



A COMMERCIAL APPLICATION OF VIROFLOW™ TECHNOLOGY

CASE STUDY: PORTLAND PINE PRODUCTS CCA - CONTAMINATED SOLIDS TREATMENT

Comparing the results to the Victorian EPA guidelines for the assessment and classification of non-liquid waste, showed that the treated CCA solid waste was well within the limits for landfill disposal.



*Treatment being applied using excavator (left).
Treated CCA stockpile after ViroFlow™ Technology Treatment application (above).*

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PROBLEM

Portland Pine Products, Victoria, embarked on a project to remove sludge from a CCA sedimentation dam and sought an economical technology to treat the CCA contaminated solids prior to disposal.

Virotec was contracted by Portland Pine Products to implement ViroFlow™ Technology to treat and safely dispose of a stockpile of CCA contaminated dam sludge. The key objective was to immobilise copper, chromium and arsenic in the excavated sludge such that the treated material would meet landfill disposal standards.



Figure 1 - Untreated CCA solid waste prior to treatment

VIROTEC TOTAL SOLUTION

Virotec implemented ViroFlow™ Technology to treat and safely dispose of a contaminated stockpile of CCA solid waste. The key objective was to immobilise the copper, chromium and arsenic in the solid material such that these potentially hazardous elements could not be leached into the environment. The process was performed in accordance with Victorian EPA guidelines and the treated solids were able to be disposed at Smythesdale landfill.

BACKGROUND

Portland, in Western Victoria is surrounded by plantation forests and has a large timber industry. Portland was Victoria's first settlement in 1834 and has previously won the award for tidiest rural town; the residents take great pride in making the town a desirable place to live.

Portland Pine uses Copper Chrome Arsenate (CCA), one of the most commonly used timber preservatives in the world, as its primary timber treatment chemical. Leachate ponds are used at most timber treatment plants to collect storm water runoff and leachate and also to act as sedimentation dams. The solid waste generated when sludge is extracted from these dams usually contains high concentrations of leachable copper, chromium and arsenate, and must be treated to

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immobilise these potentially hazardous contaminants before the solid waste can be safely disposed of. Because the limits imposed by Environment Authorities are generally very low, removal of the CCA has presented a serious challenge for the industry.

However, through a simply applied treatment, ViroBond™ reagent has been found to be able to immobilise the copper chromium and arsenate so that it is very difficult to leach from the treated material.

TREATMENT DETAILS

The Virotec Total Solution involves bench-scale testing before application and ensures that each solids treatment application provides a custom-designed and validated treatment solution that will meet all regulatory limits. The Virotec Total Solution also involves project management, liaison with EPA and landfill operators, and facilitation of treatment.

ViroBond™ Reagent is Virotec's proprietary reagent for the treatment and immobilisation of copper, chromium and arsenic wastes. ViroBond™ reagent was mixed with the semi-solid waste on an impermeable concrete surface, using earth-moving equipment. Table I outlines the treatment specifications.



Figure 2 - Treatment was applied using an excavator and loader



Figure 3 - Treated CCA stockpile after ViroFlow™ Technology Treatment application (wet weather during treatment produced some pooling)

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RESULTS

The contaminated soil was analysed for both total copper, chromium and arsenic concentrations and TCLP leachable concentrations. The treated material was also analysed for several other contaminants, to ensure that the treated waste was suitable for disposal to landfill. The samples were analysed by Richmond Water Laboratories and the Australian Government National Measurement Institute; both NATA certified laboratories.

TABLE 1: VICTORIAN EPA WASTE CLASSIFICATION LIMITS FOR LOW LEVEL CONTAMINATED SOIL (SOLID WASTE)

	Total Concentration (mg/kg)	TCLP (mg/L)
<i>Copper</i>	<i>1000</i>	<i>10</i>
<i>Chromium (VI)</i>	<i>2500</i>	<i>5</i>
<i>Arsenic</i>	<i>300</i>	<i>5</i>

TABLE 2: VIROFLOW™ TECHNOLOGY TREATMENT SPECIFICATIONS

Total Mass of Waste Treated	Method of Mixing	Period of Mixing
<i>60 Tonne</i>	<i>Excavator and Loader</i>	<i>4 hours</i>

TABLE 3: ANALYSES OF TREATED SOLID WASTE

	Total Concentration (mg/kg)		Total TCLP (mg/L)	
	After ViroFlow™ Technology Treatment	EPA Victoria Limit	After ViroFlow™ Technology Treatment	EPA Victoria Limit
<i>Copper</i>	<i>930</i>	<i>1000</i>	<i>0.13</i>	<i>10</i>
<i>Chromium</i>	<i>350</i>	<i>2500</i>	<i><0.05</i>	<i>5</i>
<i>Arsenic</i>	<i>50</i>	<i>300</i>	<i>0.80</i>	<i>5</i>

The contaminants held in the waste are within Victorian EPA regulatory limits for low level contaminated soil, and therefore the treated sludge could be safely disposed of to landfill.

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CONCLUSION

ViroFlow™ Technology was successful in treating the CCA contaminated solids. Comparing the results to the Victorian EPA guidelines for the assessment and classification of non-liquid waste, showed that the treated CCA solid waste was well within the limits for landfill disposal.

ViroFlow™ Technology provides an effective and economic solution for contaminated site remediation.



*Figure 4 - Treated CCA stockpile after ViroFlow™ Technology
Treatment waiting to be disposed of to landfill*