



**ONE OF THE LARGEST PORT AUTHORITIES IN AUSTRALIA WAS CHANGING ITS RAILWAY LAYOUT. APPROXIMATELY 30,000 CUBIC METRES OF SULPHIDIC MARINE CLAYS FROM PAST DREDGING AND LAND RECLAMATION WAS EXCAVATED AND STOCKPILED AND STARTED TO OXIDIZE AND BECAME ACIDIC.**

*An ecological scald formed – nothing would grow and the green eyes of the world were watching. A quick but long lasting fix was needed.*

Virotec was called in to help but were we up to the job?

#### **MARINE ENVIRONMENTS CAN BE SO TRICKY**

Natural marine sediments can have very low pH levels. With this port, the dredged sediments contained acid sulphate soils where the pH averaged 4. Time would not help as the sediment would oxidise and generate more acid.

The port was looking at a barren landscape for decades. As it wanted to expand in other areas, all political impediments needed to be removed permanently and soon.

Green vegetation was urgently needed and so Virotec had to get the pH above 6.5 and keep it there. This was not easy as the soil pH varied from area to area. Plus we had to stop the heavy metal leachate from the stockpile escaping into the nearby harbour.

#### **VIROTEC IS ALL ALONE**

Virotec prides itself on being able to solve all and any environmental problems and this one was right up there.

Our brief was to provide the sampling, design, engineering, application, monitoring and regulatory authority liaison. The pressure was on.

With over 14 years of know how, we thought we had the right non hazardous and non toxic reagent to fix the acidic problem – the question was how do we apply the reagent and in what dosage levels.

To get it right, the first thing Virotec did was to undertake an initial testing program. The soil was sampled on a 20 x 20 metre grid pattern to ascertain variations in soil acidity. The net acid generating potential (“NAGP”) and theoretical reagent application rates were then determined.

#### **APPLICATION IS AS IMPORTANT AS THE CHEMISTRY**

It was now down to the nuts and bolts of making it happen.

The affected soil was levelled to a thickness of approximately one metre, the required quantity reagent was spread over the surface and blade mixed with the soil and finally, the remediated soil was dozed to the required shape to form a landscape buffer.

It was then a case of test and analyse to see if we got it right. Piezometers were bored at strategic site locations to monitor ground water seepage from the soil. 80% of the returned samples gave negative NAGP results within 24 hours which was a good first hit, and the areas with a positive NAGP were retreated.

Very quickly 100% of all sulphides present within the sediments were neutralised and the average soil pH increased from 4.04 to 6.81. So far so good.

We then put on our horticultural hat. After more soil testing to get the soil to the optimum revegetation level, we had to add phosphate fertilizer and organic matter to enhance nutrient retention, retain water and promote vigorous plant growth.

The soil had a moderate salt content, so appropriate plant species were selected for planting.

### **FOREST OR DESERT?**

It was now a case of waiting 2 years to see what happened. And you guessed it. Today that site looks like natural vegetation, monitored results are great and the leachate and runoff from the site is of good quality.

*The Port Authority are more than happy - "there has been no adverse affect or public comment and the remediated soil colour is now brown which has a much better appearance than the black marine clay. This was a test for Virotec and they passed with flying colours".*



**FOR YOUR FREE SITE AUDIT, PLEASE CALL VIROTEC TODAY ON 1300 660 460**