



Report and recommendations of the Environmental Protection Authority



Mesa H Proposal (Revision to Mesa J Iron Ore Development)

Robe River Mining Co. Pty. Ltd

Report 1668

March 2020

Environmental impact assessment process timelines

Date	Progress stages	Time (weeks)
19/07/2017	EPA decides to assess – level of assessment set	
31/10/2017	EPA approved Environmental Scoping Document	14
02/04/2019	EPA accepted Environmental Review Document	74
08/04/2019	Environmental Review Document released for public review	1
24/04/2019	Public review period for Environmental Review Document closed	2
18/12/2019	EPA accepted Proponent Response to Submissions	34
23/01/2020	EPA board considered assessment	5
04/03/2020	EPA provided report to the Minister for Environment	6
09/03/2020	EPA report published	3 days
23/03/2020	Close of appeals period	2

Timelines for an assessment may vary according to the complexity of the proposal and are usually agreed with the proponent soon after the Environmental Protection Authority (EPA) decides to assess the proposal and records the level of assessment.

In this case, the EPA met its timeline objective to complete its assessment and provide a report to the Minister.



Robert Harvey
Deputy Chairman

1 March 2020

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Summary

The Mesa H Proposal (Revision to the Mesa J Iron Ore Development) was referred to the Environmental Protection Authority (EPA) by Robe River Mining Co. Pty. Ltd. on 28 June 2017.

The proposal is to develop the Mesa H deposit located about 16 kilometres south west of Pannawonica. The proposal will extend the life by about 17 years and ultimately replace the existing Mesa J Iron Ore Development, approved under Ministerial Statement 208.

On 19 July 2017 the EPA decided to assess the proposal and set the level of assessment at Public Environmental Review with a public review period of two weeks. The EPA approved the Environmental Scoping Document for the proposal on 31 October 2017. The Environmental Review Document was released for public review from 8 April 2019 to 24 April 2019.

The EPA has concluded that the proposal may be implemented, subject to conditions (Appendix 5) which include environmental management plans and offsets for the clearing of vegetation within the Hamersley Interim Biogeographic Regionalisation for Australia subregion, including northern quoll habitat and vegetation analogous to the *Triodia pisolitica* assemblages of mesas of the West Pilbara Priority Ecological Community.

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1. Introduction

This report provides the advice and recommendations of the Environmental Protection Authority (EPA) to the Minister for Environment on the outcomes of the environmental impact assessment of the Mesa H Proposal (Revision to Mesa J Iron Ore Development). The proposal is to develop the Mesa H deposit, which will extend the life of and ultimately replace the existing Mesa J Iron Ore Development approved under Ministerial Statement 208. The proponent is Robe River Mining Co. Pty. Ltd.

The EPA has prepared this report in accordance with s. 44 of the *Environmental Protection Act 1986* (EP Act). This section of the EP Act requires the EPA to prepare a report on the outcome of its assessment of a proposal and provide this assessment report to the Minister for Environment. The report must set out:

- what the EPA considers to be the key environmental factors identified during the assessment
- the EPA's recommendations as to whether or not the proposal may be implemented and, if the EPA recommends that implementation be allowed, the conditions and procedures to which implementation should be subject.

The EPA may also include any other information, advice and recommendations in the assessment report as it thinks fit.

The proponent referred the proposal to the EPA on 29 June 2017. On 19 July 2017 the EPA decided to assess the proposal and set the level of assessment at Public Environmental Review with a review period of two weeks. The EPA approved the proponent prepared Environmental Scoping Document for the proposal on 31 October 2017. The Environmental Review Document (ERD) was released for public review from 8 April 2019 to 24 April 2019 (the review period was extended by two days to accommodate public holidays).

EPA procedures

The EPA followed the procedures in the *Environmental Impact Assessment (Part IV Divisions 1 and 2) Administrative Procedures 2016* (State of Western Australia 2016) and the *Environmental Impact Assessment (Part IV Divisions 1 and 2) Procedures Manual* (EPA 2018b).

1.1 Assessment on behalf of Commonwealth

The proposal was determined to be a controlled action by a delegate of the Commonwealth Minister for the Environment under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) on 14 October 2017 as it will, or is likely to have, a significant impact on the following Matters of National Environmental Significance (MNES):

- listed threatened species and communities (s. 18 and s. 18A).

The proposal was assessed as an accredited assessment between the Commonwealth and Western Australian governments.

2. The proposal

The proponent proposes a change (referred to in this report as the 'Proposed Change') to the approved Mesa J Iron Ore Development located about 10 kilometres (km) south of Pannawonica in the Pilbara Region of Western Australia (Figure 1). The proposal is to extend the life of and ultimately replace the Mesa J Iron Ore Development through developing the adjacent Mesa H deposit, located to the west of the existing mine.

The Mesa J Iron Ore Development was assessed by the EPA in 1991 as detailed in EPA Bulletin 574 (EPA 1991) and approved for implementation by the then Minister for Environment, subject to the conditions of Ministerial Statement 208. The Mesa J Iron Ore Development currently includes:

- open cut above and below watertable pits, mined by conventional drill, blast, and load and haul techniques
- ore processing at about 35 million tonnes per annum
- ex-pit surface waste dumps, used in backfilling of the pits as far as practicable
- low grade stockpiles, topsoil and overburden stockpiles
- infrastructure:
 - dewatering and surplus water management infrastructure, including the Southern Cutback Borefield, located about 1 km south of the Mesa J Iron Ore Development, and discharge points on Jimmawurrada Creek and the West Creek tributary
 - surface water management infrastructure, including diversions to direct surface water flows around the deposit
 - sandfill facility
 - linear infrastructure, including the mine access road about 35 km long which links the mine site with the Pannawonica access road; and the rail network which transports processed ore 413 km to port facilities at Cape Lambert.

The Proposed Change comprises the following additional activities and/or elements:

- mine pits – above and below watertable open cut pits at Mesa H, predominantly comprising three main pits and several smaller pits
- processing facilities – waste dumps, ore, topsoil and subsoil stockpiles and associated infrastructure, including water management infrastructure in the mine operations area.

The existing Mesa J Iron Ore Development approved under Ministerial Statement 208, plus the Proposed Change as described in the proponent's ERD (Robe River Mining Co. Pty. Ltd 2019a), is referred to as the Revised Proposal. The Revised Proposal will use existing infrastructure at Mesa J, including processing facilities (subject to upgrades) and rail. Ore will be mined at Mesa H using open cut mining methods comprising conventional drill, blast, load and haul. Mine pit dewatering will be required, as about 20% of the ore proposed for mining is below the current watertable. Any surplus water from the mine pit dewatering will be used to supply

operational water demand for both Mesa J and H operations. Where operational water storage capacity is exceeded (particularly post wet season) surplus water will be intermittently discharged into existing Mesa J discharge points (or potentially new optimised discharge points) at Jimmawurrada Creek and/or the discharge point at West Creek (both tributaries of the Robe River).

Figure 2 shows the Development Envelope for the Revised Proposal and the Mining Exclusion Zone discussed further in section 4. Figure 3 shows the indicative infrastructure layout for the Proposed Change.

The key characteristics of the Revised Proposal are summarised in Tables 1 and 2 below. A detailed description of the Proposed Change in relation to the existing approved project is provided in section 2 of the ERD (Robe River Mining Co. Pty. Ltd 2019a).

In undertaking this assessment, the EPA has assessed the impacts of the Proposed Change in the context of the approved project, considering the cumulative impacts of the entire Revised Proposal where appropriate.

Table 1: Summary of the proposal

Proposal title	Mesa H Proposal (Revision to the Mesa J Iron Ore Development)
Short description	<p>The Revised Proposal is located about 16 km south west of Pannawonica in the Pilbara region of Western Australia. The Revised Proposal includes development of above and below watertable open cut pits at Mesa J and Mesa H, ore processing facilities, waste dumps, ore, topsoil and subsoil stockpiles and associated infrastructure, including water management infrastructure.</p> <p>This Revised Proposal uses infrastructure including processing facilities (subject to upgrades) and rail from the existing Mesa J Iron Ore Development.</p>

Table 2: Location and proposed extent of physical and operational elements

Element	Existing approval (Ministerial Statement 208 and other regulatory approvals)	Proposed change (this proposal)	Proposed extent (Revised Proposal)
<i>Physical elements</i>			
Mine and associated infrastructure	Total disturbance area (vegetation clearing) of up to 1,800 hectares (ha).	Clearing of up to 2,200 ha within the development envelope of 6,638 ha.	Clearing of up to 4,000 ha of native vegetation within a development envelope of 6,638 ha.

		<ul style="list-style-type: none"> No more than 132 ha clearing within the Mesa H Mining Exclusion Zone 	<ul style="list-style-type: none"> No more than 132 ha clearing within the Mesa H Mining Exclusion Zone
Rail	Single gauge railway line with sidings and a voice and radio data communications system with fibre optic cable, from Cape Lambert.		Remove as not environmentally relevant.
Operational elements			
Groundwater abstraction for water supply, ore processing and pit dewatering	Not specified in Ministerial Statement 208. Annual water entitlement of 30 gigalitres per annum (GL/a) (approved under the <i>Rights in Water and Irrigation Act 1914</i> licence GLW 107678(13)).	No change.	Groundwater abstraction up to 30 GL/a, including from: <ul style="list-style-type: none"> water supply from Southern Cutback Borefield pit dewatering seepage interception.
Surplus Water Management	Not specified in Ministerial Statement 208. Discharge of mine dewater at designated discharge points in Jimmawurrada Creek and a tributary of Robe River (approved under Part V Operating Licence L6820/1993/12).		Controlled surface discharge to extend along Jimmawurrada Creek / West Creek and into the Robe River no further than 8 km downstream of the discharge point under natural no-flow conditions.

