Bay to redirect stormwater that discharges into Pleasure Bay Beach to the Reserved Channel, which does not support primary contact recreation.

In June 2005, MWRA filed a motion with the Federal District Court seeking revisions to the court milestones in Schedule Six to substitute the original plan and schedule for North Dorchester Bay and the Reserved Channel with the new plans and a new schedule. The Court allowed the motion on June 30, 2005. MWRA began design of the revised plan for North Dorchester Bay in August 2004. The revised court milestones require MWRA to commence construction by August 2006 and complete the North Dorchester Bay tunnel and related facilities (including dewatering pumping station and odor control facility) by May 2011. The revised milestones also require MWRA to complete construction of the Pleasure Bay storm drain improvements by May 2006, which MWRA accomplished.

For the Morrissey Boulevard storm drain, the revised milestones require MWRA, in cooperation with BWSC, to commence design by June 2005, commence construction by December 2006, and complete construction by June 2009.

### Scope

Sub-phase	Scope
Design/ESDC:Tunnel and Pleasure Bay	Design and engineering services during construction for the North Dorchester Bay tunnel and CSO/stormwater control structures and the Pleasure Bay drainage improvements; preliminary design for the dewatering pump station, force main and remote odor control facility.
Tunnel Construction	Construction of the North Dorchester Bay tunnel, drop shafts, access shafts and CSO/stormwater control structures.
Dewater/Odor Control Construction	Construction of the 15 mgd dewatering pump station at Conley Terminal, connecting force main and the remote odor control facility near outfall BOS087. CSO storage tunnel and facilities startup activities are included.
Tunnel and Facilities CM Services	Construction management services for the North Dorchester Bay tunnel, dewatering and odor control facilities, related piping and diversion/control structures and Pleasure Bay drainage improvements, including final design review and assistance during facilities start-up and optimization.
Pleasure Bay Construction	Construction of Pleasure Bay drainage improvements.
Final Design ESDC/CSO Facilities	Final Design and engineering services during construction for the dewatering pump station, force main and remote odor control facility.

### Expenditure Forecast (in \$000s) and Project Status

Total Budget	Payments thru FY06	Remaining Balance	FY07 Projected	FY08	FY04-08	FY09-13	Beyond FY13
\$213,868	\$23,273	\$190,595	\$27,200	\$58,200	\$95,011	\$105,195	\$0

Project Status 11/06	14.0%	Status as % is approximation based on project budget and expenditures. The Tunnel Construction contract was awarded on July 19, 2006 below the engineer's estimate, and NTP was issued on August 31, 2006. The Tunnel and Facilities Construction Management Services contract was awarded in October 2005. In June 2006, the Authority executed a MOU with Massport for the Authority's construction on Massport land including the tunnel mining shaft and the dewatering pumping station. Construction of the Pleasure Bay Drain Improvements project was substantially complete on March 28, 2006. The Authority issued the NTP for Final Design services for the CSO surface facilities in November 2006.
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### Changes to Project Scope, Budget, and Schedule

Project Cost			Scheduled Completion Date			FY04-08 Spending		
FY07	PFY08	Chge.	FY07	PFY08	Chge.	FY07	PFY08	Chge.
\$242,609	\$213,868	(\$28,741)	May-11	Mar-12	10 mos.	\$114,551	\$95,011	(\$19,539)

### Explanation of Changes

- Primarily due to Tunnel Construction contract awarded for less than the budget amount on July 19, 2006. This decrease was partially offset by an expected amendment to the Tunnel & Facilities Construction Management

Services contract for additional inspection at concrete precast facility and additional environmental monitoring based on final permit requirements.

- Schedule extended for warranty services.

**CEB Impact**

- Estimate \$420k/year as of beginning in FY11 Q4 for operation, maintenance, and odor control for infrastructure associated with this project.

# S. 354 Hydraulic Relief

## Project Purpose and Benefits

- Contributes to improved public health*
- Provides environmental benefits*
- Fulfills a regulatory requirement*

*Elimination of hydraulic restrictions between local and MWRA systems at locations in Boston and Cambridge to improve transport of wet weather flows, thereby reducing CSO discharges into the Mystic and Charles Rivers. The project is court mandated, is in accordance with MWRA's approved long-term CSO control plan, and is required to meet DEP water quality standards.*

## Project History and Background

This project combines two local hydraulic relief projects, one in Cambridge to minimize CSO discharges at CAM005 and one in Charlestown to minimize CSO discharges at BOS017.

In Cambridge, the 24-inch, 40-foot long dry weather connection between the CAM005 regulator and the North Charles Metropolitan Sewer, adjacent to Mount Auburn Hospital, was relieved with a new 54-inch connection.

In Charlestown at BOS017, 190 feet of 36-inch pipe were installed in Sullivan Square to divert two local (BWSC) combined sewers to a direct connection with the Cambridge Branch Sewer. In addition, a 10-foot long restriction between the Charlestown and Cambridge Branch Sewers, adjacent to Sullivan Square, was eliminated. This improvement is expected to lower hydraulic grade lines in the Charlestown Branch Sewer during wet weather.

## Expenditure Forecast (in \$000s) and Project Status

Total Budget	Payments thru FY06	Remaining Balance	FY07 Projected	FY08	FY04-08	FY09-13	Beyond FY13
\$2,295	\$2,295	\$0	\$0	\$0	(\$7)	\$0	

Project Status 11/06	100%	Completed in 2000.
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## Changes to Project Scope, Budget, and Schedule

Project Cost			Scheduled Completion Date			FY04-08 Spending		
FY07	PFY08	Chge.	FY07	PFY08	Chge.	FY07	PFY08	Chge.
\$2,295	\$2,295	\$0	Aug-01	Aug-01	None	(\$7)	(\$7)	\$0

## Explanation of Changes

None.

## CEB Impact

n/a

# S. 347 East Boston Branch Sewer Relief

## Project Purpose and Benefits

- Contributes to improved public health*
- Provides environmental benefits*
- Fulfills a regulatory requirement*
- Improves system operability and reliability*

*To increase hydraulic capacity and provide long-term structural integrity to MWRA's East Boston Branch Sewer through the replacement or rehabilitation of the existing sewers. Completion of this project will increase wet weather transport capacity and reduce CSO discharges along the East Boston shoreline, minimizing CSO impacts to the Mystic/Chelsea Confluence and Boston Inner Harbor and facilitating the beneficial uses of these receiving water segments most of the time. The project is court mandated, is in accordance with MWRA's approved long-term CSO control plan, and is required to meet DEP water quality standards.*

## Project History and Background

This project will relieve the interceptor system serving most of East Boston, minimizing CSO discharges to Boston Harbor and Chelsea Creek through outfalls BOS003-014. Existing sewers will be replaced using a combination of construction methods including microtunneling, pipe bursting and open cut. Some were rehabilitated using relining method. The rehabilitation construction contract commenced in March 2003 and was substantially completed in May 2004. Other design and construction was delayed pending completion of a project reassessment to assure cost benefit. Regulatory agreement that the original hydraulic relief project is the appropriate plan for East Boston CSO control was achieved in March 2006. In June 2006, Design 2/CS was awarded for completion of design and construction administration for the microtunneling and pipebursting contracts.

## Scope

Sub-phase	Scope
Design/CS/RI	Design, project reassessment, and construction administration/resident inspection for rehabilitation contract.
Design 2/CS	Completion of design for the relief (microtunneling) and replacement (pipebursting) contracts, and construction administration for these contracts.
Resident Inspection Services	Resident Inspection Services for the Design 2 construction contracts.
East Boston Branch Relief Sewer Construction	Construction of 13,100 feet of replacement sewers primarily by microtunneling.
Boston Paving	Payment to City of Boston for paving.
East Boston Branch Sewer Rehab Construction	Rehabilitation of 5,400 feet of existing sewer.
Sections 38 & 207 Replacement Construction	Replacement of 5,300 feet of existing sewers by pipe bursting.

## Expenditure Forecast (in \$000s) and Project Status

Total Budget	Payments thru FY06	Remaining Balance	FY07 Projected	FY08	FY04-08	FY09-13	Beyond FY13
\$73,476	\$8,544	\$64,933	\$1,033	\$2,257	\$8,789	\$61,643	-

Project Status 11/06	12.1%	Status as % is approximation based on project budget and expenditures. The rehabilitation contract was substantially complete in May 2004. Design 2/CS was awarded in June 2006.
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**Changes to Project Scope, Budget, and Schedule**

Project Cost			Scheduled Completion Date			FY04-08 Spending		
FY07	PFY08	Chge.	FY07	PFY08	Chge.	FY07	PFY08	Chge.
\$71,654	\$73,476	\$1,822	Jun-10	Jun-10	None	\$9,681	\$8,789	(\$892)

**Explanation of Changes**

- Cost increase primarily due to inflation adjustments associated with new ENR index. Also, revised cost for street restoration work.
- Spending shifted out of FY08 based on revised expenditure forecast for the Relief Sewer contract.

**CEB Impact**

None identified at this time.

# S. 348 BOS019 Storage Conduit

## Project Purpose and Benefits

- Contributes to improved public health*
- Provides environmental benefits*
- Fulfills a regulatory requirement*

*This project is intended to reduce CSO activations and annual volume to the Little Mystic Channel (Upper Inner Harbor) from 18 to 2 discharges per year and from 8 million gallons to 0.4 million gallons, respectively, a greater than 90% reduction. The project will bring CSO discharges at outfall BOS019 into compliance with the state receiving water quality designation B(cso).*

## Project History and Background

In compliance with Schedule Seven, MWRA issued the notice to proceed with construction to Walsh Construction of Illinois on March 31, 2005. The BOS019 storage conduit comprises two, parallel 10-foot by 17-foot conduits, each 280 feet in length, providing 670,000-gallons of off-line storage that will capture CSO discharges at outfall BOS019 from all but the two largest storms in a typical year. The project will reduce CSO activations to the Little Mystic Channel from 18 to 2 times per year and will reduce annual discharge volume from 8 million gallons to 0.4 million gallons. The new facility will include a small pump station to dewater the stored flows into the collection system when available capacity in the local BWSC sewer system has returned after storms have past. Appurtenant equipment also includes an odor control system, diversion chambers and motor control center. The operation of this facility will be conducted remotely from the Operations Control Center via a System Control and Data Acquisition (SCADA) system. The construction schedule for this project is 24-months from the NTP, with a project completion date of March 2007.

## Scope

Sub-phase	Scope
Design (Contract 6258)	Project reassessments and preliminary design for BOS019 storage conduit and Fort Point Channel storage conduit/sewer separation. Final design for BOS019 storage conduit only.
BOS019 Storage Conduit Construction (Contract 6260)	Construction of the BOS019 storage conduit commenced March 31, 2005 and is expected to be completed by March 31, 2007.
Construction Management Services (Contract 7008)	Resident engineering and inspection services for the BOS019 storage conduit.

## Expenditure Forecast (in \$000s) and Project Status

Total Budget	Payments thru FY06	Remaining Balance	FY07 Projected	FY08	FY04-08	FY09-13	Beyond FY13
\$14,283	\$9,119	\$5,164	\$5,053	\$111	\$13,834	\$0	\$0

Project Status 11/06	82.8%	Status as % is approximation based on project budget and expenditures. Contractor finished the installation of lagging for the Diversion Structure in Chelsea Street. Work on the pump station is proceeding on schedule. All walls have been erected and significant progress has been made on the electrical, plumbing and HVAC.
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**Changes to Project Scope, Budget, and Schedule**

Project Cost			Scheduled Completion Date			FY04-08 Spending		
FY07	PFY08	Chge.	FY07	PFY08	Chge.	FY07	PFY08	Chge.
\$14,136	\$14,283	\$147	Mar-07	Mar-07	None	\$13,687	\$13,834	\$147

**Explanation of Changes**

- Construction contract change orders including NSTAR easement and temporary power for site, disposal of soil, and electric lighting in stairway. Also, increase in level of effort beyond original scope of services including SCADA coordination.

**CEB Impact**

None

# S. 349 Chelsea Trunk Sewer Relief

## Project Purpose and Benefits

- Contributes to improved public health*
- Provides environmental benefits*
- Fulfills a regulatory requirement*
- Improves system operability and reliability*

*To control CSO discharges at outfalls CHE002, CHE003, CHE004, and CHE008 in accordance with MWRA's approved long-term CSO control plan. These outfalls discharge to the Mystic River/Chelsea Creek Confluence and Chelsea Creek. In addition, the project will relieve the MWRA Chelsea Branch Sewer as well as the lower portion of the Revere Extension Sewer to improve service and control surcharging. The project is court mandated, is in accordance with MWRA's approved long-term CSO control plan, and is required to meet DEP water quality standards.*

## Project History and Background

This project combines three components recommended in MWRA's long-term CSO control plan: 1) relief of a City of Chelsea-owned trunk sewer to minimize CSO discharges to the Inner Harbor at three outfalls, 2) relief of the MWRA Chelsea Branch Sewer and Revere Extension Sewer to minimize CSO discharges to Chelsea Creek and reduce surcharging in the upstream transport system, and 3) repair of the existing CSO pipe in Chelsea at outfall CHE008. All of the work is complete and the contracts have been closed out.

## Scope

Sub-phase	Scope
Design/CS/RI	Design, construction services, and resident inspection for the entire project.
Chelsea Trunk Relief	The existing Chelsea Trunk Sewer, which varies in diameter from eight to 15 inches, was replaced with 2,300 feet of 30-inch diameter pipe. Information obtained during design about the physical conditions of the CHE002, CHE003, and CHE004 outfalls led to a decision to include rehabilitation of sections of the CHE002 and CHE003 outfalls. Underflow baffles were installed at each regulator to provide floatables control.
Chelsea Branch Sewer	The MWRA Chelsea Branch and Revere Extension Sewers, which run in parallel along Eastern Avenue in Chelsea, were replaced and/or relieved with approximately 4,200 feet of 42-inch pipe and 3,500 feet of 66-inch pipe along or near Cabot Street and along Eastern Avenue in Chelsea. The construction also included repairs at outfall CHE008. One underflow baffle was installed at the sole regulator structure associated with this outfall to provide floatables control.
Rehab/Chelsea Branch/Revere Extension	Cured in place pipe rehabilitation methods were used to line approximately 4,200 feet of 36-inch pipe in the Chelsea Branch and 3,000 feet of 54-inch pipe in the Revere Extension Sewer.
Modify Chelsea Screen House	Installations of connection points and provision of flow control at the Chelsea Screen House in support of the Chelsea Branch Sewer rehabilitation.

**Expenditure Forecast (in \$000s) and Project Status**

<b>Total Budget</b>	<b>Payments thru FY06</b>	<b>Remaining Balance</b>	<b>FY07 Projected</b>	<b>FY08</b>	<b>FY04-08</b>	<b>FY09-13</b>	<b>Beyond FY13</b>
\$29,765	\$29,765	\$0	\$0	\$0	\$0	\$0	\$0

Project Status 11/06	100%	Status as % is approximation based on project budget and expenditures. Project is complete.
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**Changes to Project Scope, Budget, and Schedule**

<b>Project Cost</b>			<b>Scheduled Completion Date</b>			<b>FY04-08 Spending</b>		
<b>FY07</b>	<b>PFY08</b>	<b>Chge.</b>	<b>FY07</b>	<b>PFY08</b>	<b>Chge.</b>	<b>FY07</b>	<b>PFY08</b>	<b>Chge.</b>
\$29,765	\$29,765	\$0	Jun-02	Jun-02	None	\$0	\$0	\$0

**Explanation of Changes**

- Project completed.

**CEB Impact**

None.

# S. 350 Union Park Detention Treatment Facility

## Project Purpose and Benefits

- Contributes to improved public health*
- Provides environmental benefits*
- Fulfills a regulatory requirement*

*To reduce the frequency and impacts of CSO discharges from the BWSC Union Park Pumping Station (CSO outfall BOS070). Outfall BOS070 discharges into the Fort Point Channel. This project is court mandated, is in accordance with MWRA’s approved long-term CSO control plan, and is required to meet DEP water quality standards.*

## Project History and Background

This project will improve water quality in the Fort Point Channel by providing treatment of CSO discharges through BWSC’s Union Park Pumping Station. The existing pumping station, constructed in 1976, provides flood control for the South End neighborhood of Boston. The Final EIR called for the detention/treatment facility to be constructed adjacent to the existing pumping station, on property owned by BWSC at the intersections of Albany, Malden, and Union Park Streets in the South End. Flows will pass through the new treatment facility before entering the pumping station wet well. Construction of the treatment facility commenced in March 2003 and is scheduled for completion by April 2007.

The treatment facility will include fine screens, chlorination with sodium hypochlorite, dechlorination with sodium bisulfite, and below-ground, rapid-settling detention tanks measuring approximately 90 feet by 140 feet and 20 feet deep. The buried tanks, which will have a combined storage capacity of 2.2 million gallons, will reduce the number of pumping station discharges to the Fort Point Channel. While most of the new facility will be below ground, the plan includes an addition to the aboveground structure of the existing pumping station.

Some layout changes within the existing pumping station will optimize use of available space and minimize aboveground construction. The pumping station will remain in service during construction of the treatment facility. Per MWRA and BWSC agreement, operation of the new treatment facility and the existing pumping station will be integrated.

A neighborhood playground operated by the Boston Parks Department covered approximately half of the proposed treatment facility site. As discussed at public meetings during facilities planning and as stipulated in a lease agreement signed by Boston Parks, BWSC, and MWRA in 1997, MWRA removed the playground during construction. A replacement playground will be constructed at a nearby site owned by the Boston Parks Department, and MWRA will fund construction of a passive park over the CSO facility detention basin following construction.

## Scope

Sub-phase	Scope
Design	Design and engineering services during construction for the Union Park Detention/Treatment Facility, including storage tanks with a capacity of 2.2 MG, and an addition to the existing above grade pumping station.
Construction	Construction of MWRA’s Union Park Detention/Treatment Facility.
Construction – Park	Construction of replacement and passive park by Boston Parks & Recreation, funded by MWRA.
BWSC Construction	Portions of the construction project involve upgrades to the existing pumping station that will directly support BWSC. To coordinate construction activities, the project was bid jointly and BWSC will pay for its portions of the contract.

**Expenditure Forecast (in \$000s) and Project Status**

Total Budget	Payments thru FY06	Remaining Balance	FY07 Projected	FY08	FY04-08	FY09-13	Beyond FY13
\$49,546	\$44,409	\$5,137	\$3,900	\$1,237	\$43,663	\$0	\$0

Project Status 11/06	91.3%	Status as % is approximation based on project budget and expenditures. The contractor completed installing tanks, pumps and piping for the chemical system and is continuing with the installation of the power and control wiring for the chemical systems. All major equipment is installed in the new and existing building. Physical check-out and testing of piping and equipment is on-going. Work on the project is 96% complete.
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**Changes to Project Scope, Budget, and Schedule**

Project Cost			Scheduled Completion Date			FY04-08 Spending		
FY07	PFY08	Chge.	FY07	PFY08	Chge.	FY07	PFY08	Chge.
\$48,880	\$49,546	\$665	Dec-06	Apr-07	4 mos.	\$42,998	\$43,663	\$665

**Explanation of Changes**

- Construction change orders and expected change orders to furnish and install circulation system for eye washes, relocate controls for eight motorized sodium hypochlorite valves, additional soil disposal, chemical pump thermal overload, street lighting and escalation for additional engineering and overhead.
- Schedule pushed out due to time extension as a result of change orders including relocating the sodium hypochlorite valves which impacts the functional testing of the chemical systems which impacts the critical path of completing the facility.

**CEB Impact**

None

# S. 353 Upgrade Existing CSO Facilities and MWRA Floatables Control

## Project Purpose and Benefits

- ☑ *Contributes to improved public health*
- ☑ *Provides environmental benefits*
- ☑ *Fulfills a regulatory requirement*
- ☑ *Extends current asset life*

*To minimize CSO impacts to the Lower Charles River, Upper Inner Harbor, Mystic/Chelsea Confluence, and South Dorchester Bay receiving waters by upgrading five MWRA CSO treatment facilities (Fox Point, Commercial Point, Cottage Farm, Prison Point, and Somerville Marginal), closing outfall MWR010, and providing floatables control at all MWRA CSO outfalls not associated with treatment facilities (located along the Charles River). These projects are court mandated, are in accordance with MWRA's approved long-term CSO control plan, and are required to meet DEP water quality standards.*

## Project History and Background

Five of the six existing CSO facilities (Commercial Point, Cottage Farm, Fox Point, Prison Point, and Somerville Marginal) were upgraded to improve treatment performance and meet new residual chlorine discharge limits. The work generally included replacement and upgrade of the existing chlorine disinfection systems and construction of dechlorination systems, as well as other process control and safety improvements. At the Cottage Farm and Prison Point facilities, the upgrade work took place entirely within the existing facility site bounds. The Commercial Point upgrade called for a remote 36-foot by 36-foot dechlorination building to be constructed nearly one-half mile downstream of the facility on Massachusetts Highway Department (MHD) property adjacent to the Southeast Expressway. The Fox Point upgrade included construction of a new chlorination and dechlorination building next to the existing facility and a 2,700-foot force main from the new building to the dechlorination point, where a 12-foot by 12-foot process control and sampling building was constructed adjacent to Morrissey Boulevard. The plan for Somerville Marginal was similar to that for Fox Point. A new chlorination and dechlorination building was constructed adjacent to the existing facility under the elevated portion of Route 93. A force main was installed to the dechlorination point 1,800 feet downstream of the facility, where a 12-foot by 12-foot process control and sampling building was constructed on the Assembly Square Mall property.

By 2002, MWRA completed systems optimization as part of the start-up period referenced in Schedule Six for all five upgraded facilities. Funds for programming process control systems at Cottage Farm were added to the CIP during FY01. Work has been completed.

Based on reevaluations conducted in 2001, MWRA recommended not closing outfall MWR010 and not implementing the second phase of floatables control tributary to outfall MWR018. These recommendations were accepted by DEP in October 2002.

## Scope

Sub-phase	Scope
Design	Design and engineering services during construction for upgrades to the five CSO facilities.
Design 2	Design of floatables controls upstream of MWRA outfalls along the Charles River. (eliminated)
Cottage Farm CSO Facility	Replacement/upgrade of the existing disinfection system and construction of a dechlorination system.
Prison Point CSO Facility	Replacement/upgrade of the existing disinfection system and construction of a dechlorination system.



Sub-phase	Scope
Commercial Point, Fox Point, Somerville Marginal	Upgrades including the replacement/upgrade of the existing disinfection systems. A 36-foot by 36-foot dechlorination facility was constructed approximately 0.5 miles downstream of the Commercial Point facility. New chlorination/dechlorination facilities were constructed next to the existing Fox Point and Somerville Marginal facilities. Force mains, 2,700 and 1,800 feet respectively; connect each facility to 12 feet by 12 feet process control/sampling buildings.
Non-Treated Floatables (Beacon)	MWRA non-treated CSO floatables control. Bulkhead and close MWR021 and MWR022 CSO outfalls (completed by MWRA). Construct underflow baffles at four regulators tributary to outfalls MWR019 and MWR020.
Non-Treated Floatables (Other)	Construction of underflow baffles at seven regulators tributary to outfall MWR018. (eliminated)
Closure of Outfall MWR010	Close CSO Outfall MWR010. (eliminated)
Cottage Farm Programming	Program final process control systems.

#### Expenditure Forecast (in \$000s) and Project Status

Total Budget	Payments thru FY06	Remaining Balance	FY07 Projected	FY08	FY04-08	FY09-13	Beyond FY13
\$22,385	\$22,385	\$0	\$0	\$0	\$84	\$0	\$0

Project Status 11/06	100%	Status as % is approximation based on project budget and expenditures. Project is completed.
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#### Changes to Project Scope, Budget, and Schedule

Project Cost			Scheduled Completion Date			FY04-08 Spending		
FY07	PFY08	Chge.	FY07	PFY08	Chge.	FY07	PFY08	Chge.
\$22,385	\$22,385	\$0	Oct-02	Oct-02	None	\$84	\$84	\$0

#### Explanation of Changes

- Project completed.

#### CEB Impact

None.

# S. 355 MWR003 Gate and Siphon

## Project Purpose and Benefits

- Contributes to improved public health*
- Provides environmental benefits*
- Fulfills a regulatory requirement*

*Minimizes CSO discharges to Alewife Brook as part of MWRA's Alewife Brook CSO control plan. This project is court mandated, is in accordance with MWRA's approved long-term CSO control plan, and is required to meet DEP water quality standards determinations.*

## Project History and Background

The MWR003 Gate and Siphon project was recommended in the *Notice of Project Change for the Long Term CSO Control Plan for Alewife Brook, April 2001*, and is part of the revised recommended CSO plan for Alewife Brook. The project consists of the following elements: an automated hydraulic relief gate and associated controls at CSO regulator RE031 upstream of CSO outfall MWR003; an inverted siphon barrel parallel to the existing inverted siphon barrel connecting the Alewife Brook Sewer and Alewife Brook Conduit; and floatables control consisting of an in-line net in outfall MWR003. Also included are improvements to the Alewife Reservation in the immediate project area that are expected conditions of the Department of Conservation and Recreation (DCR) construction permit and license agreement, based on preliminary discussions with DCR. Implementation of this project and other elements of the recommended plan for Alewife Brook are required by the Court Order and by conditions on the Alewife Brook/Upper Mystic River CSO Variance extension, issued by DEP on September 1, 2004.

## Scope

Sub-phase	Scope
Design	Design and engineering services during construction.
Construction	Construction of an automated gate and associated controls, 150 feet of new siphon and a floatables control structure.

## Expenditure Forecast (in \$000s) and Project Status

Total Budget	Payments thru FY06	Remaining Balance	FY07 Projected	FY08	FY04-08	FY09-13	Beyond FY13
\$2,027	\$0	\$2,027	\$0	\$0	\$0	\$2,026	\$1

Project Status 11/06	0%	Status as % is approximation based on project budget and expenditures. Design contract is expected to be awarded in October 2009.
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## Changes to Project Scope, Budget, and Schedule

Project Cost			Scheduled Completion Date			FY04-08 Spending		
FY07	PFY08	Chge.	FY07	PFY08	Chge.	FY07	PFY08	Chge.
\$1,960	\$2,027	\$67	Jan-12	Jul-12	6 mos.	\$0	\$0	\$0

## Explanation of Changes

- Inflation adjustment due to new ENR index.
- Schedule changed due to six month delay in wetlands appeal decision for Cambridge Contract #12.

## CEB Impact

None

# S. 357 Charles River CSO Controls

## Project Purpose and Benefits

- Contributes to improved public health*
- Provides environmental benefits*
- Fulfills a regulatory requirement*

*Implements wastewater system optimization measures, including structural and operational improvements, to further reduce CSO discharges to the Charles River Basin at and near the Cottage Farm CSO Facility. Also, evaluates the cost and benefit of making additional hydraulic interconnections within the interceptor systems related to Cottage Farm. This project is required to minimize CSO discharges to the Charles River Basin in accordance with the long-term control plan accepted by EPA, DEP and the Federal Court in April 2006.*

## Project History and Background

In response to the long-term CSO control plan MWRA recommended in 1997, DEP and EPA issued variances to water quality standards for the Charles River. With the variance, DEP approved and required implementation of MWRA’s plan for the Charles River Basin, and required MWRA to identify and evaluate additional measures that could further reduce CSO discharges to the Basin. In August 2005, MWRA recommended a series of optimization measures and investigations to further lower CSO discharges, including 1) bringing into operation the existing but unutilized 54-inch “Brookline Connection” that crosses beneath the Charles River from the Cottage Farm influent chamber (Cambridge side) to an improved connection with the South Charles Relief Sewer (Boston side); 2) developing gate controls and a control system to optimize and potentially automate the operation of the existing Cottage Farm influent gates; 3) providing a piped interconnection between the two overflow chambers outside the Cottage Farm facility and optimizing overflow weir settings within each chamber; 4) developing an operational strategy for optimizing the transfer of flows between the Charles River Valley Sewer and the South Charles Relief Sewer using existing gates located at three connections between these interceptors; and 5) evaluating the feasibility of improving hydraulic performance along the North Charles Metropolitan Sewer and the North Charles Relief Sewer by creating new connections or modifying existing connections between these interceptors and by adjusting overflow regulators along these interceptors.

## Scope

Sub-phase	Scope
Brookline Connection and Cottage Farm Inflow Controls Design CA	Design/CA services to bring the 54-inch Brookline Connection into operation; develop controls and operational strategy for the existing Cottage Farm influent gates; provide a piped interconnection between the two overflow chambers outside the Cottage Farm facility; and optimize weir settings within each chamber.
Brookline Connection and Cottage Farm Inflow Controls Construction	Construction and implementation of the above improvements and controls.
Interceptor Optimization Evaluations and Design CS/RI	Study, Design and CS/RI to implement an operational strategy for optimizing the transfer of flows between the Charles River Valley Sewer and the South Charles Relief Sewer using existing gates and to evaluate the feasibility of improving hydraulic performance along the North Charles Metropolitan Sewer and the North Charles Relief Sewer by creating new connections or modifying existing connections between these interceptors and by adjusting overflow regulators along these interceptors.
Existing Gate Control System	Construction and improvements designed above regarding existing gates only.

REI Services Brookline Connection Cottage Farm Inflow Controls	New subphase added for Resident Engineering Inspection Services for the Brookline Connection Cottage Farm Inflow Controls.
Additional Interceptor Connections Construction	Construction of any additional connections recommended in the study above. Scope, schedule, and cost to be determined from study recommendations.

#### Expenditure Forecast (in \$000s) and Project Status

Total Budget	Payments thru FY06	Remaining Balance	FY07 Projected	FY08	FY04-08	FY09-13	Beyond FY13
\$6,460	\$0	\$6,460	\$700	\$434	\$1,134	\$5,326	\$0

Project Status 11/06	0.6%	Status as % is approximation based on project budget and expenditures. Design/CA contract for the Brookline Connection/Cottage Farm was awarded in September 2006.
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#### Changes to Project Scope, Budget, and Schedule

Project Cost			Scheduled Completion Date			FY04-08 Spending		
FY07	PFY08	Chge.	FY07	PFY08	Chge.	FY07	PFY08	Chge.
\$6,000	\$6,460	\$460	Jan-11	Jan-11	None	\$850	\$1,134	\$284

#### Explanation of Changes

- Budget increase due to Brookline Connection/Cottage Farm Design/CA contract award was greater than originally planned. Also, REI Services Brookline Connection Cottage Farm Inflows subphase was added.

#### CEB Impact

To be identified upon completion of the design contract.

# S. 340 South Dorchester Bay Sewer Separation (Fox Point)

## Project Purpose and Benefits

- Contributes to improved public health*
- Provides environmental benefits*
- Fulfills a regulatory requirement*

*This project, together with sewer separation at Commercial Point, will eliminate CSO discharges to South Dorchester Bay by separating combined sewer systems in Dorchester. The project is court mandated, is in accordance with MWRA's approved long-term CSO control plan, and is required to meet DEP water quality standards.*

## Project History and Background

This project involves the construction of new storm drains and appurtenant structures, relocation of storm runoff connections from the existing combined sewers to the new storm drains, and rehabilitation of existing combined sewers for use as sanitary sewers. The plan calls for construction of approximately 71,000 feet of new storm drains. BWSC is implementing the project with MWRA funds.

A contract for design services was executed by BWSC in June 1996, and a preliminary design report was submitted in December 1997. BWSC executed a separate contract for construction management services in December 1998. BWSC commenced construction in April 1999. Schedule Seven requires MWRA and BWSC to complete the project by November 2008.

## Scope

Sub-phase	Scope
Design	Design services for construction contracts to be bid, awarded, and managed by BWSC.
Construction	Construction of 71,000 feet of new storm drains and appurtenant structures, managed by BWSC. Relocation of storm runoff connections from the existing combined sewers to the new storm drains, rehabilitation of the existing combined sewers for use as sanitary sewers, individual building downspout removal and street paving are also included.

## Expenditure Forecast (in \$000s) and Project Status

Total Budget	Payments thru FY06	Remaining Balance	FY07 Projected	FY08	FY04-08	FY09-13	Beyond FY13
\$53,800	\$51,200	\$2,600	\$862	\$1,729	\$27,595	\$10	\$0

Project Status 11/06	96.2%	Status as % is approximation based on project budget and expenditures.
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**Changes to Project Scope, Budget, and Schedule**

Project Cost			Scheduled Completion Date			FY04-08 Spending		
FY07	PFY08	Chge.	FY07	PFY08	Chge.	FY07	PFY08	Chge.
\$53,098	\$53,800	\$702	Nov-06	Nov-06	None	\$26,572	\$26,595	\$1,023

**Explanation of Changes**

- Budget increase and spending change is primarily due to contract overruns for rock excavation which was more than originally anticipated. Also, utility conflicts.

**CEB Impact**

- Expect to decommission the Fox Point Treatment Facility in FY09 resulting in an annual savings of \$59,000.

# S. 341 South Dorchester Bay Sewer Separation (Commercial Point)

## Project Purpose and Benefits

- Contributes to improved public health*
- Provides environmental benefits*
- Fulfills a regulatory requirement*

*This project, together with sewer separation at Fox Point, will eliminate CSO discharges to South Dorchester Bay by separating combined sewer systems in Dorchester. The project is court mandated, is in accordance with MWRA's approved long-term CSO control plan, and is required to meet DEP water quality standards.*

## Project History and Background

This project involves the construction of new storm drains and appurtenant structures, relocation of storm runoff connections from the existing combined sewers to the new storm drains, and rehabilitation of the existing combined sewers for use as sanitary sewers. The plan calls for construction of approximately 65,000 feet of new storm drains. BWSC is implementing the project with MWRA funds.

A contract for design services was executed by BWSC in June 1996, and a preliminary design report was submitted in December 1997. BWSC executed a separate contract for construction management services in December 1998. BWSC commenced construction in April 1999. Schedule Seven requires MWRA and BWSC to complete the project by November 2008.

### Scope

Sub-phase	Scope
Design	Design services for construction contracts to be bid, awarded, and managed by BWSC.
Construction	Construction of 65,000 feet of new storm drains and appurtenant structures, managed by BWSC. Relocation of storm runoff connections from the existing combined sewers to the new storm drains, rehabilitation of the existing combined sewers for use as sanitary sewers, individual building downspout removal and street paving are also included.

## Expenditure Forecast (in \$000s) and Project Status

Total Budget	Payments thru FY06	Remaining Balance	FY07 Projected	FY08	FY04-08	FY09-13	Beyond FY13
\$64,429	\$50,249	\$14,180	\$3,368	\$7,971	\$34,526	\$2,841	\$0

Project Status 11/06	81%	Status as % is approximation based on project budget and expenditures.
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## Changes to Project Scope, Budget, and Schedule

Project Cost			Scheduled Completion Date			FY04-08 Spending		
FY07	PFY08	Chge.	FY07	PFY08	Chge.	FY07	PFY08	Chge.
\$63,706	\$64,429	\$722	Nov-07	Nov-07	None	\$32,330	\$34,526	\$2,196

### **Explanation of Changes**

- Budget increase and spending change is primarily due to updated inflation adjustments on unawarded contracts and additional change orders related to conflicts with water and sewer, MBTA, and disposal of contaminated soil.

### **CEB Impact**

- Expect to decommission the Commercial Point CSO Treatment facility in FY09 and FY10 resulting in a savings of \$75,000.



# S. 344 Stony Brook Sewer Separation

## Project Purpose and Benefits

- Contributes to improved public health*
- Provides environmental benefits*
- Fulfills a regulatory requirement*

*To minimize CSO discharges to Stony Brook Conduit and the Back Bay Fens, both of which drain to the Charles River, by separating combined sewer systems in parts of Roxbury and Jamaica Plain. Implementation of the recommended sewer separation plan will reduce the number of overflows to the Stony Brook Conduit from as many as 22 to zero in a typical year. This project is court mandated, is in accordance with MWRA's approved long-term CSO control plan, and is required to meet DEP water quality standards.*

## Project History and Background

This project, which involves constructing approximately 73,000 feet of new storm drains, is being managed by BWSC with MWRA funds and oversight. The CIP reflects the 1997 FEIR recommendation for sewer separation. BWSC has agreed to complete the project and fund any costs in excess of \$45 million plus appropriate inflation adjustments.

BWSC commenced construction in July 2000 and completed the sewer separation work in September 2006, in compliance with Schedule Seven. Street paving, flow metering and analyses to verify the project's intended hydraulic performance will continue through 2007.

## Scope

Sub-phase	Scope
Design CS/RI	Design services managed by BWSC.
Construction	Construction of 73,000 feet of new storm drains, managed by BWSC.

## Expenditure Forecast (in \$000s) and Project Status

Total Budget	Payments thru FY06	Remaining Balance	FY07 Projected	FY08	FY04-08	FY09-13	Beyond FY13
\$45,056	\$41,193	\$3,862	\$1,984	\$1,878	\$29,132	\$0	\$0

Project Status 11/06	93.6%	Status as % is approximation based on project budget and expenditures. Remaining work is limited to street paving, flow metering and hydraulic performance assessment.
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## Changes to Project Scope, Budget, and Schedule

Project Cost			Scheduled Completion Date			FY04-08 Spending		
FY07	PFY08	Chge.	FY07	PFY08	Chge.	FY07	PFY08	Chge.
\$44,314	\$45,056	\$742	Sep-06	Sep-06	None	\$28,390	\$29,132	\$742

**Explanation of Changes**

- Budget increase primarily due to executed change orders primarily for rock excavation which was more extensive than anticipated and minor drainage where the original estimated quantity did not account for reconnection of house laterals; additional storm drain to separate flows from Franklin Park; and others related to water and sewer conflicts.

**CEB Impact**

None identified at this time.

# S. 342 Neponset River Sewer Separation

## Project Purpose and Benefits

- Contributes to improved public health*
- Provides environmental benefits*
- Fulfills a regulatory requirement*

*Elimination of CSO discharges to the Neponset River and protection of water quality at downstream swimming areas in South Dorchester (primarily Tenean Beach) by separating combined sewer systems in the Neponset section of Dorchester and by permanently closing CSO regulators associated with outfalls BOS093 and BOS095. The project is court mandated, is in accordance with MWRA's approved long-term CSO control plan, and is required to meet DEP water quality standards.*

## Project History and Background

This project involved construction of approximately 10,000 feet of new storm drains, and was managed by BWSC with MWRA funds and oversight. It is complete and has resulted in closing the last two CSO outfalls to the Neponset River (BOS093 and BOS095).

## Scope

Sub-phase	Scope
Design CS/RI	Design services by BWSC (complete).
Construction	Three contracts for the construction of 10,000 feet of new storm drains, by BWSC (complete).

## Expenditure Forecast (in \$000s) and Project Status

Total Budget	Payments thru FY06	Remaining Balance	FY07 Projected	FY08	FY04-08	FY09-13	Beyond FY13
\$2,681	\$2,444	\$236	\$236	\$0	\$236	\$0	\$0

Project Status 11/06	91.2%	Status as % is approximation based on project budget and expenditures. Project was substantially complete in October 2002. MWRA will release remaining balance pending completion of its final review of cost eligibility.
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## Changes to Project Scope, Budget, and Schedule

Project Cost			Scheduled Completion Date			FY04-08 Spending		
FY07	PFY08	Chge.	FY07	PFY08	Chge.	FY07	PFY08	Chge.
\$2,681	\$2,681	\$0	Oct-02	Oct-02	None	\$236	\$236	\$0

## Explanation of Changes

None.

## CEB Impact

None.

# S. 343 Constitution Beach Sewer Separation

## Project Purpose and Benefits

- Contributes to improved public health*
- Provides environmental benefits*
- Fulfills a regulatory requirement*

*Elimination of CSO discharges at the Constitution Beach CSO facility by separating combined sewer systems in parts of East Boston. The project is court mandated, is in accordance with MWRA's approved long-term CSO control plan, and is required to meet DEP water quality standards.*

## Project History and Background

The separation work involved construction of approximately 14,000 feet of new storm drains. The project was managed by BWSC with MWRA funds and oversight. It resulted in the elimination of the CSO discharge to the Constitution Beach area and the decommissioning of the MWRA's Constitution Beach CSO Facility, which has been surplus.

## Scope

Sub-phase	Scope
Design	Design services, managed by BWSC.
Construction	Construction of 14,000 feet of new storm drains, managed by BWSC.

## Expenditure Forecast (in \$000s) and Project Status

Total Budget	Payments thru FY06	Remaining Balance	FY07 Projected	FY08	FY04-08	FY09-13	Beyond FY13
\$3,769	\$3,769	\$0	\$0	\$0	\$0	\$0	\$0

Project Status 11/06	100%	Status as % is approximation based on project budget and expenditures. Project is completed.
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## Changes to Project Scope, Budget, and Schedule

Project Cost			Scheduled Completion Date			FY04-08 Spending		
FY07	PFY08	Chge.	FY07	PFY08	Chge.	FY07	PFY08	Chge.
\$3,769	\$3,769	\$0	Apr-02	Apr-02	None	\$0	\$0	\$0

## Explanation of Changes

- Project completed.

## CEB Impact

None.

# S. 346 Cambridge CAM002-004 Sewer Separation

## Project Purpose and Benefits

- Contributes to improved public health*
- Provides environmental benefits*
- Fulfills a regulatory requirement*

*To minimize CSO discharges to Alewife Brook by separating combined sewer systems in parts of Cambridge and upgrading local connections to MWRA's interceptors. This project is court mandated, is in accordance with MWRA's approved long-term CSO control plan, and is required to meet DEP water quality standards.*

## Project History and Background

The City of Cambridge is managing the separation work with MWRA funds and oversight.

As reported to the court in 1999, information gathered by the City of Cambridge during the design phase of this project indicated that the physical configurations of the Cambridge sewer and storm drain systems, including the degree to which these systems are interconnected, was significantly different from conditions shown on the city's base plans and older design plans. Both sets of plans were used by MWRA to develop the conceptual plan for the project. As a result, extensive additional work to separate sewers is required to meet CSO control goals. While construction began in 1998 on schedule, completion of construction has been delayed.

MWRA responded to the significant increase in estimated project costs by instructing Cambridge to suspend remaining final design efforts and award of any construction contracts not yet approved, until MWRA and Cambridge could complete a thorough reassessment of project costs and alternatives. At that time, Cambridge had received approval from MWRA to commence four of the ten proposed construction contracts that comprised the original scope.

Based upon an evaluation conducted by MWRA and Cambridge of alternatives that considered cost, performance, and non-monetary factors, the revised recommended plan for controlling CSO discharges to Alewife Brook, like the original plan, is a partial sewer separation alternative that includes the following components:

- Completion of sewer separation in the CAM004 tributary area (similar to the original CSO control plan, but with expanded scope).
- Separation of the CAM400 tributary area (new).
- Relief of dry weather flow connections at CAM002, CAM401B, and SOM01A (new).
- Relief of an existing siphon and installation of a flow control gate at MWR003 (new).
- No further sewer separation in the CAM002 tributary area. (Although this work was included in the original plan and a small, related construction contract was completed by Cambridge in 1999, the revised plan recommends not completing separation in this area.
- No additional CSO control recommended for the recently discovered outfall at CAM401B.
- Floatables control at remaining CSO outfalls.

On May 24, 2000, the Board of Directors approved the revised CSO Control Plan for Alewife Brook. This budget reflects MWRA's estimate of the cost and MWRA's share of the revised plan. The federal court schedule milestone for completion of construction of sewer separation was January 2000. MWRA previously informed the court and court parties that MWRA would be unable to meet this milestone due to the increased scope of the project. In April, 2006 the court schedule was amended to incorporate milestones for each of the components of the revised recommended plan.

Cambridge has submitted a Second Supplemental Preliminary Design Report (SSPDR) for the final recommended plan as presented in the Final Variance Report for the Alewife Brook/Upper Mystic River. However, the City of Cambridge continues to be unable to move forward with construction of the new stormwater outfall and constructed stormwater wetland of Contract 12 due to delays in obtaining relief from the citizens' appeal of the Superseding Order of Conditions that was issued by Massachusetts Department of Environmental Protection ("DEP") in March, 2005 pursuant to the Wetlands Protection Act. The stormwater outfall and constructed stormwater wetland are critical early components of the long-term CSO control plan for the Alewife Brook and are necessary to support

planned sewer separation in the CAM004 area and the closing of the CAM004 regulator. Partial administrative law decisions on the appeal were made in the fall of 2006. Remaining decisions are expected to be made in early 2007.

The City of Cambridge executed a contract for design services in January 1997. The first four construction contracts were completed in 2002. The last milestone in Schedule Seven for completion of the revised plan is January 2013.

**Scope**

Sub-phase	Scope
Design CS/RI	Design services.
Construction	Four construction contracts for sewer separation work have been completed The remaining scope of work for this project is outlined above.

**Expenditure Forecast (in \$000s) and Project Status**

Total Budget	Payments thru FY06	Remaining Balance	FY07 Projected	FY08	FY04-08	FY09-13	Beyond FY13
\$52,434	\$18,451	\$33,983	\$868	\$2,331	\$7,716	\$30,189	\$595

Project Status 11/06	35.2%	Status as % is approximation based on project budget and expenditures. City of Cambridge has submitted the Second Supplemental Preliminary Design Report for the final recommended plan.
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**Changes to Project Scope, Budget, and Schedule**

Project Cost			Scheduled Completion Date			FY04-08 Spending		
FY07	PFY08	Chge.	FY07	PFY08	Chge.	FY07	PFY08	Chge.
\$51,687	\$52,434	\$748	Jan-13	Jul-13	6 mos.	\$8,538	\$7,716	(\$822)

**Explanation of Changes**

- Budget increase primarily due to inflation adjustments due to new ENR index.
- Schedule pushed out due to delay in resolution of wetlands appeal.

**CEB Impact**

None identified at this time.

# S. 351 BWSC Floatables Control

## Project Purpose and Benefits

- Contributes to improved public health*
- Provides environmental benefits*
- Fulfills a regulatory requirement*

*To limit the discharge of floatable materials from five BWSC combined sewer outfalls. The project is court mandated, is in accordance with MWRA's approved long-term CSO control plan, and is required to meet DEP water quality standards.*

## Project History and Background

Floatables control at the five BWSC outfalls included in this project involved the installation of underflow baffles in existing CSO regulator structures. The work was managed by BWSC with MWRA funds and oversight. Design began in December 1998, following completion of an MWRA study on the performance of underflow baffles and a preliminary design report, which was completed in November 1999. All work was completed in 2002.

## Scope

Sub-phase	Scope
Design	Design services.
Construction	Installation of underflow baffles at ten BWCS combined sewer outfalls.

## Expenditure Forecast (in \$000s) and Project Status

Total Budget	Payments thru FY06	Remaining Balance	FY07 Projected	FY08	FY04-08	FY09-13	Beyond FY13
\$933	\$933	\$0	\$0	\$0	\$0	\$0	\$0

Project Status 11/06	100%	Status as % is approximation based on project budget and expenditures. Project is complete.
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## Changes to Project Scope, Budget, and Schedule

Project Cost			Scheduled Completion Date			FY04-08 Spending		
FY07	PFY08	Chge.	FY07	PFY08	Chge.	FY07	PFY08	Chge.
\$933	\$933	\$0	Mar-02	Mar-02	None	\$0	\$0	\$0

## Explanation of Changes

n/a

## CEB Impacts

None

# S. 352 Cambridge Floatables Control

## Project Purpose and Benefits

- Contributes to improved public health*
- Provides environmental benefits*
- Fulfills a regulatory requirement*

*To limit the discharge of floatable materials from eight Cambridge CSO outfalls. This project is court mandated, is in accordance with MWRA's approved long-term CSO control plan, and is required to meet DEP water quality standards.*

## Project History and Background

Floatables control devices will be installed at each Cambridge-owned CSO outfall on the Charles River and Alewife Brook, primarily using underflow baffles. Floatables control at one location (CAM401A) was completed in 2004. The City of Cambridge is managing the work with MWRA funds and oversight

## Scope

Sub-phase	Scope
Design	Design for the City of Cambridge construction contract.
Construction	Installation of floatables control devices at eight combined sewer outfalls.

## Expenditure Forecast (in \$000s) and Project Status

Total Budget	Payments thru FY06	Remaining Balance	FY07 Projected	FY08	FY04-08	FY09-13	Beyond FY13
\$2,855	\$922	\$1,932	\$722	\$959	\$2,226	\$251	\$0

Project Status 11/06	32.3%	Status as % is approximation based on project budget and expenditures.
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## Changes to Project Scope, Budget, and Schedule

Project Cost			Scheduled Completion Date			FY04-08 Spending		
FY07	PFY08	Chge.	FY07	PFY08	Chge.	FY07	PFY08	Chge.
\$2,792	\$2,855	\$63	Dec-08	Jun-09	6 mos.	\$2,170	2,226	\$56

## Explanation of Changes

- Budget increase primarily due to inflation adjustment to reflect new ENR index.
- Schedule extended due to delay in resolution of wetlands appeal at Alewife Brook.

## CEB Impact

None



# S. 356 Fort Point Channel Sewer Separation

## Project Purpose and Benefits

- Contributes to improved public health*
- Provides environmental benefits*
- Fulfills a regulatory requirement*
- Extends current asset life*

*To minimize CSO discharges to Fort Point Channel by separating combined sewer systems tributary to outfall BOS073 and implementing system optimization measures at BOS072. Implementation of the recommended sewer separation plan will reduce the number of overflows from these outfalls from as many as 23 to zero in a typical year. This project is court mandated, is in accordance with MWRA's approved long-term CSO control plan, and is required to meet DEP water quality standards.*

## Project History and Background

On August 14, 2003, MWRA received a Certificate from the Secretary of Environmental Affairs accepting the Notice of Project Change that recommended replacing the Fort Point Channel CSO Storage Conduit project with a plan for sewer separation and system optimization. On September 17, 2003, the Board of Directors authorized the Executive Director to negotiate related revisions to the Federal Court Order in the Boston Harbor Case. On February 27, 2004, MWRA's motion to revise the court schedule was approved by the Federal Court.

MWRA and BWSC have agreed that this project, like other sewer separation projects in the CSO control plan, should be implemented within the MOU and FAA, with BWSC performing final design, construction services and construction and MWRA funding eligible costs. BWSC would also own and operate the separated systems upon construction completion.

MWRA received the *Draft Preliminary Design Report on the Sewer Separation and System Optimization for BOS072 - BOS073* from its consultant in March 2004. The preliminary design submission includes a breakdown of eligible and ineligible project costs. BWSC has since completed final design, and it commenced construction in March 2005, in compliance with Schedule Seven.

## Scope

Sub-phase	Scope
Design	Design services for construction contracts to be bid, awarded and managed by BWSC.
Construction	Construction of approximately 4,600 linear feet of new storm drains and appurtenant structures tributary to outfalls BOS072 and BOS073, managed by BWSC. Relocation of storm runoff connections from the existing combined sewers to the new storm drains and rehabilitation of the existing combined sewers for use as sanitary sewers are also included.

## Expenditure Forecast (in \$000s) and Project Status

Total Budget	Payments thru FY06	Remaining Balance	FY07 Projected	FY08	FY04-08	FY09-13	Beyond FY13
\$7,675	\$2,394	\$5,281	\$5,242	\$39	\$7,675	\$0	\$0

Project Status 11/06	61.4%	Status as % is approximation based on project budget and expenditures.
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**Changes to Project Scope, Budget, and Schedule**

Project Cost			Scheduled Completion Date			FY04-08 Spending		
FY07	PFY08	Chge.	FY07	PFY08	Chge.	FY07	PFY08	Chge.
\$7,928	\$7,675	(\$253)	Mar-07	Mar-07	None	\$7,928	\$7,675	(\$253)

**Explanation of Changes**

- Budget decrease is primarily due to change order originally budgeted under this project, but now to be performed under a Commercial Point contract.

**CEB Impact**

None

# S. 358 Morrissey Boulevard Drain

## Project Purpose and Benefits

- Contributes to improved public health*
- Provides environmental benefits*
- Fulfills a regulatory requirement*

Reroute stormwater from the BOS087 area (and the North Dorchester Bay consolidation storage tunnel) to Savin Cove to increase level of stormwater control to the beaches.

## Project History and Background

In April 2001, MWRA filed a Notice of Project Change with MEPA, recommending a reassessment of the overall CSO control approach for North Dorchester Bay and Reserved Channel. The Secretary's Certificate, issued in June 2001, approved the reassessment as scoped by MWRA. MWRA began the reassessment in September 2001, which included updating the planning assumptions and water quality information and evaluating a full range of CSO control goals and technologies. The reassessment was completed in April 2004, when MWRA filed the Supplemental Facilities Plan and Environmental Impact Report for North Dorchester Bay and the Reserved Channel. The revised recommended plan included rerouting stormwater away from the North Dorchester Bay storage tunnel to Savin Cove in storms greater than the 1 year design storm.. Design began in June 2005, construction began in December 2006 and construction is scheduled to be complete by June 2009.

### Scope

Sub-phase	Scope
Design CS/RI	Design services for construction contracts to be bid, awarded and managed by BWSC.
Construction	Construction of a new storm drain and appurtenant structures along Morrissey Boulevard to Savin Hill Cove.

## Expenditure Forecast (in \$000s) and Project Status

Total Budget	Payments thru FY06	Remaining Balance	FY07 Projected	FY08	FY04-08	FY09-13	Beyond FY13
\$33,098	\$343	\$32,754	\$865	\$16,166	\$17,374	\$15,723	\$0

Project Status 11/06	1.9%	Status as % is approximation based on project budget and expenditures. Design began in June 2005 and construction began in December 2006.
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## Changes to Project Scope, Budget, and Schedule

Project Cost			Scheduled Completion Date			FY04-08 Spending		
FY07	PFY08	Chge.	FY07	PFY08	Chge.	FY07	PFY08	Chge.
\$19,358	\$33,098	\$13,739	Jun-09	Jun-09	None	11,918	\$17,374	\$5,456

### Explanation of Changes

- Budget increase is primarily due to a revised BWSC cost estimate (June 2006) which includes updated cost for storm drain systems, water/sewer costs, paving, police, gas relocation costs, final design and CS/RI, and force account.

### CEB Impact

None identified at this time.

# S. 359 Reserved Channel Sewer Separation

## Project Purpose and Benefits

- Contributes to improved public health*
- Provides environmental benefits*
- Fulfills a regulatory requirement*

To minimize CSO discharges to the Reserved Channel by separating combined sewer systems in an area of South Boston. Implementation of the recommended sewer separation plan will reduce the number of overflows to the Reserved Channel from as many as 37 to 3 in a typical year. This project is court mandated, is in accordance with MWRA's approved long-term CSO control plan, and is required to meet DEP water quality standards

## Project History and Background

In April 2001, MWRA filed a Notice of Project Change with MEPA, recommending a reassessment of the overall CSO control approach for North Dorchester Bay and the Reserved Channel. The reassessment was completed in April 2004, when MWRA filed the Supplemental Facilities Plan and Environmental Impact Report for North Dorchester Bay and the Reserved Channel, which recommended a new plan for controlling CSO discharges to the Reserved Channel, by separating sewers in a 355 acre drainage area tributary to the Channel. Schedule Seven in the Federal District Court Order requires MWRA, in cooperation with BWSC, to commence design by July 2006, commence construction in May 2009 and complete construction in December 2015.

## Scope

Sub-phase	Scope
Design CS/RI	Design services managed by BWSC for construction contracts to be bid, awarded and managed by BWSC.
Construction	Construction of new storm drains and appurtenant structures within a 355-acre tributary area to the SBI-NB. Relocation of storm runoff connections from the existing combined sewers to the new storm drains. Rehabilitation of the existing combined sewers for use as sanitary sewers.

## Expenditure Forecast (in \$000s) and Project Status

Total Budget	Payments thru FY06	Remaining Balance	FY07 Projected	FY08	FY04-08	FY09-13	Beyond FY13
\$59,158	\$0	\$59,158	\$1,661	\$1,261	\$2,922	\$35,840	\$20,396

Project Status 11/06	0.3%	Status as % is approximation based on project budget and expenditures. BWSC began design in July 2006.
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## Changes to Project Scope, Budget, and Schedule

Project Cost			Scheduled Completion Date			FY04-08 Spending		
FY07	PFY08	Chge.	FY07	PFY08	Chge.	FY07	PFY08	Chge.
\$57,393	\$59,158	\$1,764	Dec-15	Dec-15	None	\$3,035	\$2,922	(\$113)

## Explanation of Changes

- Budget increase is primarily due to inflation adjustments on unawarded contracts to reflect new ENR index.

## CEB Impact

None identified at this time.

# S. 360 Brookline Sewer Separation

## Project Purpose and Benefits

- Contributes to improved public health*
- Provides environmental benefits*
- Fulfills a regulatory requirement*

To minimize CSO discharges to the Charles River by separating combined sewer systems in several areas of Brookline. Implementation of the recommended sewer separation plan will reduce the number of overflows to the Charles River. This project is court mandated, is in accordance with MWRA's approved long-term CSO control plan, and is required to meet DEP water quality standards.

## Project History and Background

In response to the long-term CSO control plan MWRA recommended in 1997, DEP and EPA issued variances to water quality standards for the Charles River. With the variance, DEP approved (and required implementation of) MWRA's plan for the Charles River Basin, but maintained the water quality standard Class B pending the collection of additional water quality information and the evaluation of higher levels of CSO control. The original variance, issued in October 1998, and subsequent extensions to the variance required MWRA to prepare a report assessing the performance of the upgraded Cottage Farm CSO treatment facility. The report also evaluated the cost and benefit of constructing additional storage at this facility to lower treated discharges to the Basin. MWRA submitted the Cottage Farm CSO Facility Assessment Report to MEPA and DEP in January 2004. While concluding that additional storage at Cottage Farm would not be cost effective, the report also concluded that further CSO control could be achieved through system optimization and inflow removal such as with sewer separation projects already underway or planned by the City of Cambridge and the Town of Brookline. This project will separate several areas of Brookline, totaling 72 acres, where there are remaining combined sewers tributary to MWRA's Charles River Valley Sewer. The project is intended to reduce discharges to the Charles River at the Cottage Farm facility.

## Scope

Sub-phase	Scope
Design CS/RI	Design services for construction contracts to be bid, awarded and managed by the Town of Brookline.
Construction	Construction of new storm drains and appurtenant structures within a 72-acre tributary to MWRA's Charles River Valley Sewer, managed by the Town of Brookline.

## Expenditure Forecast (in \$000s) and Project Status

Total Budget	Payments thru FY06	Remaining Balance	FY07 Projected	FY08	FY04-08	FY09-13	Beyond FY13
\$9,000	\$0	\$9,000	\$135	\$266	\$401	\$8,145	\$454

Project Status 11/06	0%	Status as % is approximation based on project budget and expenditures. Design began in November 2006.
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## Changes to Project Scope, Budget, and Schedule

Project Cost			Scheduled Completion Date			FY04-08 Spending		
FY07	PFY08	Chge.	FY07	PFY08	Chge.	FY07	PFY08	Chge.
\$9,000	\$9,000	\$0	Jul-13	Jul-13	None	\$400	\$401	\$1

**Explanation of Changes**

n/a

**CEB Impact**

None identified at this time.

# S. 361 Bulfinch Triangle Sewer Separation

## Project Purpose and Benefits

- Contributes to improved public health*
- Provides environmental benefits*
- Fulfills a regulatory requirement*

To minimize CSO discharges to the Charles River by separating combined sewer systems in several areas of Boston, bounded by North Station, Haymarket Station, North Washington Street, and Cambridge Street. Implementation of the recommended sewer separation plan will reduce the number of overflows to the Charles River. This project is court mandated, is in accordance with MWRA's approved long-term CSO control plan, and is required to meet DEP water quality standards.

## Project History and Background

In response to the long-term CSO control plan MWRA recommended in 1997, DEP and EPA issued variances to water quality standards for the Charles River. With the variance, DEP approved (and required implementation of) MWRA's plan for the Charles River Basin, but maintained the water quality standard Class B pending the collection of additional water quality information and the evaluation of higher levels of CSO control. The original variance, issued in October 1998, and subsequent extensions to the variance required MWRA to prepare a report assessing the performance of the upgraded Cottage Farm CSO treatment facility. The report also evaluated the cost and benefit of constructing additional storage at this facility to lower treated discharges to the Basin. MWRA submitted the Cottage Farm CSO Facility Assessment Report to MEPA and DEP in January 2004. While concluding that additional storage at Cottage Farm would not be cost effective, the report also concluded that further CSO control could be achieved through system optimization and inflow removal, such as with sewer separation projects already underway or planned by the City of Cambridge and the Town of Brookline. In 2005, MWRA identified and recommended a set of system optimization measures and inflow removal projects to further reduce treated CSO discharges at Cottage Farm. This project will separate the combined sewers in the area of Boston bounded by North Station, Haymarket Station, North Washington St, and Cambridge St. The project is intended to reduce discharges to the Charles River, reduce overflows to the Prison Point CSO facility and close outfall BOS049.

## Scope

Sub-phase	Scope
Design CS/RI	Design services for construction contracts to be bid, awarded and managed by BWSC.
Construction	Construction to separate the combined sewers in the area of Boston including North Station, Haymarket Station, North Washington St, Cambridge St and immediate environs, managed by BWSC.

## Expenditure Forecast (in \$000s) and Project Status

Total Budget	Payments thru FY06	Remaining Balance	FY07 Projected	FY08	FY04-08	FY09-13	Beyond FY13
\$4,369	\$0	\$4,369	\$211	\$250	\$461	\$3,715	\$193

Project Status 11/06	0%	Status as % is approximation based on project budget and expenditures. Design commenced in August 2006.
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**Changes to Project Scope, Budget, and Schedule**

Project Cost			Scheduled Completion Date			FY04-08 Spending		
FY07	PFY08	Chge.	FY07	PFY08	Chge.	FY07	PFY08	Chge.
\$4,000	\$4,369	\$369	Jul-13	Jul-13	None	\$225	\$461	\$236

**Explanation of Changes**

- Budget increase due to Design CS/RI award amount was greater than originally anticipated.

**CEB Impact**

None identified at this time.



## S. 324 CSO Planning and Support

### Project Purpose and Benefits

- Contributes to improved public health*
- Provides environmental benefits*
- Fulfills a regulatory requirement*

*The goals of the CSO Program are to minimize CSO discharges and their impacts, eliminate beach closings caused by CSOs, and maximize the beneficial use of CSO receiving waters, in accordance with national and state CSO policies and in compliance with state water quality standards. This project includes CSO conceptual planning, system master planning, and facilities planning/environmental review. It also includes directly related watershed planning activities, development of short-term CSO control measures (known as System Optimization Plans or SOPs), various as-needed technical support activities, and acquisition of land and easements required for CSO control plan implementation.*

### Project History and Background

MWRA CSO planning work began in 1986. A revised Final Conceptual Plan and System Master Plan were completed in 1994, and a Final CSO Facilities Plan and Environmental Impact Report were filed with MEPA in August 1997. A MEPA certificate was issued in October 1997. In December 1997, DEP issued water quality determinations that were necessary for final CSO plan approval by DEP and EPA. DEP issued a two-year variance for the Charles River in October 1998 and has extended this variance several times. DEP issued a three-year variance for Alewife Brook and Upper Mystic CSOs in March 1999 and has extended the term of the variance several times. Consultant services have included assistance to MWRA in satisfying variance conditions.

As part of CSO Planning and Support, MWRA provided financial and technical assistance to the Charles River Watershed Association in its watershed planning efforts for the Charles River in the 1990s, known as the IM3 Study. MWRA also funded a portion of the costs of a USGS water quality study of the Charles River Basin. Results of these studies will provide additional technical information to support the reassessment of the appropriateness of the recommended Charles River controls in MWRA's CSO plan. To comply with its requirements under the Charles River CSO variance, in 1999 MWRA began funding USGS efforts to collect updated information on Charles River water quality. Final payments to the Charles River Watershed Association and USGS were made in the fall of 1998 and the fall of 2001, respectively.

The federal court order in the Boston Harbor Case required MWRA to develop, by June 1993, a plan for optimizing the existing combined sewer systems to maximize transport and in-system storage capacities, thereby minimizing CSO discharges prior to developing and implementing a long-term control plan. In June 1993, MWRA completed a report entitled System Optimization Plans for CSO Control, which recommended more than 100 relatively low cost and easily implemented projects to optimize operation of existing systems. The projects were designed and constructed primarily by the CSO communities, pursuant to SOP financial assistance agreements executed between MWRA and each CSO community. Under the agreements, MWRA reimbursed the communities for design and construction costs. SOP work also includes two projects that are part of the long-term plan: Somerville Baffle Manhole Separation and Somerville Floatables Control. Short-term plans for CSO SOPs were completed in 1997 and MWRA obtained regulatory approvals for its long-term plan in 1997 and 1998.

The performance of the sewerage system is constantly improving as CSO and non-CSO projects are completed and as maintenance efforts continue to increase the system's capacity. Updated assessments of the system's hydraulic performance and estimates of CSO discharges based on actual field data are essential to verify the predicted benefits of various CSO-related improvements, to recalibrate the system hydraulic model to reflect updated conditions, and to provide up-to-date information to support CSO planning and design efforts. This project provides for temporary flow metering and other efforts to gather and evaluate new data and track system performance.

Various CSO plan reevaluations and systems assessments have been performed under amendments to the CSO Master Planning contract. These include: reevaluation of the Alewife Brook sewer separation plan; assessment of Cottage Farm CSO Facility performance; reevaluation of the need for the Dorchester Brook In-line Storage Project (not included in the CSO Plan or the CIP); reevaluation of the feasibility of closing MWR010; reassessment of CSO discharges from the Boston Marginal Conduit to reevaluate the need for floatables control; and reevaluation of the cost-effectiveness of the East Boston Branch Sewer Relief project in light of cost increases.

By amendment to the Master Planning contract MWRA also added system modeling services to estimate and report actual CSO discharges on an annual basis (through 2003), in compliance with provisions in MWRA's new NPDES permit.

This project also supports land and easement acquisitions and funds permit costs for all MWRA managed projects in the long-term CSO Control Plan.

**Scope**

<b>Sub-phase</b>	<b>Scope</b>
Technical Assistance	Preliminary planning services prior to and in support of the 1988-90 Facilities Planning/EIR efforts.
Planning/EIR	Facilities planning and environmental review of CSO control alternatives (1990 Recommended CSO Control Plan).
Master Planning	System inspections, flow monitoring, water quality monitoring, and performance assessments to improve MWRA's understanding of the combined sewer and regional wastewater systems, optimize the performance of the existing systems, and reassess CSO control needs in the context of evolving EPA policy and a system master plan. Development of the 1997 Facilities Plan/EIR and subsequent reassessments of, and revisions to, that plan.
Watershed Planning	External watershed planning efforts that may affect CSO control needs, including the Charles River Watershed Association IM3 Study and ongoing USGS water quality studies.
Modeling	Receiving water quality modeling support to the Master Planning efforts.
SOP Program	Development and implementation of System Optimization Plans for short-term CSO control. Implemented by CSO communities. Also includes funding for Somerville Baffle Manhole Separation in the long-term control plan.
System Assessment	Temporary flow metering and other efforts to gather and evaluate new data on system performance.
Technical Review	Technical assistance for the entire CSO control plan including affordability analysis.
Land/Easements	Acquisition of land and easements for construction of MWRA-implemented projects. Also, permits not covered in design and construction contracts.

**Expenditure Forecast (in \$000s) and Project Status**

<b>Total Budget</b>	<b>Payments thru FY06</b>	<b>Remaining Balance</b>	<b>FY07 Projected</b>	<b>FY08</b>	<b>FY04-08</b>	<b>FY09-13</b>	<b>Beyond FY13</b>
\$50,191	\$38,722	\$11,469	\$3,454	\$2,041	\$6,913	\$5,506	\$468

Project Status 11/06	80.4%	Status as % is approximation based on project budget and expenditures. Master Planning was substantially complete in September 2004. On September 14, 2005, the MWRA Board of Directors approved an MOU with Massport that will govern the Authority's construction on land owned by Massport, including the tunnel mining shaft and the dewatering pump station.
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**Changes to Project Scope, Budget, and Schedule**

<b>Project Cost</b>			<b>Scheduled Completion Date</b>			<b>FY04-08 Spending</b>		
<b>FY07</b>	<b>PFY08</b>	<b>Chge.</b>	<b>FY07</b>	<b>PFY08</b>	<b>Chge.</b>	<b>FY07</b>	<b>PFY08</b>	<b>Chge.</b>
\$51,411	\$50,191	(\$1,220)	Jun-20	Jun-20	None	\$8,322	\$6,913	(\$1,408)

**Explanation of Changes**

- Budget decrease for Land/Easement based on an updated assessment of CSO land needs.

**CEB Impact**

None identified at this time.

## S. 128 Infiltration/Inflow Local Financial Assistance Program

### Project Purpose and Benefits

- Contributes to improved public health*
- Provides environmental benefits*
- Fulfills a regulatory requirement*

*Infiltration and inflow (I/I), groundwater and storm water that enter the collection system, contributes significantly to the total wastewater flow treated by MWRA. This depletes capacity that would otherwise be available to transmit sanitary flows, resulting in sewer surcharging, overflows of untreated sewage, more frequent combined sewage overflows, and higher pumping and treatment costs. The I/I Local Financial Assistance Program provides funding assistance for communities to rehabilitate their collection systems with the goal of structurally reducing I/I flows. Funding assistance for local projects complements other MWRA strategies for regional I/I reduction including wastewater metering to support flow based rates, provision of I/I estimates to communities, technical assistance to communities on local projects, regional coordination of I/I policy issues, and interaction with DEP and EPA.*

### Project History and Background

MWRA's Deer Island Wastewater Treatment Plant receives flow from 43 communities. The collection system encompasses 230 miles of MWRA interceptors and 5,400 miles of community sewers. These sewers are of varying size, shape, age, material, depth, and conditions. All contribute some quantity of infiltration and inflow.

