

CASE STUDY SUMMARY

Industry : Potato processing
Location : France
Problem : Poor biogas production/COD reduction
Product : BFL 4400AN

BACKGROUND

The plant produces chips (French fries) and potato flakes for use in a variety of food products. The wastewater treatment facility consists of anaerobic and aerobic treatment plants. The WWTP has an inflow of 2,800m³/day.

The anaerobic digester has a capacity of 1,000 m³. It is an internal circulation (IC) reactor. The starchy influent has a COD of 4,000mg/L. The biogas from the digester is burned as a fuel in the factory boilers.

The first objective is to increase the COD degradation capacity of the digester. The second objective is to increase the amount of biogas produced. The benefit of increasing biogas production is that less natural gas is required for the boilers. The reduction in COD means that the organic loading on the aeration tanks is reduced and this means that less energy is required for aeration.

SOLUTION

BioFuture have developed a bioenzymatic product, BFL 4400AN, specifically for anaerobic digesters. The formulation contains free enzymes (amylase, cellulase, lipase and protease), facultative anaerobic bacteria, yeast and fungi. The enzymes and the facultative anaerobes work together to quickly establish acetogenesis while the yeast and fungi optimize fermentation and digestion. It is normally the hydrolysis and acetogenesis steps which are rate limiting for the anaerobic digestion process. By quickly and efficiently generating short chain acids such as acetic and propionic acids they provide the feedstock for the methanogens which produce biogas.

OBJECTIVES

- To increase biogas production
- To improve COD degradation
- To improve pretreatment prior to aerobic treatment

TREATMENT

BFL 4400AN is added to water at a ratio of 1:10 and mixed well. It is allowed to stand for 30 minutes and then dosed into the feed to the anaerobic digester.

Dosing programme

Initial dose

Days 1 – 5 4kg BFL 4400AN per day

Maintenance dose

Weeks 2+ 4kg BFL 4400AN per week

RESULTS

Over a 3 month dosing programme:-

- Biogas yield increased from 0.34m³/kg COD removed to 0.72m³/kg COD removed – a 112% increase.
- Biogas production increased from 2,389m³/day to 4,435m³/day – an 86% increase.
- COD removal increased from 38% to 53% - a 40% increase.

Conclusion

The dosing of BFL 4400AN to the anaerobic digester of a potato processing plant resulted in increased biogas production, increased biogas yield and greater COD removal efficiency.

The benefits are:-

- ◆ Reduction in natural gas required for boilers
- ◆ Reduced energy input for subsequent aeration
- ◆ Reduced biological sludge production
- ◆ Reduction in associated costs of dewatering and disposal
- ◆ Improved sustainability of the overall plant