

MINDARIE MINERAL SANDS PROJECT

Mercunda Strandline

PROJECT OVERVIEW

Murray Zircon is a Mineral Sands company in the South Australian mining sector and has set its sights on becoming a sustainable mineral sands producer for the long term. Murray Zircon is proposing to initiate operations of the Mindarie Mineral Sands Project by re-commencing mining along the Mercunda strandline.

The Mindarie Mineral Sands Project is located approximately 150 km east of Adelaide in the Murray Mallee Region of South Australia. Murray Zircon has redeveloped and successfully operated the Mindarie Mineral Sands Project since 2012, producing heavy mineral concentrate (HMC)

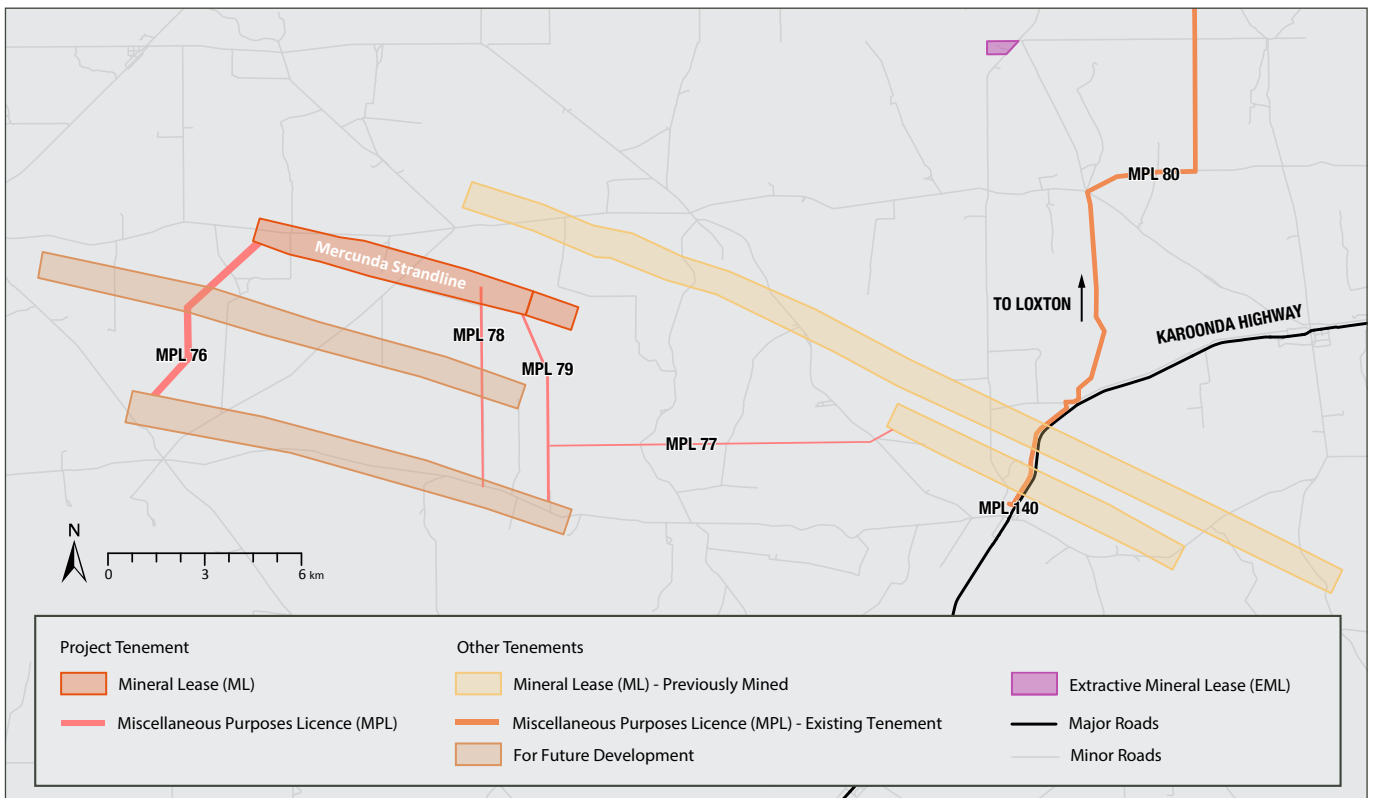
Mineral sands are natural beach sands containing economic quantities of heavy minerals including zircon, rutile and ilmenite.

Long, narrow strands of these beach sands are mined and the heavy minerals removed using gravity separation to make a HMC. HMC is then further processed to separate the various heavy minerals into individual product streams of zircon, rutile and ilmenite.

