



WSCAC Meeting

Location: MWRA Facilities
Southborough, MA
January 15, 2019 – 10:00 A.M.

Members in Bold in Attendance:

Michael Baram, WSCAC Chair, BU

Whitney Beals, NE Forestry
Terry Connolly, Town of Ware & Trout
Unlimited

William Copithorne, Town of Arlington

Andrea Donlon, CT River Conservancy

Gerald Eves, Trout Unlimited

Bill Fadden, OARS

Bill Kiley, BWSC

Paul Lauenstein, NepRWA

Jean McCluskey, ACEC/MA

Martha Morgan, Nashua River Watershed

Martin Pillsbury, MAPC

Janet Rothrock, League of Women Voters

Kurt Tramosch, Wayland Wells

Roger Wrubel, Mass Audubon

Non-Members in Attendance:

Israel Alvarez, MWRA

Lexi Dewey, WSCAC staff

Andreae Downs, WAC

Adriana Cillo, BWSC, WAC

Stephen Estes-Smargiassi, MWRA

James Guidod, MWRA Advisory Board

John Gregoire, MWRA

Michael McDonald, MWRA

Kannan Vembu, WAC

George Atallah, WAC

Alexandra Peckham, WSCAC staff

WSCAC Business

Michael Baram called the meeting to order and asked for comments on the December meeting summary. No comments were offered. Bill Fadden moved to approve. The vote was seconded, and the minutes were approved unanimously. Michael turned the meeting over to Lexi Dewey.

Lexi announced that there was not yet any update on the DWSP job vacancies or a letter from the Water Supply Protection Trust to Leo Roy, DCR Commissioner. There have been three interviews for select vacancies. Lexi will keep WSCAC members posted on any updates. Additionally, Lexi noted that WSCAC is waiting for Burlington's Draft EIR on joining the MWRA water system (the Secretary's Certificate on the ENF is available through MEPA). Burlington is already a wastewater MWRA ratepayer. There were not any dates yet for the February tour of the cannabis growing facility in Franklin.

Ace (Alexandra) and Lexi asked WSCAC members if there is anything they can do to help members share information provided by MWRA and DCR-DWSP with their individual organizations or communities. WSCAC staff is happy to provide hard copies or links to facilitate the spread of information to others who may be

interested. Paul asked if there's any sort of index or a master list of the information available. Lexi replied that the majority of information we send out is available on the [WSCAC website](#), and we are open to other ways to provide this material. Ace mentioned that the mileage fee for travel reimbursement has been updated, and the new form will be emailed shortly.

Stephen Estes-Smargiassi, the Director of Planning and Sustainability at the MWRA, was introduced, and he introduced Michael McDonald (Manager, Energy) and Israel Alvarez (MWRA Project Engineer). Before starting at MWRA, Michael was employed by American Water and worked on energy efficiency.

Mike began the presentation by showing several graphs and charts on renewable electricity generation at MWRA facilities. The first chart showed the total renewable electricity generated from 2006-2017, which included solar, wind, hydro, and methane – all green energy sources. While the chart indicates ups and downs in the production of energy, mostly due to weather, the overall trend is a significant increase. The latest hydro project, which WSCAC members toured in June 2018, is a turbine in the pipe that provides 6 mgd to the McLaughlin Fish Hatchery from the Brutsch Water Treatment facility. It went online in July of 2018, and can produce 65 kw.

Paul asked for clarification on what exactly the kilowatt indicates. Mike offered an analogy of driving across the country, where your speed might vary at any specific time, but overall, you have an average speed of 65 mph. So overall, the turbine is capable of producing a maximum of 65 kw/hr.

Kurt inquired about issues that can be encountered in bringing such a facility online. Mike and Steve explained that it was an entirely new facility, and so the issues that came up were all very much expected, such as aligning a flange or trouble-shooting the hydraulic system – nothing out of the ordinary.