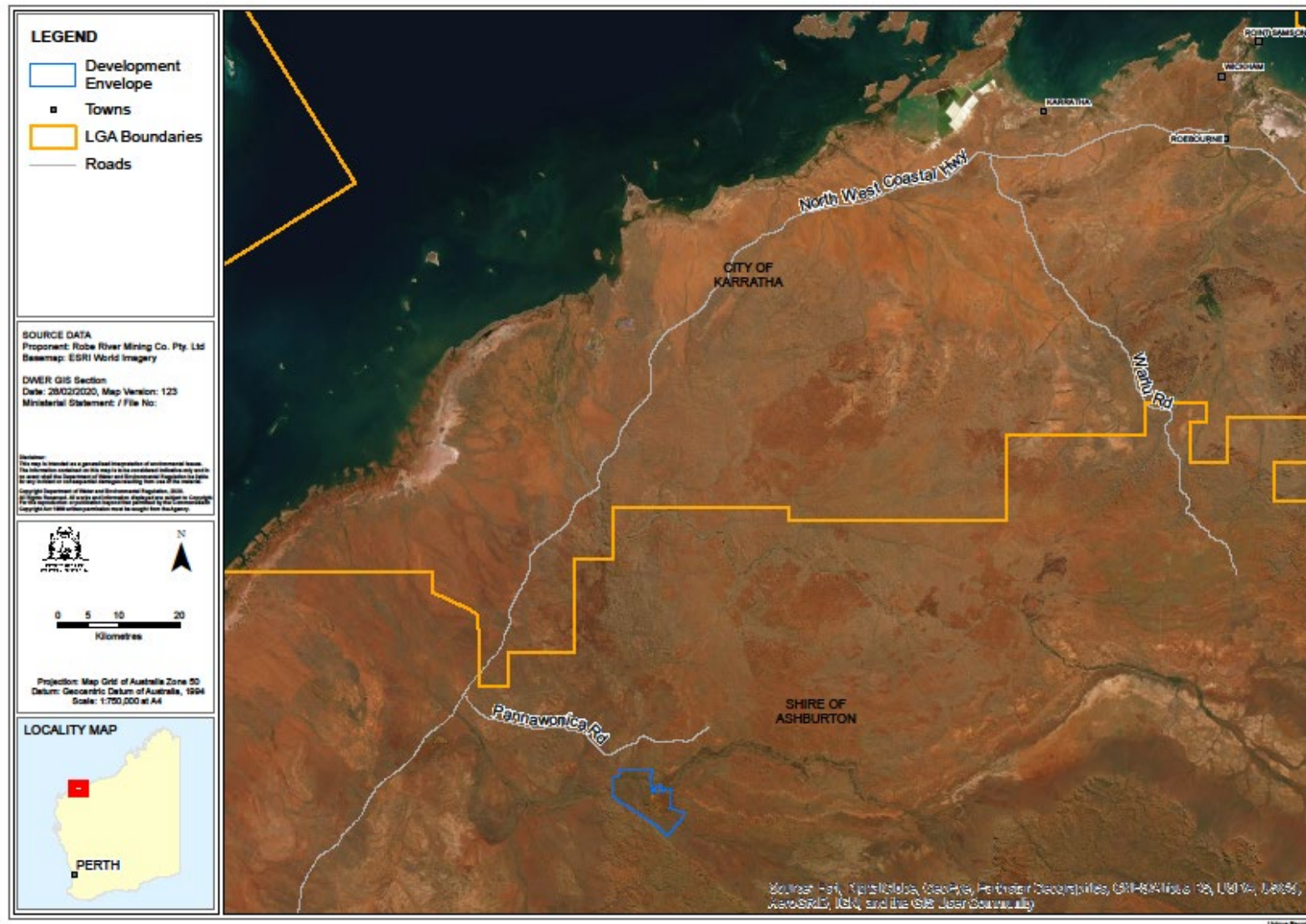


Figure 1: Regional location

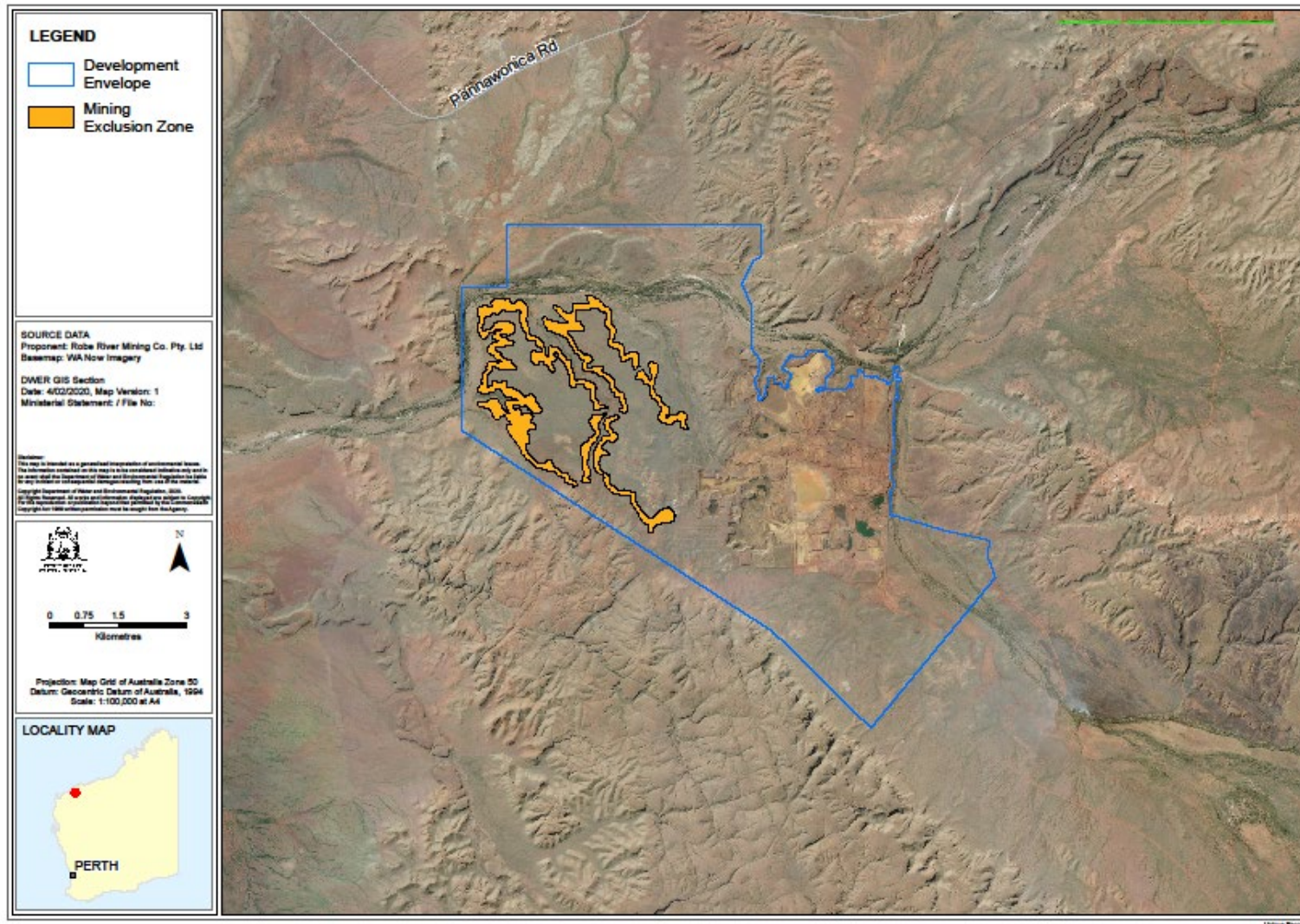


Figure 2: Development envelope for the Revised Proposal

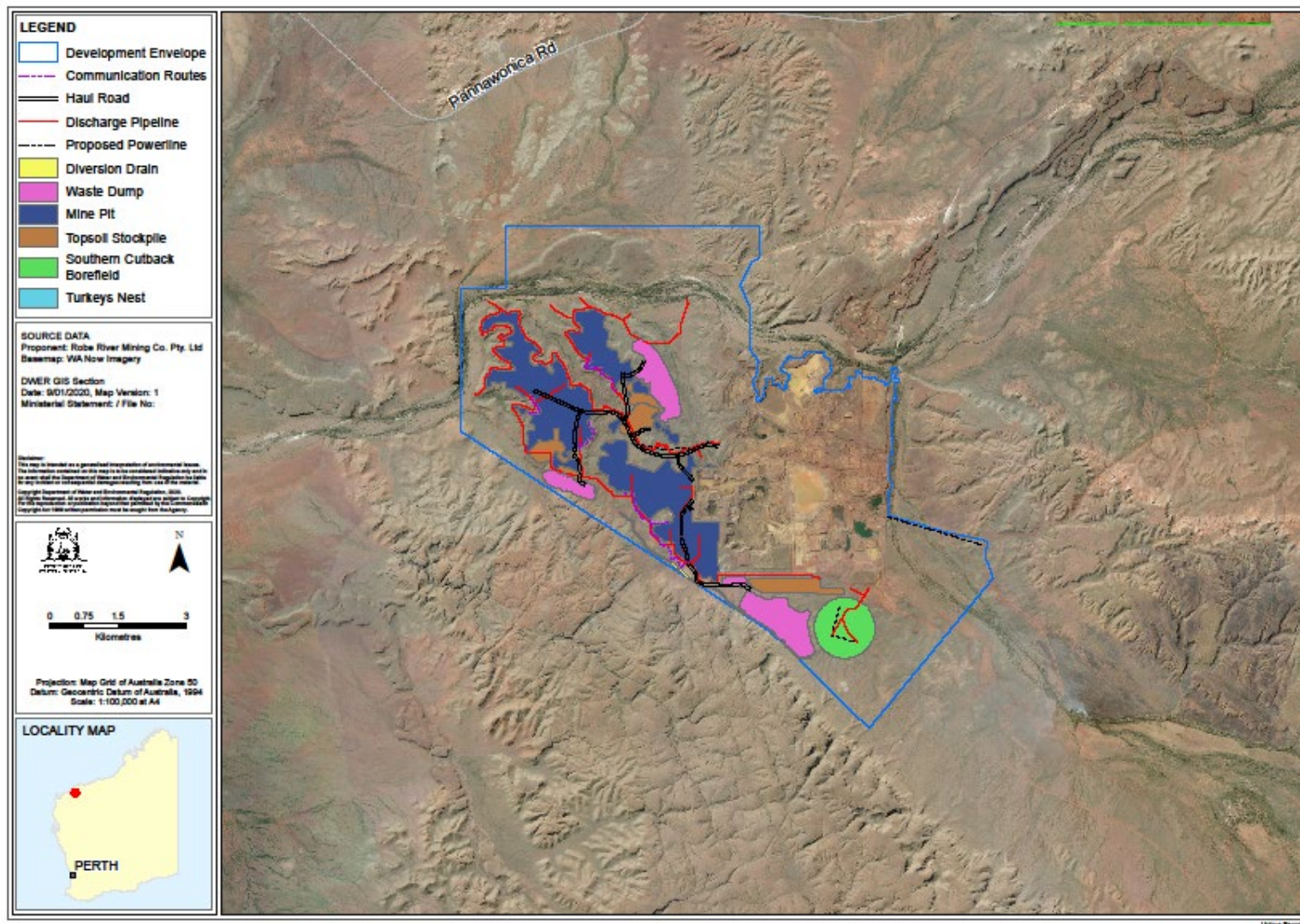


Figure 3: Indicative footprint for the Proposed Change

2.1 Context

The Revised Proposal is located in the Robe Valley, within the Western Pilbara region of Western Australia, about 16 km southwest of Pannawonica in the Shire of Ashburton (Figure 1).

The Robe Valley contains numerous mesa landforms, of which a large proportion are comprised of channel iron deposits. The Robe Valley mesas are remnants of the ancestral Robe River, where channel iron deposits have been deposited in paleochannels. Subsequent uplift and erosion of the surrounding landscape has exposed and segregated the paleochannels into a series of mesa formations, which are characterised by relatively flat tops and steep sides (escarpments). Many of these escarpments contain deep gullies and/or caves.

Mesa H is an incised and partial-formed mesa located in the central region of the Robe Valley, within the Robe River Catchment, immediately to the west and downstream of the existing Mesa J Iron Ore Development. Mesa H is bordered on its northern and western escarpments by the ephemeral Robe River which flows in a north-westerly direction.

Existing land uses in the development envelope include pastoral activities (Yarraloola Station and Yalleen Station), mineral exploration, mining activities, local tourism and Traditional Owner activities.

Other operations and/or proposals in proximity to this Revised Proposal managed by the proponent include:

- Mesa J Iron Ore Development (operating)
- Mesa K Historical and Remnant Mining Operations – about 5 km to the northeast
- Middle Robe Deepdale Historical Mining Operations – about 10 km to the east
- Coastal Water Supply Project (operating) – about 15 km to the southeast
- Mesa A and Warramboos Operations (operating) – 30 km to the northwest
- Mesa A Hub Revised Proposal
- Yalleen Pastoral Station – intersects the eastern side of the development envelope
- Yarraloola Pastoral Station – intersects the western side of the development envelope.

There is also one third party proposal (approved): Buckland Hills Iron Ore Project – about 35 km to the southeast of Mesa H and upstream of the Bungaroo Valley.

3. Consultation

The proponent consulted with government agencies and key stakeholders during the preparation of the ERD. The agencies and stakeholders consulted, the issues raised and the proponent's response are detailed in Table 3-1 of the proponent's ERD (Robe River Mining Co. Pty. Ltd 2019a).

One public submission was received during the public review period. The key issues raised relate to:

- impacts to hydrogeological processes
- impacts to flora and vegetation
- impacts to subterranean fauna.

The proponent addressed the issues raised in the Response to Submissions document (Robe River Mining Co. Pty. Ltd 2019b).

The EPA considers that the consultation process has been appropriate and that reasonable steps have been taken to inform the community and stakeholders about the proposed development. Relevant significant environmental issues identified from this process were taken into account by the EPA during its assessment of the proposal.

4. Key environmental factors

In undertaking its assessment of this proposal and preparing this report, the EPA had regard for the object and principles contained in s. 4A of the EP Act to the extent relevant to the particular matters that were considered.

The EPA considered the following information during its assessment:

- proponent's referral information, ERD and supplementary information provided during the assessment
- public comments received on the referral, stakeholder comments received during the preparation of the proponent's documentation and public and agency comments received on the ERD
- proponent's response to submissions raised during the public review of the ERD
- EPA's own inquiries
- *Statement of environmental principles, factors and objectives* (EPA 2018c)
- relevant principles, policy and guidance referred to in the assessment of each key environmental factor in sections 4.1 to 4.6.

Having regard to the above information, the EPA identified the following key environmental factors during the course of its assessment of the proposal:

- **Inland Waters** – changes to groundwater levels as a result of groundwater abstraction, and changes to the hydrological regime of Jimmawurrada Creek, West Creek and the Robe River as a result of surplus water management.
- **Flora and Vegetation** – clearing of up to 2,200 ha of native vegetation, including conservation significant flora.
- **Subterranean Fauna** – reduction in troglotauna habitat due to mine pit development. Loss of individuals and changes to assemblages due to mine pit development. Loss of stygofauna habitat due to groundwater abstraction.
- **Terrestrial Fauna** – loss and/or fragmentation of fauna habitat including breeding, foraging and dispersal habitat due to clearing. Loss of individuals from increased vehicle strikes, collisions with fencing and construction activities.
- **Social Surroundings** – disturbance of sites and places of cultural significance (via clearing, excavation and infrastructure placement), prevention or change to access to a site, indirect disturbance to sites and places of cultural significance via changes to the physical and biological attributes of the environment (via dewatering, surplus water discharge, and blast vibrations).
- **Air Quality** – production of greenhouse gas emissions and a reduction to air quality.

The EPA considered other environmental factors during the course of its assessment of the proposal. These factors, which were not identified as key environmental factors, are discussed in the proponent's ERD (Robe River Mining Co. Pty. Ltd 2019a). Appendix 3 contains an evaluation of why these other environmental factors were not identified as key environmental factors.

Having regard to the EP Act principles, the EPA considered that the following principles were particularly relevant to its assessment of the proposal:

1. **Precautionary principle** – investigations on the biological and physical environment undertaken by the proponent have provided sufficient certainty to assess risks and identify measures to avoid or minimise impacts.
2. **Principle of intergenerational equity** – the proponent has identified measures to avoid and minimise impacts, and this, together with the recommended conditions, will ensure the environment is maintained for future generations.
3. **Principle of the conservation of biological diversity and ecological integrity** – the EPA has concluded that, provided the recommended conditions are imposed on the implementation of the proposal, the proposal will not compromise biological diversity or ecological integrity.
4. **Principles relating to improved valuation, pricing and incentive mechanisms** – the EPA notes that the proponent will bear the costs relating to management of waste and pollution, including avoidance, containment, decommissioning, rehabilitation and closure.
5. **The principle of waste minimisation** – the EPA notes that the proponent proposes to minimise waste by applying the waste hierarchy to the proposal.

Appendix 2 provides a summary of the principles and how the EPA considered these principles in its assessment.

The EPA's assessment of the proposal's impacts on the key environmental factors is provided in sections 4.1 to 4.6. These sections outline whether or not the EPA considers that the impacts on each factor are manageable.

Assessment on behalf of Commonwealth

The Revised Proposal was referred to the Department of the Environment and Energy (now the Department of Agriculture, Water and the Environment)) under the EPBC Act on 17 August 2017. The Revised Proposal was determined to be a controlled action by a delegate of the Commonwealth Minister for the Environment on 14 October 2017 (EPBC reference 2017/8017). On 26 November 2017, a delegate of the Commonwealth Minister for Environment determined that the proposal would be assessed by accredited assessment under the Western Australian EP Act.

The EPA has addressed MNES under each relevant factor and has summarised its assessment of MNES in section 6.

4.1 Inland Waters

The EPA's environmental objective for this factor is *to maintain the hydrological regimes and quality of groundwater and surface water so that environmental values are protected*.

Relevant policy and guidance

The EPA considers that the following current environmental policy and guidance is relevant to its assessment of the proposal for this factor:

- *Environmental Factor Guideline – Inland Waters* (EPA 2018a)
- *WA Environmental Offsets Policy* (Government of Western Australia 2011)
- *WA Environmental Offsets Guidelines* (Government of Western Australia 2014).

The considerations for environmental impact assessment for this factor are outlined in *Environmental Factor Guideline – Inland Waters* (EPA 2018a).

In addition to the relevant current policy and guidance above, the EPA also had regard to the *Guidelines for Preparing Mine Closure Plans* (DMP and EPA 2015).

EPA assessment

Up to 30 GL/a groundwater abstraction is currently authorised for the Mesa J Iron Ore Development, and has resulted in lowered groundwater levels in the channel iron deposit and along a small section of the Jimmawurrada Creek. Periodic discharge of surplus water into tributaries of the Robe River, including West Creek and Jimmawurrada Creek, can result in channel pools occurring within these tributaries during prolonged discharge periods.

Dewatering is expected to commence at Mesa H from 2025, with peak abstraction of about 3 GL/a estimated to occur several years later (2033–2034). A total of about 15 GL is expected to be dewatered during the life of the Mesa H operations. Surplus water will be discharged via the existing authorised discharge points for the Mesa J Iron Ore Development. The discharge volumes (estimated peak of 7 GL/a) and the extent of the wetting front will be similar to the existing Mesa J Iron Ore Development.

The peak dewatering abstraction for the entire revised proposal is predicted to decrease from the current peak of 10 GL/a at Mesa J Iron Ore Development to 8 GL/a for the revised proposal (excluding surface water management and seepage inflows), mostly due to the inclusion of a thickener plant.

A number of hydrological, hydrogeological and geochemical studies have been undertaken to develop an understanding of the hydrological setting for the Proposed Change.

Impacts

The potential direct impacts of the Proposed Change are:

- changes to groundwater levels along the Robe River and Jimmawurrada Creek as a result of groundwater abstraction

- changes to the hydrological regime of Jimmawurrada Creek and the Robe River as a result of surplus water discharge
- changes to the Robe River flows as a result of surface water infrastructure.

