

DRAFT
Minutes
Dec. 7, 2018

The Wastewater Advisory Committee to the MWRA met at MAPC, 60 Temple Pl., Boston, MA.

Attendees/Contributors:

WAC: Mary Adelstein, Craig Allen, George Atallah, Wayne Chinouard, Adrianna Cillo (BWSC), Stephen Greene, Taber Keally, Martin Pillsbury, Dan Winograd (phone)

Guests: Belinda Stansbury (PAI), Kennan Vembu (Natick), John Reinhart (MYRWA), Julie Wood (CRWA), Paul Keohan, Charlie Jewell (BWSC), Erica Casarano (AECOM), Wendy Leo, Jeremy Hall, David Kubiak, Maret Smolow, David Wu, Chris Goodwin (MWRA), Juliet Simpson (MIT SEA Grant), Susy King, Cathy Vakalopoulos (MassDEP)

Staff: Andreae Downs

FUTURE MEETING DATES/TOPICS

NEXT: TUESDAY, Feb. 12 10:30am, Water Works Museum, 2450 Beacon St., Chestnut Hill: MWRA 5-year Master Plans

VOTES:

November minutes

Nomination of Belinda Stansbury and Kannan Vembu to WAC membership.

EXECUTIVE DIRECTOR'S REPORT: Full report attached. Discussion of Tour date—May 3 or 10? Sense May 10 good. Suggests Prison Point CSO facility since about to be reconstructed and of interest in terms of clogs, CSO treatment.

MWRA UPDATES:

Changes to outfall monitoring program as part of OMSAP workshop. Clinton phosphorus facility in mothballs for the winter—seasonal facility starts again in April. Wet fall. Releasing water from reservoirs after the wet fall.

AB UPDATES

On Friday December 7, the Advisory Board Executive Committee will be hosting a “Spaghetti” session to casually discuss hot topic issues and “see what sticks”. The session will help for planning meetings priorities in the coming year. The starter topics on the agenda are Storm Water Issues, Rates Management, and Unaccounted for Water”.

At the November meeting, the Advisory Board discusses the preliminary findings of the annual water and sewer retail rate survey. For the 2018 calendar year, using the AWWA (American

Water Works Assoc.) standard of 120 HCF (hundred cubic feet) per household usage annually, the average combined water and sewer bill for MWRA communities was \$1599. This is an increase of 2.59% from last year's combined bill of \$1558. In comparison, the average wholesale rate change for wholesale communities in June of 2018 was 3.07%. When factoring in local, state, and federal data, the average household usage in the MWRA service area is estimated to be 70.5 HCF a year with an average combined bill of \$878.

The next Advisory Board meeting will be held January 17, 2019 in Canton at the Canton Public Library.

PRESENTATION: CSO MONITORING AND PERFORMAMNCE ASSESSMENT UPDATE

Jeremy Hall:

A tremendous amount of has work happened since last year's update.

Finished CSO regulator* inspections, constantly reviewing meter installations and hydraulic conditions at 57 active regulators. AECOM evaluating meter data collected so far, whether metering sites are adequate for their purposes, and whether meters can be selectively removed.

Modeling update. Incorporating inspection results, commencing calibration updates using recent meter data.

Regular coordination with CSO communities, sharing data and system evaluations.

(*Regulators—structures upstream of each CSO outfall, control and direct flows to DI system and overflows to the outfall—configurations (e.g. overflow weir, high overflow pipe) and hydraulic conditions vary. →

Sharing meter results between MWRA and community and vice versa. Looked at every existing meter, and whether it met the needs of the program and is properly calibrated. Also looking at changes to the monitoring program, as needed. In a couple of places, installed temporary supplemental meters.



ADS—the name of the environmental service company that manufactures the meters & provides data analysis. Each meter (collects and transmits data) has one or more data collection sensors, measuring level, velocity/pressure/flow or tide gate position (inclinometers).

Modified or eliminated regulators as part of the CSO program. Scope of work includes documenting that these are indeed permanently closed.

For instance: Picture of a closed CSO regulator →

Monthly meter data collected. MWRA issued first semiannual progress report on November 30, 2018, including metering plan, approach and CSO discharges in storms April 15 through June 30, 2018. Next report in the spring of 2019 will also report progress with calibration of the hydraulic model.



What's done so far?

