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DEP Provides Update on \$400 Million Program to Upgrade Infrastructure at Schoharie Reservoir



Photos and Diagrams of the Work are Available on [DEP's Flickr Page](#)

The New York City Department of Environmental Protection (DEP) today provided an update to the Schoharie County Board of Supervisors on the \$400 million program to upgrade water supply infrastructure at Schoharie Reservoir. The program includes a number of projects that have strengthened infrastructure and will improve operational flexibility at Schoharie Reservoir, which annually supplies about 15 percent of New York City's drinking water. Work on those projects began in 2005 and is expected to be finished in 2022.

The upgrades at Schoharie Reservoir include three central projects. The first major project, [a full-scale rehabilitation of Gilboa Dam](#), was completed in 2014. The \$138 million rehabilitation included the addition of approximately 234 million pounds of concrete, molded and dyed to resemble the original bluestone face of the dam, along with more than 500 massive spillway slabs and upgrades to the abutment walls that support the dam. The work at Gilboa Dam was recognized with several state and national awards for engineering excellence.

DEP is currently working on the other two largest components of the program at Schoharie Reservoir. Workers continue to build a low-level outlet that will be capable of releasing water downstream from Schoharie Reservoir into the Schoharie Creek. DEP is also making steady progress on a full rehabilitation of the Shandaken Tunnel Intake Chamber, which conveys drinking water from the reservoir into an 18-mile tunnel on its way to Ashokan Reservoir in Ulster County.

More Information

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Progress on the Schoharie Reservoir release works

DEP has made substantial progress on the \$142 million project to build release works at Schoharie Reservoir. The release, also known as a low-level outlet, will give DEP the ability to release water downstream of the reservoir into Schoharie Creek to facilitate dam maintenance, respond to potential emergencies, mitigate flood risk for downstream communities, and enhance downstream habitat for fish and wildlife.

Tunneling for the new release works is nearly complete. Tunneling began after workers built a 182-foot-deep gate shaft to serve as the starting point for both legs of the tunnel. A 9.5-foot-diameter micro-tunnel boring machine began to excavate the new release tunnel in 2017. The micro-tunnel boring machine is unmanned and operated by remote control from the surface, where experts track its progress and performance by watching it on monitors inside a control room. Workers only entered the tunnel when the machine needed maintenance. The tunneling work included the construction of approximately 2,118 linear feet of tunnel running as deep as 185 feet below the surface.

Last May, [DEP announced that it finished the land leg of the new release tunnel](#), which ran 1,188 feet from the gate shaft near Route 990V to the location of a future valve chamber on the eastern bank of Schoharie Creek (read the press release from May, 2018).

In October, excavation began on the water leg of the tunnel, which stretches approximately 930 feet from the gate shaft to an intake structure at the bottom of Schoharie Reservoir, several hundred feet south of the dam. DEP expects the water leg to be finished as early as this weekend. Once workers bore into the bottom of the reservoir, a specialized dive team will remove the micro-tunnel boring machine from the 135-foot-deep water and install the remaining parts of the intake structure. Some of that work, including the removal of the micro-tunnel boring machine, will likely wait until spring when the reservoir is free of ice.

As the tunnel was constructed, workers also made progress on the low-level outlet valve chamber, which will regulate the flow of water into Schoharie Creek. It will include two valves capable of releasing about 65 million to 1,550 million gallons of water each day. A third, smaller valve will be capable of smaller releases up to 65 million gallons per day.

Over the past year, DEP has made substantial progress on the foundation of the future valve chamber, which included pouring a thick concrete slab and anchoring it to the bedrock below. Workers also installed pipes that will eventually be connected to the valves that regulate flow. In 2019, DEP plans to continue building the remaining portions of the valve chamber, install the valves, and finish the channel that will convey that water into Schoharie Creek.

DEP is continuing to work with experts from the state Department of Environmental Conservation (DEC) to finalize a plan for how the release works will be used to support the ecological health of Schoharie Creek and mitigate flood risk for downstream communities. This analysis will likely include the installation of a high-level outlet at Gilboa Dam. A high-level outlet would allow DEP to release water from higher elevations in the reservoir during much of the year, thereby preserving the cold water at the bottom for diversion through the Shandaken Tunnel to support the Esopus Creek’s trout fishery. Additional details on these downstream releases are pending coordination with and review by the state DEC.

Progress on the Shandaken Tunnel Intake Chamber

DEP has also made considerable progress on the \$47 million rehabilitation of the Shandaken Tunnel Intake Chamber (STIC). That facility controls the flow of drinking water from Schoharie Reservoir into the Shandaken Tunnel, which travels 18 miles through the Catskills. The tunnel discharges water into the Esopus Creek, in which the water travels another 11 miles to help refill Ashokan Reservoir throughout the year.

