



THE METROPOLITAN DISTRICT WATER TREATMENT PLANTS



ABOUT THE METROPOLITAN DISTRICT'S RESERVOIRS

This introduction to The Metropolitan District's (MDC) West Hartford and Reservoir #6 water treatment plants will help you understand how the MDC provides the greater Hartford region with an abundant supply of pure drinking water – each and every day.

The two water treatment plants are a vital part of a process that delivers nearly 50 million gallons of water daily – and as much as 100 million gallons on hot summer days. Although each plant uses a slightly different method of treatment, the result is the same: clean, safe drinking water for the people we serve.



WATER RESOURCES

Water flows to the treatment plants from either of two surface water supplies: the 30.3 billion gallon Barkhamsted Reservoir, or the 9.5 billion gallon Nepaug Reservoir. Both are located in Connecticut's Northwest Hills, within 25 miles of each plant. There are also four smaller reservoirs near the treatment facilities that supplement daily needs and provide for emergencies.

A highly efficient water transmission system, built in phases from the early 1900s to the present, pipes the water to each plant through the treatment process and into the distribution system by gravity.

TWO KINDS OF FILTRATION

When the MDC was established in 1929, the region's water was filtered at what was then a state-of-the-art slow sand filtration facility that is still in use at the West Hartford Reservoir. In the early 1970s, the MDC constructed a rapid sand filtration plant at Reservoir #6. It was upgraded to a rapid dual media filtration plant in 2011, doubling its capacity from 21 MGD to 42 MGD. Today, both plants produce high-quality water.

ABOUT THE SAND

The filters at the MDC's water treatment plants contain a combined 50,000 tons of special quartz sand. The sand, which measures about 1/75th of an inch in diameter, captures both solids and microscopic bacteria suspended in water.

RESERVOIR #6

WATER TREATMENT PLANT

LOCATION:

Bloomfield, CT (Entrance off Route 44, West Hartford)

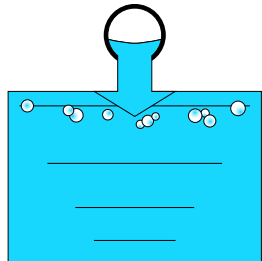
BEGAN OPERATION:

1972

FILTRATION:

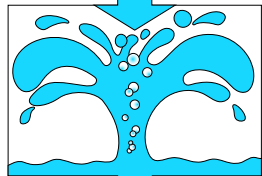
Rapid Dual Media Filtration System

THE PROCESS:



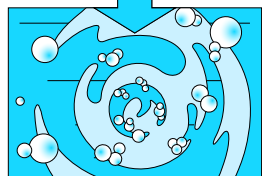
RAW WATER ENTERS THE PLANT

Water from Barkhamsted and Nepaug flows through a tunnel in Talcott Mountain to Reservoir #6. From the reservoir it enters the plant's intake house, where it travels by gravity through a large concrete pipe to the aerator.



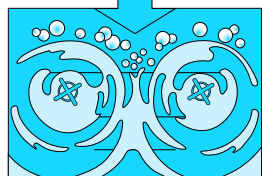
AERATION

The aerator's turbulent, bubbling action releases concentrated gasses in the water, improving its taste.



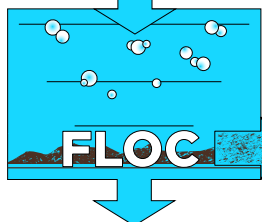
FLASH MIXING/COAGULATION

Aerated water then flows to the flash mixing tank, where Aluminum Sulfate is added and thoroughly blended. Powdered Activated Carbon is added seasonally to reduce seasonal taste and odor.



FLOCCULATION

Mixing continues in the flocculation chamber, where the aluminum sulfate causes the small, suspended particles within the water to stick together and sink to the bottom of the chamber. These particles are called floc.

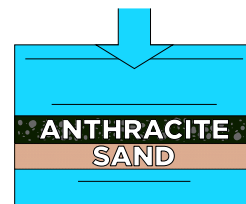


SEDIMENTATION

The water gradually moves to the neighboring sedimentation basin, where the heavy floc and powdered activated carbon settles out. The settled solids are sent to another part of the plant for disposal, while the remaining water goes on to the sand filters.

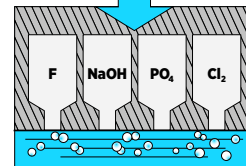
RAPID DUAL MEDIA FILTRATION SYSTEM

The Reservoir #6 rapid dual media filtration system combines chemical treatment with filtration utilizing six filters. Pre-treating the water with chemicals before it is filtered removes most of the impurities. The remaining impurities are removed by filters at a rate 40 times faster than at West Hartford. This is why the process is called rapid dual media filtration. On average, about one-third of all the water delivered to MDC customers is filtered at the Reservoir #6 Water Treatment Facility.



FILTRATION

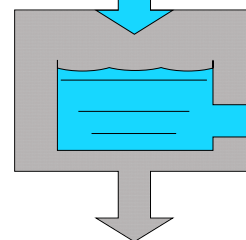
Remaining particles are removed in the six filters. Each 1,240 square foot filter holds 83,500 gallons of water. Water enters the filters and gradually passes through 18 inches of anthracite and 12 inches of sand, where the remaining impurities are removed.



