

Minutes
May 6, 2016

The Wastewater Advisory Committee to the MWRA toured the Ward Street Headworks in Boston

Attendees/Contributors:

WAC: Taber Keally (chair), Craig Allen, Stephen Greene, Mary Adelstein, Karen Golmer, Beth Miller

Guests: Charlie Jewell, Eileen Snedeker, Paul Keohan, Patrick Brown (BWSC), Wendy Leo, (MWRA), Julie Simpson (MIT), Michael Armes (ADS Environmental), John Dempsey (resident, Brookline)

Staff: Andreae Downs (WAC)

FUTURE MEETING DATES/TOPICS

NEXT: June 3, 2016, 10:30 a.m., Planning for upcoming year, at MAPC offices, 60 Temple Place, Boston

VOTES:

- April notes approved
- Comment letter on DEP funding approved

EXECUTIVE DIRECTOR'S REPORTS: The governor has filed legislation that, if approved, would allow DEP to assume primacy over wastewater permits. The bill's narrative estimates that the program would take 40 FTEs, rather than the earlier estimate of 50, and \$4.5 million a year, rather than \$7.5. Also, the narrative assumes the funding would come from the general fund. The worry that environmentalists expressed in meetings with legislators on May 5 was whether the funding was adequate and might be cut in the future. In addition, monitoring of water isn't now being done by DEP, a result of past budget cuts, and the concern is that this required task might not be part the program. An additional worry: water suppliers now pay a permit fee, but the drinking water program—for which DEP has primacy--doesn't get the full amount.

MWRA doesn't have a position on primacy, and may not take one. The Advisory Board supports, but with concerns about funding.

TOUR:

MWRA's Steven Cullen and Charles Ryan:

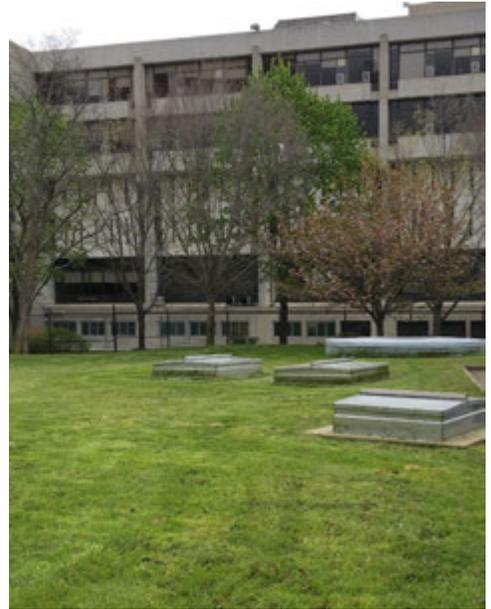
Ward Street Headworks sits right in the middle of the Fenway neighborhood. Odor control is important. 95% of all flow to Deer Island comes through the headworks.

To the right: The drop shaft to the Boston Main Tunnel, which goes to Deer Island (raised structure in the grass) with Wentworth Institute of Technology dorms in the background →



← To the left, the exhaust stacks at Ward. On the left is the boiler stack. A generator stack is to the far left. MassArt's dormitory is behind.

Outside, Steven Cullen described the headworks' role—which is to screen out the floating debris (wipes, rats, the occasional valuable etc.) and the heavier grit before the wastewater is sent to Deer Island.



The flow comes from Boston, parts of Brookline, Newton and further west and comes to Ward by gravity sewers only. Normal flows average about 80 mgd, but range from 45 million gallons at night to 120 during the day.



Before 1985, Ward St. was a steam pump station, which pumped sewage to Nut Island—then a treatment plant.

← This is the **headworks** facility, where the water comes in.

There are four channels at Ward. Three are active during wet weather, the other is dry for maintenance. Normal flow takes two.

The **screens** capture the larger, lighter material. This is one of four climber screens, which are fairly slow. →

The bulk of what WAC saw in the screenings was wipes. “They are a real problem, but mostly for smaller pump stations.”

In rainstorms, even with an additional channel and screen open, the screens can’t always keep up with the flow. When renovating the Chelsea Creek Headworks, the MWRA will employ a faster, catenary screen system, which will also move the screenings directly to a dumpster.

In wet weather, up to three people will staff the headworks, to keep ahead of the screenings.

MWRA keeps additional parts and engines off site for the screens, which are no longer manufactured.

With the climber screens, a single operator rakes the solids caught on the screens into a pneumatic “pod” that shoots the solids through a series of pipes to a container on the ground floor. In the renovated headworks, a conveyor belt will replace the sole employee in moving screenings to the pod. A contractor comes to collect the container and truck it to a landfill.

