

The hazards of heavy metal

In order to comply with Brisbane Water's trade waste discharge requirements, CP Plating is transforming hazardous sludge into inert waste. By Garth Lamb.

Heavy metal levels are one of the most tightly regulated aspects of industrial wastewater discharge, with a wide variety of processes producing metal-laden effluent and sludge that needs to be safely managed. In the US, electroplating operations alone produce nearly half a million tonnes of hazardous sludge annually.

Brisbane's largest electroplater, CP Plating, has recently improved its heavy metal management through a relatively simple upgrade. Specialising in zinc and chrome plating, the company contracted Virotec to optimise its wastewater treatment system in



Simple reagent substitutions can allow the removal of more heavy metals.

order to meet Brisbane Water's trade waste discharge limits.

The ViroFlow technology it has since employed uses the ElectroBind reagent, which boasts properties including high acid neutralising capacity, fast settling rate characteristics, improved flocculation, reduced sludge volume and high metal binding efficiency. The red powder removes heavy metals by bonding to it through a process of adsorption and isomorphous substitution.

"The metals are coming to the surface of our reagent, being adsorbed into the surface and they then start being re-crystallised ... the net result of the re-crystallisation is you've got metals that are extremely tightly bound to the reagent," explains Virotec GM Daniel Blair.

With the traditional industry treatment involving the use of alkaline or lime technologies to remove metals, Blair says moving to ViroFlow is "a simple product substitution" requiring no infrastructure changes.

Water reused, not wasted

Blair claims the technology increases heavy metals removal from wastewater by 50 per cent and also improves water clarity. Metal levels in CP Plating's wastewater are now below one-tenth of the statutory limit. Getting these impurities out of the effluent not only reduces trade waste discharge costs, but opens up the opportunity for on-site recycling, with the company's potable water consumption falling from 25ML in 2005 to 8ML this year.

"Because [CP Plating] is getting such good water quality now, they can actually – instead of putting it down the drain – reuse it back in their process," says Blair, adding this is "a very good indicator that the technology works".

The stable sludge that contains the metals is said to be more easily dewatered than the material produced using conventional treatment methods, reducing its weight and therefore disposal costs. It can also be disposed to landfill as inert waste, rather than a hazardous material.

"Because all metals are bound up in the sludge permanently, there's no need for treatment prior to landfill," says Blair.

While suitable for any industrial wastewater with heavy metal issues, he sees a lot of potential in the electroplating sector alone, with a national market of some 30 or 40 companies and less than six already on Virotec's books.

More information at www.virotec.com

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