

The raw materials for our titanium minerals operation comes from ancient shoreline sand deposits in the Mid-West region of Western Australia. Our current mining operation is located between Cervantes and Dongara and carries a local Aboriginal name Cooljarloo. We mine the heavy mineral concentrates at Cooljarloo using dredging technique before transporting by road to the Chandala processing plant.

Cooljarloo is 170 kilometres north of Perth, where the company produces heavy mineral concentrates from dredging and dry mining operations. Grains of valuable heavy minerals were deposited on ancient shorelines thousands of years ago, where the action of waves and wind formed belts of minerals called strand lines. Today, Tronox produces over 400,000 tonnes of heavy mineral concentrate a year from strand lines using a dredging operation.

The dredging operation uses one of the world's largest floating dredges in a purpose-built pond to pump slurried ore at a rate of 3,000 tonnes per hour to a floating concentrator which recovers heavy minerals from the sand and clay using a series of gravity spirals. The heavy mineral concentrate produced at Cooljarloo is transported south in specially designed road trains to Tronox's Chandala Processing Plant for separation and processing.

As mining operations move through the orebody, sand and clay are returned to fill the void and the surface is contoured to landforms similar to those that existed prior to mining. Because less than 5% of the total sands mined are removed during mining, the rehabilitation program can establish similar landforms and ecosystems to the original countryside.

Mining Lease: 9,744 hectares (ha)

- 1,076 ha of freehold land
- 1034 ha owned by Tronox
- 42 ha owned by a third party
- 7,634 ha of unallocated crown land

Current Area Open 1,563 ha (EOY 2018)

- Down from a peak of 1,755 ha in 2006
- Rehab to EOY 2018 2,234 ha

Performance

The dredging operation at the south mine excavates the deeper deposits located below the water table.

Employees	
Chandala	94
Piacentini	30
Other Contractors	20

Site Costs: Approximately \$62M per year

A contract overburden removal fleet handles an average of 2.5 million bulk cubic m (BCM) of overburden per annum. The overburden is generally between 2-15 metres thick. Equipment used to remove this overburden includes one Komatsu PC2000 250 tonne excavator with a fleet of four Caterpillar 777D 100 tonne dump trucks. The Komatsu excavator can move up to 800 BCM/hour.

Two dredges operate in a pond up to 25 m deep and mine ore between 22 and 30 m thick. Together they mine 24 million tonnes of ore per year, which is delivered to the shared Wet Processing Plant. The pond water is natural groundwater and is fresh. The pond is up to one km long and 400 m wide. These facilities are controlled by operators via computers and GPS satellite navigation.



Cooljarloo Mine

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HMC is pumped to a central stockpile where it is stacked, ready for rehandling into road trains for transport to our processing facility at Chandala. Tailings from the plant comprise washed sand and clay at 2,950 tonnes per hour. The tails are directed either via a float line and floating tails stacker back to the dredge pond to form stable beaches and return stripped overburden or sent via external tails pipelines up to six kilometres in length to backfill previously mined out pits.

Clay from the ore is dried in purpose-built cells on the mined pits and on future mine path. No chemicals are used in the process.

Details	Wet Plant: South	Dredges	
		Cooljarloo I	Pelican
Height (m)	35	3,500	1,500
Number of floors	6	80 x 16	65 x 12
Number of spiral starts	1,781	25	15
Number of pumps	45	1,400	800
Dry weight (t)	3,600		

Community Engagement

Social responsibility has always been a key component of Tronox's licence to operate. The Cooljarloo site has close ties to the communities surrounding it, with an emphasis on education, health, environment and community growth. Cooljarloo has partnerships with all six local schools supplying financial, in kind and expert knowledge to ensure the best quality education to children living in the area. Tronox has been a key support of DPaW's Western Shield Fox and Feral Cat eradication programme in the National Parks surrounding the Cooljarloo site, where monitoring has shown a decrease in feral animals and an increase in native fauna. Local clubs and organisations can apply directly for sponsorship through Tronox's Community Grants (non-capital), along with Tronox and the Shire of Dandaragan Community Grants programme (capital), which allows communities to continue to operate and offer sporting and cultural activities to residents.

Indigenous Affairs

The Cooljarloo mine is situated on the traditional lands of the Yued people of whom Tronox has had a long and respectful relationship. Land access agreements have been reached for new mining leases applied for since the introduction of native title. These agreements focus on programmes that assist with the development of local aboriginal people and particularly its youth. Items such as traineeships, apprenticeship, work ready programmes, mentoring, health programmes, scholarships and cross-cultural awareness training are included in the agreements.



Environment

Tronox has progressively rehabilitated 2,234 ha of native vegetation and 502 ha of farmland to a high standard since 1991. The Cooljarloo mine site is located in an area of high floral diversity. This is recognised by Tronox through trials and research projects conducted with universities and consultants to improve rehabilitation performance and promote the return of conservation significant flora, with multiple rare and priority species successfully established in rehabilitated areas.

Tronox is renowned for implementing comprehensive dieback hygiene management processes and research to protect the valuable rehabilitated and undisturbed vegetation. A dieback eradication project, conducted with support from Murdoch University, is the largest-scale attempt globally to eliminate a *Phytophthora cinnamomi* (dieback) infestation. Preliminary results have recorded a decline in the presence of dieback since commencement of the project.