



## Application for Licence Amendment

### Part V Division 3 of the *Environmental Protection Act 1986*

---

<b>Licence Number</b>	L8739/2013/1
<b>Licence Holder</b>	Cable Sands (W.A.) Pty Ltd
<b>ACN</b>	009 137 142
<b>File Number</b>	DER2014/000656-1
<b>Premises</b>	Wonnerup Mineral Sands Mine 109 Sues Rd YALYALUP WA 6280  Being Lot 100 on Deposited Plan 65306, Mining Lease M70/360 and M70/569 and part of Miscellaneous Licences L70/159 and L70/161, as depicted in Schedule 1 of the revised licence
<b>Date of Report</b>	4 March 2022
<b>Decision</b>	Revised licence granted

**A/MANAGER, RESOURCE INDUSTRIES  
REGULATORY SERVICES**

*An officer delegated by the CEO under section 20 of the EP Act*

## Table of Contents

<b>1. Decision summary</b>	<b>3</b>
<b>2. Scope of assessment</b>	<b>3</b>
2.1 Regulatory framework	3
2.2 Application summary	3
2.2.1 Expansion of mining area – Wonnerup North Stage 2 Phase B	3
2.3 Other Approvals	6
2.3.1 Part IV of the EP Act	6
2.3.2 Part V, Division 2 of the EP Act	6
2.3.3 Environment Protection Biodiversity Conservation Act 1999 (Commonwealth)	6
<b>3. Prevailing wind data</b>	<b>6</b>
<b>4. Risk assessment</b>	<b>7</b>
4.1 Source-pathways and receptors	7
4.1.1 Emissions and controls	7
4.1.2 Receptors	8
4.2 Risk ratings	11
4.3 Detailed risk assessment for dust impact to residential receptors (both construction and mining)	14
4.4 Detailed risk assessment for noise amenity impact to residential receptors (construction and operation)	16
<b>5. Consultation</b>	<b>19</b>
<b>6. Conclusion</b>	<b>19</b>
6.1 Summary of amendments	19
<b>References</b>	<b>20</b>
<b>Appendix 1: Summary of Licence Holder’s comments on risk assessment and draft conditions</b>	<b>21</b>
<b>Appendix 2: Application validation summary</b>	<b>22</b>

Table 1: Proposed changes associated with the Wonnerup North Stage 2 Phase B expansion	4
Table 2: Additional changes initiated by DWER	5
Table 3: Licence Holder controls	7
Table 4: Sensitive human and environmental receptors and distance from prescribed activity	8
Table 5: Risk assessment of potential emissions and discharges from the Premises during construction and operation	12
Table 6: Consultation	19
Table 7: Summary of licence amendments	19

Figure 1: Location of expansions for Wonnerup North Stage 2; this amendment relates to Phase B .....	5
Figure 2: Annual wind rose for Busselton Aerodrome (site no 009603), approximately 7km from Wonnerup at (a) 9am and (b) 3pm .....	6
Figure 3: Distance to residential receptors .....	10
Figure 4: Dust deposition dust data from AN8 .....	16
Figure 5: Schematic representation of the progression of mine voids.....	18

# 1. Decision summary

Licence L8739/2013/1 is held by Cable Sands (WA) Pty Ltd (Licence Holder) for the Wonnerup Mineral Sands Mine (the Premises), located at Lot 100 on Plan 65306, Mining Leases M70/360 and M70/569 (added this amendment), and part of Miscellaneous Licence L70/161 (transport corridor), as depicted in Schedule 1 of the Revised Licence. The Licence Holder is a wholly owned subsidiary of Tronox.

This Amendment Report documents the assessment of potential risks to the environment and public health from proposed changes to the emissions and discharges during the construction and operation of the Premises. As a result of this assessment, Revised L8739/2013/1 has been granted.

The Revised Licence issued as a result of this amendment consolidates and supersedes the existing Licence previously granted in relation to the Premises.

## 2. Scope of assessment

### 2.1 Regulatory framework

In completing the assessment documented in this Amendment Report, the department has considered and given due regard to its Regulatory Framework and relevant policy documents which are available at <https://dwer.wa.gov.au/regulatory-documents>.

### 2.2 Application summary

On 21 October 2021, the Licence Holder applied to the department to amend Licence L8739/2013/1 under section 59 and 59B of the *Environmental Protection Act 1986* (EP Act). The amendment is sought to expand the active mining area. There is no change in throughput proposed, as previous mining areas are progressively being completed and rehabilitated.

#### 2.2.1 Expansion of mining area – Wonnerup North Stage 2 Phase B

Mining is currently being undertaken on Wonnerup North Stage 2 Phase A (on M70/569), and post-mining rehabilitation activities on the Wonnerup site (Lot 100) and Wonnerup North Stage 1 (on M70/360). The Licence Holder proposes to expand active mining on M7/360 and M70/569 to the north of the Abba River as shown in Figure 1 (Wonnerup North stage 2 Phase B).

The Licence Holder proposes to expand active mining to the north of the Abba River, to be known as Wonnerup North stage 2 Phase B (referred to hereafter just as Phase B). Mined ore will be piped in slurry form to the existing processing plant, as per the existing mining operations. An engineered crossing of the Abba River is proposed to be constructed to facilitate this.

The design of this crossing has been assessed and approved by the Australian Government Department of Agriculture, Water and the Environment (DAWE), under the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) approval 2014/7205. (DAWE 2021).

Construction and operation activities are outlined below.

#### Construction

- Initial vegetation clearing and topsoil stripping and stockpiling, up to 3 months ahead of mining;
- formation of topsoil stockpiles into boundary noise walls;

- Initial internal noise walls/ barriers installed within 100m of the mining unit (primary screening plant);
- Installation of new noise monitoring station AN7;
- Allocation of dust monitoring stations AQ9-AQ10 for placement of portable monitoring equipment;
- construction of new solar evaporation ponds in mine voids; and
- Installation of Abba River services corridor river crossing.

### Operations

- extraction of mineral sands ore using conventional dry mining equipment (dozers and loaders);
- backfilling of sand residues (i.e. clay fines, sand tailings, coarse rejects (oversize), and tailings returned from off-site secondary processing) following mineral processing to solar evaporation ponds in either the active mining area (behind the advancing ore extraction area) or constructed above ground;
- subsequent clearing and topsoil stockpiling as mining progresses through the initially cleared area;
- each time the mining unit is moved, the internal ore and external topsoil bunds are extended to 100m beyond the mining unit;
- progressive rehabilitation behind the advancing mining operation; and
- discharge of surplus mine water at existing discharge points, and new discharge point W3 on the Abba River.

Clearing and topsoil stripping will be undertaken progressively. This is both due to conditions of clearing permit CPS 8046/1 and to minimise the amount of farming land out of action at any given time. Clearing will be ongoing during operations, approximately 6-8 weeks (100m) ahead of the mining front. It is therefore considered for the current assessment that although initial works constitute part of the construction phase for this approval, ongoing clearing, stripping, and construction of noise bunds are considered to be operational phase activities.

