

Snack Foods Factory (Golden Flake)

Golden Flake Snack Foods, Inc. located in Alabama, USA, produces a variety of snack foods, from potato, tortilla and corn chips, to cheese puffs, cheese curls and pork rinds.

Prior to August 2009, Golden Flake Snack Foods sent raw wastewater to a primary clarifier which settled the heavy solids and the supernatant was discharged to the local POTW resulting in expensive surcharges and odors associated with the clarifier. Surcharges imposed by the POTW to accept/treat the Golden Flake snack foods processing wastewater were increasing significantly on an annual basis. This resulted in Golden Flake seeking opportunities for onsite wastewater treatment with discharge to a nearby stream, reducing the cost burden associated with relying on the POTW accepting their process wastewater.

In 2008, an on-site membrane bioreactor (MBR) pilot study was conducted at Golden Flake Snack Foods. It was determined that the MBR process offered the lowest capital cost solution and the most compact footprint. It was also evident that the MBR process provided the best solution for meeting the strict effluent requirements for direct discharge for BOD (< 10 mg/l), TSS (< 30 mg/l), NH₃-N (< 1.5 mg/l), and dissolved oxygen (> 6 mg/l). The MBR system appeared to be the most economical and best technology for this case and a full-scale system was designed, built in 9 months and commissioned in August 2009. Despite periods of high influent COD concentration (COD concentration fluctuated highly, see Actual data on page 2) the MBR system continues to perform exceptionally well with BOD₅ and COD removals consistently greater than 99.7 %, and 99.4%, respectively. The effluent TSS is constitutently less than 2 mg/l, as expected, due to the membrane's ability to retain all suspended solids within the bioreactor. Effluent NH₃-N was consistently less than the effluent limit of 1.5 mg/l, showing little variation during steady operating conditions. All MBR effluent is discharged to the local stream, thereby improving the local ecosystem and eliminating the surcharges from the POTW.



Photo of Kubota membrane units before start-up (left) and in operation (right)

【Outline of the Facility】

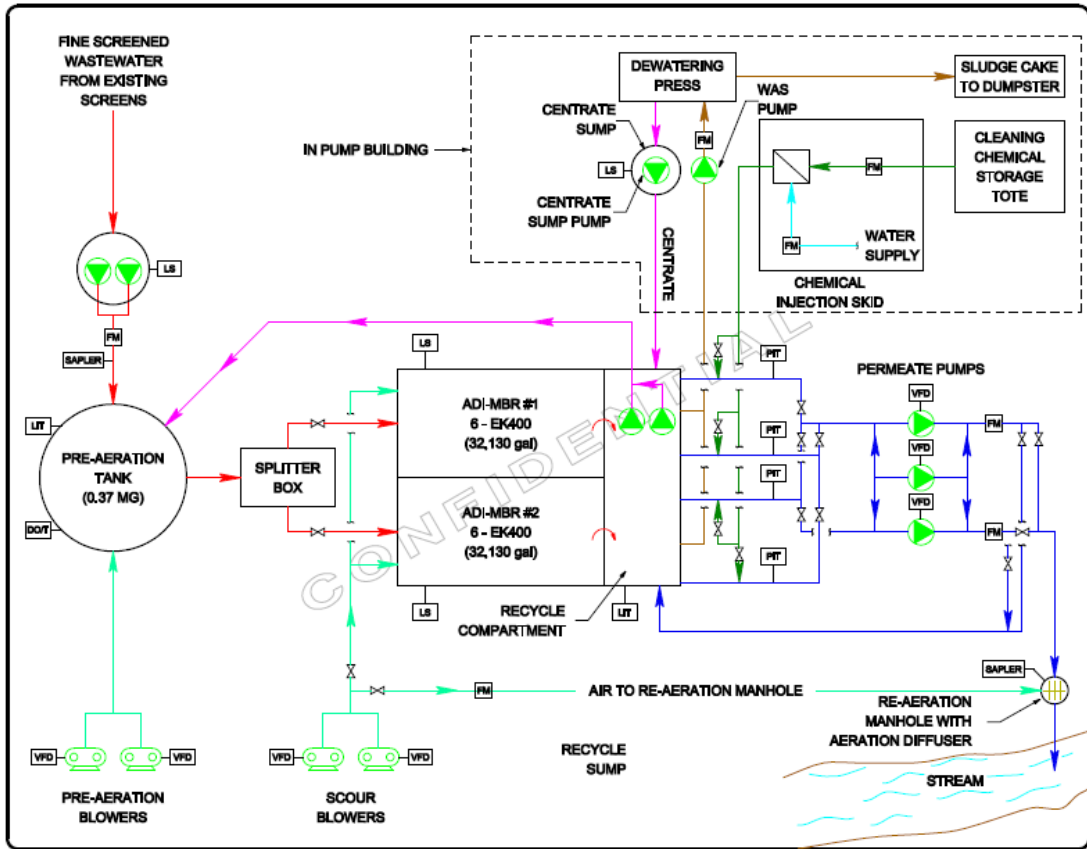
Location :	Alabama, USA
Type of wastewater :	Snack foods factory wastewater
Flow :	700 m ³ /d (average) 1,600 m ³ /d (peak)
Commissioned :	August, 2009

Kubota MBR Case Study

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【MBR Process Flow Sheet】



【Design Parameter and Actual Data】

Parameter	Influent	Effluent	
	Raw water (actual)	MBR Effluent (actual)	Consent limit
BOD (mg/L)	760-5,500 (ave. 2,200)	6 (ave.)	<10
COD _{Cr} (mg/L)	840-16,600 (ave. 5,500)	45 (ave.)	-
TSS (mg/L)	600-5500 (ave. 1,700)	<2	<30
TN (mg/L)	75	-	-
NH ₃ -N (mg/l)	-	<1.5	<1.5

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