



Minutes  
Friday, March 5, 10:30 am  
virtual

WAC Members: **Karen Lachmayr** (Chair), **Wayne Chouinard** (Vice-Chair), **Adrianna Cillo** (BWSC), **Craig Allen**, Dan Winograd, **George Atallah**, **James Guiod** (AB), **Kannan Vembu**, **Martin Pillsbury**, **Mary Adelstein**, **Philip Ashcroft**, **Stephen Greene**, **Taber Keally** (Members in attendance in **bold**)

WSCAC Members: Bill Fadden, Andrea Donlon, Paul Lauenstein, Janet Rothrock, Bill Kiley (BWSC), (Martin Pillsbury, James Guiod), Steve Daunais, Bill Copithorne,

Guests: **Advisory Board:** Lou Taverna (Newton); Jeremy Marsette (Natick), Ali Hiple, Denis MacDougall, Alicia Hunt, Tim McGivern (City of Medford), Diane Stokes (Cambridge), Charlie Jewell, Ariana Carr (Boston Water and Sewer Commission),

Michele Barden, Matthew Liebman, Evan Lewis, Abdulrahman Ragab, Meridith Finegan (EPA Region 1),

Vandana Rao (EoEA),

John Raschko, Mass. Office of Technical Assistance,  
Jennifer Wood, Susannah King, Jim Barsanti, Joe Nerden, Kathleen Baskin, Wilfred Mbah, Janice Pare (MassDEP),

Anne Herbst, Van Du (MAPC),  
Marilyn McCrory, DCR

David Granados, Rebecca Weidman, Katie Ronan, Wendy Leo, Sally Carroll, Margery Johnson, Sean Navin (MWRA)

Phyllis Carter, Kim Broberg (MIT),

Phil Guerin (Worcester DPWP & MCWRS),  
Steve Changaris (National Waste Recycling Association),  
Lindsay D'Anna, Jamie Ecker, Steve Pogy? (Waste Management),

Joan Smyth (Smith Gardner, Inc),  
Ivan Cooper (Civil & Environmental Consultants, Inc.),  
Rosa Gwinn, AECOM,

Lisa Kumpf, (CRWA), Beth Wilkinson (Newton Conservators), Debra Darby (Tetra Tech), Julie Simpson (MIT Sea Grant and OMSAP), Phil Goddard (Bourne), Alison Field-Juma, (OARS), Stephen Perkins (MyRWA), Karen Frecker (Rep. Kate Hogan), Daniel Moss (urban planner)

**Staff:** Andreae Downs, WAC

Lexi Dewey, WSCAC

## REPORTS

MWRA—Strategic Business Plan was presented to the MWRA Board in February. This is a strategic look at things beyond budget, for example Energy Efficiency. Second 5-year cycle. A Diversity, Equity and Inclusion initiative was added to this iteration of the plan.

Lots of job openings at MWRA. Also paid internships.

Advisory Board—Current Expense Budget of MWRA was transmitted to AB, so now in full budget review. 3.6% rate revenue requirement increase. Pretty average increase in a normal year. Positive outlook for the water & sewer sector—nationally, less shortfall than expected from COVID. Locally, the lower water use in Boston has certainly affected rates in other communities.

Chair—Thrilled to see such a large group, welcomes first-timers. Always welcome public.

Director—full report at end. Highlights

- wipes legislation filed. HD1625. 15 Representatives, 3 senators co-sponsoring.
- Replacement of the combined heat & power plant at Deer Island is moving forward. This would be the biggest next step in energy efficiency for MWRA.
- Advisory Board is looking to change the MWRA enabling act to allow the MWRA Board to select its own chair.
- Written report includes notes from a full-day PFAS conference.

## PRESENTATION

PFAS—Kathy Baskin for DEP, Becky Weidman for MWRA's TRAC program

**DEP** – Kathy Baskin: Just touching on what the Bureau of Water Resources is working on re: PFAS as it might relate to WAC & WSCAC. Further details—ask.

DEP focused on PFAS primarily as they affect public health. That's why started by looking at drinking water. Doesn't mean they aren't in consumer products. Even those that have been discontinued are appearing in the environment. Half-life of 8 years. Our bodies take in more daily. So, DEP looking at areas where we can make a difference.

Drinking water—if high levels, then considered a prime route to exposure. There are no Federal levels. MA has created a PFAS6 list (sum of 6 PFAS) Maximum Contaminant Level (MCL) of 6ppt for drinking water as of Oct. 2020.

DEP regulations require that it does an evaluation of the science every three years to determine, because science is evolving so quickly.

Summary of federal and state guidance/MCLs

Drinking Water Values for PFAS (ppt)						
	PFOS	PFOA	PFNA	PFHxS	PFHpA	PFDA
U.S. EPA	70	NA	NA	NA	NA	NA
Health Advisory	Sum of two					
MA MCL, GW standard	70 (2018 ORSG) → 20 (MCL; MCP GW standard) Sum of five → Sum of six (add PFDA) <b>MCL October 2020: Sum of six PFAS = 20</b>					
VT MCL	20 Sum of five					NA
CT Action Levels	70 Sum of five					NA
WI Recommended GW standard	20					
ATSDR Based on draft ATSDR toxicity values and EPA exposure parameters	7	11	10	70	NA	NA
NY MCL	10	10	NA	NA	NA	NA
NJ MCL	13	14	13	NA	NA	NA
CA Notification levels (Response Levels)	6.5 (40)	5.1 (10)	NA	NA	NA	NA
MI MCL	16	8	6	51	NA	PFNA value recommended
MN guidelines	15	35	NA	47	NA	NA
NH MCL	15	12	11	18	NA	NA
Most other states (EPA value by default)	70					

The MA MCL applies to water systems that are used daily by more than 25 people.

It is very expensive for water suppliers to address this contaminant. Can cost millions of \$\$\$. Some can just turn off a well; others need a new treatment facility.

State has added funding to the State Revolving Fund at 2% loan.

Also added \$8.4 m for testing, design grants, free lab analysis.

468 public water systems have been tested. These supply most of the state’s population. 37 have an issue with PFAS6. Some cannot address this issue immediately.

There’s a MA story map (<https://www.mass.gov/info-details/per-and-polyflouroalkyl-substances-pfas>)

Legislature also gave DEP funding for private well testing, which is targeted to communities where there’s little public water supply—greater than 60% on private wells (84 towns).

DEP just started looking at PFAS in wastewater. EPA is no longer issuing joint permits with MassDEP, so MassDEP is issuing both permits. MA is using its own authority to require PFAS monitoring in any WWTP where permits are being renewed. There are no PFAS limits; this is strictly data-gathering. Testing influent, effluent, solids. What’s the difference in values?

DEP is also requiring industrial quarterly sampling within 6 months of effective date of their discharge permit.

Asking industry to look at their processes to remove PFAS from their processes.

