



**WATER SUPPLY CITIZENS
ADVISORY COMMITTEE**
to the Mass. Water Resources Authority

485 Ware Road
Belchertown MA 01007
(413) 213-0454
fax: (413) 213-0537
email: info@wscac.org

WAC/WSCAC Meeting

Location: Waterworks Museum
Boston, MA
February 12, 2019 – 10:30 A.M.

WSCAC Members in Bold in Attendance:

Michael Baram, WSCAC Chair, BU
Whitney Beals, NE Forestry

William Copithorne, Town of Arlington

Andrea Donlon, CT River Conservancy
Gerald Eves, Trout Unlimited

Bill Fadden, OARS

Bill Kiley, BWSC

Paul Lauenstein, NepRWA

Jean McCluskey, ACEC/MA

Martha Morgan, Nashua River Watershed

Martin Pillsbury, MAPC

Janet Rothrock, League of Women Voters

Kurt Tramosch, Wayland Wells

Roger Wrubel, Mass Audubon

WAC Members in Attendance:

Wayne Chinouard
Adrianna Cillo, BWSC
James Guid, MWRA

Karen Lachmayr
Craig Allen

Non-Members in Attendance:

Andreae Downs, WAC
Stephen Estes-Smargiassi, MWRA
Kristin Hall, MWRA
Wendy Leo
Carl Leone

Lise Marx
Trevor O'Brien (Northeastern student)
Meshari Alzahrani (Northeastern student)
Mohammad Alhammadi (Northeastern student)
Saeed Alkhoori (Northeastern student)

WSCAC Business

WSCAC January meeting summary was approved.

Stephen Estes-Smargiassi presented the MWRA Update on 2018 Water and Wastewater Master Plan. The updates are done entirely by internal MWRA staff, and are used to provide the direction forward, record latest projects by the MWRA, and succession planning. He began with some background on MWRA Capital Investments. From FY1986 through FY2018, the MWRA has spent \$8.3 billion on capital spending. 70% (\$5.8 billion) of this was devoted to Wastewater, 28% (\$2.3 billion) on Waterworks, and 2% (\$200 million) went to Business and Operations Support. Additionally, Steve reviewed the Water System Infrastructure Replacement Asset Value, which totals approximately \$6.6 billion, broken down into sections ranging from tunnels/aqueducts to meters. These figures do not include the reservoirs, which are state-owned and managed by the Department of Conservation and Recreation (DCR). Wastewater System Infrastructure Replacement Asset Value totals

approximately \$6.7 billion, and is again broken down into sections ranging from the Deer Island Treatment Plant to sewer pipelines.

An overview of MWRA Master Planning revealed that the forty-year Master Plan has planned updates every 5 years. Recent updates include one in 2006 (for FY2007-FY2048) and 2013 (for FY2014-FY2053). The latest iteration includes all projects that are programmed in FY2019 CIP, as well as additional projects that are recommended for the next 40 year planning period. MWRA is focusing on the next two CIP Cap Periods (FY2019-FY2023 and FY2024-FY2028).

Steve emphasized that there is a difference between the Master Plan (which involves a detailed listing, explanation, and prioritization of all short and long-term projects that impact capital needs over a 40-year period, and is used by Staff and Advisory Board to develop capital investment priorities during development of annual CIP and to help project long-term rates), and the Business Plan (which is a concise listing of MWRA goals over a 5-year period, and is used to engage the Board of Directors and outside agencies in discussion of MWRA's goals and the plan to meet them).

The presentation reviewed the goals of the Water System, which are as follows:

1. Provide reliable water delivery
2. Deliver high quality water
3. Assure an adequate supply of water
4. Manage the system efficiently and effectively

The 2018 Master Plan specifies that the five-year (FY2019-FY2023) CIP Cap is \$984.8M, and that the FY2019 Approved CIP Spending for one year is \$122.9M (excluding community grant and loan programs). It identifies the System Needs as \$5.7 billion over 40 years (\$2.6B of that is devoted to water, \$3.2B to wastewater).

Steve provided an MWRA Water System Overview with details about the water system including the number of miles of active transmission mains and tunnels (102 miles), and standby transmission facilities (43 miles). The figures were accompanied by a map of the Water System, spanning from the Quabbin to Boston Harbor.

The Water System Master Plan themes have changed over the past two five-year plans. Steve showed a comparison of 2006 and 2013, and then 2013 and 2018 (for details of the changes, please see [this presentation link](#), pages 11-12). The plan includes certain basic assumptions, including that the MWRA will have enough water to stay beneath the safe yield mark (300 mgd) and fulfill future water needs. There will be no significant new regulations in the coming years, and that climate change impacts on yield will be insignificant.

The Master Plan recommends several projects to focus on in the next forty years, including: redundancy and storage projects (approximately \$1.72B); improvements and extensions to several facilities, including the Wachusett Aqueduct Pump Station, Northern Intermediate High, and the Section 75 Extension; inspections of the Quabbin Tunnel (included in CIP) and Cosgrove Tunnel and Metropolitan Tunnel System (recommended); and \$65M recommended for design/rehabilitation of the Metropolitan Tunnels.