Inspections of active and closed regulators—needs to be documented. Confirmed that “44” (corrected to 40 after the meeting) of original 84 CSOs are “closed” or converted to storm drain only. 35 are entirely closed to CSO. Five are “effectively” closed—CSO is prevented up to a 25 - year storm along the South Boston beaches. Work includes verifying that South Boston CSO storage tunnel achieves that level of control. Before tunnel approximately discharges/year to the beaches. No CSO discharge since tunnel brought on-line on May 4, 2011, but haven't had a 25 - year storm or greater to test the system, but the tunnel appears to be working as designed – will be verified.

Total number of storms April 15-June 30 (first semiannual progress report): 27. Overflows at 23 storms (corrected after meeting to 9 storms). More rainfall in 2018 than average – good for data collection.

MWRA compares actual rain storms to Typical Year storms (key basis for CSO performance objectives) Looking at inches per hour and now at cloud bursts, peak intensities and how they affect CSOs. Peak intensity later in the storm may have more effect on CSO than earlier. Also looking at groundwater and its influence on CSO.

Charlie: weather has changed. How do you adjust for that?

We did look at typical year & whether it has changed. It hasn't. We had a wet 2018, but two dry years before.

DK: focusing in on each storm. Calibrating model. It is the model that is used to determine whether meeting the court ordered level of control (based on “Typical Year” rainfall – 93 storms from 40-year record to 1992).

SG: Is the data correlated to the catchment area?

Yes. 20 gauges in all for this CSO study provide coverage of catchment areas.

Calibration of the hydraulic model, used to predict CSO discharge frequency and volume in the typical year, is included in the Consultants contract. Model calibration works best when a range of storm

magnitudes, intensities and durations is available. In order to maximize the range of storms it was a high priority to capture the spring of 2018 storms. The Consultant designed, installed, and got meters running by 4/14. The temporary metering portion of the MWRA Post Construction Monitoring and Performance Assessment is unprecedented in size. The amount of data in which the consultants are crunching is unbelievable. The cost of the CSO metering program alone is over a million dollars.

With all the storms since the metering program began—it been like Christmas. We have collected some great data. The data being used to identify active or relatively inactive CSO outfall, Calibrate the model, verify model predictions, and quantify CSO discharge (volume and duration).

Each metered location required its own design because each location is unique. The design takes into consideration for access, wastewater flow conditions, physical restrictions, tide gates, etc. Each site has a meter that is connected to sensors used to collect the data.

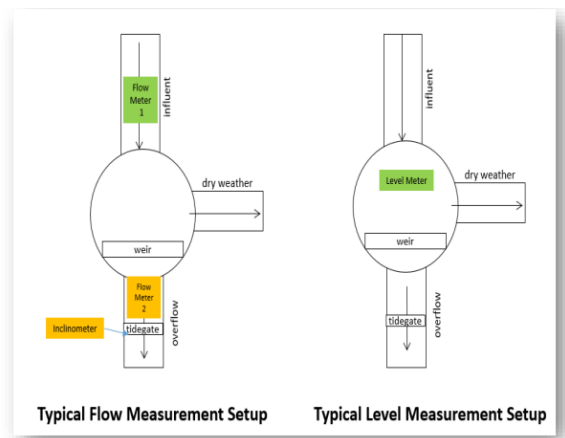
The information is also being collected from the (26) permanent community meters, MWRA meters, etc. AECOM reviewed the data that was collected from the community meters. If the meters installed were not collecting the data that was required suggested improvements were made. AECOM also reviewed the MWRA’s suggested metering plan (Exhibit 4 of the contract) Based on the review AECOM suggested modify the program to meter all active regulators. Not only the locations where the model predicted overflow in typical year and /or 2-year design storm. As anticipated, at a few locations, adjustments to metering program has occurred after AECOM reviewed the initial data. We will continue to adjust meters and or relocate when needed in order to collect accurate reliable data

What is the purpose of the meters?

Identify relatively inactive CSO outfalls, calibrate model and verify predictions, quantity CSO discharges.

Data from each meter collected in 5-minute intervals. Uploaded every 2 hours. The 5-minute data collection is important because overflows can happen in less than 15 minutes. The decision to collect data in 5 minutes’ intervals was made because using 15-minute data only (common practice) for data collection could result in missing an activation or miscalculating the duration and volume.