Technical assistance for industry—with Office of Technical Assistance.

Residuals—38 % of residuals are land-applied. Some that apply in MA generate their residuals outside of MA. Requiring quarterly sampling of residuals that are land-applied as of

July 2020. No federal lab methods; MassDEP reviews proposed lab methods of each entity that land applies residuals in MA. No land-application standards for PFAS.

Looking to evaluate possible impacts of PFAS on water and soil. . Also need to consider the impact of disrupting the market for residuals.

Slide says “fertilizer” but should be “land applied”

The DEP is also getting a better idea of rates at which residuals are land applied (for example, based on the need of specific crops and nitrogen content of the residuals).

Working with various stakeholder groups to advise DEP on residuals and land application. These include generators of residuals, environmental advocates, health experts, and others.

Q: What is DEP finding in the residuals testing?

KB: DEP just starting to require that samples be collected and we don’t have enough information to answer this yet. Different residuals have different PFAS characteristics, and these may change with the seasons. Also, can’t compare residual concentrations to drinking water levels—we don’t yet know what levels should trigger concern.

#### PFAS and Surface Waters

DEP will release a study done with USGS involving the sampling of river water upstream and downstream of WWTPs, as well as streams that should not be impacted by WWTPs. Three rounds of monthly sample collection. What are the PFAS personalities, if any? What concentrations? KB suspects that will generate a lot more questions. This is the first study of PFAS and rivers in MA.

#### Other PFAS

Mosquito spraying over areas with EEE done by MA Department of Agricultural Resources. Tested samples and found PFAS. Turns out the containers had traces of PFAS, and now there is concern about other containers and their PFAS concentrations including other pesticides that may also have PFAS in their containers.

Q: what are the containers made of?

A: will get that information to you.

Comment: Watershed groups are very interested in the results of this study

DEP has had a take-back program for AFFF (aqueous fire fighting foam). Hoping this source control will start to address the problem.

**MWRA**—Becky Weidman, director of TRAC

MWRA is sampling drinking water per DEP requirements.

Sampling for the following 16 compounds in biosolids:

Six Bold PFAS compounds = Massachusetts MCL	
All PFAS compounds = AOS Sampling Requirements	
<b>PFOA</b>	<b>Perfluorooctanoic acid</b>
<b>PFOS</b>	<b>Perfluorooctanesulfonic acid</b>
<b>PFNA</b>	<b>Perfluoronanoic acid</b>
<b>PFHxS</b>	<b>Perfluorohexanesulfonic acid</b>
<b>PFHpA</b>	<b>Perfluoroheptanoic acid</b>
<b>PFDA</b>	<b>Perfluorodecanoic acid</b>
PFBA	Perfluorobutanoic Acid
PFPeA	Perfluoropentanoic Acid
PFHxA	Perfluorohexanoic Acid
PFUnA	Perfluoroundecanoic Acid
PFDoA	Perfluorododecanoic Acid
PFTTrDA	Perfluorotridecanoic Acid
PFBS	Perfluorobutanesulfonic Acid
PFPeS	Perfluoropentanesulfonic Acid
PFNS	Perfluorononanesulfonic Acid
PFDS	Perfluorodecanesulfonic Acid

TRAC is reaching out to significant industrial users. 190-200 odd total. Number of industries have shut down during the pandemic. Sent them outlines of coming regulations, and referred them to the Office of Technical Assistance at EoEA to get free & confidential services to analyze their processes for PFAS and how to change them to remove PFAS from their effluent.

A number have taken advantage of these services, but can't tell you the outcome because they are confidential.

Have identified a number of industries that we know or suspect are using PFAS in the MWRA service area.

Deer Island discharge (NPDES) permit is up for renewal, so is Clinton in 2021. Summary of what's required—timelines are slightly different:

Both are monitoring the 6 compounds. Anticipate these requirements:



#### National Pollutant Discharge Elimination System (NPDES) Permits

MWRA is tracking EPA changes, which are under review as the presidential administration changed.

EPA efforts underway include methods to identify PFAS in media outside of drinking water.

EPA is pursuing limits in drinking water of PFOS and PFOA (the two oldest PFAS). Not sure of impact on MA.

- EPA Region 1 NPDES and MassDEP Surface Water Discharge permits include new PFAS monitoring requirements
  - 6 PFAS Compounds
  - Beginning 6 months after approved WW method or 2 years after issued (whichever is earlier)
    - Influent (Quarterly)
    - Effluent (Quarterly)
    - Biosolids (Quarterly)
    - SIUs (Annually)

For the Unregulated Contaminant Monitoring Rule 5 (UCMR5) monitoring will probably start in 2023-25. Will include 29 PFAS compounds. MWRA is required to sample.

EPA added 172 PFAS to the toxic release inventory chemical list, 100lb reporting limit. OTA added these 172 compounds (plus three just added, according to John Raschko) to their hazardous substance list. Those updates made to MA's Toxic or Hazardous Substance List (301 CMR 41.00) at the end of 2020 (the first 172 PFAS compounds). That is unlikely to add many industries into the fold of those who need to report—first reporting requirement is in 2021.

Per TSCA certain manufacturers and importers have to start reporting long-chain PFAS.

EPA also released draft guidance on destruction and disposal.

Advanced notice from EPA on proposed rulemaking for PFAS manufacturers and formulators in the effluent limitation guidelines for organic chemicals, plastics, and synthetic fibers. Is on hold now.

Watching closely with WWTP—the potential to list PFAS as a hazardous substance under the Resource Conservation & Recovery Act (RCRA) and Comprehensive Environmental Response Compensation & Liability Act (CERCLA). All watching that because if PFAS is identified under those two acts, could potentially result in WWTP facilities being liable for cleanup even though don't produce these compounds.

Lastly, no surface water quality standards. EPA said they would be working on developing them, but not seeing anything yet.

Participating in a number of studies on how PFAS makes its way through water treatment processes. No results yet. Not enough data to identify any trends.

Working very closely with DEP and EPA on everything to do with PFAS.

Q: Are there any studies of uptake in plants?

KB: No studies yet on that. Definitely a concern.

Q: How much of the PFAS 6 have been found in MWRA drinking water?

BW: Results from January 2021 are on the MWRA.com website. Sum of PFAS6 was 0 ppt.

Q: When will wastewater testing methods be approved:

BW: Steve Rhode of MWRA labs is on the EPA advisory group. Hope to have a method by the end of 2021.

Q: What's expected to happen to limits on wastewater discharged to groundwater sources (this is a state, not federal, law)

KB: DEP has thought about that, and about septic systems as sources, but haven't started the data collection yet. So many potential sources!

Q: What's happening with the collected AFFF?

KB: foam is sent to a facility in Ohio, which is blending it to create a fuel for incinerators that burn it at high temperatures—one of the only ways to destroy PFAS)

Q: Any additional studies of PFAS in effluent outside of MA?

