ASSESSMENT REPORT

for the application of a mineral lease from **IRD Mining Operations Pty Ltd for the Central Eyre Iron Project**

SOUTH AUSTRALIA

Government of South Australia
Department of State Development

Prepared by
Mining Regulation Branch
Department of State Development
SOUTH AUSTRALIA

14 December
2016

Government of South Australia
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Minerals Document number 2016D023509

Preferred way to cite this publication. Department of State Development 2016. *Assessment report for the application of a mineral lease from IRD Mining Operations Pty Ltd for the Central Eyre Iron Project,* Minerals Document number 2016D023509, Mining Regulation Branch. Department of State Development, South Australia, Adelaide.

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EXECUTIVE SUMMARY

Executive summary

Introduction

This report describes the South Australian Government's assessment of the mine component of IRD Mining Operations Pty Ltd's (Iron Road) proposed Central Eyre Iron Project (CEIP). This assessment considers environmental, social and economic impacts, the potential to mitigate or manage these impacts, and whether or not the impacts posed by the project would, on balance, be deemed as appropriate.

This report has been prepared in accordance with the requirements of the *Mining Act 1971* (the Act), and the SA Government's framework for best practice regulation outlined in *Regulating mineral exploration and mining in South Australia* (2016)[1].

The CEIP Mining Lease application

The proposed CEIP is a magnetite iron and infrastructure project consisting of a mine, its power and water supply, employee village, rail and port. The proposed mine is located in South Australia, approximately 30 km south-east of Wudinna in Eyre Peninsula and approximately 315 km north-west of Adelaide.

In November 2015, Iron Road submitted a Mining Lease Application (MLA) and an accompanying Mining Proposal (the Proposal, or MP) to the South Australian Government for the mine component of the CEIP.
The proposed Mineral Lease (ML) area consists of approximately 8458 ha over registered Mineral Claim (MC) 4383.

Separate applications for the power and water supply, employee village, rail and port have been made under the *South Australian Development Act 1993* (the Development Act) and *Commonwealth Environment Protection and Biodiversity Conservation Act 1999* (the EPBC Act). These

[1] https://sarigbasis.pir.sa.gov.au/WebtopEw/ws/samref/sarig1/image/DDD/BROCH005.pdf.

applications have been assessed by the Department of Planning, Transport and Infrastructure (DPTI).

Iron Road reported a JORC compliant mineral resource of approximately 4.5 billion tonnes (Bt) at a grade of 16% iron to the Australian Securities Exchange (ASX) on 27 February 2015. This mineral resource estimate underpins Iron Road's current proposed 25 year mine plan and production schedule for the CEIP mine as well as presenting the potential to extend the life of the proposed mine beyond the initial 25 year mine life (see the Proposal p.3-9). A JORC compliant ore reserve of 3.7 Bt at a grade of 15% has also been reported (ASX release 18 November 2016).

The proposed CEIP mine includes two open pits, on-site ore processing plant and a waste rock handling facility. The ore processing plant would comprise metallurgical facilities, crushing, grinding and milling facilities, and tailings handling and retention. Waste rock and tailings would be combined into an integrated waste landform (IWL), which would be developed on site. Magnetite concentrate would be produced and loaded via a rail loop and loading facility into covered, bottom-dumping wagons for transport to a new export facility at Cape Hardy.

It is proposed that the mine would produce 21.5 Mt of magnetite iron concentrate per annum following a staged ramp-up over 2.5 years. On 13 October 2015, Iron Road announced the results of an optimisation study, which included the potential for the production rate to increase to 24 Mt of magnetite iron concentrate per annum.

Additional on-site infrastructure requirements includes a small desalination plant to supply potable water, temporary and permanent camps for accommodation, workshops, warehouses, and security and emergency services (see the Proposal p.1-5).

The proposed open pits would have two distinct stages of production. The first, focusing on the Murphy South pit area, and the second, extending into the Boo Loo pit area. At mine completion it has been estimated that the Murphy South pit would be approximately 6.2 km long, 1.4 km wide and 630 m deep and the Boo Loo pit would be approximately 3 km long, 1 km wide and 325 m deep.

The IWL would be located south of the open pits. Designed as a semi-circle with a radius of approximately 3 to 3.5 km it could reach a maximum height of approximately 135 m above the existing ground surface.

Currently, the land within and adjacent to the proposed ML is primarily used for cereal cropping, with some areas of remnant native vegetation. There are also a number of third party-owned dwellings near the proposed ML area. The Warramboo township is the closest population centre and is approximately 5 km west of the proposed mine pit and 750 m west of the proposed ML boundary. The Hambidge Wilderness Protection Area (WPA) is approximately 3.8 km south-east of the proposed mine site.

Legislative requirements

Iron Road has submitted a proposal under the Act to support its application for a ML to mine and produce magnetite iron ore at the CEIP. This report details the SA Government's assessment of Iron Road's Mining Proposal.

The CEIP MLA is subject to consideration under a number of South Australian and Commonwealth Government statutes. Primary assessment of the proposed mine-related activities has been undertaken in relation to applications made by Iron Road under the South Australian *Mining Act 1971.*

South Australian Mining Act 1971:
The proposed mining activities at the CEIP have been considered in accordance with the provisions of the *Mining Act 1971* (the Act) and Mining Regulations 2011 (the Regulations).

The South Australian Government has also considered the Proposal in the context of the requirements of other Acts, including the *Environment Protection Act 1993, Aboriginal Heritage Act 1988,* and *Native Vegetation Act 1991.*

Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth):
Iron Road submitted a referral to the Commonwealth Department of the Environment (DoE) pursuant to the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) on 29 September 2014 in relation to the proposed mine component of the CEIP. On 28 October 2014, the DoE determined that the proposed mine was not a Controlled Action, therefore no approvals are required under the EPBC Act by Iron Road in respect to the mine component of the CEIP.

However, as a result of potential impacts to the Southern Right Whale, some infrastructure aspects of the CEIP (including the proposed port) were assessed by the DoE to be Controlled Actions, which would require approvals under the EPBC Act. The actions that relate to potential impacts to the Southern Right Whale are being assessed separately under the South Australian Development Act, by DPTI and in accordance with the South Australian and Commonwealth Government's EPBC bilateral agreement.

Consultation under the Mining Act

As detailed in Section 5 of the Proposal, Iron Road implemented a program of community and stakeholder engagement in the development of the CEIP mining application in accordance with s.35(1)(iv) of the Act and s.30(1)(c) and s.30(1)(e) of the Mining Regulations 2011 (the Regulations). Iron Road's initial public consultation period began in 2011 and was followed by more targeted consultation in 2014 and 2015.

In accordance with legislative requirements specified in s.35A of the Act, the Department of State Development (DSD) initiated a period of statutory public consultation on 19 November 2015 to enable the public and SA Government agencies to make written submissions in relation to the MLA. This consultation period ended on 2 February 2016. It resulted in 105 public submissions being received, which were provided to Iron Road, and additional confidential public submissions, which were not provided to Iron Road.

Following the collation of public and government agency submissions, on 18 March 2016 DSD provided Iron Road with a request to respond to those submissions. DSD's request for a response included a copy of all of the public submissions (excluding confidential submissions) and a consolidated list of government questions. Iron Road formally responded to this request in October 2016 and the Response Document was made publicly available on the government website.

Mining Act assessment process

The submission of the Response Document initiated the comprehensive government assessment of Iron Road's Proposal, the submissions to statutory public consultation and the Response Document in accordance with the requirements of the Act. The assessment has been informed by technical specialists from South Australian Government agencies, including DSD, the Environment Protection Authority (EPA) and the Department of Environment, Water and Natural Resources (DEWNR).

The assessment has considered the potential impacts and benefits that may result from the proposed CEIP mine during construction, operation and post-mine completion. In particular it has considered:

1. whether Iron Road has provided adequate information about the existing receiving environment.
2. whether Iron Road has identified all of the receptors and environmental values that may potentially be impacted by the Proposal. The assessment also considered additional sensitive receptors and environmental values identified by DSD, other government agencies and/or the public.
3. whether Iron Road has identified, and correctly assessed, the consequence of all credible impact events. The assessment also considered additional potential impact events identified by DSD, other government agencies and/or the public.
4. DSD has had regard to all issues and concerns that were raised during the statutory public consultation and has made an assessment as to which issues are within the scope of the Proposal. Issues raised that were outside the scope of the Proposal have not been specifically mentioned in this report; however, they have been considered in the assessment process.
5. whether, for each impact event, an 'outcome' would or would not be required. An outcome is a statement of the level of impact subsequent to control strategies. DSD requires outcomes when it considers there is

a potential significant impact to the receiving environment that requires management during construction, operation and/or post-mine completion. An outcome is required for the purpose of determining the appropriateness and achievability of the level of the impact described by the outcome. All impact events require an outcome unless the primary consequence of the event has been demonstrated to be trivial in nature. For the purpose of assessment, trivial is defined as an insignificant consequence.

6. the appropriateness of the Iron Road proposed outcome. That is, whether the expected level of impact to the environment subsequent to control strategies as described by Iron Road is appropriate. If the Iron Road proposed outcome is not appropriate, DSD recommends a new outcome.
7. the achievability of the proposed outcome. This is an assessment of whether proposed control and management strategies would achieve the outcome. For closure events this considers whether the proposed strategies would be self-sustaining in the long term. The assessment also considers any assumptions and uncertainty in relation to the impact event and the control strategies.
8. the proposed environmental, social and economic benefits from the Proposal.

Primary environmental, social and economic project impacts

The environmental aspects and values considered in the assessment are:

- public safety
- traffic
- Aboriginal heritage
- non-Aboriginal heritage
- native fauna and pest species
- vegetation and weeds
- soils and land quality
- air quality
- noise
- air blast and vibration
- waste disposal and management
- surface water
- groundwater
- visual amenity
- land use and tenure
- social
- economic.

Discussion

Detailed assessments of the socio-economic benefits and environmental impacts have been provided in Sections 6 and 8 of this report.

Potential impacts associated with the proposed project have been identified by Iron Road and stakeholders (including community members and community groups). DSD and other relevant SA Government agencies have assessed Iron Road's potential impacts and identified additional potential impacts of the proposed mining project.

DSD has recommended a statement of environmental outcome for all impacts assessed to have a confirmed source, pathway and receptor and the consequence of the potential impact is greater than trivial. These environmental outcome statements, in conjunction with the proposed or recommended measurement criteria, define what is deemed as an 'appropriate' level of impact on the receiving environment. Section 8 of this report sets out DSD's recommendations for the appropriate environmental outcomes for the aspects and values listed above.

Potential direct and indirect benefits as a result of the CEIP include economic growth, job creation (for both the mine and its associated service industries), and improvements to local infrastructure and community services.

Conclusion

Based on the information provided in both the Proposal and the subsequent Response Document, DSD considers that the potential impacts of the proposed mining operations can be managed to an appropriate level, and any negative impacts would be balanced by potential socio-economic benefits created by the project.

This assessment concludes that the CEIP mine, as described in the Proposal, can be undertaken in an environmentally responsible manner, with effective mitigation and management strategies implemented to control impacts and ensure that the project is undertaken in a manner that provides a net-benefit for the local, regional and broader South Australian community.

Recommendations

The DSD assessment recommends:

1) That in accordance with the requirements of the Act, the Minister for Mineral Resources and Energy (or delegate) considers, on the basis of the Proposal, the results of statutory public consultation, the Response Document and this Assessment Report, whether or not to grant an ML for the proposed CEIP.

2) That if a decision is made to grant an ML for which Iron Road has applied, the body of recommended terms, conditions, requirements and clauses identified in Appendix 2 of this Assessment Report become legal requirements of the ML.

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1 Introduction

1.1 General

Iron Road has submitted a Mining Proposal (the Proposal or MP) under the *Mining Act 1971* (the Act) to support the application for a Mineral Lease (ML) to mine and produce magnetite iron at the Central Eyre Iron Project (CEIP).

The proposed mine is located in South Australia approximately 30 km south-east of Wudinna in the Eyre Peninsula and approximately 315 km north-west of Adelaide.

This Assessment Report addresses the environmental, social and economic impacts and benefits of mining operations described in the Proposal. While this Assessment Report is intended to be a stand-alone document, the detailed information on which it is based is contained in:

- Iron Road's CEIP Mining Proposal, including supporting appendices (circulated for public comment on 19 November 2015) (referred to as the Proposal, or MP)
- public submissions received during the public consultation period from 19 November 2015 to 2 February 2016 (referred to as Public Submissions)
- Iron Road's response to the technical issues raised during the public consultation process (referred to as the Response Document).

This Assessment Report has been compiled using information and specialist technical advice provided by appropriate South Australian Government agencies including the Department of State Development (DSD), the Environment Protection Authority (EPA) and Department of the Environment, Water and Natural Resources (DEWNR).

All figures and tables contained in the description of environment and description of operations sections are taken from the Proposal.

1.2 Assessment process

The following is a summary of the process that has been undertaken to assess, under the Act, Iron Road's ML Application (the MLA).

The application and supporting Proposal was been developed by Iron Road in accordance with:

- *Mining Act 1971 (SA)*
- Mining Regulations 2011 (SA)
- Ministerial Determination 006 – Minimum information required to be provided in a mining proposal or management plan for ML and any associated MPL applications for metallic and industrial minerals (excluding extractive minerals, coal and uranium) (DSD 2012).

The following summarises the process undertaken by Iron Road to lodge the Proposal and subsequent documentation, which has formed the basis of this assessment.

1. Iron Road submitted applications to DSD on 5 November 2015.
2. In accordance with s.35A(1a) and s.35A(2) of the Act DSD reviewed the Proposal and accepted it as a valid application within 14 days of its lodgement.
3. Statutory public consultation was initiated in accordance with s.35A(1a) and s.35A(2) of the Act. The Act requires the Minister to undertake a minimum two-week statutory public consultation process on all mining production tenement applications. Due to the size and complexity of the Proposal, the potential impacts on landowners and surrounding communities, and broader stakeholder interest, the Minister commenced a ten-week public consultation period on 19 November 2015 with a closing date of 2 February 2016. This involved:
    - public notices in *The Advertiser*, *Port Lincoln Times*, *Eyre Peninsula Tribune*, *Whyalla News*, *West Coast Sentinel*, *The Granite*, SA Government Gazette and the DSD website
    - providing copies of the Proposal to all immediate and adjacent landowners, the Wudinna District Council, the District Council of Tumby Bay, the District Council of Kimba and the District Council of Cleve
    - making the Proposal document available for viewing on the DSD website
    - providing electronic copies of the Proposal to other stakeholders and members of the general public who requested it.
4. Submissions received during the statutory public consultation were progressively provided to Iron Road, unless confidentiality had been requested by the submitter.
5. At the conclusion of the statutory public consultation period, DSD produced a consolidated technical summary of comments received from government agencies. This summary was provided to Iron Road, along with complete copies of all public submissions received during the statutory public consultation period (apart from those submissions where confidentiality was requested) and made publicly available on the government website. On 18 March 2016, DSD formally requested

that Iron Road respond to submissions received during the statutory public consultation. Iron Road submitted its response to DSD in October 2016. The Response Document was made publicly available on the government website.
6. Receipt of the Response Document by DSD initiated the comprehensive technical assessment of the complete Proposal (being the Proposal circulated for public comment, submissions received during the statutory public consultation and the Response Document).
7. DSD engaged technical specialists from SA Government agencies to participate in the comprehensive assessment (particularly the EPA and DEWNR).

The following is a summary of the processes that are to be undertaken subsequent to the completion of the assessment of the Proposal.

1. The DSD Tenement Review Committee (TRC) reviews the Assessment Report to ensure the correct statutory processes have been undertaken in making the assessment. TRC endorses the report or requests changes to be made.
2. TRC will then make a recommendation to the Minister (or delegate) in relation to the Application.
3. The Minister (or delegate) is provided with all documents supporting the Assessment Report and recommended terms, conditions and requirements to be imposed on the mining tenement should the mining tenement be granted.
4. The Minister (or delegate) then makes a decision to either notify the applicant of the proposed terms, conditions and requirements of the mining tenement or refuse the Application.
5. Should the Minister (or delegate) make a decision to refuse the Application, the Minister (or delegate) will notify Iron Road of the decision and the process ends.
6. If the Minister (or delegate) determines he/she is willing to notify Iron Road of the proposed terms, conditions and requirements of the mining tenement, then he/she will do so formally in writing.
7. Iron Road must, within seven days (or such longer period as the Mining Registrar may allow), notify the Minister in writing as to whether Iron Road is willing to accept the terms, conditions and requirements.
8. If Iron Road accepts the terms, conditions and requirements and pays the appropriate fees under the Act, the Minister will grant the mining tenements.
9. The Minister will then move to publicly release the Assessment Report and details of the terms, conditions and requirements of grant or refusal.
10. The grant of the mining tenements would not give Iron Road the right to commence mining operations. Should the mining tenement be granted, Iron Road would be required to prepare a comprehensive and detailed Program for Environment Protection and Rehabilitation (PEPR) for submission to DSD.

11. Mining operations cannot commence until the PEPR is approved and a bond is registered in the Mining Register to cover the maximum mine rehabilitation liability.
12. In addition, mining operations cannot commence on exempt land until Iron Road has obtained registered Waivers of Exemption in accordance with s.9AA of the Act. These Waivers would then need to be registered in the Mining Register.
13. Iron Road may require approvals under other legislation including various EPA licences. These would also be required to be sought prior to commencing mining operations.

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2 Background

2.1 Description of applications

Iron Road is proposing the development of the CEIP, located in South Australia (see Figure 2.1). Iron Road has made an application pursuant to the Act for a proposed open-cut mine and processing facility to produce a magnetite iron concentrate. The CEIP mineral deposit is located on Mineral Claim (MC) 4383.

Iron Road made a Referral to the Commonwealth Department of Environment with regards to potential impacts on matters of National Environmental Significance from the proposed mine under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). Following a period of statutory public consultation and formal assessment, the outcome of this Referral was that the proposed activity was declared to be 'not a Controlled Action' under the EPBC Act.

Separate applications for the power and water supply, employee village, rail and port have been made under the *South Australian Development Act 1993* (the Development Act) and EPBC Act. These separate applications have been assessed by the Department of Planning, Transport and Infrastructure (DPTI) in a separate report.

For the purpose of clarity, Table 2.1 outlines the purpose of relevant applications that have been assessed under the Act, the Development Act and the EPBC Act in relation to the Iron Road CEIP mine and infrastructure project.

Table 2.1 – Description of applications

Purpose of Application	Applicable Legislation	Reference Number	Status
The open-cut mine, ore processing facility, IWL and other operations as described in the Mining Proposal			
ML Application Proposed mining operations for the CEIP for the recovery of magnetite iron ore.	South Australian Mining Act	Mineral Claim 4383	Mineral Lease Application for this activity is the subject of this assessment report.
Referral under the Commonwealth EPBC Act Purpose to construct and operate an open cut iron ore mine near Warramboo on the Eyre Peninsula.	Commonwealth EPBC Act	EPBC 2014/7349	Not a Controlled Action.
The power and water supply, employee village, rail and port			
Development Application (DA) for Cape Hardy deep-sea port, infrastructure corridor and long-term employee village.	South Australian Development Act		The application for the CEIP infrastructure is being assessed by DPTI in a separate report.
Referral under the Commonwealth EPBC Act Purpose to clear native vegetation and develop an infrastructure corridor, borefield and port facility on the Eyre Peninsula.	Commonwealth EPBC Act	EPBC 2014/7285	The proposed action is 'Controlled' as a result of potential impacts to the Southern Right Whale and is being assessed by DPTI in accordance with a SA and Commonwealth government's bilateral agreement.

2.2 Location

The application area for the proposed mine is in South Australia, approximately 30 km south-east of Wudinna on the Eyre Peninsula and approximately 315 km north-west of Adelaide. The Warramboo township is the closest population centre, approximately 5 km west of the proposed mine pit and 750 m west of the proposed ML boundary. The Hambidge Wilderness Protection Area (WPA) is located approximately 3.8 km south-east of the proposed mine site. The proposed ML comprises an area of approximately 8458 ha over registered Mineral Claim (MC) 4383.

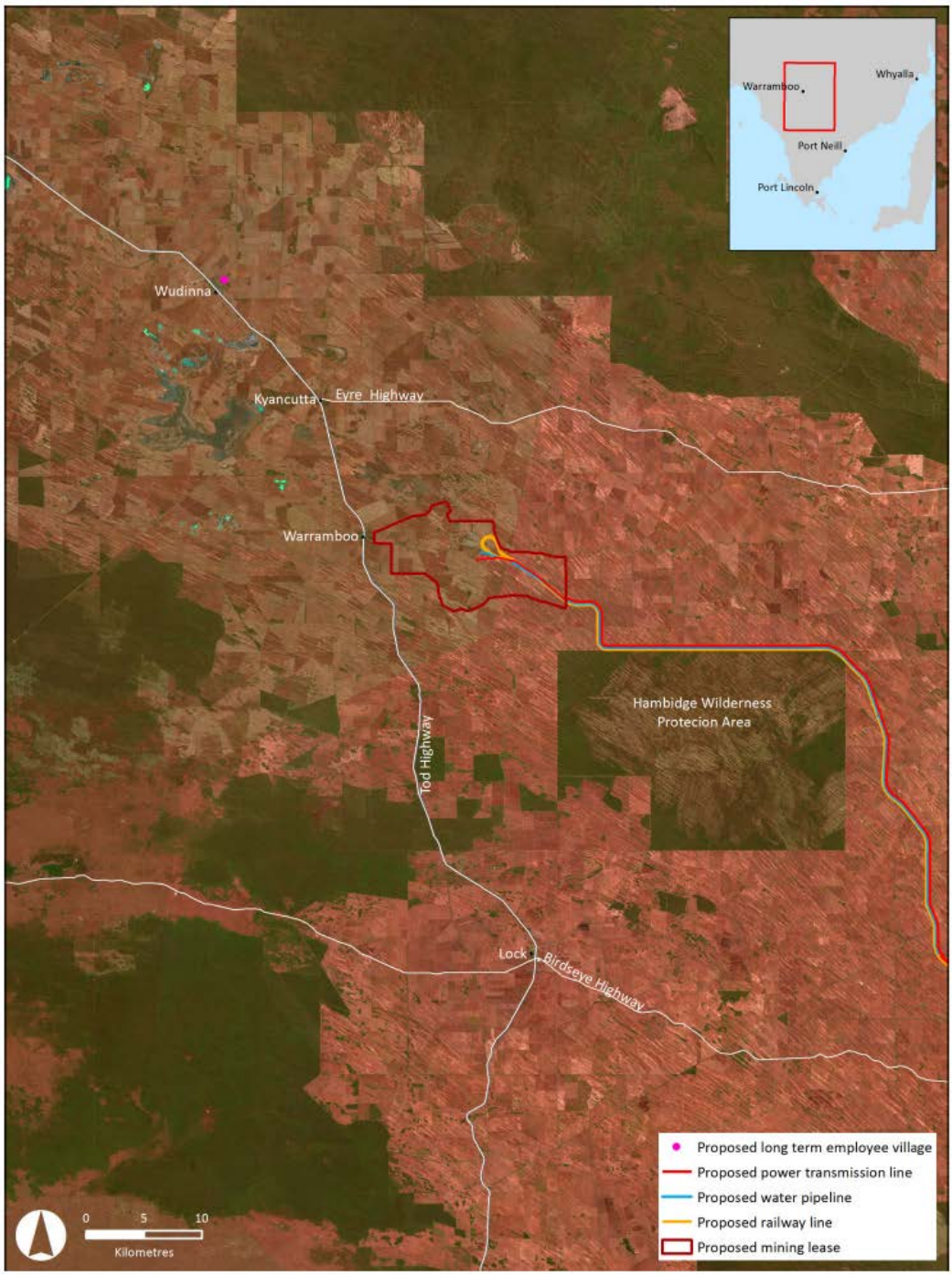

Figure 2.1 – The location of the CEIP proposed ML

2.3 Land tenure

Underlying tenure of the proposed ML is freehold land. It covers 11 parcels of land held under freehold title within the hundred of Warramboo. Two easements exist within the proposed ML boundary, both in favour of the ETSA Corporation. The easements are 30 m wide and traverse sections 12 and 13 of CT 5328/6 and CT5474/844 in order to accommodate ElectraNet's 132 kV transmission line from the Yadnarie Substation to Wudinna. The location of easements is shown in Figure 21-3 of the Proposal. In addition, the proposed ML includes portions of four road reserves under the care, control and management of the Wudinna District Council.

Land tenure is described in Section 21 of the Proposal and summarised in Table 2.2 below.

Table 2.2 – Land ownership (Source: the Proposal p.21-9)

Ownership	Certificate of title	Section ID
Leanne Fay Traeger Leased to Iron Road Limited Sub-leased to CG, CE and T Sampson	CT Volume 5474 Folio 844	Section 12
DK and BM Murphy Nominees Pty Ltd	CT Volume 5328 Folio 6	Section 13
GA Veitch Pty Ltd Leased to L and G Veitch	CT Volume 5945 Folio 769 CT Volume 5184 Folio 280 CT Volume 5429 Folio 702	Section 20 Section 21 Section 23
David John Murphy and Wendy Karen Murphy	CT Volume 5971 Folio 434 CT Volume 5255 Folio 886	Section 22 Section 24
Colin Geoffrey Sampson and Carmen Elizabeth Sampson	CT Volume 5359 Folio 856 CT Volume 5550 Folio 29	Section 25 Section 29
Daniel John Van de Vorstenbosch and Patricia Kate Van de Vorstenbosch	CT Volume 5391 Folio 108	Section 35
Fred Heath Nominees Pty Ltd	CT Volume 5566 Folio 577	Section 34

2.4 Exempt land and receptors

Exempt land and Waivers of Exemption are identified in Section 2.2.2 of the Proposal. Exempt land can broadly be described as cultivated land, land being within 400 m of a residence, land within 150 m of infrastructure, industrial buildings, springs, wells, reservoirs or dams. Iron Road's obligations in regards to exempt land are set out in s.9 and s.9AA of the Act.

