

## Zero Liquid Discharge System for Golf Course Irrigation WTP

**Water Treatment Systems, Inc.** has recently commissioned a brackish water 1.2 MGD (4.5 million liters per day) reverse osmosis water treatment plant for a Texas, USA golf course community. In addition to providing irrigation quality water, another goal was to recover as much of the concentrate as possible, or, "Zero Liquid Discharge". The WTS design has achieved approximately 98% recovery.

This is a very important development for the Golf industry. In many parts of the country, and indeed worldwide, golf course managers struggle with the problems of availability, cost, or quality of water for irrigation of their golf course property. Reverse Osmosis has solved the problem of utilizing brackish groundwater for irrigation. Unfortunately, many Golf Clubs that plan to purchase RO water treatment plants run directly into a major obstacle. The problem is finding a suitable location to send the RO concentrate water. The lower the amount of RO concentrate, the smaller the problem is. The Texas ROWTP is producing high



quality water for irrigation. Daily product water production is 1.2 MGD. Daily concentrate production is 19,728 based on 24/7 operation. Overall system recovery is 98%. The membrane systems are arranged in three stages. The second and third stage trains utilize concentrate water as their feed source. The original design for the Texas Golf Club called for zero liquid discharge with the use of evaporators as the final treatment phase. Evaporators are expensive both in capital and operat-

ing cost. But our client was fortunate to obtain permitting for approximately 5% of the concentrate thus eliminating the evaporation phase which saved about a million dollars. The (nearly) zero liquid discharge design by Water Treatment Systems, Inc., using membrane systems is a lower cost investment for golf clubs everywhere. Water Treatment Systems, Inc. Boca Raton, Florida, USA, designs and manufactures reverse osmosis systems and water treatment plants. ■