Reducing Effluent strength at an Abattoir with a re-conditioned SAF

- Designed to treat the effluent on site to acceptable levels for disposal to Welsh Water works
- Gross solids screened out of the effluent with Groundhog Standard and Super-Dry Separators prior to biological treatment
- Reduction in COD of 84% and Suspended solids of 75% mean massive reductions on trade effluent charges
- Above ground installation that reduced civil cost and installation time scale
- Re-Conditioned ex-hire system
- Low operation and maintenance cost. Payback would be expected within 2 years

Project Description

Menai Meats were continually failing their COD and S/S consents (with the threat of closure) as they had no facilities on site to biologically reduce the strength of their effluent. To screen out the gross solids from the effluent they have had Groundhog Separators installed since 1995. Pollution Control supplied a re-conditioned (ex-hire) high performance modular Eco-SAF biological system comprising of:

- Mechanical brush screens (Groundhog Standard and Super-Dry Separators) for solids screening
- Primary settlement (existing)
- Hydraulic flow control
- Up-flow Bioreactor based on Submerged Aerated Filter (SAF) technology

Flow	110m³/day
Maximum COD	5270mg/l
Maximum BOD	3162mg/l
Maximum S/S	840mg/l
Max Hydraulic loading	12m³/hour
Design flow	0.8l/s

The on-site effluent treatment system is to treat the site wastewater to the minimum trade effluent quality as follows:

Parameter	Unit	Permitted Discharge	Achieved discharge
COD (settled)	mg/l	3000	800-900
BOD (5 day settled)	mg/l	1200	300-360
Suspended Solids	mg/l	120	200-250

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Preliminary Treatment:

Comprising of the following elements:

- Mechanical screening with two existing Groundhog Separators
- Pump station c/w Duty/Assist set back vortex impellor submersible pumps
- Existing concrete reception pits

Secondary Treatment:

The **Eco-SAF** module – the essential biological stage where bacterial microorganisms are cultivated and actively consume the suspended organic material found in the decanted liquid from the primary process. The aerated cells are equipped with a fine-bubble aeration system distributing the oxygen required by the heterotrophic bacteria to grow. Oxygen is supplied to the air diffuser system by side channel blower that requires minimum maintenance.

The module is a series of aerated cells and anoxic zones. The aerated cells are also furnished with fully submerged bio-film growth media to ensure that the microorganisms have a substantial area for growth and a stable environment. Full floor coverage with the aeration diffusers ensures there is maximum oxygen transfer and there are no 'unaerated' dead zones as in circular tank designs.

The Eco-SAF system was selected for the following reasons:

- Predictable performance
- Lower operation and maintenance costs
- No interruption to the process whilst servicing the aeration system
- Modular design that can be added if production is increased
- Better whole life cost with payback within 2 years
- Easy installation with minimum excavation required
- Life expectancy of over 20 years with minimum maintenance
- No internal moving parts
- Easy to de-sludge
- Manufactured to Quality Management System ISO 9001