Exempt land within the application area is described by Iron Road in the Proposal (p.2-6) as follows:

"The majority of the land within the proposed ML is exempt land by virtue of it being used for cropping or other agricultural purposes, or due to the existence of housing and other buildings such as shearing sheds. However, there are many areas of remnant native vegetation, including within HA 869, which are not classified as 'exempt land'. Figure 2-3 (in the Proposal) shows the areas of native vegetation, the known locations of

dwellings and other buildings and identifies that all other land is exempt by virtue of it being used for cropping or other agricultural purposes. There are no known springs, wells, reservoirs or dams in the area. Table 2-2 (in the Proposal) sets out the land titles, the person entitled to an exemption and reason for the exemption for all land located within the boundary of the proposed mining lease."

Details of exempt land are presented in Table 2.3 and Figure 2.2.

Table 2.3 – Summary of exempt land within the proposed ML (Source: the Proposal)

Name of person entitled to exemption	Certificate of title	Reason for exemption
Leanne Fay Traeger Leased to Iron Road Limited Sub-leased to CG, CE and T Sampson	CT Volume 5474 Folio 844	Cropping land; within 150 m of buildings
DK and BM Murphy Nominees Pty Ltd	CT Volume 5328 Folio 6	Cropping land; within 400 m of dwelling; within 150 m of buildings
GA Veitch Pty Ltd Leased to L and G Veitch	CT Volume 5945 Folio 769 CT Volume 5184 Folio 280 CT Volume 5429 Folio 702	Cropping land; land within 150 m of buildings
David John Murphy and Wendy Karen Murphy	CT Volume 5971 Folio 434 CT Volume 5255 Folio 886	Cropping land; within 150 m of buildings
Colin Geoffrey Sampson and Carmen Elizabeth Sampson	CT Volume 5359 Folio 856 CT Volume 5550 Folio 29	Cropping land; within 150 m of buildings
Daniel John Van de Vorstenbosch and Patricia Kate Van de Vorstenbosch	CT Volume 5391 Folio 108	Cropping land; within 150 m of buildings
Fred Heath Nominees Pty Ltd	CT Volume 5566 Folio 577	Cropping land; within 400 m of dwelling; within 150 m of buildings

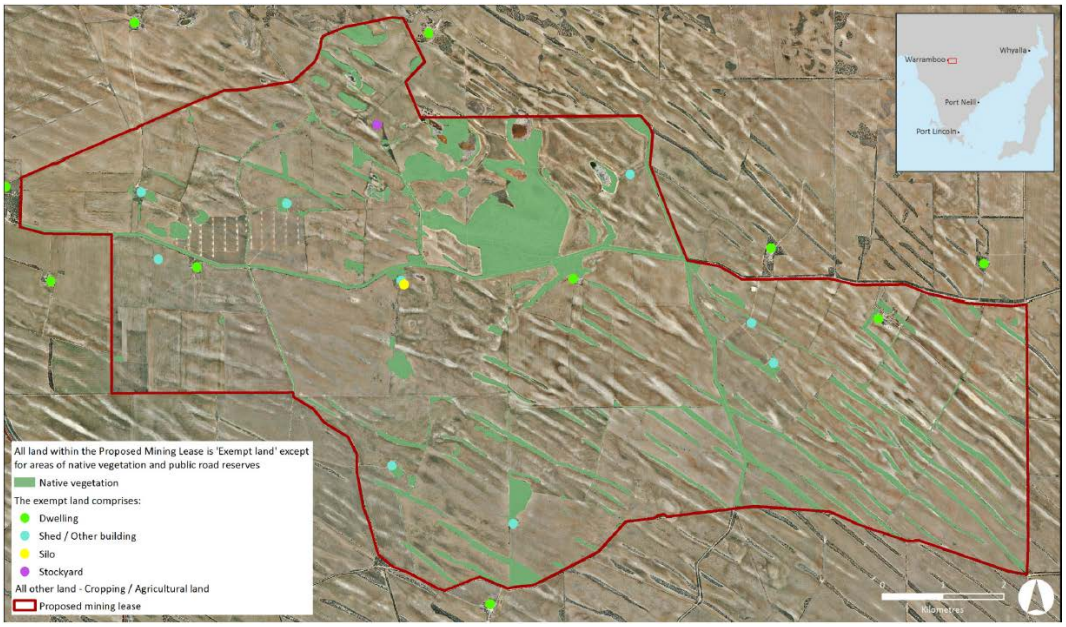

Figure 2.2 – Exempt land identified (Source: the Proposal)

In the Proposal (p. 22-61) Iron Road states the following in relation to land within the proposed ML:

"The land contained within the proposed ML is currently held by six families. Of these, one family would be required to relocate for mining and processing to occur due to the location of the home. One other family may choose to reside on the land as their home would not be directly impacted by the mining and processing infrastructure. One family is an absentee landlord and therefore is not directly affected by any requirement to relocate. The other three families do not live within the proposed ML boundary and may choose to move if their remaining land is insufficient to provide a viable business or they are unable to purchase nearby additional land. The decision to stay in the local area or to relocate outside of the district would be made by individual landholders."

Iron Road states the following in relation to the potential for land access within the proposed ML (the Proposal p. 2-7):

"It is Iron Road's intention to negotiate the sale and purchase of all the land comprised within the proposed ML prior to the commencement of mining operations on those individual parcels. At the very least Iron Road will (and must) enter into appropriate access arrangements, including the "waiving" of any exempt land, before it can commence mining operations on that exempt land." (See p. 2-7 of the Proposal for additional information in relation to land access).

In the Proposal, Iron Road have not considered dwellings within the proposed ML to be receptors for the purpose of their impact assessment. This is evidenced in the Air Quality chapter of the Proposal where Iron Road state:

“The closest sensitive receivers to the proposed mine are illustrated in Figure 15-1. The sensitive receivers closest to the proposed mine are residential dwellings located intermittently around the proposed mine site, the Warramboo township and the Warramboo grain silos. Table 15-5 lists the sensitive receivers and their estimated distance to the proposed mine site boundary.” (The Proposal p. 15-7).

Figure 15-1 of the Proposal is shown below which indicates that the dwellings within the proposed ML are not considered in Iron Road’s air quality impact assessment.

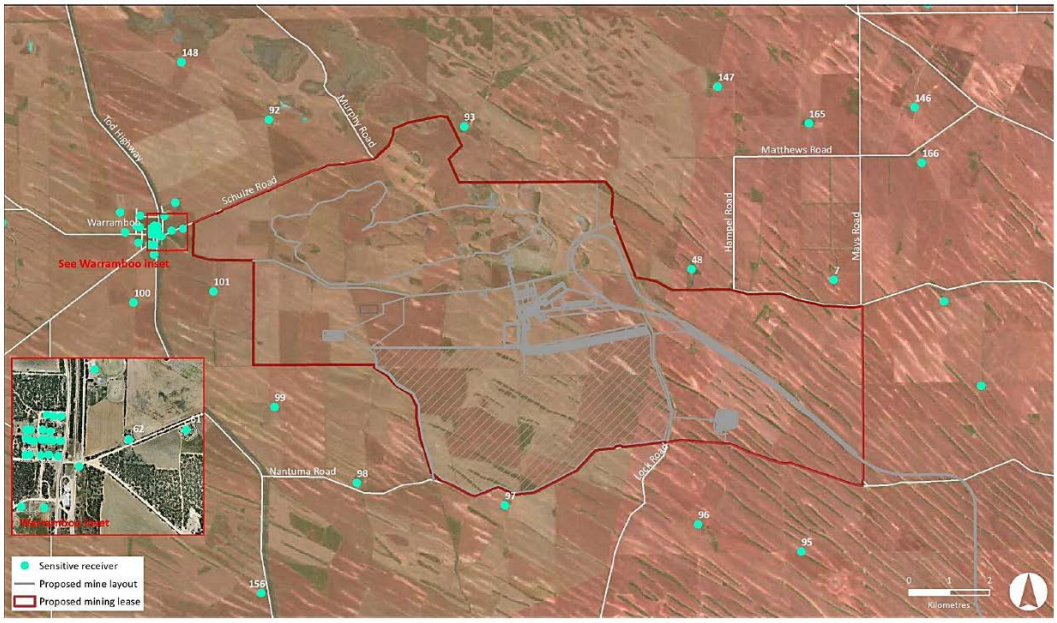

Figure 2.3 – Air Quality Impact Assessment – sensitive receivers (Source: Figure 15-1 of the Proposal)

Iron Roads Noise chapter within the Proposal states the following in regards to the consideration of sensitive receptors within the proposed ML:

“Any residential buildings within the mine site were not taken into account in the noise assessment, due to the fact that the intent is for Iron Road or a subsidiary company to own all of the land within the mine site boundary prior to commencing works.” (The Proposal p. 16-7).

Figure 16-4 of the Proposal is shown below and the dwellings within the land are not considered in the noise impact assessment.

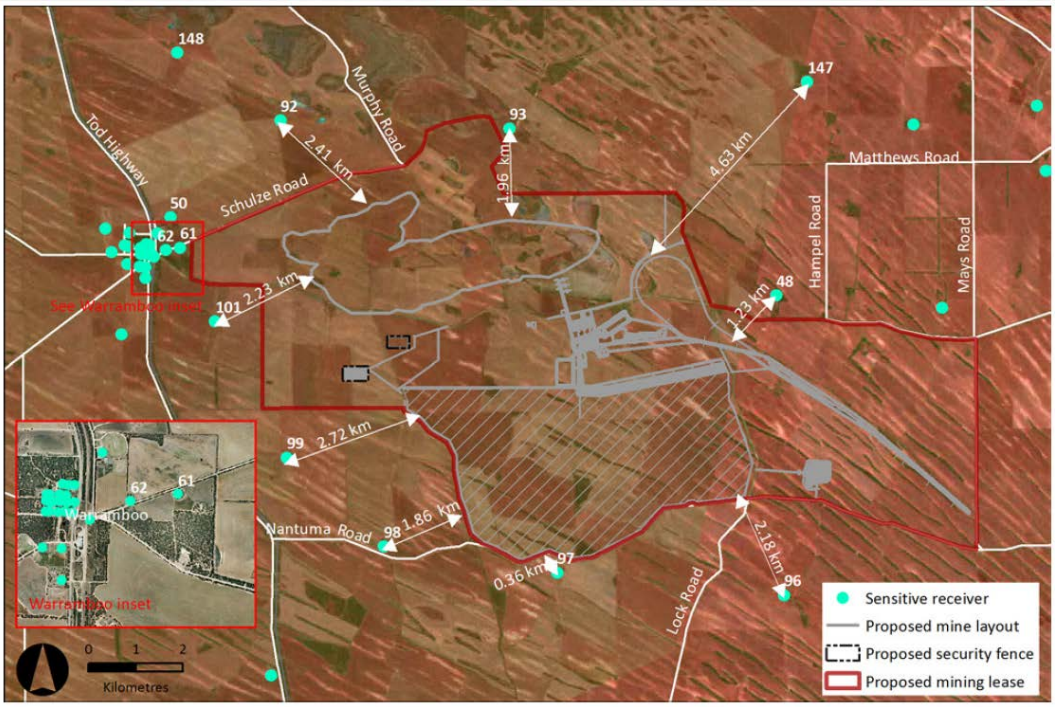

Figure 2.4 – Noise Impact Assessment – sensitive receivers (Source: Figure 16-4 of the Proposal)

In the Airblast and Vibration chapter of the Proposal (p. 17-4) Iron Road state that “any residential buildings within the proposed mine site were not taken into account in the noise and vibration assessment as the intent is for Iron Road or a subsidiary company to own all of the land within the mine site boundary prior to commencing works.”

Potential impacts from flyrock as a result of blasting are considered by Iron Road in the Public Safety chapter of the Proposal. Iron Road state the following:

“A member of the public injured by fly rock or air blast from blasting – The assessment of mine blasting shows that any impacts from air blast would meet Australian Standards at the nearest sensitive receivers. Flyrock management will be necessary to ensure in pit conveyors are not damaged. Modelling indicates flyrock is not likely to travel more than 50 m. As the open pit is at least 500 m from the proposed ML (ML) boundary, there is a considerable margin of safety. In addition, blasting would not occur until after overburden removal meaning the pit wall will also act as a partial barrier (and increasingly so as the pit deepens).Consequently, no harm would occur to a receptor (PIM_07_22)” (the Proposal p. 7-5).

Iron Road’s Impact Assessment in relation to blasting, including airblast, vibration and flyrock considers that public safety and third party land use receptors within the proposed ML would not exist.

Iron Road has not assessed the potential impacts to public receptors or third party land use located within the proposed ML in relation to blasting,

air quality and noise. Hence, DSD's assessment of the proposed mining operations has been based on Iron Road's proposal that there would be no public receptors located within the proposed mining lease. DSD recommends a second schedule lease condition to address Iron Road's intention "to own all of the land within the mine site boundary prior to commencing works" and that potential impacts to public receptors within the proposed ML have not been proposed or assessed.

The scale and nature of the proposed mining operations are such that within the first three years of construction and operation, the majority of the site would be subject to activity and disturbance (see the Proposal Figures 3-9, through to Figure 3-11). To ensure that there would be no impacts to public receptors within the proposed ML resulting from any early construction works (which are impacts that have not been assessed), DSD further recommends that land access arrangements must be in place for all parcels of land within the proposed ML prior to any pre-strip or construction activities commencing.

DSD does support the following investigative and data collection activities (authorised through a PEPR) to be undertaken on the proposed mineral lease prior to land access arrangements for all parcels of land being in place:

- Baseline environmental data collection (particularly if this is required for the development of measurement criteria)
- Ongoing environmental impact assessments (particularly if this is required for the development of measurement criteria)
- Site works to support any metallurgical testwork or trials
- Geotechnical and soil investigations to support the detailed design of the IWL or other infrastructure
- Additional mineral resource definition and sterilisation investigations

If required, land access arrangements (including, but not limited to, specific waivers of exemption) relating to any such investigative and data collection activities would need to be obtained prior to such mining operations being authorised through a PEPR.

DSD recommends that should a lease be granted, the following be a condition of the second schedule of the lease.

Recommended regulatory response

1. For the purposes of this Additional Condition:
    1.1. 'Preliminary mining operations' means: -
        1.1.1. Baseline environmental data collection (particularly if this is required for the development of measurement criteria):
        1.1.2. Ongoing environmental impact assessments (particularly if this is required for the development of measurement criteria);
        1.1.3. Site works to support any metallurgical test work or trials;

1.1.4. Geotechnical and soil investigations to support the detailed design of the IWL or other infrastructure;

1.1.5. Additional mineral resource definition and sterilisation investigations; or

1.1.6. Any other activity determined in writing by the Director of Mines (including an activity that is defined below as a principal mining operation).

1.2. 'Principal mining operations' means: -

1.2.1. Pre-strip and mining of the open pits;

1.2.2. Preparation and construction of the IWL;

1.2.3. Construction of the ore processing facility;

1.2.4. Construction of the concentrate handling facility;

1.2.5. Construction of the rail infrastructure on the Land;

1.2.6. Any pre-strip or early earthworks relating to any of the above activities; or

1.2.7. Any variation to this definition as determined in writing by the Director of Mines.

1.3. The Tenement Holder may carry out preliminary mining operations on any exempt land after it has obtained a waiver of exemption (whether by agreement with every person who has the benefit of the exemption, or by a court order, or a combination of a waiver by agreement and court order) from every person who has the benefit of the exemption in respect of the particular exempt land on which the Tenement Holder wishes to perform the preliminary mining operations.

1.4. The Tenement Holder must not carry out any principal mining operations unless the Tenement Holder has obtained waivers of exemption (whether by agreement with every person who has the benefit of the exemption, or by a court order, or a combination of a waiver by agreement and court order) in respect of all the exempt land unless the Director of Mines is satisfied that no mining operations would be required to occur in respect of any particular exempt land for the life of the project.

Explanatory note: The Tenement Holder can carry out principal mining operations on land that is exempt due to a feature located outside of the Land (see subsection 9(1)(d) of the Act) provided the Tenement Holder has a waiver or waivers for that land. If the Tenement Holder does not need to perform mining operations on land that is exempt due to a feature located outside of the Land (see subsection 9(1)(d) of the Act), no waiver would be necessary.

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chapter

3 Description of the environment

The Central Eyre Iron Project (CEIP) is located in the central north Eyre Peninsula, South Australia, 185 km north of Port Lincoln, 245 km west of Whyalla and 235 km south-east of Ceduna (see Figure 3.1). The township of Wudninna, is 30 km to the north-west and Warramboo is 750 m west of the proposed mine boundary.

Chapter 2 of Iron Road's Proposal and relevant environmental aspect chapters provide more in-depth information.

The existing environment has been described in the Proposal in accordance with Ministerial Determination MD006. The following section summarises the description of the existing environment in order to provide context for this report. Detailed reviews of the descriptions of the environment are discussed within the relevant impact assessment sections of this report.

3.1 Local community

The proposed ML is located within the Wudinna District Council (DC), which covers an area of approximately 5,400 km^2 (ABS 2013a), and encompasses the townships of Warramboo, Kyancutta, Wudinna, Yaninee and Minnipa. The prime source of income within the Wudinna DC is agriculture-related industry, predominantly cereal cropping, and grazing sheep and beef cattle. At the 2011 Census, the Wudinna DC had a resident population of 1253 people (ABS 2012a).

Wudinna is the main service centre within Wudinna DC. The proposed long-term employee village for the mine would be located next to the Wudinna township. Wudinna has a resident population of 557 people (ABS 2012a), which is around 45% of the total population of the Wudinna DC area.

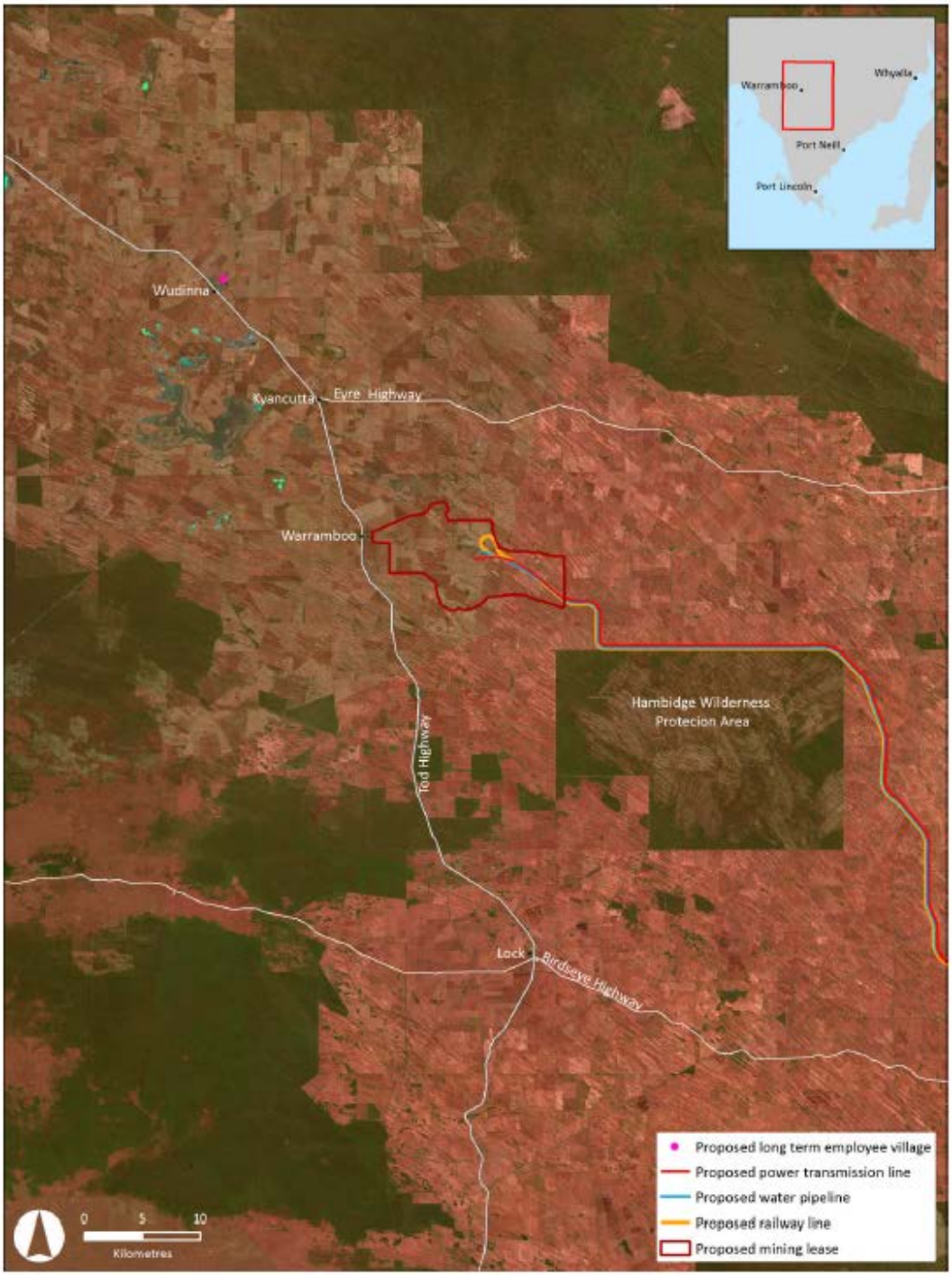

Figure 3.1 – Location of proposed ML

3.2 Land use

The proposed ML is in an undulating landscape of low dunes and ephemeral saline wetlands. The soils of this area support cereal cropping with some grazing. They support limited remnant native vegetation. The Western Eyre Peninsula agricultural district produces approximately one-third of South Australia's grain.

3.3 Proximity to infrastructure and housing

Wudinna is the main service centre for the Wudinna DC and provides a range of social and recreational services in addition to a variety of retail and business services, including a supermarket, bakery, butcher, pharmacy, newsagent, rural suppliers, accommodation and eateries. As at the 2011 Census, there were 256 dwellings within Wudinna, all of which were detached. More than 90% of these dwellings were occupied (ABS 2013b).

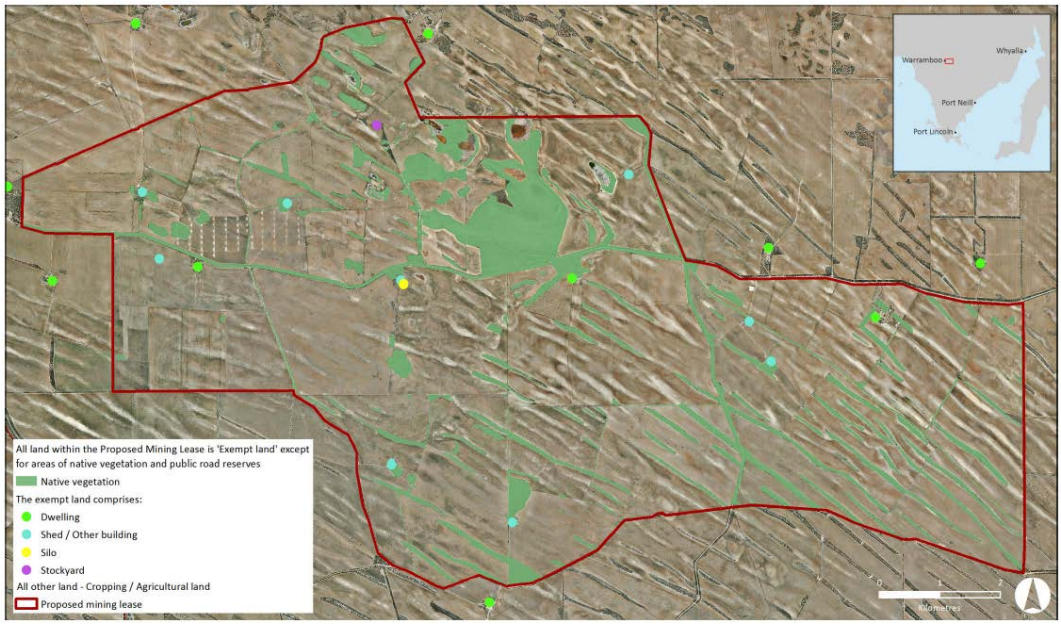

Figure 3.2 – Land use and dwellings within the proposed ML

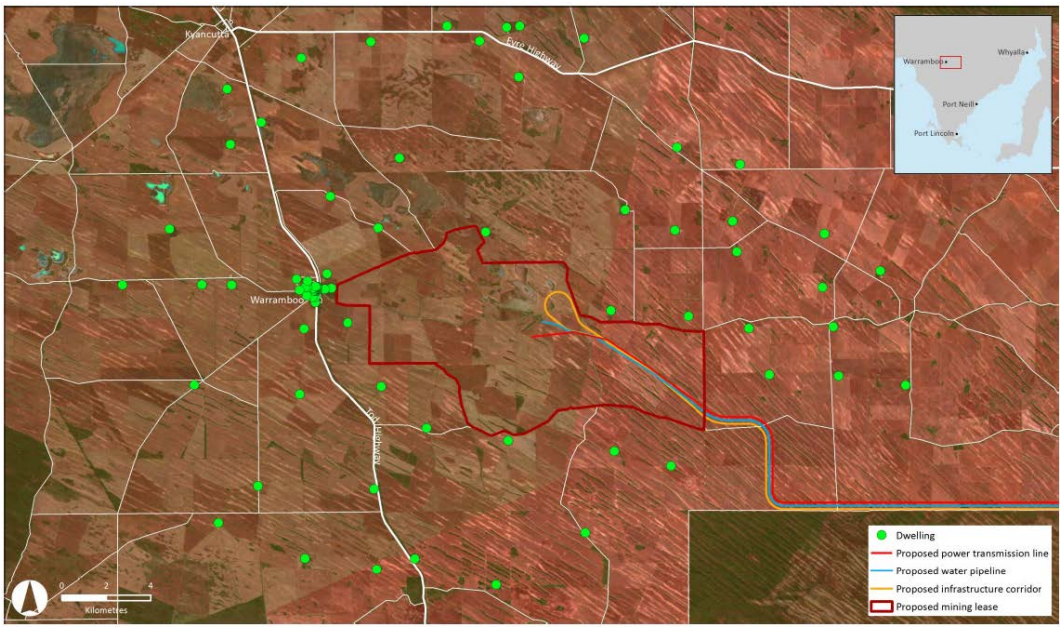

Figure 3.3 – Dwellings within 5 km of the proposed ML

Housing in the immediate vicinity of the proposed ML is of a rural nature and density, typical of Eyre Peninsula areas away from major district centres or townships.

The Eyre Peninsula is connected to a range of electricity, water, gas and communications networks that service residential, agricultural and industrial users. Existing mining operators on the Peninsula have utilised pre-existing infrastructure during project development. It is widely considered that existing infrastructure is largely at capacity, with little scope for additional demand to be supported (Deloitte 2013).