The potential indirect impacts of the Revised Proposal on Inland Waters are changes to surface and groundwater quality.

The Proposed Change also has the potential to contribute to cumulative hydrological impacts to the Robe River Catchment.

Impacts to riparian vegetation as a result of altered hydrological regimes are assessed under the key environmental factor of Flora and Vegetation in section 4.2.

Impacts to subterranean fauna and terrestrial (including aquatic) fauna as a result of altered hydrological regimes are assessed under the key environmental factors of Subterranean Fauna in section 4.3 and Terrestrial Fauna in section 4.4.

Robe River Pools

Permanent and semi-permanent pools exist along the Robe River. The pool at Yeera Bluff is the only permanent pool in the vicinity of the revised proposal, and it has significant Aboriginal Heritage and social value.

The proposed dewatering at Mesa H, combined with lower rainfall since 2011 and periodic drought conditions, has the potential to impact pools along the Robe River. Modelling indicates a maximum drawdown less than 0.5 metres (m) to the Robe River to the north of Mesa H and a short term maximum (less than one year) of 0.7 m drawdown around Yeera Bluff. The predicted groundwater drawdown is within the natural fluctuations observed within the water levels of the Robe River (2 to 3 m).

Permanent and semi-permanent pools greater than 1 m depth are not expected to be significantly impacted, however shallower (less than 0.5 m) semi-permanent or seasonal pools may dry out more quickly during periods of low rainfall or extended drought.

The magnitude and frequency of stream flow events is such that a single large rainfall event can completely replenish and effectively 're-set' the aquifer levels, and the proponent expects the deeper pools and the permanent pool at Yeera Bluff to continue to persist without active management. The proponent has proposed monitoring and contingency measures, as discussed below, in the event that impacts as a result of the revised proposal are greater than expected.

Jimmawurrada Creek

Groundwater abstraction for the Mesa J Iron Ore Development has resulted in drawdown of 4 to 6 m along Jimmawurrada Creek, immediately east of the Southern Cutback Borefield. The combined abstraction for the revised proposal will further lower the water table across a 12 km section of Jimmawurrada Creek, resulting in a

cumulative drawdown of 9 m (along a 6.5 km section) from pre-mining water table levels by 2030.

Mitigation and management measures

Water management at Mesa H will be integrated with current water management practices at Mesa J.

The proponent has made the following commitments to manage and mitigate impacts to Inland Waters:

- Minimise groundwater abstraction to that required to access the resource and to meet site water requirements, with peak abstraction for the revised proposal expected to be similar to that currently authorised for the Mesa J Iron Ore Development.
- Implementation of a thickener plant for the waste fines storage facility to optimise water recovery and reduce the water demand from the Southern Cutback Borefield.
- Monitoring of groundwater levels (including pool water levels) along the Robe River and Jimmawurrada Creek in the vicinity of the revised proposal, with mitigation measures to be implemented in the event that adverse changes are detected, including:
 - Ceasing of dewatering below 120 m reduced level (RL) in the Mesa H Pit 7 during dry periods, and resuming mining once a stream flow event occurs, if monitoring of semi-permanent and permanent pools of the Robe River shows a decline in pool water levels beyond that predicted in this impact assessment (i.e. up to 1 m beyond natural seasonal water fluctuations) as a direct result of dewatering.
 - Optimisation of the location of discharge points in Jimmawurrada Creek to provide periodic supplementary water in areas predicted to be affected by groundwater drawdown.
 - Targeted supplementary water (derived from Mesa H mine pit dewatering) directly to the permanent pools to minimise impacts.

The proponent has developed a Mesa J Hub Mine Closure Plan (Robe River Mining Co. Pty. Ltd 2019a, Appendix 7), which includes closure objectives to maintain and restore pool ecosystem health at closure.

Summary

The EPA has paid particular attention to the:

- proponent's hydrological and hydrogeological investigations

- proponent's proposed mitigation and management measures addressing the potential impacts resulting from groundwater drawdown and surplus water discharge.

The EPA considers, having regard to the relevant EP Act principles and environmental objective for Inland Waters that the impacts to this factor are manageable, provided there is:

- control through authorised extent in schedule 1 of the recommended environmental conditions (Appendix 5)
- preparation and implementation of an Environmental Management Plan to ensure the outcomes of recommended condition 6-1 (Inland Waters and Vegetation) are met
- preparation and implementation of a Mine Closure Plan (recommended condition 9).

The EPA notes there is a requirement for:

- licensing of water abstraction under the *Rights in Water and Irrigation Act 1914*
- works approvals and licensing of emissions and discharges under Part V of the EP Act.

4.2 Flora and Vegetation

The EPA's environmental objective for this factor is *to protect flora and vegetation so that biological diversity and ecological integrity are maintained*.

Relevant policy and guidance

The EPA considers that the following current environmental policy and guidance is relevant to its assessment of the proposal for this factor:

- *Environmental Factor Guideline – Flora and Vegetation* (EPA 2016b)
- *Technical Guidance – Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA 2016f)
- *WA Environmental Offsets Policy* (Government of Western Australia 2011)
- *WA Environmental Offsets Guidelines* (Government of Western Australia 2014).

The considerations for environmental impact assessment for this factor are outlined in *Environmental Factor Guideline – Flora and Vegetation* (EPA 2016b).

In addition to the relevant current policy and guidance above, the EPA also had regard to the *Guidelines for Preparing Mine Closure Plans* (DMP and EPA 2015).

EPA Assessment

Under the Interim Biogeographic Regionalisation for Australia (IBRA) classification, the revised proposal is located within the Hamersley sub-region of the Pilbara IBRA region.

Most of the vegetation (80%) within the area of the Proposed Change is in 'Very Good' to 'Excellent' condition. Vegetation in the Robe River and its tributaries ranges from 'Poor' to 'Excellent' condition, with poorer condition vegetation generally a result of weed proliferation and/or grazing and trampling by cattle.

Numerous flora and vegetation surveys have been undertaken in or near the development envelope since 2003. A detailed survey was conducted in the area of the Proposed Change, and in riparian areas that will be potentially impacted by changes in hydrology (Astron 2016). Subsequent to this, targeted surveys of the riparian areas were conducted to further refine the vegetation mapping within the riparian zones of the Robe River and Jimmawurrada Creek.

Potential impacts

Potential direct impacts to Flora and Vegetation are:

- Loss of vegetation due to clearing (up to 2,200 ha of native vegetation within the revised 6,638 ha development envelope). The majority of clearing (993 ha) is of mesa tops and hilltops, and mesa slopes and hillslopes vegetation associations.
- Loss of conservation significant flora due to clearing.

Significant vegetation in the Proposed Change Area includes:

- Riparian vegetation
 - Robe River – groundwater dependent vegetation (dominated by the obligate phreatophyte *Melaleuca argentea*) along the river and surrounding the semi-permanent and permanent pools.
 - Jimmawurrada Creek – Riparian vegetation (dominated by facultative phreatophytes *Eucalyptus camaldulensis* and *Eucalyptus vitrix*).
- Vegetation analogous to *Triodia pisolitica* assemblages of mesas of the West Pilbara Priority Ecological Community.

Potential indirect impacts to Flora and Vegetation are:

- Loss or degradation of groundwater dependent vegetation as a result of groundwater drawdown:
 - Potential for some decline in canopy of *Melaleuca argentea* and *Eucalyptus camaldulensis* dominated riparian vegetation along a 14 km section of the Robe River including pools during the period of dewatering for Mesa H.
 - Significant canopy decline and potential for increased mortality of up to 7 ha of *Melaleuca argentea* and *Eucalyptus* dominated riparian vegetation (0.3 ha of which was present pre-mining) and up to 84 ha of *Eucalyptus* dominated riparian vegetation along a 6.5 km section of Jimmawurrada Creek.
 - Decline in canopy and some potential for increased mortality of up to 3.4 ha of *Melaleuca argentea* and *Eucalyptus* (1 ha of which was present pre-mining) dominated riparian vegetation and up to 174 ha of *Eucalyptus*

dominated riparian vegetation along a 5.5 km section of Jimmawurrada Creek.

- Loss or degradation of riparian vegetation as a result of surface water discharge:
 - Some temporary changes in structure, cover and health of both *Melaleuca argentea* and Eucalyptus dominated riparian vegetation communities up to 8 km downstream from the discharge point on Jimmawurrada Creek and West Creek.
- Loss or degradation of riparian vegetation as a result of surface water management.
- Degradation of vegetation due to ingress of weeds.
- Degradation of vegetation due to increased dust deposition.

Priority Flora

The Proposed Change will avoid known locations of Priority Flora as far as practicable, however clearing is expected to result in the direct loss of some individuals of conservation significant flora.

Triodia pisolitica (P3) (previously *Triodia* sp. Robe River) is found on crests and upper slopes of mesas, gullies and/or gorges. The Proposed Change will potentially impact up to 28,293 individuals, equating to 31% of individuals found within the Proposed Change Area, and 9.8% of records in the broader area.

Indigofera sp. Bungaroo Creek (P3) is found in the floodplains of major creeks. Four individuals are proposed to be cleared for the Proposed Change, equating to 17% of individuals found within the Proposed Change Area, and 0.01% of the 50,225 individuals within the broader area.

Rhynchosia bungarensis (P4) is found in association with major drainage (eg. Robe River). The Proposed Change will result in clearing of 121 individuals, equating to 4% of the individuals recorded within the Proposed Change Area and 1% of the 12,736 individuals recorded in the broader area.

Priority Ecological Community (PEC)

Almost six hectares (5.7 ha) of the vegetation unit resembling the Priority 3 PEC *Triodia pisolitica* assemblages of the West Pilbara is proposed to be cleared, which equates to 39% of the total mapped extent within the Proposed Change Area. The areas to be impacted occur on the top, breakaway and gullies of the mesa landform, where clearing is required to access the orebody and locate key infrastructure.

Recent flora and vegetation investigations associated with other proposals in the Pilbara have identified more occurrences of this community than previously recorded, significantly increasing the known extent of this PEC (EPA 2019). The EPA considers the 5.7 ha of clearing required for the Proposed Change is unlikely to significantly impact this PEC.

Riparian vegetation

Less than 2 ha of sub-regionally and locally significant groundwater dependent vegetation will be directly impacted by clearing, most of this for widening an existing access road.

Riparian vegetation along Jimmawurrada Creek has already experienced 4 to 6 m of groundwater drawdown and recovery over the past ten years, and is currently exhibiting some signs of drought stress (Astron 2018). A predicted maximum drawdown of up to 9 m along a 6.5 km stretch of Jimmawurrada Creek (including 108 ha of facultative phreatophytic vegetation) is likely to result in impacts including areas of significant canopy decline and occasional tree mortality. A further 5.5 km stretch of Jimmawurrada Creek is predicted to experience less significant effects due to a reduced level of groundwater drawdown or, where downstream of a discharge outlet, periodic surface water discharge.

Groundwater dependent vegetation communities on the Robe River are predicted to experience less than one metre of groundwater drawdown, which is considered to be within the range of natural groundwater availability, however up to 232 ha of obligate phreatophytic vegetation may experience some canopy decline as a result of the Proposed Change.

Surplus water discharge associated with the Proposed Change will not exceed that already authorised for Mesa J Iron Ore Development, and is not expected to cause significant additional impacts.

Cumulative Impacts

The Proposed Change will result in clearing of up to 2,200 ha of vegetation, in addition to the 1,800 ha approved under Ministerial Statement 208 for the existing Mesa J Iron Ore Development, totalling 4,000 ha of clearing for the revised proposal. Existing and proposed clearing at other mining operations by Rio Tinto in the Robe Valley total 10,710 ha.

Mitigation and Management Measures

The EPA notes that in designing the Proposed Change, the proponent has considered the application of the mitigation hierarchy, in accordance with the *Environmental Factor Guideline – Flora and Vegetation* (EPA 2016b).

The EPA notes that the proponent has designed the Proposed Change to:

- minimise clearing of vegetation, particularly significant vegetation, where practicable
- minimise indirect impacts to vegetation as far as practicable.

The proponent has proposed mitigation measures in the event that groundwater drawdown is greater than anticipated in the Robe River alluvial aquifer as a result of groundwater abstraction for the revised proposal, including:

- providing abstracted water directly back into the permanent pools of the Robe River

- avoiding mining below the 120 m reduced level in the northern-most pit, particularly during extended drought periods.

The EPA considers that impacts to riparian vegetation can be managed, and recommends condition 5 requiring the proponent to develop and implement a Condition Environmental Management Plan to manage impacts to riparian vegetation (condition 6-1(2)).

The proponent has developed a Mine Closure Plan for the revised proposal which includes an objective to ensure that vegetation on rehabilitated land is self-sustaining and compatible with the final land use.

The EPA considers that significant residual impacts to Flora and Vegetation remain, and recommends that the proponent makes a contribution to the Pilbara Environmental Offset Fund for the clearing of Good to Excellent condition native vegetation.

Summary

The EPA has paid particular attention to:

- *Environmental Factor Guideline – Flora and Vegetation* (EPA 2016b)
- the proponent's flora and vegetation investigations
- the proponent's proposed mitigation and management measures to avoid and minimise disturbance to vegetation and significant flora.

The EPA considers, having regard to the relevant EP Act principles and environmental objective for Flora and Vegetation that the impacts to this factor are manageable, provided there is:

- control through the authorised extent in Schedule 1 of the Recommended Environmental Conditions
- preparation and implementation of the Condition Environmental Management Plan required by condition 5 to ensure the outcomes for riparian vegetation (condition 6-1(2)) are met
- preparation and implementation of a Mine Closure Plan (condition 9)
- contribution of funds to the Pilbara Offset Fund (condition 11) to counterbalance the significant residual impact of additional clearing of vegetation in 'Good' to 'Excellent' condition, including riparian vegetation.

The EPA notes there is a requirement for:

- licensing of emissions and discharges from prescribed activities by the Department of Water and Environmental Regulation (DWER) under Part V of the EP Act
- licensing of water abstraction by the DWER under the *Rights in Water and Irrigation Act 1914*.

4.3 Subterranean Fauna

The EPA's environmental objective for this factor is *to protect subterranean fauna so that biological diversity and ecological integrity are maintained*.

Relevant policy and guidance

The EPA considers that the following current environmental policy and guidance is relevant to its assessment of the proposal for this factor:

- *Environmental Factor Guideline – Subterranean Fauna* (EPA 2016d)
- *Technical Guidance – Subterranean Fauna Survey* (EPA 2016j)
- *Technical Guidance – Sampling Methods for Subterranean Fauna* (EPA 2016g)
- *WA Environmental Offsets Policy* (Government of Western Australia 2011)
- *WA Environmental Offsets Guidelines* (Government of Western Australia 2014).

The considerations for environmental impact assessment for this factor are outlined in *Environmental Factor Guideline – Subterranean Fauna* (EPA 2016d).

In addition to the relevant current policy and guidance above, the EPA also had regard to the *Guidelines for Preparing Mine Closure Plans* (DMP and EPA 2015).

EPA Assessment

Stygofauna and troglafauna communities are present within the Proposed Change Area and the area of potential groundwater drawdown.

