CASE STUDY

CONTROL OF ODOR IN A STARCH PLANT EFFLUENT THROUGH THE ADDITION OF BCP22, BCP50 AND STIMULUS

INTRODUCTION

The effluent from a starch plant contains nitrogen compounds primarily in the form of organic compounds that are easily converted into ammonia in a treatment plant. These compounds are not wanted in the treated wastewater and attempts are made to remove or convert them before their discharge into the sewage system. Many wastewater treatment plants are operated in such a way that nitrification will take place as follows:

$$2\,NH_4^+ + 3O2 \rightarrow 2NO_2^- + 4H^+ + 2H_2O + \text{energy}$$

Nitrosomonas

$$2NO_2 + 2O_2 \rightarrow NO_3^- + \text{energy}$$

Nitrobacter

METHOD

The purpose of this experiment was to demonstrate the use of Bionetix biologicals BCP22, BCP50 and trace amounts of STIMULUS and their effect on the water purification process and reduction in odor in a starch plant.

A 2 tonne tote (1m x 1.3m x 1.5m) was filled with 1.5m^3 of sludge liquor (consisting of 6% slag) with a BOD concentration of 6000 mg/L. An oxygen cylinder (150um x 4) was used for air curation.

STIMULUS odor-reducing test – 1L of STIMULUS with a concentration of 0.66% was added to the sludge liquor and after 30 minutes the mixture was observed.

STIMULUS and BCP22 – 1L of STIMULUS (concentration 0.66%) and then 0.5kg of BCP22 were added to the sludge liquor and the results were observed 7 days later. Since there was little change at that point it was decided that the oxygen level used (4%) was not high enough and the level was raised to 6%. The oxygen flow was reset to 0.2 m^3/min and the pH value at 8.2.

STIMULUS and BCP50 – 1L of STIMULUS (concentration 0.66%) and 0.5kg of BCP50 were added to the sludge liquor to compare the performance with that of STIMULUS and BCP22. The oxygen rate was set at 6%, oxygen flow at 0.2m^3/min. and the pH value at 8.2.

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RESULTS

	Odor Intensity	Odor Type	pH Change
STIMULUS	Reduced		
STIMULUS plus BCP22	Reduced	Odor of Ammonia	6.7
STIMULUS plus BCP50	Reduced	Odor of Ammonia	7.8

Concentration of odorous compounds was significantly reduced and hence odour intensity was significantly reduced.

CONCLUSIONS

The selected biologicals are capable of efficient degradation of odorous compounds including ammonia. This degradation led to a reduced concentration of these compounds. A reduction in the concentration level of these odorous compounds led to a reduction in the level of odour intensity.