DUBLIN ROAD WATER TREATMENT PLANT CAPACITY INCREASE PROJECT
Ohioans know how to get things done.

In 1908, the city of Columbus constructed the Scioto Water Purification Plant and Pumping Station to supply drinking water to its citizens. The plant used a first-of-its-kind process to both filter and soften the water.

This new process significantly reduced occurrences of waterborne illness and was so effective that engineers from around the world came to visit and learn about the “Columbus Experiment”. The treatment processes
The John R. Doutt Upground Reservoir is located approximately 30 miles upstream of the DRWP. It’s an off stream reservoir supplied by a pumping station that diverts water from the Scioto River during high-flow conditions. It has a nominal storage volume of 9.3 BG and was put in service in 2014.

pioneered by the city are still in use today in Columbus and many other places around the world.

As the population of Ohio’s capital continued to grow, the city built additional water plants to serve increased demand. In 1975, a new plant was built on the Scioto Plant site and renamed the Dublin Road Water Plant (DRWP). The new facility could treat 65 million gallons of water per day (mgd) using a conventional two-stage water softening process.
Resin innovations benefit people in different ways. At Dublin Road, Purolite ion exchange resins provide a community with clean, safe drinking water by removing nitrate and other contaminants that can cause sickness and disease. To discover how to get the highest quality municipal water...

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Purolite is a leading manufacturer in ion exchange, catalyst, adsorbent and specialty high-performance resins.

Purolite products are used in a wide variety of businesses from agriculture, food, beverage and paper production to the petrochemical, power, pharmaceutical and water treatment industries. Chemists, engineers, scientists, researchers and support specialists at Purolite share the common goal of solving customer application challenges through research, knowledge and experience.

Ion exchange technology is not well known outside of industry. However, it plays an integral part of modern life. The tiny resin beads produced by Purolite do big work. Many water and wastewater plants—both private and municipal—use Purolite resins to remove harmful contaminants through safe chemistry, enabling clean potable water to enter homes, and industrial effluents to get safely reintroduced to the environment.

Contaminants regulated by the EPA are important to consumers. Regulations present guidelines on what is considered safe, but acceptable contamination levels can change over time. Contaminants and pollutants such as nitrate, perfluorochemicals (PFCs), arsenic, organics, perchlorate, tannins, uranium and hexavalent chromium are all regulated contaminants, and can be safely removed from water systems with Purolite resins.

Purolite’s goal is to get levels of contamination well below the federal and state maximum contaminant levels (MCLs)—as they did at Ohio’s Dublin Road Water Plant using Purolite® A520E, a resin designed specifically to remove nitrate.

Purolite continually invests in R&D to provide cutting-edge solutions for water treatment applications, bringing more new products into the market than any other resin company. The company owns production plants in the USA, Romania and China, as well as multiple R&D and applications laboratories. Additionally, their secure network of global warehouses allows for short lead times, on-time shipping and a stable supply chain.

With offices in over 40 countries, Purolite has extensive knowledge of global water safety, and works with professionals in every industry sector. The large, knowledgeable sales force is always available for consultation, inspections, troubleshooting, and system optimization. In today’s rapidly changing regulatory and workforce environment, this flexibility is advantageous to clients.

Purolite Corporation is based in King of Prussia, PA, and is the only global company that focuses exclusively on resin technology. For more information on using resins for water treatment or other specialty applications, contact Purolite at 800-343-1500 or through the company website at www.purolite.com.

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The DRWP has been providing safe, clean, and affordable drinking water to the city for more than 40 years.

“The plant is a tribute to the people who originally designed it and to the people who have been operating and maintaining it,” enthused Dave Opferman, Engineer with Dublin Road. “It’s impressive that after 45 years of operation the facility remains highly adaptable. A lot of regulations have become more stringent and we are still able to meet those requirements. The heart of the plant is still there, and we want to get another 45 years out of it.”

To do that, the Columbus Division of Water began planning for a major upgrade to the facility so that it could continue to serve the city well into the 21st century.

