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RENDERING PLANT
CUSTOMER STORY \ DEC 2018
A LARGE FOOD MANUFACTURING PLANT

Boosting biogas

yields to offset energy costs at a rendering plant

ACTI-Mag™

Case Study Snapshot

CHALLENGES

- Excessive pH, nitrates and phosphates levels in rendering plant effluent.
- Excessive struvite formation and pipe blockage.
- Low gas yields from anaerobic ponds.

SOLUTION

Calix was engaged to dose the plant's anaerobic ponds with ACTI-Mag to help with the treatment of wastewater and the production of biogas.

ACTI-Mag is a highly reactive, concentrated and stabilised suspension of Magnesium Hydroxide manufactured by hydrating ultra high surface area Magnesium Oxide.

With a higher neutralising value per dry kilo when compared with caustic and lime, ACTI-Mag is safer to handle, non-hazardous to humans and the environment, non-toxic and non corrosive.

BENEFITS

- Reduction of phosphorous
- Faster neutralisation of wastewater sludge reduction
- Prevention of struvite pipe blockages
- Increased biogas production, resulting in lower energy costs

Background

LOCATION

Beaudesert, QLD

OBJECTIVES

- Effectively control pH of effluent stream.
- Precipitate nitrates and phosphates.
- Eliminate blockages by stopping struvite formation on critical infrastructure.
- Increase methane gas yields in anaerobic ponds.

INTRODUCTION

A large food manufacturing plant operate a rendering plant that processes 4,000,000 kgs of animal waste per week. The facility processes excess, non-edible offal from the meat and poultry industry to produce tallow, poultry oil as well as poultry, blood and feather meals.

The Beaudesert plant uses a substantial amount of energy for its operations. To process 55,000 kgs of raw material per hour, the plant consumes $130,000 worth of electricity per month, burning 24,000 tonnes of black coal per year. The plant sources half its energy from a coal powered generator and the other half from biogas generated from the anaerobic treatment of waste water.

The effluent is initially treated in covered anaerobic lagoons (CAL), before being aerobically treated in a sequenced batch reactor (SBR.) The effluent then flows to an irrigation dam via a maturation pond.

The final effluent is irrigated onto the plant's own woodlot and pasture land.

The CALs capture methane rich biogas that is used to fire gas boilers, which produces the steam required for processing the raw material. This renewable method reduces the plant's reliance on coal and makes the wastewater treatment a source of energy and revenue stream.

Rendering plant effluent needs to be further processed to remove high levels of nitrates and phosphates. The SBR stage is efficient at removing nitrates but is unable to sufficiently reduce phosphates. This results in the final effluent exceeding the allowable phosphate limit by double. Additionally, the nitrates and phosphates were co-precipitating in pipes to form struvite crystals and causing blockages.

ABOUT ACTI-Mag

ACTI-Mag is a concentrated, stabilised suspension of magnesium hydroxide manufactured by hydrating Calix's ultra high surface area magnesium oxide. ACTI-Mag is safe to handle and environmentally friendly.

ACTI-Mag provides more alkalinity on an equal weight basis than hydrated lime and caustic soda, thus lowering chemical consumption.

By controlling pH, ACTI-Mag provides a stable environment for bacteria to break down organic matter and improve the quality and volume of bio-gas produced. Additionally, it provides up to 30% faster neutralisation of acidic waste streams and precipitates nitrates and phosphates directly into sludge.

ACTI-Mag™

The Results

Observations showed a definite improvement in the quality and amount of bio-gas produced, to a point where the wastewater treatment is now a revenue centre that offsets energy costs.

Phosphate level were tested to be as low as 40 mg / litre after having dosed ACTI-Mag in a system with a 6 month retention time. Additionally, pipe blockages due to struvite formation were reduced as ACTI-Mag worked to precipitate nitrates and phosphates directly into the sludge.

Positive trial results encouraged a large food manufacturing plant to set up a permanent ACTI-Mag dosing station.

As such, ACTI-Mag is now an intrinsic part of the rendering plant's waste water management strategy.

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