City of Hickory Water Treatment Plant

The City of Hickory's Water Treatment Plant is a regional water supply facility, providing potable drinking water to three counties and manages three purchased water systems extending from Icard to Claremont and from northern Alexander County to the Town of Catawba and Sherrills Ford. We also supply water to the towns of Maiden, Brookford, Catawba and occasionally to Long View.

The plant is a conventional surface water treatment facility, drawing water from the Catawba River. The Catawba River Basin originates from springs in the tallest mountains of the Appalachian Mountain chain and flows east past Hickory. This provides us with an abundant water source, relatively free from contamination. Duke Power operates two hydroelectric dams, Rhodhiss upstream and Oxford downstream from the plant. These two dams create a deep-water reservoir at our intake and help manage the water flow to reduce contamination from water run-off.

We employ eleven state certified operators, one state certified laboratory chemist and one part-time grounds keeper. We operate 24 hours a day, 7 days a week...we never close! We have a rated capacity of 32 million gallons of water per day.

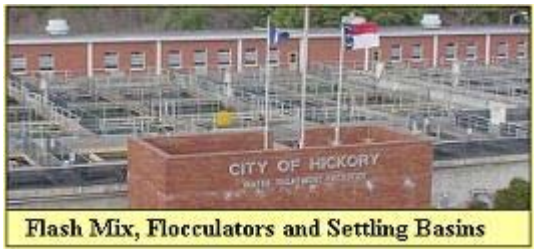
Raw Water Pumps

The Treatment Process

1. Raw water is pumped from the Catawba River and large things such as sticks, fish and plants are screened at the pump intake. The raw water is treated with chemicals in this first step of the treatment process. A chlorine disinfectant is added to the water to kill pathogenic (disease-causing) organisms, Aluminum Sulfate is added to help remove fine particles that are suspended in the water by coagulation and Sodium Hydroxide is added to adjust the pH and provide alkalinity to the mixed water. The raw water pumps push the water to the flash mixer and is gravity fed through the rest of the treatment process.

2. At the flash mixer, the water is then rapidly mixed to evenly distribute the chemicals. The flash mixer is a small basin that will contain the water for just a matter of seconds and provide even distribution of the coagulant chemicals that were just added.

3. The water then flows to a large basin where the chemicals cling to the impurities in the water in a process called *coagulation.* Flocculators move the water slower in this basin to provide the chemicals contact with the impurities and to clump together in large particles.Their action is much like that of kneading bread. This process is called *flocculation*. The water remains in the flocculators for several minutes.

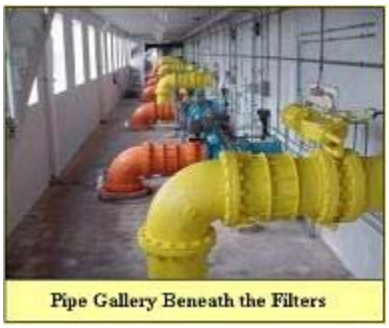


Flash Mix, Flocculators and Settling Basins

4. The treated water then moves to the settling basin where the large, heavy particles quickly settle to the bottom. Water moves very slowly and is not disturbed during the*sedimentation* process. Depending on raw water flow rate, it takes from 6 hours to 12 hours for the water to move through this basin.


Filters, each square is a filter

5. After making it's journey across the settling basin, the water along the top of the sedimentation basin flows through common troughs to the filters. The filters are comprised of layers of gravel, sand and hard coal (anthracite). The filters remove any of the remaining small particles of floc that failed to settle and any other impurities left in the water.