On August 19, 1992, the Board of Directors approved \$25 million to fund the initial phase of the I/I Local Financial Assistance Program. On June 28, 1995, the Board approved \$38.8 million to fund a second phase of the program. Both Phase 1 and 2 funds were distributed as 25% grants and 75% interest-free loans. The Board approved \$37 million to fund a third phase of the program on June 24, 1998, an additional \$40 million for Phase 4 on June 13, 2001, an additional \$40 million for Phase 5 on June 23, 2004, and an additional \$40 million for Phase 6 on June 28, 2006. Because the grant/loan ratio was revised for Phase 3, 4, 5 and 6 to 45% grants and 55% interest-free loans, MWRA decided that a community would need to exhaust its available Phase 2 funds prior to becoming eligible for any Phase 3, 4, 5 and 6 allocations. As of June 2006, all Phase 2 funds have been fully utilized by member communities. All program funds are allocated to the 43 member communities based on their share of MWRA's wholesale sewer assessment. Binding commitments for funds are issued by MWRA in the form of Financial Assistance Agreements. Distribution of funds is authorized through FY2015. Through November 2006, MWRA has distributed \$49.7 million in grants and \$89.1 million in no-interest loans to fund 310 separate projects in 43 communities under the I/I Local Financial Assistance Program.

### Expenditure Forecast (in \$000s) and Project Status

Total Budget	Payments thru FY06	Remaining Balance	FY07 Projected	FY08 Projected	FY04-08	FY09-13	Beyond FY13
\$86,594	\$72,688	\$13,906	\$1,759	\$730	\$25,643	\$17,104	(\$5,687)

Project Distribution Status 11/06	42.9%	Through November 2006, MWRA has distributed \$49.7 million in grants and \$89.1 million in no-interest loans to fund 310 separate projects in 43 communities under the I/I Local Financial Assistance Program.
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Project Repayment Status 11/06	48.4%	Through November 2006 a total of \$65 million has been repaid by member communities receiving interest-free loans.
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**Changes to Project Scope, Budget, and Schedule**

Project Cost			Scheduled Completion Date			FY04-08 Spending		
FY07	PFY08	Chge.	FY07	PFY08	Chge.	FY07	PFY08	Chge.
\$86,594	\$86,594	\$0	Jun-20	Jun-20	None	\$22,797	\$25,643	\$2,846

**Explanation of Changes**

- Spending shift is a result of the timing of member community requests for financial assistance.

**CEB Impact**

None

# **Integrated Water Supply Improvement Program**

MWRA's Integrated Water Supply Improvement Program is a 10-year, \$1.7 billion initiative consisting of a series of projects to protect reservoir watersheds, build new water treatment and transmission facilities, and upgrade distribution storage and MWRA and community pipelines. The program improves each aspect of the water system from the watersheds to the consumer to ensure that high quality water reliably reaches to MWRA customers' taps. The program began in 1995 and the principle components have been completed by 2005. The main program components are as follows:

**Watershed Protection** The watershed areas around Quabbin and Wachusett Reservoirs are pristine areas with 85% of the land covered in forest or wetlands and about 75% protected from development by direct ownership or development restrictions. MWRA works in partnership with the Department of Conservation and Recreation (DCR) to manage and protect the watersheds. MWRA also finances all the operating and capital expenses for the watershed activities of DCR, including CIP funding for a completed sewer project and on-going land acquisition activities.

**MetroWest Water Supply Tunnel** The 17-mile-long 14-foot diameter tunnel connects the new John J. Carroll Water Treatment Plant at Walnut Hill in Marlborough to the greater Boston area. It is now the main transmission line moving water into the metropolitan Boston area. Once inspection, repairs and interconnections are complete, the old Hultman Aqueduct will be used in parallel as the back-up transmission link. Construction began on the tunnel in 1986 and the completed tunnel placed in service in October 2003.

**John J. Carroll Water Treatment Plant** The new water treatment plant in Marlborough began operating in July 2005 and it has a maximum day capacity of 405 million gallons per day. This project consolidates all treatment steps into one plant which uses ozone for primary disinfection because ozone is a strong disinfection agent against pathogens such as *Cryptosporidium* while reducing levels of chlorine disinfection byproducts. The plant also provides corrosion control by adding carbon dioxide and sodium carbonate to raise the water's pH and alkalinity and thus control lead leaching from home plumbing fixtures. The treatment process concludes with fluoridation and residual disinfection with chloramines. A 45 million gallon storage tank on the site allows for daily variation in demand and flexibility in plant operation.

**Water Storage Tanks** As required by Massachusetts Department of Environmental Protection (DEP) rules, MWRA is building covered storage tanks to replace small open reservoirs near cities and towns to lessen the risk that contaminants will get into the tap water. A 20 million gallon tank in Stoneham replaced the open Fells Reservoir, two 12.5 million gallon circular tanks in Ludlow replaced the Nash Hill Reservoir and the 20 million gallon Loring Road tank replaced the Weston Reservoir. The largest tank, the 115 million gallon Norumbega Covered Storage Facility replaced the open Norumbega Reservoir in Weston and was placed in full service in 2004. MWRA has completed environmental review of a 20 million gallon tank to replace the currently off-line Blue Hills Reservoir in Quincy and awarded a design/build contract for this project in November 2006. MWRA's Water Master Plan also identifies additional storage facilities that are currently scheduled to be built beyond FY13.

**Pipeline Rehabilitation** An important component of the overall Integrated Water Supply Improvement Program is focus on the long-term rehabilitation of older, unlined cast iron water mains in the MWRA and community systems. Water in direct contact with the iron surface corrodes through both biological and chemical processes resulting in tuberculation, thus narrowing the pipes and providing surfaces for bacteria growth. These processes also often result in consumer complaints about rusty water. To reap the full value of the other investments in the water system, MWRA decided to replace or rehabilitate the poor quality pipe particularly given that as of 1993, more than 80 percent of MWRA pipes were unlined. Since then, MWRA has been replacing or rehabilitating (normally through cleaning and lining) between 2 and 3 percent of its own unlined cast iron mains each year. Furthermore, in 1998, almost half (47%) of community pipes were unlined. In 1999, MWRA created a \$250 million zero-interest loan program to encourage and facilitate rehabilitation of local mains.

## S. 542 John J. Carroll Water Treatment Plant (JJCWTP)

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### Project Purpose and Benefits

- Contributes to improved public health*
- Fulfills a regulatory requirement*

*To provide high quality drinking water to MWRA customers and to ensure that the water delivered from the Wachusett Reservoir meets the drinking water quality standards established by the federal Safe Drinking Water Act (SDWA). Part of this objective will be met by constructing a 405 million-gallon per day (maximum) water ozonation/chloramination treatment plant primarily in Marlborough with portions of the facility located in Southborough and Northborough.*

### Project History and Background

MWRA provides drinking water to 2.3 million people in 41 metropolitan Boston communities. The source water supply comes from the Quabbin and Wachusett reservoirs; two large, high quality water bodies in Central Massachusetts. About 50% of the water flowing from the Wachusett Reservoir comes first from the Quabbin Reservoir, the larger reservoir to the west. MWRA received a waiver from filtration requirements for the Quabbin Reservoir in 1991 from the Massachusetts Department of Environmental Protection (Mass DEP), the agency granted primacy to enforce the SDWA by the United States Environmental Protection Agency (USEPA) in Massachusetts.

In June 1993, MWRA negotiated an administrative consent order with DEP setting forth the steps needed to comply with the Surface Water Treatment Rule (SWTR). The consent order required MWRA to find a site, design a filtration plant, and build it, unless MWRA along with MDC could demonstrate to Massachusetts DEP no later than 1998 that the system met the criteria for avoiding filtration and therefore that filtration was not required. After an extensive research and decision-making process, the MWRA Board of Directors voted in October 1998 to request a waiver of the filtration requirements from Mass DEP and to build a new water treatment facility using ozonation with chloramination for the water from Wachusett Reservoir as part of the Integrated Water Supply Improvement Program. The decision recognized that an ozonation/chloramination plant would provide appropriate treatment of the MWRA water supply from Wachusett Reservoir and that adding filtration components costing \$180 million to the new plant would not provide as much additional benefit as would using funds to rehabilitate old, unlined cast iron pipes in the MWRA and local distribution systems. As part of the treatment technology decision, MWRA's Board also made a commitment to an expanded program of public health surveillance, financial incentives for communities to target rehabilitation of community pipes, and a full review of the need for further treatment including filtration when the plant was complete.

Mass DEP agreed with the MWRA approach in December 1998 and determined that filtration was not required for the MWRA system. Through the Department of Justice, USEPA sued under its SDWA "overfiling" rights, seeking to require MWRA to build a filtration plant and contending that the SDWA allowed no other option. After an extended trial, on May 5, 2000 Judge Stearns issued his decision that MWRA currently complies with all 11 federal criteria for avoiding filtration under the Surface Water Treatment Rule of the Safe Drinking Water Act. He evaluated the current quality of MWRA water and found MWRA's integrated drinking water improvement program including ozonation treatment technology the better approach to "preserving its safety." He found EPA failed to show that filtration of MWRA water was required either as a matter of cost-benefit or scientific necessity. The judge denied EPA's request for injunctive relief but ordered MWRA to give the Court notice of any future violations of the avoidance criteria to allow the consideration of whether the type of relief requested by USEPA might be necessary. No other order was issued. On July 16, 2001, the U.S. Court of Appeals for the First Circuit affirmed Judge Stearns ruling.

The new John J. Carroll Water Treatment Plant (formerly Walnut Hill Treatment Plant) was placed in service in July 2005. It provides treatment necessary to fully comply with all current drinking water regulations. EPA issued new regulations in January 2006 for microbial protection (Long Term 2 Enhanced Surface Water Treatment Rule) and disinfection byproduct control (Stage 2 Disinfectants/Disinfection Byproducts Rule). MWRA will not need to make changes to comply with the Stage 2 D/DBP rule, but the LT2ESWT rule will require a second primary disinfectant

and a somewhat more stringent inactivation of cryptosporidium than the plant's current design. This project includes the addition of an ultraviolet light disinfection treatment process at the plant to meet requirements of both the D/DBP and LT2ESWT rules.

## Scope

Sub-phase	Scope
Study 1	Investigation of the potential impacts of SDWA amendments on the MWRA system and evaluation of the need, feasibility, and benefits of improved treatment processes.
Study 2	Evaluation of alternative filtration, disinfection, and corrosion control processes to determine the most appropriate for MWRA source waters. Construction and operation of a pilot plant at the Wachusett Reservoir to allow testing of various treatment technique combinations. Identification of potential locations for treatment facilities.
AWWARF Red Water Control Strategy Study	Evaluation of treatment options for eliminating discolored water caused by unlined cast-iron pipe. Also investigation of the fundamental aspects of iron chemistry and corrosion using unlined cast-iron pipe from the MWRA community distribution system.
Emergency Distribution Reservoir Water Management Study	Investigation of potential impacts on the emergency distribution reservoirs resulting from their replacement by new covered distribution reservoirs, and study of ways to maintain their water quality for emergency supply. Norumbega, Weston, Spot Pond, Fells, and Blue Hills Reservoirs have been studied. A pilot study was conducted to evaluate in-reservoir algae treatment for Wachusett Reservoir.
<i>Cryptosporidium</i> Inactivation Study	Determination of the site-specific efficacy of inactivating <i>Cryptosporidium</i> in Wachusett Reservoir source water using disinfectant alternatives (chlorine/chloramine and ozone/chloramine), and then development of design criteria for the full-scale disinfection contacting system.
Construction: Cosgrove Disinfection Facility Phases I and II	Construction of the Cosgrove Disinfection Facility. Free chlorine is applied at the Cosgrove Aqueduct to utilize travel time to achieve primary disinfection prior to corrosion control treatment and secondary disinfection.
Immediate Disinfection-MECo	Massachusetts Electric Co. power line installation to support the disinfection process at the Cosgrove Disinfection Facility.
Distribution Water Consultant	To provide technical assistance related to distribution system management.
EIR/Conceptual Design	Environmental reviews, data collection and analyses, and facility designs to support the dual track compliance approach, evaluation of design criteria, site plans, plant hydraulics, and construction of a small-scale demonstration water treatment plant.
Design/CS/RI: Walnut Hill WTP	Design and Engineering Services During Construction for the water treatment plant and associated components.
WHCP1: Wachusett and Cosgrove Intakes	Upgrade of the Cosgrove Intake and powerhouse to allow automatic, unstaffed operation of the facility. Replacement of the valves and piping in the Wachusett Intake is required to allow this facility to serve as a backup water supply.
WHCP2: Interim Aqueduct Rehabilitation	Shotcrete lining of the Wachusett Aqueduct to ensure supply of water continues to greater Boston during modifications to Shaft C and to enable it to serve as a backup to the Cosgrove Tunnel.
WHCP3: Site Work and Storage Tank	Includes clearing and excavation, site access roads, yard piping, and construction of a 45-million gallon storage tank.



<b>Sub-phase</b>	<b>Scope</b>
WHCP4: Treatment Facilities	Construction of ozonation, corrosion control, chloramination operations and emergency generator buildings, modifications to Shafts B and C, and installation of system wide instrumentation from Wachusett Reservoir to Norumbega Reservoir.
WHCP6: Late Site Work	Final grading, landscaping, and paving of treatment facility site.
Design & Construction WHCP7: Existing Facilities Modifications	Modification to and conversion of the Interim Corrosion Control Facility, Cosgrove Disinfection Facility, Transmission Maintenance Facility, and the new outside enclosed storage (4,800 sq. ft) with covered storage (1,000 sq. ft) and 6,000 sq. ft paved area with fence at JJCWTP. These buildings will be converted from water treatment/quality uses to expanded maintenance/storage/warehouse facilities for the new water treatment plant. In addition, the contract includes demolition of old electrical building, old wooden building at Southboro, some miscellaneous items at Cosgrove Intake Building and replacement of the roof and HVAC system for Water Quality Lab at Southboro.
Design Management Support	Professional services and value engineering support to MWRA in review of the water treatment plant design.
Construction Management/RI	Construction management and resident inspection during construction of the water treatment plant.
Cosgrove Disinfection Facility Underwater Improvements	Installation of underwater piping needed to apply sodium hypochlorite at Shaft A.
Community Chlorine Analyzers	Purchase of free chlorine residual analyzers for eight communities to work in association with interim chloramination facilities.
OCIP	Owner Controlled Insurance Program, providing pollution liability, workers' compensation, general liability, and excess loss coverage during construction of the JJCWTP.
Professional Services	As needed legal, insurance, design, and construction specialty services for the John J. Carroll Water Treatment Plant.
Marlborough MOA	Agreement to mitigate the impacts of the construction of the John J. Carroll Water Treatment Plant on Marlborough.
WHWTP – MECo	Relocation of electric power lines.
Site Security Services	Site security services at the John J. Carroll Water Treatment Plant.
CSX Crossing	Railroad track improvements adjacent to JJCWTP.
Wachusett Algae Design and Construction	Design and Construction of automated chemical dispensing system for algae control.
Public Health Research	With the assistance of public health agencies and researchers, evaluation of the public health impact of the water treatment changes that occurred in 2004.
Security Equipment	Design and installation of card access, improved motion and intrusion alarm systems, video surveillance, and monitoring equipment for MWRA facilities.
WHCP8– Cosgrove Screens Design/CS/RI and Construction	Replace existing manual screens with finer automatically controlled traveling screens.
Cosgrove Tunnel Inspection	Inspection of Cosgrove Tunnel while it is inactivated during construction of the connection to the John J. Carroll Water Treatment Plant.
AWWARF-Evaluation Ozone and UV	Study of the effects of ozone and ultraviolet treatment on cryptosporidium to ensure inactivation in Wachusett Reservoir.
Fitout/Construction	Non-construction related items for start-up and operation of the new water treatment plant including furnishings, shop and maintenance equipment, audio/visual supplies, laboratory equipment, and miscellaneous consumable supplies.

Sub-phase	Scope
Walnut Hill Ultra Violet Disinfection Design, and Construction	Design and construction programs to add Ultra Violet (UV) to the JJCWTP.
As-Needed Technical Assistance #1 and #2	As-needed design services to support the start-up of the JJCWTP including electrical engineering, HVAC engineering, mechanical engineering, civil engineering and a variety of geotechnical, environmental, and architectural technical assistance.
Ancillary Modifications Construction 1	Follow-up construction from the As-Needed Technical Assistance contracts.
Ancillary Modifications Design and Construction 2	Address improvements in reliability, optimization of plant performance and/or reduce plant operating costs.

#### Expenditure Forecast (in \$000s) and Project Status

Total Budget	Payments thru FY06	Remaining Balance	FY07 Projected	FY08	FY04-08	FY09-13	Beyond FY13
\$437,350	\$372,223	\$65,127	\$3,678	\$2,948	\$92,827	\$51,353	\$7,148

Project Status 11/06	85.4%	Status as % is approximation based on project budget and expenditures. WH CP4 Treatment Plant and WH CP6 Late Site Work were substantially complete in July 2005 and January 2006, respectively. The Existing Facilities Modifications draft concept finalization report was received in November 2005 and the project is in design phase. UV Design is expected to begin in Jan 2008.
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#### Changes to Project Scope, Budget, and Schedule

Project Cost			Scheduled Completion Date			FY04-08 Spending		
FY07	PFY08	Chge.	FY07	PFY08	Chge.	FY07	PFY08	Chge.
\$429,337	\$437,350	\$8,013	Oct-13	Oct-13	None	\$93,762	\$92,827	(\$936)

#### Explanation of Changes

- Cost increase primarily due to addition of Ancillary Modifications Design and Construction 2 subphases.
- Schedule for the WHCP7 Existing Modifications contract pushed out due to the changes required during review of the draft CFR and as part of space needs assessment. Also due to the reconfiguration of Southboro TMF, back-up computer capability at the ICCF and separate storage structure at CWTP.

#### CEB Impact

- Estimate \$1.2M for UV licensing fees when new UV facility comes on-line in FY14. Expect \$18K for Wachusett Algae Facility in FY15 and \$18K in FY16 for utilities.

# S. 543 Quabbin Water Treatment Plant

## Project Purpose and Benefits

- Contributes to improved public health*
- Fulfills a regulatory requirement*

*To improve the quality of drinking water delivered to the Chicopee Valley Aqueduct (CVA) communities of Chicopee, Wilbraham, and South Hadley Fire District No. 1, and to ensure that the water delivered meets the drinking water quality standards established by the federal Safe Drinking Water Act. Improvements to the CVA system thus far have included the construction of covered storage at Nash Hill and construction of disinfection and contact time (CT) monitoring facilities.*

## Project History and Background

MWRA provides water to the three CVA communities under long-term contracts. The three communities pay assessments based on actual capital and operating costs for the CVA system. MWRA expects that these agreements will continue beyond the contract dates. In the event the communities do not choose to extend the contracts, they would be required to reimburse MWRA for the capital investment to improve the CVA system.

Quabbin Reservoir is the source of the water delivered to the CVA communities. Massachusetts DEP has granted a conditional waiver from filtration for Quabbin Reservoir water serving the CVA. MWRA and DEP signed a consent order covering activities to support the continuation of the filtration waiver under the Surface Water Treatment Rule (SWTR) in December 1991. It required new disinfection facilities and the replacement of the open Nash Hill Reservoir with covered storage. The Nash Hill Covered Storage Facilities were constructed and put on-line in March 1999 in compliance with the consent order requirements. In February 1994, MWRA submitted to DEP a consent order schedule for design and construction of permanent disinfection facilities, which were needed to comply with the federal and state drinking water standards. Under the consent order, the approved treatment processes for disinfection were chlorination for primary disinfection, and chloramination for residual disinfection.

The publication of new regulations (Enhanced Surface Water Treatment Rule (ESWTR) and Disinfectant/Disinfection By-Products Rule (D/DBPR)), and discussions regarding a possible *Cryptosporidium* rule raised questions regarding the long-term efficacy of these treatment technologies and whether future modifications would be required. A life cycle cost analysis performed in 1995 as part of an action plan for the CVA system determined that disinfection with chlorine/chloramine was the most cost-effective treatment option, even if the treatment processes had to be upgraded as early as two years later. MWRA issued the notice to proceed for construction of the chlorination and chloramination facilities in November 1998. After commencement of field construction activities in March 1999, citizen opposition arose relative to the siting of the secondary disinfection facility resulting in the cancellation of construction of the secondary disinfection facility in Ludlow. Instead, MWRA built a CT monitoring station at the Ludlow site. Both the primary disinfection facility and the Ludlow monitoring facility went on-line in summer 2000, in compliance with the consent order schedule, which is now closed out.

EPA issued new regulations in January 2006 (LT2ESWTR and Stage 2 D/DBP, see John J. Carroll Water Treatment Plant project description) that will require cryptosporidium inactivation and the addition of a second primary disinfectant to the CVA system. MWRA conducted an evaluation of the application of ultraviolet technology and determined it was the most cost-effective and efficient upgrade for the system. Design and construction of the addition of UV treatment to the existing Ware Disinfection Facility are included in this project.

**Scope**

<b>Sub-phase</b>	<b>Scope</b>
Quabbin WTP: Design/CA/RI and Construction	System hydraulics study, design, construction administration, resident inspection, and construction of disinfection and CT monitoring facilities.
Ware Fire Department MOA	“First Responder” training and protective clothing for the Ware Fire Department for Quabbin Disinfection Facility emergency scenarios.
WQ Analysis Equipment	Water quality analysis equipment for the Quabbin Disinfection Facility in Ware.
Quabbin Ultraviolet Water Treatment Plant: Study/Pilot, Design CS/RI, and Construction	Evaluation and implementation of ultraviolet technology at the Quabbin Disinfection Facility to meet new regulations requiring cryptosporidium inactivation and two primary disinfectants for unfiltered systems.

**Expenditure Forecast (in \$000s) and Project Status**

<b>Total Budget</b>	<b>Payments thru FY06</b>	<b>Remaining Balance</b>	<b>FY07 Projected</b>	<b>FY08</b>	<b>FY04-08</b>	<b>FY09-13</b>	<b>Beyond FY13</b>
\$16,085	\$10,144	\$5,942	\$0	\$200	\$900	\$5,742	\$0

Project Status 11/06	63.1%	Status as % is approximation based on project budget and expenditures. Completed disinfection and contact time monitoring facilities in September 2000. The Quabbin Study/Pilot was completed in Dec 2005. Expect to begin Quabbin UVWTP Design CS/RI by October 2007.
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**Changes to Project Scope, Budget, and Schedule**

<b>Project Cost</b>			<b>Scheduled Completion Date</b>			<b>FY04-08 Spending</b>		
<b>FY07</b>	<b>PFY08</b>	<b>Chge.</b>	<b>FY07</b>	<b>PFY08</b>	<b>Chge.</b>	<b>FY07</b>	<b>PFY08</b>	<b>Chge.</b>
\$16,020	\$16,085	\$65	Oct-11	Oct-11	None	\$936	\$900	(\$36)

**Explanation of Changes**

- Budget increased primarily due to revised cost for Quabbin Water Treatment UV Design.

**CEB Impact**

- Annual incremental operating costs for UV treatment are estimated at \$100,000 with impacts beginning in Q3 FY2012 (\$110K in FY12 and \$50K in FY13). Includes \$60,000 for UV license fee in FY12.

## S. 544 Norumbega Covered Storage

### Project Purpose and Benefits

- Contributes to improved public health*
- Fulfills a regulatory requirement*
- Improves system operability and reliability*

*To help provide high quality drinking water to MWRA customers and to ensure that the water meets the drinking water quality standards established by the federal Safe Drinking Water Act (SDWA) by constructing a 115 million gallon covered storage facility at Norumbega Reservoir.*

### Project History and Background

Norumbega Reservoir is an uncovered distribution storage reservoir that was connected to the Hultman Aqueduct in Weston. It normally provides active distribution storage and hydraulic control for 100% of the water supplied to the metropolitan Boston area. The reservoir has a capacity of 205 million gallons and a surface area of approximately 40 acres.

DEP, MWRA, and MDC entered into a consent agreement on June 11, 1993 for the Wachusett Reservoir water supply. The consent order requires MWRA to bring Norumbega Reservoir into compliance with state and federal regulations. Based on the fifth amendment to the consent order (dated July 12, 1999), construction of two cells of covered storage facilities must be substantially complete by December 2003. The third tank cell and final site work must be completed by December 2004. MWRA has met these milestones by using a design/build project delivery approach to construct distribution storage, connect to the MetroWest Water Supply Tunnel, and provide associated facilities in the vicinity of Norumbega Reservoir. The project site boundaries on the north, east, south, and west are the Massachusetts Turnpike (Mass Pike), Oak Street, the Hultman Aqueduct right-of-way, and Wellesley Street, respectively.

The primary component of the project is construction of a 115 million gallon reinforced concrete storage tank west of Schenk's Pond, between Norumbega Reservoir and the Mass Pike, on land previously owned by the Town of Weston and the Weston Forest and Trail Association. The tank covers approximately 17 acres, and stores water that has been fully treated at the John J Carroll Water Treatment Plant. Start-up of the new covered reservoir coincided with the start-up of the MetroWest Water Supply Tunnel.

Existing disinfection facilities will be modified for emergency use in the event that it is necessary to draw water directly from the open Norumbega Reservoir and/or Schenk's Pond. Chlorine would be applied at the Norumbega gatehouse during emergency operation.

On January 14, 1998, the Board of Directors authorized staff to proceed with a design/build project delivery approach for the project. The Norumbega Covered Storage Design/Build contract notice to proceed was issued in November 1999. The MWRA took partial utilization of the covered tank in November 2003 and the open reservoir was removed from service in March 2004. The Covered Storage Tank became fully operational in August 2004.

### Scope

Sub-phase	Scope
Conceptual Design/EIR	Environmental reviews, data collection and analyses, conceptual designs, and wetland permitting for covered storage at Norumbega Reservoir.
Owner's Representative	Provision of technical program management for the Norumbega covered storage design/build contract procurement, monitoring, and administration.

Sub-phase	Scope
Design/Build	Design and construction by a single contractor of a 115 million gallon covered storage facility at Norumbega Reservoir.
Land	Land Acquisition for Norumbega Covered Storage.
Professional Services	Technical assistance services for the Norumbega Covered Storage project.

#### Expenditure Forecast (in \$000s) and Project Status

Total Budget	Payments thru FY06	Remaining Balance	FY07 Projected	FY08	FY04-08	FY09-13	Beyond FY13
\$106,736	\$105,912	\$824	\$395	\$17	\$17,050	\$412	\$0

Project Status 11/06	99.4%	Status as % is approximation based on project budget and expenditures. The Covered Storage Tank became fully operational in August 2004.
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#### Changes to Project Scope, Budget, and Schedule

Project Cost			Scheduled Completion Date			FY04-08 Spending		
FY07	PFY08	Chge.	FY07	PFY08	Chge.	FY07	PFY08	Chge.
\$106,994	\$106,736	(\$259)	Jan-10	Jun-08	(18 mos.)	\$17,138	\$17,050	(\$89)

#### Explanation of Changes

- Budget decreased due to Booster Disinfection Design subphase no longer needed.

#### CEB Impact

No additional operating costs identified at this time.

## S. 545 Blue Hills Covered Storage

### Project Purpose and Benefits

- Improves system operability and reliability
- Contributes to improved public health

To ensure sufficient distribution storage for MWRA's Southern High Service Area. Presently, the area relies on the existing open reservoir for non-potable emergency storage, creating the potential for supply disruption and a boil water order if repairs are needed on a major transmission line for Quincy and other communities in the Southern High Service Area. Covered distribution storage will equalize pressure at the extremities of the Southern High pressure zone and provide potable emergency storage in case of unexpected interruptions of supply. New covered storage facilities at the Blue Hills Reservation will have a capacity of 20 million gallons.

### Project History and Background

Blue Hills Reservoir is an inactive, emergency, open distribution reservoir. MWRA's long-term plan is to provide 320 million gallons of enclosed storage at various locations throughout the waterworks system. This quantity represents approximately one day of maximum demand. A covered storage facility in the Southern High Service Area will equalize water pressure during periods of peak demand and work in conjunction with surface mains and the Chestnut Hill emergency pump station to supply water to the Southern High service area in the event that the Dorchester Tunnel requires repairs. In addition, this facility will supply water to Quincy and Milton if the northern portion of Section 22 is shut down because of a break or for repairs. A citizens' working group has been formed to participate in the EIR/Conceptual Design process.

MWRA's consultant began conceptual design and environmental assessment activities in April 1997. The Secretary of Environmental Affairs certified the Final Environmental Impact Report as adequate and complete in December 2001. The DEP Commissioner issued a Wetlands Protection Act Variance for the project in November 2003, which was appealed by a citizens group. The wetlands appeal was dismissed by the Superior Court in October 2006 and MWRA awarded a Design/Build contract in November 2006 to complete the project.

### Scope

Sub-phase	Scope
EIR/Conceptual Design/OR	Completion of an Environmental Impact Report, Conceptual Design and wetlands permitting. Preparation of Design/Build contract scope and specifications and technical support throughout Design/Build process.
Design/Build Field Oversight	Field oversight and administration of the Design/Build contract will be performed by in-house staff.
Design/Build	Design/Build of a 20 million gallon covered storage facility.

### Expenditure Forecast (in \$000s) and Project Status

Total Budget	Payments thru FY06	Remaining Balance	FY07 Projected	FY08	FY04-08	FY09-13	Beyond FY13
\$40,427	\$1,660	\$38,768	\$3,463	\$9,870	\$13,711	\$25,420	\$15

Project Status 11/06	4.4%	Status as % is approximation based on project budget and expenditures. Design/Build contract was awarded on November 15, 2006.
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### Changes to Project Scope, Budget, and Schedule

Project Cost			Scheduled Completion Date			FY04-08 Spending		
FY07	PFY08	Chge.	FY07	PFY08	Chge.	FY07	PFY08	Chge.
\$35,860	\$40,427	\$4,567	Jun-10	Jun-10	None	\$19,228	\$13,711	(\$5,517)

#### Explanation of Changes

- Budget increase due to actual award amount on 11/15/06 was greater than originally anticipated.
- Spending reflects actual award amount and Notice-to-Proceed schedule change.

#### CEB Impact

None identified at this time.



# S. 550 Low Service Storage Near Spot Pond

## Project Purpose and Benefits

*☑ Contributes to improved public health ☑ Improves system operability and reliability*

*A new storage facility is required to meet the state and federal drinking water guidelines and MWRA’s goal of providing a one-day supply of storage. With the Weston and Spot Pond Reservoirs removed from service, MWRA no longer meets the one-day supply goal.*

## Project History and Background

The Low Service System, which supplies 25% of the total metropolitan area demand, formerly had Weston Reservoir at its western end, where water was introduced into the system, and Spot Pond as its terminal reservoir at the northeast extremity. Due to transmission problems caused by old, corroded pipe with significantly reduced carrying capacity, this system gradually ceased to function properly and it became necessary, as a makeshift measure, to break this system into segments and transfer water from high service in order to serve large portions of the Low Service area.

The principal low service mains (Weston Aqueduct Supply Mains, Boston Low, and East and West Spot Pond Mains) are being rehabilitated or replaced, and their capacity is being restored to as-new condition. This makes it possible to restore the integrated low service system. Once Spot Pond is replaced with a covered distribution reservoir it will be possible to operate the system as it was originally designed. The new Weston Covered Storage Facility at Loring Road (constructed as part of the MetroWest Tunnel project) replaced the open Weston Reservoir. Low Service Storage near Spot Pond will replace Spot Pond Reservoir.

The new Low Service Storage near Spot Pond will be approximately 15 feet lower in elevation than the Weston Facility. At night, when water demand is low, the capacity of the Low Service transmission mains will be used to fill the Spot Pond tanks by gravity. During peak demand periods of the day, water will flow into the Low Service System from both Weston and Spot Pond.

At 20 million gallon capacity, the Low Service Storage near Spot Pond will be the same size as that at Loring Road. Just as pressure reducing valves allow the tanks at Loring Road to be filled from the high service Norumbega Covered Storage, it will also be possible to fill the Low Service Storage tank with water reduced in pressure from the high service system. However, this should only be necessary during periods of very high water use when the Low Service Storage tank does not fill at night by gravity.

## Scope

Sub-phase	Scope
Environmental Reviews, Conceptual Design and Owner’s Representative Services	Preliminary engineering for tank siting, environmental reviews, conceptual design, and owner’s representative services.
Design/Build	Design and construction by a single contractor of a 20 million gallon water storage tank.
Easements/Land acquisition	To provide adequate land for construction of the water storage tank.

**Expenditure Forecast (in \$000s) and Project Status**

Total Budget	Payments thru FY06	Remaining Balance	FY07 Projected	FY08	FY04-08	FY09-13	Beyond FY13
\$39,456	\$233	\$39,223	\$0	\$0	\$0	\$16,692	\$22,531

Project Status 11/06	0.6%	Status as % is approximation based on project budget and expenditures. Environmental Review/Conceptual Design/Owner's Representative services expected to begin in April 2009.
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**Changes to Project Scope, Budget, and Schedule**

Project Cost			Scheduled Completion Date			FY04-08 Spending		
FY07	PFY08	Chge.	FY07	PFY08	Chge.	FY07	PFY08	Chge.
\$233	\$39,456	\$39,223		Sep-14	n/a	\$0	\$0	\$0

**Explanation of Changes**

- Budget increase due to Design Build,, Environmental Review/Conceptual Design/Owner's Representative, and Easement/Land Acquisition subphases added.

**CEB Impact**

None identified at this time.

# S. 604 MetroWest Water Supply Tunnel

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## Project Purpose and Benefits

- ☑ *Contributes to improved public health*
- ☑ *Fulfills a regulatory requirement*
- ☑ *Extends current asset life*
- ☑ *Improves system operability and reliability*

*To provide transmission redundancy for the Hultman Aqueduct ensuring reliable water delivery and providing sufficient hydraulic capacity to support the new John J. Carroll Water Treatment Plant and covered storage distribution facilities. This project consists of construction of a 17.6-mile deep rock tunnel from Shaft D in Marlborough to Shaft 5 of the City Tunnel in Weston, and to Shaft W in Weston, as well as the construction of a covered storage facility at Loring Road in Weston. Also includes construction of shafts and valve chambers for connections of Shaft 4 in Southborough and to the Norumbega Covered Storage facility.*

## Project History and Background

Adequate transmission capacity is a critical component of MWRA's Integrated Water Supply Improvement Program. MWRA's water delivery depends on a system of tunnels and aqueducts that transport water from the Quabbin and Wachusett Reservoirs to the distribution reservoirs in western metropolitan Boston. The existing tunnels and aqueducts were deficient in several respects. First, the transmission system was unable to supply sufficient hydraulic capacity during peak flow periods, leading to pressure deficiencies in all high service areas during the summer months. Second, key sections of the transmission system, such as the Hultman Aqueduct and the Southborough Tunnel, rely on a single conduit. In the event of failure of any of the major transmission sections, the remaining waterworks system could not meet the demand for water.

Construction of the MetroWest Water Supply Tunnel and its extension to the Weston Aqueduct Terminal Chamber will provide the critically needed minimum level of transmission redundancy for the Hultman Aqueduct. In the future, enhancements and improvements to the reliability of the City Tunnel and the City Tunnel Extension will be planned as part of the Metropolitan Tunnel Loop project. This will also enhance system maintenance by allowing each major supply conduit to be taken out of service for inspection, cleaning, and repair.

In June 1989, MWRA began engineering work on reconstruction of the Sudbury Aqueduct. On May 9, 1990, the Board of Directors directed staff to put minimum effort into further study of the Sudbury Aqueduct reconstruction alternatives and maximum effort into study of the all-tunnel alternative. The advantages of tunneling included a large reduction in surface activities resulting in a reduced environmental impact, and the potential to obtain a large increase in water transmission capacity to enable the tunnel to supplant the Weston Aqueduct as well as provide redundancy to the Hultman Aqueduct. Other advantages included a higher pressure rating by constructing a tunnel deeper into rock, and the ability to construct along a straight line, reducing the overall length of the project by three miles.

In November 1990, the Board of Directors directed staff to eliminate the planned tunnel from Norumbega Reservoir to the Chestnut Hill Reservoir in favor of connecting to Shaft 5 of the City Tunnel and to the eastern end of the Weston Aqueduct. The connection will allow the Weston Aqueduct and Weston Reservoir to be taken off-line and used only for emergency supply as required by the Safe Drinking Water Act.

In December 1995, the Board of Directors authorized solicitation of bids on the first major construction contract of the MetroWest Tunnel project. In June 1996, a notice to proceed was issued on this contract, beginning the transition from design to construction of the project. In November 2003, the tunnel was placed in service.

## Program Elements

The MetroWest Tunnel is 17.6 miles long with a 14-foot finished diameter. The first segment of the tunnel extends from the water treatment plant site at Walnut Hill on the Marlborough/Southborough line to Shaft 4 of the Hultman Aqueduct in Southborough. From there, the tunnel continues to a "WYE" connection east of Norumbega Reservoir,

and continues east from the "WYE" to Shaft 5 of the City Tunnel and northward to the Weston Aqueduct Terminal Chamber. The tunnel depth varies from 200 to 500 feet below ground surface along the alignment.

With the MetroWest Tunnel and the John Carroll Water Treatment Plant now in service, the Hultman Aqueduct will be inspected and rehabilitated. Surface distribution facilities, including piping, valve chambers, and risers will connect the tunnel to the Hultman Aqueduct and local community services. Intermediate connections between the MetroWest Tunnel and the Hultman Aqueduct will permit operation of segments of either the aqueduct or the tunnel interchangeably, allowing flexibility in the maintenance of the two conduits.

### Scope

<b>Sub-phase</b>	<b>Scope</b>
Study	Study of the aqueduct/tunnel system to determine the best alternative to improve hydraulic capacity and create redundancy.
Construction- Sudbury Pipe Bridge	Rehabilitation of the Siphon Pipe Bridge at the Weston Aqueduct which experienced significant leakage.
Design/EIR-Tunnel-Engineering Services During Construction	Environmental impact report (EIR) process and design of the 17.6-mile long, 14-foot diameter tunnel. Construction support services, including environmental and safety compliance, claims assistance, contract administration, quality assurance testing, and community relations.
Construction: Western Tunnel Segment – CP1	Construction of the western portion of the tunnel and associated surface facilities. Shaft E was constructed at the Sudbury Dam and a tunnel was excavated 4.9 miles to Shaft D, located adjacent to the clear well of the Walnut Hill Water Treatment Plant (WHWTP). A riser shaft has been excavated to connect the tunnel to Southborough's Hosmer Pump Station and includes the surface piping facilities necessary to bring water from the Wachusett Reservoir.
Construction: Middle Tunnel Segment – CP2	Construction of approximately 11.9 miles of tunnel between Southborough and Weston. Construction was staged from Shaft L, located at a sand and gravel pit in Framingham, where a permanent connection to the Hultman will be constructed. Along the alignment, four small-diameter shafts have been constructed for community connections to Framingham and Weston. The western reach of the Middle Tunnel Segment portion of the tunnel terminates at Shaft E. The eastern reach terminates at the "WYE" where it meets the East Tunnel Segment. Shafts NE and NW will be constructed on the northwest side of Norumbega Reservoir where surface work will include construction of valve chambers and surface piping to allow connections to the Hultman Aqueduct and Norumbega Reservoir. The design at Shaft N includes provisions for future connections to the Norumbega Covered Storage Facility and the proposed Metropolitan Tunnel Loop.
Construction: Shaft 5A- CP3	Shaft 5A was excavated near the intersection of Route 128 and the Massachusetts Turnpike.
Construction: Eastern Tunnel Segment – CP3A	Construction of the eastern portion of the tunnel. An approximately 4,400-foot long, 12-foot finished diameter tunnel was constructed from the Shaft 5A bottom through the "WYE" where it meets the Middle Tunnel Segment and on to Shaft W where a shaft connection to the Loring Road storage tanks was made.
Construction: MHD Salt Sheds – CP5	Massachusetts Highway Department (MHD) salt storage operations were relocated from the Shaft 5A site to a new, nearby location on MHD property on Recreation Road in Weston. This allowed demolition of the MHD salt sheds at the Shaft 5A site.
Testing and Disinfection – CP7	Pressure testing of the MWWST from Shaft E (west) to Shaft W and 5A, and disinfection and dechlorination of the entire tunnel from Shaft D to Shafts W and 5A, and final disinfection of the Norumbega Covered Storage tanks. Also includes the disinfection and dechlorination of the Wachusett Aqueduct and the piping connections through Walnut Hill to MetroWest Shaft D.

<b>Sub-phase</b>	<b>Scope</b>
Construction: Loring Road Covered Storage- CP8	Construction of surface facilities at the Shaft W site including a 20 million-gallon storage facility that replaces the function of the existing Weston Aqueduct/Weston Reservoir system, allowing the system to be taken off-line and placed on emergency stand-by status. The storage facility has been constructed as two concrete tanks partially buried in a hillside adjacent to Shaft W. Connections will be made under this contract at Shaft W to two WASM (1 and 2) low service mains and the WASM 4 high service main, as well as to the 7-foot diameter branch of the Hultman Aqueduct. Also includes rehabilitation of 4,100 linear feet of 60-inch pipe and four master meters.
Construction Management/RI	Full inspection of all construction activity, as well as provision of construction support services including environmental and safety compliance, claims assistance, contract administration, quality assurance testing, community relations, labor relations, engineering services during construction, and provision of technical assistance.
Hultman Study	Risk analyses to determine which leaks should be repaired now and a monitoring plan for leaks which presently do not threaten the integrity of the aqueduct.
Hultman Leak Repair	Test pit excavation and leak repair on the Hultman Aqueduct.
Hultman Repair Bands	Purchase of external repair bands to be installed as part of Hultman investigation and repair.
Hultman Investigation and Repair	Evaluation of various segments of the Hultman Aqueduct and installation of repair bands at major leak sites.
Land Acquisition	Easements along the 17.5-mile tunnel construction route, as well as land at the Shaft W and Shaft L sites.
Professional Services	Services such as construction safety, contractor audit, legal services, risk management consulting services, and other miscellaneous services.
Framingham MOU	Agreement to mitigate the impacts of the construction on the City of Framingham.
Weston MOU	Agreement to mitigate the impacts of the construction on the Town of Weston.
Southborough MOU	Agreement to mitigate the impacts of the construction on the Town of Southborough.
Local Water Supply Contingency Design/CA/RI and Construction	Design and implementation of a Water Supply Contingency Plan including the installation of new local mains where residential well supplies could be affected by tunnel construction.
Community Technical Assistance	Funds to assist communities with the redesign of utility plans.
Owner Controlled Insurance	Owner controlled insurance program providing workers' compensation, general liability, and pollution liability insurance for MetroWest construction.
Design CA/RI Hultman Interconnect CP6	Design CA/RI of the interconnections between the MetroWest Water Supply Tunnel and the Hultman Aqueduct as well as inspection and design of the rehabilitation of the aqueduct after it has been taken off-line. Inspection of Southboro Tunnel.
Construction: Hultman CP9	Construction of Valve Chamber E-3.
Interim Disinfection	Temporary disinfection related to CP-7 sub-phase.
Equipment prepurchase	Prepurchase one 10 feet diameter butterfly valve.

Sub-phase	Scope
Construction CP6ALower Hultman Rehab. and 6B Upper Hultman Rehab.	Construction of interconnections between Metrowest Tunnel and the Hultman Aqueduct, and rehabilitation of Hultman Aqueduct including replacement or repair of air relief structures, blow off valves, culverts beneath the aqueduct; replacement of existing valves; and additional items to restore the aqueduct to safe and efficient operation after 60 years of service without an overhaul.
Construction 6A Demolition	Demolition of existing chlorine storage building to allow for construction of a new valve chamber on the Hultman Aqueduct.
CP6 Easements	Easement acquisitions for access to bifurcation interconnections.

#### Expenditure Forecast (in \$000s) and Project Status

Total Budget	Payments thru FY06	Remaining Balance	FY07 Projected	FY08	FY04-08	FY09-13	Beyond FY13
\$698,025	\$626,996	\$71,029	\$4,089	\$32	\$17,051	\$55,560	\$11,349

Project Status 11/06	90.1%	Status as % is approximation based on project budget and expenditures. Placed Metrowest Tunnel into service in November 2003. Awarded Hultman Interconnect Final Design/CA contract in September 2005 and Hultman Rehab CP9 was completed in December 2006.
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#### Changes to Project Scope, Budget, and Schedule

Project Cost			Scheduled Completion Date			FY04-08 Spending		
FY07	PFY08	Chge.	FY07	PFY08	Chge.	FY07	PFY08	Chge.
\$698,180	\$698,025	(\$155)	Jul-12	Jul-15	37 mos.	\$39,924	\$17,051	(\$15,873)

#### Explanation of Changes

- Budget decreased primarily due to Valve Chamber Modifications subphase deleted since it is no longer needed..
- Spending shifted as a result of CP6A Lower Hultman Rehabilitation schedule being pushed out based on a reevaluation of Authority priorities.

#### CEB Impact

No additional costs identified at this time.

## S. 601 Sluice Gate Rehabilitation

### Project Purpose and Benefits

- ☑ *Contributes to improved public health*
- ☑ *Provides environmental benefits*
- ☑ *Extends current asset life*
- ☑ *Improves system operability and reliability*

*Completion of this project will improve the condition of and access to sluice gates used to regulate the release of water from upstream reservoirs and streams via aqueducts in accordance with legislative and flood control requirements. Motorized gates will replace manual gates and 12 facilities will be rehabilitated at Sudbury Reservoir, Framingham Reservoir, Spot Pond, and various locations along the Sudbury Aqueduct.*

### Project History and Background

MWRA operates and maintains sluice gates and facilities that house the gates at reservoirs and aqueducts throughout the waterworks system. The existing gates are typically 80 to 100 years old, are in poor condition, and must be operated by hand. In a Dam Safety Inspection Report by the Army Corps of Engineers, the sluice gates at Wachusett Reservoir and the four Sudbury System Reservoirs were cited as needing repairs to restore operability for flood control use. Failure to make repairs could lead to the Corps downgrading dam safety assessments at these sites. In addition, the structural condition of some of the facilities is such that they are unsafe for access by MWRA personnel for operation and maintenance purposes. To prevent further deterioration and to ensure safe access to and reliable operation of the sluice gates, MWRA is rehabilitating the facilities in conjunction with the replacement of the gates.

Phase 1 included the installation of motorized operators, upgrade of the gate houses and replacement of gates and sliding tracks at Sudbury Reservoir, Spot Pond, and Framingham Reservoir 3. The construction was completed in 1993. Design for Phase 2 rehabilitation began in April 1998, and included input from the Boston Landmark Commission Order of Conditions and the Massachusetts Historical and Chestnut Hill Historical Commissions. Construction for Phase 2 Rehabilitation began in September 2003 and was completed in June 2005.

### Scope

Sub-phase	Scope
Design/CS/RI and Construction 1	Design and construction of the installation of motorized operators, upgrade of the gate houses, and replacement of gates and sliding tracks at Sudbury Reservoir, Spot Pond, and Framingham Reservoir 3.
Design/CS/RI and Construction 2	Design, construction services, and resident inspection for Phase 2. Installation of motorized operators, upgrade of 10 gatehouses, and replacement of 30 gates at various distribution reservoirs.
Design and Construction – Stop Planks	Design and construction of stop planks at all sites required to de-water wet wells before sluice gates can be installed.
Construction – Sudbury Toe Drain Repair	Payment to the DCR for construction of new toe drains, filter blanket, and pressure relief wells, repair or abandonment of existing toe drains, and repair of the stone masonry spillway, dam crest roadway, gate house, and wing walls at the Sudbury Dam.

**Expenditure Forecast (in \$000s) and Project Status**

<b>Total Budget</b>	<b>Payments thru FY06</b>	<b>Remaining Balance</b>	<b>FY07 Projected</b>	<b>FY08</b>	<b>FY04-08</b>	<b>FY09-13</b>	<b>Beyond FY13</b>
\$9,365	\$9,407	(\$41)	(\$41)	\$0	\$5,111	\$0	\$0

Project Status 11/06	97.8%	Status as % is approximation based on project budget and expenditures. Sudbury Toe Drain Repair and Stop Plank construction are complete. Phase II construction was completed in June 2005.
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**Changes to Project Scope, Budget, and Schedule**

<b>Project Cost</b>			<b>Scheduled Completion Date</b>			<b>FY04-08 Spending</b>		
<b>FY07</b>	<b>PFY08</b>	<b>Chge.</b>	<b>FY07</b>	<b>PFY08</b>	<b>Chge.</b>	<b>FY07</b>	<b>PFY08</b>	<b>Chge.</b>
\$9,617	\$9,365	(\$252)	Jun-05	Jun-05	None	\$5,363	\$5,111	(\$252)

**Explanation of Changes**

- Final cost adjustment. Project is completed.

**CEB Impact**

None identified at this time.



## S. 614 Metropolitan Tunnel Loop

### Project Purpose and Benefits

- Contributes to improved public health*
- Provides environmental benefits*
- Extends current asset life*
- Improves system operability and reliability*

### Project History and Background

This project is to initiate a new study of long term redundancy alternatives for critical elements of the transmission system. It will consider pressurization of the Wachusett Aqueduct, pressurization of the Sudbury Aqueduct, construction of the tunnel loop alternatives, and other possible solutions for long term redundancy of the transmission system. This study would also determine the feasibility and develop plans for the inspection of the Quabbin Tunnel, City Tunnel, City Tunnel Extension and Dorchester Tunnel in order to ensure reliable transmission capability and allow for inspection, maintenance, and repair of these facilities.

For the metropolitan tunnel system east of Shaft 5, previous plans were for full redundancy utilizing a closed loop tunnel system, as originally planned in 1936 by the system's designers, created by constructing a 16.5-mile deep rock tunnel from Norumbega Reservoir in Weston to Fells Reservoir and the City Tunnel Extension. A supplemental or alternative plan to consider would be a tunnel loop from Norumbega Covered Storage to Blue Hills Covered Storage and the Dorchester Tunnel (southern tunnel loop).

For the western system, this project will develop a conceptual design and construction cost estimate for the pressurization of the Wachusett Aqueduct which is necessary to provide redundancy for water supply to the John J. Carroll Water Treatment Plant and to support the shut down and repair of the Cosgrove Tunnel. Detailed design and construction funds are included in S.624 Wachusett Aqueduct Pressurization. This study will provide information to support the design and construction cost estimate on which to better define the funds needed in the CIP and will help prioritize pressurization of the Wachusett Aqueduct with respect to other projects such as redundancy for the City Tunnel.

### Scope

Sub-phase	Scope
Redundancy Study/Tunnel Inspection	Redundancy Study/Tunnel Alternatives for long term redundancy.

### Expenditure Forecast (in \$000s) and Project Status

Total Budget	Payments thru FY06	Remaining Balance	FY07 Projected	FY08	FY04-08	FY09-13	Beyond FY13
\$3,500	\$0	\$3,500	\$0	\$0	\$0	\$3,500	\$0

Project Status 11/06	0%	Status as % is approximation based on project budget and expenditures.
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**Changes to Project Scope, Budget, and Schedule**

<b>Project Cost</b>			<b>Scheduled Completion Date</b>			<b>FY04-08 Spending</b>		
<b>FY07</b>	<b>PFY08</b>	<b>Chge.</b>	<b>FY07</b>	<b>PFY08</b>	<b>Chge.</b>	<b>FY07</b>	<b>PFY08</b>	<b>Chge.</b>
\$0	\$3,500	\$3,500		Jun-11	n/a	\$0	\$0	\$0

**Explanation of Changes**

- New project.

**CEB Impact**

None identified at this time.

## S. 615 Chicopee Valley Aqueduct Redundancy

### Project Purpose and Benefits

- Contributes to improved public health*
- Extends current asset life*
- Improves system operability and reliability*

*To provide redundancy for water service for the three communities supplied by the Chicopee Valley Aqueduct (CVA) in case of a CVA failure or shutdown.*

### Project History and Background

The Chicopee Valley Aqueduct (CVA) supplies water to South Hadley Fire District No. 1, Chicopee, and Wilbraham. The 48-inch and 36-inch diameter aqueduct was built in 1949 of reinforced concrete pipe with an embedded steel cylinder. It is the only means of supplying these communities with water. The capacity of the aqueduct is 23 million gallons per day, which is sufficient to meet the communities' peak summer demand. It is currently not possible to perform routine maintenance without disrupting supply to these communities. If supply through the CVA were shut off upstream of Nash Hill Covered Storage, Chicopee would be without water after two days, and South Hadley and Wilbraham would be without water even sooner. If the CVA were shut off downstream of Nash Hill Covered Storage, Chicopee would be immediately without water supply.

New construction under this project consists of a 8,100 feet long second barrel of the CVA from Nash Hill Covered Storage to Chicopee of 30-inch diameter pipe; 3,100 feet of 16-inch redundant pipeline between the Nash Hill Covered Storage and the South Hadley takeoff; and 2,400 feet of 20-inch redundant pipeline between the Route 21 Valve Chamber and the Wilbraham takeoff, new fire tank hookups within three host communities, and two emergency mutual aid interconnections between the CVA system and the Springfield Water & Sewer Commission system in Ludlow. With these new pipelines in place, the three communities will be connected to Quabbin Reservoir, Nash Hill Covered Storage, or both in the event of a failure anywhere along the length of the aqueduct. Construction also includes rehabilitation of the Bondsville throttling station and the Route 21 Valve Chamber. This project will also provide additional mainline valves along the aqueduct that will help isolate manageable segments of the CVA; and by rehabilitating appurtenances such as meters, air valves, and blow-off valves.

### Scope

Sub-phase	Scope
Pipeline Redundancy – Planning	In-house planning of redundant pipelines and aqueducts for Chicopee, South Hadley Fire District # 1, and Wilbraham, and Bondsville construction.
Pipeline Redundancy – Design and Construction	Design, construction administration, resident inspection, and construction for CVA redundancy facilities.

### Expenditure Forecast (in \$000s) and Project Status

Total Budget	Payments thru FY06	Remaining Balance	FY07 Projected	FY08	FY04-08	FY09-13	Beyond FY13
\$8,704	\$3,410	\$5,293	\$4,831	\$463	\$7,880	\$0	\$0

Project Status 11/06	63.9%	Status as % is approximation based on project budget and expenditures. Construction began in October 2005.
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**Changes to Project Scope, Budget, and Schedule**

Project Cost			Scheduled Completion Date			FY04-08 Spending		
FY07	PFY08	Chge.	FY07	PFY08	Chge.	FY07	PFY08	Chge.
\$8,623	\$8,704	\$81	Oct-07	Oct-07	None	\$7,799	\$7,880	\$81

**Explanation of Changes**

- Budget increased due to expected change orders including installing 84 linear feet of 12-inch PVC pipe and 12-inch flex-ring ductile iron pipe of new bypass piping.

**CEB Impact**

None identified at this time.

## S. 597 Winsor Dam Hydroelectric

### Project Purpose and Benefits

*☑ Extends current asset life ☑ Results in a net reduction in operating costs*

*To license and rehabilitate the turbine generator at the Winsor Dam in Belchertown to allow the dam to produce hydroelectric power to be used to sell to the electric grid, or to potentially wheel power to other MWRA facilities. Also, to consider station piping improvements which would allow water to go to the Swift River without going through the isolation valve. Winsor Relief Pipeline Release work is also included.*

### Project History and Background

Winsor Dam impounds the Quabbin Reservoir. At the dam, an intake feeds two conduits that are interconnected at a powerhouse below the dam. One conduit discharges to the Chicopee Valley Aqueduct; the other conduit feeds a hydroelectric turbine/generator unit that is inoperative due to a fire in 1991 that destroyed the electrical switchgear. A bypass valve at the Winsor powerhouse also allows flow to be discharged directly to the Swift River.

Around the time that the fire occurred, hydropower re-development was not a priority given the low value of energy and the capital costs of station rehabilitation (in addition to switchgear replacement, turbine/generator repairs were also required). Another factor that forestalled hydropower development was that the Winsor dam hydroelectric facilities were never licensed by the Federal Energy Regulatory Commission (FERC). Shortly before the fire occurred, FERC directed MWRA to license the facilities. Given that the Swift River hosts a valued trout fishery, fishery concerns promised to complicate an already onerous federal licensing process.

Efforts to rehabilitate the Winsor hydropower facilities began in 1995 when MWRA obtained a preliminary permit from FERC, the first step in the FERC process. The FERC preliminary permit secures the applicant a priority position to file a license application for development - it does not authorize development, however. The permit's conditions required MWRA to consult with resource agencies and to conduct environmental and engineering studies to assess the project's feasibility and to support a license application. Therefore, MWRA consulted with resource agencies and conducted a number of environmental studies required for a license application. Some specialized fisheries studies were conducted by a consultant; various other studies were prepared in-house by MWRA with assistance from MDC staff.

Engineering and economic feasibility studies and concept design were also required to develop information to satisfy FERC's license requirements and to develop preliminary cost information to support financial analysis and decisions regarding whether or not to proceed with hydropower re-development. Accordingly, in 1997, MWRA procured the services of Duke Engineering and Services (DE&S) to conduct certain technical evaluations.

The first phase of work was completed in mid-1998. DE&S evaluated two alternatives for redeveloping Winsor Dam hydropower facilities. The study found that it would be feasible to 1) rehabilitate the existing turbine/generator; or 2) install a new turbine generator that would operate at higher efficiencies due to modern technology and a design optimized for minimum flow conditions and 24-hour/day operations.

The hydroelectric subphase includes monies for an updated feasibility study to address permitting and energy economics. If restoration of the hydroelectric operation is viable, the project will continue with permitting, technical design, and ESDC.

The water supply infrastructure within the Winsor Power Station is in need of major repair and upgrade as much of it is over 75 years old. Several other subphases are needed to address the extensive work on the Quabbin Transmission System and the Swift River bypasses. These subphases include:

- Pipeline Replacement Phase 1 – To repair and upgrade large-diameter piping and valving in the basement of the Winsor Power Station including the bypasses;

- Shaft 12 Quabbin Aqueduct Sluice Gates- To replace the antiquated and unreliable shutter system with a sluice gate to control flow at the intake to the Quabbin Aqueduct on the shores of Quabbin Reservoir;
- Winsor Release Pipeline- To convey cold, well-oxygenated hypolimnetic water from Quabbin Reservoir to the downstream trout hatchery via a new pipeline.

**Scope**

Sub-phase	Scope
Preliminary Permit Study	Study to determine project feasibility.
Licensing and Detail Design (potentially by design/builder)	Licensing and detail design for hydropower at the Winsor Dam. Work will include replacing switchgear, controls, and turbines.
Construction	Replacement or refurbishment of the hydroelectric generator.
Winsor Power Station Pipeline Replacement Design and Construction	Design and Construction to address station piping improvements for water supply and Swift River bypasses.
Shaft 12 Quabbin Aqueduct Sluice Gates Design and Construction	Installation of a sluice gate to control flow at Shaft 12, the intake to the Quabbin Aqueduct, thereby improving safety and reliability of the transmission system.
Winsor Release Pipeline Design and Construction	Design and construction of a pipeline to convey water from the Winsor Power Station to the downstream trout hatchery.

**Expenditure Forecast (in \$000s) and Project Status**

Total Budget	Payments thru FY06	Remaining Balance	FY07 Projected	FY08	FY04-08	FY09-13	Beyond FY13
\$10,381	\$38	\$10,342	\$0	\$0	\$0	\$10,342	\$0

Project Status 11/06	0.4%	Status as % is approximation based on project budget and expenditures. Expect Design to commence by July 2009 for Shaft 12 Quabbin Aqueduct Sluice Gate subphase.
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**Changes to Project Scope, Budget, and Schedule**

Project Cost			Scheduled Completion Date			FY04-08 Spending		
FY07	PFY08	Chge.	FY07	PFY08	Chge.	FY07	PFY08	Chge.
\$83	\$10,381	\$10,298		Jun-12	n/a	\$45	\$0	(\$45)

**Explanation of Changes**

- Budget increased due to new subphases added for Turbine, Winsor Power Station Pipeline Replacement, Winsor Release Pipeline, and Shaft 12 Quabbin Aqueduct Sluice Gate.

# S. 616 Quabbin Transmission Rehabilitation

## Project Purpose and Benefits

- ☑ Provides environmental benefits
- ☑ Extends current asset life
- ☑ Improves system operability and reliability

To ensure continued reliable delivery of high quality water to MWRA customer communities through inspection, evaluations, and rehabilitation of the aging transmission system. Many of the transmission facilities and structures were constructed in the 1930s and 1940s and are in need of repair, routine maintenance, updating, and modifications for code compliance, health and safety, and security. The hydraulic control facilities of the Quabbin Tunnel are 70 to 80 years old and badly in need of renewal and upgrade. Based on the findings and recommendations of this inspection phase, MWRA will add design and construction phases at a later date.

## Project History and Background

This project will initially provide an engineering assessment of key water transmission facilities, structures and operations. Many of the 44 facilities were constructed in the 1930s and 1940s and are in need of repairs, routine maintenance, and modifications for code compliance, health and safety, and security. The facilities and structures include dams and spillways, structures on tops of shafts, hydraulic diversion facilities, gatehouses, intake buildings, service buildings, and garages. The facilities are spread over a large geographic area ranging from Quabbin Reservoir eastward to the Boston Metropolitan area.

The engineering assessment will utilize existing information and site visits to inventory the condition of each facility. The work will yield a facility report that identifies existing conditions and provides recommendations for needed improvements, rehabilitation, and repairs. The project will also result in the development of a conceptual design for each facility including alternatives, basic design criteria, cost estimates, required permits, and schedules. MWRA will use the final conceptual design reports to develop a detailed scope of work for the future procurement of engineering services for subsequent design, construction administration, and resident inspection services. Staff will integrate and coordinate project findings with MWRA’s current master planning efforts.

One critical component of the Quabbin Tunnel, the pressure-reducing valves at the Oakdale Power Station, has already been targeted for immediate replacement. These valves are in poor condition. Due to their important function of reducing hydraulic head to allow water from the Quabbin Reservoir to flow into Wachusett Reservoir, replacement of the Oakdale Valves is a high priority.

## Scope

Sub-phase	Scope
Facilities Inspection	Assessment of existing conditions; update of infrastructure rehabilitation evaluation; identification of improvements/repairs/upgrades, establishment of priorities for repairs, and preparation of cost estimates.
Oakdale Valves Phase 1	Study, design, and construction for the rehabilitation/replacement of two valves and miscellaneous support equipment at the Oakdale facility.
Equipment Pre-Purchase	The two large butterfly valves (84 inch and 72 inch) and the fixed orifice valve (48 inch), that will be needed in Phase I Valve Rehabilitation, require 6 to 10 months to fabricate and must be pre-purchased so the valves will be available for installation.

**Expenditure Forecast (in \$000s) and Project Status**

<b>Total Budget</b>	<b>Payments thru FY06</b>	<b>Remaining Balance</b>	<b>FY07 Projected</b>	<b>FY08</b>	<b>FY04-08</b>	<b>FY09-13</b>	<b>Beyond FY13</b>
\$4,863	\$3,423	\$1,440	\$1,433	\$3	\$4,859	\$4	\$0

Project Status 11/06	75.9%	Status as % is approximation based on project budget and expenditures. Valves were received in February 2006 and Phase I Construction was substantially complete in May 2006.
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**Changes to Project Scope, Budget, and Schedule**

<b>Project Cost</b>			<b>Scheduled Completion Date</b>			<b>FY04-08 Spending</b>		
<b>FY07</b>	<b>PFY08</b>	<b>Chge.</b>	<b>FY07</b>	<b>PFY08</b>	<b>Chge.</b>	<b>FY07</b>	<b>PFY08</b>	<b>Chge.</b>
\$5,342	\$4,863	(\$480)	Jun-06	Jun-06	None	\$5,198	\$4,859	(\$339)

**Explanation of Changes**

- Budget decreased and spending shifted primarily due to equipment award less than budget.

**CEB Impact**

None identified at this time.



## S. 617 Sudbury Aqueduct Repairs

### Project Purpose and Benefits

- Contributes to improved public health*
- Extends current asset life*
- Improves system operability and reliability*

*To ensure continued reliable delivery of high quality water to MWRA customer communities through study, design, and implementation of repairs to the Sudbury and Weston Aqueducts. These backup systems are both more than 100 years old, and need to be ready for emergency use.*

### Project History and Background

This project includes the inspection of the Sudbury Aqueduct in preparation for future repairs. This aqueduct is 120 years old and is in need of renewal and upgrade. This is a critical back-up facility for the City Tunnel and the Sudbury Reservoir emergency supply. The project will start with an inspection phase and then progress to short-term repairs required to prepare the aqueduct for short-term use. MWRA will also consider funding additional construction phases in future capital budgets as needed improvements are identified.

This project will also fund inspections of the Weston Aqueduct which is more than 100 years old. The results of the inspection will allow MWRA to evaluate and prioritize future construction and repair work for this aqueduct.

### Scope

Sub-phase	Scope
Hazardous Materials	Remove contaminated sediment from aqueduct.
Sudbury and Weston Aqueduct Inspection	Inspection of the Sudbury and Weston Aqueducts to identify need for future repair work.
Sudbury Short-Term Repairs Design and Construction	Repairs needed in order to prepare the Sudbury Aqueduct for short-term use (flow test and emergency activation). Recent study indicated several issues need to be addressed before any short-term use.

### Expenditure Forecast (in \$000s) and Project Status

Total Budget	Payments thru FY06	Remaining Balance	FY07 Projected	FY08	FY04-08	FY09-13	Beyond FY13
\$4,497	\$643	\$3,854	\$243	\$161	\$788	\$3,450	\$0

Project Status 11/06	13.3%	Status as % is approximation based on project budget and expenditures. Inspection of Sudbury Aqueduct was completed in October 2005 and the Sudbury Aqueduct Short Term Repairs Design is expected to start in October 2007.
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**Changes to Project Scope, Budget, and Schedule**

Project Cost			Scheduled Completion Date			FY04-08 Spending		
FY07	PFY08	Chge.	FY07	PFY08	Chge.	FY07	PFY08	Chge.
\$3,954	\$4,497	\$543	Nov-07	Oct-09	23 mos.	\$3,686	\$788	(\$2,898)

**Explanation of Changes**

- Budget increased due to addition of new subphase for Sudbury Aqueduct Short Term Repair Design.
- Project completion and spending shifted due to revised construction schedule as a result of the new design subphase added above.

**CEB Impact**

None identified at this time.

## S. 618 Northern High NW Trans Section 70-71

### Project Purpose and Benefits

- Contributes to improved public health*
- Extends current asset life*
- Results in a net reduction in operating costs*
- Improves system operability and reliability*

### Project History and Background

The Northern High System Pipeline Sections 70, 71 and 79 are the primary distribution mains that supply water to seven north shore communities. These water mains are constructed of unlined steel and are over 55 years old. Rehabilitation of these pipelines will extend their useful life and postpone the need for more costly pipe replacement in the future. This project includes an initial planning study that will assess the existing pipe condition and develop a sequence of work that would ensure uninterrupted service to the north shore communities while pipeline segments are out of service for rehabilitation. Future phases for design and construction of the rehabilitation will be added to this project based on the results of the planning study.

### Scope

Sub-phase	Scope
Planning	Planning phase for the rehabilitation of more than 10 miles of NHS Sections 70, 71, and 79.

### Expenditure Forecast (in \$000s) and Project Status

Total Budget	Payments thru FY06	Remaining Balance	FY07 Projected	FY08	FY04-08	FY09-13	Beyond FY13
\$1,000	\$0	\$1,000	\$0	\$0	\$0	\$1,000	\$0

Project Status 11/06	0.0%	Status as % is approximation based on project budget and expenditures. Planning is expected to begin in July 2010.
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### Changes to Project Scope, Budget, and Schedule

Project Cost			Scheduled Completion Date			FY04-08 Spending		
FY07	PFY08	Chge.	FY07	PFY08	Chge.	FY07	PFY08	Chge.
\$0	\$1,000	\$1,000		Jun-12	n/a	\$0	\$0	\$0

### Explanation of Changes

- New Project

### CEB Impact

- No additional impacts expected at this time.

# S. 620 Wachusett Reservoir Spillway Improvements/Winsor Dam Repair

## Project Purpose and Benefit

- ☑ Extends current asset life
- ☑ Improves system operability and/or reliability.

*Project will provide the necessary spillway improvements to the Wachusett Reservoir Dam including replacing the existing flashboards with motorized gate for regulating the reservoir water level and improving its storage capacity. This project will also repair the Winsor Dam drainage system to include upgrading the existing 24" corrugated metal pipe (CMP) and the 24" clay tile pipe to improve surface drainage and its water quality discharged into the Swift River.*

## Project History and Background

The Winsor Dam (Quabbin Reservoir) and the Wachusett Reservoir Dam are more than 60 and 100 years old respectively. Previously they were under the care and control of the Department of Conservation and Recreation (DCR), formerly the Metropolitan District Commission (MDC). However, MWRA assumed responsibility for capital improvements to this facility as of April 2004 per legislative approval of a Memorandum of Understanding between the MWRA and the Massachusetts DCR. This project will upgrade the existing flashboards that regulate the reservoir water level and improve its water storage capacity at the Wachusett reservoir, and rehabilitate the existing drainage system at the downstream of Winsor Dam.

The Wachusett Reservoir Dam is part of the major dam system that will be inspected, tested and repaired if necessary under a separate project. However, more urgently, its spillway and dike on the north side of the reservoir have shown signs of wear and tear since the early 1990s. In 1992, the DCR had contracted GZA Consultant to design the needed repairs to the dike as well as a series of mechanically operated gates to replace the old flashboards (100 ft lower section) that are used to regulate the reservoir level and to control flood. However, DCR postponed this project due to difficulty in issuing bonds to finance the work.

The scope of the Wachusett Reservoir Spillway portion of this project includes inspection and reassessment of the conditions for the entire spillway (100 ft lower section as well as 350 ft upper section) and the North Dike, and review of the existing Hydraulics & Hydrology study. Based on the H&H study results it will ensure that the auxiliary spillway channel will, together with the existing spillway, be able to pass the maximum probable flood (MPF). Also included is design for the installation of the crest gate and repair the Bastion Chamber to house the crest gate hydraulic power unit and its control. It also covers review and revision of the twelve (12) year old design as necessary to bring the existing design plans and specifications up to date for construction.

The Winsor Dam Repair portion of this project provides a review of the recently completed existing design specifications and drawings that were produced by the DCR. Work includes re-pointing to the main spillway, repair or replacing the drainage system and installing piezometers for monitoring any dam seepage.

## Scope

Sub-phase	Scope
Design and Construction	Covers inspection and reassessment of the design and including Engineering Services during Construction (ESDC) and Resident Inspection (RI) for the rehabilitation of the spillway and dike at the Wachusett Reservoir and the drainage system at the Quabbin Reservoir.
Equipment Pre-Purchase	Pre-purchase the Wachusett Crest Gate so that it will be fabricated and delivered in time for installation by the construction contractor.