Processing of mined ore will occur at the existing Wonnerup Plant. Dewatering is expected to be required at some times during mining of Wonnerup North and will be added to the existing site process water circuit. Where water generated on site exceeds usage requirements for processing and dust control, excess water is currently discharged at W1 on the Sabina River and W2 on the Abba River. As the current and proposed mining areas are further up the Abba River catchment, the Licence Holder has requested to add an additional mine water discharge point W3.

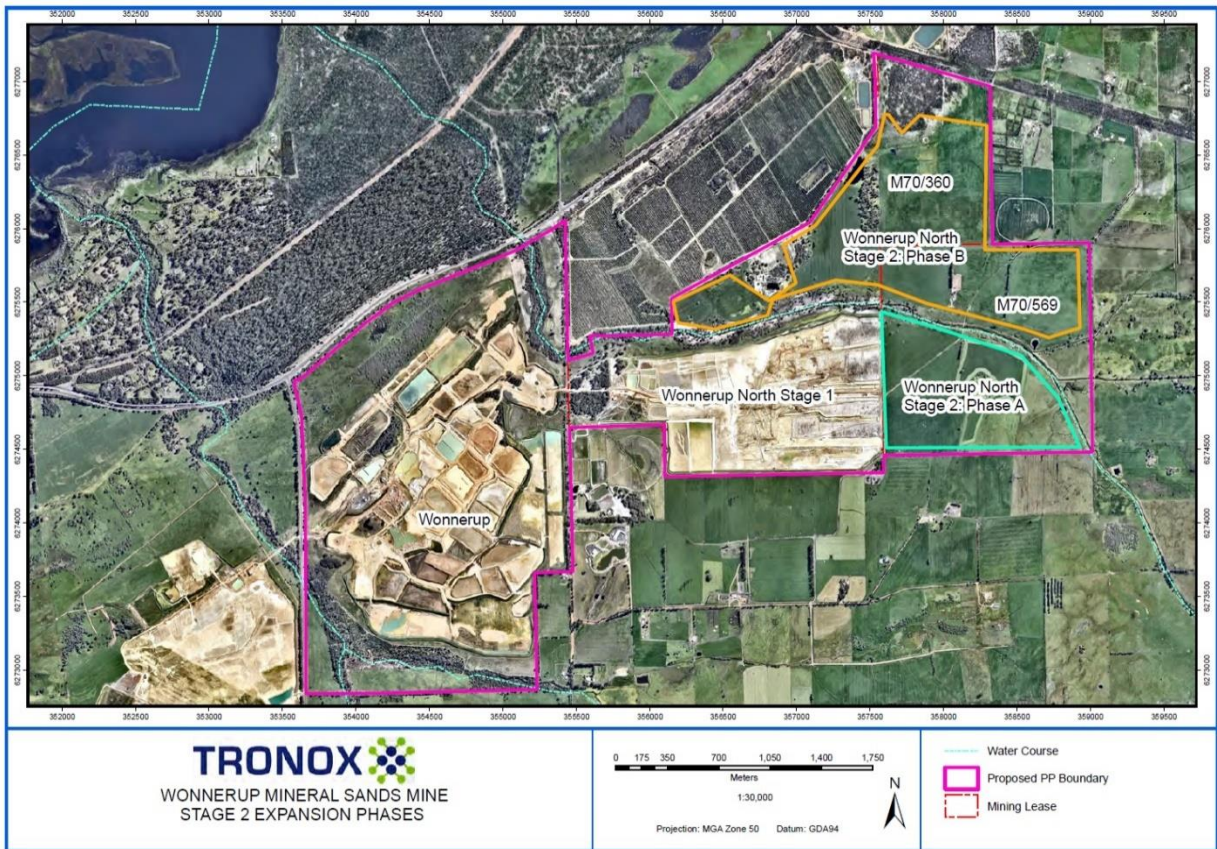
There are a number of proposed licence changes associated with this mining area expansion, as outlined in Table 1.

**Table 1: Proposed changes associated with the Wonnerup North Stage 2 Phase B expansion**

Operational aspect	Licence amendment requested
Construction of extension Infrastructure	Amend to allow for construction of new noise walls, and a services corridor river crossing.
Noise and dust monitoring sites	Amend to include new noise and dust monitoring sites commensurate with the risks of the extension area.  The Delegated Officer considers that any noise and dust emissions associated with the installation of these monitoring points will be short term and negligible, therefore will not be considered further in this assessment.

Solar evaporation ponds

Amend to authorise new solar evaporation ponds (mine voids where tailings sands and clays are deposited) in the extension area



**Figure 1: Location of expansions for Wonnerup North Stage 2; this amendment relates to Phase B**

**Table 2: Additional changes initiated by DWER**

Condition	Change made and reason
2.2.3	Remove. Condition is redundant due to the upgrade of emission point W2. Compliance report (DWERDT432768) was received on 26 March 2021. This was assessed and a response provided on 10 May 2021 (A2005342) that it is satisfactory.
1.2.7-1.2.8	Removal of conditions relating to commissioning. There is no environmental commissioning required to move from the construction phase to the operations phase, therefore these conditions are redundant. It is noted that these conditions were introduced in Amendment Notice 1, but no commissioning activities were identified or assessed.
1.2.9 renumbered as 1.2.7	Due to the deletion above.
2.4.2 and 3.4.1	AQ4 removed. This monitoring point was removed in an amendment issued 2 November 2020, but added back by administrative error in a subsequent amendment (5 March 2021)

## 2.3 Other Approvals

### 2.3.1 Part IV of the EP Act

The Wonnerup North extension was referred to the EPA for assessment. The decision made was Not Assessed - Public Advice Given (EPA 2014).

### 2.3.2 Part V, Division 2 of the EP Act

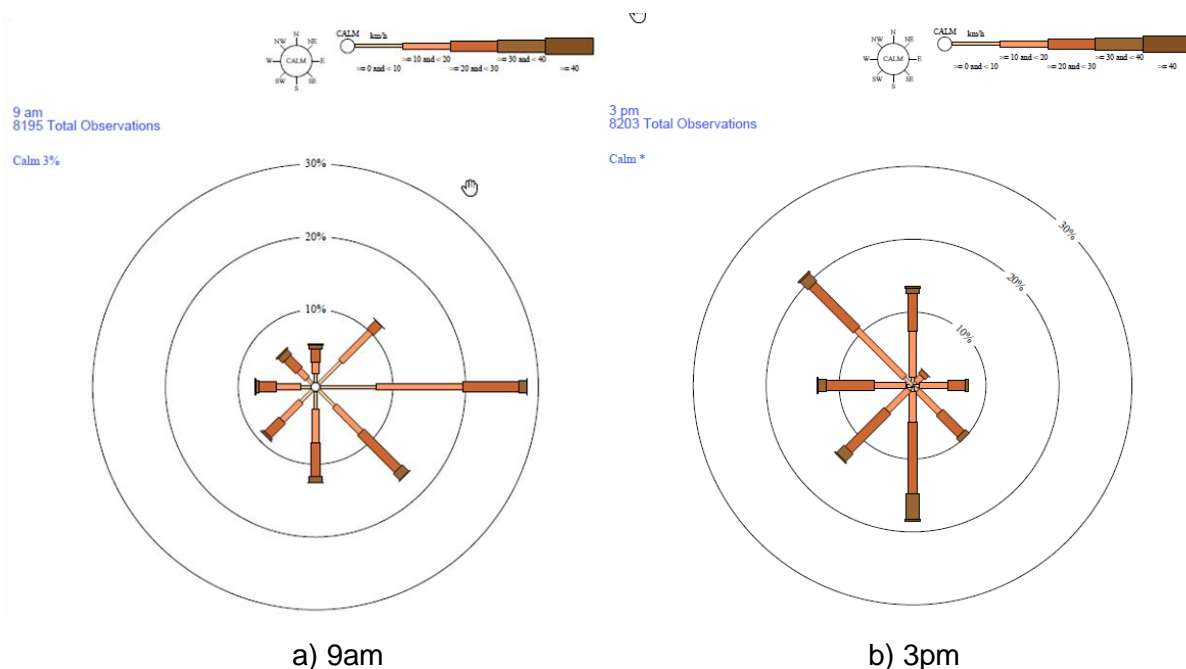
Clearing permit CPS 8046/1 has been issued for the Wonnerup North Stage 2 area.

