

RFAC Summary for April 26, 2023

Committee Business:

A meeting of the Regulated Flow Advisory Committee was held on April 26, 2023, via Zoom. Jennifer Garigliano was the chair for this meeting and began the meeting at 1 pm. The meeting members introduced themselves. A motion to accept the minutes from the last meeting was made by Kelly Anderson and seconded by Stefanie. The motion carried and the minutes were accepted as is.

Jennifer Garigliano (NYCDEP) presented an update on the Delaware Aqueduct Repair.

Jen introduced the group to John Milgrim, the director of watershed outreach at NYCDEP. She then gave a brief overview of the NYC water supply system. The Delaware Aqueduct is the longest tunnel in the world and NYC supplies 1.1 billion gallons of water per day to the City and eight counties north of the city. Service began in 1944 and it was last inspected in 1957-1958. In 1990 and 1992, leaks were discovered in the aqueduct near Roseton and Wawarsing. The leaks are caused by faulted limestone and are estimated to be a combined 30 million gallons per day. In 2015, a study was conducted to determine the best way to repair the leaks. The study concluded that the best solution was to repair the Wawarsing leak by grouting and build a bypass tunnel around the Roseton leak. The bypass tunnel is now complete, but the small connections from the bypass to the aqueduct still need to be made.

In order to make these connections, the aqueduct will need to be drained and depressurized. This will take place from October 2023 to May 2024. During this time, New York City will need to rely on its other water supply systems, including the Croton and Catskill reservoirs. The NYCDEP has been planning for this shutdown for 20 years. The Water Supply Management Plan has been updated to ensure that there is enough water available during the shutdown. The plan also includes contingencies in case of bad weather or other problems.

The decision to proceed with the shutdown of the Delaware Aqueduct depends on hydrologic conditions and infrastructure readiness. If the conditions are favorable, the shutdown will commence on Oct 1. The process of turning the aqueduct back on during is called "bailout time," which takes 1 to 9 weeks depending on where NYC is in the construction cycle. Key infrastructure such as pumps will also be involved in this process. The timeline for the shutdown of the aqueduct involves several steps. In June, the drawdown of the Delaware reservoir will begin to preserve the Catskill and Croton reservoirs. By October, the aqueduct will be shut down, and contingencies will be in place in case something goes wrong. When construction finishes, at the latest by June 2024, the aqueduct will be turned back on, and rebalancing will begin.

Operations during the shutdown will be different from normal. Typically, the drawdown rate of the Delaware reservoir is the same as that of the other systems. However, before the shutdown, the drawdown rate will be higher for the Delaware reservoir during the pre-shutdown phase. During the shutdown, the Catskill and Croton reservoirs will be drawn down, and the Delaware reservoirs will refill, however releases will still be made in accordance with the 2017FFMP. Once the aqueduct is back in operation, the Delaware reservoirs will be relied upon while the Catskill and Croton reservoirs to refill. Jen explained a graph that showed the percentage of storage over a 12-month period, with a range of possibilities. During the shutdown, NYC anticipates drawing down the Delaware Reservoirs by 30%. For Rondout, they will lose the ability to evacuate water during the shutdown, so siphons have been

installed (which can handle 260 MGD total). The release works for PCN are sufficient to manage the water, and the siphons at Rondout will be removed once the shutdown is over.

The NYCDEP is confident that the shutdown will be successful. The agency has a team of experienced engineers and scientists who are working on the project. The NYCDEP is also working with stakeholders, including local governments and businesses, to ensure that everyone is prepared for the shutdown. The next update on the Delaware Aqueduct repair project will be given in late August or early September. The NYCDEP will also be giving this same presentation about the project at the DRBC meeting on May 11 in Trenton.

A question came in from the public: Arlene McCoy asked about the estimated combined storage level for the NYC Delaware River reservoirs at the end of the drawdown period (Oct 2023). The answer is 70%, as opposed to the current 85%.

Amy Shallcross (DRBC) presented on the potential hydrologic impacts of the shutdown.

DRBC performed an evaluation of the potential effect operations during the shutdown would have on drought, conservation releases and flooding. An ensemble modeling approach was used to estimate the probability of different outcomes for operations during the shutdown compared to typical operations under the Flexible Flow Management Program. Each program was simulated with 90 years of data that represent a range of hydrologic conditions. Three different diversions were simulated to reflect the potential reservoir withdrawals for a dry, normal, and wet year.