The EPA is satisfied that the proponent has conducted surveys consistent with technical guidance for subterranean fauna and has provided sufficient information to describe the receiving environment and assess potential impacts.

Troglafauna

Four geological units were identified as potential troglafauna habitat in the development envelope; channel iron deposit (Robe Pisolite) (likely to be the primary habitat within the Proposed Change Area), alluvium, colluvium, and the Wittenoom Dolomite Formation.

No troglafauna listed as Priority, Schedule or Vulnerable at State or Federal levels were recorded during the surveys at Mesa H. There are no Threatened Ecological Communities that will be affected by the Proposed Change. Two Priority 1 PECs are present in or intersect the development envelope:

- *Subterranean invertebrate communities of mesas in the Robe Valley region*
- *Subterranean invertebrate community of pisolitic hills in the Pilbara.*

Thirty three species have been recorded within the Proposed Change Area. Six of these have also been recorded from outside the Proposed Change Area, and have demonstrated wider distributions. Twenty seven species are only known from within

the area of the Proposed Change. One troglofauna species is currently known only from the mine-pit impact area at Mesa H – *Japygidae* sp. 'DJA011'.

The proponent considers the occurrence of some taxa from multiple locations within Mesa H and the absence of known geological barriers and faults indicate a high level of connectivity of troglofauna habitat across Mesa H, and that the singleton troglofauna species currently only recorded from inside the proposed impact area is likely to have distributions that extend beyond the proposed impact area into the mining exclusion zone.

Impacts to troglofauna

Potential direct impacts to troglofauna as a result of the Revised Proposal are:

- reduction in up to 50% of the volume of pre-mining troglofauna channel iron deposit habitat at Mesa H due to mine pit development
- loss of individuals and changes to assemblages due to mine pit development.

Mining activities other than pit development that may result in indirect impacts to troglofauna include:

- clearing of vegetation and placement of mineral waste potentially leading to a reduction in organic inputs into the subterranean environment
- seepage from the waste fines storage facility generating a saturated zone above the groundwater table, resulting in a temporary reduction in troglofauna habitat
- blasting may cause voids and mesocaverns within the remnant mesa formations to collapse, resulting in a reduction in troglofauna habitat
- exposure of pit faces may cause changes to the temperature and humidity in the subterranean environment, potentially leading to degradation of troglofauna habitat
- hydrocarbon spills may result in a reduction in the quality of troglofauna habitat.

Cumulative impacts

Troglofauna generally demonstrate extreme short-range endemism, and many of the documented troglofauna species in the Robe Valley appear to be isolated to individual mesa formations. Cumulative impacts to troglofauna, therefore, are limited to separate impacts at each mesa. In addition, mining at Mesa J and other sites commenced before troglofauna had been discovered in the Robe Valley, making it difficult to determine baselines for estimating cumulative impacts.

To contextualise the cumulative impacts to general troglofauna habitat across the Robe Valley, the proponent has estimated impacts to the subterranean fauna PECs as follows:

- The Proposed Change will impact up to 9.20 ha of the *Subterranean invertebrate communities of the mesas in the Robe Valley region* PEC of this PEC, representing an incremental impact of 0.07% of the original pre-European extent (the proponent estimates the current extent of the PEC is 11,773.4 ha, about 85.6% of the original extent).

- The Proposed Change will impact up to 788.1 ha of *Subterranean invertebrate community of pisolitic hills in the Pilbara* PEC, representing an incremental impact of 7.97% of the original pre-European (the proponent estimates the current extent of the PEC is 952.3 ha, about 80.41% of the original extent).

Mitigation and management measures

The Proposed Change has been designed to retain significant amounts of connected troglofauna habitat by delineating a mining exclusion zone (MEZ) (Figure 2). A MEZ has been implemented at the geologically similar Mesa A and K operations, and monitoring results from Mesa A and K have been used to guide the design of the Mesa H MEZ.

The MEZ has been designed, as far as practicable, to retain at least one location where each troglobitic taxon has been recorded, and will retain connected habitat of at least 5 to 15 m depth with a width of at least 50 m around the mesa plateau and a minimum of 50% by volume of the pre-mining habitat at Mesa H. The proponent has committed to additional troglofauna sampling with the aim of increasing the recorded occurrences of current single location and singleton troglofauna taxa.

The MEZ precludes mining excavation, but not other activities including clearing of vegetation and location of infrastructure with the potential for indirect impacts to subterranean habitats. The proponent has committed to minimising indirect impacts.

The EPA notes that the Mine Closure Plan includes a closure objective to achieve a final landform that is stable and considers ecological objectives. The proponent has identified the need to maintain the integrity of the mesa escarpment in order to preserve habitat post closure, and backfilling will be prioritised around narrow areas of MEZ that protrude into the pit as a result of avoiding singleton troglofauna species.

Biological diversity and ecological integrity of the troglofauna communities are expected to be maintained given:

- the troglofauna habitat present is connected and extends beyond the proposed impact areas
- monitoring evidence indicates that the existing MEZ at the analogous Mesa A Operations is functioning as intended, in protecting the ecological integrity of troglofauna habitat and assemblages.

Stygofauna

The Robe River and Jimmawurrada alluvial aquifers, together with the below watertable channel iron deposit aquifers of Mesas J, H, Jimmawurrada and Bungaroo, are the most likely to provide habitat for stygofauna, based on their physical and hydraulic characteristics. Of the key geological units, alluvium, colluvium and riverine sheet floodplain are considered likely to provide primary habitat for stygofauna where they occur below watertable.

The stygofauna sampling results and hydrogeological data indicate there is unlikely to be any significant physical barriers to stygofauna dispersal within the channel iron

deposit aquifers and alluvial aquifers in the vicinity of the Proposed Change Area and surrounds.

No threatened ecological communities or environmentally sensitive areas relating to stygofauna occur in the Proposed Change Area or modelled groundwater impact areas. One PEC is located within the Proposed Change Area and modelled groundwater impact area: *the Stygofauna community of the Bungaroo Aquifer* (P1).

Forty six species of stygofauna are known from the Proposed Change Area. Thirty one of these have been recorded within the predicted extent of groundwater drawdown:

- 13 potential short range endemics
- Three conservation listed species:
 - *Nedsia hurlberti* (amphipod - historical record) listed as Threatened – Vulnerable under the *Biodiversity Conservation Act 2016* (BC Act)
 - *Nedsia sculptilis* (amphipod - historical record) listed as Threatened – Vulnerable under the *BC Act*
 - *Ophisternon candidum* (blind cave eel) listed as Threatened – Vulnerable under the EPBC Act and Vulnerable under Schedule 3 of the BC Act
- 15 widespread species.

Seven of these species are currently only known from within the modelled extent of cumulative drawdown.

Impacts to stygofauna

The Proposed Change will cause direct impacts to stygofauna species through:

- Reduction in stygofauna habitat due to below watertable pit excavation at Mesa H.
- Reduction in stygofauna habitat due to groundwater abstraction resulting in groundwater drawdown at Jimmawurrada Creek and Mesa H. There will be direct impact over a 12 km stretch of the Jimmawurrada Creek Alluvial Aquifer, with the greatest impact over a 6.5 km stretch impacting the stygofauna PEC.
- Loss of individuals and changes to assemblages due to below watertable mining at Mesa H and due to groundwater abstraction at Mesa H and Jimmawurrada Creek.

The Proposed Change may also cause indirect impacts to stygofauna species through:

- seepage from in-pit disposal of waste fines which has the potential to change groundwater chemistry and degrade stygofauna habitat
- hydrocarbon and wastewater spills which may result in a reduction in the quality of groundwater habitat.

The proponent's investigations and modelling show connection of habitat will be maintained throughout mining and closure, taking into account the excavation of mine pits causing permanent habitat removal, and groundwater abstraction causing temporary habitat removal. Of the seven species only known from within the modelled extent of cumulative drawdown, five were recorded from sites associated with the saturated alluvium along Jimmawurrada Creek, where at peak groundwater drawdown (estimated at around 2030) refugial saturated habitat of between 5 to 15 m thickness will remain and be hydraulically connected along the length of Jimmawurrada Creek. The other two species were recorded from sites that will be more substantially affected by groundwater drawdown or mine pit excavation, however the presence of connected habitat and data from other co-occurring species suggests these species are unlikely to be truly restricted to the recorded sites.

Mitigation and Management Measures

The proponent has proposed mitigation and management measures including:

- minimising dewatering to that required to access the resource, and using water from mine dewatering onsite where possible
- using a thickener plant at the waste fines storage facility to optimise water recovery and reduce overall water demand
- placing waste fines in-pit at Mesa J reducing seepage risks into stygofauna habitat at Mesa H
- monitoring groundwater levels to ensure groundwater drawdown is within the predicted range
- monitoring groundwater levels and water quality to ensure viable and connected stygofauna habitat is maintained
- ongoing stygofauna monitoring to detect changes in assemblages.

The EPA notes that pits will be backfilled at closure to enable recovery of groundwater levels and prevent the formation of pit lakes (and associated changes in water quality).

Biological diversity and ecological integrity of the stygofauna communities are expected to be maintained given:

- the extent and connectivity of stygofauna habitat at Mesa H and Jimmawurrada to other primary stygofauna habitat beyond the proposed impact areas, including the extensive Robe River Alluvial Aquifer and upstream channel iron deposit aquifer
- the maintenance of between 10 to 22 m of saturated thickness of the Jimmawurrada Creek Alluvial Aquifer and greater than 40% of habitat even during peak drawdown (and including consideration of extended dry periods and seasonal water table lows) in the impact areas.

Summary

The EPA has paid particular attention to:

- *Environmental Factor Guideline – Subterranean Fauna* (EPA 2016d)
- subterranean fauna surveys and investigations carried out by the proponent
- the likely extent of troglofauna habitat within and outside of disturbance areas
- the mitigation measures proposed by the proponent, including the delineation of a MEZ to ensure the retention of at least 50% by volume of connected pre-mining troglofauna habitat at Mesa H
- the likely extent and connectivity of stygofauna habitat within and outside the development envelope and the predicted area of groundwater drawdown.

The EPA considers, having regard to the relevant EP Act principles and environmental objective for Subterranean Fauna that the impacts to this factor are manageable and would no longer be significant, provided there is:

- control through authorised extent in Schedule 1 of the recommended environmental conditions (Appendix 5)
- preparation and implementation of a Condition Environmental Management Plan including measures to ensure the outcomes/objectives of recommended condition 7 (Subterranean fauna) are met
- preparation and implementation of a Mine Closure Plan (condition 9).

The EPA notes there is a requirement for:

- licensing of emissions and discharges from prescribed activities by the DWER under Part V of the EP Act
- licensing of water abstraction by the DWER under the *Rights in Water and Irrigation Act 1914*.

4.4 Terrestrial Fauna

The EPA's environmental objective for this factor is *to protect terrestrial fauna so that biological diversity and ecological integrity are maintained*.

Relevant policy and guidance

The EPA considers that the following current environmental policy and guidance is relevant to its assessment of the proposal for this factor:

- *Environmental Factor Guideline – Terrestrial Fauna* (EPA 2016e)
- *Technical Guidance – Sampling Methods for Terrestrial Vertebrate Fauna* (EPA 2016i)
- *Technical Guidance – Terrestrial Fauna Surveys* (EPA 2016k)
- *Technical Guidance – Sampling of Short Range Endemic Invertebrate Fauna* (EPA 2016h)

- *WA Environmental Offsets Policy* (Government of Western Australia 2011)
- *WA Environmental Offsets Guidelines* (Government of Western Australia 2014).

The considerations for environmental impact assessment for this factor are outlined in *Environmental Factor Guideline – Terrestrial Fauna* (EPA 2016e).

In addition to the relevant current policy and guidance above, the EPA also had regard to the *Guidelines for Preparing Mine Closure Plans* (DMP and EPA 2015).

EPA Assessment

Terrestrial fauna surveys have been undertaken in the Robe Valley area around Mesa J since 1991, progressively extending to Mesa A – Warrambo. The combined coverage of these surveys provides a considerable knowledge base of the terrestrial fauna present in the Robe Valley, and provides context for the Proposed Change. A two-phase terrestrial fauna assessment was conducted specifically relating to the Proposed Change (Astron 2017), as well as additional targeted fauna surveys as detailed in the proponent's ERD.

The EPA is satisfied that the proponent has conducted surveys consistent with technical guidance for terrestrial fauna and has provided sufficient information to describe the receiving environment and assess potential impacts.

Seven broad-scale habitat types have been recorded in the Proposed Change Area, with Gorge, Breakaway, and Riverine habitats considered to be of elevated significance for terrestrial fauna.

Six species of conservation significance have been recorded within the Proposed Change Area:

- northern quoll (*Dasyurus hallucatus*) – Endangered under the BC Act and the EPBC Act
- Pilbara olive python (*Liasis olivaceus barroni*) – Vulnerable under the BC Act and the EPBC Act
- Pilbara leaf-nosed bat (*Rhynonictoris aurantia*) – Vulnerable under the BC Act and the EPBC Act
- ghost bat (*Macroderma gigas*) – Vulnerable under the BC Act and the EPBC Act
- lined soil-crevice skink (*Notoscincus butleri*) – Priority 4
- western pebble mound mouse (*Pseudomys chapmani*) – Priority 4.

The Gorge and Breakaway habitats within the development envelope are important for northern quoll, providing denning sites for breeding and diverse microhabitats for foraging. The Riverine habitat may also provide important foraging sites for northern quoll.

A total of 13 ghost bat records, two diurnal roosts/possible maternal roosts and nine nocturnal feeding roosts have been identified in the Proposed Change Area. An assessment of caves associated with ghost bats at Mesa H indicates that ghost bat

presence at the mesa is intermittent, with the mesa being used for nocturnal foraging and occasional diurnal roosting. All known bat roost caves within the Proposed Change Area will be avoided.

No known short range endemic invertebrate species have been recorded in the Proposed Change Area. However, four potential short-range endemic (SRE) species were recorded in a number of habitat types including Riverine, Loamy/Stony Plains, Breakaway, Gorge habitats and disturbed areas. The scorpion *Lychas* 'sp. nov. 2' was collected from two locations in the widespread and common Loamy / Stony Plain habitat; one of these locations is within the proposed pit however, given the widespread distribution of the habitat, it is possible this species occurs elsewhere.

One fish of conservation significance (P4) has been recorded in the Proposed Change Area; the Fortescue Grunter. This species is endemic to the Pilbara and is known only from the Fortescue, Robe and Ashburton Rivers, however is common within its range.

Impacts

The Proposed Change may cause direct impacts to Terrestrial Fauna through:

- loss or fragmentation of fauna habitat including breeding, foraging and dispersal habitat due to clearing of up to 2,200 ha of vegetation
- loss of individuals from increased vehicle strikes, collisions with fencing and construction activities.