Zircon is used in a wide range of products including:

- Ceramics
- Food
- Pharmaceuticals
- Electronics
- Aviation equipment

Rutile and ilmenite are predominantly used in paint pigments and steelmaking.



Project enquiries
community@murrayzircon.com.au

Employment and supplier enquiries
info@murrayzircon.com.au

MINDARIE MINERAL SANDS PROJECT

Mercunda Strandline

PROJECT CONTEXT

Murray Zircon is proposing to initiate operations of the Mindarie Mineral Sands Project by re-commencing mining along the Mercunda strandline. To facilitate operations, Murray Zircon is required to undertake a Program for Environmental Protection and Rehabilitation – PEPR.

A Program for Environmental Protection and Rehabilitation (PEPR) is a government approval document mining companies are required to develop prior to commencement of operations. A PEPR sets out the potential environmental, social and economic impact and risk events associated with a project, and outlines how the company will mitigate such events.

The PEPR forms the basis to the operational documents and procedures that Murray Zircon and its contractors must comply with over the life of the mine. It will include monitoring and management of all environmental matters, such as air quality, water, noise and vibration, traffic and mine closure.



A PEPR is developed in consultation with stakeholders



Murray Zircon plans to submit the PEPR to the Department for Energy and Mining in mid-2022.

The Regulator reviews all aspects of the Project during the assessment of the PEPR to ensure:

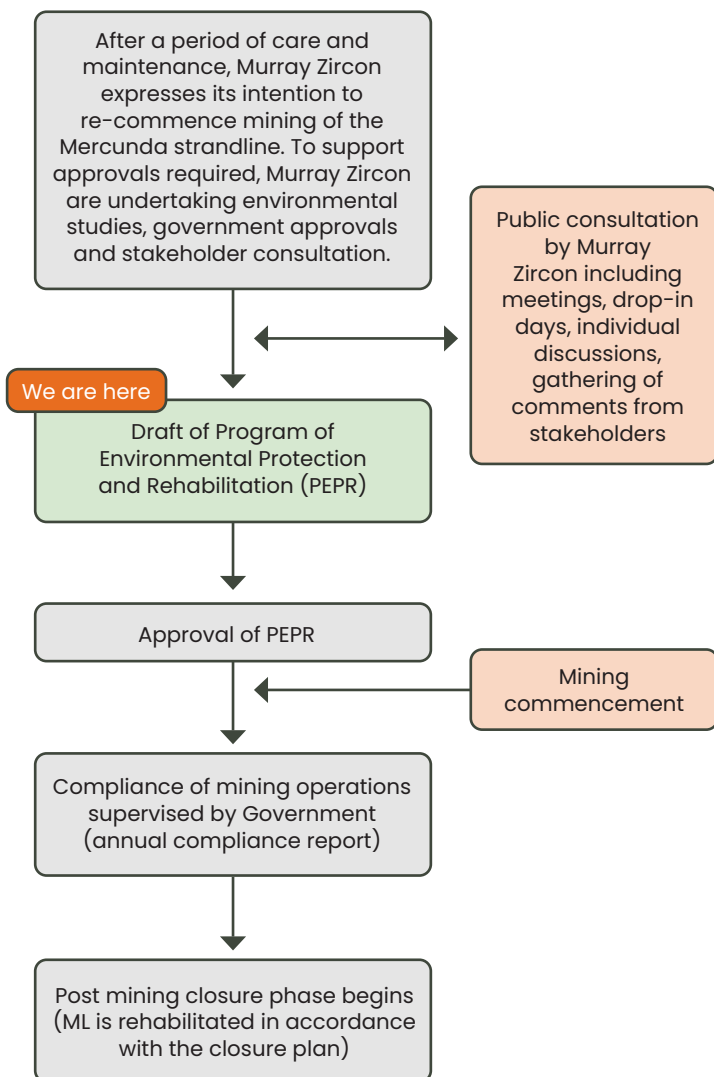
- There is a reasonable prospect that a mineral resource can be 'effectively and efficiently mined'.
- All potential environmental impacts (including ecology, soils, heritage, air quality, noise, traffic, groundwater and surface water) have been identified.
- The proposed level of impact (environmental outcome) is acceptable given the economic and social benefits.
- The proposed control strategies will achieve an acceptable level of impact.
- There is a control mechanism at all stages during the development of the Mindarie Mineral Sands Project.
- That Murray Zircon work to ensure regulatory requirements and community expectations are met at all stages of the mine development, operation and closure.

Feedback and Comments

Murray Zircon is seeking feedback from interested parties on their views on how to minimise potential impacts and maximise opportunities associated with the Project.

