

BIODIESEL ENTERS THE CARBON TAX FRAY

Biodiesel makes its mark in the Western Australian mining scene. Environmental and Social Responsibility teams at several significant mine operations in Western Australia are exploring the use and production of biodiesel on site.

RioTio, Newmont and Citic Mining have both entered the biodiesel fray with positive results to report.

RioTinto's Tom Price operations in the Pilbara have worked with the Ashburton Aboriginal Corporation (AAC) and its subsidiary ASHOIL Pty Ltd to establish a biodiesel production facility in Tom Price. The State Government joined the partnership through Royalties for Regions in 2009. The biodiesel product has now been sufficiently tested to be used by RioTinto's Pilbara operations for blasting and the project continues to provide significant training and employment opportunities for indigenous people through the AAC. A supply agreement was finalised with Rio Tinto Iron Ore, signed on 14 July 2010, and ASHOIL now supplies up to 10,000 litres of biodiesel per week to RioTinto Pilbara for production of AMPHO.

The production facility and process was reconfigured by Physicist Jonathon Thwaites from Medical and Scientific Services Pty Ltd, following production problems to make it simple, efficient and reliable.

Currently feedstock is sourced as used vegetable oil from camp kitchens throughout the Pilbara and is collected by AAC. This oil would otherwise present an environmental problem and has previously been trucked back to Perth, an expensive and inefficient process.

RioTino Pilbara Mining Operations and AAC have initiated a Moringa oil tree trial block in the Pilbara to investigate the feasibility of growing oil feedstock for the operations to increase capacity and feedstock reliability.

CITIC Pacific Mining and the Department of Agriculture and Food have established a trial of Moringa with irrigation using grey water from mine accommodation and locally sourced groundwater.

Dr Gabriella Pracilio from CITIC Pacific Mining said "This project will test whether we can grow Moringa in the Pilbara and if it is suitable to grow in areas currently infested with Mesquite, a noxious weed. The Moringa shrub has benefits of being suitable for producing biodiesel and cattle feed. The four year trial is also a fantastic opportunity for us to use wastewater from surrounding mine accommodation camps and villages effectively and environmentally friendly."

Newmont Asia Pacific's Jundee site commenced small scale (150 litre batch process) biodiesel production in November 2011. The biodiesel plant produces fuel out of waste cooking oil generated from the camp kitchen and is used to fuel a Toyota Landcruiser at Jundee. Approximately 2600L of biodiesel will be produced per year.

"Biodiesel has a far smaller carbon footprint than the mineral diesel it displaces," said Bryan Williams, Principal Advisor Climate Change & Energy Efficiency. "This project has given the team a good understanding of how biodiesel production works and it certainly has the potential for application at our other operations with a dry mess," he said. It is a good way to explore the potential of Biodiesel, with little financial or other operational risks in preparation for possible Carbon Tax mitigation strategies.

The production units for Newmont and AAC were manufactured by Jonathon Thwaites from Medical and Scientific Services Pty Ltd and cost approximately \$3,000. It will have a payback period of 1.7 years, limited by our current feedstock supply and could be as low as 4 months.

This ground breaking project is part of Asia Pacific (APAC) Climate Change Strategy, which includes energy efficiency, renewable energy and forestry offset initiatives among others. This pilot project has the potential to be applied at other APAC sites.

RioTinto and ACC are currently investigating future partnerships including a waste water / mine dewatering project for oilseed cropping. The project fits neatly into RioTinto's commitment to the ongoing support for Aboriginal people to obtain intergenerational wealth and positive social outcomes as our business grows.

The first Moringa trial crops in Tom Price were planted in late September 2010 in the Nameless Valley in the hope that the project can bring a sustainable and economically viable source of biofuel to the mining industry. The trees will grow into two metre high trees within nine months. The seed pods will be harvested and the seeds crushed for oil.

The "Moringa" is a fast-growing, drought-resistant tree that grows best in dry sandy soil. Moringa tolerates poor soil and can be grown in coastal and frost-free areas. It is widely cultivated as one of the world's most useful trees. Moringa

is a traditional and valuable food crop throughout North Africa and the Indian sub continent as well as being used for its medicinal properties. It is expected the planting of Moringa will lead to future research and development. If the crops prove to be sustainable then a larger commitment will be made.

Almost every part of the Moringa tree can be used for food or has some other beneficial property. A traditional food plant, this tree has potential to improve nutrition, boost food security, foster rural development, produce biodiesel and support sustainable landcare efforts.

Moringa seeds yield 38–40% edible oil. The refined oil is clear, odourless, and resists rancidity at least as well as any other botanical oil. The seed cake remaining after oil extraction may be used as a fertilizer or as a flocculent to purify water.

Biodiesel produced from waste cooking oil has proven to work well at the Tom Price mine with no downsides, and Moringa offers the potential to expand production sustainably and create new food crop industries.

The Shire of Ashburton assisted Ashburton Aboriginal Corporation to source funding for the project and provided the trial site for the Moringa crops. Shire of Ashburton engineering services executive manager Jeffrey Breen said that the Moringa crop trial was just another example of the Shire and Ashburton Aboriginal Corporation working together to establish a sustainable business for local Indigenous people.

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The Environment Team at Jundee and the biodiesel manufacturing plant (150 litre batch) built by Jonathon Thwaites (orange vest). jonathon.thwaites@uwa.edu.au



Ashburton Aboriginal Corporation, biodiesel manufacturing plant in Tom Price, up to 10,000 litres per week



Jonathon Thwaites' Licensed Excisable Petroleum Fuel Manufacturing Facility licensed with the Australian taxation Office – (an oil company) at his residence in suburban Cottesloe in Perth.

