

## Meeting Water Needs with Borrowed Technology

Since the early 1990's the Victory/Schuylerville Board of Water Management had been developing a plan to upgrade their water treatment system, and when the New York State Department of Health (NYSDOH) issued a consent order to comply with the "Surface Water Treatment Rule", it became vital. Until this year both communities have received their water from an open reservoir fed by springs located across the Hudson River in the neighboring Town of Easton. The open system required that the unfiltered water be treated with high amounts of chlorine to ensure its safety and compliance with the requirements of the NYSDOH. In the past complaints about poor quality, taste and odor were logged with the Board of Water Management.

The Victory/Schuylerville Board of Water Management engaged Laberge Group to provide engineering and construction services after an extended process and many unrealized goals. Laberge Group is a full service engineering, architecture, surveying, and planning firm with a diverse portfolio of municipal, commercial, and private projects. Laberge Group provides creative, integrated and distinctive solutions to engineering projects like the water treatment project in Schuylerville, New York.

After review of the work completed to date, the new plan called for a new ground water source and a filtration facility in Schuylerville located to the south on NYS Route 32 along with the rehabilitation of a decommissioned plant to provide drinking water to about 2,000 Schuylerville and Victory residents. The first of its kind for municipal use in New York State, the new plant uses Reverse Osmosis technology to treat the groundwater. This technology has been used in industrial filtration uses for years, however, the high degree of filtration it affords is usually not needed in potable water systems. It was decided that borrowing the technology for this application would give the communities the best balance of quality and economics for their water supply.

Compared to the open reservoir system, the two water treatment plants significantly decrease the risk of contamination. In addition, these facilities will solve the quantity problem of supplying enough quality drinking water for their citizens and businesses now and well into the future. Mayor John Sherman said, "We'll never run short, this source is capable of pumping 1,000 gallons a minute, we won't have it at capacity, but it is capable."

The plant is expected to produce 600 gallons a minute using Reverse Osmosis technology that pushes water through a membrane instead of the traditional sand filtration method. Reverse Osmosis filtration is being utilized to remove chlorides and other contaminants from the groundwater source that other conventional treatment systems will not remove. In this system,

ground water will be disinfected with ultraviolet light and then fed an antiscalant, which aids in keeping the concentrated materials from fouling the membranes.

Reverse osmosis filtration technology was selected for this application because of the need to remove the dissolved chlorides from the communities' only available and adequate ground water source. Ronald J. Laberge, P.E., Principal-in Charge for the project, indicated that "reverse osmosis offered the most economical treatment alternative for the Victory/Schuylerville Board of Water Management, when compared to micro filtration and other membrane filtration technologies."

The Villages covered the cost of the project's \$4.8 million price tag by applying for grants and zero-interest loans. The Victory/Schuylerville Board of Water Management received a \$1.3 million dollar grant and an additional \$2 million in interest free loans from the New York Drinking Water State Revolving Fund (DWSRF) for drinking water projects. Senate Majority Leader Joseph L. Bruno said, "Providing a safe, clean and reliable source of drinking water is critical to the well-being of our children and families... Through the DWSRF, these communities will be able to construct a new treatment facility and make the necessary system upgrades that will protect the public's health and provide quality drinking water for years to come." The DWSRF, administered by EFC and the New York State Department of Health (DOH), offers significant financial assistance to public water suppliers for drinking water infrastructure

improvement projects. Their assistance may include grants, short-term interest free loans and/or long-term low interest rate loans. The Board also applied for and received a \$1.5 million Financial Assistance to Business (FAB) Water grant through EFC.

Once the Board of Water Management completed the fiscal plan for this project, they still faced several other challenges. The first was how to power the plant. The reverse osmosis process requires high operating pressures and powerful pumps to produce filtered water. Getting enough power brought in to power the pumps represented another coordination and financial hurdle that was encountered and overcome with the help of National Grid.

Another issue that needed to be overcome was the taste of the water to be produced. While the amount of chlorine to be added to the water will be reduced, the reverse osmosis process removes virtually everything including minerals from the water, creating "sterile" water. Most drinking water has some mineral content, which gives the water its taste. In order to give the community water that would taste better, a small percentage of water, which will not go through the reverse osmosis filtration, is being blended with the treated water.

Historic compatibility was also a concern. The new plant is in view of an historic Revolutionary war site at Fort Hardy Park which is the location of the commemorative “surrender tree”, the Field of Grounded Arms, and the official British Army surrender on October 17, 1777 that marked the end of the Battle of Saratoga. Due to the historic context of this site, the exterior of the building needed to be sympathetic to the site. In addition to the exterior architecture style enhancements, the building’s footprint needed to be minimized and the piping and equipment design had to be compact, reducing the chance of disturbing any historic artifacts during construction.

The project is scheduled to conclude the operational and process testing later this month. The communities anticipate the new system to be on line by June of this year. For questions regarding this project, please contact Laberge Group at (518) 458-7112, or via email at [clientservices@labergegroup.com](mailto:clientservices@labergegroup.com).