

Desalting Groundwater

Waterworks has been desalting groundwater since 1998. We use water from two very old aquifers. An aquifer is layer of rock or sediment deep under the ground that holds water like a giant underground sponge.

The water from these aquifers is brackish (slightly salty), so we must take the salt out. This is called desalination. Our desalination facility is located next to our water treatment plant in the Lee Hall area of Newport News.

The desalting process we use is called Reverse Osmosis (RO). In the RO process, water is forced across a membrane at high pressure. The membrane traps salt and other impurities, including bacteria. It allows only clean water to flow through. Our desalting plant can produce almost 6 million gallons of water a day. After the water is desalted, Waterworks blends it with treated surface water.



At the end of the desalting process, a watery mix of salt and other impurities is left over. This mixture, called brine or concentrate, is much saltier than the groundwater it came from. The Virginia Department of Environmental Quality allows us to pipe the brine into the James River, because the saltiness of the brine is similar to the saltiness of the river.

It is very expensive to desalt water. One reason for this is that it takes a lot of electricity to push the water through the membranes. It costs Waterworks about \$1.20 to desalt 1,000 gallons of groundwater. It only costs about 25 to 45 cents to treat 1,000 gallons of surface water. That makes the desalted water the most expensive water we produce.