BW: Michigan is at the forefront of regulating PFAS in effluent and setting surface water quality standards for PFAS. Check their website. CA has also done some work. Lots of literature available.

Q: when PFAS is incinerated, what does it mean that PFAS are destroyed? What happens to the fluorine atoms?

KB: The very strong bonds between hydrogen & fluorine are broken. Not clear what might be coming out of the stack and being deposited. Good point. Are the byproducts also toxic? There are several thousand PFAS, MA regulates 6. Lots that we don't understand about PFAS.

AD: Over 5,000 PFAS as of last year, and concern that destruction of long-chain PFAS may be creating new, short-chain PFAS.

EPA's announcement: <https://www.epa.gov/newsreleases/epa-takes-action-investigate-pfas-contamination>

IIRC is a good resource, they are tracking regulations and standards by states for PFAS: <https://pfas-1.itrcweb.org/fact-sheets/>

Lexi: Holding WSCAC minutes for the March 9 WSCAC meeting. Topic is Reservoir Operations, dams, invasive aquatic plants, water use trends for 2020.

**Next meeting:**

**April 20, 10:30 am, Virtual**

MWRA's Capital and Current FY22 Budgets

## February Director's Report

### 2/9 EBC PFAS Conference

#### **Linda Gaines, EPA, Historical PFAS usage**

First: carbon tetrafluoride 1886. Started being used widely in 1950s. AFFF developed in the 1960s. Became product of choice in the 1970s-2002. Another version to 2004. AFFF is still being used, but <800 ppb of PFOA and PFOS

Used in metal plating 1954-currently.

Textiles: repelling water, oil, stains. Outerwear, carpets, fiberglass, Kevlar, firefighting clothing

Plastics: processing aid, raw material, cookware, medical industries, electrical cable insulation, building materials.

1960s: membranes in fuel cells and electrolyzers. Useful in high temperature/harsh environments

In mosquito sprays--because of the container.

Lining paper and cardboard for water & oil resistance (i.e., coffee cups). Added to pulp at paper-making stage; not a coating

Lubricants for magnetic tapes/disks. Used inside & outside devices to protect from moisture.

Used in batteries, semiconductors, wafers

In film, paper and plates to repel dirt and reduce friction. Anti-reflective coating

Cleaning products--carpet cleaning, cleaning for dentures, shampoos, floors, dishwashing, auto waxes, concrete, masonry and dry-cleaning

Coatings: waxes, paints, inks, varnish. Ink jet ink, ski wax, caulk, windshields, eyeglass lenses.

Used as inert ingredients in many pesticides, no longer allowed except one.

Medicine: discontinued: substitute blood, medical diagnostics/imaging, ultrasound contrast, implantable devices & contact lenses



Personal care products--lubricants, cosmetics, sunscreen, toothpastes, chewing gum. Dental floss

Building & construction---concrete mix, coating of tents, prevents fouling of lines.

Explosives since 1950s. Tracking flares, warheads for bio/chemical warfare

Used in oil & gas recovery wells. Evaporating inhibitors for gas, oils. Maybe oil spills?

Mining: enhancing metal recovery

## EPA Action on PFAS

### • Water Actions

- Health advisory level for PFAS: 70 ppt. (Not an MCL)
- Collecting data re: presence and treatment of PFAS manufacturer effluent

### • Toxics

- Added 172 PFAS to EPCRA's Toxics Release Inventory
  - If working with  $\geq 100$  lbs of any PFAS, must track and report usage by **July 1, 2021**
- Banned the manufacture and import of long-chain PFAS absent EPA review and approval

### • Cleanup Actions

- Interim recommendations for addressing groundwater contaminated with PFOA & PFOS in federal cleanup programs

### • What's Next?

- CERCLA hazardous substances designation for PFOA/PFOS
- Developing PFOA/PFOS national drinking water regulation
- President Biden to ask Amanda Gorman, "What rhymes with PFAS?"

**CHUBMAN**

### Mark Benotti: PFAS Forensics

Still evolving field. PFAS degrade to different PFAS.

Some information based on how the PFAS were manufactured. Different chemical signatures and electrochemical fluorination--developed by 3M, now discontinued in the US.

# Challenges of PFAS Forensics (Compared to more “Mature” Contaminant Forensics)

Question	Hydrocarbon Forensics	PFAS Forensics
Can we understand the “holistic” contaminant signature?	Yes <ul style="list-style-type: none"> <li>GC-FID showing boiling point distribution of hydrocarbons</li> </ul>	No <ul style="list-style-type: none"> <li>Fugitive PFAS is often in the form of unknown “precursors”</li> <li>Cannot directly measure “precursors” but they can degrade to PFOS, PFOA or other PFAS of concern</li> </ul>
Can we compare environmental data to a library of source materials?	Yes	Not yet
Are there manufacturing/processing practices that impart unique chemical signatures?	Yes <ul style="list-style-type: none"> <li>Boiling point distributions of hydrocarbons in refined fuels</li> <li>Alkylated PAH distribution in petroleum vs. MGP waste</li> </ul>	Yes <ul style="list-style-type: none"> <li>Electrochemical fluorination (ECF)-produced PFAS has even- and odd-numbered perfluorinated carbon chains</li> </ul>
Do we understand environmental weathering?	Yes	Partially

Perspective. Vision. Solutions.



## Use & Disposal Challenges AFFF, Richard Spiese, VT Dept. of Environmental Conservation

AFFF--up to 20% solvents, <2% fluorosurfactants (PFAS). Mostly water. Current AFFF has lower levels of PFAS than precursors. Transitioning away from fluorinated AFFFs.

Risk management model--past, present & what will use in future.

VT has take back program--very high cost (storing product before disposal. Disposal to NY facility). NY and MA did fuel-blending in takeback. MI and WA did take-back--stabilization of foams and landfilling (expensive). NH and CT working on take-back programs.

Disposal options: stabilization & burial, deep well injection, incineration. All are unproven. Many think AFFF should be stored until disposal better understood. Interim guidance from EPA (12/18/20)

## PFAS Legal Issues, Andrew Davis

Critical to understand background levels of PFAS.

Part of the problem is the number of PFAS. >5,000 compounds developed

Also, a lot of uncertainty. Getting regulated fast. Hot new contaminant. Measured in PPT. Our bodies have ppb. High potential for cross-contamination for sampling and handling.