**MATTERS OF THE HEART, CHEMICALLY-SPEAKING**

As the 14th largest city in America, Columbus is experiencing healthy growth. The Mid-Ohio Regional Planning Commission estimates the city’s population will grow by an additional one million residents by 2050. Increased population means increased demands for potable water. The DRWP Capacity Increase Project will position the Division of Water to meet not only increased water demands, but it will also enhance the treatment capabilities of the plant and increase reliability and redundancy.
“The capacity increase project adds a lot of different components to the Dublin Road plant,” explained Matt Steele, the City’s Water Supply and Treatment Coordinator.

“In addition to expanding the plant’s capacity from 65 mgd to 80 mgd and replacing aging physical infrastructure components such as pumps and motors, the water treatment process was also upgraded to keep pace with tighter federal regulations.”

To that end, the project combines two new technologies: anion exchange and ozone treatment with biologically active filters (BAF). Ozone-BAF is the water department’s response to the EPA’s Disinfectants and Disinfection Byproducts Rules, regulations designed to reduce the risks from microbial pathogens and disinfection byproducts that occur naturally in the water treatment process. Anion exchange is the city’s answer to occasional nitrate maximum contaminant level (MCL) exceedances.

“Chlorine reacts with naturally occurring organics to create disinfection byproducts,” Steele stressed, pointing out that
EPA rules mandate limiting trihalomethanes and haloacetic acids levels in drinking water.

“We investigated ways we could bring the disinfection byproduct levels down to meet the Division’s goal of always being less than 80 percent of any regulation. Ozone gas is highly reactive, so when it is injected into water it reacts with the organics that are present, and breaks them down from large complex molecules to simpler, organic molecules. Water then goes through the biological filters, and those filters grow healthy bacteria, which consume the smaller, simpler organic molecules to lessen the organics thus reducing disinfection byproducts when we add chlorine.”

Fertilizer and pesticide use is part of life in Central Ohio’s corn producing regions. Runoff events can spike levels of nitrates and atrazine in the city’s source water above drinking water regulations.

Columbus, on occasion, has violated the MCL for nitrate, most recently in 2015 and 16. The new anion exchange facility with nitrate selective resin will enable the city to remove nitrates from its water supply.
source water and meet the regulation.

Upgrading and expanding the DRWP while ensuring uninterrupted water availability in the summer months and minimal disruption to the populace was a highly complex undertaking, especially when the City’s other two water plants also underwent upgrades.

The water utility worked to build partnerships with all the project stakeholders, including the design professional, construction contractor, professional construction management team, city staff and regulators, which proved to be a difficult yet ultimately rewarding process.

“In the end, everyone pulled together and did a great job,” Opferman affirmed.

As of this writing, the Dublin Road facility is 90 percent complete, with construction scheduled to wrap up in 2018.

“The DRWP Capacity Increase Project is not only a significant investment in public health protection, it also helps support development and economic growth in the City and surrounding communities [...] growing, vibrant communities need a plentiful source of clean, safe, and affordable drinking water,” he added.

CLEAN WATER, WATER EVERYWHERE

The $200 million Dublin Road Capacity Increase project isn’t the only water improvement work underway in the Columbus
area. The Parsons Avenue Water Plant, which processes 50 million gallons daily, is undergoing a $65 million upgrade that includes rebuilding filters, new clearwell construction, new water clarification mechanisms, and major electrical upgrades.

The largest water treatment facility in Columbus, the Hap Cremean Water Plant, was also upgraded with ozone-BAF to the tune of $75 million. Recently finished, it increased the plant’s capacity from 100 mgd to 125 mgd.

That said, work on the Dublin Road project continues, with several impressive designs in process. They include ultraviolet (UV) disinfection and the installation of a standby power system that will allow the plant to continue to supply water during a region-wide power outage.

“We’ve done a lot of work, and we’re close to being finished but there are still a few more things to do,” Steele said. “When completed, Dublin Road will be one of the most cutting-edge water plants in the country with new, high end treatment processes.”

Columbus recently completed construction of a new $120m upground reservoir, increasing the supply of source water to meet ongoing needs as it fulfills its destiny as one of America’s leading metropolitan areas.