

DRAFT
Minutes
Nov. 2, 2018

The Wastewater Advisory Committee to the MWRA met at MAPC, 60 Temple Pl., Boston, MA

Attendees/Contributors:

WAC: Wayne Chinouard, Philip Ashcroft, Adrianna Cillo (BWSC), James Guiod (AB), Mary Adelstein, Karen Lachmayr, Craig Allen, Stephen Greene (phone), George Atallah, Taber Keally, Zhanna Davidowitz, Martin Pillsbury

Guests: Belinda Stansbury, Kennan Vembu, Becky Weidman, Wendy Leo

Staff: Andreae Downs

FUTURE MEETING DATES/TOPICS

NEXT: Friday, Dec. 7 10:30am, MAPC: CSO Project update

VOTES:

October minutes

EXECUTIVE DIRECTOR'S REPORT: Karen Golmer has stepped down. Both Kennan Vembu and Belinda Stansbury are interested in WAC membership. WAC agreed to send a congratulatory note to Kathy Soni on retirement. Full report attached.

MWRA UPDATE: OMSAP Nov. 13th. MWRA producing an overview of its outfall monitoring, which should be available then. Sept and Oct storms—wet weather activity. Got a chance to test pumps at the Alewife Pump Station. Deer Island—working on influent gates to primary treatment. Clinton—finished summertime optimization of Phosphorus removal facility. Will collect more data through the winter. Lower phosphorus limit begins April 1, and treatment should be ready by then. Just submitted a report on the status of that. Also Larry Thomas taken over as director, is updating the Operations Manual. Landfill for sludge—first cell is full, still plenty of capacity in 2 & 3, but will start closing cell 1. EPA is looking at blending policy. Public comment period just closed.

AB UPDATE: MWRA finance team presented to AB Executive committee last month. Much more detail in this presentation, particularly around bonds. If you find that interesting, James Guiod has copies of a 41 page combined utility budget, includes debt service and what's owed by utility, and which pockets of debt. AB still advocating around phosphorus in Bay State fertilizer pellets. New regulations on biosolids, which may affect MWRA's sales. Trying to get studies done to show MWRA pellets do not leach. New video (<http://mwraadvisoryboard.com/phosphorus-and-mwra-pellets/>). Another area is TRAC fees. Two new Greensheet videos on finance—last year's and this year's. Rate survey should start to come out this month. Next AB meeting is Thursday, Nov. 17th at BWSC. Alex Dunn of EPA will NOT be there (as advertised).

PRESENTATION:

Becky Weidman, TRAC director

Hired in April from MassDEP, where was director of watershed management (monitoring, drinking water, water allocation permitting). Previously with Cadmus Group, working with small wastewater and drinking water utilities on a program called effective utility management. And before that at New England Interstate Water Pollution Control Commission working on a variety of Clean Water Act programs.

Moved via Pittsburgh, grew up in MN, CT, and DC.

John Riccio retired in January. Lot of other TRAC retirements and promotions out of TRAC to other positions. Currently 3 vacancies. 2018 was a year of transition for TRAC staff. Expecting more stability in 2019.

Had first EPA audit since 2009. Looked at 9 permits. Overall positive, EPA had a few questions. EPA's findings still not issued. No deficiencies found. EPA has 2 industrial pre-treatment staff for all of NE.

Annual report due Oct. 31 in both DI and Clinton sewerage service areas. Currently posted on MWRA website. Had some delays in permitting because of the staff transition. Timeline goals for issuance of Significant Industrial Users (SIU) permits were not all met last year, although the target number of issued permits was met. Getting back on track this year. Deer Island SIU permits must be issued within 120-180 days of the submittal of a completed application or permit expiration. Clinton SIU permits must be issued within 90 days of a completed application or permit expiration.

8m permitting program now part of TRAC—looks at work being done within the service area, particularly construction (near or over/under MWRA infrastructure). Brought in additional staff to help. TRAC core regulatory program within MWRA so made sense to work together. Still working to integrate into TRAC processes (e.g., integrating into the PIMS (industrial pre-treatment) database).

TRAC conducts a variety of sampling, including: industrial, local limits, and CSO to name a few projects. TRAC currently has 11 sampling associates, 2 senior sampling associates. MWRA's laboratory analyses a subset of samples collected by MWRA; however, some samples are sent to outside labs, e.g., whole effluent toxicity.