Mike showed the next chart, which outlined the FY17 Hydro Production. Steve pointed out how valuable it is to be able to see the data, and know when more power generation is needed – “what gets measured gets managed”.

Kannan asked whether any of the hydro facilities are run in the river. All are “in system” – all water goes through the turbines and generates power that way. However, none of them discharge from a reservoir to the environment except the Deer Island Treatment Plant where the water is released into the ocean from the outfall after being treated.

George asked whether MWRA uses all the power that's generated, or whether they sell some back to the grid. Mike said most is used on site, but a small amount is sold back.

Andreae asked about the life expectancy for the turbines. Mike confirmed that they're on the older side, and due to the corrosive environment, they age more rapidly. Next steps are being assessed, whether that involves sizing or operating them differently. MWRA focuses on water and waste-water, and they aim for environmentally sound decisions, but also need to ensure cost-effectiveness.

Paul asked about the fluctuations visible on the chart between some hydro stations. Steve explained that when there's an excessive amount of rain, like in the spring/summer of 2018, there's little to no need to transfer water between reservoirs, and so certain hydro stations produce less energy.

Janet asked about a difference visible on the chart between the budget and the cumulative bar. Steve explained that MWRA's finance department wants to be kept aware of what's budgeted, and what's estimated – the budget is a best guess for what will be produced next year.

Adriana asked why Deer Island's power output decreased. Steve explained that sanitary flow is down, people are using less water, and MWRA has been working to improve efficiency. The plant was originally designed to handle an increase in flow, but is instead experiencing a decrease. Facilities are built to last 40 – 80 years, but it can be hard to know what will happen in the future.

Adriana also asked about the effect of bottled water on water flow. Steve said that drinking water consumption represents less than 1% of cumulative water use, so bottled water's difference is negligible. The decrease that MWRA is seeing in water use is more related to appliances such as dishwashers, washing machines and other appliances being more efficient.

Mike brought up geothermal energy capture next. The Wachusett Aqueduct Pump Station uses geothermal to heat the station, and is also producing solar energy (both roof and ground mount) to offset the energy usage from National Grid. The goal for this station is to have the energy use at net zero when the pumps aren't operating.

Mike took a few minutes to review SRECs, the solar program in Massachusetts (where facilities with solar panels are given renewable energy credits), which has recently been replaced by the SMART program (which promises revenue for the next 20 years). One of the projects featured by the SMART program is parking lot canopies with solar panels. These offer a big advantage as the land is already cleared, and the canopies offer shelter and shade to cars parking beneath them. The MWRA is considering three specific sites at Deer Island to install parking canopies, and one possible ground mount. The process is still in its early stages, so the MWRA is working with a consultant to review options.

Kurt asked whether wind turbines (which are near one of the potential canopy sites) would interfere with solar collection, and also whether there is any risk of icing or the snowload on the canopies. Mike said they're considering any potential issues, and Andreae remarked that Newton has solar canopies, and there haven't been any issues so far.

Kurt asked about heavy snowfalls, such as the winter of 2014-2015, and whether solar panels would be too low to get sun over the snow piles. Steve commented that it's really a balance of initial cost vs ongoing cost, and they're working to come to the best outcome.

Mike also mentioned that the MWRA is considering the addition of a solar panel canopy over the storage tanks in Cambridge, pending public approval. Kannan asked what challenges are expected in working with the neighborhood, and Steve responded that Cambridge, Boston, and many other communities require approval for all major cosmetic changes, so they're working with public groups.

Mike reviewed the SMART program. Massachusetts is divided into three areas for electrical servicing: Eversource, Eversource West, and National Grid. Each area has different incentives to reward consumers for using solar panels.

Mike then showed graphs of energy harvested from wind turbines and digester gas at Deer Island. Paul asked about the difference between electric generation and heat generation from digester gas, and which was more

effective. Steve responded that this is definitely on MWRA's radar, and they're reviewing the differences in the upcoming months. They may be able to get up to a 90% increase in energy generation in the years to come.

