# GOLDEN FLAKE ELIMINATES SEWER SURCHARGES WITH ADI® MEMBRANE BIOREACTOR

## CLIENT

Golden Flake Snack Foods Inc., originally known as Magic City Foods, is a producer of potato chips, tortilla and corn chips, cheese curls, pork rinds, and other snack foods. It has grown from a small two-person company to over 1,200 employees. Since 1923 Golden Flake has been producing delicious snack foods, and the company now serves its extensive product line to a 12-state market.

**Technology**
ADI® Membrane Bioreactor (MBR)

**Sector**
Food & Beverage

**Location**
Alabama, USA

## CHALLENGE

Golden Flake's 50 acre (20 hectare) Birmingham, Alabama, USA, corporate headquarters is home to a 350,000 $ft^2$ (32,516 $m^2$) manufacturing facility that processes more than 20 million lb (9 million kg) of snack foods per year. The plant's production mix can fluctuate, causing its wastewater to have varying strengths and consistencies, with flow rates ranging from 100,000-350,000 gpd (380-1,330 $m^3/d$).

Golden Flake was permitted to release up to 400,000 gpd (1,520 $m^3/d$) of wastewater to the local sewer; however, that privilege came with wastewater surcharges. If Golden Flake could reach prescribed total suspended solids (TSS), biochemical oxygen demand (BOD), ammonia-nitrogen ($NH_3$-N), and dissolved oxygen (DO) concentrations, the major regional snack food producer could convey treated effluent directly into a creek that runs beside its property and bypass the sewer system altogether. Golden Flake required a treatment technology that allowed the company to effectively treat wastewater on-site, thereby eliminating expensive surcharges.

## SOLUTION

ADI Systems conducted an on-site pilot study and was subsequently contracted to design/build a full-scale ADI® membrane bioreactor (MBR) that would treat the wastewater at the Birmingham production facility. ADI Systems was tasked with engineering a solution that would fit into Golden Flake's existing treatment system configuration. The MBR system was selected because this technology fits within a compact footprint and consistently produces a high quality effluent, as well as offers an attractive payback on savings in current and future surcharge fees imposed by the local publicly owned treatment works (POTW).

The MBR system consists of an influent pumping station, influent force main, 370,000 gal (1,406 $m^3$) bolted-steel preaeration tank, two 32,000 gal (122 $m^3$) precast concrete membrane tanks equipped with flat-sheet submerged membrane units, a reaeration chamber, sludge dewatering system, control building, and laboratory. The system is complete with pumps, aeration blowers, aeration systems, process piping and valving, a membrane chemical cleaning system, instrumentation, and controls.

## RESULTS

The MBR system allows Golden Flake to direct-discharge its treated effluent to a small stream located adjacent to the plant, eliminating significant POTW surcharges. The treated effluent also serves to enhance the downstream environment by increasing the water flow within the small watercourse, beneficially impacting the local ecosystem.

The MBR system treats up to 400,000 gpd (1,520 $m^3/d$) of Golden Flake's raw snack food wastewater following fine screening, with design $BOD_5$ and TSS concentrations of 1,500 and 250 mg/l, respectively. The MBR consistently produces effluent with undetectable $BOD_5$ and TSS concentrations and less than 1.5 mg/l $NH_3$-N concentrations. The longer solids retention time of the MBR leads to better soluble COD removals compared to conventional systems and carries the added benefit of lower sludge production.

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