The STIC rehabilitation project includes replacing eight sluice gates that control

the flow of water into the Shandaken Tunnel by opening and closing large waterways. The gates within the intake structure were installed during the 1920s when the reservoir was built. Three of the gates are currently stuck because they broke off their lifting mechanisms and became wedged in place. Last year, skilled divers descended about 130 feet into the gate shaft and used sonar equipment to take precise measurements of the gates and the grooves that guide them. Those measurements are being used to fabricate new gates, lifting mechanisms and other infrastructure to restore the full function of the intake chamber.

Work on that effort will continue in 2019. The Shandaken Tunnel will be shut down from March 1–April 30 this year while workers install a plug and bypass system within the intake structure. The approximately 8-foot-diameter plug will block the flow of water into the Shandaken Tunnel and prevent divers from being pulled into the tunnel while they remove and replace the old gates. The bypass system—which includes a pipe that runs through the plug—will allow DEP to safely move up to 100 million gallons of water each day into the tunnel without harming the divers or their work.

DEP will replace the sluice gates once the plug is installed. That work will take approximately two years, from 2019-2021. DEP's ability to move water from Schoharie Reservoir into the Esopus Creek will be limited during that time. While the gravity-fed bypass pipe can convey up to 100 million gallons of water each day, its capacity at any given time will depend upon reservoir elevation.

A portion of the limited-capacity bypass system will be left in place and modified after the rehabilitation of the Shandaken Tunnel Intake Chamber is finished. The pipe will be connected to an articulating arm, which can pivot 45 feet up and down, giving DEP the ability to draw water from multiple depths within Schoharie Reservoir for the first time. The current intake structure only draws water from the bottom of the reservoir. In the future, this intake will help DEP convey higher quality water from Schoharie Reservoir and extend the life of its cold-water bank that supports the trout fishery on the Esopus Creek. Workers last year cored a 5-foot-diameter cylinder through the outer wall of the intake chamber in preparation for the bypass pipe. Additional cores will be drilled through the shaft wall this year to allow for the installation of the bypass pipe, its control valves and other components.

In 2018, DEP also began work to improve the exterior and interior of the chamber. Approximately 4,200 slate shingles were installed on the roof of the chamber, along with new copper gutters. The bluestone structure was cleaned using a special micro-abrasion method to restore its original luster. All the lead paint inside the chamber was also successfully removed. Work on the building this year will include the installation of new energy-efficient windows and insulation. The inside of the building will be refurbished to include offices for approximately 12 DEP employees who work at Schoharie Reservoir and its watershed.

Future work at Schoharie Reservoir

Once construction is completed on the three central projects, DEP will also work to restore the worksite to resemble its original condition. Grass and trees will be restored to areas that were taken up by construction equipment and work trailers.

In addition, DEP will build a new public overlook on the eastern side of Gilboa Dam, along Route 990V. The new overlook will include benches and a scenic vista of Schoharie Reservoir and Gilboa Dam. A decorative-stone wall will include information displays about the New York City water supply, the history of Gilboa, and watershed recreation opportunities. Several of the [380-million-year-old Gilboa fossils—remnants](#) of the oldest forest in the world—will also be displayed for people to enjoy at the new overlook.

About Schoharie Reservoir

Schoharie Reservoir, the northernmost reservoir in New York City's water supply system, was built from 1919 to 1927. It was formed by the construction of Gilboa Dam, 2024 feet long and 182 feet high, which impounded the waters of Schoharie

Creek. Schoharie Reservoir can store up to 19.6 billion gallons of water, and it accounts for nearly 15 percent of the drinking water delivered to New York City each day. Schoharie Reservoir collects water from a 314-square-mile watershed. It diverts that water through the 18-mile Shandaken Tunnel, which discharges into the Esopus Creek where it travels another 11 miles before entering Ashokan Reservoir. From Ashokan Reservoir, the water flows south through the 92-mile-long Catskill Aqueduct to New York City.

DEP manages New York City's water supply, providing more than 1 billion gallons of high-quality water each day to more than 9.6 million New Yorkers. This includes more than 70 upstate communities and institutions in Ulster, Orange, Putnam and Westchester counties who consume an average of 110 million total gallons of drinking water daily from New York City's water supply system. This water comes from the Catskill, Delaware, and Croton watersheds that extend more than 125 miles from the City, and the system comprises 19 reservoirs, three controlled lakes, and numerous tunnels and aqueducts. DEP has nearly 6,000 employees, including almost 1,000 scientists, engineers, surveyors, watershed maintainers and other professionals in the watershed. In addition to its \$70 million payroll and \$168.9 million in annual taxes paid in upstate counties, DEP has invested more than \$1.7 billion in watershed protection programs—including partnership organizations such as the Catskill Watershed Corporation and the Watershed Agricultural Council—that support sustainable farming practices, environmentally sensitive economic development, and local economic opportunity. In addition, DEP has a robust capital program with \$19.4 billion in investments planned over the next decade that will create up to 3,000 construction-related jobs per year. For more information, visit nyc.gov/dep, like us on [Facebook](#), or follow us on [Twitter](#).

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