### Expenditure Forecast (in \$000s) and Project Status

Total Budget	Payments thru FY06	Remaining Balance	FY07 Projected	FY08	FY04-08	FY09-13	Beyond FY13
\$8,931	\$264	\$8,667	\$1,234	\$5,668	\$7,166	\$1,765	\$0

Project Status 11/06	7.7%	Status as % is approximation based on project budget and expenditures. Design contract was awarded in January 2006. Expect to commence construction by April 2007.
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### Changes to Project Scope, Budget, and Schedule

Project Cost			Scheduled Completion Date			FY04-08 Spending		
Y07	PFY08	Chge.	FY07	PFY08	Chge.	FY07	PFY08	Chge.
\$9,258	\$8,931	(\$327)	Jul-08	Jul-08	None	\$7,185	\$7,166	(\$19)

### Explanation of Changes

- Budget decreased due to Equipment Pre-Purchase award amount was less than anticipated. This decrease was partially offset by an expected amendment for additional design tasks including electrical work, Winsor drainage changes and Quabbin security gates.

### CEB Impact

None identified at this time.

## S. 621 Watershed Land

### Project Purpose and Benefit

- Fulfills regulatory requirement.*
- Provides water quality benefits.*
- Continues to improve public health.*

*Acquire, in the name of the Commonwealth, parcels of real estate or interests in real estate that are important or critical to the maintenance of water quality in MWRA water supply sources and the advancement of watershed protection.*

### Project History and Background

The Watershed Protection Act (WsPA) regulates land use and activities within critical areas of the Quabbin Reservoir, Ware River and Wachusett Reservoir watersheds for the purpose of protecting the quality of drinking water. Since the passage of WsPA in 1992, watershed lands had been purchased by the Commonwealth through its bond proceeds. The MWRA was then billed for and, over the years, paid increasing percentages of the debt service on those bonds, eventually reaching 100% of the debt service. MWRA also makes Payments In Lieu of Taxes (Pilot) to each watershed community for the land owned for water supply protection.

Since 1992, land acquisition has evolved into program-status and is a significant component of the Watershed Protection Plans for Quabbin Reservoir/Ware River and Wachusett Reservoir. Land in the watersheds undergoes analysis by the Land Acquisition Panel (LAP), which is comprised of Department of Conservation and Recreation (DCR) and MWRA staff. The LAP analyzes critical criteria for protection of the source water resources, including presence of streams and aquifers, steep slopes, forest cover, and proximity to the reservoirs. Parcels are ranked as to their value to the water supply system and, when the desirable parcels become available, are pursued through the LAP for acquisition through a “friendly taking” in fee or conservation restriction. LAP maintains an active list of parcels to pursue as seller and LAP interest, and funding availability, exist to support acquisition.

Under the revised Memorandum of Understanding between MWRA and DCR, executed April 2004, MWRA will utilize its own bond issuances for the purpose of acquiring, in the name of the Commonwealth, parcels of real estate or interests in real estate for the purpose of watershed protection. At its December 15<sup>th</sup> meeting, the MWRA Board of Directors approved the use of MWRA bond proceeds for such purpose.

### Scope

Sub-phase	Scope
Land acquisition.	Acquire parcels of real estate or interests in real estate critical to protection of the watershed and source water quality.

### Expenditure Forecast (in \$000s) and Project Status

Total Budget	Payments thru FY06	Remaining Balance	FY07 Projected	FY08	FY04-08	FY09-13	Beyond FY13
\$19,000	\$0	\$19,000	\$8,000	\$3,000	\$11,000	\$8,000	\$0

Project Status 11/06	0%	Status as % is approximation based on project budget and expenditures. MWRA expects to purchase land in FY07.
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**Changes to Project Scope, Budget, and Schedule**

<b>Project Cost</b>			<b>Scheduled Completion Date</b>			<b>FY04-08 Spending</b>		
<b>FY07</b>	<b>PFY08</b>	<b>Chge.</b>	<b>FY07</b>	<b>PFY08</b>	<b>Chge.</b>	<b>FY07</b>	<b>PFY08</b>	<b>Chge.</b>
\$19,000	\$19,000	\$0	Jun-12	Jun-12	None	11,000	\$11,000	\$0

**Explanation of Changes**

n/a

**CEB Impact**

None identified at this time.

## S. 623 Dam Projects

### Project Purpose and Benefits

- Contributes to improved public health*
- Provides environmental benefits*
- Extends current asset life*
- Results in a net reduction in operating costs*
- Improves system operability and reliability*

### Project History and Background

All earthen dams and masonry dams under MWRA responsibility were built in the late 1800 to early 1900 are in need of repairs. Based on ongoing inspections, immediate repairs ranging from riprap at various dams and removal of trees at Fells Reservoir dams are necessary.

### Scope

Sub-phase	Scope
Engineering Studies	In accordance with the 2004 MOU between MWRA and DCR on the coordination and implementation of watershed and waterworks responsibilities, MWRA agreed to share capital responsibility for Dams, Dikes and related infrastructure on the active reservoir systems at Quabbin Reservoir, Ware River, and Wachusett Reservoir. This MOU notes that MWRA had previously accepted capital and maintenance responsibility for the emergency Sudbury Reservoir system and the now off-line Weston Reservoir, Norumbega Reservoir, Schencks Pond, Blue Hills Reservoir, and Waban Reservoir. Furthermore, preexisting separate memoranda of understanding with DCR reveals MWRA has capital and maintenance responsibility for dams and dikes at the now off-line Spot Pond, Chestnut Hill Reservoir and Fells Reservoir. The scope of work for all these structures shall consist of review of consultant inspection reports on dam safety and maintenance improvement recommendations, as well as hydraulic/hydrologic reports on spillway capacity as required under State Dam Safety regulation 302 CMR 10.00. MWRA shall assess the need for consequent capital improvements where spillway design flood cannot be met due to existing engineering standards, and routine and special capital maintenance improvements such as rip-rap repair and tree clearing.
Immediate Repair Dams	Based on ongoing inspections, provide plans and specs and ESDC for the immediate repairs to these earthen and masonry dams, including riprap at various dams and removal of trees at Fells Reservoir dams are necessary.

### Expenditure Forecast (in \$000s) and Project Status

Total Budget	Payments thru FY06	Remaining Balance	FY07 Projected	FY08	FY04-08	FY09-13	Beyond FY13
\$4,460	\$0	\$4,460	\$0	\$230	\$230	\$4,230	\$0

Project Status 11/06	0.0%	Status as % is approximation based on project budget and expenditures. Engineering Studies for Dam Risk is expected to begin in July 2007.
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**Changes to Project Scope, Budget, and Schedule**

Project Cost			Scheduled Completion Date			FY04-08 Spending		
FY07	PFY08	Chge.	FY07	PFY08	Chge.	FY07	PFY08	Chge.
\$0	\$4,460	\$4,460		Jun-11	n/a	\$0	\$230	\$230

**Explanation of Changes**

- New Project

**CEB Impact**

- No impacts identified at this time.

## S. 624 Wachusett Aqueduct Pressurization

### Project Purpose and Benefits

- Contributes to improved public health*
- Provides environmental benefits*
- Extends current asset life*
- Results in a net reduction in operating costs*
- Improves system operability and reliability*

### Project History and Background

This project is recommended to allow for shut down and repair of the Cosgrove Tunnel and to allocate design and construction funds for the pressurization of the Wachusett Aqueduct. The study phase of this work is included in project S.614 Metropolitan Tunnel Loop, which will study transmission system long term redundancy issues, including pressurization of the Wachusett Aqueduct to provide redundancy for water supply to the John J. Carroll Water Treatment Plant.

Although the rehabilitation of the Wachusett Aqueduct allowed its use during a short winter duration period so that the Cosgrove Tunnel could be connected to the CWTP, it cannot fully replace the Cosgrove. Since the Cosgrove Tunnel's inspection has indicated the need for repairs, this is problematic. The Wachusett Aqueduct is limited in its flow capacity of 240-250 MGD which does not allow it to meet summer demands. Also, since the aqueduct delivers water at a low elevation, it cannot supply flow into the ozone contactors at the CWTP and would require that temporary chlorination facilities be activated for treatment. It would also take at least a day to activate the Wachusett Aqueduct to deliver flow into the MWWST for use in the metropolitan Boston area in the same manner that was done for the CWTP start-up. Since the CWTP plant flow system would not be supplied, the current supply to Northboro, Marlborough, Southborough and the Westborough State Hospital would require special temporary pumping as was done temporarily during CWTP start-up but which was disassembled afterward.

The alternative to address redundancy for the Cosgrove is to pressurize the Wachusett Aqueduct which would allow it to meet system demands to the full CWTP capacity to create a transparent changeover during an emergency.

### Scope

Sub-phase	Scope
Wachusett Aqueduct Pressurization Des/Con	To allow structural repair of cracks in the Cosgrove Tunnel, allocate design and construction funds for the pressurization of the Wachusett Aqueduct.

### Expenditure Forecast (in \$000s) and Project Status

Total Budget	Payments thru FY06	Remaining Balance	FY07 Projected	FY08	FY04-08	FY09-13	Beyond FY13
\$100,000	\$0	\$100,000	\$0	\$0	\$0	\$7,000	\$93,000

Project Status 11/06	0.0%	Status as % is approximation based on project budget and expenditures. Design is expecting to begin in July 2011.
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**Changes to Project Scope, Budget, and Schedule**

Project Cost			Scheduled Completion Date			FY04-08 Spending		
FY07	PFY08	Chge.	FY07	PFY08	Chge.	FY07	PFY08	Chge.
\$0	\$100,000	\$100,000		Jun-16	n/a	\$0	\$0	\$0

**Explanation of Changes**

- New Project

**CEB Impact**

- No impacts identified at this time.

## S. 625 Long Term Redundancy

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### Project Purpose and Benefits

- Contributes to improved public health*
- Provides environmental benefits*
- Extends current asset life*
- Results in a net reduction in operating costs*
- Improves system operability and reliability*

### Project History and Background

A new study of long term water transmission redundancy alternatives for the City Tunnel and its Extensions will be initiated as part of Project S.614 Metropolitan Tunnel Loop. An element of this study will address the metropolitan tunnel system from Shaft 5 eastward. It will consider long term use of the Sudbury Aqueduct (pressurization), tunnel loop alternatives and other possible solutions. This project will follow-up on the recommendations of that study and includes design and construction contracts for the recommended redundancy improvements to the City Tunnel, the City Tunnel Extension, and the Dorchester Tunnel.

The tunnels in the Metropolitan Boston area, i.e. the City Tunnel, City Tunnel Extension and Dorchester Tunnel remain a weak link. While the integrity of the underground tunnel sections is believed to be good based on very low unaccounted for water levels in the MWRA Transmission system, there is still risk of failure, mainly due to pipe failures at the surface connections to the distribution system or major subsurface issues such as structural issues due to earthquake or faults. A rupture of piping at surface connection points on any of the metropolitan area tunnel shafts would cause an immediate loss of pressure throughout the entire High Service area and would require difficult emergency valve closures and lengthy repairs. Although the assumption is that tunnels have a useful life of 100 years, due to the need to keep these lines in service, these subsurface structures have not been inspected and their actual condition is unknown. Facilities at the tops of tunnel shafts have been examined and a number of hardening measures are needed for risk reduction at these sites. Completion of planned distribution system storage projects like the Blue Hills Tanks also provide mitigation of the effects of piping rupture at these points.

In the event of a failure of the City Tunnel, a limited amount of water could be transferred through the WASM 3 line (scheduled for major rehabilitation) and WASM 4 and the Sudbury Aqueduct would need to be brought on line. Extensive use of the Sudbury Aqueduct/Chestnut Hill Emergency Pump Station and open distribution storage at Spot Pond and Chestnut Hill would be required. Supply would be limited and a boil order would be put in place. Failure of the City Tunnel Extension would be similar with reliance on WASM 3 and open storage at Spot Pond.

If the Dorchester Tunnel were to experience a problem, flow could be routed to the south through surface mains. However, this relies on the completion of the Chestnut Hill Connecting Mains project.

The original solution proposed to address redundancy in the metropolitan area was the 1936 plan for a tunnel loop. Although the City Tunnel, City Tunnel Extension and Dorchester Tunnel were built, the section to the north, completing the loop, was never constructed. The closed loop system increases reliability by allowing flow to reach any point from two directions. If constructed today, a northern loop would go further north and west of the plan developed in 1936 because the City Tunnel Extension itself extends further north. A new tunnel could begin at Norumbega and continue to Fells Reservoir and end at the City Tunnel Extension.

Depending upon system needs, a southern tunnel loop could also be constructed. Such a loop might go from Norumbega Covered Storage to the Blue Hills Covered Storage facility and proceed to the end of the Dorchester Tunnel.

**Scope**

<b>Sub-phase</b>	<b>Scope</b>
Long-term Redundancy Des/Con	Following the Long Term Redundancy Study under the Metropolitan Tunnel Loop Project, it is expected that design and construction of recommended redundancy improvements for the eastern part of the system will be needed.

**Expenditure Forecast (in \$000s) and Project Status**

<b>Total Budget</b>	<b>Payments thru FY06</b>	<b>Remaining Balance</b>	<b>FY07 Projected</b>	<b>FY08</b>	<b>FY04-08</b>	<b>FY09-13</b>	<b>Beyond FY13</b>
\$100,000	\$0	\$100,000	\$0	\$0	\$0	\$0	\$100,000

Project Status 11/06	0.0%	Status as % is approximation based on project budget and expenditures. Project is expecting to begin in July 2013.
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**Changes to Project Scope, Budget, and Schedule**

<b>Project Cost</b>			<b>Scheduled Completion Date</b>			<b>FY04-08 Spending</b>		
<b>FY07</b>	<b>PFY08</b>	<b>Chge.</b>	<b>FY07</b>	<b>PFY08</b>	<b>Chge.</b>	<b>FY07</b>	<b>PFY08</b>	<b>Chge.</b>
\$0	\$100,000	\$100,000		Jun-23	n/a	\$0	\$0	\$0

**Explanation of Changes**

- New Project added.

**CEB Impact**

- No impacts identified at this time.

## S. 677 Valve Replacement

### Project Purpose and Benefits

- ☑ *Contributes to improved public health*
- ☑ *Provides environmental benefits*
- ☑ *Fulfills a regulatory requirement*
- ☑ *Extends current asset life*
- ☑ *Improves system operability and reliability*

*To retrofit approximately 500 blow-off valves and replace several hundred main line valves within the pipeline distribution system. Blow-off valve retrofits eliminate cross-connections into sewers or drainage piping. Main line valve replacements improve MWRA's ability to respond to emergency situations such as pipe breaks and provide tight shutdown for pipeline construction projects. Faster responses reduce negative impacts on customers. Combining the two valve replacement efforts reduces the need for repeat construction at sites and alleviates traffic impacts, re-paving needs, and other site-specific issues.*

### Project History and Background

MWRA owns and operates nearly 300 miles of distribution pipeline, which contain approximately 767 blow-off valves and 1,160 main line valves. Some blowoff valves are cross-connected into sewers or drainage piping. To ensure there is no chance of contamination, DEP requires retrofitting of the blow off valves to provide air gaps to ensure that non-potable water cannot reach the potable water lines. In addition, many of the main line valves in the system are significantly beyond their original design life. Many of these are either inoperable or inadequate and require replacement, repair or retrofitting.

However, significant progress has been made in the last several years in correcting the cross connections at the blowoffs and in replacing defective main line valves and adding new valves to improve operations throughout the system. The valve replacement program continues this process. MWRA utilizes in-house crews and outside contractors to replace several blow off and main line valves every year, both as part of the Valve Replacement Program and pipeline rehabilitation contracts.

### Scope

Sub-phase	Scope
Design/Phase 1	Design of valve replacements, setting priorities based on the level of urgency or risk associated with each valve, and scheduling work on valves that would not otherwise be replaced during upcoming pipeline rehabilitation projects.
Construction - Phase 1	Purchase and installation of 27 blow-off valve retrofits.
Construction - Phase 2	Purchase and installation of ten blow-off valve retrofits and ten main line valve replacements.
Construction - Phase 3	Purchase and installation of ten blow-off valve retrofits and 12 main line valve replacements; rehabilitation of two meters.
Construction - Phases 4-6	For each phase, purchase and installation of blow-off valve retrofits and main line valve replacements, and rehabilitation of miscellaneous meters. Phase 4 Contract included 12 main line valves, 10 blow-off retrofits, 2 check valves, and the rehabilitation of 2 meters. Phase 5 Contract included 10 blow-off valve retrofits and 13 main line valve replacements. Phase 6 includes 4 blow-off valve retrofits, 8 main line valve replacements, and 9 globe valves (tank isolation).
Construction 7-9	For each phase, purchase and installation of blow-off valve retrofits and main line valve replacements, and rehabilitation of miscellaneous meters. Each phase includes approximately ten blow-off valve retrofits and ten main line valve replacements.
Equipment Purchase	Purchase of approximately 20 main line valves per phase for ten phases for replacement work to be done by in-house staff. Also includes the cost of line stops associated with this work.

**Expenditure Forecast (in \$000s) and Project Status**

<b>Total Budget</b>	<b>Payments thru FY06</b>	<b>Remaining Balance</b>	<b>FY07 Projected</b>	<b>FY08</b>	<b>FY04-08</b>	<b>FY09-13</b>	<b>Beyond FY13</b>
\$19,679	\$7,246	\$12,434	\$859	\$2,329	\$4,768	\$6,746	\$2,500

Project Status 11/06	36.8%	Status as % is approximation based on project budget and expenditures. Phases 1-5 are complete. Remaining Phases 6 and 7 scheduled to commence in February 2007 and October 2009, respectively. Phases 8 and 9 will commence in 2011 and 2013, respectively.
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**Changes to Project Scope, Budget, and Schedule**

<b>Project Cost</b>			<b>Scheduled Completion Date</b>			<b>FY04-08 Spending</b>		
<b>FY07</b>	<b>PFY08</b>	<b>Chge.</b>	<b>FY07</b>	<b>PFY08</b>	<b>Chge.</b>	<b>FY07</b>	<b>PFY08</b>	<b>Chge.</b>
\$14,589	\$19,679	\$5,091	May-10	Jun-16	73 Mos.	\$5,356	\$4,768	(\$588)

**Explanation of Changes**

- Cost increase reflects the addition of new construction phase and inflation adjustments due to new ENR index.
- Spending decreased within FY04-08 due to Equipment purchases pushed out beyond FY08.

**CEB Impact**

None identified at this time.

# S. 712 Cathodic Protection of Distribution Mains

## Project Purpose and Benefits

- Contributes to improved public health*
- Extends current asset life*
- Improves system operability and reliability*

*To evaluate the condition of approximately 30 miles of steel pipelines and determine the feasibility of upgrading or installing cathodic protection systems to protect pipelines from corrosion.*

## Project History and Background

Approximately 60 miles or 23% of MWRA's waterworks pipelines ranging from 24 inches to 60 inches in diameter are made of steel and are particularly subject to corrosion from acidic soils, fluctuating groundwater levels (especially where the groundwater is saline), and stray electrical currents. These steel pipelines are located in 26 of MWRA's 46 water communities.

Cathodic protection reduces deterioration of steel pipelines, thereby increasing pipeline life and deferring the need for replacement. Without proper cathodic protection, pipeline leaks and failures increase, causing potentially costly property damage and possible loss of service to customers.

Some sections of MWRA's existing steel pipes were originally equipped with cathodic protection systems intended to reduce the effects of corrosion. Other steel pipelines had cathodic protection systems installed sometime after the original pipe installation. Still other sections of steel pipeline have never received cathodic protection.

## Scope

Sub-phase	Scope
Planning	Evaluation of the condition of the steel pipelines, identification of areas of rapid corrosion due to stray currents, and design and installation of corrosion test stations.
Test Station Installation 2 to 4	Installation of approximately 415 test stations at approximately 400-foot intervals. Wires will be attached to the pipes and to reference anodes to collect test data. Upon completion of the four test contracts, planning and engineering staff will set priorities and determine the scope of rehabilitation work needed to ensure cathodic protection of the pipelines.

## Expenditure Forecast (in \$000s) and Project Status

Total Budget	Payments thru FY06	Remaining Balance	FY07 Projected	FY08	FY04-08	FY09-13	Beyond FY13
\$1,518	\$141	\$1,377	\$0	\$0	\$0	\$0	\$1,377

Project Status 11/06	9.3%	Status as % is approximation based on project budget and expenditures. Project Planning Phase complete. Test Station Installations 2-5 will commence in May 2013.
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**Changes to Project Scope, Budget, and Schedule**

<b>Project Cost</b>			<b>Scheduled Completion Date</b>			<b>FY04-08 Spending</b>		
<b>FY07</b>	<b>PFY08</b>	<b>Chge.</b>	<b>FY07</b>	<b>PFY08</b>	<b>Chge.</b>	<b>FY07</b>	<b>PFY08</b>	<b>Chge.</b>
\$1,472	\$1,518	\$46	May-16	May-16	None	\$0	\$0	\$0

**Explanation of Changes**

- Inflation adjustments on unawarded contracts due to new ENR index.

**CEB Impact**

None identified at this time.

# S. 730 Rehabilitation of Weston Aqueduct Supply Mains (WASM)

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## Project Purpose and Benefits

- ☑ *Contributes to improved public health*
- ☑ *Extends current asset life*
- ☑ *Improves system operability and reliability*

*To improve the condition and carrying capacity of these major supply lines and the quality of the water supplied to the communities in the Low, High, Intermediate, and Extra High pressure zones. Timely rehabilitation will reduce the costs of replacing corroded pipes, reduce red water and chlorine tastes, and improve water pressure.*

## Project History and Background

MWRA's tunnels and aqueducts bring water to the metropolitan area from the supply reservoirs in central Massachusetts. In Weston, where the existing Hultman Aqueduct and the MetroWest Tunnel end, the water is still miles away from most customers. Together, the City Tunnel and the four Weston Aqueduct Supply Mains (WASMs) carry the water this final distance. When the rehabilitation of the WASMs is complete, they will transmit about one-third of the water to MWRA's service areas, and the City Tunnel will carry the remaining two-thirds. The WASMs are now the only means of conveying water to the city in the event of a problem with the City Tunnel. The Sudbury Aqueduct can deliver non-potable water during extreme emergency.

WASM 1 is a 48-inch diameter unlined cast iron pipeline about 38,700 feet long that was constructed in 1904. WASM 2, built in 1916, is a 60-inch diameter unlined cast iron pipeline about 34,800 feet long. WASMs 1 and 2 begin in Weston at the Weston Aqueduct Terminal Chamber (WATC) and run parallel through Newton, mostly along Commonwealth Avenue, ending in Boston near Chestnut Hill Reservoir. These pipelines supply water to the Boston Low pressure zone.

WASM 3 is an 11-mile steel pipeline that was installed in 1926 and 1927. This major supply line carries high service water from the 7-ft diameter branch of the Hultman Aqueduct to community connections and MWRA pumping stations serving the Northern High, Intermediate High, and Northern Extra High service systems. It extends from the Hultman Aqueduct branch in Weston northeast to the Shaft 9 line in Medford and is the sole source of supply to 230,000 customers. WASM 4 was constructed in 1932 and is predominantly a 60-inch diameter pipeline consisting primarily of unlined steel with some pre-stressed concrete cylinder and cast iron sections. It extends 47,000 linear feet from Weston through Newton, Watertown, and Boston, and into Cambridge.

WASM 3 and WASM 4 were originally part of the Low Service System and conveyed water from the Weston Aqueduct to the Spot Pond Supply Mains. Upon completion of the Hultman Aqueduct, and its interconnection to the Weston Aqueduct Terminal Chamber in 1941, WASM 3 became part of the High Service System. With the addition of Newton to the metropolitan service area in the early 1950s, the western portion of WASM 4 was transferred to the High Service System as a temporary means of conveying water from the Hultman to portions of Newton and Watertown. Supply to the Spot Pond Supply Mains from WASMs 3 and 4 was maintained at their east ends through pressure reducing valves.

The WASMs are currently functioning below full capacity because of the build up of rust deposits and other matter along the pipeline walls, and undersized main line valves. Rehabilitation of these pipelines is necessary to restore their original carrying capacity and will include replacement of valves to provide more efficient operations and emergency response, elimination of tuberculation on the interior walls, and application of cement mortar lining to the interior pipe walls to prevent further internal corrosion and improve water quality.

The joints on WASM 1 and WASM 2 are constructed of bells and spigots filled with lead packing. The bell and spigot construction gives the joints some flexibility, but lead packed joints are more prone to failure compared to push-on or mechanical joints with modern synthetic gasket material. The existing joints are subject to potential failure because of deterioration, or pipe movement due to frost, settlement, or adjacent construction. Water leaking from a failing joint can undermine the pipe, causing catastrophic failure. These failures can cause severe damage and disruption. WASM 2 also has insulating joints consisting of cast-iron pipes with wood fillers. These joints

were intended to prevent electrical current from flowing along the pipeline but, in general, have been prone to failure and leakage.

When this project is complete WASM 1 and WASM 2 will connect to the new Loring Road tanks in Weston and will supply the Boston Low mains in Clinton Road, Beacon Street, and Boylston Street, which were rehabilitated as part of the Boston Low Service Rehabilitation project. With the completion of these projects the entire Boston Low Service System, which accounts for 15% of overall MWRA water demand, will have been rehabilitated from Weston to Boston. The rehabilitation of WASMs 1 and 2 is complete.

There is no back up for WASM 3, which is the sole source of supply for the higher elevation portions of Waltham, Belmont, Arlington, Lexington, Bedford, and Winchester. This pipeline cannot be shut down for maintenance or rehabilitation until the initial segments of the Shaft 7 to WASM 3 connecting mains project are constructed. Next to a failure of the Hultman Aqueduct, analysis has shown that failure of WASM 3 is one of the highest risks in the MWRA distribution system. The Shaft 7 to WASM 3 Connecting Mains project will provide redundancy so that the main can be rehabilitated in phases.

Until recently, the middle portion of WASM 4 along Nonantum Road was shut down due to an excessive leakage rate. Nonantum Road construction (rehabilitation by sliplining and cleaning and lining) was completed in March 1997 and the rehabilitation of the western portion of WASM 4 was completed in March 2001, including meter upgrades. In order to remove the western portion of WASM 4 from service to allow it to be rehabilitated, MWRA provided alternative supplies for Watertown Meter 103 and Newton Meters 104 and 105. Meter 103 was upgraded and local water main improvements were built along Galen Street in Watertown. These efforts allow the other Watertown meters to temporarily supply the area normally served by Meter 103. These improvements were constructed as non-participating bid items (i.e., funded by MWRA) under a contract administered by the Massachusetts Highway Department. Alternative sources for the Newton northern pressure district, normally supplied by Meters 104 and 105, have been constructed. Two pressure reducing valves, one at Chestnut Street and one at Walnut Street, were installed to allow the southern pressure district that is supplied by the Commonwealth Avenue Pumping Station to temporarily serve the northern pressure district. The rehabilitation of the eastern portion of WASM 4 included fixing a portion of the South Charles River Valley Sewer Sections 163 (D) and 164 (E), a 100+ year old brick sewer that is located directly below the water main. The rehabilitation of WASM 4 is substantially complete.

WASM 4, since rehabilitated will continue to operate as a high service main from the Hultman Aqueduct Branch connection to Shaft W of the MetroWest Tunnel up to the pressure reducing valve facility at Nonantum Road. It will then continue as a low service main to its connection with the East and West Spot Pond Supply Mains. WASM 4 also has the capability to operate completely as a low service main. This flexibility in operating conditions allows WASM 4 to best support the system. When in the split high/low mode, WASM 4 will be able to support WASM 3 through the planned connecting mains during planned shutdowns or emergencies. The availability of this support has significantly reduced the cost of the New Connecting Mains-Shaft 7 to WASM 3 project.

### Scope

Sub-phase	Scope
Design/CA/RI – WASMs 1 & 2 (6142)	Design, construction administration, and resident inspection for the rehabilitation of WASM 1 and WASM 2 (construction contracts 6280 and 6281).
Design/CA/RI - WASM 4 (5147)	Design, construction administration, and resident inspection for the rehabilitation of WASM 4 (construction contracts 6203, 6175, 6312, 6176, and 6313).
Construction - Newton WASMs 1 & 2 (6280)	Construction work on WASM 1 and WASM 2 along Commonwealth Avenue and WASM 1 through Centre Street to the Newton Commonwealth Golf Course.

<b>Sub-phase</b>	<b>Scope</b>
Construction - Boston WASMs 1 & 2 (6281)	Construction on the remaining lengths of WASMs 1 and 2 consists of rehabilitation of 8,640 linear feet of Section 4 of WASM 1 through the Newton Commonwealth Golf Course to Gatehouse #1, rehabilitation of 11,450 linear feet of Sections 7 and 8 of WASM 2 between Grant Avenue and Cleveland Circle, and installation of 650 linear feet of 36-inch pipe from Shaft 7 to Section 47.
Design/CA/RI WASM 3 (6539)	Design, construction administration and resident inspection for construction phases CP2, CP3 and CP4.
Construction - Waltham WASM3 CP2 (6543)	Rehabilitation of the westerly portion of WASM 3 generally located between the Hultman Branch and the Watertown Branch.
Construction – Belmont WASM 3 CP3 (6544)	Rehabilitation of the middle portion of WASM 3 generally located between the Watertown Branch and the Belmont Pumping Station.
Construction - Arlington WASM 3 CP4 (6545)	Rehabilitation of the easterly portion of WASM 3 and a short segment of Section 51 generally located between the Belmont Pumping Station and the Shaft 9 line.
Construction - Arlington Section 28 CP1 (6546)	Rehabilitation of Section 28, the suction main to the Brattle Court Pumping Station, from the WASM 3 connection to the pumping station.
Construction - Auburndale WASMs 1, 2 & 4 (6175)	Cleaning and lining of 5,300 linear feet of 48-inch and 12,300 linear feet of 60-inch diameter mains of WASMs 1, 2 and 4 (Sections 2, 5, 13 and portions of 1) from Weston across the Charles River along Commonwealth Avenue to the Mass Pike in Newton, as well as replacement of existing line valves, air/vacuum valves and blow-off valves.
Construction - Newton WASMs 2 & 4 (6312)	Cleaning and cement lining of 21,200 linear feet of 60-inch pipe on WASM 4 (Sections 13 & 14) along Rowe, Webster, Elm and Washington Streets in Newton, and 5,800 linear feet of 60-inch pipe on WASM 2 (Section 2) along Commonwealth Avenue from Bullough Parkway to Grant Avenue. Rehabilitation of Meters 104 and 105, the Nonantum Road PRV and sliplining of 1,600 linear feet of pipe from Brooks Street to North Beacon Street.
Construction - Allston WASM 4 & W. Ave Sewer (6313)	Sliplining with some limited pipe replacement and cement lining of 10,538 linear feet of 60-inch pipe mostly along Western Avenue, 1,008 linear feet of 42-inch pipe mostly along Memorial Drive, 808 linear feet of twin parallel 30-inch pipes within the Western Avenue Bridge, replacement of Master Meter 100 and rehabilitation of the South Charles River Valley Sewer to include installation of a cured-in-place liner in approximately 5,150 feet of sewer, as well as removal and disposal of sediment in the existing brick sewer, power washing, and rehabilitation of existing manholes and installation of new manholes.
Temporary Water Supply Plan (6996)	Temporary supply of water during WASM 3 construction work.
Construction – WASM 3 PCCP SPL12 (7000)	Replacement of approximately 2,100 linear feet of 60-inch Prestressed Concrete Cylinder Pipe (PCCP) on WASM 3 (Section 12) in Arlington. Includes replacement of air release manhole, replacement of two blow-offs and addition of new mainline butterfly valve with chamber and separate air release manhole.
Design CA/RI WASM 3 PCCP SPL12 (7001)	Design, construction administration and resident inspection services for the replacement of the PCCP pipe portion of WASM 3 (Section 12).

<b>Sub-phase</b>	<b>Scope</b>
Design CA/RI Section 28 (7083)	Design, construction administration, and resident inspection services for the rehabilitation of Section 28, suction main to the Brattle Court Pumping Station, from the WASM 3 connection to the pumping station.

#### Expenditure Forecast (in \$000s) and Project Status

<b>Total Budget</b>	<b>Payments thru FY06</b>	<b>Remaining Balance</b>	<b>FY07 Projected</b>	<b>FY08</b>	<b>FY04-08</b>	<b>FY09-13</b>	<b>Beyond FY13</b>
\$117,967	\$60,410	\$57,557	\$670	\$1,707	\$19,955	\$29,682	\$25,498

Project Status 11/06	51.3%	Status as % is approximation based on project budget and expenditures. Newton WASMs 1 & 2, Boston WASMs 1 & 2, Auburndale WASMs 1, 2 & 4, Newton WASMs 2 & 4, Allston WASM 4 & W. Ave Sewer, and WASM 3 PCCP SPL12 are complete. Design CA/RI WASM 3 is expected to commence in July 2007.
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#### Changes to Project Scope, Budget, and Schedule

<b>Project Cost</b>			<b>Scheduled Completion Date</b>			<b>FY04-08 Spending</b>		
<b>FY07</b>	<b>PFY08</b>	<b>Chge.</b>	<b>FY07</b>	<b>PFY08</b>	<b>Chge.</b>	<b>FY07</b>	<b>PFY08</b>	<b>Chge.</b>
\$116,215	\$117,967	\$1,751	Apr-17	Oct-17	6 mos.	\$21,059	\$19,555	(\$1,104)

#### Explanation of Changes

- Project Cost increase due to inflation adjustments to reflect new ENR index.
- Schedule shift to coordinate with New Connecting Mains-Shaft 7 to WASM 3 project.

#### CEB Impact

None identified at this time.

# S. 732 Walnut Street Pipeline Rehabilitation

## Project Purpose and Benefits

- Contributes to improved public health*
- Extends current asset life*
- Improves system operability and reliability*

*To improve water quality and hydraulic capacity of a pipeline serving the City of Boston. Cleaning and cement mortar lining this cast iron main will enhance water quality, and enable this pipeline to meet maximum demand conditions.*

## Project History and Background

Through this project MWRA will rehabilitate the Walnut Street Pipeline. The work will include the rehabilitation of approximately 5,900 linear feet of 48-inch cast iron mains installed in 1895. An additional length of 2,000 l.f. was cleaned and lined via change order under Contract 5194 (Heath Hill). The pipeline is located in Walnut Street in Brookline and serves Boston Meter 5. Due to internal corrosion, the hydraulic carrying capacity has been reduced. The hydraulic grade line at Meter 5 is not adequate at maximum demand conditions. In addition, unlined cast iron mains may be a significant contributor to diminished water quality within the distribution system. Rehabilitation through cleaning and cement mortar lining with internal joint seals will address this condition. The scope of work will include construction of a pressure reducing valve station and a new Meter 5 near the Boston City Line.

## Scope

Sub-phase	Scope
Construction	Design and rehabilitation of approximately 5,900 linear feet of 48-inch cast iron mains located on Walnut Street in Brookline, construction of a pressure reducing valve station, and the relocation of Meter 5 serving Boston.

## Expenditure Forecast (in \$000s) and Project Status

Total Budget	Payments thru FY06	Remaining Balance	FY07 Projected	FY08	FY04-08	FY09-13	Beyond FY13
\$3,467	\$51	\$3,417	\$753	\$2,504	\$3,308	\$160	\$0

Project Status 11/06	1.5%	Status as % is approximation based on project budget and expenditures. Construction of Phase I to begin in May 2007.
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## Changes to Project Scope, Budget, and Schedule

Project Cost			Scheduled Completion Date			FY04-08 Spending		
FY07	PFY08	Chge.	FY07	PFY08	Chge.	FY07	PFY08	Chge.
\$3,354	\$3,467	\$113	Aug-08	Nov-08	3 mos.	\$2,060	\$3,308	\$1,248

## Explanation of Changes

- Budget increased due to updated inflation to account for more current ENR index for Phase I.
- Schedule changed and spending shifted due to staffing constraints and additional time needed to coordinate with Section 52 and paving of Route 9 in Brookline.

## CEB Impact

None identified at this time.

## S. 683 Heath Hill Road Pipe Replacement

### Project Purpose and Benefits

- Contributes to improved public health*
- Extends current asset life*
- Improves system operability and reliability*

*To repair and improve pipelines and valves in the Southern High and Southern Extra High Service areas which are in poor condition. The targeted pipelines in Brookline and Boston have experienced numerous leaks and breaks, and their hydraulic performance is inadequate. Work includes a fast-track pipe replacement phase, and mostly cleaning and lining along the other pipe segments.*

### Project History and Background

These sections of pipeline near Heath Hill Road supply water to Brookline, Boston, and the Southern Extra High Service System. The severe corrosion on Sections 19, 20, 52, and 58 has resulted in 23 leaks during the last ten years. This project consists of the rehabilitation and/or replacement of these pipelines. Section 58 is 60 years old, and Sections 19 and 20 are 100 years old. All sections have extensive records of leaks and breaks and warrant rehabilitation or replacement. These 36-inch and 48-inch diameter cast iron and steel mains run parallel to the Dorchester Tunnel and serve as suction mains to the Hyde Park Pump Station which supplies the Southern Extra High System. Section 52, a 70-year old, 54-inch steel main, extends from the Chestnut Hill Pump Station to Sections 19, 20, and 58 and provides suction to the Newton Street Pump Station. The construction contract for Rehabilitation of Section 52 was awarded at the January 2006 MWRA Board meeting.

### Scope

Sub-phase	Scope
Design/CS/RI Section 52 Phase 1	Design and related construction services for the replacement of 820 linear feet of pipe with new 54-inch diameter pipe and installation of a new butterfly valve.
Design/CS/RI Section 52 Phase 2	Design, construction services, and resident inspection for rehabilitation of Section 52.
Construction Section 52 New	Replacement of 820 linear feet of pipe with new 54-inch diameter pipe.
Construction Section 52 Rehabilitation	Cement mortar lining and sliplining of 11,500 linear feet of 54-inch steel pipe and removal and replacement of valves.
Design/CS/RI Sections 20 and 58	Design, construction administration, and resident inspection of rehab of sections 20 and 58 in the City of Boston.
Construction Sections 58,20,19	Rehabilitation of approximately 11,000 feet of 48-inch diameter and 10,000 feet of 36-inch diameter segments of Sections 19, 20, and 58. Also includes valve, meter, and vault construction at Shaft 7C to incorporate all hazardous material work at Shaft 7C into one contract.

**Expenditure Forecast (in \$000s) and Project Status**

<b>Total Budget</b>	<b>Payments thru FY06</b>	<b>Remaining Balance</b>	<b>FY07 Projected</b>	<b>FY08</b>	<b>FY04-08</b>	<b>FY09-13</b>	<b>Beyond FY13</b>
\$19,915	\$11,981	\$7,934	\$6,857	\$10,428	\$10,428	\$0	\$0

Project Status 11/06	76.6%	Status as % is approximation based on project budget and expenditures. Phase I is complete with only design and construction of the Section 52 rehab remaining to be completed.
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**Changes to Project Scope, Budget, and Schedule**

<b>Project Cost</b>			<b>Scheduled Completion Date</b>			<b>FY04-08 Spending</b>		
<b>FY07</b>	<b>PFY08</b>	<b>Chge.</b>	<b>FY07</b>	<b>PFY08</b>	<b>Chge.</b>	<b>FY07</b>	<b>PFY08</b>	<b>Chge.</b>
\$19,282	\$19,915	\$633	Oct-07	Oct-07	None	\$9,527	\$10,428	\$902

**Explanation of Changes**

- Budget and spending increase due to change order to include a new section of pipeline for cleaning and cement-lining.

**CEB Impact**

None identified at this time.



## S. 721 Southern Spine Distribution Mains

### Project Purpose and Benefits

- ☑ *Contributes to improved public health*
- ☑ *Extends current asset life*
- ☑ *Improves system operability and reliability*

*To increase carrying capacity and improve valve operability along the large surface mains that run parallel to the Dorchester Tunnel and provide service to the Southern High and Southern Extra High systems. Currently these mains have serious hydraulic deficiencies and many inoperable valves. Hydraulic performance improvements are needed to provide redundancy for the Dorchester Tunnel. Work will include rehabilitation of more than 12 miles of large diameter pipeline.*

### Project History and Background

The Southern Spine Distribution Mains comprise the surface piping which parallels the Dorchester Tunnel. The mains begin in the vicinity of Shaft 7B in Brookline and end at the Blue Hills Reservoir in Quincy. The mains serve the Southern High and Southern Extra High System communities of Boston, Brookline, Milton, Quincy, Norwood, and Canton.

Because of the poor conditions of the valves, MWRA operations staff must frequently close several valves in order to shut down a line. This practice often results in closing more of the system than is otherwise necessary. Several of these pipelines are currently functioning at approximately 50% of their original carrying capacity due to the build up of rust deposits and other matter along the pipeline walls. In their present condition, these mains could not provide adequate service to users if the Dorchester Tunnel was taken off-line.

Construction of the first two contracts for Section 22 South was completed by June 2005. The design for Section 107 Phases 1 and 2 are 90% complete.

### Scope

Sub-phase	Scope
Sections 21,43, 22 Design/CS/RI	Design, construction services, and resident inspection for five construction contracts in Phase 1, including rehab of 32,000 linear feet of 24- to 48-inch main, and installation of 17,000 linear feet of 36- to 48-inch main. Rehabilitation to consist of cleaning and cement mortar lining, and replacement of the main line valves, blow-off valves, and appurtenances.
Section 22 South Construction	Rehabilitation of approximately 10,000 linear feet of existing 48-inch Section 22 South, and installation of 1,700 linear feet of new pipe.
Adams Street Bridge	Relocation of a pipeline made necessary by the reconstruction of this bridge by the MBTA.
Southern High Ext Study	Study to determine the feasibility of expanding water services to additional communities in the Southern High Service Area. Cost of the study and public participation was fully funded by the Commonwealth of Massachusetts.
Section 22 North Facility Plan/EIR	Facility Plan/EIR for Section 22 North
Section 22 North Design/ESDC	Design/ESDC for Section 22 North.
Section 22 North Construction	Rehabilitation of 17,300 linear feet of existing 48-inch Section 22 North.
Section 107 Phase 1 Construction	Construction of 4,400 linear feet of new 48-inch water main from East Milton Square to Furnace Brook Parkway in Milton and Quincy.

Sub-phase	Scope
Section 107 Phase 2 Construction	Replacement of existing Sections 21 and 43 with 11,000 linear feet of new 48-inch water main from Dorchester Lower Mills in Boston to East Milton Square.
Contract 1 A Construction	Rehabilitation of 4,400 linear feet of Section 22 South.

#### Expenditure Forecast (in \$000s) and Project Status

Total Budget	Payments thru FY06	Remaining Balance	FY07 Projected	FY08	FY04-08	FY09-13	Beyond FY13
\$67,489	\$12,827	\$54,662	\$636	\$5,062	\$15,328	\$31,446	\$17,518

Project Status 11/06	19.1%	Status as % is approximation based on project budget and expenditures. Construction of Contracts 1 and 1A for Section 22 South is completed. Section 107 Phase 1 Construction is expected to begin in May 2007.
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#### Changes to Project Scope, Budget, and Schedule

Project Cost			Scheduled Completion Date			FY04-08 Spending		
FY07	PFY08	Chge.	FY07	PFY08	Chge.	FY07	PFY08	Chge.
\$62,265	\$67,489	\$5,225	May-16	May-16	None	\$13,215	\$15,328	\$2,113

#### Explanation of Changes

- Budget increase primarily due to additional work added to project scope, including facility plan/EIR for Section 22 North, and updated inflation to account for more current ENR index.
- FY04–08 spending shifted with the project reconfiguration and re-sequencing.

#### CEB Impact

None identified at this time.

# S. 727 Southern Extra High Redundancy & Storage

## Project Purpose and Benefits

- ☑ *Contributes to improved public health*
- ☑ *Provides environmental benefits*
- ☑ *Extends current asset life*
- ☑ *Improves system operability and reliability*

## Project History and Background

This project will provide redundancy to Sections 77 and 88, which are currently single spine mains serving Canton, Norwood, Stoughton and Dedham-Westwood, through construction of a redundant pipeline. Approximately 30,000 lf of 36-inch main will be constructed. The project will also increase distribution storage within the service area to improve system operation and reliability.

MWRA's Southern Extra High pressure zone serves Canton, Dedham, Norwood, Stoughton, Westwood, portions of Brookline, Milton, and Newton, and the Roslindale and West Roxbury sections of Boston. Water is pumped to this pressure zone from the Dorchester tunnel through three pump stations.

The Southern Extra High pressure zone is currently deficient in distribution storage and lacking in redundant distribution pipelines. The average day water use of the Southern Extra High communities from MWRA's system is 13.3 million gallons per day (mgd); the maximum day use is 21.1 mgd. MWRA maintains two distribution storage tanks (Bellevue Tank 1 and Bellevue Tank 2) totaling 6.2 million gallons of storage for the entire Southern Extra High service area, which is significantly below the goal of one day of storage. Further highlighting the deficiency is the fact that the overflow elevation for the 2.5-million-gallon Bellevue Tank 1 is 25 feet lower than the overflow elevation for the newer 3.7-million-gallon Bellevue Tank 2, limiting its useful capacity.

The five communities in the southern portion of the service area (Canton, Norwood, Dedham, Westwood and Stoughton) are served by a single MWRA 36-inch diameter transmission main (Section 77), which is five miles long. Canton and Stoughton are served by a branch (Section 88) off of Section 77. Although several of these communities are partially supplied by MWRA, the loss of this single transmission main would result in a rapid loss of service in Norwood and Canton, and water restrictions for Stoughton and Dedham/Westwood.

In addition, the Southern Extra High service area has expanded during the past several years with the addition of the partially-supplied Town of Stoughton and the Dedham-Westwood Water District. This growth has been concentrated to the south while the Bellevue tanks are located at the northern end of the service area. Although several of these communities are partially supplied by MWRA, the Town of Norwood is fully supplied by this line and has no back-up source of supply. There have been several instances when the water supply to Norwood has been interrupted due to valve and/or pipe failures.

## Scope

Sub-phase	Scope
Concept Plan	A study to assess storage, capacity and condition of existing distribution pipes, new pipeline routing options and tank sites will be identified.
SEH Storage Des/Con	This project includes design and construction for additional storage with the location and volume to be determined by the Concept Study.
Redundancy Loop Des/Con	Provide redundancy to Sections 77 & 88 through design and construction of a redundant pipeline. Approximately 30,000 lf of 36-inch main to be constructed from the Hyde Park PS to the south.
Section 77/88 Des/Con	Rehab of Sections 77 & 88 after redundant pipeline is in place.

**Expenditure Forecast (in \$000s) and Project Status**

<b>Total Budget</b>	<b>Payments thru FY06</b>	<b>Remaining Balance</b>	<b>FY07 Projected</b>	<b>FY08</b>	<b>FY04-08</b>	<b>FY09-13</b>	<b>Beyond FY13</b>
\$41,372	\$0	\$41,372	\$350	\$550	\$900	\$25,489	\$14,983

Project Status 11/06	0.0%	Status as % is approximation based on project budget and expenditures. Conceptual Design began in December 2006.
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**Changes to Project Scope, Budget, and Schedule**

<b>Project Cost</b>			<b>Scheduled Completion Date</b>			<b>FY04-08 Spending</b>		
<b>FY07</b>	<b>PFY08</b>	<b>Chge.</b>	<b>FY07</b>	<b>PFY08</b>	<b>Chge.</b>	<b>FY07</b>	<b>PFY08</b>	<b>Chge.</b>
\$0	\$41,372	\$41,372		Jun-23	n/a	\$0	\$900	\$900

**Explanation of Changes**

- New Project

**CEB Impact**

No impacts identified at this time.

# S. 719 Chestnut Hill Connecting Mains

## Project Purpose and Benefits

- ☑ *Contributes to improved public health*
- ☑ *Extends current asset life*
- ☑ *Improves system operability and reliability*

*To simplify the complex arrangement of old pipes near the Chestnut Hill pump stations for safety and operability. Also, create a connection between Shaft 7 of the City Tunnel and the Southern Distribution surface mains to provide redundancy along the Dorchester Tunnel. MWRA is restructuring the piping arrangement through a combination of constructing new pipelines, rehabilitating older pipe lines, sliplining abandoned aqueducts, replacing pressure regulating valves, replacing the emergency pumps at Chestnut Hill, and abandoning pipes and valves which are no longer needed for service.*

## Project History and Background

At Chestnut Hill the City Tunnel divides into two branches: the City Tunnel Extension going north to supply the Northern High System and the Northern Intermediate High System, and the Dorchester Tunnel, which goes south to supply the Southern High System and the Southern Extra High System. There are two shafts in the Chestnut Hill area: Shaft 7 on the City Tunnel, located immediately west of the Chestnut Hill Reservoir, and Shaft 7B on the Dorchester Tunnel, located immediately east of the reservoir. At each of these shafts two newer pipes extend to connect to the older pipelines of the Boston Low Service System, the Northern Low Service System, and the Southern High Service System.

The Southern High System can only be supplied from Shaft 7B. If the Dorchester Tunnel were to be out of service, it would be necessary to activate the Sudbury Reservoir System, transport water from there via the Sudbury Aqueduct (currently on standby) to the Chestnut Hill Reservoir (currently on standby) and utilize the newly constructed emergency pump station at Chestnut Hill to pump water from the reservoir to the Southern High System. This water would not be of acceptable quality and its use would require a boil order.

The older pipes in the area were originally designed to be supplied from the Cochituate and Sudbury Aqueducts, the Chestnut Hill Reservoir, or the Chestnut Hill High Service and Low Service pump stations. None of these facilities is presently in normal use, though the new underground pump station has replaced the Chestnut Hill stations. The pipe network is not only old and inordinately complex, but it is not designed to take water from the two tunnel shafts that are the present sources of potable supply. Portions of this pipe network have been rehabilitated and integrated into the present operation of the system. Considerable lengths of pipe with minimal or stagnant flow, which are a source of red water, have been abandoned. Some new pipe was added to better connect the two tunnel shafts with the surface pipe network. The interconnections between the potable water system and standby facilities, which are considered non-potable, have been rebuilt to eliminate the possibility of cross-connections during normal operation.

The High and Low Service pump station buildings at Chestnut Hill housed facilities which served four functions: emergency pumping, surge relief for the Boston Low System, level control for the Chestnut Hill Reservoir, and remote hydraulic operation of large valves on and near the site of the High Service station. Construction of a new underground pump station provides more reliable emergency pumping capacity and has enabled MWRA to abandon the pump station buildings and return them to the Commonwealth. Surge relief was provided in a new Shaft 7B pressure reduction chamber that also interconnects restructured piping. Future design efforts will relocate reservoir level control functions. Gate House No. 2 has also been refurbished to provide supply to the new pump station. New valves have been constructed to replace the old hydraulic valves.

## Scope

Sub-phase	Scope
Design/CA/RI and Construction – Pump Station Potable Connection	Construction of potable suction and discharge piping to the emergency pump station, restructuring piping to permit surplusing of Chestnut Hill pumping station site, elimination of potential cross connections with non-potable suction and discharge lines, reconstruction of the Shaft 7B PRV Station, upgrade of the Shaft 9A PRV station, rehabilitation of valves at Waban Hill Reservoir, and abandonment of the Ward Street Pumping Station and associated piping. Construction to provide potable low service suction to the new pump station and to restructure piping to permit surplusing of the historic pumping stations site. Completion of upgrades of facilities that also may be used during the Walnut Hill Water Treatment Plant startup at Shaft 7B, Shaft 9, and Ward Street.
Preliminary Engineering	Provide preliminary design services for the rehabilitation and upgrade of facilities so that MWRA is able to operate the water system during normal conditions and specific emergency scenarios.
Design/CS/RI and Construction – Emergency Pump Relocation	Relocation of the emergency pumping function and other minor facilities from the existing High and Low Service pump station buildings to a new 90-mgd underground pump station constructed adjacent to the Low Service building. The relocation enables MWRA to surplus these historic buildings. The new pump station has the capacity to pump 90-mgd from the Sudbury Aqueduct/Chestnut Hill Reservoir to the Southern High Distribution System.
Boston Paving	Payment(s) to the City of Boston for paving work provided.
BECo Emergency Pump Connection	Payment to Boston Edison Company for installation of electrical service to meet special requirements. Provision of the services eliminated the need to install a standby generator.
Equipment Pre-Purchase	Valve pre-purchase to support potable connection construction so that the Chestnut Hill Pump Station site could be returned to the Commonwealth of Massachusetts as surplus property.
Demolition of Garages	Demolition of garages prior to transfer of property to the Commonwealth, at request of state Department of Capital Asset Management.
Final Design CA/RI	Design CA/RI services for final pipe connections work (Chapter 30 & 149).
Chapter 30 Construction	Chapter 30 Construction final pipe connection.
Chapter 149 Construction	Chapter 149 Construction final pipe connection.

## Expenditure Forecast (in \$000s) and Project Status

Total Budget	Payments thru FY06	Remaining Balance	FY07 Projected	FY08	FY04-08	FY09-13	Beyond FY13
\$24,558	\$17,468	\$7,090	\$26	\$0	\$1,755	\$7,065	\$0

Project Status 11/06	71.1%	Status as % is approximation based on project budget and expenditures. Preliminary engineering for the final pipe connections reached substantial completion in April 2006. Final Design CA/RI is expected to begin in July 2008.
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**Changes to Project Scope, Budget, and Schedule**

Project Cost			Scheduled Completion Date			FY04-08 Spending		
FY07	PFY08	Chge.	FY07	PFY08	Chge.	FY07	PFY08	Chge.
\$19,070	\$24,558	\$5,488	Jun-11	Jan-12	7 mos.	\$2,068	\$1,755	(\$313)

**Explanation of Changes**

- Budget increased and schedule extended due to the addition of Chapter 30 and Chapter 149 Final Pipe Connection construction phases.

**CEB Impact**

None identified at this time.

## S. 704 Rehabilitation of Other Pump Stations

### Project Purpose and Benefits

- ☑ *Contributes to improved public health*
- ☑ *Extends current asset life*
- ☑ *Results in a net reduction in operating costs*
- ☑ *Improves system operability and reliability*

*To rehabilitate five active pump stations (Brattle Court, Reservoir Road, Hyde Park, Belmont, and Spring Street) - each of which is more than 40 years old and is overdue for renewal for safety, reliability, and efficiency reasons.*

### Project History and Background

MWRA's waterworks distribution system includes ten active pump stations. Extensive rehabilitation of the James L. Gillis, Newton Street, Lexington Street, and Commonwealth Avenue pump stations is complete. The Dudley Road Pump Station will not be rehabilitated because the station will be abandoned.

The Brattle Court, Reservoir Road, Hyde Park, Belmont, and Spring Street stations are between 40 and 80 years old and are overdue for major rehabilitation. The Brattle Court Pump Station serves the towns of Arlington, Lexington, Waltham, and Winchester. The Reservoir Road Pump Station serves Brookline. The Hyde Park Pump Station serves Boston, Milton, Norwood, and Canton. The Belmont Pump Station serves Belmont, Arlington, and Watertown. The Spring Street Pump Station serves Lexington, Bedford, part of Waltham, Belmont, Arlington, and Winchester. Some equipment at each pump station is inoperable, and system demand patterns have shifted during the life of the stations, requiring adjustments to pumping capacity. In addition, station improvements have not kept pace with changes in building and safety codes.

MWRA has divided construction into two contracts. The first contract (Construction - Interim Automation), based on a fast-track design and completed in February 2001, involved installation of SCADA systems at each station. Under the second construction contract, MWRA will complete rehabilitation of the five pump stations. The second construction contract was awarded in October 2006.

### Scope

Sub-phase	Scope
Preliminary Design	Planning and conceptual design including inspection and evaluation of the HVAC systems, buildings, pipes, valves, and other systems at the pump stations; determination of the need for improvements; and preparation of a conceptual design report.
Design 1/CS/RI	Design for rehabilitation of five pump stations, including installation of SCADA systems.
Construction II and C	Installation of instrumentation at five pump stations to enable remote operation and monitoring.
Rehab of 5 Pump Stations	Rehabilitation of Belmont, Brattle Court, Spring Street, Hyde Park, and Reservoir Road pump stations, including installation of new mechanical, electrical, instrumentation, and security systems, and building and site refurbishment, and SCADA installation.
Proprietary Equipment Purchases	Purchase of proprietary materials for SCADA system for Interim Instrumentation and Control.
Design 2 CS/RI	Final Design, construction services, and resident inspection for rehabilitation of five pump stations.



**Expenditure Forecast (in \$000s) and Project Status**

Total Budget	Payments thru FY06	Remaining Balance	FY07 Projected	FY08	FY04-08	FY09-13	Beyond FY13
\$26,183	\$4,556	\$21,626	\$3,859	\$5,804	\$10,545	\$11,963	\$0

Project Status 11/06	17.8%	Status as % is approximation based on project budget and expenditures. Construction rehabilitation of 5 pump stations (Belmont, Brattle Court, Spring Street, Hyde Park, and Reservoir Road) NTP was issued in October 2006 and expected to be completed in FY10.
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**Changes to Project Scope, Budget, and Schedule**

Project Cost			Scheduled Completion Date			FY04-08 Spending		
FY07	PFY08	Chge.	FY07	PFY08	Chge.	FY07	PFY08	Chge.
\$29,483	\$26,183	(\$3,301)	Mar-10	May-10	2 mos.	\$14,016	\$10,545	(\$3,471)

**Explanation of Changes**

- Budget decreased due to actual construction award amount was less than budget.

**CEB Impact**

None identified at this time.

# S. 722 Northern Intermediate High Redundancy and Covered Storage

## Project Purpose and Benefits

- Contributes to improved public health*
- Extends current asset life*
- Improves system operability and reliability*

*The Northern Intermediate High System lacks both pipeline redundancy and sufficient storage. The intent of this project is to identify and take measures that reduce both the risk and impacts of a pipeline failure within the Northern Intermediate High System.*

## Project History and Background

This system serves Reading, Stoneham, Wakefield, Winchester and Woburn, with an average day demand of 7.8 million gallons. Wilmington is also considering application to MWRA supplemental water. If Wilmington is included, the population served is approximately 150,000. The current six million gallon capacity of MWRA's Bear Hill Tank in Stoneham is both insufficient to meet MWRA's 1993 Water System Master Plan goal of one day of emergency storage for the service area and is not advantageously placed within the NIH system.

Section 89 is a three mile, four foot diameter PCCP transmission main with no redundancy other than the low capacity, century old Section 29 that parallels its route for a short distance. The 10,500-foot length of Section 89 northwest of Spot Pond is constructed of Class IV wire which is of significant concern given experience with catastrophic failures elsewhere in the country. Section 29 is 96 years old and measures 6,300 feet in length and 24 inches in diameter. Because of its age and the fact that it is unlined, tuberculation has reduced the pipeline carrying capacity to approximately 45% of the original design capacity (C-value: 58). In the event of a shut down in Section 89, Section 29 may not be able to meet the minimum hydraulic needs of the area and additional chlorination to maintain water quality may be required.

## Scope

Sub-phase	Scope
Concept Plan	Develop a concept level plan to evaluate options to reduce the risk and the impacts of potential failures in Sections 29 and 89. Measures may include (but are not limited to) valve improvements, improved community interconnections, pipeline redundancy, targeted emergency response plans, additional storage or other improvements that can be implemented within the NIH system. The Concept Plan will be completed in Summer, 2007.
Design CA/RI and Construction NIH Improvements	<b>This phase is subject to change pending completion of the Concept Plan.</b> The Concept Plan will identify short-term and long-term measures to reduce the risk and impact of pipeline failures. This phase will cover the design and construction of short-term measures identified in the conceptual plan.
Design and Construction Section 89/29 Redundancy	The Concept Plan has developed preliminary route alternatives in order to provide redundancy to Section 89. Final routes will be determined following consultations with local elected officials, consideration of permitting requirements, project impacts and the location of the recommended storage for the NIH system.
NIH Storage Design and Construction	The Concept Plan has identified several potential storage locations in the NIH system. The goal is to provide approximately 6MG of additional storage in the short-term with the potential identification of a future storage location should longer-term population and employment growth require additional storage.
Section 89/29 Rehab Design and Construction	There must be a redundant pipeline prior to Section 89 being taken off line for repairs. At that point, the pipeline can be inspected and rehabilitated as necessary. The extent to which Section 29 will be rehabilitated will depend in part, upon the route of the redundant pipeline.

NIH Gillis Redundancy Design and Construction	Design and construction to provide redundancy for the Gillis Pump Station. The Concept Plan will identify potential locations for this facility as part of the long-term improvements for the NIH system.
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**Expenditure Forecast (in \$000s) and Project Status**

Total Budget	Payments thru FY06	Remaining Balance	FY07 Projected	FY08	FY04-08	FY09-13	Beyond FY13
\$57,200	\$42	\$57,158	\$719	\$210	\$971	\$41,052	\$15,177

Project Status 11/06	0.4%	Status as % is approximation based on project budget and expenditures. Concept planning NTP was February 2006 followed by design with a start date of July 2008.
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**Changes to Project Scope, Budget, and Schedule**

Project Cost			Scheduled Completion Date			FY04-08 Spending		
FY07	PFY08	Chge.	FY07	PFY08	Chge.	FY07	PFY08	Chge.
\$7,412	\$57,200	\$49,788	Jun-12	Jun-18	72 mos.	\$972	\$971	(\$1)

**Explanation of Changes**

- Budget increase due to the addition of Section 89/29 Redundancy, NIH Storage, Section 89/29 Rehabilitation, and NIH Gillis Redundancy subphases.

**CEB Impact**

None identified at this time.

# **S. 689 James L. Gillis Pump Station Rehabilitation**

## **Project Purpose and Benefits**

- Contributes to improved public health*
- Provides environmental benefits*
- Fulfills a regulatory requirement*
- Extends current asset life*
- Improves system operability and reliability*

*To improve and modernize pumping facilities and equipment at the 90-year old formerly named Spot Pond Pump Station. These improvements directly benefit the Northern High and Northern Intermediate High systems, and improve MWRA's system-wide emergency response capabilities. Project components included rehabilitation of the pump station, installation of a new suction line, rehabilitation of discharge lines, construction of a sanitary sewer, and remediation of a contaminated land site. Completion of this project also enables MWRA to comply with Safe Drinking Water Act requirements.*

## **Project History and Background**

MWRA used the pump station at Spot Pond (built in 1905) to chlorinate and pump water from the pond to the Northern Intermediate High Service Area (Bear Hill Reservoir) and the Northern High Service Area (Fells Reservoir). Due to the age, condition, and critical need for the facility, rehabilitation of the pump station was a top priority for MWRA. Project work included refurbishment of the site, facility, and equipment, electrical and mechanical system upgrades, and installation of new equipment needed for improved facility operation.

In addition, MWRA has installed a new 14,500 feet, 60- to 72-inch diameter suction pipeline from the City Tunnel shaft in Malden to the rehabilitated facility, now known as the James L. Gillis Pump Station. The new suction line provides the station with water at a pressure head greater than the pond, significantly reducing pumping requirements, and eliminating the need to take water from Spot Pond, an uncovered water source, in compliance with the requirements of the Safe Drinking Water Act. As a result of completing this project, MWRA removed the open Spot Pond Reservoir from active service in 1997.

The new pipeline has improved system reliability by providing increased capacity to transfer water between the low and high service systems during emergencies and facilitates use of the new Fells Reservoir covered storage facility as the main distribution reservoir for the Northern High Service System. To provide adequate discharge capability, this project included rehabilitation of 7,525 feet of Sections 13 and 64. These 36-inch diameter mains extend from the pump station to the Fells Reservoir, and deliver water to Melrose and Stoneham. Because the structural integrity of these pipelines was determined to be sound, staff chose rehabilitation rather than replacement to improve carrying capacity, reduce friction and turbulence, and reduce the risk of water quality impairment. This project also included a major improvement to the layout of valves between the pump station and Fells Reservoir.

A 1,500-foot sanitary sewer is also being constructed to replace an existing septic system that serves the pump station and an adjacent house. Sewage from both facilities is pumped by a small ejector station to an MDC sewer on Pond Street in Stoneham. During design of the pump station rehabilitation, several environmental problems were discovered including contamination of soil, groundwater, and an adjacent brook. Under an emergency compliance order MWRA and DEP worked together to eliminate the sources of contamination at the pump station. MWRA is completing the cleanup process at the site, as required by DEP.

The Gillis Pump Station project also involved evaluation of the environmental conditions at the site and the nearby Spot Pond Brook area and the preparation and implementation of a remedial cleanup plan. This portion of the project is comprised of three phases and follows the Massachusetts Contingency Plan as specified by DEP. The first phase (study) consists of an environmental assessment to determine the type and extent of contamination. The second phase (Feasibility Study/Remedial Response Plan) includes a risk assessment to determine the level of risk to the environment and to the public, and the development of a plan of corrective actions. The third phase (Implementation of Remedial Response Plan) consists of performing the corrective action and restorative work specified in the remedial response plan.

The new pump station has been operable since the fall of 1997 and final site restoration was performed in the spring of 1999. Construction of the suction pipeline (Section 99) was completed in July 1998. The only remaining work is remediation of contamination on-site.

**Scope**

Sub-phase	Scope
Environmental Assessment, Remediation Plan, and DEP Review	Determination of the nature and extent of contamination at the pump station and brook area, risk assessment to determine the level of risk to the environment and to the public, and development and implementation of a remedial action plan.

**Expenditure Forecast (in \$000s) and Project Status**

Total Budget	Payments thru FY06	Remaining Balance	FY07 Projected	FY08	FY04-08	FY09-13	Beyond FY13
\$33,446	\$33,378	\$69	\$64	\$5	\$338	\$0	\$0

Project Status 11/06	99.8%	Status as % is approximation based on project budget and expenditures. Project is complete.
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**Changes to Project Scope, Budget, and Schedule**

Project Cost			Scheduled Completion Date			FY04-08 Spending		
FY07	PFY08	Chge.	FY07	PFY08	Chge.	FY07	PFY08	Chge.
\$34,146	\$33,446	(\$700)	Sep-07	Sep-07	None	\$1,038	\$338	(\$700)

**Explanation of Changes**

- Budget decrease reflects the elimination of the Remedial Action Plan from the project scope.

**CEB Impact**

No additional impacts expected at this time.

# **S. 713 Spot Pond Supply Mains - Rehabilitation**

## **Project Purpose and Benefits**

- Contributes to improved public health*
- Extends current asset life*
- Improves system operability and reliability*

*To improve the condition, carrying capacity, and valve operability of the two long supply mains which extend north from Chestnut Hill to Spot Pond. These cast-iron mains, which are 100 years old, deliver water to the Northern Low Service System. Improvements involve a combination of replacement, cleaning and lining, and valve replacement depending on specific site conditions and needs. Improving these supply lines will reduce the need to take water from the City Tunnel to augment the Low Service System and improve the quality of water delivered to eight user communities.*

## **Project History and Background**

The East and West Spot Pond Supply Mains (SPSMs) serve the Northern Low Service Area, including portions of Brighton, East Boston, Charlestown, Chelsea, Malden, Medford, Somerville, and Everett. The lines are also designed to fully supply Cambridge during drought or emergency. The mains have historically supplied Spot Pond and subsequently the James L. Gillis Pump Station (formerly the Spot Pond Pump Station). With the closure of Spot Pond as a water supply source and the construction of the Spot Pond Suction Main (Section 99) as the primary supply to the Gillis Pump Station, the Spot Pond Supply Mains will serve as distribution mains to the eight communities and will provide emergency backup supply to the Gillis Pump Station. In the event Section 99 is out of service, the station would take suction directly from these mains, rather than from Spot Pond.

The East Spot Pond Supply Main consists of 61,000 linear feet of mostly 48-inch diameter pipeline which passes through Brookline, Boston, Cambridge, Somerville, Medford, Malden, Melrose, and Stoneham. The West Spot Pond Supply Main consists of 53,000 linear feet of 48-inch and 60-inch diameter pipeline that passes through Brookline, Boston, Cambridge, Somerville, Medford, and Stoneham. Portions of the SPSMs in Brookline, primarily on Beacon Street, are being rehabilitated under the Boston Low Service Pipe and Valve Rehabilitation project.

The carrying capacities of the 100-year old mains have been significantly reduced as a result of the build up of rust deposits (tubercules) and other matter along the pipeline walls, which also contributes to water quality deterioration in the Low Service System. The ability of the mains to withstand service pressures is drastically reduced in some areas due to exterior corrosion of pipes. In addition, inoperable or poorly operating valves along the line make isolation and re-routing of flow difficult to implement.

Section 67 is included in this project because it provides a connection between the East and the West Supply Mains from Section 11 at Porter Square in Cambridge to Section 4 at Union Square in Somerville. Section 67 consists of 6,900 linear feet of 48-inch diameter steel pipeline constructed in 1949. Rehabilitation of this main is needed because of the age of the pipe and the critical role of the main in providing flow to the East and West mains during shut downs for maintenance and construction.

Internal lining of these mains to restore capacity and improve structural integrity, will ensure adequate peak and emergency flow to user communities, alleviate water quality deterioration, and provide emergency back-up capacity for the Northern High System via the Gillis Pump Station. MWRA's planned reconfiguration of the water distribution system provides for the Spot Pond Supply Mains to be fed from the City Tunnel Extension only during periods of peak demand, thus conserving tunnel supply for High Service use. Supply to the Low Service System will be provided by Weston Aqueduct Supply Mains 1 and 2, which will be connected to the new Loring Road covered storage tanks in Weston that have been constructed as part of MWRA's MetroWest Water Supply Tunnel project. A portion of the supply will be from WASM 4, which connects to the East and West Spot Pond Supply Mains at Western Avenue and North Harvard Avenue and on Memorial Drive at Magazine Beach in Cambridge.

Completion of this project will facilitate consolidation of the Boston Low and Northern Low Service Areas into one service area and will improve pressures to the far reaches of the Northern High Service Area by reducing the

demand burden on the City Tunnel Extension. The quality of water delivered to eight communities will improve as a result of the upgrade of 18 miles of deteriorated pipe.