The Tod Highway is the closest major road. It runs north to south approximately 1 km west of the proposed ML boundary and connects Kyancutta and Lock via Warramboo. Approximately 220 vehicles travel along the Tod Highway each day.

Kimba Road runs perpendicular to the Tod Highway from Warramboo to Kimba. Iron Road has assumed it carries approximately 100 to 150 vehicles per day. Kimba, Dolphin, Murphy and Lock roads all cross the proposed ML and will therefore need to be realigned or closed to allow for construction and operation of the mine.

3.4 Amenity

A summary in relation to the existing amenity of the application area and its surrounding areas is provided in Section 8.14 of this report.

3.5 Noise

A summary in relation to noise is provided in Section 8.10 of this report.

3.6 Dust and air quality

A summary in relation to air quality is provided in Section 8.9 of this report.

3.7 Topography

The landscape of the wider Eyre Peninsula is unique and varied, comprising limestone rolling plains, granite inselbergs, coastal and inland wetlands, salt lakes, and ephemeral lakes. The majority of the proposed mine site area lies within dunal plains and is less than 100 m AHD. The proposed ML area does not have defined drainage systems and supports the south-eastern extent of the Lake Warramboo complex (ephemeral salt lakes) to the east of Murphy Road.

3.8 Climate

The climate of central northern Eyre Peninsula is described by Iron Road as being in the hot summer–cool winter zone. There is no site-specific weather station that currently operates at the site location. However, the Bureau of Meteorology (BoM) has measured meteorological data at Wudinna since 1999 and at Kimba since 1930.

Wudinna has a mean annual rainfall of 263 mm and morning northerly winds are predominate in the winter, autumn and spring months, with strong south-easterly winds in summer months. Afternoon breezes come predominantly from the south in summer and autumn, from the west in spring, and from the north-west in winter.

3.9 Geohazards

Naturally occurring acid sulphate soils (ASS) associated with low-lying areas with groundwater close to the surface can be found within the proposed ML. Iron Road has determined that in these areas there can be a 30% to 60% potential of encountering ASS. Potentially acid forming (PAF) material may be contained within the ASS. Iron Road state that there is sufficient acid neutralising capacity in available non-acid forming (NAF) material to negate the potential for acid formation when all material, including tailings, is placed into the IWL.

Given the geology and topography of the project area, the proposed ML area is observed to be stable and not at risk of landslip. Supporting these observations, the Central Eyre Peninsula has no recorded incidences of landslip (Geoscience Australia 2015a). No major fault zones were identified in Iron Road's drill core logging data (Coffey 2014).

The Mining Proposal (MP) is located within an area not considered to be at significant risk of earthquakes. Seismic events are rare and typically small in nature. The South Australian Seismology Report (Love et al. 2010) indicates that no seismic events were recorded in proximity to the proposed ML.

An analysis of composite samples from the proposed mine lease for naturally occurring asbestos and other fibres was undertaken in accordance with AS4964–2004 for qualitative identification of asbestos in bulk samples. No asbestos was detected.

3.10 Hydrology

A summary in relation to hydrology is provided in Section 8.12 of this report.

3.11 Groundwater

A summary in relation to groundwater is provided in Section 8.13 of this report.

3.12 Native vegetation

A summary in relation to native vegetation is provided in Section 8.6 of this report.

3.13 Weeds and plant pathogens

A summary in relation to Weeds and Plant Pathogens is provided in Sections 8.5 and 8.6 of this report.

3.14 DSD assessment of description

DSD has assessed that the description of the environment in the Proposal is accurate and provides sufficient detail to identify potential impacts posed by the proposed mining operation.

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4 Description of the proposed mining operations

This section provides a brief summary of Iron Road's proposed mining operations as indicated in the Mining Proposal (MP).

4.1 Reserves, products and markets

Iron Road reported a JORC compliant mineral resource of approximately 4.5 billion tonnes (Bt) at a grade of 16% iron to the ASX on 27 February 2015. This mineral resource estimate underpins the current proposed 25 year mine plan and production schedule for the CEIP mine as well as presenting potential for extending the life of the proposed mine post 25 years (the Proposal p. 3-9). A JORC compliant ore reserve of 3.7 Bt at a grade of 15% has also been reported (ASX release 18 November 2016).

Iron Road has stated that the iron ore from the CEIP mine is readily and simply processed into a premium high grade magnetite concentrate.

The Iron Road Proposal states that:

> "…as reported in Iron Road's Australian Securities Exchange announcement 26 February 2014, the CEIP mine product is suitable for use in the north Asian sinter plants as sinter feedstock without additional processing into pellets before use. Sinter plants feed the majority of blast furnace-based steel mills around the world." "The positive market outlook for high quality concentrates is supported by independent market research which identified significant opportunities to position the CEIP mine concentrate into the expanding north Asian steel sector. The available market for the CEIP mine product is therefore significantly larger than for many other proposed magnetite projects."

4.2 Summary of description of mining operations

The proposed mine will include an open pit excavation with an on-site ore processing plant and waste rock handling facility. The ore processing plant

will comprise metallurgical facilities, crushing, grinding and milling facilities and tailings handling and retention. Waste rock and tailings will be combined into an Integrated Waste Landform (IWL) to be developed at the site. Magnetite concentrate will be produced and then loaded via a rail loop and loading facility into covered, bottom-dumping wagons for transport to a new export facility at Cape Hardy. It is proposed that the mine will produce 21.5 Mt of magnetite iron concentrate per annum following a staged ramp-up over 2.5 years. On 13 October 2015, Iron Road announced the results of an optimisation study that included the potential for the production rate to increase to 24 Mt of magnetite iron concentrate per annum.

Additional on-site infrastructure at the proposed mine will include a small desalination plant to supply potable water, temporary and permanent camps for accommodation, workshops, warehouses and security and emergency services (the Proposal p.1-5).

An open-cut mine is proposed with two distinct stages of production. The first focuses on the Murphy South pit area, and the second focuses on extending into the Boo Loo pit area. At mine completion it has been estimated that the Murphy South pit will be approximately 6.2 km long, 1.4 km wide and 630 m deep and the Boo Loo pit will be approximately 3 km long, 1 km wide and 325 m deep.

The IWL is located to the south of the open pits. Designed as a semi-circle with a radius of approximately 3 to 3.5 km it could reach a maximum height of approximately 135 m above the existing ground surface.

Figures 4.1 and 4.2 below show a plan of the layout of the proposed mining operations and a simplified process flow diagram.)

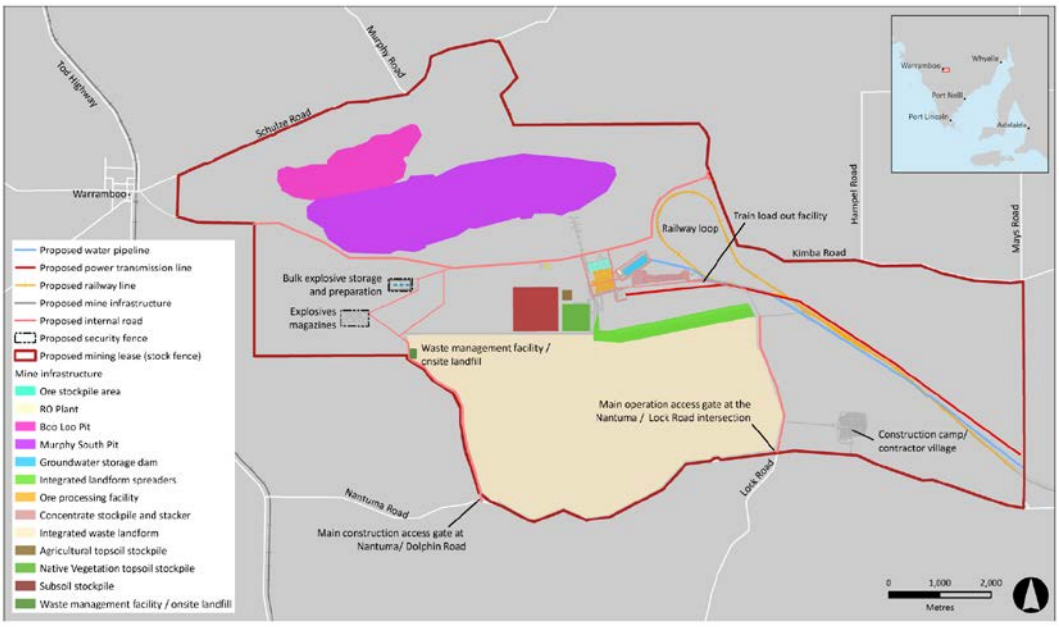

Figure 4.2 – **Proposed layout of mining operations** (Source: the Proposal)

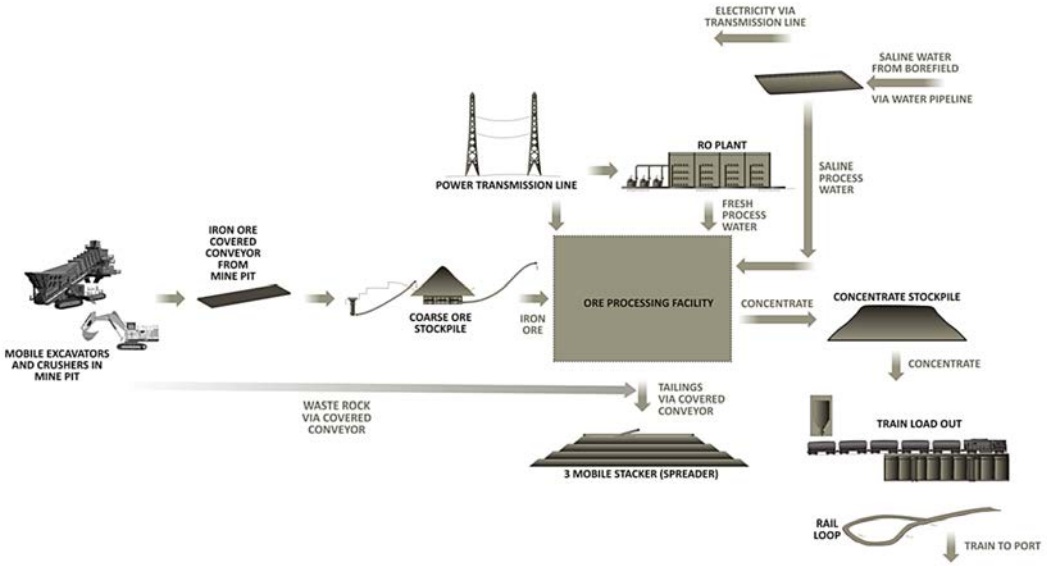

Figure 4.3 – **Process flow diagram** (Source: the Proposal)

For a full description of the proposed mining operations see Section 3 of Iron Road's Proposal.

4.3 DSD assessment of description

The description of proposed operations provided by Iron Road in the Proposal and the Response Document is considered to be adequate and complies with the requirements set out in Ministerial Determination 006.

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chapter

5 Mine closure and rehabilitation

5.1 Objectives

The Proposal provides outcomes, strategies and an overarching plan for progressively rehabilitating, closing and completing the mine. Should a lease be granted, the PEPR will provide detail on outcomes, strategies, timings and measurement criteria to demonstrate achievement of mine completion outcomes.

Iron Road state in the Proposal that for areas of the mine site that have been rehabilitated or were unused, it is anticipated that similar land uses to current (e.g. agricultural uses) will re-commence post mine completion.

The Conceptual IWL Design for Rehabilitation and Closure report (refer to Appendix S of the Proposal) proposes a number of land use options for the IWL. These alternative final land uses may include agricultural production (cropping and grazing), agroforestry (multiple land use), a native woodland ecosystem for conservation or mixed use vegetation. Consideration of these alternative final land use options will incorporate an understanding of climatic influences and climate change upon long-term productivity and sustainability.

Alternative land use options and their capacity to achieve stakeholder expectations and the primary objectives of a stable, rehabilitated landform are all to be considered by investigation and research, as part of the forward work plan during the investigation, construction and operational stages of the CEIP.

5.2 Stakeholder engagement

The views on closure and rehabilitation raised by affected parties and stakeholders are documented and addressed by the Proposal in relevant sections.

Iron Road state in the Proposal that post closure land use options will be discussed in detail with the Wudinna DC, State Government, local landowners and other key stakeholders during the later stages of mining.

Should a lease be granted, the PEPR must include detailed mine closure strategies and must demonstrate evidence of consultation on strategies for achieving closure and defining future land use.

5.3 Description of closure domains, rehabilitation and closure

Iron Road state that following the production phase, a mine closure phase will be completed prior to relinquishment of the proposed ML at mine completion. The closure phase will involve decommissioning of site infrastructure, any works required to stabilise (make-safe) the mine pit and prevent unauthorised entry and final rehabilitation of the IWL.

At mine completion the mine site will comprise the following areas/domains:

- Rehabilitated land where surface infrastructure and buildings have been decommissioned and removed and infrastructure for future use.

  Iron Road state in the Proposal, Section 3.7.1:

  > "Based on liaison with Wudinna DC, local landowners and other key stakeholders during the late stages of mining, it will be determined which site infrastructure is of value and which will be decommissioned and removed from site." Iron Road anticipates the railway line and power transmission lines will be retained.

  Decommissioning and removal of site infrastructure would involve site assessment and remediation planning and removal of fuel and chemical storage and wastewater treatment facilities.

- A mine pit which will be stabilised and become a pit lake as rainwater collects and groundwater discharges into the pit

  Iron Road state in the Proposal, Section 3.7.2:

  > "Iron Road must ensure that the mine is safe, including prevention of unauthorised entry. Prior to mine closure, a detailed assessment of slope stability will be made based on observations of the performance of the pit walls and data collected during excavation of the mine pit."

  Iron Road will construct a mine pit safety bund around the open pit using guidelines published by the Western Australian Dept. of Industry and Resources.

  After mining and dewatering ceases, a pit lake will form due to ingress of groundwater and rainwater. It's anticipated that the pit lake level will become near stable at -300 m AHD after 500 years and stabilise at -275 m AHD after 1000 years.

- An IWL with a surface cover which allows successful re-vegetation. Appendix S of the Proposal contains details of the completed IWL.

  Iron Road state in the Proposal, Section 3.7.3:
  - The landform will be physically stable and safe.
  - The landform will contain all PAF mined in a manner that alleviates any risk of acid drainage.
  - The landform will contain saline material in a manner that prevents distribution of that material beyond the outer upper surfaces of the landform.
  - The landform will allow rehabilitation outcomes to be met.

Iron Road's Proposal acknowledges that management of surface water flow is critical to the long-term stability of any constructed landform. "At mine completion, the IWL should demonstrate that surface water flows are not being concentrated and that appropriate drainage features on the upper surface, berms and bunds are preventing over-topping onto constructed slopes and infiltration of rainfall for storage within the upper soil profile for plant root access and subsequent growth is occurring."

Appendix S of the Proposal provides details of the conceptual IWL design for rehabilitation and closure. Iron Road state that appropriate placement of suitable topsoil and subsoil within the stabilising rock matrix on the cover surface should facilitate effective re-vegetation or rehabilitation by native vegetation on the slopes and batters. At mine completion, early slope rehabilitation should demonstrate self-sustaining ecosystems with evidence of water and nutrient cycling and recruitment by key plant species.

Iron Road expects successful revegetation of the slopes to improve surface stability. The IWL concept design includes a surface cover which incorporates topsoil and subsoil into a stabilising rock matrix. This medium is expected to allow establishment of native plant species which will act to further stabilise the slopes and soften the visual impacts of the landform.

Revegetation and rehabilitation trials will commence as soon as the final landform height is reached, to determine the optimal mix of waste rock and soils and progressive rehabilitation will reduce the area of land exposed to surface water and wind erosion. (Proposal Section 3.5.2, p. 3-52)

5.4 Exploration

Iron Road does not propose any further exploration to take place on the mine site.

DSD records show that exploration activities for the CEIP have been rehabilitated and there are no outstanding environmental liabilities.

5.4.1 *Post closure monitoring*

Monitoring of rehabilitation and mine closure management activities will continue after closure and until relinquishment of the ML (Table 7.3.7).

5.5 DSD assessment

The full impact assessment and required regulatory responses are detailed in Appendix 3 inclusive of outcomes that encompass rehabilitation and closure. Respective aspect sections within the Proposal address rehabilitation and closure for that aspect.

DSD acknowledges that progressive rehabilitation and associated domain closure designs proposed by Iron Road in the Proposal are conceptual. Iron Road has undertaken to commence rehabilitation trials on the IWL as soon as the final landform height is reached. DSD considers the range of additional progressive rehabilitation measures are likely to be practical and should be identified in the PEPR (should a lease be granted). Time frames for monitoring progress of rehabilitation will be dependent on demonstration of achievement of relevant outcomes and may take longer than five years. Additional monitoring requirements may also be required and would be based on the full suite of measurement criteria arising from outcomes.

A number of rehabilitation and closure strategies contain uncertainties and assumptions, e.g. proposed strategies for closure, responsibility for the maintenance of drainage structures at the foot of the IWL, sediment controls post-mine completion and how long these would be required to be functional for. Iron Road's closure strategies are assessed by DSD to be conceptual and would be required to be updated in the PEPR (should a lease be granted).

5.5.1 *Assessment of lease term*

DSD recommends that should a lease be granted, the lease be subject to a Term of 21 years. The recommendation for a Term of 21 years is based on the following assumptions and assessment:

Action	Time
Time from Lease grant to approval of the PEPR	One year - legislated time period (Regulation 65(10))
Time from approval of the PEPR to commencement of mining operations (including construction)	One year - legislated time period (Regulation 35)
The construction time for the mine as stated by Iron Road	Three years (p 3-19 of the Proposal)
The operational life of the mine as per the Proposal	25 years (p 3-19 of the Proposal)
The minimum time for rehabilitation, closure, post closure monitoring and tenement relinquishment	Five to 10 years DSD expects that there is the potential for this time to be longer
Time contingency as estimated by DSD	Five to 10 years

Hence, the recommended Lease Term is 21 years to align with the maximum allowable term detailed in s.38 of the Act and noting that the Act provides for rights of renewal of the Lease.

5.5.2 *Project timing*

There are two legislated time frames under the Act in relation to the commencement of mining operations subsequent to the grant of a mineral lease:

- Regulation 65(10) - Time from Lease grant to approval of the PEPR = One year
- Regulation 35 - Time from approval of the PEPR to commencement of mining operations (including construction) = One year

The Regulations in both cases allows for the Minister to determine, agree or allow a longer period of time subsequent to a request from the Tenement Holder.

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chapter

6 Description of potential benefits

Iron Road has undertaken a separate Social Impact Assessment (SIA) and Economic Impact Assessment (EIA) as part of developing the CEIP ML Application. The results of these studies are documented in chapters 22 and 23 of the Proposal respectively. The SIA and EIA investigated both the positive and negative changes the proposed mine may have on existing social and economic environments at local, regional and state level.

The following DSD assessment is an analysis of the social and economic benefits described by Iron Road in the Proposal.

6.1 Social benefits

Iron Road states that the proposed mine will result in some changes to the existing social environment on the Eyre Peninsula through increased employment, diversification of the economy, changes to the social character and changes to local access and amenity. These changes have the potential to affect how people experience their environment in both positive and negative ways.

Rose Bowey and Associates was engaged by Iron Road to undertake a detailed SIA of the CEIP. Its SIA report is provided as Appendix Q of the Proposal.

The method undertaken for the SIA included the following key elements:

- defining the study area (focusing on communities in the region that are most likely to be affected by the proposed mine)
- profiling the existing social environment within the study area to establish baseline social conditions
- consulting with local and regional stakeholders to identify potential issues, impacts and opportunities from the proposed mine
- other research to identify potential positive and negative social impacts, mitigations and enhancements.

The following sections summarise the social benefits identified by Iron Road in the SIA.

6.1.1 *Employment and business*

Current business activities in the Eyre Peninsula Region are primarily built around agricultural, fishing and aquaculture industries. Agricultural activities are mainly cereal cropping and livestock production. Aquaculture is scattered throughout the region including at Port Lincoln, Coffin Bay and other coastal centres. Tourism is a key industry, with tourist destinations including Port Lincoln, Coffin Bay and national parks. Mining and renewable energy are emerging as growth industries in the area (e.g. Arrium's Middleback Ranges operations, and the Iluka Resources Jacinth Ambrosia mine in the Far West).

Iron Road's EIA of the CEIP, which included the mine and infrastructure proposals, was estimated by Iron Road to create around 1985 full-time jobs in SA (both direct and indirect), of which 1040 jobs would be in the Eyre and Western Region during operations. Iron Road state that the CEIP would offer significant benefits by creating new long-term employment opportunities at local, regional and state levels. The proposed mine would employ approximately 1050 people during construction, and 560 during operation. Additional local employment opportunities would also exist during construction and operation of CEIP infrastructure, and in Iron Road's head office in Adelaide. The labour and skill requirements for the CEIP are outlined in Section 3 of the Proposal.

A summary of projected employment opportunities from the Proposal is outlined below (from Section 23 of the Proposal – Economic).

Table 6.1 – Predicted employment resulting from CEIP at a regional and local study area (EconSearch 2015)

Employment[1] (Number and %[2])	Year 1	Year 2	Year 3	Year 4
Eyre Peninsula (excluding local study area)	• 7 FTE jobs • Less than 1%	• 163 FTE jobs • 1%	• 448 FTE jobs • 2%	• 315 FTE jobs • 1%
Wudinna DC	• 13 FTE jobs • 2% of total FTE jobs in area	• 478 FTE jobs • 72% of total FTE jobs in area	• 1356 FTE jobs • 203% of total FTE jobs in area	• 898 FTE jobs • 134% of total FTE jobs in area
DC of Kimba	• 1 FTE jobs • Less than 1% of total FTE jobs in area	• 6 FTE jobs • 1% of total FTE jobs in area	• 14 FTE jobs • 3% of total FTE jobs in area	• 8 FTE jobs • 2% of total FTE jobs in area
DC of Cleve	• 4 FTE jobs • 1% of total FTE jobs in area	• 140 FTE jobs • 16% of total FTE jobs in area	• 397 FTE jobs • 45% of total FTE jobs in area	• 263 FTE jobs • 30% of total FTE jobs in area
DC of Tumby Bay	• 6 FTE jobs • 1% of total FTE jobs in area	• 228 FTE jobs • 24% of total FTE jobs in area	• 651 FTE jobs • 68% of total FTE jobs in area	• 433 FTE jobs • 46% of total FTE jobs in area

[1]Direct and Flow-on
[2]Compared with 2012/2013 employment figures

Most of the construction workforce is expected to be fly-in fly-out (FIFO) or drive-in drive-out (DIDO) due to the number, skill sets and relatively short duration of construction activities. They would be accommodated in a construction camp located on the proposed mine site.

Iron Road's consultation with stakeholders indicated a desire for the proposed mine to offer local employment opportunities, rather than a FIFO workforce. As such, Iron Road intends to recruit the workforce through local and regional recruitment channels in the first instance. As the Eyre Peninsula Regional Plan (RDAWEP 2013) states that the Eyre and Western Region does not have a large enough population to provide the necessary workforce for proposed mining growth, Iron Road intends to supplement the workforce for the proposed mine with FIFO workers, who would be encouraged to relocate and live locally.

Iron Road states that it would work with government, education and training providers (including Wudinna TAFE) and other relevant organisations to enable local people to gain the necessary skills to work at the proposed mine.

The proposed mine may also encourage young people to stay in the region and take up training and employment opportunities, or attract them back to the region after completing studies elsewhere. It may also provide a source of employment to supplement often-variable farming incomes with off-farm earnings, if mine rosters could be arranged to accommodate farm work.

Business opportunities during both the construction and operation phases are likely to include requirements for fuel supplies, communication, transport and logistics, engineering and construction services, supply of services, goods or consumables to camp and village accommodation, catering, training and the provision of materials. Iron Road states that it would encourage its operational workforce to live locally, in order to maximise local business benefits.

The CEIP would therefore provide substantial direct and indirect business opportunities for local, regional and state-wide businesses. Indirect flow-on effects may also result from higher income levels and consumer spending in the region. This could benefit a range of business types from small to large, stimulate growth in the local and regional economy, and contribute to the overall well-being of communities.

The EIA estimated that 24% of direct construction expenditure (~$286 million per annum) and 18% of direct operational expenditure (~$201 million per annum) would be spent in the Eyre and Western region. The greatest flow-on employment effects for industries in the local and regional study areas would be in wholesale trade, accommodation, food services and retail trade.

6.1.2 *Population and social services*

Anticipated flow-on benefits from an increase in the population of local townships, as a result of the CEIP construction and operational workforce, were assessed holistically by Iron Road because the impacts of the mine site workforce and the infrastructure workforce were seen to overlap and combine.

Iron Road estimates a total peak construction workforce of 1050 people for the mine, with an additional 900 people required for the proposed infrastructure, and 540 people to be employed in head office in Adelaide. The mine site construction workforce would be accommodated in a construction camp on the proposed ML, along with approximately 250 CEIP infrastructure construction workers. Additional infrastructure construction workers will be based at a second camp to be constructed at the Cape Hardy port site.

As the majority of the construction workforce will be made up of FIFO and DIDO workers, there is not expected to be any long-term change in the population or demography of the local areas during construction.

During the operational phase of mining, new residents are expected to be attracted to live in townships near the proposed mine, which will have an influence on population dynamics and services.

In addition to the mine's operational workforce, the EIA has estimated an additional 196 flow-on jobs could be created in support industries in Wudinna DC, which may also have flow-on population effects.

Iron Road states that it will develop policies and offer incentives to encourage the operational workforce to relocate to Wudinna or nearby townships. Attracting a workforce and their families to relocate may require upgrades to social services and community infrastructure to provide the quality of life and liveability expected by contemporary communities. This would benefit existing local residents as well as incoming residents.

Iron Road will also collaborate with key agencies, including local government, to support the provision of appropriate and sustainable services and amenities that benefit residents and workers in Wudinna. To this end, Iron Road has committed to work with the DC of Wudinna to support the development of a new Structure Plan for the town, which would take into account the proposed workers' village, its location and its links with the township.

Iron Road suggests that with forward planning, opportunities may also exist to support township growth/resource management issues on a more sustainable and cost-effective basis and create new investment benefits.

