

---

## Fixed-Film Bioreactor System for a Major Chemical Manufacturer

### ***Challenge***

A major chemical manufacturer contacted Envirogen to evaluate, design, and optimize a system to handle their mixed aqueous waste stream.

### ***Solution***

Envirogen evaluated, redesigned and optimized a biological system to treat a variety of contaminants in the plant's waste streams. The system uses a fixed-film bioreactor, the operation of which was complicated by high organic loads. Envirogen was contracted to summarize the capability and capacity of the current system, and to provide operational guidance for the revised treatment system configuration.

Envirogen also evaluated the suitability of treating other waste streams produced in the facility with the modified biological treatment system. The revised treatment system consists of a combination of physical/chemical and biological unit processes.

First, the water is treated in a pH adjustment process to remove particulates, which are then filtered and removed. The filtrate containing soluble organics is subsequently fed to the submerged fixed-film reactor where greater than 98+% of the biochemical oxygen demand is removed. Finally, the water flows to the evaporated unit where it is reduced to dryness.

### ***Results***

This treatment train results in zero discharge of contaminated waters produced during the industrial manufacturing process. Envirogen was selected for this work based on its knowledge of microbiology, waste treatment, and on its experience with bioreactor systems, specifically, the demonstration and operation of fixed-film bioreactors.