Wastewater Advisory Committee
Minutes
Nov.1, 2019, 10:30 am
MAPC, 60 Temple Pl., Boston

Attendees:
WAC: Stephen Greene, Craig Allen, Dan Winograd (all on phone), Taber Keally (NepRWA), Martin Pillsbury (MAPC), Belinda Stansbury, Mary Adelstein, Kannan Vembu, Karen Lachmayr (chair), James Guiod (AB),

Guests: Wendy Leo, Sally Carroll (MWRA) Lisa Kumpf (CRWA)

Staff: Andreae Downs

VOTES: Approval of October minutes

MWRA Updates:
CSO monitoring remains active. MWRA got a year's extension to finish the work. The third semi-annual report is on the MWRA website (http://www.mwra.state.ma.us/cso/pcmapa.html)

CSO receiving water models requested by 2021. Charles and Alewife/Mystic variances extended until 2024.

Various other deliverables in the meantime

Doing a Deer Island shaft inspection project—stopping flow to the headworks for a few hours at a time to accomplish. These inspections are done in dry weather.

Work continues on Chelsea headworks and the DI gravity thickeners.
The HEEC is now energized.
The Clinton phosphorus facility met the new lower limits. Now shut for winter maintenance and testing of new polymers

The Clinton landfill for solids is being capped—the first of three cells.

DEP has new draft surface water quality standards. Comment ends Nov. 8. Mostly updating to match EPA standards.

A pretreatment report is now on the MWRA website (http://www.mwra.state.ma.us/annual/tracindustrialwastereport/iwr-2019.pdf)

An operations and maintenance report will be published soon. (Link: http://www.mwra.com/harbor/pdf/omstatus.pdf)

We have a new EPA administrator for Region 1.

Advisory Board updates: November 21, joint meeting of AB and WSCAC with a poverty law professor at the Wellesley Free Library. Topic: Rates and rate structures

Also at this meeting—initial retail rate survey presentation; Cambridge CSO project.

ED Report: --attached.

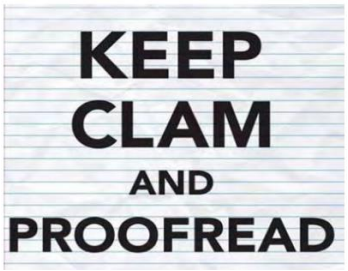
Presentation: envisioning data: Sally Carroll

MWRA Environmental Quality department has a lot of data, and we need to get it to the public.

From 1984-1990, when the outfall opened, MWRA was always in the news, mostly about high rates.

From 1990-2002 MWRA published the State of Boston Harbor, but outfall fed to Mass Bay after 2000

From 2000 MWRA starting putting data on its website as part of its NPDES permit.



The data needs to be understandable.

Since befroe the outfall came online in 2000, MWRA has also published an outfall monitoring overview.

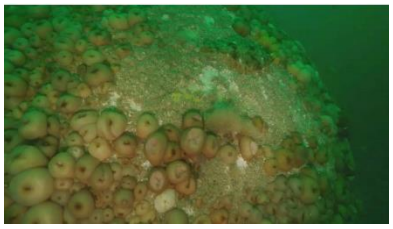
Things Sally keeps in mind when trying to present readable data to the general public:

- People skim. They don't want a wall of text—divide topics into
    - Headlines
        - Sub headlines

Boxes

- A MAJORITY OF = **MOST**
- NEARFIELD = **NEAR THE OUTFALL**
- IT WAS OBSERVED = **WE FOUND**
- AT THE PRESENT TIME = **NOW**
- SAMPLES WERE TAKEN = **MWRA SAMPLED**
- IN GREATER ABUNDANCE = **MORE ABUNDANT**

And pictures



- Use **Hyperlinks** to include foot note information or details
- Better to make the information readable with a big main message, details in the link.
- Use empty space
- Make the images related to the text
- The first glance is important.
- Topic sentence at the top of a chart/picture
- Show (rather than tell) when you can (video/map, etc.)
- Avoid the passive voice and bureaucratic language/jargon.

Challenges:

- How to make information simpler to absorb—always lose some information. The wrong information is very simple
- Good news is hard to sell

Discussion:

A pet peeve of laypeople reading science is that it's often hard to read.