### Scope

Sub-phase	Scope
Preliminary Design and Design/CA/RI	Preliminary design, design, construction administration, and resident inspection of the rehabilitation or replacement of Sections 3, 4, 5, 6, 7, 9, 10, 11, 12, 67, and portions of Sections 2, 16W, and 57.
North (Medford/Melrose) Construction-CP1	Cleaning and lining of 20,300 feet of 48-inch and 60-inch pipe in Medford, Malden, Melrose, and Stoneham (Sections 7 and 12). Replacement of valves and reconfiguration of blow-off valves to eliminate cross-connections with storm drains or sewers. Elimination of connection with Spot Pond (considered a cross connection with a non-potable water source), and configuration to allow emergency reconnection if needed.
Middle (Medford/Somerville) Construction – CP2	Cleaning and lining of 24,100 feet of the East Spot Pond Main (48-inch pipe) in Somerville and Malden (Sections 4, 5, 6, and 7) including reinforcement at rail and MBTA crossings; cleaning and lining of 14,000 feet of the West Spot Pond Main (48-inch pipe) in Medford and Somerville; and some steel pipe replacement on the Mystic Valley Parkway (800 feet, 60-inch, Section 16W), and Middlesex Fells Parkway (700 feet, 48-inch, Section 5 on land). Cleaning and lining on Somerville Avenue (Section 67, 6,500 feet of 48-inch steel). Replacement of valves throughout the pipelines, including in Medford Square at the interconnections of Sections 12, 16W, and 57.
South (Cambridge/Boston) CA/RI Construction – CP3	Cleaning and lining of 11,700 linear feet of the East Spot Pond Main in Charles River Crossing and Cambridge (48-inch, Sections 3 and 4) including valve replacement, and cleaning and lining of 16,800 linear feet of the West Spot Pond Main in Harvard St., Franklin St., No. Harvard Avenue, and Massachusetts Avenue (48-inch, Sections 9 and 11, Brighton and Cambridge).
Early Valve Replacement Contract	Installation of nine main line valves and associated blow-off valves, as well as permanent by-pass piping to meters and air valves. Also includes removal of pipe at three locations for materials strength testing.
Construction 4 – Trusses	Section 4 Bridge Trusses spanning the Fitchburg Main Line and the New Hampshire-Maine Line are in need of repair, painting and replacement, respectively.
Early Valve Equipment Purchase	Purchase Order for 12 valves that were installed from 1998-1999 as a precursor to the cleaning and lining contracts.

### Expenditure Forecast (in \$000s) and Project Status

Total Budget	Payments thru FY06	Remaining Balance	FY07 Projected	FY08	FY04-08	FY09-13	Beyond FY13
\$62,629	\$51,467	\$11,163	\$8,505	\$1,697	\$37,581	\$0	\$960

Project Status 11/06	87.5%	Status as % is approximation based on project budget and expenditures. Work in Contract 2 is substantially complete including Malden, Somerville and a major portion of Medford. Work in Contract 3 is complete in Brighton and the West Spot Pond Main in Cambridge. Contract 3 work continues on the East Spot Pond Main in Cambridge.
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### Changes to Project Scope, Budget, and Schedule

Project Cost			Scheduled Completion Date			FY04-08 Spending		
FY07	PFY08	Chge.	FY07	PFY08	Chge.	FY07	PFY08	Chge.
\$61,795	\$62,629	\$834	Dec-09	Dec-18	108 mos.	\$36,954	\$37,581	\$627

#### Explanation of Changes

- Budget increased due to change orders and expected change orders for South and Middle construction contracts.
- Schedule shift a result of management decision.
- FY04 – FY08 Spending changed as a result of the budget changes above.

#### CEB Impact

None identified at this time.



# S. 723 Northern Low Service Rehabilitation - Section 8

## Project Purpose and Benefits

- ☑ *Contributes to improved public health*
- ☑ *Extends current asset life*
- ☑ *Improves system operability and reliability*

*To improve the condition and reliability of an unlined pipeline serving a portion of the Northern Low System. This pipeline, Section 8, has reduced carrying capacity because of rust build-up, and has experienced leaks at above average rates. Improvements will consist primarily of replacement of a portion of Section 8 and cleaning, lining, and valve repairs along nearly 1.5 miles of water main. Rehabilitation of Sections 37 and 46 will improve the service to East Boston and will allow the shutdown of Section 8 for rehabilitation. The construction of Section 97A will provide needed redundancy to East Boston via the Northern High System.*

## Project History and Background

Section 8 was installed between 1897 and 1913 and serves Malden, Everett, Chelsea, and East Boston. The Section 8 pipeline is currently functioning at approximately 45% of its original capacity (C-value: 60) due to the build up of rust deposits and other matter along the pipeline walls. Excavations for the installation of new valves along portions of Section 8 have indicated possible severe external corrosion on the pipe wall, which could affect the structural stability of the pipeline.

Before rehabilitating Section 8, the distribution system supplying East Boston must be strengthened. The existing Sections 37 and 46, located in Chelsea, are older 36-inch cast iron mains. These two pipe sections connect between Section 57, previously rehabilitated, and the two Chelsea River crossings to East Boston at Sections 8 and 38. It is anticipated that these two pipelines will need cleaning and cement mortar lining. Section 97A, a new 16-inch pipeline will provide redundancy to East Boston via Northern High System. The pipeline will connect to existing Meter 99 in East Boston and to the Boston low-pressure system through a new pressure-reducing valve.

## Scope

Sub-phase	Scope
Survey, Design CA/RI and Construction – Section 8	Cleaning and cement mortar lining of the pipeline interior, replacement of all defective and inoperable valves, and the addition of new valves for 7,500 linear feet of 48-inch pipe on Section 8 in Malden and Everett. Replacement work consists of replacing 9,722 feet of 42-inch pipeline with new 36-inch ductile iron main and replacement of blow-off connections from Second Street in Everett to the Mystic River Bridge in Chelsea.
Rehab Sections 37, 38, and 46 Chelsea, East Boston Construction	Rehabilitation of approximately 3,550 linear feet of 36-inch cast iron main (Section 37) and approximately 2,500 linear feet of 36-inch cast iron main (Section 46). Both sections are located in Chelsea and are critical to the supply of water to East Boston. Section 38, the 36-inch ductile iron pipeline under the Chelsea River, is assumed to not need rehabilitation.
Section 97A Construction	Installation of approximately 2,000 linear feet of 16-inch water main and a new pressure-reducing valve. This new work will be part of the Northern High System and add redundancy to East Boston, including Logan Airport.

**Expenditure Forecast (in \$000s) and Project Status**

<b>Total Budget</b>	<b>Payments thru FY06</b>	<b>Remaining Balance</b>	<b>FY07 Projected</b>	<b>FY08</b>	<b>FY04-08</b>	<b>FY09-13</b>	<b>Beyond FY13</b>
\$17,629	\$1	\$17,628	\$54	\$1,536	\$1,591	\$1,352	\$14,686

Project Status 11/06	0.1%	Status as % is approximation based on project budget and expenditures. Project Survey started in FY07. Section 97A construction will start in October 2007.
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**Changes to Project Scope, Budget, and Schedule**

<b>Project Cost</b>			<b>Scheduled Completion Date</b>			<b>FY04-08 Spending</b>		
<b>FY07</b>	<b>PFY08</b>	<b>Chge.</b>	<b>FY07</b>	<b>PFY08</b>	<b>Chge.</b>	<b>FY07</b>	<b>PFY08</b>	<b>Chge.</b>
\$17,208	\$17,629	\$421	Aug-11	Jul-16	59 mos.	\$1,576	\$1,591	\$15

**Explanation of Changes**

- Budget increase reflects updated inflation for Section 8 design and construction and Section 97A construction based on most current ENR index.
- Schedule shift a result of department priorities and staffing.

**CEB Impact**

None identified at this time.

## **S. 702 New Connecting Mains - Shaft 7 to WASM 3**

### **Project Purpose and Benefits**

- Contributes to improved public health*
- Extends current asset life*
- Improves system operability and reliability*

*To provide redundancy and improve the reliability of WASM 3; provide hydraulic looping and redundancy, enable Intermediate High Sections 59 and 60 to be taken off-line for rehabilitation, and improve water quality by reducing the length of unlined cast iron water mains in the MWRA system. Completion of this project will help provide the basis for a strong hydraulic network of piping among WASM 3, WASM 4, the City Tunnel, and the possible future Metropolitan Tunnel Loop. The future conversion of Sections 23 and 24 to the Intermediate High Service system to create a unified Intermediate High Service area connecting the Belmont and Commonwealth Avenue pump stations will also be possible. This project will involve installation of 18,100 linear feet of new pipeline, and rehabilitation of 56,770 linear feet of pipeline.*

### **Project History and Background**

WASM 3 is a 56- to 60-inch diameter rock-bar steel pipe installed in 1926 and 1927. It is connected to the MetroWest Tunnel and Hultman Branch at the west end and the City Tunnel Extension at its east end. It extends from Weston through Waltham, Belmont, Arlington and Somerville to Medford. Most of its flow comes from the MetroWest Tunnel Shaft W, with peak flow of 57 million gallons per day. A lesser amount enters the main from the City Tunnel Extension Shaft 9. Upon completion of the Hultman Aqueduct and its interconnection to the Weston Aqueduct Terminal Chamber in 1941, WASM 3 became part of the High Service system. There are no connecting mains along the length of this 11-mile pipeline, and no other means available to adequately supply the nine communities it serves. WASM 3 serves communities northwest of Boston and is the sole source of supply to the Northern Extra High Service Area (Bedford, Lexington, Waltham, Arlington and Winchester) and the Intermediate High Service Area (Belmont, Arlington and Watertown). It also supplies a portion of the Northern High Service Area (Waltham, Watertown, Belmont, Arlington, Medford, and Somerville), and is a means of supplying the Spot Pond Reservoir. WASM 3 serves a population of about 240,000.

A break almost anywhere on this pipeline would result in severe service disruptions in Waltham, Watertown, Arlington, Lexington, Bedford, Winchester, and Belmont. Virtually no water would reach Waltham if a break were to occur at the west end of the pipeline; water normally supplied through the Shaft W connection would be forced through the Shaft 9 connection, increasing flows and reducing hydraulic grade lines in WASM 3, the City Tunnel and City Tunnel Extension. The lack of redundancy also makes routine cleaning and lining of the 80-year old pipeline impossible. The need for maintenance is indicated by a significant number of leaks, particularly on the most vulnerable west end, which are the result of corrosion pitting through the pipe wall, as well as by the reduced carrying capacity of the line.

Completion of this project will facilitate conveyance of high service water from WASM 4 to WASM 3 and improve the capability to convey water from Shaft 9 of the City Tunnel Extension to WASM 3. This will be accomplished by rehabilitating or replacing existing dead-end mains between the City Tunnel Extension and WASM 3, and connecting these mains by constructing new pipelines, such that transmission loops will be formed between the City Tunnel and WASM 3. The rehabilitation of WASM 4 is also closely related to this project, because WASM 4 will be interconnected to the new connecting mains of the Shaft 7 to WASM 3 project. WASM 4, which can be operated on high or low service, runs parallel to the City Tunnel from Shaft 5 to Shaft 8, midway between the City Tunnel and WASM 3. Using WASM 4 as a supply means for the new connecting mains will result in cost savings by delaying or eliminating the need for a new pipeline south of WASM 4 to a Shaft 7 connection. This project has evolved from the Shaft 7 to WASM 3 Connecting Mains project to the WASM 3 and WASM 4 Connecting Mains project. The revised project route through Newton and Waltham is shorter and less expensive.

**Scope**

<b>Sub-phase</b>	<b>Scope</b>
Watertown MOU	Payment to the City of Watertown to fund a portion of its Galen Street project to replace an existing 10-inch diameter pipeline with a new 12-inch diameter water main.
Routing Study (5163)	Identification of alternatives to determine the optimum approach for providing additional strong connections to WASM 3.
Design/CA/RI-DP1 (6383)	Design, construction administration and residential inspection services for CP-1.
Revised North Segment (CP1) (6391)	Installation of 13,300 linear feet of new 48-inch connecting main from WASM 4 to WASM 3.
Design/CA/RI DP2/4 Meter 120 (6384)	Design, construction administration and residential inspection services for CP-2/4 Meter 120.
Design and Construction CP2 C&L Sections 59 & 60 (7086/6548)	Cleaning and lining of 16,400 linear feet of 20-inch diameter pipe on Sections 59 and 60 (Intermediate High) from Section 25 in Watertown to Meter 121 in Arlington.
South Segment CP3 (6392)	Cleaning and lining of 6,900 linear feet of 20-inch pipe (Section 24) from Meter 120 to WASM 4, 5,350 linear feet of 36-inch (Section 23) and 10,170 linear feet of 20-inch (Sections 24 and 47) pipe, and 2,950 linear feet of 20-inch pipe along Section 24 from WASM 4 to Meter 40.
NE Segment CP5 (6394)	Rehabilitation of 15,000 linear feet of 20 and 48-inch diameter pipe for Sections 18, 50, and 51 for the Northeast Segment.
Replacement of Section 25 Design (6955) and Construction (6956)	Replacement of existing section 25 (approximately 4,800 linear feet of existing 16" pipe) with a new pipeline.

**Expenditure Forecast (in \$000s) and Project Status**

<b>Total Budget</b>	<b>Payments thru FY06</b>	<b>Remaining Balance</b>	<b>FY07 Projected</b>	<b>FY08</b>	<b>FY04-08</b>	<b>FY09-13</b>	<b>Beyond FY13</b>
\$53,644	\$3,953	\$49,691	\$1,007	\$7,092	\$9,003	\$39,791	\$1,801

Project Status 11/06	7.8%	Status as % is approximation based on project budget and expenditures. Watertown MOU and Routing Study are complete and design work is in progress. Construction of the North Segment CP-5 is expected to begin in October 2007. Construction, of the South Segment CP3 and CP1A are expected to begin in February 2008 and June 2008, respectively.
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**Changes to Project Scope, Budget, and Schedule**

<b>Project Cost</b>			<b>Scheduled Completion Date</b>			<b>FY04-08 Spending</b>		
<b>FY07</b>	<b>PFY08</b>	<b>Chge.</b>	<b>FY07</b>	<b>PFY08</b>	<b>Chge.</b>	<b>FY07</b>	<b>PFY08</b>	<b>Chge.</b>
\$51,564	\$53,644	\$2,080	Jun-09	Jul-09	1 mo.	\$10,033	\$9,003	(\$1,030)

**Explanation of Changes**

- Budget increased due to revised pipeline route and updated inflation to account for more current ENR index for unawarded contracts.
- Spending shifted primarily due to revised expenditure forecast for North Segment CP1A and schedule for Northeast Segment CP5 which resulted in spending outside the FY04-08 CAP period.

**CEB Impact**

None identified at this time.

## S. 692 Northern High Service – Section 27 Improvements

### Project Purpose and Benefits

- Contributes to improved public health*
- Extends current asset life*
- Improves system operability and reliability*

To rehabilitate/replace a segment of 107-year old pipe in Lynn which suffers from poor hydraulic performance and frequent leakage. Rehabilitate/replacement of approximately 7,200 linear feet of pipeline will improve service to the communities north of Lynn.

### Project History and Background

Section 27 is a 12–20 inch diameter cast iron main installed in 1898 that serves the communities north of Lynn. The main has become severely corroded. As a result of this deterioration, various major leaks have occurred since 1966. Because the main runs under major thoroughfares in Lynn, repair of emergency leaks is disruptive and costly. Appropriate corrosion control methods will be employed on the pipeline to minimize corrosion potential in Section 27. During preliminary design, an evaluation determined MWRA should abandon an adjacent pipeline, Section 35.

### Scope

Sub-phase	Scope
Construction Sections 27	Rehabilitation/replacement of 7,200 linear feet of pipeline to replace severely corroded pipe.

### Expenditure Forecast (in \$000s) and Project Status

Total Budget	Payments thru FY06	Remaining Balance	FY07 Projected	FY08	FY04-08	FY09-13	Beyond FY13
\$2,789	\$124	\$2,665	\$1	\$1	\$2	\$15	\$2,648

Project Status 11/06	4.4%	Status as % is approximation based on project budget and expenditures. Construction/Rehab of Section 27 scheduled to begin in Sept 2013.
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### Changes to Project Scope, Budget, and Schedule

Project Cost			Scheduled Completion Date			FY04-08 Spending		
FY07	PFY08	Chge.	FY07	PFY08	Chge.	FY07	PFY08	Chge.
\$2,701	\$2,789	\$88	Mar-15	Mar-15	None	\$2	\$2	(\$1)

### Explanation of Changes

- Increases due to inflation adjustment on unawarded contracts to reflect more current ENR index.

### CEB Impact

None identified at this time.

# S. 693 Northern High Service - Revere and Malden Pipeline Improvements

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## Project Purpose and Benefits

- ☑ *Contributes to improved public health*
- ☑ *Extends current asset life*
- ☑ *Improves system operability and reliability*

*To improve the delivery capabilities of major distribution lines serving the Northern High System. The existing pipelines are inadequate and suffer from extensive corrosion and leakage. Replacement, rehabilitation, and/or reinforcement will provide a strong and reliable means to convey water from the City Tunnel Extension to communities in the northern and eastern portions of the Northern High Service Area.*

## Project History and Background

The southeast corner of the Northern High Service Area has experienced pressure deficiencies because of undersized pipes and extensive pipeline corrosion. The corrosion problems have led to numerous leaks and the pressure deficiencies cause fire-fighting difficulties. These deficiencies particularly affect Malden, Revere, Lynn, Winthrop, Deer Island, East Boston, Saugus, Nahant, Peabody, Marblehead, and Swampscott. To correct these problems, MWRA is implementing a series of pipeline improvements.

This project includes installation of pipeline on Sections 97, 97A, 53A, and 68 in Revere and Section 53 in Malden; rehabilitation of Sections 53 and 55 in Revere; and installation of control valves to improve water pressure. All the work for this project, with the exception of the design and construction of Section 53, Revere Section 53A, Section 68 and the Shaft 9A-D Extension is complete. Completion of this construction will improve the pressure and flow of water conveyed to the Northern High Service Area.

A hydraulic study of the distribution system recommended that MWRA install a new pipeline in Revere, beginning at the Everett/Chelsea/Revere border and extending through Revere to the East Boston border. This new pipeline runs parallel with existing pipelines and carries a large portion of the flow formerly carried by the existing system, thereby increasing water pressure and flow to Revere, East Boston, Winthrop, and Deer Island, particularly during periods of high demand. Installation of new control valves was required to regulate water pressure and fill the Winthrop standpipe. The original control valves between Winthrop pipelines and MWRA transmission mains were inadequate. Fluctuations in pressure threatened to rupture the town's pipelines. More efficient valves were required to eliminate the danger. Flow tests performed on Sections 32 and 55 of the existing Revere and Winthrop pipeline revealed that these sections had severe flow problems. The pipeline was only able to carry a fraction of its designed capacity because of internal corrosion. Cleaning and lining the pipeline restored flow capacity.

Section 53 in Malden and Revere was an 18,900-foot long, 30-inch steel pipeline, exceeding 60 years of age. Workers dug four test pits to determine the condition of this pipeline and uncovered 18 holes in the pipe. Investigations into recent failures revealed severe corrosion through the pipe wall in several locations. Replacement of the Malden portion of Section 53 with a new 48-inch main has been completed. The Revere portion of Section 53 will be rehabilitated and/or replaced as necessary. In addition to feeding into the new 48-inch Saugus/Lynn pipeline, this pipeline will play an important role in the supply network for Deer Island. Section 53A, an old 24-inch pipeline, is used to connect Section 53 to Shaft 9A of the City Tunnel. It is undersized for this purpose and is a severe restriction. A new 3,000-foot, 60-inch diameter pipeline is needed to reinforce Section 53A. An 850-foot portion of Section 68 interconnects Section 53 with the new Saugus/Lynn pipeline. This section needs to be reinforced with 850 feet of 48-inch pipeline. The Shaft 9A-D Extension will provide a more reliable connector to the Section 99 pipeline that serves as the suction line to the Gillis Pump Station.

Construction of the Malden Section 53 and Revere Beach pipelines was substantially completed in September and October 1994 respectively.

**Scope**

<b>Sub-phase</b>	<b>Scope</b>
Design/CS/RI – Revere/Malden	Design, construction services, and resident inspection for Section 53 in Malden and Sections 97 and 97A in Revere.
Construction Revere Beach	Installation of 5,491 linear feet of 36-inch pipeline and 10,111 linear feet of 30-inch pipeline on Section 97, as well as 3,872 linear feet of 24-inch pipeline, and 1,350 linear feet of 20-inch pipeline on Section 97A in the vicinity of Revere Beach Parkway.
Construction Malden Section 53	Installation of 11,907 feet of 48-inch diameter pipeline in Malden on Section 53.
Construction Linden Square	Construction and construction administration of a 1,000 linear feet segment of Section 53 in the Linden Square area of Malden. The Massachusetts Highway Dept constructed this section as part of its roadway reconstruction project around Linden Square.
Construction Revere Section 53	Rehabilitation of 4,900 linear feet of 30-inch pipe in Revere on Section 53 and replacement of 1,500 linear feet under Route 1 in Revere.
Construction Road Restoration	Design, construction administration, and construction of the full road restoration to ensure a stable road surface without cracking on Eastern Avenue in Malden in compliance with the requirements of the Massachusetts Architectural Access Board. The City of Malden will do this work.
Construction Control Valves	Installation of control valves needed to regulate water pressure and fill the Winthrop standpipe.
Construction DI Pipeline Cleaning & Lining (C&L)	Design and cleaning and lining of the 2,000 linear feet, 8-inch diameter water supply main to Deer Island.
Construction – Winthrop C&L	Rehabilitation of 7,900 linear feet of 16-inch diameter pipe on Section 32 and 20-inch diameter pipe on Section 55 in Revere and Winthrop.
Construction 68 & 53A	Construction of 850 linear feet of new 48-inch pipe (Section 68) and 3,000 linear feet of new 60-inch pipe (Section 53A) in Malden.
Shaft 9A-D Extension Construction	Construction of approximately 2,000 linear feet of new pipeline in Malden connecting the Shaft 9A-D line to Section 99.

**Expenditure Forecast (in \$000s) and Project Status**

<b>Total Budget</b>	<b>Payments thru FY06</b>	<b>Remaining Balance</b>	<b>FY07 Projected</b>	<b>FY08</b>	<b>FY04-08</b>	<b>FY09-13</b>	<b>Beyond FY13</b>
\$32,145	\$23,854	\$8,291	\$14	\$2,616	\$2,630	\$223	\$5,438

Project Status 11/06	74.2%	Status as % is approximation based on project budget and expenditures. Revere Beach, Malden Section 53 and Linden Square construction are complete. Revere Section 53 construction is now expected to commence in February 2008.
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**Changes to Project Scope, Budget, and Schedule**

Project Cost			Scheduled Completion Date			FY04-08 Spending		
FY07	PFY08	Chge.	FY07	PFY08	Chge.	FY07	PFY08	Chge.
\$32,052	\$32,145	\$93	Nov-15	Nov-15	None	\$1,678	\$2,630	\$951

**Explanation of Changes**

- Budget increase due to inflation adjustment to new ENR index.
- Spending increased in CAP period due to revised forecast for Section 53.

**CEB Impact**

None identified at this time.

# S. 731 Lynnfield Pipeline

## Project Purpose and Benefits

- Contributes to improved public health*
- Improves system operability and reliability*

*To meet high demands in Lynnfield by installing approximately 7,300 linear feet 24-inch water main. The Lynnfield Water District serves a portion of the Town of Lynnfield. The community meter is served by an 8-inch main, approximately 7,000 feet long. The main is undersized and its capacity is inadequate to meet high water demands. Rehabilitation of the main will not increase the capacity sufficiently.*

## Project History and Background

MWRA supplies Lynnfield Water District via Meter 169 located adjacent to Route 1 at the Saugus/Lynnfield town line. An eight-inch cast iron main, approximately 7,000 feet long, connects Meter 169 to Section 70 in Saugus. This main does not have the hydraulic capacity to serve the meter during high demand periods. This project includes construction of a supplemental main from Section 70 to the meter, possibly parallel to the existing main which, for much of its length, is located along Route 1. An interim interconnection to the Saugus system will be constructed in FY07.

## Scope

Sub-phase	Change/Explanation
Temporary Interconnect Construction Ph 1	Install approximately 150 feet of 24" main.
Design and Construction Ph 2	Construction of 7,300 linear feet of new 24-inch main.

## Expenditure Forecast (in \$000s) and Project Status

Total Budget	Payments thru FY06	Remaining Balance	FY07 Projected	FY08	FY04-08	FY09-13	Beyond FY13
\$6,990	\$0	\$6,990	\$150	\$910	\$1,060	\$5,930	\$0

Project Status 11/06	0.0%	Status as % is approximation based on project budget and expenditures. Expect Temporary Interconnect Construction Phase I to now commence in February 2007.
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## Changes to Project Scope, Budget, and Schedule

Project Cost			Scheduled Completion Date			FY04-08 Spending		
FY07	PFY08	Chge.	FY07	PFY08	Chge.	FY07	PFY08	Chge.
\$4,000	\$6,990	\$2,990	Jul-11	Jul-11	None	\$425	\$1,060	\$635

## Explanation of Changes

- Budget and spending increase due to revised engineer's estimates for Phase 2 Design and Construction, and Temporary Interconnect Construction.

## CEB Impact

None identified at this time.

# **S. 708 Northern Extra High Service - New Pipelines**

## **Project Purpose and Benefits**

- Contributes to improved public health*
- Extends current asset life*
- Improves system operability and reliability*

*To improve hydraulic service and reliability for major portions of the Northern Extra High System. Existing lines are undersized and frequently experience pressure problems. Improvements will include construction of two new pipe segments and rehabilitation of an existing main.*

## **Project History and Background**

Sections 34, 36, and 45 provide service to the Northern Extra High (NEH) communities of Belmont and Arlington. The existing pipelines are not large enough to meet maximum day plus fire flow service goals. Construction of a new larger pipeline will improve reliability, pressure, and flows, which will result in better fire protection and reduced pumping costs. Section 34, which is an undersized 1,532 linear feet 12-inch diameter cast iron main installed in 1911, may be the source of water quality problems. The pipe is a key component of the NEH Service System and provides service between Brattle Court Pump Station and the distribution system. Section 36 is an undersized 5,136 linear feet 16-inch cast iron main installed in 1911 that serves as a critical portion of the discharge pipe system from the Brattle Court Pump Station. Section 45 is a 16-inch cast iron main 3,374 linear feet long that was installed in 1920. A portion of Section 45 was rehabilitated in an earlier phase of this project. The current phase includes rehabilitation of the remaining portion of the pipeline.

## **Scope**

Sub-phase	Scope
Design/CA/RI and construction – Sections 45, 63, and 83.	Replacement of approximately 2,600 linear feet of Section 45 with 24-inch diameter pipe extending from the connection point at Meter 47 to Section 82 on Park Street at the Intersection of Paul Revere Road in Arlington; installation of about 2,100 linear feet of new 24-inch pipeline, parallel to a portion of Section 83, starting from Meter 182 and proceeding to the intersection of Waltham Street (in Lexington and part of Waltham) and Concord Ave (in Lexington). Rehabilitation of Section 63, consisting of about 3,400 linear feet of 20-inch pipeline connecting Section 63 to Meter 136.
Construction Sections 34, 36, 45	Construction of approximately 6,700 linear feet of new 20-inch pipe (Sections 34 & 36) and rehabilitation of approximately 3,400 linear feet of existing 16-inch cast iron main.

## **Expenditure Forecast (in \$000s) and Project Status**

Total Budget	Payments thru FY06	Remaining Balance	FY07 Projected	FY08	FY04-08	FY09-13	Beyond FY13
\$8,919	\$3,632	\$5,287	\$1	\$2	\$72	\$34	\$5,250

Project Status 11/06	40.7%	Status as % is approximation based on project budget and expenditures. Construction of a portion of Section 45 was rehabilitated in September 2001. In-house design of Sections 34, 36 and 45 followed by construction scheduled to start in FY14.
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**Changes to Project Scope, Budget, and Schedule**

Project Cost			Scheduled Completion Date			FY04-08 Spending		
FY07	PFY08	Chge.	FY07	PFY08	Chge.	FY07	PFY08	Chge.
\$8,746	\$8,919	\$173	Nov-15	Nov-15	None	\$72	\$72	\$0

**Explanation of Changes**

- Budget increased due to inflation adjustment on unawarded contracts to reflect more current ENR index.

**CEB Impact**

None identified at this time.

# S. 725 Hydraulic Model Update

## Project Purpose and Benefits

- Contributes to improved public health*
- Provides environmental benefits*
- Extends current asset life*

*To bring MWRA hydraulic and water quality modeling capabilities up to modern standards, and to integrate the water quality model with MWRA's GIS, SCADA, and Telog systems. Completion of the project will also improve the use of the existing hydraulic model to manage system operations by making screen displays geographically accurate, standardizing model facility naming to coordinate with GIS, and allowing simulations to be conducted to predict changes to disinfection residual levels in the water as it moves through the MWRA system. The project builds on the foundation of the existing model and incorporates improvements already implemented in the GIS system.*

## Project History and Background

The MWRA Water System Model Study completed in 1991 by Camp, Dresser and McKee included the development of a computer based hydraulic model of the MWRA water system. Transmission and distribution system piping, pump stations, storage facilities, revenue meters, pressure reducing valves, and other system appurtenances were incorporated into the model. The model was developed using software written by Stoner Associates, Inc.

In working towards an updated model, staff have incorporated capital improvements to the waterworks system, updated community demand information using data from the telog data collection system, and updated the model operating environment. The operating system platform was changed from a VAX/VMS environment to a desktop PC Windows operating system to make the interface more user friendly and to make the model more accessible to staff. In addition to hardware and software improvements, current model data files need to be updated and enhanced. Some of these enhancements include improving geographic accuracy, adding the ability to separate the entire water system into smaller subset models (e.g., by pressure zone), implementing changes to the system water quality model, and efficiently updating the system by creating links to other databases. This project also includes development and implementation of field tests to collect system data used to calibrate the computer model and verify its accuracy.

## Scope

Sub-phase	Scope
Hydraulic Model Update	Revisions and upgrades to the computer based model of MWRA's water system.
Model Enhancement Support Services	Purchase of software to support MWRA's water quality modeling requirements per discussions with American Waterworks Association Research Foundation and other large utilities performing similar work.

## Expenditure Forecast (in \$000s) and Project Status

Total Budget	Payments thru FY06	Remaining Balance	FY07 Projected	FY08	FY04-08	FY09-13	Beyond FY13
\$686	\$598	\$88	\$60	\$28	\$88	\$0	\$0

Project Status 11/06	87.2%	Status as % is approximation based on project budget and expenditures. Hydraulic Model Update complete with only model enhancements work remaining.
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## Changes to Project Scope, Budget, and Schedule

Project Cost			Scheduled Completion Date			FY04-08 Spending		
FY07	PFY08	Chge.	FY07	PFY08	Chge.	FY07	PFY08	Chge.
\$686	\$686	\$0	Jun-06	Jun-07	12 mos.	\$88	\$88	\$0

**Explanation of Changes**

- Schedule shifted out due to project priorities.

**CEB Impact**

None identified at this time.

# S. 753 Central Monitoring System

## Project Purpose and Benefits

- ☑ *Contributes to improved public health*
- ☑ *Improves system operability and reliability*
- ☑ *Extends current asset life*
- ☑ *Results in a net reduction in operating costs*

*To provide a modern centralized system for monitoring, coordinating, and controlling critical waterworks functions. Many existing MWRA facilities are monitored and operated using obsolete methods and equipment, which can hinder emergency response capabilities and prevent coordinated system operation. Two operations control centers are already operational, and various field facilities have been equipped with telemetry and communications equipment as part of this project.*

## Project History and Background

MWRA has been converting to system-wide remote monitoring and control of essentially all hydraulic and hydroelectric operations. The original instrumentation used to measure operating parameters was incomplete, old, and in poor condition. In many cases necessary instrumentation did not exist. The system also lacked telemetry to provide centralized and immediate information on system performance, and the ability to remotely intervene when malfunctions occurred. Without telemetry, operating decisions had to be delayed until field personnel were dispatched to collect measurements. This was a cumbersome and undesirable mode of operation, particularly in emergency situations.

The lack of flow measurement within the water delivery system also impeded identification of sources of unmetered water. When fully implemented, the central monitoring system will generate instantaneous data on water flow and pressure in 18 subsystems beginning with the supply sources and ending at the delivery points to user communities. The data will assist operations staff in detecting and pinpointing leaks in the system. The response time for leak repair work can then be lessened, resulting in significant savings of water and reduction in potential MWRA liability for public safety and property damage.

The central monitoring project has grown from the initial automation of the Reservoir Road Pump Station to include eight other pump stations. Monitoring and control of water treatment facilities has expanded to include the Interim Corrosion Control Facility in Marlborough, the Cosgrove Disinfection Facility, the Norumbega Temporary Disinfection Facility and the Ware Disinfection Facility. In addition, water quality is monitored at seven locations from two Operations Control Centers. Real time SCADA monitoring of Telog data is being established with 150 sites currently active. Operation control centers (OCCs) at the MWRA Chelsea and Clinton facilities provide remote monitoring and control of all the SCADA facilities. Also, as part of its Integrated Water Supply Improvement Program, MWRA is building several new and upgraded facilities. These include the Nash Hill Covered Storage facility and the Loring Road Covered Storage facility, which are complete, and the Walnut Hill Water Treatment Plant, the MetroWest Water Supply Tunnel, and the Norumbega Covered Storage facility, which are under construction. The existing system-wide backbone microwave communications network has been improved to connect these new facilities to the waterworks communications system.

## Scope

Sub-phase	Scope
Study	Study to determine the implementation phases.
Design	Design of the replacement and rehabilitation of 34 existing master meter sites, 22 new master meter sites, 15 western revenue meter sites, 28 reservoir level instrumentation sites, ten pumping stations, eight pressure regulator control sites, four major throttle valve sites, six chemical feed sites, four hydroelectric sites, five weather stations, five sluice gate control sites, one stream gauging station, and other facilities.

<b>Sub-phase</b>	<b>Scope</b>
Communications Structures	Installation of two radio towers, five antennas, one satellite dish, and an equipment shelter.
CS/Start-Up Services	Construction and startup services for the metropolitan Operations Control Center, as well as metering and monitoring construction.
Equipment Pre-Purchase	Purchase of instrumentation equipment, mechanical equipment, and new master meters.
Construction 1 – Reservoir Road and Cosgrove Pilots	Purchase and installation of equipment to automate the Reservoir Road Pump Station and an aqueduct monitoring system for use by the Cosgrove Intake and Shaft 4 operators. MWRA staff installed the equipment.
SCADA Implementation	Purchase of Supervisory Control and Data Acquisition System (SCADA) equipment for monitoring and metering sites and pressure reducing valve sites. MWRA staff will install most of this equipment. Connections of SCADA equipment to local utilities.
Microwave Equipment	Purchase of services and equipment necessary to allow MWRA to convert from analog to digital communications to continue to utilize the Commonwealth’s Interagency Microwave System.
Construction – Operations Center	Construction of a 5,000 square feet center including an environmentally controlled computer room, a printer room, a control room, office space, and sanitary facilities in Chestnut Hill.
System Wide Backbone C.P. Construction–Monitoring & Control Communications Network	Improvement of the existing Waterworks system wide backbone including upgrades of microwave antennas at MDC Hill and Bellevue water tank and provision of new microwave antennas at five facilities.
Study and Design –Waterworks Monitoring & Control Communications Network	Provision of microwave antennas and radio equipment at twelve facilities.
Microwave Communication for Waterworks Facilities	Furnish and install seventeen microwave antennas (dishes), three 3-legged, 90- to 100-foot towers, one unpowered 80-foot steel monopole, and two prefabricated concrete shelters to house radio equipment with associated racks, cabinets and wiring.

**Expenditure Forecast (in \$000s) and Project Status**

<b>Total Budget</b>	<b>Payments thru FY06</b>	<b>Remaining Balance</b>	<b>FY07 Projected</b>	<b>FY08</b>	<b>FY04-08</b>	<b>FY09-13</b>	<b>Beyond FY13</b>
\$16,092	\$15,627	\$465	\$91	\$150	\$1,010	\$225	\$0

Project Status 11/06	97.4%	Status as % is approximation based on project budget and expenditures. All contracts are complete except for SCADA Implementation work, which is scheduled for completion in June 2009.
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**Changes to Project Scope, Budget, and Schedule**

Project Cost			Scheduled Completion Date			FY04-08 Spending		
FY07	PFY08	Chge.	FY07	PFY08	Chge.	FY07	PFY08	Chge.
\$16,143	\$16,092	(\$50)	Jun-09	Jun-09	None	\$1,085	\$1,010	(\$75)

**Explanation of Changes**

- Budget decreased to account for final cost adjustment.

**CEB Impact**

No additional impacts identified at this time.

## S. 763 Distribution Systems Facilities Mapping

### Project Purpose and Benefits

- Contributes to improved public health*
- Improves system operability and reliability*

*To produce a complete, up-to-date set of appropriate scale maps of all underground waterworks facilities, along with a comprehensive database inventory. Existing maps were outdated and unreliable, complicating emergency response, field repairs, and planning.*

### Project History and Background

In 1995 MWRA did not have an adequate, updated set of maps of all of its underground waterworks facilities. Existing maps did not consistently show current conditions and were often incompatible or contradictory with MWRA databases. Engineering, operations, and emergency response were all affected by this inadequacy. Outdated maps hampered engineering because maps needed to be re-created. Field operations crews could not predict with certainty the results of valve shut-offs during repair efforts. The planning process was impaired because management did not have authoritative, consolidated data to evaluate pipe condition, age, C-Values, materials, and soil conditions. Additionally, the lack of a comprehensive understanding of the relationships between MWRA and local community pipe systems could result in service delays. The former mapping system created the possibility of incorrect actions, and in critical instances could have resulted in exacerbated property damage.

Reliable engineering records do not exist for certain sections of the distribution system. The Records Development sub-phase will create record drawings and detail records for high priority areas.

### Scope

Sub-phase	Scope
Planning/Design	Creation of a complete set of 200 to 400 scale maps of the distribution system with an associated verified inventory of size, material, age, and condition of pipes.
Data Purchase	Purchase of project related data from Boston Edison.
Records Development	Automation of MWRA record drawings.

### Expenditure Forecast (in \$000s) and Project Status

Total Budget	Payments thru FY06	Remaining Balance	FY07 Projected	FY08	FY04-08	FY09-13	Beyond FY13
\$2,348	\$1,036	\$1,312	\$0	\$423	\$430	\$889	\$0

Project Status 11/06	44.1%	Status as % is approximation based on project budget and expenditures. Records Development is the one outstanding sub-phase and has been delayed due to staffing constraints and competing project priorities. Expect NTP in early FY07.
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**Changes to Project Scope, Budget, and Schedule**

Project Cost			Scheduled Completion Date			FY04-08 Spending		
FY07	PFY08	Chge.	FY07	PFY08	Chge.	FY07	PFY08	Chge.
\$2,305	\$2,348	\$43	Dec-08	Dec-09	12 mos.	\$937	\$430	(\$507)

**Explanation of Changes**

- Project schedule moved out due to department project priorities.

**CEB Impact**

None identified at this time.

## S. 765 Local Water Pipeline Assistance Program

### Project Purpose and Benefit

- Contributes to improved public health*
- Provides environmental benefits.*

*To provide loans to facilitate the rehabilitation or replacement of unlined water pipelines in MWRA communities.*

### Project History and Background

The Local Pipeline Assistance Program is a critical piece of MWRA's Integrated Water Supply Improvement Program. In November 1999, the Board of Directors approved an MWRA-administered program, supported for ten years through a Tax Exempt Commercial Paper (TECP) program, to make \$25 million available annually in loans to MWRA communities for pipeline relining and replacement in proportion to each community's share of total unlined pipe miles. Communities are required to pay back principal for each loan during a ten-year time period beginning one year after the project funding is approved. To qualify for funding communities must demonstrate appropriate distribution system management practices. MWRA increased the initial total program budget to \$255,517,500 to provide funds for additional water system communities: Stoughton (\$4,480,000), Reading (\$710,000), Lynnfield (\$320,000) and Dedham/Westwood (\$7,500).

### Scope

Sub-phase	Scope
Community Loans	Loans for MWRA water communities to replace and rehabilitate local water pipelines allocated based on each community's share of total unlined pipe miles.
Community Repayments	Principal repayment over a ten-year period beginning one year after origination of the loans.

### Expenditure Forecast (in \$000s) and Project Status

Total Budget	Payments thru FY06	Remaining Balance	FY07 Projected	FY08	FY04-08	FY09-13	Beyond FY13
\$0	\$79,117	(\$79,117)	\$13,506	\$6,343	\$53,422	\$16,715	(\$115,682)

Project Status 11/06	46.4%	Through November 2006, \$118.5 million in loans was distributed to member communities.
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### Changes to Project Scope, Budget, and Schedule

Project Cost			Scheduled Completion Date			FY04-08 Spending		
FY07	PFY08	Chge.	FY07	PFY08	Chge.	FY07	PFY08	Chge.
\$0	\$0	\$0	Jun-23	Jun-23	None	\$48,575	\$53,422	\$4,847

### Explanation of Changes

- Spending shift is a result of the timing of member community requests for financial assistance.

### CEB Impact

None.

# S. 766 Waterworks Facility Asset and Pumping Facility Asset Protection

## Project Purpose and Benefits

- Contributes to improved public health*
- Extends current asset life*
- Improves system operability and reliability*

*To protect the investment of MWRA ratepayers by ensuring timely replacement of equipment and systems.*

## Project History and Background

This project was developed to ensure that MWRA maintains ongoing service while optimizing operations in its water facilities. This project in its current form addresses immediate critical facility and equipment issues. This project will eventually include five areas:

1. Equipment replacement (pumps, HVAC equipment, blowers, etc.).
2. Architectural projects (concrete corrosion, etc.).
3. Utilities projects (water, sewer, drainage, electrical wiring, heating system, etc.).
4. Support Projects (process control system upgrades, etc.).
5. Specialty Projects (instrumentation upgrades, fuel storage tanks, etc.).

While the current schedule indicates a completion date of 2017 for construction, the Waterworks Facility Asset Protection project will be ongoing throughout the useful life of the facilities.

## Scope

Sub-phase	Scope
Meter Vault Manhole Retrofits	Retrofit approximately 195 meter manholes.
Design and Construction Walnut Hill Tank	Full structural analysis of the Walnut Hill Elevated Tank based on corrosion discovered. Rehab of the tank based on the structural analysis.
Waltham Pipe Bridge Replacement	Replacement of approximately 100 feet of 30-inch steel pipe over commuter rail tracks in Waltham including a bridge crossing.
Design and Construction Cosgrove Valve Seat Replacement	Replacement of isolation sluice gates at Cosgrove Intake to improve reliability for emergency shut down of Cosgrove facility and to isolate new sliding sleeve valves to facilitate preventive maintenance and any future corrective maintenance. Installation of vent structures in draft of new sliding sleeve valves to relieve vacuum conditions when valves are operating and to prevent damage to floor plates and to eliminate an unsafe and unsanitary condition.
Design of Cosgrove Turbine Isolation	Modification of means of downstream isolation of Cosgrove turbines to allow for preventive and corrective maintenance against new tailwater elevation which was increased to allow flow to Walnut Hill water treatment plant.

**Expenditure Forecast (in \$000s) and Project Status**

<b>Total Budget</b>	<b>Payments thru FY06</b>	<b>Remaining Balance</b>	<b>FY07 Projected</b>	<b>FY08</b>	<b>FY04-08</b>	<b>FY09-13</b>	<b>Beyond FY13</b>
\$4,098	\$221	\$3,877	\$24	\$1	\$246	\$1,906	\$1,946

Project Status 11/06	5.4%	Status as % is approximation based on project budget and expenditures. Waltham Pipe/Bridge Replacement project was substantially complete in September 2004. Expect Valve Seat Replacement Design to commence in July 2011.
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**Changes to Project Scope, Budget, and Schedule**

<b>Project Cost</b>			<b>Scheduled Completion Date</b>			<b>FY04-08 Spending</b>		
<b>FY07</b>	<b>PFY08</b>	<b>Chge.</b>	<b>FY07</b>	<b>PFY08</b>	<b>Chge.</b>	<b>FY07</b>	<b>PFY08</b>	<b>Chge.</b>
\$4,050	\$4,098	\$48	Jun-17	Jun-17	None	\$315	\$246	(\$68)

**Explanation of Changes**

- Spending shifted due to the re-evaluation of project priorities.

**CEB Impact**

None identified at this time.

## S. 933 Capital Maintenance Planning/Development

### Project Purpose

*To optimize the efficiency and effectiveness of MWRA maintenance practices by developing and implementing a strategic maintenance plan for MWRA assets.*

### Project History and Background

MWRA is responsible for rehabilitating, repairing, and maintaining the regional water and sewerage system infrastructure. Since its assumption of the ownership and operations of the water and sewer systems in 1985, MWRA has undertaken an ambitious program of capital improvements to the systems, with estimated expenditures of more than \$7 billion for fiscal years 1986 through 2013.

Given the significant value and critical nature of these assets, system maintenance is of paramount importance. This project helps MWRA optimize maintenance practices by evaluating alternative approaches to equipment, infrastructure and facility maintenance, recommending a maintenance strategy, implementing a pilot program to test the recommended strategy, and developing a plan to implement the recommended strategy throughout MWRA.

In the FY01-03 CIP the Capital Maintenance Planning/Development project was part of the first phase of the Wastewater Facilities Asset Management Program (FAMP). This initial phase of FAMP consisted of evaluating maintenance strategies for equipment and systems at Deer Island, and led to the adoption of Reliability Centered Maintenance (RCM) as the maintenance strategy for Deer Island and subsequently the rest of MWRA. As a result of the decision to implement RCM throughout MWRA, the Capital Maintenance Planning/Development project was created. The remaining FAMP components, which address equipment system monitoring, Maximo improvements, and improved business practices at Deer Island, have been renamed Deer Island Treatment Plant Asset Protection.

### Scope

Sub-phase	Scope
Inventory & Evaluation Phases 1 & 2	Development of a comprehensive, strategic maintenance plan for MWRA. (Completed by July 2005).
As-Needed Design	Contracts for professional design and/or technical assistance services for either wastewater or waterworks system improvement projects to supplement existing engineering resources for specialized and/or complex engineering issues. Subphases consist of As-Needed Design phases 1-4, and Long Term-As Needed Design.

### Expenditure Forecast (in \$000s) and Project Status

Total Budget	Payments thru FY06	Remaining Balance	FY07 Projected	FY08	FY04-08	FY09-13	Beyond FY13
\$8,891	\$2,710	\$6,181	\$1,549	\$720	\$2,806	\$3,912	\$0

Project Status 11/06	32.5%	Status as % is approximation based on project budget and expenditures. All tasks in <i>Inventory &amp; Evaluation Phases 1 &amp; 2</i> are complete. Use of the first two As-Needed Design contracts started in FY2005. As-Needed Design contracts 3 & 4 expected to begin in February 2007.
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**Changes to Project Scope, Budget, and Schedule**

Project Cost			Scheduled Completion Date			FY04-08 Spending		
FY07	PFY08	Chge.	FY07	PFY08	Chge.	FY07	PFY08	Chge.
\$8,893	\$8,891	(\$2)	Feb-13	Feb-13	None	\$2,808	\$2,806	(\$2)

**Explanation of Changes**

n/a

**CEB Impact**

- One of the final tasks under the *Inventory & Evaluation Phases 1 & 2* contract consisted of REI/ESDC services on the *Equipment Condition Monitoring* subphase, one of the projects under S.206, *Deer Island Treatment Plant Asset Protection*. Condition Monitoring provides DITP staff with real time, non-intrusive means of evaluating equipment performance (through vibration and temperature monitoring). Maintenance tasks are then performed when the trends indicate that a problem exists, saving staff time and reducing unnecessary maintenance. Total budgetary benefits are not quantified at this time.



## S. 881 Equipment Purchase

### Project Purpose

*To provide critical equipment for improved maintenance and operations at MWRA facilities.*

### Project History and Background

This project includes the purchase of large vehicles, purchase and installation of security equipment at various MWRA facilities, and purchase of an Inductively Coupled Plasma-Mass Spectrometer (ICP-MS) for MWRA's Central Laboratory. The security equipment and installation component of the project includes the design and installation of security systems at MWRA facilities. MWRA is ranking facilities and locations with respect to the critical nature of service delivery, with an emphasis on the waterworks system. This ranking will frame the extent and scheduling of the security improvements for each specific site.

### Scope

Sub-phase	Scope
Security Equipment & Installation	Design and installation of security systems at various MWRA facilities and sites.
ICP-MS Lab Testing Equipment	Purchase of Inductively Coupled Plasma – Mass Spectrometer to replace a 14-year-old instrument and expand the laboratory's high sensitivity metals testing capacity.
<i>Vehicles:</i>	
TV Inspection Truck	Purchase of a replacement TV inspection vehicle (WRA36) in June 2001.
Backhoe (Excavator)	Purchase in June 2003 of excavator (WRA310) to support maintenance staff.
Vactor Truck	Purchase in June 2003 of vactor truck (WRA479) used to clean out and jet sewer lines at the site by Field Operations Department personnel.
Water Service Truck	Purchase in June 2004 of water service truck (WRA777) for Field Operations Department.
Bucket Machine	Purchase of bucket machine (will replace WRA272 & 273) to support Field Operations Department maintenance staff.
Excavator	Purchase of equipment (replace WRA532) to support maintenance staff in water pipeline unit of Field Operations Department.
Grove Crane	Purchase of crane (replaces WRA14 and 046) to support maintenance staff in Field Operations Department.
Landfill Loader	Purchase landfill loader (WRA124) to support Clinton Wastewater Treatment Plant staff in landfill operations.
Power Sweeper/Catch Basin	Purchase of equipment (WRA210) in September 2004 to support maintenance staff at Chelsea in Field Operations Department. Will be used agency-wide.
Backhoe	Purchase in January 2005 of equipment (WRA817; replaced WRA 385) to support maintenance staff in Water Pipeline Unit of Field Operations Department.
Closed Circuit TV Inspection Truck	Purchase of TV Inspection Truck (WRA700) to support Wastewater Pipeline Unit of Field Operations Department.
Front-End Loader	Two phases to purchase front-end loaders to support maintenance staff primarily in the Water Pipeline Unit of the Field Operations Department and at Deer Island.
Crane	Purchase of crane (WRA185) to support the Water Pipeline Unit in the Field Operations Department.

**Expenditure Forecast (in \$000s) and Project Status**

<b>Total Budget</b>	<b>Payments thru FY06</b>	<b>Remaining Balance</b>	<b>FY07 Projected</b>	<b>FY08</b>	<b>FY04-08</b>	<b>FY09-13</b>	<b>Beyond FY13</b>
\$8,703	\$3,904	\$4,799	\$1,464	\$1,630	\$6,240	\$1,705	\$0

Project Status 11/06	45.5%	Status as % is approximation based on project budget and expenditures. Purchase and installation of security equipment is in process and will continue through FY07.
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**Changes to Project Scope, Budget, and Schedule**

<b>Project Cost</b>			<b>Scheduled Completion Date</b>			<b>FY04-08 Spending</b>		
<b>FY07</b>	<b>PFY08</b>	<b>Chge.</b>	<b>FY07</b>	<b>PFY08</b>	<b>Chge.</b>	<b>FY07</b>	<b>PFY08</b>	<b>Chge.</b>
\$8,703	\$8,703	\$0	Jun-07	Jun-07	None	\$7,946	\$6,240	(\$1,705)

**Explanation of Changes**

- Modified spending for purchases of security equipment.

**CEB Impact**

None identified at this time.

## S. 930 MWRA Chelsea Facility

### Project Purpose

*To improve MWRA operations by consolidating maintenance, operations, administrative, and equipment storage functions into a single facility. This will relieve current overcrowding and adverse traffic impacts on neighborhoods abutting existing facilities.*

### Project History and Background

When MWRA was created in 1986, 80 employees and 22 vehicles were transferred from MDC to MWRA to support maintenance of the metropolitan waterworks system and the northern sewerage system. During the past 21 years, MWRA has invested significantly in new facilities and improved maintenance and repair of the systems.

While maintenance programs were updated, the inadequacy of MWRA's maintenance support facilities became a serious constraint. In addition to being inefficiently located, virtually all of the maintenance and support facilities were already decades old when inherited from MDC, in disrepair, and too small to house necessary workforce and equipment. To accommodate the maintenance program, a number of temporary measures were taken to provide support facilities, including creation of temporary quarters in rented trailers, leasing of space, and reuse of space in "retired" buildings like the East Boston Pump Station.

MWRA also designed and constructed facilities to meet some specific maintenance program needs. These facilities included the South Maintenance Yard (1990) created at Fore River to serve the sewerage system maintenance needs south of Boston and the Transmission Maintenance Facility in Southborough (1993) to serve waterworks transmission system needs in central and western Massachusetts. In addition, the Deer Island Maintenance Building opened in 1995 to support the new plant.

The most pressing remaining need was for a maintenance facility to serve sewerage facilities north of Boston and waterworks facilities not efficiently served from Southborough. MWRA's new Chelsea facility consists of two buildings, a 124,000 square feet administration building and a 92,000 square feet maintenance building. There are nearly three acres for outside material and equipment storage, parking for more than 650 MWRA and employee vehicles, an on-site fueling station, and a radio communications tower and 400 square feet radio equipment building. Upon completion of the administration building in June 2001 MWRA relocated staff from the Charlestown Navy Yard and Linden Street. Relocation of staff to the Maintenance building from the Chestnut Hill Pump Station, the East Boston Steam Station, Glenwood Yard, Mystic Shops, Nay Street, Winchester Yard, FRSA, and Charlestown Pump Station began in December and was completed by the end of January 2002. In FY06, additional staff were relocated from the Charlestown Navy Yard enabling MWRA to complete the reorganization of its engineering function and reduce the amount of leased space needed in CNY. A total of 575 staff now work out of the Chelsea facility.

### Scope

Sub-phase	Scope
Planning	Planning for the new MWRA Chelsea facility.
Conceptual Design	Conceptual and schematic architectural programming and design services for development of a Request for Proposals.
Negotiating Support	Real estate consultant to assist with lease negotiations.
Legal Services	Contract for a real estate attorney to assist with lease negotiations and review of lease documents.
Design Review	Architectural review of proposals and verification of specifications.
Fit out/Office Furnishing/ Equipment	Purchase of furnishings and equipment for the new facility.

Sub-phase	Scope
Information/ Telecommunication Consultant	Consultant to implement plan for information and telecommunications systems at the new facility.
Fit out – All other items	Purchase of equipment, furnishings, and specialized items for the Operations Control Center, Emergency Operations Center, water quality laboratory, maintenance shops, data center, warehouse, vehicle maintenance facilities, training rooms, library, TRAC sampling area, and muster room.
Existing Facility Button Up	Closeout of existing facilities and sites that were vacated by MWRA and declared surplus.
Moving Expense	Costs associated with moving staff to the Chelsea facility.
Moving Expense- CNY	Costs associated with moving staff from Building 36 to Buildings 39 and 34 in the Charlestown Navy Yard.
CNY Retrofit	Construction and materials to reconfigure Buildings 34 and 39 to accommodate staff vacating Building 36.
MIS Network and Minicomputer Architecture, Performance, and Implementation	Network, minicomputer, and server performance upgrades, and equipment to provide adequate speed and performance to the new data center. This equipment is designed to accommodate future technology requirements.
Communications Tower	Erection of a communications tower at Deer Island to link Deer Island and the Chelsea facility.

#### Expenditure Forecast (in \$000s) and Project Status

Total Budget	Payments thru FY06	Remaining Balance	FY07 Projected	FY08	FY04-08	FY09-13	Beyond FY13
\$10,227	\$9,842	\$385	\$385	\$0	\$1,674	\$0	\$0

Project Status 11/06	96.2%	Status as % is approximation based on project budget and expenditures. This project is substantially complete. Expect remaining balances to be paid in FY07
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#### Changes to Project Scope, Budget, and Schedule

Project Cost			Scheduled Completion Date			FY04-08 Spending		
FY07	PFY08	Chge.	FY07	PFY08	Chge.	FY07	PFY08	Chge.
\$10,227	\$10,227	\$0	May-07	Jun-07	1 mo.	\$1,674	\$1,674	\$0

#### Explanation of Changes

n/a

#### CEB Impact

No additional impacts identified at this time.

## S. 925 Technical Assistance

### *Project Purpose*

*To ensure ready access on an as needed basis, to professional and technical services not available or not cost-effectively provided by in-house staff.*

### Project History and Background

Efficient implementation of MWRA's Capital Improvement Program and other projects often requires specialized skills and technical assistance that are not available from in-house staff. This project ensures ready access to a variety of services through a series of task order contracts with pre-set limits. Task orders are used when immediate expertise on projects is required. When a task order is complete, the expense is transferred to the appropriate capital project or Current Expense Budget cost center.

### Scope

Sub-phase	Scope
Technical Assistance	MWRA technical assistance contracts include the following: mechanical, materials testing, surveying, hazardous materials assessment, instrumentation control, and wetland/environmental.

**Status** MWRA uses technical assistance contracts in support of various CIP and CEB projects.

### Expenditure Forecast (in \$000s)

Total Budget	Payments thru FY06	Remaining Balance	FY07 Projected	FY08	FY04-08	FY09-13	Beyond FY13
\$ 1,650	\$0	\$1,650	\$0	\$550	\$550	\$1,100	\$0

### Changes in Project Scope, Budget, and Schedule

Project Cost			Scheduled Completion Date			FY04-08 Spending		
FY07	PFY08	Chge.	FY07	PFY08	Chge.	FY07	PFY08	Chge.
\$1,650	\$1,650	\$0	Jun-09	Jun-10	12 mos.	\$1,100	\$550	(\$550)

### Explanation of Changes

- Schedule shift to reflect continuation of some contracts for an additional year.

### CEB Impact

- When Technical Assistance contracts are used to support a project in the operating budget, the costs are charged to the CEB.

# S. 931 Business Systems Plan

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## **Project Purpose**

*To develop, improve, and procure management information systems (MIS) to adapt to the changing business needs associated with managing the waterworks and sewerage systems.*

## **Project History and Background**

During the process of developing the FY94-96 Capital Improvement Program, it became evident that MWRA needed to invest in the upgrade, enhancement, and expansion of its management information systems (MIS) to adapt to the changing business needs of the waterworks and sewerage systems, and to respond to new regulatory requirements. To address these needs, MWRA initiated and implemented a business system planning effort to determine future MIS support requirements. Annual plan updates have assisted staff, external constituencies, and the Board of Directors in understanding the critical role of information systems in carrying out MWRA's environmental and economic mission.

The initial business systems plan focused primarily on FY95-97 (Phase 1) with the goal of getting greater use out of existing systems. Implementation of Phase I improvements was completed in June 1997.

Phase II (FY97-99) built on the progress made during Phase I and continued the development of economies of scale through optimization of existing assets, technology conversion promoting database integration, and infrastructure improvement. Except for improvements to the TRAC Information System, Phase II is complete. The TRAC I/S was competitively bid in FY06 and the project is expected to be completed in FY08.

Phase III (FY99-01) focused on implementing a new, integrated financial, procurement and human resources/payroll system (Lawson) – replacing three separate and obsolete software products. This project was substantially completed in May 2000 and met schedule and budgetary targets. Implementation of a Treasury workstation and integration with MAXIMO was completed by the close of FY01. The system reduces duplication of databases, streamlines several business processes, and improves staff ability to perform trend analysis.

Phase IV of the Business Systems Plan supported MWRA's effort in anticipation of the year 2000 to assess systems and applications and implement corrective actions to avoid systems failures. This phase was completed in February 2000, and MWRA did not experience any major system failures or disruptions. In addition, approximately 65% of Phase IV spending was for items that would have been purchased anyway and have useful lives well beyond 2000.

Phase V (FY01-09) supports MWRA's ongoing program of information system improvements. The focus is on development of a Waterworks Operations Management system similar to the one used to support Deer Island management, implementation of MAXIMO for the Field Operations Department (completed), and improvements to the laboratory information system to keep pace with changing business needs and technology standards. In addition, Phase V includes replacement of obsolete minicomputers and improvements to GIS and TV Inspection systems based on benchmarking results (completed).

Phase VI (FY03-09) supports the replacement of obsolete PBXes at major sites, re-licensing of Microsoft Office products, storage/server improvements for Computer Center operations and the conversion of Lawson portfolio to a current supported operating system.

A new MIS Plan as part of the overall Authority's Master Plan is under development. The major areas of focus are: replacing aging systems and the network architecture, improving disaster recover, enhancing data integration, consolidating server/computing resources, and implementing applicable best practices as part of software vendor solutions. The goal is to continue to support efficient administrative, financial, operational, engineering and planning functions with cost-effective technology. Key projects identified include: a NET2020 project, storage/server improvements (SAN), Computer Center and OCC infrastructure equipment replacements, document management software and telecommunications equipment replacement.

## Scope

Sub-phase	Scope
Phase I (FY95-97)	<u>Various improvements (complete):</u> Upgrade of BHP minicomputers; Unix-based minicomputer for GIS integration; implementation and enhancement of the Sewerage Analysis and Management System (SAMS) including high-end workstations to incorporate improved hydraulic modeling capabilities, condition information, mapping, and GIS data so that CSO Master Plan and Transport data requirements are met; PC replacements; storage and functionality improvements for TRAC Information Systems (IS) and wastewater flow data; leasing of three replacement minicomputers for administration and finance systems to address capacity and performance issues; implementation of CADD software and related tools including the establishment of a document management system to index thousands of engineering documents maintained by the Records Management Center and technical information centers at CNY and Deer Island; and development of a network plan for Business Systems Plan updates to address industry changes, maintenance/replacement concerns, and functionality needs.
Phase II (FY97-10)	Eight elements key to MWRA staff productivity: (1) server consolidation, (2) network scalability program, (3) database integration program, (4) PBX replacement, (5) records management inventory program, (6) maintenance management, (7) TRAC I/S replacement, and (8) waterworks programming services. With the exception of the TRAC I/S replacement currently underway and a Storage Area Network (SAN) to support the new TRAC I/S, new LIMS and other mission-critical applications, this phase is complete. The new TRAC I/S is expected to be in production by April 2008 (the CIP includes 3 years of maintenance through FY10) and the first SAN with corresponding server replacements in FY07 and enhanced through FY09. MWRA's first SAN will collapse up to 32 minicomputers and servers over a two-year period into one storage pool. The selection of servers is based on the amount of data, costs, and its mission-critical designation.
Phase III (FY99-01)	Procurement of new integrated financial, procurement and human resources/payroll system. Purchase and installation of a back-up generator for Building 36 in the Charlestown Navy Yard and network project support. Complete.
Phase IV	Year 2000 assessment and improvements. Complete.
Phase V (FY01-09)	<p><u>Waterworks Operations Management System (OMS):</u> Establishment of a system to integrate SCADA, water quality, flow, and related data for management reporting and analysis (SCADA incorporation to Process Book is ongoing; data warehouse completion expected in FY09 once the new LIMS is in production). In FY01, the scope was expanded to include replacement of obsolete Open-VMS minicomputers at Deer Island with current servers running Microsoft-NT and also updating OMS software to run on the new platform (expected completion in FY08 based on vendor product-line extensions). In FY06, a Harbor Outfall Monitoring Database project was identified and the system is expected to be in production in FY07.</p> <p><u>Laboratory Information Management System:</u> Implementation of software improvements to stay current with industry standards and meet ongoing business needs. A competitive bid is expected in FY07.</p> <p><u>Geographical Information Management System (GIS):</u> Conversion of GIS from UNIX to NT based on vendor software changes (complete). Also, completed recommendations from a TV Inspection Benchmarking Project by purchasing new software to improve data and operational efficiencies. New business requirements, including expansion of GeoXH handhelds to collect information on manhole inspections and its incorporation into GIS, are being handled under the CEB.</p>

Sub-phase	Scope
Phase VI (FY04–09)	<p><u>Telecommunications:</u> Replacement of the Deer Island PBX (completed in FY04).</p> <p><u>Lawson Minicomputer:</u> Purchase of a backup UNIX minicomputer to be used for Lawson processing, storage improvements for all MWRA's minicomputer and server resources (scheduled for FY08).</p> <p><u>Disaster Recovery:</u> In FY06, as part of the MWRA-wide Continuity of Operations Planning project, it was determined that a permanent disaster recovery computer center would be located at the Interim Corrosion Control Facility at the CWTP. A disaster recovery computer center was viewed as a higher priority than the originally budgeted server consolidation line item (it was expected due to the decreases in hardware prices that the TRAC I/S replacement project would yield savings to accomplish a SAN). In 2009, the new center is expected to be opened with the goal of providing automatic fail-over capability for all mission-critical applications in the event of a Chelsea disaster.</p> <p><u>Microsoft:</u> Microsoft's current strategy is 2 years of final maintenance on a version once a newer version has been released; Office 2007 is scheduled to be released in 2007. The remaining CIP provides for approximately 350 Office new 2007 licenses (previous re-licensing programs yielded a credit). The outstanding licenses will be purchased under the CEB (estimated cost of \$150,000 over 2 years in FY09 and FY10).</p> <p><u>Document Management:</u> The replacement of InfoStar, the MWRA Document Management System was originally part of this phase but it was eliminated in December 2004 and is requested for FY15.</p>
NET2020 (FY10–FY12)	<p>The current MWRA network architecture was implemented in CY2000 in preparation for the facility and staffing consolidation that took place in Chelsea in 2001. The goal was to establish a computer network architecture that would support MWRA's evolving information technology requirements over a 10-year period through 2010. MWRA's architecture emphasizes manageability, stability, flexibility, and adaptability. MWRA major sites connected to Chelsea are: Advisory Board, Carroll Water Treatment Plant, Clinton, Cosgrove, Deer Island Treatment Plant and CSB, Nut Island, Pellet Plant, Quabbin Reservoir Lab, and Southborough. Due to costs and limited provider options, smaller sites gain access to the MWRA network through a variety of methods such as dial-up (modem over telephone lines) and virtual private network (VPN) over DSL lines or cable company connections. VPN will also be used to support planned projects of wireless connectivity for field staff using MAXIMO, Global Position Units, and for full systems access by the Emergency Services Unit during drills, security incidents, and disasters. The NET2020 project will address the new network architecture for the period 2010 to 2020 including replacing all network equipment (3 main switches, 105 premise switches, and numerous appliances) with newer products</p>
SAN II (FY12) SAN III (FY15)	<p>SANs provide modular scalability, high availability, increased fault tolerance, and centralized storage management. Historical data can also be archived to cheaper storage following industry best practices. The use of a SAN reduces footprint requirements. Also, energy needed to run and cool the SAN equipment is reduced by approximately 50%. The current inventory of major servers and minicomputers is 87 (this does not include site servers for file sharing and printing). The first SAN (Phase II above) will collapse up to 32 servers/minicomputers' direct attached storage. SAN II will collapse up to an additional 32 servers/minicomputers' direct storage in FY12. In FY15, a SAN III has been planned to replace the original SAN with the then current technology.</p>



Sub-phase	Scope
Telecommunications (FY14–FY15)	Voice communication is done using private branch exchanges (PBXs) located at Charlestown, Chelsea, Southborough, Carroll Water Treatment Plant, Deer Island, Clinton, and Nut Island. Because the PBXs are networked, staff at these facilities can use four-digit dialing to call each other at no cost. Charlestown and Chelsea operator consoles are linked to permit Chelsea to be the primary call-intake facility. Likewise, Chelsea and Deer Island are uniquely linked to allow Chelsea to be the backup console. A full replacement of the equipment is not planned until FY14, prior to which new technologies will be reviewed such as Voice over IP (telephone communications using the Internet), before the next 10-year architecture is established.
Computer Center & OCC Infrastructure (FY15–FY16)	The Chelsea facility hosts the Computer Center, Operations Control Center (OCC) and the primary Emergency Operations Center. Specialty fire suppression systems, UPS equipment, environmental control and alarming systems, console apparatus, etc. was purchased in 2000/01 with the facility opening. All of this equipment has a useful life of approximately 15 years and will require replacement beginning in FY15.

#### Expenditure Forecast (in \$000s) and Project Status

Total Budget	Payments thru FY06	Remaining Balance	FY07 Projected	FY08	FY04-08	FY09-13	Beyond FY13
\$30,076	\$18,961	\$11,115	\$1,457	\$2,133	\$4,572	\$4,676	\$2,850

Project Status 11/06	63.2%	Status as % is approximation based on project budget and expenditures. Phases V and VI are in process. The TRAC IS system was competitively bid in FY06 and awarded during FY07 Q1. The LIMS replacement will be competitively bid in FY07 Q3 and is expected to be awarded by FY07 Q4.
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#### Changes to Project Scope, Budget, and Schedule

Project Cost			Scheduled Completion Date			FY04-08 Spending		
FY07	PFY08	Chge.	FY07	PFY08	Chge.	FY07	PFY08	Chge.
\$25,126	\$30,076	\$4,950	Jun-09	Jun-16	84 mos.	\$6,521	\$4,572	(\$1,950)

#### Explanation of Changes

- Budget, schedule, and spending changed due to new subphases added for Computer Center-OCC Infrastructure, NET 2020, SAN II, SAN III, and Telecommunications.

#### CEB Impact

- The incremental software and/or hardware maintenance costs for the TRAC system, Phase II SAN & CPUs for TRAC & LIMS, PH V LIMS Replacement (GIS & OMS), PH VI Lawson, MS Licensing & JJCWTP will be approximately \$299,000 in FY11; NET2020 impacts will be \$50,000 in FY14; Document Imaging & Control will have a \$75,000 impact in FY18, and SAN III and Telecommunications will have a \$125,000 impact in FY19.

## S. 932 Environmental Remediation

### Project Purpose

*To implement remedial programs necessary to protect the environment and to ensure compliance with the Clean State Initiative.*

### Project History and Background

Fuel tank replacements at Prison Point CSO, Cottage Farm CSO, and Chelsea Creek Headworks will enable MWRA to meet all current regulatory requirements and provide enhanced spill prevention and leak detection capabilities.

In accordance with the Massachusetts Contingency Plan, MWRA installed an oil recovery system to clean up oil contamination at Prison Point in conjunction with the tank replacement. Removed contaminated soil in conjunction with the tank replacement at the Chelsea Creek Headworks.