There have been redundancy updates since the 2013 Master Plan. The construction of the Wachusett Aqueduct Pump Station, which will provide redundancy for the Cosgrove Tunnel, is nearing completion. Other redundancy issues include failure of Deep Rock Tunnels (unlikely), failure of surface connection valves and piping (possible), failure of the surface connection at a shaft (which can require isolation of a large portion of

the tunnel system), and older isolation valves at three key shafts which require maintenance, and must be taken out of service temporarily.

Additionally, the Metropolitan Tunnel Redundancy project is beginning, with procurement processes underway as well as a future contract for preliminary design and MEPA review which is planned for 2020. An interim Improvements Program has been implemented to mitigate risks during planning and construction of the proposed redundant tunnel, which includes new designs for improvements to the tops of shafts, improvements to the Chestnut Hill Emergency Pump Station, WASM 3 rehabilitation, improvements to low service PRV, and improvements to the Commonwealth Ave Pump Station, which is a redundant connection to the Low Service system. The Northern Intermediate High and the Southern Extra High Redundancy programs are underway.

The MWRA Metropolitan Area Storage Capacity has changed significantly over the past twenty years, and is now all covered storage. There are three areas that may need more storage in the future: Northern Intermediate High, Southern Extra High, and Northern Extra High. The question was posed as to whether there's been any push to add solar panels. This is considered, but it's always a trade-off – sacrificing public access and habitat, in return for greener energy.

The Metropolitan System has several existing and recommended rehabilitations coming up. There's a need to line older unlined cast-iron mains (in order to preserve the water quality), there's a planned expansion of the Cathodic Protection Program, and steel pipes that need to be repaired or replaced. A Pipeline Study is recommended in 2025 to assess needs for further rehabilitation.

Asset Protection Projects, both existing and recommended, total \$361M for the next forty years. This includes equipment, valves, pump stations, storage facilities, treatment facilities, transmission buildings, dams, and ancillary support systems. The Carroll Water Treatment Plant will likely need replacements or upgrades for its electrical and mechanical systems. Existing Carroll Plant projects total \$41M in FY2019 CIP, and an additional \$30M is recommended in FY2029-FY2058. The Water System Dams have had significant improvements applied to them over the past several years, and have an additional \$10M recommended for further improvements in FY2019-FY2058.

The MWRA provides no-interest loans for over 6,612 miles of community-owned water pipes, with approximately 1,800 miles (27%) of those still unlined. Since July 2000, they have distributed \$400M for repairs and rehabilitation, with two more phases of community funds recommended in FY2029-FY2048.

Existing projects and new recommendations total \$2.58B over the next 40 years, divided between water projects recommended in the FY19 CIP, and projects recommended in the Master Plan. These numbers do not include local water system assistance program funds.

The MWRA is working to increase renewable energy generation, improve energy efficiency, reduce greenhouse gas emissions, and prepare for sea level rise. As such, since 2006, they have seen a 16.8% increase in renewable energy generation, and a nearly 20% decrease in energy usage. Their greenhouse gas emissions have been reduced 32.1% in the same time frame. This has been accomplished through various methods, big and little – from changing out inefficient lightbulbs to improving insulation and eliminating mixers at the Carroll Treatment Plant. The next significant planned change will occur at Deer Island, via a combined heat and power plant replacement. Adapting for climate change is not its own line item, but rather opportunities present themselves as

projects for rehabilitation or renewal. For example, at Alewife Brook Pump Station, planned improvements include both exterior and interior flood logs, as well as a new valve for a landing drain.

Additionally, the MWRA is adding increased public access where they can, such as trails along aqueducts and at the Cambridge wetlands.

Steve went on to review progress and planned updates to the wastewater system.

The Q&A session revealed some additional information. Water use per capita has gone down due to low-flow toilets, showers, efficient dishwashers and washing machines, fewer leaks, and improved awareness of water waste. The maximum demand that the MWRA saw this past year was July 10, at 297.5mgd, while in the past, the daily average was 300 mgd.

The generation of renewable energy decreases when there's plenty of water in the reservoirs. Hydro generation occurs only when water is transferred between Quabbin and Wachusett. Fewer transfers occurred due to the abundance of rain and so less energy was generated.

When the reservoirs spill, the water goes into the Nashua River, the Sudbury River, and the Swift River (and from there to the Connecticut River). Historically, MWRA has had years where water was spilling into rivers all year long, actually more water was spilled than what was being withdrawn for human use. The spillway water does not currently produce power, though that is a desired goal. An economically viable plan for this hasn't been discovered yet.

In the early 1980s, a model on future water usage estimated that water needs in the metro Boston region would exceed 450 mgd by 2020. As we have seen, water demand has been greatly reduced from that time period thanks to greater efficiency and awareness.

The meeting was adjourned.

**WSCAC will meet again on March 12, 2019 at 10:00 AM at the MWRA Facilities in Southborough.
Please [visit our website](#) for more information on this meeting.**