### 2.3.3 Environment Protection Biodiversity Conservation Act 1999 (Commonwealth)

The Wonnerup North Project was assessed under the *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC 2014/7205). The relevant Controlling Provisions are wetlands of international importance (Vasse Wonnerup system) and listed threatened species and communities (Black cockatoos and Western Ring-tail Possum). The approval includes conditions relating to the construction of service corridors across the Abba River, vegetation retention areas buffering the Abba River, management plans for water and acid sulphate soils, biodiversity offset areas, dieback management

## 3. Prevailing wind data

Figure 2 shows the prevailing wind direction at the Busselton Aerodrome (site no 009603), approximately 7km from the premises. Winds are mostly easterly at 9am (Figure 2A), which means that nearby residences are predominantly upwind of the proposed operations. At 3pm (Figure 2B), wind direction varies more throughout the year and tends to be more southerly to north-westerly.



**Figure 2: Annual wind rose for Busselton Aerodrome (site no 009603), approximately 7km from Wonnerup at (a) 9am and (b) 3pm**

## 4. Risk assessment

The department assesses the risks of emissions from prescribed premises and identifies the potential source, pathway and impact to receptors in accordance with the *Guidance Statement: Risk Assessments* (DER 2017).

To establish a Risk Event there must be an emission, a receptor which may be exposed to that emission through an identified actual or likely pathway, and a potential adverse effect to the receptor from exposure to that emission.

### 4.1 Source-pathways and receptors

#### 4.1.1 Emissions and controls

The key emissions and associated actual or likely pathway during premises construction and operation which have been considered in this Amendment Report are detailed in Table 3 below. Table 3 also details the proposed control measures the Licence Holder has proposed to assist in controlling these emissions, where necessary.

**Table 3: Licence Holder controls**

Emission	Sources	Potential pathways	Proposed controls
Dust	Earthmoving, vehicle movements	Air/windborne pathway	As per existing licence
Noise	Mining	Air/windborne pathway	As per existing licence Mufflers/noise screens, limited operations after hours, shutdown in response to real time monitoring Installation of noise attenuation walls/bunds constructed out of ore (internal) and stripped topsoil (boundary)
Contaminated runoff	Contaminated stormwater from operational areas	Surface runoff to Abba River	Allocation of existing upstream and downstream surface water quality monitoring sites to provide comparison No mining activities in Abba River, and approval 2014/7205 under the EPBC Act stipulates a vegetation retention zone providing a buffer around the Abba River. Runoff on site contained and retained as process water. Discharge of excess regulated under existing licence conditions.
Increased sediment	Mining Construction of river crossing	Abba River	River crossing 2 has been assessed and approved by the Australian Government Department of Agriculture Water and the Environment, as required by approval 2014/7205 under the EPBC Act. This assesses changes to sediment in the Abba River, as this may impact the downstream Vasse-Wonnerup wetlands. The above approval prohibits mining within 50 m of the river banks.



Emission	Sources	Potential pathways	Proposed controls
Seepage	Sand and clay tailings disposed in mine voids	Seepage through floor of voids	Sand and clay tailings (consisting principally of silica sand) to be returned to the mine void will have undergone wet separation only and are unlikely to contain contaminants.  Seepage is unlikely to cause significant mounding, as it will be offset by mine dewatering where groundwater is shallow. Monitoring is conducted in accordance with the Wonnerup Groundwater Operating Strategy.
Process water	Overflow of solar evaporation ponds	Overflow to surface water	Solar evaporation ponds are designed with weir boxes to capture supernatant water for recycling within the mine water circuit, so as to not allow overtopping.
Mine water	Mine dewatering to access ore	Discharged to Abba River	Preferentially used on site as process water and for dust suppression. Discharge only occurs when process water circuit is at capacity.  Water quality criteria as per existing licence.