Many MWRA underground storage tanks (USTs) have been upgraded or replaced to meet current regulations. Two USTs at the Prison Point CSO were replaced in spring 1999, with remediation work remaining to be completed. Chelsea Creek Headworks and Cottage Farm UST replacement construction was completed in December 2002. The Commercial Point CSO and Hingham Pump Station UST Upgrades construction contract began in February 2003 and was completed in March 2003.

### Scope

Sub-phase	Scope
Technical Assistance – Environmental Remediation	Design, construction oversight, and waste site clean-up services for Prison Point, Cottage Farm, and Chelsea Creek tank replacements.
Prison Point Tank Replacement – Construction	Removal and replacement of two underground fuel storage tanks at the Prison Point CSO facility. Operation of oil recovery system. Assessment, design and installation of system upgrades.
Cottage Farm Tank Replacement – Construction	Removal and replacement of two underground fuel storage tanks at the Cottage Farm CSO facility.
Cosgrove Power Station – Design/CS and Construction	Design and construction of stormwater collection and surface water discharge system.
Oakdale Power Station – Design and Construction	Design and construction of non-contact cooling water disposal system. Design includes resolution of MCP issues associated with ground water conditions.

### Expenditure Forecast (in \$000s) and Project Status

Total Budget	Payments thru FY06	Remaining Balance	FY07 Projected	FY08	FY04-08	FY09-13	Beyond FY13
\$1,831	\$1,369	\$462	\$87	\$52	\$370	\$216	\$107

Project Status 11/06	76.8%	Status as % is approximation based on project budget and expenditures. The Prison Point oil recovery system upgrade assessment is in progress.
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**Changes to Project Scope, Budget, and Schedule**

Project Cost			Scheduled Completion Date			FY04-08 Spending		
FY07	PFY08	Chge.	FY07	PFY08	Chge.	FY07	PFY08	Chge.
\$1,831	\$1,831	\$0	Jun-07	Jan-13	66 mos.	\$465	\$370	(\$95)

**Explanation of Changes**

- Revised spending projection for Prison Point work.
- Schedule shift to reflect completion date for Prison Point work.

**CEB Impact**

None

## S. 934 MWRA Facilities Management and Planning

### Project Purpose

*To improve MWRA operations by consolidating projects and providing a central point of review and decision making for space planning decisions.*

### Project History and Background

This project consolidates existing MWRA projects (DI Maintenance Facilities and DI CSB Demolition) to provide a central point of review and decision making for space planning decisions. This project will cover work to rehabilitate or demolish the old Administration Building on Deer Island as the building has deteriorated and certain structures need to be upgraded to current standards if it is to remain occupied. Project also includes installation of the paint and sandblast booths, purchased from the Chelsea Facility developer, in the Chelsea Maintenance Building for a fully functional shop, and funds to construct a washdown area to sanitize tools, equipment, and parts before working on them in the shop area at Chelsea. Of the \$6.8 million project budget, \$2.4 million is a transfer of existing phases from DI for maintenance facilities. The remainder is for new work proposed to complete the work in Chelsea and for the development of a small annex near the Chelsea Facility that would house the washdown area and provide garage space for the weather-sensitive wastewater pipeline equipment and vehicles.

### Scope

Sub-phase	Scope
Design & Engineering Services	Design and engineering services to support space plan.
Facilities Construction	Construction of modifications to MWRA facilities in accordance with space plan.
Facilities Fit-out	Purchase of furniture and other items to fit-out new and/or modified facilities.

### Expenditure Forecast (in \$000s) and Project Status

Total Budget	Payments thru FY06	Remaining Balance	FY07 Projected	FY08	FY04-08	FY09-13	Beyond FY13
\$6,753	\$0	\$6,753	\$535	\$920	\$1,455	\$5,298	\$0

Project Status 11/06	0%	Status as % is approximation based on project budget and expenditures. Planning for this project is in process.
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### Changes to Project Scope, Budget, and Schedule

Project Cost			Scheduled Completion Date			FY04-08 Spending		
FY07	PFY08	Chge.	FY07	PFY08	Chge.	FY07	PFY08	Chge.
\$4,091	\$6,753	\$2,662	Jan-10	Jul-10	6 mos.	\$1,454	\$1,455	\$1

**Explanation of Changes**

- Revised cost estimate and schedule for Facilities Construction.

**CEB Impacts**

None identified at this time.

## APPENDIX 2

# Fiscal Year 2007 – 2017 Expenditure Forecast Report with Planned NTP and SC dates

# Understanding the Expenditure Forecasts

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Capital expenditure forecasts, sometimes referred to as project cashflows, are presented in this section of the Proposed FY08 CIP document. Expenditure forecasts are accrual based, i.e., projected expenditures are estimated based on when services are expected to be rendered. Projects appear in this report in the same order they appear on-line, organized by capital program area. Grant and loan receipts for various projects and programs appear in the section following the expenditure forecasts.

The following presents a description of each column in the expenditure forecast tables:

**Project and Subphase Names**

The first column of the expenditure forecast identifies the organizational hierarchy of the CIP: capital program area (e.g., Wastewater System Improvements), program category (e.g., Interception and Pumping), project (e.g., Quincy Pump Facilities), phase (for BHP only), and sub-phases (e.g., Facilities Plan/EIR). Sub-phases represent awarded and unawarded contracts.

**The Five Digit (FMS) and Four Digit (PSI) Numbers**

To the left of each project name is a string of nine numbers preceded by an S. These numbers are assigned by the Rates and Budget Department, and are the number reference for the sub-phase in MWRA's capital budgeting database, CAPSTAN.

Following the "S" is a five-digit number representing the MWRA Lawson Activity Management System sub-phase number. Project budgets and expenditures are tracked by this account number.

Following the five-digit sub-phase number is a four-digit number representing the contract reference number in MWRA's contract management system. This reference number is used to access contract information such as the award amount, change order activity, and processed invoices.

**Project Participant**

The project participant is the consultant, designer, or contractor who has been awarded the contract for the project phase. Non-awarded contracts are identified by "TBS" (to be selected).

**Notice to Proceed and Substantial Completion**

Project schedules are tracked by two key milestones: Notice to Proceed and Substantial Completion. These milestones indicate the expected start and end dates for contract activity.

**Total Contract Amount**

The Total Contract Amount represents the budget amount for the program, program category, project, or sub-phase. For unawarded contracts, the contract amount is based on a cost estimate. For awarded contracts, this amount includes the award amount plus any change orders, amendments, and purchase orders accounted for prior to completing the budget.

**Projected Payments through FY06**

Projected Payments through FY06 includes actual and accrued expenditures since the inception of the contract through the end of FY06.

**Remaining Balance 6/30/06**

Remaining Balance 6/30/06 is calculated by subtracting Projected Payments through FY06 from the Total Contract Amount. This amount is then spread in the columns to the right, from FY07 to Beyond FY17.

**Expenditure Forecasts**

The remaining columns in the spreadsheet contain projections for capital spending by sub-phase during FY07-17. Forecasts are presented annually for FY08-17.

**ATTACHMENT A  
MWRA CAPITAL IMPROVEMENT PROGRAM SUMMARY**

CAPITAL IMPROVEMENT PROGRAM EXPENDITURE FORECAST FY2004-2008 (\$000)													
	Total Contract Amount	Project Payments Thr. FY06	Balance FY06	FY2004 Actual	FY2005 Actual	FY2006 Actual	FY2007 Estimate	QI FY08	QII FY08	QIII FY08	QIV FY08	FY2008	5-Year Total FY04-08
<b>Wastewater System Improvements</b>	<b>2,198,552</b>	<b>951,887</b>	<b>1,246,665</b>	<b>92,163</b>	<b>88,615</b>	<b>102,263</b>	<b>99,329</b>	<b>48,354</b>	<b>33,876</b>	<b>45,285</b>	<b>27,483</b>	<b>154,998</b>	<b>537,368</b>
Interception & Pumping	676,650	429,095	247,555	31,853	21,843	32,909	31,496	10,940	10,844	8,329	5,266	35,379	153,481
Treatment	419,345	35,601	383,744	3,978	9,240	12,230	8,579	4,406	4,219	6,242	6,397	21,265	55,291
Residuals	212,131	63,811	148,320	8,930	-1,700	-38	0	50	90	90	265	495	7,687
CSO	803,551	350,411	453,140	45,867	53,663	45,541	57,494	32,125	18,750	30,784	15,471	97,130	299,695
Other Wastewater	86,875	72,969	13,906	1,535	10,069	11,620	1,759	832	-26	-160	83	730	25,714
<b>Waterworks System Improvements</b>	<b>2,271,946</b>	<b>1,500,457</b>	<b>771,489</b>	<b>100,093</b>	<b>76,276</b>	<b>48,458</b>	<b>65,555</b>	<b>11,858</b>	<b>17,403</b>	<b>16,035</b>	<b>17,344</b>	<b>62,640</b>	<b>353,022</b>
Drinking Water Quality Improvements	640,054	490,171	149,884	55,706	30,579	17,632	7,536	3,085	3,005	3,326	3,620	13,035	124,488
Transmission	972,725	644,181	328,544	9,221	7,360	8,159	19,788	1,891	3,136	1,525	3,005	9,557	54,085
Distribution And Pumping	629,140	262,615	366,525	23,819	25,472	14,713	24,609	7,354	8,737	8,709	8,331	33,132	121,746
Other Waterworks	30,027	103,490	-73,463	11,347	12,864	7,954	13,621	-472	2,526	2,475	2,388	6,917	52,703
<b>Business &amp; Operations Support</b>	<b>68,132</b>	<b>36,786</b>	<b>31,345</b>	<b>1,761</b>	<b>2,798</b>	<b>1,626</b>	<b>5,477</b>	<b>1,849</b>	<b>1,378</b>	<b>1,275</b>	<b>1,503</b>	<b>6,005</b>	<b>17,667</b>
Contingency	156,192		156,192					6,024	5,444	6,219	4,431	22,117	22,117
<b>Total MWRA w/Contingency</b>	<b>4,694,822</b>	<b>2,489,130</b>	<b>2,205,691</b>	<b>194,016</b>	<b>167,689</b>	<b>152,347</b>	<b>170,361</b>	<b>68,085</b>	<b>58,101</b>	<b>68,814</b>	<b>50,761</b>	<b>245,760</b>	<b>930,174</b>

CAPITAL IMPROVEMENT PROGRAM EXPENDITURE FORECAST FY2008-2017 (\$000)													
			FY2008	FY2009	FY2010	FY2011	FY2012	FY2013	FY2014	FY2015	FY2016	FY2017	10-Year Total FY08-17
<b>Wastewater System Improvements</b>			<b>154,998</b>	<b>154,871</b>	<b>133,998</b>	<b>83,547</b>	<b>45,553</b>	<b>36,197</b>	<b>54,049</b>	<b>60,581</b>	<b>54,283</b>	<b>35,014</b>	<b>813,091</b>
Interception & Pumping			35,379	8,062	8,232	11,741	10,573	6,122	19,323	20,119	26,259	25,583	171,393
Treatment			21,265	37,473	35,452	24,002	8,385	4,118	11,952	9,233	8,417	8,250	168,547
Residuals			495	1,150	675	2,000	2,000	667	7,334	18,334	20,833	5,417	58,905
CSO			97,130	107,219	87,608	42,532	20,814	18,236	9,381	8,166	4,155	101	395,342
Other Wastewater			730	967	2,031	3,272	3,780	7,054	6,059	4,729	-5,381	-4,336	18,905
<b>Waterworks System Improvements</b>			<b>62,641</b>	<b>72,306</b>	<b>71,403</b>	<b>79,339</b>	<b>91,916</b>	<b>100,187</b>	<b>78,333</b>	<b>62,304</b>	<b>46,331</b>	<b>11,729</b>	<b>676,489</b>
Drinking Water Quality Improvements			13,035	16,848	18,082	12,622	21,071	30,996	21,777	7,917	0	0	142,348
Transmission			9,557	7,934	6,921	26,304	28,608	25,085	45,777	47,795	40,759	10,018	248,758
Distribution And Pumping			33,132	39,612	40,800	37,135	39,345	44,055	31,341	24,954	21,658	16,093	328,125
Other Waterworks			6,917	7,913	5,600	3,278	2,893	51	-20,562	-18,362	-16,086	-14,382	-42,740
<b>Business &amp; Operations Support</b>			<b>6,005</b>	<b>5,885</b>	<b>7,021</b>	<b>1,368</b>	<b>1,957</b>	<b>676</b>	<b>432</b>	<b>1,775</b>	<b>750</b>	<b>0</b>	<b>25,869</b>
Contingency			22,117	23,312	20,925	14,968	12,255	12,295	15,263	14,491	13,150	7,417	156,192
<b>Total MWRA w/Contingency</b>			<b>245,761</b>	<b>256,374</b>	<b>233,347</b>	<b>179,222</b>	<b>151,681</b>	<b>149,355</b>	<b>148,077</b>	<b>139,151</b>	<b>114,514</b>	<b>54,160</b>	<b>1,671,641</b>

**FY08 Proposed**

Total FY04-08 (see FY04-08 Table)	194,016	167,689	152,347	170,361	245,760	930,174
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Total FY09-13			256,374	233,347	179,222	151,681	149,355	969,979
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Total FY08-17			245,761	256,374	233,347	179,222	151,681	149,355	148,077	139,151	114,514	54,160	1,671,641
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**Massachusetts Water Resource Authority  
Capital Expenditure Forecast: 2007-2017  
(\$000s)**

Program / Project	NTP	SC	Total Contract Amount	Payments Thru FY06	Remaining Balance 6/30/06	FY07	FY08	FY09	FY10	FY11	FY12	FY13	FY14	FY15	FY16	FY17	Beyond FY17
<b>Total MWRA</b>			<b>4,538,630</b>	<b>2,489,131</b>	<b>2,049,499</b>	<b>170,361</b>	<b>223,643</b>	<b>233,063</b>	<b>212,422</b>	<b>164,255</b>	<b>139,425</b>	<b>137,060</b>	<b>132,813</b>	<b>124,660</b>	<b>101,364</b>	<b>46,743</b>	<b>363,691</b>
<b>S.1 Wastewater System Improvements</b>			<b>2,198,552</b>	<b>951,887</b>	<b>1,246,665</b>	<b>99,329</b>	<b>154,998</b>	<b>154,871</b>	<b>133,998</b>	<b>83,547</b>	<b>45,553</b>	<b>36,197</b>	<b>54,049</b>	<b>60,581</b>	<b>54,283</b>	<b>35,014</b>	<b>334,245</b>
<b>S.10 Interception &amp; Pumping</b>			<b>676,650</b>	<b>429,095</b>	<b>247,555</b>	<b>31,496</b>	<b>35,379</b>	<b>8,062</b>	<b>8,232</b>	<b>11,741</b>	<b>10,573</b>	<b>6,122</b>	<b>19,323</b>	<b>20,119</b>	<b>26,259</b>	<b>25,583</b>	<b>44,666</b>
<b>S.102 Quincy Pump Facilities</b>			<b>25,897</b>	<b>25,897</b>	<b>0</b>												
S.10024.5400 Facilities Plan/EIR	Dec-87	Mar-95	526	526	0												
S.10025.5402 Design/CS Rehab	Aug-88	Jul-91	110	110	0												
S.10026.5403 Construction-Rehab	Jul-89	Sep-95	328	328	0												
S.10033.5843 Land Acq - Squantum	Jan-95	Nov-99	22	22	0												
S.10027.5404 Design/CS/RI1	Aug-94	Dec-04	4,881	4,881	0												
S.10028.5405 Squantum P.S. Construction	Oct-00	Sep-03	4,415	4,415	0												
S.10029.5407 Quincy P.S. Construction	Nov-00	Dec-02	7,103	7,103	0												
S.10030.5408 Hough's Neck P.S. Construction	Jun-98	Nov-99	1,720	1,720	0												
S.10031.5409 Early Rehab Squantum F.M.	Mar-93	Feb-95	2,042	2,042	0												
S.10276.6102 Squantum Force Main Rehab	Jul-98	Jul-99	2,061	2,061	0												
S.10277.6103 Quincy Force Main Rehab	Jun-98	Jul-99	1,489	1,489	0												
S.10260.6069 Legal	Jul-95	Sep-03	77	77	0												
S.10032.5950 Technical Assistance	Dec-87	Sep-03	44	44	0												
S.10388.6810 Const Corrosion Mitigation	Sep-02	Apr-03	1,079	1,079	0												
<b>S.104 Braintree-Weymouth Relief Facilities</b>			<b>221,199</b>	<b>200,870</b>	<b>20,329</b>	<b>4,475</b>	<b>10,550</b>	<b>303</b>	<b>835</b>	<b>1,667</b>	<b>1,667</b>	<b>831</b>					
S.10045.5311 Facilities Planning Phase 1	Oct-81	Dec-90	331	331	0												
S.10046.5312 EIR Phase 1	Nov-84	Oct-90	514	514	0												
S.10057.5324 Final EIR/Fac.Plan	Apr-91	Aug-93	1,111	1,111	0												
S.10044.5332 Geotechnical - Land	Nov-91	Mar-92	8	8	0												
S.10001.5333 Geotechnical - Marine	Nov-91	Apr-92	443	443	0												
S.10047.5313 Design 1/CS/RI	Nov-94	Jun-06	18,991	18,944	46	46											
S.10251.6016 Sedimentation Testing	Sep-94	Apr-96	96	96	0												

**Massachusetts Water Resource Authority  
Capital Expenditure Forecast: 2007-2017  
(\$000s)**

Program / Project	NTP	SC	Total Contract Amount	Payments Thru FY06	Remaining Balance 6/30/06	FY07	FY08	FY09	FY10	FY11	FY12	FY13	FY14	FY15	FY16	FY17	Beyond FY17
S.10058.5331 Design 2/CS/RI	Apr-95	Jun-08	15,265	12,127	3,138	1,335	1,500	303									
S.10048.5314 Land Acquisition	Mar-97	Apr-07	3,630	3,616	13	13											
S.10049.5315 Tunnel Construction/Rescue	Jun-99	Jul-03	83,580	83,671	-91	-91											
S.10050.5316 Intermediate P.S. Construction	Dec-00	Apr-05	47,451	47,161	290	290											
S.10051.5303 No. Weymouth Relief Interceptor	Mar-01	Jun-02	4,705	4,705	0												
S.10052.5373 HDD Siphon Construction	Jul-03	May-07	16,343	16,357	-14	-14											
S.10054.5375 B-W Replacement Pump Station	Jan-05	Jan-08	17,582	5,888	11,694	2,671	9,023										
S.10452.7193 Rehab of Section 624 Des	Jul-09	Jun-13	1,000	0	1,000				500	200	200	100					
S.10060.5310 Rehab Sections 624 & 652	May-10	Jun-13	4,000	0	4,000				335	1,467	1,467	731					
S.10302.6368 Mill Cove Siphon Construction	Aug-97	Jun-98	2,749	2,749	0												
S.10055.5308 Design - Rehab	Sep-88	Dec-89	24	24	0												
S.10056.5309 Construction - Rehab	Jan-92	Dec-96	255	255	0												
S.10265.6074 Hazardous Waste	Jul-95	Apr-07	5	2	3	3											
S.10263.6072 Legal	Jul-95	Apr-07	400	274	126	126											
S.10264.6073 Public Relations	Jul-95	Apr-07	5	0	5	5											
S.10061.5951 Technical Assistance	Nov-84	Apr-07	144	144	0												
S.10278.6119 Design - Marine Pipeline	Feb-97	Aug-97	1,100	1,100	0												
S.10354.6631 Community Technical Assistance	Jul-99	Apr-07	1,111	1,111	0												
S.10375.6766 Geotechnical Consultant	Sep-00	Mar-03	56	56	0												
S.10378.6792 IPS/RPS Communication System	Dec-02	Apr-07	300	182	118	90	28										
<b>S.105 New Neponset Valley Relief Sewer</b>			<b>30,300</b>	<b>30,300</b>	<b>0</b>												
S.10062.5380 Facilities Plan	Apr-83	Dec-86	594	594	0												
S.10063.5381 EIR/Supp. Fac. Plan	Jan-88	Dec-91	626	626	0												
S.10064.5382 Design/CS/RI	Feb-89	Jul-99	4,054	4,054	0												
S.10065.5383 Land Acquisition	Dec-90	Nov-93	531	531	0												
S.10076.5377 Consultant-Canton	Sep-93	Jul-99	130	130	0												
S.10067.5385 Construction 1	Sep-93	Apr-96	5,203	5,203	0												
S.10068.5390 Construction 2	Dec-93	Nov-94	2,549	2,549	0												

**Massachusetts Water Resource Authority  
Capital Expenditure Forecast: 2007-2017  
(\$000s)**

Program / Project	NTP	SC	Total Contract Amount	Payments Thru FY06	Remaining Balance 6/30/06	FY07	FY08	FY09	FY10	FY11	FY12	FY13	FY14	FY15	FY16	FY17	Beyond FY17
S.10069.5834 Construction 3	Apr-94	May-96	3,265	3,265	0												
S.10070.5835 Construction 4	Dec-93	Oct-95	2,960	2,960	0												
S.10071.5389 Construction 5	Dec-94	Jul-96	9,599	9,599	0												
S.10072.5386 Study Dedham Street	Nov-90	Oct-96	537	537	0												
S.10074.5379 Power Line	Jul-95	Jul-99	64	64	0												
S.10073.5952 Technical Assistance	Apr-88	Mar-96	189	189	0												
<b>S.131 Upper Neponset Valley Sewer System</b>			<b>53,955</b>	<b>22,961</b>	<b>30,995</b>	<b>17,928</b>	<b>12,646</b>	<b>421</b>									
S.10256.6031 Design/CS/RI	May-00	Apr-09	4,438	3,600	838	485	325	28									
S.10290.6191 Replace Sewer Sections 685-686	Mar-05	Apr-08	36,576	17,405	19,172	15,190	3,982										
S.10352.6629 Replacement Sewer Section 687	Oct-06	Apr-08	8,334	0	8,334	1,200	7,134										
S.10439.7072 Resident Engineering/Inspection	Apr-05	Aug-08	2,347	519	1,827	695	740	392									
S.10311.6450 Land Acquisition	Jun-00	Apr-08	1,870	1,303	567	248	319										
S.10266.6075 Legal	Jun-00	Apr-08	5	0	5	2	3										
S.10267.6076 Public Relations	Jun-00	Apr-08	5	0	5	2	3										
S.10268.6077 Hazardous Waste	Jun-00	Apr-08	5	0	5	2	3										
S.10393.6830 Boston Paving	Apr-05	Apr-08	376	134	242	105	137										
<b>S.106 Wellesley Ext Replacement Sewer</b>			<b>64,359</b>	<b>64,359</b>	<b>0</b>												
S.10091.5345 Study	Oct-81	Dec-84	324	324	0												
S.10080.5346 Design/EIR/CS/RI	Dec-84	May-99	8,107	8,107	0												
S.10081.5347 Land Acquisition	Aug-88	Jul-07	3,097	3,097	0												
S.10082.5348 Consultant-Needham	Jun-89	Nov-98	171	171	0												
S.10083.5344 Consultant-Dedham	Jun-89	Jul-98	53	53	0												
S.10094.5842 Consultant-Dover	Aug-91	Jul-98	5	5	0												
S.10084.5349 Construction 1	Jun-89	Jul-91	15,069	15,069	0												
S.10086.5351 Construction 2	Aug-89	Sep-90	5,087	5,087	0												
S.10087.5434 Construction 3	Mar-90	Jul-91	6,927	6,927	0												
S.10085.5350 Construction 4	Aug-89	Sep-90	4,821	4,821	0												

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S.10088.5431 Construction 5	Nov-90	Apr-92	5,387	5,387	0												
S.10089.5432 Construction 6	Dec-91	Jul-92	2,070	2,070	0												
S.10090.5433 Construction 7	Sep-93	Jan-96	12,454	12,454	0												
S.10259.6065 EIC	Sep-95	Mar-01	369	369	0												
S.10269.6078 Legal	Feb-97	Dec-12	225	225	0												
S.10093.5953 Technical Assistance	Jun-89	Dec-12	193	193	0												
<b>S.107 Framingham Extension Relief Sewer</b>			<b>47,855</b>	<b>47,855</b>	<b>0</b>												
S.10099.5318 Fac Plan Update/EIR	Feb-90	Jul-91	1,397	1,397	0												
S.10100.5321 Land Acquisition	Jun-91	Aug-02	1,838	1,838	0												
S.10101.5319 Design/CS/RI	Jul-90	Sep-04	5,837	5,837	0												
S.10102.5320 Install Force Main	May-96	Apr-98	7,256	7,256	0												
S.10103.5322 Install Gravity Sewer	May-96	Apr-98	6,147	6,147	0												
S.10104.5323 Pump Station Construction	Jul-96	Apr-98	7,803	7,803	0												
S.10106.5825 Early Sewer Rehabilitation	Jun-94	Mar-95	4,803	4,803	0												
S.10107.5342 Late Sewer Rehabilitation	Oct-00	Sep-04	12,609	12,609	0												
S.10105.5954 Technical Assistance	Feb-90	Aug-02	162	162	0												
S.10374.6754 Conservation Commission	Oct-00	Sep-02	4	4	0												
<b>S.127 Cummingsville Replacement Sewer</b>			<b>9,379</b>	<b>7,354</b>	<b>2,025</b>	<b>847</b>	<b>1,047</b>	<b>130</b>									
S.10217.5826 Facilities Plan/EIR	Jun-92	Jul-95	602	602	0												
S.10275.6092 Design/CS/RI	May-98	Sep-08	2,333	1,796	538	207	200	130									
S.10285.6186 Cummingsville Branch Sew Const	Apr-05	May-06	4,897	4,900	-3	-3											
S.10284.6185 Land Acquisition	Apr-00	Sep-07	102	41	61	40	20										
S.10334.6571 Public Participation	Jul-99	Sep-07	5	0	5	3	2										
S.10335.6572 Legal	Jul-99	Sep-07	15	15	0												
S.10403.6916 Siphon Modifications	Feb-07	Sep-07	1,425	0	1,425	600	825										
<b>S.130 Siphon Structure Rehabilitation</b>			<b>940</b>	<b>940</b>	<b>0</b>												

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S.10253.6017 Planning	Jan-96	Nov-98	938	938	0												
S.10280.6165 Land Acquisition	Jun-06	Dec-10	2	2	0												
<b>S.132 Corrosion &amp; Odor Control</b>			<b>11,503</b>	<b>3,003</b>	<b>8,500</b>										<b>4,250</b>	<b>4,250</b>	
S.10279.6137 Planning/Study	Jan-97	Dec-98	587	587	0												
S.10327.6553 Design/CS/RI	Aug-02	Jun-05	1,788	1,788	0												
S.10323.6549 Land Acquisition			3	3	0												
S.10325.6551 Legal	Dec-00	Jul-08	2	2	0												
S.10373.6743 Interim Corrosion Control	Jul-00	Dec-01	622	622	0												
S.10453.7196 FES Tunnel Rehab Des	Jul-15	Jun-17	1,700	0	1,700										850	850	
S.10405.6918 FES Tunnel Rehab	Dec-15	Jun-17	6,800	0	6,800										3,400	3,400	
<b>S.136 West Roxbury Tunnel</b>			<b>88,881</b>	<b>8,880</b>	<b>80,001</b>	<b>1</b>				<b>1,667</b>	<b>1,667</b>	<b>1,666</b>	<b>15,000</b>	<b>15,000</b>	<b>15,000</b>	<b>15,000</b>	<b>15,000</b>
S.10299.6230 Inspection	Jul-98	Sep-99	344	344	0												
S.10333.6570 Design/CS/RI	Apr-00	Jun-03	1,413	1,412	1	1											
S.10332.6569 Construction	Jun-01	Jun-02	6,674	6,674	0												
S.10330.6567 Legal	Apr-00	Mar-10	2	2	0												
S.10331.6568 Land Acquisition	Apr-00	Mar-10	440	440	0												
S.10366.6709 Technical Assistance	Nov-99	Mar-10	8	8	0												
S.10400.6897 Tunnel Design	Jul-10	Jun-18	16,000	0	16,000					1,667	1,667	666	2,400	2,400	2,400	2,400	2,400
S.10401.6898 Tunnel Construction	Jul-12	Jun-18	64,000	0	64,000							1,000	12,600	12,600	12,600	12,600	12,600
<b>S.137 Wastewater Central Monitoring</b>			<b>20,277</b>	<b>3,877</b>	<b>16,400</b>	<b>6,440</b>	<b>6,909</b>	<b>2,653</b>	<b>399</b>								
S.10301.6232 Planning	Jan-98	Jul-99	563	563	0												
S.10319.6532 Design and Integration Services	Jun-02	Nov-08	6,145	2,358	3,787	1,448	1,600	739									
S.10320.6533 Construction 1 (CP1)	Mar-06	Apr-07	7,260	950	6,310	4,782	1,528										
S.10321.6534 Construction 2 (CP2)	Jul-07	Aug-08	4,854	0	4,854		3,640	1,214									
S.10357.6657 Construction 3 (CP3)	Jul-08	Aug-09	1,099	0	1,099			700	399								
S.10398.6861 Equipment Prepurchase	Apr-05	Nov-07	356	5	351	210	141										

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<b>S.139 South System Relief Project</b>			<b>4,945</b>	<b>3,440</b>	<b>1,505</b>	<b>4</b>	<b>189</b>	<b>750</b>	<b>563</b>								
S.10309.6419 CS/RI-Archdale	Nov-98	Aug-99	6	6	0												
S.10310.6420 Construction-Archdale	May-99	Aug-99	211	211	0												
S.10318.6519 Sec 70&71 HLS Eval.	Sep-98	Oct-99	215	215	0												
S.10349.6611 Sec 70 & 71 HLS Construction	Jun-99	Oct-99	417	417	0												
S.10345.6595 Design Outfall 023	Jun-99	Sep-99	1	1	0												
S.10346.6596 Cleaning Outfall 023	Apr-00	Nov-00	1,098	1,098	0												
S.10347.6605 Land Acquisition/Easements	Apr-99	Apr-05	5	5	0												
S.10350.6616 Milton Financial Assistance	Oct-99	Jun-00	1,488	1,488	0												
S.10362.6680 Legal/Permits	Jul-99	Jun-07	5	0	5	4	1										
S.10386.6801 Outfall 023 Str Improvements	Jan-08	Dec-09	1,500	0	1,500		188	750	563								
<b>S.141 Wastewater Process Optimization</b>			<b>2,272</b>	<b>930</b>	<b>1,342</b>	<b>24</b>		<b>54</b>	<b>76</b>	<b>395</b>	<b>768</b>	<b>25</b>					
S.10367.6733 Planning	Aug-01	Aug-04	954	930	24	24											
S.10413.6931 Somerville Sewer-Design	Oct-08	Aug-11	200	0	200			54	76	60	10						
S.10414.6932 Somerville Sewer-Construction	Mar-11	Aug-11	968	0	968					335	633						
S.10415.6933 Siphon- Planning	Nov-11	Jun-12	150	0	150						125	25					
<b>S.142 Wastewater Meter Sys-Equip Replace</b>			<b>26,578</b>	<b>4,959</b>	<b>21,620</b>	<b>145</b>	<b>140</b>	<b>35</b>				<b>100</b>	<b>73</b>	<b>452</b>	<b>2,342</b>	<b>1,667</b>	<b>16,666</b>
S.10371.6739 Planning/Study	Jan-13	May-13	100	0	100							100					
S.10379.6793 Equipment Purchase/Installation	Nov-03	Jun-08	5,278	4,959	320	145	140	35									
S.10410.6928 Design	Jul-13	Jan-16	200	0	200								73	83	44		
S.10411.6929 Construction	Jan-15	Jan-16	1,000	0	1,000									369	631		
S.10451.7191 Wastewater Metering Asset Protection	Jul-15	0	20,000	0	20,000										1,667	1,667	16,666
<b>S.143 Regional I/I Management Planning</b>			<b>169</b>	<b>169</b>	<b>0</b>												
S.10372.6740 Cmom/Planning	Jan-01	Jun-03	169	169	0												
<b>S.145 I&amp;P Facility Asset Protection</b>			<b>63,141</b>	<b>3,303</b>	<b>59,839</b>	<b>1,631</b>	<b>3,898</b>	<b>3,716</b>	<b>6,360</b>	<b>8,012</b>	<b>6,471</b>	<b>3,500</b>	<b>4,250</b>	<b>3,000</b>	<b>3,000</b>	<b>3,000</b>	<b>13,000</b>
<b>S.1400 Interceptors</b>			<b>8,653</b>	<b>2,156</b>	<b>6,498</b>	<b>1,030</b>	<b>2,727</b>	<b>740</b>		<b>2,000</b>							

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S.10383.6798 Rehab of Section 93A Lexington	Jul-03	Apr-04	1,568	1,566	2	2											
S.10392.6829 Technical Assistance	Jul-02	Nov-08	40	14	27	11	14	2									
S.10394.6842 Sections 80&83	Jan-07	Nov-07	682	0	682	186	496										
S.10395.6843 Section 160	Mar-07	Aug-08	3,139	0	3,139	185	2,216	738									
S.10396.6857 Survey	Nov-04	May-05	52	11	41	41											
S.10397.6858 Permits	May-03	Nov-08	6	3	3	2	1										
S.10440.7073 Land/Easements			150	21	129	129											
S.10423.6987 93 A Force Main Replacement	May-06	Jan-07	474	0	474	474											
S.10424.7004 Mill Brook Valley Sewer Sec 79&92	Jun-04	Mar-05	542	542	0												
S.10447.7163 Interceptor AP-Interc Renewal Des #1	Jul-10	Jun-11	400	0	400					400							
S.10448.7164 Interceptor AP-Interc Renew #1 Const	Dec-10	Jun-11	1,600	0	1,600					1,600							
<b>S.1410 Facilities</b>			54,488	1,147	53,341	601	1,171	2,976	6,360	6,012	6,471	3,500	4,250	3,000	3,000	3,000	13,000
S.10380.6795 Prison Point HVAC Upgrades	Mar-09	Feb-10	694	0	694			167	527								
S.10381.6796 Remote Headworks Heating Sys Upgrade	May-05	May-06	1,248	1,147	101	101											
S.10382.6797 Alewife Brook Pump & Screen Repl	Nov-10	Nov-11	2,914	0	2,914					1,121	1,793						
S.10387.6802 Hdwks Screen Replacement	Aug-08	Oct-11	5,000	0	5,000			1,053	1,580	1,580	787						
S.10399.6886 Hdwks Cond Assess/Facilities Plan	Nov-06	Nov-08	2,000	0	2,000	500	1,000	500									
S.10419.6937 Alewife Brook Pump Screen Repl Des/CA	Jun-08	Nov-11	507	0	507			120	143	143	101						
S.10420.6938 Des-Prison Pt HVAC Upgrades	Jul-07	Feb-10	150	0	150		50	60	40								
S.10427.7033 Hingham PS Isolation Gate Const	Sep-08	Mar-09	350	0	350			350									
S.10431.7037 Caruso PS Replace Generator	Jul-13	Sep-13	250	0	250								250				
S.10432.7038 Chelsea Sluice Gate Engnr Study	Jun-07	Dec-07	50	0	50		50										
S.10433.7039 Prison Pt/Cottage Farm Pipe Des	Jan-08	Sep-09	150	0	150		21	86	43								
S.10434.7040 Prison Pt/Cottage Farm Pipe Constr	Mar-09	Sep-09	500	0	500			70	430								
S.10436.7042 Fram PS Sluice Gates Cond Assess	Jun-07	Dec-07	50	0	50		50										
S.10438.7044 Caruso PS Shaft Replac Const	Jul-09	Jul-10	425	0	425				327	98							
S.10444.7144 Nut Island Headworks Fire Alarm/Wire	Jul-09	Jun-09	200	0	200				200								
S.10455.7206 HW Facility Plan Upgrades Des	Jul-09	Jun-28	7,000	0	7,000				525	525	525	525	560	560	560	560	2,660

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S.10445.7161 HW Fac. Plan Upgrades 3 Older HWKS	Dec-09	Jun-28	28,000	0	28,000				1,975	1,975	1,975	1,975	2,440	2,440	2,440	2,440	10,340
S.10446.7162 PS/CSO Condition Assessment	Jul-11	Jun-14	3,000	0	3,000						1,000	1,000	1,000				
S.10449.7165 Alewife Brook PS-Additional Costs	Jul-08	Jun-12	400	0	400			200	100	50	50						
S.10450.7166 Alewife Brook PS-Addtl Costs Const.	Dec-08	Jun-12	1,600	0	1,600			370	470	520	240						
<b>S.146 D.I. Cross Harbor Tunnel</b>			<b>5,000</b>	<b>0</b>	<b>5,000</b>									<b>1,667</b>	<b>1,667</b>	<b>1,666</b>	
S.10454.7199 Tunnel Shaft Repairs Plan/Des/Const	Jul-14	Jun-17	5,000	0	5,000									1,667	1,667	1,666	
<b>S.25 Treatment</b>			<b>419,345</b>	<b>35,601</b>	<b>383,744</b>	<b>8,579</b>	<b>21,265</b>	<b>37,473</b>	<b>35,452</b>	<b>24,002</b>	<b>8,385</b>	<b>4,118</b>	<b>11,952</b>	<b>9,233</b>	<b>8,417</b>	<b>8,250</b>	<b>206,617</b>
<b>S.200 DI Plant Optimization</b>			<b>70,427</b>	<b>27,868</b>	<b>42,559</b>	<b>4,140</b>	<b>2,381</b>	<b>1,022</b>	<b>1,188</b>	<b>2,478</b>	<b>3,799</b>	<b>1,300</b>	<b>750</b>	<b>750</b>	<b>750</b>	<b>750</b>	<b>23,250</b>
S.19156.6235 Construction-Plumbing	Apr-96	Apr-98	110	110	0												
S.19170.6369 Supplementary Mod Pkg #1	Jun-99	Mar-00	488	213	275	275											
S.19154.6233 As-Needed Des. Phase 1	Jul-98	May-03	1,122	1,122	0												
S.18212.6364 Ancil Mods-Des 1	Jun-99	Apr-07	2,105	1,998	108	108											
S.19189.6590 Ancil Mods Des 2-1 (REI)	Aug-01	Jun-03	584	584	0												
S.19190.6591 Ancil Mods - Des 3-1	Feb-01	Nov-05	941	941	0												
S.19191.6592 Ancil Mods - Prelim Des 4	Sep-07	Jul-08	360	0	360		288	72									
S.19303.7088 Ancils Mods Final Des 4	Jul-09	Jun-12	734	0	734				288	201	245						
S.19220.6721 Long Term As Needed Des No.1	Mar-10	Mar-14	2,000	0	2,000				450	500	500	550					
S.19183.6499 Ancil Mods-Con 1	Jul-04	Mar-06	9,887	9,837	50	50											
S.19186.6536 Ancil Mods Constr 2-1	Aug-01	Jun-03	2,836	2,836	0												
S.19232.6744 Ancil Mods Constr 2-2	May-05	Oct-07	5,381	2,068	3,313	2,254	1,059										
S.19187.6537 Ancil Mods-Constr 3-1	Nov-03	Nov-04	3,387	3,387	0												
S.19188.6538 Ancil Mods-Con 4	Nov-10	May-12	3,831	0	3,831					1,277	2,554						
S.19221.6722 Long -Term As Needed Des No.2	Mar-10	Mar-14	2,000	0	2,000				450	500	500	550					
S.19206.6673 Digester Storage Tank - Repair	Aug-97	Oct-97	275	550	-275	-275											
S.19215.6702 As-needed Design Phase 2-1	Oct-00	Jan-03	760	760	0												
S.19234.6753 As-needed design Phase 2-2	Oct-00	Jan-03	695	695	0												
S.19214.6701 As-needed Des. Phase 3-1	Apr-03	May-05	796	796	0												



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S.19257.6874 As-needed Design Phase 3-2	Mar-03	Mar-05	625	625	0												
S.19211.6698 As Needed Des Phase 4-1	Mar-05	Mar-07	1,125	423	702	702											
S.19212.6699 As Needed Des Phase 4-2	Mar-05	Mar-07	1,000	372	628	628											
S.19305.7090 As-needed Des Phase 5-1	Mar-07	Mar-09	1,000	0	1,000	75	450	475									
S.19306.7091 As-needed Des Phase 5-2	Mar-07	Mar-09	1,000	0	1,000	75	450	475									
S.19240.6768 Ancil Mods Des2-2 (REI/ESDC)	Jun-04	Dec-07	651	268	383	248	135										
S.19286.6201 BHP Site Completion	Oct-98	Dec-04	285	284	1	1											
S.19311.7121 DI As needed Tech Design	Mar-13	0	26,450	0	26,450							200	750	750	750	750	23,250
<b>S.206 DI Treatment Plant Asset Protection</b>			<b>348,285</b>	<b>7,733</b>	<b>340,552</b>	<b>4,324</b>	<b>18,615</b>	<b>36,201</b>	<b>34,264</b>	<b>21,524</b>	<b>4,587</b>	<b>2,818</b>	<b>11,202</b>	<b>8,483</b>	<b>7,667</b>	<b>7,500</b>	<b>183,367</b>
<b>S.1800 Equipment Replacement</b>			<b>140,130</b>	<b>4,472</b>	<b>135,657</b>	<b>80</b>	<b>1,799</b>	<b>10,032</b>	<b>15,377</b>	<b>8,057</b>	<b>2,512</b>	<b>2,000</b>	<b>9,200</b>	<b>2,750</b>	<b>2,000</b>	<b>2,000</b>	<b>79,850</b>
S.19182.6478 Equip Replacement Projection	Oct-00	Jun-17	110	0	110						110						
S.19193.6594 Equipment Condition Monitoring	May-04	Jan-05	1,777	1,777	0												
S.19231.6742 Drive Chain Replacement	Oct-01	Jul-03	264	264	0												
S.19238.6765 CTG Modifications	Mar-01	May-02	482	482	0												
S.19176.6422 Pump Packing Replacement	Sep-03	Jun-08	750	551	199	107	92										
S.19177.6423 Demineralizer Construction	Jul-00	Dec-00	51	51	0												
S.19264.6881 Grit & Odor Air Handling Repl	Sep-08	Mar-10	1,014	0	1,014			420	594								
S.19265.6882 CEMS Equip. Replacement	Nov-05	Mar-06	106	72	34	34											
S.19268.6899 Prim Clarifier Rehab Construction	Nov-08	May-11	12,020	0	12,020			2,732	5,342	3,642	304						
S.19273.6904 Fire Alarm Syst Repl -Des	Mar-08	Jun-11	304	0	304		28	124	70	76	6						
S.19287.7005 Digester Chiller Replacement	Sep-05	May-06	574	635	-61	-61											
S.19288.7006 Dystor Tank Membrane Replacement	Sep-04	Oct-05	640	640	0												
S.19289.7051 Fire Alarm Syst Repl Const	Jul-09	Jul-11	1,457	0	1,457				668	728	61						
S.19290.7052 Grit Blower Replac Construction	Nov-08	Nov-09	346	0	346			250	96								
S.19291.7053 Thick Prim Sldg Pump Repl Des	Apr-08	May-11	561	0	561		28	252	129	140	12						
S.19292.7054 TPS Pump Replac Construction	May-08	May-10	3,000	0	3,000			1,500	1,000	500							
S.19294.7056 LOCAT Scrubber Replac Const	Aug-09	Aug-10	3,030	0	3,030				2,273	758							
S.19295.7057 Centrifuge Backdrive Replac	Sep-07	Sep-09	2,235	0	2,235		652	1,117	466								

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S.19309.7111 HVAC Control System Repl-Des	Aug-08	May-11	180	0	180			55	55	50	20						
S.19310.7110 HVAC Control System Repl-Const	Feb-09	Aug-10	728	0	728			81	486	162							
S.19312.7122 DI Digester Sludge Pump Repl Des	Jul-09	Jun-18	800	0	800				400								400
S.19313.7123 DI Digester Sludge Pump Repl Const	Jul-09	Jun-18	3,200	0	3,200				1,600								1,600
S.19315.7125 DI Equipment Replacement Projection	Jul-08	0	70,000	0	70,000			2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	52,000
S.19325.7135 DI Dystor Membrane Replacements	Jul-14	0	3,000	0	3,000									750			2,250
S.19327.7137 DI Centrifuge Replacements Des	Jul-13	0	4,160	0	4,160								1,040				3,120
S.19328.7138 DI Centrifuge Replacements Constr	Dec-13	0	16,640	0	16,640								4,160				12,480
S.19329.7139 DI Cryogenics Plant-Equip Repl Des	Jul-13	0	1,600	0	1,600								400				1,200
S.19330.7140 DI Cryogenics Plant-Equip Repl Constr	Dec-13	0	6,400	0	6,400								1,600				4,800
S.19335.7169 South Systm PS Lube System Repl	Jul-07	Jun-09	1,700	0	1,700		700	1,000									
S.19336.7170 DI Grit and Odor Control Air Handlers	Jul-07	0	3,000	0	3,000		300	500	200								2,000
<b>S.1810 Architectural</b>			<b>3,332</b>	<b>729</b>	<b>2,603</b>		<b>444</b>		<b>1,000</b>	<b>159</b>							<b>1,000</b>
S.19226.6727 Study/Concept Des-Concrete Rpr	May-07	Mar-08	300	0	300		300										
S.19204.6668 Expansion Joint Repair-Design	Apr-99	Oct-04	149	149	0												
S.19205.6669 Expansion Joint Repair- Constr 1	Aug-02	Nov-03	305	305	0												
S.19218.6705 Expansion Joint Repair- Constr 3	May-10	Nov-10	159	0	159					159							
S.19217.6704 Expansion Joint Repair- Constr 2	May-07	Nov-07	144	0	144		144										
S.19244.6812 Secondary Clarifier Access	Sep-01	Jul-02	275	275	0												
S.19334.7168 Barge Berth and Fac. Replacement	Jul-09	0	2,000	0	2,000				1,000								1,000
<b>S.1820 Utilities</b>			<b>182,425</b>	<b>2,407</b>	<b>180,018</b>	<b>3,090</b>	<b>13,088</b>	<b>23,471</b>	<b>17,070</b>	<b>12,761</b>	<b>1,900</b>	<b>718</b>	<b>1,902</b>	<b>5,633</b>	<b>5,567</b>	<b>2,900</b>	<b>91,917</b>
S.19243.6811 Outfall Modification-Inspection	Dec-01	Jul-02	174	174	0												
S.19307.7094 DI Electrical Modifications	Jun-07	Jun-09	2,000	0	2,000		833	1,000	167								
S.19239.6767 Elec Equip Upgrade Constr 2	Apr-05	Feb-07	1,913	730	1,184	1,184											
S.19236.6763 Busduct Replacement (2+22)	Jan-01	Oct-01	196	196	0												
S.19245.6813 Transformer Replacement			38	38	0												
S.19252.6851 Chemical pipe Replacement-Des	Sep-09	Nov-11	399	0	399				181	183	35						
S.19253.6852 Chemical pipe Replac - Constr	Jul-10	Jul-11	1,330	0	1,330					1,219	111						

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S.19254.6853 Sodium Hypo Pipe Repl-Des	Jul-10	Aug-11	240	0	240					185	55						
S.19255.6854 Sodium Hypo Pipe Repl- Constr	Jul-10	Jul-11	2,845	0	2,845					2,371	474						
S.19256.6855 Elect Equip Upgrade Const 3	May-07	May-09	8,558	0	8,558		3,922	4,279	357								
S.19258.6875 WTF VFD Replace Constr	Dec-08	Jan-10	1,415	0	1,415			434	980								
S.19259.6876 Heat Loop Pipe Repl Constr 1	Mar-05	Dec-05	615	615	0												
S.19260.6877 Misc. VFD Replacements	May-05	May-08	2,625	503	2,122	885	1,142	95									
S.19266.6883 Heat Loop Pipe Replac Constr 2	Jan-07	Mar-08	1,470	0	1,470	315	1,155										
S.19267.6884 PICS Replacement Const	Jul-09	Jul-10	1,617	0	1,617				1,213	404							
S.19270.6901 Elect Equip Upgrade Const 4	Jul-09	Jan-11	2,443	0	2,443				1,222	1,222							
S.19314.7124 DI Elec Equip Upgrade Ph.5	Jul-10		20,000	0	20,000					1,000	1,000	500	500	500	500	500	15,500
S.19271.6902 NMPS VFD Repl Des/ESDC	May-07	Jan-11	518	0	518		259	86	104	69							
S.19272.6903 NMPS VFD Replace Constr	May-08	Nov-10	14,428	0	14,428			4,476	5,971	3,981							
S.19280.6969 Fuel Transfer Pipe Repl Des	Nov-11	Apr-14	399	0	399						109	107	183				
S.19281.6970 Fuel Transfer Pipe Repl Const	Mar-13	Mar-14	1,330	0	1,330							111	1,219				
S.19282.6971 NMPS Motor Ctrl Ctr Des	Jun-07	Apr-10	633	0	633		316	167	149								
S.19283.6972 NMPS Motor Ctrl Ctr Constr	Jul-08	Dec-09	5,818	0	5,818			3,205	2,613								
S.19285.6974 DI Wind Power Constr	Jan-08	Dec-08	7,000	0	7,000		2,000	5,000									
S.19296.7058 DITP Switchgear Replac Design	Jul-09	Oct-11	465	0	465				175	175	116						
S.19297.7059 DITP Switchgear Repl Constr	Oct-09	Oct-10	2,909	0	2,909				1,454	1,454							
S.19298.7060 Power Consult Recs Design	Jan-06	Jan-10	2,000	152	1,848	706	372	462	308								
S.19299.7061 Power System Improv Constr	Oct-07	Dec-09	6,105	0	6,105		148	2,818	1,879								
S.19300.7062 NMPS VFD Repl-REI	May-08	Nov-10	748	0	748			249	299	199							
S.19301.7063 Heat Loop pipe Repl- Const 3	Sep-07	Sep-08	2,880	0	2,880		1,680	1,200									
S.19316.7126 Future SSPS VFD Replacements Des	Jul-15		4,800	0	4,800										2,400	480	1,920
S.19317.7127 Future SSPS VFD Replacements Constr	Jul-16		19,200	0	19,200											1,920	17,280
S.19318.7128 Future NMPS VFD Replacements Des	Jul-17		4,420	0	4,420												4,420
S.19319.7129 Future NMPS VFD Replacements Constr	Jul-18		17,680	0	17,680												17,680
S.19320.7130 Future Misc. VFD Replacements Des	Jul-17	Jun-27	1,333	0	1,333												1,333

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S.19321.7131 Future Misc. VFD Replacements Constr	Jul-18	Jun-27	5,334	0	5,334												5,334
S.19322.7132 DI Switchgear Replacement Design	Jul-17	Jul-21	3,250	0	3,250												3,250
S.19323.7133 DI Switchgear Replacement Constr	Jul-18	Jul-21	13,000	0	13,000												13,000
S.19324.7134 DI PICS Replacement Construction	Jul-14		5,400	0	5,400									1,800			3,600
S.19326.7136 DI CTG Rebuilds	Jul-14		6,000	0	6,000									1,333	667		4,000
S.19333.7167 Leak Protection System Upgrade	Jul-10		900	0	900					300							600
S.19338.7172 DI PICS Dist. Proc. Units Replac	Jul-14		8,000	0	8,000									2,000	2,000		4,000
<b>S.1830 Support</b>			<b>603</b>	<b>125</b>	<b>478</b>	<b>40</b>	<b>166</b>	<b>71</b>	<b>71</b>	<b>71</b>	<b>61</b>						
S.19162.6241 DISC Application	Jun-96	Dec-08	250	125	125	30	95										
S.19241.6791 Document Format Conversion	Mar-07	Mar-12	353	0	353	10	71	71	71	71	61						
<b>S.1840 Specialties</b>			<b>21,795</b>	<b>0</b>	<b>21,795</b>	<b>1,114</b>	<b>3,118</b>	<b>2,627</b>	<b>746</b>	<b>476</b>	<b>113</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>2,600</b>	<b>10,600</b>
S.19304.7089 Sodium Hypo Tk Lnr Removal	May-06	Sep-06	196	0	196	196											
S.19237.6764 Hypochlorite tanks 1&3 Reline	Mar-07	Aug-07	2,200	0	2,200	800	1,400										
S.19249.6848 Metals Lab Fume Hood Repl	Aug-07	Feb-08	200	0	200		200										
S.19250.6849 Hypochlorite Tanks 2&4 Reline	Mar-08	Sep-08	2,226	0	2,226		370	1,856									
S.19251.6850 Metals Lab Modification Constr	Feb-07	Jun-08	947	0	947	118	712	117									
S.19261.6878 Lab Sample Area Mod-Des	Jul-08	Aug-10	111	0	111			40	40	31							
S.19262.6879 Lab Sample Area Mod-Const	Aug-09	Aug-10	445	0	445				259	185							
S.19276.6965 Prim Clarif/Thickener Rehab Des	Sep-07	Jun-11	1,200	0	1,200		436	313	277	160	13						
S.19331.7141 Laboratory As needed Tech Des	Jul-08		4,000	0	4,000			100	100	100	100	100	100	100	100	100	3,100
S.19332.7142 Future Sodium Hypo Tank Rehab	Jul-16		10,000	0	10,000											2,500	7,500
S.19337.7171 Central Lab Fume Hood Replacement	Jul-08	Jul-09	270	0	270			200	70								
<b>S.210 Clinton Wastewater Treatment Plant</b>			<b>633</b>	<b>0</b>	<b>633</b>	<b>115</b>	<b>269</b>	<b>250</b>									
S.19302.7075 Clinton Soda Ash Replacement	Dec-07	Dec-08	375	0	375		125	250									
S.19308.7095 Clinton Perm Standby Generator	Dec-06	Sep-07	259	0	259	115	144										
<b>S.12 Residuals</b>			<b>212,131</b>	<b>63,811</b>	<b>148,320</b>		<b>495</b>	<b>1,150</b>	<b>675</b>	<b>2,000</b>	<b>2,000</b>	<b>667</b>	<b>7,334</b>	<b>18,334</b>	<b>20,833</b>	<b>5,417</b>	<b>89,415</b>

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<b>S.261 Residuals</b>			<b>63,811</b>	<b>63,811</b>	<b>0</b>												
S.25941.5667 Design/RI/CS-Pelletizing 1	Dec-94	Dec-03	9,098	9,098	0												
S.25948.5669 Fast-Track Equip. Prepurchase	Aug-94	Jul-95	301	301	0												
S.26055.6009 Fast-Track Equip. Installation	Oct-94	Apr-96	1,450	1,450	0												
S.26056.6010 Phase 2 Outside Construction	Jan-96	Aug-98	12,981	12,981	0												
S.26057.6011 Phase 3 Equip. Prepurchase	Feb-95	Jul-98	4,746	4,746	0												
S.26058.6012 Phase 3 Inside Construction	Mar-97	Dec-01	29,778	29,778	0												
S.26065.6612 Fire Related Costs	May-99	Oct-99	1,694	1,694	0												
S.25961.5643 Res. Research	Aug-90	Apr-97	419	419	0												
S.25968.5831 Royalty Payment	Feb-96	Sep-97	575	575	0												
S.26066.6615 Legal Services for Sludge Processing	Apr-99	Apr-05	2,768	2,768	0												
<b>S.271 Residuals Asset Protection</b>			<b>148,320</b>	<b>0</b>	<b>148,320</b>		<b>495</b>	<b>1,150</b>	<b>675</b>	<b>2,000</b>	<b>2,000</b>	<b>667</b>	<b>7,334</b>	<b>18,334</b>	<b>20,833</b>	<b>5,417</b>	<b>89,415</b>
S.26069.7143 Residual Plant System Reliability	Jul-07	Jun-09	620	0	620		320	300									
S.26070.7145 Residuals Pellet Plant Upgrade Design	Jul-10	Jun-18	8,000	0	8,000					2,000	2,000	667	667	667	667	667	665
S.26072.7147 Condition Assessment/Fac Plan	Jul-08	Jun-10	1,000	0	1,000			500	500								
S.26073.7148 Six Rotary Dryer Replacements Des	Jul-13		12,000	0	12,000								1,334	1,333	1,333		8,000
S.26074.7149 Six Rotary Dryer Replacements Constr	Dec-13		48,000	0	48,000								5,333	5,334	5,333		32,000
S.26075.7150 Six Air Scrubber Replacements Des	Jul-15		1,800	0	1,800										300	300	1,200
S.26076.7151 Six Air Scrubber Replacements Constr	Dec-15		7,200	0	7,200										1,200	1,200	4,800
S.26077.7152 Plant MCC Replacements Des	Jul-16		900	0	900											150	750
S.26078.7153 Plant MCC Replacements Const	Dec-16		3,600	0	3,600											600	3,000
S.26079.7173 FRSA Pier Rehab Des	Dec-07	Jun-10	140	0	140		35	70	35								
S.26080.7174 FRSA Pier Rehab Const.	Mar-08	Jun-10	560	0	560		140	280	140								
S.26081.7175 Rehab Rail System Des.	Jul-16	Jun-22	600	0	600											100	500
S.26082.7176 Rehab Rail System Const.	Dec-16	Jun-22	2,400	0	2,400											400	2,000
S.26083.7177 Replace 9 Pellet Storage Silos Des	Jul-15	Jun-22	1,200	0	1,200										200	200	800
S.26084.7178 Replace 9 Pellet Storage Silos Const.	Dec-15	Jun-22	4,800	0	4,800										800	800	3,200
S.26085.7179 Sludge Conveyor Replacement Des.	Jul-14		600	0	600									200			400

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S.26086.7180 Sludge Conveyor Replacement Const.	Dec-14		2,400	0	2,400									800			1,600
S.26087.7181 Sludge Storage Tank Rehab Des	Jul-15		600	0	600										200		400
S.26088.7182 Sludge Storage Tank Rehab	Dec-15		2,400	0	2,400										800		1,600
S.26089.7183 Upgrade Pumping System Des.	Jul-14		1,200	0	1,200									200	200		800
S.26090.7184 Upgrade Pumping System Const.	Dec-14		4,800	0	4,800									800	800		3,200
S.26091.7185 Replace 12 Centrifuges Des	Jul-14		7,200	0	7,200									1,800	1,800		3,600
S.26092.7186 Replace 12 Centrifuges Const.	Dec-14		28,800	0	28,800									7,200	7,200		14,400
S.26093.7187 Utility Upgrades Des.	Jul-16		1,200	0	1,200											200	1,000
S.26094.7188 Utility Upgrades Const.	Dec-16		4,800	0	4,800											800	4,000
S.26095.7189 Odor Control System Upgrade Des	Jul-17		300	0	300												300
S.26096.7190 Odor Control System Upgrade Const.	Dec-17		1,200	0	1,200												1,200
<b>S.13 CSO</b>			<b>803,551</b>	<b>350,411</b>	<b>453,140</b>	<b>57,494</b>	<b>97,130</b>	<b>107,219</b>	<b>87,608</b>	<b>42,532</b>	<b>20,814</b>	<b>18,236</b>	<b>9,381</b>	<b>8,166</b>	<b>4,155</b>	<b>101</b>	<b>304</b>
<b>S.3520 MWRA Managed</b>			<b>414,104</b>	<b>139,790</b>	<b>274,314</b>	<b>37,886</b>	<b>62,238</b>	<b>79,202</b>	<b>70,905</b>	<b>22,092</b>	<b>1,849</b>	<b>142</b>	<b>1</b>				
<b>S.339 North Dorchester Bay</b>			<b>213,868</b>	<b>23,273</b>	<b>190,595</b>	<b>27,200</b>	<b>58,200</b>	<b>45,800</b>	<b>39,100</b>	<b>20,091</b>	<b>204</b>						
S.32660.6220 Design ESDC/Tunnel	Sep-04	Apr-11	24,619	20,225	4,393	1,622	1,028	1,135	484	124							
S.32661.6244 Tunnel Construction (Ch30)	Aug-06	Dec-09	150,750	0	150,750	23,177	54,967	39,402	26,115	7,089							
S.32662.6245 Dewater/Odor Control Constr	Jan-09	Mar-12	19,504	0	19,504			1,608	8,846	8,846	204						
S.32726.6993 Tunnel & Facilities CM Services	Oct-05	Apr-12	11,544	261	11,283	1,027	1,250	2,800	2,800	3,406							
S.32732.7012 Pleasure Bay Construction	Sep-05	May-06	3,216	2,787	429	429											
S.32733.7013 Design ESDC/Facilities	Nov-06	May-12	3,385	0	3,385	494	755	755	755	626							
S.32744.7103 Tunnel Rescue/Emergency Response	Nov-06	Oct-09	850	0	850	450	200	100	100								
<b>S.354 Hydraulic Relief Projects</b>			<b>2,295</b>	<b>2,295</b>	<b>0</b>												
S.32692.6250 Design/CS/RI	Aug-97	Aug-01	558	558	0												
S.32669.6252 Construction	Jul-99	Aug-00	1,737	1,737	0												
<b>S.347 East Boston Branch Sewer Relief</b>			<b>73,476</b>	<b>8,544</b>	<b>64,933</b>	<b>1,033</b>	<b>2,257</b>	<b>29,917</b>	<b>30,635</b>	<b>1,091</b>							

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S.32673.6256 Design	Mar-00	Sep-06	3,490	3,322	168	168											
S.32742.7087 Design 2 CS	Jun-06	Jun-10	2,996	0	2,996	839	868	839	419	31							
S.32743.7097 Resident Inspection Services	Jun-08	Jun-10	3,304	0	3,304		75	1,552	1,618	59							
S.32674.6257 East Boston Branch Relief Sewer	Jun-08	Jun-10	49,159	0	49,159		966	23,596	23,596	1,001							
S.32716.6790 Boston Paving	Oct-07	Nov-07	348	0	348		348										
S.32719.6840 East Boston Branch Sewer Rehab	Apr-03	May-04	5,248	5,222	26	26											
S.32720.6841 Sections 38 & 207 Replacement	Dec-08	Mar-10	8,932	0	8,932			3,930	5,002								
<b>S.348 BOS019 Storage Conduit</b>			<b>14,283</b>	<b>9,119</b>	<b>5,164</b>	<b>5,053</b>	<b>111</b>										
S.32675.6258 Design	Jul-02	Nov-04	2,045	2,020	25	25											
S.32677.6260 BOS019 Storage Conduit Constr	Mar-05	Mar-07	10,897	6,525	4,372	4,372											
S.32728.7008 Construction Management Services	Apr-05	Mar-07	1,342	575	767	656	111										
<b>S.349 Chelsea Trunk Sewer</b>			<b>29,765</b>	<b>29,765</b>	<b>0</b>												
S.32659.6198 Design/CS/RI	Jun-97	Aug-03	3,637	3,637	0												
S.32679.6262 Chelsea Trunk Relief	Sep-99	Aug-00	3,577	3,577	0												
S.32680.6263 Chelsea Branch Sewer	Dec-99	Jul-01	19,141	19,141	0												
S.32689.6370 Rehab/Chelsea Brnch/Revere Ext	Aug-01	Jun-02	3,125	3,125	0												
S.32690.6371 Modify Chelsea Screen House	Aug-00	Dec-00	284	284	0												
<b>S.350 Union Park Detention Treatment Fac</b>			<b>49,546</b>	<b>44,409</b>	<b>5,137</b>	<b>3,900</b>	<b>1,237</b>										
S.32681.6264 Design	Dec-99	Dec-07	8,624	7,259	1,365	1,259	106										
S.32682.6265 Construction	Mar-03	Apr-07	46,074	41,116	4,958	3,994	964										
S.32718.6826 Construction - Park	Apr-03	Dec-06	500	333	167		167										
S.32721.6909 BWSC Construction ...	Mar-03	Dec-06	-5,653	-4,299	-1,353	-1,353											
<b>S.353 Upgrade Existing CSO Facilities</b>			<b>22,385</b>	<b>22,385</b>	<b>0</b>												
S.32647.6123 Design	Jun-96	Oct-02	6,499	6,499	0												
S.32685.6268 Cottage Farm CSO Facility	Mar-98	Jan-00	4,377	4,377	0												
S.32686.6269 Prison Point CSO Facility	May-99	Feb-01	3,339	3,339	0												

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S.32693.6496 Comm/Fox Point, Som. Marginal	Nov-99	Aug-01	8,029	8,029	0												
S.32687.6270 Non-Treated Floatable (Beacon)	Mar-99	Dec-99	124	124	0												
S.32717.6803 Cottage Farm Programing	Dec-00	Dec-01	17	17	0												
<b>S.355 MWR003 Gate &amp; Siphon</b>			<b>2,027</b>	<b>0</b>	<b>2,027</b>				<b>100</b>	<b>140</b>	<b>1,644</b>	<b>142</b>	<b>1</b>				
S.32722.6952 Design	Oct-09	Jul-13	338	0	338				100	140	85	12	1				
S.32723.6953 Construction	May-11	Jul-12	1,689	0	1,689						1,559	130					
<b>S.357 Charles River CSO Controls</b>			<b>6,460</b>	<b>0</b>	<b>6,460</b>	<b>700</b>	<b>434</b>	<b>3,485</b>	<b>1,070</b>	<b>770</b>	<b>1</b>						
S.32729.7009 Brookline Connection/Cottage Farm E/D	Sep-06	Jun-10	1,260	0	1,260	700	325	205	30								
S.32740.7080 Brookline Connect/Cott Farm Inf Contr	Jun-08	Jun-09	3,000	0	3,000			2,850	150								
S.32730.7010 Interceptor Optimization Eng/Des	Jan-08	Jan-12	800	0	800		109	270	250	170	1						
S.32741.7081 REI Service Brookline Conn CF Int Con	Jun-08	Sep-09	200	0	200			160	40								
S.32731.7011 Existing Gate Controls System	Jan-10	Jan-11	1,200	0	1,200				600	600							
<b>S.340 S. Dorch Bay Sew Separ (Fox Pt.)</b>			<b>53,800</b>	<b>51,200</b>	<b>2,600</b>	<b>862</b>	<b>1,729</b>	<b>10</b>									
S.32651.6155 Design	Jun-96	Aug-09	11,172	10,879	294	249	35	10									
S.32664.6247 Construction	Apr-99	Nov-06	42,628	40,321	2,307	613	1,694										
<b>S.341 S. Dorch Bay Sew Separ (Comm. Pt.)</b>			<b>64,429</b>	<b>50,249</b>	<b>14,180</b>	<b>3,368</b>	<b>7,971</b>	<b>2,837</b>	<b>3</b>								
S.32650.6154 Design	Jun-96	Aug-09	14,191	12,679	1,511	738	587	183	3								
S.32665.6248 Construction	Apr-99	Nov-07	50,238	37,570	12,668	2,630	7,384	2,654									
<b>S.344 Stony Brook Sewer Separation</b>			<b>45,056</b>	<b>41,193</b>	<b>3,862</b>	<b>1,984</b>	<b>1,878</b>										
S.32667.6395 Design/CS/RI	Jul-98	Apr-07	9,775	9,108	667	521	146										
S.32668.6251 Construction	Jul-00	Sep-06	35,281	32,085	3,196	1,463	1,733										
<b>S.342 Neponset River Sewer Separation</b>			<b>2,681</b>	<b>2,444</b>	<b>236</b>	<b>236</b>											
S.32652.6156 Design/CS/RI	Apr-96	Dec-03	480	470	10	10											
S.32653.6160 Construction	Aug-96	Oct-02	2,201	1,975	226	226											



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<b>S.343 Constitution Beach Sewer Separation</b>			<b>3,769</b>	<b>3,769</b>	<b>0</b>												
S.32649.6153 Design/CS/RI	Oct-96	Dec-02	673	673	0												
S.32666.6249 Construction	May-98	Apr-02	3,096	3,096	0												
<b>S.346 Cambridge CAM002-004 Sew.Separation</b>			<b>52,434</b>	<b>18,451</b>	<b>33,983</b>	<b>868</b>	<b>2,331</b>	<b>3,353</b>	<b>3,970</b>	<b>7,811</b>	<b>7,711</b>	<b>7,344</b>	<b>595</b>				
S.32654.6161 Design/CS/RI	Jan-97	Jan-14	13,323	8,683	4,639	488	463	492	796	1,028	671	661	40				
S.32672.6255 Construction	Jul-98	Jul-13	39,112	9,768	29,344	380	1,868	2,861	3,174	6,783	7,040	6,683	555				
<b>S.351 BWSC Floatables Controls</b>			<b>933</b>	<b>933</b>	<b>0</b>												
S.32657.6168 Design	Dec-98	Dec-02	555	555	0												
S.32683.6266 Construction	Aug-00	Mar-02	378	378	0												
<b>S.352 Cambridge Floatables Controls</b>			<b>2,855</b>	<b>922</b>	<b>1,932</b>	<b>722</b>	<b>959</b>	<b>251</b>									
S.32655.6162 Design	Jan-97	Jun-09	404	377	27	19	6	2									
S.32684.6267 Construction	Oct-02	Jun-09	2,451	545	1,905	703	953	249									
<b>S.356 Fort Point Channel Sewer Separation</b>			<b>7,675</b>	<b>2,394</b>	<b>5,281</b>	<b>5,242</b>	<b>39</b>										
S.32724.6991 Design	May-04	Mar-08	1,096	679	416	377	39										
S.32725.6992 Construction	Mar-05	Mar-07	6,580	1,715	4,865	4,865											
<b>S.358 Morrissey Boulevard Drain</b>			<b>33,098</b>	<b>343</b>	<b>32,754</b>	<b>865</b>	<b>16,166</b>	<b>15,674</b>	<b>49</b>								
S.32735.7015 Design	Jun-05	Dec-09	4,880	343	4,537	622	2,178	1,688	49								
S.32713.6696 Construction	Dec-06	Jun-09	28,217	0	28,217	243	13,988	13,986									
<b>S.359 Reserved Channel Sewer Separation</b>			<b>59,158</b>	<b>0</b>	<b>59,158</b>	<b>1,661</b>	<b>1,261</b>	<b>2,383</b>	<b>8,542</b>	<b>8,690</b>	<b>8,114</b>	<b>8,111</b>	<b>8,111</b>	<b>8,111</b>	<b>4,114</b>	<b>60</b>	
S.32734.7014 Design	Jul-06	Jun-16	11,700	0	11,700	1,661	1,261	1,197	1,423	1,571	995	992	992	992	556	60	
S.32727.6994 Construction	May-09	Dec-15	47,458	0	47,458			1,186	7,119	7,119	7,119	7,119	7,119	7,119	3,558		
<b>S.360 Brookline Sewer Separation</b>			<b>9,000</b>	<b>0</b>	<b>9,000</b>	<b>135</b>	<b>266</b>	<b>1,025</b>	<b>1,780</b>	<b>1,780</b>	<b>1,780</b>	<b>1,780</b>	<b>445</b>	<b>9</b>			
S.32736.7076 Design CS/RI	Nov-06	Jan-14	1,800	0	1,800	135	266	265	265	265	265	265	65	9			
S.32737.7077 Construction	Nov-08	Jul-13	7,200	0	7,200			760	1,515	1,515	1,515	1,515	380				