Iron Road states that it expects population increases in Wudinna associated with the proposed mine would also have a positive impact by expanding the potential membership base for volunteer organisations. It

proposes to develop a corporate volunteering program to bolster the membership base of volunteering organisations.

The project will provide an opportunity to leverage infrastructure improvements that would benefit local communities. For instance, the FIFO workforce would stimulate investment in the Wudinna airport and local aviation services, and benefit local residents through the provision of a new airline service.

The proposed mine may assist in reversing population losses that have been experienced in many rural communities in the Eyre Peninsula. The mine may encourage young people to stay in the region and take up training and employment opportunities or attract them back to the region after completing studies elsewhere because of local job opportunities. It could also bring back people who have left the region to find work. It is anticipated that an increase in population would assist in providing the critical population mass to increase support opportunities to the project and therefore increase services in the long term.

No commitments have been made regarding the delivery of services; however, it is expected that Iron Road will contribute to monitoring and managing growth in relation to the impacts of this development.

This should take the form of annual reporting in a number of areas to assist the SA Government to plan for growth needs in that community.

6.1.3 *Social character*

The size of the operational workforce based in Wudinna would represent a large increase in the township's population and introduce people with different demographic profiles, values and backgrounds to existing residents.

Iron Road states that the location and design of a long-term employee village at Wudinna would provide an opportunity to integrate the village with the existing town's communities. This could provide opportunities for employees to socialise, build networks, interact and encourage participation in sports clubs, volunteering and community projects. The interaction between non-resident workers and local residents could promote familiarity and a greater sense of belonging. Directing resources and effort to building relationships and investing in benefits for the community overall and new employees could enhance integration and encourage social cohesion between residents and non-resident workers.

In the medium to long term, a population increase in Wudinna, as a result of the CEIP residential workforce increasing, could have a positive effect on the social fabric of the community if families and young people return to the community. This could bring about and contribute to improvements in the levels and types of services, expand the membership base for local recreational and volunteer organisations and encourage a greater diversity

of lifestyles and opportunities that would generally be afforded in a larger township.

Iron Road states that it will work with the Wudinna DC to develop strategies to strengthen social cohesion and social interactions between existing residents in Wudinna, incoming residents and non-residents.

6.1.4 *Post mine closure*

In anticipation of a reduction in the level of economic activity and employment following the mine's closure, Iron Road states that it has committed to working cooperatively with local and state governments regarding closure planning and adjustment programs.

These will be outlined in the social management plan and developed further over the life of the mine as the social and economic changes, and potential post-mining opportunities, become more apparent. Iron Road suggests the following measures will be applied in closure planning:

- collaborative processes with the community and government to determine post-mining land uses that will maximise local economic benefits
- collaborative programs with the community and government during the mine's life to diversify the local economic base and reduce dependence on the CEIP
- providing support for retraining programs
- providing support for business planning and marketing that will assist businesses to diversify their income, or relocate their business.

6.2 Economic benefits

Iron Road expects that the proposed mine would bring significant economic benefit to the local communities within the Eyre Peninsula and more broadly across South Australia and Australia. Those benefits include an increase in economic activity resulting in economic growth, an increase in employment and training opportunities, an increase in business development opportunities for suppliers and an increase in government revenue.

Section 23 of the Proposal describes the existing economic environment at a local and regional level, and provides an assessment of predicted positive and negative economic impacts associated with the construction and operations of the CEIP (both the mine components together with the infrastructure components). The full EIA undertaken by Iron Road's consultant Econsearch is presented in Appendix R of the Proposal. This details the contribution of each stage of the project to the relevant local government areas and South Australia overall.

EIA considered the combined economic benefit of both the mine and infrastructure components, this provided an estimation of project benefits rather than the benefits likely to occur from the mine alone.

The existing economic environment is characterised by jobs in agriculture (66% of SA's wheat and barley is produced in the local area), fishing (80% of the SA's commercial seafood industry), mining (Eucla Basin, Gawler Craton) and manufacturing (Whyalla Steelworks).

The analysis below summarises the expected annual average economic impacts as derived from economic modelling conducted for the CEIP, with the construction phase of the project expected to take four years, and the remaining operational phase (to follow) (i.e. the life of the mine) continuing for a further 25 years.

In summary, Table ES-1 (from the Proposal Appendix R) shows the regional employment analysis (direct and flow-on) from the construction and operational phases and the regional impact. Table ES-2 (from the Proposal Appendix R) includes the state and regional economic impacts from both construction and operational phases.

Table ES-1 Local and regional economic impact of the CEIP, construction and operation phases

	Wudinna	Kimba	Cleve	Tumby Bay	Elliston	Rest of Eyre & Western	**Total Eyre & Western**
Construction (avg/an, yrs 1-4)							
Gross Regional Product ($m)							
Direct	29	0	12	16	0	0	**57**
Flow-on	12	1	4	6	0	33	**55**
Total	**41**	**1**	**15**	**22**	**0**	**33**	**112**
Employment (fte)							
Direct	551	0	164	273	0	0	**988**
Flow-on	135	7	37	57	1	233	**470**
Total	**686**	**7**	**201**	**330**	**1**	**233**	**1,458**
Operation (avg/an, yrs 5-29)							
Gross Regional Product ($m)							
Direct	2,376	0	1	2	0	0	**2,379**
Flow-on	26	2	3	2	1	19	**52**
Total	**2,401**	**2**	**4**	**4**	**1**	**19**	**2,431**
Employment (fte)							
Direct	654	0	26	25	0	0	**705**
Flow-on	195	11	20	13	7	88	**335**
Total	**849**	**11**	**46**	**38**	**7**	**88**	**1,040**

Table ES-2 Regional, state and national economic impact of the CEIP, construction and operation phases

	Eyre & Western	Rest of South Australia	Total South Australia	Rest of Australia	Total Australia
Construction (Avg/an, yrs 1-4)					
Gross State Product ($m)	112	406	518	653	1,171
Employment (fte)	1,458	1,569	3,027	2,451	5,478
Operation (Avg/an, yrs 5-29)					
Gross State Product ($m)	2,431	294	2,725	98	2,823
Employment (fte)	1,040	945	1,985	244	2,228

6.2.1 *Construction*

Iron Road identifies total expected expenditures of $4.8 billion (including at regional, state, inter-state and overseas levels) of which $2.7 billion (56%) is expected to occur in South Australia.

The average expenditure of $673 million within the state during the construction phase is expected to create a maximum of approximately 2500 jobs within the Eyre and Western region specifically and SA as a whole (source: The Proposal - Appendix Q – Page 95 – Figure 4-1). At the regional level, although the construction phase employment is expected to be transitory, it is also expected to have a local spinoff as the local demand for housing and other services is expected to increase in line with employment levels.

At a regional level, the direct and flow-on average gross regional product (GRP) for the life of construction in the total Eyre Peninsula is expected to be $112 million per annum. Contribution to State and Commonwealth government revenue during the construction period is estimated to be $17.3 million per annum (made up of $300,000 to local government, $4 million to the State Government and an average annual contribution of $13 million to the Commonwealth).

6.2.2 *Operation*

On average the proponent expects that the CEIP will generate a gross operating surplus (GOS) of $2.3 billion per year during operation. It is also expected that an average of $1.1 billion will be spent on the mine, rail, port and general supply chain during the 25 years of operations.

As a result of these expenditures, the proponent has suggested that 1985 full-time employees (FTEs) are expected to be created during the operational phase. At an SA regional level, the Wudinna local government area (LGA) is expected to be the largest beneficiary with 849 full-time direct and flow-on employees. Further, both Cleve (46 FTE) and Tumby Bay (38 FTEs per annum on average) are likely to benefit from strong regional employment growth (assumptions have been made based on potential operations such as 40% local workers, and 60% long distance commute workers (FIFO).

Economic activity is expected to increase within the Wudinna DC by (on average) $59 million per annum (which excludes direct project profits). This would have a transformative effect on the local economy.

In South Australia the CEIP is expected to contribute an estimated annual average of $2.725 billion per annum. Across Australia more broadly, the predicted contribution to gross national product (GNP) is $2.8 billion, or 0.2% of GNP.

The contribution to the revenue of both SA and Commonwealth governments through taxes and royalties would be significant during the operations phase. Total annual Government revenue would be $663 million with an average annual contribution of $300,000 to local government, $165.8 million to the State Government and $469 million to the Commonwealth Government per annum.

DSD recommendation

DSD considers that Iron Road has provided an adequate assessment of the likely social and economic benefits and impacts of the CEIP.

The Proposal (p. 22-41 and Table 22-21) describes the proposed control and management strategies, initiatives and commitments in relation to potential social impacts and benefits. Similarly, the Proposal (p. 23-12 and Table 23-5) describes the proposed control and management strategies in relation to potential economic impacts and benefits. These measures aim to enhance the positive benefits and reduce the negative impacts associated with the proposed mine. Appendix 3 of this report contains DSD's complete assessment of Iron Road's potential impact events, technical justifications and recommended regulatory responses.

Iron Road would need to continue to engage with the local and regional community to ensure the most effective implementation of commitments discussed in the Proposal.

Recommended regulatory response

DSD recommends that should a lease be granted the following be a condition of Schedule 2 of the lease:

Social Management Plan (SMP)

The Tenement Holder must prepare, implement and maintain an SMP within 12 months from the date of the grant of the Mining Tenement (in consultation with the relevant State Government agencies and key community stakeholders) that addresses (but is not limited to):

- All strategies, initiatives and commitments described in Chapter 22 of the Mining Lease Proposal;
- A process for reviewing and updating the SMP on a regular basis; and
- Anything further that the Director of Mines (or other authorised officer) directs in writing.
- The Tenement Holder must make the SMP publicly available.

- The implementation and maintaining of the SMP must be audited by a suitably qualified independent expert on an annual basis, or at a frequency as the Director of Mines (or other authorised officer) may specify by notice in writing.
- The expert must prepare a report of the findings of the audit and this report must be made publically available within one month of completion of the audit.

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7 Results of stakeholder and community engagement

7.1 Public consultation

7.1.1 *Description of statutory public consultation*

Iron Road state in the Proposal they actively engaged and consulted with stakeholders as the project developed including:

- Directly and indirectly impacted landowners
- Local communities
- Local government
- Local businesses
- Native Title parties and Aboriginal groups
- State and Federal politicians
- State and Federal government agencies
- Industry
- Service providers
- Non-government organisations and special interest groups
- The general public

Iron Road utilised principles and approaches drawn from a range of established codes of practice and methodologies for stakeholder engagement; including those of Dr Peter Sandman, the International Association for Public Participation and the South Australian Chamber of Mines and Energy's Code of Practice for Stakeholder and Community Engagement.

Iron Road's active engagement with stakeholders commenced in 2011 with project updates provided at meetings in Wudinna and Warramboo. Table 5-3 in the ML Proposal details community information sessions and public meetings. Iron Road also met with directly affected landowners, the Barngarla Aboriginal Corporation, local businesses, and service providers.

Focus Groups were convened by Iron Road in 2012; these were constituted of interested community members and provided Iron Road feedback and information on:

- Business and Economic Impacts
- Environment
- Social Impacts
- Transport and Access
- Training and Education
- Housing and Accommodation

The Proposal states that after the focus group process, in 2013, Iron Road partnered with the community to establish the CEIP Community Consultative Committee (CCC). The CCC framed its purpose in a Terms of Reference and meetings were facilitated by an independent Chair. CCC meetings and working groups took place until June 2015.

Between February 2015 and April 2015, Iron Road undertook a number of "Talking Topic" round table sessions, engaging with the CCC, community and stakeholders to address specific environmental aspects or themes associated with the proposed mine.

In support of local consultation, Iron Road maintained a website containing information about the project and engagement events. Table 5-8 of the Proposal summarises key issues, benefits and Iron Road's response to those matters.

The Department of State Development (DSD) and the Department of Planning, Transport and Infrastructure (DPTI) worked in partnership to deliver a consolidated approach to the assessment of the Iron Road applications under the Development Act (accredited for the EPBC Act) and Mining Act. This collaborative effort included a joint government approach to public consultation, ensuring the requirements of the Development Act, EPBC Act and Mining Act were met.

In accordance with legislative requirements specified in s.35A of the Act, consultation with relevant stakeholders was undertaken to enable the public to make written submissions in relation to the application for a ML for the Central Eyre Iron Project. This consultation, undertaken by DSD in conjunction with DPTI utilised a comprehensive engagement plan including consultation with relevant district councils, landholders, community groups and relevant government agencies to ensure all potentially impacted stakeholders were adequately informed of the opportunity to provide comment on the Proposal. The statutory public consultation period commenced 19 November 2015 and closed on 2 February 2016.

Notice was given under s.35A(4) of the Act and advertised in the following publications:

- The Advertiser
- Port Lincoln Times

- Whyalla News
- Eyre Peninsula Tribune
- West Coast Sentinel
- The Granite
- South Australian Government Gazette
- CEIP Website (http://ceipconsultation.sa.gov.au/)

A hard copy of the Proposal was circulated to all affected landowners, the Wudinna District Council, Cleve District Council and the District Council of Tumby Bay. During the statutory public consultation, the Proposal document was available for downloading and viewing through the government's CEIP Consultation website. Due to the size of the document and slow internet speeds in some rural areas, hard copies were made available for viewing at council offices and USB memory sticks containing electronic copies of the Proposal were provided to the public. DSD referred the Proposal to relevant State Government agencies including DSD, DEWNR, EPA, DPTI and Safework SA. Technical experts from those agencies provided input to the assessment.

DSD in conjunction with DPTI undertook three public meetings associated with the ML application and development application during the public consultation period. These were held at:

- Port Neill on Tuesday 8 December 2015,
- Cleve on Wednesday 9 December 2015, and
- Wudinna on Thursday 10 December 2015.

The public meetings utilised an open house format. DSD and DPTI staff were available to answer questions and discuss the application processes. Iron Road staff were also available to discuss the Proposal, EIS and EPBC documents. Overview presentations were given by DSD, DPTI and Iron Road during the meetings and attendees had the opportunity to speak from the floor.

7.1.2 *Public submissions*

Public submissions received were made available to the public on the government website during the assessment.

A total of 105 public submissions were received for the MLP, EIS and EPBC consultation during the statutory circulation period. Full copies of the public submissions were provided to Iron Road. The submissions were attached to the request for a response to consultation issued by DSD to Iron Road.

7.1.3 *Government submissions*

The Proposal with associated Appendices were provided for assessment to a number of State Government agencies including DSD, DEWNR (inclusive of the NRM board), EPA, DPC, DPTI and Safework SA.

The assessment by agencies raised issues requiring points of clarification and/or additional information to enable a comprehensive assessment of the Proposal.

7.1.4 *Description of the process for Iron Road's response to public and government submissions*

Both government and the public submissions identified a range of issues for further consideration, points of clarification and/or additional information required to enable a comprehensive assessment of the CEIP.

Government issues were summarised in a table and provided to Iron Road as an attachment to the request for response letter. The table was structured to show the topic (aspect), a reference to the relevant section of the Proposal, the description of the issue raised by the State Government and the requirement to address the issue.

Iron Road were provided the opportunity to formally respond to the issues raised in the submissions as specified in the DSD request for a response to consultation letter dated 18 March 2016. The government required Iron Road to review each of the public submissions and the government submission in detail and then prepare a thorough response document accordingly.

7.1.5 *Assessment of response document*

DSD and the relevant government agencies reviewed the Response Document to confirm that the issues raised during the statutory consultation were adequately addressed. Following a thorough assessment, DSD deemed on 28 September 2016 that the Response Document was suitable for the purpose of assessing the Central Eyre Iron Project. DSD received Iron Road's formal response "Central Eyre Iron Project ML Proposal Response Document" (the Response Document) on the 30 September 2016. The Response Document was made available on governments CEIP consultation website.

7.2 Conclusion

DSD considers that Iron Road has undertaken an engagement process to identify concerns raised by relevant stakeholders and address those concerns in the development of the Proposal. DSD also considers that statutory consultation requirements established under s.35A of the Act have been satisfied through the circulation of the ML application and supporting Proposal calling for public submissions, together with the development and subsequent release of Iron Road's Response Document.

The number and content of submissions received during the public consultation period highlights the level of public interest of both the local and wider community in relation to the ML Application.

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8 Assessment of impacts and project risks

The Act and Regulations provide for a risk and performance-based regulatory approach for the preparation and assessment of Mining Proposals that accompany an application for a ML. A risk-based approach focuses on identifying key environmental impacts and then developing appropriate environmental outcomes for those impacts, which the applicant is then required to achieve. A performance-based regulatory approach focuses on what *should* be achieved (i.e. the required outcomes).

The meaning of 'environment' throughout this report is defined by s.6(4) of the Act. This section of the Act provides for a broad consideration of the natural, social and economic aspects of the environment.

Environmental outcomes (referred to as 'outcomes') are defined by DSD as a statement of the appropriate level of impact on the receiving environment that must be achieved.

In accordance with Regulation 30(2), the Proposal must:

- be balanced, objective and concise
- state any limitations that apply, or should apply, to the use of the information in the Proposal
- identify any matter in relation to which there is a significant lack of relevant information or a significant degree of uncertainty
- where relevant, identify the sensitivity to any assumption that has been made and the potential consequences if this assumption later proves to be incorrect.

Iron Road's impact and risk assessment process

Iron Road's environmental impact and risk assessment, including proposed outcomes and criteria, are provided in sections 7 to 23 (and Appendix C) of the Proposal. Iron Road's methodology and approach is detailed in section 6.

Iron Road identified those sensitive receptors that have the potential to be impacted by the Proposal and sought to establish an environmental baseline for the receptors either through field studies or desktop studies.

Iron Road identified (and numbered) potential environmental impact events for all stages of the project (i.e. construction, operation, closure and post-mine completion). Identification was based on Iron Road's knowledge of the existing environment, experience with other similar operations and issues of concern to key stakeholders. Iron Road then assessed each potential impact to determine which events would be likely to occur and if they would be significant in consequence.

The potential environmental impact events were described through a source-pathway-receptor model, excluding any potential management and/or mitigation measures. A potential impact event is the combination of a source, a pathway and an environmental receptor where the source has the potential to cause harm to an environmental receptor because a pathway between the source and the receptor is likely to exist. Where a source and environmental receptor is identified but a pathway is determined not to exist, justification (evidence) was provided to demonstrate the conclusion. The source, pathway and environmental receptor of each potential impact event were described prior to the implementation of engineering or administrative control measures.

An assessment of assumptions and uncertainty was then made assuming effective implementation of management and/or mitigation measures.

Outcomes, as defined above, are then proposed for impact events that have been assessed to require an outcome. Iron Road has adopted the principle that where a source, pathway and receptor linkage has been established prior to the implementation of control/management measures, then an outcome is required.

Iron Road identified stakeholder views, and applicable legislation and standards for each environmental aspect discussed in the Proposal which assisted in the identification of potential impact events of concern to the community. Outcomes were developed following stakeholder and community consultation, taking into account issues raised.

DSD process for assessing environmental impacts

DSD, in conjunction with other SA government agencies, has assessed the Proposal, public submissions and Iron Road's subsequent Response Document. This assessment considered the following:

a) whether Iron Road provided adequate information about the existing receiving environment
b) whether Iron Road identified all sensitive receptors and environmental values that may potentially be impacted by the project. (Additional sensitive receptors and environmental values may also be identified by DSD, other government agencies and/or the public)

c) whether Iron Road provided adequate information about the proposed mining operations
d) whether Iron Road provided adequate evidence of consultation with landowners and potentially affected persons, community and stakeholders in the development of the Proposal and environmental outcomes
e) which issues raised were within the scope of the Proposal and whether all those issues and concerns were assessed. Issues raised, which are outside the scope of the Proposal or too general in nature, have not been included in this report; however, they have been considered in the assessment
f) whether Iron Road identified and correctly assessed all potential impact events. Additional potential impact events may also be identified by DSD, other government agencies, and/or members of the public. The assessment of potential impact events considers the following six matters:
    1) For each impact event, whether the source, pathway and receptor are confirmed to exist for each phase of the Proposal (construction, operation and post-mine completion). Impact events, outcomes and measurement criteria related to closure and mine completion are incorporated into each environmental aspect.
    2) Whether the proposed outcome statement is appropriate. That is, whether the expected level of impact to the environment (subsequent to management and/or mitigation measures as described by Iron Road) is appropriate. If the proposed outcome is not appropriate or requires amendment, DSD recommends a new appropriate outcome. If DSD assesses that it is not possible to state an appropriate outcome that can be achieved, DSD makes a recommendation to refuse the application.
    3) Whether the proposed or recommended outcome is achievable. This is an assessment based on the likelihood that the proposed management and/or mitigation measure(s) would be effective in achieving the outcome. For closure events this would consider whether the proposed strategies would be self-sustaining in the long-term. The assessment also considers any assumptions and uncertainties in relation to the impact event and control strategies proposed by Iron Road.
    4) The recommended regulatory response in relation to the requirement for outcomes, strategies or conditions to be included in the lease document. All confirmed potential impact events require an outcome unless the consequence of the potential impact event has been demonstrated to be ‘trivial’ in nature. For the purpose of assessment, ‘trivial’ is defined as ‘an insignificant consequence’. Recommended outcomes are based on the extent to which the Proposal will limit an impact on the environment. Outcome statements are designed to be reasonable, realistically achievable, appropriate, and meet applicable legislative requirements.
    5) Whether the draft measurement criteria are an appropriate measurement to demonstrate achievement of the proposed or recommended outcome and the requirement for criteria to be

included in the ML document. The assessment of draft measurement criteria considers whether relevant recognised industry, legislative or regulatory standards have been applied to the criteria. If appropriate standards have not been applied, DSD recommends their consideration. Recommendations for the modification or addition of new criteria are made where appropriate. Refinement of measurement criteria would occur in the PEPR, should a lease be granted.

6) Whether there is a high level of reliance on control strategies to ensure achievement of the proposed or recommended outcome. If there is a high level of reliance, DSD considers the requirement for draft leading indicator criteria to be included in the ML document. Recommendations for the modification or addition of new leading indicator criteria are made where appropriate. Refinement of leading indicator criteria would occur in the PEPR, should a lease be granted.

To avoid duplication, impact events, outcomes, strategies and measurement criteria may be assessed under a single environmental aspect – even though they may be related to more than one aspect. For example, impacts relating to the IWL as a source have been largely assessed in the soil aspect (even though the IWL may have the potential to impact surface water, groundwater and land use).

Should a lease be granted, the recommended regulatory response in relation to the requirement for outcomes, strategies, criteria and conditions are ultimately included in the Mineral Lease Document. Compliance with outcomes is determined using measurement criteria as required by Regulation 65 of the Regulations. Should a lease be granted, the Act requires measurement criteria to be finalised in accordance with the Regulations in the provision of a PEPR.

DSD's full review of the Iron Road impact and risk assessment is provided as Appendix 3 of this report. The DSD assessment was based on the tables provided by Iron Road in Appendix C of the Proposal. DSD inserted new assessment columns into this table (shown in green) in order to assess each of Iron Road's potential impact events. The assessment considerations above that are numbered from (1) to (6) correlate identically to the assessment process (and numbering) in Appendix C and the remainder of Chapter 8 of this report.

This chapter includes a summary of DSD's full assessment of each environmental aspect from Appendix 3 of this report.

8.1 Public safety

8.1.1 *Description of environment*

Iron Road's Public Safety chapter addresses existing site environmental elements relevant to public safety:

- geochemical composition of ore, concentrate and waste
- fire hazards

- natural geohazards (including structural instability due to slips, faults, karst features or geological discontinuities).

The chapter also addresses safety relevant to the public's interaction with mining operations within the proposed tenement, such as:

- site access
- built structures accessible by the public
- mine pits
- the IWL
- pre-existing contamination.

The Public Safety chapter does not address issues such as traffic safety or safety (health) issues related to air quality or noise as those matters are addressed in other specific chapters.

The Iron Road Proposal states the following:
"The mine is located within a region considered to be geologically stable and not at significant risk of earthquakes or other geohazards. The area of the mine site and surrounding region is relatively clear of vegetation, resulting in low fuel loads. As such, no significant fire events have been recorded at the location of the mine. Bushfires are, however, considered to be a significant risk on the Eyre Peninsula, with six significant fire events on the Peninsula since the year 2000.

The mineral and geological composition of the iron concentrate and waste material indicates that it is largely inert and does not include elemental concentrations in excess of the health investigation levels outlined by the National Environment Protection Council (1999). Surficial calcrete materials which would be removed during early pre-stripping of the mine pit would be used in an acid neutralisation capacity where required for the approximate 2% of waste material (by volume) considered PAF (MWH 2015)."

There would be respirable silica present in the fine tailings at an approximate concentration of 0.07% by weight.

The proposed mine may present a range of hazards to public safety due to:

- the open mine pit
- injury or death to the public during unauthorised access to the site
- injury or death to public during authorised access to mine site (IWL collapse, viewing platform collapse)
- fire originating from mine site
- disturbance of contaminated land
- contamination of soils and or groundwater.

DSD considers that the description of the existing environment relating to public safety in the Proposal (Section 7) is a suitable characterisation of the receiving environment that may be affected by mining operations.

8.1.2 *Views of affected parties*

The primary issues raised during the statutory public consultation are summarised below in Table 8.1 and are cross-referenced with the relevant Iron Road impact events. The cross-referencing of the views of affected parties to impact event identification numbers (IDs) enables a link between an issue raised and DSD's recommended regulatory response determined subsequently in this chapter. The 'Public Submission ID' in the table below relates to the unique public submission number and the name of the submitter. If the submitter has requested privacy, then 'name and address withheld' is indicated in the table.

Table 8.1 – Impact events relating to issues raised during statutory consultation

Public submission ID	Issues raised	Where addressed – Impact Event ID
004-Nield	Additional fire hazard threat	IM_07_08
010-Sampson	Mine lease fencing – nature and maintenance Likelihood of IWL failure	IM_07_00 IM_07_02 IM_07_07 IM_07_11 IM_07_14
063-Edwards	Fire hazard management	IM_07_08
078 Name and address withheld	Fire hazard management	IM_07_08
096-SIMGI	Fire hazard management	IM_07_08
102-TBRARA	Confidence in analysis of tailings samples given limited (3) samples used for pit 9km long, 630m deep and 1.5km wide Fire hazard management and fire ignition source from train movements	IM_07_16 IM_07_17 IM_07_08

8.1.3 *Impact event assessment*

Section 8.0 of this report provides a description of DSD's process for assessing potential impact events. Appendix 3 of this report contains DSD's complete assessment of Iron Road's potential impact events, technical justifications and recommended regulatory responses. The following two tables in this section are based on DSD's complete assessment provided in Appendix 3.

