



AVONBANK PROJECT INFORMATION SHEET

ORE PROCESSING

FREQUENTLY ASKED QUESTIONS

OVERVIEW

WIM Resource Pty Ltd (WIM) will process the Avonbank ore using a standard mineral sands spiral separation plant, that uses water and gravity to separate valuable minerals from non-valuable minerals.

- ◆ Valuable minerals are heavier than the non-valuable minerals and are separated using water and gravity with a series of spirals (figure 2).
- ◆ The ore is not trucked to the processing plant. It is pumped from the mine void to the process plant in the WIFT Precinct.
- ◆ The processing plant does not use chemicals – only water is utilised to separate the valuable minerals, and approximately 95% of the ore is returned to the mine void as tailings.

Key stages of the processing at Avonbank will include:

- Stage 1* Ore is received at the active mine pit via the Mining Units Plants (MUPs)
- Stage 2* Processing of slurried ore from the MUP to the WCP and removal of fines
- Stage 3* Separation of the slurried ore at the WCP using spiral separators to produce a Heavy Mineral Concentrate (HMC)
- Stage 4* On-going recycling of water

GLOSSARY

Flocculant – a substance used to encourage particles suspended in liquid to form larger particles.

Ore – material that contains valuable minerals.

Rare Earths – Rare earth minerals are a set of 17 chemical elements – the 15 lanthanides, scandium and yttrium. Rare earths at Avonbank are Xenotime and Monazite.

Spiral separator – a gravity separation device, sometimes called a spiral concentrator, used to divide slurry components by density (depending on how heavy they are).

Valuable Minerals – Ilmenite, Zircon, Rare Earths

WIFT Precinct – Wimmera Intermodal Freight Terminal (WIFT) Precinct is an area that has been zoned for industrial purposes, including for mineral sands processing.

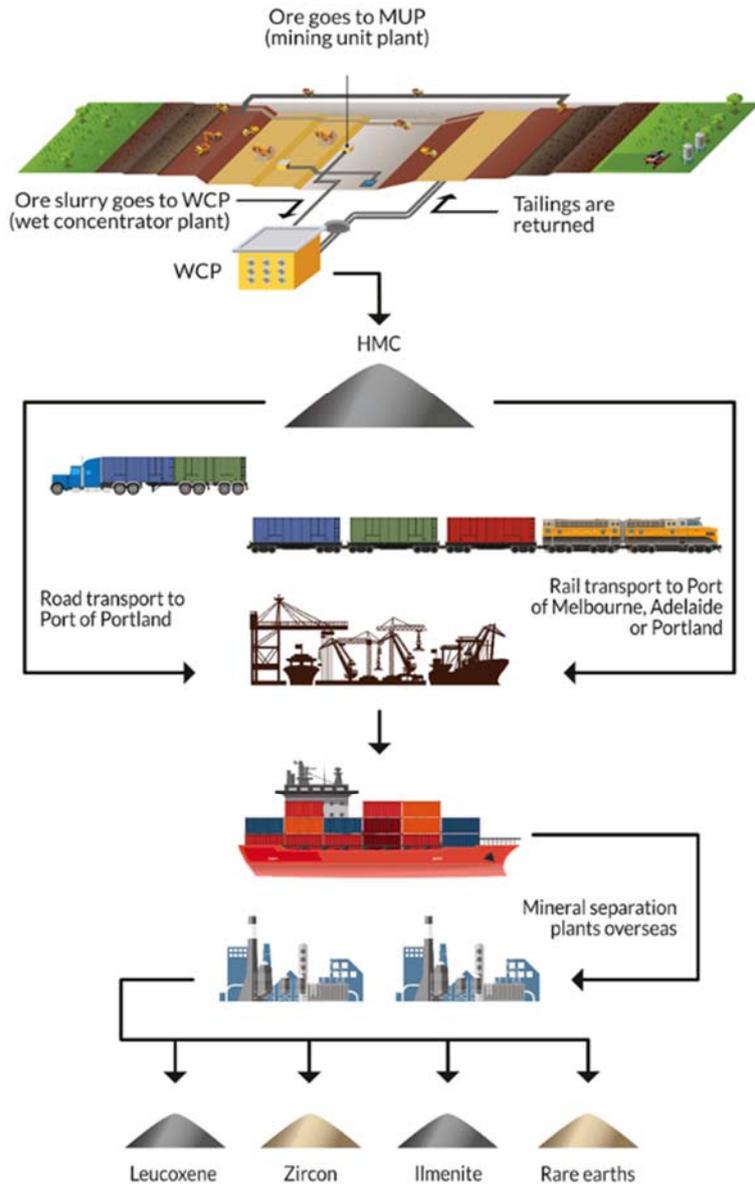
What are the main stages for the Avonbank operation?