Stats: Over 4,000 commercial and industrial facilities. Track those with MWRA permits and those without. Will soon grow—going to regulate dental offices (1,000+). 1,300 active permits as of June 30th—moving target as facilities open & close. 195 significant industrial users. Other individual permittees: 231. 640 low-flow permittees. 116 food processors. Used to have a larger group of photo processors, down to 21. TRAC conducts regular surveys to find new industries that might require a new permit.

FY18—345 individual industrial users. Over 1300 inspections of industrial facilities. Inspect SIUs twice a year. Don't inspect restaurant grease traps, but look at gas and oil separators at gas stations. Permit and inspect septage receiving sites—136 of those in MWRA system. Over 2,800 monitoring events, which includes CSO and local limit sampling.

Low penalty collection year in FY18 (\$1,000). Expect more in FY19. 273 enforcement actions.

Many of MWRA's permitted SIUs are bio techs and pharma. Industry composition is changing. Used to have metal finishers, but have less now. Also have some steam electric plants and agriculture.

Is there coordination between DEP and MWRA?

Yes—have Mass DEP's operator certification and training coordinator attended both of TRAC's 2018 SIU meetings. TRAC works closely with EPA because MA is not a NPDES delegated state.

In FY19—looking to revise TRAC regulations—3 sets—360 CMR 1.00 (adjudicatory proceedings), 360 CMR 2.00 (enforcement and administrative penalties), and 360 CMR 10.000 (sewer use).

Revision driven by EPA 2005 electronic reporting requirement—also looking to get all reports electronically, and 2017 federal dental effluent guidelines. MWRA is now required to regulate a subset of dental facilities— they must have installed an amalgam separator—state already has a program in place. MWRA will be asking all dental offices to submit a one-time compliance form to determine if they are regulated under the new federal effluent guidelines. Looking at a group 5-year permit for dental offices. MWRA will occasionally audit to make sure dentists are maintaining equipment.

Also in regulations: as a result of the new Clinton NPDES permit MWRA reviewed the Clinton local limits and made a few recommended changes: FOG, formaldehyde, and the list of regulated total toxic organics. Hope to have out for public comment in spring 2019.

Also reviewing program incentive fee increases. Looking to make whatever we set good for 5 years (through FY24). Can't tie to an unknown escalator, like Consumer Price Increase.

JG: Advisory Board stance is that fees need to represent about 50% of TRAC costs. Many years' lag, and AB would like to see the rates reflect the lost years. Current fees haven't been updated since FY12.

Local limits are currently different for Deer Island and Clinton service areas.

BS: DI fairly generous with industrial operations, because have such large capacity. Saves smaller industries money to locate here. Also different limits because discharge into marine waters, not freshwater. But mostly capacity and flow.

GA: Ask about enforcement escalation process—enforcement response plan. 1. Notice of violations; 2. Notice of non-compliance 3. Orders 4. Fines. Have 4 compliance coordinators and a manager, plus support staff and a lawyer. Common violations are forgetting to send reports, limit violations.

SIUs—TRAC determines if in significant non-compliance (SNC). Annual report lists those industries in non-compliance.

Director's Report November 2018:

Karen Golmer—stepping down.

She sends everyone her best, but with two jobs is having difficulty making meetings. Hopes to come by now & again.

10/4: 495/MetroWest Partnership: Think Blue Massachusetts—stormwater coalition

Framingham s/w engineer Kerry Reed

Robin Craver, Charlton town administrator, chair of the MA statewide Municipal Stormwater Coalition. “Build it once, share it widely.” 10 regional coalitions, over 130 of the MS4 communities, but still many communities not in the coalition yet.

Doing education with DEP stormwater grant of \$200K “Think Blue Massachusetts” Kick off is 10/5. Posters, flyers, billboards developed.

MS4 permit—phase II, 260 communities of <100,000 people.

Challenges

- no dedicated \$\$ for s/w. Competing for general fund \$\$.
- Overwhelming new requirements under MS4
- No single authority over stormwater—conservation, highway, water & sewer
- Limited public knowledge of s/w infrastructure

Coalition coordinates quarterly meetings with guest speakers, share tools & trainings.

Public education requirements:

4 audiences:

1. Residents
2. Businesses, institutions
3. Developers
4. Industry

Two educational messages to each audience, spaced a year apart at least. Can use existing materials. May partner with other groups/watershed organizations.