Table 8.1.1 contains a summary of DSD's recommended regulatory responses for impact events that have been assessed by DSD to require: (1) environmental outcome(s) only (i.e. no other lease conditions/requirements), or (2) no environmental outcome.

Table 8.1.2 contains DSD's detailed assessment for impact events where DSD's recommended regulatory response includes the requirement for a combination of outcomes, strategies, criteria or conditions.

Table 8.1.1 – Summary of impact events where DSD recommends (1) outcome(s) only, or (2) no outcome(s) (see Appendix 3 for DSD's complete assessment)

Impact Event ID	Iron Road impact event description	DSD recommends that should a lease be granted the following outcomes be a requirement of Schedule 6 of the lease
IM_07_02 IM_07_03 IM_07_04 IM_07_05 IM_07_06 IM_07_12 IM_07_16	*Collapse of IWL during construction or operation causes injury or fatality to member of public* *Mine viewing platform fails during construction or operation causing injury to member of public* *Health impacts to local community during construction or operation as a result of disturbance of contaminated land*	The Tenement Holder must during construction and operation, ensure that unauthorised entry to the Land does not result in public injuries and or deaths that could have been reasonably prevented.
IM_07_18	*Fire originating in ML during construction or operation results in injuries or fatalities to members of the public*	The Tenement Holder must during construction and operation, ensure that there are no public injuries and or deaths as a result of uncontrolled fires caused by mining operations that could have been reasonably prevented.
IM_07_13	*Mine viewing platform fails causing injury to member of public (post-mine completion)*	The Tenement Holder must demonstrate that post-mine completion, the risks to the health and safety of the public so far as it may be affected by mining operations are as low as reasonably practicable.

Table 8.1.2 – Assessment of impact events where DSD recommends a combination of outcomes, strategy, criteria or conditions (see Appendix 3 for DSD's complete assessment)

Impact Event ID	DSD assessment of the impact event, source/pathway/receptor, strategies, proposed outcome and draft criteria
IM_07_00 IM_07_14	**Iron Road Impact Event** *Member of public falls into pit (Construction and operation).* *Unauthorised access to IWL results in injury to member of public (Construction and operation).* **DSD Source, Pathway, Receptor Assessment** For operation and closure, a receptor is not created by authorised access to the mine site by members of the public. Authorised access to the mine site by members of the public would be regulated by SafeworkSA. A receptor is created by unauthorised access by members of the public to the mine site (IWL). Members of the public adjacent to the mine site are also receptors. For post-mine completion, see the assessment for impact event PIM_07_15 below. The public would be a receptor regardless of the means of access to the site. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required. (1) DSD confirms that the Source(s), Pathway(s) and Receptor(s) would exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required. **Iron Road proposed Outcome** *Unauthorised entry to the ML during construction, operation and closure does not result in public injuries and or deaths that could have been reasonably prevented.* **DSD Assessment of Outcome, Strategies and Uncertainty** The Mining Proposal (MP) document (p.p.7-6) includes a detailed list of control strategies for preventing unauthorised access. The MP (p.p. 7-8) states, 'during construction and operation, the mine would be fully fenced with access limited via secure gate houses'. (2) The outcome appropriately states the level of impact subsequent to controls. The outcome statement requires amendment to accurately reflect the applicable mine phases. (3) The outcome is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. **DSD Recommended Regulatory response – outcome and strategies** <u>(4) DSD recommends that should a lease be granted the following outcomes be a requirement of Schedule 6 of the lease:</u> The Tenement Holder must during construction and operation, ensure that unauthorised entry to the Land does not result in public injuries and or deaths that could have been reasonably prevented.

Impact Event ID	DSD assessment of the impact event, source/pathway/receptor, strategies, proposed outcome and draft criteria
	Iron Road Proposed Measurement Criteria *Independent investigation of all incidents that result in injury or death to a member of the public are completed in 14 days, or as agreed with the Director of Mines (or other authorised officer), and demonstrate that the mine operator could not have reasonably prevented the incident (injury or death) from occurring.* **DSD Assessment of Draft Measurement Criteria** Amendments to the criteria are proposed in red and underlined. The criteria could be improved by including reference to a process that requires learnings from the investigation to be incorporated into updated strategies in the PEPR. Should a lease be granted, the measurement criteria would be finalised in the PEPR. (5) DSD considers the proposed draft measurement criteria to be an appropriate measurement to demonstrate achievement of the proposed outcome. **Iron Road Proposed Leading Indicator Criteria** *Annual safety audit does not identify additional actions that could reasonably be taken to reduce risks to the public.* **DSD Assessment of Leading Indicator Criteria** DSD assesses that an annual audit of procedures and strategies to prevent unauthorised access to the mine site would support effectiveness of strategies and encourage continuous improvement. Should a lease be granted, the leading indicator criteria would be finalised in the PEPR. (6) DSD considers that there is a high level of reliance on control strategies to ensure achievement of the outcome, hence, leading indicator criteria is required.
IM_07_01	**Iron Road Impact Event** *Member of public falls into pit or pit lake (Post-mine completion)* **DSD Source, Pathway, Receptor Assessment** DSD classifies closure to be a part of the operations mine phase. Progressive rehabilitation and mine closure is not a phase that discretely happens after production has finished; rather it is a process that must occur throughout the full life cycle of the mine. DSD classifies 'post-mine completion' to be a mine phase. This assessment applies to all impact events in this table and this wording is not repeated moving forward. (1) DSD confirms that the Source(s), pathway(s) and receptor(s) would exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required. **Iron Road Proposed Outcome** *Post mine completion, risks to the safety of the public from the open pit are as low as reasonably practicable.* **DSD Assessment of Outcome, Strategies and Uncertainty** A fence is proposed to prevent access to the open pit and pit lake post mine completion. The longevity of a fence as a control strategy to prevent public access would require ongoing maintenance and an appropriate transfer of maintenance/liability post-mine completion. Passive engineering designs which do

Impact Event ID	DSD assessment of the impact event, source/pathway/receptor, strategies, proposed outcome and draft criteria
	not require ongoing maintenance are more effective in the long term, for example, the proposal to ensure benches are constructed in the pit wall to prevent falls for the public, and other designs to enable safe egress from the pit lake. The Mining Proposal (MP) document (p.p.7-6) also refers to an earthen bund for preventing unauthorised access. This is an appropriate strategy, however, should a lease be granted, the details of the size and location of the bund would be required in a PEPR. (2) The outcome appropriately states the level of impact subsequent to controls. The outcome statement requires minor amendment. (3) The outcome is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. **DSD Recommended Regulatory Response – Outcome and Strategies** (4) DSD recommends that should a lease be granted the following outcomes be a requirement of Schedule 6 of the lease: The Tenement Holder must demonstrate that post-mine completion, the risks to the health and safety of the public so far as it may be affected by mining operations are as low as reasonably practicable. DSD recommends that should a lease be granted the following be a requirement of Schedule 6 of the lease: The Tenement Holder is required to address the following matters for the purpose of Regulation 65(2)(c) in relation to the post-mine completion public safety outcome: • Develop strategies to ensure final landform design for the open pit void meets the outcome for protection of public safety post-mine completion and in the long term to address the following potential hazards (but not limited to): - The risk of falling; - The risk of drowning; - The risk of vehicle incidents/accidents; and - Ground instability. **Iron Road Proposed Measurement Criteria** *Independent audit of the physical stability of the pit and physical barrier (eg: bunding) and other control strategies (eg: benching in the pit, pit lake egress design), post closure, demonstrates risks to the public are as low as reasonably practicable.* **DSD Assessment of Draft Measurement Criteria** DSD amendments to the criteria are proposed in red and underlined. Should a lease be granted, the measurement criteria would be finalised in the PEPR submission. (5) DSD considers the proposed draft measurement criteria to be an appropriate measurement to demonstrate achievement of the proposed outcome. **Iron Road Proposed Leading Indicator Criteria** *None proposed*

Impact Event ID	DSD assessment of the impact event, source/pathway/receptor, strategies, proposed outcome and draft criteria
	DSD Assessment of Leading Indicator Criteria (6) Should a lease be granted, the requirement for a leading indicator criteria would be finalised in the PEPR.
IM_07_07 IM_07_08 IM_07_09 IM_07_10 IM_07_11	**Iron Road Impact Event** All of these impact events relate to the 'post-mine completion' mine phase. *Collapse of IWL as a result of surface water erosion causes injury or fatality to member of public* *Collapse of IWL as a result of wind erosion causes injury or fatality to member of public* *Collapse of IWL as a result of poor consolidation of material causes injury or fatality to member of public* *Collapse of IWL as a result of poor geomorphological design causes injury or fatality to member of public* *Collapse of IWL as a result of seismic event causes injury or fatality to member of public* **DSD Assessment of Source, Pathway, Receptor** (1) DSD confirms that the potential impact event includes a significant Source, a credible pathway and sensitive receptors. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required. **Iron Road Proposed Outcome** *Post mine completion, risks to the safety of the public from loss of stability in the IWL are as low as reasonably practicable.* **DSD Assessment of Outcome, Strategies and Uncertainty** For post-mine completion, the closure design for the IWL p. 7-6 of the MP states "the design parameters of the IWL will ensure it is geotechnically stable and safe". The MP (p.3-46 and Figure 3-20) states the final IWL would have outer slope angles ranging from 9 degrees to 18 degrees. The benches are not designed to have large falls, hence the risk to public safety from slips, trips and falls is mitigated. The IWL cover design would also be integral to mitigate surface water erosion. The design of the final IWL is a key control strategy to ensure the protection of the public post-mine completion, and hence a second schedule lease condition is recommended to ensure this design would be independently peer reviewed for the PEPR (should a lease be granted). The IWL consolidation, cover design and revegetation would be integral to mitigate wind erosion. The design of the final IWL is a key control strategy to ensure the protection of the public post-mine completion, and hence a second schedule lease condition is recommended to ensure this design would be independently peer reviewed for the PEPR (should a lease be granted). The design of the final IWL, including ensuring the design is appropriate to withstand seismic events in the long term, are key control strategies to ensure the protection of the public post-mine completion. The MP (p.2-30) states that: "the mine site is located within an area not considered to be at significant risk of earthquakes". The IWL design in the MP is conceptual and does not specifically address how seismic events have been considered in the design. A second schedule lease condition is recommended to ensure this design would be independently peer reviewed for the PEPR (should a lease be granted). "Validation of construction of IWL to design (QA/QC)" is also a key control strategy proposed by Iron Road. DSD recommends that this be included in the Sixth Schedule of the lease.

Impact Event ID	DSD assessment of the impact event, source/pathway/receptor, strategies, proposed outcome and draft criteria
	Strategies in relation to the IWL cover design are further assessed against outcomes in the Soils section. (2) The outcome appropriately states the level of impact subsequent to controls. The outcome statement requires minor amendment. (3) The outcome is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. **DSD Recommended Regulatory Response – Outcome and Strategies** <u>(4) DSD recommends that should a lease be granted the following be a condition of Schedule 2 of the lease:</u> In accordance with section 70B(2)(d) of the Act it is a condition of the grant of the Mining Tenement that a proposed PEPR submitted in accordance with Part 10A of the Act must include reports from suitably qualified independent experts on the following matters: The effectiveness of the proposed strategies in the proposed PEPR achieving the environmental outcomes identified in the proposed PEPR, including but not limited to reports from: • an independent geotechnical engineering expert (i.e. for IWL and mine waste design and construction methodology) • an independent mine waste cover system expert (i.e. for IWL and mine waste cover systems design) • an independent geomorphology expert (i.e. for landform design, soil and erosion management) • an independent hydrology expert (i.e. for surface water management). <u>DSD recommends that should a lease be granted the following outcome be a requirement of Schedule 6 of the lease:</u> The Tenement Holder must demonstrate that post-mine completion, the risks to the health and safety of the public so far as it may be affected by mining operations are as low as reasonably practicable. <u>DSD recommends that should a lease be granted the following be a requirement of Schedule 6 of the lease:</u> The Tenement Holder is required to address the following matters for the purpose of Regulation 65(2)(c) in relation to the public safety outcomes: • Quality control arrangements for all stages of construction and operation of the IWL including supervision by appropriately qualified and experienced persons, documented procedures, quality control testing and record keeping. **Iron Road Proposed Measurement Criteria** *Ecosystem Function Analysis (EFA) at representative sites on rehabilitated areas demonstrates that rehabilitation will achieve sustainability thresholds.* *Landform modelling based on established IWL material parameters and geometry confirm alignment with outcomes from conceptual modelling.* **DSD Assessment of Draft Measurement Criteria** EFA would measure gully erosion, but does not comprehensively measure surface water erosion across the entire IWL which is the source of impact in this outcome. EFA relies on utilising metric sites to indicate how the rehabilitated site is performing relative to the metric site. Further quantitative measurement of erosion should be considered. The use of modelling is supported, however, validation of erosion modelling can also be used.

Impact Event ID	DSD assessment of the impact event, source/pathway/receptor, strategies, proposed outcome and draft criteria
	An independent audit of the final IWL that demonstrates that it has been rehabilitated, constructed and is performing (over a period of time post closure) to achieve the mine completion outcome is also an appropriate criteria. DSD considers that there are methodologies that are appropriate to demonstrate achievement of the outcome. Should a lease be granted, the measurement criteria would be finalised in the PEPR submission. (5) DSD recommends amendment to the proposed draft criteria to ensure an appropriate measurement to demonstrate achievement of the proposed outcome. **Iron Road Proposed Leading Indicator Criteria** *None Proposed* **DSD Assessment of Leading Indicator Criteria** An annual audit of the QA/QC data for the construction of the IWL could be considered for leading indicator criteria. (6) Should a lease be granted, the requirement for a leading indicator criteria would be finalised in the PEPR.
IM_07_15	**Iron Road Impact Event** *Unauthorised access to IWL results in injury to member of public (post-mine completion)* **DSD Assessment of Source, Pathway, Receptor** (1) DSD confirms that the Source(s), pathway(s) and receptor(s) would exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required. **Iron Road Proposed Outcome** *Post mine completion, risks to the safety of the public from loss of stability in the IWL are as low as reasonably practicable.* **DSD Assessment of Outcome, Strategies and Uncertainty** For post-mine completion, the closure design for the IWL p.7-6 of the MP states "the design parameters of the IWL will ensure it is geotechnically stable and safe". The MP (p.3-46 and Figure 3-20) states the final IWL would have outer slope angles ranging from 9 to 18 degrees. The benches are not designed to have large falls, hence the risk to public safety from slips, trips and falls is mitigated. The design of the final IWL is a key control strategy to ensure the protection of the public post-mine completion, hence a second schedule lease condition is recommended to ensure this design would be independently peer reviewed for the PEPR (should a lease be granted). "Validation of construction of IWL to design (QA/QC)" is also a key control strategy proposed by Iron Road and DSD recommends that this be included in the sixth schedule of the lease. (2) The outcome appropriately states the level of impact subsequent to controls. The outcome statement requires minor amendment. (3) The outcome is assessed to be achievable given the proposed controls and identified assumptions and uncertainty.

Impact Event ID	DSD assessment of the impact event, source/pathway/receptor, strategies, proposed outcome and draft criteria
	DSD Recommended Regulatory Response – Outcome and Strategies (4) DSD recommends that should a lease be granted the following be a condition of Schedule 2 of the lease: In accordance with section 70B(2)(d) of the Act it is a condition of the grant of the Mining Tenement that a proposed PEPR submitted in accordance with Part 10A of the Act must include reports from suitably qualified independent experts on the following matters: The effectiveness of the proposed strategies in the proposed PEPR achieving the environmental outcomes identified in the proposed PEPR, including but not limited to reports from: • an independent geotechnical engineering expert (i.e. for IWL and mine waste design and construction methodology) • an independent mine waste cover system expert (i.e. for IWL and mine waste cover systems design) • an independent geomorphology expert (i.e. for landform design, soil and erosion management) • an independent hydrology expert (i.e. for surface water management). DSD recommends that should a lease be granted the following outcome be a requirement of Schedule 6 of the lease: The Tenement Holder must demonstrate that post-mine completion, the risks to the health and safety of the public so far as it may be affected by mining operations are as low as reasonably practicable. DSD recommends that should a lease be granted the following be a requirement of Schedule 6 of the lease: The Tenement Holder is required to address the following matters for the purpose of Regulation 65(2)(c) in relation to the public safety outcomes: • Quality control arrangements for all stages of construction and operation of the IWL including supervision by appropriately qualified and experienced persons, documented procedures, quality control testing and record keeping. **Iron Road Proposed Measurement Criteria** *EFA at representative sites on rehabilitated areas demonstrates that rehabilitation will achieve sustainability thresholds.* *Landform modelling based on established IWL material parameters and geometry confirm alignment with outcomes from conceptual modelling.* **DSD Assessment of Draft Measurement Criteria** EFA would not directly measure physical stability of the IWL which is the source of impact in this outcome. EFA relies on utilising "metric" sites to indicate how the rehabilitated site is performing relative to the metric site. The use of modelling is supported, however, validation of the model should also be considered. An independent audit of the final IWL that demonstrates that it has been rehabilitated, constructed and is performing (over a period of time post closure) to achieve the mine completion outcome is also an appropriate criteria. DSD considers that there are methodologies that are appropriate to demonstrate achievement of the outcome. Should a lease be granted, the measurement criteria would be finalised in the PEPR submission.

Impact Event ID	DSD assessment of the impact event, source/pathway/receptor, strategies, proposed outcome and draft criteria
	(5) DSD recommends amendment to the proposed draft criteria to ensure an appropriate measurement to demonstrate achievement of the proposed outcome. **Iron Road Proposed Leading Indicator Criteria** *None proposed* **DSD Assessment of Leading Indicator Criteria** An annual audit of the QA/QC data for the construction of the IWL could be considered for leading indicator criteria. (6) Should a lease be granted, the leading indicator criteria would be finalised in the PEPR.
PIM_07_22	**Iron Road Impact Event** *Member of the public is injured by fly rock or air blast from blasting (construction & operation)* **DSD Assessment of Source, Pathway, Receptor** The MP (p. 7-5) includes a description of the potential impact from fly rock on members of the public. The receptor for this impact event is 'local residents'. At the time of DSD's assessment of the mining application, the land access and land use for all areas within the proposed ML had not been finalised. Iron Road proposes to maximise the land available within the proposed ML for agricultural use (see Land use impact event PIM_21_01). Given that there is the potential for multiple land use within the Lease, there is uncertainty in relation to how close human receptors would be in relation to the open pit. Hence, for this impact event, DSD has considered there is the potential for receptors to exist within the lease boundary and therefore an outcome is required. There is no impact event that considers impacts from blasting on aircraft. The MP (p. 21-13) states that "the use of aircraft for agricultural purposes has not been observed within the local study area". Regional airports are located on the Eyre Peninsula, including at Wudinna. There is uncertainty in regards to the potential use of aircraft in proximity to the open pit, and hence, it is assessed that an outcome is required for this impact event. (1) Iron Road assessed that there was no linkage between the source, pathway and receptor and hence no outcome was proposed. DSD assesses that the Source, Pathway and Receptor would exist. DSD assesses that the consequence of the potential impact is greater than trivial and hence, an outcome is required. **Iron Road Proposed Outcome** *None proposed* **DSD Assessment of Outcome, Strategies and Uncertainty** As no outcome was proposed, no specific control strategies were set out for flyrock. The MP (p. 7-5) includes a description of the potential impact from fly rock on members of the public. The MP (p. 17-6) does set out control and management strategies for airblast and vibration of which the following are applicable to flyrock and/or airblast: - Blasting procedures would be developed and implemented in accordance with AS2187.2-2006

Impact Event ID	DSD assessment of the impact event, source/pathway/receptor, strategies, proposed outcome and draft criteria
	A sixth schedule lease requirement is recommended in relation to development of strategies to ensure achievement of the blasting outcome in relation to flyrock (see the regulatory response below). For a complete assessment of impacts as a result of blasting, also refer to the Airblast and Vibration section for an assessment of impacts to the public from Airblast and Vibration (see PIM_17_01 and 17_04). (2) A public safety outcome (see regulatory response) is required in relation to potential impacts from flyrock and airblast. (3) The outcome proposed by DSD (see regulatory response) is assessed to be achievable given that there are industry and Australian standards for the management of blasting and flyrock. **DSD Recommended Regulatory Response – Outcome and Strategies** (4) DSD recommends that should a lease be granted the following outcome be a requirement of Schedule 6 of the lease: The Tenement Holder must during construction and operation, ensure that there are no adverse impacts to: • public safety, • human comfort, • third party property (including stock), • adjacent land use, • aircraft; or • other receptors, from airblast, flyrock and vibration caused by blasting. DSD recommends that should a lease be granted the following be a requirement of Schedule 6 of the lease: The Tenement Holder is required to address the following matters for the purposes of Regulation 65(2)(c) in relation to the blasting outcome; • Notify property owners or residents adjacent to and within the Land, subject to their consent, of all blasts no less than forty eight hours in advance of those blasts; • Develop strategies for the management of impacts from blasting, including the determination and requirement of blast exclusion zones, in accordance with relevant standards including the Australian Standard AS 2187.2; • Develop strategies for establishing and implementing a blast exclusion zone between any third party property or land use, and the designated blast area, for all blasting events during mining operations; • If required, develop strategies to ensure that a blast exclusion zone is maintained between the public and the designated blast area, for all blasting events during mining operations.

Impact Event ID	DSD assessment of the impact event, source/pathway/receptor, strategies, proposed outcome and draft criteria
	• Develop a blasting protocol and blasting schedule in consultation with owners and residents of land within and adjacent the Land to reflect the needs of the adjacent land use practices. Note: Should a lease be granted, the recommended regulatory response above should be included under the 'blasting' sub heading in the lease document (rather than the 'public safety' sub heading). **Iron Road Proposed Measurement Criteria** *None proposed* **DSD Assessment of Draft Measurement Criteria** (5) DSD considers that there are methodologies that are appropriate to demonstrate achievement of the outcome. Should a lease be granted, the measurement criteria would be finalised in the PEPR submission. DSD recommends that should a lease be granted the following criteria be a requirement of Schedule 6 of the lease: The Tenement Holder is required to address the following matters for the purposes of Regulation 65(2)(d) in relation to the blasting outcome; • All blasts must be monitored and measured for vibration and airblast overpressure; • Blasting criteria is set in accordance with the Australian Standard AS 2187.2; • Measurements taken to demonstrate achievement of the blasting outcome must be taken in accordance with Australian Standard AS2187.2. Note: Should a lease be granted, the recommended regulatory response above should be included under the 'blasting' sub heading in the lease document (rather than the 'public safety' sub heading). **Iron Road Proposed Leading Indicator Criteria** *None proposed.* **DSD Assessment of Leading Indicator Criteria** (6) Should a lease be granted, the requirement for a leading indicator criteria would be finalised in the PEPR.

8.1.4 *Summary of the recommended regulatory response*

DSD has assessed that all potential impacts associated with public safety during construction, operations and post-mine completion have been identified through this assessment and appropriate outcomes have been recommended for all potential impact events where the pre-control strategy consequence is greater than trivial. DSD has considered each of these outcomes and determined that they set an appropriate level of impact for sensitive receptors (including the public) and the receiving environment during construction, operation and post-mine completion. DSD considers that these outcomes would be achievable following the successful implementation of control strategies and that suitable methods are available for measuring the achievement of these outcomes.

8.2 Traffic

8.2.1 *Description of environment*

The Eyre Peninsula's road system is a mix of sealed highways, unsealed secondary roads and sealed roads around towns. There is a limited rail network servicing grain transport for shipping from Port Lincoln to the south. Iron Road intends to construct and operate a rail link from the mine to Cape Hardy for the transport of ore. Impacts associated with this element of the project will be addressed by the EIS.

The Eyre Peninsula is serviced by four main highways:

- Lincoln Highway (east coast N/S)
- Tod Highway (central N/S)
- Birdseye Highway (lower central E/W)
- Eyre Highway (northern E/W).

The Tod Highway passes through Warramboo, to the west of the proposed ML. The Eyre Highway passes approximately 5 km north of the proposed ML. Iron Road anticipate that mine traffic will use all the major highways.

The local road network mainly consists of unsealed roads maintained by Wudinna DC. Dolphin, Kimba, Lock and Murphy roads cross the proposed mining tenement and will be closed by the mine should it proceed. Schulze Road, Nantuma Road and Mays Road run along the northern, southern and western boundaries of the proposed ML. See Figure 8.1 showing the local road network surrounding the proposed mine.

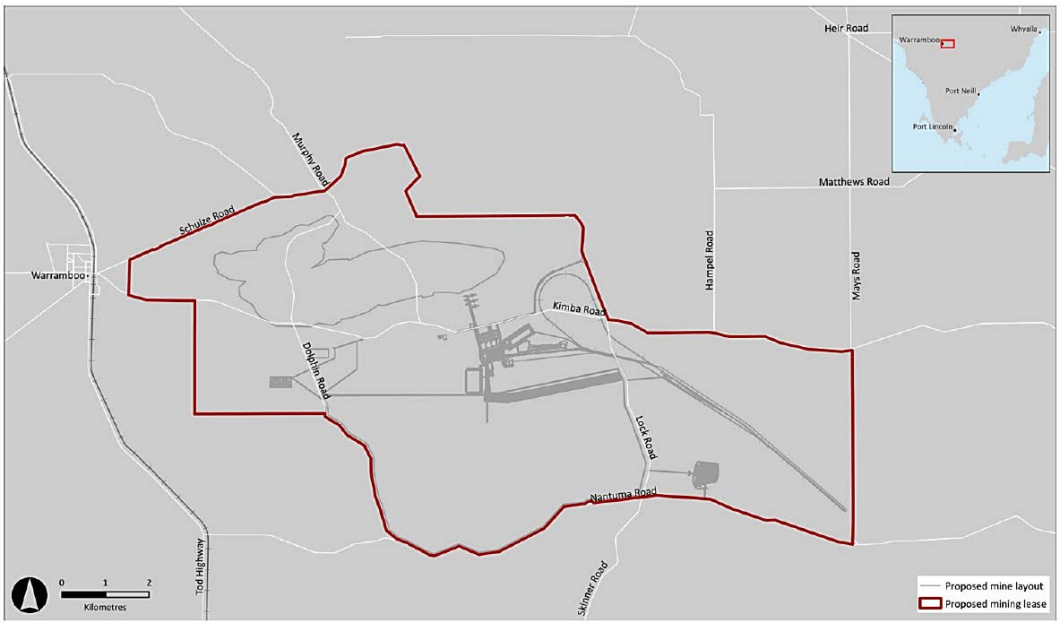

Figure 8.1 – Local road network surrounding proposed mine

Local roads and highways provide access for local traffic throughout the year with peaks in usage during certain periods, such as sowing or harvesting. School busses bring students in from throughout the district to schools in Wudinna, with bus routes changing as needs require.

