

built to win

By Dean W. Potratz

Filtration plants
produce
award-winning
drinking water

ARTICLE SUMMARY

Challenge: The villages of St. Henry, Ohio, and Oxford, Mich., were both in need of new water treatment plants.

Solution: Both villages opted for an Artesian of Pioneer Inc. filtration plant featuring M.A.R.I.S. media, a granular manganese dioxide filtering media used for reducing iron, manganese, hydrogen sulfide and arsenic from water.

Conclusion: Both water filtration plants placed in the top four of the Berkeley Springs International Water Tasting Contest.

In 2013, Artesian of Pioneer Inc. (AOP) will reach 50 years in the water filtration business. Located in northwest Ohio in the rural town of Pioneer, the company has provided design-build municipal and countywide water treatment plants throughout the Midwest to communities of all sizes. AOP boasts its “turnkey filtration plants” for towns, villages, county systems, developers, manufactured home communities, and industrial and commercial properties.

The company recently was recognized at the 2012 Berkeley Springs International Water Tasting Contest when two of its water filtration plants placed within the top four spots, competing with entries from all over the world. The Berkeley Springs contest has been held annually for the past 22 years, bringing recognition to drinking water quality produced by municipal water plants and the professionals who operate them.

It was the first time that two filtration plants designed and constructed by the same company have placed in the awards program. Berkeley Springs, W.V., has been well known for its mineral springs since the 1700s when a 16-year-old George Washington visited the warm mineral springs on a survey trip to the area.

Developing a Winner

AOP built the St. Henry, Ohio, filtration plant that placed first in the U.S. and received the title, “Best Municipal Plant Drinking Water In The United States of America.”

Finishing fifth in the world and fourth place in the U.S. was another filtration plant built by the company, located in the village of Oxford, Mich. It was the second year in a row that the village placed in this spot.

Both of these water filtration plants have one component in common: M.A.R.I.S. media, an NSF/ANSI Standard 61 granular manganese dioxide filtering media used for reducing iron, manganese, hydrogen sulfide and arsenic from water. Its active surface coating oxidizes and precipitates soluble iron and manganese. Hydrogen sulfide is oxidized to sulfur. The precipitates are filtered out in the granular bed and removed by backwashing. It has a much broader range of operation than many other iron removal media and is capable of treating raw water with a pH level as low as 6.2. With M.A.R.I.S. media, dissolved oxygen is not essential, and its light weight reduces backwash water requirements.

St. Henry, Ohio

AOP builds new filtration plants, renovates old filtration plants and fixes the problems of existing filtration plants that are not operating properly due to operational errors, poor quality equipment, difficult-to-treat raw water, and a whole host of other problems. St. Henry is an example of a municipal filtration plant that was not producing quality drinking water due to the low quality of filtration equipment in the existing filtration plant. AOP evaluated the plant’s equipment problems, tested the raw water, met with the Ohio Environmental Protection Agency and instituted a plan to resolve the issues. The rehabilitation



Filter tank and valves at the St. Henry water filtration plant

tasks included enlarging the building, installing new pressure filters—which doubled the processing capacity—updating the faulty equipment and installing proper controls for the facility. The water problems were resolved and water quality standards could be met for the community and a large meat processing plant that provides processed meat to a national account.

Due to the seriousness of the water quality problem and the need to keep water flowing, AOP found itself in the challenging position of having to change out all of the equipment over a 72-hour time period to avoid interrupting water production from the filtration plant and impacting production for the meat processor.

“St. Henry has had a great relationship with Artesian for many years,” said Don Hess, former administrator of St. Henry. “[They] helped us out of a bad situation in the early ‘90s, when our original plant was built with a national firm’s filter equipment. Until [they] got involved, our operators were never able to produce iron-free water with that system, and we had a major water user threatening to leave town. Artesian fixed our problems, and the water user doubled the plant’s capacity the next year. It’s good to know that 20 years later the plant is still turning out great-tasting water.”

AOP installed ASME code-designed vertical pressure filters constructed of carbon steel with welded seams. Each tank has a premium baffle plated with 1-in.-thick steel with industrial/municipal distributors. Further, large entrance ports are located on the top and bottom of each filter tank so access to the interior of the tank for inspection or maintenance is easy. By having access below the baffle plate, the walls can be treated with NSF-approved epoxy lining both above and below the baffle plate to ensure a longer life for the vessel.

The St. Henry filtration plant does not soften its water, but it does include a custom-made induced draft aeration system and a chlorine contact tank, both of which are located prior to the vertical pressure tanks. The final piece of equipment is the chlorine feed pump, which ensures safe drinking water in the distribution system. Next to the filtration plant sits the town’s water tower.



Oxford's gravity filter system



Oxford water filtration plant



The St. Henry water filtration plant produces the "best municipal plant drinking water in the U.S.," according to the 2012 Berkeley Springs International Water Tasting Contest.

Oxford, Mich.

Oxford Village Manager Joe Young spoke for the community by saying, "We are very pleased with the new water treatment plant has resulted in the village water being recognized as one of the best in the world for the past two years. The \$2.5-million investment in 2008 for the new 2-million-gal-per-day [mgd] treatment plant will serve the village well for many years to come."

The village of Oxford decided to give AOP full responsibility for its new municipal water filtration plant by choosing a design-build formula, which gave the village single-source accountability for the whole project. The village looked to AOP for evaluation, creation, design, permitting and approvals, construction, startup, training of personnel, and supervision of plant operation once in service, all at a fixed price. This process proved cost-effective and also allowed the village to offer input.

The submittal of proposed plans on Oct. 22, 2008, to the Michigan Department of Environmental Quality and returned approved plans took 30 days with a few minor changes. AOP includes each state's water regulatory personnel throughout its process

of designing a filtration plant, which can shorten the time needed to get final approval for their projects and removes any possible conflicts that can stall or stop a project. This filtration plant was put into operation on April 15, 2009, six months after construction commenced.

A 2,208-sq-ft masonry building was constructed to house the Artesian Filter King Gravity System, which was designed to produce 2.2 mgd of drinking water for the village. The old plant building was changed on the outside to match the new plant building to make it more appealing to the residential neighborhood located across the street. The old plant was transformed into rooms to house the lab, office, chemical feed room, electrical room, generator room, mechanical room, bathroom and storage area.

Oxford softens its water, therefore, AOP installed three softeners with ASME code approval. These softening units meet the flow design at approximately 30% blend when softening at a 7-gal-per-minute-per-sq-ft rate. Two exterior bulk salt storage tanks with lower heating units were installed on the rear of the building for

easy access by semi-trailer delivery. An interesting event took place at the beginning of the project: Once AOP received the contract, one of the existing, 40-year-old softeners completely failed. At no charge, AOP loaned the village a softening unit, installed it near the existing building, and placed it in operation so water quality could be continued for the village.

The replacement of a major utility such as a water filtration plant by a community has a lasting effect on its infrastructure for decades to come and can put many elected officials in an uneasy position of trying to make correct and long lasting choices for their citizens. Therefore, it is important to have long-lasting and high-quality functioning water filtration plants, both large and small, and to show care in dealing with water treatment plants. **WWD**

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