



RUNNING SPRINGS WATER DISTRICT WATER RECLAMATION PLANT



The Running Springs, CA Water Reclamation Plant was originally constructed in 1968 to treat the sewage from Running Springs, Snow Valley and Arrow Bear. At present the plant services about 5,000 connections, producing an average daily flow of about 500,000 gallons per day, with a present design capacity of 600,000 gallons per day. The original plant discharge requirement was 30 mg/l BOD₅ and 30 mg/l TSS. Final effluent is sent to a group of ponds about 2,000 feet below the plant on US Forest Service controlled property. Over the last few years the Forest Service became concerned with local water quality impacts due to the plant discharge, and threatened to revoke the Water District's discharge permit. During negotiations, the District promised they would upgrade the plant to produce water of near drinking water quality and convert two of the ponds to a wildlife refuge in order to maintain their permit.

The plant is located at an elevation of 5,000 feet and experiences a full seasonal temperature profile, and the wastewater reaches a low temperature in Winter of about 10 degrees C. The existing plant was a complete-mix activated sludge

system and could not maintain sufficient biomass to nitrify in Winter, thus making denitrification and nitrogen removal impossible. The site is extremely restricted and construction of additional tankage was considered impractical.

Use of the Membrane Bioreactor process allowed for maintaining an MLSS concentration of 10,000 to 15,000 mg/l, which is sufficient to ensure nitrification under Winter conditions. The existing plant had two aeration tanks and two vacuum clarifiers. In the upgraded design, the aeration tanks were converted to MBR basins, one clarifier was converted to a combined denitrification and flow equalization tank and the other clarifier has been converted to an anaerobic tank for biological phosphorus removal. The MBR tanks will be operated in Enviroquip's patented Symbio[®] mode, facilitating simultaneous nitrification and denitrification. This biomonitoring and control system also saves energy and minimizes the need for recycle. The MBR process operates in a gravity permeate mode and no permeate pumps are required.

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Effluent from the MBR system is delivered to an existing circular aerobic digester that was converted to an effluent storage tank. This is required as they are only allowed to use their effluent irrigation system when the plant is staffed, or 7 days per week, 8 hours per day.

Plant effluent is disinfected with ultraviolet light and given a slight chlorine residual prior to storage. Waste sludge is taken directly from the MBR tanks and dewatered in a belt press to complete the process. Final effluent characteristics are now BOD₅ less than 5 mg/l, Total N less than 10 mg/l, Total Phosphorus less than 1 mg/l and fecal coliform less than 2.3 MPN/100 ml, suitable for reuse on adjacent land.

The plant layout was very tight due to the very small site, so it was not possible to construct a piping gallery for the MBR piping. Enviroquip came up with

a solution involving the construction of a galvanized steel bridge structure in the tanks to support all of the MBR piping. The submerged valves which control the permeate and cleaning solution are three-way plastic valves that are suitable for submerged use. The handles of the operating valve stems for each unit can be seen in the photograph.

The photo shows the plant without the aluminum covers on the basins so you can see the MBR in operation. A checker-plate walkway goes down the middle of the bridge to provide access to the valves.

Plant startup for the first MBR basin was performed in March 2003 and the complete retrofitted facility went fully on-line in June 2003. Enviroquip's MBR and Symbio[®] technologies ensure that the plant is easy to operate and produces a consistently high effluent quality.

EQUIPMENT OR PROVIDERS:

Inlet Screen	Waste Tech FSM Stainless Steel Band Screen with 3 mm Openings.
Membrane Bioreactor	Enviroquip System Provider with Kubota System Flat-Plate Membranes
Process Aeration	Sanitaire Fine Bubble Membrane Disk Diffusers
Process Return Sludge Pumps	Pumpex Submersible Pumps
Anoxic and Anaerobic Mixers	Landia Submersible Mixers
Process Air Blowers	Roots Rotary Positive Blowers
UV Disinfection System	Suntech LPX 200 Open Channel
Sludge Dewatering	Hydrocal Belt Press – Single belt Stainless Steel Frame
Major Equipment Representative	Saddleback Environmental Equipment, Inc.
Turnkey Contractor	Gierlich-Mitchell, Inc.
Project Engineer	Arthur S. Anderson
District Engineer	Engineering Resources, Barry Biersbach

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Barry Bierschbach P.E.



Enviroquip, Inc.
OF AUSTIN, TEXAS