Must show evidence of focused messaging. Must be able to document # people reached.

Coalition is implementing an integrated strategy for public outreach.

Kerry Reed, Framingham:

MS4 permit requirements for education intimidating for engineers.

Surveyed 400 MA residents about stormwater—finding “water words that work,”

- Most people think industry causes pollution in water, not something local
- Most residents don’t understand terms—not stormwater, but polluted runoff
- Picking up a layer isn’t how people get a message—half get it from media, social or other

Surveyed communities:

- Staff has little time for education
- See value of stealing each other’s materials—coalition stuff can be rebranded with community logo
- Not eager to create their own
- Print is easy. Social media is getting easier, public events & press are harder—takes a lot o time.

Think Blue—brand! Maine been using effectively.

Modified rubber duck video from Think Blue Maine. Can put on your web page, tweet it, etc.

Think Blue facebook page—available right now. Can be used as a public message now. Was created as a facebook ad, targeted to coalition area. Ca. 4 million people or 60% of the state’s population. Ad budget worked out to be 2.5 cents/resident.

Materials are all in Word and can be modified for each community’s needs (room for a logo!)

Website—has NOI information, how to do outreach & measure it, how to enter into Annual Report to EPA. Also have a training on how to measure outreach & make it easy—papers in a file, with numbers for how much educational information handed out at each (do at end of each event).

If your community is in a regional coalition, community can use coalition report.

If community shares Think Blue posts, can measure & report that.

Newspaper ad in Wicked Local papers Oct. 2018 to reach older audience. Also, a press release to share with papers not covered by the campaign.

Will have a booth at the MMA conference Jan. 18-19, 2019.

Also reaching out to 5th grade science teachers. Very responsive age.

Ducks: 4imprint.org 1500 for about \$2K, but cheaper if you buy more. Go with coalition of communities.

Coalition invites communities to do something around stormwater this week, to go with the launch of the Think Blue campaign.

Did not know about Boston’s “We are All Connected” campaign. Will look to link to it.

Coalition is hoping to track changes in behaviors with WPI (all volunteer) for Central Mass coalition.

Fred (DEP)—looks at change over time. Don’t expect an immediate change in behavior. Earth Day 48 years ago—twice as many rivers are now swimmable/fishable.

Presentation will be available on 495/Metrowest website, under Water cluster.

10/9/18 WSCAC

Alexandra Peckham is the new WSCAC assistant, replacing Heidi.

Meeting topics Ware River Public Access Plan is about to be updated. Process will take a year. Complicated because a lot of stakeholders want more public access. WSCAC will comment.

Quabbin forestry.

Water Supply Protection Trust: How does DCR spend MWRA \$\$\$. WSCAC can send letters to trustees with suggestions and concerns. They are not filling 19 vacancies, and can't get the needed work. Supported to be stewards of the forest. Hasn't been as professional as should be.

Beth Card:

System expansion: MWRA: top priority is good service. But bringing in additional communities very carefully.

Driven by:

- own operating and admission policies
 - new sewer connections: must straddle a municipal boundary
 - Emergency water supply withdrawals
 - Outside MWRA water service area
 - Maximum of 6 months
 - Usually also a DEP Declaration of Emergency—drought, repairs,
 - Water connections partially located in non-MWRA community
 - Integrated plan
 - Water straddle
 - Admission of a new community to MWRA Water
 - Mepa
 - Interbasin transfer
 - Next community over has to sign off
 - Legislative act
 - Entrance fee
 - Prevailing rate for water
 - New sewer community
- MA Environmental Policy Act (MEPA)
 - 301CMR 11.00
 - Public review process
 - Applies to rejects that require a state agency action
 - Aims to avoid, minimize and mitigate environmental damage
 - Thresholds include
 - New interbasin transfer of 1 mgd or more
 - New water service
 - Construction of 5 or more miles of new main
 - New withdrawal or expansion of 25mgd
- Interbasin Transfer Act

- 313 CMR 4.00
- Administered by water resources commission—officials from all areas impacted by water & staffed by DCR. Experts in water.
- Governs transfers of water & wastewater outside of original river basin
- Ensures resource in donor basin are not adversely impacted—criticized for being too slow and too complicated, but WRC did some revisions 2 years ago to make smaller withdrawals less burdensome. MWRA looking at streamlining, but Card is not convinced the process is too burdensome now.
- Requests evaluated based on applicable criteria
 - MEPA compliance
 - Adequate water conservation
 - Development of all viable in-basin sources
- Donor basin application enables regional water supply systems to increase service to multiple communities by reviewing the donor basin separately from the receiving areas.

