KOVALUS Separation Solutions™

CASE STUDY

# PULSION® MBR Keeps Pacific Grove Golf Links Green

## Overview

Located about 100 miles south of San Francisco on the Monterey Peninsula, the City of Pacific Grove is home to an esteemed 18-hole golf course and parkland. The Pacific Grove Golf Links was established in 1932 and attracts visitors and locals of varying skill levels to enjoy the traditional Scottish-style course. Although neighboring the ocean, the municipal golf course has been kept green using potable water, an environmentally inefficient irrigation method and one that risks business shutdown during drought conditions, at the discretion of the state.

### The Challenge

The aim of this project was to reduce the golf course's reliance on potable water for irrigation and create an alternative source of suitable water through the treatment and recycle of city sewer water.

### The Solution

The Pacific Grove Golf Links project constructed a satellite water treatment plant and a complete recycled water distribution system to irrigate the golf course. Sewage from the city of Pacific Grove is redirected to the site and is treated using Kovalus Separation Solutions' PULSION MBR filtration technology. The system treats 0.25 million gallons per day (MGD), or about 950 cubic meters per day, with a peak daily flowrate of 0.30 MGD, or about 1,140 cubic meters per day. The ultrafiltration membranes effectively remove micro-organisms and suspended solids to leave behind clean water that serves the course, as well as providing greywater to two on-site restrooms.

The PULSION MBR submersible membrane modules feature highly permeable reinforced PVDF membranes that are designed to avoid breakage, minimize downtime, and provide high productivity without fouling.

### Key Highlights

Kovalus achieved higher capacities with less membrane area, reducing the overall system costs.

1. PULSION MBR treats 0.25 million gallons per day
2. The municipality reduced their costs by roughly 25%
3. Provides clean water that serves the course and greywater to two on-site restrooms

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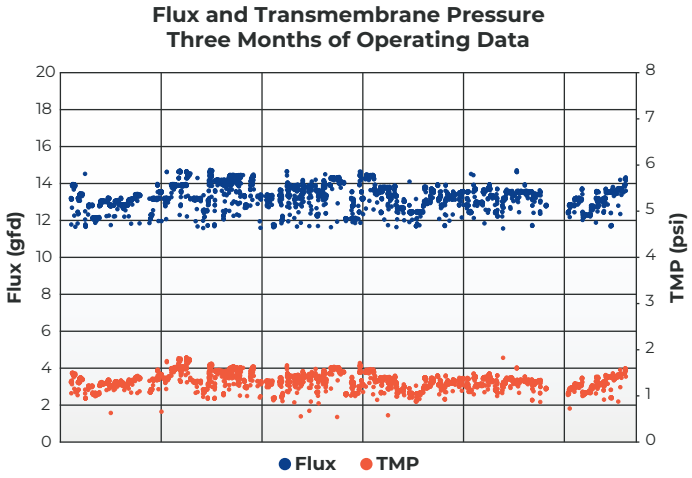
## The Solution (Cont.)

The hollow fiber membranes are fixed only at the bottom to eliminate solids buildup and to allow clean water to filter through uncontaminated. To help control fouling, the membrane modules are scoured with an integrated aeration system, which introduces large bubbles of air into the dedicated fiber bundle chambers. This innovative technology helps increase productivity by 25% while reducing aeration energy by up to 40% compared to traditional air scour methods.




## Operation Experience

The city of Pacific Grove chose KSS over other hollow fiber membrane manufacturers for this project due to the unique and flexible design of the PULSION® MBR system, ability to achieve higher capacities with less membrane area, and significant energy cost savings. With the PULSION MBR, they are also seeing reductions in BOD content and TSS content by over 98% and 99%, respectively.

The municipality was using up to 125 acre-feet per year (425 cubic meters per day) of potable water to irrigate the golf course, at a cost of about $7,000 per acre-foot.

Repurposing the city's sewage water to keep the course green reduced their costs by roughly 25%.

Since the system's commissioning in December 2017, it has been running without issue and producing high quality effluent for the Pacific Grove Golf Links. In addition to providing economic and environmental benefit, the success of the water recovery effort using KSS' PULSION MBR system has the potential to pave the way for net water credits in the future. This could help facilitate long awaited commercial development opportunities for the city and help support growth of the community.

Decentralized wastewater treatment plants offer a variety of economic and environmental benefits to their surrounding communities. They provide a reliable source of water for businesses while maximizing efficiency of land and energy usage. The Pacific Grove Golf Links project is an excellent demonstration of how municipalities impacted by drought and water scarcity can cost-effectively optimize clean water recovery and recycle.

KOVALUS Separation Solutions™

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