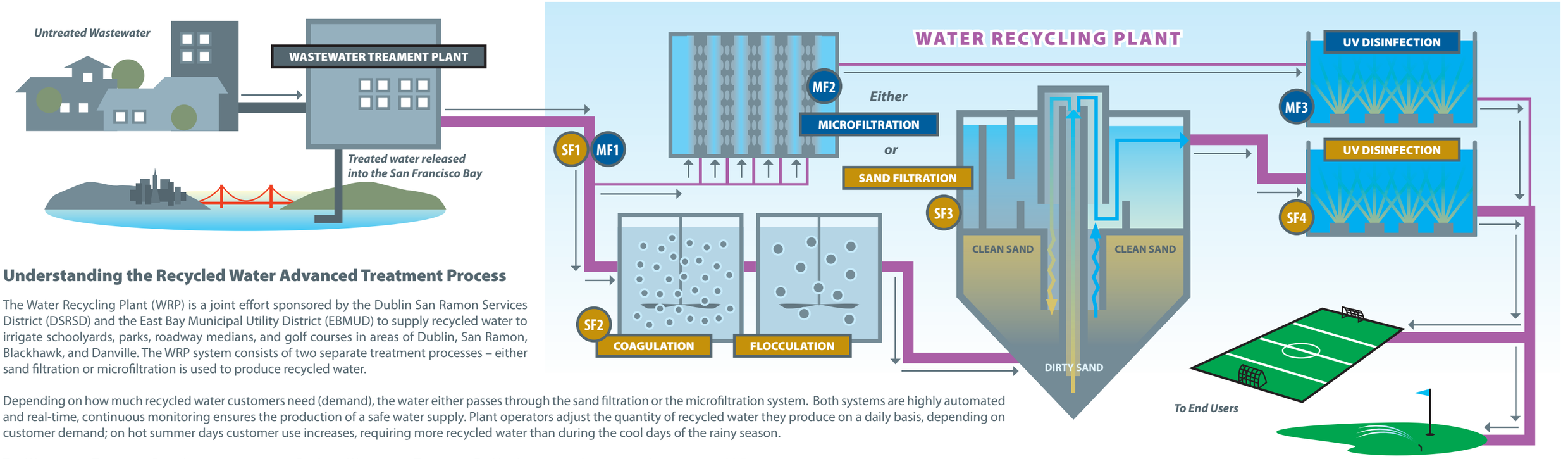

Understanding the Recycled Water Advanced Treatment Process

The Water Recycling Plant (WRP) is a joint effort sponsored by the Dublin San Ramon Services District (DSRSD) and the East Bay Municipal Utility District (EBMUD) to supply recycled water to irrigate schoolyards, parks, roadway medians, and golf courses in areas of Dublin, San Ramon, Blackhawk, and Danville. The WRP system consists of two separate treatment processes – either sand filtration or microfiltration is used to produce recycled water.

Depending on how much recycled water customers need (demand), the water either passes through the sand filtration or the microfiltration system. Both systems are highly automated and real-time, continuous monitoring ensures the production of a safe water supply. Plant operators adjust the quantity of recycled water they produce on a daily basis, depending on customer demand; on hot summer days customer use increases, requiring more recycled water than during the cool days of the rainy season.

The Wastewater Treatment Plant is also located at the Regional Wastewater Treatment Facility. It has a maximum capacity to process 20.7 mgd of wastewater (average dry weather flow) and is the source of water (secondary effluent) processed by the Water Recycling Plant.

Sand Filtration Treatment Process

Sand filtration, because of its lower cost at higher output, is used during high demand periods, mainly from March through October. The system can be operated at a flow from 2.5 to 9.7 million gallons per day (mgd).

Step 1 (SF1/MF1): Secondary effluent (wastewater that has completed primary and secondary treatment, removing up to 95% of suspended solids and meeting requirements for discharge to the Bay) enters the Water Recycling Plant.

Step 2 (SF2): Chemicals are added to disinfect and concentrate particles remaining in the water. The chemicals (called coagulants) clump small particles together into larger particles so they are easier to filter out of the water (a process called flocculation).

Step 3 (SF3): The water then passes through an 80-inch deep continuous backwash sand filter system, which removes the remaining solids. The sand is Colorado silica, which has a nicely rounded shape and does a good job filtering the clumps of undesirable particles from the water. Because the sand is 80-inches deep (would fill two train boxcars, approximately 4,000 cubic feet), it is a more reliable system (most sand filtration systems are only 40-inches deep). This process reduces the turbidity of the water to less than two nephelometric turbidity units (NTUs). Turbidity is cloudiness of the water and a lower number of NTUs means clearer water. Drinking water in California can not exceed 1 NTU.

Step 4 (SF4): The filtered water slowly passes by ultraviolet (UV) lights, which kill any bacteria and viruses that might remain in the water. UV light mimics nature in that it is similar to the disinfecting power of sunlight and is able to destroy the DNA of any remaining viruses and bacteria.

Microfiltration Treatment Process

Microfiltration, because of its higher cost at lower output, is used primarily as back up to sand filtration, and during the off-season from November through February. The microfiltration system can be operated from 0 to 3 mgd.

Step 1 (SF1/MF1): Secondary effluent (wastewater that has completed primary and secondary treatment, removing up to 95% of suspended solids and meeting requirements for discharge to the Bay) enters the Water Recycling Plant.

Step 2 (MF2): The water passes through a microporous membrane filtration process, removing particulates and contaminants. The pore size of a typical microfiltration membrane ranges from 0.1 to 10 micrometres (about one tenth the width of a human hair). Microfiltration can remove pathogens from water including *Giardia*, *Cryptosporidium* and any large bacteria.

Step 3 (MF3): The filtered water slowly passes by ultraviolet (UV) lights, which kill any bacteria and viruses that might remain in the water. UV light mimics nature in that it is similar to the disinfecting power of sunlight and is able to destroy the DNA of any remaining viruses and bacteria.