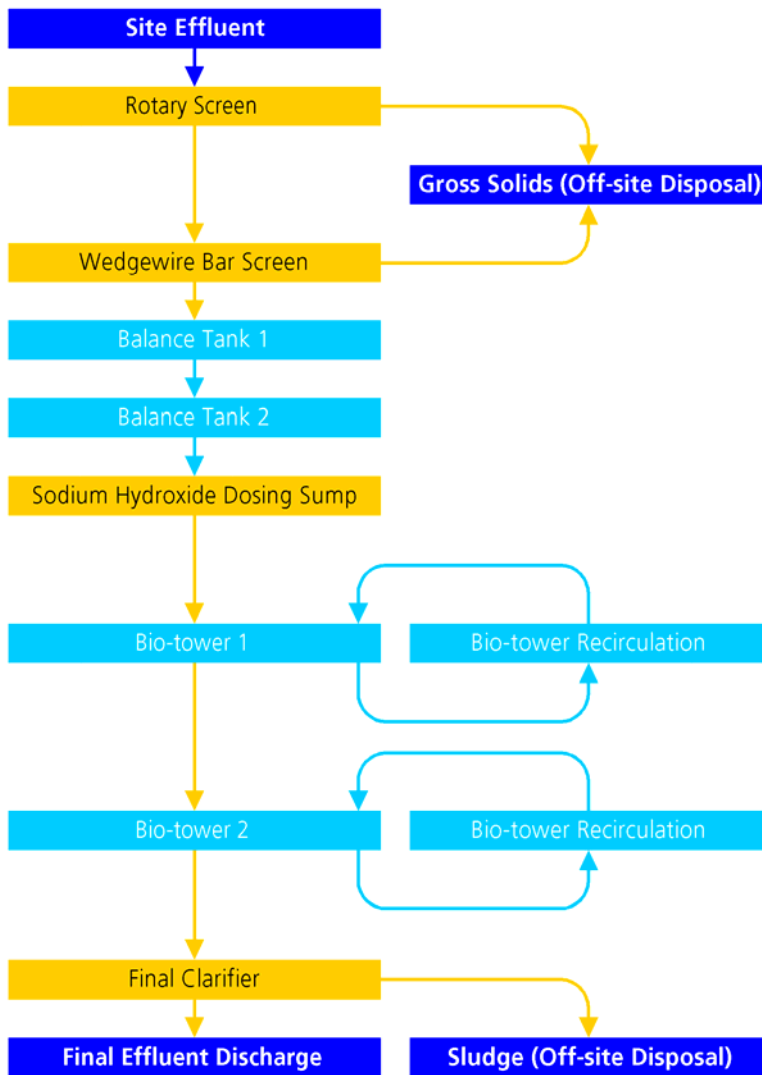


Food industry

Sauces and pickles processing plant



The customer operates an effluent treatment plant, principally two balance tanks, two bioreactors and a final clarifier.

From October 2003 the suspended solid and chemical oxygen demand concentrations discharged had increased, prejudicing wastewater operating expenditure forecasts.

In August 2005 Optimiser completed an investigation to increase effluent volume throughput whilst reducing unit costs by:

- Identifying high strength point source effluent discharges;
- Evaluating the performance of the bio-towers to;
 - Determine solids and nutrients within the influent of the bio-towers;
 - Reduce shock loading via recycling treated final effluent;
 - Ascertain the dosing characteristics of the bio-towers;
 - Improve bio-tower airflow.



study findings:

In May and June 2005 auto-samplers monitored sauce and pickle effluent to determine which were imparting significant pollution loads on the total factory effluent loading.

The study showed that bio-tower 1 performed well, the actual effluent load removal rates coming into line with the expected parameters.

However, bio-tower 2 operated at below 50% of its expected removal efficiency. This was because of a number of factors;

- Firstly, the pH of the influent stream inhibited the performance of the bacteria;
- Secondly, the chemical oxygen demand concentration to both bio-towers were above design maximums, inhibiting removal rates;
- Thirdly, oxygen levels were not sufficient to promote good operating performance; indeed some of the ventilation ports were blocked;
- Lastly, the recycling configuration is not effectively sharing the pollution loads between the 2 bio-towers.

recommendations:

1. Evaluate the benefits of changing the filter media within the bio-towers. The media was found to be random packed and the influent was finding paths of least resistance (channelling).
2. Optimise the performance of bio-tower dosing rates to reflect the strength and flow of the influent.
3. Improve the recycling configuration between bio-towers 1 and 2.

benefits:

1. Changing filter media will allow all the media within the bio-tower to be employed and areas of excessive loading will be removed.
2. Changing the dosing rate will improve biological oxygen demand removal and reduce biofilm thickness and odours.
3. Modifying the recycling configuration promotes good distribution of raw effluent across the media. Additionally it reduces the effect on short term spikes in raw effluent quality.

Subject to operating within the hydraulic capacity of the 2 bio-towers and clarifier it has been shown that effluent volumes could be increased by 100% of current levels, whilst simultaneously reducing trade effluent charges, including tankering costs, by 50%.

The customer has a quantified understanding of how to achieve improvements in the performance of the existing effluent treatment plant.