



## **WSCAC Meeting**

December 8, 2015-11:00 AM

Location: MWRA Facilities in Southborough

### Members in Bold in Attendance:

**Whitney Beals, WSCAC Chair, NE Forestry**

Paul Lauenstein, NepRWA

Bill Fadden, OARS, Wild & Scenic Rivers

Terry Connolly, Town of Ware

Martin Pillsbury, MAPC

Elie Saroufim, Boston Water & Sewer

**Michael Baram, BU & CLF**

Martha Morgan, Nashua River Watershed

**Kurt Tramosch, Wayland Wells**

**Gerald Eves, Trout Unlimited**

**Andrea Donlon, CRWC**

### Non –Members in Attendance:

Lexi Dewey, WSCAC staff

Kathy Baskin, EOEEA

Andreae Downs, WAC

Vandana Rao, EOEEA

Laurel Schaidler, Silent Spring Institute

Heidi Waugh, WSCAC staff

Joshua Das, MWRA

Alison Field-Juma, OARS

Belinda Stansbury, WAC

### WSCAC Business

Whitney Beals called the meeting to order. Members and non-members introduced and identified themselves for the recording. Following introductions, Whit announced that the November meeting summary needed to be approved. Whit made a motion and Michael seconded the motion. The minutes were passed unanimously.

### Emerging Contaminants in Cape Cod Drinking Water: Dr. Laurel Schaidler, Silent Spring Institute

Dr.Schaidler, a research scientist at Silent Spring Institute introduced herself and her presentation titled, “*Emerging contaminants in Cape Cod Drinking Water: Where are they coming from and how worried should we be?*” She informed the committee she would be discussing the sources of emerging contaminants and the concerns associated with them. The presentation would focus on a study conducted by Silent Spring Institute on public wells on Cape Cod.

Laurel explained that the topic of pharmaceuticals and emerging contaminants gained a lot of attention in 2002 when the Associated Press released a study showing that the water of forty-one million Americans contained trace levels of pharmaceuticals. At the same time, there were an increasing number of reports regarding feminized male fish in rivers and lakes throughout the country, particularly related to hormones in wastewater.

Emerging contaminants, Laurel explained, are termed emerging because the ability to detect and analyze chemicals has improved in recent years. Perhaps the contaminants have been there all along, but researchers are just now able to detect them due to better analytical tools. Some chemicals could be new as different products go on the market every year.

Emerging contaminants are not currently regulated in drinking water, but many are of concern for potential human and ecological health effects. Some perfluorinated chemicals and hormones are on the current cycle of the Contaminant Candidate List 3 (CCL3) and the Unregulated Contaminant Monitoring Rule 3 list (UCMR3).

Emerging contaminants are often detected in surface water, ground water, and drinking water. In terms of ecological concern, Laurel said it is easier to study the effects on fish than it is to determine the connection between the contaminants, drinking water, and human health.

Laurel explained that emerging contaminants often come from sewage treatment plants, but our daily household wastewater also plays a role. Industrial and commercial wastewater sources also contribute. Laurel said that a lot of people think pharmaceuticals are the major point of concern, and as a result they advocate for drug take-back programs. Although such programs are great, she pointed out that most pharmaceuticals get into wastewater through the human body via the process of excretion.

Laurel turned the focus of her presentation to Cape Cod. She explained that although it is a fairly densely developed area, eighty-five percent of residents rely on individual septic systems. The Cape has a ‘perfect storm’ of factors: many people’s wastewater is going directly into the ground, there is a sand and gravel sole source aquifer, and the area has experienced rapid development. Laurel explained that septic systems and wastewater treatment plants are not designed to remove emerging contaminants, so all wastewater, regardless of location, will have some presence of emerging contaminants.

Laurel then provided some background information on Silent Spring Institute. The Institute is a nonprofit research organization with a mission that focuses on chemicals in our daily lives and how that relates to women’s health. The organization was founded by breast cancer activists that were concerned about relatively high incidence rates of breast cancer on Cape Cod. The Institute’s initial question being, “is there something different about drinking water on the Cape and how does it relate to health?” In respect to water quality research, Silent Spring Institute focuses on the following:

- Measuring endocrine disruptors and other emerging contaminants in drinking water, ground water, and ponds
- Evaluating septic systems as sources of contaminants and characterizing subsurface transport
- Informing wastewater management and drinking water treatment and protection decision-makers

