

## **OMSAP Ad Hoc meeting on Chemicals of Emerging Concern (CECs)**

**May 19, 2020**

**1:00 pm to 3:00 pm**

**Via Zoom**

**Hosted by Juliet Simpson, MIT Sea Grant**

Presentations and notes from previous meetings are available here:

<https://drive.google.com/open?id=12c9iJtcbjvES1x6sC6O5JouwFF5QMdRQ>

### **Welcome and Introduction: Dr. Judith Pederson, OMSAP Chair**

The focus of today's Ad hoc OMSAP meeting is Contaminants of Emerging Concern, following up from the November 2018 workshop and the October 2019 OMSAP meeting.

Our goal is to evaluate to what extent do we consider monitoring CECs in the MWRA Ambient Monitoring Plan. We plan to write a white paper to send to agencies and to funding agencies

Goals of the meeting:

What contaminants are of concern, what are their sources, pathways, impacts, the roles of WWTP in releasing CECs, and what are the next steps for monitoring, special studies and to raise awareness.

### **MWRA Update: Betsy Reilley, Ken Keay**

Betsy Reilley reported on the effects of Covid-19 restrictions on MWRA. Staffing at Deer Island has been maintained but the level of staffing for monitoring has been reduced for health and safety reasons. The treatment facilities ongoing as normal, effluent permit limits have been met.

The Mass Bay water column monthly monitoring March survey was cancelled.

MWRA received approval for survey in April, planned for last week in April, but delayed to May 4 due to weather. The regularly scheduled May survey happened on May 18, but sampling crew had to be reduced to account for social distancing. The PCCS were able to perform surveys in April and May.

MWRA prioritized sampling parameters for contingency plan thresholds, e.g. water column profiles and *Alexandrium*.

Flounder survey delayed until May 11.

Next sediment surveys in June and August will have a few modifications.

MWRA has been keeping OMSAP, EPA and DEP informed and appreciates the latitude.

Dave Duest Deer Island manager has seen about a 6 percent decrease in effluent discharges, until the rains started.

Regarding nutrient monitoring, Ken Keay reported that for 2019 the load was over 13,000 metric tons, which exceeded the nitrogen threshold, although this is not a permit violation. It was below the warning threshold of 14,000 which was projected in 1988 for a loading in 2020. Despite the higher nitrogen load, the performance of the plant is still excellent. MWRA plans to provide an update on the nitrogen at the fall meeting.

**Recommendations for monitoring PPCPs: Drs. Peter Burn, Todd Callaghan and Mark Cantwell**  
**PPCPs and surrogates in wastewater and recommendations for monitoring**

Peter Burn provided an overview and is pleasantly surprised that there are fewer adverse effects than expected 20 years ago. We are now considering modifying the plan again, and considering monitoring for Contaminants of Emerging Concern, or CEC's. Hopefully we will be able to come up with some recommendations.

PPCPs, pharmaceuticals and personal care products is an "enormous" list of chemicals.

Identifying and ranking is interesting and challenging.

Peter is especially interested in endocrine disruptors.

Chemical behavior determines transport and fate.

They are pseudopersistent.

Many not regulated.

Levels of pharmaceuticals in ambient water do not approach therapeutic levels.

Spatial and temporal patterns are sometimes predictable.

They are active at low doses making testing challenging.

Not acutely toxic, but chronically toxic and may have effects on behavior.

Though you may not see affects, it doesn't mean they are not there.

Todd Callaghan surveyed some studies of effects on marine fish and invertebrates, e.g. with triclosan and titanium oxide.

MWRA has contractors on hand to look for contaminants in fish and shellfish and sediments, so not starting from scratch.

Center for Coastal Studies has found PPCP in Cape Cod waters, including in oysters.

Mass DEP has looked at priorities, presented at the November 2018 workshop.

SCCWRP has done most of the good screening work already.

They give the scope of a monitoring program and a conceptual model.

Mark Cantwell EPA Narragansett has conducted research and found PPCPs at many estuaries, e.g. Long Island Sound, Hudson River, Salem Sound, Narragansett Bay. He has winnowed down the study list to 24 PPCPs in 8 therapeutic categories. Mark described the shift in focus from legacy contaminants to emerging contaminants. There have been studies here in northeast estuaries on UV stabilizers called benzotriazoles, dishwasher detergents, and household products. Reductions of benzotriazoles in near surface sediments in Salem Sound showed a reduction, likely due to a WWTP upgrade.

Triclosan, which is a very stable chlorinated phenol ether has been studied in Narragansett Bay and although prevalent, concentrations have declined as this chemical has been phased out.

Hudson River shows PPCPs associated with WWTP outfalls and tributaries.

Sucralose can be used as an indicator of pharmaceuticals for water soluble chemicals.

