Expanded MWRP Process:

- Sewage from inside homes and businesses travels through sewer pipelines 1 to the MWRP headworks facility, 2 which includes three fine screens to remove debris and three grit chambers to remove sand, rocks, and grit.
- Four new primary treatment sedimentation tanks, (3) which remove organic solids from the sewage, will supplement five existing tanks. Primary influent flows slowly through the in-ground tanks, allowing suspended solids to settle to the bottom or float to the surface, where the solids are collected for disposal. A new primary effluent pump station will direct flow to: the existing secondary treatment process, 6 the new membrane bioreactor, 6 or the existing flow equalization basins 4 (used for temporary storage to equalize daily flow variations).
- The membrane bioreactor 6 includes treatment basins with much higher concentrations of microbiology compared to the typical secondary treatment process. The membrane bioreactor also replaces the sedimentation tanks and filters with membrane filters. The result is high-quality water that can be disinfected without further treatment for reuse.
- High-rate clarifiers 7 are occasionally used to condition secondary-treated water prior to filtration in order to maximize the effectiveness and capacity of the filters. The high rate clarifier uses coagulants and sand to bind suspended matter into larger and heavier particles that can be settled and collected. The sand is then cleaned and recycled within the system.
- Conditioned secondary-treated water is further treated in the existing dual-media filters (8) to remove suspended solids particles and produce tertiary-treated water. The water passes by gravity through an anthracite coal layer followed by a sand layer. Following this filtration, the water is disinfected with a sodium hypochlorite (bleach) in the upgraded chlorine contact tank. 9
- The high-quality water produced by the new membrane bioreactor will be disinfected using ultraviolet light. ⁽¹⁾ The water flows by gravity in concrete channels past specially designed ultraviolet lights.



Irvine Ranch Water District. Alchelson Water Recycling Plant.

IRWD Background:

Established in 1961. Irvine Ranch Water District provides pumping, treatment and distribution of potable water, sewage collection and treatment, and distribution of recycled water. IRWD's tertiary treatment of sewage at its Michelson Water Recycling Plan results in an excellent quality of recycled water that is used for landscape and agricultural irrigation, and for industrial and commercial needs. IRWD's proactive long-term planning identified the need to expand MWRP in order to meet the projected 56 percent increased recycled water demands by the year 2025.

Project Background:

In 1967 IRWD's Michelson Water Recycling Plant began delivering approximately two million gallons per day (MGD) of tertiary-treated recycled water to agricultural users. By 2008, MWRP's capacity had grown to 18 MGD. Planners estimate that when the IRWD service area reaches "final build out" in approximately 2025, a recycled water capacity of 33 MGD will be required to meet demands.

A master plan was prepared to ensure that the MWRP will meet



Benefits of Recycled Water from MWRP:

- Decreases the need for additional potable water supplies
- Helps maintain long-term sustainability
- Saves a gallon of potable water for every gallon of recycled water used



Summer 2016

Treatment basins for the cutting-edge membrane bio-reactor process at Michelson Water Recycling Plant, part of the recent Phase 2 expansion of this facility.

these requirements. The current MWRP expansion construction began in the fall of 2009 and was completed in spring of 2014.

Reduces dependence on imported water

- Provides a source of water that may be used for: toilet flushing in
 - commercial buildings, air conditioning cooling towers, irrigation of
 - public areas, agriculture and some industrial uses

Michelson Water Recycling Plant Overview.



Michelson Water Recycling Plant Legend

- 1. Influent Sewers
- 2. Headworks
- 3. Primary Sedimentation Tanks
- 4. Flow Equalization
- 5. Secondary Treatment
- 6. Membrane Bioreactor
- 7. High-Rate Clarifier
- 8. Dual-Media Filtration
- 9. Chlorine Contact Tank
- 10. Ultraviolet Disinfection
- 11. Recycled Water Pump Station
- 12. Flood Protection Wall

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