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<b>S.361 Bulfinch Triangle Sewer Separation</b>			<b>4,369</b>	<b>0</b>	<b>4,369</b>	<b>211</b>	<b>250</b>	<b>443</b>	<b>818</b>	<b>818</b>	<b>818</b>	<b>818</b>	<b>188</b>	<b>5</b>			
S.32738.7078 Design CS/RI	Aug-06	Jan-14	1,169	0	1,169	211	250	93	143	143	143	143	38	5			
S.32739.7079 Construction	Nov-08	Jul-13	3,200	0	3,200			350	675	675	675	675	150				
<b>S.324 CSO Support</b>			<b>50,191</b>	<b>38,722</b>	<b>11,469</b>	<b>3,454</b>	<b>2,041</b>	<b>2,041</b>	<b>1,541</b>	<b>1,341</b>	<b>542</b>	<b>41</b>	<b>41</b>	<b>41</b>	<b>41</b>	<b>41</b>	<b>304</b>
S.32400.5790 Technical Assistance	Feb-94	Dec-95	228	228	0												
S.32407.5970 Tech. Assistance-Geotech			61	61	0												
S.32401.5791 Planning/EIR	Mar-88	Sep-90	10,769	10,769	0												
S.32403.5716 Master Planning	Mar-92	Sep-04	22,007	21,877	130	130											
S.32645.6036 Watershed Planning	Dec-94	Apr-01	877	877	0												
S.32409.5795 Modeling	May-92	Mar-95	300	300	0												
S.32411.5767 SOP Program	Jan-94	May-01	1,957	1,957	0												
S.32691.6372 System Assessment	May-97	Jun-20	476	27	449		21	21	21	21	21	21	21	21	21	21	244
S.32648.6150 Technical Review	Jul-96	Jun-20	794	529	265		21	21	21	21	21	21	21	21	21	21	60
S.32658.6169 Land/Easement	Jul-96	Jun-12	12,723	2,098	10,625	3,324	2,000	2,000	1,500	1,300	501						
<b>S.14 Other</b>			<b>86,875</b>	<b>72,969</b>	<b>13,906</b>	<b>1,759</b>	<b>730</b>	<b>967</b>	<b>2,031</b>	<b>3,272</b>	<b>3,780</b>	<b>7,054</b>	<b>6,059</b>	<b>4,729</b>	<b>-5,381</b>	<b>-4,336</b>	<b>-6,756</b>
<b>S.128 I/I Local Financial Assistance</b>			<b>86,594</b>	<b>72,688</b>	<b>13,906</b>	<b>1,759</b>	<b>730</b>	<b>967</b>	<b>2,031</b>	<b>3,272</b>	<b>3,780</b>	<b>7,054</b>	<b>6,059</b>	<b>4,729</b>	<b>-5,381</b>	<b>-4,336</b>	<b>-6,756</b>
S.10273.6084 Grants - Phase II	May-93	May-06	15,938	10,129	5,809	5,809											
S.10274.6085 Loans - Phase II	May-93	May-06	47,664	30,386	17,278	17,278											
S.10282.6170 Repayment - Phase II	May-94	May-11	-47,664	-26,802	-20,862	-18,603	-1,098	-476	-400	-285							
S.10368.6736 Grants - Phase IV	Nov-99	May-13	34,650	11,553	23,097	17,775	1,238	900	900	900	450	934					
S.10369.6737 Loans - Phase IV	Nov-99	May-13	42,350	14,120	28,230	21,725	1,513	1,100	1,100	1,100	550	1,142					
S.10370.6738 Repayment - Phase IV	Nov-00	May-18	-42,350	-4,872	-37,478	-17,390	-5,200	-4,175	-3,528	-2,500	-1,535	-1,073	-833	-613	-393	-173	-63
S.10348.6609 Public Participation	Feb-99	Jun-02	6	6	0												
S.10407.6925 Grants-Phase V	Aug-04	Jun-13	18,000	3,895	14,105	1,575	1,800	1,800	1,800	2,250	2,250	2,630					
S.10408.6926 Loans-Phase V	Aug-04	Jun-13	22,000	4,760	17,240	1,925	2,200	2,200	2,200	2,750	2,750	3,215					
S.10409.6927 Repayments-Phase V	Aug-05	Jun-18	-22,000	-370	-21,630	-952	-1,447	-1,887	-2,327	-2,397	-2,365	-2,420	-2,513	-2,073	-1,633	-1,083	-533

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S.10441.7107 Grants-Phase VI	Nov-06	Jun-15	18,000	0	18,000	1,125	900	900	1,350	1,125	1,350	1,800	4,950	4,500			
S.10442.7108 Loans - Phase VI	Nov-06	Jun-15	22,000	0	22,000	1,375	1,100	1,100	1,650	1,375	1,650	2,200	6,050	5,500			
S.10443.7109 Repayments-Phase VI	Nov-07	Jun-20	-22,000	0	-22,000		-275	-495	-715	-1,045	-1,320	-1,375	-1,595	-2,585	-3,355	-3,080	-6,160
<b>S.138 Sewerage System Mapping Upgrade</b>			<b>281</b>	<b>281</b>	<b>0</b>												
S.10307.6417 Contract 1-Base Maps	Mar-99	Feb-01	67	67	0												
S.10308.6418 Contract 2-Existing Data	Jun-99	Apr-04	174	174	0												
S.10360.6666 Quincy Data Sharing	Jan-00	Dec-02	20	20	0												
S.10361.6667 Weymouth Data Sharing	Jan-00	Jun-01	20	20	0												

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<b>S.2 Waterworks System Improvements</b>			<b>2,271,946</b>	<b>1,500,457</b>	<b>771,489</b>	<b>65,555</b>	<b>62,641</b>	<b>72,306</b>	<b>71,403</b>	<b>79,339</b>	<b>91,916</b>	<b>100,187</b>	<b>78,333</b>	<b>62,304</b>	<b>46,331</b>	<b>11,729</b>	<b>29,446</b>
<b>S.16 Drinking Water Quality Improvements</b>			<b>640,054</b>	<b>490,171</b>	<b>149,884</b>	<b>7,536</b>	<b>13,035</b>	<b>16,848</b>	<b>18,082</b>	<b>12,622</b>	<b>21,071</b>	<b>30,996</b>	<b>21,777</b>	<b>7,917</b>			
<b>S.542 John J. Carroll Water Treatment Plant</b>			<b>437,350</b>	<b>372,223</b>	<b>65,127</b>	<b>3,678</b>	<b>2,948</b>	<b>6,328</b>	<b>5,883</b>	<b>3,996</b>	<b>17,650</b>	<b>17,497</b>	<b>6,569</b>	<b>579</b>			
S.53293.5023 Study 1	Jan-88	Feb-89	444	444	0												
S.53294.5024 Study 2	Jul-90	Mar-94	2,368	2,368	0												
S.53375.6182 AWWARF Study	Dec-96	Sep-03	650	650	0												
S.53376.6206 Emerg Dis Res Water Mgmt Study	Nov-98	Sep-02	1,454	1,454	0												
S.53367.6118 Crypto. Inactivation Study	Feb-97	May-00	150	150	0												
S.53390.6365 Cosgrove Disinfection Ph II	Apr-98	May-99	2,169	2,169	0												
S.53391.6397 Cosgrove Disinfection Ph I	Jul-97	Oct-97	150	150	0												
S.53393.6406 Immediate Disinf. MECO	Jul-97	Jul-97	10	10	0												
S.53392.6401 Distribution Water Consultant	Jul-97	Jun-98	3	3	0												
S.53304.5157 Permit Fees	Jul-93	Dec-05	59	47	12	4	4	3	1								
S.53300.5997 Technical Assistance	Jan-88	Jun-00	72	72	0												
S.53296.5042 EIR/Conceptual Design	Nov-93	Jul-95	5,808	5,808	0												
S.53301.5017 Design/CS/RI - Wachusett WTP	Oct-96	Sep-06	48,880	48,220	660	600	60										
S.53377.6207 WHCP1 Wachusett Cosgrove Intakes	Jun-00	Jun-03	15,391	15,391	0												
S.53412.5522 WHCP2 Interim Rehab. Wach. Aque.	Dec-00	Oct-02	23,400	23,400	0												
S.53413.6488 WHCP3 Sitework & Storage Tanks	Mar-99	Nov-02	67,368	67,368	0												
S.53414.6489 WHCP4 Treatment Facility	Dec-00	Jul-05	145,847	145,742	105	105											
S.53416.6491 WHCP6 Late Sitework	Jul-04	Jan-06	4,088	4,228	-140	-140											
S.53426.6650 WHCP7 Existing Facilities Mods	Jul-08	Jun-10	5,000	0	5,000			2,000	2,000	1,000							
S.53371.6134 Design Management Support	Apr-97	Apr-00	1,730	1,730	0												
S.53378.6208 Construction Management/RI	Aug-98	Sep-06	31,827	30,967	860	860											
S.53406.6479 Cosgrove Disinf.-Fac. Underwater Imps.	Jan-98	Jun-98	217	217	0												
S.53410.6485 Community Chlorine Analyzers	Apr-98	Jun-98	49	49	0												
S.53418.6494 OCIP	Mar-99	Dec-07	5,107	5,107	0												

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S.53419.6495 Professional Services	Sep-98	Oct-05	2,857	2,744	113	37	21	15	15	15	11						
S.53420.6497 Marlboro MOA	Sep-98	Jun-05	5,859	5,859	0												
S.53421.6520 WHWTP- MECO	Sep-98	Mar-05	128	128	0												
S.53425.6613 Site Security Services	May-99	Mar-05	1,264	1,264	0												
S.53427.6670 CSX Crossing	Aug-01	Dec-01	65	65	0												
S.53428.6671 Wachusett Algae Design CS/RI	Sep-11	Dec-14	450	0	450						128	129	128	65			
S.53432.6691 Public Health Research	Jul-00	Jun-07	2,273	1,566	707	368	339										
S.53435.6756 Security Equipment	Jun-00	Jun-00	571	571	0												
S.53437.6773 WHCP8 Cosgrove Screens Con	Aug-03	Aug-04	3,238	3,238	0												
S.53443.6815 AWWARF-Evaluation Ozone & UV	Jul-01	Jan-04	302	302	0												
S.53445.6827 Fitout/Construction	Oct-03	Dec-09	1,350	501	849	104	200	445	100								
S.53448.6889 Wachusett Algae ...	Feb-13	Dec-14	1,800	0	1,800							257	1,029	514			
S.53450.6923 WH Ultra Violet Dis Des ESDC/RI	Jan-08	Oct-13	9,500	0	9,500		655	1,965	1,965	309	1,947	1,947	712				
S.53451.6924 WH Ultra Violet Disinfect Cons	Apr-11	Oct-13	34,000	0	34,000					1,172	14,064	14,064	4,700				
S.53452.6939 As needed Tech Assistance #1	Jan-06	Dec-07	750	50	700	306	394										
S.53456.7084 Ancillary Mods Constr 1	Jul-06	Jun-07	750	0	750	600	150										
S.53453.6951 Des WH CP7 Existing Fac Mods	Jul-05	Jun-10	1,601	114	1,487	514	272	400	301								
S.53455.6989 As needed Tech Assistance ...	Jan-06	Dec-07	750	77	673	320	353										
S.53457.7085 Ancillary Mods Const 2	Oct-08	Jun-13	6,080	0	6,080			1,296	1,296	1,296	1,296	896					
S.53458.7192 Carroll WTP Ancil Mods Des	Oct-07	Jun-13	1,520	0	1,520		500	204	204	204	204	204					
<b>S.543 Quabbin Water Treatment Plant</b>			<b>16,085</b>	<b>10,144</b>	<b>5,942</b>		<b>200</b>	<b>300</b>	<b>838</b>	<b>3,066</b>	<b>1,538</b>						
S.53363.6043 Quabbin WTP Des/CA/RI	May-95	Aug-01	3,823	3,823	0												
S.53382.6212 Construction	Nov-98	Sep-00	5,071	5,071	0												
S.53381.6211 Utilities	Aug-98	Jan-12	13	13	0												
S.53380.6210 Permit Fees	Jan-98	Jan-12	10	7	3			1	2								
S.53433.6706 Ware Fire Dept. MOA	Oct-99	Jul-00	25	25	0												
S.53434.6711 W Q Analysis Equipment	Jan-01	Jun-06	49	49	0												
S.53439.6775 Quabbin UVWTP: Des/CA/RI	Oct-07	Oct-11	1,090	0	1,090		200	299	144	296	151						

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S.53440.6776 Quabbin UVWTP: Construction	Feb-10	Oct-11	4,849	0	4,849				692	2,770	1,387						
S.53442.6804 Quabbin UVWTP:Study/Pilot	May-02	Dec-05	1,156	1,156	0												
<b>S.544 Norumbega Covered Storage</b>			<b>106,736</b>	<b>105,912</b>	<b>824</b>	<b>395</b>	<b>17</b>	<b>410</b>	<b>1</b>								
S.53297.5041 Conceptual Design/EIR	Sep-92	Oct-99	2,873	2,873	0												
S.53364.6057 Owners Representative	Apr-98	Dec-05	4,636	4,608	28	28											
S.53383.6213 Design/Build	Nov-99	Aug-05	96,154	95,394	760	360		400									
S.53372.6145 Land	Mar-97	Dec-97	3,000	3,000	0												
S.53365.6115 Appraisal	Nov-95	Dec-97	17	17	0												
S.53403.6466 Permits	Jun-99	Dec-09	5	2	3		1	1	1								
S.53424.6606 Professional Services	Sep-98	Jun-08	51	19	32	7	16	9									
<b>S.545 Blue Hills Covered Storage</b>			<b>40,427</b>	<b>1,660</b>	<b>38,768</b>	<b>3,463</b>	<b>9,870</b>	<b>9,810</b>	<b>10,760</b>	<b>4,830</b>	<b>10</b>	<b>10</b>	<b>10</b>	<b>5</b>			
S.68025.6139 EIR/Preliminary Design/OR	May-97	Jun-10	2,557	1,641	916	252	260	200	150	54							
S.53386.6216 Design Build	Dec-06	Jun-10	37,766	0	37,766	3,200	9,600	9,600	10,600	4,766							
S.53385.6215 Tech Support/Permit Comp	Apr-02	Dec-15	104	19	85	10	10	10	10	10	10	10	10	5			
<b>S.550 Low Service Storage Near Spot Pond</b>			<b>39,456</b>	<b>233</b>	<b>39,223</b>				<b>600</b>	<b>730</b>	<b>1,873</b>	<b>13,489</b>	<b>15,198</b>	<b>7,333</b>			
S.53400.6455 Env Rev	Apr-02	Feb-03	233	233	0												
S.53401.6456 Env Rev Con Des Owners Rep	Apr-09	Sep-14	2,500	0	2,500				500	576	576	500	300	48			
S.53402.6457 Design/Build	Apr-12	Apr-14	36,093	0	36,093						1,143	12,834	14,834	7,282			
S.53447.6868 Easement/Land Acquisition	Apr-09	Apr-14	630	0	630				100	154	154	155	64	3			
<b>S.17 Transmission</b>			<b>972,725</b>	<b>644,181</b>	<b>328,544</b>	<b>19,788</b>	<b>9,557</b>	<b>7,934</b>	<b>6,921</b>	<b>26,304</b>	<b>28,608</b>	<b>25,085</b>	<b>45,777</b>	<b>47,795</b>	<b>40,759</b>	<b>10,018</b>	<b>60,000</b>
<b>S.604 MetroWest Tunnel</b>			<b>698,025</b>	<b>626,996</b>	<b>71,029</b>	<b>4,089</b>	<b>32</b>	<b>1</b>		<b>16,425</b>	<b>19,567</b>	<b>19,567</b>	<b>5,777</b>	<b>4,795</b>	<b>759</b>	<b>18</b>	
S.59794.5043 Study	Jun-84	Oct-89	415	415	0												
S.59796.5048 Construction-Sudbury Pipe Bridge	Nov-91	Jun-92	296	296	0												
S.59795.5044 Design/EIR - Tunnel/ESDC	Apr-92	Mar-07	37,984	37,869	115	115											
S.59798.6054 West Tunnel Segment - CP1	Apr-97	Apr-03	147,787	147,787	0												

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S.60013.6055 Midd.Tunnel Segment - CP2	Jun-96	Apr-03	245,809	245,809	0												
S.60015.6059 Shaft 5A - CP3	Aug-97	Aug-98	5,872	5,872	0												
S.60040.6374 East Tunnel Segment-CP3A	Nov-98	Sep-02	55,976	55,976	0												
S.60014.6056 MHD Salt Sheds - CP5	Sep-96	Jun-97	1,314	1,314	0												
S.60031.6205 CP6B Upper Hultman Rehab	Jul-13	Jul-15	6,300	0	6,300								2,740	3,288	272		
S.60030.6204 Testing & Disinfection-CP7	Jan-03	Oct-03	3,612	3,612	0												
S.60029.6203 Loring Road Storage Tanks CP-8	Sep-97	Nov-00	41,368	41,368	0												
S.59799.5284 Const. Mgmt/Resident Inspect	May-95	Apr-04	39,405	39,412	-8	-8											
S.59806.5141 Hultman Study	Apr-95	Mar-05	1,864	1,864	0												
S.60022.6128 Hultman Leak Repair	Aug-96	May-97	307	307	0												
S.60026.6140 Hultman Repair Band	Aug-96	Dec-96	28	28	0												
S.60042.6430 Hultman Investigation and Repair	Jun-99	Nov-00	1,604	1,604	0												
S.60043.6492 Hultman Repair Bands 98-99	Apr-99	Jun-99	116	116	0												
S.60083.7082 Hultman Interconnect RI/Svcs	Jun-10	Jun-15	4,000	0	4,000					655	787	787	787	787	197		
S.59805.5139 Land Acquisition	Oct-95	Mar-08	6,259	6,259	0												
S.59804.5976 Technical Assistance	Jun-84	Jun-98	131	131	0												
S.60012.6037 DEP Permit Fees	Oct-94	Jun-02	50	45	5	1	3	1									
S.60020.6117 Prof. Services	Nov-95	Dec-03	731	731	0												
S.60023.6129 Framingham MOU	May-96	Dec-03	2,444	2,444	0												
S.60039.6367 Weston MOA	Apr-96	Oct-04	1,018	1,018	0												
S.60038.6366 Southboro MOA	May-97	Jun-03	255	209	46	46											
S.60053.6762 Wayland MOA	Jun-00	Dec-02	35	35	0												
S.60017.6063 Local Sup Cont Des/CA/RI	May-96	Oct-99	859	859	0												
S.60024.6130 Loc. Support Cont. Constr	Jun-97	Dec-03	4,308	4,283	25	10	15										
S.60025.6131 Loc. Sup Cont. Legal/Easement	Apr-97	Jun-02	9	9	0												
S.60018.6067 Community Technical Assistance	Jun-95	Apr-99	297	297	0												
S.60021.6122 OCIP	Jun-96	May-06	24,516	23,729	787	787											
S.60054.6777 Equipment Prepurchase	Jun-05	Mar-06	198	178	20	20											

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S.60058.6856 Hultman Rehab CP9	Nov-05	Oct-06	3,260	1,390	1,870	1,870											
S.60059.6872 Interim Disinfection	Jan-03	Oct-05	1,245	1,245	0												
S.60066.6911 Hultman Interconnect/Fin Des/CA Insp	Sep-05	Jul-16	5,388	483	4,905	997				720	720	720	720	720	290	18	
S.60073.6975 CP6A Lower Hultman Rehab	Jul-10	Jul-13	52,700	0	52,700					15,050	18,060	18,060	1,530				
S.60085.7105 CP6 Easements	Jan-07	Jul-12	175	0	175	160	15										
S.60086.7106 CP6A Demolition	Jan-07	May-07	90	0	90	90											
<b>S.601 Sluice Gate Rehabilitation</b>			<b>9,365</b>	<b>9,407</b>	<b>-41</b>	<b>-41</b>											
S.59757.5255 Design/CS/RI	Aug-88	Jun-93	177	177	0												
S.59758.5256 Construction 1	Apr-91	Jul-93	1,529	1,529	0												
S.60034.6272 Design CS/RI 2	Apr-98	Sep-06	1,298	1,085	213	213											
S.59760.5258 Construction 2	Sep-03	Jun-05	4,771	4,771	0												
S.59761.5259 Constr-Stop Planks	Dec-88	Jun-89	444	444	0												
S.60027.6158 Const-Sudbury Toe Drain Repair	Sep-96	Jun-97	1,145	1,400	-255	-255											
<b>S.614 Metropolitan Tunnel Loop</b>			<b>3,500</b>	<b>0</b>	<b>3,500</b>				<b>1,500</b>	<b>2,000</b>							
S.60035.6273 Redundancy Study/Tunnel Insp Fea Study	Jul-09	Jun-11	3,500	0	3,500				1,500	2,000							
<b>S.615 Chicopee Valley Aqed. Redundancy</b>			<b>8,704</b>	<b>3,410</b>	<b>5,293</b>	<b>4,831</b>	<b>463</b>										
S.60045.6527 Pipeline Redundancy Des/CA/RI	Apr-00	Apr-08	1,860	1,337	524	307	216										
S.60046.6528 Pipeline Redundancy Construction	Oct-05	Oct-07	6,596	2,034	4,562	4,316	246										
S.60065.6908 Construction Easements	Apr-03	Oct-06	147	29	118	118											
S.60074.7002 Permits	May-04	Oct-06	50	11	39	39											
S.60084.7100 MWRA/SHFD NO.1 Take -off	Oct-06	Dec-06	50	0	50	50											
<b>S.597 Winsor Dam Hydroelectric</b>			<b>10,381</b>	<b>38</b>	<b>10,342</b>			<b>800</b>	<b>955</b>	<b>3,529</b>	<b>3,541</b>	<b>1,518</b>					
S.60032.6276 Preliminary Permit Study & Licensing	Nov-97		38	38	0												
S.60033.6277 Detail Design	Jul-09	Feb-11	359	0	359				155	100	104						
S.60044.6526 Construction	Aug-10	Feb-11	1,406	0	1,406					690	716						
S.60087.7114 Winsor Power Station Pipe Des	Sep-08	Jun-12	1,012	0	1,012			500	100	212	200						



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S.60088.7115 Winsor Power Station Pipe Constr Ph1	Apr-10	Jun-12	4,047	0	4,047				400	1,827	1,820						
S.60095.7197 Shft 12 Quabbin Aqdcet Sluice Gate Des	Jul-08	Jun-12	400	0	400			300	50	25	25						
S.60096.7198 Shft 12 Quabbin Aqdcet Sluice Gate Con	Jul-09	Jun-12	1,600	0	1,600				250	675	675						
S.60077.7017 Winsor Release Pipeline Design & Const	Apr-06	Jun-08	1,518	0	1,518							1,518					
<b>S.616 Quabbin Transmission System</b>			<b>4,863</b>	<b>3,423</b>	<b>1,440</b>	<b>1,433</b>	<b>3</b>	<b>2</b>	<b>2</b>								
S.75491.6690 Phase 1 Oakdale Valves Const.	Oct-05	Jun-06	1,837	1,706	131	131											
S.60055.6828 Facilities Inspection	Oct-05	Apr-07	1,007	275	732	732											
S.75496.6831 Ph 1 Oakdale Valves Study/Des	Apr-04	May-07	1,475	907	568	568											
S.60075.7007 Equipment Pre-purchase	Feb-05	Jun-10	543	534	9	2	3	2	2								
<b>S.617 Sudbury / Weston Aqueduct Repairs</b>			<b>4,497</b>	<b>643</b>	<b>3,854</b>	<b>243</b>	<b>161</b>	<b>2,636</b>	<b>814</b>								
S.75486.6617 Haz Material Sudbury Aqueduct	Apr-99	May-05	300	265	35	35											
S.60056.6838 Sudbury Aqueduct Inspection	Aug-05	Oct-06	587	378	209	209											
S.60057.6839 Sudbury Aqueduct S/T Rep Des	Oct-07	Oct-09	500	0	500		147	250	103								
S.60070.6947 Weston Aqueduct Inspection	Apr-08	Mar-09	300	0	300		14	286									
S.60076.7016 Sudbury Short-Term Repairs	Oct-08	Oct-09	2,811	0	2,811			2,100	711								
<b>S.618 Northern High NW Trans Sect 70-71</b>			<b>1,000</b>	<b>0</b>	<b>1,000</b>					<b>500</b>	<b>500</b>						
S.60063.6895 Planning	Jul-10	Jun-12	1,000	0	1,000					500	500						
<b>S.620 Wachusett Res Spill Impr/Winsor Dam Repairs</b>			<b>8,931</b>	<b>264</b>	<b>8,667</b>	<b>1,234</b>	<b>5,668</b>	<b>1,765</b>									
S.60079.7019 Design	Jan-06	Jul-08	1,394	264	1,129	593	420	117									
S.60080.7020 Construction	Apr-07	Jul-08	7,000	0	7,000	411	4,941	1,648									
S.60078.7018 Equipment Pre-purchase	Jul-06	Aug-09	537	0	537	230	307										
<b>S.621 Watershed Land</b>			<b>19,000</b>	<b>0</b>	<b>19,000</b>	<b>8,000</b>	<b>3,000</b>	<b>2,000</b>	<b>2,000</b>	<b>2,000</b>	<b>2,000</b>						
S.60081.7069 Land Acquisition	Apr-06	Jun-12	19,000	0	19,000	8,000	3,000	2,000	2,000	2,000	2,000						
<b>S.623 Dam Projects</b>			<b>4,460</b>	<b>0</b>	<b>4,460</b>		<b>230</b>	<b>730</b>	<b>1,650</b>	<b>1,850</b>							
S.60089.7154 Engineering Studies for Dam Risk	Jul-07	Jun-09	460	0	460		230	230									

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S.60094.7194 Immediate Repair Dams	Jul-08	Jun-11	4,000	0	4,000			500	1,650	1,850							
<b>S.624 Wachusett Aqueduct Pressurization</b>			<b>100,000</b>	<b>0</b>	<b>100,000</b>						<b>3,000</b>	<b>4,000</b>	<b>30,000</b>	<b>33,000</b>	<b>30,000</b>		
S.60090.7156 Wachusett Aqueduct Pressurization Des	Jul-11	Jun-16	20,000	0	20,000						3,000	4,000	5,000	4,000	4,000		
S.60091.7157 Wachusett Aqueduct Pressurization Con	Jul-13	Jun-16	80,000	0	80,000								25,000	29,000	26,000		
<b>S.625 Long Term Redundancy</b>			<b>100,000</b>	<b>0</b>	<b>100,000</b>								<b>10,000</b>	<b>10,000</b>	<b>10,000</b>	<b>10,000</b>	<b>60,000</b>
S.60092.7159 Long Term Redundancy Des	Jul-13	Jun-23	20,000	0	20,000								2,000	2,000	2,000	2,000	12,000
S.60093.7160 Long Term Redundancy Construction	Dec-13	Jun-23	80,000	0	80,000								8,000	8,000	8,000	8,000	48,000
<b>S.18 Distribution And Pumping</b>			<b>629,140</b>	<b>262,615</b>	<b>366,525</b>	<b>24,609</b>	<b>33,132</b>	<b>39,612</b>	<b>40,800</b>	<b>37,135</b>	<b>39,345</b>	<b>44,055</b>	<b>31,341</b>	<b>24,954</b>	<b>21,658</b>	<b>16,093</b>	<b>13,790</b>
<b>S.677 Valve Replacement</b>			<b>19,679</b>	<b>7,246</b>	<b>12,434</b>	<b>859</b>	<b>2,329</b>	<b>1,325</b>	<b>1,415</b>	<b>1,810</b>	<b>1,195</b>	<b>1,000</b>	<b>500</b>	<b>1,000</b>	<b>1,000</b>		
S.67559.5126 Construction 1	Nov-95	Nov-96	718	718	0												
S.68012.6105 Construction 2	Nov-97	Jul-99	1,385	1,357	28	28											
S.68039.6278 Construction 3	Feb-00	Aug-01	1,338	1,338	0												
S.68079.6345 Construction 4	May-02	Oct-03	1,540	1,540	0												
S.68080.6346 Construction 5	Mar-04	Jul-05	1,389	1,389	0												
S.68126.6435 Construction 6	Feb-07	Jun-08	1,882	0	1,882	230	1,328	324									
S.68127.6436 Construction 7	Oct-09	May-11	2,270	0	2,270				765	1,310	195						
S.68300.7195 Valve Replacement 8&9 Construction	Jul-10	Jun-16	5,000	0	5,000					500	1,000	1,000	500	1,000	1,000		
S.68005.6088 Equip. Purchase	Oct-95	Jun-09	4,036	787	3,249	600	1,000	1,000	649								
S.67560.5124 Technical Assistance	Oct-95	May-10	111	111	0												
S.68239.6859 Permits	Jan-02	May-10	5	1	4	1	1	1	1								
S.68240.6860 Easements	Jan-02	May-10	6	6	0												

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<b>S.712 Cathodic Protection Of Distr.Mains</b>			<b>1,518</b>	<b>141</b>	<b>1,377</b>								459	459	459		
S.68002.6058 Planning Phase I	Apr-95	Dec-97	108	108	0												
S.68129.6438 Test Station Installation 2	May-13	May-14	459	0	459								459				
S.68130.6439 Test Station Installation 3	May-14	May-15	459	0	459									459			
S.68131.6440 Test Station Installation 4	May-15	May-16	459	0	459										459		
S.68216.6751 Technical Assistance	Jan-00	May-09	33	33	0												
<b>S.678 Boston Low Serv.-Pipe &amp; Valve Rehab</b>			<b>23,691</b>	<b>23,691</b>	<b>0</b>												
S.67570.5120 Study - Pipe	Sep-84	Feb-91	297	297	0												
S.67571.5122 Design/CS	Jul-92	Feb-05	1,604	1,604	0												
S.67572.5123 Ph 1 Equip Prepurchase	Feb-95	Dec-95	892	892	0												
S.68000.6045 Const Clinton Rd & Boylston St	Apr-98	Jul-99	7,933	7,933	0												
S.67999.6044 Construction Beacon Street	Jun-00	Sep-03	12,964	12,964	0												
S.68217.6769 Technical Assistance	Jun-00	Aug-03	1	1	0												
<b>S.730 Weston Aqueduct Supply Mains (WASMs)</b>			<b>117,967</b>	<b>60,410</b>	<b>57,557</b>	<b>670</b>	<b>1,707</b>	<b>1,742</b>	<b>3,835</b>	<b>7,314</b>	<b>8,225</b>	<b>8,565</b>	<b>4,015</b>	<b>4,015</b>	<b>3,990</b>	<b>8,886</b>	<b>4,591</b>
S.68027.6142 Design/CA/RI-PhA/W1&2	Jun-97	Jul-06	5,374	5,035	339	279	60										
S.67865.5147 Design/CA/RI - W4	Mar-95	Sep-07	6,149	5,826	323	168	155										
S.68041.6280 Newton WASM 1&2	Mar-00	Jun-02	9,219	9,219	0												
S.68042.6281 Boston WASM 1&2	Feb-03	Jun-05	7,058	7,039	19	19											
S.68166.6539 Design/CA/RI WASM3	Jul-07	Oct-18	9,267	0	9,267		1,252	1,502	1,502	656	834	880	417	417	417	926	464
S.68285.7083 Design/CA/RI Section 28	Oct-06	Mar-11	908	0	908	94	160	160	154	340							
S.68170.6543 Waltham WASM 3-CP2	Jan-11	Mar-13	17,127	0	17,127					2,446	7,341	7,340					
S.68171.6544 Belmont WASM 3 - CP3	Apr-13	Jun-15	13,008	0	13,008							295	3,548	3,548	3,548	2,069	
S.68172.6545 Arlington WASM 3 - CP4	Jul-16	Oct-17	10,005	0	10,005											5,885	4,120
S.68173.6546 Section 28, Arlington-CP1	Mar-10	Sep-10	4,226	0	4,226				1,056	3,170							
S.68031.6175 Auburndale WASM 1,2&4	Jun-97	Nov-98	4,001	4,001	0												
S.68069.6312 Newton WASM 2&4	Apr-98	Mar-01	8,282	8,282	0												
S.68070.6313 Allston WASM 4 & W. Ave. Sewer	Feb-02	Dec-04	17,331	17,331	0												

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S.68032.6176 Construction Meter 103	Oct-96	Jul-98	61	61	0												
S.59774.5034 Construction Newton Water Mains	Apr-95	Oct-96	669	669	0												
S.59776.5975 Technical Assistance	Mar-95	Oct-18	186	186	0												
S.68030.6174 Appraisal/Easement	Mar-95	Oct-18	753	292	461	23	50	50	50	50	50	50	50	50	25	7	7
S.68245.6870 Survey	Dec-01	Oct-18	210	89	121	5	30	30	30	26							
S.68269.6996 Temporary Water Supply Plan	Jul-09	Dec-10	1,669	0	1,669				1,043	626							
S.68272.7000 Section PCCP W-12 ...	Oct-04	Jul-05	2,114	2,114	0												
S.68273.7001 WASM3 SPL12 PCCP Des	May-04	Aug-06	349	266	83	83											
<b>S.720 Warren Cottage Line Rehab</b>			<b>1,205</b>	<b>1,205</b>	<b>0</b>												
S.68081.6285 Construction	Sep-01	Dec-02	1,158	1,158	0												
S.68082.6286 Easements	Oct-99	Jan-03	3	3	0												
S.68195.6618 Technical Assistance	Mar-99	Jan-03	43	43	0												
<b>S.732 Walnut St. &amp; Fisher Hill Pipeline Rehab.</b>			<b>3,467</b>	<b>51</b>	<b>3,417</b>	<b>753</b>	<b>2,504</b>	<b>160</b>									
S.68189.6586 Construction Phs. 1	May-07	Nov-08	3,407	0	3,407	750	2,500	157									
S.68220.6779 Technical Assistance	Jan-04	Nov-08	21	21	0												
S.68221.6780 Survey	May-04	Aug-08	35	30	5	2	2	2									
S.68270.6998 Permits	Jul-04	Nov-08	5	0	5	2	2	2									
<b>S.683 Heath Hill Road Pipe Replacement</b>			<b>19,915</b>	<b>11,981</b>	<b>7,934</b>	<b>6,857</b>	<b>1,078</b>										
S.67639.5192 Design/CS/RI-Sec 52 Ph 1	May-89	Apr-92	218	218	0												
S.68047.6288 Design Sec 52 Ph 2	Sep-02	Oct-08	2,408	1,509	899	673	226										
S.67645.6042 Const-Sect 52 New	Apr-96	Jun-97	745	745	0												
S.67642.5194 Construction Section 52 Rehab	Jan-06	Oct-07	8,227	1,337	6,890	6,095	795										
S.67640.5206 Design/CS/RI - Sec 58,20	Jan-91	Jan-01	1,595	1,595	0												
S.67643.5102 Construction Sect 58,20,19	Jun-97	Nov-99	6,362	6,362	0												
S.67644.5985 Technical Assistance	May-89	Jun-08	19	19	0												
S.68008.6100 Legal/Easements-New	Jan-95	Dec-95	17	17	0												

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S.68048.6289 Legal/Easements Rehab	Mar-02	Oct-07	303	178	124	75	49										
S.68201.6648 Public Participation	Mar-02	Oct-07	5	0	5	3	2										
S.68202.6649 Legal	Mar-02	Oct-07	5	0	5	3	2										
S.68241.6862 Boston Paving	Dec-05	Oct-08	12	0	12	8	4										
<b>S.721 Southern Spine Distribution Mains</b>			<b>67,489</b>	<b>12,827</b>	<b>54,662</b>	<b>636</b>	<b>5,062</b>	<b>3,625</b>	<b>9,148</b>	<b>9,321</b>	<b>2,236</b>	<b>7,117</b>	<b>5,981</b>	<b>4,408</b>	<b>6,100</b>	<b>951</b>	<b>78</b>
S.68083.6290 Sec 21,43,22 Design	Sep-00	Mar-12	7,776	4,464	3,312	433	560	560	600	600	559						
S.68084.6291 Sec 21,43,22 Easements	Mar-02	Feb-09	176	68	107	30	40	37									
S.68085.6292 Section 22 South Construction	Jul-03	Jun-05	4,993	4,993	0												
S.68089.6296 Sec 20 & 58 Design	Feb-12	May-17	2,178	0	2,178						100	400	400	400	400	400	78
S.68090.6297 Sec 20 & 58 Easements	Sep-10	Sep-14	48	0	48					10	10	10	10	8			
S.68091.6298 Sec 20 & 58 Construction	Sep-14	May-16	10,251	0	10,251									4,000	5,700	551	
S.68122.6396 Adams Street Bridge	Jul-98	Dec-99	154	154	0												
S.68193.6601 Southern High Public Part	Oct-98	May-99	15	15	0												
S.68194.6602 Southern High Ext Study	Sep-98	May-99	242	242	0												
S.68228.6787 Boston Paving	Jul-03	Mar-12	265	3	262	36	48	48	48	48	34						
S.68299.7155 Southern Spine Sect 22 N Fac Plan/EIR	Jul-07	Jun-09	1,000	0	1,000		500	500									
S.68298.7120 Section 22 North Design/ESDC	Jul-09	Jan-14	2,500	0	2,500				600	600	500	500	300				
S.68235.6844 Section 22 North Construction	Jan-12	Jan-14	12,511	0	12,511						1,033	6,207	5,271				
S.68236.6845 Section 107 Ph 1 Constr	May-07	Oct-08	6,391	0	6,391		3,912	2,479									
S.68290.7099 Section 107 Ph2 Construction	May-09	Apr-11	15,963	0	15,963				7,900	8,063							
S.68237.6846 Legal			5	1	4	2	2										
S.68238.6847 Technical Assistance			28	28	0												
S.68247.6885 Contract 1A Construction	Nov-03	Jun-05	2,859	2,859	0												
S.68291.7104 Milton Pressure Reg Valve	Jun-06	Nov-06	135	0	135	135											
<b>S.714 South. Extra High Sects 41,42 &amp; 74</b>			<b>3,657</b>	<b>3,650</b>	<b>7</b>	<b>7</b>											
S.68014.6107 Design/CA/RI	Apr-97	Jan-05	770	763	7	7											
S.68049.6299 Easements	Apr-97	Jun-03	46	46	0												

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S.68050.6300 Construction	Dec-00	Sep-03	2,345	2,345	0												
S.68183.6561 Boston Paving	Sep-98	Oct-02	496	496	0												
<b>S.727 SEH Redundancy &amp; Storage</b>			<b>41,372</b>	<b>0</b>	<b>41,372</b>	<b>350</b>	<b>550</b>	<b>100</b>	<b>1,500</b>	<b>2,500</b>	<b>8,430</b>	<b>12,959</b>	<b>9,924</b>				<b>5,059</b>
S.53397.6452 Concept Plan/Prelim Des/Env Rev	Dec-06	Jun-08	900	0	900	350	550										
S.53398.6453 SEH Storage Final Des/CS/RI	Apr-09	Jun-14	2,024	0	2,024				500	500	30	509	485				
S.53399.6454 SEH Storage Construction	Jul-12	Jun-14	8,094	0	8,094							4,550	3,544				
S.68135.6444 SEH Red Loop Final Des/CA/RI	Apr-09	Jun-14	4,047	0	4,047			100	1,000	1,000	1,000	500	447				
S.68136.6445 SEH Redund Loop Construction	Apr-11	Apr-14	21,248	0	21,248					1,000	7,400	7,400	5,448				
S.68292.7112 Design Sect 77/88 Rehab	Jul-18	Jun-23	1,012	0	1,012												1,012
S.68293.7113 Section 77/88 Rehab	Sep-20	Jun-23	4,047	0	4,047												4,047
<b>S.719 Chestnut Hill Connecting Mains</b>			<b>24,558</b>	<b>17,468</b>	<b>7,090</b>	<b>26</b>		<b>328</b>	<b>1,264</b>	<b>2,958</b>	<b>2,474</b>	<b>41</b>					
S.68026.6141 Des/CA/RI PS Potable Connection	Mar-00	Dec-04	1,360	1,360	0												
S.68051.6301 Preliminary Engineering	Jan-05	Apr-06	440	438	2	2											
S.68157.6503 Design/CA/RI - Emer. Pump Relocation	May-98	May-01	1,121	1,121	0												
S.68052.6302 Construction- Chp 149	Jan-10	Jan-12	3,431	0	3,431				527	1,583	1,321						
S.68155.6501 Const - Emer. Pump Relocation	Feb-99	Mar-01	6,502	6,502	0												
S.68053.6303 Easements	Apr-03	Dec-07	81	81	0												
S.68180.6558 Boston Paving	Jul-99	Dec-07	133	133	0												
S.68182.6560 Legal	Jul-99	Jun-08	1	1	0												
S.68199.6623 BECO Emergency Pump Construction	Sep-99	Jun-00	431	431	0												
S.68203.6651 Const.- Pump Station Potable Connection	Apr-02	Dec-03	7,132	7,132	0												
S.68230.6814 Equipment pre-purchase	Apr-01	Oct-01	178	154	24	24											
S.68231.6820 Demolition of Garages	Feb-02	May-02	72	72	0												
S.68244.6869 Utilities	Jun-02	Aug-02	44	44	0												
S.68267.6982 Construction-Chp 30	Jan-10	Jan-12	2,220	0	2,220				342	1,025	853						
S.68268.6995 Final Design CA/RI	Jul-08	Jan-13	1,414	0	1,414			328	395	350	300	41					

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<b>S.704 Rehab of Other Pumping Stations</b>			<b>26,183</b>	<b>4,556</b>	<b>21,626</b>	<b>3,859</b>	<b>5,804</b>	<b>5,717</b>	<b>5,123</b>	<b>1,100</b>	<b>23</b>						
S.67885.5153 Preliminary Design	Aug-94	Mar-96	351	351	0												
S.68017.6110 Design/CS/RI	May-97	Nov-04	2,710	2,546	164	164											
S.68072.6304 Construction II&C	Jan-00	Feb-01	639	639	0												
S.68102.6375 Rehab of 5 Pump Stations	Oct-06	May-10	18,157	0	18,157	3,227	5,000	5,000	4,430	500							
S.68178.6556 Public Participation	Jul-99	Jan-10	5	0	5	2	2	1	1								
S.68179.6557 Legal	Jul-99	Jan-10	5	0	5	2	2	1	1								
S.68204.6676 Proprietary Equipment Purchases	Jun-99	Jan-10	285	158	127	30	40	40	17								
S.68266.6980 Design 2 CS/RI	Dec-04	Mar-11	4,030	862	3,168	435	760	675	675	600	23						
<b>S.722 NIH Redundancy &amp; Covered Storage</b>			<b>57,200</b>	<b>42</b>	<b>57,158</b>	<b>719</b>	<b>210</b>	<b>2,773</b>	<b>4,000</b>	<b>8,578</b>	<b>14,581</b>	<b>11,120</b>	<b>689</b>	<b>828</b>	<b>4,739</b>	<b>5,709</b>	<b>3,212</b>
S.68093.6306 Easements	Jul-09	Apr-10	300	0	300				300								
S.53454.6954 Concept Plan	Feb-06	Aug-07	969	42	927	718	209										
S.68276.7026 NIH Improvements Const	Jun-10	Jun-12	5,219	0	5,219					2,200	2,400	619					
S.68277.7045 Design CA/RI NIH Improvements	Jul-08	Jun-12	1,111	0	1,111			264	291	233	255	68					
S.68278.7047 Permits	Jan-06	Jun-12	5	0	5	1	1	1	1	1							
S.68279.7048 Technical Assistance	Jul-08	May-10	18	0	18			8	8	2							
S.68252.6906 Section 89/29 Redundancy Design	Jul-08	Jun-13	5,059	0	5,059			2,000	1,600	559	500	400					
S.68282.7066 Sec 89&29 Redundancy Constr	Jul-10	Jun-13	19,224	0	19,224				1,300	5,553	6,367	6,004					
S.68283.7067 NIH Storage Fin Des/CS/RI	Jul-08	Sep-12	2,024	0	2,024			500	500	30	509	485					
S.68284.7068 NIH Storage Construction	Sep-10	Sep-12	8,094	0	8,094						4,550	3,544					
S.68294.7116 Section 89/29 Rehab Design	Jul-13	Jun-17	1,012	0	1,012								229	276	227	280	
S.68295.7117 Section 89/29 Rehab Construction	Jul-15	Jun-17	4,047	0	4,047										1,839	2,208	
S.68296.7118 NIH Gillis Redundancy Design	Jul-13	Jun-18	2,024	0	2,024								460	552	293	364	355
S.68297.7119 NIH Gillis Redundancy Construction	Jul-15	Jun-18	8,094	0	8,094										2,380	2,857	2,857
<b>S.689 James L. Gillis Pump Station Rehab.</b>			<b>33,446</b>	<b>33,378</b>	<b>69</b>	<b>64</b>	<b>5</b>										
S.67701.5249 Pump	Aug-86	Aug-86	70	70	0												
S.67702.5076 Electrical Upgrade	May-84	Sep-87	200	200	0												

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S.67709.5074 Construction Diesel Exhaust	Apr-88	Dec-88	60	60	0												
S.67703.5077 Design/CS-Pump Station	Feb-88	Jun-99	2,308	2,308	0												
S.67707.5078 Construction-PS-Phase 1	May-90	Jul-91	630	630	0												
S.67708.5051 Const-P.S.-Ph2	May-95	Dec-98	12,890	12,890	0												
S.67998.6038 Hydraulic Transient Analysis	Apr-95	Sep-95	61	61	0												
S.67716.5047 Oil Control Plan	Aug-92	Dec-92	171	171	0												
S.67717.5050 Drain Line Cleaning	Nov-92	Jan-93	268	268	0												
S.67704.5072 Design/CS/RI-Suction Pipe	Jul-90	Apr-01	1,379	1,379	0												
S.67705.5071 Study-Suction Pipe	Nov-89	Nov-90	603	603	0												
S.67706.5073 Construction-Suction Pipe	Oct-95	Nov-97	11,265	11,265	0												
S.68054.6307 Construction-Tudor Barn	Oct-98	Dec-99	88	88	0												
S.68105.6378 Woodland Road Pavement Improvements	Aug-99	Jun-04	396	396	0												
S.67994.6030 Pavement Highland Ave	Oct-94	Nov-94	86	86	0												
S.67720.5219 Constr-Rehab Discharge	May-02	Nov-03	2,041	2,041	0												
S.67719.5144 Construction Sewer P.S.	May-96	Dec-96	203	203	0												
S.67714.5983 Technical Assistance	May-84	Dec-95	163	163	0												
S.67718.5053 Environ Assess & Remedial Plan	Oct-94	Sep-07	534	487	48	48											
S.67991.6027 DEP Review Fees	Jul-94	Dec-07	30	9	21	16	5										
<b>S.713 Spot Pond Supply Mains - Rehab</b>			<b>62,629</b>	<b>51,467</b>	<b>11,163</b>	<b>8,505</b>	<b>1,697</b>									<b>200</b>	<b>760</b>
S.68038.6223 Prelim Design & Design/CA/RI	Sep-98	Apr-08	10,874	10,404	470	428	42										
S.68059.6316 Easements/Paving CP1	May-00	Mar-02	143	143	0												
S.68106.6379 Easements CP2	May-02	Jun-06	71	50	22	22											
S.68107.6380 Easements CP3	Apr-04	Nov-07	267	70	196	134	62										
S.68151.6476 Easements CP4	Sep-06	May-09	1	1	0												
S.68060.6317 North (Medford/Melrose)	May-00	Jan-02	6,597	6,597	0												
S.68108.6381 Middle (Medford/Somerville)	Jun-02	Jul-06	22,691	21,790	901	901											
S.68109.6382 South (Cambridge/Boston)	Oct-04	Apr-08	17,186	9,410	7,776	6,514	1,262										
S.68150.6475 Early Valve Replacement Contract	Sep-98	Jan-00	2,387	2,387	0												



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S.68209.6697 Construction 4-Trusses	Apr-17	Dec-18	960	0	960											200	760
S.68153.6483 Early Valve Equip. Purchase	May-98	Nov-01	161	161	0												
S.68274.7003 CA/RI CP3	Sep-04	Apr-08	1,289	451	838	507	331										
<b>S.723 Nor Low Service Rehab Secs. 8</b>			<b>17,629</b>	<b>1</b>	<b>17,628</b>	<b>54</b>	<b>1,536</b>	<b>601</b>	<b>1</b>			<b>750</b>	<b>3,300</b>	<b>6,800</b>	<b>4,150</b>	<b>347</b>	<b>90</b>
S.68094.6321 Sec 8 Survey	Jun-06	May-09	80	0	80	25	35	20									
S.68287.7092 Design CA/RI Sec 8	Jul-12	Jul-16	2,040	0	2,040							750	500	400	150	150	90
S.68095.6322 Sec 8 Construction	Jul-14	Jul-16	10,197	0	10,197									6,000	4,000	197	
S.68262.6962 Rehab Sects 37,38 Chel/EB Con	May-13	May-14	3,200	0	3,200								2,800	400			
S.68263.6977 Permits	Jul-05	Aug-11	5	0	5	3	1	1	1								
S.68264.6979 Technical Assistance	Jul-05	Aug-11	27	1	26	26											
S.68275.7021 Section 97A Construction	Oct-07	Oct-08	2,080	0	2,080		1,500	580									
<b>S.702 New Connecting Mains - Shaft 7 to ...</b>			<b>53,644</b>	<b>3,953</b>	<b>49,691</b>	<b>1,007</b>	<b>7,092</b>	<b>22,670</b>	<b>11,367</b>	<b>1,663</b>	<b>1,610</b>	<b>2,480</b>	<b>1,200</b>	<b>601</b>			
S.68035.6199 Watertown MOU	Jun-94	Sep-97	167	167	0												
S.67846.5163 Routing Study	Aug-94	Nov-96	397	397	0												
S.68110.6383 Design/CA/RI DP1	Sep-98	Jun-10	4,810	2,615	2,195	548	600	600	447								
S.68118.6391 Revised N. Segment (CP1A) New 48"	Jun-08	Jun-10	26,408	0	26,408			16,000	9,000	1,408							
S.68114.6387 Easements CP1 A&B	Jan-08	Jun-08	800	17	783		783										
S.68111.6384 Des/CA/RI DP2/4 Meter 120	Aug-02	Sep-09	2,943	757	2,185	419	400	800	566								
S.68286.7086 Design CA/RI Sec 59&60	Nov-10	Sep-14	500	0	500					100	100	100	100	100			
S.68174.6548 Constr CP2 C&L Sec 59&60	Nov-12	Sep-14	3,251	0	3,251							1,750	1,000	501			
S.68175.6547 Easements CP2	May-11	Nov-12	45	0	45					5	35	5					
S.68119.6392 South Segment (CP3)	Feb-08	Sep-09	5,437	0	5,437		2,000	2,750	687								
S.68115.6388 Easements CP3	Mar-07	Aug-09	69	0	69	30	39										
S.68121.6394 Northeast Segment (CP5)	Nov-07	Jul-09	6,266	0	6,266		3,250	2,500	516								
S.68117.6390 Easements CP5	Dec-06	Jun-09	50	0	50	10	20	20									
S.68255.6955 Repl of Sect 25-Design CA/RI	Jul-09	Nov-12	400	0	400				150	150	75	25					
S.68256.6956 Repl of Sect 25-Construction	Jul-11	Nov-12	2,100	0	2,100						1,400	600	100				

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<b>S.706 NHS - Con. Mains from Sec. 91</b>			<b>2,360</b>	<b>2,342</b>	<b>18</b>	<b>18</b>											
S.67930.5165 Design/CA/RI	Jun-95	Oct-01	729	711	18	18											
S.68077.6332 Construction	Nov-00	Jun-02	1,631	1,631	0												
<b>S.692 NHS - Section 27 Improvements</b>			<b>2,789</b>	<b>124</b>	<b>2,665</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>6</b>	<b>8</b>	<b>758</b>	<b>1,803</b>	<b>88</b>		
S.67769.6333 Construction Sect 27	Sep-13	Mar-15	2,664	27	2,638								750	1,800	88		
S.68192.6589 Easements	Apr-12	Mar-15	23	0	23						5	8	8	3			
S.68211.6712 Technical Assistance	Oct-99	Mar-12	64	60	5	1	1	1	1	1	1						
S.68229.6809 Surveying	Jun-01	Dec-01	37	37	0												
<b>S.693 NHS - Revere &amp; Malden Pipeline Impr</b>			<b>32,145</b>	<b>23,854</b>	<b>8,291</b>	<b>14</b>	<b>2,616</b>	<b>209</b>	<b>4</b>	<b>4</b>	<b>4</b>	<b>3</b>	<b>3,303</b>	<b>2,032</b>	<b>102</b>		
S.67780.5185 Design/CS/RI-Revere/Malden	May-88	Sep-94	1,786	1,786	0												
S.67781.5186 Constr-Revere Beach	Aug-92	Oct-94	6,314	6,314	0												
S.67782.5176 Constr-Malden Sect 53	Apr-92	Sep-94	10,026	10,026	0												
S.68020.6113 Landscaping Malden Section 53	Apr-96	Jun-96	20	20	0												
S.67792.5238 Construction - Linden Square	Apr-91	Nov-91	1,849	1,849	0												
S.67793.5239 Construction Admin.-Linden Squar	Apr-91	Nov-91	125	125	0												
S.67784.5177 Const-Revere Sect 53	Aug-07	Sep-08	2,800	0	2,800		2,600	200									
S.68078.6334 Easements Revere 53	Sep-02	Sep-08	27	0	27	11	11	5									
S.67996.6033 Des/CA/RI-Rd Restoration	Nov-94	Dec-95	77	77	0												
S.67997.6034 Construction Road Restoration	Jul-95	Jun-96	1,714	1,714	0												
S.68033.6183 Sidewalk Restoration	Sep-96	Oct-96	54	54	0												
S.67785.5191 Constr-Control Valves	Jun-88	Aug-89	949	949	0												
S.67786.5179 Const.-DI Pipeline C&L	Jun-90	Sep-90	158	158	0												
S.67787.5178 Constr-Win C&L	Jun-90	Aug-90	575	575	0												
S.67790.6335 Constr 68 & 53A	Jul-13	Nov-14	4,229	0	4,229								3,000	1,229			
S.67791.5986 Technical Assistance	Jul-06	Nov-15	206	206	0												
S.68258.6958 Shaft 9A-D Ext Construction	Apr-14	Nov-15	1,200	0	1,200								300	800	100		

**Massachusetts Water Resource Authority  
Capital Expenditure Forecast: 2007-2017  
(\$000s)**

Program / Project	NTP	SC	Total Contract Amount	Payments Thru FY06	Remaining Balance 6/30/06	FY07	FY08	FY09	FY10	FY11	FY12	FY13	FY14	FY15	FY16	FY17	Beyond FY17
S.68265.6978 Survey	Jul-06	Nov-15	30	0	30	3	4	3	3	3	3	3	3	3	2		
S.68280.7049 Permits	Apr-05	Nov-15	5	0	5		1	1	1	1	1						
<b>S.731 Lynnfield Pipeline</b>			<b>6,990</b>	<b>0</b>	<b>6,990</b>	<b>150</b>	<b>910</b>	<b>360</b>	<b>3,140</b>	<b>1,880</b>	<b>550</b>						
S.68196.6619 Easem/Legal/License/Permits	Jul-07	Jul-11	200	0	200		60	60	40	30	10						
S.68251.6905 Design CA/RI	Jul-07	Jul-11	1,240	0	1,240		700	300	100	100	40						
S.68289.7096 Temporary Interconnect Constr(Ph 1)	Feb-07	Aug-07	300	0	300	150	150										
S.68187.6584 Construction (Phase 2)	Jul-09	Jul-11	5,250	0	5,250				3,000	1,750	500						
<b>S.708 Nor Extra High Serv - New Pipelines</b>			<b>8,919</b>	<b>3,632</b>	<b>5,287</b>	<b>1</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>7</b>	<b>12</b>	<b>12</b>	<b>1,211</b>	<b>3,009</b>	<b>1,030</b>		
S.67970.5242 Design/CA/RI	Sep-94	Jun-01	588	588	0												
S.67972.6340 Construction	Aug-99	Sep-01	3,032	3,032	0												
S.68162.6522 Construction-Sections 34,36,45	Jan-14	Nov-15	5,226	0	5,226								1,200	3,000	1,026		
S.68176.6554 Public Participation	Jul-99	Nov-15	5	0	5	1	1	1	1	1							
S.68177.6555 Legal	Jul-99	Nov-15	5	0	5	1	1	1	1	1							
S.68210.6707 Technical Assistance	Nov-10	Nov-15	54	8	46					5	10	10	10	8	4		
S.68215.6749 PLC Equipment Purchases	Dec-99	Dec-00	4	4	0												
S.68281.7050 Permits	Nov-10	Nov-15	5	0	5					1	1	1	1	1	1		
<b>S.725 Hydraulic Model Update</b>			<b>686</b>	<b>598</b>	<b>88</b>	<b>60</b>	<b>28</b>										
S.68101.6342 Hydraulic Model Update	Jun-99	Dec-02	563	563	0												
S.68165.6531 Model Enhancement Support Services	Jul-00	Jun-07	123	35	88	60	28										
<b>S.19 Other</b>			<b>30,027</b>	<b>103,490</b>	<b>-73,463</b>	<b>13,621</b>	<b>6,917</b>	<b>7,913</b>	<b>5,600</b>	<b>3,278</b>	<b>2,893</b>	<b>51</b>	<b>-20,562</b>	<b>-18,362</b>	<b>-16,086</b>	<b>-14,382</b>	<b>-44,345</b>
<b>S.753 Central Monitoring System</b>			<b>16,092</b>	<b>15,627</b>	<b>465</b>	<b>91</b>	<b>150</b>	<b>120</b>	<b>105</b>								
S.75300.5025 Study	Mar-84	Sep-86	190	190	0												
S.75301.5026 Design	Oct-87	Jan-92	2,651	2,651	0												
S.75304.5160 Communications Structures	Nov-92	May-93	161	161	0												
S.75305.5173 CS/Start Up Services	Jul-92	Aug-98	352	352	0												

**Massachusetts Water Resource Authority  
Capital Expenditure Forecast: 2007-2017  
(\$000s)**

Program / Project	NTP	SC	Total Contract Amount	Payments Thru FY06	Remaining Balance 6/30/06	FY07	FY08	FY09	FY10	FY11	FY12	FY13	FY14	FY15	FY16	FY17	Beyond FY17
S.75302.5027 Equipment Prepurchase	Oct-87	Dec-93	2,162	2,162	0												
S.75306.5171 Construction 1	Nov-97	Nov-98	209	209	0												
S.75303.5028 SCADA Implementation	Aug-96	Jun-09	2,201	1,736	465	91	150	120	105								
S.75474.6125 Microwave Equipment	Mar-96	Dec-01	782	782	0												
S.75308.5849 Operations Center Construction	Sep-92	Jun-94	1,499	1,499	0												
S.75309.5987 Technical Assistance	Jul-92	Dec-97	386	386	0												
S.75488.6653 Microwave Comm System-Wide Backbone	Sep-01	Jun-02	1,694	1,694	0												
S.75489.6654 Study & Design Monitoring & Control	Dec-99	Sep-04	1,808	1,808	0												
S.75494.6816 Microwave Comm for Waterworks Facil	Sep-02	Jul-04	1,957	1,957	0												
S.75495.6825 Ludlow Communications	Sep-01	Oct-01	41	41	0												
<b>S.763 Distribution Systems Facs. Mapping</b>			<b>2,348</b>	<b>1,036</b>	<b>1,312</b>		<b>423</b>	<b>507</b>	<b>382</b>								
S.75458.5162 Planning Design	Feb-95	Dec-98	936	936	0												
S.75476.6152 Data Purchase	Nov-95	Aug-96	100	100	0												
S.75484.6525 Records Development	Jul-07	Dec-09	1,312	0	1,312		423	507	382								
<b>S.764 Local Water Infrastr Rehab Ast Progr</b>			<b>7,488</b>	<b>7,488</b>	<b>0</b>												
S.75477.6343 Loans	Aug-97	Jun-99	22,304	22,304	0												
S.75478.6344 Loan Repayment	Aug-98	Jun-04	-22,304	-22,304	0												
S.75479.6408 Grants	Aug-97	Jun-99	7,488	7,488	0												
<b>S.765 Local Water Pipeline Imp. Loan Program</b>			<b>0</b>	<b>79,117</b>	<b>-79,117</b>	<b>13,506</b>	<b>6,343</b>	<b>7,223</b>	<b>5,023</b>	<b>2,823</b>	<b>2,121</b>	<b>-474</b>	<b>-20,562</b>	<b>-18,697</b>	<b>-16,760</b>	<b>-15,091</b>	<b>-44,572</b>
S.75485.6608 Community Loans	Aug-00	Jun-13	255,518	104,602	150,915	23,966	19,200	22,000	22,000	22,000	22,000	19,749					
S.75493.6759 Community Repayment	Aug-01	Jun-23	-255,518	-25,485	-230,032	-10,460	-12,857	-14,777	-16,977	-19,177	-19,879	-20,223	-20,562	-18,697	-16,760	-15,091	-44,572
<b>S.766 Waterworks Facility Asset Protection</b>			<b>4,098</b>	<b>221</b>	<b>3,877</b>	<b>24</b>	<b>1</b>	<b>63</b>	<b>91</b>	<b>455</b>	<b>772</b>	<b>525</b>		<b>335</b>	<b>674</b>	<b>709</b>	<b>228</b>
S.75490.6689 Meter Vault Manhole Retrofits	Sep-14	Jun-17	1,466	0	1,466									335	503	503	125
S.75497.6832 Design-Walnut Hill Tank	Sep-08	Mar-13	300	0	300			60	90	86	64						
S.75498.6833 Construction-Walnut Hill Tank	Oct-10	Mar-12	1,000	0	1,000					368	632						
S.75501.6910 Waltham Pipe/Bridge Repl	Mar-04	Sep-04	238	221	16	16											

**Massachusetts Water Resource Authority  
Capital Expenditure Forecast: 2007-2017  
(\$000s)**

Program / Project	NTP	SC	Total Contract Amount	Payments Thru FY06	Remaining Balance 6/30/06	FY07	FY08	FY09	FY10	FY11	FY12	FY13	FY14	FY15	FY16	FY17	Beyond FY17
S.75502.6920 Permits/Legal Fees	Mar-04	Mar-12	15	0	15	8	1	3	1	1	1						
S.75506.7023 Design Cosgrove Turbine Isolation	Jul-15	Dec-17	480	0	480										171	206	103
S.75509.7064 Cosgrove Valve Seat Repl	Jul-12	Dec-12	500	0	500							500					
S.75510.7065 Des Cosgrove Valve Seat Repl	Jul-11	Dec-12	100	0	100						75	25					
<b>S.3 Business &amp; Operations Support</b>			<b>68,132</b>	<b>36,786</b>	<b>31,345</b>	<b>5,477</b>	<b>6,005</b>	<b>5,885</b>	<b>7,021</b>	<b>1,368</b>	<b>1,957</b>	<b>676</b>	<b>432</b>	<b>1,775</b>	<b>750</b>		
<b>S.933 Capital Maintenance Planning/Development</b>			<b>8,891</b>	<b>2,710</b>	<b>6,181</b>	<b>1,549</b>	<b>720</b>	<b>807</b>	<b>828</b>	<b>828</b>	<b>828</b>	<b>621</b>					
S.19175.6421 Inventory & Evaluation-1&2	Apr-00	Jul-05	2,579	2,579	0												
S.92387.6976 As-needed Design Contract 1	Mar-05	Mar-07	750	80	670	670											
S.92393.6988 As Needed Design Contract 2	Mar-05	Mar-07	750	51	699	699											
S.92402.7101 As-Needed Des Contract 3	Feb-07	Feb-09	750	0	750	90	360	300									
S.92403.7102 As-Needed Des Contract 4	Feb-07	Feb-09	750	0	750	90	360	300									
S.92399.7070 Long-Term As-Needed Design	Feb-09	Feb-13	3,312	0	3,312			207	828	828	828	621					
<b>S.881 Equipment Purchase</b>			<b>8,703</b>	<b>3,904</b>	<b>4,799</b>	<b>1,464</b>	<b>1,630</b>	<b>1,100</b>	<b>605</b>								
S.92367.6732 TV Inspection Truck	Jul-00	Mar-01	175	175	0												
S.92374.6760 Security Equip & Installation	Jan-01	Jun-07	6,112	2,343	3,769	584	1,480	1,100	605								
S.92379.6808 ICP-MS Lab Testing Equip	Jan-08	Mar-08	150	0	150		150										
S.92381.6866 Back Hoe	Apr-03	Jun-04	130	130	0												
S.92382.6867 Vactor Truck	Apr-03	Jun-03	220	220	0												
S.92383.6907 Water Service Truck	Apr-04	Jun-04	114	114	0												
S.92384.6944 Bucket Machine	Oct-04	Dec-04	137	137	0												
S.92385.6945 Excavator	Apr-07	Jun-07	265	0	265	265											
S.92386.6946 Grove Crane	May-05	Aug-05	311	311	0												
S.92388.6981 Land Fill Loader	May-05	Aug-05	113	113	0												
S.92392.6986 PowerSweeper/Catch Basin ...	Apr-04	Jun-04	155	155	0												
S.92394.6990 Back Hoe (WRA385)	Oct-04	Dec-04	97	97	0												
S.92395.7027 Closed Circuit TV Insp Truck	Apr-07	Jun-07	165	0	165	165											

**Massachusetts Water Resource Authority  
Capital Expenditure Forecast: 2007-2017  
(\$000s)**

Program / Project	NTP	SC	Total Contract Amount	Payments Thru FY06	Remaining Balance 6/30/06	FY07	FY08	FY09	FY10	FY11	FY12	FY13	FY14	FY15	FY16	FY17	Beyond FY17
S.92396.7028 Front-End Loader	Jul-05	Mar-06	240	110	130	130											
S.92400.7074 Crane (WRA-185)	Apr-06	Jun-06	320	0	320	320											
<b>S.930 MWRA Facility - Chelsea</b>			<b>10,227</b>	<b>9,842</b>	<b>385</b>	<b>385</b>											
S.92321.5052 Planning	Jan-95	Jun-97	30	30	0												
S.92320.5886 Conceptual Design	Sep-97	Dec-98	49	49	0												
S.92354.6510 Design Review	Sep-99	Mar-05	385	378	7	7											
S.92355.6511 Fitout - Office Furnish/Equip	Feb-01	Jun-04	644	644	0												
S.92356.6512 Inform./Telecom. Consultant	Aug-00	Jun-01	382	382	0												
S.92357.6513 Existing Facility "Button Up"	Dec-01	Dec-05	380	379	1	1											
S.92358.6514 Moving Expense	Dec-01	Jun-04	362	362	0												
S.92362.6624 Legal	Mar-99	Dec-99	14	14	0												
S.92363.6713 Moving Expenses CNY	Mar-01	Jun-01	237	237	0												
S.92364.6714 CNY Retrofit	Jul-00	Jun-01	1,577	1,573	4	4											
S.92365.6715 MIS Network	Mar-01	May-07	1,664	1,639	25	25											
S.92366.6716 Fitout - All Other	Feb-01	Jun-07	4,476	4,153	323	323											
S.92375.6757 Communication Tower	Jul-01	Dec-01	25	0	25	25											
<b>S.925 Technical Assistance</b>			<b>1,650</b>	<b>0</b>	<b>1,650</b>	<b>550</b>	<b>550</b>	<b>550</b>									
S.30000.MECH Mechanical			150	0	150	50	50	50									
S.50000.MATT Material Testing			150	0	150	50	50	50									
S.80000.SURV Surveying			150	0	150	50	50	50									
S.90000.HAZM Hazardous Material			900	0	900	300	300	300									
S.33000.INST Instrument Control			150	0	150	50	50	50									
S.44000.WETP Wetland/Permitting			150	0	150	50	50	50									
<b>S.931 Business Systems Plan</b>			<b>30,076</b>	<b>18,961</b>	<b>11,115</b>	<b>1,457</b>	<b>2,133</b>	<b>1,861</b>	<b>1,214</b>	<b>500</b>	<b>1,100</b>		<b>375</b>	<b>1,725</b>	<b>750</b>		
S.92338.6014 Phase I (FY95-97)	Jul-94	Mar-03	1,146	1,146	0												
S.92339.6013 Hardware-Phase I	Jul-94	Dec-96	441	441	0												

**Massachusetts Water Resource Authority  
Capital Expenditure Forecast: 2007-2017  
(\$000s)**

Program / Project	NTP	SC	Total Contract Amount	Payments Thru FY06	Remaining Balance 6/30/06	FY07	FY08	FY09	FY10	FY11	FY12	FY13	FY14	FY15	FY16	FY17	Beyond FY17
S.92322.6015 Network-Phase I	Jul-94	Dec-96	142	142	0												
S.92343.6177 Phase II FY97-99	Jul-96	Dec-08	4,274	2,156	2,118	1,159	938	11	11								
S.92347.6362 Phase III (FY99-01)	Dec-97	Jun-04	10,807	10,748	58	58											
S.92352.6508 Phase IV / Year 2000 Imp.	Jul-98	Jan-00	3,051	3,038	13	13											
S.92353.6509 Phase V	Jul-01	Jun-09	2,957	258	2,699	199	595	1,202	704								
S.92380.6865 Phase VI	Jan-03	Jun-09	2,308	1,031	1,277	28	600	649									
S.92404.7200 Computer Center - OCC Infrastructure	Jul-14	Jun-16	1,500	0	1,500									750	750		
S.92405.7201 Net 2020	Jul-09	Jun-12	1,500	0	1,500				500	500	500						
S.92406.7203 SAN II	Jul-11	Jun-12	600	0	600						600						
S.92407.7204 SAN III	Jul-14	Jun-15	600	0	600									600			
S.92408.7205 Telecommunications	Jul-13	Jun-15	750	0	750									375	375		
<b>S.932 Environmental Remediation</b>			<b>1,831</b>	<b>1,369</b>	<b>462</b>	<b>87</b>	<b>52</b>	<b>52</b>	<b>40</b>	<b>40</b>	<b>29</b>	<b>55</b>	<b>57</b>	<b>50</b>			
S.92368.6741 FRSA Hazardous Materials	0	0	0	0	0												
S.92369.6745 Tech Asst./ Env. Remediation	Feb-99	Jun-07	545	545	0												
S.92370.6746 Prision Point Tank Removal - Const.	Feb-99	Aug-99	777	354	422	48	52	52	40	40	29	55	57	50			
S.92371.6747 Cottage Farm Tank Replace - Const	Jun-02	Dec-02	428	428	0												
S.92372.6748 Chelsea Creek Tank Removal	May-02	Nov-02	0	0	0												
S.92376.6805 Oakdale Power Station	Sep-03	Dec-04	73	33	40	40											
S.92377.6806 Cosgrove Power Station	0	0	8	8	0												
S.92378.6807 Design/CS/Cosgrove P.S.	Nov-00	Jun-03	0	0	0												
<b>S.934 MWRA Facilities Management &amp; Planning</b>			<b>6,753</b>	<b>0</b>	<b>6,753</b>	<b>535</b>	<b>920</b>	<b>1,514</b>	<b>3,784</b>								
S.92389.6983 Design/Engineering Services	Mar-05	Jan-10	1,259	0	1,259	225	220	814									
S.92390.6984 Facilities Construction	Jul-09	Jul-10	5,334	0	5,334	150	700	700	3,784								
S.92391.6985 Facilities Fitout	0	0	0	0	0												
S.92401.7098 CSB Roof Replacement	Nov-06	Jun-07	160	0	160	160											

**MASSACHUSETTS WATER RESOURCES AUTHORITY  
CONTINGENCY FUND FORECAST FY2008 - 2017  
(\$000)**

	<b>Total Contingency Budget FY08-17</b>	<b>Q1 FY2008</b>	<b>Q2 FY2008</b>	<b>Q3 FY2008</b>	<b>Q4 FY2008</b>	<b>FY2008</b>	<b>FY2009</b>	<b>FY2010</b>	<b>FY2011</b>	<b>FY2012</b>	<b>FY2013</b>	<b>FY2014</b>	<b>FY2015</b>	<b>FY2016</b>	<b>FY2017</b>
<b>Wastewater System Improvements</b>															
FY2008	16,454	4,643	3,994	4,819	2,999	16,454									
FY2009	16,515						16,515								
FY2010	13,955							13,955							
FY2011	7,471								7,471						
FY2012	3,356									3,356					
FY2013	2,230										2,230				
FY2014	5,369											5,369			
FY2015	6,215												6,215		
FY2016	6,766													6,766	
FY2017	4,735														4,735
<b>Total Wastewater System Improvements</b>	<b>\$83,068</b>	<b>\$4,643</b>	<b>\$3,994</b>	<b>\$4,819</b>	<b>\$2,999</b>	<b>\$16,454</b>	<b>\$16,515</b>	<b>\$13,955</b>	<b>\$7,471</b>	<b>\$3,356</b>	<b>\$2,230</b>	<b>\$5,369</b>	<b>\$6,215</b>	<b>\$6,766</b>	<b>\$4,735</b>
<b>Waterworks System Improvements</b>															
FY2008	5,117	1,210	1,326	1,286	1,296	5,117									
FY2009	6,263						6,263								
FY2010	6,323							6,323							
FY2011	7,361								7,361						
FY2012	8,703									8,703					
FY2013	9,997										9,997				
FY2014	9,850											9,850			
FY2015	8,098												8,098		
FY2016	6,309													6,309	
FY2017	2,682														2,682
<b>Total Waterworks System Improvements</b>	<b>\$70,703</b>	<b>\$1,210</b>	<b>\$1,326</b>	<b>\$1,286</b>	<b>\$1,296</b>	<b>\$5,117</b>	<b>\$6,263</b>	<b>\$6,323</b>	<b>\$7,361</b>	<b>\$8,703</b>	<b>\$9,997</b>	<b>\$9,850</b>	<b>\$8,098</b>	<b>\$6,309</b>	<b>\$2,682</b>
<b>Business &amp; Operations Support</b>	<b>\$2,422</b>	<b>\$171</b>	<b>\$124</b>	<b>\$114</b>	<b>\$137</b>	<b>\$545</b>	<b>\$533</b>	<b>\$647</b>	<b>\$137</b>	<b>\$196</b>	<b>\$68</b>	<b>\$43</b>	<b>\$178</b>	<b>\$75</b>	<b>\$0</b>
<b>Total MWRA</b>	<b>\$156,192</b>	<b>\$6,024</b>	<b>\$5,444</b>	<b>\$6,219</b>	<b>\$4,431</b>	<b>\$22,117</b>	<b>\$23,312</b>	<b>\$20,925</b>	<b>\$14,968</b>	<b>\$12,255</b>	<b>\$12,295</b>	<b>\$15,263</b>	<b>\$14,491</b>	<b>\$13,150</b>	<b>\$7,417</b>



# APPENDIX 3

## Project Status Overview

**Appendix 3  
Project Status Overview**

The following information presented below provides an approximation of status for design and construction phases in the current capital budget. Planned end dates are provided for ongoing phases. Planned start dates are provided for future phases. These dates are anticipated Notice-to-Proceed dates after the bid period. All dates are subject to change.

