

Bioreactor Technology and Greenhouse Gases **Just the ticket for big holes in the ground!**



This image was taken in October 2008 at the Woodlawn Bioreactor site near Tarago NSW.

The open cut mine took ten years to create as the copper, lead and zinc ores were removed. Eight million tons of ore were extracted from the open cut mine and the resulting void was 600 metres across and 200m deep. The rocks extracted from the mine were crushed at Woodlawn and froth flotation was used to separate the valuable minerals before they were transported, first by road and then by rail, to Newcastle for transfer overseas by ship for further processing to produce pure copper, lead and zinc metals.

An innovative solution has been found to fill this void and solve a waste problem from Sydney. The mine void has been converted into an in-situ bioreactor. The same railway lines that used to transport the minerals away from the mine are now being used to carry containers filled with Sydney waste to the mine site. Each day the waste is transported first by rail and then by road and deposited in the mine. A network of pipes are placed across the waste and with careful management and

monitoring the decomposition of the waste is facilitated. Methane generated from the decomposition process is trapped and used to produce electrical energy.

The rapid decomposition of the waste and biogas capture expedites the stabilisation of the waste and greatly reduces the escape of greenhouse gases into the atmosphere.

The bioreactor at Woodlawn has been in operation since 2005 and in this time over 600,000 tonnes of waste from Sydney have been deposited. It is anticipated that it will take another 50 or 60 years to completely fill the void.

Teachers in the ACT and New South Wales wishing to take their students on a tour of the site can make a booking by contacting Veolia on (02) 4844 6262.

In Queensland a former open cut coal mine is also using bioreactor technology to stabilise the waste, generate green electricity and rehabilitate the open cut mine site at Ti-Tree Bioenergy facility at WillowBank QLD. An animated tour of this bioreactor facility is available at <http://www.titreebioenergy.com.au/index.php?categoryid=20>.

Teachers wishing to bring their class to view this facility in Queensland need to make contact through the website at <http://www.titreebioenergy.com.au/index.php?categoryid=50>

Methane is a greenhouse gas that is twenty times more potent than carbon dioxide. Watch this video clip at Catalyst TV to find out why the bioreactor technology is such a good innovation in terms of addressing climate change.

Methane, the forgotten gas at <http://www.abc.net.au/catalyst/stories/2373958.htm>.

Creating compost heaps will provide insight into the processes involved in bioreactors. An excellent recipe for creating the best-ever compost is available at: <http://www.css.cornell.edu/compost/outdoorbest.html>

TESEP takes teachers to Woodlawn

The Woodlawn site was visited this October as part of the Teacher Earth Science Education Programme (TESEP) Professional Development workshop, 'Riding the Climate Roller Coaster' run for ACT and southern NSW teachers.

Teachers who attended this workshop will shortly receive a CD of resource materials together with copies of the Power Point Presentations.