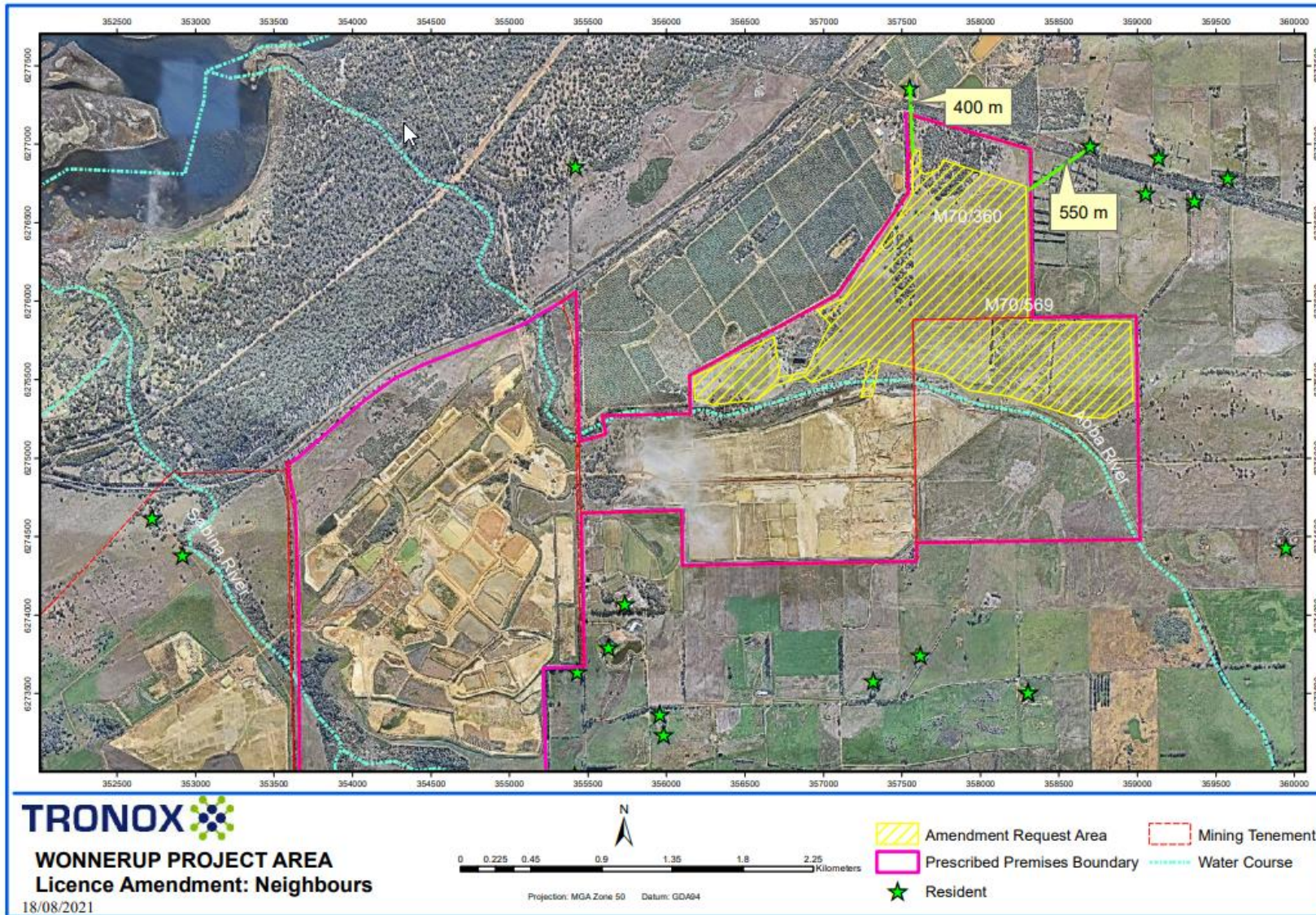
#### 4.1.2 Receptors

In accordance with the *Guidance Statement: Risk Assessment* (DER 2017), the Delegated Officer has excluded employees, visitors and contractors of the Licence Holder from its assessment. Protection of these parties often involves different exposure risks and prevention strategies, and is provided for under other state legislation. Table 4 below provides a summary of potential human and environmental receptors that may be impacted as a result of activities upon or emission and discharges from the prescribed premises (*Guidance Statement: Environmental Siting* (DER 2016)).

**Table 4: Sensitive human and environmental receptors and distance from prescribed activity**

Human receptors	Distance from prescribed activity
Residential Premises (farm houses)	Shown in Figure 3. The closest of which are: <ul style="list-style-type: none"> <li>• 400m North of Phase B mining area</li> <li>• 550 North East of Phase B mining area</li> <li>• 1.5km south of Phase B mining area (700m south of already approved phase A)</li> </ul>
Environmental receptors	Distance from prescribed activity
Underlying groundwater (potable)	Underlying the premises
Avocado farm	Along the north west boundary of Wonnerup North Stage 2 phase B
Threatened or Priority Fauna	Black Cockatoo, Western Ringtail Possum

Abba River	<p>Within boundary. However EPBC 2014/7205 prohibits mining within 50 m of the river banks.</p> <p>Premises is located within the Abba River surface water catchment, with the river flowing from south east to north west along the top of phases A. The river is ephemeral in nature, with flow predominantly taking place in winter.</p>
Vasse-Wonnerup wetlands	Approximately 2km downstream of the Premises. Listed under the RAMSAR convention as a wetland of international importance (as migratory bird habitat).
Ruabon Road Reserve (contains PEC, TEC and rare flora)	200m buffer applied in clearing permit.
Potential acid sulphate soils	Within boundary



**Figure 3: Distance to residential receptors**

Licence: L8739/2013/1

IR-T15 Amendment Report Template v2.0 (July 2020)

## 4.2 Risk ratings

Risk ratings have been assessed in accordance with the *Guidance Statement: Risk Assessments* (DER 2017) for those emission sources which are proposed to change and takes into account potential source-pathway and receptor linkages as identified in Section 4.1. Where linkages are in-complete they have not been considered further in the risk assessment.

Where the Licence Holder has proposed mitigation measures/controls (as detailed in Section 4.1), these have been considered when determining the final risk rating. Where the Delegated Officer considers the Licence Holder's proposed controls to be critical to maintaining an acceptable level of risk, these will be incorporated into the licence as regulatory controls.

Additional regulatory controls may be imposed where the Licence Holder's controls are not deemed sufficient. Where this is the case the need for additional controls will be documented and justified in Table 5.

The Revised Licence L8739/2013/1 that accompanies this Amendment Report authorises emissions associated with the operation of the Premises i.e. mineral sands mining. There is no change to mineral sands processing in this amendment.

The conditions in the Revised Licence have been determined in accordance with *Guidance Statement: Setting Conditions* (DER 2015).

**Table 5: Risk assessment of potential emissions and discharges from the Premises during construction and operation**

Risk Event					Risk rating <sup>1</sup> C = consequence L = likelihood	Licence Holder's controls sufficient?	Conditions <sup>2</sup> of licence	Justification for additional regulatory controls
Source/Activities	Potential emission	Potential pathways and impact	Receptors	Licence Holder's controls				
<b>Construction</b>								
Topsoil and overburden stripping and stockpiling, including construction of initial noise bunds	Dust	Air/windborne pathway causing impacts to health and amenity	Residences as shown in Figure 3. The closest of which are 400m North and 550 North East of Phase B mining area	Refer to Section 4.1.1	C = Moderate L = Possible <b>Medium Risk</b>	Y – but modifications required to monitoring	Existing conditions <ul style="list-style-type: none"> <li>2.4.3 – dust management plan (updated)</li> <li>3.4.1 – dust monitoring and limits/targets</li> <li>1.2.5 – construction of new dust monitoring site AQ9-10</li> </ul> Monitoring - <b>AQ9-10 added to 3.4.1</b> and Maps. Dust deposition added at AQ7	See section 4.3 for why monitoring frequency differs from applicant proposal.
	Noise	Air/windborne pathway causing impacts to amenity			C = Minor L = Possible <b>Medium Risk</b>	Y	Existing conditions (expanded to apply to Wonnerup North Stage 2 Phase B) <ul style="list-style-type: none"> <li>1.2.5 - works, infrastructure and equipment requirements (new monitoring site AN7). AN8 already constructed.</li> <li>1.2.6 - hours of operation</li> <li>2.5.1 - operational noise controls</li> </ul> Monitoring – AN7-8 added to 3.4.1 and Maps.	Proponent controls conditioned
<b>Operation</b>								
Mining and in-pit screening of ore	Dust	Air/windborne pathway causing impacts to health and amenity	Residences as shown in Figure 3. The closest of which are 400m North and 550 North East of Phase B mining area	Refer to Section 4.1.1	C = Moderate L = Possible <b>Medium Risk</b>	Y – but modifications required to monitoring	Existing conditions <ul style="list-style-type: none"> <li>2.4.3 – dust management plan (updated)</li> <li>3.4.1 – dust monitoring and limits/targets</li> <li>1.2.5 – construction of new dust monitoring site AQ9-10</li> </ul> Monitoring - <b>AQ9-10 added to 3.4.1</b> and Maps. Dust deposition added at AQ7	See section 4.3 for why monitoring frequency differs from applicant proposal.
	Noise	Airborne pathway causing impacts to amenity			C = Moderate L = Possible <b>Medium Risk</b>	Y	Existing conditions (expanded to apply to Wonnerup North Stage 2 Phase B) <ul style="list-style-type: none"> <li>1.2.5 - works, infrastructure and equipment requirements (new monitoring site AN7). AN8 already constructed.</li> <li>1.2.6 - hours of operation</li> <li>2.5.1 - operational noise controls</li> </ul> Monitoring – AN7-8 added to 3.4.1 and Maps.	Proponent controls conditioned

