



## Industry Regulation fact sheet

# Mineral sands mining or processing

This fact sheet provides guidance on the Department of Water and Environmental Regulation’s (DWER) administration of licences and works approvals for mineral sands mining or processing premises.

Any premises where an activity listed in Schedule 1 of the [Environmental Protection Regulations 1987](#) (EP Regulations) is carried out at, or above, the specified production or design capacity, are prescribed premises and regulated by DWER under Part V of the [Environmental Protection Act 1986](#) (EP Act).

Prescribed premises require a works approval for their construction and will require either a licence or registration to operate.

Mineral sands mining or processing is described in Category 8 of the EP Regulations:

### Category 8: Mineral sands mining or processing

Description of category	Production or design capacity
<b>Category 8</b>	
Mineral sands mining or processing: premises on which mineral sands ore is mined, screened, separated or otherwise processed.	5,000 tonnes or more per year

### Application

#### Interpretation

Mineral sands ore refers to ore that contains titanium dioxide minerals (ilmenite, rutile, and leucoxene), zircon, monazite, staurolite, kyanite and/or garnet. Mineral sands ore is defined with reference to its high specific gravity of greater than 2.85g/cm<sup>3</sup>.

Silica sand, construction sand, lime sand, industrial diamonds, gemstones and gypsum are not considered to be mineral sands ores.

Mineral sands mining and processing can involve a range of activities, beginning with clearing vegetation and ending with the backfilling of mined voids for final rehabilitation.

Mineral sands mining and processing may comprise the following activities:

- clearing large areas of land;
- transporting large volumes of topsoil, overburden, rocks, and sand with earthmoving and mining equipment;
- dewatering, and storage and disposal of dewatering effluent;
- wet (dredging) or dry mining of ore;



- wet or dry concentration of mineral sands ore to produce heavy mineral concentrate (HMC), and sand and clay tailings;
- onsite or offsite secondary processing producing ilmenite, rutile, zircon, leucoxene, monazite, staurolite, kyanite or garnet, and process tailings from HMC;
- onsite disposal of waste generated from offsite mineral sands processing (not including downstream chemical manufacturing); and
- disposal of sand, clay, and ore processing tailings either separately or together into specific containment structures or into mined voids.

### Production/design capacity

The production or design capacity for Category 8: Mineral sands mining or processing is measured in wet tonnes, and is the larger of:

- a) the amount of ore that can be mined; or
- b) the amount of ore that can be processed by the plant and equipment.

'Wet tonnes' is determined with reference to the moisture content of the ore as it is mined or processed.

### Environmental risk

Mineral sands mining and processing involves a risk of causing pollution or environmental harm unless prescribed premises are appropriately regulated and managed. The EP Act sets out a range of offences that specifically relate to occupiers of prescribed premises, in addition to general offences relating to pollution and environmental harm. For further information on these offences, refer to DWER's *Industry Regulation Guide to Licensing* and the EP Act.

Emissions and discharges from the mining and processing of mineral sands ore can include:

- noise from fixed and mobile plants and vehicles;
- dust from open areas and material handling operations;
- point source dust from ore processing;
- point source discharge of dewatering and ore processing wastewater;
- contaminated stormwater;
- disposal of solid wastes (sand, clay, ore processing tailings); and
- seepage to groundwater from solid waste containment or disposal locations.

Mineral sands mining or processing premises may also disturb or generate acid sulfate soils, and the propensity to involve acid sulfate soils will form part of DWER's assessment.

### Naturally occurring radiological material

Mineral sands mining and processing may result in the concentration of Naturally Occurring Radiological Material (NORM). This can produce radiological risks.

The management of radiological risks from NORM is undertaken jointly by the Department of Mines, Industry Regulation and Safety (DMIRS) and the Radiological Council of Western Australia (RCWA). DWER defers the management of risks from NORM to these government agencies.



## Monitoring

Monitoring of ambient noise and dust levels may be required where there is a risk of impacts from mine operations on sensitive receptors. Where receptors are within close proximity and the determined risk of impact is high, continuous monitoring may be required in order to demonstrate compliance with prescribed standards and provide assurance of the effectiveness of noise and dust management at the site.

