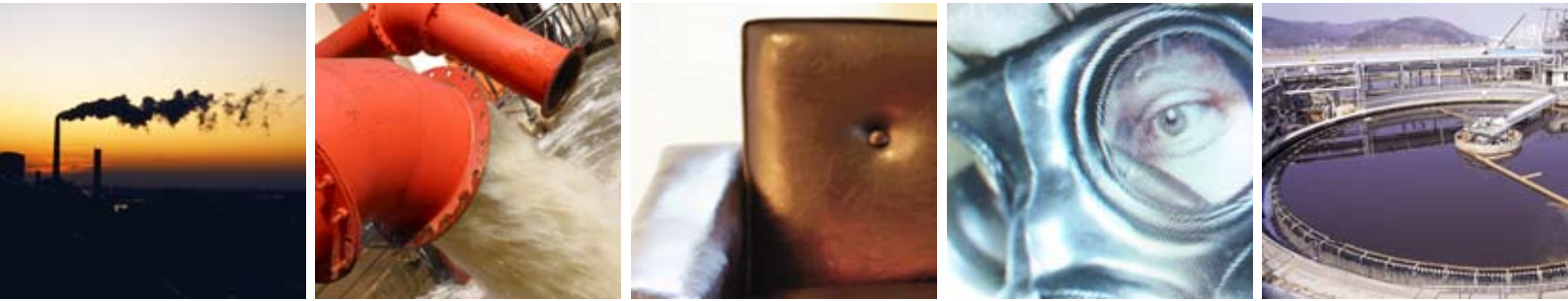




## ODOUR MANAGEMENT WITH VIROFLOW™ TECHNOLOGY

*Virotec's technology has been successfully applied in industries as diverse as sewage treatment, composting and tanneries.*



Wastewater treatment plants (such as sewage treatment plants), solid waste management sites (such as composting plants), food production facilities (such as piggeries and poultry rearing plants) and industrial facilities using complex organic compounds (such as tanneries, chemical and pharmaceutical production sites and paper pulp mills) have traditionally produced unpleasant odours.

The growing importance placed on odour control from such plants has led governments to consider stricter odour regulatory controls to police the emission of odours.

These developments have resulted in planning applications for the creation or modification of existing plants being challenged on the grounds that a plant may have negative odour impacts on the local community, and a greater willingness on the part of regulatory authorities to warn, fine and even close offending facilities.

For this reason, odour control and prevention have become key issues both in the management and operation of existing facilities and in the process of developing new sites to meet obligations under stricter environmental regulations.

### VIROFLOW™ TECHNOLOGY

Virotec has developed a range of treatment solutions for the treatment of acidic and metal contaminated waters and soils and phosphate contaminated water. These treatment solutions are based on a range of 19 reagent blends.

Many of the reagents used in these solutions have been found to have the additional benefit of reducing odour when either added to malodorous effluents or when such effluents are passed through pelletised versions of the reagents. This has been particularly evident in projects undertaken on tanneries, composting sites and at sewage treatment plants.

### TREATMENT OF GASEOUS EMISSIONS

Recent work undertaken in the UK now also indicates that the reagents abilities extend to odour removal from gaseous emissions. This work compares the use of the reagent ViroFresh™ against activated carbon for the removal of gaseous hydrogen sulphide emissions generated by the Cambi process.

In this project ViroFresh™ reagent in its pelletised form was placed in a filter unit to intercept the wet gaseous emissions from the Cambi reactor. Hydrogen sulphide levels were independently measured before and after the filter unit. The data produced indicated that ViroFresh™ reagent was equal to or better at removing hydrogen sulphide levels from gas than activated carbon, as shown in the Table 1.

**TABLE 1: VIROFRESH™ TREATMENT RESULTS**

Batch	Untreated H <sub>2</sub> S (ppm)	Activated Carbon Filter H <sub>2</sub> S (ppm)	ViroFresh™ Filter H <sub>2</sub> S (ppm)
1	3,500	20	14
2	2,800	16	<10
3	3,000	14	15

**VIROFLOW™ TECHNOLOGY: HOW DOES IT WORK?**

ViroFresh™ reagent consists of a cocktail of very finegrained minerals, which are either positively or negatively charge depending on pH conditions. They have a high surface area to volume ratio and a high surface charge to mass ratio. These properties make the reagent extremely surface active, and charge it with an ability to attract and hold malodorous-charged particles or polar molecules.

When such odour-causing molecules are attached to the solid mineral particles of the reagent, they are no longer able to disperse in the atmosphere, and thus can not be noticed as objectionable odours.

The fine-grained nature of ViroFresh™ also allows the mechanical trapping of odour generating molecules and the formation of a substrate for bacteria and fungi which can also biologically break down odour compounds.

In particular ViroFresh™ can be used to bind the following odour generating compounds:

> **Fats, oils and greases** – the reagents contain reactive hydroxides which help hydrolyse oils, greases and fatty acids forming charged or polar reaction compounds that become attached to the oppositely charge mineral particle surfaces of the reagent.

> **Esters** – Esters are organic molecules formed when an acid (usually an organic acid) reacts with an alcohol; the reaction also produces water. Most esters that have a particularly strong odour are polar molecules that can be electrochemically bound by the charged mineral particles in ViroFresh™.

> **Volatile sulphides and sulphur dioxide** – have particularly noticable and frequently unpleasant odours. The minerals in ViroFresh™ reagents react with the charged ions that form

when the sulphides or other sulphur compounds dissolve in water or in a wet gaseous emission, permanently removing volatile sulphides and sulphur dioxide.

**EXAMPLE APPLICATIONS:**

> **Odour reduction at municipal sewage works**

Biosolids produced from the Pine Rivers Shire Council STP, a large-scale BNR sewage treatment plant in Strathpine, Queensland, were shown to contain both hydrogen sulphide (H<sub>2</sub>S) and methyl mercaptan (CH<sub>3</sub>SH), creating significant odour generation. Following the addition of ViroFresh™ to the biosolids, monitoring data showed that the hydrogen sulphide had been completely eliminated and the methyl mercaptan had been significantly reduced. The total area of hydrogen sulphide reduced from 18.1 million to zero, and methyl mercaptan reduced from 1.54 million to 53,000.

> **Odour reduction at tanneries**

Tasman Sheepskin Tannery Pty Ltd, a well-established, medium-sized tannery in Southeast Queensland was producing a waste high in Cr III. More importantly, Tasman’s process was producing an obnoxious smell, which resulted in multiple monthly complaints to the Queensland Environmental Protection Agency (“EPA”). On more than one occasion, Tasman had been threatened with closure due to the number of complaints about its foul smelling odour; this problem had only increased with the rapid encroachment of residential neighbourhoods up to its boundary. Application of ViroFlow™ Technology reduced total chromium from 50-100 ppm to 0.3ppm, and lowered BOD and COD from 1,000-2,000 ppm to 222 ppm and 2,000-3,000 ppm to 350 ppm respectively. Odour levels were reduced from “very high” to “very low”, with no complaints to the EPA at all for the first six months of the application.

> **Odour reduction from composting facilities**

Queensland Organic Recycling Systems operates a largescale composting facility which includes two leachate ponds. These ponds were generating a highly objectionable odour which threatened the existence of the plant. After treatment using ViroFlow™ Technology, odour levels in the ponds, which had been rated at “10” by the EPA (the highest level of objectionable odour) prior to treatment was rated “0” by the EPA after treatment.