

HOW FOREST PARK WATER WORKS



Water treated at Forest Park begins at the Delaware River.

Water Diversion from the Delaware River

The process of producing drinking water begins at the Delaware River, where untreated, or “raw” water, is pumped by the Delaware River Pumping Station through a two-and-a-half mile transmission main to the Bradshaw Reservoir.

The plant operator remotely controls the release of water from the reservoir into a pipe, which travels one mile before spilling into the North Branch Neshaminy Creek.

Water then travels about six and a half miles to Lake Galena. Lake Galena is surrounded by Peace Valley Park and was built in 1970 for flood control, drinking water supply and recreational use.

Plant operators adjust water diversion flows from the Delaware River to control the level of Lake Galena, to ensure a sufficient drinking water supply and to facilitate recreational activities.

Gates located in Lake Galena release water through the dam and back into the North Branch Neshaminy Creek where it flows approximately two miles to the Forest Park raw water intake.

Most treatment facilities are located on the banks of their primary water source, but Forest Park Water is unique for this part of the country in that the Delaware River water is diverted to the plant from miles away.

Raw Water Intake

The intake is comprised of an inflatable rubber dam and steel bar racks. The dam creates a water pool that allows water to flow by gravity through the bar rack intake and into the raw water pump station. Excess water flows over the rubber dam to maintain downstream creek flow.



Inflatable Rubber Dam

In addition to the intake bar racks, traveling screens capture leaves and debris before water enters the pump station.

Pre-treatment Stage

As raw water enters the Forest Park Water Treatment Plant, it's pumped to the initial treatment stage. First, a coagulant is added to the water to promote the clumping together of particles such as dirt and organic matter, in a process called coagulation. Coagulant-treated water then enters a gentle mixing stage called flocculation, where smaller particle masses combine to form larger, visible clumps called “floc.” The floc-laden water enters sedimentation basins where, with the aid of special inclined plates, the majority of the solids settle to the bottom before the water flows to the next stage.

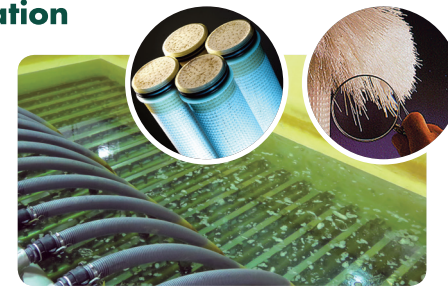


Sedimentation Basin

Water exiting the sedimentation basins is called “clarified water.” Clarified water flows to an advanced microfiltration stage where microscopic particles are filtered out by submerged membranes.

Membrane Filtration

Membrane filtration is a more effective barrier than traditional media filters against the passage of microscopic particles, including potentially harmful pathogens. The entire membrane system consists of approximately 45 million hollow-tube fibers that remove impurities larger than .1 microns, which is smaller than one human blood cell. The surface area of all the membrane fibers combined would cover just over 30 football fields. The filtered water flowing through each fiber flows into a common pipe and is pumped to the next stage. Membrane filtration is one of this plant's most notable features and is considered the filtration technology of the future.



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Ozone Treatment

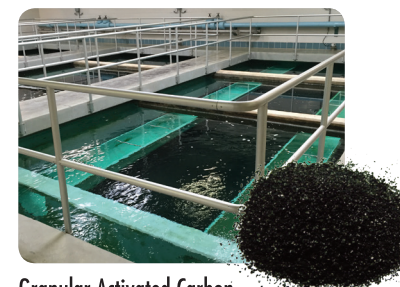
After water flows through the membrane filters, ozone gas is added to the water. The primary benefit of ozone is its powerful disinfection potential. However, it also destroys taste and odor causing compounds typically found in surface water. Because ozone gas is short-lived, it must be generated onsite and applied immediately.



Ozone is a powerful disinfectant and destroys taste and odor causing compounds.

Carbon Treatment

The ozonated water gets pumped to granular activated carbon contactors where trace amounts of undesirable organic and chemical compounds are removed by adsorptive and biological mechanisms. This occurs as the water flows through a six-foot deep bed of carbon media.



Granular Activated Carbon, or GAC, Contactors remove trace amounts of undesirable compounds.

Final Treatment

In the final treatment stage, a corrosion inhibitor is added and pH is adjusted to prevent water from leaching metals from piping in home plumbing. Chlorine is also added to maintain disinfection throughout each water authority's system.

Delivery to Customers

Clean, sparkling water is collected in the plant's clearwell, which is a 2 million gallon underground reservoir.



The pump room helps deliver clean, safe water to NPWA and NWWA customers.

Finished water flows through massive pumps for delivery to each authority's distribution system, comprised of a complex network of piping, pump stations and storage tanks. Chlorine is added at various points throughout each authority's system to ensure clean and safe water. Ninety percent of water supplied to North Penn and North Wales customers is surface water that is treated at Forest Park Water. The remaining ten percent is ground water.

Each day, high quality, affordable water is delivered to more than 100,000 homes and businesses. Excellent water quality is assured through operational proficiency and diligent monitoring. We perform continuous monitoring using online instruments, routine process analysis by the Operator, and analysis by state certified laboratories. Water leaving Forest Park consistently surpasses all state and federal regulatory standards. Therefore, our customers enjoy with confidence the refreshing water flowing from their taps.

Timeline of Milestones

- 1960's** Droughts and ground water shortages.
- 1970's**
- 1983** Construction of the Delaware River Pump Station began.
- 1989** Interim Forest Park Water Treatment Plant built to meet the growing water needs.
- 1994** Forest Park Water Treatment Plant complete.
- 2007** FPW expanded to produce 40 million gallons of water a day and retrofitted with Membrane Filtration, the treatment process of the future.
- 2014** Bucks County Water and Sewer signed a contract for 10 million gallons of water a day and a 17-mile transmission main was built going into lower Bucks County.
- 2019** FPW expanded to produce 43 million gallons of water a day.



All Forest Park Water Operators have the highest license available in the state for water works operation. The technology is set up so that a single operator can handle the treatment plant around the clock all while being able to freely move around the plant.



Forest Park Water