MWRA connections:

- All new connections since 2002 are in compliance
- 2017: recovered from drought—0 emergency connections
- Progress made on potential new connections: Ashland. Usually ask for more than they intend to use, to avoid having to repeat the process if need more water later.

MWRA: Safe yield 300 mgd. Now using just under 200 mgd. Track constantly. WSCAC concerns with emergency supplies in 2016 got over 300 mgd. Summer in particular.

Peabody the latest candidate—have decided not to pursue MWRA water. Buying emergency supply while one plant gets rebuilt. Card would have liked a Peabody connection, because then MWRA could supply Ipswich communities, which are in dire need.

Wastewater expansion:

- Union Point a possibility but need to be careful about wet weather capacity. Have a lot of work to do both on water & wastewater sides.
- Most new connections since 2002 in compliance
- Crescent Ridge Dairy in Sharon looking to connect—dairy/milk waste. Connecting through Stoughton. Need to go via Interbasin Transfer to get a recommendation of insignificance (small volumes). Also needs a TRAC permit.

Water Quality—total coliform positives—3-500 samples/week for many different contaminants. If detected >5%/mo, additional samples required. Warmer months see more often. Rust inside the system contributes. Boil water orders if eColi goes in. Increase chlorine in the summer months, and may incrementally increase in areas with positive tests.

Tunnel Redundancy for the Metro area. Currently hiring staff for that project. Public outreach & relations will be critical.

Other issues to focus on:

- Climate—vehicle emissions and MWRA fleet; LEED by example, preparedness.
- Stormwater—MS4 permit—tough lift for communities. Pressure to have MWRA take some of it on.
- Blending—federal policy on discharge during wet weather. EPA is looking at its policy again. May also start to hear about a new NPDES permit for Deer Island.

- Lead in drinking h2o
- waters of the US — federal rule of what EPA controls. Applies to areas MWRA discharges to, including the forebay near the Wachusett Aqueduct pumping station. Trump admin wants to revert to pre-2005 conditions.
- emerging contaminants—thinking about PCPs, PFAS, pharma, watching what emerges.

WSCAC raises the possibility of the railroad contaminating the water at the Wachusett reservoir. Long conversation about the pellets post-molybdenum level raising.

Gray water reuse for irrigation has strict DEP limits. No MWRA involvement.

10/10: Water Resources and Sustainability Symposium, Devens, MA

One Water: no water no beer; no water no milk; no water no agriculture—slides available for all presentations.

Green Infrastructure may be the most effective single intervention to clean stormwater, infiltrate water, and prevent flooding.

Integrated water management—Pinehills community in Plymouth: Has its own water supply & wastewater treatment. Neal Price, senior hydrogeologist, Horsley Witten Group: nprice@horsleywitten.com

Batch reactor, 250K gpd. Treat for nitrogen mostly. Irrigation from wells. Drinking water treated only for pH. 23 wells—some just for irrigation—spread out over the development.

Integrated water management:

- ❖ Designed LID (low impact development)—designed around old trees, minimize impervious cover, begin with siting water/wastewater. Minimize impacts. Shared driveways, smaller rooftops. =70% open space (and Miles Standish State Forest at top of the aquifer)
- ❖ Sited irrigation/interceptor wells 2 years downstream from the wwtp, so captures the plume to reuse as irrigation for the golf courses (there are 3). (2 years is the lifespan of bacteria & viruses in groundwater)
- ❖ Units share roofs, driveways, small roads—more units, smallest space possible.
- ❖ Infiltrating road runoff with bioswales. Infiltration facilities under a rye meadow. Roof drainage to dry wells,
- ❖ With engineered water infiltration, can increase the amount of water going into the groundwater table. Have done a fully balanced irrigation withdrawal for one golf course that recharges as much as it withdraws.