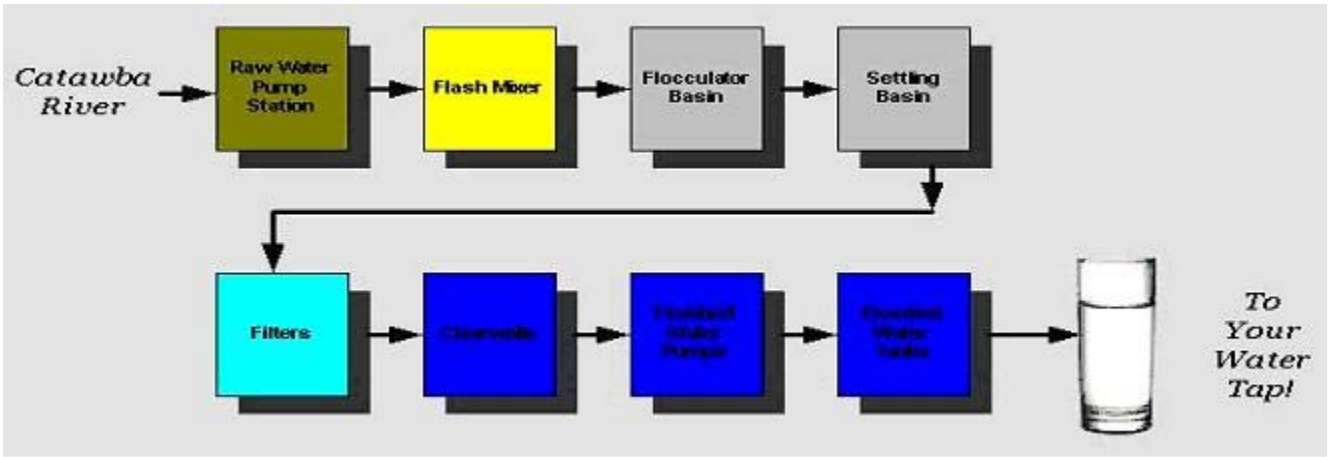

Pipe Gallery Beneath the Filters

6. After filtering, the water is chemically treated once again. Chlorine is added to provide enough of residual to remain in the distribution system. Fluoride is added to prevent tooth decay. More Sodium Hydroxide is added to raise the pH level of the water. Finally, a phosphate is added to inhibit corrosion and prevent copper and lead from leaching into the water through piping in the distribution system.


Finished Water Pumps

7. The finished water is then stored in ground storage tanks, called*clearwells* before being pumped to elevated storage tanks. The water is stored in these tanks for just hours. This gives the final dosing of disinfectant some time to work before the water is delivered to the first customers.

8. The final step is pumping the finished water up to the elevated storage tanks. The elevated storage tanks create water pressure to deliver the water to customers and provide a ready supply for the customer.



Sodium Hypochlorite Generation

For nearly a century, water plants have used Chlorine gas. It is a very good disinfectant, but there are so many other problems with the handling of Chlorine gas, many water plants are switching over to Sodium

Hypochlorite as a disinfectant. Most plants have concentrated commercial grade delivered by truck, but Hickory was the first in North Carolina to purchase its own Sodium Hypochlorite generator.

The Sodium Hypochlorite generator currently has 2 cells with an expansion capability in the future for additional cells. Each cell consists of about a 10-inch diameter and about 10-foot long clear Plexiglas vessel with electrically charged plates inside. One end is positively charged and the other negative. Saturated brine is pumped into the vessel as voltage is applied. Hydrogen gas boils off the electro-chemical reaction and Sodium Hypochlorite is pumped to storage tanks.

Sodium Hypochlorite Generators

Chlorine gas reacts with organics in the water to create chemicals in the tri-halomethane group. These chemicals have been identified by the Environmental Protection Agency as possible carcinogens.Sodium Hypochlorite seems to be less prone to reacting with organics in this manner and reduces the total tri-halomethanes found in the distribution system. Also, the Sodium Hypochlorite seems to keep a residual longer in the distribution system using smaller dosages than just Chlorine gas.

Why Drink Purified Water?

Purified drinking water is tested every day for pathogenic bacteria in our state certified laboratory. We conduct over 50,000 individual laboratory tests each year. Our chemist and operators continuously monitor chlorine content, daily physical analysis, and treatment monitoring tests to assure quality standards that meet or exceed all state and federal regulations for drinking water. Purified drinking water is never discolored after heavy rains. The City of Hickory's water has a low iron and hardness content so that it will wash clothes better. Fluoride is added for the prevention of tooth decay (this is particularly important in children). But mainly, it's safe and has a pleasant taste!

For Further Information

Thanks for stopping by our web site! If we can be of further assistance or to schedule a tour, please feel free to call the City of Hickory Water Treatment Plant at (828) 323-7530.