

DBP Compliance

EPA Quarterly Update



Quarter 3 Update: July – September, 2023

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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. Additional information is included on the following pages.

- **Clearwell & Backwash Pump Station** – CH Nickerson (contractor) worked to complete finishing touches on the facility and site restoration while waiting for the arrival of the pump Motor Control Centers (MCCs), which arrived in early September three months behind schedule due to supply chain issues. The MCC delay pushed the substantial completion date back by three months, now anticipated in November. After the MCCs arrived, the contractor installed them and began startup and testing activities. The contractor is currently completing pump and system testing and the facility is scheduled to be brought online in mid-October. Final tie-ins to the transmission mains to isolate and disconnect the existing clearwell and final demolition of existing equipment are scheduled for late October into November.
- **New Water Treatment Plant Design** – Over the 3rd quarter Hazen developed 90% design documents and hosted meetings with Commission staff to closely review each aspect of the design and receive input on final design details. Hazen's permitting efforts for this quarter included submitting a 60% Engineering Report and drawings to MassDEP for an early review to help expedite review of the project. In September Hazen submitted 90% design documents for the Commission's review, and will host a workshop with Commission staff to review the deliverable in October. Hazen continues to host specialized weekly design review meetings with the Commission as well. A 3rd party peer review of the 90% design plans and specifications is also scheduled in October. Construction cost estimates reflecting the 90% peer reviewed drawings will be available in October.
- **42-inch Raw Water Transmission Main / Energy Dissipating Valve (EDV) and Equalization Tank Facility** – AECOM developed 90% design documents and progressed with permitting for the project, coordinating with the Westfield Conservation Commission and MassDEP (401 water quality certificate) to complete the necessary environmental permit applications. The MassDEP Drinking Water Program is currently reviewing the permit application for the EDV Facility. AECOM submitted 90% design documents for the Commission's review in July. Kleinfelder/Stantec completed a peer review of the 90% documents and conducted a workshop to review the comments in August. AECOM is currently combining the documents for the EDV Facility and the 42-inch Raw Water Transmission Main into one construction project. The combined project is now projected to be bid in mid-to-late October (pending receipt of MassDEP permits) and completed in mid-2025.
- **Cobble Mountain Hydroelectric Station Improvements for Primary Raw Water Conveyance** - Stantec and Kleinfelder are developing conceptual design documents for improvements to the Cobble Mountain Hydrostation, which is the primary raw water conveyance for the Commission. Improvements to the power plant are projected to be completed in mid-2026 but the schedule may change as design progresses. The Commission has also applied for federal grant funding and is awaiting that decision.

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 will replace the existing clearwell and backwash, domestic, and process water pumps.
- The existing clearwell is 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 cannot be taken offline for maintenance, presenting a single point of failure for the direct filtration plant. The existing backwash, domestic, and process water pumps are original to the plant and parts are no longer readily available for more frequently necessary repairs.
- This project will provide the reliability and redundancy needed to maintain existing operations and will also function 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 MassDEP Drinking Water SRF.
- Design Progress:** Tighe & Bond finalized the design and submitted the final design documents in November 2022.
- Const. Progress:** CH Nickerson (contractor) worked to complete finishing touches on the facility and site restoration while waiting for the arrival of the pump Motor Control Centers (MCCs). Inside the pump station, the contractor completed piping, electrical work, floor coating, and early punch list items. The domestic water treatment system was completed and the tank was pressure-washed.
- Onsite, the contractor completed final pressure testing of site piping, completed the influent meter vault, and installed site lighting and fencing. Final grading, loaming, and seeding were completed, and the roads were prepped and paved. Inside the existing treatment plant, the contractor installed caustic piping and electrical equipment and relocated a caustic injection point that will be demolished at the completion of the project.
- The MCCs arrived in early September, three months late due to supply shortages, and the contractor installed them and began startup and testing. The contractor disinfected the backwash tanks and is currently completing pump and system testing. The facility is scheduled to be brought online in mid-October. Final tie-ins to the transmission mains to disconnect the existing clearwell and demolition of existing equipment are scheduled for late October into November.
- Supply Chain:** The MCCs, which were a critical path item, were scheduled to be shipped in June but did not arrive until early September, causing a project delay. The ship date for the VFDs and 20-inch check valves were also delayed but did not impact overall project schedule.
- Project Delays:** Changes in design scope to improve the function of the facility as requested by the Commission and AECOM during the 60% design review, along with pipe delivery delays, resulted in a four-month delay in project completion. Delays in the delivery of the MCCs resulted in an additional three-month construction delay.
- Operational Issues:** This project continued to require regular coordination between the contractor and the Commission in Quarter 3. Pressure testing and flushing activities were conducted in coordination with operations staff; equipment startups and trainings were conducted; and pump testing and startup are ongoing. Operations staff are currently preparing for bringing the facility online and for the final tie-ins to the transmission mains.
- Schedule:** The contractual substantial completion date is August 2023 (delayed from February 2023) but is currently projected to be extended into November 2023 due to the delay in the MCC delivery date.