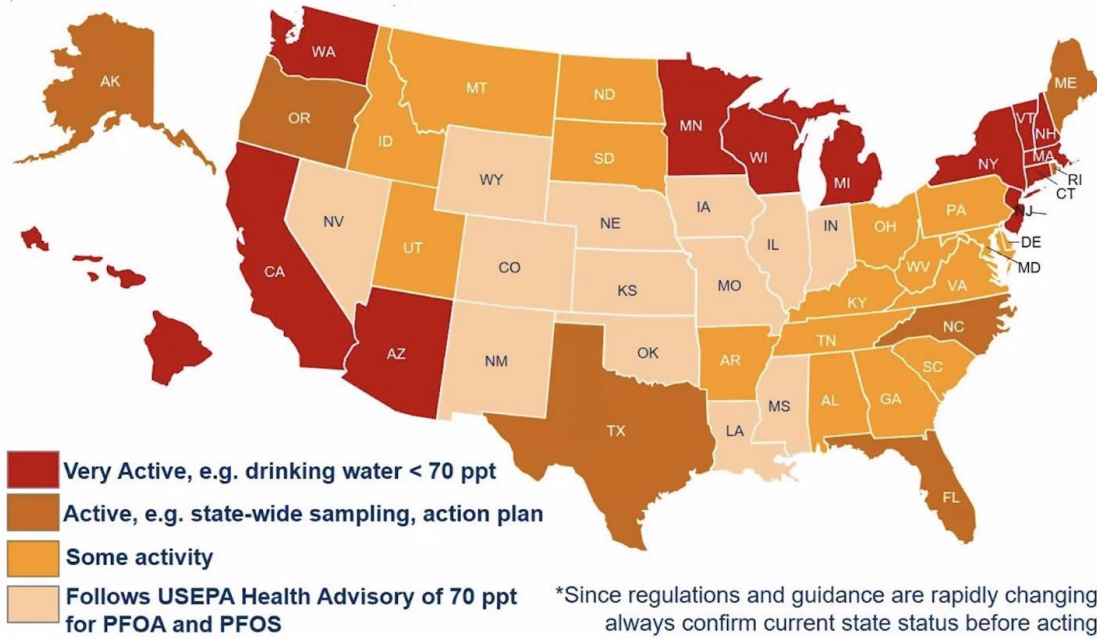
Only two methods for measuring PFAS & don't cover all compounds. Food-specific method.

Technical and legal issues with PFAS.

	Drinking Water*	Groundwater*	Other Notes
CT	70 ppt for 5 PFAS	70 ppt for 5 PFAS	- Must be addressed as an Significant Enviro. Hazard
MA	MCL: 20 ppt for 6 PFAS and 3.3 ppt individually for PFOA, PFOS, and more...	20 ppt for 6 PFAS	- MA Contingency Plan requires notification & cleanup for soil & gw - Subject to Waste Site Cleanup Program
ME	70 ppt for PFOA/PFOS 400 ppt for all PFAS		- Also has standards for "beneficial use soils" and biosolids
MI	MCL: 8 ppt for PFOA; 16 ppt for PFOS; and more...	8 ppt for PFOA; 16 ppt PFOS; and more...	- Has a robust testing, investigation and research program (MPART)
NH	MCL: 12 ppt for PFOA; 15 ppt for PFOS; and more...	70 ppt for PFOA/PFOS (revisions pending)	- Must sample public water, landfills, and wastewater plants
NY	MCL: 10 ppt individually for PFOA/PFOS	10 ppt for PFOA/PFOS 100 ppt for any PFAS 500 ppt for all PFAS	- If in NYS cleanup program, must sample for 21 PFAS in soil, GW, and surface water <b>- Jan 2021: NYSDEC proposed to regulate PFOA in Air Emissions</b>
RI	20 ppt for 5 PFAS (proposed)	70 ppt for PFOA/PFOS	
VT	MCL: 20 ppt for 5 PFAS and 4 ppt individually for PFOA, PFOS, and more...		For public water supplies: if < 20 ppt = monitoring required; if >20 ppt = Do Not Drink order
* For efficiency, this table includes maximum contaminant levels (MCLs); advisory, action, and guideline levels; and proposed requirements. Please review state-specific requirements as necessary.			

Further EPA regulation is highly likely. Patchwork of state regulations.

## “Heat Map” of PFAS Activity in US States



15 Credit – ERM Webinar, 12/2020

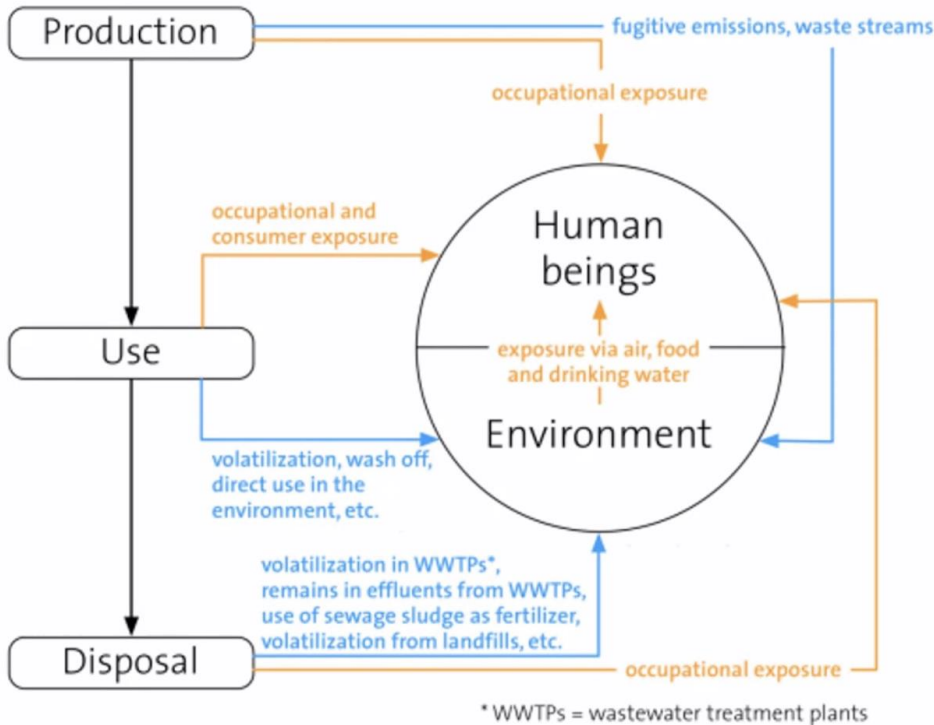
**SHIPMAN**

### Risk Assessment, Jenny Philips

Mostly toxicity

--long-term exposure, concentration levels, ecological risk

**Figure 2: Exposure routes of PFAAs and their potential precursors to the environment and human beings during the life cycle of PFAS-containing products**



\* WWTPs = wastewater treatment plants

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OECD/UNEP Global Pfc Group:  
Synthesis Paper On Per- And  
Polyfluorinated Chemicals  
(PFCS) 2013