Murray Zircon values input from all interested parties and encourages anyone to provide feedback/comments on the Mindarie Mineral Sands Project - Mercunda Strandline

To provide feedback please forward an email to community@murrayzircon.com.au



MINDARIE MINERAL SANDS PROJECT

Mercunda Strandline

REHABILITATION

Murray Zircon is committed to ensuring the land we operate on is rehabilitated effectively to ensure continued use of agricultural land.

How will Murray Zircon undertake rehabilitation?

Murray Zircon (MZ) will always develop a rehabilitation plan in consultation with the landholder with the aim to ensure effective rehabilitation of the land is undertaken and returned as close to its original, productive state.

Progressive rehabilitation

Mineral sands mining is unique in that rehabilitation occurs throughout the mining process rather than at the end. Progressive rehabilitation of the mined area will occur to ensure the area of disturbance is minimised and the impacted land is returned as close to its original state as soon as practical.

Prior to breaking ground, site surveys are conducted to record the original landscape and provide a measure for returning the land to its original state once the project is complete.

Progressive rehabilitation preparation begins at the commencement of operations by removing the topsoil and subsoil and stockpiling them separately for later use. The overburden is removed and stockpiled to access the deposit. Following processing of the ore, clean materials from the mineral separation plant and overburden will be used to backfill the disturbed site. The subsoil and topsoil will be placed back in original order, to ensure the soil profile supports productive plant growth from agricultural activities following operations. The rehabilitation will be subject to a soil management plan to ensure the topsoil and subsoil remains as close to its original condition.

All material will be replaced in a way that is complimentary to the surrounding landscape and similar to the land prior to mining.

Equipment such as excavators and trucks will be used to replace material in the ground and backfill any excavated areas.

Final Rehabilitation

At completion of mining operations, all non-necessary infrastructure will be removed and soil management techniques such as scarring will be undertaken to ensure compaction of soils are reduced. Where required, the company will re-establish vegetation on cleared land.

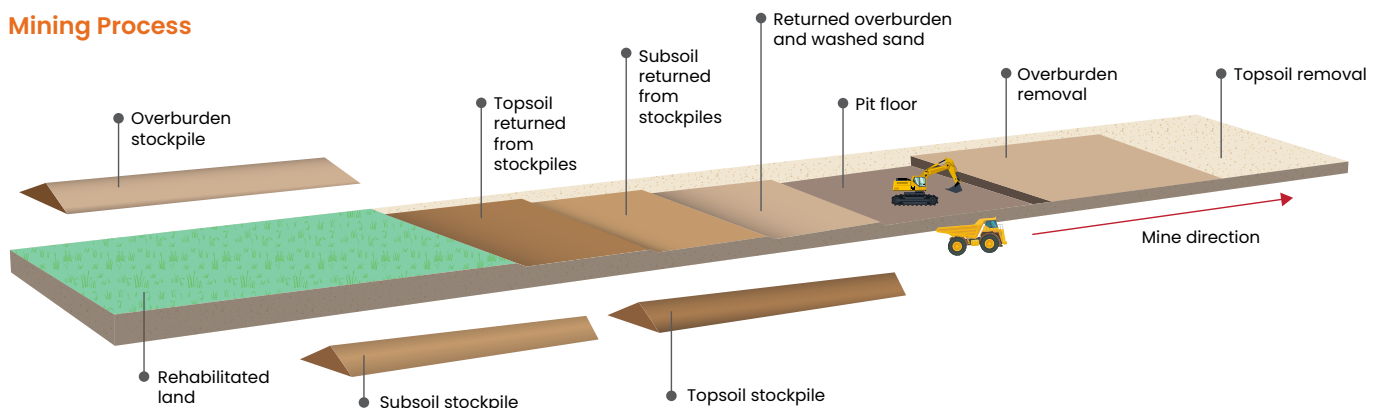


Before rehabilitation



After rehabilitation

Mining Process



Project enquiries
community@murrayzircon.com.au

Employment and supplier enquiries
info@murrayzircon.com.au

MINDARIE MINERAL SANDS PROJECT

Mercunda Strandline

ENVIRONMENTAL MANAGEMENT STRATEGIES

Murray Zircon is committed to undertaking operations in a safe and environmentally sustainable manner by implementing environmental control strategies to reduce our impact on the land in which we operate.

What environmental management strategies will Murray Zircon implement?

As part of our proposed operations, a Program for Environmental Protection and Rehabilitation (PEPR) is being developed. The PEPR will outline potential environmental impacts, and how we propose to manage or reduce these impacts.

The company is committed to ensuring these impacts are minimised to the greatest extent practicable. Initial proposed design and management measures are outlined below.