Kurt mentioned that the Deer Island turbines had to be installed at a reduced height, due to Logan Airport's flight plans, and asked if they're performing up to expected figures, as well inquiring about maintenance efforts. Steve said that the turbines are working as expected, but they require a notorious amount of maintenance.

Mike and Steve also returned to a question asked earlier about whether the energy is used on site or sold back to the grid. In locations like Deer Island, which use a lot of energy, all energy generated is used on site. However, other locations don't need as much energy as they're producing, so in those cases, energy is sold back to the grid. MWRA has Memorandums of Understanding with both Eversource and National Grid, which in the past saved the cost of 18 million kw hours, or \$1.7 million in savings, demonstrating the cost effectiveness of using renewable energy.

George asked, if there was no funding or reward from incentives, whether going green would be financially worthwhile, which is challenging to answer, because it depends on the value assigned to each kw by the electric company. Additionally, the scale of the MWRA's facilities is so much greater than the average person's home that it highly benefits the energy companies (who want to reduce energy use to save money) to work with the MWRA to facilitate their transition to greener energy. Paul asked if this is why the MWRA's savings are so significantly higher than his own, and Steve said correct, the power companies are essentially investing in green energy so they don't have to invest in building another power plant.

Mike explained that much of the low-lying fruit, like replacing light bulbs, has already been done, so now a big focus is being placed on energy use monitoring, installing meters to get metrics.

Kannan asked whether water energy efficiency tests have been done to compare water energy efficiency to other methods, and Mike said that yes, there are some studies, but those metrics are more challenging to gauge, due to different water energy generation methods used across different locales.

George inquired which technology had the highest payback, and Steve said that switching out lightbulbs was the fastest and easiest switch, especially considering the (minimal) effort involved. Kurt pointed out that geothermal has the surest payback from a green energy standpoint, so why isn't it done more? Steve explained that it makes great sense for brand-new construction, but it's much more challenging to retrofit, and the MWRA solutions need to be cost-efficient as well as energy-efficient. Janet asked whether geo-thermal only works with heating water (e.g. steam radiators), and Steve said that you can convert geothermal to air, but it reduces its efficiency. The most cost-effective approach is to incorporate energy efficiency with other required renovations.

Mike emphasized that it's very important to monitor energy use and demand, and shared a few graphs outlining efforts in this arena. At this time, the MWRA has reduced purchased energy nearly 20% from 2006-2017, including using higher-demand equipment during lower energy use times.

Mike then reviewed a few proposed projects to improve Deer Island energy efficiency, such as the DI Sludge Pump Optimization (recently completed), as well as several other under consideration, including some additional lighting projects.

Kurt asked how much of the energy savings would be attributed to the lower flows of wastewater coming in to Deer Island. Steve and Mike explained that they try to take these factors into account, but it's challenging to determine the numbers. They also explained that they estimate how much energy they'll need and how much they'll generate over the year, and then work to procure the necessary energy in the most cost-effective way possible. As a part of a demand/response program with the energy suppliers, they shut down and switch over to generator power during short and specific times of the year. This saves a significant amount of money.

Kannan asked if there is a breakdown of renewal energy sources and how those will pay out in the future. Steve responded that they aren't really looking at it in that way; the biggest changes are going to be at Deer Island, whether they're planning on switching to generate electricity first, then heat (rather than the other way around).

Steve also explained that all the facilities have backup power, which is very necessary. If there's a power failure, even a brief flicker, it can cause the whole facility to shut down, and it can take an hour or more to restart all the machinery. So during storms, facilities are switched over to generator power, to reduce the risk that the plant will shut off entirely.

Steve reviewed a chart showing greenhouse gases produced by MWRA facilities, and what's being focused on next. They've reduced quite a lot of emissions, but they've plateaued at this point. Kurt asked about digesters, and how several years ago, the state was pushing co-digestion, but it's no longer an emphasis. Steve explained that, if at the time the MWRA could have converted to digesters, it might have made sense to convert. But it was a high financial cost, and the market altered, so it was not feasible for Deer Island to do so.