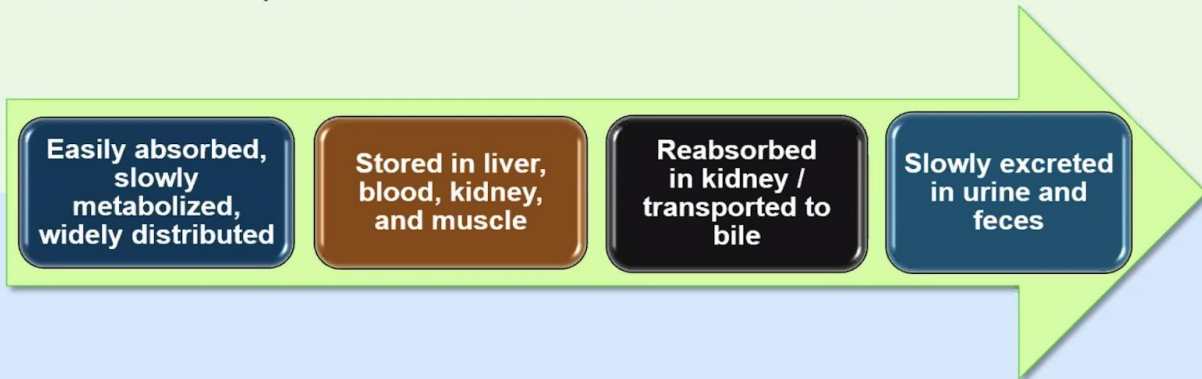
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Risk=Dose (Concentration x Exposure) x Toxicity

PFAS concentration correlated with population density

Toxicity data/studies--focused initially on older PFAS, now including more. Mostly due to concentrations in drinking water, not in other exposures.

- Human half-life 2-10 years (up to 70 years for complete removal)
- Have a low affinity for lipids and preferentially bind to proteins
- Cross the placental barrier and are excreted into breast milk



Outline of the differences in state-to-state regulatory levels and the science used for each.

Data Gaps are substantial, but may be filled quickly.

- Limited data on bioaccumulation and toxicity for most PFAS
  - Most available values only for PFOS/PFOA
  - Bird TRVs for PFOS and PFBS only
  - No TRVs for amphibians, reptiles, benthic invertebrates – more research needed
- Challenges
  - Mixtures (additivity?)
  - Precursors
  - Field studies and background
  - Exposure assessment – diet composition, varying receptors, home ranges etc.
- ITRC: Sections 7.2 & 9.2 for Eco Risk
  - Tables 7-1 through 7-3 for ecotoxicity summary tables
  - Table 9-3 & 9-4 for aquatic thresholds
- Several SERDP projects: leading eco risk assessment
  - ER18-1614 Conder et al. 2020 (recommended input parameters for eco risk, risk-based tool)
  - ER18-1653 Divine et al. 2020 (screening levels for various receptors, recommended input parameters for eco risk)

<https://www.serdp-estcp.org/News-and-Events/Blog/PFAS-Ecotoxicity-Risks-How-SERDP-is-Closing-the-Knowledge-Gaps>

7.2 Ecological Toxicity

9.2 Eco Risk Assessment

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## George Naslas: Overview--water supply and wastewater/products

Outlines various state standards & guidelines

Generally, PFAS is found where people have sampled for it. (Ubiquitous)

# Status of PFAS related to Wastewater

## Discharge Permits

### NPDES PERMITS (EPA Region 1)

- Five DRAFT NPDES permits recently issued with Per- and Polyfluoroalkyl substances sampling requirements (Report Only)
  - Quarterly Sampling – Influent, Effluent and Sludge - PFHxS, PFHpA, PFNA, PFOS, PFOA, PFDA
  - Sludge Disposal Concerns - dried sludge from \$18 to \$38 dry ton, \$140/ton wet sludge
  - Targeting specific industries via Industrial Pretreatment Program (IPP) Requirements

**Virginia Biosolids Council** – Endorses Purdue studies of land applied biosolid impacts and potential remedies in Virginia, Pennsylvania and Indiana

### Groundwater Discharge Permits – Could be next

Treatments for drinking water, pressure filtration, etc. exist and are proven. More research on optimization.

Soil treatments are next--stabilizing, thermal treatment....

## Wastewater Issues

- If you look for it, you will find it.
- No known WW related limits yet in any state.
- EPA requiring testing for PFAS though NPDES
- Many impacted downstream surface water (and groundwater) supplies “blame” WWTF
- Some states/entities have done testing of sludge and land application sites. **Maine biosolid limits essentially cease all land application in 2019.**
- Sludge handling pricing already going up and PFAS exclusions and/or surcharge clauses showing up in hauling and disposal contracts.



Also, in many pesticide containers, food containers, food, AFFF, synthetic playing fields



NH is doing a study of PFAS in biosolids.

What do you do with solid waste if you can't incinerate? Capping is an option. But need to know more about impacts to groundwater.

Final panel on degree regulating PFAS, new guidance/programs, frequency of detection in water supply.

Includes sampling results in some states.

NY 2016 declared PFOA and PFOS as hazardous substances, which stopped AFFF & got them Superfund \$\$

Soil cleanup guidance--regulations pending

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## Guidance Values for Various Exposures

Land Use	PFOA	PFOS
Unrestricted	0.66 ppb	0.88 ppb
Residential	6.6 ppb	8.8 ppb
Groundwater Protection	1.1 ppb	3.7 ppb
Restricted Residential	33 ppb	44 ppb
Commercial	500 ppb	440 ppb
Industrial	600 ppb	440 ppb

CT

Evaluating wastewater influent, effluent, sludge @ 44 WWTP

Toxics in packaging state legislation (not necessarily only food--all consumer)

MA: Paul Locke, MassDEP

## MassDEP Programs & Efforts

<https://www.mass.gov/info-details/per-and-polyfluoroalkyl-substances-pfas>

<b>Toxicology</b>	Apply the same Reference Dose (5E-06 mg/kg/day) to six PFAS: PFDA, PFHpA, PFHxS, PFNA, PFOS & PFOA
<b>Laboratory</b>	Purchased 2 <sup>nd</sup> LC/MS/MS to expand analytical capacity
<b>Site Cleanup</b>	Promulgated Reportable Concentrations and Cleanup Standards for Groundwater & Soil; conducting site/source discovery activities around known contamination
<b>Source Reduction</b>	Implemented AFFF Takeback Program with Division of Fire Services
<b>Drinking Water</b>	Promulgated MCL of 20 ng/L for PFAS6 for Public Water Supplies; implemented associated sampling program
<b>Residuals/ Biosolids</b>	Required monitoring of PFAS in residuals with Approval of Suitability; series of Stakeholder Meetings on screening values



Also sampling public and private wells. So far, about 10% do not meet limits

NH

Doing biosolids sample, also wastewater (POWWTP, industrial, municipal) sludge and soil, fish & shellfish

Also, how to destroy PFAS.

WI -- testing wells, fish, deer flesh...