MWRA produces some excellent publications; reserve the website for people with questions and think about how to get the general public the information they are looking for. Related—how to convey information generally to residents who aren't necessarily looking for it?

→What are ratepayers getting for all that money?

Sally: see the What's New part of the website.

CRWA also faces the challenge of how to keep its science user friendly.

People see better than they think (read/digest)

For MWRA **all** the rate payers are the audience. It would be useful to compare the service area to other big city sewer systems.

The Advisory Board does a rate comparison—perhaps that should include more communities.

October Director's Report

MWRA Board 10/16

Personnel

Finance Division organizational changes—creating a dep. director position, which Matt Horan was hired to fill (was Treasurer). Horan will fill in for Director—Tom Durkin—in his absence, and supervise the Budget director, controller and risk manager.

Admin & Finance

MWRA rehabilitation of DCR capital assets in the watershed:
As mentioned in the Sept. joint meeting, the DCR has not been maintaining several structures and infrastructure in the watershed. The staff summary proposes that the MWRA plan, construct and finance improvements to the Administration Building at the Quabbin, remove lead paint from the neoclassical Administration Building at the cemetery, build a new maintenance building (garage & equipment storage), restore water service to the cemetery and fix electric, water, sewer (septic), HVAC, fire alarms, fire suppression and accessibility at the Quabbin Administrative Building.

MWRA has already completed $25m in DCR watershed capital projects—mostly dam safety repairs and dam removal.

MWRA plans to spend up to $2m annually on future DCR watershed capital projects.

MWRA will drill the well for the cemetery, add pipes. DCR will repair the cemetery administration building after lead is abated using MWRA funds

MWRA is designing and repairing the river road near the Wachusett Reservoir, which has washed out twice. Also doing Quabbin road restoration.

Board asks whether DCR has any responsibility for preventative maintenance. Yes, they do. MWRA staff assists as needed. MWRA pays DCR for that maintenance.

Laskey-we have come to the conclusion that all these facilities will continue to deteriorate, and since MWRA pays anyway, we decided to take control of the process. Yes, it will be a money pit. Older buildings in particular have a lot of issues.

Haven't revised the MOU with DCR, but there is a provision for MWRA to take over when DCR can't fill its responsibilities. Laskey agrees with board members that something more formal may be needed, given the extent of the work and expense. Wolowicz found DCR staff on a water protection tour were unconcerned with the

deficiencies and felt low expectations were acceptable. Board members unhappy with the situation and suggest thinking of taking ownership of the structures if DCR can't maintain them.

First quarter fiscal update—revenue higher because Stoughton entered the system and paid off its loan early. DCR budget reporting changes at the Board's direction—show actuals as reported—currently $1.9m variance because of watershed activities—$500K variance for underspending. Another $500 credit for land MWRA paid for directly that DCR took credit for. DCR also underspent on training and equipment.

Vandana—DCR is hiring aggressively, but retirements and internal promotions….

Wastewater

TRAC—revised regulations promulgated Sept. 6, new limits for Clinton, higher permit charges for the next 5 years and minor additional changes. Will go into effect early Nov.

Caught up on permit issuance
Developing online permitting process—starting with a pilot.
Dental permitting starts soon—compliance with federal rules
Are enforcement numbers up? They go up & down. Mostly low-level, fewer high-level. The low-level are compliance related and often resolved.
TRAC is running community forums for industrial users to educate them on the rules and how to stay in compliance. Seeing more small labs, breweries, marijuana processors.

City of Cambridge CSO proposal (discussed in Sept-Oct. director's report).

Cottage Farm CSOs are dependent on sewer separation in Cambridge. Proposal to do partial separation so reduce phosphorus in the Charles. DEP and EPA agree. This is a pilot/trial. Needs to benefit the MWRA, not add cost. Advisory Board stipulation that future such inclusions of stormwater into MWRA sewers can only happen in current CSO areas. MWRA's Beth Card says Authority recommends this course of action because it makes sense for MWRA. Will try for 12 months and then modify if not getting results need for the long-term control plan. Trial of the 6" orifice to determine if it's the right size to get the desired level of CSO control.

$1.6m for the rehabilitation of 1892-vintage, 42-48" brick sewer interceptors along the Charles in Newton.