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Backwash Pump Station & Clearwell Site, 08/10/23



Backwash Pumps inside Pump Station, 09/26/23



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 with additional Commission revenue bonding as needed to provide complete project financing.
- Progress:** Over the 3rd quarter Hazen developed 90% design documents and hosted meetings and workshops with Commission staff to closely review each aspect of the design and receive input on final design details. Hazen's permitting efforts for this quarter included submitting a 60% Engineering Report and drawings to MassDEP for an early review to help expedite review of the project. In September Hazen submitted 90% design documents for the Commission's review, and will host a workshop with Commission staff to review the deliverable in October. Hazen continues to host specialized weekly meetings with the Commission to review specific aspects of the design as well. A 3rd party peer review of the 90% plans and specifications is also scheduled for October. Construction cost estimates reflecting the 90% peer reviewed drawings will be available in October.
- Supply Chain:** Supply chain impacts on this project are currently unknown but are a concern. Lead times for some electrical equipment can be as high as one to two years. The project team is currently discussing how supply lead times may affect the project schedule and exploring options to minimize the impact.
- Project Delays:** The Commission changed the delivery approach to this project, which preliminarily used two construction contracts: the first contract for demolition and site preparation activities and a second contract for the construction of the new WTP. The Commission now plans to complete the project with one contract to reduce scheduling and financial risks associated with multiple contractors working on the same project by placing the responsibility for project completion on one contractor. This results in an estimated 6-month delay for project completion, but reduces the overall risk of project delays by having a single responsible party for construction.
- Schedule:** The contract is scheduled to be awarded in June of 2024 and to substantially completed by August 2028.

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Water Operations staff meet with Hazen's architect for a workshop on the new laboratory design (7/27/23)



May 2023 progress rendering of the new WTP exterior



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 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 developed 90% design documents and progressed with permitting for the project, coordinating with the Westfield Conservation Commission and MassDEP (401 Water Quality Certificate) to complete the necessary permit applications. The MassDEP Drinking Water Program is currently reviewing the permit application for the EDV Facility. AECOM submitted 90% design documents for the Commission's review in July. Kleinfelder/Stantec completed a peer review of the 90% documents and conducted a workshop to review the comments in August. AECOM is combining the documents for the EDV Facility and the 42-inch Raw Water Transmission Main into one construction contract to streamline the project and allow for final testing of the 42-inch pipeline. The combined project is now projected to be bid in mid-to-late October (pending receipt of MassDEP permits) and completed in mid-2025.

Supply Chain: Supply chain impact on this project is uncertain. Current lead times on materials indicate that this may be less of a concern than some of our other projects.

Project Delays: The combined project is now projected to be completed in mid-2025, which is three months later than previously projected. The schedule has been updated to more accurately reflect the anticipated combined project duration as design progressed.

Schedule: Project anticipated to be completed mid-2025.

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 reduce 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). The Commission has applied for federal grant funding and is awaiting that decision.