Holistic Water Management on the Salmon Falls Watershed (ME/NH)

Kira Jacobs, EPA Drinking water protection program & Starr Glenn, Berwick, ME water department

Headwaters is in Acton, ME, and in Wakefield, NH. Roughly a dozen small communities. Just north of Portsmouth. Huge development pressure. Drinking water source for 47,000 including Berwick and Somersworth NH. 90% privately owned.

National source water collaborative: www.sourcewatercollaborative.org

- ✓ 27 national organizations protecting drinking water at the source (includes AWWA)
- ✓ Established 2006
- ✓ They selected Salmon Falls Watershed Collaborative in 2009, and provided \$6K in “seed money, which unlocked state \$\$.
- ✓ US Forest Service identified Salmon Falls as the most threatened watershed in the nation. Currently forested & could be developed into housing.

Action Plan:

- ✓ Conserve priority land
- ✓ Promote low impact development
- ✓ Protect aquifers and waterways via local ordinances
- ✓ I'd and clean up sources of contamination
- ✓ Engage governments, citizens & organizations

Berwick, ME water department—challenges—river is the source of clean water, but also was used by former tanning company (Prime Tanning) to dump tanning chemicals. Also used for recreation now. Flooding is a challenge, as well as dry conditions. 500-year flood line is at the door of the plant.

1998 system — no longer need as much as when Prime Tanning was using water. Spills are a threat to the system. In a drought, river flows dry up, and water becomes anaerobic (2016). Tough to treat. High manganese levels. No interconnection with Somersworth now.

Berwick wastewater is settling tanks—sludge dewatering. Recycle into the river. Recycle about 95% of wastewater. System works, just not in the winter if it freezes.

Infiltrator[®] decentralized wastewater treatment

Approved for use in all 50 states; 30 years of success. Largest manufacturer of septic tanks in the world. Uses recycled plastic—over 100 million pounds/year.

Central sewers—unsustainable. Pipes break, or are overwhelmed by rainstorms.

His company—infiltration fields, septic tanks. Can locate in open space, under Foxboro, under parking lots—Foxboro parking lot. For peak flow, have a storage tank.

Siting Green Infrastructure for Drought Resilience Ellie Baker, Senior Environmental planner & Jennifer Relstab, Senior Water Resources Engineer, Horsley Witten

GI—tool to increase annual recharge. What are suitable sites?

- Not already occupied
- Permeable soil
- Not too close to surface water/wetlands—soils are usually bad & regulatory hurdles
- Not contaminated
- Sufficient depth to groundwater/bedrock
- Fairly flat
- Down hill from a significant source of stormwater

Use GIS analysis for sites, drainage, available space—then do a field investigation.

—>good slides on analysis.

Implementation:

- Ownership
- Some
- On-site impervious area (surface as well as subsurface)
- Runoff capture

Overlap—best sites for suitability Then look at particular sites directly. Verify. Use local stormwater utility data, review other utilities for conflicts

Field: start with google maps, then go look at the most promising ones.

In Milford—incorporated with town planning. Looking to dig once. Integrate with other planning—MS4, open space, etc. add criteria such as land conservation, drought resilience. Sometimes have low or poor GIS data—so map, google street view, walk.

A successful plan

- Partner with local groups
- Outreach/education
- Climate resiliency (climate-smart cities tool)
- Cost of construction
- Cost of materials & maintenance
- Can use EPA Region 1 Opti-Tool
- Coordinate with CIP

Building Consensus for Integrated Plans: A value proposition

Kirk Westphal, senior principal planner, Kleinfelder

Using language to address water problems. Using consensus (has risks) and compromise (have to give up something)

Language of poetry.

Engineers and technical people tend to take problems and expand them—make more complicated.

When need to communicate simply—

- Concise
- Will be used/read
- Takes a complex notion and express in a new light
- When 5 people interpret it 5 ways, but agree that it advances the art. —consensus, not perfection, but satisfaction

Value proposition

Avoid completion or perfection, or “our” answer—>instead, accept brevity, ambiguity, progress, common interest.

Three common faces of environmental debate: regulators, utilities, activists: preserve all beneficial uses, responsibly use, and protect the balance (similar goals).

Sometimes if a project is oversold as being consensus, danger it can interpreted as consent.

As a practice—need to better simplify things in their totality—language and perspective. Also need to clarify the relative worth of alternatives to decision makers.

Integrated modeling—simplification of data, clears up interdependencies, trade offs, screening—>more informed decision.

