



A COMMERCIAL APPLICATION OF
VIROFLOW™ TECHNOLOGY

CASE STUDY BLAYNEY TREATED PINE

“Blayney Treated Pine was in urgent need of a solution for our contaminated leachate pond. The treated water quality had CCA metal levels below the required NEPC (1999) Guidelines for Contaminated Sites... (and) water clarity improved significantly.”



Blayney Treated Pine facility

PROBLEM

Blayney Treated Pine operates a large-scale timber treatment facility near Bathurst, NSW, and the leachate interception pond located on site contained heavy metals at concentrations higher than national environmental guidelines for contaminated sites. There was an urgent need for corrective action to treat the contaminated pond water.

Blayney Treated Pine had been searching for a cost-effective technology capable of treating its copper, chrome and arsenate (CCA) contaminated leachate pond. The objective was to treat leachate pond water to reduce CCA concentrations to below National Environmental Protection Council, NEPC (1999) Guidelines and to improve overall water quality.



Treated timber ready for shipment at Blayney Treated Pine.

VIROTEC TOTAL SOLUTION

The solution involved the adoption of Virotec's ViroFlow™ Technology using proprietary ViroBond™ reagent. The ViroFlow™ Technology application involved a custom designed treatment that was applied in two separate stages.

The implementation of ViroFlow™ Technology achieved the following outcomes:

- > Elimination of a major environmental hazard, and a potential environmental incident;
- > Effluent was released with copper, chromium and arsenic concentrations that were well below NEPC (1999) Guideline limits;
- > Fast mobilisation and treatment time; and
- > Customer satisfaction.

BACKGROUND

The Blayney Treated Pine plant is located about 15 minutes from Bathurst, NSW. The plant produces up to 30,000 cubic meters of treated timber per year for both local and export markets. Most of the treated timber products manufactured are for commercial and domestic building.

Treatment of the logs begins with a steaming process (Figure 3, overleaf), which opens the cells in the timber.

Once opened, these cells stay open, allowing a more effective chemical treatment to occur. The chemical treatment, known as CCA, involves adding copper and arsenic to protect the timber from insect and fungal degradation, and chromium to chemically seal the copper and arsenic into the timber. The plant uses about 200 tonnes of CCA per year.



Timber being loaded into the treatment vessel.

Historically, the logs were stored in an open holding bay to dry after treatment. Water seepage from the logs as they dry results in leachate being collected in a 2.0 ML pond nearby. The leachate is contaminated with varying amounts of copper, chromium and arsenic. Although current practices ensure that there is no leachate from the treated timber during the curing stage, Blayney Treated Pine had a historical environmental problem in the leachate pond.



Blayney Treated Pine steaming vessel.

The ViroFlow™ Technology comprised the following elements:

- > Chemical treatment of the contaminated water to remove CCA and improve water clarity;
- > Validation of treated water quality;
- > Ongoing technical support; and
- > Liaison with regulatory authorities.

Blayney Treated Pine was being sold, and as part of the due diligence process, a comprehensive site contamination audit was performed. The audit found that the concentrations of CCA in the leachate pond were higher than those prescribed in the National Environment Protection Council (NEPC) Guidelines, Measure for Contaminated Sites. Consequently, the business could not be sold until the leachate pond was treated to reduce CCA concentrations to below the regulatory limits.

The NEPC (1999) Guidelines for contaminated sites are very stringent, with concentration limits for copper, chromium and arsenic several orders of magnitude lower than normal discharge to trade waste.

TREATMENT METHODS

The ViroFlow™ Technology treatment developed for the site comprised a two-stage chemical addition using the proprietary ViroBond™ reagent. The Virotec treatment ensures that every job has a custom-designed treatment solution that will meet customer requirements in the most cost effective manner. The treatment regime for Blayney Treated Pine was designed from Virotec's previous commercial experience in CCA treatment and laboratory test work.