The Proposed Change may cause indirect impacts to Terrestrial Fauna through:

- alteration of fauna habitat due to altered hydrology arising from groundwater abstraction and increased temporal availability of surface water from discharge of surplus water
- loss or degradation of habitat due to noise and vibration
- degradation of habitat due to dust and light emissions
- degradation of habitat due to altered fire regime, introduction or spread of weeds and changes to feral animal populations
- degradation of aquatic fauna habitat due to changes in water chemistry as a result of discharge of surplus water.

Mitigation and management measures

The EPA notes that the proponent has designed the proposed change to:

- avoid impacting the habitat types that are considered to be of elevated importance to fauna, including conservation significant fauna, being Gorge, Breakaway and Riverine habitats
- avoid direct disturbance to all identified ghost bat roosts, and designed the MEZ to ensure that mine pits are set back from recorded diurnal/maternity roosts by a minimum of 40 m from the lateral extent (recorded back) of the cave and from nocturnal roosts by a minimum of 50 m from the entrance to the cave.

At closure the proponent commits to rehabilitating the area to a safe, stable and self-sustaining native ecosystem that may provide opportunity for suitable fauna habitat.

The EPA considers that significant residual impacts to Terrestrial Fauna remain, and recommends that the proponent makes a contribution to the Pilbara Environmental Offsets Fund to offset the significant residual impact of clearing fauna habitat (condition 11).

Summary

The EPA has paid particular attention to the:

- *Environmental Factor Guideline – Terrestrial Fauna* (EPA 2016e)
- application of the mitigation hierarchy to avoid and minimise clearing of fauna habitat
- loss of no more than 0.1 ha of Gorge habitat, 3.4 ha of Breakaway habitat, and 1.3 ha of Riverine habitat
- avoidance of all of the known ghost bat roosts within the Proposed Change Area.

The EPA considers, having regard to the relevant EP Act principles and environmental objective for Terrestrial Fauna that the impacts to this factor are manageable and would no longer be significant, provided there is:

- a limit on the clearing of native vegetation through the authorised extent in Schedule 1 of the recommended environmental conditions (Appendix 5)
- preparation and implementation of a Condition Environmental Management Plan to ensure the outcome/objective of recommended condition 8 (Terrestrial Fauna Habitat) is met
- preparation and implementation of a Mine Closure Plan (recommended condition 9)
- a contribution of funds to the Pilbara Environmental Offset Fund (recommended condition 11) to counterbalance the significant residual impact of clearing significant fauna habitat.

4.5 Social Surroundings

The EPA's environmental objective for this factor is *to protect social surroundings from significant harm*.

Relevant policy and guidance

The EPA considers that the following current environmental policy and guidance is relevant to its assessment of the proposal for this factor:

- *Environmental Factor Guideline – Social Surroundings* (EPA 2016c).

The considerations for environmental impact assessment for this factor are outlined in *Environmental Factor Guideline – Social Surroundings* (EPA 2016c).

In addition to the relevant current policy and guidance above, the EPA also had regard to the *Guidelines for Preparing Mine Closure Plans* (DMP and EPA 2015).

EPA Assessment

The proposal is located within the determined Robe River Kuruma Native Title area (WCD2018/003).

The proponent has Native Title agreements with the Robe River Kuruma People that include an established consultation framework for ongoing engagement on relevant aspects of the proponent's operations.

Extensive archaeological and ethnographic surveys have been conducted across the Proposed Change Area and immediate surrounds with the involvement of the Robe River Kuruma People.

The most significant heritage values in the Proposed Change Area as identified by the Robe River Kuruma People are:

- all watercourses, including the Robe River and Jimmawurrada Creek
- semi-permanent and permanent pools of the Robe River
- visual amenity of the mesas including use as navigational landmarks
- Jirtiwi Thalu (ethnographic site)
- gender restricted quarry site MJ04-09
- Deepdale burial
- law grounds.

Impacts

The Proposed Change will cause direct impacts to Social Surroundings through:

- Disturbance of sites and places of cultural significance (via clearing, excavation and infrastructure placement). Based on current designs the Proposed Change footprint will directly impact 18 archaeological sites comprising 17 artefact scatters (including one with an associated scarred tree) and one quarry (not gender restricted)
- Indirect disturbance to sites and places of cultural significance via changes to the physical and biological attributes of the environment (via dewatering, surplus water discharge, and blast vibrations)
- Prevention or reduction of access to a site.

Mitigation

The EPA notes that the proponent has designed the Proposed Change to minimise impacts to Aboriginal Heritage, in particular:

- Infrastructure locations have been designed to limit physical disturbance to the Robe River and its pools.

- The mesa escarpments (facades) will be retained through delineation of the MEZ, except where cuts are required to facilitate haul road access. The retention of the mesa escarpments will enable the mesa landforms to continue to function as navigational landmarks for the Robe River Kuruma People.
- All recorded rockshelters will be protected by the MEZ, and blasts will be trimmed as the pit margins approach the MEZ to minimise the risk of damage to the escarpment.
- The Proposed Change footprint has been modified and buffered at the request of the Robe River Kuruma People to avoid direct impact to the significant sites Jirtiwi Thalu and the gender restricted quarry site MJ04-09.

Summary

The EPA has paid particular attention to the:

- *Environmental Factor Guideline – Social Surroundings* (EPA 2016c)
- proponent's application of the mitigation hierarchy to avoid and minimise disturbance of ethnographic and archaeological importance
- participation Agreement and an Indigenous Land Use Agreement between the proponent and the Robe River Kuruma People.

The EPA considers, having regard to the relevant EP Act principles and environmental objective for Social Surroundings, that the impacts to this factor are manageable.

The EPA notes that the proponent has consulted with the Robe River Kuruma People. The proponent is aware of its obligations under the *Aboriginal Heritage Act 1972* and the EPA considers that any impacts to registered sites can be managed under the Act.

4.6 Air Quality

The EPA's environmental objective for this factor is *to maintain air quality and minimise emissions so that environmental values are protected*.

Relevant policy and guidance

The EPA considers that the following current environmental policy and guidance is relevant to its assessment of the proposal for this factor:

- *Environmental Factor Guideline – Air Quality* (EPA 2016a).

The considerations for environmental impact assessment for this factor are outlined in *Environmental Factor Guideline – Air Quality* (EPA 2016a).

EPA Assessment

The existing Mesa J Iron Ore Development emits Scope 1 emissions of about 46,630 tonnes CO₂ equivalent per year and Scope 2 emissions of about 10,815 tonnes CO₂ equivalent per year. The Proposed Change may result in greenhouse gas emissions and impacts to air quality through:

- diesel combustion by haul trucks
- clearing of native vegetation
- use of explosives during blasting
- power consumption for ore processing.

The Proposed Change will contribute, on average, additional Scope 1 emissions of about 51,468 tonnes CO₂ equivalent per year and additional Scope 2 emissions of about 5,806 tonnes CO₂ equivalent per year. The key energy demands for the Proposed Change, contributing the most significant proportion of Scope 1 greenhouse gas emissions, are emissions due to combustion of diesel fuel for haulage from Mesa H back to Mesa J Production Hub, and emissions due to generation of electricity.

The total cumulative Scope 1 greenhouse gas emissions for the revised proposal will be up to about 120,896 (average 98,098) tonnes CO₂ equivalent per year. The proponent has committed to continue to manage greenhouse gas emissions in accordance with relevant legislation and national and state strategies relating to greenhouse gas emissions.

Although the proposal is not a major contributor to the State's greenhouse gas emissions, the EPA has recommended condition 10 requiring the proponent to develop and implement a Greenhouse Gas Management Plan to ensure greenhouse gas emissions are minimised as far as practicable.

Summary

The EPA has paid particular attention to the:

- *Environmental Factor Guideline – Air Quality* (EPA 2016a)
- predicted greenhouse gas emissions.

The EPA considers, having regard to the relevant EP Act principles and environmental objective for Air Quality, that the impacts to this factor are manageable provided there is:

- control through authorised extent in schedule 1 of the recommended environmental conditions (Appendix 5)
- a condition requiring a Greenhouse Gas Management Plan (condition 10).

The EPA notes there is a requirement for licensing of emissions and discharges from prescribed activities by the DWER.

5. Offsets

As stated in the *Environmental Impact Assessment (Part IV Divisions 1 and 2) Procedures Manual* (EPA 2018b), if a proposal relates to a change to, or an expansion of an approved proposal, current offsets practice applies to these changes. Consistent with this, the EPA is only assessing whether offsets are appropriate for the additional impacts arising from the Proposed Change. The clearing approved under Ministerial Statement 208 is exempt from offsets requirements, as offsets were not applied at the time the implementation agreement or decision was made.

Relevant policy and guidance

The EPA considers that the following policy and guidance is relevant to its assessment of offsets for the proposal:

- *WA Environmental Offsets Policy* (Government of Western Australia 2011)
- *WA Environmental Offset Guidelines* (Government of Western Australia 2014)
- *Environmental Impact Assessment (Part IV Divisions 1 and 2) Procedures Manual* (EPA 2018b).

The EPA has also considered its strategic advice on *Cumulative environmental impacts of development in the Pilbara Region – Advice of the Environmental Protection Authority to the Minister for Environment under Section 16 (e) of the Environmental Protection Act 1986* (EPA 2014), for the assessment of offsets.

EPA Assessment

Environmental offsets are actions that provide environmental benefits which counterbalance the significant residual impacts of a proposal. The EPA may apply environmental offsets where it determines that the residual impacts of a proposal are significant, after avoidance, minimisation and rehabilitation have been pursued.

Mitigation measures are assessed under the relevant environmental factor (see sections 4.1 to 4.6 of this report). In applying the residual impact significance model (Government of Western Australia 2014), the EPA considers that the Proposed Change would have a significant residual impact from the following:

- clearing up to 1,986 ha of native vegetation in 'Good' to 'Excellent' condition including foraging or dispersal habitat for the northern quoll, ghost bat, Pilbara leaf-nosed bat and the Pilbara olive python
- up to 2 ha of riparian vegetation
- clearing of critical habitat for the northern quoll (Breakaway, Gorge and Riverine habitat)
- clearing up to 6 ha of vegetation analogous to the *Triodia pisolitica* assemblages of the West Pilbara PEC.

In its advice on the cumulative impacts in the Pilbara (EPA 2014), the EPA considered that without intervention, the increasing cumulative impacts of

development and land use in the Pilbara region will significantly impact on biodiversity and environmental values. The EPA considers that the clearing of native vegetation and impacts on other associated environmental values in the Pilbara Interim Biogeographic Regionalisation for Australia (IBRA) bioregion is significant where the cumulative impact may reach critical levels if not managed.

The proposal is located within the Hamersley IBRA subregion. Only 13% of the Hamersley subregion is currently reserved for conservation.

Consistent with the Residual Impact Significance Model in the *WA Environmental Offsets Guidelines*, where the cumulative impact may reach critical levels if not managed, the clearing of native vegetation in 'Good to Excellent' condition within the Hamersley IBRA subregion, and impacts to Matters of National Environmental Significance including conservation significant fauna requires an offset to counterbalance the significant residual impact of the clearing. The *WA Environmental Offsets Guidelines* also identify that clearing of native vegetation that is watercourse or wetland dependent may be a significant residual impact that requires an offset. Consistent with this, the clearing of 2 ha of riparian vegetation constitutes a significant residual impact that requires an offset.

Conservation areas in the Pilbara bioregion total about 8% of the area, with the remainder mostly crown land overlain with mining tenements and pastoral leases. The EPA recognises that the opportunity for proponents to undertake individual offsets in the Pilbara Region is constrained by overlapping land tenure arrangements and limited land access to undertake on-ground offset actions. Therefore, traditional approaches to offsets, namely land acquisition and management offsets, are limited.

In its advice on cumulative impacts in the Pilbara (EPA 2014), the EPA proposed the establishment of a strategic conservation initiative for the Pilbara as a mechanism to pool offset funds to achieve biodiversity conservation outcomes. Such an approach would provide a mechanism to overcome some of the offset implementation constraints. A pooled offset approach is consistent with the *WA Environmental Offsets Policy*, which states that environmental offsets will be focused on longer term strategic outcomes (Principle 6). Strategic approaches, such as the use of a fund, can provide a coordinating mechanism to implement offsets across a range of land tenures (Government of Western Australia 2014).

A contribution to a strategic conservation initiative focused on these or similar types of actions would allow for an outcome that counterbalances the significant residual impacts from this proposal. The EPA considers that there should be a clear target outcome for each offset project supported by the offset funds. A clear link must be drawn between the outcomes and the significant residual impacts of the individual proposal. Funds should be used for landscape scale on-ground actions in the Pilbara IBRA region and indirect actions (such as research) that will directly counterbalance the significant residual impacts and contribute to biodiversity conservation outcomes in the region.

The EPA has stated that the type of environmental offsets in the Pilbara that contribute to a strategic conservation initiative will ensure a consistent and

transparent approach and contribute to longer term strategic outcomes, with contributions based on an assessment of the significance of environmental impacts.

The EPA's view is that project funding for offsets should not be used to provide substitute funding for existing government programs or proponent obligations.

Commensurate with other decisions within the Hamersley IBRA subregion, the EPA recommends that the following offset rates should apply in the form of a contribution to a Pilbara strategic conservation initiative for landscape-scale actions to protect biodiversity in the Pilbara:

- \$833 AUD (excluding GST) per hectare of 'Good' to 'Excellent' condition native vegetation, including foraging or dispersal habitat for the northern quoll, ghost bat, Pilbara leaf-nosed bat and the Pilbara olive python, cleared within the Proposed Change Area within the Hamersley IBRA subregion.
- \$1,666 AUD (excluding GST) per hectare of riparian vegetation associated with the Robe River and/or Jimmawurrada Creek cleared within the Proposed Change Area within the Hamersley IBRA subregion.
- \$1,666 AUD (excluding GST) per hectare of critical habitat for the northern quoll (Breakaway, Gorge and Riverine habitat) cleared within the Proposed Change Area within the Hamersley IBRA subregion.
- \$1,666 AUD (excluding GST) per hectare of the Priority 3 PEC *Triodia pisolitica* assemblages of the West Pilbara cleared within the Proposed Change Area within the Hamersley IBRA subregion.

6. Matters of National Environmental Significance

The Commonwealth Minister for the Environment has determined that the proposal is a controlled action under the EPBC Act as it is likely to have a significant impact on one or more MNES. It was determined that the proposed action is likely to have a significant impact on the following matters protected by the EPBC Act:

- Listed threatened species and communities (s. 18 and s. 18A).

The EPA has assessed the controlled action on behalf of the Commonwealth as an accredited assessment under the EPBC Act.

This assessment report is provided to the Commonwealth Minister for Environment who will decide whether or not to approve the proposal under the EPBC Act. This is separate from any Western Australian approval that may be required.

