

CASE HISTORY

Japanese Tobacco International, Turkey

End User Japanese Tobacco International
Process Membrane Bioreactor
Application Industrial Effluent Treatment



MBR tank containing 2 No Double Deck Units



Testing of Aeration tank



Aeration Tank in Service

Introduction

ACWA Services Ltd was awarded a turnkey contract to upgrade the industrial effluent treatment plant at the Japanese Tobacco International production facility in Torbali, Turkey.

The project design requirements were to upgrade the existing treatment facility in order to achieve an improved discharge quality whilst ensuring minimum disruption to the existing plant.

The original activated sludge plant treated a combined flow of domestic sewage waste plus the industrial waste from the cigarette processing facility. The upgrade included refurbishment of the existing activated sludge plant and aeration system and the addition of a small membrane bioreactor (MBR) stage. These modifications increased the capacity of the plant by 60%.

Design Information

The following table indicates the Influent and final effluent quality:

Description	Units	Influent Characteristics		Effluent Quality Requirements
		Average	Maximum	
Flow	m ³ /day	175	366	
Suspended Solids	mg/l	500		
BOD	mg/l	2355		50
	kg/day	412	862	
COD	mg/l	4711		150
	kg/day	824	1724	
TKN	mg/l	16		
Phosphorus	mg/l	1		
pH	pH units	6.0	9.0	6.0 – 9.0
Temperature	°C	25		

Description

The industrial effluent is transferred from the industrial equalisation basin to the aeration tank via an existing screen. The domestic effluent is transferred from the domestic effluent collection sump to the aeration basin via the same pipeline as the industrial effluent. Both wastewaters pass through a new 3mm screen prior to entry to the aeration tank.

The existing aeration tank was refurbished and upgraded to allow an existing primary sedimentation basin to be removed from operational service and also to ensure that increased biological loads could be treated. The upgrade included replacement of an air diffuser system with a fine bubble aeration system, new dissolved oxygen monitors and additional blowers.

From the aeration tank the mixed liquors are transferred by pumps into the new MBR treatment stage. Installation of an MBR process allowed the existing secondary sedimentation basin to be removed from operational service and also provide a treated effluent of much higher standard. The MBR tank installed has two compartments. Each compartment houses two Kubota flat-sheet double-deck membrane units (EK 400's). The mixed liquors flow across the membrane surface, allowing some of the treated effluent to permeate the membrane whilst the activated sludge remains within the tank. The treated effluent (permeate) gravitates from the tank to the discharge line. The return activated sludge (RAS) is recycled back to the aeration tank by gravity. The RAS flow is controlled by a flow meter and modulating valve. Each MBR zone is fitted with a dedicated air diffuser system to scour the membrane units.

Surplus activated sludge is removed periodically and transferred via sludge storage to a belt press for treatment. Dewatered sludge is removed from site, and sludge liquors are returned to the industrial equalisation basin.