$77K Change order on repairs to the #9 north wastewater pump at DI, which should result in $20K annual savings because it is more energy efficient (by 11%) than the current pump. MWRA will also receive a $59K incentive. Payback in 3-6 years.
30% of energy demand on DI is pumping, and ⅔ of that is the north pump station.

Water Supply

Lead & Copper Rules: Draft just out from EPA.

- Action levels at 15ppb, not changed.

- Lower level at 10ppb, where need to make changes—not sure how that works for MWRA
- Did not mandate lead service line replacement, but triggers at 10 and 15 ppb.
- Requirement that entire lead service line be replaced with few exceptions
- If homeowner replaces their section of the line the city has to replace the city section
- 3 months' worth of filters to each homeowner if the lead line is disturbed in the case of emergency repairs

Every system:

- Needs complete inventory of known lead lines and lines where not sure
- Need a plan to replace known lines
- All sampling has to be at homes with known lead service lines
- All systems have to test at schools and daycares
- Every sample above the action level has to be reported immediately
- If a community is over the action level, treating it as an acute situation and has to notify within 24 hours

60-day comment period.

MWRA is notifying communities so they can do as much as possible before the regulations are finalized.

One concern is corrosion control adjustments may need to be made to MWRA water.

Tunnel Update:

Preliminary Design procurement RFQ went out early Oct. RFP in December, recommendation in April & notice to proceed in May. Design est. to take 3.5 years.

Tasks include:

- Environmental notifications and coordination of stakeholders
- Evaluation of alternatives
- Environmental impact report
- Geotechnical and hazmat investigation
- Base mapping and survey
- Preliminary design

Hydraulics analysis—projects future water demand.

Formation of an Expert Review Panel—currently includes 5 people with deep rock tunnel construction experience, who will advise MWRA on an as-needed basis.

Laskey: strong interest from some very strong teams.

Emergency water supply for Burlington, want eventually to be a full water member.

Chair Kate Theoharides: report: minor drought this early fall. Hot summer, dry Sept. Flash drought happens now.

PFAS—Governor's Supp. Budget has $8.4m for testing and $20m in clean water trust.

Number of new climate change regional coordinators for infrastructure resiliency. One just Boston area. Part of MVP program—to get towns through planning for climate change. Grant opportunity of $10m for communities—may be related to water.

Laskey—water won another MWWA award.

Successful bond yield of 2.66% and purchased taxable bonds also for first time.
Advertised for a paid-family-medical-leave firm to provide MWRA with insurance. Have serious interest.
Financial audit—clear & clean, like the water

Carrol moves to amend the Cambridge CS proposal to state the financial impact on the rest of the MWRA communities. Laskey asks if staff analysis is ok. Accepted.

Outfall Monitoring: Betsy Reilley

- Ambient monitoring in the waters of MassBay
- Effluent quality won a Platinum 12 award
- No contingency exceedances
- 2018 was a wet year but almost no blending
- Nitrogen levels are rising toward the permit —trending upward in 2019 so far. Could exceed limit of 12.5K tons/year. MWRA has done the research to know why numbers are high and what it means. Know that eutrophication is not a significant risk at double that amount. Run the models with temperatures.
- Still no evidence of adverse impact.
- Did have red tide—in from the southern Gulf of Maine
- Southern cape cod bay had hypoxia—lobster, fish, scallop die-off. Result of sunny, warm, calm weather. With advanced warning, lobstermen could have removed their traps and saved some lobsters from death

OMSAP—report outcomes and comments.

NEBRA/NEWEA Conference PFAS 10/18

(all presentations available on the NEBRA website https://www.nebiosolids.org/)

Jay Suthi, Hazen & Sawyer. PFAS in Biosolids, state of knowledge and treatment options.

PFAS are one of 350+ EPA unregulated contaminants of concern. States various limits in flux. Maine Moratorium—expect to get more stringent in other states.

Landfilling these wastes—higher cost, lower capacity. Will probably also be regulating PFAS in landfill leachates, therefore how much they will accept.

So PFAS is ubiquitous—where should it be removed? Comes in to WWTP from various sources. It cannot be destroyed below 1,000 degrees F. In existing WWTP processes, including thermal hydrolysis. None remove PFAS. If you heat dry, amount of PFAS goes up—breaking down the precursors and creating newer ones.