Subphase/Project	Total Contract Amount	Projected Pmts. Thr. FY07	Status Based on % of Budget Expended	% Complete	Planned Start	Planned End
<b>S.102 Quincy Pump Facilities</b>	<b>25,897</b>	<b>25,897</b>	<b>Complete</b>	<b>100.0%</b>		
S.10024.5400 Facilities Plan/EIR	526	526	Complete	100.0%		
S.10025.5402 Design/CS Rehab	110	110	Complete	100.0%		
S.10026.5403 Construction-Rehab	328	328	Complete	100.0%		
S.10033.5843 Land Acq - Squantum	22	22	Complete	100.0%		
S.10027.5404 Design/CS/R11	4,881	4,881	Complete	100.0%		
S.10028.5405 Squantum P.S. Construction	4,415	4,415	Complete	100.0%		
S.10029.5407 Quincy P.S. Construction	7,103	7,103	Complete	100.0%		
S.10030.5408 Hough's Neck P.S. Construction	1,720	1,720	Complete	100.0%		
S.10031.5409 Early Rehab Squantum F.M.	2,042	2,042	Complete	100.0%		
S.10276.6102 Squantum Force Main Rehab	2,061	2,061	Complete	100.0%		
S.10277.6103 Quincy Force Main Rehab	1,489	1,489	Complete	100.0%		
S.10260.6069 Legal	77	77	Complete	100.0%		
S.10032.5950 Technical Assistance	44	44	Complete	100.0%		
S.10388.6810 Const Corrosion Mitigation	1,079	1,079	Complete	100.0%		

Subphase/Project	Total Contract Amount	Projected Pmts. Thr. FY07	Status Based on % of Budget Expended	% Complete	Planned Start	Planned End
<b>S.104 Braintree-Weymouth Relief Facilities</b>	<b>221,199</b>	<b>205,345</b>	<b>92.8%</b>	<b>92.8%</b>		
S.10045.5311 Facilities Planning Phase 1	331	331	Complete	100.0%		
S.10046.5312 EIR Phase 1	514	514	Complete	100.0%		
S.10057.5324 Final EIR/Fac.Plan	1,111	1,111	Complete	100.0%		
S.10044.5332 Geotechnical - Land	8	8	Complete	100.0%		
S.10001.5333 Geotechnical - Marine	443	443	Complete	100.0%		
S.10047.5313 Design 1/CS/RI	18,991	18,991	Complete	100.0%		
S.10251.6016 Sedimentation Testing	96	96	Complete	100.0%		
S.10058.5331 Design 2/CS/RI	15,265	13,462	88.2%	88.2%		Jun-08
S.10048.5314 Land Acquisition	3,630	3,630	Complete	100.0%		
S.10049.5315 Tunnel Construction/Rescue	83,580	83,580	Complete	100.0%		
S.10050.5316 Intermediate P.S. Construction	47,451	47,451	Complete	100.0%		
S.10051.5303 No. Weymouth Relief Interceptor	4,705	4,705	Complete	100.0%		
S.10052.5373 HDD Siphon Construction	16,343	16,343	Complete	100.0%		
S.10054.5375 B-W Replacement Pump Station	17,582	8,559	48.7%	48.7%		Jan-08
S.10452.7193 Rehab of Section 624 Des	1,000	0	Future	0.0%	Jul-09	
S.10060.5310 Rehab Sections 624 & 652	4,000	0	Future	0.0%	May-10	
S.10302.6368 Mill Cove Siphon Construction	2,749	2,749	Complete	100.0%		
S.10055.5308 Design - Rehab	24	24	Complete	100.0%		
S.10056.5309 Construction - Rehab	255	255	Complete	100.0%		
S.10265.6074 Hazardous Waste	5	5	Complete	100.0%		
S.10263.6072 Legal	400	400	Complete	100.0%		
S.10264.6073 Public Relations	5	5	Complete	100.0%		
S.10061.5951 Technical Assistance	144	144	Complete	100.0%		
S.10278.6119 Design - Marine Pipeline	1,100	1,100	Complete	100.0%		
S.10354.6631 Community Technical Assistance	1,111	1,111	Complete	100.0%		
S.10375.6766 Geotechnical Consultant	56	56	Complete	100.0%		
S.10378.6792 IPS/RPS Communication System	300	272	90.7%	90.7%		Apr-07
<b>S.105 New Neponset Valley Relief Sewer</b>	<b>30,300</b>	<b>30,300</b>	<b>Complete</b>	<b>100.0%</b>		
S.10062.5380 Facilities Plan	594	594	Complete	100.0%		
S.10063.5381 EIR/Supp. Fac. Plan	626	626	Complete	100.0%		
S.10064.5382 Design/CS/RI	4,054	4,054	Complete	100.0%		
S.10065.5383 Land Acquisition	531	531	Complete	100.0%		
S.10076.5377 Consultant-Canton	130	130	Complete	100.0%		
S.10067.5385 Construction 1	5,203	5,203	Complete	100.0%		
S.10068.5390 Construction 2	2,549	2,549	Complete	100.0%		
S.10069.5834 Construction 3	3,265	3,265	Complete	100.0%		
S.10070.5835 Construction 4	2,960	2,960	Complete	100.0%		
S.10071.5389 Construction 5	9,599	9,599	Complete	100.0%		
S.10072.5386 Study Dedham Street	537	537	Complete	100.0%		
S.10074.5379 Power Line	64	64	Complete	100.0%		
S.10073.5952 Technical Assistance	189	189	Complete	100.0%		
<b>S.131 Upper Neponset Valley Sewer System</b>	<b>53,955</b>	<b>40,889</b>	<b>75.8%</b>	<b>75.8%</b>		
S.10256.6031 Design/CS/RI	4,438	4,084	92.0%	92.0%		Apr-09
S.10290.6191 Replace Sewer Sections 685-686	36,576	32,595	89.1%	89.1%		Apr-08
S.10352.6629 Replacement Sewer Section 687	8,334	1,200	14.4%	14.4%		Apr-08
S.10439.7072 Resident Engineering/Inspection	2,347	1,214	51.7%	51.7%		Aug-08
S.10311.6450 Land Acquisition	1,870	1,551	82.9%	82.9%		Apr-08
S.10266.6075 Legal	5	2	40.0%	40.0%		Apr-08
S.10267.6076 Public Relations	5	2	40.0%	40.0%		Apr-08
S.10268.6077 Hazardous Waste	5	2	40.0%	40.0%		Apr-08
S.10393.6830 Boston Paving	376	239	63.6%	63.6%		Apr-08

Subphase/Project	Total Contract Amount	Projected Pmts. Thr. FY07	Status Based on % of Budget Expended	% Complete	Planned Start	Planned End
<b>S.106 Wellesley Ext Replacement Sewer</b>	<b>64,359</b>	<b>64,359</b>	<b>Complete</b>	<b>100.0%</b>		
S.10091.5345 Study	324	324	Complete	100.0%		
S.10080.5346 Design/EIR/CS/RI	8,107	8,107	Complete	100.0%		
S.10081.5347 Land Acquisition	3,097	3,097	Complete	100.0%		
S.10082.5348 Consultant-Needham	171	171	Complete	100.0%		
S.10083.5344 Consultant-Dedham	53	53	Complete	100.0%		
S.10094.5842 Consultant-Dover	5	5	Complete	100.0%		
S.10084.5349 Construction 1	15,069	15,069	Complete	100.0%		
S.10086.5351 Construction 2	5,087	5,087	Complete	100.0%		
S.10087.5434 Construction 3	6,927	6,927	Complete	100.0%		
S.10085.5350 Construction 4	4,821	4,821	Complete	100.0%		
S.10088.5431 Construction 5	5,387	5,387	Complete	100.0%		
S.10089.5432 Construction 6	2,070	2,070	Complete	100.0%		
S.10090.5433 Construction 7	12,454	12,454	Complete	100.0%		
S.10259.6065 EIC	369	369	Complete	100.0%		
S.10269.6078 Legal	225	225	Complete	100.0%		
S.10093.5953 Technical Assistance	193	193	Complete	100.0%		
<b>S.107 Framingham Extension Relief Sewer</b>	<b>47,855</b>	<b>47,855</b>	<b>Complete</b>	<b>100.0%</b>		
S.10099.5318 Fac Plan Update/EIR	1,397	1,397	Complete	100.0%		
S.10100.5321 Land Acquisition	1,838	1,838	Complete	100.0%		
S.10101.5319 Design/CS/RI	5,837	5,837	Complete	100.0%		
S.10102.5320 Install Force Main	7,256	7,256	Complete	100.0%		
S.10103.5322 Install Gravity Sewer	6,147	6,147	Complete	100.0%		
S.10104.5323 Pump Station Construction	7,803	7,803	Complete	100.0%		
S.10106.5825 Early Sewer Rehabilitation	4,803	4,803	Complete	100.0%		
S.10107.5342 Late Sewer Rehabilitation	12,609	12,609	Complete	100.0%		
S.10105.5954 Technical Assistance	162	162	Complete	100.0%		
S.10374.6754 Conservation Commission	4	4	Complete	100.0%		
<b>S.127 Cummingsville Replacement Sewer</b>	<b>9,379</b>	<b>8,202</b>	<b>87.5%</b>	<b>87.5%</b>		
S.10217.5826 Facilities Plan/EIR	602	602	Complete	100.0%		
S.10275.6092 Design/CS/RI	2,333	2,003	85.9%	85.9%		Sep-08
S.10285.6186 Cummingsville Branch Sew Const	4,897	4,897	Complete	100.0%		
S.10284.6185 Land Acquisition	102	82	80.4%	80.4%		Sep-07
S.10334.6571 Public Participation	5	3	60.0%	60.0%		Sep-07
S.10335.6572 Legal	15	15	Complete	100.0%		
S.10403.6916 Siphon Modifications	1,425	600	42.1%	42.1%		Sep-07
<b>S.130 Siphon Structure Rehabilitation</b>	<b>940</b>	<b>940</b>	<b>Complete</b>	<b>100.0%</b>		
S.10253.6017 Planning	938	938	Complete	100.0%		
S.10280.6165 Land Acquisition	2	2	Complete	100.0%		
<b>S.132 Corrosion &amp; Odor Control</b>	<b>11,503</b>	<b>3,003</b>	<b>26.1%</b>	<b>26.1%</b>		
S.10279.6137 Planning/Study	587	587	Complete	100.0%		
S.10327.6553 Design/CS/RI	1,788	1,788	Complete	100.0%		
S.10323.6549 Land Acquisition	3	3	Complete	100.0%		
S.10325.6551 Legal	2	2	Complete	100.0%		
S.10373.6743 Interim Corrosion Control	622	622	Complete	100.0%		
S.10453.7196 FES Tunnel Rehab Des	1,700	0	Future	0.0%	Jul-15	
S.10405.6918 FES Tunnel Rehab	6,800	0	Future	0.0%	Dec-15	

Subphase/Project	Total Contract Amount	Projected Pmts. Thr. FY07	Status Based on % of Budget Expended	% Complete	Planned Start	Planned End
<b>S.136 West Roxbury Tunnel</b>	<b>88,881</b>	<b>8,881</b>	<b>10.0%</b>	<b>10.0%</b>		
S.10299.6230 Inspection	344	344	Complete	100.0%		
S.10333.6570 Design/CS/RI	1,413	1,413	Complete	100.0%		
S.10332.6569 Construction	6,674	6,674	Complete	100.0%		
S.10330.6567 Legal	2	2	Complete	100.0%		
S.10331.6568 Land Acquisition	440	440	Complete	100.0%		
S.10366.6709 Technical Assistance	8	8	Complete	100.0%		
S.10400.6897 Tunnel Design	16,000	0	Future	0.0%	Jul-10	
S.10401.6898 Tunnel Construction	64,000	0	Future	0.0%	Jul-12	
<b>S.137 Wastewater Central Monitoring</b>	<b>20,277</b>	<b>10,317</b>	<b>50.9%</b>	<b>50.9%</b>		
S.10301.6232 Planning	563	563	Complete	100.0%		
S.10319.6532 Design and Integration Services	6,145	3,806	61.9%	61.9%		Nov-08
S.10320.6533 Construction 1 (CP1)	7,260	5,732	79.0%	79.0%		Apr-07
S.10321.6534 Construction 2 (CP2)	4,854	0	Future	0.0%	Jul-07	
S.10357.6657 Construction 3 (CP3)	1,099	0	Future	0.0%	Jul-08	
S.10398.6861 Equipment Prepurchase	356	215	60.4%	60.4%		
<b>S.139 South System Relief Project</b>	<b>4,945</b>	<b>3,444</b>	<b>69.6%</b>	<b>69.6%</b>		
S.10309.6419 CS/RI-Archdale	6	6	Complete	100.0%		
S.10310.6420 Construction-Archdale	211	211	Complete	100.0%		
S.10318.6519 Sec 70&71 HLS Eval.	215	215	Complete	100.0%		
S.10349.6611 Sec 70 & 71 HLS Construction	417	417	Complete	100.0%		
S.10345.6595 Design Outfall 023	1	1	Complete	100.0%		
S.10346.6596 Cleaning Outfall 023	1,098	1,098	Complete	100.0%		
S.10347.6605 Land Acquisition/Easements	5	5	Complete	100.0%		
S.10350.6616 Milton Financial Assistance	1,488	1,488	Complete	100.0%		
S.10362.6680 Legal/Permits	5	4	80.0%	80.0%		Jun-07
S.10386.6801 Outfall 023 Str Impovements	1,500	0	Future	0.0%	Jan-08	
<b>S.141 Wastewater Process Optimization</b>	<b>2,272</b>	<b>954</b>	<b>42.0%</b>	<b>42.0%</b>		
S.10367.6733 Planning	954	954	Complete	100.0%		
S.10413.6931 Somerville Sewer-Design	200	0	Future	0.0%	Oct-08	
S.10414.6932 Somerville Sewer-Construction	968	0	Future	0.0%	Mar-11	
S.10415.6933 Siphon- Planning	150	0	Future	0.0%	Nov-11	
<b>S.142 Wastewater Meter Sys-Equip Replace</b>	<b>26,578</b>	<b>5,103</b>	<b>19.2%</b>	<b>19.2%</b>		
S.10371.6739 Planning/Study	100	0	Future	0.0%	Jan-13	
S.10379.6793 Equipment Purchase/Installation	5,278	5,103	96.7%	96.7%		Jun-08
S.10410.6928 Design	200	0	Future	0.0%	Jul-13	
S.10411.6929 Construction	1,000	0	Future	0.0%	Jan-15	
S.10451.7191 Wastewater Metering Asset Protection	20,000	0	Future	0.0%	Jul-15	
<b>S.143 Regional I/I Management Planning</b>	<b>169</b>	<b>169</b>	<b>Complete</b>	<b>100.0%</b>		
S.10372.6740 Cmom/Planning	169	169	Complete	100.0%		

Subphase/Project	Total Contract Amount	Projected Pmts. Thr. FY07	Status Based on % of Budget Expended	% Complete	Planned Start	Planned End
<b>S.145 I&amp;P Facility Asset Protection</b>	<b>63,141</b>	<b>4,934</b>	<b>7.8%</b>	<b>7.8%</b>		
S.10383.6798 Rehab of Section 93A Lexington	1,568	1,568	Complete	100.0%		
S.10392.6829 Technical Assistance	40	24	60.0%	60.0%		Nov-08
S.10394.6842 Sections 80&83	682	186	27.3%	27.3%		Nov-07
S.10395.6843 Section 160	3,139	185	5.9%	5.9%		Aug-08
S.10396.6857 Survey	52	52	Complete	100.0%		
S.10397.6858 Permits	6	4	66.7%	66.7%		Nov-08
S.10440.7073 Land/Easements	150	150	Complete	100.0%		
S.10423.6987 93 A Force Main Replacement	474	474	Complete	100.0%		
S.10424.7004 Mill Brook Valley Sewer Sec 79&92	542	542	Complete	100.0%		
S.10447.7163 Interceptor AP-Interc Renewal Des #1	400	0	Future	0.0%	Jul-10	
S.10448.7164 Interceptor AP-Interc Renew #1 Const	1,600	0	Future	0.0%	Dec-10	
S.10380.6795 Prison Point HVAC Upgrades	694	0	Future	0.0%	Mar-09	
S.10381.6796 Remote Headworks Heating Sys Upgrade	1,248	1,248	Complete	100.0%		
S.10382.6797 Alewife Brook Pump & Screen Repl	2,914	0	Future	0.0%	Nov-10	
S.10387.6802 Hdwks Screen Replacement	5,000	0	Future	0.0%	Aug-08	
S.10399.6886 Hdwks Cond Assess/Facilities Plan	2,000	500	25.0%	25.0%		Nov-08
S.10419.6937 Alewife Brook Pump Screen Repl Des/CA	507	0	Future	0.0%	Jun-08	
S.10420.6938 Des-Prison Pt HVAC Upgrades	150	0	Future	0.0%	Jul-07	
S.10427.7033 Hingham PS Isolation Gate Const	350	0	Future	0.0%	Sep-08	
S.10431.7037 Caruso PS Replace Generator	250	0	Future	0.0%	Jul-13	
S.10432.7038 Chelsea Sluice Gate Engnr Study	50	0	Future	0.0%	Jun-07	
S.10433.7039 Prision Pt/Cottage Farm Pipe Des	150	0	Future	0.0%	Jan-08	
S.10434.7040 Prision Pt/Cottage Farm Pipe Constr	500	0	Future	0.0%	Mar-09	
S.10436.7042 Fram PS Sluice Gates Cond Assess	50	0	Future	0.0%	Jun-07	
S.10438.7044 Caruso PS Shaft Replac Const	425	0	Future	0.0%	Jul-09	
S.10444.7144 Nut Island Headworks Fire Alarm/Wire	200	0	Future	0.0%	Jul-09	
S.10455.7206 HW Facility Plan Upgrades Des	7,000	0	Future	0.0%	Jul-09	
S.10445.7161 HW Fac. Plan Upgrades 3 Older HWKS	28,000	0	Future	0.0%	Dec-09	
S.10446.7162 PS/CSO Condition Assessment	3,000	0	Future	0.0%	Jul-11	
S.10449.7165 Alewife Brook PS-Additional Costs	400	0	Future	0.0%	Jul-08	
S.10450.7166 Alewife Brook PS-Addtl Costs Const.	1,600	0	Future	0.0%	Dec-08	
<b>S.146 D.I. Cross Harbor Tunnel</b>	<b>5,000</b>	<b>0</b>	<b>Future</b>	<b>0.0%</b>		
S.10454.7199 Tunnel Shaft Repairs Plan/Des/Const	5,000	0	Future	0.0%	Jul-14	

Subphase/Project	Total Contract Amount	Projected Pmts. Thr. FY07	Status Based on % of Budget Expended	% Complete	Planned Start	Planned End
<b>S.200 DI Plant Optimization</b>	<b>70,427</b>	<b>32,008</b>	<b>45.4%</b>	<b>45.4%</b>		
S.19156.6235 Construction-Plumbing	110	110	Complete	100.0%		
S.19170.6369 Supplementary Mod Pkg #1	488	488	Complete	100.0%		
S.19154.6233 As-Needed Des. Phase 1	1,122	1,122	Complete	100.0%		
S.18212.6364 Ancil Mods-Des 1	2,105	2,105	Complete	100.0%		
S.19189.6590 Ancil Mods Des 2-1 (REI)	584	584	Complete	100.0%		
S.19190.6591 Ancil Mods - Des 3-1	941	941	Complete	100.0%		
S.19191.6592 Ancil Mods - Prelim Des 4	360	0	Future	0.0%	Sep-07	
S.19303.7088 Ancils Mods Final Des 4	734	0	Future	0.0%	Jul-09	
S.19220.6721 Long Term As Needed Des No.1	2,000	0	Future	0.0%	Mar-10	
S.19183.6499 Ancil Mods-Con 1	9,887	9,887	Complete	100.0%		
S.19186.6536 Ancil Mods Constr 2-1	2,836	2,836	Complete	100.0%		
S.19232.6744 Ancil Mods Constr 2-2	5,381	4,322	80.3%	80.3%		Oct-07
S.19187.6537 Ancil Mods-Constr 3-1	3,387	3,387	Complete	100.0%		
S.19188.6538 Ancil Mods-Con 4	3,831	0	Future	0.0%	Nov-10	
S.19221.6722 Long -Term As Needed Des No.2	2,000	0	Future	0.0%	Mar-10	
S.19206.6673 Digester Storage Tank - Repair	275	275	Complete	100.0%		
S.19215.6702 As-needed Design Phase 2-1	760	760	Complete	100.0%		
S.19234.6753 As-needed design Phase 2-2	695	695	Complete	100.0%		
S.19214.6701 As-needed Des. Phase 3-1	796	796	Complete	100.0%		
S.19257.6874 As-needed Design Phase 3-2	625	625	Complete	100.0%		
S.19211.6698 As Needed Des Phase 4-1	1,125	1,125	Complete	100.0%		
S.19212.6699 As Needed Des Phase 4-2	1,000	1,000	Complete	100.0%		
S.19305.7090 As-needed Des Phase 5-1	1,000	75	7.5%	7.5%		Mar-09
S.19306.7091 As-needed Des Phase 5-2	1,000	75	7.5%	7.5%		Mar-09
S.19240.6768 Ancil Mods Des2-2 (REI/ESDC)	651	516	79.3%	79.3%		Dec-07
S.19286.6201 BHP Site Completion	285	285	Complete	100.0%		
S.19311.7121 DI As needed Tech Design	26,450	0	Future	0.0%	Mar-13	

Subphase/Project	Total Contract Amount	Projected Pmts. Thr. FY07	Status Based on % of Budget Expended	% Complete	Planned Start	Planned End
<b>S.206 DI Treatment Plant Asset Protection</b>	<b>348,285</b>	<b>12,058</b>	<b>3.5%</b>	<b>3.5%</b>		
S.19182.6478 Equip Replacement Projection	110	0	Future	0.0%	Oct-00	
S.19193.6594 Equipment Condition Monitoring	1,777	1,777	Complete	100.0%		
S.19231.6742 Drive Chain Replacement	264	264	Complete	100.0%		
S.19238.6765 CTG Modifications	482	482	Complete	100.0%		
S.19176.6422 Pump Packing Replacement	750	658	87.7%	87.7%		Jun-08
S.19177.6423 Demineralizer Construction	51	51	Complete	100.0%		
S.19264.6881 Grit & Odor Air Handling Repl	1,014	0	Future	0.0%	Sep-08	
S.19265.6882 CEMS Equip. Replacement	106	106	Complete	100.0%		
S.19268.6899 Prim Clarifier Rehab Construction	12,020	0	Future	0.0%	Nov-08	
S.19273.6904 Fire Alarm Syst Repl -Des	304	0	Future	0.0%	Mar-08	
S.19287.7005 Digester Chiller Replacement	574	574	Complete	100.0%		
S.19288.7006 Dystor Tank Membrane Replacement	640	640	Complete	100.0%		
S.19289.7051 Fire Alarm Syst Repl Const	1,457	0	Future	0.0%	Jul-09	
S.19290.7052 Grit Blower Replac Construction	346	0	Future	0.0%	Nov-08	
S.19291.7053 Thick Prim Sldg Pump Repl Des	561	0	Future	0.0%	Apr-08	
S.19292.7054 TPS Pump Replac Construction	3,000	0	Future	0.0%	May-08	
S.19294.7056 LOCAT Scrubber Replac Const	3,030	0	Future	0.0%	Aug-09	
S.19295.7057 Centrifuge Backdrive Replac	2,235	0	Future	0.0%	Sep-07	
S.19309.7111 HVAC Control System Repl-Des	180	0	Future	0.0%	Aug-08	
S.19310.7110 HVAC Control System Repl-Const	728	0	Future	0.0%	Feb-09	
S.19312.7122 DI Digester Sludge Pump Repl Des	800	0	Future	0.0%	Jul-09	
S.19313.7123 DI Digester Sludge Pump Repl Const	3,200	0	Future	0.0%	Jul-09	
S.19315.7125 DI Equipment Replacement Projection	70,000	0	Future	0.0%	Jul-08	
S.19325.7135 DI Dystor Membrane Replacements	3,000	0	Future	0.0%	Jul-14	
S.19327.7137 DI Centrifuge Replacements Des	4,160	0	Future	0.0%	Jul-13	
S.19328.7138 DI Centrifuge Replacements Constr	16,640	0	Future	0.0%	Dec-13	
S.19329.7139 DI Cryogenics Plant-Equip Repl Des	1,600	0	Future	0.0%	Jul-13	
S.19330.7140 DI Cryogenics Plant-Equip Repl Constr	6,400	0	Future	0.0%	Dec-13	
S.19335.7169 South Systm PS Lube System Repl	1,700	0	Future	0.0%	Jul-07	
S.19336.7170 DI Grit and Odor Control Air Handlers	3,000	0	Future	0.0%	Jul-07	
S.19226.6727 Study/Concept Des-Concrete Rpr	300	0	Future	0.0%	May-07	
S.19204.6668 Expansion Joint Repair-Design	149	149	Complete	100.0%		
S.19205.6669 Expansion Joint Repair- Constr 1	305	305	Complete	100.0%		
S.19218.6705 Expansion Joint Repair- Constr 3	159	0	Future	0.0%	May-10	
S.19217.6704 Expansion Joint Repair- Constr 2	144	0	Future	0.0%	May-07	
S.19244.6812 Secondary Clarifier Access	275	275	Complete	100.0%		
S.19334.7168 Barge Berth and Fac. Replacement	2,000	0	Future	0.0%	Jul-09	
S.19243.6811 Outfall Modification-Inspection	174	174	Complete	100.0%		
S.19307.7094 DI Electrical Modifications	2,000	0	Future	0.0%	Jun-07	
S.19239.6767 Elec Equip Upgrade Constr 2	1,913	1,913	Complete	100.0%		
S.19236.6763 Busduct Replacement (2+22)	196	196	Complete	100.0%		
S.19245.6813 Transformer Replacement	38	38	Complete	100.0%		
S.19252.6851 Chemical pipe Replacement-Des	399	0	Future	0.0%	Sep-09	
S.19253.6852 Chemical pipe Replac - Constr	1,330	0	Future	0.0%	Jul-10	
S.19254.6853 Sodium Hypo Pipe Repl-Des	240	0	Future	0.0%	Jul-10	
S.19255.6854 Sodium Hypo Pipe Repl- Constr	2,845	0	Future	0.0%	Jul-10	
S.19256.6855 Elect Equip Upgrade Const 3	8,558	0	Future	0.0%	May-07	
S.19258.6875 WTF VFD Replace Constr	1,415	0	Future	0.0%	Dec-08	
S.19259.6876 Heat Loop Pipe Repl Constr 1	615	615	Complete	100.0%		
S.19260.6877 Misc. VFD Replacements	2,625	1,388	52.9%	52.9%		May-08
S.19266.6883 Heat Loop Pipe Replac Constr 2	1,470	315	21.4%	21.4%		Mar-08
S.19267.6884 PICS Replacement Const	1,617	0	Future	0.0%	Jul-09	
S.19270.6901 Elect Equip Upgrade Const 4	2,443	0	Future	0.0%	Jul-09	
S.19314.7124 DI Elec Equip Upgrade Ph.5	20,000	0	Future	0.0%	Jul-10	
S.19271.6902 NMPS VFD Repl Des/ESDC	518	0	Future	0.0%	May-07	
S.19272.6903 NMPS VFD Replace Constr	14,428	0	Future	0.0%	May-08	



Subphase/Project	Total Contract Amount	Projected Pmts. Thr. FY07	Status Based on % of Budget Expended	% Complete	Planned Start	Planned End
S.19280.6969 Fuel Transfer Pipe Repl Des	399	0	Future	0.0%	Nov-11	
S.19281.6970 Fuel Transfer Pipe Repl Const	1,330	0	Future	0.0%		
S.19282.6971 NMPS Motor Ctrl Ctr Des	633	0	Future	0.0%	Jun-07	
S.19283.6972 NMPS Motor Ctrl Ctr Constr	5,818	0	Future	0.0%	Jul-08	
S.19285.6974 DI Wind Power Constr	7,000	0	Future	0.0%		
S.19296.7058 DITP Switchgear Replac Design	465	0	Future	0.0%	Jul-09	
S.19297.7059 DITP Switchgear Repl Constr	2,909	0	Future	0.0%	Oct-09	
S.19298.7060 Power Consult Recs Design	2,000	859	43.0%	43.0%		
S.19299.7061 Power System Improv Constr	6,105	0	Future	0.0%	Oct-07	
S.19300.7062 NMPS VFD Repl-REI	748	0	Future	0.0%	May-08	
S.19301.7063 Heat Loop pipe Repl- Const 3	2,880	0	Future	0.0%	Sep-07	
S.19316.7126 Future SSPS VFD Replacements Des	4,800	0	Future	0.0%	Jul-15	
S.19317.7127 Future SSPS VFD Replacements Constr	19,200	0	Future	0.0%	Jul-16	
S.19318.7128 Future NMPS VFD Replacements Des	4,420	0	Future	0.0%	Jul-17	
S.19319.7129 Future NMPS VFD Replacements Constr	17,680	0	Future	0.0%	Jul-18	
S.19320.7130 Future Misc. VFD Replacements Des	1,333	0	Future	0.0%	Jul-17	
S.19321.7131 Future Misc. VFD Replacements Constr	5,334	0	Future	0.0%	Jul-18	
S.19322.7132 DI Switchgear Replacement Design	3,250	0	Future	0.0%	Jul-17	
S.19323.7133 DI Switchgear Replacement Constr	13,000	0	Future	0.0%	Jul-18	
S.19324.7134 DI PICS Replacement Construction	5,400	0	Future	0.0%	Jul-14	
S.19326.7136 DI CTG Rebuilds	6,000	0	Future	0.0%	Jul-14	
S.19333.7167 Leak Protection System Upgrade	900	0	Future	0.0%	Jul-10	
S.19338.7172 DI PICS Dist. Proc. Units Replac	8,000	0	Future	0.0%	Jul-14	
S.19162.6241 DISC Application	250	155	62.0%	62.0%		Dec-08
S.19241.6791 Document Format Conversion	353	10	2.8%	2.8%		Mar-12
S.19304.7089 Sodium Hypo Tk Lnr Removal	196	196	Complete	100.0%		
S.19237.6764 Hypochlorite tanks 1&3 Reline	2,200	800	36.4%	36.4%		Aug-07
S.19249.6848 Metals Lab Fume Hood Repl	200	0	Future	0.0%	Aug-07	
S.19250.6849 Hypochlorite Tanks 2&4 Reline	2,226	0	Future	0.0%	Mar-08	
S.19251.6850 Metals Lab Modification Constr	947	118	12.5%	12.5%		Jun-08
S.19261.6878 Lab Sample Area Mod-Des	111	0	Future	0.0%	Jul-08	
S.19262.6879 Lab Sample Area Mod-Const	445	0	Future	0.0%	Aug-09	
S.19276.6965 Prim Clarif/Thickener Rehab Des	1,200	0	Future	0.0%	Sep-07	
S.19331.7141 Laboratory As needed Tech Des	4,000	0	Future	0.0%	Jul-08	
S.19332.7142 Future Sodium Hypo Tank Rehab	10,000	0	Future	0.0%	Jul-16	
S.19337.7171 Central Lab Fume Hood Replacement	270	0	Future	0.0%	Jul-08	

Subphase/Project	Total Contract Amount	Projected Pmts. Thr. FY07	Status Based on % of Budget Expended	% Complete	Planned Start	Planned End
<b>S.210 Clinton Wastewater Treatment Plant</b>	<b>633</b>	<b>115</b>	<b>18.2%</b>	<b>18.2%</b>		
S.19302.7075 Clinton Soda Ash Replacement	375	0	Future	0.0%	Dec-07	
S.19308.7095 Clinton Perm Standby Generator	259	115	44.4%	44.4%		Sep-07
<b>S.261 Residuals</b>	<b>63,811</b>	<b>63,811</b>	<b>Complete</b>	<b>100.0%</b>		
S.25941.5667 Design/RI/CS-Pelletizing 1	9,098	9,098	Complete	100.0%		
S.25948.5669 Fast-Track Equip. Prepurchase	301	301	Complete	100.0%		
S.26055.6009 Fast-Track Equip. Installation	1,450	1,450	Complete	100.0%		
S.26056.6010 Phase 2 Outside Construction	12,981	12,981	Complete	100.0%		
S.26057.6011 Phase 3 Equip. Prepurchase	4,746	4,746	Complete	100.0%		
S.26058.6012 Phase 3 Inside Construction	29,778	29,778	Complete	100.0%		
S.26065.6612 Fire Related Costs	1,694	1,694	Complete	100.0%		
S.25961.5643 Res. Research	419	419	Complete	100.0%		
S.25968.5831 Royalty Payment	575	575	Complete	100.0%		
S.26066.6615 Legal Services for Sludge Processing	2,768	2,768	Complete	100.0%		
<b>S.271 Residuals Asset Protection</b>	<b>148,320</b>	<b>0</b>	<b>Future</b>	<b>0.0%</b>		
S.26069.7143 Residual Plant System Reliability	620	0	Future	0.0%	Jul-07	
S.26070.7145 Residuals Pellet Plant Upgrade Design	8,000	0	Future	0.0%	Jul-10	
S.26072.7147 Condition Assessment/Fac Plan	1,000	0	Future	0.0%	Jul-08	
S.26073.7148 Six Rotary Dryer Replacements Des	12,000	0	Future	0.0%	Jul-13	
S.26074.7149 Six Rotary Dryer Replacements Constr	48,000	0	Future	0.0%	Dec-13	
S.26075.7150 Six Air Scrubber Replacements Des	1,800	0	Future	0.0%	Jul-15	
S.26076.7151 Six Air Scrubber Replacements Constr	7,200	0	Future	0.0%	Dec-15	
S.26077.7152 Plant MCC Replacements Des	900	0	Future	0.0%	Jul-16	
S.26078.7153 Plant MCC Replacements Const	3,600	0	Future	0.0%	Dec-16	
S.26079.7173 FRSA Pier Rehab Des	140	0	Future	0.0%	Dec-07	
S.26080.7174 FRSA Pier Rehab Const.	560	0	Future	0.0%	Mar-08	
S.26081.7175 Rehab Rail System Des.	600	0	Future	0.0%	Jul-16	
S.26082.7176 Rehab Rail System Const.	2,400	0	Future	0.0%	Dec-16	
S.26083.7177 Replace 9 Pellet Storage Silos Des	1,200	0	Future	0.0%	Jul-15	
S.26084.7178 Replace 9 Pellet Storage Silos Const.	4,800	0	Future	0.0%	Dec-15	
S.26085.7179 Sludge Conveyor Replacement Des.	600	0	Future	0.0%	Jul-14	
S.26086.7180 Sludge Conveyor Replacement Const.	2,400	0	Future	0.0%	Dec-14	
S.26087.7181 Sludge Storage Tank Rehab Des	600	0	Future	0.0%	Jul-15	
S.26088.7182 Sludge Storage Tank Rehab	2,400	0	Future	0.0%	Dec-15	
S.26089.7183 Upgrade Pumping System Des.	1,200	0	Future	0.0%	Jul-14	
S.26090.7184 Upgrade Pumping System Const.	4,800	0	Future	0.0%	Dec-14	
S.26091.7185 Replace 12 Centrifuges Des	7,200	0	Future	0.0%	Jul-14	
S.26092.7186 Replace 12 Centrifuges Const.	28,800	0	Future	0.0%	Dec-14	
S.26093.7187 Utility Upgrades Des.	1,200	0	Future	0.0%	Jul-16	
S.26094.7188 Utility Upgrades Const.	4,800	0	Future	0.0%	Dec-16	
S.26095.7189 Odor Control System Upgrade Des	300	0	Future	0.0%	Jul-17	
S.26096.7190 Odor Control System Upgrade Const.	1,200	0	Future	0.0%	Dec-17	
<b>S.339 North Dorchester Bay</b>	<b>213,868</b>	<b>50,473</b>	<b>23.6%</b>	<b>23.6%</b>		
S.32660.6220 Design ESDC/Tunnel	24,619	21,848	88.7%	88.7%		Apr-11
S.32661.6244 Tunnel Construction (Ch30)	150,750	23,177	15.4%	15.4%		Dec-09
S.32662.6245 Dewater/Odor Control Constr	19,504	0	Future	0.0%	Jan-09	
S.32726.6993 Tunnel & Facilities CM Services	11,544	1,288	11.2%	11.2%		Apr-12
S.32732.7012 Pleasure Bay Construction	3,216	3,216	Complete	100.0%		
S.32733.7013 Design ESDC/Facilities	3,385	494	14.6%	14.6%		May-12
S.32744.7103 Tunnel Rescue/Emergency Response	850	450	52.9%	52.9%		Oct-09
<b>S.354 Hydraulic Relief Projects</b>	<b>2,295</b>	<b>2,295</b>	<b>Complete</b>	<b>100.0%</b>		
S.32692.6250 Design/CS/RI	558	558	Complete	100.0%		
S.32669.6252 Construction	1,737	1,737	Complete	100.0%		

Subphase/Project	Total Contract Amount	Projected Pmts. Thr. FY07	Status Based on % of Budget Expended	% Complete	Planned Start	Planned End
<b>S.347 East Boston Branch Sewer Relief</b>	<b>73,476</b>	<b>9,577</b>	<b>13.0%</b>	<b>13.0%</b>		
S.32673.6256 Design	3,490	3,490	Complete	100.0%		
S.32742.7087 Design 2 CS	2,996	839	28.0%	28.0%		Jun-10
S.32743.7097 Resident Inspection Services	3,304	0	Future	0.0%	Jun-08	
S.32674.6257 East Boston Branch Relief Sewer	49,159	0	Future	0.0%	Jun-08	
S.32716.6790 Boston Paving	348	0	Future	0.0%	Oct-07	
S.32719.6840 East Boston Branch Sewer Rehab	5,248	5,248	Complete	100.0%		
S.32720.6841 Sections 38 & 207 Replacement	8,932	0	Future	0.0%	Dec-08	
<b>S.348 BOS019 Storage Conduit</b>	<b>14,283</b>	<b>14,172</b>	<b>Complete</b>	<b>99.2%</b>		
S.32675.6258 Design	2,045	2,045	Complete	100.0%		
S.32677.6260 BOS019 Storage Conduit Constr	10,897	10,897	Complete	100.0%		
S.32728.7008 Construction Management Services	1,342	1,231	91.7%	91.7%		Mar-07
<b>S.349 Chelsea Trunk Sewer</b>	<b>29,765</b>	<b>29,765</b>	<b>Complete</b>	<b>100.0%</b>		
S.32659.6198 Design/CS/RI	3,637	3,637	Complete	100.0%		
S.32679.6262 Chelsea Trunk Relief	3,577	3,577	Complete	100.0%		
S.32680.6263 Chelsea Branch Sewer	19,141	19,141	Complete	100.0%		
S.32689.6370 Rehab/Chelsea Brnch/Revere Ext	3,125	3,125	Complete	100.0%		
S.32690.6371 Modify Chelsea Screen House	284	284	Complete	100.0%		
<b>S.350 Union Park Detention Treatment Fac</b>	<b>49,546</b>	<b>48,309</b>	<b>97.5%</b>	<b>97.5%</b>		
S.32681.6264 Design	8,624	8,519	Complete	98.8%		
S.32682.6265 Construction	46,074	45,110	97.9%	97.9%		Apr-07
S.32718.6826 Construction - Park	500	333	66.6%	66.6%		Dec-06
S.32721.6909 BWSC Construction ...	-5,653	-5,653	Complete	100.0%		
<b>S.353 Upgrade Existing CSO Facilities</b>	<b>22,385</b>	<b>22,385</b>	<b>Complete</b>	<b>100.0%</b>		
S.32647.6123 Design	6,499	6,499	Complete	100.0%		
S.32685.6268 Cottage Farm CSO Facility	4,377	4,377	Complete	100.0%		
S.32686.6269 Prision Point CSO Facility	3,339	3,339	Complete	100.0%		
S.32693.6496 Comm/Fox Point, Som. Marginal	8,029	8,029	Complete	100.0%		
S.32687.6270 Non-Treated Floatable (Beacon)	124	124	Complete	100.0%		
S.32717.6803 Cottage Farm Programing	17	17	Complete	100.0%		
<b>S.355 MWR003 Gate &amp; Siphon</b>	<b>2,027</b>	<b>0</b>	<b>Future</b>	<b>0.0%</b>		
S.32722.6952 Design	338	0	Future	0.0%	Oct-09	
S.32723.6953 Construction	1,689	0	Future	0.0%	May-11	
<b>S.357 Charles River CSO Controls</b>	<b>6,460</b>	<b>700</b>	<b>10.8%</b>	<b>10.8%</b>		
S.32729.7009 Brookline Connection/Cottage Farm E/D	1,260	700	55.6%	55.6%		Jun-10
S.32740.7080 Brookline Connect/Cott Farm Inf Contr	3,000	0	Future	0.0%	Jun-08	
S.32730.7010 Interceptor Optimization Eng/Des	800	0	Future	0.0%	Jan-08	
S.32741.7081 REI Service Brookline Conn CF Int Con	200	0	Future	0.0%	Jun-08	
S.32731.7011 Existing Gate Controls System	1,200	0	Future	0.0%	Jan-10	
<b>S.340 S. Dorch Bay Sew Separ (Fox Pt.)</b>	<b>53,800</b>	<b>52,062</b>	<b>96.8%</b>	<b>96.8%</b>		
S.32651.6155 Design	11,172	11,128	Complete	99.6%		
S.32664.6247 Construction	42,628	40,934	96.0%	96.0%		Nov-06
<b>S.341 S. Dorch Bay Sew Separ (Comm. Pt.)</b>	<b>64,429</b>	<b>53,617</b>	<b>83.2%</b>	<b>83.2%</b>		
S.32650.6154 Design	14,191	13,417	94.5%	94.5%		Aug-09
S.32665.6248 Construction	50,238	40,200	80.0%	80.0%		Nov-07
<b>S.344 Stony Brook Sewer Separation</b>	<b>45,056</b>	<b>43,177</b>	<b>95.8%</b>	<b>95.8%</b>		
S.32667.6395 Design/CS/RI	9,775	9,629	Complete	98.5%		
S.32668.6251 Construction	35,281	33,548	95.1%	95.1%		Sep-06
<b>S.342 Neponset River Sewer Separation</b>	<b>2,681</b>	<b>2,681</b>	<b>Complete</b>	<b>100.0%</b>		
S.32652.6156 Design/CS/RI	480	480	Complete	100.0%		
S.32653.6160 Construction	2,201	2,201	Complete	100.0%		
<b>S.343 Constitution Beach Sewer Separation</b>	<b>3,769</b>	<b>3,769</b>	<b>Complete</b>	<b>100.0%</b>		
S.32649.6153 Design/CS/RI	673	673	Complete	100.0%		
S.32666.6249 Construction	3,096	3,096	Complete	100.0%		
<b>S.346 Cambridge CAM002-004 Sew.Separation</b>	<b>52,434</b>	<b>19,319</b>	<b>36.8%</b>	<b>36.8%</b>		
S.32654.6161 Design/CS/RI	13,323	9,171	68.8%	68.8%		Jan-14
S.32672.6255 Construction	39,112	10,148	25.9%	25.9%		Jul-13

Subphase/Project	Total Contract Amount	Projected Pmts. Thr. FY07	Status Based on % of Budget Expended	% Complete	Planned Start	Planned End
<b>S.351 BWSC Floatables Controls</b>	<b>933</b>	<b>933</b>	<b>Complete</b>	<b>100.0%</b>		
S.32657.6168 Design	555	555	Complete	100.0%		
S.32683.6266 Construction	378	378	Complete	100.0%		
<b>S.352 Cambridge Floatables Controls</b>	<b>2,855</b>	<b>1,644</b>	<b>57.6%</b>	<b>57.6%</b>		
S.32655.6162 Design	404	396	98.0%	98.0%		
S.32684.6267 Construction	2,451	1,248	50.9%	50.9%		Jun-09
<b>S.356 Fort Point Channel Sewer Separation</b>	<b>7,675</b>	<b>7,636</b>	<b>Complete</b>	<b>99.5%</b>		
S.32724.6991 Design	1,096	1,056	96.4%	96.4%		Mar-08
S.32725.6992 Construction	6,580	6,580	Complete	100.0%		
<b>S.358 Morrissey Boulevard Drain</b>	<b>33,098</b>	<b>1,208</b>	<b>3.6%</b>	<b>3.6%</b>		
S.32735.7015 Design	4,880	965	19.8%	19.8%		Dec-09
S.32713.6696 Construction	28,217	243	0.9%	0.9%		Jun-09
<b>S.359 Reserved Channel Sewer Separation</b>	<b>59,158</b>	<b>1,661</b>	<b>2.8%</b>	<b>2.8%</b>		
S.32734.7014 Design	11,700	1,661	14.2%	14.2%		Jun-16
S.32727.6994 Construction	47,458	0	Future	0.0%	May-09	
<b>S.360 Brookline Sewer Separation</b>	<b>9,000</b>	<b>135</b>	<b>1.5%</b>	<b>1.5%</b>		
S.32736.7076 Design CS/RI	1,800	135	7.5%	7.5%		Jan-14
S.32737.7077 Construction	7,200	0	Future	0.0%	Nov-08	
<b>S.361 Bulfinch Triangle Sewer Separation</b>	<b>4,369</b>	<b>211</b>	<b>4.8%</b>	<b>4.8%</b>		
S.32738.7078 Design CS/RI	1,169	211	18.0%	18.0%		Jan-14
S.32739.7079 Construction	3,200	0	Future	0.0%	Nov-08	
<b>S.324 CSO Support</b>	<b>50,191</b>	<b>42,177</b>	<b>84.0%</b>	<b>84.0%</b>		
S.32400.5790 Technical Assistance	228	228	Complete	100.0%		
S.32407.5970 Tech. Assistance-Geotech	61	61	Complete	100.0%		
S.32401.5791 Planning/EIR	10,769	10,769	Complete	100.0%		
S.32403.5716 Master Planning	22,007	22,007	Complete	100.0%		
S.32645.6036 Watershed Planning	877	877	Complete	100.0%		
S.32409.5795 Modeling	300	300	Complete	100.0%		
S.32411.5767 SOP Program	1,957	1,957	Complete	100.0%		
S.32691.6372 System Assessment	476	27	5.7%	5.7%		
S.32648.6150 Technical Review	794	529	66.6%	66.6%		Jun-20
S.32658.6169 Land/Easement	12,723	5,422	42.6%	42.6%		Jun-12
<b>S.128 I/I Local Financial Assistance</b>	<b>86,594</b>	<b>74,447</b>	<b>86.0%</b>	<b>86.0%</b>		
S.10273.6084 Grants - Phase II	15,938	15,938	Complete	100.0%		
S.10274.6085 Loans - Phase II	47,664	47,664	Complete	100.0%		
S.10282.6170 Repayment - Phase II	-47,664	-45,405	95.3%	95.3%		May-11
S.10368.6736 Grants - Phase IV	34,650	29,328	84.6%	84.6%		
S.10369.6737 Loans - Phase IV	42,350	35,845	84.6%	84.6%		May-13
S.10370.6738 Repayment - Phase IV	-42,350	-22,262	52.6%	52.6%		May-18
S.10348.6609 Public Participation	6	6	Complete	100.0%		
S.10407.6925 Grants-Phase V	18,000	5,470	30.4%	30.4%		Jun-13
S.10408.6926 Loans-Phase V	22,000	6,685	30.4%	30.4%		Jun-13
S.10409.6927 Repayments-Phase V	-22,000	-1,322	6.0%	6.0%		Jun-18
S.10441.7107 Grants-Phase VI	18,000	1,125	6.3%	6.3%		Jun-15
S.10442.7108 Loans - Phase VI	22,000	1,375	6.3%	6.3%		Jun-15
S.10443.7109 Repayments-Phase VI	-22,000	0	Future	0.0%	Nov-07	
<b>S.138 Sewerage System Mapping Upgrade</b>	<b>281</b>	<b>281</b>	<b>Complete</b>	<b>100.0%</b>		
S.10307.6417 Contract 1-Base Maps	67	67	Complete	100.0%		
S.10308.6418 Contract 2-Existing Data	174	174	Complete	100.0%		
S.10360.6666 Quincy Data Sharing	20	20	Complete	100.0%		
S.10361.6667 Weymouth Data Sharing	20	20	Complete	100.0%		

Subphase/Project	Total Contract Amount	Projected Pmts. Thr. FY07	Status Based on % of Budget Expended	% Complete	Planned Start	Planned End
<b>S.542 John J. Carroll Water Treatment Plant</b>	<b>437,350</b>	<b>375,901</b>	<b>85.9%</b>	<b>85.9%</b>		
S.53293.5023 Study 1	444	444	Complete	100.0%		
S.53294.5024 Study 2	2,368	2,368	Complete	100.0%		
S.53375.6182 AWWARF Study	650	650	Complete	100.0%		
S.53376.6206 Emerg Dis Res Water Mgmt Study	1,454	1,454	Complete	100.0%		
S.53367.6118 Crypto. Inactivation Study	150	150	Complete	100.0%		
S.53390.6365 Cosgrove Disinfection Ph II	2,169	2,169	Complete	100.0%		
S.53391.6397 Cosgrove Disinfection Ph I	150	150	Complete	100.0%		
S.53393.6406 Immediate Disinf. MECO	10	10	Complete	100.0%		
S.53392.6401 Distribution Water Consultant	3	3	Complete	100.0%		
S.53304.5157 Permit Fees	59	51	86.4%	86.4%		Dec-05
S.53300.5997 Technical Assistance	72	72	Complete	100.0%		
S.53296.5042 EIR/Conceptual Design	5,808	5,808	Complete	100.0%		
S.53301.5017 Design/CS/RI - Wachusett WTP	48,880	48,820	Complete	99.9%		
S.53377.6207 WHCP1 Wachusett Cosgrove Intakes	15,391	15,391	Complete	100.0%		
S.53412.5522 WHCP2 Interim Rehab. Wach. Aque.	23,400	23,400	Complete	100.0%		
S.53413.6488 WHCP3 Sitework & Storage Tanks	67,368	67,368	Complete	100.0%		
S.53414.6489 WHCP4 Treatment Facility	145,847	145,847	Complete	100.0%		
S.53416.6491 WHCP6 Late Sitework	4,088	4,088	Complete	100.0%		
S.53426.6650 WHCP7 Existing Facilities Mods	5,000	0	Future	0.0%	Jul-08	
S.53371.6134 Design Management Support	1,730	1,730	Complete	100.0%		
S.53378.6208 Construction Management/RI	31,827	31,827	Complete	100.0%		
S.53406.6479 Cosgrove Disinf.-Fac. Underwater Imps.	217	217	Complete	100.0%		
S.53410.6485 Community Chlorine Analyzers	49	49	Complete	100.0%		
S.53418.6494 OCIP	5,107	5,107	Complete	100.0%		
S.53419.6495 Professional Services	2,857	2,780	97.3%	97.3%		
S.53420.6497 Marlboro MOA	5,859	5,859	Complete	100.0%		
S.53421.6520 WHWTP- MECO	128	128	Complete	100.0%		
S.53425.6613 Site Security Services	1,264	1,264	Complete	100.0%		
S.53427.6670 CSX Crossing	65	65	Complete	100.0%		
S.53428.6671 Wachusetts Algae Design CS/RI	450	0	Future	0.0%	Sep-11	
S.53432.6691 Public Health Research	2,273	1,934	85.1%	85.1%		Jun-07
S.53435.6756 Security Equipment	571	571	Complete	100.0%		
S.53437.6773 WHCP8 Cosgrove Screens Con	3,238	3,238	Complete	100.0%		
S.53443.6815 AWWARF-Evaluation Ozone & UV	302	302	Complete	100.0%		
S.53445.6827 Fitout/Construction	1,350	605	44.8%	44.8%		Dec-09
S.53448.6889 Wachusetts Algae ...	1,800	0	Future	0.0%	Feb-13	
S.53450.6923 WH Ultra Violet Dis Des ESDC/RI	9,500	0	Future	0.0%	Jan-08	
S.53451.6924 WH Ultra Violet Disinfect Cons	34,000	0	Future	0.0%	Apr-11	
S.53452.6939 As needed Tech Assistance #1	750	356	47.5%	47.5%		Dec-07
S.53456.7084 Ancillary Mods Constr 1	750	600	80.0%	80.0%		Jun-07
S.53453.6951 Des WH CP7 Existing Fac Mods	1,601	628	39.2%	39.2%		Jun-10
S.53455.6989 As needed Tech Assistance ...	750	397	52.9%	52.9%		
S.53457.7085 Ancillary Mods Const 2	6,080	0	Future	0.0%	Oct-08	
S.53458.7192 Carroll WTP Ancil Mods Des	1,520	0	Future	0.0%	Oct-07	
<b>S.543 Quabbin Water Treatment Plant</b>	<b>16,085</b>	<b>10,144</b>	<b>63.1%</b>	<b>63.1%</b>		
S.53363.6043 Quabbin WTP Des/CA/RI	3,823	3,823	Complete	100.0%		
S.53382.6212 Construction	5,071	5,071	Complete	100.0%		
S.53381.6211 Utilities	13	13	Complete	100.0%		
S.53380.6210 Permit Fees	10	7	70.0%	70.0%		Jan-12
S.53433.6706 Ware Fire Dept. MOA	25	25	Complete	100.0%		
S.53434.6711 W Q Analysis Equipment	49	49	Complete	100.0%		
S.53439.6775 Quabbin UVWTP: Des/CA/RI	1,090	0	Future	0.0%	Oct-07	
S.53440.6776 Quabbin UVWTP: Construction	4,849	0	Future	0.0%	Feb-10	
S.53442.6804 Quabbin UVWTP:Study/Pilot	1,156	1,156	Complete	100.0%		

Subphase/Project	Total Contract Amount	Projected Pmts. Thr. FY07	Status Based on % of Budget Expended	% Complete	Planned Start	Planned End
<b>S.544 Norumbega Covered Storage</b>	<b>106,736</b>	<b>106,307</b>	<b>Complete</b>	<b>99.6%</b>		
S.53297.5041 Conceptual Design/EIR	2,873	2,873	Complete	100.0%		
S.53364.6057 Owners Representative	4,636	4,636	Complete	100.0%		
S.53383.6213 Design/Build	96,154	95,754	Complete	99.6%		
S.53372.6145 Land	3,000	3,000	Complete	100.0%		
S.53365.6115 Appraisal	17	17	Complete	100.0%		
S.53403.6466 Permits	5	2	40.0%	40.0%		Dec-09
S.53424.6606 Professional Services	51	26	51.0%	51.0%		Jun-08
<b>S.545 Blue Hills Covered Storage</b>	<b>40,427</b>	<b>5,123</b>	<b>12.7%</b>	<b>12.7%</b>		
S.68025.6139 EIR/Preliminary Design/OR	2,557	1,894	74.1%	74.1%		Jun-10
S.53386.6216 Design Build	37,766	3,200	8.5%	8.5%		
S.53385.6215 Tech Support/Permit Comp	104	29	27.9%	27.9%		Dec-15
<b>S.550 Low Service Storage Near Spot Pond</b>	<b>39,456</b>	<b>233</b>	<b>0.6%</b>	<b>0.6%</b>		
S.53400.6455 Env Rev	233	233	Complete	100.0%		
S.53401.6456 Env Rev Con Des Owners Rep	2,500	0	Future	0.0%	Apr-09	
S.53402.6457 Design/Build	36,093	0	Future	0.0%	Apr-12	
S.53447.6868 Easement/Land Acquisition	630	0	Future	0.0%	Apr-09	
<b>S.604 MetroWest Tunnel</b>	<b>698,025</b>	<b>631,084</b>	<b>90.4%</b>	<b>90.4%</b>		
S.59794.5043 Study	415	415	Complete	100.0%		
S.59796.5048 Construction-Sudbury Pipe Bridge	296	296	Complete	100.0%		
S.59795.5044 Design/EIR - Tunnel/ESDC	37,984	37,984	Complete	100.0%		
S.59798.6054 West Tunnel Segment - CP1	147,787	147,787	Complete	100.0%		
S.60013.6055 Midd.Tunnel Segment - CP2	245,809	245,809	Complete	100.0%		
S.60015.6059 Shaft 5A - CP3	5,872	5,872	Complete	100.0%		
S.60040.6374 East Tunnel Segment-CP3A	55,976	55,976	Complete	100.0%		
S.60014.6056 MHD Salt Sheds - CP5	1,314	1,314	Complete	100.0%		
S.60031.6205 CP6B Upper Hultman Rehab	6,300	0	Future	0.0%	Jul-13	
S.60030.6204 Testing & Disinfection-CP7	3,612	3,612	Complete	100.0%		
S.60029.6203 Loring Road Storage Tanks CP-8	41,368	41,368	Complete	100.0%		
S.59799.5284 Const. Mgmt/Resident Inspect	39,405	39,405	Complete	100.0%		
S.59806.5141 Hultman Study	1,864	1,864	Complete	100.0%		
S.60022.6128 Hultman Leak Repair	307	307	Complete	100.0%		
S.60026.6140 Hultman Repair Band	28	28	Complete	100.0%		
S.60042.6430 Hultman Investigation and Repair	1,604	1,604	Complete	100.0%		
S.60043.6492 Hultman Repair Bands 98-99	116	116	Complete	100.0%		
S.60083.7082 Hultman Interconnect RI/Svcs	4,000	0	Future	0.0%	Jun-10	
S.59805.5139 Land Acquisition	6,259	6,259	Complete	100.0%		
S.59804.5976 Technical Assistance	131	131	Complete	100.0%		
S.60012.6037 DEP Permit Fees	50	46	92.0%	92.0%		
S.60020.6117 Prof. Services	731	731	Complete	100.0%		
S.60023.6129 Framingham MOU	2,444	2,444	Complete	100.0%		
S.60039.6367 Weston MOA	1,018	1,018	Complete	100.0%		
S.60038.6366 Southboro MOA	255	255	Complete	100.0%		
S.60053.6762 Wayland MOA	35	35	Complete	100.0%		
S.60017.6063 Local Sup Cont Des/CA/RI	859	859	Complete	100.0%		
S.60024.6130 Loc. Support Cont. Constr	4,308	4,293	Complete	99.7%		
S.60025.6131 Loc. Sup Cont. Legal/Easement	9	9	Complete	100.0%		
S.60018.6067 Community Technical Assistance	297	297		100.0%		
S.60021.6122 OCIP	24,516	24,516	Complete	100.0%		
S.60054.6777 Equipment Prepurchase	198	198	Complete	100.0%		
S.60058.6856 Hultman Rehab CP9	3,260	3,260	Complete	100.0%		
S.60059.6872 Interim Disinfection	1,245	1,245	Complete	100.0%		
S.60066.6911 Hultman Interconnect/Fin Des/CA Insp	5,388	1,480	27.5%	27.5%		Jul-16
S.60073.6975 CP6A Lower Hultman Rehab	52,700	0	Future	0.0%	Jul-10	
S.60085.7105 CP6 Easements	175	160	91.4%	91.4%		Jul-12
S.60086.7106 CP6A Demolition	90	90	Complete	100.0%		

Subphase/Project	Total Contract Amount	Projected Pmts. Thr. FY07	Status Based on % of Budget Expended	% Complete	Planned Start	Planned End
<b>S.601 Sluice Gate Rehabilitation</b>	<b>9,365</b>	<b>9,365</b>	<b>Complete</b>	<b>100.0%</b>		
S.59757.5255 Design/CS/RI	177	177	Complete	100.0%		
S.59758.5256 Construction 1	1,529	1,529	Complete	100.0%		
S.60034.6272 Design CS/RI 2	1,298	1,298	Complete	100.0%		
S.59760.5258 Construction 2	4,771	4,771	Complete	100.0%		
S.59761.5259 Constr-Stop Planks	444	444	Complete	100.0%		
S.60027.6158 Const-Sudbury Toe Drain Repair	1,145	1,145	Complete	100.0%		
<b>S.614 Metropolitan Tunnel Loop</b>	<b>3,500</b>	<b>0</b>	<b>Future</b>	<b>0.0%</b>		
S.60035.6273 Redundancy StudyTunnel Insp Fea Study	3,500	0	Future	0.0%	Jul-09	
<b>S.615 Chicopee Valley Aqued. Redundancy</b>	<b>8,704</b>	<b>8,241</b>	<b>94.7%</b>	<b>94.7%</b>		
S.60045.6527 Pipeline Redundancy Des/CA/RI	1,860	1,644	88.4%	88.4%		
S.60046.6528 Pipeline Redundancy Construction	6,596	6,350	96.3%	96.3%		Oct-07
S.60065.6908 Construction Easements	147	147	Complete	100.0%		
S.60074.7002 Permits	50	50	Complete	100.0%		
S.60084.7100 MWRA/SHFD NO.1 Take -off	50	50	Complete	100.0%		
<b>S.597 Winsor Dam Hydroelectric</b>	<b>10,381</b>	<b>38</b>	<b>0.4%</b>	<b>0.4%</b>		
S.60032.6276 Preliminary Permit Study & Licensing	38	38	Complete	100.0%		
S.60033.6277 Detail Design	359	0	Future	0.0%	Jul-09	
S.60044.6526 Construction	1,406	0	Future	0.0%	Aug-10	
S.60087.7114 Winsor Power Station Pipe Des	1,012	0	Future	0.0%	Sep-08	
S.60088.7115 Winsor Power Station Pipe Constr Ph1	4,047	0	Future	0.0%	Apr-10	
S.60095.7197 Shft 12 Quabbin Aqdct Sluice Gate Des	400	0	Future	0.0%	Jul-08	
S.60096.7198 Shft 12 Quabbin Aqdct Sluice Gate Con	1,600	0	Future	0.0%	Jul-09	
S.60077.7017 Design and Construction	1,518	0	Future	0.0%	Apr-06	
<b>S.616 Quabbin Transmission System</b>	<b>4,863</b>	<b>4,856</b>	<b>Complete</b>	<b>99.9%</b>		
S.75491.6690 Phase 1 Oakdale Valves Const.	1,837	1,837	Complete	100.0%		
S.60055.6828 Facilities Inspection	1,007	1,007	Complete	100.0%		
S.75496.6831 Ph 1 Oakdale Valves Study/Des	1,475	1,475	Complete	100.0%		
S.60075.7007 Equipment Pre-purchase	543	537	Complete	98.9%		
<b>S.617 Sudbury / Weston Aqueduct Repairs</b>	<b>4,497</b>	<b>887</b>	<b>19.7%</b>	<b>19.7%</b>		
S.75486.6617 Haz Material Sudbury Aqueduct	300	300	Complete	100.0%		
S.60056.6838 Sudbury Aqueduct Inspection	587	587	Complete	100.0%		
S.60057.6839 Sudbury Aqueduct S/T Rep Des	500	0	Future	0.0%	Oct-07	
S.60070.6947 Weston Aqueduct Inspection	300	0	Future	0.0%	Apr-08	
S.60076.7016 Sudbury Short-Term Repairs	2,811	0	Future	0.0%	Oct-08	
<b>S.618 Northern High NW Trans Sect 70-71</b>	<b>1,000</b>	<b>0</b>	<b>Future</b>	<b>0.0%</b>		
S.60063.6895 Planning	1,000	0	Future	0.0%	Jul-10	
<b>S.620 Wachusets Res Spill Impr/Winsor Dam Repairs</b>	<b>8,931</b>	<b>1,498</b>	<b>16.8%</b>	<b>16.8%</b>		
S.60079.7019 Design	1,394	857	61.5%	61.5%		
S.60080.7020 Construction	7,000	411	5.9%	5.9%		Jul-08
S.60078.7018 Equipment Pre-purchase	537	230	42.8%	42.8%		Aug-09
<b>S.621 Watershed Land</b>	<b>19,000</b>	<b>8,000</b>	<b>42.1%</b>	<b>42.1%</b>		
S.60081.7069 Land Acquisition	19,000	8,000	42.1%	42.1%		
<b>S.623 Dam Projects</b>	<b>4,460</b>	<b>0</b>	<b>Future</b>	<b>0.0%</b>		
S.60089.7154 Engineering Studies for Dam Risk	460	0	Future	0.0%		
S.60094.7194 Immediate Repair Dams	4,000	0	Future	0.0%	Jul-08	