Laurel reviewed previous research projects conducted by Silent Spring Institute. In respect to the study of groundwater, the Institute conducted a research project designed to characterize the kind of contaminants that can create a plume moving from one septic system into the groundwater. Researchers determined that in groundwater where the oxygen levels were higher, the emerging contaminants tended to break down as there was more aerobic degradation from the microbial communities. In the anoxic part of the plume, researchers saw a greater persistence and transport from hormones and pharmaceuticals. That same groundwater on the Cape is the main source of input into the ponds on the Cape. Silent Springs studied six ponds – three in more densely

developed areas and three in less densely developed areas – on the Cape to discern an integrated measure on the effects of land use within watershed areas. Not surprisingly, the researchers found that ponds in more densely developed areas had higher levels and more frequent detections of pharmaceuticals and hormones. The ponds affect the groundwater which is the source of drinking water for all Cape residents.

Laurel stated that she would focus on a study conducted on twenty public-water drinking wells. The main objectives of the study included the following:

- Measure emerging contaminants in Cape Cod public water drinking wells
- Compare results to other U.S. drinking water sources and to health-based guideline values
- Determine whether land use and chemical wastewater markers are predictors of emerging contaminants
- Make sure local decision makers were informed of the research in order to motivate local discussion surrounding wastewater treatment and drinking water protection

Researchers tested raw water for about one hundred emerging contaminants, including the following:

- PPCPs (pharmaceuticals, personal care products, fragrances)
- Hormones
- Perfluorinated chemicals (PFOS, PFOA)
- Alkylphenols and AP ethoxylates (found in detergents)
- Herbicides
- Organophosphate flame retardants

Kurt asked if cytotoxic chemotherapy drugs were included in the study. Laurel said the commercial labs they worked with didn't have any existing methods for measuring these. If she could include them in another study, it would be interesting as she knows they are extremely potent. Kurt then asked if researchers looked at viral transport of biologics. Laurel said that they did not look at biologics for this study; the USGS has conducted studies that have. Kurt asked if the topic was of interest to Laurel in combination with the current work she is doing. She replied that it could be in the future.

Laurel continued to state that Silent Spring Institute invited all of the water supply districts on Cape Cod to take part in the study. Nine water districts volunteered to learn more about what may be present in their water. Researchers collected samples in October of 2009 from twenty wells within the nine districts. The objective was to include a range of likely impacts and to be fairly representative of the wells in each district.

Testing detected eighteen of the one hundred chemicals included in the study. Three-quarters of the wells tested had at least one of the eighteen chemicals at detectable levels; the most found in a single well was twelve. The most frequently detected chemicals were an antibiotic called Sulfamethoxazole (used to treat urinary tract infections and pneumonia) and a perfluorinated chemical called PFOS.

Laurel stated that the cost for the analyses was around \$1,800 a sample. Researchers were interested to see if they could predict additional wells that might have high levels of certain chemicals given that they couldn't test every well of interest. Researchers evaluated several predictors of the presence of emerging contaminants. One was nitrate as it is a great marker of wastewater. They evaluated boron as well, also a marker of wastewater; boron is used in soaps and detergents. Researchers also considered well depth; they predicted that deeper wells would have lower levels of contaminants. Finally, they conducted land use analyses and considered two different zones: a 500-m zone and a zone of contribution.

Researchers determined that wells near residential development had more emerging contaminants. They also determined that wells with higher nitrate had more emerging contaminants. Deeper wells tended to have lower levels and fewer emerging contaminants.

Researchers questioned if there was something different about wells on Cape Cod. They asked, “How do these levels compare to other drinking water sources throughout the U.S.?” After comparing their results with other locations, they determined that water sources on the Cape have some of the highest levels of Sulfamethoxazole found. Similarly, in respect to Carbamazepine, the second most frequently detected chemical in the study, researchers determined that the highest levels on the Cape are higher than most other locations.

Researchers initially believed that septic systems are likely the main source of contamination, but there are other sources that contribute. Wastewater treatment plant effluent, fire fighting foams, runoff, and landfills are also contributors.

Laurel explained the importance of putting the results of the study into context. How should researchers weigh the effects of low dose exposure to pharmaceuticals and other emerging contaminants? Orders of magnitude must be considered. For instance, pharmaceuticals in drinking water will not have the same effect as a therapeutic dose. Nevertheless, emerging contaminants in drinking water do raise concerns for human health. Pharmaceuticals are potent and contain risks to children and pregnant women. Furthermore, there is a range of sensitivity among individuals and side effects vary significantly.