DSD considers that the description of the existing environment in the Proposal is a suitable characterisation of the receiving environment that may be affected by mining operations.

8.2.2 *Views of affected parties*

The primary issues raised during the statutory public consultation are summarised below in Table 8.2 and are cross-referenced with the relevant Iron Road impact events. The cross referencing of the views of affected parties to Impact Event IDs enables a link between an issue raised and DSD's recommended regulatory response determined subsequently in this section. The Public Submission ID in the table below relates to the unique public submission number and the name of the submitter. If the submitter has requested privacy, then 'name and address withheld' is indicated in the table.

Table 8.2 – Impact events relating to issues raised during the statutory public consultation

Public submission ID	Issues raised	Where addressed – impact event ID
023 - Name and address withheld	Impact to designated road train routes (grain movement) School bus run – extended travel times	IM 8_03 IM 8_10
024 - O'Brien	Machinery transport across mine site – loss of local roads (Murphy, Lock, Dolphin)	IM 8_03
025 - O'Brien	Extended travel times due to close of roads at mine site. Additional transport cost of grain due to loss of direct roads. Machinery movement from north to south – additional cost at harvest and seeding. School bus run – additional travel time due to loss of connecting roads through mine site.	IM 8_03 IM 8_10 Refer to Iron Road's Response Document Submission 25, issue 3.
028 - Name and address withheld	School busses – interaction with rail	IM 8_10
055 - Wudinna District Council	Road maintenance and improvement in response to changed use patterns due to mine	IM 8_01 IM 8_02
071 - Name and address withheld	School bus routes – additional travel time to drop off children due to changes in road network	IM 8_10
082 - Fechner	Impacts to structural integrity of local highway, between Warramboo and Wudinna.	IM 8_01 IM 8_02
096 - SIMGI	Traffic delays due to module transport Road pavement condition and wear Increased school bus travel times Additional travel time for all road users	IM 8_01 IM 8_02 IM 8_03 IM 8_05 IM 8_10
102 - TBRARA	Economic cost of road closures due to additional travel time – haulage cost Road maintenance due to change in usage Noting many local roads were not constructed to carry loads contemplated by the Proposal	IM 8_01 IM 8_02 IM 8_03 IM 8_05

8.2.3 *Impact event assessment*

Section 8.0 of this report provides a description of DSD's process for assessing potential impact events. Appendix 3 of this report contains DSD's complete assessment of Iron Road's potential impact events, technical justifications and recommended regulatory responses. The following two tables in this section are based on DSD's complete assessment provided in Appendix 3.

Table 8.2.1 contains a summary of DSD's recommended regulatory responses for impact events that have been assessed by DSD to require: (1) environmental outcome(s) only (i.e. no other lease conditions/requirements), or (2) no environmental outcome.

Table 8.2.2 contains DSD's detailed assessment for impact events where DSD's recommended regulatory response includes the requirement for a combination of outcomes, strategies, criteria or conditions.

Table 8.2.1 – Summary of impact events where DSD recommends (1) outcome(s) only, or (2) no outcome(s) (see Appendix 3 for DSD's complete assessment)

Impact Event ID	Iron Road impact event description	DSD recommends that should a lease be granted the following outcomes be a requirement of Schedule 6 of the lease
IM 8_06 IM 8_07	*Transport of mine modules results in safety risks for road users in the region (Construction)* *Mine site traffic increases road safety risk for local residents and other road users.(Construction and operation)*	The Tenement Holder must during construction and operation, ensure that there are no traffic accidents involving the public and mine related traffic that could have been reasonably prevented by the Tenement Holder.
IM_8_05 IM 8_08, IM 8_09 IM_8_10	*Impacts on existing Level of Service on roads and intersections as a result of increased road traffic from mine construction and operation*	The Tenement Holder must during construction, operation and post-mine completion ensure travel delays to the public as a result of the transport of mining modules, mine related traffic, road closures and road realignments are as low as reasonably practicable.

Table 8.2.2 – Assessment of impact events where DSD recommends a combination of outcomes, strategy, criteria or conditions (see Appendix 3 for DSD's complete assessment)

Impact Event ID	DSD assessment of the impact event, source/pathway/receptor, strategies, proposed outcome and draft criteria
IM_8_01 IM_8_02	**Iron Road Impact Event** *Deterioration of roads and Increased road maintenance requirements as a result of mine site traffic during construction* *Deterioration of roads and Increased road maintenance requirements as a result of mine traffic during operations* **DSD Assessment of Source, Pathway, Receptor** (1) DSD confirms that the Source(s), pathway(s) and receptor(s) would exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required. **Iron Road Proposed Outcome** *No unauthorised damage to public infrastructure (e.g. pavement damage) as a result of mining operations* **DSD Assessment of Outcome, Strategies and Uncertainty** For construction and operation, the control strategies to prevent unauthorised damage to public infrastructure (including pavement) are provided on p. 8-17 of the MP and DSD has assessed them to be appropriate. 'Monitoring of pavement condition' is also proposed in this table and is supported. (2) The outcome appropriately states the level of impact subsequent to controls. The outcome statement requires minor amendment. (3) The outcome is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. **DSD Recommended Regulatory Response – Outcome and Strategies** (4) DSD recommends that should a lease be granted the following outcome be a requirement of Schedule 6 of the lease: The Tenement Holder must during construction and operation, ensure no unauthorised damage to public or private property and infrastructure, including road pavements, as a result of traffic movements from mining operations. **IRD Proposed Measurement Criteria** *Evidence that agreements are in place with DPTI and/or Council requirements regarding pavement or other infrastructure damage.* **DSD Assessment of Draft Measurement Criteria** The MP (p. 8-17) includes details of the content of a pavement monitoring, management and rehabilitation procedure. 'Monitoring of pavement condition' is also proposed in this table and is supported. Measurement criteria could be developed based on the auditing of the performance of this procedure (and linked to the monitoring of pavement condition) to demonstrate that no unauthorised damage had occurred during the audit period. DSD considers that there are methodologies that are appropriate to demonstrate achievement of the outcome. Should a lease be granted, the measurement criteria would be finalised in the PEPR submission. (5) DSD considers the proposed draft measurement criteria requires amendment to demonstrate achievement of the proposed outcome. **Iron Road proposed Leading Indicator Criteria** *None Proposed*

Impact Event ID	DSD assessment of the impact event, source/pathway/receptor, strategies, proposed outcome and draft criteria
	DSD Assessment of Leading Indicator Criteria (6) Should a lease be granted, the requirement for a leading indicator criteria would be finalised in the PEPR.
IM_8_03	**Iron Road Impact Event** *Road closures at mine site result in increased travel times for local community (Construction, operation and post-mine completion).* **DSD Assessment of Source, Pathway, Receptor** The mine phase of 'post-mine completion' must be included in this impact event. Potential impacts 'post-mine completion' must be considered as strategies to mitigate impacts during construction and operation may be different to the strategies post-mine completion. This is the case if travel times are managed by allowing access to the mine site during operations which may change post-mine completion (1) DSD confirms that the Source(s), pathway(s) and receptor(s) would exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required. **Iron Road proposed Outcome** *Travel delays to the public as a result of road closures and realignments are as low as reasonably practicable* **DSD Assessment of Outcome, Strategies and Uncertainty** For construction and operation, the control strategies to mitigate travel delays are provided on p. 8-17 of the MP and DSD has assessed them to be appropriate. The Response Document (Attachment B, p. 24) states, "Third party land users may be escorted across the ML if there is a clear need and this has been agreed in principle with an adjacent landowner. Any access to land by third parties will only be allowed following induction training and in accordance with agreed requirements." The proposed strategy to allow access to the mine site in order to reduce travel times for impacted land owners will be effective in mitigating impacts. DSD recommends a schedule 2 lease condition that requires a Communications Protocol which includes land access protocols to address the above strategy. Refer to the Assessment report for the full wording of this lease condition. (2) The outcome appropriately states the level of impact subsequent to controls. The outcome statement requires minor amendment. (3) The outcome is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. **DSD Recommended Regulatory Response – Outcome and Strategies** <u>(4) DSD recommends that should a lease be granted the following be a condition of Schedule 2 of the lease:</u> A Communications Protocol to be developed between the Tenement Holder and owners of land adjacent to and on the Land that includes access protocols. Refer to the Assessment Report for the full wording of this lease condition. <u>DSD recommends that should a lease be granted the following outcome be a requirement of Schedule 6 of the lease:</u> The Tenement Holder must during construction, operation and post-mine completion ensure travel delays to the public as a result of the transport of mining modules, mine related traffic, road closures and road realignments are as low as reasonably practicable. **Iron Road Proposed Measurement Criteria** *Review undertaken in consultation with Wudinna Council confirms all road closures are necessary for mine safety and security and that all agreed upgrades of existing roads have been completed in the required timeframe*

Impact Event ID	DSD assessment of the impact event, source/pathway/receptor, strategies, proposed outcome and draft criteria
	DSD Assessment of Draft Measurement Criteria The proposed measurement criteria relies on Wudinna Council for demonstration of achievement which is not appropriate. The key strategies for mitigating increased travel time relate to communications with stakeholders and allowing access to the mine site. Measurement criteria could be developed based on the auditing of the processes and procedures for mitigating increased travel time to demonstrate achievement of the outcome. DSD considers that there are methodologies that are appropriate to demonstrate achievement of the outcome. Should a lease be granted, the measurement criteria would be finalised in the PEPR submission. (5) DSD considers the proposed draft measurement criteria to be an inappropriate measurement to demonstrate achievement of the proposed outcome. **Iron Road proposed Leading Indicator Criteria** *None proposed* **DSD Assessment of Leading Indicator Criteria** (6) Should a lease be granted, the requirement for a leading indicator criteria would be finalised in the PEPR.
IM_8_04	**Iron Road Impact Event** *Dragout from mine traffic results in a safety hazard for local traffic* **DSD Assessment of Source, Pathway, Receptor** (1) DSD confirms that the Source(s), pathway(s) and receptor(s) would exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required. **Iron Road proposed Outcome** *No significant public amenity impacts off the ML caused by, noise, dust and/or dragout associated with mine related traffic.* **DSD Assessment of Outcome, Strategies and Uncertainty** Dragout can be effectively monitored and managed to mitigate public safety impacts to other road users. (2) The outcome does not appropriately state the level of impact subsequent to controls. The outcome statement requires amendment to reflect that the receptor is public safety (not public amenity). (3) The outcome is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. **DSD Recommended Regulatory Response – Outcome and Strategies** (4) DSD recommends that should a lease be granted the following outcome be a requirement of Schedule 6 of the lease: The Tenement Holder must during construction and operation, ensure that no public impacts off the Land are caused by noise, dust and/or dragout associated with mine related traffic. **Iron Road Proposed Measurement Criteria** *Weekly inspection of entry/exit points demonstrates no build-up of dragout material is occurring.* Compliance with dust and noise criteria as set out for relevant outcome

Impact Event ID	DSD assessment of the impact event, source/pathway/receptor, strategies, proposed outcome and draft criteria
	DSD Assessment of Draft Measurement Criteria Amendments to the criteria are required to ensure that it meets the requirements of Regulation 65(2)(d) and includes all of the required elements of criteria. For example, dragout could be measured and recorded using photo points which are compared to specific control or baseline data. Should a lease be granted, the measurement criteria would be finalised in the PEPR. (5) DSD considers the proposed draft measurement criteria to be an appropriate measurement to demonstrate achievement of the proposed outcome. **Iron Road proposed Leading Indicator Criteria** *None proposed* **DSD Assessment of Leading Indicator Criteria** (6) Should a lease be granted, the requirement for a leading indicator criteria would be finalised in the PEPR.
DSD identified impact event	**Impact Event** *Potential for injury or death to a member of the public from a road and rail interaction at or near the proposed mine lease boundary.* **DSD Assessment of Source, Pathway, Receptor** DSD raised this potential impact event during the response document process. See Iron Road's response document (Appendix B, Issue 29, p. 24) for further details. The Proposal (P. 8-34) states "the risk of catastrophic consequences are present at railway and road crossings and along roads across Australia and the risk assessment of a vehicle accident applied here is not sensitive to the additional traffic generated by the project (ie: the same risk rating would still apply to public safety if the project did not occur)." The CEIP is proposing a new railway and hence it is assumed that new potential impact events are being created as a result of this proposed development. Figure 8-10 indicates proposed Rail level crossings on the south east corner of the proposed lease boundary and approximately 2km from the south east corner of the proposed lease boundary. Iron Road's Impact/Risk Assessment Register (the Proposal Appendix C) does not include potential impact events that involve a train interaction with the public either on the proposed lease or adjacent to the proposed the lease. DSD confirms that the Source, Pathway and Receptor would exist. DSD assesses that the consequence of the potential impact is greater than trivial, and hence, an outcome is required. **DSD Recommended Regulatory response – outcome** <u>DSD recommends that should a lease be granted the following outcome be a requirement of Schedule 6 of the lease:</u> The Tenement Holder must during construction and operation, ensure that there are no traffic accidents involving the public and mine related traffic that could have been reasonably prevented by the Tenement Holder. In the above outcome, DSD defines the term 'mine related traffic' to include both automobiles and trains related to the mine.

8.2.4 *Summary of the recommended regulatory response*

DSD has assessed that all potential impacts associated with Traffic during construction, operations and post-mine completion have been identified through this assessment and appropriate outcomes have been recommended for all potential impact events where the pre-control strategy consequence is greater than trivial. DSD has considered each of these outcomes and determined that they set an appropriate level of impact for sensitive receptors and the receiving environment during construction, operation and post-mine completion. DSD considers that these outcomes would be achievable following the successful implementation of control strategies and that suitable methods are available for measuring achievement of these outcomes.

8.3 Aboriginal heritage

8.3.1 *Description of environment*

The proposed ML lies within an area traditionally utilised by the Barngarla and Nauo-Barngarla people.

The Barngarla people hold native title over the land and waters covering the eastern half of the Eyre Peninsula and extending in a broad finger northwest of Kyancutta. Iron Road worked with the Barngarla to develop an Indigenous Land Use Agreement (ILUA) for the CEIP. At the time of submission of the Proposal, the ILUA was in the process of being executed by all parties (Iron Road, Barngarla, Attorney-General of South Australia and South Australian Native Title Services Limited (SANTS)) and then was being submitted to the Native Title Tribunal for registration under the *Native Title (South Australia) Act 1994*. In Iron Road's 30 June 2016 ASX quarterly activities report the following is stated:

> "The Indigenous Land Use Agreement (ILUA) between Iron Road, the Barngarla Aboriginal Corporation, SA Native Title Services and the Attorney General was submitted to the National Native Title Tribunal for assessment during the Quarter. Registration of the ILUA is expected during Q4 this year." At the time of writing this assessment report, there has been no further public update in regards to the progress of the ILUA.

All land within the proposed ML is either held under freehold tenure or public road reserve. As such native title rights and interests have been extinguished over this land.

Heritage surveys undertaken have not identified any sites, objects or remains of significance within or nearby to the proposed mine area. The nearest registered site is approximately 10 km north from the proposed mine area. Several areas were identified as habitable and the area has been occupied by Aboriginal people in the past. A natural scattering of ochre was identified during the survey. Although not determined to be protected under the *Aboriginal Heritage Act 1988*, Iron Road has committed to removing it prior to mining. It is possible that sites, objects or remains of significance are present in the proposed ML area that were not identified via desktop analysis or previous heritage surveys.

Iron Road has identified the following as environmental values that may be impacted due to the potential impacts from mining operations on Aboriginal heritage:

- Aboriginal sites, objects or remains

DSD considers that the description of the existing environment in the Proposal is a suitable characterisation of the receiving environment that may be affected by mining operations.

8.3.2 *Views of affected parties*

No specific issues relating to Aboriginal heritage or native title were raised during statutory public consultation.

8.3.3 *Impact event assessment*

Section 8.0 of this report provides a description of DSD's process for assessing potential impact events. Appendix 3 of this report contains DSD's complete assessment of Iron Road's potential impact events, technical justifications and recommended regulatory responses. The following two tables in this section are based on DSD's complete assessment provided in Appendix 3.

Table 8.3.1 contains a summary of DSD's recommended regulatory responses for impact events that have been assessed by DSD to require: (1) environmental outcome(s) only (i.e. no other lease conditions/requirements), or (2) no environmental outcome.

Table 8.3.1 – Summary of impact events where DSD recommends (1) outcome(s) only, or (2) no outcome(s) (see Appendix 3 for DSD's complete assessment)

Impact Event ID	Iron Road impact event description	DSD recommends that should a lease be granted the following outcome be a requirement of Schedule 6 of the lease
IM_09_01	*Aboriginal site, object or remain is damaged, disturbed or interfered with (Construction and operation)*	The Tenement Holder must during construction and operation, ensure that there is no disturbance to Aboriginal heritage sites, objects or remains unless prior approval under the relevant legislation is obtained.

8.3.4 *Summary of the recommended regulatory response*

DSD has assessed that all potential impacts associated with Aboriginal heritage and native title during construction, operations and post-mine completion have been identified through this assessment. The pre-control strategy consequence of this impact event was assessed as greater than trivial and hence an appropriate outcome has been recommended. DSD has considered the outcome and determined that it sets an appropriate level of impact for Aboriginal heritage and native title during construction, operation and post-mine completion. DSD considers that this outcome would be achievable following the successful implementation of control strategies and that suitable methods are available for measuring the achievement of this outcome.

8.4 Non-Aboriginal heritage

8.4.1 *Description of environment*

European settlement began in the Eyre Peninsula in 1839. Some of the sites established since that time have been determined to have heritage values in addition to areas with significant native vegetation or geological structures.

The following sites were identified as being of non-Aboriginal heritage significance in proximity to the proposed ML:

- Hambidge WPA (3.5 km southeast)
- Waddikee Rocks (15 km north)
- Lutheran and Uniting churches in Wudinna (24 km northwest)
- Uniting, Lutheran and Presbyterian churches at Lock (30 km south)
- Vegetation Heritage Agreement HA869 (within the boundary of the proposed ML)
- Warramboo cemetery (200 m west)

Iron Road has identified the following as environmental values that have the potential to be impacted:

- Hambidge WPA (3.5 km southeast)
- Waddikee Rocks (15 km north)
- Vegetation Heritage Agreement HA869 (within the boundary of the proposed mining lease)
- Warramboo cemetery (200 m west)

DSD considers that the description of the existing environment in the Proposal is a suitable characterisation of the receiving environment which may be affected by mining operations.

8.4.2 *Views of affected parties*

The primary issues raised during the statutory public consultation are summarised below in Table 8.4 and are cross-referenced with the relevant Iron Road impact events. The cross referencing of the views of affected parties to Impact Event ID's enables a link between an issue raised and DSD's recommended regulatory response determined subsequently in this chapter. The Public Submission ID in the table below relates to the unique public submission number and the name of the submitter. If the submitter has requested privacy, then 'name and address withheld' is indicated in the table.

Table 8.4 – Impact events relating to issues raised during the statutory public consultation

Public submission ID	Issues raised	Where addressed – impact event ID
010 – Sampson	"Old stone chimney" built 1920 located Section 4 Hundred of Warramboo (adjacent to Tod Highway) within 4 km of proposed ML boundary. Potential impact on structure from blasting. Impact of blasting on the Warramboo cemetery. Impact of noise from the mine at the Warramboo cemetery whilst services are taking place.	PIM_10_01 PIM_10_02 PIM_10_02 IM_16_01 to IM_16_11
032 – Name and address withheld	Damage to the graves and subsidence at the cemetery due to blasting.	PIM_10_02
067 – Murphy	"Homestead ruin" on Section 26 Hundred Warramboo, 2 km from proposed pit. Several other homesteads of family significance. Potential impacts from blasting.	PIM_10_01 PIM_10_02
102 – TBRARA	Vegetation Heritage Agreement (HA 869) will be partially or fully cleared by mining.	IM_12_01 IM_12_02 Impacts to the Vegetation Heritage Agreement area have been addressed in Section 8.5: Fauna and Section 8.6: Native Vegetation.

8.4.3 *Impact event assessment*

Section 8.0 of this report provides a description of DSD's process for assessing potential impact events. Appendix 3 of this report contains DSD's complete assessment of Iron Road's potential impact events, technical justifications and recommended regulatory responses. The following two tables in this section are based on DSD's complete assessment provided in Appendix 3.

Table 8.4.1 contains a summary of DSD's recommended regulatory responses for impact events that have been assessed by DSD to require: (1) environmental outcome(s) only (i.e. no other lease conditions/requirements), or (2) no environmental outcome.

Table 8.4.1 – Summary of impact events where DSD recommends (1) outcome(s) only, or (2) no outcome(s) (see Appendix 3 for DSD's complete assessment)

Impact Event ID	Iron Road impact event description	DSD recommendation
PIM_10_01 PIM_10_02	*Disturbance to non-identified sites/items of non-Aboriginal heritage significance* *Warramboo cemetery affected by vibration from blasting operations*	DSD assesses that the evidence for the lack of a linkage between the source, pathway and receptor supports the requirement for no outcome. No outcomes are required.

8.4.4 *Summary of the recommended regulatory response*

DSD has assessed that all potential impacts associated with non Aboriginal heritage during construction, operations and post-mine completion have been identified through this assessment and no outcomes are required.

8.5 Native fauna and pest species

8.5.1 *Description of environment*

The proposed ML is located within the Eyre Mallee subregion of the Eyre Yorke Block (EYB) bioregion as described by the Interim Biogeographic Regionalisation for Australia (IBRA) (Thackway and Cresswell 1995). The landscape of the wider EYB bioregion is unique and varied, comprising limestone rolling plains, granite inselbergs, coastal and inland wetlands, salt lakes, ephemeral lakes, stands of mangroves and offshore islands. The EYB bioregion contains the transition from semi-arid to arid ecological communities, where habitat fragmentation and degradation are key threatening processes for native fauna due to clearance of native vegetation for agriculture and grazing.

Feral animals are relatively common (including rabbits, foxes, cats, goats and horses as well as introduced stock) and present substantial threats to native habitat and animal species through grazing, competition and predation. Further threats to habitat values in the bioregion include competition from aggressive exotic weed species (e.g. Bridal Creeper and exotic grasses) (DEH 2002, Brandle 2010).

The Eyre Mallee subregion has the highest biodiversity within the EYB bioregion with 1212 recorded plant species, 177 bird species, 82 reptile species and 23 species of mammals (DEH 2002). Habitat for fauna primarily occurs within small, isolated remnant blocks within farmland, often restricted to dune crests. Pinkawillinie Conservation Park and Hambidge WPA, to the north-east and south-east of the study area respectively, provide key areas of fauna habitat within the subregion, particularly for threatened species.

Approximately 13% of the area proposed for the mine contains remnant native vegetation, which occurs on isolated dune crests, roadsides and around playa lakes. Vegetation Heritage Agreement HA 869 is the largest

contiguous block of remnant vegetation within the proposed ML, conserving 254 ha of remnant native vegetation under the *Native Vegetation Act 1991*.

Five fauna sampling sites within the proposed ML were chosen as being representative of the most intact habitat of the four habitat types found within the proposed ML:

- Red Mallee (*Eucalyptus oleosa*)/Yorrell (*E. gracilis*)/Narrow-leaved Mallee (*E. leptophylla*) low open woodland on calcareous sandy plains and low dune flanks
- Ridge-fruited Mallee (*E. incrassata*)/Beaked Red Mallee (*E. socialis*) / Gilga (*E. brachycalyx*) low open woodland on the deeper sands of dune crests
- Southern Cypress Pine (*Callitris gracilis*) open woodland on sandy calcareous plains
- Boree (*Melaleuca pauperiflora* ssp. *mutica*) low open woodland with Brown-head Samphire (*Tecticornia indica* ssp. *leiostachya*) and Grey Samphire (*T. halocnemoides* ssp. *halocnemoides*) open low shrubland on saline depressions.

The information gathered at the five sampling sites is supported by biological information collated by the Biological Survey of the Eyre Peninsula, South Australia (Brandle 2010) and information contained in the Biological Database of South Australia.

Iron Road states the area within the proposed ML provides low habitat values for native fauna due to fragmentation and degraded nature of remnant vegetation patches. A summary of fauna species by habitat type is as below (Source: the Proposal):

Summary of fauna species by habitat type

Site	Broad habitat type within proposed mine site	Birds[1]	Reptiles	Mammals[1]	Total[1]
1	Mixed Mallee low open woodland with patches of tall open shrubland and low open shrubland	17	4	1	22 (0)
2	Mixed Mallee and Boree (*M. pauperiflora ssp. mutica*) low open woodland with low very open shrubland	22	2	3 (1)	27 (1)
3	Mixed Mallee low open woodland with patches of tall open shrubland and low open shrubland	25	3	2 (1)	30 (1)
4	Mixed Mallee low open woodland with open shrubland and Spinifex hummock grassland	22 (1)	4	3 (2)	29 (3)
5	Boree (*M. pauperiflora*) low open woodland with Samphire low open shrubland	13 (2)	0	(2)	13 (4)

[1] Pest species numbers in brackets

Iron Road's desktop review found a total of 16 fauna species of national or state conservation significance as potentially occurring within the area of proposed ML (including a 5 km buffer). Iron Road's on ground surveys found no fauna species of national or state conservation significance.