Subphase/Project	Total Contract Amount	Projected Pmts. Thr. FY07	Status Based on % of Budget Expended	% Complete	Planned Start	Planned End
<b>S.624 Wachusett Aqueduct Pressurization</b>	<b>100,000</b>	<b>0</b>	<b>Future</b>	<b>0.0%</b>		
S.60090.7156 Wachusett Aqueduct Pressurization Des	20,000	0	Future	0.0%	Jul-11	
S.60091.7157 Wachusett Aqueduct Pressurization Con	80,000	0	Future	0.0%	Jul-13	
<b>S.625 Long Term Redundancy</b>	<b>100,000</b>	<b>0</b>	<b>Future</b>	<b>0.0%</b>		
S.60092.7159 Long Term Redundancy Des	20,000	0	Future	0.0%	Jul-13	
S.60093.7160 Long Term Redundancy Construction	80,000	0	Future	0.0%	Dec-13	
<b>S.677 Valve Replacement</b>	<b>19,679</b>	<b>8,105</b>	<b>41.2%</b>	<b>41.2%</b>		
S.67559.5126 Construction 1	718	718	Complete	100.0%		
S.68012.6105 Construction 2	1,385	1,385	Complete	100.0%		
S.68039.6278 Construction 3	1,338	1,338	Complete	100.0%		
S.68079.6345 Construction 4	1,540	1,540	Complete	100.0%		
S.68080.6346 Construction 5	1,389	1,389	Complete	100.0%		
S.68126.6435 Construction 6	1,882	230	12.2%	12.2%		Jun-08
S.68127.6436 Construction 7	2,270	0	Future	0.0%	Oct-09	
S.68300.7195 Valve Replacement 8&9 Construction	5,000	0	Future	0.0%	Jul-10	
S.68005.6088 Equip. Purchase	4,036	1,387	34.4%	34.4%		Jun-09
S.67560.5124 Technical Assistance	111	111		100.0%		
S.68239.6859 Permits	5	2	40.0%	40.0%		May-10
S.68240.6860 Easements	6	6	Complete	100.0%		
<b>S.712 Cathodic Protection Of Distr.Mains</b>	<b>1,518</b>	<b>141</b>	<b>9.3%</b>	<b>9.3%</b>		
S.68002.6058 Planning Phase I	108	108	Complete	100.0%		
S.68129.6438 Test Station Installation 2	459	0	Future	0.0%	May-13	
S.68130.6439 Test Station Installation 3	459	0	Future	0.0%	May-14	
S.68131.6440 Test Station Installation 4	459	0	Future	0.0%	May-15	
S.68216.6751 Technical Assistance	33	33	Complete	100.0%		
<b>S.678 Boston Low Serv.-Pipe &amp; Valve Rehab</b>	<b>23,691</b>	<b>23,691</b>	<b>Complete</b>	<b>100.0%</b>		
S.67570.5120 Study - Pipe	297	297	Complete	100.0%		
S.67571.5122 Design/CS	1,604	1,604	Complete	100.0%		
S.67572.5123 Ph 1 Equip Prepurchase	892	892	Complete	100.0%		
S.68000.6045 Const Clinton Rd & Boylston St	7,933	7,933	Complete	100.0%		
S.67999.6044 Construction Beacon Street	12,964	12,964	Complete	100.0%		
S.68217.6769 Technical Assistance	1	1	Complete	100.0%		
<b>S.730 Weston Aqueduct Supply Mains (WASMs)</b>	<b>117,967</b>	<b>61,080</b>	<b>51.8%</b>	<b>51.8%</b>		
S.68027.6142 Design/CA/RI-PhA/W1&2	5,374	5,314	Complete	98.9%		
S.67865.5147 Design/CA/RI - W4	6,149	5,994	97.5%	97.5%		Sep-07
S.68041.6280 Newton WASM 1&2	9,219	9,219	Complete	100.0%		
S.68042.6281 Boston WASM 1&2	7,058	7,058	Complete	100.0%		
S.68166.6539 Design/CA/RI WASM3	9,267	0	Future	0.0%	Jul-07	
S.68285.7083 Design/CA/RI Section 28	908	94	10.4%	10.4%		Mar-11
S.68170.6543 Waltham WASM 3-CP2	17,127	0	Future	0.0%	Jan-11	
S.68171.6544 Belmont WASM 3 - CP3	13,008	0	Future	0.0%	Apr-13	
S.68172.6545 Arlington WASM 3 - CP4	10,005	0	Future	0.0%	Jul-16	
S.68173.6546 Section 28, Arlington-CP1	4,226	0	Future	0.0%	Mar-10	
S.68031.6175 Auburndale WASM 1,2&4	4,001	4,001	Complete	100.0%		
S.68069.6312 Newton WASM 2&4	8,282	8,282	Complete	100.0%		
S.68070.6313 Allston WASM 4 & W. Ave. Sewer	17,331	17,331	Complete	100.0%		
S.68032.6176 Construction Meter 103	61	61	Complete	100.0%		
S.59774.5034 Construction Newton Water Mains	669	669	Complete	100.0%		
S.59776.5975 Technical Assistance	186	186	Complete	100.0%		
S.68030.6174 Appraisal/Easement	753	314	41.7%	41.7%		Oct-18
S.68245.6870 Survey	210	94	44.8%	44.8%		Oct-18
S.68269.6996 Temporary Water Supply Plan	1,669	0	Future	0.0%	Jul-09	
S.68272.7000 Section PCCP W-12 ...	2,114	2,114	Complete	100.0%		
S.68273.7001 WASM3 SPL12 PCCP Des	349	349	Complete	100.0%		



Subphase/Project	Total Contract Amount	Projected Pmts. Thr. FY07	Status Based on % of Budget Expended	% Complete	Planned Start	Planned End
<b>S.720 Warren Cottage Line Rehab</b>	<b>1,205</b>	<b>1,205</b>	<b>Complete</b>	<b>100.0%</b>		
S.68081.6285 Construction	1,158	1,158	Complete	100.0%		
S.68082.6286 Easements	3	3	Complete	100.0%		
S.68195.6618 Technical Assistance	43	43	Complete	100.0%		
<b>S.732 Walnut St. &amp; Fisher Hill Pipeline Rehab.</b>	<b>3,467</b>	<b>804</b>	<b>23.2%</b>	<b>23.2%</b>		
S.68189.6586 Construction Phs. 1	3,407	750	22.0%	22.0%		Nov-08
S.68220.6779 Technical Assistance	21	21	Complete	100.0%		
S.68221.6780 Survey	35	32	91.4%	91.4%		Aug-08
S.68270.6998 Permits	5	2	40.0%	40.0%		Nov-08
<b>S.683 Heath Hill Road Pipe Replacement</b>	<b>19,915</b>	<b>18,838</b>	<b>94.6%</b>	<b>94.6%</b>		
S.67639.5192 Design/CS/RI-Sec 52 Ph 1	218	218	Complete	100.0%		
S.68047.6288 Design Sec 52 Ph 2	2,408	2,182	90.6%	90.6%		Oct-08
S.67645.6042 Const-Sect 52 New	745	745	Complete	100.0%		
S.67642.5194 Construction Section 52 Rehab	8,227	7,432	90.3%	90.3%		Oct-07
S.67640.5206 Design/CS/RI - Sec 58,20	1,595	1,595	Complete	100.0%		
S.67643.5102 Construction Sect 58,20,19	6,362	6,362	Complete	100.0%		
S.67644.5985 Technical Assistance	19	19	Complete	100.0%		
S.68008.6100 Legal/Easements-New	17	17	Complete	100.0%		
S.68048.6289 Legal/Easements Rehab	303	253	83.5%	83.5%		Oct-07
S.68201.6648 Public Participation	5	3	60.0%	60.0%		Oct-07
S.68202.6649 Legal	5	3	60.0%	60.0%		Oct-07
S.68241.6862 Boston Paving	12	8	66.7%	66.7%		Oct-08
<b>S.721 Southern Spine Distribution Mains</b>	<b>67,489</b>	<b>13,463</b>	<b>19.9%</b>	<b>19.9%</b>		
S.68083.6290 Sec 21,43,22 Design	7,776	4,897	63.0%	63.0%		Mar-12
S.68084.6291 Sec 21,43,22 Easements	176	98	55.7%	55.7%		Feb-09
S.68085.6292 Section 22 South Construction	4,993	4,993	Complete	100.0%		
S.68089.6296 Sec 20 & 58 Design	2,178	0	Future	0.0%	Feb-12	
S.68090.6297 Sec 20 & 58 Easements	48	0	Future	0.0%	Sep-10	
S.68091.6298 Sec 20 & 58 Construction	10,251	0	Future	0.0%	Sep-14	
S.68122.6396 Adams Street Bridge	154	154	Complete	100.0%		
S.68193.6601 Southern High Public Part	15	15	Complete	100.0%		
S.68194.6602 Southern High Ext Study	242	242	Complete	100.0%		
S.68228.6787 Boston Paving	265	39	14.7%	14.7%		Mar-12
S.68299.7155 Southern Spine Sect 22 N Fac Plan/EIR	1,000	0	Future	0.0%	Jul-07	
S.68298.7120 Section 22 North Design/ESDC	2,500	0	Future	0.0%	Jul-09	
S.68235.6844 Section 22 North Construction	12,511	0	Future	0.0%	Jan-12	
S.68236.6845 Section 107 Ph 1 Constr	6,391	0	Future	0.0%	May-07	
S.68290.7099 Section 107 Ph2 Construction	15,963	0	Future	0.0%	May-09	
S.68237.6846 Legal	5	3	60.0%	60.0%		
S.68238.6847 Technical Assistance	28	28	Complete	100.0%		
S.68247.6885 Contract 1A Construction	2,859	2,859	Complete	100.0%		
S.68291.7104 Milton Pressure Reg Valve	135	135	Complete	100.0%		
<b>S.714 South. Extra High Sects 41,42 &amp; 74</b>	<b>3,657</b>	<b>3,657</b>	<b>Complete</b>	<b>100.0%</b>		
S.68014.6107 Design/CA/RI	770	770	Complete	100.0%		
S.68049.6299 Easements	46	46	Complete	100.0%		
S.68050.6300 Construction	2,345	2,345	Complete	100.0%		
S.68183.6561 Boston Paving	496	496	Complete	100.0%		
<b>S.727 SEH Redundancy &amp; Storage</b>	<b>41,372</b>	<b>350</b>	<b>0.8%</b>	<b>0.8%</b>		
S.53397.6452 Concept Plan/Prelim Des/Env Rev	900	350	38.9%	38.9%		Jun-08
S.53398.6453 SEH Storage Final Des/CS/RI	2,024	0	Future	0.0%	Apr-09	
S.53399.6454 SEH Storage Construction	8,094	0	Future	0.0%	Jul-12	
S.68135.6444 SEH Red Loop Final Des/CA/RI	4,047	0	Future	0.0%	Apr-09	
S.68136.6445 SEH Redund Loop Construction	21,248	0	Future	0.0%	Apr-11	
S.68292.7112 Design Sect 77/88 Rehab	1,012	0	Future	0.0%	Jul-18	
S.68293.7113 Section 77/88 Rehab	4,047	0	Future	0.0%	Sep-20	

Subphase/Project	Total Contract Amount	Projected Pmts. Thr. FY07	Status Based on % of Budget Expended	% Complete	Planned Start	Planned End
<b>S.719 Chestnut Hill Connecting Mains</b>	<b>24,558</b>	<b>17,493</b>	<b>71.2%</b>	<b>71.2%</b>		
S.68026.6141 Des/CA/RI PS Potable Connection	1,360	1,360	Complete	100.0%		
S.68051.6301 Preliminary Engineering	440	440	Complete	100.0%		
S.68157.6503 Design/CA/RI - Emer. Pump Relocation	1,121	1,121	Complete	100.0%		
S.68052.6302 Construction- Chp 149	3,431	0	Future	0.0%	Jan-10	
S.68155.6501 Const - Emer. Pump Relocation	6,502	6,502	Complete	100.0%		
S.68053.6303 Easements	81	81	Complete	100.0%		
S.68180.6558 Boston Paving	133	133	Complete	100.0%		
S.68182.6560 Legal	1	1	Complete	100.0%		
S.68199.6623 BECO Emergency Pump Construction	431	431	Complete	100.0%		
S.68203.6651 Const.- Pump Station Potable Connection	7,132	7,132	Complete	100.0%		
S.68230.6814 Equipment pre-purchase	178	178	Complete	100.0%		
S.68231.6820 Demolition of Garages	72	72	Complete	100.0%		
S.68244.6869 Utilities	44	44	Complete	100.0%		
S.68267.6982 Construction-Chp 30	2,220	0	Future	0.0%	Jan-10	
S.68268.6995 Final Design CA/RI	1,414	0	Future	0.0%	Jul-08	
<b>S.704 Rehab of Other Pumping Stations</b>	<b>26,183</b>	<b>8,415</b>	<b>32.1%</b>	<b>32.1%</b>		
S.67885.5153 Preliminary Design	351	351	Complete	100.0%		
S.68017.6110 Design/CS/RI	2,710	2,710	Complete	100.0%		
S.68072.6304 Construction II&C	639	639	Complete	100.0%		
S.68102.6375 Rehab of 5 Pump Stations	18,157	3,227	17.8%	17.8%		May-10
S.68178.6556 Public Participation	5	2	40.0%	40.0%		Jan-10
S.68179.6557 Legal	5	2	40.0%	40.0%		Jan-10
S.68204.6676 Proprietary Equipment Purchases	285	188	66.0%	66.0%		Jan-10
S.68266.6980 Design 2 CS/RI	4,030	1,297	32.2%	32.2%		Mar-11
<b>S.722 NIH Redundancy &amp; Covered Storage</b>	<b>57,200</b>	<b>761</b>	<b>1.3%</b>	<b>1.3%</b>		
S.68093.6306 Easements	300	0	Future	0.0%	Jul-09	
S.53454.6954 Concept Plan	969	760	78.4%	78.4%		Aug-07
S.68276.7026 NIH Improvements Const	5,219	0	Future	0.0%	Jun-10	
S.68277.7045 Design CA/RI NIH Improvements	1,111	0	Future	0.0%	Jul-08	
S.68278.7047 Permits	5	1	20.0%	20.0%		Jun-12
S.68279.7048 Technical Assistance	18	0	Future	0.0%	Jul-08	
S.68252.6906 Section 89/29 Redundancy Design	5,059	0	Future	0.0%	Jul-08	
S.68282.7066 Sec 89&29 Redundancy Constr	19,224	0	Future	0.0%	Jul-10	
S.68283.7067 NIH Storage Fin Des/CS/RI	2,024	0	Future	0.0%	Jul-08	
S.68284.7068 NIH Storage Construction	8,094	0	Future	0.0%	Sep-10	
S.68294.7116 Section 89/29 Rehab Design	1,012	0	Future	0.0%	Jul-13	
S.68295.7117 Section 89/29 Rehab Construction	4,047	0	Future	0.0%	Jul-15	
S.68296.7118 NIH Gillis Redundancy Design	2,024	0	Future	0.0%	Jul-13	
S.68297.7119 NIH Gillis Redundancy Construction	8,094	0	Future	0.0%	Jul-15	

Subphase/Project	Total Contract Amount	Projected Pmts. Thr. FY07	Status Based on % of Budget Expended	% Complete	Planned Start	Planned End
<b>S.689 James L. Gillis Pump Station Rehab.</b>	<b>33,446</b>	<b>33,441</b>	<b>Complete</b>	<b>100.0%</b>		
S.67701.5249 Pump	70	70	Complete	100.0%		
S.67702.5076 Electrical Upgrade	200	200	Complete	100.0%		
S.67709.5074 Construction Diesel Exhaust	60	60	Complete	100.0%		
S.67703.5077 Design/CS-Pump Station	2,308	2,308	Complete	100.0%		
S.67707.5078 Construction-PS-Phase 1	630	630	Complete	100.0%		
S.67708.5051 Const-P.S.-Ph2	12,890	12,890	Complete	100.0%		
S.67998.6038 Hydraulic Transient Analysis	61	61	Complete	100.0%		
S.67716.5047 Oil Control Plan	171	171	Complete	100.0%		
S.67717.5050 Drain Line Cleaning	268	268	Complete	100.0%		
S.67704.5072 Design/CS/RI-Suction Pipe	1,379	1,379	Complete	100.0%		
S.67705.5071 Study-Suction Pipe	603	603	Complete	100.0%		
S.67706.5073 Construction-Suction Pipe	11,265	11,265	Complete	100.0%		
S.68054.6307 Construction-Tudor Barn	88	88	Complete	100.0%		
S.68105.6378 Woodland Road Pavement Improvements	396	396	Complete	100.0%		
S.67994.6030 Pavement Highland Ave	86	86	Complete	100.0%		
S.67720.5219 Constr-Rehab Discharge	2,041	2,041	Complete	100.0%		
S.67719.5144 Construction Sewer P.S.	203	203	Complete	100.0%		
S.67714.5983 Technical Assistance	163	163	Complete	100.0%		
S.67718.5053 Environ Assess & Remedial Plan	534	534	Complete	100.0%		
S.67991.6027 DEP Review Fees	30	25	83.3%	83.3%		Dec-07
<b>S.713 Spot Pond Supply Mains - Rehab</b>	<b>62,629</b>	<b>59,972</b>	<b>95.8%</b>	<b>95.8%</b>		
S.68038.6223 Prelim Design & Design/CA/RI	10,874	10,832	Complete	99.6%		
S.68059.6316 Easements/Paving CP1	143	143	Complete	100.0%		
S.68106.6379 Easements CP2	71	71	Complete	100.0%		
S.68107.6380 Easements CP3	267	204	76.4%	76.4%		Nov-07
S.68151.6476 Easements CP4	1	1	Complete	100.0%		
S.68060.6317 North (Medford/Melrose)	6,597	6,597	Complete	100.0%		
S.68108.6381 Middle (Medford/Somerville)	22,691	22,691	Complete	100.0%		
S.68109.6382 South (Cambridge/Boston)	17,186	15,924	92.7%	92.7%		Apr-08
S.68150.6475 Early Valve Replacement Contract	2,387	2,387	Complete	100.0%		
S.68209.6697 Construction 4-Trusses	960	0	Future	0.0%	Apr-17	
S.68153.6483 Early Valve Equip. Purchase	161	161	Complete	100.0%		
S.68274.7003 CA/RI CP3	1,289	958	74.3%	74.3%		Apr-08
<b>S.723 Nor Low Service Rehab Secs. 8</b>	<b>17,629</b>	<b>55</b>	<b>0.3%</b>	<b>0.3%</b>		
S.68094.6321 Sec 8 Survey	80	25	31.3%	31.3%		May-09
S.68287.7092 Design CA/RI Sec 8	2,040	0	Future	0.0%	Jul-12	
S.68095.6322 Sec 8 Construction	10,197	0	Future	0.0%	Jul-14	
S.68262.6962 Rehab Sects 37,38 Chel/EB Con	3,200	0	Future	0.0%	May-13	
S.68263.6977 Permits	5	3	60.0%	60.0%		Aug-11
S.68264.6979 Technical Assistance	27	27	Complete	100.0%		
S.68275.7021 Section 97A Construction	2,080	0	Future	0.0%	Oct-07	

Subphase/Project	Total Contract Amount	Projected Pmts. Thr. FY07	Status Based on % of Budget Expended	% Complete	Planned Start	Planned End
<b>S.702 New Connecting Mains - Shaft 7 to ...</b>	<b>53,644</b>	<b>4,960</b>	<b>9.2%</b>	<b>9.2%</b>		
S.68035.6199 Watertown MOU	167	167	Complete	100.0%		
S.67846.5163 Routing Study	397	397	Complete	100.0%		
S.68110.6383 Design/CA/RI DP1	4,810	3,163	65.8%	65.8%		Jun-10
S.68118.6391 Revised N. Segment (CP1A) New 48"	26,408	0	Future	0.0%	Jun-08	
S.68114.6387 Easements CP1 A&B	800	17	2.1%	2.1%		Jun-08
S.68111.6384 Des/CA/RI DP2/4 Meter 120	2,943	1,176	40.0%	40.0%		Sep-09
S.68286.7086 Design CA/RI Sec 59&60	500	0	Future	0.0%	Nov-10	
S.68174.6548 Constr CP2 C&L Sec 59&60	3,251	0	Future	0.0%	Nov-12	
S.68175.6547 Easements CP2	45	0	Future	0.0%	May-11	
S.68119.6392 South Segment (CP3)	5,437	0	Future	0.0%	Feb-08	
S.68115.6388 Easements CP3	69	30	43.5%	43.5%		Aug-09
S.68121.6394 Northeast Segment (CP5)	6,266	0	Future	0.0%	Nov-07	
S.68117.6390 Easements CP5	50	10	20.0%	20.0%		Jun-09
S.68255.6955 Repl of Sect 25-Design CA/RI	400	0	Future	0.0%	Jul-09	
S.68256.6956 Repl of Sect 25-Construction	2,100	0	Future	0.0%	Jul-11	
<b>S.706 NHS - Con. Mains from Sec. 91</b>	<b>2,360</b>	<b>2,360</b>	<b>Complete</b>	<b>100.0%</b>		
S.67930.5165 Design/CA/RI	729	729	Complete	100.0%		
S.68077.6332 Construction	1,631	1,631	Complete	100.0%		
<b>S.692 NHS - Section 27 Improvements</b>	<b>2,789</b>	<b>124</b>	<b>4.4%</b>	<b>4.4%</b>		
S.67769.6333 Construction Sect 27	2,664	27	1.0%	1.0%		Mar-15
S.68192.6589 Easements	23	0	Future	0.0%	Apr-12	
S.68211.6712 Technical Assistance	64	61	95.3%	95.3%		Mar-12
S.68229.6809 Surveying	37	37	Complete	100.0%		
<b>S.693 NHS - Revere &amp; Malden Pipeline Impr</b>	<b>32,145</b>	<b>23,868</b>	<b>74.3%</b>	<b>74.3%</b>		
S.67780.5185 Design/CS/RI-Revere/Malden	1,786	1,786	Complete	100.0%		
S.67781.5186 Constr-Revere Beach	6,314	6,314	Complete	100.0%		
S.67782.5176 Constr-Malden Sect 53	10,026	10,026	Complete	100.0%		
S.68020.6113 Landscaping Malden Section 53	20	20	Complete	100.0%		
S.67792.5238 Construction - Linden Square	1,849	1,849	Complete	100.0%		
S.67793.5239 Construction Admin.-Linden Squar	125	125	Complete	100.0%		
S.67784.5177 Const-Revere Sect 53	2,800	0	Future	0.0%	Aug-07	
S.68078.6334 Easements Revere 53	27	11	40.7%	40.7%		Sep-08
S.67996.6033 Des/CA/RI-Rd Restoration	77	77	Complete	100.0%		
S.67997.6034 Construction Road Restoration	1,714	1,714	Complete	100.0%		
S.68033.6183 Sidewalk Restoration	54	54	Complete	100.0%		
S.67785.5191 Constr-Control Valves	949	949	Complete	100.0%		
S.67786.5179 Const.-DI Pipeline C&L	158	158	Complete	100.0%		
S.67787.5178 Constr-Win C&L	575	575	Complete	100.0%		
S.67790.6335 Constr 68 & 53A	4,229	0	Future	0.0%	Jul-13	
S.67791.5986 Technical Assistance	206	206	Complete	100.0%		
S.68258.6958 Shaft 9A-D Ext Construction	1,200	0	Future	0.0%	Apr-14	
S.68265.6978 Survey	30	3	10.0%	10.0%		Nov-15
S.68280.7049 Permits	5	0	Future	0.0%	Apr-05	
<b>S.731 Lynnfield Pipeline</b>	<b>6,990</b>	<b>150</b>	<b>2.1%</b>	<b>2.1%</b>		
S.68196.6619 Easem/Legal/License/Permits	200	0	Future	0.0%	Jul-07	
S.68251.6905 Design CA/RI	1,240	0	Future	0.0%	Jul-07	
S.68289.7096 Temporary Interconnect Constr(Ph 1)	300	150	50.0%	50.0%		Aug-07
S.68187.6584 Construction (Phase 2)	5,250	0	Future	0.0%	Jul-09	

Subphase/Project	Total Contract Amount	Projected Pmts. Thr. FY07	Status Based on % of Budget Expended	% Complete	Planned Start	Planned End
<b>S.708 Nor Extra High Serv - New Pipelines</b>	<b>8,919</b>	<b>3,634</b>	<b>40.7%</b>	<b>40.7%</b>		
S.67970.5242 Design/CA/RI	588	588	Complete	100.0%		
S.67972.6340 Construction	3,032	3,032	Complete	100.0%		
S.68162.6522 Construction-Sections 34,36,45	5,226	0	Future	0.0%	Jan-14	
S.68176.6554 Public Participation	5	1	20.0%	20.0%		Nov-15
S.68177.6555 Legal	5	1	20.0%	20.0%		Nov-15
S.68210.6707 Technical Assistance	54	8	14.8%	14.8%		Nov-15
S.68215.6749 PLC Equipment Purchases	4	4	Complete	100.0%		
S.68281.7050 Permits	5	0	Future	0.0%	Nov-10	
<b>S.725 Hydraulic Model Update</b>	<b>686</b>	<b>658</b>	<b>95.9%</b>	<b>95.9%</b>		
S.68101.6342 Hydraulic Model Update	563	563	Complete	100.0%		
S.68165.6531 Model Enhancement Support Services	123	95	77.2%	77.2%		Jun-07
<b>S.753 Central Monitoring System</b>	<b>16,092</b>	<b>15,718</b>	<b>97.7%</b>	<b>97.7%</b>		
S.75300.5025 Study	190	190	Complete	100.0%		
S.75301.5026 Design	2,651	2,651	Complete	100.0%		
S.75304.5160 Communications Structures	161	161	Complete	100.0%		
S.75305.5173 CS/Start Up Services	352	352	Complete	100.0%		
S.75302.5027 Equipment Prepurchase	2,162	2,162	Complete	100.0%		
S.75306.5171 Construction 1	209	209	Complete	100.0%		
S.75303.5028 SCADA Implementation	2,201	1,827	83.0%	83.0%		Jun-09
S.75474.6125 Microwave Equipment	782	782	Complete	100.0%		
S.75308.5849 Operations Center Construction	1,499	1,499	Complete	100.0%		
S.75309.5987 Technical Assistance	386	386	Complete	100.0%		
S.75488.6653 Microwave Comm System-Wide Backbone	1,694	1,694	Complete	100.0%		
S.75489.6654 Study & Design Monitoring & Control	1,808	1,808	Complete	100.0%		
S.75494.6816 Microwave Comm for Waterworks Facil	1,957	1,957	Complete	100.0%		
S.75495.6825 Ludlow Communications	41	41	Complete	100.0%		

Subphase/Project	Total Contract Amount	Projected Pmts. Thr. FY07	Status Based on % of Budget Expended	% Complete	Planned Start	Planned End
<b>S.763 Distribution Systems Facs. Mapping</b>	<b>2,348</b>	<b>1,036</b>	<b>44.1%</b>	<b>44.1%</b>		
S.75458.5162 Planning Design	936	936	Complete	100.0%		
S.75476.6152 Data Purchase	100	100	Complete	100.0%		
S.75484.6525 Records Development	1,312	0	Future	0.0%	Jul-07	
<b>S.764 Local Water Infrastr Rehab Ast Progr</b>	<b>7,488</b>	<b>7,488</b>	<b>Complete</b>	<b>100.0%</b>		
S.75477.6343 Loans	22,304	22,304	Complete	100.0%		
S.75478.6344 Loan Repayment	-22,304	-22,304	Complete	100.0%		
S.75479.6408 Grants	7,488	7,488	Complete	100.0%		
<b>S.765 Local Water Pipeline Imp. Loan Program</b>	<b>0</b>	<b>92,623</b>				
S.75485.6608 Community Loans	255,518	128,569	50.3%	50.3%		Jun-13
S.75493.6759 Community Repayment	-255,518	-35,945	14.1%	14.1%		Jun-23
<b>S.766 Waterworks Facility Asset Protection</b>	<b>4,098</b>	<b>245</b>	<b>6.0%</b>	<b>6.0%</b>		
S.75490.6689 Meter Vault Manhole Retrofits	1,466	0	Future	0.0%	Sep-14	
S.75497.6832 Design-Walnut Hill Tank	300	0	Future	0.0%	Sep-08	
S.75498.6833 Construction-Walnut Hill Tank	1,000	0	Future	0.0%	Oct-10	
S.75501.6910 Waltham Pipe/Bridge Repl	238	238	Complete	100.0%		
S.75502.6920 Permits/Legal Fees	15	8	53.3%	53.3%		Mar-12
S.75506.7023 Design Cosgrove Turbine Isolation	480	0	Future	0.0%	Jul-15	
S.75509.7064 Cosgrove Valve Seat Repl	500	0	Future	0.0%	Jul-12	
S.75510.7065 Des Cosgrove Valve Seat Repl	100	0	Future	0.0%	Jul-11	
<b>S.933 Capital Maintenance Planning/Development</b>	<b>8,891</b>	<b>4,259</b>	<b>47.9%</b>	<b>47.9%</b>		
S.19175.6421 Inventory & Evaluation-1&2	2,579	2,579	Complete	100.0%		
S.92387.6976 As-needed Design Contract 1	750	750	Complete	100.0%		
S.92393.6988 As Needed Design Contract 2	750	750	Complete	100.0%		
S.92402.7101 As-Needed Des Contract 3	750	90	12.0%	12.0%		Feb-09
S.92403.7102 As-Needed Des Contract 4	750	90	12.0%	12.0%		Feb-09
S.92399.7070 Long-Term As-Needed Design	3,312	0	Future	0.0%	Feb-09	
<b>S.881 Equipment Purchase</b>	<b>8,703</b>	<b>5,368</b>	<b>61.7%</b>	<b>61.7%</b>		
S.92367.6732 TV Inspection Truck	175	175	Complete	100.0%		
S.92374.6760 Security Equip & Installation	6,112	2,927	47.9%	47.9%		Jun-07
S.92379.6808 ICP-MS Lab Testing Equip	150	0	Future	0.0%	Jan-08	
S.92381.6866 Back Hoe	130	130	Complete	100.0%		
S.92382.6867 Vactor Truck	220	220	Complete	100.0%		
S.92383.6907 Water Service Truck	114	114	Complete	100.0%		
S.92384.6944 Bucket Machine	137	137	Complete	100.0%		
S.92385.6945 Excavator	265	265	Complete	100.0%		
S.92386.6946 Grove Crane	311	311	Complete	100.0%		
S.92388.6981 Land Fill Loader	113	113	Complete	100.0%		
S.92392.6986 PowerSweeper/Catch Basin ...	155	155	Complete	100.0%		
S.92394.6990 Back Hoe (WRA385)	97	97	Complete	100.0%		
S.92395.7027 Closed Circuit TV Insp Truck	165	165	Complete	100.0%		
S.92396.7028 Front-End Loader	240	240	Complete	100.0%		
S.92400.7074 Crane (WRA-185)	320	320	Complete	100.0%		

Subphase/Project	Total Contract Amount	Projected Pmts. Thr. FY07	Status Based on % of Budget Expended	% Complete	Planned Start	Planned End
<b>S.930 MWRA Facility - Chelsea</b>	<b>10,227</b>	<b>10,227</b>	<b>Complete</b>	<b>100.0%</b>		
S.92321.5052 Planning	30	30	Complete	100.0%		
S.92320.5886 Conceptual Design	49	49	Complete	100.0%		
S.92354.6510 Design Review	385	385	Complete	100.0%		
S.92355.6511 Fitout - Office Furnish/Equip	644	644	Complete	100.0%		
S.92356.6512 Inform./Telecom. Consultant	382	382	Complete	100.0%		
S.92357.6513 Existing Facility "Button Up"	380	380	Complete	100.0%		
S.92358.6514 Moving Expense	362	362	Complete	100.0%		
S.92362.6624 Legal	14	14	Complete	100.0%		
S.92363.6713 Moving Expenses CNY	237	237	Complete	100.0%		
S.92364.6714 CNY Retrofit	1,577	1,577	Complete	100.0%		
S.92365.6715 MIS Network	1,664	1,664	Complete	100.0%		
S.92366.6716 Fitout - All Other	4,476	4,476	Complete	100.0%		
S.92375.6757 Communication Tower	25	25	Complete	100.0%		
<b>S.925 Technical Assistance</b>	<b>1,650</b>	<b>0</b>	<b>Future</b>	<b>0.0%</b>		
S.30000.MECH Mechanical	150	0	Future	0.0%		
S.50000.MATT Material Testing	150	0	Future	0.0%		
S.80000.SURV Surveying	150	0	Future	0.0%		
S.90000.HAZM Hazardous Material	900	0	Future	0.0%		
S.33000.INST Instrument Control	150	0	Future	0.0%		
S.44000.WETP Wetland/Permitting	150	0	Future	0.0%		
<b>S.931 Business Systems Plan</b>	<b>30,076</b>	<b>20,418</b>	<b>67.9%</b>	<b>67.9%</b>		
S.92338.6014 Phase I (FY95-97)	1,146	1,146	Complete	100.0%		
S.92339.6013 Hardware-Phase I	441	441	Complete	100.0%		
S.92322.6015 Network-Phase I	142	142	Complete	100.0%		
S.92343.6177 Phase II FY97-99	4,274	3,315	77.6%	77.6%		Dec-08
S.92347.6362 Phase III (FY99-01)	10,807	10,807	Complete	100.0%		
S.92352.6508 Phase IV / Year 2000 Imp.	3,051	3,051	Complete	100.0%		
S.92353.6509 Phase V	2,957	457	15.5%	15.5%		Jun-09
S.92380.6865 Phase VI	2,308	1,060	45.9%	45.9%		Jun-09
S.92404.7200 Computer Center - OCC Infrastructure	1,500	0	Future	0.0%	Jul-14	
S.92405.7201 Net 2020	1,500	0	Future	0.0%	Jul-09	
S.92406.7203 SAN II	600	0	Future	0.0%	Jul-11	
S.92407.7204 SAN III	600	0	Future	0.0%	Jul-14	
S.92408.7205 Telecommunications	750	0	Future	0.0%	Jul-13	
<b>S.932 Environmental Remediation</b>	<b>1,831</b>	<b>1,456</b>	<b>79.5%</b>	<b>79.5%</b>		
S.92369.6745 Tech Asst./ Env. Remediation	545	545	Complete	100.0%		
S.92370.6746 Prision Point Tank Removal - Const.	777	402	51.7%	51.7%		
S.92371.6747 Cottage Farm Tank Replace - Const	428	428	Complete	100.0%		
S.92376.6805 Oakdale Power Station	73	73	Complete	100.0%		
S.92377.6806 Cosgrove Power Station	8	8	Complete	100.0%		
<b>S.934 MWRA Facilities Management &amp; Planning</b>	<b>6,753</b>	<b>535</b>	<b>7.9%</b>	<b>7.9%</b>		
S.92389.6983 Design/Engineering Services	1,259	225	17.9%	17.9%		Jan-10
S.92390.6984 Facilities Construction	5,334	150	2.8%	2.8%		Jul-10
S.92401.7098 CSB Roof Replacement	160	160	Complete	100.0%		

# APPENDIX 4

## Municipality and Project Reference by Municipality



**APPENDIX 4**  
**PROJECT/MUNICIPALITY(S)**  
**New Projects from Master Plan Shaded**

Project Number/ Project	Community(s) Served
104	Braintree-Weymouth Relief Facilities
127	Cummingsville Replacement Sewer
128	Infiltration/Inflow Local Financial Assistance Program.
131	Upper Neponset Valley Sewer System
132	Corrosion and Odor Control Study
136	West Roxbury Tunnel
137	Wastewater Central Monitoring
139	South System Relief Project
141	Wastewater Process Optimization
142	Wastewater Metering System Equipment Replacement
145	Interception & Pumping Facility Asset Protection
146	D.I. Cross Harbor Tunnel
200	Deer Island Plant Optimization
206	Deer Island Treatment Plant Asset Protection
210	Clinton Wastewater Treatment Plant
271	Residuals Asset Protection
324	CSO Support
339	North Dorchester Bay & Reserve Channel Conduits/CSO
340	South Dorchester Bay Sewer Separation (Fox Point)
341	South Dorchester Bay Sewer Separation (Commercial Pt.)
342	Neponset River Sewer Separation
343	Constitution Beach Sewer Separation
344	Stony Brook Sewer Separation
346	Cambridge CAM002-004 Sewer Separation
347	East Boston Branch Sewer Relief
348	Fort Point Channel & BOS019 Conduits
349	Chelsea Trunk Sewer
350	Union Park Detention Treatment Facility
351	BWSC Floatables Control
352	Cambridge Floatables Control
353	Upgrade Existing CSO Facilities
354	Hydraulic Relief Projects
355	MWR003 Gate and Siphon
356	Fort Point Channel Sewer Separation
357	Charles River CSO Controls
358	Morrisey Boulevard Drain
359	Reserved Channel Sewer Separation
360	Brookline Sewer Separation
361	Bulfinch Triangle Sewer Separation
542	Walnut Hill Treatment Plant
543	Quabbin Water Treatment Plant
544	Norumbega Covered Storage
545	Blue Hills Covered Storage
597	Winsor Dam Hydroelectric
601	Sluice Gate Rehabilitation
604	MetroWest Tunnel
615	Chicopee Valley Aqueduct Redundancy
616	Quabbin Transmission System
617	Sudbury/Weston Aqueduct Repairs
618	Northern High NW Trans Section 70-71
620	Wachusett Reservoir Spillway
621	Watershed Land
622	Cosgrove/Wachusett Redundancy
623	Dam Projects
624	Wachusett Aqueduct Pressure

**APPENDIX 4**  
**PROJECT/MUNICIPALITY(s)**  
**New Projects from Master Plan Shaded**

Project Number/ Project	Community(s) Served
625 Long Term Redundancy	All Water Customers (except Chicopee, Wilbraham, South Hadley Fire District #1, Worcester, Clinton, and Leominster)
677 Valve Replacement	All Water Communities
683 Heath Hill Road Pipe Replacement	Boston, Brookline
689 James L. Gillis Pump Station Rehabilitation	Lynn, Lynnfield, Malden, Marblehead, Medford, Melrose, Nahant, Peabody, Reading, Saugus, Stoneham, Swampscott, Wakefield, Winchester, Woburn
690 Northern Low Service Pipeline Replacement	Chelsea, Everett, Malden
692 Northern High Service Section 27 Improvements	Lynn, Marblehead, Nahant, Swampscott
693 Northern High Service Pipe Improvements - Revere/Malden	Boston, Lynn, Malden, Marblehead, Nahant, Peabody, Reading, Revere, Saugus, Winthrop
702 New Connecting Mains - Shaft 7 to WASM 3	Arlington, Bedford, Belmont, Boston, Lexington, Medford, Newton, Somerville, Waltham, Watertown, Winchester
704 Rehabilitation of Other Pump Stations	Arlington, Bedford, Belmont, Boston, Brookline, Canton, Lexington, Milton, Norwood, Waltham, Watertown, Winchester
706 Northern High Service Connecting Mains from Sec. 91	Lynn, Lynnfield, Marblehead, Nahant, Revere, Saugus, Swampscott
708 Northern Extra High Service - New Pipelines	Arlington, Bedford, Lexington, Waltham
712 Cathodic Protection of Distribution Mains	All Water Communities
713 Spot Pond Supply Mains Rehabilitation	Arlington, Boston, Cambridge, Chelsea, Everett, Malden, Medford, Somerville
714 Southern Extra High - Sections 41, 42, and 74	Boston, Brookline, Milton, Norwood, Dedham, Westwood, Stoughton
719 Chestnut Hill Connecting Mains	Boston, Brookline, Newton
721 Southern Spine Distribution Mains	Boston, Brookline, Canton, Milton, Norwood, Quincy, Dedham, Westwood, Stoughton
722 Bear Hill Improvements - Section 29 Rehabilitation	Reading, Stoneham, Wakefield, Winchester, Woburn
723 Northern Low Service Rehab. - Sections 8	Chelsea, Boston, Everett
725 Hydraulic Model Update	All Water Communities
727 SEH Redundancy & Storage	Boston, Brookline, Canton, Milton, Norwood, Dedham, Westwood, Stoughton
730 Weston Aqueduct Supply Mains	Weston, Newton, Boston, Watertown, Cambridge, Waltham, Belmont, Arlington, Somerville
731 Lynnfield Pipeline	Lynnfield, Saugus
732 Walnut St. & Fisher Hill Pipeline Rehabilitation	Boston
753 Central Monitoring System	All Water Communities
763 Distribution Systems Facilities Mapping	All Water Communities
766 Waterworks Facility Asset Protection	All Water Communities
881 Centralized Equipment Purchase	All MWRA Customers
925 Technical Assistance	All MWRA Customers
930 North Maintenance Facility - Chelsea	All MWRA Customers
931 Business Systems Plan	All MWRA Customers
932 Environmental Remediation	All MWRA Customers
933 Capital Maintenance Planning/Development	All MWRA Customers
934 MWRA Facilities Management	All MWRA Customers

# APPENDIX 5

## Municipality and Project Reference by Project

**APPENDIX 5  
MUNICIPALITY/PROJECT(s)**

<b>Municipality Project Number/Project</b>	<b>Municipality Project Number/Project</b>
<b>All MWRA COMMUNITIES</b>	<b>Ashland</b>
881 Equipment Purchase	136 West Roxbury Tunnel
925 Technical Assistance	
930 MWRA Facility - Chelsea	
931 Business Systems Plan	<b>Bedford</b>
932 Environmental Remediation	702 New Connecting Mains - Shaft 7 to WASM 3
933 Capital Maintenance Planning/Development	704 Rehabilitation of Other Pump Stations
934 MWRA Facilities Management	708 Northern Extra High Service - New Pipelines
<b>ALL WASTEWATER COMMUNITIES</b>	<b>Belmont</b>
128 Infiltration/Inflow Local Financial Assistance Program	702 New Connecting Mains - Shaft 7 to WASM 3
132 Corrosion & Odor Control Study	704 Rehabilitation of Other Pump Stations
137 Wastewater Central Monitoring	730 Weston Aqueduct Supply Mains
141 Wastewater Process Optimization	
142 Wastewater Metering System Equipment Replacement	<b>Boston</b>
145 Interception & Pumping Facilities Asset Protection	136 West Roxbury Tunnel
146 D.I. Cross Harbor Tunnel	139 South System Relief Project
200 Deer Island Plant Optimization	324 CSO Support
206 Deer Island Treatment Plant Asset Protection	339 North Dorchester Bay & Reserve Channel Conduits/CSO
271 Residuals Asset Protection	340 South Dorchester Bay Sewer Separation (Fox Point)
	341 South Dorchester Bay Sewer Separation (Commercial Pt.)
<b>ALL WATER COMMUNITIES</b>	342 Neponset River Sewer Separation
541 Watershed Protection	344 Stony Brook Sewer Separation
597 Winsor Dam Hydroelectric	347 East Boston Branch Sewer Relief
601 Sluice Gate Rehabilitation	348 BOS019 Storage Conduit
620 Wachusett Reservoir Spillway	350 Union Park Detention Treatment Facility
621 Watershed Land	351 BWSC Floatables Control
622 Cosgrove/Wachusett Redundancy	353 Upgrade Existing CSO Facilities
623 Dam Projects	354 Hydraulic Relief Facilities
624 Wachusett Aqueduct Pressurization	355 MWR003 Gate and Siphon
625 Long-Term Redundancy	356 Fort Point Channel Sewer Separation
677 Valve Replacement	357 Charles River CSO Controls
712 Cathodic Protection of Distribution Mains	358 Morrissey Boulevard Drain
725 Hydraulic Model Update	359 Reserved Channel Sewer Separation
753 Central Monitoring System	361 Bulfinch Triangle Sewer Separation
763 Distribution Systems Facilities Mapping	545 Blue Hills Covered Storage
765 Local Water Pipeline Improvement Loan Program	549 SEH Additional Storage
766 Watertown Facility Asset Protection	683 Heath Hill Road Pipe Replacement
	693 Northern High Service Pipe Improvements - Revere/Malden
<b>ALL WATER COMMUNITIES (except South Hadley, Chicopee, Wbraham, Worcester, Clinton, and Leominster)</b>	702 New Connecting Mains - Shaft 7 to WASM 3
542 Walnut Hill Treatment Plant	704 Rehabilitation of Other Pump Stations
	713 Spot Pond Supply Mains Rehabilitation
544 Norumbega Covered Storage	714
604 MetroWest Tunnel	Southern Extra High - Sections 41, 42, and 74
	719
<b>Arlington</b>	Chestnut Hill Connecting Mains
702 New Connecting Mains - Shaft 7 to WASM 3	721 Southern Spine Distribution Mains
704 Rehabilitation of Other Pump Stations	723 Northern Low Service Rehab. - Sections 8 & 57
708 Northern Extra High Service - New Pipelines	727 SHE Redundancy & Storage
713 Spot Pond Supply Mains Rehabilitation	730 Weston Aqueduct Supply Mains
730 Weston Aqueduct Supply Mains	732 Walnut St. & Fisher Hill Pipeline Rehabilitation
730 Weston Aqueduct Supply Mains	<b>Braintree</b>
	104 Braintree-Weymouth Relief Facilities

**APPENDIX 5  
MUNICIPALITY/PROJECT(s)**

<b>Municipality Project Number/Project</b>	<b>Municipality Project Number/Project</b>
<b>Brookline</b> 131 Upper Neponset Valley Sewer System 136 West Roxbury Tunnel 357 Charles River CSO Controls 360 Brookline Sewer Separation 683 Heath Hill Road Pipe Replacement 704 Rehabilitation of Other Pump Stations 714 Southern Extra High - Sections 41, 42, and 74 719 Chestnut Hill Connecting Mains 721 Southern Spine Distribution Mains 727 SHE Redundancy & Storage	<b>Chicopee</b> 543 Quabbin Water Treatment Plant 548 Nash Hill Covered Storage 615 Chicopee Valley Aqueduct Redundancy 616 Quabbin Transmission System
<b>Burlington</b> 127 Cummingsville Replacement Sewer	<b>Clinton</b> 210 Clinton Wastewater Treatment Plant
<b>Cambridge</b> 324 CSO Support 346 Cambridge CAM002-004 Sewer Separation 352 Cambridge Floatables Control 353 Upgrade Existing CSO Facilities 354 Hydraulic Relief Projects 355 MWR003 Gate and Siphon 357 Charles River CSO Controls 713 Spot Pond Supply Mains Rehabilitation 730 Weston Aqueduct Supply Mains	<b>Dedham</b> 131 Upper Neponset Valley Sewer System 136 West Roxbury Tunnel 727 SEH Redundancy & Storage
<b>Canton</b> 101 Wastewater Metering System Upgrade 545 Blue Hills Covered Storage 549 SEH Additional Storage 704 Rehabilitation of Other Pump Stations 714 Southern Extra High - Sections 41, 42, and 74 721 Southern Spine Distribution Mains 727 SHE Redundancy & Storage	<b>Dover</b> 136 West Roxbury Tunnel
<b>Chelsea</b> 101 Wastewater Metering System Upgrade 324 CSO Support 347 East Boston Branch Sewer Relief 349 Chelsea Trunk Sewer 713 Spot Pond Supply Mains Rehabilitation 723 Northern Low Service Rehab. - Sections 8 & 57	<b>Everett</b> 347 East Boston Branch Sewer Relief 713 Spot Pond Supply Mains Rehabilitation 723 Northern Low Service Rehab. - Sections 8 & 57
	<b>Framingham</b> 136 West Roxbury Tunnel 617 Sudbury/Weston Aqueduct
	<b>Hingham</b> 104 Braintree-Weymouth Relief Facilities
	<b>Holbrook</b> 104 Braintree-Weymouth Relief Facilities 617 Sudbury/Weston Aqueduct

**APPENDIX 5  
MUNICIPALITY/PROJECT(s)**

<b>Municipality Project Number/Project</b>	<b>Municipality Project Number/Project</b>
<b>Lexington</b>	<b>Milton</b>
702 New Connecting Mains - Shaft 7 to WASM 3	139 South System Relief Project
704 Rehabilitation of Other Pump Stations	545 Blue Hills Covered Storage
708 Northern Extra High Service - New Pipelines	704 Rehabilitation of Other Pump Stations
	714 Southern Extra High - Sections 41, 42, and 74
	721 Southern Spine Distribution Mains
	727 SEH Redundancy & Storage
<b>Lynn</b>	<b>Nahant</b>
618 Northern High NW Trans Section 70-71	618 Northern High NW Trans Section 70-71
689 James L. Gillis Pump Station Rehabilitation	689 James L. Gillis Pump Station Rehabilitation
692 Northern High Service Section 27 Improvements	692 Northern High Service Section 27
693 Northern High Service Pipe Improvements - Revere/Malden	693 Northern High Service Pipe Improvements - Revere/Malden
<b>Lynnfield</b>	<b>Natick</b>
618 Northern High NW Trans Section 70-71	136 West Roxbury Tunnel
689 James L. Gillis Pump Station Rehabilitation	617 Sudbury/Weston Aqueduct Repairs
731 Lynnfield Pipeline	
<b>Malden</b>	<b>Needham</b>
689 James L. Gillis Pump Station Rehabilitation	136 West Roxbury Tunnel
693 Northern High Service Pipe Improvements - Revere/Malden	
713 Spot Pond Supply Mains Rehabilitation	
<b>Marblehead</b>	<b>Newton</b>
618 Northern High NW Trans Section 70-71	131 Upper Neponset Valley Relief Sewer
689 James L. Gillis Pump Station Rehabilitation	136 West Roxbury Tunnel
692 Northern High Service Section 27	702 New Connecting Mains - Shaft 7 to WASM 3
693 Northern High Service Pipe Improvements - Revere/Malden	715 Newton Service Improvements
	719 Chestnut Hill Connecting Mains
	730 Weston Aqueduct Supply Mains
<b>Medford</b>	<b>Norwood</b>
547 Fells Covered Storage	545 Blue Hills Covered Storage
689 James L. Gillis Pump Station Rehabilitation	549 SEH Additional Storage
702 New Connecting Mains - Shaft 7 to WASM 3	704 Rehabilitation of Other Pump Stations
713 Spot Pond Supply Mains Rehabilitation	714 Southern Extra High - Sections 41 and 42
	721 Southern Spine Distribution Mains
	727 SEH Redundancy & Storage
<b>Melrose</b>	<b>Peabody</b>
618 Northern High NW Trans Section 70-71	618 Northern High NW Trans Section 70-71
689 James L. Gillis Pump Station Rehabilitation	689 James L. Gillis Pump Station Rehabilitation
	693 Northern High Service Pipe Improvements - Revere/Malden

**APPENDIX 5  
MUNICIPALITY/PROJECT(s)**

<b>Municipality Project Number/Project</b>	<b>Municipality Project Number/Project</b>
<b>Quincy</b>	<b>Wakefield</b>
104 Braintree-Weymouth Relief Facilities	618 Northern High NW Trans Section 70-71
545 Blue Hills Covered Storage	689 James L. Gillis Pump Station Rehabilitation
721 Southern Spine Distribution Mains	722 Bear Hill Improvements - Section 29 Rehabilitation
<b>Randolph</b>	<b>Waltham</b>
104 Braintree-Weymouth Relief Facilities	702 New Connecting Mains - Shaft 7 to WASM 3
	704 Rehabilitation of Other Pump Stations
	708 Northern Extra High Service - New Pipelines
	730 Weston Aqueduct Supply Mains
<b>Reading</b>	<b>Watertown</b>
689 James L. Gillis Pump Station Rehabilitation	702 New Connecting Mains - Shaft 7 to WASM 3
722 Bear Hill Improvements - Section 29 Rehabilitation	704 Rehabilitation of Other Pump Stations
	730 Weston Aqueduct Supply Mains
<b>Revere</b>	<b>Wellesley</b>
324 CSO Support	136 West Roxbury Tunnel
349 Chelsea Trunk Sewer	617 Sudbury/Weston Aqueduct Repairs
353 Upgrade Existing CSO Facilities	
693 Northern High Service Pipe Improvements - Revere/Malden	<b>West Roxbury</b>
	131 Upper Neponset Valley Relief Sewer
<b>Saugus</b>	<b>Weston</b>
618 Northern High NW Trans Section 70-71	617 Sudbury/Weston Aqueduct Repairs
689 James L. Gillis Pump Station Rehabilitation	730 Weston Aqueduct Supply Mains
693 Northern High Service Pipe Improvements - Revere/Malden	
731 Lynnfield Pipeline	<b>Westwood</b>
	714 Southern Extra High - Sections 41, 42, and 74
<b>Somerville</b>	721 Southern Spine Distribution Mains
324 CSO Support	727 SEH Redundancy & Storage
353 Upgrade Existing CSO Facilities	
702 New Connecting Mains - Shaft 7 to WASM 3	<b>Weymouth</b>
713 Spot Pond Supply Mains Rehabilitation	104 Braintree-Weymouth Relief Facilities
730 Weston Aqueduct Supply Mains	
<b>South Hadley</b>	<b>Winchester</b>
543 Quabbin Water Treatment Plant	127 Cummingsville Replacement Sewer
615 Chicopee Valley Aqueduct Redundancy	689 James L. Gillis Pump Station Rehabilitation
616 Quabbin Transmission System	702 New Connecting Mains - Shaft 7 to WASM 3
	704 Rehabilitation of Other Pump Stations
<b>Stoneham</b>	722 Bear Hill Improvements - Section 29 Rehabilitation
618 Northern High NW Trans Section 70-71	
689 James L. Gillis Pump Station Rehabilitation	<b>Winthrop</b>
722 Bear Hill Improvements - Section 29 Rehabilitation	693 Northern High Service Pipe Improvements - Revere/Malden
<b>Stoughton</b>	<b>Woburn</b>
714 Southern Extra High - Sections 41, 42, and 74	127 Cummingsville Replacement Sewer
721 Southern Spine Distribution Mains	689 James L. Gillis Pump Station Rehabilitation
727 SEH Redundancy & Storage	722 Bear Hill Improvements - Section 29 Rehabilitation
<b>Sudbury</b>	
617 Sudbury/Weston Aqueduct Repairs	
<b>Swampscott</b>	
618 Northern High NW Trans Section 70-71	
689 James L. Gillis Pump Station Rehabilitation	
692 Northern High Service Section 27	
<b>Wilbraham</b>	
543 Quabbin Water Treatment Plant	
615 Chicopee Valley Aqueduct Redundancy	
616 Quabbin Transmission System	

# APPENDIX 6

## MWRA Completed Projects



## APPENDIX 6

### MWRA Completed Projects (as of December 31, 2006)

Project	Total Cost (\$000)	Completion Date	Summary
<b>Wastewater</b>	\$4,168,173		
<b>Waterworks</b>	\$191,472		
<b>Business and Operations Support</b>	\$33,644		
<b>MWRA Total</b>	<b>\$4,393,289</b>		

<b>Wastewater</b>			
Boston Gatehouses	\$65	Dec-86	Identification of alternatives to minimize construction impacts.
Boston Harbor Project	\$3,519,253	Nov-01	BHP constructed to minimize the pollution of Boston Harbor. The new Deer Island Primary and Secondary Treatment Facilities are the largest components of the Project to comply with the requirements of the federal Clean Water Act and to improve the harbor for recreational and commercial uses.
Chelsea CSO Facility	\$90	Jan-91	Elimination of sewage overflows.
Deer Island Microwave Equipment Replacement	\$235	Nov-86	Replacement of obsolete equipment.
Deer Island Sludge Grinding	\$291	Jun-87	Improvements to Deer Island sludge grinding system.
Industrial Waste-Technical Support	\$63	Oct-86	Provision of laboratory services for the Toxic Reduction and Control Department.
Porter Street Construction	\$136	Sep-93	Reimbursement to Central Artery project for CSO related construction.
Residuals Management – Interim Phase	\$109,407	Feb-92	Construction of the Residual Treatment Facility at the FRSA. Termination of sludge discharge to Boston Harbor.
Residuals Management Walpole Landfill	\$15,025	Sep-93	Development of minor residuals landfill plan.
S.101 Wastewater Metering	\$7,516	Dec-93	Construction of system to provide accurate flow data.
S.102 Quincy Pump Facilities	\$25,897	Sep-03	Constructed 3 new pumpstation and rehabbed force mains to ensure continuous pumping to treatment facilities.
S.103 Hingham Pump Station	\$3,027	Apr-92	Elimination of untreated sewage discharges.
S.105 New Neponset Valley Relief Sewer	\$30,300	Jul-96	Relief facilities to correct structural and hydraulic deficiencies in the New Neponset Valley Interceptor Sewer System.
S.106 Wellesley Extension Replacement Sewer	\$64,359	Jan-96	Construction of a replacement sewer and rehabilitation of sections of existing sewer lines to alleviate capacity restraints, improve the water quality of the Charles River, protect aquifers, and reduce back-ups in Needham and Dedham.
S.107 Framingham Extension Relief Sewer	\$47,855	Sep-04	Installation of a new force main and gravity sewer and construction of a new pumpstation.
S.108 Alewife Brook Parkway Pump Station Rehabilitation	\$1,455	May-95	Replacement of equipment, construction of building addition and wetwell modifications.
S.110 East Boston Pump Facilities	\$48,304	Jan-93	Constructed to eliminate sewage back-ups.
S.111 Bremen Street Siphon Replacement	\$102	Mar-90	Evaluation of current siphon condition and development of a system for improved waste disposal.
S.112 Charlestown Pump Station Replacement	\$32,529	Apr-93	New 93 mgd pump station to increase pumping efficiency and eliminate overflows to the Mystic River.
S.113 Millbrook Valley Interceptor Relief Sewer	\$6,176	Mar-88	Increase in flow capacity to eliminate surcharges.
S.114 Southern System Modeling	\$2,607	Jun-88	Collection and study of flow data needed for system capacity assessment.

## APPENDIX 6

### MWRA Completed Projects (as of December 31, 2006)

Project	Total Cost (\$000)	Completion Date	Summary
S.115 Reading Pump Station Replacement and Extension	\$412	Sep-87	Elimination of surcharges, reduction in staff requirements, and correction of safety hazards.
S.117 Slade's Siphon	\$1	Sep-88	Elimination of seawater inflows and sewage overflows.
S.118 Bell Isle Siphon Rehabilitation	\$78	Apr-89	Reduction of salt water infiltration and increase in system capacity.
S.129 North Metropolitan Trunk Sewer	\$11,997	Mar-99	Rehabilitation of a 19,700 linear-foot 100-year old sewer line.
S.130 Siphon Structure Rehab	\$940	Nov-98	Planning for the rehab and improvement of 127 siphons to improve flow and increase odor control.
S.138 Sewerage System Mapping	\$281	Apr-04	Updated and new GIS maps of sewer system.
S.143 Regional I/I Management Planning	\$169	Jun-03	Reduction in infiltration and inflow water entering the MWRA system.
S.178 Deer Island Dual Fuel Engine/Generator	\$32,943	Dec-89	Provision of uninterrupted electricity supply for Deer Island.
S.178 Deer Island Pump and Power Station Upgrade	\$32,943	Feb-91	Constructed to prevent sewage surcharges and overflows in the upstream sewer system by improving flows to Deer Island Tunnel System and Plant.
S.179 Deer Island Remote Headworks Improvements	\$27,450	Jul-99	Facility rehabilitation restored headworks capacity.
S.180 D.I. Sedimentation Tank System Improvements	\$1,657	Jul-89	Restoration of operating efficiency by replacing 80 inlet sluice gates and baffles, rehabilitation of control building and other improvements.
S.181 Deer Island Intermediate Upgrade	\$9,490	Jun-92	Upgrade of the old Deer Island treatment plant.
S.184 Nut Island Immediate Upgrade	\$1,254	Dec-86	Upgrade or replacement of equipment, including switch gear, sludge cross collectors and replacement of electric distribution substation to accommodate increased flows to Deer Island Treatment Plant.
S.185 Clinton Wastewater Treatment Plant	\$36,747	Sep-92	Upgrade existing plant to improve water quality and meet standards by rehabbing and new equipment.
S.187 Deer Island Sludge Thickeners Rebuilding	\$114	Sep-88	Ensuring efficient operation of Deer Island treatment plant digesters.
S.190 Deer Island Electrical Equipment Upgrade	\$27	Mar-88	Restoration of system operating efficiency.
S.191 Deer Island Chlorination Facility Rehabilitation	\$4	Mar-89	Provision of effective disinfection operation and safe working environment.
S.192 Deer Island Operation and Construction Coordination Program	\$733	Jan-89	Provision of coordination services for operations and construction activities.
S.193 Deer Island Odor Monitoring	\$334	Feb-89	Provision of data needed to develop odor management plan for Deer Island.
S.194 Nut Island Intermediate Upgrade	\$2,686	Dec-92	Improvements to ensure effective operation of the Nut Island treatment plant.
S.195 Deer Island Digester Rehabilitation	\$7,354	Oct-86	Restoration of digester operating efficiency.
S.197 Deer Island Treatment Plant Outfall Repair	\$1,300	Sep-97	Repair of effluent discharge Outfall 002.

## APPENDIX 6

### MWRA Completed Projects (as of December 31, 2006)

Project	Total Cost (\$000)	Completion Date	Summary
S.198 Boston Harbor Performance Certification	\$1,276	Dec-02	Certification required for continuous federal grant and loan programs during construction.
S.259 Interim Scum Management	\$22	Jul-89	Provision of an interim scum processing solution.
S.261 Residuals	\$63,811	Dec-01	<i>To expand the residuals processing plant at the Fore River Staging Area in Quincy to provide the capacity to process the sludge quantities produced by Deer Island.</i>
S.325 Fox Point CSO Facility	\$160	Apr-89	Elimination of untreated sewage discharges.
S.326 Commercial Point CSO Facility	\$7,117	Feb-91	Improvements to water quality by reducing wet weather overflows via construction of a screening and disinfection facility.
S.327 Southwest Corridor CSO	\$290	Fall 86	Elimination of combined sewer overflows.
S.328 Industrial Discharge Limitations	\$215	Aug-86	Development of industrial discharge limitation guidelines.
S.330 St. Mary's Street CSO Modifications	\$17	Feb-87	Identification of solution for storm water detention.
S.331 Constitution Beach CSO Facility	\$1,265	Sep-87	Elimination of untreated sewage discharges into Boston Harbor.
S.332 Cottage Farm CSO and Charlestown Pump Repair	\$133	Dec-87	Restoration of system capacity.
S.332 Somerville Marginal CSO Rehabilitation	\$98	Feb-89	Elimination of inadequately treated sewage discharges.
S.335 Moon Island CSO Facility	\$269	Sep-86	Examination of options for treatment of CSO discharges.
S.338 Cottage Farm CSO Ventilation System Repairs	\$133	Sep-94	Rehabilitation of HVAC duct work.
S.402 Comprehensive Safety Action Project	\$891	Nov-90	Correction of safety hazards at MWRA facilities and establishment ongoing safety management program.
S.403 Sewerage Division Management Services	\$1,930	Dec-86	Provision of engineering design and construction advice.
S.922 Fore River Preservation	\$4,946	Nov-97	Modify FRSA for on-going construction and operational support.
S.924 Harbor Environmental Studies	\$1,666	Jun-92	Collection and study of harbor water quality data.
Watertown Siphon Reconstruction	\$328	May-88	Extension of Watertown sewer system useful life.
<b>Sub-Total Wastewater</b>	<b>\$4,168,173</b>		

## APPENDIX 6

### MWRA Completed Projects (as of December 31, 2006)

Project	Total Cost (\$000)	Completion Date	Summary
<b>Waterworks</b>			
Air Release Valves	\$82	Apr-90	Removal of excess air to maintain the carrying capacity of pipes.
Cosgrove Intake Screens	\$317	Dec-87	Prevention of debris entering the aqueducts.
Cosgrove Intake Turbine Repair	\$225	Jul-86	Full resumption of hydroelectric power generation.
Instrumentation Telemetry	\$24	Sep-86	Development of a future operation plan for the water distribution system.
S.532 Long-Range Water Supply	\$5,579	Apr-89	Identification of water supply programs.
S.533 Local Sources of Supply	\$2,108	Jul-95	Provision of assistance to communities to promote effective <u>protection of existing local water supply sources and encourage</u>
S.535 Reservoir Risk Assessment	\$647	Jun-92	Development of maps and data to determine at risk areas.
S.538 Sudbury Reservoir Treatment Plant Study and EIR	\$513	Sep-92	Evaluation of alternative uses of the Sudbury Reservoir.
S.541 Watershed Protection	\$8,500	Dec-03	To develop watershed protection measures for the MWRA/MDC <u>reservoir system.</u>
S.547 Fells Covered Storage	\$17,995	Jun-00	Covered storage for Northern High Service System.
S.548 Nash Hill Covered Storage	\$14,297	Jul-99	To improve the quality of drinking water to the three Chicopee <u>Valley Aqueduct communities.</u>
S.598 Wachusett Reservoir Bypass Tunnel	\$15	Jan-89	Evaluation of the option of constructing a tunnel by-pass.
S.599 Dam Control Valve Replacement	\$1,751	Jul-98	Valve replacement at Sudbury Reservoir in Southborough and Wachusett Dam.
S.600 Oakdale Power Station Generator Repair	\$881	Sep-91	Repair of substation metering and transformer systems.
S.602 Hultman – Weston Aqueduct Transfer for Hydropower	\$4,506	May-89	Production of approximately 3,700,000 kW hours per year of electricity.
S.603 Transmission Maintenance Facility	\$5,025	May-93	Construction of new waterworks maintenance facility in <u>Southborough.</u>
S.605 Echo Bridge Rehabilitation	\$356	Sep-92	Repair and cleaning of bridge façade and construction of new <u>surface topping.</u>
S.606 Norumbega Chlorination Facility	\$10	Mar-89	Provision of a new water disinfection facility.
S.607 Weston Reservoir Chlorination Facility	\$2,539	Jun-93	Replacement of obsolete facility with new 4,000 sq.ft. <u>chlorination and ammonia feed facility.</u>
S.675 Water Distribution Master Plan	\$1,178	Mar-93	Development of data base and recommendations for master plan.
S.678 Boston Low Service Pipe & Valve Rehab	\$23,691	Sep-03	<i>Improve the condition and operability of the pipelines serving the Boston Low Service System.</i>

## APPENDIX 6

### MWRA Completed Projects (as of December 31, 2006)

Project	Total Cost (\$000)	Completion Date	Summary
S.679 Nonantum Road Pipe Rehabilitation	\$2,138	Mar-97	Rehabilitation and/or replacement of deteriorated pipeline.
S.681 Southern Service Improvements	\$14,458	Oct-99	Reliability and capability improvements to pipelines and pump stations serving the Southern service area.
S.684 Commonwealth Ave Pump Station	\$8,509	Dec-99	Modernize and improve station serving a major portion of Newton.
S.685 Ward Street Pump Station	\$35	Aug-89	Evaluation of the feasibility of pump station rehabilitation.
S.686 Dudley Road Pump Station	\$55	Jun-91	Evaluation of the feasibility of pump station rehabilitation.
S.687 Lexington St Pump Station Rehabilitation	\$3,985	Jun-99	Installation of larger capacity pumping units, backup power generation, and various electrical upgrades.
S.688 Northern Immediate High Service	\$1,026	Aug-92	Increase in water treatment capacity.
S.688 Northern Intermediate High Pipelines	\$927	Nov-88	Increase in pipe capacity and pressure.
S.690 Northern Low Service Pipeline Replacement	\$714	Aug-99	Repair of Section 16W with replacement and pipe slip lining methods.
S.691 Northern High Service Improvements - Lynn Pipeline	\$13,483	Jun-99	Installation of a new primary supply line for the northeast section of the Northern High Service System.
S.694 General Edwards Bridge Pipe Replacement	\$74	Nov-89	Repair of pipe leaks.
S.701 Northern Extra High Service – Bedford Pipeline	\$71	Jan-92	Development of a plan to supply water to Bedford.
S.706 NHS - Con. Mains from Section 91	\$2,342	Jun-02	To integrate the new Section 91 pipeline with the existing grid network, improving service pressures and reliability to community meters.
S.715 Newton Service Improvements	\$5,762	Nov-99	New supply to Newton's Oak Hill Tank replacing an antiquated pump station and providing some system redundancy in the area.
S.716 Water Main Relocation in Chelsea River	\$10,648	Nov-00	Relocation of the Section 8 water main over the Chelsea River.
S.717 Blue Hills Reservoir Cover – Quincy	\$31	Dec-86	Identification of solutions to a seagull contamination problem.
S.720 Warren Cottage Line Rehab	\$1,205	Dec-02	To improve the carrying capacity and internal condition of the Warren Cottage Line.
S.723 Northern Low Service – Section 57	\$1,814	Oct-87	Restoration of pipe capacity and pressure.
S.754 Domestic Device Retrofit	\$10,319	Dec-93	Installation of water saving devices to reduce demand.
S.755 Leak Detection Survey	\$751	Aug-90	Provision of data on the magnitude and location of water leaks.
S.756 Asbestos Abatement	\$562	Aug-90	Elimination of asbestos in MWRA facilities.
S.757 PCB Abatement	\$432	Aug-91	Replacement of equipment with unacceptable levels of PCB
S.758 Rehab of Existing	\$14,205	Nov-02	Upgrade various facilities in need of significant capital
S.759 Municipal Toilet Replacement	\$127	Dec-90	Reduction in water consumption.
S.764 Local Water Infrastructure Rehab Asst. Program	\$7,488	Jun-04	To provide financial support to MWRA waterworks communities to replace, rehabilitate, and maintain their waterworks system infrastructures.
S.926 Chestnut Hill Low Service Pump Station	\$72	May-88	Repair of the front granite steps of the station.
<b>Sub-Total Water</b>	<b>\$191,472</b>		

## APPENDIX 6

### MWRA Completed Projects (as of December 31, 2006)

Project	Total Cost (\$000)	Completion Date	Summary
<b>Business &amp; Operations Support</b>			
S.882 Radio Communications System	\$1,000	Sep-89	Enhancement of communication among geographically dispersed facilities.
S.901 Charlestown Headquarters	\$6,827	Jun-91	Provision of office equipment at MWRA headquarters.
S.902 Permanent Headquarters	\$161	Jun-87	Examination and evaluation of options for relocation of office space.
S.903 Vehicle Maintenance Garage	\$412	Mar-89	Improved management and maintenance control of the vehicle fleet.
S.921 Management Information Systems	\$24,117	Dec-92	Enhancement to information systems to support more effective management of MWRA business activities.
S.923 Engineering Feasibility Study	\$249	Jun-89	Evaluation of the integrity of the water and wastewater systems.
S.928 MWRA Mitigation Program	\$475	Oct-88	Mitigation of the construction impacts of the Deer Island Treatment Plant on Winthrop.
S.929 Affirmative Action Study	\$403	Mar-91	Evaluation of minority participation in the MWRA procurement process.
<b>Sub-Total BOS</b>	<b>\$33,644</b>		