Example of a typical flow measurement (capturing depth and velocity) and a typical level (depth) setup within a standard regulator configuration. Two regulator examples →



Metering program constantly evolving. To ensure accurate reliable data.

What does ADS field professional do?

Determine what equipment needed and where

Install meters in the regulators

Calibrate the inclinometers, sensors etc.

Periodically check equipment, clean sensors, replace batteries

Verify data results—check data. Want to be sure the meters are continuously collecting good data.

Goal—95% uptime at each sensor location.

Most regulators are over 100 years old.

AECOM office staff, After the ADS field staff verify the data it is passed on to the AECOM engineers and the data is reviewed again, to correlate with system conditions, evaluate the contributing factors that happened before the rainfall, make sure the data makes sense.

Looking for trends and where activity isn't predicted by historical model results: Or where discharges vary from historical predictions. Also looking for any unreasonable data, or data that just didn't make any sense— might indicate that equipment (sensors) needed updating or replacing.

Model variances: upstream of Stony Brook outfall in the Charles; Fort Point Channel—

Meter Data Review Collected Apr 15-Jun 30, 2018

Not consistent with historical model estimates

Outfalls where meter shows regulator activity not predicted by model:

- MWR023 (Charles River)
- BOS070 (Fort Point Channel)

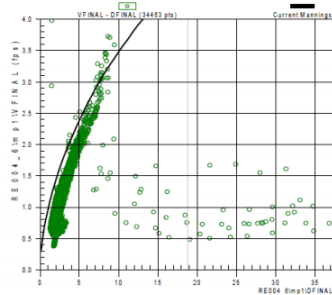
Outfalls where discharges vary from historical predictions:

- CAM005 (Charles River)
- SOM01A (Alewife Brook)
- CHE008 (Chelsea Creek)

Unreasonable Data

Where the data doesn't make sense.

- CAM001 (Alewife Brook)



headwater. Massive storm drains upstream, and CSO regulators that discharge upstream into those massive storm drains. Both are former wetlands/brook systems.

What we are showing with this slide ← is that we are responding to this data, not just ignoring it and saying “our model says this.” We are not necessarily trusting meter data or model results. Trying to make the two align as closely as possible.

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The Fort Point outfall and Stony Brook are draining what used to be wetland but was filled. (Widett Circle—was South Bay, for example).

Wood: CAM05—hasn't Cambridge metered for years? Is this new metering? Jeremy: We are seeing activations there that weren't anticipated. May be a blockage or something physical going on. Not far away is CAM007, both tied to same interceptor system. It is not discharging, and should be simultaneous. We supplemented the Cambridge meter there to get the dry weather flows, not just the overflow data.

Removal: once there is sufficient data to calibrate the model, meters may be removed. At regulators where the data indicates no overflows or the possibility of an overflow the meter may be removed. MWRA is carefully documenting reasons for removal of meters for the regulators.

Will this be used as part of I/I program?

Dave:

Interceptor meters are used for I/I in communities to identify in each community how much I/I is coming in. Those are permanent meters, used also in this analysis

Modeling, incorporating at least 3 storms with varying intensities and duration and ground water conditions will be used for calibrating the MWRA's model. The calibrated model will be used to verify typical year level of control.

Taber: any corresponding wet weather sampling to correlate cleanup to results?

George: when remove rain gauges how will be able to predict? Only added 3 temporary rain gauges. Rest are permanent.

Martin: had a lot of rain events. None seem to have been high intensity. Will model be able to extrapolate larger storms?

Dave: still waiting for that one larger storm before we finish calibration. Still praying for rain.

MWRA is continuing to collect receiving water samples with a focus on Charles and Upper Mystic/Alewife.

MWRA submitted the Draft Water Quality Analysis Plan to DEP/EPA in July (2018). MWRA is currently having discussing with EPA and DEP about their concerns with the MWRA water quality assessments.

Wendy: We have performed sampling since 1989. Data showing improvements in parts of the harbor over the years, particularly re CSOs—annual CSO report from Spring 2015 has a lot of the long-term trend data. MWRA submitted its Water Quality Report in July. In some cases, separating sewers has decreased water quality, because the stormwater is no longer being treated at the plant.