CHEMICALS

As the filtered water travels to storage, 4 chemicals are added.

- Fluoride (**F**) - to help prevent tooth decay
- Sodium Hydroxide (**NaOH**) - to reduce the water's natural acidity which, in turn, protects pipes in the distribution system from corrosion.
- Orthophosphate (**PO₄**) - to reduce corrosion.
- Chlorine (**Cl₂**) - in the form of liquid Sodium Hypochlorite, to kill any remaining bacteria.



STORAGE

Up to 10 million gallons of filtered water are stored in two underground concrete basins that are continuously replenished as the water is withdrawn by gravity to the distribution system and to consumers' faucets.

CLEANING THE FILTERS

Each filter is backwashed as needed to remove particles trapped in the filter media. A combination of water and air are used to enhance the filter cleaning process that scour and dislodge any trapped material removed during the filtration process. Water from two 500,000 gallon tanks, located above the plant, along with two 250 HP air blowers, supply the water and air that make for a very effective and efficient cleaning method. The cleaning process takes about 15 minutes.

WEST HARTFORD WATER TREATMENT PLANT

LOCATION:

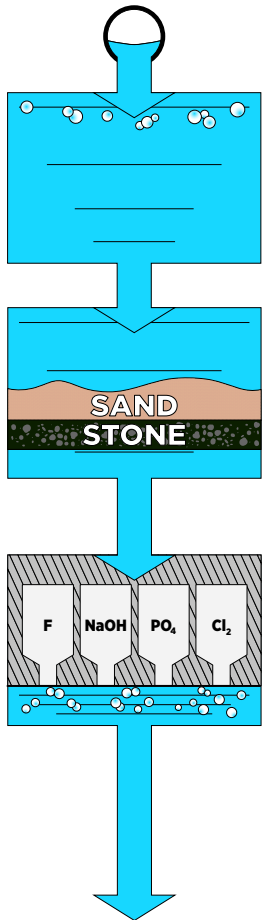
West Hartford, CT (Farmington Avenue/Route 4,)

BEGAN OPERATION:

1922

FILTRATION:

Slow Sand Filtration System



THE PROCESS:

RAW WATER ENTERS THE PLANT

Untreated water is screened as it enters the filtration plant at the reservoir's intake houses. Gravity then helps the water flow through a complex piping system.

FILTRATION

The screened raw water is piped to sixteen $\frac{1}{2}$ acre and six $\frac{3}{4}$ acre filter beds. In the filter beds, water trickles down through 27 inches of sand and 12 inches of stone, where solid particles are microscopic bacteria are trapped and filtered out. The filtered water flows to two storage basins.

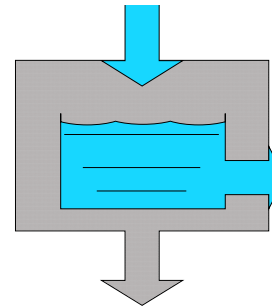
CHEMICALS

As the filtered water travels to storage, 4 chemicals are added.

- **Fluoride (F)** to help prevent tooth decay
- **Sodium Hydroxide (NaOH)** to reduce the water's natural acidity which, in turn, protects pipes in the distribution system from corrosion.
- **Orthophosphate (PO₄)** to reduce corrosion.
- **Chlorine (CL₂)** in the form of liquid Sodium Hypochlorite, to kill any remaining bacteria.

SLOW SAND FILTRATION SYSTEM

The slow sand filtration system at the West Hartford Plant has 22 underground filter beds, some as large as a football field. Raw (untreated) water is piped directly from the reservoirs to each bed for filtering. Because the water is not pretreated, the filtration process is relatively "slow". Nevertheless, the size of the plant enables about two-thirds of all MDC water to be filtered here.



STORAGE

Up to 15 million gallons of filtered water are stored in two underground concrete basins that are continuously replenished as the water is withdrawn by gravity to the distribution system and to consumers' faucets.

CLEANING THE FILTERS

Each filter bed is cleaned every six to eight weeks. With all but a foot of water drained, a tractor pulls a spring tooth harrow through the top 12" of sand. Like a large rake, the harrow loosens the trapped particles which are then washed into a nearby drain. The sand is loosened the following day using a dry harrowing process.





The Metropolitan District
555 Main Street
Hartford, CT 06142-800
860.278.7850

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ENSURING THE QUALITY OF YOUR WATER

MDC water is thoroughly tested each day to make sure it meets or surpasses the high standards of the Connecticut Department of Public Health and the U.S. Environmental Protection Agency. (USEPA).

At our State-licensed laboratory at Reservoir #6, our expert staff annually conducts over 140,000 physical, chemical, and bacteriological tests.

By testing water from our reservoirs, at the treatment plants and at approximately 50 sampling sites throughout our service area, we're ensuring the MDC water is of the highest quality – from the source to your tap. And that will always be our highest priority.

The Metropolitan District (MDC) is a public, non-profit municipal corporation created by the Connecticut General Assembly in 1929 to provide Hartford area municipalities with quality, potable waters and sanitary sewer systems.

The MDC provides clean, safe drinking water to over 400,000 people in its eight member towns – Bloomfield, East Hartford, Hartford, Newington, Rocky Hill, West Hartford, Wethersfield, Windsor – and in parts of Glastonbury, Farmington, South Windsor, East Granby, Windsor Locks and Portland.

