**Roddas Effluent Treatment Plant Process Overview**

Factory effluent is pumped to the mixed 150 m3 balance tank. Ultrasonic level measurement controls the duty/standby feed pumps. Duty/standby feed pumps pump the effluent from the balance tank to the 1st DAF through the pipe flocculator. PH is measured and adjusted with acid dosing to the required set point. Flocculant and coagulant are dosed into the pipe flocculator after PH correction.

Dedicated chemical dosing pumps are controlled by the PLC proportionally to the flow rate through the DAF. Sulphuric acid 50% is stored in a 10,000Lt bulk holding tank with remote telemetry monitoring in addition to the standard visual level monitoring. Polymer is prepared for both DAFs by dedicated Polymore preparation units, supplied with concentrated emulsion from IBC containers.

In the DAF, dissolved air floats the separated particles to form a sludge layer which is scraped off to a sludge compartment. Duty/standby pumps remove the sludge to the waste tank. An air control panel is supplied with compressed air, which is regulated to 7 Bar and supplies air to a saturation vessel where it mixes with recirculated water from the DAF discharge. The recirculated water is pumped at 6 Bar. The air flow can be adjusted with a flow meter up to a maximum of 10 litres/min, normal operating levels are 3 – 4 lt/min.

Treated effluent discharges under gravity to the anoxic sump; PH is measured and corrected with Sodium Hydroxide 32% to a 2nd set point, before entering the anoxic pit. In the anoxic pit the treated effluent is mixed, by a submersible mixer, with return activated sludge (RAS) from the 2nd DAF. Duty/Standby submersible pumps are controlled by an ultrasonic level sensor to pump from the anoxic zone. From the anoxic pit the mixed liquor is pumped to the aeration tank with three VSD controlled surface aerator/mixers. These aerators add oxygen to the activated sludge for the biological process and keep the tank well mixed. Dissolved oxygen is measured to maintain the correct level for a healthy system.

From the aeration tank, under the control of a submersible pressure transmitter, the sludge is pumped to the 2nd DAF to separate the bio solids with the aid of a prepared flocculant (polymer) and dissolved air flotation.

The bio-solids float to the surface where they are skimmed off and returned to the aeration tank. These solids can also be redirected into a second sludge holding tank, which are collected by a waste contractor and sent for anaerobic digestion. The clarified treated effluent then flows to the mineshaft discharge point, through and MCERT flow meter. This discharge pipe has a composite sampler fitted and the effluent is tested daily on site for COD, Ammonia, Phosphorus and pH. A sample is also collected fortnightly and sent to an externally certificated laboratory for independent analysis. This laboratory test for BOD, Ammoniacal Nitrogen, Phosphorus, Suspended Solids and pH. The site has a reed bed system which is not currently operational.