Flora and Fauna

- Design controls to minimise impacts to native vegetation
- Native vegetation management plan that includes seed stockpiling, watering schedules, Significant Environmental Benefit (SEB)
- Weed controls (i.e. car washing, vehicle inspections), reporting feral animal sightings
- Mine Close and Rehabilitation Plan



Noise and Vibration

- Locating noisy equipment at the greatest practical distance from dwellings
- Equipment maintained and repaired
- Throttled down when not in use



Traffic

- Traffic controls (i.e. signage)
- Road improvements (where needed)
- Liaison with District Council of Karoonda East Murray and DIT regarding traffic management controls and maintenance
- Traffic Management and monitoring Plan



Heritage

- Stop work procedures
- Pre-mining heritage clearance surveys



Community

- Community consultation plan
- Incident and complaints procedures
- Reinstate Murray Mallee Community Consultative Committee (MMCCC) meetings



Visual Amenity

- Reduced height for stockpiles
- Appropriately coloured buildings
- Placement of light equipment to reduce light spill



Air Quality

- Dust management plan
- Stockpile stabilisation techniques
- Water carts for dust suppression
- Waste management plans to reduce odour
- Air Quality and Management and Monitoring Plan



Radiation and asbestiform minerals

- Radiation management plan
- Ongoing radiation monitoring during project development and operations



Surface Water

- Drainage designed as part of construction, site water management and monitoring plan



Groundwater

- Bunding of chemicals, effective plant design to reduce potential of spillage, use of groundwater to be monitored and reported on, recycling of water from plant
- Groundwater extraction will not exceed the volume allocation specified in Murray Zircon's water extraction licence



Topsoil and Subsoil

- Spill containment kits, bunding, visual inspections of soil
- Top Soil and Subsoil Management and Monitoring Plan

MINDARIE MINERAL SANDS PROJECT

Mercunda Strandline

THE PROCESSING CYCLE

The Mercunda strandline will be developed as a 2.6 km long strip mine. The nominal width is for the Mercunda strandline is approximately 200 m. The mine process will advance at an approximate rate of 300 m/month (10 m/day).



The proposed Mindarie mining and processing operation is made up of several areas. These include field preparation in the form of a Mobile Mining Unit (MMU) and Field Screening Unit (FSU), the processing plant area consisting of a collection of modules that are collectively named the Wet Concentrator Plant (WCP), and the Tailings Deposition area. These areas have the primary objective to produce a Heavy Mineral Concentrate (HMC) product at maximum grade and recovery, with the minimum possible water content.



All units located in the field have been designed for frequent moves. The MMU is located on tracks that can be remotely controlled, while the FSU, field pumps, and field process water module are mounted on skids that can be towed by a bulldozer.



The expected sequence at start up is to strip top soil, subsoil and overburden from the first mining block, push ore forwards to make available enough space to construct the first in-void tailings cell.



Ore from a 100m ore block is fed into the slurry unit utilising the dozer push method to blend and homogenise ore feed to the MMU, The Mobile Mining Unit (MMU) is located at the floor of the open pit and is designed to receive the ore at a nominal rate of 750 dry tonnes per hour (with peaks up to 900 t/h).



The field screening unit (FSU) is located close by to the MMU and receives pumped material from the MMU.



Following a screening process, slurry is piped to the WCP which has been designed to treat a nominal 745 dry tonnes per hour (t/h) of ore. The WCP produces the HMC product which is deposited onto the ground into a stockpile and allowed to dry. The dry material is loaded onto trucks and transported to the Port of Adelaide.



The in-pit haul road is required to facilitate as much direct return of overburden material ahead of the mining sequence as possible. This will reduce the overall material being double-handled.



Each tailing cell is designed to contain all returned tailings. Once a tailing cell reaches its full capacity, it will overflow into the next cell. Once this begins the tailings discharge outlet will be relocated to the next cell. Tailings material is made up of coarse sand, desliming cyclone overflow and thickener underflow. These are co-disposed pumped back to the mine void.



The tailing cell will dry for a period of one month in order to become trafficable for overburden backfilling purposes. Direct returned overburden material will cover the dried tailing cell to the required final contour; and as soon as the overburden is contoured and crowned, it will be ready to be rehabilitated with subsoil material followed by topsoil material.