Commonwealth policy and guidance

The EPA had regard to the following relevant Commonwealth guidelines, policies and plans during its assessment:

- Threatened Species Scientific Committee (2008). *Commonwealth Conservation Advice on Liasis olivaceus barroni (Olive Python (Pilbara subspecies))*. Department of the Environment, Water, Heritage and the Arts, 2008.
- Hill, B. & S. Ward (2010). *National Recovery Plan for the Northern Quoll Dasyurus hallucatus*. Department of Natural Resources, Environment, the Arts and Sport, Northern Territory.
- Threatened Species Scientific Committee (2016). *Approved Conservation Advice for Macroderma gigas (ghost bat)*. Canberra: Department of the Environment.
- Threatened Species Scientific Committee (2016). *Approved Conservation Advice for Rhinonictis aurantia (Pilbara form) (Pilbara Leaf-nosed Bat)*. Department of the Environment.
- Department of Sustainability, Environment, Water, Population and Communities, 2012 *Environment Protection and Biodiversity Conservation Act 1999 Environmental Offsets Policy*.

EPA assessment

Impacts to the environment are covered under the key environmental factors of Inland Waters, Flora and Vegetation, Subterranean Fauna, and Terrestrial Fauna, where relevant.

The proponent has described five broad habitat types according to landforms and importance to, and use by, MNES within the Proposed Change Area and wider Robe Valley:

- Breakaways and Gullies
- River
- Mesa Plateau

- Hills
- Plains.

The most significant habitat types for MNES within the Proposed Change Area are Breakaway and Gullies and River. The Proposed Change has been designed to avoid impacts to these habitat types, with disturbance to Breakaways and Gullies limited to 3.5 ha (and a further 3.8 ha of habitat within 10 m of Breakaways and Gullies) and disturbance to River habitat limited to 1.3 ha.

Northern quoll (*Dasyurus hallucatus*)

Northern quolls were recorded 32 times in the Proposed Change Area during surveys in 2016 (Astron 2017), and there is a total of 50 records from all surveys undertaken within the development envelope. The proponent has identified the northern quoll population recorded in the Proposed Change Area as a 'population important for the long-term survival' of the species, as defined in the EPBC Act referral guidelines for the Endangered Northern Quoll *Dasyurus hallucatus* (DoE 2016).

The Breakaways and Gullies habitat and River habitat have the potential to provide shelter for the northern quoll. Foraging and dispersal habitat is less understood, but based on current knowledge, is considered to be "any land comprising predominantly native vegetation in the immediate area (i.e. within 1 km) of shelter habitat, quoll records or land comprising predominantly native vegetation that is connected to shelter habitat within the range of the species" (DoEE 2016).

The most important habitat for northern quoll within the development envelope is Breakaways and Gullies, and River, with more than 80% of northern quoll records within, or within 10 m of, these habitat types.

Ghost bat (*Macroderma gigas*)

A total of 13 records, two diurnal roosts/possible maternal roosts, and nine nocturnal feeding roosts have been identified within the Proposed Change Area. All caves used as diurnal/nocturnal roosts within the Proposed Change Area will be retained, and indirect impacts minimised.

The most significant habitat for ghost bats within the Proposed Change Area is the Breakaways and Gullies, including the mesa escarpments, and the River habitat, as these areas provide potential roost and foraging habitat.

Pilbara leaf-nosed bat (*Rhinonicteris aurantia*)

The Pilbara leaf-nosed bat has been recorded 11 times within the Proposed Change Area. No caves within the Proposed Change Area match the depth, temperature and humidity criteria to be classified as diurnal roost sites for this species, and the nearest recorded diurnal roost is 10 km to the south-east of the Proposed Change Area.

The most significant habitats for Pilbara leaf-nosed bat within the Proposed Change Area, providing foraging and dispersal value, are the Breakaways and Gullies and the River.

Pilbara olive python (*Liacis olivaceus barroni*)

A single juvenile Pilbara olive python was recorded in the River habitat within the Proposed Change Area, and scats were recorded on two other occasions in Hills and Mesa Plateau habitat types. Breakaways and Gullies habitat and River habitat likely provide breeding and foraging habitat, particularly areas close to semi-permanent and permanent pools in the Robe River.

Blind cave eel (*Ophisternon candidum*)

Previously only known from karstic caves in the Cape Range Peninsula and karstic aquifers at Barrow Island off the Pilbara Coast, this species was first recorded in the Robe River catchment in 2009 during annual stygofauna sampling. Since then, targeted sampling has increased the number of records of this species in the Robe River Catchment to 20 records from 16 sites (Rio Tinto 2019):

- Eight records from four sites in Jimmawurrada Creek, within the area of impact of the Proposed Change
- 12 records from 12 sites in the Robe River (eight of which are pools); six of these sites will have limited or negligible impact from the Proposed Change, six of these are reference sites with no predicted impact from the Proposed Change.

Habitat is understood to be primarily associated with the Robe River Catchment alluvial aquifer – considered an interconnected habitat with no geological or hydrological barriers. The majority of records have been found in semi-permanent and permanent pools in the Robe River.

Summary

The EPA has assessed the potential impacts of the Proposed Change on MNES, and notes the change has been designed to avoid habitat important to MNES. The EPA has recommended the following environmental conditions to minimise impacts on MNES:

- a limit on the clearing of native vegetation through the authorised extent in Schedule 1 of the recommended environmental conditions (Appendix 5)
- preparation and implementation of a Condition Environmental Management Plan to ensure the outcome of condition 8-1(1) (Terrestrial Fauna Habitat) is met.

The EPA considers there will be a significant residual impact from the clearing of fauna habitat, including habitat for significant fauna species. The EPA has recommended condition 11 (Offsets) (see section 5) which takes into account the significant residual impact to listed fauna species.

The EPA's view is that, with the offsets recommended by condition 11, the impacts from the proposal on the above-listed MNES are not expected to result in an unacceptable or unsustainable impact on the listed threatened species and communities.

7. Conclusion

The EPA has considered the proponent's proposal to revise and expand the existing Mesa J Iron Ore Development, located about 10 km south of Pannawonica, by developing the adjacent Mesa H deposit.

Application of mitigation hierarchy

Consistent with relevant policies and guidance, the proponent has addressed the mitigation hierarchy by identifying measures to avoid, minimise and rehabilitate environmental impacts including, but not limited to:

- designing the Proposed Change to preserve the values of habitat types that are more restricted, or otherwise considered to be of elevated importance due to supporting a number of MNES species (Breakaways and Gullies, and River habitats)
- delineating a mining exclusion zone to preserve subterranean fauna habitat and the mesa escarpments, protecting a number of environmental, heritage and amenity values associated with the mesa landforms
- avoiding disturbance of all ghost bat roosts identified within the Proposed Change Area
- avoiding almost all direct disturbance to riparian vegetation associated with the Robe River and/or Jimmawurrada Creek
- minimising impacts to Priority flora species
- managing surplus water discharge for the Revised Proposal within the existing extent authorised for the Mesa J Iron Ore Development
- preparing environmental management plans for the Revised Proposal.

Offsets

The EPA considers that the Proposed Change would have a significant residual impact in the Hamersley IBRA subregion due to:

- clearing of up to 1,986 ha of native vegetation in 'Good' to 'Excellent' condition including foraging and/or dispersal habitat for the northern quoll, Pilbara leaf-nosed bat, ghost bat, and Pilbara olive python
- clearing up to 2 ha of riparian vegetation
- clearing of critical habitat for the northern quoll (Breakaway, Gorge and Riverine habitat)
- clearing of up to 6 ha of vegetation analogous to the *Triodia pisoliticola* assemblages of the West Pilbara PEC.

The proponent is proposing to fulfill all offset requirements through a financial contribution to the Pilbara Environmental Offset Fund, established and administered by the Government of Western Australia. The EPA has recommended condition 11 (Offsets) specifying the offset requirements, and requiring the preparation and implementation of an Impact Reconciliation Procedure.

Conclusion

The EPA has taken the following into account in its assessment of the proposal as a whole, including the:

- impacts to all the key environmental factors
- EPA's confidence in the proponent's proposed mitigation measures
- relevant EP Act principles and the EPA's objectives for the key environmental factors
- EPA's view that the impacts to the key environmental factors are manageable, provided the recommended conditions are imposed.

Given the above, the EPA has concluded that the proposal may be implemented subject to the conditions recommended in Appendix 5.

8. Recommendations

That the Minister for Environment notes:

1. The proposal assessed is for a revision of the Mesa J Iron Ore Development, located about 10 km south of Pannawonica, through the development of the adjacent Mesa H deposit.
2. The key environmental factors identified by the EPA in the course of its assessment are Inland Waters, Flora and Vegetation, Subterranean Fauna, Terrestrial Fauna, Social Surroundings and Air Quality, set out in section 4.
3. The EPA has concluded that the proposal may be implemented, provided the implementation of the proposal is carried out in accordance with the recommended conditions and procedures set out in Appendix 5. Matters addressed in the conditions include the following:
 - a) a mining exclusion zone to avoid impacts to subterranean fauna and threatened species habitat
 - b) environmental management plan/s to minimise impacts to Inland Waters, Flora and Vegetation, Subterranean Fauna, and Terrestrial Fauna
 - c) a mine closure plan to address rehabilitation and closure
 - d) offsets to counterbalance impacts from the clearing of:
 - 'Good' to 'Excellent' condition native vegetation within the Hamersley IBRA subregion, including foraging and dispersal habitat for the northern quoll, Pilbara leaf-nosed bat, ghost bat, and Pilbara olive python,
 - up to 2 ha of riparian vegetation;
 - critical habitat for the northern quoll (Breakaway, Gorge and Riverine habitat);
 - up to 6 ha of vegetation analogous to the *Triodia pisolitica* assemblages of mesas of the West Pilbara PEC.
 - e) a Greenhouse Gas Management Plan.

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Robe River Mining Co. Pty. Ltd 2019b, *Mesa H Proposal, Revision to Mesa J Iron Ore Development Response to Submissions*. Prepared by Rio Tinto on behalf of Robe River Mining Co. Pty Ltd.

State of Western Australia 2019, *Western Australian Government Gazette*, No. 223, 13 December 2016.

Appendix 1: List of submitters

Organisations:

The Wilderness Society WA

Appendix 2: Consideration of principles

EP Act Principle	Consideration
<p>1. The precautionary principle</p> <p><i>Where there are threats of serious or irreversible damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation. In application of this precautionary principle, decisions should be guided by –</i></p> <ul style="list-style-type: none"> <i>a) careful evaluation to avoid, where practicable, serious or irreversible damage to the environment; and</i> <i>b) an assessment of the risk-weighted consequences of various options.</i> 	<p>In considering this principle, the EPA notes that vegetation in 'Good' to 'Excellent' condition, riparian vegetation, subterranean fauna habitat, and habitat for matters of national environmental significance (MNES) species could be significantly impacted by the Proposed Change. The assessment of these impacts is provided in this report.</p> <p>The proponent has proposed a mining exclusion zone (MEZ) to retain at least 50% of pre-mining troglofauna habitat. The proponent has conducted monitoring at the analogous Mesa A MEZ which indicates a MEZ is an appropriate mitigation strategy. The proponent has committed to further monitoring to monitor and manage, and improve knowledge of, the remaining troglofauna habitat. The MEZ will also retain high value terrestrial fauna habitat within the mesa escarpment.</p> <p>The EPA has recommended conditions to ensure that environmental outcomes are achieved, that environmental management plans are prepared to the satisfaction of the CEO of the Department of Water and Environmental Regulation and effective long-term management and minimisation of impacts to riparian vegetation, northern quoll, and ghost bat.</p> <p>From its assessment of this proposal the EPA has concluded that there is no threat of serious or irreversible harm.</p>

EP Act Principle	Consideration
<p>2. The principle of intergenerational equity</p> <p><i>The present generation should ensure that the health, diversity and productivity of the environment is maintained and enhanced for the benefit of future generations.</i></p>	<p>In considering this principle, the EPA notes that Inland Waters, Flora and Vegetation, Subterranean Fauna and Terrestrial Fauna could be significantly impacted by the proposal. The assessment of these impacts is provided in this report.</p> <p>In assessing the proposal, the EPA has recommended conditions to manage impacts to Inland Waters, Flora and Vegetation, Subterranean Fauna and Terrestrial Fauna, in particular the pools and riparian vegetation of the Robe River, troglofauna habitat and northern quoll habitat.</p> <p>From its assessment of this proposal, the EPA has concluded that the environmental values will be protected and the health, diversity and productivity of the environment will be maintained for the benefit of future generations.</p>
<p>3. The principle of the conservation of biological diversity and ecological integrity</p> <p><i>Conservation of biological diversity and ecological integrity should be a fundamental consideration.</i></p>	<p>This principle is a fundamental and relevant consideration for the EPA when assessing and considering the impacts of the proposal on the environmental factors of Flora and Vegetation, Subterranean Fauna and Terrestrial Fauna. This principle is also relevant to the EPA's consideration of the proposed offset strategy.</p> <p>The proponent has undertaken comprehensive baseline studies to understand and assess potential impacts to biological diversity and ecological integrity. The EPA notes that the proponent has identified measures to avoid or minimise impacts. The EPA has considered these measures during its assessment.</p> <p>The EPA has recommended conditions for the factors of Inland Waters, Subterranean Fauna, and Terrestrial Fauna to ensure that impacts are not greater than predicted. Significant residual impacts will be offset.</p> <p>From its assessment of this proposal, the EPA has concluded that the proposal would not compromise the biological diversity and ecological integrity of the affected areas.</p>

EP Act Principle	Consideration
<p>4. Principles relating to improved valuation, pricing and incentive mechanisms</p> <p><i>(1) Environmental factors should be included in the valuation of assets and services.</i></p> <p><i>(2) The polluter pays principles – those who generate pollution and waste should bear the cost of containment, avoidance and abatement.</i></p> <p><i>(3) The users of goods and services should pay prices based on the full life-cycle costs of providing goods and services, including the use of natural resources and assets and the ultimate disposal of any waste.</i></p> <p><i>(4) Environmental goals, having been established, should be pursued in the most cost effective way, by establishing incentive structure, including market mechanisms, which enable those best placed to maximise benefits and/or minimize costs to develop their own solution and responses to environmental problems.</i></p>	<p>In considering this principle, the EPA notes that the proponent would bear the cost relating to waste and pollution, including avoidance, containment, decommissioning, rehabilitation and closure.</p> <p>The EPA has had regard to this principle during the assessment of the proposal.</p>
<p>5. The principle of waste minimisation</p> <p><i>All reasonable and practicable measures should be taken to minimise the generation of waste and its discharge into the environment.</i></p>	<p>In considering this principle, the EPA notes that the proponent proposes to minimise waste by adopting the waste hierarchy (avoid, minimise, reuse, recycle and safe disposal).</p> <p>The EPA has had regard to this principle during the assessment of the proposal.</p>

Appendix 3: Evaluation of other environmental factors

Environmental factor	Description of the proposal's likely impacts on the environmental factor	Government agency and public comments	Evaluation of why the factor is not a key environmental factor
LAND			
Landforms	<p>The mesas landforms are significant features of the Robe Valley, evidenced by their importance as landmarks for Aboriginal navigation.</p> <p>The escarpments of the mesas also provide high value habitat (Breakaways and Gorge) for terrestrial fauna including MNES species.</p> <p>The proposed change will excavate the centre of Mesa H, leaving the majority of the escarpment intact except where cuts are required to access the mining area.</p>	No agency or public comments were received regarding Landforms.	<p>Landforms was identified as an 'other factor' when the EPA decided to assess the proposal and in the Environmental Scoping Document.</p> <p>The proposed mining exclusion zone will retain the façade of Mesa H, apart from where cuts are required to access the mining area, so that there will be minimal visual impact from the valley floor.</p> <p>The EPA considered the potential impacts to amenity and Aboriginal use under Social Surroundings, and the potential impacts to fauna habitat under Terrestrial Fauna.</p> <p>Accordingly, the EPA did not consider Landforms to be a key environmental factor at the conclusion of its assessment.</p>

Appendix 4: Proposed changes to conditions for revised proposal

Proposed Implementation Agreement (Ministerial Statement)

The EPA recommends that the proposal may be implemented and further recommends that the implementation of the proposal be subject to the Implementation Agreement (Ministerial Statement) set out in Appendix 5.