## WHOSE PFAS STANDARDS ARE CORRECT?

Units (ng/L)	PFOA	PFOS	PFHxS	PFNA	PFHpA	PFDA	
Massachusetts	20	20	20	20	20	20	Sum of 6 (MCL/GW-1)
Connecticut	70	70	70	70	70	-	Sum of 5 (Drinking Water Action Level)
Rhode Island	70	70	-	-	-	-	PFAS 6 MCL coming (same 6 as MA)
New Hampshire	12	15	18	11	-	-	MCL
Vermont	20	20	20	20	20	-	Sum of 5 (MCL)
New York	10	10	-	-	-	-	MCL
Wisconsin	20	20	-	-	-	-	GW Quality Standard Proposed 20 ng/L for sum of PFOS. PFOA, FO. NEtFOSE

VT--looks like soils do not impact groundwater. MA agrees with that interpretation.

### 2/11 Water Resources Commission

Lots of snow, a full month with no drought! Drought dashboard being developed with Cornell U. to automate calculations and put online in real time. Also looking to automate fire danger index. Creating a state impact reporting system.

### Hydrologic Report

January precipitation was low, between .75 and over 2" below normal. Temperatures above normal. Nothing on drought monitor. Outlook no drought forecast.

Overview of several potential Interbasin transfer requests. Some are transfers of wastewater. Some want more water, or relaxation of water conservation restrictions. Reading wants to join MWRA for full water supply so they can water outdoors.

Presentation:

Changes to the performance standards as part of Interbasin Transfer

Why full cost pricing for water. Required in the ITA now. Proposing to make the language stronger--full cost recovery to include fees & other charges. Currently only cover the water service (required). Talking about adding a requirement for an enterprise fund, with some leeway.

An alternative is a special revenue funds, but trend is away from this and toward enterprise funds. Recommended by DOR.

Question on capacity to enforce. Rates that must encourage water conservation.

No vote this meeting. Updating all performance standards, with guidance next month.

Also requiring monthly billing

## 2/17 MWRA Board

### Director's Report:

**Kevin Cotter** is leaving the board (retiring) after 18 years of service. This is his last meeting. He was the Labor appointment by the Mayor of Boston. (By contrast, the Chief of environmental affairs appointment from Boston has changed every 2 years or so since 2011). Multiple accolades from fellow board members. Thanks them and notes labor agreements that have benefitted the MWRA and the workers.

Board member **Brian Pena** has been promoted to water superintendent in Andover. Yesterday Laskey joined a virtual bill signing of the **CSO notification bill**. MWRA has already implemented most of the requirements so are in compliance (mostly) now.

Chair's Report: Carroll: Bernie Cooper & he were in contact up until the end, texting and talking. His last text was to ask about water & sewer assessments for Norwood.

### MWRA Strategic Business Plan FY21-25: Carolyn Fiore

Highlights: Organized by Strategic Priorities. Added a **sixth Priority**--Diversity, Equity and Workforce Development.

Changes are because of the goals achieved or changes in the landscape (new contaminants). Included **lessons learned** on safety & COVID. **Cyber-resiliency** added. New initiatives to lower MWRA **carbon footprint**.

### Orange Notebook--

**Maintenance backlog** at DI is higher than usual because of staff absences. Water supply and field operations are also seeing delays.

**Molybdenum** in pellets has fallen back to normal. Not sure why it was higher than normal in September. As a result, those pellets had to be shipped out of state. Still well under the Federal limit

Laskey: MWRA believes the state molybdenum limit is too low.

### Capital Project Spending 6-month report

24% underspent.

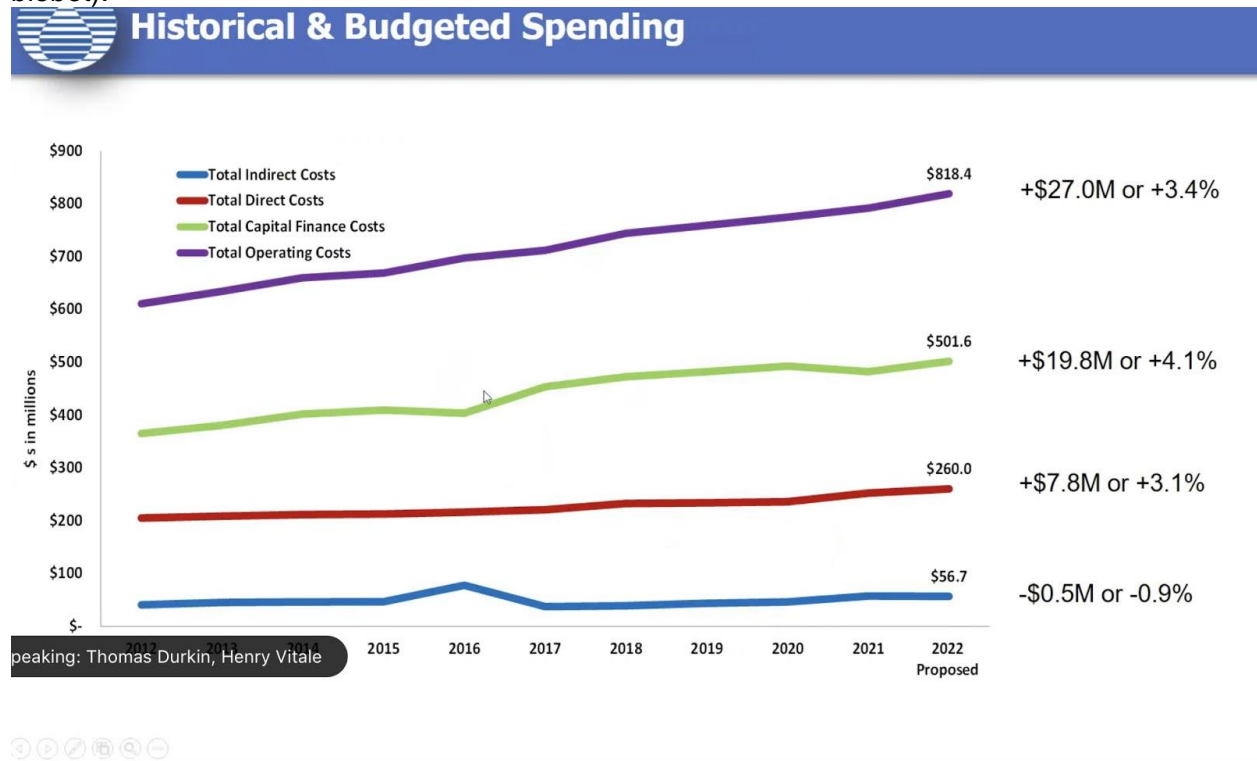
FY22 CIP, project through the end of the year. Projecting 25-26% underspending, which is about normal.

Why so far underspent? This year, the big driver is COVID and the necessity to shut down when someone is exposed.

10 projects drive the majority of the underspending.

### FY21 Financial Update

Have some underspending, mostly lower interest rates. Expect \$23.9m to be available to debt service. Overspending in MIS for teleworking; lab services for COVID-19 testing (including biobot).



