

CASE HISTORY

SOUTHERN WATER, ASHFORD

End User Southern Water
Process AMTREAT®
Application Sludge Liquor Treatment - Municipal sewage sludge



Introduction

Southern Water upgraded Ashford WwTW and sludge treatment centre to ensure compliance with its AMP4 obligations. The upgrade to the sludge treatment centre included sludge dewatering, thickening and drying. Although the WwTW was also upgraded it was deemed more cost effective to install a dedicated sludge liquor treatment plant to treat liquors produced from the sludge treatment processes.

The AMTREAT® Sludge Liquor Treatment Plant is a purpose designed high-rate activated sludge process that can be specifically used for treating high strength ammonia wastewaters. By careful control of key design parameters, high ammonia removal efficiencies can be achieved at high loading rates.

The advantages of such a process is that the technology and equipment used is familiar, is easy to operate and control, is extremely robust, has a smaller footprint compared to conventional activated sludge processes, full nitrification / denitrification is achievable and, as temperature is maintained at 20–30°C there is no seasonal dependency.

Design Information

The following table indicates the influent quality and the final effluent quality required:

Description	Average Influent Characteristics	Maximum Influent Characteristics	Treated Effluent Quality
Flow m ³ /day	1200	2100	
Suspended Solids mg/l	1750	1750	200
BOD mg/l	650	650	200
Ammoniacal Nitrogen mg/l	850	900	50
Temperature °C	20 - 30	28 – 33	

Description

The Ashford AMTREAT[®] Sludge Liquor Treatment Plant (SLTP) consists of a hot liquor balance tank and hot and cold liquor blending tube feeding to a twin stream liquor treatment plant. Each stream of the biological treatment plant consists of an anoxic tank, AMTREAT[®] reactor, degassing column, settlement tank and associated mechanical equipment (pumps, blowers) and instrumentation.

Liquors at elevated temperatures from the drying process are collected in the hot liquor balance tank. Cool liquors from the gravity belt thickeners and centrifuge washdowns are collected separately then mixed with the hot liquors downstream of the balance tank in a blending tube to provide the optimum flow, load and temperature for the process.

From the blending tube the flow is directed to the liquor treatment plant. The plant is a twin stream AMTREAT[®] process operating at 50% per stream. In terms of hydraulic throughput each stream is able to take 100% flow, allowing flexibility for maintenance.

Under normal operation the flow is split equally to the anoxic tanks. Sodium hydroxide is added as a supplemental alkalinity source at this point, to ensure that full nitrification can take place within the AMTREAT[®] Reactors. The anoxic tanks also receive a mixed liquor suspended solids recycle flow and a return activated sludge flow.

From the anoxic tanks the liquors flow to the AMTREAT[®] reactors where biological degradation and nitrification take place. The reactors are equipped with a fine bubble diffused air system and dissolved oxygen monitors. Duty / duty / common standby blowers supply air to the reactors, controlled by the dissolved oxygen requirement, as monitored by the dissolved oxygen monitors within the reactors.

The mixed liquors from the AMTREAT[®] reactors gravitate, via degassing columns to remove entrained gas, to the settlement tanks. From the degassing columns a mixed liquor suspended solids recycle is directed back to the anoxic tanks. Within the settlement tanks the biomass settles to the bottom from where it is transferred as return activated sludge to the anoxic tanks. Surplus biomass is removed and taken for further treatment by the Client. The clarified liquor overflows a peripheral weir and is directed to the head of the existing wastewater treatment works.

Construction and Process commissioning has been completed and the works has been handed over to the client.