> Stage 1 - ViroBond™ Reagent Part A Treatment

ViroBond™ Reagent Part A is Virotec's proprietary reagent for the treatment of copper, chromium and arsenic. ViroBond™ Reagent Part A effectively adsorbs and binds copper, chromium and arsenic from the water in the leachate ponds.

ViroBond™ Reagent Part A was premixed in a mixing vessel (see Figure 5) and subsequently sprayed over the surface of the pond (see Figure 6). The reagent was allowed to settle and form a blanket over the bottom of the ponds, where metals were permanently trapped. The pond water pH increased after the addition of



Pre-mixing of ViroBond™ Reagent.

ViroBond™ Reagent Part A.

> Stage 2 – ViroBond™ Reagent Part B Treatment

ViroBond™ Reagent Part B complimented Part A and was necessary for effective coagulation of particulate matter in the leachate pond. ViroBond™ Reagent Part B also promoted the removal of organic matter from the water. The addition of ViroBond™ Reagent Part B lowered the water pH and after pH adjustment water pH met all regulatory requirements for discharge.



Application of ViroBond™ Reagent A.

RESULTS

After treatment with ViroFlow™ Technology, copper, chromium and arsenic concentrations were dramatically reduced. Treatment results are summarised in Table 1.

After treatment copper, chromium and arsenic concentrations were all well below NEPC (1999) Guideline limits. In the addition, the pH was within the normal limits for discharge to the environment.

Table 1: Leachate pond treatment results (mg/L) – Pond capacity: 2,000,000 L

| Analyte | Before ViroFlow™ Technology Application | After ViroFlow™ Technology Application | NEPC Guidelines 1999 |
|----------|---|--|----------------------|
| pH | 4.95 | 7.53 | 6.0 - 8.5 |
| Arsenic | 0.146 | 0.005 | 0.05 |
| Chromium | 0.250 | 0.002 | 0.01 |
| Copper | 0.103 | 0.004 | 0.005 |



All analyses were performed by Australian Laboratory Services (ALS), a large commercial laboratory with NATA (National Authority for Testing, Australia) certification.

The image on the left shows the visual appearance of the leachate pond pre- and post-treatment. It was noticed that there was a substantial improvement in water clarity. Additionally, the large amounts of scum present before treatment was eliminated with ViroFlow™ Technology.

Blayney leachate pond before treatment

CONCLUSION

ViroFlow™ Technology was highly successful in reducing copper, chromium and arsenic concentrations in the leachate pond water to below NEPC (1999) Guideline limits and in improving the general water quality in the leachate pond.

The ViroFlow™ Technology has proven to be a highly cost-effective treatment for contaminated CCA leachate ponds, and the technology can be rapidly applied for urgent treatments.



After treatment with ViroBond™ Reagent A.

TESTIMONIAL

“Blayney Treated Pine was in urgent need of a solution for our contaminated leachate pond. As part of the due diligence for the business sale, there was an immediate requirement to remove all contamination that had accumulated on site for many years. We were recommended to Virotec by a competing, large timber processing company for whom Virotec had previously successfully treated CCA contamination in leachate ponds.

Once Virotec was contacted, they were extremely efficient in providing a detailed proposal with guarantees within 24 hours from my first phone call. Virotec was fully mobilised and treated the leachate pond within two weeks.

The treated water quality had CCA metal levels below the required NEPC (1999) Guidelines for Contaminated Sites. It was also noticed that water clarity improved significantly after treatment.

Whilst on site Virotec acted professionally and followed all site safety procedures. The staff were friendly and aware of our urgent needs. I therefore look forward to working with Virotec on other environmental improvement projects.

In summary, Virotec was totally committed to the urgency of our situation and reacted professionally and diligently to provide Blayney Treated Pine with a solution. I therefore have no hesitation in recommending Virotec for similar work.”

MICHAEL ROBERTSON

Managing Director
Blayney Treated Pine



Visual improvement in water quality before treatment (right) and after ViroBond™ reagent treatment (left)

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643/MKT/11 12.07.11

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