Andreae Downs asked if these chemicals can be taken out during the water treatment process. Laurel explained that there is a broad range of chemicals, so the answer is that it depends. You also have to consider how chemicals are transformed as they go through the treatment process. The chemical may still be there, but in a slightly different form that is no longer detectable by the treatment method used.

Laurel continued to state that regulations do not consider low-dose endocrine disruption. We are used to seeing greater effects from chemicals at greater levels of exposure. Some endocrine disrupters however, can cause more disruption at lower levels. This is changing how we need to think about risk assessment. It is also a challenge to think about the synergistic effects of chemical mixtures.

Laurel concluded by addressing the water suppliers that participated in the study. The suppliers were eager and interested to learn more about the possibility of emerging contaminants in their water, despite the lack of regulations and known health effects. Laurel said that Cape communities and water suppliers can work together to protect their drinking water by reducing sources of contaminants, protecting zones of contribution, and raising general awareness of groundwater vulnerability.

Vandana Rao asked if there are any regulations pertaining to emerging contaminants and if so, what form do they take? Laurel said that some guidelines have been developed. The EPA has several guidelines. In terms of enforcement, Laurel said, there isn't a great deal; it may look different from place to place.

Kathy Baskin thanked Laurel for the research and the presentation. She noted that Laurel didn't mention the less politically correct thing that Kathy typically mentions: the demographics on the Cape. Kathy believes the Cape is a perfect place to study a population that is ingesting more pharmaceuticals than a typical population. Additionally, it's all going into the water supply. She believes it is important to get a better idea of the whole picture and is pleased Silent Spring Institute is conducting the work. Kathy also asked Laurel if they collected their samples for the study at the same time of year and under the same conditions. Laurel said they did them all at once. Kathy then asked if Laurel looked at the data in terms of demographics such as age, income, or population density. Laurel said for this study, they did not consider those specifics. For the private well study they did look at population density.

Joshua Das asked about the presence of hormones. Laurel said they tested for eight hormones, but they did not detect them. They tend not to show up in groundwater. Hormones are a bit more persistent in surface water.

Vandana Rao wondered about the direction of the general discourse on emerging contaminants. She mentioned that the levels are so low, and the known effects appear insignificant, so perhaps the general public will not be concerned about this issue. How do we elevate the conversation to a place where the impacts will be seriously considered at the political level? Vandana believes this must go beyond research papers and asked Laurel what her recommendation is for moving forward.

Laurel said the conversation must be contextually specific. How communities move forward depends on the specific planning issues they are faced with and their resources. Laurel said it is a great question and was curious as to what others thought about it.

Kurt raised the issue of private well regulation. He advocates for statewide private well testing. The USGS considers the lack of private well regulation one of the greatest public health oversights in the country. Kurt asked if Laurel has seen any push for this on the Cape.

Laurel said she thinks there is a lot of testing that goes on, but no one is compiling it.

Kathy Baskin asked what direction Silent Spring Institute is moving in terms of research. Laurel explained they are focusing on Perfluorinated chemicals because they were frequently identified in their private well study. The Institute is interested in moving outside of the Cape to get further representation throughout the state to see what other people are being exposed to. Laurel said they are also trying to be more solutions oriented; they are looking at sustainable wastewater management and source reduction.

The committee thanked Laurel for her presentation.

Alison-Field Juma provided a short update on the request to MWRA by the Sudbury Assabet and Concord Wild and Scenic River Stewardship Council for a conversation regarding the possibility of flow augmentation for the Sudbury River from Framingham Reservoirs 1 & 2. Alison believes it is an extremely important issue that should be seen separately from wells and water supplies and anything else that is going on in the watershed. The reservoirs in question are not water supplies, so flow augmentation for the river shouldn't affect the ability to supply water. Alison said she thinks this is a conversation that is now happening and she is glad for that. The Stewardship Council has requested to have a meeting with MWRA and Alison hopes it will happen soon.

The meeting was adjourned.

For more information on Silent Spring Institute please visit their [website](#).

**The next WSCAC meeting will be held on January 12<sup>th</sup> at 10 A.M. in Southborough.  
Dave Coppes, Director of MWRA Waterworks will discuss redundancy performance and provide updates  
on several additional topics.**