Breakout session: stormwater management Cambridge near Fresh Pond—recreational resource, but also drinking water supply. Old rail tracks, victory gardens which were inaccessible, jogging trail that drained to the pond. Added elevated hummocks and berms to shield people from traffic noise and sights, retain and infiltrate water, keep flood waters out of the pond. Improved recreation, water quality, resiliency.

10/17: MWRA Board

Kathy Soni retires next month.

Business Plan Progress: Beitneicher

The plan takes MWRA core values and mission and shows how getting to gals.

Initiatives: core, what MWRA must do, and special—these come & go. Can be optimization, adding efficiencies, identifying gaps. Examples: lead testing all child care centers, water redundancy, phosphorus removal, energy efficiency

Board asked MWRA to show accomplishments in a more visible way, esp. for ongoing tasks.

Financial Update—board asked about overtime. Often thunderstorms in the evening, need people at the CSO facilities. Also as dams are getting annual inspections, need to clear brush and catch up.

Board asked—quarterly underspending and overspending in maintenance—will that even out at the end?

Probably not. Depends on the projects. Usually MWRA underspends, depends on the schedule and sometimes things slip into the next year. Spending fluctuates based on the season. The hope is that at the end of the year, MWRA will be on budget.

Is overtime related to understaffing?

No—mostly weather events.

TRAC annual report: Carolyn Fiore, Becky Weidman

Fiore: TRAC did not meet its EPA requirements on inspections because of the gap from when John Riccio retired (Jan) and when Becky Weidman was hired (April). But reached 100% by the year's end.

Weidman: TRAC updating sewer use regulations by end of 2019, looking at fee change, new Clinton local limits, clarifying regulations, updating lab data submittals to meet new EPA requirements.

Board: want better cost recovery for TRAC

Fiore: the fees are in the regulations, so changing will take time, but should be in during 2019.

Laskey: We accepted the Advisory Board recommendation, so we are looking at how to implement them. Should be in place by FY2020.

Outfall monitoring—Betsy Reilly, Ken Keay. The next water quality flyer will be on the decrease in nutrient loadings.

Joe Favaloro: Save the Harbor is convening an OMSAP/PIAC meeting in November. Will be looking at new questions for OMSAP and MWRA to answer. While may be worthy questions, not sure their investigation should be paid for by ratepayers.

Contract for the Thermo & Hydro power plant maintenance: Steam generators (digester gas) save \$17.5m/year. Hydro saves \$500K/year. Repairs cost \$7m.

Board: are the hydro turbines still profitable. MWRA: yes

Chemicals: Ferric chloride is up 20%. Bulk of increase due to transportation and competition from fracking.

Braintree-Weymouth Pump station contract—\$2.1 m

Laskey: newer station, but challenging to operate. Issue is rags—can't find the source. Added more screens & staff to deal with. But screens are inadequate and costly to staff. Pumps hard to maintain. Also need to fix odor control. This contract would fix some issues

Chelsea Creek Headworks-change order of \$600K in contract administration for unanticipated conditions—engineering around obstacles, sequencing the work. Challenging because need to operate 24/7 during construction.

Metro Tunnel: procuring consultants for program support and preliminary design.

Full Board—Laskey:

MWRA has two awards, new—Water Environment Fund—for energy generation and recovery...

Sustainable Water Utility award with BWSC

MWRA had told board that 61% of hires were internal promotions. But four of the job descriptions in the new hires are entry level (can't be promoted into). After eliminating them from the calculation, realized MWRA has 76% of hires from within the Authority—in other words, a deep bench.

Wachusett Pump station has been tested as a full backup supply to the Carroll Treatment plant. Fish Hatchery turbine is running well. The Quabbin is at capacity and has started spilling.

HEEC cable has started construction at Deer Island.

10/19: AB Financial workshop

Tom Durkin, Matt Horan (MWRA)

Debt—1986-2002 spent about 40 years worth of debt on Boston Harbor project—structured & debt service assistance. Was up to \$50m, at some point went to \$0, now at \$1.5 m.

3 types—long term fixed rate, long term variable, short term variable. 80% is fixed rate.
Tax-exempt revenue bonds—pledging lien on MWRA revenue (operating first, then debt.
Because can only get revenue if operate) Different rules than municipal debt.