Introduced fauna species occurrences (source: the Proposal)

Common Name	Species Name	Occurrence	Justification for Occurrence[1]
Cat	*Felis catus*	Present	PMST - likely to occur, no records within 5 km, regional BDBSA records (2001, 10 km), recorded during field survey.
Common Blackbird	*Turdus merula*	Present	No records within 5 km, recorded during field survey.
Common Starling	*Sturnus vulgaris*	Present	PMST - likely to occur, BDBSA records within 5 km (2001), recorded during field survey.
European Goldfinch	*Carduelis Carduelis*	Likely	PMST - likely to occur, no BDBSA records within region.
European Red Fox	*Vulpes vulpes*	Present	PMST - likely to occur, no records within 5 km, regional BDBSA records (1969, 15km), recorded during field survey and opportunistic sightings in 2011 (infrastructure corridor survey).
Goat	*Capra hircus*	Likely	PMST - likely to occur, no records within 5 km, regional BDBSA records (2003, >32 km).
House Mouse	*Mus musculsu*	Present	PMST - likely to occur, no records within 5 km (2001), recorded during field survey.
House Sparrow	*Passer domesticus*	Present	PMST - likely to occur, records within 5 km (2001), recorded during field survey.
Rabbit	*Oryctolagus cuniculus*	Present	PMST - likely to occur, no records within 5 km, regional BDBSA records (2001, 13 km), recorded during field survey.
Rock Pigeon	*Columbia livia*	Likely	PMST - likely to occur, no BDBSA records within region.

[1]PMST – EPBC Protected Matters Search Tool invasive species likelihood of occurrence recommendation;
BDBSA = Biological Database South Australia.

Iron Road identifies the Common White Snail (*Cernuella virgata*), which has the potential to contaminate crops, as occurring in the region. Other invertebrates likely to occur are honeybees, the Egyptian beetle, European wasp and Plague locusts.
Iron Road identifies habitat quality as the key environmental value associated with fauna.
DSD considers that the description of the existing environment in the Proposal is a suitable characterisation of the receiving environment that may be affected by mining operations.

8.5.2 *Views of affected parties*

The primary issues raised during the statutory public consultation are summarised below in Table 8.5 and are cross-referenced with the relevant Iron Road impact events. The cross referencing of the views of affected parties to Impact Event IDs enables a link between an issue raised and DSD's recommended regulatory response determined subsequently in this section. The Public Submission ID in the table below relates to the unique public submission number and the name of the submitter. If the submitter has requested privacy, then 'name and address withheld' is indicated in the table.

Table 8.5 – Impact events relating to issues raised during the statutory public consultation

Public submission ID	Issues raised	Where addressed – Impact Event ID
010 - Sampson	White snail movement and control	IM_11_07 IM_11_08 IM_11_10
021 - Name and address withheld	Introduction or movement of weeds and snails	IM_11_07 IM_11_08 IM_11_10
022 - name and address withheld	Noting thorny devils are found along the corridor	
025 - O'Brien	Weed management, noting presence of: • Skeleton weed • Caltrop • Onion weed • Horehound at proposed mine site.	IM_11_19
78 - name and address withheld	Loss of habitat for fauna	IM_11_01 IM_11_02
102 - TBRARA	Loss of habitat due to change of groundwater levels and consequent change to Groundwater Dependent Ecosystems.	IM_11_01 IM_11_02

8.5.3 *Impact event assessment*

Section 8.0 of this report provides a description of DSD's process for assessing potential impact events. Appendix 3 of this report contains DSD's complete assessment of Iron Road's potential impact events, technical justifications and recommended regulatory responses. The following two tables in this section are based on DSD's complete assessment provided in Appendix 3.

Table 8.5.1 contains a summary of DSD's recommended regulatory responses for impact events that have been assessed by DSD to require: (1) environmental outcome(s) only (i.e. no other lease conditions/requirements), or (2) no environmental outcome.

Table 8.5.1 – Summary of impact events where DSD recommends (1) outcome(s) only, or (2) no outcome(s) (see Appendix 3 for DSD's complete assessment)

Impact Event ID	Iron Road impact event description	DSD recommends that should a lease be granted the following outcomes be a requirement of Schedule 6 of the lease
IM_11_01 IM_11_02	*Clearance of vegetation results in reduction of habitat for fauna (not conservation significant) (Construction and operation)*	The Tenement Holder must during construction, operation and post-mine completion, ensure no loss of abundance or diversity of native vegetation on or off the Land through; • clearance, • dust/contaminant deposition, • fire, • reduction in water supply

Impact Event ID	Iron Road impact event description	DSD recommends that should a lease be granted the following outcomes be a requirement of Schedule 6 of the lease
		• salinisation, or • other damage, unless a significant environmental benefit has been approved in accordance with the relevant legislation. Note: This outcome will be summarised against the native vegetation section of the ML rather than the fauna and pest species section.
IM_11_04 IM_11_05 IM_11_13 IM_11_17 IM_11_03 IM_11_06 IM_11_09 IM_11_13 IM_11_11 IM_11_12 IM_11_17 IM_11_18	*Direct or indirect mortality of conservation significant fauna during vegetation clearance, vehicle strike or accidental capture. (Construction and operation)* *Direct or indirect mortality of general fauna during vegetation clearance, vehicle strike or accidental capture. (Construction and operation)* *Altered fauna behaviour as a result of light. (Construction and operation)* *Altered fauna behaviour as a result of noise. (Construction and operation)* *Direct mortality of fauna as a result of falling into pit lake. (Post-mine completion)* *Bushfire Impacts to native fauna. (Construction and operation)*	The Tenement Holder must during construction, operation and post-mine completion, ensure that there are no native fauna injuries or deaths due to mining operations that could reasonably have been prevented.
IM_11_07 IM_11_08 IM_11_10 IM_11_19	*Increase in feral animal and pest animal presence. (Construction and operation)* *Weed impacts to fauna habitat. (Construction and operation)*	The Tenement Holder must during construction, operation and post-mine completion, ensure no introduction of new species of weeds, plant pathogens or pests (including feral animals), nor sustained increase in abundance of existing weed or pest species on the Land.

8.5.4 *Summary of the recommended regulatory response*

DSD has assessed that all potential impacts associated with native fauna and pest species during construction, operations and post-mine completion have been identified through this assessment and appropriate outcomes have been recommended for all potential impact events where the pre-control strategy consequence is greater than trivial. DSD has considered each of these outcomes and determined that they set an appropriate level of impact for sensitive receptors and the receiving environment during construction, operation and post-mine completion. DSD considers that these outcomes would be achievable following the successful implementation of control strategies and that suitable methods are available for measuring the achievement of these outcomes.

8.6 Vegetation, weeds and plant pathogens

8.6.1 *Description of environment*

The proposed ML is located within the Eyre Mallee subregion of the Eyre Yorke Block (EYB) bioregion as described by the Interim Biogeographic Regionalisation for Australia (IBRA) (Thackway and Cresswell 1995). The landscape of the wider EYB bioregion is unique and varied, comprising limestone rolling plains, granite inselbergs, coastal and inland wetlands, salt lakes, ephemeral lakes, stands of mangroves and offshore islands. The EYB bioregion contains the transition from semi-arid to arid ecological communities, with at least 25 plant species endemic to the bioregion. Habitat fragmentation and degradation are key threatening processes for native flora due to clearance of native vegetation for agriculture and grazing. Feral animals and introduced stock, present threats to native habitat and flora species through grazing, trampling and weed spread. Competition from exotic weed species such as bridal creeper, wild oats and veldt grass presents a further threat to habitat values in the bioregion (DEH 2002, Brandle 2010).

The Eyre Mallee subregion has the highest biodiversity within the EYB (DEH, 2002). The vegetation of this subregion occurs on undulating calcareous plains which are overlain by quartz sands and widely- spaced low sand dunes. Dominant vegetation formations found in the sub-region include Mallee low woodland and shrubland, tea-tree low woodland and chenopod low shrubland. A large proportion of the remnant native vegetation in the region has been cleared for agriculture and habitat for flora species is now typically found as comparatively small, disjunct remnant blocks within farmland, often restricted to dune crests. Regional exceptions are Pinkawillinie Conservation Park and Hambidge WPA.

Approximately 13% of the area proposed for the mine supports remnant native vegetation, which occurs on isolated dune crests, roadsides and around playa lakes. Vegetation Heritage Agreement HA 869 is the largest contiguous block of remnant vegetation within the proposed ML, conserving 254 ha of remnant native vegetation under the *Native Vegetation Act 1991*.

Iron Road has identified the following as environmental values that have the potential to be impacted due to mining operations:

- regional ecological biodiversity
- regional environmental processes (water flow through the environment, groundwater recharge)
- fauna habitat

DSD considers that the description of the existing environment in the Proposal is a suitable characterisation of the receiving environment that may be affected by mining operations.

8.6.2 *Views of affected parties*

The primary issues raised during statutory public consultation are summarised below in Table 8.6 and are cross-referenced with the relevant

Iron Road impact events. The cross referencing of the views of affected parties to Impact Event ID's enables a link between an issue raised and DSD's recommended regulatory response determined subsequently in this section. The Public Submission ID in the table below relates to the unique public submission number and the name of the submitter. If the submitter has requested privacy, then 'name and address withheld' is indicated in the table.

Table 8.6 – Impact events relating to issues raised during statutory public consultation

Public submission ID	Issues raised	Where addressed – Impact Event ID
017 – name and address withheld	Impact of dust on native vegetation.	IM_12_16
018 – name and address withheld	Clearance of native vegetation along the corridor resulting in erosion of soil.	IM_13_13
021 – name and address withheld	Spread of weeds from rail corridor impacting upon native vegetation. Earthworks/clearance of native vegetation resulting in erosion of sandy soils.	IM_11_19 IM_13_13
022 – name and address withheld	Impact of rail corridor causing fire impacting upon native vegetation. Spread of weeds from rail corridor impacting upon native vegetation.	IM_12_10 IM_11_19
025 - O'Brien	Impact of clearance on regional amount of native vegetation. Clearance of native vegetation increasing dust and rising salinity. Spread of weeds impacting upon native vegetation.	IM_12_02 IM_12_14 & IM_12_16 IM_11_19
028 – name and address withheld	Earthworks/clearance of native vegetation resulting in erosion of sandy soils.	IM_13_13
035 - Veitch	Impact of dust suppression with saline water on nearby native vegetation. Impact of groundwater drawdown on native vegetation. Potential impacts of clearance on unidentified native vegetation of conservation significance.	IM_13_03 PIM_12_13 IM_12_01
074 - Dodd	Establishment of native vegetation along the rail corridor could connect patches of native vegetation is a potential benefit of this project.	Benefit
102 - TBRARA	Concern that any offset provided for clearance of native vegetation will not be provided locally. Impact of using saline water for dust suppression preventing regrowth of native vegetation and offsite salinization of soils (from wind or runoff).	IM_12_18 IM_13_03 PIM_12_13

Public submission ID	Issues raised	Where addressed – Impact Event ID
	Impact of groundwater drawdown following mine closure on surrounding native vegetation including the Hambidge WPA.	IM_12_14
	Impact of groundwater contamination on surrounding native vegetation including the Hambidge WPA.	IM_12_01
	Clearance of protected species that were not identified during the surveys.	IM_12_16
	Impact of dust on native vegetation.	IM_12_17
	Impact of unauthorised clearance of native vegetation.	IM_12_11
	Fire resulting from mining operations impacting upon Hambidge WPA.	

8.6.3 *Impact event assessment*

Section 8.0 of this report provides a description of DSD's process for assessing potential impact events. Appendix 3 of this report contains DSD's complete assessment of Iron Road's potential impact events, technical justifications and recommended regulatory responses. The following two tables in this section are based on DSD's complete assessment provided as Appendix 3.

Table 8.6.1 contains a summary of DSD's recommended regulatory responses for impact events that have been assessed by DSD to require: (1) environmental outcome(s) only (i.e. no other lease conditions/requirements), or (2) no environmental outcome.

Table 8.6.2 contains DSD's detailed assessment for impact events where DSD's recommended regulatory response includes the requirement for a combination of outcomes, strategies, criteria or conditions.

Table 8.6.1 – Summary of impact events where DSD recommends (1) outcome(s) only, or (2) no outcome(s) (see Appendix 3 for DSD's complete assessment)

Impact Event ID	Iron Road impact event description	DSD recommends that should a lease be granted the following outcomes be a requirement of Schedule 6 of the lease
IM_12_01 IM_12_02 IM_12_17	*Clearance of vegetation resulting in loss of indigenous species and communities, including conservation listed species and communities. (Construction and operation).*	The Tenement Holder must during construction, operation and post-mine completion, ensure no loss of abundance or diversity of native vegetation on or off the Land through; • clearance, • dust/contaminant deposition, • fire, • reduction in water supply • salinisation, or • other damage, unless a significant environmental benefit has been approved in accordance with the relevant legislation.
IM_12_10	*Loss of native vegetation within ML and Hambidge as a result of fire from mining activities. (Construction and operation).*	
IM_12_16	*Vegetation stress or mortality due to dust deposition from mining activities (Construction and operation).*	
IM_12_03 IM_12_04	*Weed impacts to vegetation and flora habitat on and off the mine site. (Construction and operation).*	The Tenement Holder must during construction, operation and post-mine completion, ensure no introduction of new species of weeds, plant pathogens or pests (including feral animals), nor sustained increase in abundance of existing weed or pest species in the Land.
IM_12_19	*Increase in feral and pest animal impacts to native vegetation. (Construction and operation).*	
IM_12_05 IM_12_06 IM_12_07 IM_12_11 IM_12_12 IM_12_13 IM_12_15 IM_12_20	*All impacts post mine completion* *Poor revegetation and regeneration as a result of:* • *landform design not providing adequate surface growth medium.* • *wind erosion of surface materials reducing surface growth medium* • *surface water erosion reducing surface growth medium* • *saline material in landform* • *poor species / community selection* • *landform design not providing adequate moisture retention* • *degradation of topsoils and seedbanks during stockpiling* • *unstable soils* • *geotechnical failure of the IWL*	The Tenement Holder must ensure that the Land is progressively and finally rehabilitated to support the future land use. Note: Should a lease be granted, the outcome above should be included under the 'Land Use' sub heading in the lease document (rather than the 'Native Vegetation' sub heading).
IM_12_09	*Poor germination reduces rehabilitation success on IWL due to absence of natural fire regimes (post-mine completion).*	

Table 8.6.2 – Assessment of impact events where DSD recommends a combination of outcomes, strategy, criteria or conditions (see Appendix 3 for DSD's complete assessment)

Impact Event ID	DSD assessment of the impact event, source/pathway/receptor, strategies, proposed outcome and draft criteria
IM_12_14	**Iron Road Impact Event** *Impacts on Hambidge WPA as a result of saline groundwater elevation due to seepage from the landform.* **DSD Assessment of Source, Pathway, Receptor** (1) DSD confirms that the Source(s), pathway(s) and receptor(s) would exist. DSD assesses that the consequence of the potential impact is greater than trivial,and hence, an outcome is required. **Iron Road proposed Outcome** *No loss of abundance or diversity of native vegetation on or off the lease during construction, operation and post-mine completion through;* • *clearance,* • *dust/contaminant deposition,* • *fire,* • *reduction in water supply* • *salinisation, or* • *other damage,* *unless prior approval under the relevant legislation is obtained.* **DSD Assessment of Outcome, Strategies and Uncertainty** The assessment of impacts to native vegetation from groundwater salinity is provided on p. 12-51 of the MP. The Iron Road impact assessment table (MP Appendix C) proposed the following control strategies or mitigation measures, "seepage modelling indicates a low level of seepage which results in a small elevation of local groundwater table (33-50mm per year) for life of mine, following closure groundwater levels quickly revert to previous, groundwater level beneath Hambidge is 15mbgl and it is a significant distance from the ML" and "undertake groundwater monitoring on ML boundary once IWL established to verify seepage rates." It is recommended that groundwater monitoring (as proposed by Iron Road) is included as a requirement of the sixth schedule of the lease. The Iron Road Response Document (Attachment B) Issue #14 also includes a discussion on this impact event. (2) The outcome appropriately states the level of impact subsequent to controls. (3) The outcome is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. **DSD Recommended Regulatory Response – Outcome and Strategies** <u>(4) DSD recommends that should a lease be granted the following outcome be a requirement of Schedule 6 of the lease:</u> The Tenement Holder must during construction, operation and post-mine completion, ensure no loss of abundance or diversity of native vegetation on or off the Land through; • clearance, • dust/contaminant deposition, • fire,

Impact Event ID	DSD assessment of the impact event, source/pathway/receptor, strategies, proposed outcome and draft criteria
	• reduction in water supply • salinisation, or • other damage, unless a significant environmental benefit has been approved in accordance with the relevant legislation. <u>DSD recommends that should a lease be granted the following be a requirement of Schedule 6 of the lease:</u> The Tenement Holder is required to address the following matters for the purposes of Regulation 65(2)(c) in relation to the native vegetation outcome for impacts from groundwater recharge from the IWL; • Undertake groundwater monitoring at appropriate locations once the IWL is established and during operations to validate the groundwater model and IWL seepage rates. **Iron Road Proposed Measurement Criteria** *Groundwater monitoring outside of the proposed ML boundary are in line with model predictions and seasonal variations.* **DSD Assessment of Draft Measurement Criteria** Amendments to the criteria are required to ensure that it meets the requirements of Regulation 65(2)(d) and includes all of the required elements of criteria. Measuring the groundwater level and quality outside of the proposed lease boundary can be used as an appropriate criteria to infer impacts to Hambidge WPA and is supported, however, the appropriate land access arrangements would need to be in place. Monitoring at the lease boundary could be used to infer potential impacts and is supported (it is noted that monitoring at the lease boundary is proposed in this table but is contradicted by the draft criteria which proposes monitoring off the lease). DSD recommends that the location of groundwater monitoring bores and any groundwater level used to demonstrate achievement of the outcome is reviewed against groundwater modelling data to ensure that the locations and level are appropriate. As this impact event relates to unplanned clearance as a result groundwater salinisation at Hambidge WPA, measurement could include monitoring of the impact on the receptor, ie: the vegetation condition at Hambidge WPA. DSD considers that there are methodologies that are appropriate to demonstrate achievement of the outcome. Should a lease be granted, the measurement criteria would be finalised in the PEPR submission. (5) DSD considers the proposed draft measurement criteria requires amendments to ensure demonstration of achievement of the proposed outcome. **Iron Road proposed Leading Indicator Criteria** *Groundwater levels are in line with model expectations (refer to G/W chapter)* **DSD Assessment of Leading Indicator Criteria** Leading indicator criteria is recommended if the measurement criteria chosen monitors the source/pathway (groundwater). In this case, leading indicator criteria can provide a warning that a control strategy is failing or that an outcome may not be achieved in the future. (6) Should a lease be granted leading indicator criteria would be finalised in the PEPR.

8.6.4 *Summary of the recommended regulatory response*

DSD has assessed that all potential impacts associated with native vegetation and weeds during construction, operation and post-mine completion have been identified through this assessment and appropriate outcomes have been recommended for all potential impact events where the pre-control strategy consequence is greater than trivial. DSD has considered each of these outcomes and determined that they set an appropriate level of impact for sensitive receptors and the receiving environment during construction, operation and post-mine completion. DSD considers that these outcomes would be achievable following the successful implementation of control strategies and that suitable methods are available for measuring the achievement of these outcomes.

8.7 Soils and land quality

8.7.1 *Description of environment*

The proposed ML area is centrally located on the Eyre Peninsula, in an undulating landscape of low dunes and ephemeral saline wetlands. The soils of this area support cereal cropping with some grazing and limited remnant native vegetation. The Western Eyre Peninsula Agricultural district produced approximately one-third of South Australia's grain.

Within the proposed ML, soils are comprised of older, eroded and partly consolidated carbonate sands of the Bridgewater Formation in the western half of the project area, with younger overlying quartz sands in the north and east. Iron Road used information available in published soil studies, geotechnical investigations and test pits to demonstrate an understanding of the site's soil characteristics.

Naturally occurring acid sulphate soils (ASS) associated with low-lying areas with groundwater close to the surface can be found within the proposed ML. Iron Road have determined that in these areas, there can be a 30% to 60% potential of encountering ASS. Potentially acid forming (PAF) material may be contained within the ASS. Iron Road state that there is sufficient acid neutralising capacity in available non acid forming (NAF) material to negate the potential for acid formation when all material, including tailings is placed into the IWL.

Iron Road's stated history of land use in the area suggests that the likelihood of pre-existing site contamination is generally low. Previous land use practices may have caused isolated locations of organophosphate/organochlorine pesticides, hydrocarbons, heavy metals and microbiological contamination from septic treatments.

Long-term soil management and agricultural practices in the district have developed productive soils suitable for cropping and grazing.

Iron Road identified that agricultural productivity is the key environmental value that has the potential to be impacted by mine operations.

DSD considers that the description of the existing environment in the Proposal is a suitable characterisation of the receiving environment that may be affected by mining operations.

8.7.2 *Views of affected parties*

The primary issues raised during statutory public consultation are summarised below in Table 8.7 and are cross-referenced with the relevant Iron Road impact events. The cross referencing of the views of affected parties to Impact Event IDs enables a link between an issue raised and DSD's recommended regulatory response determined subsequently in this section. The Public Submission ID in the table below relates to the unique public submission number and the name of the submitter. If the submitter has requested privacy, then 'name and address withheld' is indicated in the table.

Iron Road's stakeholder consultation highlighted long-term sustainable agricultural productivity as a key aspect related to soil and land quality that may be impacted by mine operations. DSD notes that this was reiterated in the statutory public consultation process.

Table 8.7 – Impact events relating to issues raised during statutory public consultation

Public submission ID	Issues raised	Where addressed – Impact Event ID
003 - Wetherby	IWL rehabilitation success – achievability of stated outcomes for re-establishment of soil and natural systems on IWL. Rehabilitation bond	IRD Response Document Submission 3 issue 1. Impact events IM_13_02 IM_13_07 IM_13_08 IM_13_09 IM_13_13
010 - Sampson	Provide confidence that rehabilitation is achievable Timelines for full rehabilitation Boron contamination from overburden Soil stockpile management	IRD response submission 10 issues 4, 22, 36, 37 and 59. Impact events IM_13_02 IM_13_07 IM_13_08 IM_13_09 IM_13_13
027 - Triple B Nominees	Contamination of adjacent farm land by salt from the mine site	IRD response submission 27 issue 2. Impact event IM_13_03
040 - Grain Producers SA	Rehabilitation costs and bond sufficient to cover actual cost of rehabilitation.	IRD Response submission 40 issue 4.
050 - Stringer	Provision for adequate rehabilitation bond should mine cease operating at any stage.	IRD Response submission 50 issue 2.
061 - Hegarty	Release of boron from subsoils IWL failure impacting adjacent land	IM_13_02 IM_13_07 IM_13_08 IM_13_09

Public submission ID	Issues raised	Where addressed – Impact Event ID
		IM_13_13
068 - Murphy	Concerns about long term IWL stability and resistance to erosion	IRD Response submission 68 issue 3. IM_13_02 IM_13_07 IM_13_08 IM_13_09 IM_13_13
096 - SIMGI	Sediment deposition on adjacent land from IWL Long term stability of IWL Salt leaching onto adjacent land	IRD Response submission 96 issues 8 and 22. Impact events IM_13_01 IM_13_02 IM_13_07 IM_13_08 IM_13_09 IM_13_13
102 - TBRARA	Capacity of IWL to contain salts and other potential pollutants. Capacity of IWL surface (cover) to perform to design specification. Copper contamination in the IWL may inhibit plant growth in IWL Salts entrained in the IWL may suppress revegetation on IWL.	IRD Response submission 102 issues 32, 39 and 58. IM_13_01 IM_13_02 IM_13_07 IM_13_08 IM_13_09 IM_13_13

8.7.3 *Impact event assessment*

Section 8.0 of this report provides a description of DSD's process for assessing potential impact events. Appendix 3 of this report contains DSD's complete assessment of Iron Road's potential impact events, technical justifications and recommended regulatory responses. The following two tables in this section are based on DSD's complete assessment provided in Appendix 3.

Table 8.7.1 contains a summary of DSD's recommended regulatory responses for impact events that have been assessed by DSD to require: (1) environmental outcome(s) only (i.e. no other lease conditions/requirements), or (2) no environmental outcome.

Table 8.7.2 contains DSD's detailed assessment for impact events where DSD's recommended regulatory response includes the requirement for a combination of outcomes, strategies, criteria or conditions.

Table 8.7.1 – Summary of impact events where DSD recommends (1) outcome(s) only or (2) no outcome(s) (see Appendix 3 for DSD's complete assessment)

Impact Event ID	Iron Road impact event description	DSD recommends that should a lease be granted the following outcomes be a requirement of Schedule 6 of the lease
IM_13_02 IM_13_12	*Elevated soil salinity on ML due to use of saline water for dust suppression* *Contamination of land from spills, leaks and uncontrolled releases.*	The Tenement Holder must, ensure that: • There is no contamination of land and soils either on or off the Land as a result of mining operations; and • no contamination of land and soils either on or off the Land after mine completion occurs as a result of mining operations. The Tenement Holder must during construction, operation and post-mine completion ensure that the existing (pre-mining) soil quality and quantity is maintained.
IM_13_03	*Elevated soil salinity off ML due to use of saline water for dust suppression*	The Tenement Holder must during construction, operation and post-mine completion, ensure no impacts to agricultural productivity, including but not limited to; • reduction in crop yield; • reduction in grain quality; or • adverse health impacts to livestock; for third party land users on or off the Land as a result of saline water used in mining operations, other than those agreed between the Tenement Holder and the affected user.
IM_13_01 IM_13_11	*Migration of salts into cover profile of IWL leads to deterioration of soil quality (Post-mine completion).* *Compacted soil reducing productivity and / or vegetation growth*	The Tenement Holder must ensure that the Land is progressively and finally rehabilitated to support the future land use. Note: Should a lease be granted, the outcome above should be included under the 'Land Use' sub heading in the lease document (rather than the 'Soils' sub heading).

