

# DBP Compliance

## EPA Quarterly Update



### Quarter 1 Update: January – March 2024

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**Date:** March 29, 2024

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The Springfield Water and Sewer Commission (Commission) has embarked on large-scale upgrades to replace 50- to 100-year-old drinking water infrastructure and to achieve compliance with regulatory limits for disinfection by-products (DBPs). This is a quarterly update on projects related to DBP compliance and water supply capacity.

The following projects to reduce DBPs in the Commission's drinking water and maintain a consistent supply of safe drinking water have progressed over the last quarter:

- **Clearwell & Backwash Pump Station** – CH Nickerson (contractor) completed startup activities and final connections in December and was granted partial substantial completion for the backwash, process water, and washwater pumps, as well as the tanks, HVAC, and other support systems, effective October 13. They continue to work on punch list activities and additional work on the sodium hypochlorite booster system to resolve issues with unstable chlorine residuals in the plant domestic water system.
- **New Water Treatment Plant Design** – Hazen received approval from MassDEP for the WS25 Modification of Treatment Facility permit application on January 8. They submitted the 100% design for the water treatment plant to the Commission and to Kleinfelder for a final peer review in mid-January. Hazen finalized the design and released the documents for bid on February 28. The bid opening is currently scheduled for June 4. Hazen continues to work on addenda for the project as is typical in the bidding process.
- **42-inch Raw Water Transmission Main / Energy Dissipating Valve (EDV) and Equalization Tank Facility** – AECOM finalized bid documents and released them for bid on February 21. The bid opening is scheduled for April 26. The project is anticipated to be completed by December 2025.
- **Cobble Mountain Hydroelectric Station Improvements for Primary Raw Water Conveyance** – The Commission is currently considering project approaches in response to the conceptual design documents submitted by Stantec and Kleinfelder last quarter. Improvements to the power plant and raw water transmission system are projected to be completed in 2027 but the schedule may change as design progresses and more specifics are known about the project.

We have included additional information for each project on the following project update pages.

Please contact us if you would like more information about these projects. More information is also available at <https://waterandsewer.org/projects/>.



### Clearwell & Backwash Pump Station

- Project Purpose:** This facility replaced the existing clearwell and backwash, domestic, and process water pumps.
- The existing clearwell was a 1920s slow sand filter that was retrofitted for use as a clearwell and backwash water storage tank for the direct filtration plant in the 1970s. The structural integrity of the clearwell is uncertain and the roof is leaky, allowing rainwater to infiltrate into the filtered water. The roof leaks have been temporarily mitigated by the installation of a geomembrane cover over the clearwell. The clearwell could not be taken offline for maintenance, presenting a single point of failure for the direct filtration plant. The existing backwash, domestic, and process water pumps were original to the plant; parts were no longer readily available for more frequently necessary repairs.
- This project provided the reliability and redundancy needed to maintain existing operations and also functioned as the first component of the new water treatment plant.
- Delivery Approach:** Design-Build with AECOM (OPM), Tighe & Bond (Engineer), and CH Nickerson (GC). Financed by MA Drinking Water SRF.
- Design Progress:** Tighe & Bond submitted the final design documents in November 2022.
- Const. Progress:** CH Nickerson (contractor) completed startup activities and final connections in December. The existing clearwell was taken offline on December 10. The contractor was granted partial substantial completion for the backwash, process water, and washwater pumps, as well as the tanks, HVAC, and other support systems, effective October 13. They continue to work on punch list activities and additional work on the sodium hypochlorite booster system to resolve issues with unstable chlorine residuals in the plant domestic water system. A WS34 - Chemical Addition Retrofit permit application was submitted to MassDEP on March 4 for changes to the sodium hypochlorite feed system that should stabilize chlorine residuals in the domestic water system.
- Supply Chain:** No supply chain issues at this stage in the project.
- Project Delays:** The original substantial completion date at the onset of this project was February 2023. Due to several factors, including changes in design scope, pipe delivery delays, electrical equipment delays, and startup issues with the domestic water system, the project has not yet reached full substantial completion.
- Operational Issues:** This project continues to require regular coordination between the contractor and the Commission for completion of punch list items and improvements to the domestic water system.
- Schedule:** Improvements to the domestic water system are scheduled for early April, at which time we anticipate granting full substantial completion.