1st—operating—3 months worth of budget

2nd—senior debt service—fixed rate, AA+

3rd—subordinate debt variable rate, SRF— AA

4th—debt service reserve—funded with bond proceeds. Now at 50% of maximum debt service.
Protection for holders of bonds. Helps MWRA credit rating. MWRA doesn't put revenue in that account.

5th—Commonwealth obligation funds—water supply protection trust, debt on water supply land, PILOT

6th—Rebate fund. Goes to IRS, etc.

7th—Reserves—operating reserve fund—2 months—usually don't draw from

8th—insurance fund. Set every 3 years by insurance adjuster. Now \$12-16m. For catastrophic event

9th—renewal & replacement fund. If EPA came along and said MWRA has to upgrade an asset, they have the funds available (many of the above are based on MDC history)

10th—water pollution abatement fund — used to pay the SRF

Last—general fund—this goes for other priorities, rate stabilization, defeasance.

Use of reserves signals distress, so MWRA is careful about using them.

100% collection history from cities & towns. Reserves are to reassure the market. Just in case communities aren't able to pay up. Gets MWRA a better interest rate. Under Enabling Act,

MWRA can take state aid from communities that don't pay MWRA. Boston—at 33% of revenue, is BWSC, separate from City of Boston.

As a mature agency, looked to amend bond resolution in 2007. Q of how to structure. Ultimately, want to protect bond rating (and lower interest rate). Changed debt reserves to 50%, eliminated another reserve fund.

Took 8 years to implement the amendments. Need 75% bond holder consent/for some reserves need 100% bond holder consent. But eventually MWRA took \$113m out of reserves. Defeased some bonds with some of it.

Taxes—many calculations because private entities aren't allowed to make a profit without paying taxes (under MWRA's tax exempt status): examples: HEEC cable; solar panel services; Wachusett railroad. Tax-exempt bonds can't be used for these, so MWRA uses pay-go. Taxable bonds can be used, but carry a higher interest rate. MWRA monitors continually.

Taxable bonds can be up to 1% higher interest than exempt bonds. Advantage of taxable is that don't have to track it for IRS purposes. Current revenue for capital is money MWRA spends—not really reserve—lead loans, HEEC cable, may be gone by end of 2020.

Durkin: long-term vision is to move to pay-go. Now at 10%. Ideally, as move from building new assets and focus more on maintenance of effort, pay-as-you-go will allow MWRA to save on debt service (interest). Arguments against—volatility of rates, generational equity. Clearly don't pay for a 100-year tunnel in 1 year. MWRA has a plan to move to more pay-go. 15% next year. Will always be doing borrowing. Financing and policy decision.

How MWRA issues debt:

Oversight from SEC, IRS, Municipal Securities Rule Making Board.

—disclosure documents a week or so before issue bonds. Mostly not competitive bonds; negotiation with firms. Usually can call in 10 years (meaning not all interest paid after 10 years. MWRA may buy back to refinance at lower rate)

—Update credit rating agencies—they issue a rating Some treat MWRA as if it were AAA—the May interest (fixed) on 30-year was 3.67% on AA+ debt

When MWRA issues debt, they adjust the interest rate in a sort of reverse auction, reducing interest over the course of a day (of issuance).

Now MWRA has 65 bond series (each water & sewer, so double). Every month, MWRA puts aside the money to pay debt service. FY19 totals \$447 million.

MWRA pays back bond holders Aug. 1 and sometimes in December. Paid in FY after the monthly payments.

Debt Service Variance:

MWRA projects where interest rates on variable debt should be. Start projecting 18 months ahead. Recently, the variable rates have been lower than projected. The difference means MWRA budgets come in below projected and they have surplus that they can then use for defeasance. Reason: variable rates can be volatile. MWRA does not want to come to board mid-year asking for a rate increase to cover variable bonds.

Recently, with very low interest rates, MWRA has realized savings on debt. Refunded a lot of debt while rates were low. (Basically, refinancing). With the new tax code, they can't refinance except in the current year.

Jen Matte: PFM Financial Advisors, LLC—

Role is as additional staff for Authority, looking at debt.

Removing advance refundings as part of the tax cuts (2017) in order to pay for some of the income tax cuts. Now there's a 10-year call limit. There are some ways to get around it.

Old rules: most municipal bonds can be called after 10 years for no premium to get a cheaper rate.

Advance refunding: can do it before 10 years but have to escrow (reserve funds). MWRA has used this to save \$\$ on interest

New Rules: can't do that.