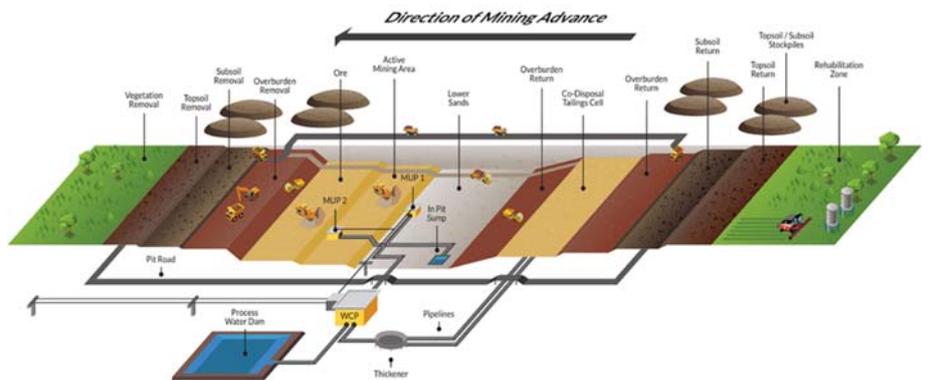
Figure 1: Avonbank Pilot Plant: MUP ore receipt via feed hopper



Figure 2: heavy minerals recovered as HMC



How will the operation work with respect to processing and mining?



How is the ore moved from the pit void to the processing plant?

The ore is pushed by a dozer into the MUP where water is added and the ore is turned into slurry. During the pilot plant the Avonbank ore was fed by a front-end loader into the MUP (figure 1). The MUP will be in the mine void and it essentially acts like a vacuum cleaner to suck up the ore, and prepare into a slurry for pumping in overland pumps to the WCP.

To prepare the ore for slurring to the spiral separator, the ore enters a scrubber and trommel, which acts like a washing machine to scrub the ore and remove some oversize material (figure 3).



Figure 3: Avonbank Pilot Plant feed hopper conveying ore into the scrubber and trommel section of the MUP



Figure 4: detail of the spiral separator module

How is the ore processed to produce a mineral concentrate?

The ore is processed using a spiral separator with the addition of only water. As the ore travels down the spirals, the heavier minerals travel to the inside of the spiral and are recovered into a final HMC (Heavy Mineral Concentrate).

What happens to the tailings?

The fine tailings (clay fraction) are thickened using a flocculant in a thickener (figure 5, top). Once the fine tailings are thickened, they are combined with the coarser tailings, and pumped back to the in-pit tailings cell.

They are dosed with a flocculent at the mine void, which helps release the water from the tails. The tails then form a beach and continually drain water to a sump where the water is returned to the processing plant for re-use (figure 5, middle).

The tailings compress and dry over time. Once they are of sufficient strength and are considered a stable landform, they are covered with overburden, subsoil and topsoil (figure 5, bottom).



Figure 5: tailings process at the test pit

CONTACT

For more information on WIM’s approach to mining, please contact free call 1800 959 298.

Information on the Avonbank Project may also be found on the website www.wimresource.com.au.

For more information from state and federal government bodies regarding mining in Australia, please visit:

Victoria State Government Department of Jobs, Precincts and Regions
<https://earthresources.vic.gov.au/>

Australian Minerals Resources
<http://australianminerals.gov.au/home>

Australian Government Department of Industry, Science, Energy and Resources
www.industry.gov.au

How much water will WIM use?

WIM will use approximately 2.5-4.5GL of water per year. The water used for processing is recycled as much as possible. The main water losses are from water seeping into the ground from the tailings and evaporation.

How does WIM propose to minimise water use?

WIM is using flocculants in the thickener and at the mine void to recover as much water as possible. WIM will also catch surface water that has run off disturbed mining areas and add this to the process water system.

How much ore will be processed each year?

WIM will process approximately 11 million tonne (t) each year. This will produce approximately 500,000t of HMC each year.

What products are produced at site?

WIM will produce a HMC that will be shipped overseas. The HMC will contain mainly zircon, ilmenite, and residual rare earth minerals.

What are the mineral sands ore processing stages?

