



*A COMMERCIAL APPLICATION OF
VIROFLOW™ TECHNOLOGY*

**CASE STUDY
LARGE CONSUMER GOODS
MANUFACTURER, QUEENSLAND,
AUSTRALIA**

“The implementation of ViroFlow™ Technology resulted in dramatically reduced phosphorous, TSS (Total Suspended Solids) and COD (Chemical Oxygen Demand) loads whilst maintaining accurate pH control...”



The production facility of the company produces well-known consumer products

PROBLEM

Virotec was contracted by a large, well-known consumer goods manufacturer to implement ViroFlow™ Technology in treating industrial wastewater and to overcome the inadequacies of their current wastewater treatment system. Their current wastewater treatment system was regularly exceeding trade waste limits set by the local water authority. The wastewater was characterised by high and variable phosphorous, TSS and COD loads.



The wastewater treatment plant at the production facility of a large consumer goods manufacturer.

ViroFlow™ Technology, using ViroPhos™ reagents, was selected to remove phosphorous and suspended solids from the wastewater.

VIROTEC TOTAL SOLUTION

The Virotec total solution proved to be an innovative, efficient, effective and immediately applicable means of treating the phosphorous-rich effluent at the plant.

During the application of ViroFlow™ Technology, all treated effluent from the plant complied with Council discharge limits.

ViroPhos™ reagent that has been used to remove phosphate does not lose its inherent metal binding or acid neutralising capacity and thus, the sediment formed when ViroPhos™ reagent settles and dries could be re-used in other applications where the acid neutralising and metal binding capacity can be used. Additionally, because a proportion of the bound phosphate is plant available, but not water leach-able, the sediment is ideal for re-use as a fertiliser/soil amendment in agricultural soils.

The major advantages of using ViroFlow™ Technology can be summarised as:

- > Substantial reduction in phosphorous concentrations in discharge water;
- > Reductions in COD and suspended solids loads in discharge water;
- > Reduction in sludge volumes generated;
- > High pH buffering capacity;
- > Compliance with trade waste discharge limits;
- > Increased settling rates resulting in improved water quality; and
- > Elimination of the need for major capital upgrades by increasing effluent throughput.

The ViroFlow™ Technology components included design, engineering, trial application and ongoing monitoring. The solution is ideal as an ongoing treatment for the process wastewater.



ViroFlow™ Technology plant holding reagents

BACKGROUND

The company is one of the largest manufacturers of household and personal goods in the world. It has annual worldwide sales of over US\$9 billion. In Australia, the company has a turnover of around \$400 million per annum.

The plant consists of two separate manufacturing facilities, producing consumer goods for the South Pacific region.

The effluent treatment plant at the facility consists of a primary clarifier, bioreactor and secondary clarifier. The bioreactor is extremely difficult to control with effect of very poor settling in the secondary clarifier.

The treated effluent from the original wastewater treatment plant was characterised by high phosphorous, suspended solids and COD loadings and the existing wastewater treatment system did not provide adequate phosphorous and suspended solids removal.

TREATMENT METHOD

ViroFlow™ Technology incorporates the use of ViroPhos™ reagent, a patented environmentally safe reagent. The properties of ViroPhos™ reagent include high acid neutralising capacity, excellent settling rate characteristics, and high phosphate and metal binding efficiency.

The ViroFlow™ Technology system was initially trialled over a two week period and the successful results obtained subsequently led to full-scale implementation. ViroPhos™ reagents A and B were added in liquid form at pre-determined rates for optimum removal of phosphorous; ViroPhos™ reagent A was dosed into the feed line to the secondary clarifier while ViroPhos™ reagent B was dosed directly into the inlet well of the secondary clarifier.

ViroFlow™ Technology replaced the conventional treatment regime using polymers and produced a dense, stable sediment that was easily recovered and dewatered. ViroFlow™ Technology was complementary to the existing treatment facilities and required minimal capital works and plant modifications.



The plant's bioreactor



The secondary clarifier

RESULTS

ViroFlow™ Technology is currently used to successfully treat over 480,000L of effluent per week at the plant of this large consumer goods manufacturer. Following treatment with ViroPhos™ reagents, results for total phosphorous concentrations were below the Council discharge limits of 10mg/L when compared to the previous reagents (polymer) used.

Analyte	Raw Effluent	Before ViroFlow™ Technology Treatment	After ViroFlow™ Technology Treatment	Council Discharge Limits
pH	6.8	7.1	6.9	6.0 - 10.0
Phosphorous (mg/L)	40	28	0.6	10
TSS (mg/L)	2,647	700	22	400
COD (mg/L)	1,360	1,200	76	1,000

Similarly, all COD and suspended solids readings were below discharge limits and water pH was within the allowable range for discharge. The treated water clarity was noticeably better when using ViroFlow™ Technology.

An important finding was the ease with which ViroFlow™ Technology could be integrated into the existing treatment system.

CONCLUSION

ViroFlow™ Technology has proven to be applicable for the treatment of phosphorous, trace metals and acidity problems encountered in a typical industrial setting.

The implementation of ViroFlow™ Technology at the manufacturer's treatment plant resulted in dramatically reduced phosphorous, TSS (Total Suspended Solids) and COD (Chemical Oxygen Demand) loads whilst maintaining accurate pH control, and meeting all Council trade waste limits.

ViroPhos™ reagent is non-toxic, non-hazardous and environmentally safe. Used ViroPhos™ reagent is not a hazardous or prescribed waste material.



The dosing point for ViroPhos™ Reagent B.