

Sustainable Wastewater Treatment Chemicals In a Dairy

Problem/Definition

Atana Ltd has been tasked in reducing sludge generation produced at the sites effluent plant by introducing a new chemical regime. This would bring considerable savings on their daily running costs; reduce the need for hazardous substances and prevent any corrosive issues through the removal of inorganic chemicals. The plant also has consent issues with FOG and Suspended Solids along with reliability issues of dosing PAC and maintaining coagulation.

Site Specific Background

Current physical set up to manage waste water

Reception tank > Aqua rake > Balance tank 150m³ > DAF similar to Puriflow DAF > sewer

Trade Consent

Daily flow 150m³ per 24 hours

COD 3000mg/l

BOD 2000mg/l

pH 5-11

FOG 200mg/l

TSS 1000mg/l

Current chemical treatment regime to manage waste water

Sodium Hydroxide (32%) & Hydrochloric Acid (28%) used for pH correction (set at 10.5) into balance tank as required. 1000 litres per week ordered currently at Acid £126/1000ltrs, Caustic £261/1000ltrs.

Hydrochloric Acid (28%) used for pH correction into the influent poly mix chamber of DAF.

PAC used as a coagulant at approx. 10000 litres / 6-8 weeks at £1650/10000ltrs.

Anionic polymer used as a Flocculant at approx 1000 litres pure product/12 month period at £1050/IBC.

Sludge generation after dewatering equates to 26m³ every 10 days (3 per month max) @ £1100/tanker

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Annual costs equate to £73,150.00

Atana's chemical treatment regime to manage waste water

Sodium Hydroxide (32%) & Hydrochloric Acid (28%) used for pH correction (altered to 7.5) into balance tank as required. 1000 litres every 3 weeks ordered at Acid £126/1000ltrs, Caustic £261/1000ltrs. This is currently being optimized further. Hydrochloric Acid (28%) used for pH correction into the influent poly mix chamber of DAF.

Cofloc SG10 vegetable coagulant used to replace PAC. Cost £595.00/1000 litres approx. every 2 weeks.

Trufloc TF300C Cationic polymer used as a Flocculant at approx 25 litres pure product/2.5 week period at £105.00/25kg pail.

Sludge generation without being dewatered equates to 26m³ every 21 days @ £1100/tanker, *Dewatering the sludge holding tank could improve sludge uplift days further.

Note: Sludge samples are currently being analysed for alternate disposal method which could potentially remove sludge disposal costs or be a revenue stream.

Annual costs equate to £43,480.00

Summary

To summarise the work done so far, we have achieved a minimum of a 50% reduction in sludge volumes.

Grab samples by the local water authority laboratory have seen all consent levels met for the first time with one result giving FOG 25mg/l and Suspended Solids 139mg/l.

The regular operators of the Effluent Treatment Plant are very impressed at the plants consistent performance.

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