### Water & Sewer Assessments

3.6% combined W&S increase.

Communities are seeing some unexpected increases as a result in the change of water use because of COVID.

### FY22 Proposed CEB

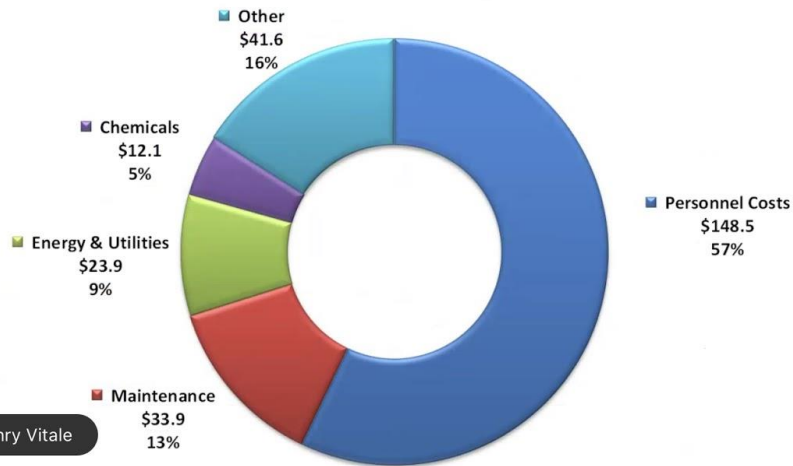
Again, looking at multiple years. Pandemic has been challenging, and has put pressure on the out years.



## FY22 Proposed CEB Budget Structure – Direct Expenses

### Direct Expenses by Category

(\$s in millions)



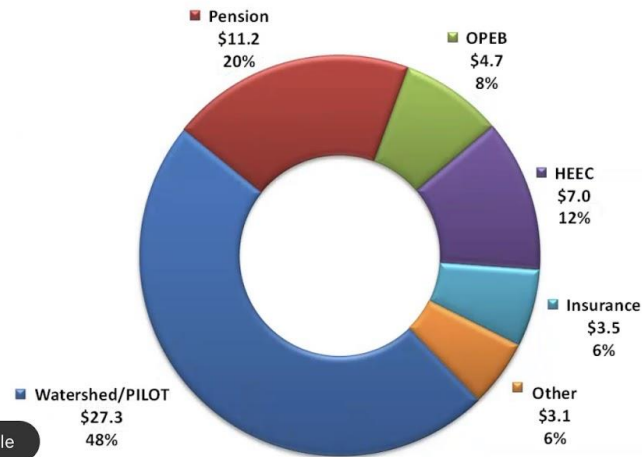
speaking: Michael Cole, Henry Vitale



## FY22 Proposed CEB Budget Structure – Indirect Expenses

### Indirect Expenses by Category

(\$s in millions)



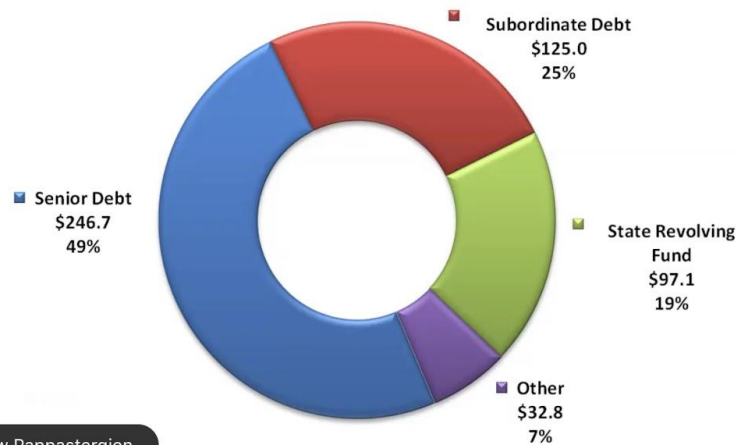
speaking: Michael Cole, Henry Vitale



## FY22 Proposed CEB Budget Structure – Capital Finance Expenses

### Capital Financing by Category

(\$s in millions)



Accounting: Matthew Horan, Andrew Pappastergion

Debt: continuing to spend down principal faster than accruing new debt.

So far, no federal relief money that can go to MWRA as a regional authority. Funds for rate relief would go to individuals or communities directly.

#### Combined Heat & Power contract time extension

Evaluating long term supply and on-site alternatives.

New CHP could increase green energy to 75-85% from 55-60%,

Increase to greater than 50% electrical production from 22%

Digester gas used for electricity directly

Would be the second largest in the country.

Study is critical to ensure cost effective solution into the future



## CHP Technology Recommendation

- Technology Evaluation Completed
- Recommend digester gas fueled reciprocating engine
  - Superior “part-load” performance means more electricity generated
  - Optimum regardless of heating season
  - Improved electrical generation efficiency > 50%
- Next step - 25-yr Models & Life Cycle cost analysis



Reciprocating Engine

Reciprocating engine uses spark plugs internal combustion. Better efficiency than diesel. Can be switched to another fuel.

Laskey: biggest project for MWRA after the tunnel project and will get MWRA closer to net zero.