Jeremy: The semiannual reports are where the MWRA will be showcasing the data that has been collected. The focus for the second annual report, due out in April 2019, will include the steps taken to upgrade the hydraulic model, follow up on the recommendation made in the first report

to perform additional regulator investigations, and discuss the steps taken to remove meters where sufficient data has been collected.

~~Dave: when I ask about 27 storms vs 23 storms. There were 27 April 15 - June 30 in that period. Jeremy said 23 storms caused a CSO discharge. At what location? Why did they get a discharge - high intensity. Often short. But 23 activations - where did they occur? Suspect it's the Somerville Marginal CSO treatment facility. There's a difference in water quality. That information is already provided in the semiannual report - outfall by outfall. If 23 is true, it is associated with Somerville Marginal Treatment Facility. Based on further review of the activation tables, 9 not 23 storms caused activations during April 15 to June 30.~~

Julie: if minimum volume for an overflow is 100th of an inch is that surprising?

Dave: the response may be to raise the weir. It may flood people upstream in the big storms. That's why want a model to ensure the higher weir won't flood upstream.

Paul K: do you have an interval before a storm is considered separate? Wendy: 12 hours.

George: how long will this model be used? Does it take into account more buildings?

Dave: always updating, based on a new project, something unexpected in the data. 2015 updates included 35 projects (sewer/stormwater projects that change MWRA system). Adding more pieces to the model. Communities are provided our hydraulic model add their own systems (generally in much greater detail than is needed for our modeling needs). The model will last as long as it's useful. As modeling technology improves, we may change models.

George: do you send it out or is it in-house?

It's in-house.

Development projects add huge additional sanitary (mostly) flows, could compromise benefits of the CSO control plans. DEP requires any large project to pay to remove 4:1 new flow in I/I. DEP has authority over that and the communities are responsible for enacting. We review every MEPA project and always pushing communities to comply with DEP regulations.

Good topic for future

Projects tend to reduce stormwater runoff.

Adrianna: When you close one outfall, how does that affect other nearby areas?

The main reason to close an outfall is because of a sewer separation project that removed significant volume of water. Whenever we consider closing an outfall, we model it first. Changes such as closing an outfall could impact other areas therefore it is important to see how the entire system is affected.

One of the locations where the metered discharges are higher than what the permit requires is Somerville O1A, which discharges to Alewife Brooke—large volumes of stormwater into our system. We are required to take more of that water at DI. We did the work to divert that water, but haven't opened up yet because of number of projects going on in that area in the area that would be negatively affected if we opened it. Now that we can open it, are looking at how much more water we can send to DI without causing problems at other outfalls.

CSO is treated at 4 large CSO treatment facilities. One of the long term goals is to get most of the flow to these facilities.

Any video monitoring?

Not yet. Put in critter cams at Chelsea OO8, because of the fats oils and grease & other problems.

John Reinhart: what's the treatment at the CSO facilities?

Coarse & fine screening, chlorination, dechlorination, and at some locations, basins to store flow and send back to DI after the storm. If still too much, slow flow down to reduce solids and oxygen demand. Monitor the water discharged.

What kind of quality water does come out?

Wendy: we test for bacteria, residuals, chlorine, TSS, BOD—enterococcus and fecal coliform. We generally meet limits, but there are challenges particularly with fecal coliform and chlorine residuals. Hard to pace the chemical addition when the flows vary a lot. At Union Park having issues with Ph, but think it may be a measurement issue. Not really a pattern.

You can see the results of testing on MWRA website: Harbor & Bay, look for NPDES permit compliance.

Mary: How does water coming out post-treatment compare with the receiving water?

Wendy: Charles river basin water quality is a lot better than it used to be. Not worse than Cottage Farm discharge.

Dave: Our facilities required to remove bacteria at a higher level and when raining, the Charles isn't meeting these levels.

David Wu: Sometimes the Charles is cleaner than the CSO discharge. But upstream of Cottage Farm (most upstream CSO discharge) is the worst water quality. Very large storm drains upstream of that area.

Julie: downstream of Cottage Farm, rarely have a bacterial violation.

Dave K: if we demonstrate that we can meet those levels of control in the permit, it shows that CSOs will not contribute to violations of the bacterial standard at least 98% of the time. I would guess that stormwater contributions to exceedences are more likely the source.

Martin: why we have an MS4 permit.

Julie: rainfall comparison—is that in the report?

Yes.