Risk Event					Risk rating <sup>1</sup> C = consequence L = likelihood	Licence Holder's controls sufficient?	Conditions <sup>2</sup> of licence	Justification for additional regulatory controls
Source/Activities	Potential emission	Potential pathways and impact	Receptors	Licence Holder's controls				
	Contaminated stormwater runoff	Runoff to Abba River; Wonnerup Wetlands	Abba River; Wonnerup Wetlands	Refer to Section 4.1.1	C = Minor L = Unlikely <b>Medium Risk</b>	Y	EPBC 2014/7205 prohibits mining within 50 m of the river banks.	NA
	Oxidation of Acid Sulphate Soils from physical disturbance of ASS material	Leachate to groundwater; discharge of acidic water to Abba or Sabina Rivers	Groundwater, groundwater dependent vegetation, Abba and Sabina Rivers	As per existing Licence	C = Moderate L = Possible <b>Medium Risk</b>	Y	<ul style="list-style-type: none"> <li>Existing condition 1.3.4 - Acid sulphate soils management plan</li> <li>Existing condition 2.2.2 - criteria for point source emissions to surface water</li> </ul>	NA
Transport of slurried ore to the WCP via pipeline; or tailings from the WCP to disposal points	Rupture of pipeline causing slurry discharge to land or water	Direct discharge leading to smothering or contamination	Abba River, Remnant vegetation	As per existing Licence	C = Moderate L = Possible <b>Medium Risk</b>	Y	<ul style="list-style-type: none"> <li>Existing condition 1.2.5 - initial pipeline construction</li> <li>Existing condition 1.3.2 - inspections</li> <li>Existing condition 1.3.5 - ongoing pipeline construction during operations</li> </ul>	Crossing approved under EPBC Act, so not reassessed.
Disposal of sand and clay tailings (solar evaporation ponds in mine voids; generally below ground level but may be above ground)	Seepage of water entrained within tailings to groundwater	Seepage to groundwater, causing contamination or mounding	Groundwater, groundwater dependent vegetation	Refer to Section 4.1.1	C = Minor L = Unlikely <b>Medium Risk</b>	Y	<ul style="list-style-type: none"> <li>Existing condition 2.3.1. – approved location</li> <li>Existing condition 1.3.1 – pond construction</li> </ul>	NA
	Overtopping/ breach of containment causing discharge to land or waters	Direct discharge to vegetation, run off to surface waters	Vegetation, Abba River	Refer to Section 4.1.1	C = Minor L = Rare <b>Low Risk</b>	Y	<p>Existing conditions</p> <ul style="list-style-type: none"> <li>1.3.1 – minimum freeboard, overflow to process water pond</li> <li>1.3.2 – inspections for freeboard</li> </ul>	NA

Note 1: Consequence ratings, likelihood ratings and risk descriptions are detailed in the *Guidance Statement: Risk Assessments* (DER 2017).

Note 2: Proposed Licence Holder's controls are depicted by standard text. **Bold and underline text** depicts additional regulatory controls imposed by department.

### 4.3 Detailed risk assessment for dust impact to residential receptors (both construction and mining)

Construction and mining activities are likely to result in increased ambient dust within and around the mining areas. Dust exposure of personnel on site is an occupational health matter, and outside the scope of this assessment. Impacts of dust deposition on remnant native vegetation are likely to be minor. There is a commercial avocado orchard along the northwest boundary of the Phase B area, and the Licence Holder reports that the operator has some concerns about dust impacting the productivity of the avocado trees. A stakeholder letter was sent by DWER to the orchard manager to advise of this works approval application, but no comments were received.

Nearby residences are key receptors for dust emissions. Residents could be impacted by reduced amenity (visible dust, deposition on domestic surfaces) or respiratory health impacts.

Condition 2.4.3 of the existing licence L8739/2013/1 specifies several dust management controls. The Licence Holder has a mature Air Quality Management Plan, which has recently been updated. DWER has no record of previous dust complaints associated with the Wonnerup mineral sands mine. Existing dust management practices appear reasonable and working satisfactorily to date.

Fugitive dust emission modelling was provided as part of the Phase B application. This indicated that PM<sub>10</sub> levels may sometimes exceed 50µg/m<sup>3</sup> at the premises boundary but are unlikely to exceed this level at receptors. DWER emissions modelling specialists identified several concerns around the methodology of the modelling, but also advised that modelling for fugitive dust has significant inherent limitations that mean further investment into refinement of the model is likely not justified. The Delegated Officer considers that changes to the model are unlikely to change the assessed risk in this case. Therefore no refinement of the modelling is required.

The locations of the closest residences are shown in Figure 3. The Licence Holder proposes two new dust monitoring sites (AQ9 and AQ10) for the phase B mining area.

The Delegated Officer considers that given the existing licence conditions, it is **Possible** that there could be **Moderate** health or amenity impacts to receptors, due to mining associated dust. This gives a risk rating of **Medium**.

The Delegated Officer considers that existing controls on the licence are adequate to control the risk of amenity and human health impacts associated with dust, in conjunction with appropriate dust monitoring to inform management actions. Monitoring at AQ1 – AQ3, AQ5 – AQ6 and AQ8 have not been reviewed in this amendment, as they relate more closely to areas previously assessed and the amendment application did not include review of these. AQ4 has previously been removed (see Table 2). AQ5, AQ6 and AQ8 do give data relevant to receptors to the south, but Phase B will have less potential impact on these receptors than Wonnerup North Stage 1 and Wonnerup North Stage 2 Phase B (previously assessed), so it is not necessary to review monitoring frequency at these points in this assessment.

#### Human health:

The concentration of particulate matter 10 micrometres or less in diameter (PM<sub>10</sub>) correlates with likely impacts to human health. The Delegated Officer has considered the location of receptors with respect to the proposed mining area, in conjunction with the wind data in section 3. AQ9 is close to residences to the north east of the premises, and for much of the Phase B area will lie between operations and these receptors. Therefore continuous PM<sub>10</sub> monitoring is recommended at AQ9 throughout Phase B to provide a real-time indication of respirable dust travelling toward these receptors. When mining or earthmoving occurs within Phase B on M70/569, AQ9 alone may not be indicative of dust to residences so continuous monitoring at AQ10 will also be required. AQ7 does not require PM<sub>10</sub> monitoring as there are

no nearby residences in that direction.