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*Backwash Pump Station & Clearwell Facility, 03/18/2024*



*Domestic Water Sodium Hypochlorite Booster System*

## New Water Treatment Plant Design

**Project Purpose:** This project is for design and construction of a new water treatment plant (WTP) to meet system demand while providing a higher level of treatment to achieve long-term, consistent compliance with the Disinfection By-Product (DBP) Rule. The new WTP will replace the existing direct filtration and slow sand filtration plants, which were not designed to remove adequate dissolved natural organic matter (NOM) to meet current regulatory limits for HAA5s and THMs.

The Commission has been in periodic non-compliance for HAA5s since 2018. To address this issue, after completing several studies, the Commission identified that modifications to the existing plant processes would not be sufficient to achieve compliance, and that the addition of clarification was needed to reliably remove NOM and maintain compliance. Based on the results of a three-season pilot plant operation, Dissolved Air Flotation (DAF) with a polyaluminum chloride coagulant was selected as the clarification process for the new conventional plant.

**Delivery Approach:** Design-Bid-Build with Hazen (Engineer). Planned financing using WIFIA and SRF.

**Progress:** Hazen received approval from MassDEP for the WS25 Modification of Treatment Facility permit application on January 8. They submitted the 100% design to the Commission and to Kleinfelder for a final peer review in mid-January. Hazen finalized the design and released the documents for bid on February 28. The bid opening is currently scheduled for June 4. Hazen continues to work on addendum for the project and to complete local and state permitting requirements.

**Supply Chain:** Lead times for some electrical equipment can be as high as one to two years. Supply chain impacts on this project are a concern but were considered during the development of the project schedule.

**Schedule:** The contract is scheduled to be awarded in June of 2024 and to be completed by September 2028. No project delays were introduced during this past quarter.



*October 2023 progress rendering of the new WTP exterior and landscaping*

### 42-inch Raw Water Transmission Main, Energy Dissipating Valve, and Equalization Tank

**Project Purpose:** This project is for the repair of the 42-inch bypass raw water conveyance PCCP pipeline and construction of a new energy dissipating facility (EDV) at the outlet. The pipeline and EDV facility were damaged when a new EDV failed in 2019. The pipeline and EDV facility provide an important alternative/redundant route for raw water to bypass the Cobble Mountain Hydroelectric Station (CMHS), the Intake Reservoir, and the 72-inch Intake Tunnel. The EDV facility provides necessary energy dissipation for the 42-inch outlet, which conveys high pressure water (approximately 200 psi) directly from Cobble Mountain Reservoir. The project also includes the design of a new raw water equalization (EQ) tank that will be used in the future to directly provide raw water to the new water treatment plant. The EQ tank will eventually replace the need to use the sedimentation basin for raw water storage.

With the 42-inch raw water transmission bypass out of service, the Commission currently relies on the Diversion Gates (the low-level dam outlet) to release water from the Cobble Mountain Reservoir when the CMHS is offline for routine maintenance. This outlet was not designed to operate as a regular intake and is not operable remotely, requiring staff to regularly perform a complicated confined space entry that would require assistance from a technical rescue team should an emergency evacuation be required. With the 42-inch bypass out of service, there is currently no bypass for the 72-inch Tunnel.

Returning this route to service will allow the Commission to take the CMHS and 72-inch Intake Tunnel offline for maintenance when needed while maintaining raw water supply to the current and future water treatment plants.

**Delivery Approach:** Design-Bid-Build with AECOM (Engineer).

**Progress:** AECOM finalized bid documents and released them for bid on February 21. The bid opening is scheduled for April 26. The project construction is anticipated to be completed by December 2025.

**Supply Chain:** Supply chain impact on this project is uncertain.

**Schedule:** The combined project is now projected to be completed in December 2025, which is later than projected in the previous update. Some project delays were related to needing to secure a waiver from EPA WIFIA program for the specified valves for the facility which are not made in America. Other delays have been related to the need to coordinate some aspects of the design with the design of the new WTP.