Extreme flows: Most of the sewers that feed into Ward are separate. Boston is down to 25% combined (sewer and stormwater) sewers, Charlie Jewell said. But even in separate sewers, when precipitation is high, wastewater plants see more flows—coming from illegal sump pumps and various leaks.

In the event that the flow to the plant exceeds its capacity of 256mgd, a set of weirs sends the excess flow to Cottage Farm, a CSO facility near Magazine Beach in Cambridge. Excess flow gets treated before being discharged to the Charles.



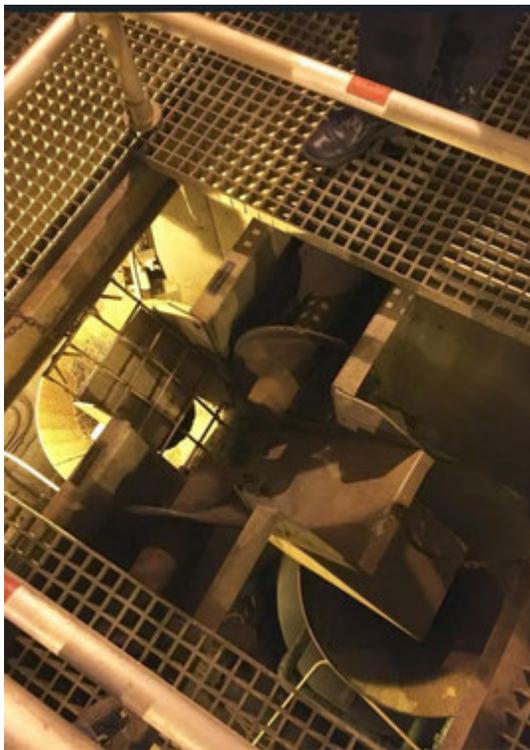
Grit: The screened water is channeled to grit channel and slowed down. →

Heavier material settles out there. Flight chains with paddles on them gather this material, and funnel it to screw augers and into grit pods.

Have to be careful with grit, because it's too heavy for the pneumatic system if the pod gets too full.

Grit and sand can be abrasive. Over the years, MWRA has developed more resistant material for the pipes, especially at turns.

After the grit channel, the water cascades to the effluent shaft--the pipe to Deer Island. Agitated wastewater can release hydrogen sulfide gas, which, when it condenses, becomes sulfuric acid. So everything near the outfall needs to be corrosion proof.



← **The grit collection pod.**

All the electronic equipment is explosion proof, because of the gases in the building. Most of the operations of the headworks can be controlled remotely.

Resilience: After Superstorm Sandy, MWRA worked with FEMA and the city of Boston to determine the vulnerabilities of all its facilities under new flooding projections. Some headworks (Chelsea Creek, but not so much Ward) were in the 100-year flood zone, and MWRA did calculations of at what height they needed to protect each facility to. The Authority now has started to install stop logs in doors and windows where facilities are in low-lying, flood-prone areas. In new designs, they are putting all the electric equipment above the 100-year flood elevation to protect it. Some are up above 5 feet and platforms have to be built for regular operations. But if a storm floods above that, the Authority would shut down to

save the equipment and be able to restart faster.

Air: Regulations require 12 air changes an hour when people are in the building—or every 5 minutes.

Odor Control: To keep odors down, MWRA pulls air through wet scrubbers—chimneys full of what look like whiffle balls. These are sprinkled with water and chemicals that scrub the air of foul odors. Big fans pull the air up and out of the headworks. Operationally, employees don't like it because of the sodium hydroxide used, which can burn skin. When they need cleaning, they do so with an acid wash—which is also a nasty job. In renovations, the Authority is moving to carbon beds, which are safer and use less energy. Air is drawn through activated carbon and that rids the air of smells and gases.

The Authority is also adding odor control redundancy—a third fan when two are needed, and extra carbon beds. That way, if one fan breaks down, they can switch to the reserve fan while the broken one gets fixed.

At Nut Island, the Authority designed for very high levels of odors. They put in both wet scrubbers and carbon filters—but the gas levels never got as high as predicted. With one wet scrubber out because of a fire, the Authority is going through the summer on carbon filters alone. They have a permit to emit about 1ppb, but never get anywhere close to that level.

Computer controls: everything about the facility's process is on the computer controls in the office, and also at the offsite Operations Control center. Staff can monitor, can control equipment, get alarms—and all of this can happen remotely. As headworks are renovated, the headworks will become fully automated. People will still visit to check on everything, but won't be required to operate each one in normal conditions.

LETTERS:

Letter on DEP Funding: Slight changes from previous letter to reflect the budget's progress through the legislature.