There is one additional residential receptor directly north of the premises. This is farm worker accommodation rather than a permanent residence, but is still a receptor for this assessment. Although slightly closer than the receptors to the north east, this premises is screened by vegetation. Clearing Permit 8046/1 specifies this as outside the approved area of clearing, and gives rehabilitation objectives for this area. It is anticipated therefore that there will be less dust impacts to this residence than those to the north east, and with the dust management practices in place the Delegated Officer considers that additional monitoring to the north specifically for this residence is not justified at this stage. The Licence Holder advises that an amenity agreement with this landholder is close to finalisation.

A target of  $50 \mu\text{g}/\text{m}^3$  (24-hour average) will be used at all sites for  $\text{PM}_{10}$ . This is based on the *National Environmental Protection (Ambient Air Quality) Measure* (NEPM). However it is noted that the NEPM applies at receptors, so an exceedance at the boundary does not imply a breach of the NEPM at receptors. It is purely a trigger level to review management practices and implement corrective actions to mitigate dust emissions from operations. DWER recommends that the Licence Holder develop internal triggers for shorter periods (e.g. 15min - 1 hour) that prompt internal investigation and management response to avoid exceedance of the 24 hour target.

#### Amenity:

DWER internal technical advice states that dust deposition monitoring is appropriate for the assessment of amenity impacts. It is also expected that any impact to avocado productivity would correlate with dust deposition rates. Monthly dust deposition monitoring will therefore be required at AQ7, AQ9 and AQ10.

The *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales (2016)* recommends a limit of not more than  $4\text{g}/\text{m}^3/\text{month}$ , and not more than  $2\text{g}/\text{m}^3/\text{month}$  above background levels. Unfortunately there is no background data at the northern premises boundary or receptors, and due to the imminent start of mining, there will not be opportunity to obtain such data. The only available dust deposition data on or near the premises is less than a year of data from AQ8 (dry season only), shown in Figure 4. The Delegated Officer notes that this data shows dust in excess of  $4\text{g}/\text{m}^3/\text{month}$  in some months, when mining is not yet close to that monitoring point. Agricultural activities can generate significant dust, and AQ8 is in the middle of an active dairy farm. The Licence Holder suggests that April / May is likely to coincide with seeding and fertilising and October with cutting hay. All existing and proposed monitoring points are also in or adjacent to agricultural areas. It is therefore difficult to determine the contribution of mine dust to total depositions.



Dust Deposition AS 3580.10.1			
		Total Solids*	Total Solids
		MG	G/M2/MTH
EQL		0.1	0.1

Field ID	Date		
WODu08	26/03/2021*	170	4.3
WODu08	24/05/2021	140	4.5
WODU08	29/10/2021	92	3.7
WODU08	29/11/2021	34	2.7
WODU08	29/12/2021	24	1.4
WODU08	27/01/2022	29	1.8

\* First jar was combined March / April as left out for two months.

**Figure 4: Dust deposition dust data from AN8**

Given the lack of reliable background data, the Delegated Officer will set a target of 4g/m<sup>3</sup>/month to trigger investigation and reporting. It is noted however that this target may not always be achievable due to influences outside the premises. Reporting and assessment of trends should consider changes over time as mining/earthmoving proximity to the monitoring point changes, as well as external influences that may influence dust deposition rates.

Amenity impacts are highly subjective and will be heavily influenced by expectations and experience of living in a rural area and the presence of amenity agreements. Although TSP monitoring could be used at the premises boundary to provide real-time feedback on dust levels, there are no established limits applicable. The Delegated Officer considers that as dust composition is unlikely to vary significantly with time, the continuous PM<sub>10</sub> monitoring will provide sufficient feedback on dust fluctuations to inform management actions. Boundary TSP monitoring is not required at this stage. If the department receives complaints of amenity impacts due to dust, this could be considered in the future.

#### 4.4 Detailed risk assessment for noise amenity impact to residential receptors (construction and operation)

The Licence Holder submitted a noise impact assessment for Wonnerup North Stage 2 Phase B (Wood 2020). This found that there is potential for exceedances at some nearby receptors under worst-case day and night time conditions, but with specified controls it is expected that mining can occur in compliance with the Environmental Protection (Noise) Regulations 1997 (noise regulations). A sensitivity analysis was also undertaken on the impact of using only bunds close to active mining, without external bunds. (Wood, 2021a). This found that the external bunding makes little difference to noise levels at receptors, with most reduction being due to the bunds within 100m of the mining unit. A third analysis assuming operations at the closest points to residences (Wood 2021b) also indicated that it is likely that the noise regulations can be met.

The controls proposed are in line with those currently conditioned for the Wonnerup North (Stage 1) operations. This includes existing condition 1.2.5 for initial works, infrastructure and equipment requirements; existing condition 1.2.6 for hours of operation and existing condition

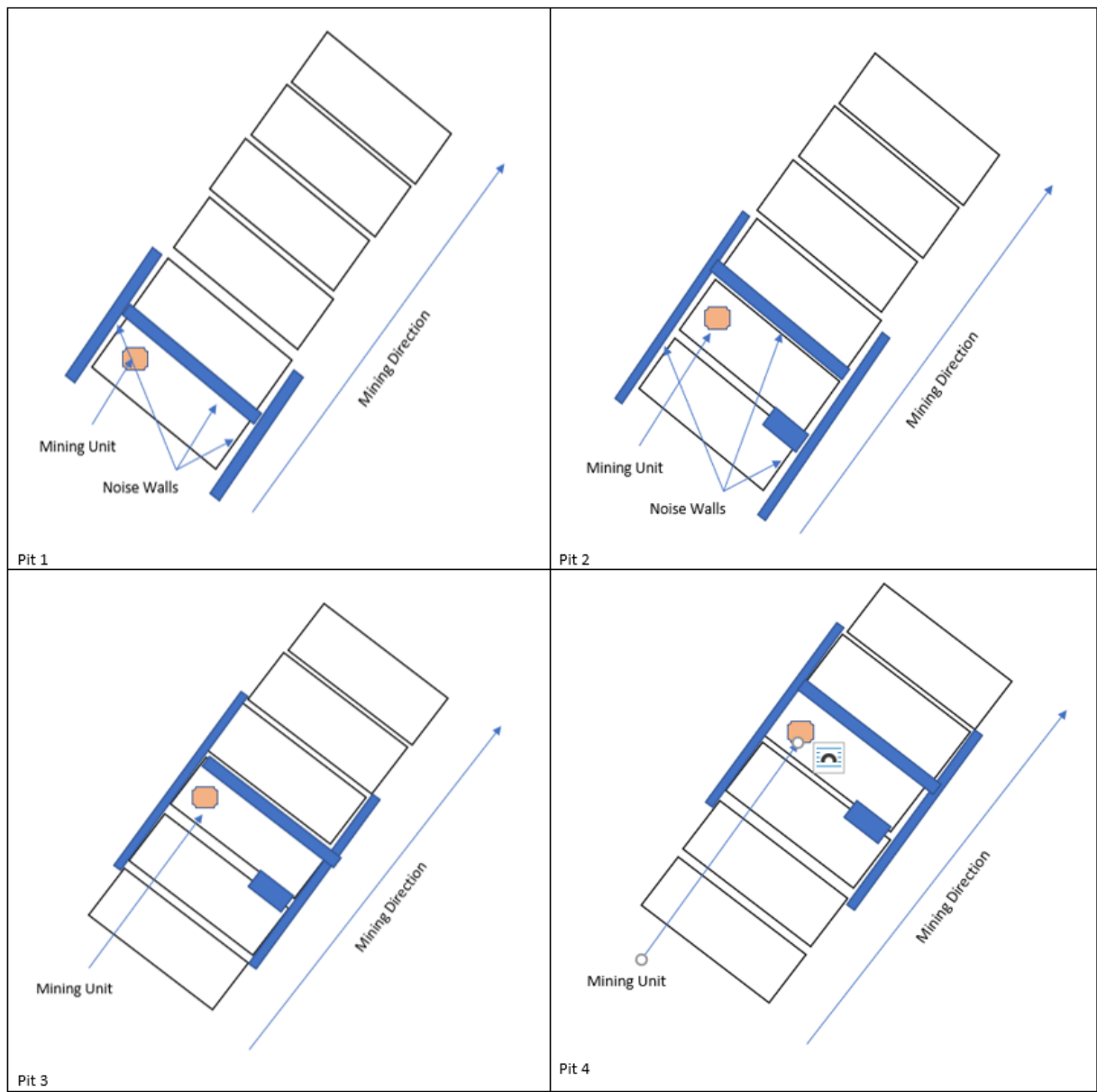
2.5.1 for operational noise controls. These conditions will be updated to apply to all of the Wonnerup North site, including Stage 2 Phase B.

