

Anaerobic Digestion, biogas to renewable energy, McCains, Whittlesey,  
United Kingdom.



McCain's covered anaerobic treatment lagoon, the size of two football pitches, produces methane for burning or flaring from 77,000 cubic metres of wastewater rich in potato starch. The anaerobic lagoon is the first stage in McCain's wastewater treatment process. It removes most of the COD\* and BOD\* ahead of subsequent treatment stages including a polishing plant before discharge. The lagoon's cover keeps out oxygen and enables collection of methane destined for burning in the combined heat and power (CHP) gas engine to produce electricity. Currently, McCain is burning its own biogas in its steam-producing boilers to reduce its use of natural gas. Its renewable energy in the CHP engine will provide about ten percent of the factory's annual electricity needs.



McCain Foods corporate affairs director, Bill Bartlett said, "The Geotech static gas analyser is here to analyse gas quality as it is drawn off before and after a hydrogen sulphide scrubber. The analyser readings will measure scrubber performance and protect our gas engine. If H<sub>2</sub>S levels exceed pre-set limits, the McCain control systems will respond automatically to the analyser's signals and divert gas to flare and avoid compromising the engine."

The use of anaerobic digesters is being promoted to the European food-processing industry by national governments as a means both of reducing CO<sub>2</sub> emissions and of improving water conservation. A digester not only produces useable biogas, and reduces the volume and odour of solid waste, it also greatly reduces the presence of pathogens and viruses – so that the remaining wastewater can be filtered, cleaned and pumped safely back into river systems. The McCain covered lagoon transforms passive venting of biogas to atmosphere from earlier open-top biodegradation lagoons and halts release of the powerful greenhouse gas, methane. Instead it turns it in to a valuable energy-from-wastewater commodity.

As the anaerobic digester produces its biogas, the Geotech static gas analyser is set to produce five readings. It automatically measures four extracted gases: methane, carbon dioxide, low-level oxygen and highly corrosive hydrogen sulphide before they enter a scrubber. It will then measure



the H2S after scrubbing. For each of the five channels, changes in a 4-20mA current relate to calibrated increases or decreases in the concentration of each gas. McCain's systems receive the signals, measured at 10-minute intervals, enabling the company to achieve on-line, real-time, continuous monitoring of: -

- Methane content c.65 sixty-five percent, from which McCain can calculate gas calorific value
  - CHP gas engine protection from high H2S levels
  - Hydrogen sulphide scrubber performance.
  - Protection from dangerous oxygen levels
- } (*Here, Geotech's gas analyser is McCain's 'watchdog'*)

*By measuring O2 and being aware of the lower explosive limit and diverting to flare or if O2 ever reached dangerous levels, shut the flare and maintain safety and protection.*

#### **Wind Power – as well**

In August 2007 McCain introduced wind turbines at its Whittlesey plant, in a groundbreaking drive to lower its carbon footprint and move its operations towards a sustainable future. Its wastewater lagoon will make further progress towards that aim as it offsets electricity demand. Within the heart of the gas producing lagoon's information and control systems is a Geotech gas analyser doing its job dependably, reliably and economically.

For further information contact [sales@geotech.co.uk](mailto:sales@geotech.co.uk)