CASE STUDY – IMPROVING DAIRY PLANT OPERATING EFFICIENCY – ANTWERP, BELGIUM

THE PROBLEM

The INZA Dairy WWTP in Antwerp, Belgium was experiencing problems in the operation of its sewage treatment facilities. The problems centered on an excess concentration of foam developing on the surface of both the aerator and sedimentation tanks, excess concentrations of floating sludge in the effluent, and an overall reduction of the efficiency of the wastewater treatment resulting in average COD discharge levels of 130 mg/L. In addition, the energy costs of operating the facility were having a negative impact on the facility's bottom line.

OUR APPROACH

Upon examination of the treatment facility and review of both influent and effluent data, Nordevco Associates Ltd. staff realized that residence times for the influent was not sufficient to allow for a complete treatment of the dairy waste. In addition, the foam and floating sludge were reducing the efficiency of the aeration and treatment. As a result, it was decided to augment the capabilities of the treatment facility by applying the BactiDomus® Technology product to both the primary and secondary aeration tanks to break down sludge, enhance the aerobic degradation, and ease of application (applied to the surface area of both aerators).

THE TECHNOLOGY

Nordevco's BactiDomus® Technology was developed by a diversified group of research scientists working together at Universities in Belgium and France. Their goal was to create a mechanism with the flexibility to delivery biological solutions to a range of environmental issues more effectively and efficiently

The foundation for the success of the BactiDomus® Technology was the development team's clear understands that for any carrier material to be successful it had to meet specific underlying needs of the organisms:

- Regardless of the organisms used, they would be cultured in a sterile laboratory and would require time to acclimate to the environment they were activated in.
- Microorganisms, like humans, do not exist or thrive in isolation of each other but rather rely on others for stimulation and competition;
- Organisms prefer to grow and live in colonies or flocs and prefer to attach to something to anchor these colonies;
- Individual species of microorganisms do not work in isolation to break down organic compounds. To successfully break down any organic completely to CO2 and H20, a variety of different organisms are required;

The result of that work is the BactiDomus® Technology which is based on the use of an inorganic limestone-like porous carrier material. The porosity of the material allows it to be bathed in a nutrient broth, absorbing key micro-nutrients that act as an initial food source when the product is activated. It is then impregnated with a range of different naturally occurring and non-pathogenic organisms, selected for their ability to breakdown specific organic contaminants.

The organisms selected for inclusion are selected based on the understanding that each contaminated environment can be aerobic, anaerobic or facultative anaerobic. Therefore, aerobic, anoxic and anaerobic organisms are selected and used in each product to ensure that they can function successfully in a broad range of environments.

The carrier material's large surface area to size ratio provides the organisms with both internal and external floc points where they grow and create large effective colonies of biodegraders working together to break down the organic contaminant into carbon dioxide and water.
The carrier material's hydrophilic nature allows it to absorb both the water and contamination. This provides a steady strong contact between the imbedded organisms and organic contaminant. This ensures that the organisms have a continuous food source as they grow and create flocs within the protective confines of the capillary network of the carrier material.

THE RESULTS

The application of the BactiDomus® Technology had a significant positive impact on the effluent leaving the treatment facility and on the operating costs. Over the 25 months that the BactiDomus® Technology was used, all foam disappeared (see pictures below), there was a significant reduction in the effluent's suspended solids, and the operating efficiency of the plant was increased. In addition, the need for mechanical aeration was reduced significantly from 75 kWh before the Nordevco treatment was initiated to 38 kWh or a reduction of 49.3%. These results were achieved even as the average COD of the influent increased by 4.8%.

	Average prior to treatment[1]	Average during treatment[2]	% Improvement
Influent COD	1574	1650	N/a
Effluent COD	127	80	37.0
Treatment Efficiency	91.8%	95.2%	N/a
Suspended Solids	82	47	42.7

1. Based on the average for the eight month period prior to the initiation of the treatment
2. Based on the 25 month period of treatment

PRIMARY AERATOR BEFORE TREATMENT

PRIMARY AERATOR AFTER TREATMENT

PHONE: 1-204-261-1801
FAX: 1-204-269-9097
EMAIL; INFO@NORDEVCO.NET
WWW.NORDEVCO.NET