Kannan asked why there was an uptick in greenhouse gas emissions between 2016 and 2017. Steve said there were just a few factors that came into play – more storms, so a higher need for the diesel generators, and similar causes. Kannan also asked why nitrous oxide is listed as an emission, and Steve explained that some of these figures are generated by the EPA.

Steve reviewed a pie chart that outlined where many of the greenhouse gas emissions numbers came from, including vehicles, methane emissions (that which they can't capture for reuse) and other small figures. About 86% of their emissions come straight from the energy that the facility uses, and so as the grid gets cleaner, the MWRA numbers will also get cleaner. Other things aren't negotiable, such as the diesel generators. He also presented several other charts, including showing where MWRA's emissions savings have come from, and also provided one that demonstrated how much bottled water costs in terms of greenhouse gases vs from the tap – tap water has 1/10,000 of the greenhouse gas emissions that bottled water does.

Paul asked about the methane that escapes from harvesting, and whether it's part of the gas industry's footprint. Steve said he's not sure, but the MWRA's protocols for tracking their greenhouse gas emissions continue to evolve, so the emissions figures are somewhat roughly generated.

Paul then expressed appreciation for all the effort that the MWRA has shown, and asked if there are any press releases to bring awareness to the public. Steve said that they recently received an award, which is announced on the website.

Steve and Mike wrapped up their presentation, and John Gregoire, Reservoir Operation Program Manager, was introduced.

John shared some drone footage of the Quabbin Reservoir spillway. Quabbin started spilling on October 11th, and had been doing so for 95 days. At the peak, about 375 mgd was going over the spillway and down the Swift River. Thirty-five million gallons per day is spilling from the Wachusett Reservoir and down the South Branch of the Nashua. John showed drone footage of a containment training exercise where a material similar to peat moss was spilled into the area and containment protocols were initiated.

John will share additional drone footage at the March WSCAC meeting on Reservoir Operations. He offered still photos to anyone who might want them for distribution.

Steve announced that the MWRA Board Packet has a 2018 overview of water use, and offered a few statistics, including a slight increase in water use in the Boston area. He also shared the completion of the Wachusett Pump Station to provide redundancy to the Wachusett Aqueduct. Steve noted that the drought from previous years is finally over, but the large amount of rain over the past several months has altered the water treatment at the Carroll Water Treatment Plant.

Steve also recommended reading a MWRA Staff Summary on the lead program as well as the Lead and Copper Rule.

Kurt asked about a recent opinion article in the Boston Globe suggesting that the MWRA take on the issue of emerging contaminants. Steve responded that questions have been asked and answered, and there's already a lot of monitoring and oversight by MWRA.

A discussion ensued about Deer Islands' ability to last into the future (Steve confirmed that the facility was built to last and is doing so), and whether it would be worth distributing wastewater to smaller more widely distributed plants, which has advantages and disadvantages.

Bill Kiley then spoke briefly about tunnel redundancy and whether there was an opportunity to incorporate hydro-electric capabilities into the new tunnels as they are constructed.

Steve discussed the suggestion, but was unsure how to implement it. If the water is getting discharged to the environment, treatment chemicals, like chlorine, would have to be removed. The best option to utilize this idea would be to build the tunnel and hydro facility, and then run it all the time, but for this specific example, it would only be running for a few hours at the time. Bill and Steve discussed the issue to see if there were other ways to work it in. Steve was concerned with the MWRA's future need for the water, or the risk of flooding other water bodies with discharge water.

Lexi asked Steve if there were any updates on the tunnel. Steve will check and respond.

Steve, Mike, John, and Bill Kiley were thanked for their presentations.

The meeting was adjourned.

WSCAC will meet again in a joint meeting with WAC on February 12, 2019 at 10:30 AM at the Waterworks Museum. Please [visit our website](#) for more information on this meeting.