MINDARIE MINERAL SANDS PROJECT

Mercunda Strandline

MINE SITE PLAN

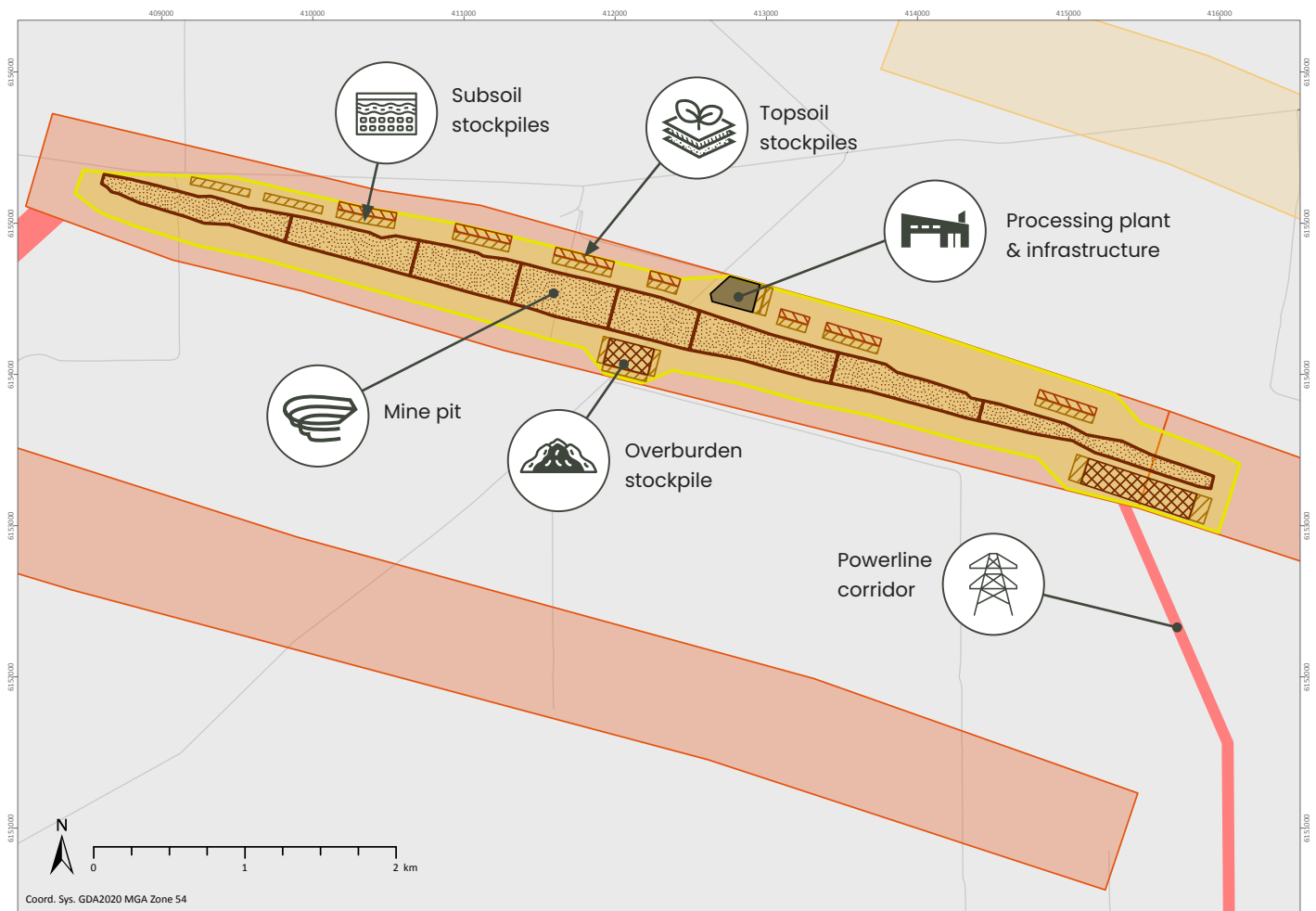
Mine form including contrasting and reflective aspects will be visually softened during construction and operation.

Murray Zircon will develop the Project with construction planned for October 2022 and will include:

- Processing plant and infrastructure
- Construction of haul and access roads
- Laydown areas
- Offices and crib rooms
- Topsoil and subsoil stripping
- A 11kV powerline

Mine life is expected to be 11 months from start to completion.

At completion of mining operations, all non-necessary infrastructure will be removed and areas rehabilitated.



Project Tenement

- Mineral Lease (ML)
- Miscellaneous Purposes Licence (MPL)

Other Tenements

- Mineral Lease (ML) - Previously Mined
- Minor Roads

Mine Layout

- Mine Disturbance Area
- Mine Pit
- Processing Plant & Infrastructure
- Overburden Stockpile
- Subsoil Stockpiles
- Topsoil Stockpiles



Project enquiries
community@murrayzircon.com.au

Employment and supplier enquiries
info@murrayzircon.com.au