Progress: Stantec and Kleinfelder are developing conceptual design documents for improvements to the CMHS, which will include rehabilitation of one turbine. This quarter, a comprehensive facility inspection was conducted to gather critical information about the existing equipment and structural integrity of the CMHS interior, exterior, and underwater features. A wetlands delineation was also completed. The design team is holding monthly meetings with the Commission to provide design updates and receive feedback.

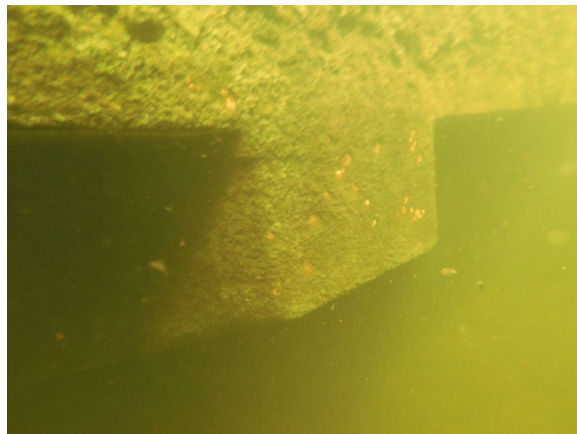
Supply Chain: Supply chain impacts on this project are currently unknown but are a concern.

Project Delays: None at this time.

Schedule: This project is currently projected to be completed in mid-2026, but this date is subject to change as design progresses.



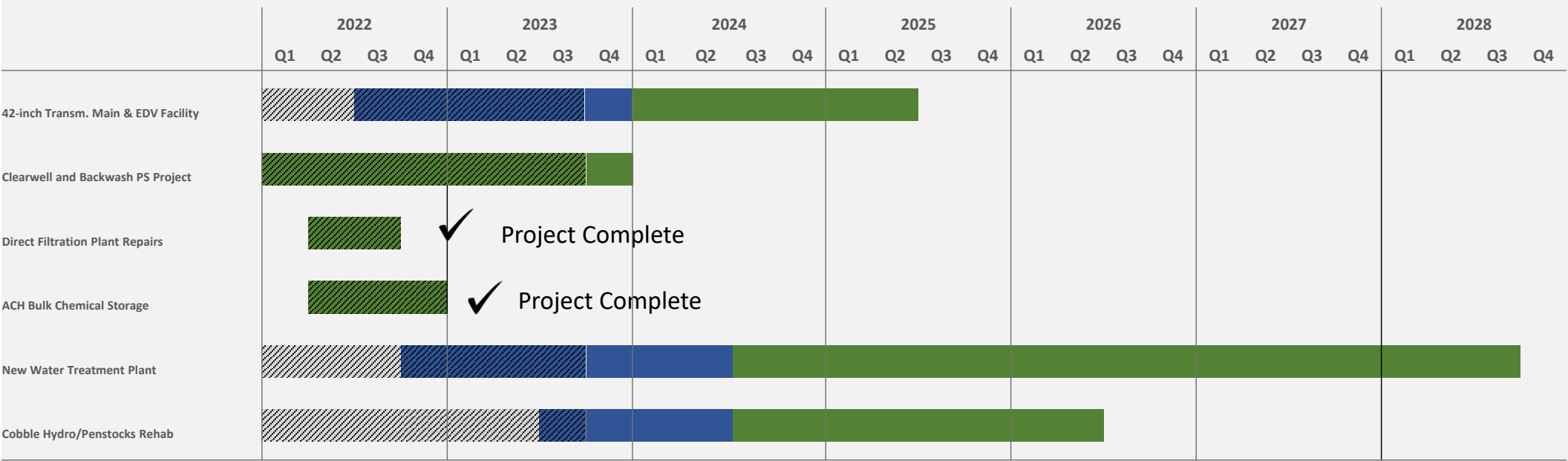
*CMHS Exterior
(08/24/23)*



*Scuba inspection of draft tube opening
(08/24/23)*

Engineering Capital Projects Schedule

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Note: Schedule is generalized and subject to change