The potential impacts are largely the result of the timing of withdrawals from the reservoirs and the resulting storage. NYC will rely heavily on the DRB system from June-September in preparation for the shutdown so water in the non-Delaware portion of their system can be preserved. However, the amount of water that NYC diverts from the Delaware River Basin is shifted from its normal seasonal pattern. During the shutdown, beginning in October and lasting 6-8 months, no water will be diverted from the reservoirs because the only way water leaves the reservoirs is through the release works or over the spillway. Reservoir storages will most likely be at their lowest levels in late September or early October because NYC intends to take more than normal amounts of water during the pre-shutdown period. The reservoirs are likely to refill sooner, mid-winter, because no water will be diverted from the reservoirs during the shutdown.

Drought-related impacts are unlikely. The combination of diversions and releases are not anticipated to decrease the combined storage by more than 30 percent, which is above the drought watch line. Even if the storage approaches or is below the drought watch line, the reservoirs will begin to refill immediately after the shutdown and would recover to above the drought watch line quickly.

Reservoir releases are dependent upon forecast available water, which considers the current storage (St), target storage on June 1, 2023 (Sf), diversion from today to June 1 (D), and predicted inflow (I) from today to June 1. The amount of water that can be released (R) between today and June 1 is determined as follows: $R=Sf-St+I-D$. Although the demand will be high during the pre-shutdown period, the demand will be low during the shutdown. Thus, R is likely to be high than typical and the maximum rate under normal conditions can be used for the conservation release.

The risk of minor flooding is marginally increased, but the risk of moderate to major flooding is typical compared with normal operations. During the shutdown, less water will be used for releases and diversions than normal. The reservoirs are expected to fill sooner and thus be above the Conditional

Seasonal Storage Objective, which allows for flood mitigation releases to maintain a void. The risk of moderate and major flooding is similar to the FFMP because voids only capture so much flood water.

The FFMP has the flexibility to manage the system leading up to and during the shutdown. Drought conditions are unlikely to occur as the result of the pre-shutdown diversions. Releases are likely to remain the same or better than they would be under the FFMP. During the shutdown, the risk of moderate to major flooding is largely unchanged compared to the FFMP, but the risk of minor flooding is slightly increased.

Jennifer Garigliano (NYCDEP) presented on the FFMP table selection process.

An initial analysis showed that the changes proposed did not have a significant impact on NYC storage. Further in-depth analysis was explored, including DSS modeling (a habitat model). The DRBC also did an analysis, which showed both positive and negative impacts. Conversations were held with PA Fish and Boat and NYSDEC Fisheries, and based on those conversations, NYC decided not to change the way the releases table is calculated. The reason for this decision is that the proposed changes would result in more water being released in the summer and less in the winter, which may have an impact on a fish species. NYC may explore changes again in the future when more information is available.

Kendra Russel (USGS ODRM) provided an update on the FFMP negotiations.

In October 2017, an agreement was signed with a 10-year timeline, set to expire in May 2028. The FFMP (Flexible Flow Management Plan) called for an interim review to be completed prior to May 31, 2023, and the parties involved have been working together to conduct this review. The plan is to sign an amendment to the FFMP, which will maintain the 10-year timeline, with the agreement set to remain in effect until May 2028. There have been some delays in the interim studies timeline, pushing the completion date to 2026. The amendment will recommend that future studies consider cumulative effects and include a synthesis study. The signing is planned for May 8. It is important to note that there will be no changes to Appendix A in this amendment.

Public Comment Session

There were a few questions about the shutdown of the Delaware Aqueduct. Arlene inquired about the 30% drawdown which could require Merrill Creek Reservoir to go into release mode. Amy Shallcross responded that she will follow up with Arlene and report on this at the next RFAC meeting. There was another question whether there is any expected change to the NYC releases connected to the salt front. In response, there is no risk during the shutdown, and no changes are planned for the vernier in the FFMP.

Adjournment

The meeting concluded at 2:35pm when Steve Domber motioned to adjourn. Brenan Tarrier Seconded, and the motion passed unanimously.

Committee Members in attendance

- Jen Garigliano, NYCDEP (chair)
- Stefanie Baxter, DGS
- Patty Murray, DNREC

- Hoss Liaghat, PADEP
- Joseph Miri, NJDEP
- Kelly Anderson, PWD
- Steven Domber, NJDEP
- Laura Bittner, USACE
- Brenan Tarrier, NYSDEC
- Kendra Russell, USGS