The recommended Ministerial Statement has been developed in accordance with the *Environmental Impact Assessment (Part IV Divisions 1 and 2) Procedures Manual* (EPA 2018b) and includes a review of the following implementation conditions:

- Ministerial Statement 208: Mesa J Iron Ore Development, Pannawonica (590), issued on 16 January 1992.

Proposed changes

The main changes between the proposed new Ministerial Statement (Appendix 5) and the existing Ministerial Statement 208 relate to:

- removal of redundant conditions
- updating conditions to reflect the EPA's contemporary condition setting approach.

Recommended environmental conditions

The EPA notes the following:

- condition 3 of the recommended conditions requiring the preparation of a Compliance Assessment Plan
- condition 4 of the recommended conditions requiring the proponent to make data publicly available
- condition 5 of the recommended conditions requiring the proponent to prepare and implement a Condition Environmental Management Plan(s) to meet environmental values for the factors Inland Waters, Flora and Vegetation, Subterranean Fauna and Terrestrial Fauna.

Recommended proposal details (Schedule 1)

The description of the Revised Proposal contained in Schedule 1 (Appendix 5) has been updated to reflect the EPA's contemporary approach to project descriptions described in the EPA's Procedures Manual (EPA 2018b).

Changes include:

- clearing values updated to reflect the cumulative area of up to 4,000 hectares within the revised development envelope of 6,638 hectares.
- groundwater abstraction volumes included in the authorised extent
- surplus water discharge included in the authorised extent
- removal of key proposal characteristics that are not considered relevant to environmental impacts.

Appendix 5: Identified Decision-Making Authorities and Recommended Environmental Conditions

Identified Decision-Making Authorities

Section 44(2) of EP Act specifies that the EPA's report must set out (if it recommends that implementation be allowed) the conditions and procedures, if any, to which implementation should be subject. This Appendix contains the EPA's recommended conditions and procedures.

Section 45(1) requires the Minister for Environment to consult with decision-making authorities (DMAs), and if possible, agree on whether or not the proposal may be implemented, and if so, to what conditions and procedures, if any, that implementation should be subject.

The following decision-making authorities have been identified:

Decision-making Authority	Legislation (and Approval)
1. Minister for Aboriginal Affairs	<i>Aboriginal Heritage Act 1972</i> (Section 18 clearances)
2. Minister for State Development	<i>Iron Ore (Robe River) Agreement Act 1964</i>
3. Minister for Water	<i>Rights in Water and Irrigation Act 1914</i> (Water abstraction licence)
4. Minister for Environment	<i>Biodiversity Conservation Act 2016</i> (Taking of flora and fauna)
5. Minister for Mines and Petroleum	<i>Mining Act 1978</i>
6. CEO, Department of Water and Environment Regulation	<i>Environmental Protection Act 1986</i> (Works Approval and Licence) <i>Environmental Protection (Clearing of Native Vegetation) Regulations 2014</i> (Clearing Permit)
7. Department of Mines, Industry Regulation and Safety Executive Director, Resource and Environmental Compliance Chief Dangerous Goods Officer State Mining Engineer	<i>Mining Act 1978</i> (Mining Proposal) <i>Dangerous Goods Safety Act 2004</i> (Dangerous goods) <i>Mines Safety and Inspection Act 1994</i> (Mines Safety) <i>Mines Safety and Inspection Regulations 1995</i> (approval to commence mining operations)

8. Chief Executive Officer, Shire of Ashburton	<i>Health Act 1911</i> Health (Treatment of Sewage and Disposal of Effluent and Liquid Waste) Regulation 1974
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Note: In this instance, agreement is only required with DMAs 1 to 5 since these DMAs are Ministers.

RECOMMENDED ENVIRONMENTAL CONDITIONS

STATEMENT THAT A REVISED PROPOSAL MAY BE IMPLEMENTED (*Environmental Protection Act 1986*)

MESA H PROPOSAL (REVISION TO THE MESA J IRON ORE DEVELOPMENT)

Proposal: The Revised Proposal is a revision of the existing Mesa J Iron Ore Development, the subject of Statement No. 208 dated 16 January 1992.

The Revised Proposal is located approximately 16 kilometres south west of Pannawonica in the Pilbara region of Western Australia. The Revised Proposal includes development of above and below watertable open cut pits at Mesa J and Mesa H, ore processing facilities, waste dumps, ore, topsoil and subsoil stockpiles and associated infrastructure, including water management infrastructure, as documented in Schedule 1 of this Ministerial Statement.

Proponent: Robe River Mining Co. Pty. Limited
Australian Company Number 008 694 246

Proponent Address: 152-158 St Georges Terrace
PERTH WA 6000

Assessment Number: 2121

Report of the Environmental Protection Authority: 1668

Previous Assessment Number: 590

Previous Report of the Environmental Protection Authority: 574

Previous Statement Number: 208

Pursuant to section 45, read with section 45B of the *Environmental Protection Act 1986*, it has been agreed that:

1. the Revised Proposal described and documented in Table 2 of Schedule 1 may be implemented;
2. this Statement supersedes Statement No. 208, and from the date of this Statement each of the implementation conditions in Statement No. 208 no longer apply in relation to the Revised Proposal; and
3. the implementation of the Revised Proposal is subject to the following implementation conditions:

1 Proposal Implementation

- 1-1 When implementing the Revised Proposal, the proponent shall not exceed the authorised extent of the Revised Proposal as defined in Table 2 of Schedule 1, unless amendments to the Revised Proposal and the authorised extent of the Revised Proposal have been approved under the *Environmental Protection Act 1986*.

2 Contact Details

- 2-1 The proponent shall notify the CEO of any change of its name, physical address or postal address for the serving of notices or other correspondence within twenty-eight (28) days of such change. Where the proponent is a corporation or an association of persons, whether incorporated or not, the postal address is that of the principal place of business or of the principal office in the State.

3 Compliance Reporting

- 3-1 The proponent shall prepare, submit and maintain a Compliance Assessment Plan which is submitted to the CEO within six (6) months of the date of this Statement.
- 3-2 The Compliance Assessment Plan shall indicate:
- (1) the frequency of compliance reporting;
 - (2) the approach and timing of compliance assessments;
 - (3) the retention of compliance assessments;
 - (4) the method of reporting of potential non-compliances and corrective actions taken;
 - (5) the table of contents of Compliance Assessment Reports; and
 - (6) public availability of Compliance Assessment Reports.
- 3-3 After receiving notice in writing from the CEO that the Compliance Assessment Plan satisfies the requirements of condition 3-2 the proponent shall assess compliance with conditions in accordance with the Compliance Assessment Plan required by condition 3-1.
- 3-4 The proponent shall retain reports of all compliance assessments described in the Compliance Assessment Plan required by condition 3-1 and shall make those reports available when requested by the CEO.
- 3-5 The proponent shall advise the CEO of any potential non-compliance within seven (7) days of that non-compliance being known.

- 3-6 The proponent shall submit to the CEO the first Compliance Assessment Report by 30 April 2021 addressing the previous calendar year period and then annually from the date of submission of the first Compliance Assessment Report, or as otherwise agreed in writing by the CEO.

The Compliance Assessment Report shall:

- (1) be endorsed by the proponent's CEO or a person delegated to sign on the CEO's behalf;
- (2) include a statement as to whether the proponent has complied with the conditions;
- (3) identify all potential non-compliances and describe corrective and preventative actions taken;
- (4) be made publicly available in accordance with the approved Compliance Assessment Plan; and
- (5) indicate any proposed changes to the Compliance Assessment Plan required by condition 3-1.

4 Public Availability of Data

- 4-1 Subject to condition 4-2, within a reasonable time period approved by the CEO of the issue of this Statement and for the remainder of the life of the Revised Proposal the proponent shall make publicly available, in a manner approved by the CEO, all validated environmental data (including sampling design, sampling methodologies, empirical data and derived information products (e.g. maps)), management plans and reports relevant to the assessment of this Revised Proposal and implementation of this Statement.

- 4-2 If any data referred to in condition 4-1 contains particulars of:

- (1) a secret formula or process;
- (2) confidential commercially sensitive information; or
- (3) culturally or environmentally sensitive information

the proponent may submit a request for approval from the CEO to not make those parts of the data, plans and reports publicly available. In making such a request the proponent shall provide the CEO with an explanation and reasons why the data, plans and reports should not be made publicly available.

5 Condition Environmental Management Plan(s)

- 5-1 Within six (6) months of issue of this Statement (or as otherwise agreed in writing by the CEO) the proponent shall prepare and submit a Condition Environmental Management Plan to the satisfaction of the CEO to demonstrate that the environmental outcomes specified in conditions 6-1, 7-1 and 8-1, and the environmental objectives specified in condition 7-2, will be met.
- 5-2 For outcome based provisions, the Condition Environmental Management Plan(s) shall:
- (1) specify the environmental outcomes to be achieved, as specified in condition 5-1;
 - (2) specify trigger criteria that must provide an early warning that the threshold criteria may not be met;
 - (3) specify threshold criteria to demonstrate compliance with the environmental outcomes specified in condition 5-1. Exceedance of the threshold criteria represents non-compliance with these conditions;
 - (4) specify monitoring to determine if trigger criteria and threshold criteria are exceeded;
 - (5) specify trigger level actions to be implemented in the event that trigger criteria are exceeded;
 - (6) specify threshold contingency actions to be implemented in the event that threshold criteria are exceeded; and
 - (7) provide the format and timing for the reporting of monitoring results against trigger criteria and threshold criteria to demonstrate that condition 5-1 has been met over the reporting period in the Compliance Assessment Report required by condition 3-6.
- 5-3 For management based provisions, the Condition Environmental Management Plan(s) shall:
- (1) specify the environmental objectives to be achieved, as specified in condition 5-1;
 - (2) specify management actions to meet the environmental objective;
 - (3) specify management targets;
 - (4) specify monitoring to determine if management targets are being met;

- (5) provide the format and timing for the reporting of monitoring results against management targets to demonstrate that condition 5-1 has been met over the reporting period in the Compliance Assessment Report required by condition 3-6;
 - (6) specify a process for revision of management actions and changes to Revised proposal activities, in the event that the management targets are not achieved. The process shall include an investigation to determine the cause of the management target(s) not being achieved;
- 5-4 The proponent shall continue to implement Environmental Management Plan RTIO-HSE-0175388 until the CEO has confirmed by notice in writing the Condition Environmental Management Plan(s) satisfies the requirements of conditions 5-1, 5-2 and 5-3.
- 5-5 After receiving notice in writing from the CEO that the Condition Environmental Management Plan(s) satisfies the requirements of conditions 5-1, 5-2 and 5-3 the proponent shall:
- (1) implement the Condition Environmental Management Plan(s), or any subsequently approved versions; and
 - (2) continue to implement the Condition Environmental Management Plan(s) until the CEO has confirmed by notice in writing that the proponent has demonstrated the outcomes and objectives specified in condition 5-1 have been met.
- 5-6 In the event that the monitoring indicates an exceedance of the threshold criteria specified in the Condition Environmental Management Plan(s), the proponent shall:
- (1) report the exceedance in writing to the CEO within seven (7) days of the exceedance being identified;
 - (2) implement the threshold level contingency actions specified in the Condition Environmental Management Plan(s) within twenty four (24) hours and continue implementation of those actions until the CEO has confirmed by notice in writing that it has been demonstrated that the threshold criteria are being met and the implementation of the threshold contingency actions is no longer required;
 - (3) investigate to determine the cause of the threshold criteria being exceeded;
 - (4) investigate to provide information for the CEO to determine potential environmental harm that occurred due to the threshold criteria being exceeded; and

- (5) provide a report to the CEO within twenty one (21) days of the exceedance being reported as required by condition 5-6(1).

The report shall include:

- (a) details of threshold contingency actions implemented;
- (b) the effectiveness of the threshold contingency actions implemented, against the threshold criteria;
- (c) the findings of the investigations required by condition 5-6(3) and condition 5-6(4);
- (d) measures to prevent the threshold criteria being exceeded in the future;
- (e) measures to prevent, control or abate the environmental harm which may have occurred, and
- (f) justification of the threshold remaining, or being adjusted based on better understanding, demonstrating that the outcomes would continue to be met.

5-7 The proponent:

- (1) may review and revise the Condition Environmental Management Plan(s), or
- (2) shall review and revise the Condition Environmental Management Plan(s) as and when directed by the CEO.

5-8 The proponent shall implement the latest revision of the Condition Environmental Management Plan(s) which the CEO has confirmed by notice in writing satisfies the requirements of conditions 5-1, 5-2 and 5-3.

6 Inland Waters and Vegetation

6-1 The proponent shall manage the implementation of the Revised Proposal to meet the following environmental outcomes:

- (1) ensure no irreversible impact to the health of the Robe River and Jimmawurrada Creek ecosystems, including associated riparian vegetation, as a result of groundwater abstraction for the Revised Proposal;
- (2) ensure no irreversible impact to the health of the Robe River and Jimmawurrada Creek ecosystems, including associated riparian

vegetation, as a result of discharge of surplus water for the Revised Proposal; and

- (3) ensure no irreversible impact to the health of the pools of the Robe River, as a result of groundwater abstraction and/or discharge of surplus water for the Revised Proposal.

7 Subterranean Fauna

7-1 The proponent shall manage the implementation of the Revised Proposal to meet the following environmental outcomes:

- (1) A minimum of fifty (50) per cent by volume of pre-mining troglofauna habitat shall be retained at Mesa H through the implementation of a Mining Exclusion Zone (MEZ) as delineated in Figure 1 of Schedule 1.

7-2 The proponent shall manage the implementation of the Revised Proposal to ensure the following environmental objectives:

- (1) The proponent shall protect the biological diversity and ecological integrity of the troglofauna assemblages of Mesa H by minimising impacts as far as practicable.
- (2) The proponent shall protect the biological diversity and ecological integrity of the stygofauna assemblages of the local aquifers by minimising impacts as far as practicable.