The Licence Holder has a mature noise management plan, and DWER has no record to date of noise complaints from neighbours of the Wonnerup mineral sands site.

In previous mining areas, the Licence Holder has constructed bunds around the perimeter of the mining area before the commencement of mining operations. For Phase B It is still proposed that such bunds are constructed (as topsoil storage, and visual and dust screening), but not necessarily before the commencement of mining activities. The sensitivity analysis for Wonnerup North Stage 2 Phase A shows that the external bunds, being often a significant distance from the mining unit, have minimal impact on the reduction of noise to residence. The internal bunds within 30m of the mining unit, have a far more significant effect.

The modelling in the sensitivity analysis (Wood 2021) shows that most of the noise reduction due to bunding is achieved by internal ore bunds within 100m of the mining unit, and at least 100m in advance of the unit. This approach was approved for Stage 2 Phase A, and no noise complaints have been received by the department to date. The Delegated Officer is comfortable that this approach is also suitable for Phase B, with appropriate monitoring. The Delegated Officer therefore considers the proposal to allow construction of noise bunding progressively (at least 100m in advance of the mining unit) to be reasonable.

The general arrangements of bunds is shown in Figure 5. The short blue bund represents that there will be some residual of the previous mining area bund, which doesn't play a significant role in noise attenuation.



**Figure 5: Schematic representation of the progression of mine voids**

Existing monitoring conditions provide a framework to assess impacts to receptors, and trigger equipment relocation or cessation of mining if required. New monitoring points AN7 and AN8 are proposed to monitor the impact to receptors to the north east during mining of Wonnerup North Stage 2 Phase B. The Delegated Officer considers that as a minimum, noise monitoring should be undertaken at AN8 while mining on M70/569 and AN7 while mining on M70/360.

Monitoring at existing monitoring point AN6 is required during all previously approved mining on Wonnerup North, but the Licence Holder does not propose to continue monitoring at this point for Phase B. The department has reviewed the usefulness of monitoring point AN6 with respect to quantifying noise impacts to receptors when mining activities are north of the Abba River. The nearest residence to the south east is approximately 1.3km from the Phase B mining area so the likelihood of impact is not high, and lower than when mining in the already approved Phase A mining area. The location of AN6 is not strongly indicative of noise to this receptor anyway. The closest receptors to the south (for which AN6 is most useful) are about 2km from the Phase B mining area. The Delegated Officer therefore agrees that requiring monitoring at AN6 is not justified when mining in the Phase B area.

It is noted that there is one additional receptor, a farm workers accommodation directly north of the premises approximately 400m from the nearest active mining, and that impacts to this receptor may not be readily reflected in the monitoring at AN7 or AN8 when mining is in the northwest corner of M70/360. A stakeholder notification was sent to the manager of this receptor, and no response received. The noise regulations apply at this premises, but the Delegated Officer considers that with existing controls and monitoring, it is not justified to require an additional monitoring point to the north for this single residence. The Licence Holder advises that an amenity agreement with this landholder is close to finalisation.

The Delegated Officer considers that with the above controls in place, there is a risk of low level impact to amenity at off site residential receptors, and the noise regulations are likely to be met most of the time. This gives a consequence rating of **Minor**. It is **Possible** that this impact could occur at some time, giving a risk rating of **Medium**.

## 5. Consultation

Table 6 provides a summary of the consultation undertaken by the department.

**Table 6: Consultation**

Consultation method	Comments received	Department response
Local Government Authority and Department of Mines, Industry Regulation and Safety (DMIRS) advised of proposal when originally applied for (27/11/2020).	None received	N/A
Residents within 500m of the proposed premises were notified of the amendment application (10/12/2021)	None received	N/A
Licence Holder was provided with draft amendment on 25 February 2022	Refer to Appendix 1	Refer to Appendix 1

## 6. Conclusion

Based on the assessment in this Amendment Report, the Delegated Officer has determined that a Revised Licence will be granted, subject to conditions commensurate with the determined controls and necessary for administration and reporting requirements.

### 6.1 Summary of amendments

Table 7 provides a summary of the key proposed amendments and will act as record of implemented changes. All proposed changes have been incorporated into the Revised Licence as part of the amendment process.

**Table 7: Summary of licence amendments**

Condition no.	Proposed amendments
1.2.5; Table 1.2.2	Updated to authorises Wonnerup North Stage 2 Phase B activities. Infrastructure constructed in Phase 1 is removed as a compliance report (DWERDT432768) was received on 26 March 2021. This was assessed and a response provided on 10 May 2021 (A2005342) that it is satisfactory.
1.2.7-1.2.8	Removed redundant conditions relating to commissioning of Wonnerup North
1.2.9	Renumbered to 1.2.7 due to deletion above.

