

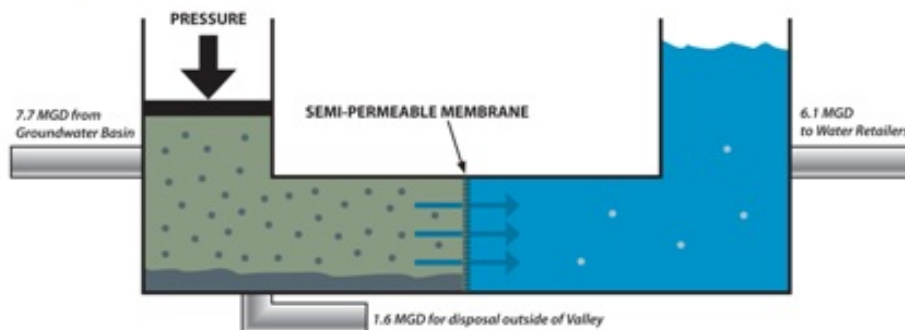


Mocho Groundwater Demineralization Plant Reduces Water Hardness, Enhances Reliability

Zone 7 Water Agency's Mocho Groundwater Demineralization Plant reduces the buildup of salts and minerals within the Livermore-Amador Valley's groundwater basin to:

- 1) improve the groundwater basin's salt balance, and protect the basin's long-term use,
- 2) allow regional water recycling for irrigation purposes, thereby enhancing the Valley's overall water-supply reliability, and
- 3) enhance delivered water quality on the west side of Zone 7's water-delivery system.

RO reverse osmosis



Using a process called reverse osmosis (RO), the Mocho Groundwater Demineralization Plant reduces the hardness of groundwater pumped from Zone 7's existing wells in the vicinity of Stoneridge Drive and Santa Rita Road in northern Pleasanton. The facility can remove minerals from up to 7.7 million gallons per day (mgd) of groundwater. After mineral concentrate is removed, up to 6.1 mgd of demineralized water can be blended with other groundwater and surface-water supplies prior to delivery to retailers (primarily the City of Pleasanton and the Dublin San Ramon Services District (DSRSD), since Livermore and the California Water Service Company typically get State Water Project surface water imported via the Delta from Zone 7).

Zone 7 has partnered with DSRSD to discharge up to 1.6 mgd of mineral concentrate out of the Valley to San Francisco Bay via the DSRSD brine sewer line and, ultimately, the Valley's treated wastewater export pipeline. This reduces the amount of salts and minerals re-entering the groundwater basin.

Project Highlights

When: Operational in late Summer 2009, with at least one more plant planned in the future

Where: Northwest corner of Stoneridge Drive and Santa Rita Road in northern Pleasanton

Facility Cost: \$35.6 million for planning, design and construction, funded by water rates, new development fees and a \$740,000 Proposition 50 state grant

Operating Cost: \$1.5 million per year

Capacity: 6.1 million gallons per day (mgd) of demineralized groundwater, blended with other water supplies for delivery to retailers

Defining hard water

- Hard water contains a higher amount of naturally occurring minerals, or salts, particularly calcium and magnesium, than soft water.
- Groundwater typically has more minerals and is harder than surface water. Water becomes hard by picking up soluble minerals as it seeps through soil and rock into groundwater storage basins. Since water is a good solvent, it picks up minerals easily. The higher mineral levels in the local groundwater are not a health issue at the levels present.
- While hard water can leave water spots on shower doors and buildup on plumbing fixtures, it is safe for drinking, cooking and other household uses (in fact, calcium carbonate is the same mineral found in calcium vitamin supplements). However, hard water can shorten the life of plumbing fixtures and appliances (i.e. hot-water heaters and dishwashers), leave white spots on cars and dishes after washing, and require more soap and detergent for laundry/other cleaning.

Measuring hardness

- Water hardness is measured as calcium carbonate. In 2008, Zone 7's surface-water supplies averaged from 115 to 120 milligrams per liter (considered moderately hard), while the groundwater from its seven wells averaged from 260 to 440 mg/L (considered very hard). The new Mocho Groundwater Demineralization Plant will lower a portion of Zone 7's groundwater supplies to a level of approximately 150 mg/L.
- The actual mix of groundwater and surface water that reaches the tap, and the degree to which a particular resident could experience reduced water hardness in the tap due to the initial demineralization plant project, varies depending on where the resident lives in the Valley; seasonal water-supply variations that affect how many total wells are operating; and water-system operational decisions, some made by Zone 7 and some made by individual retailers.

