
Treatment Systems for Leachate

Engineered Systems: Leachate Treatment

Case History: Winterton Leachate Site, Winterton

Background

During 2004, The Waste Recycle Group will install a leachate treatment facility with a specifically designed plant incorporating an Aerated Suspended Growth Plant (ASGP) with an additional dissolved air flotation (DAF) plant for assistance in the removal of residual suspended solids and colloidal material in conjunction with chemical dosing for nutrient and pH control at:

The main treatment process is described as follows.

Raw leachate, collected from the landfill will be pumped to the RLBL. The control of the leachate collection system is existing

From the RLBL, the leachate will be pumped under controlled conditions to the annulus of the ASGP. This zone of the ASGP comprises an aqueous matrix of leachate and biomass and will be aerated continuously for 24 hours per day, 7 days per week. At intervals of 6 hours, mixed liquor will be drawn off into the inner settling zone of the ASGP, where it will be allowed to settle. At pre-determined intervals, a pre-set volume of supernatant will be decanted from the settlement zone into the TLBT. The remaining volume of supernatant and the settled biomass will then be mixed together and pumped back into the aerated zone of the ASGP.

From the TLBT, the treated leachate will be pumped to the header tank of the DAF plant. The DAF plant, using compressed air, coagulant and flocculant aids, will remove solids from the treated leachate, after which the treated leachate will be pumped to the TLBL. From the TLBL the treated leachate will be pumped to sewer. The final discharge pumping system in the TLBL exists and the control of its operation shall be integrated into the leachate treatment plant control system

During the treatment process, chemical reagents; sodium hydroxide and phosphoric acid, will be added to the aerated section of the ASGP. This will be for pH balancing and nutrient addition respectively.

Equipment Installed

The key elements of the MEICA system are shown on the Process Flow Diagram Drawing N^o 404 and can be summarised as follows: -

- Raw Leachate Feed Pumps Submersible Pumps mounted on a floating pontoon
- Raw Leachate Lagoon 10kW Mixer
- Raw Leachate Flow Meter

- Aeration Zone, monitoring for DO, pH, Level & Liquid Temperature.
- Aeration Zone Jet Aerators, Six Number Landia 18.5kW providing oxygen saturation and mixing of the liquor, mounted on the inner circle of the Aeration Zone
- Aeration Zone - Monorail Mounted Electric Chain Hoists for the removing of the Jet Aerators.
- Aeration Zone Electrically Actuated 300^{mm} Knife Gate Valve
- Settlement Zone within the Aerobic Suspended Growth Plant monitoring for level detection.
- Settlement Zone – Decant Pipework consisting of Bell Mouth with Actuated Stopper, Actuated Decant Valve and interconnecting Pipework.
- Settlement Zone – One Submersible Mixer
- Settlement Zone – One Guide Rail Mounted Submersible Pump , Pipework and valves for the transfer of Sludge to the Aeration Zone or Sludge Holding Tank.
- Caustic Soda Storage and Dosing System
- Phosphoric Acid Storage and Dosing System
- Treated Leachate Balancing Tank monitoring for level detection.
- Duty Standby DAF Plant Feed Pumps, Pipework and valves.
- Flow Meter
- DAF Header Tank.
- Proprietary DAF Plant
- DAF Effluent Pumps - 2nr Guide Rail Mounted Submersible Pumps, Pipework and Valves.
- Container incorporating MCC, PLC, SCADA & Instrumentation in one section and Washroom in the other.
- MCC with PLC and SCADA systems.