8 Terrestrial Fauna Habitat – Conservation Significant Fauna Species: Northern Quoll (*Dasyurus hallucatus*), Ghost Bat (*Macroderma giga*) and Pilbara Leaf-Nosed Bat (*Rhinonicteris aurantia* - Pilbara form)

8-1 The proponent shall manage the implementation of the Revised Proposal to meet the following environmental outcome:

- (1) no irreversible impact, as a result of the Revised Proposal, to Breakaways and Gullies habitat retained within the Mesa H MEZ, other than existing and authorised disturbance.

9 Rehabilitation and Decommissioning

9-1 The proponent shall manage the implementation of the Revised Proposal to meet the following environmental objectives:

- (1) ensure the Revised Proposal is rehabilitated and decommissioned in an ecologically sustainable manner; and
- (2) ensure that closure planning and rehabilitation are undertaken in a progressive manner.

- 9-2 Within twelve (12) months of the issue of this Statement, or as otherwise agreed in writing by the CEO, the proponent shall prepare and submit a Mine Closure Plan in accordance with the *Guidelines for Preparing Mine Closure Plans* (EPA and DMP 2015) (or any subsequent revisions of the guidelines), to the requirements of the CEO, on advice of the Department of Mines, Industry Regulation and Safety.
- 9-3 The proponent shall review and revise the Mine Closure Plan required by condition 9-2 at intervals not exceeding three (3) years, or as otherwise specified by the CEO, and submit the plan to the CEO at the agreed interval.
- 9-4 The proponent shall implement the latest revision of the Mine Closure Plan, which the CEO has confirmed by notice in writing, satisfies the requirements of condition 9-2.

10 Air Quality

- 10-1 The proponent shall manage the implementation of the Revised Proposal to meet the following environmental objective:
- (1) avoid, where possible, and minimise greenhouse gas emissions as far as practicable.
- 10-2 Within six (6) months of the issue of this Statement, the proponent must prepare a Greenhouse Gas Management Plan to meet the objective specified by condition 10-1.
- 10-3 The Greenhouse Gas Management Plan must address the following matters:
- (1) benchmarking against applicable standards;
 - (2) design to minimise greenhouse gas emissions as far as practicable;
 - (3) opportunities for continuous improvement and minimising net emissions in the future;
 - (4) timeframes and interim targets for reduction of greenhouse gas emissions; and
 - (5) regular monitoring and public reporting.
- 10-4 After receiving notice in writing from the CEO that the Greenhouse Gas Management Plan satisfies the requirements of conditions 10-2 and 10-3 the proponent must implement the Greenhouse Gas Management Plan.
- 10-5 The proponent may review and revise the Greenhouse Gas Management Plan.

- 10-6 The proponent must review and revise the Greenhouse Gas Management Plan as and when directed by the CEO.
- 10-7 The proponent must continue to implement the version of the Greenhouse Gas Management Plan most recently approved by the CEO until the CEO has confirmed by notice in writing that the plan meets the objective specified in condition 10-1.

11 Offsets

- 11-1 In view of the significant residual impacts and risks as a result of implementation of the Revised Proposal, the proponent shall contribute funds to the Pilbara Environmental Offset Fund calculated pursuant to condition 11-2, subject to any reduction approved by the CEO under condition 11-9.
- 11-2 The proponent's contribution to the Pilbara Environmental Offset Fund shall be paid biennially, with the amount to be contributed calculated based on the clearing undertaken in each year of the biennial reporting period in accordance with the rates in condition 11-3. The first biennial reporting period shall commence from vegetation clearing activities affecting the environmental values identified in condition 11-3.
- 11-3 Calculated on the 2019 calendar year, the contribution rates are:
- (1) \$833 AUD (excluding GST) per hectare of 'Good' to 'Excellent' condition native vegetation, including foraging or dispersal habitat for the Pilbara olive python, northern quoll, Pilbara leaf-nosed bat and the ghost bat, cleared within Proposed Change Area within the Hamersley IBRA subregion (delineated in Figure 2).
 - (2) \$1,666 AUD (excluding GST) per hectare of riparian vegetation associated with the Robe River and/or Jimmawurrada Creek cleared within the Proposed Change Area within the Hamersley IBRA subregion (delineated in Figure 2).
 - (3) \$1,666 AUD (excluding GST) per hectare of critical habitat for the northern quoll (Breakaway, Gorge and Riverine habitat) cleared within the Proposed Change Area within the Hamersley IBRA subregion (delineated in Figure 2).
 - (4) \$1,666 AUD (excluding GST) per hectare of the Priority 3 PEC *Triodia pisoliticola* assemblages of mesas of the West Pilbara within the Proposed Change Area within the Hamersley IBRA subregion (delineated in Figure 2).

- 11-4 From the commencement of the 2019 calendar year, the rates in condition 11-3 will be adjusted annually each subsequent calendar year in accordance with the percentage change in the CPI applicable to that calendar year.
- 11-5 Within three (3) months of the issue of this Statement, the proponent shall prepare and submit an Impact Reconciliation Procedure to the CEO, for the CEO to provide written confirmation that the Impact Reconciliation Procedure satisfies the requirements of condition 11-6.
- 11-6 The Impact Reconciliation Procedure required pursuant to condition 11-5 shall:
- (1) state that clearing calculation for the first biennial reporting period will commence from vegetation clearing activities for the environmental values identified in condition 11-3 and end on the second 31 December following this date;
 - (2) state that clearing calculations for each subsequent biennial reporting period will commence on 1 January of the required reporting period, unless otherwise agreed by the CEO;
 - (3) include a methodology to calculate the amount of clearing undertaken during each year of the biennial reporting period for each of the environmental values identified in condition 11-3;
 - (4) indicate the timing and content of the Impact Reconciliation Reports; and
 - (5) be prepared in accordance with *Instructions on how to prepare Environmental Protection Act 1986 Part IV Impact Reconciliation Procedures and Impact Reconciliation Reports* (or any subsequent revisions).
- 11-7 The proponent shall submit an Impact Reconciliation Report in accordance with the Impact Reconciliation Procedure required by condition 11-5.
- 11-8 The Impact Reconciliation Report required pursuant to condition 11-7 shall provide the location and spatial extent of the clearing of each environmental value pursuant to condition 11-3 during each year of each biennial reporting period.
- 11-9 The proponent may apply in writing and seek the written approval of the CEO to reduce all or part of the contribution payable under condition 11-2 where:
- (1) a payment has been made to satisfy a condition of an approval under the *Environment Protection and Biodiversity Conservation Act 1999* in relation to the Revised Proposal;

- (2) the payment is made for the purpose of counterbalancing impacts of the Revised Proposal on matters of national environmental significance; and
- (3) the payment is made for the purpose of counterbalancing the significant residual impacts to the environmental value identified in condition 11-3.

11-11 The clearing of 1,800 ha of native vegetation previously authorised under Ministerial Statement 208 is exempt from the requirement to offset under condition 11-1.

11-12 Where clearing coincides with more than one environmental value under conditions 11-3(1) to 11-3(4) the higher contribution rate applies.

Table 1: Summary of the Proposal

Proposal Title	Mesa H Proposal (Revision to the Mesa J Iron Ore Development)
Short Description	<p>The Revised Proposal is located approximately 16 kilometres south west of Pannawonica in the Pilbara region of Western Australia. The Revised Proposal includes development of above and below water table open cut pits at Mesa J and Mesa H, ore processing facilities, waste dumps, ore, topsoil and subsoil stockpiles and associated infrastructure, including water management infrastructure.</p> <p>This Revised Proposal utilises infrastructure including processing facilities (subject to upgrades), waste fines and storage facilities from the existing Mesa J Iron Ore Development.</p>

Table 2: Location and authorised extent of physical and operational elements

Element	Location	Authorised Extent
<i>Physical Elements</i>		
Mine and associated infrastructure	Figures 1 and 2; GIS coordinates in Schedule 2	<p>Clearing of up to 4,000 ha of native vegetation within the 6,638 ha Development Envelope</p> <ul style="list-style-type: none"> • no more than 132 ha clearing within the Mesa H MEZ
<i>Operational Elements</i>		
Groundwater abstraction		<p>Groundwater abstraction of up to 30 GL/a from:</p> <ul style="list-style-type: none"> • Southern Cutback Borefield • Pit dewatering
Surplus Water Management		Controlled surface discharge to extend along Jimmawurrada Creek / West Creek and into the Robe River no further than 8 kilometres downstream of the discharge point under natural no-flow conditions.

Table 3: Abbreviations and Definitions

Acronym, Abbreviation or Term	Definition
CEO	The Chief Executive Officer of the Department of the Public Service of the State responsible for the administration of section 48 of the <i>Environmental Protection Act 1986</i> , or his delegate.
Condition environmental objective	The proposal-specific desired state for an environmental factor/s, to be achieved from the implementation of management-based Condition EMP provisions, as required in a management-based implementation condition
CPI	The All Groups Consumer Price Index numbers for Perth compiled and published by the Australian Bureau of Statistics.
EP Act	<i>Environmental Protection Act 1986</i>
ha	Hectare
GL/a	Gigalitres per annum
Ground disturbing activity	Activities that are associated with the substantial implementation of a proposal including but not limited to, digging (with mechanised equipment), blasting, earthmoving, vegetation clearance, grading, gravel extraction, construction of new or widening of existing roads and tracks.
IBRA	Interim Biogeographic Regionalisation for Australia
Management actions	Identified actions undertaken to mitigate the impacts of implementation of a proposal on the environment and achieve the condition environmental objective.
Management target	A measurable boundary of acceptable impact with proposal or sites specific parameters, that assesses the efficacy of management actions against the condition environmental objective and beyond which management actions have to be reviewed and revised. Proposal- or site-specific parameters may include location, scale, time period, specific species/ population/community and a relative benchmark (e.g. baseline or reference).
MEZ	Mining Exclusion Zone
Pilbara Environmental Offsets Fund	The special purpose account that has been created pursuant to section 16(1)(d) of the Financial Management Act 2006 by the Department of Water and Environmental Regulation.
Proposed Change	The new activities of the Revised Proposal associated with mining at Mesa H (as described in the Mesa H Proposal, Revision to the Mesa J Iron Ore Development Environmental Review Document, Rio Tinto April 2019).
Revised Proposal	Mesa H Proposal (Revision to Mesa J Iron Ore Development) – the existing Mesa J Iron Ore Development approved under Ministerial Statement 208 plus the Proposed Change.
Threshold criteria	Environmental criteria representative of the limit of acceptable impact beyond which indicate that the environmental outcome is not being met
Threshold contingency actions	Response actions that are implemented when monitoring shows that threshold criteria have been exceeded.

Trigger criteria	Environmental criteria that forewarn of the approach of the threshold criteria and signal the need to undertake trigger level actions to ensure the threshold criteria are not exceeded.
Trigger level actions	Response actions that are implemented when monitoring shows that trigger criteria have been exceeded.

Figures (attached)

Figure 1 Development Envelope for the Revised Proposal

Figure 2 Proposed Change Area within the Development Envelope for the Revised Proposal

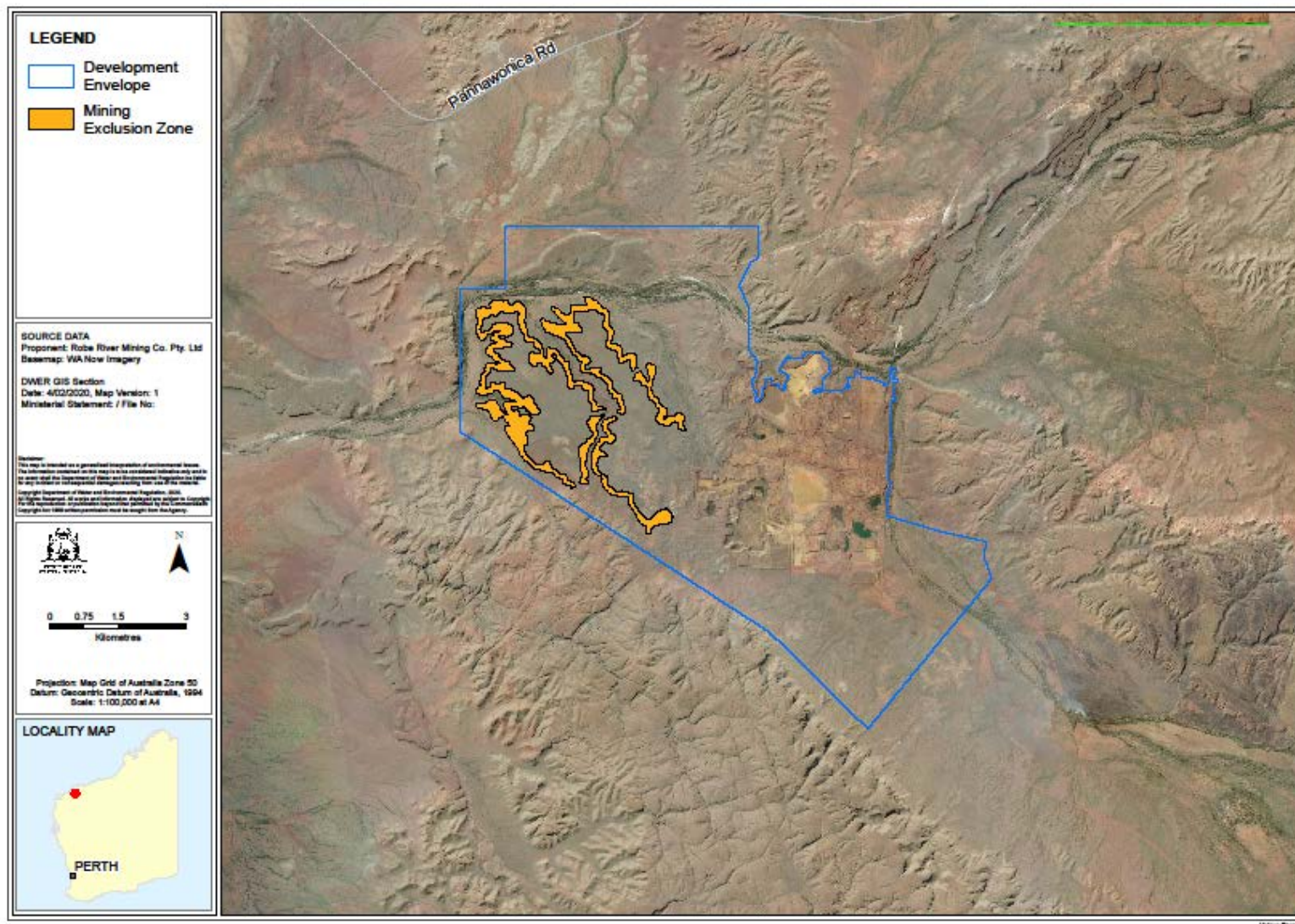


Figure 1. Development Envelope for the Revised Proposal

Schedule 2

Co-ordinates defining the areas shown in Figures 1 and 2 are held by the Department of Water and Environmental Regulation (DWER) under reference numbers 2019-1552009907604 and DWERDT258701.

All co-ordinates are in metres, listed in Map Grid of Australia Zone 50 (MGA Zone 50), datum of Geocentric Datum of Australia 1994 (GDA94).