2.2.3	Redundant condition removed.
2.4.2	AQ4 removed – see Table 2
5.5.1	Noise bunding updated to include requirements for Phase B
3.4.1	New noise monitoring points added
3.4.2	<ul style="list-style-type: none"> <li>• AQ4 removed – see Table 2</li> <li>• Monitoring season moved to table footnote 3</li> <li>• Monitoring added for AQ7, AQ9, AQ10</li> </ul>
3.4	Monitoring locations updated. Dust deposition added to give an indication of dust impact to receptors, and provide indicative (not background) data for future expansions.
4.2.1	Condition references updated
Schedule 1	Maps updated

## References

1. Department of Environment Regulation (DER) 2016, *Guidance Statement: Environmental Siting*, Perth, Western Australia.
2. DER 2017, *Guidance Statement: Risk Assessments*, Perth, Western Australia.
3. DER 2015, *Guidance Statement: Setting Conditions*, Perth, Western Australia.
4. Environmental Protection Authority 2014, *letter dated 3 June 2020 to Mr Ken Bell regarding Wonnerup North Mineral Sands Project*, available at <https://www.epa.wa.gov.au/proposals/wonnerup-north-mineral-sands-project>.
5. Wood 6 November 2020. *Tronox Wonnerup North Stage 2 Environmental Noise Impact Assessment* (Rpt01-1404556.1-Rev1) (in DWER Document DWERDT363433)
6. Wood 2021a. *Tronox Wonnerup Topsoil sensitivity analysis for M70-569 extension* (in DWER Document A1983790)
7. Wood 2021b. *Tronox Wonnerup mining equipment worst-case analysis for Stage 2 extension* (in DWER Document A2065615)
8. Australian Government Department of Agriculture, Water and the Environment (DAWE) 2021, *Letter: Wonnerup North Mineral Sands Project, Ruabon, Western Australia – Service Corridor Design (EPBC 2014/7205)*, Canberra, Australian Capital Territory (in DWER Document A2071120).

## Appendix 1: Summary of Licence Holder's comments on risk assessment and draft conditions

Condition	Summary of Licence Holder's comment	Department's response
Front page	Request that category 8 throughput of 2,365,200 tonnes per year be rounded up to 2,500,000 tpa	The Delegated Officer is comfortable that this increase of approximately 5.7% will not alter the environmental risk profile. Existing conditions are still considered appropriate. Annual fees have been reviewed and will not change based on this change in throughput.
1.2.1	Phase A (on M70/569) should be updated to Phase B (on M70/569 and M70/360)	Agreed, updated.
1.2.5	(M70/569) should be updated to (M70/569 and M70/360)	Agreed, updated.
1.2.7	(M70/360) should be updated to (M70/569 and M70/360)	Agreed, updated.
2.5.1	<ol style="list-style-type: none"> <li>Existing row relating to noise bunding applicable for north of Abba River on M70/569 only, not M70/360</li> <li>Separate row proposed for M70/360 due to different mining direction relative to receptors</li> </ol>	<ol style="list-style-type: none"> <li>Existing row narrowed to relate only to north of Abba River on M70/569.</li> <li>New row added for M70/360, and bund descriptions corrected to reflect the direction of mining on this tenement. Bund map updated to indicate direction of mining, and diagrammatic explanation added to decision report.</li> </ol>
3.4.1 – noise monitoring	AN7 and AN8 to be non-directional monitoring only (DWER document A2086362)	Technical advice from DWER's Environmental Noise Branch (A2086590) indicates that the approach proposed is appropriate. Table 3.4.1 modified to remove directional monitoring for AN7 and AN8.
	AN6 to be only required when mining is south of the Abba River	The department has reviewed the usefulness of monitoring point AN6 with respect to quantifying noise impacts to receptors when mining activities are north of the Abba River. The nearest residence to the south east is approximately 1.3km from the Phase B mining area so the likelihood of impact is not high, and lower than when mining in the already approved Phase A mining area. The location of AN6 is not strongly indicative of noise to this receptor anyway. The closest receptors to the south (for which AN6 is most useful) are about 2km from the Phase B mining area. The Delegated Officer therefore agrees that requiring monitoring at AN6 is not justified when mining in the Phase B area. Section 4.4 of Decision Report updated to reflect this review.
Schedule 1	Updated map of emission points provided	Acceptable, inserted.

## Appendix 2: Application validation summary

SECTION 1: APPLICATION SUMMARY				
<b>Application type</b>				
Amendment to licence	<input checked="" type="checkbox"/>	Current licence number:	L8739/2013	
		Relevant works approval number:	-	N/A
Date application received		21 October 2021		
<b>Applicant and Premises details</b>				
Applicant name/s (full legal name/s)		Cable Sands (W.A.) Pty Ltd – (Note current licence says Cable Sands (WA) Pty Ltd, but the ASIC extract A1985018 includes full stops. To be corrected this amendment.)		
Premises name		Wonnerup Mineral Sands Mine		
Premises location		109 Sues Rd YALYALUP WA 6280 Legal description –  Lot 100 on Deposited Plan 65306, Mining Lease M70/360 and M70/569 and part of Miscellaneous Licence and L70/161		
Local Government Authority		City of Busselton		
<b>Application documents</b>				
HPCM file reference number:		FA260730		
Key application documents (additional to application form):		Design of Abba River crossing Proposed new noise and dust monitoring locations Noise and air quality (dust) modelling Noise and Dust management plans		
<b>Scope of application/assessment</b>				
Summary of proposed activities or changes to existing operations.		Expansion of mining area to the North of Abba River, including river crossing. Noise attenuation bunds constructed of topsoil.  Installation of new noise and dust monitoring stations, and these added to monitoring schedule  Removal of Wonnerup North Stage 1 conditions.		
<b>Category number/s (activities that cause the premises to become prescribed premises)</b>				
No change in categories or throughput. Still category 6 (dewatering) and category 8 (mineral sands mining or processing)				
<b>Legislative context and other approvals</b>				
Has the applicant referred, or do they intend to refer, their proposal to the EPA under Part IV of the EP Act as a significant proposal?		Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>  Formal assessment not required		Referral decision No: Managed under Part V <input checked="" type="checkbox"/> Assessed under Part IV <input type="checkbox"/>

Does the applicant hold any existing Part IV Ministerial Statements relevant to the application?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Ministerial statement No: EPA Report No:
Has the proposal been referred and/or assessed under the EPBC Act?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Reference No: EPBC 2014/7205
Has the applicant demonstrated occupancy (proof of occupier status)?	Yes <input type="checkbox"/> No <input type="checkbox"/>	Mining lease / tenement <input checked="" type="checkbox"/> M70/360 provided. M70/569 Not provided in this application, but previously provided.
Has the applicant obtained all relevant planning approvals?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A <input type="checkbox"/>	If N/A explain why? Mining Tenure
Has the applicant applied for, or have an existing EP Act clearing permit in relation to this proposal?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	CPS No: 8046
Has the applicant applied for, or have an existing CAWS Act clearing licence in relation to this proposal?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Application reference No: N/A Licence/permit No: N/A
Has the applicant applied for, or have an existing RIWI Act licence or permit in relation to this proposal?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Licence/permit No: GWL202089
Does the proposal involve a discharge of waste into a designated area (as defined in section 57 of the EP Act)?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
Is the Premises situated in a Public Drinking Water Source Area (PDWSA)?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
Is the Premises subject to any other Acts or subsidiary regulations	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Mining Act 1978
Is the Premises within an Environmental Protection Policy (EPP) Area?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
Is the Premises subject to any EPP requirements?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
Is the Premises a known or suspected contaminated site under the <i>Contaminated Sites Act 2003</i> ?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	