Thermal processes in WWTP and effect on PFAS:

1. Incineration—typically at 1,450-1,550F. Ash to a settling lagoon. Exhaust gases up the stack (after scrubbing). Don't know if PFAS destroyed, or whether end up in the gas or ash.
2. Gasification,pyrolysis—former at 1,400-2,500F—create ash with some char, breaks down enough that get low btu fuel on the back side. Pyrolysis—no air, 750-1000 F. Part of gasification that raises temps to up to 2,500F may destroy PFAS. Morrisville, PA is doing a gasification of biosolids. Linden Roselle JF just broke ground. Silicon Valley, CA—pyrolysis. No PFAS in the end, but is it destroyed?
3. Biochar— a byproduct of #2. Many more outlets.
4. Wet solids technologies, emerging—trying to mimic the natural production of coal.

Short term: plan for increase in costs for biosolids disposal, investigate sources of PFAS so you can source control if that's an option. Regulatory environment is uncertain. May want to wait before deciding on a new biosolids process. Address citizen concerns. Test land application impacts.

Long term

- Source control
- Thermal technologies
- High quality biosolids or value-added products (bio char, bio oil—Contra Costa, CA)

Jsurti@hazenandsawyer.com

PFAS Sampling in residuals, Leigh Dorsey, Andrew Carpenter, Northern Tilth

Main challenge—PFAS are everywhere, and measured in parts per trillion. And humans are covered in PFAS—
To reduce adding PFAS in the sample, can't shower with soap, apply lotion, floss, wear some clothing with PFAS. And food can be an issue, depending on packaging

IN sunscreens & insect repellants, dryer sheets, fabric softener...etc. She samples soils from 8" to surface.

Field samples—take 3-45 minutes per field if they are 10 acres or less. Soil analysis is $235-300 per.

Biosolids in Maine are over the Maine screening standard of 2.5 for PFOA and 5.2 per PFOS (ppb). Levels dropping since voluntary phrase out. NEBRA average is 5 and 14. Median for Maine is 2.8 and 15.

29 Fields amended with Class B—Median 1.9 and 6.1. All long-time applications. Reflect higher concentrations from past applications. Haven't left the soils.

Manufactured top soil—1 part compost to 2 parts loam. Loam also has PFOA and PFOS. 1.3 and 2.3 are the relative levels. “Solution to pollution is dilution”

Also tested milk and forage from 4 farms that used biosolids regularly. All were below limits, unlike the one farm in southern Maine.

In other media:

- Human blood 1999: ppb in human blood: 5 and 30; 2012 2 and 6
- In dust in US daycare centers, 2008: 142 and 201
- Household compost, 2007: median of 6 all PFAS
- VT background, 2019, soil: .52 and 1.1
- Foundation (cosmetics) 2018: up to 2370

Composts are also high—particularly from bigger producers—higher than the ME screening levels for biosolids

Manures have antibiotics. See residuals pesticides even in organic garden composts. Trace metals — arsenic in chicken manure, zinc in wood ash

<u>PFAS in Waste, Harry Behzadi, Emerging Technologies</u>

Landfill leachate is 2,000 - 29,000 ppt. Not a lot of volume, but in total roughly 600kg in 2013 for all of the US. A lot of waste.

Incineration may destroy, but danger is that the compounds may become airborne via the stacks. And phasing out here is not particularly effective control if China and other countries continue to use and export to us.

Case study: carpets are particularly high in PFAS if treated for stain resistance. Considerable production of PFAS in creating textiles that are stain, soil, oil or water resistant.

Most carpet in CA is land filled (leachate). Some recycled, but little. 21 million pounds (6%) incinerated. Decomposition and burning releases PFAS to environment.

Effluent is a significant source of PFAS in the environment. They are highly soluble, so will gravitate to water.

Biosolids land application: not biodegradable Alabama and Maine farms had high levels-the Alabama biosolids were from a plant that received fluorochemical industrial waste. (The Maine farm was near a field where paper waste was applied).

EPA is required by senate legislation (not yet passed house) to issue guidance on PFAS within a year.

PFAS disposal is likely to be an issue. Should see air testing. Release and distribution in water is very quick. PFAS forensics likely to come into play soon.

PFAS biosolids leachability Assessment—Allan Horneman, Arcadia, Portland, ME

German farm 3.1 sq. miles—where biosolids applied, PFAS detected.