Where Our Water Comes From

- The tap water Zone 7 provides is primarily surface water (a blend of State Water Project water conveyed through the Delta and local storm runoff that has been purified at Zone 7's water-treatment plants), along with some groundwater. More groundwater is pumped during dry or drought periods, summertime-peak demand or when water-treatment facilities are closed for maintenance.
- Where the customer lives also affects the amount of surface water vs. groundwater delivered to the customer's tap. Under normal conditions, Zone 7 provides surface water to Livermore and to southeast Pleasanton. But during much of the year, it provides more of a blend of surface and groundwater elsewhere in Pleasanton and to the Dublin San Ramon Services District. In addition, both the California Water Service Company, which serves part of Livermore, and the City of Pleasanton operate their own groundwater wells to add to their Zone 7 water supplies. These non-Zone 7 groundwater sources are not affected by Zone 7's demineralization project.

Benefits of Demineralization

Many people in Pleasanton and Dublin will see some reduction in water hardness at the tap, the degree depending on a number of factors, including where they live in relation to the demineralization plant, water demands in each retailer's service area, and seasonal variations that determine how many other wells (both retailer wells and other Zone 7 wells) are operating at any given time. Some people will see less change, either because they don't get groundwater or because they receive groundwater from wells not directly connected to the plant. The Mocho facility will soften about 29 percent of Zone 7's total groundwater pumping capacity (including capacity being added to the system in September, 2009). When Zone 7 needs to pump from its wells, it intends to

do so first from those wells that are connected to the Mocho Demineralization Plant and to use its other groundwater wells only during peak summer demands and drought conditions.

- In the long term, water-supply reliability for all Valley residents will be enhanced by the plant's operation because salt removal from the groundwater basin (about 4,000 tons a year) will meet San Francisco Bay Regional Water Quality Control Board requirements in permitting the Valley's use of recycled water for irrigation purposes. This is especially important in light of continuing concerns about the long-term reliability of water supplies conveyed through the ecologically fragile Delta.
- While Zone 7 typically delivers groundwater only to Pleasanton and DSRSD, the plant could also reduce potential Livermore water hardness if groundwater needs to be sent there due to emergency outages of the South Bay Aqueduct affecting surface-water imports from the State Water Project.

Pros and Cons of Home Water Softeners

A water softener is not needed to make tap water safer, so to purchase or to continue to use a water softener is really a matter of personal preference. Here are some things to consider:

- Before making a decision, you might want to wait until the Mocho Groundwater Demineralization Plant has been up and running for awhile to see what effect it has on the water delivered to your home. Maybe there is no need for a water softener.
- Many water softeners exchange calcium and magnesium for sodium and potassium. Extra sodium in water may be a concern to people on sodium-restricted diets, and is not recommended for watering plants, lawns or gardens.
- Extremely soft water from these water softeners can also corrode pipes.
- Certain types of home water softeners release high concentrations of mineral salts into the municipal wastewater system that can adversely affect wastewater treatment processes and degrade the quality of local recycled water. Consider using a softener with a portable cartridge that allows the water-softener company to haul the used brine away for disposal under controlled conditions. Contact your wastewater collection provider for more information.

Pros and Cons of Home Reverse Osmosis Units

- Reverse osmosis removes minerals from the water; it does not exchange them with other minerals.
- It removes not only hardness, but also fluoride, chlorine, and some organic chemicals.
- Reverse osmosis units are often more costly than water softeners.
- Reverse osmosis units usually produce relatively small volumes of water.

Household Tips to Combat Hard Water

- Leave a squeegee inside the shower and have each family member squeegee the walls and shower door after each use. This reduces hard-water buildup and a whole lot of scrubbing later on.
- Try applying plain white vinegar and lemon juice -- acids that help loosen and remove hard water deposits from glass shower enclosures.
- If your showerhead plugs up from hardness, fill a sandwich bag with vinegar and use a rubber band to fasten the bag to your shower head. Leave it overnight.
- Pour a cup of white vinegar in the toilet bowl and leave it there overnight. Flush in the morning.

Who to Contact: For general information about the Mocho groundwater demineralization project, call Zone 7 at 925-454-5000. For questions about how your particular home or business might benefit, contact your water retailer.