Found strong gradient in Narragansett Bay from population sources and WWTP sources to the mouth of the bay.

But some nuances, caffeine present year round everywhere.

Sampling in Boston Harbor found fewest concentration and most non-detects. Sampled during rainstorm with some CSO discharges.

Recommendations from Mark are to focus on chemicals that have adverse effects and persistence, i.e. PBTs -- persistence, bioaccumulation, and toxicity.

We should do non-target screening for wastewater tracers or evaluate passive samplers.

We have a PFAS study underway in Stellwagen Bank and would be great to finish the samples. Things are on hold until they are allowed back into the lab which hopefully will be in summer 2020.

### **Discussion: facilitated by Dr. Judith Pederson**

Can tox tests help screen for chemicals, or are there relationships between toxicity and concentrations?

No silver bullet to destroy the chemicals at the treatment plant.

The effects are kind of elusive.

At this point PPCPs don't seem to be a category to focus a lot of effort on, maybe do passive sampling, see what gets removed, should focus on chemicals that have PBT, persistent, bioaccumulative, and toxic.

We are trying to protect human health, when we swim and eat fish, are we safe?

Could use toxicity tests using mysid shrimp, sea urchin larvae, *Menidia*.

Mark Patterson agrees with Todd's suggestions.

There was a study in 2010, that we can look at.

Don't need to look at triclosan it has been phased out.

Mark said on the California list, would be good to look at PBDEs because they are bioaccumulative, along with the legacy pfas.

Peter is trying to contact the Harvard School of Public Health research group on PPCPs and if he finds out anything Peter will pass them along.

What about interaction between microplastics and PPCPs?

It would be good to just look at the effluent concentrations and then use the model to determine dilution in the receiving environment.

Do we know if there are any other estimates from other treatment plants?

Triclosan has been banned from over the counter by FDA in 2018.

Look at Todd's final summary slide.

Would like to look at passive sampling, presentation by Loretta Fernandez.

This summary is good enough to get to the next meeting as a good base.

Jeff Rosen says let's not pursue because it seems more like research than monitoring and is beyond the scope of the MWRA monitoring. But, at the same time how do we keep our eyes open for this? Let's use the transport model to estimate the concentrations in the receiving waters.

Might be worth considering a one-shot survey, to see if we find any compound in the sediments or receiving waters.

Maybe do a special study.

Wanted to do a meeting in June and put together a package for example for a special study. To find the best fit for the goals we set out at the beginning and find the best balance. It's complicated and not easy.

If you do a special study with caged mussels and hydrophobics, and look at the mussels in the initial dilution, and see if they can bioaccumulate.

### **Next steps and closing remarks: Dr. Judith Pederson**

Judy said there were 43 on the call, down to 36. Cathy has the list of people attending.

In conclusion, thanks to everyone participating, we made progress today and look forward to next couple of meetings.

The goal is for OMSAP to write a paper to the agencies and find funding for special studies if necessary.

Next meeting in the fall to summarize findings from 2019.

### **Attendance**

#### **OMSAP members**

Judy Pederson, MITSG

Bob Beardsley, WHOI

Peter Burn, Suffolk U

Ginny Edgcomb, WHOI

Loretta Fernandez, NEU

Mark Patterson, NEU

Jeff Rosen, Corona Environmental Consulting

Julie Simpson, MITSG

Juanita Urban-Rich, U Mass Boston

#### **PIAC**

Bruce Berman, Save the Harbor/Save the Bay

Rich Delaney, Provincetown Center for Coastal Studies

Andreae Downs, MWRA Wastewater Advisory Committee

Joe Favaloro, MWRA Advisory Board

Heather McElroy, Cape Cod Commission

Tim Pasakarnis, Cape Cod Commission

Vi Patek, Safer Waters in Massachusetts

#### **IAAC**

Todd Callaghan, CZM

Ben Haskell, Stellwagen Bank National Marine Sanctuary

Jeff Kennedy, MA Division of Marine Fisheries

Cathy Vakalopoulos, MassDEP

Prassede Vella, CZM

Steve Wolf, USACOE

**Observers/Contributors**

Sally Carroll, MWRA

Lucner Charlestra, MWRA

Dan Codiga, MWRA

Ken Keay, MWRA

Wendy Leo, MWRA

Dave Duest, MWRA

Chris Goodwin, MWRA

Doug Hersh, MWRA

Betsy Reilley, MWRA

Steve Rhode, MWRA

Maret Smolow, MWRA

Dave Taylor, MWRA

Jianjun Wang, MWRA

David Wu, MWRA

Ellie Baptiste, Battelle

Carlton Hunt, retired

Kevin Brander, MassDEP

Michele Barden, EPA

Mel Cote, EPA

Mark Cantwell, EPA Narragansett

Amy Mueller, Northeastern University

Lenna Ostrodka, MWRA Advisory Board