

WATER MANAGEMENT IN MINING

– THE HAMERSLEY AGRICULTURAL PROJECT

I love a sunburnt country,
A land of sweeping plains,
Of ragged mountain ranges,
Of droughts and flooding rains.
I love her far horizons,
I love her jewel-sea,
Her beauty and her terror -
The wide brown land for me!

Most of us are familiar with Dorothea McKellar's poem, and the above verse is typical of the Pilbara region in Western Australia, where the searing sun often reaches 55°C, scorching the land beneath. But thanks to Rio Tinto, the scorched wide brown land of the Pilbara is now becoming a little greener.

In what is one of Australia's largest irrigation projects, and after five years of planning, water is now flowing through the first of what will be 17 irrigation centre pivots at Rio Tinto's Hamersley Agricultural Project, situated 45 kilometres north east of Tom Price in the Pilbara region of Western Australia.

The Hamersley Agricultural Project (HAP) is one of several uses of surplus water from below water table mining at Rio Tinto's Marandoo, as part of the Marandoo extension project. Approved in February 2011 and at a spend of \$950 million, the project extends the Marandoo mine life by 16 years. It also means that the mine will maintain its current mining rate of 15 million tonnes a year by developing the adjacent reserves below the water table. The project

includes the construction of a wet processing plant and on-site facilities. The mine will utilise the surplus water for the Hamersley Agricultural Project (HAP), with other surplus water options for Rio Tinto's Marandoo mine, including operational supply to Tom Price Township and reinjection to the Southern Fortescue Borefield, which Rio Tinto has been draining since 1966.

Irrigation centre pivots are not unusual in this country, but this is the first time that they have been used in the Pilbara. The Hamersley Agriculture Project (HAP) is the first project of its kind in the Pilbara and relies on 35 kilometres of pipe, 22 pumps and a large scale associated pumping infrastructure. The project irrigates around 850 hectares of land with the use of the very large centre pivots, with each able to cover an area of 40 - 50 hectares. The giant centre pivot machines were shipped from the USA and assembled on site and are designed to slowly cover the ground on sets of self-propelled wheels to deliver the supply of water evenly and automatically.

Rio Tinto general manager Climate Change, Water and Environment Allan Jackson says the project provides a direct environmental benefit by reducing the discharge of surplus water into the surrounding ecosystems and importantly, it is likely to help in the reduction of its large carbon footprint, by five per cent.

"By establishing irrigated agriculture in the Pilbara region we can potentially increase localised stocking rates, reduce the total area grazed and effectively rest large areas that may be under pressure from grazing," he says.

The initial stages of the project involved the installation of industrial scale sprinkler systems over a 1650 hectare area of Hamersley station. With water from the Marandoo below water table expansion being used to irrigate the station, there is anticipation of 30,000 tonnes of hay each year being produced. Something that is quite remarkable in a region with an annual rainfall of just 427mm.

The hay that is produced by the Hamersley Agricultural Project will be used to feed the some 25,000 head of cattle across Rio Tinto's six stations – Hamersley, Karratha, Rocklea, Juna, Yalleen and Yarraloola. Excess hay can then also be sold on to other pastoralists in the Pilbara. This will enable pastoralists to contain cattle within a smaller area, allowing for planting of trees and other vegetation to potentially offset five per cent of the Rio Tinto carbon footprint.

Rio has held the pastoral leases to allow access to a range of mining tenements, and will use the tens of millions of litres of water below the ground at its nearby mines to irrigate the land.

"The majority of irrigated land will be used for hay production and several hectares have also been set aside to optimise native vegetation growth, with the aim of producing seed for mine-site rehabilitation programs across the Pilbara," Mr. Jackson said.

"We believe we can turn it into a real business for hay sales in the Pilbara and even into the Kimberley, with a rich soil for growing, already there" Mr. Jackson said.

Mr. Jackson says that the project also represents Rio Tinto's ongoing conscious commitment and responsibility to preserve environmental values wherever possible, by not only conserving water used in operations but also putting to the best use, surplus water extracted through mining activities.

Mr. Jackson said that receiving the first water through the pivots was a significant milestone for the innovative project.

"It was significant that we were able to celebrate this milestone with the Minister for Agriculture and Food, the Hon. Terry Redman MLA who was on site to officially turn on the valve connecting the surplus mine water through to the pivots.

A number of stakeholders have been involved in the project, with initial trials conducted in Carnarvon that looked at the species and the agricultural model that needed to be put in place to maximize production.

"We have worked with a number of stakeholders to get this project up and running and we thank them for their support" Mr. Jackson said. "In consultation with the Department of Agriculture and Food, the trial in Carnarvon looked at the species and the agricultural model that needed to be put in place to get the best production," he said.

Many of the world's biggest food producing regions are in the most inhospitable environments, but Mr. Jackson says the Pilbara's dry and hot climate won't be an issue. While it is early stages and the first significant investment of its kind in the Pilbara area. The potential is substantial and there is a belief that agriculture could well become a mining legacy in the Pilbara.

Other Key HAP Facts:

There are 17 centre pivots, 12 @ 50ha, 4 @ 39ha and one at 7ha.

All water delivered to the irrigators will have a base injection of fertiliser. Each centre pivot will also be equipped with a fertiliser injector to allow top up of nutrients and micro management of trace elements.

Control of each pivot, generator and fertiliser injection system is by remote via an Observant developed communication and control network linked by radio and internet.

Sensors connected through the Observant system will monitor and allow control of soil moisture, soil conductivity, pivot application rates, fertiliser injection rates, pivot position and all alarms.

Power is delivered by generator at each pivot. Each generating set is remotely controlled and monitored through the Observant control centre.



TO GROW HAY OUT HERE IT HELPS TO BE OBSERVANT.

Observant provides customised solutions for monitoring and controlling irrigation projects. They work in even the toughest environments and on any scale. Our system enables the Hamersley Agriculture Project system to be managed from end to end. Observant and our partners Total Eden, Global Groundwater and AFS are proud to be part of this innovative program.

If you want all this power, convenience and choice in the palm of your hand, then find your local Observant partner on **1300 224 688** or **info@observant.com.au**

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