Not just PFAS also Polyfluorinated compounds (over 4,000)—precursor compounds. Don't analyze for them and don't test for them in environment. With oxidation become PFAS.

Hydrophobic PFAS are retarded by organic rich soils. Oil increases sorption.

Knowledge of Toxicology so far:

European food safety—limits for daily intake 150 milligrams per kg of bodyweight/day in 2008. Now cut several orders of magnitude smaller 1,8 and .86 ngkg bw/day.

Risks still uncertain

Study in the Rhine Valley—industrial sludge land applied. Groundwater wells supply municipal water. 2011 had a fire and fire suppression foam was used. Tested & found PFAS associated with the foams.

Other wells then were tested & found PFAS, but not with the foam signature. 2015 study found elevated ground water levels in areas where sludge was land-applied.

In Europe more compounds regulated, but have higher levels allowed.

Some wells were taken off production because of higher levels of PFAS, some have installed carbon filters—which don't always catch the shorter-chain PFAS. Modeling plumes in groundwater.

Organic (higher carbon) soils have higher concentrations. Test top 50 cm. Leachate shows more kinds of PFAS than soil samples (same field/same samples) — water shows more of the contamination than solids. Soil tests can underestimate PFAS. Also precursors in soil can change into PFAS over time & leach into water—potential significant risk implications.

Management strategy: choosing which crops to grow on the land impacted. Testing the plants/meat produced.

What if we had to treat all water to ppt levels; Tim Jones, Tech Environmental

First PFAS produced 90 years ago.

Accumulate more than they degrade. Only been around for 1-2 generations. Ubiquitous— so unprecedented.
PFAS come from every household, not just from industry.
Won't be phased out for some time. Balance exposure and benefits of treatment
Q: what is the direct exposure pathway from WWTP?

- Air—minimal unless combustion of sludge
- Wastewater—treated, so minimal?
- Biosolids—not generally accessible

Closest analogy is Phosphorous

- Need to assess capacity of receiving fields
- Difference is also receiving ground water
- Another difference is that drinking water already has PFAS
- At 50ppt, likely >50% of drinking water for 330m people will need treatment
- Treatment is carbon filters—but where does that go
    - Landfills will leach
    - Leachate requires treatment AGAIN
    - Very costly
- Two pathways to reduce PFAS: thermal destruction, stop production, evolve
    - This will take a lot of time. In the meantime
        - Focus on hotspots
        - Focus on direct exposure pathways in air, water and food
        - Think outside "capture & treat"

Conclusion: the lower the PFAS threshold, the higher the WWTP cost and higher the costs. When drinking water treated anyway, may not be worth doing to wastewater.

<u>Ned Beecher—Mass Sludge Survey 2018</u> with Mass CEC (clean energy center)
85 responses. All major facilities.

180,800 dry tons total. 38% land applied

PFOS and PFOA (oldest PFAS) in human blood serum 1999-2014–declining. Down 70%. Source reduction works

WA state has 100% recycling of biosolids. State mandated. Have a biosolids chapter in the PFAS reduction strategy for the state—very deliberate.

National resources: NACWA, WEF, CASA (excellent fact sheet). Jennifer Wood at MassDEP.

Now sampling and testing—annual. Meeting coming up.
Site cleanup standards are in development with 20ppt groundwater standard for 6 PFAS in water

NH has drinking water standards at 11-18ppt for 4 PFAS. Legal challenge to be heard today. Now required to set surface water standards

ME and NH talking about incinerating sludge for PFAS destruction.

Guiding principles:

- Address PFAS hot spots now
- Think carefully about chasing ambient background levels of PFAS. Will we see neighbor suing neighbor around PFAS in septic water?
- Focus on advancing understanding
    - Define what data are lacking to devise practical solutions
- Know full repercussions of policies or regulations

Where will we be in 10 year?

- Ambient background PFAS likely to still remain
- There won't be the $$ to get it all out
- Drinking water will be a priority
- Thermal destruction or other systems for high-PFAS wastes
- Biosolids will still be land-applied
- Some PFAS will be phased out.

(Note—PFOS sticks to soils. Little leaching)
Most expensive way to handle PFAS contamination is via WWTP. Upstream is much cheaper.

NEBRA and NEWEA are working on a PR campaign—including how to reduce exposure

Also bill stuffers, etc.