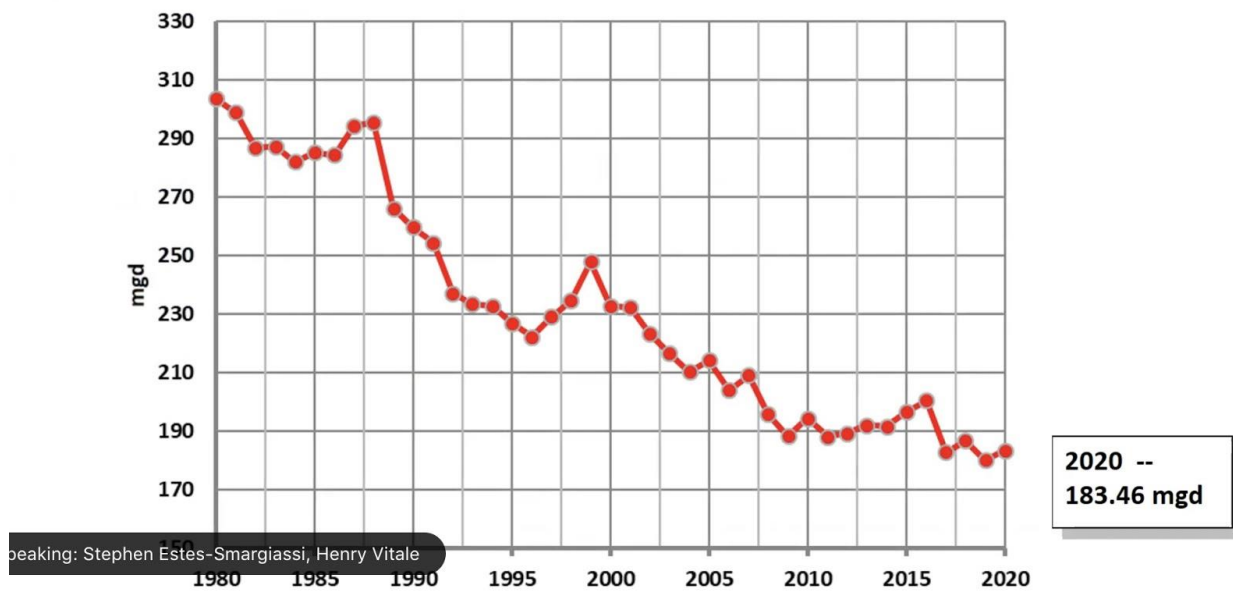
### Water Use Trends & Reservoir

Boston's usage was down -- lowest since earliest measurements





## Total Consumption by MWRA Communities (1980 to 2020)



Usage across the system was up slightly. Home gardening, work from home, etc.  
 Vitale: Through Sept. lowest he's ever seen Boston's water sales.

Water redundancy tunnel is starting the MEPA process.

### Affirmative Action Plan

WSCAC letter supporting Green Certification of the forest/lumber in the watersheds

### 2/18 Advisory Board

John Carroll--not able to attend, his 93rd birthday

Bernie Cooper tribute--last text to Joe F. was for the Norwood W&S assessment. To honor him, looking to place a memorial bench on MWRA grounds that has some connection to Norwood--on Blue Hills walking trails near the MWRA reservoir.

Presentation: John Scannel: DCR Watershed Protection Annual Update

Effects of COVID: some altered schedule for rangers when initially present. High visitor usage. Some rangers got COVID-19. No Quabbin rental boats, and late start to fishing season. Expect to start on time this year.

All watershed activities guided by the 5-year protection plan. Rewriting starts soon.

# Watershed Control Programs



- Land Acquisition
- Watershed Preservation Restrictions
- Land Management
- Wildlife Management
- Public Access Management
- Watershed Security
- Infrastructure
- Watershed Protection Act
- Education and Outreach
- Water Quality and Hydrologic Monitoring
- Watershed Monitoring and Assessment
- Aquatic Invasive Species
- Wastewater Management
- Stormwater Management
- Emergency Response

Use a heat map to determine most valuable watershed land to acquire.

Wildlife: gulls, beavers, deer...

Working to reduce sodium chloride, monitoring tributaries

Pulling aquatic invasive plants--DCR provides oversight.

Reducing stormwater discharges--working with DOT

Using GIS for a number of mapping/tracking and decision-making

Trespassing--rather significant near outfalls, but handled.

Staffing? Backfilled 8 positions--should have gotten to 139, but two staff left agency. So, at 137 Scanlan has to get approval to fill positions...

Executive committee is suggesting that the Legislature change the MWRA enabling act:

## **Advisory Board Language**

One member of the board of directors shall be the secretary of the executive office of ~~environmental affairs~~ **energy and environmental affairs, or a designee** serving ex officio,

~~The secretary of the executive office of environmental affairs shall be the chairman of the Authority. The board of directors annually shall elect one of its members as vice-chairman~~ **every two years shall elect one of its members as chairperson and one of its members as vice-chairperson.**

Transmittal of the CEB -- will review in March meeting.

This budget looks similar to previous years, 3.5% proposed Rate Revenue increase.

CSO notification bill--Operations March 2 meeting at 10 am. Also, will talk about wastewater metering and lead & copper rules.

### 2/25 Hatch webinar on digital solutions

Wastewater industry doing more with less: strict standards, resource recovery, complex operations, troubleshooting, reducing costs/improving sustainability, climate change & weather, capacity building, resilience, institutional knowledge

Have process simulators & process tools to help WWTP operators without extensive institutional knowledge to make timely decisions, based on what they actually can control.

They also have a web-based AI service to make predictions of flows, etc., based on weather & past weather. Control for nutrient exceedances. Can also reduce costs (energy, chemicals, etc).

### 3/2 MWRA AB Operations Committee

**Update on Chapter 322 of the Acts of 2021** – An Act Promoting Awareness of Sewage Pollution in Public Waters – Betsy Reilley, Director, ENQAL

Regulations should out by January 2022, six months to comply--so July 2022. Know DEP is focused on:

- CSOs
- Metering at outfalls & rapid notification of an activation
- Recommend that you become aware when activations happen
- Subscriber-based notification system (email)--also 2 largest news organizations
- For volume, can use a 3-year average.

Monthly updates. At Feb. 3 update--not clear only CSOs included. SSOs might be included, blending...some confusion, although CSOs the intent.

DEP planning to pull together a stakeholder group to work on regulations. 19 CSO communities. If law covers SSOs, then will have to whittle down the list. ‘

MWRA already has a notification system, as do Boston, Cambridge, Somerville and Chelsea. Required under variances for Charles and Mystic (in effect through 2023). Different from the CSO notification law--question of which takes precedence.

Big concern for attendees is that SSOs may be included--tough to meter those.

Lou Mammalote, Chelsea: Need to do the O&M work to prevent SSOs. Focus on understanding system deficiencies and putting them on the front burner. As a group, should argue less and have DEP help communities to fix sewer infrastructure.

John Sanchez: often SSO blockages that we can't anticipate--in one case flushed towels! These things are random, and we have no control over that.

**Update on Final Revisions to Lead and Copper Rule** – Steve Estes-Smargiassi, Director, Planning and Sustainability

Communities need to inventory all lead & galvanized steel service lines, notify every household with one of the risks, test the known lead-lines annually, develop & submit a plan to replace lead & galvanized service lines.

There are also new notification rules, and stricter sampling protocols. New requirement--find and fix. Also, more testing of schools and day care centers' water supply.

Lead Goosenecks? If you know about it, find it, replace it. But don't have to go looking for them in the street. MWRA will be making some changes to corrosion control after new testing regime starts.

Caveat--new administration & environmental challenges, so this may change.

**Wastewater Meter Replacement Update** – Steve Estes-Smargiassi, Director, Planning and Sustainability

Now in “hold-harmless” period because some meters already installed. Working with contractor right now to be sure plans and schedules are all organized. Expect training of MWRA staff in March on the new meter technology. Start installing in April. Hope to finish by the end of 2021.

Usually only takes a day to install. Testing is longer, but does not require a detail. These are laser meters, and more accurate than the old ones--which are also at the end of their useful life.

Going in where can, most efficiently. Doesn't matter now because in "hold harmless" period.

### **New Business**

Joe Favaloro: James sent out a survey to communities about delinquency rates for water & sewer payments. Really important data for AB. Staff are carefully monitoring CARES Act funding distributions. Defining with MEMA and FEMA on what is/isn't eligible. Helps AB show impacts of COVID in making the plea for Federal & State help.