Monitoring of groundwater levels and quality may also be required where there is a risk of groundwater mounding and/or contamination from seepage of residues from deposited mine tailings. Monitoring of groundwater quality (pH, total dissolved solids, total acidity, total alkalinity and so on) may also be required where there is a risk of direct and/or indirect disturbance of acid sulfate soils.

The volume and quality of waste discharged onto land or waters, including tailings, may require monitoring to demonstrate the quality of the discharge is environmentally acceptable and determine the annual discharge fee payable. Pollutants monitored can include, but are not limited to, total dissolved solids, total suspended solids, total titratable acidity, and sulfate.

## Assessment

DWER applies a risk-based approach to its regulatory functions under the *EP Act*. DWER's publications [Guidance statement: Decision-making](#) and [Guidance statement: Risk assessments](#), detail the approach taken by DWER in assessing applications for works approvals and licences under Part V of the *EP Act*.

In assessing applications for works approvals and licences for Category 8 premises, DWER will:

- have regard to emission management and contingency measures implemented by the operator;
- consider as 'tailings' the onsite disposal of waste, including sand tailings, clay tailings, co-disposed sand and clay mixtures, ore processing wastes, and ancillary wastes generated onsite or offsite;
- assess the disposal of tailings into mining voids as a component of mineral sands mining and processing;
- defer the regulation of radiological impacts to DMIRS and RCWA;
- consider that mineral sands mining or processing commences at the point of overburden removal, after vegetation and topsoil have been cleared;
- consider that mineral sands mining or processing is complete when the mined voids achieve the landform state defined in the approved Mine Closure Plan; and
- not assess the reinstatement of topsoil and rehabilitation of vegetation as part of mineral sands mining or processing.

If waste has arisen from past contamination as a result of historic waste management practices, DWER will consider the disposal of small quantities of waste into mined voids – including radiologically contaminated material from other mineral sands ore processing premises – to be a component of mineral sands mining or processing. This small scale waste disposal will not be considered as a separate prescribed premises category.

Where a prescribed premises has been assessed by the Environmental Protection Authority as a 'significant proposal' and is subject to a Ministerial Statement granted under Part IV of



the EP Act, the conditions of a works approval or licence granted under Part V must not be contrary to the conditions of the Ministerial Statement.

### Other prescribed premises categories that may be relevant

The following activities may constitute a separate prescribed premises category:

- dewatering 50,000 tonnes or more of mineral sands orebody per year (Category 6: Mine dewatering);
- further processing of 100 tonnes or more of ilmenite, rutile and other mineral sands products, for example the production of titanium dioxide or synthetic rutile (Category 31: Chemical manufacturing);
- electric power generation facilities of 20 MW or more (natural gas) or 10 MW or more (for fuel other than natural gas) on remote locations (Category 52); and
- mining accommodation camp facilities, including wastewater treatment plants of 100m<sup>3</sup> per day (Category 54) or more than 20m<sup>3</sup> but less than 100m<sup>3</sup> per day (Category 85) and putrescible landfills of 20 tonnes per year (Category 64) or more than 20 but less than 5000 tonnes per year (Category 89).

Please refer to the relevant fact sheets for further information on these categories.

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### More Information

For further information, please contact DWER Regulatory Services (Environment) on 6364 7000. For advice on NORM please contact DMIRS on 9222 3333 or RCWA on 9382 0701.

This document is available in alternative formats and languages on request.

Additional publications about Industry Regulation are available online at [www.der.wa.gov.au/our-work/licences-and-works-approvals/publications](http://www.der.wa.gov.au/our-work/licences-and-works-approvals/publications) or can be requested by phoning 6364 7000.

### Legislation

This document is provided for guidance only. It should not be relied upon to address every aspect of the relevant legislation. Please refer to the State Law Publisher (SLP) for copies of the relevant legislation, available electronically from the SLP website at [www.slp.wa.gov.au](http://www.slp.wa.gov.au).

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