Now also can't deduct full state & local taxes of federal income taxes. But that made municipal bonds more interesting to individuals in high-tax states looking to sheltering some income.

Corporate buyers don't have as much tax to shelter, so MWRA bonds may not be as favorable to them.

Another consequence: fewer municipal bonds on the market. Flatter yield curve. Yet still looking at significantly lower rates than in the 1990s.

65% of those owning muni bonds are individuals who pay income tax—"high net worth individuals" and moving back. Banks are starting to sell. Insurance companies also, just not life insurance.

Matte's firm looks at who owns MWRA bonds and similar bonds (other water & sewer utilities/MassPort, MBTA). Vanguard owns the most of any individual fund

MWRA examining shorter call times on bonds to get around the call rules under the new tax code. But if don't call (because interest rates are higher), lose \$\$\$. Investors want to be assured can hold a bond at a certain level of interest, so ask for more \$\$\$ if you want to be able to call earlier. MWRA assessing options with each bond issue.

Taxable bonds have full protection of investor for the full term of the bond, which means you can't call it early without paying all the principle and interest.

Market interest, post-LIBOR is the Secured Overnight Financing Rate (SOFR), which is more transparent.

Lessons from the 2007-2009 downturn: no insurance on bonds; more banks own MWRA debt (not just 3-4). Also diversified over time (when bonds are due)

Durkin: Liabilities: Pension

MWRA most fully funded of any of the state's funds. Also went through the investment allocation for the pension fund. Currently at \$545m. Assuming 7.75% return as of this year. Actuaries say 9%+2% pension contributions are working (11%) to fully fund individual pension payouts. Exceptions are for fire & police (earlier retirement age). Because MWRA is fully funded, they invest more conservatively

OPEB—also impacted by actuarial tables, whether Medicare eligible, plus volatility of cost of healthcare. Unfunded until FY2015, when put \$10m from reserves in. Now putting in about half of recommended contribution—but strategy remains to fund pensions 100% and then fund OPEB. Currently liability is \$121+m. Investing toward more risk in this fund because so little of it is funded, and have 40 years to get to 100%

10/23—webinar: Green Infrastructure to protect Cambridge's water supply

Fresh Pond watershed mostly controlled privately. Over 4,000 users/ year of the park immediately surrounding—not including the golf course!

2000 Fresh Pond masterplan—priority #1 threats to water quality, followed by deterioration, ecological value

Multi-departmental advisory community, plus robust public engagement.

Number of challenges, including road building in the 1800s, poor drainage, compacted soils and clay, invasive plants and no vegetative buffers.

Strategies: porous pavement, flexible porous pavement (keeps tree roots alive, gives underfoot), bioswales

Benefits: slowing water, water utility, flood reduction, ecosystem services. Side-benefits: less ice on the road, softer surface, ADA compliance, preservation of specimen trees and protection of the water.

Also—restored wetland functions, built soils, added diversity. Whole watershed maintenance plan.

Project #1—little fresh pond: severely degraded, flooding of golf course, high water table, etc. Goals: improve water quality into the little, reduce seasonal flooding, stabilizing shoreline

Figured out where water was going, soil characteristics, plant inventory, golf course use, historic flooding.

- 1- Bioretention swale/basin;
- 2- Improve woodland
- 3- Riparian buffers along the stream & with retention ponds

Used volunteer planters (labor)

In some cases, excavated out filled wetlands & crossed with boardwalks

Also created a vegetation management plan.

Project#2—Glacken slope— had erosion, severe compaction, poor soil. Runoff. Ponding on perimeter road.

Worked top to bottom to control runoff, stabilize slope.

Evaluated slopes, soils & vegetation. Strong constraints—no quick fix

Reduced impervious surface at top of hill, stabilized slopes, removed invasive, removed paths, improved perimeter path

Maintenance: rent a regenerative vacuum—minimum of 4 hours 4x/year. Do whatever can do in 4 hours.

Not just stormwater benefits—ecosystem benefits, etc. that don't get from gray infrastructure. One benefit is that the golf course hasn't had to shut down (3-5x/year) because now the flooding is more controlled.

Cost-benefit over gray infrastructure includes not having the additional cost of building a flood control system or a cleaning system on top of a stormwater/drainage system.

[Selected slides in second document]