*Drone footage of a section of the cross-country buried 42-inch pipeline, 02/22/2024*

### Cobble Mountain Hydroelectric Station Improvements for Primary Raw Water Conveyance

**Project Purpose:** The Cobble Mountain Hydroelectric Station (CMHS) is an essential component of the Commission's raw water conveyance system. As part of the primary raw water conveyance route, the CMHS delivers water from the Broome Gate Intake down to the Intake Reservoir while generating power by using the 450-foot elevation difference between the two reservoirs. This project will identify alternatives for upgrades to hydropower generation in response to failing infrastructure at the facility. The existing 1930 turbines are mostly beyond the end of their operational lives, with only one out of the original three turbines currently operational on a limited schedule to limit wear and reduce the risk of failure.

When the CMHS is offline for maintenance, the remaining routes for raw water conveyance are the 42-inch bypass (currently out of service) and the low-level Diversion Gates, which are not designed for regular operation. Restoring the CMHS conveyance route is vital to establishing reliable raw water conveyance for the Commission.

**Delivery Approach:** Design-Bid-Build with Kleinfelder/Stantec (Engineer) with some Design-build improvements being considered.

**Progress:** Stantec and Kleinfelder submitted alternatives for project delivery this quarter, following the completion of conceptual design documents for improvements to the CMHS last quarter. The Commission is now considering how to proceed. Improvements to the power plant are projected to be completed in 2027 but the schedule may change as design progresses.

**Supply Chain:** Supply chain impacts on this project are currently unknown but are a concern.

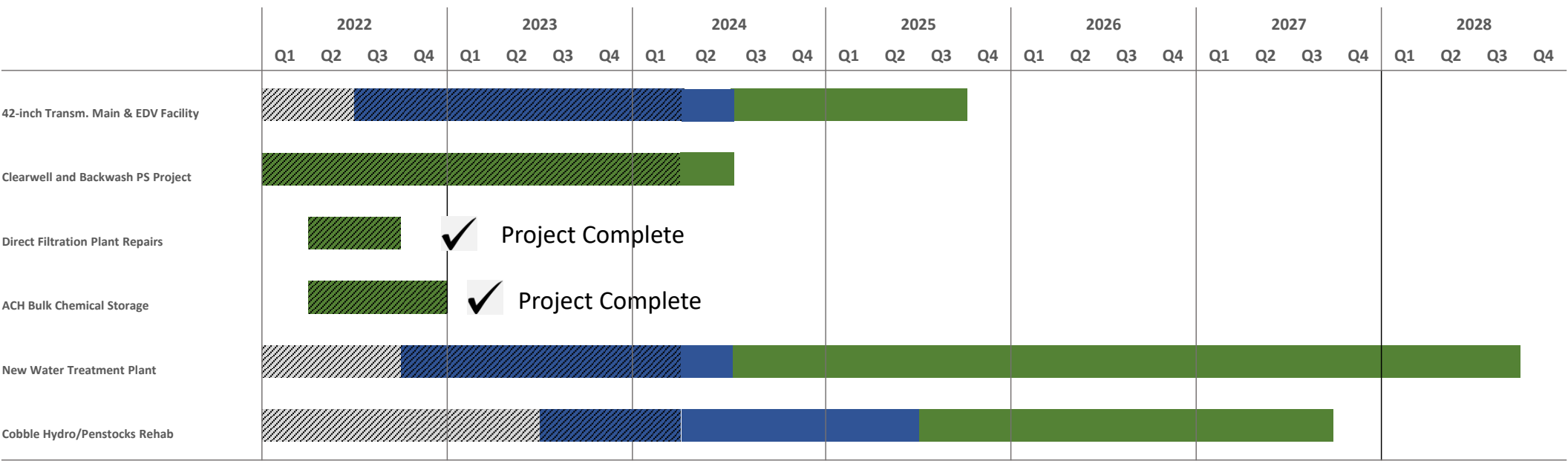
**Schedule:** This project is currently projected to be completed in 2027, but this date is subject to change as design progresses.



*Powerhouse Generator Room in 1931 (left), Powerhouse Generator Room in 2022 (right)*

# Engineering Capital Projects Schedule

EPA Quarterly Update – March 2024



Planning
  Design
  Construction

Note: Schedule is generalized and subject to change