Table 8.7.2 – Assessment of impact events where DSD recommends a combination of outcomes, strategy, criteria or conditions (see Appendix 3 for DSD's complete assessment)

Impact Event ID	DSD assessment of the impact event, source/pathway/receptor, strategies, proposed outcome and draft criteria
IM_13_04 IM_13_05 IM_13_06	**Iron Road Impact Event** *Deposition of sediments from erosion of slopes of IWL during operations affects productive land on ML (Operation and post-mine completion)* *Deposition of sediments from erosion of slopes of IWL during operations affects productive land off ML (Operation and post-mine completion)* *Deposition of sediments from erosion of slopes of IWL post closure affects productive land (Operation and post-mine completion)* **DSD Assessment of Source, Pathway, Receptor** (1) DSD confirms that the Source(s), pathway(s) and receptor(s) would exist. DSD assesses that the consequence of the potential impact is greater than trivial, and hence, an outcome is required. Note: PIM_21_04 and PIM_21_05 also consider potential impacts from IWL stability on land use. For the purpose of this assessment, lease requirements for the IWL in relation to stability have been consolidated against PIM_13_04 in the Soils Section. **Iron Road proposed Outcome** *No impacts to agricultural productivity for third party land users as a result of mining operations, including:* • *reduction in crop yield;* • *reduction in grain quality; or* • *adverse health impacts to livestock* *other than where agreed between the tenement holder and the affected user.* **DSD Assessment of Outcome, Strategies and Uncertainty** The MP (p. 13-14) states the control and management strategies for soil and land quality and DSD considers that they are appropriate. The following strategies are proposed by Iron Road in their impact assessment table "management and placement of dispersive material, stabilisation of slopes through revegetation and slope design, earthen bund to contain runoff if required, characterisation of dispersive material, monitoring and field trails of rehabilitation". The MP states that "a native topsoil stockpile would be generated during construction to collect, store and protect the valuable native topsoil for progressive use throughout the production phase" (MP p. 3-51). Key strategies to prevent erosion and deposition of sediments are as follows: • Characterisation of all materials to be used within the IWL and the cover system, including dispersive soils. • The design of the IWL outer slopes including slope angle, slope length and slope shape and structure (concave and benching). • The design of the IWL cover system including material selection, waste to soil ratios and profile thickness for topsoil and waste/subsoil. • Progressive rehabilitation of the IWL commencing immediately after completion of the first section of the IWL, including placement of the cover system and revegetation. • QA/QC during the construction of the IWL.

Impact Event ID	DSD assessment of the impact event, source/pathway/receptor, strategies, proposed outcome and draft criteria
	• QA/QC during the placement of the cover system. • Performance monitoring of the cover system. The MP states that "revegetation and rehabilitation trials would commence as soon as the final landform height is reached, to determine the optimal mix of waste rock and soils and progressive rehabilitation would reduce the area of land exposed to surface water and wind erosion" (MP p. 3-52). Field trials are supported, however, the early commencement of field trials would be essential to ensure the results of the trials can be utilised to inform progressive rehabilitation. Additional laboratory scale and pilot testing is also recommended in relation to material characterisation and performance of the IWL materials prior to operations. The MP (Appendix S - Conceptual IWL Design for Rehabilitation and Closure) includes a detailed list of Future Works (Section 5 - p. 70). All items in the Future works list must be completed in a timely manner. It is recommended that strategies in regards to the design, construction and rehabilitation of the IWL, including the cover, are included in the sixth schedule of the lease. The Response Document (Appendix B) Issue 21 provides a discussion in relation to the IWL capacity. The IWL as designed in the MP has a capacity to hold 54% of the total waste/tailings. Extra zone A (an extension of the IWL) and zone B (in pit) have been proposed for extra storage capacity. It is recommended that strategies in regards to the capacity of the IWL, including the cover system, are included in the sixth schedule of the lease. The Response Document (Appendix B) Issue 22 provides a discussion in relation to the combined waste rock and tailing density and the impact of changes to density on IWL capacity. It is recommended that strategies in regards to the combined waste rock and tailings density of the IWL are included in the sixth schedule of the lease. The Response Document (Appendix B) Issue 23 provides a discussion on the importance of (i) particle size distribution and (ii) the mixing ratio of waste rock and filtered tailings on IWL stability. It is recommended that strategies in regard to these matters are included in the sixth schedule of the lease. The Response Document (Appendix B) Issues 25 and 27 provides a discussion on the importance of the tailings moisture content on IWL stability and the site water balance. It is recommended that strategies in regard to this matter are included in the sixth schedule of the lease. The Response Document (Appendix B) Issue 26 provides a discussion on the effectiveness of tailings dewatering equipment (thickeners and filters) to achieve the required tailings moisture content. It is recommended that strategies in regard to this matter are included in the sixth schedule of the lease. (2) The outcome appropriately states the level of impact subsequent to controls. The outcome statement requires amendment to accurately reflect the applicable mine phases. (3) The outcome is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. **DSD Recommended Regulatory Response – Outcome and Strategies** <u>(4) DSD recommends that should a lease be granted the following condition be a requirement of Schedule 2 of the lease:</u> The IWL construction and operation must be audited by a suitably qualified independent expert approved by the Director of Mines (or other authorised officer), against the design and plans that have been adopted for the IWL construction and operation: • for the initial stage of IWL foundation preparation and construction; and • for each subsequent stage of IWL foundation preparation and construction ; and

Impact Event ID	DSD assessment of the impact event, source/pathway/receptor, strategies, proposed outcome and draft criteria
	• on an annual basis for construction and operations (including the construction of the cover system) or at a frequency as the Director of Mines (or other authorised officer) may specify by notice in writing. The expert must prepare reports of the findings of each audit. The initial expert report for IWL foundation preparation and construction audit must be provided to the Director of Mines (or other authorised officer) prior to the initial placement of tailings and waste in the IWL. Subsequent reports must be provided to the Director of Mines (or other authorised officer) within 1 month of completion of the audit and all reports will be made publically available. In accordance with section 70B(2)(d) of the Act it is a condition of the grant of the Mining Tenement that a proposed PEPR submitted in accordance with Part 10A of the Act must include reports from suitably qualified independent experts on the following matters: The effectiveness of the proposed strategies in the proposed PEPR achieving the environmental outcomes identified in the proposed PEPR, including but not limited to reports from: • an independent geotechnical engineering expert (i.e. for IWL and mine waste design and construction methodology) • an independent mine waste cover system expert (i.e. for IWL and mine waste cover systems design) • an independent geomorphology expert (i.e. for landform design, soil and erosion management) • an independent hydrology expert (i.e. for surface water infrastructure design and surface water management) • an independent chemical, process or metallurgical engineering expert (i.e. for tailings dewatering design, waste/tailings mixture ratio and density necessary for geotechnical stability of the IWL and timely construction of the IWL cover system). <u>DSD recommends that should a lease be granted the following outcomes be a requirement of Schedule 6 of the lease:</u> The Tenement Holder must during construction, operation and post-mine completion, ensure no impacts to agricultural productivity, including but not limited to; • reduction in crop yield; • reduction in grain quality; or • adverse health impacts to livestock; for third party land users on or off the Land as a result of contamination and/or sediments from mining operations, other than those agreed between the Tenement Holder and the affected user. <u>DSD recommends that should a lease be granted the following be a requirement of Schedule 6 of the lease:</u> The Tenement Holder is required to address the following matters for the purposes of Regulation 65(2)(c) in relation to the IWL soil and land use outcome: • Complete all future works listed in Section 5 of Appendix S of the Mining Proposal ("Conceptual Integrated Waste Landform Design for Rehabilitation and Closure - October 2015" (MWH)). • Characterisation of all materials to be used within the IWL and the cover system, including dispersive soils.

Impact Event ID	DSD assessment of the impact event, source/pathway/receptor, strategies, proposed outcome and draft criteria
	• A program of testwork to determine the performance and properties (including (but not limited to) density and particle size distribution) of representative samples of the combined crushed waste rock and filtered tailings material (in the appropriate representative mixing ratios) that will be placed in the IWL. The results of the testwork are to inform the design of the IWL. • A program for determining the erodibility of the waste rock/tailings mix to ensure that no erodible waste rock/tailings mix is placed immediately underneath subsoil on external batters. The results of the program are to inform the design of the IWL. • Develop a detailed waste, tailings and soil material balance to ensure the capacity required by the IWL and in-pit dumps are accurately determined and that the amount of soil required for the cover system is accurately determined. • The design for the construction, operation and rehabilitation of in-pit dumps is based on (but not limited to) the technical information required by this lease clause and the design is demonstrated to be effective in achieving all relevant outcomes. • The design for the construction, operation and rehabilitation of the IWL is based on (but not limited to) the technical information required by this lease clause and the design is demonstrated to be effective in achieving all relevant outcomes. • The design, construction and maintenance of mine waste cover systems including, but not limited to, a detailed cover system design, construction methodology, cover system modelling and erosion modelling. • Provision of a program of works for field trials and collection of site specific data to validate/calibrate the model(s). • Field trials for the cover system, rehabilitation and revegetation will commence as soon as practicable after commencement of operations • Quality control arrangements for all stages of construction and operation of the IWL and cover system, including supervision by appropriately qualified and experienced persons, documented procedures, quality control testing and record keeping. • Strategies for achieving and maintaining design tailings discharge densities, moisture content and IWL consolidation rates to ensure geotechnical stability of the IWL and timely construction of the IWL cover system. • Tailings discharge density and moisture content trigger limits and remedial actions to ensure design densities and moisture contents are achieved. The remedial actions must include strategies for managing the site water balance should the design tailings dewatering moisture content not be achieved (i.e.: increased water reporting to the IWL and an increased need for water supply). **Iron Road Proposed Measurement Criteria** *Monthly inspection confirms there is no visible sedimentation from runoff from the IWL outside the designated buffer.* *Should the crop productivity monitoring program (YieldProphetTM) be supported by surrounding landowners, then crop yields as determined by YieldProphet on properties within the proposed ML are comparable with control sites during construction, operation and closure of the mine, measured annually* **DSD Assessment of Draft Measurement Criteria** Amendments to the criteria are required to ensure that it meets the requirements of Regulation 65(2)(d) and includes all of the required elements of criteria. Visible monitoring of sedimentation is not an effective measurement and other techniques should be adopted. Proposed measurement criterion utilises YieldProphet methodology to measure crop performance (yield) against metric sites. This methodology is supported as it measures the impact on the receptor, however, insufficient detail is provided on the YieldProphet methodology. The location of compliance sites and control sites would be critical for this methodology to be effective. The selection of compliance sites within the lease may not be effective in measuring

Impact Event ID	DSD assessment of the impact event, source/pathway/receptor, strategies, proposed outcome and draft criteria
	potential impacts on adjacent land use (refer PIM_13_05 and PIM_13_06 for impact events relating to adjacent land use). Consultation with stakeholders would be essential for this measurement criteria. DSD considers that there are methodologies that are appropriate to demonstrate achievement of the outcomes. Should a lease be granted, the measurement criteria would be finalised in the PEPR submission. (5) DSD considers the proposed draft measurement criteria to be an inappropriate measurement to demonstrate achievement of the proposed outcome. **Iron Road proposed Leading Indicator Criteria** *Mine records demonstrate characterisation and placement on dispersive material is in accordance with IWL design specifications.* **DSD Assessment of Leading Indicator Criteria** (6) Should a lease be granted, the leading criteria would be finalised in the PEPR.
IM_13_07 PIM_13_08	**Iron Road Impact Event** *Soils on site impacted due to contamination within existing materials (including PAF and ASS) (operation and post-mine completion)* *Soils off site impacted due to contamination within materials (including PAF and ASS) (operation and post-mine completion)* **DSD Assessment of Source, Pathway, Receptor** IM_13_07 The source for this impact event is stated as 'contaminants', including PAF and ASS. For this assessment, all potential contaminants are considered. (1) DSD confirms that the Source(s), pathway(s) and receptor(s) would exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required. PIM_13_08 The IWL design is currently at a conceptual level. The current assessment of PAF undertaken by Iron Road (through consultant MWH) contains some assumption and uncertainty (see assessment of PIM_13_04 and PIM_13_07). Given the uncertainty, it is assessed that an outcome is required in relation to potential impacts to offsite land use and soils in relation to contamination (including PAF and ASS). (1) DSD confirms that the Source(s), pathway(s) and receptor(s) would exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required. **Iron Road proposed Outcome** *No adverse impacts on soil quality or quantity within the ML that could compromise the post mining land use* **DSD Assessment of Outcome, Strategies and Uncertainty** The MP (p. 13-14 and 13-15) states the control and management strategies for soil and land quality, in particular for PAF and ASS. The MP Appendix S (Appendix E - Oxide Zone Geochemistry Review and IWL Management - Sept 2015 (MWH)) includes a detailed list of Actions (Section 5 - p. 38). All items in the Action list must be completed. The MWH report also indicates that the majority of PAF material is located in the oxide zones which would be extracted at specific times within the mine plan (see MWH report Plate 3-8).

Impact Event ID	DSD assessment of the impact event, source/pathway/receptor, strategies, proposed outcome and draft criteria
	Key strategies to prevent contamination of soils, particularly from PAF and ASS are as follows: • "Storage of PAF material will not occur in the top 10 m layer of the IWL, to demonstrate that it is well buried in the landform. The IWL will be designed in accordance with the GARD Guide" (MP p. 19-33). • "Separation of PAF material from the outer zones of the IWL and containment in neutralising material (with more detailed measures to be identified in the PEPR and an IWL Plan)" (MP p. 13-15). • An ASS management plan As PAF material would be extracted at different times during the mine plan, the sequencing of PAF material into the IWL would be important to ensure that appropriate and effective encapsulation and/or co-disposal can occur. The method that PAF material would be blended with either NAF waste rock and Tails is also important. It is recommended that strategies in regards to the identification and management of ASS and PAF material are included in the sixth schedule of the lease. (2) The outcome appropriately states the level of impact subsequent to controls. An additional outcome is required to ensure no contamination of land and soils. (3) The outcome is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. **DSD Recommended Regulatory Response – Outcome and Strategies** (4) DSD recommends that should a lease be granted the following conditions be a requirement of Schedule 2 of the lease: The extraction of NAF and PAF from the Land, and placement of NAF and PAF in the IWL must be audited by a suitably qualified independent expert approved by the Director of Mines (or other authorised officer) on a 3 monthly basis, or at a frequency as the Director of Mines (or other authorised officer) may specify by notice in writing. The expert must prepare a report of the findings of the audit and this report must be provided to the Director of Mines (or other authorised officer) within 1 month of completion of the audit. In accordance with S. 70B(2)(d) of the Act it is a condition of the grant of the Mining Tenement that a proposed PEPR submitted in accordance with Part 10A of the Act must include reports from suitably qualified independent experts on the following matters: The effectiveness of the proposed strategies in the proposed PEPR achieving the environmental outcomes identified in the proposed PEPR, including but not limited to reports from: • An Independent Environmental Geochemist Expert (i.e.: for PAF material and acid metalliferous drainage management). DSD recommends that should a lease be granted the following outcomes be a requirement of Schedule 6 of the lease: The Tenement Holder must, ensure that: • There is no contamination of land and soils either on or off the Land as a result of mining operations; and • no contamination of land and soils either on or off the Land post-mine completion occurs as a result of mining operations. The Tenement Holder must during construction, operation and post-mine completion ensure that the existing (pre-mining) soil quality and quantity is maintained. DSD recommends that should a lease be granted the following be a requirement of Schedule 6 of the lease: The Tenement Holder is required to address the following matters for the purposes of Regulation 65(2)(c) in relation to the contamination and soil outcomes:

Impact Event ID	DSD assessment of the impact event, source/pathway/receptor, strategies, proposed outcome and draft criteria
	• Complete all Actions listed in Section 5 of Appendix S of the Mining Proposal ("Appendix E - Oxide Zone Geochemistry Review and IWL Management - Sept 2015" (MWH)). • Determine a sulphur cut-off grade for PAF material through further testing for each waste unit. • Block modelling the sulphur distribution of all waste and ore to be mined for the purpose of determining the distribution and estimating the volume of NAF and PAF using the sulphur cut-off grade. • Integration of the sulphur model with the geological model to provide confidence in the definition of PAF boundaries, potential zones of high neutralising capacity and potential geological controls on mineralisation. • Procedures for regularly updating the models with new geological and sulphur assay data collected in the course of mine production operations. • Procedures for ensuring PAF and NAF boundaries derived from the sulphur cutoff and the sulphur block model are included in open pit mine plans. • Procedures for assaying the sulphur content of drill cuttings or excavated material, produced during the course of blast hole drilling or mining, for verifying PAF and NAF information against mine plans to provide a final check that all PAF and NAF materials have been correctly identified. • Procedures and recording systems for selective mining of the identified PAF and NAF materials and placement in accordance with the IWL design. • IWL designed and constructed for the selective placement of the total volume of PAF material with it effectively co-disposed with NAF and/or encapsulated by NAF. • A program for determining the erodibility of the waste rock/tailings mix to ensure that no erodible waste rock/tailings mix is placed immediately underneath subsoil on external batters. • IWL designed to ensure PAF material is not exposed as a result of potential open pit wall failure post mine completion. • Strategies included in any guidelines provided by the Director of Mines. **Iron Road Proposed Measurement Criteria** *Mine records demonstrate all areas of PAF and ASS encountered are appropriately contaminated/or treated* **DSD Assessment of Draft Measurement Criteria** It is assessed that the word 'contaminated' in the draft criteria is an error and should read 'contained'. Amendments to the criteria are required to ensure that it meets the requirements of Regulation 65(2)(d) and includes all of the required elements of criteria. DSD considers that there are methodologies that are appropriate to demonstrate achievement of the outcome. Should a lease be granted, the measurement criteria would be finalised in the PEPR submission. (5) DSD considers the proposed draft measurement criteria to be an inappropriate measurement to demonstrate achievement of the proposed outcome. **Iron Road proposed Leading Indicator Criteria** *None proposed* **DSD Assessment of Leading Indicator Criteria** (6) Should a lease be granted, the requirement for a leading indicator criteria would be finalised in the PEPR.

Impact Event ID	DSD assessment of the impact event, source/pathway/receptor, strategies, proposed outcome and draft criteria
IM_13_08 IM_13_09	**Iron Road Impact Event** *Reduced soil quality, capacity as a result of material handling (e.g. stockpiling) compromises rehabilitation. (post-mine completion)* **DSD Assessment of Source, Pathway, Receptor** (1) DSD confirms that the Source(s), pathway(s) and receptor(s) would exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required. **Iron Road proposed Outcome** *No adverse impacts on soil quality or quantity within the ML that could compromise the post mining land use.* **DSD Assessment of Outcome, Strategies and Uncertainty** The MP (p. 13-14) states the control and management strategies for soil and land quality. DSD has assessed them to be appropriate. Some key strategies to ensure soil quality are as follows (refer to the full list in the MP): • Development of a soil management program • "Soil stockpiled at a height of no greater than 2 m to minimise compaction" (MP p. 13-14) • "The use of saline water for dust suppression during the stripping of topsoil containing native seedbanks will be avoided where practicable to preserve any native seedbank that may occur" (MP p. 13-14 and p. 3-23) The MP (p. 3-28) states that "agricultural topsoil stockpile will be a maximum height of 10 m" which is inconsistent with the strategies stated on p. 13-14. It is recommended that strategies in regards to maintaining soil quality and quantity are included in the sixth schedule of the lease. (2) The outcome appropriately states the level of impact subsequent to controls. The outcome statement requires minor amendment. (3) The outcome is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. **DSD Recommended Regulatory Response – Outcome and Strategies** <u>(4) DSD recommends that should a lease be granted the following outcome be a requirement of Schedule 6 of the lease:</u> The Tenement Holder must during construction, operation and post-mine completion ensure that the existing (pre-mining) soil quality and quantity is maintained. <u>DSD recommends that should a lease be granted the following be a requirement of Schedule 6 of the lease:</u> The Tenement Holder is required to address the following matters for the purposes of Regulation 65(2)(c) in relation to the soil quality and quantity outcomes: • Strategies to achieve recovery of topsoil and subsoil from areas to be disturbed by mining operations. • Strategies for maintaining the quality and quantity of stockpiled soil/s until such time that it is used for rehabilitation purposes. • Strategies that take into consideration the optimal soil stockpile heights for achieving the soil outcomes. • Strategies for reinstatement of these soils so as to maximise the likelihood of achieving the soil outcomes. • An auditable record of soil movement including recovery, stockpiling and reinstatement.

Impact Event ID	DSD assessment of the impact event, source/pathway/receptor, strategies, proposed outcome and draft criteria
	• Strategies for the establishment of post-mine completion land uses and areas, including the re-establishment of land for agriculture where practicable. • Progressive rehabilitation implemented for all domains as soon as practicable. **Iron Road Proposed Measurement Criteria** IM_13_08 - *Annual audit of soil movement records shows no measurable decline in soil quality or quantity* IM_13_09 - *Ecosystem Function Analysis (or similar) demonstrate progress towards achieving closure criteria* **DSD Assessment of Draft Measurement Criteria** Additional or alternative measurement criteria could be adopted for this completion outcome. Amendments to the criteria are required to ensure that it meets the requirements of Regulation 65(2)(d) and includes all of the required elements of criteria. DSD considers that there are methodologies that are appropriate to demonstrate achievement of the outcome. Should a lease be granted, the measurement criteria would be finalised in the PEPR submission. (5) DSD considers the proposed draft measurement criteria to be an appropriate measurement to demonstrate achievement of the proposed outcome. **Iron Road proposed Leading Indicator Criteria** *None proposed* **DSD Assessment of Leading Indicator Criteria** (6) Should a lease be granted, the requirement for a leading indicator criteria would be finalised in the PEPR.
PIM_13_11	**Iron Road Impact Event** *Land quality reduced on-lease as a consequence of microclimatic changes adjacent IWL (wind, shade) (operation and post-mine completion).* **DSD Assessment of Source, Pathway, Receptor** The impact event refers to 'wind', however, the evidence provided by Iron Road relates to 'shading' (MP p. 21-17, 21-18 and 21-19). DSD has only considered 'shading' as the pathway for impact from the IWL to the adjoining agricultural land use. At the time of DSD's assessment of the mining application, the land access and land use for all areas in the proposed ML had not been finalised. Iron Road propose to maximise the land available within the proposed ML for agricultural use (see Land use impact event PIM_21_01). Given that there is the potential for multiple land use (and ownership) within the Lease, there is uncertainty in relation to the extent of agricultural land use within the proposed mining lease. Hence, an outcome is required for this impact event. See PIM_21_06 for an additional impact event that refers to off-lease impacts. (1) DSD confirms that the Source(s), pathway(s) and receptor(s) would exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required. **Iron Road proposed Outcome** *N/A*

Impact Event ID	DSD assessment of the impact event, source/pathway/receptor, strategies, proposed outcome and draft criteria
	DSD Assessment of Outcome, Strategies and Uncertainty The MP (p. 21-17 and figures 21-4 and 21-5) summarise the assessment for impacts to land use from shading from the IWL. The impact assessment shows that shading would have an impact the amount of sunlight available to properties adjacent to the IWL (both on and off the proposed lease). For PIM_21_06: The environmental outcome proposed by Iron Road for 'off lease impacts' commits to 'no impacts to agricultural productivity, including, crop yield, grain quality and livestock' other than those impacts agreed with the affected users. This outcome is appropriate and achievable given that any impact must be agreed with affected users. The 'IWL design' has been stated by Iron Road as a key control strategy. As the IWL progresses from a conceptual design to a detailed design, it is recommended that shading be further considered. A sixth schedule lease condition is recommended in regards to shading. (2) A new outcome is required (see the regulatory response). (3) The outcome is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. **DSD Recommended Regulatory Response – Outcome and Strategies** <u>(4) DSD recommends that should a lease be granted the following outcomes be a requirement of Schedule 6 of the lease:</u> The Tenement Holder must during construction, operation and post-mine completion, ensure no impacts to agricultural productivity, including but not limited to; • reduction in crop yield; • reduction in grain quality; or • adverse health impacts to livestock; for third party land users on or off the Land as a result of shading from mining operations, other than those agreed between the Tenement Holder and the affected user. <u>DSD recommends that should a lease be granted the following be a requirement of Schedule 6 of the lease:</u> The Tenement Holder is required to address the following matters for the purposes of Regulation 65(2)(c) of the Regulations in relation to the third party land use outcomes; • Develop strategies for the design of the IWL to ensure impacts from shading to agricultural productivity for third party land users on or off the Land are as low as reasonably practicable. Note: Should a lease be granted, the recommended regulatory response above should be included under the 'Land Use' sub heading in the lease document (rather than the 'Soils' sub heading). **Iron Road Proposed Measurement Criteria** *N/A* **DSD Assessment of Draft Measurement Criteria** (5) The measurement of crop yield and quality is appropriate as this directly measures the impact on the receptor.

Impact Event ID	DSD assessment of the impact event, source/pathway/receptor, strategies, proposed outcome and draft criteria
	DSD considers that there are methodologies that are appropriate to demonstrate achievement of the outcome. Should a lease be granted, the measurement criteria would be finalised in the PEPR submission. **Iron Road proposed Leading Indicator Criteria** *N/A* **DSD Assessment of Leading Indicator Criteria** (6) Should a lease be granted, the requirement for a leading indicator criteria would be finalised in the PEPR.
IM_13_13	**Iron Road Impact Event** *Loss of topsoil as a result of erosion. (construction, operation and post-mine completion)* **DSD Assessment of Source, Pathway, Receptor** (1) DSD confirms that the Source(s), pathway(s) and receptor(s) would exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required. **Iron Road proposed Outcome** *No adverse impacts on soil quality or quantity within the ML that could compromise the post mining land use.* **DSD Assessment of Outcome, Strategies and Uncertainty** **Assessment:** The MP (p. 13-14) states the control and management strategies for soil and land quality and DSD has assessed them to be appropriate. Some key strategies to ensure soil quantity are as follows (refer to the full list in the MP): • Development of a soil management program • Stockpiles located away from surface water flows and trafficked areas. • Vegetation cover over stockpiles maintained (where soil cannot be immediately reused). • Topsoil inventory developed and maintained • Progressive rehabilitation and progressive use of soils It is recommended that strategies in regards to maintaining soil quality and quantity are included in the sixth schedule of the lease. (2) The outcome appropriately states the level of impact subsequent to controls. The outcome statement requires minor amendment. (3) The outcome is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. **DSD Recommended Regulatory Response – Outcome and Strategies** (4) DSD recommends that should a lease be granted the following outcome be a requirement of Schedule 6 of the lease: The Tenement Holder must during construction, operation and post-mine completion ensure that the existing (pre-mining) soil quality and quantity is maintained.

Impact Event ID	DSD assessment of the impact event, source/pathway/receptor, strategies, proposed outcome and draft criteria
	DSD recommends that should a lease be granted the following be a requirement of Schedule 6 of the lease: The Tenement Holder is required to address the following matters for the purposes of Regulation 65(2)(c) in relation to the soil quality and quantity outcomes: • Strategies to achieve recovery of topsoil and subsoil from areas to be disturbed by mining operations. • Strategies for maintaining the quality and quantity of stockpiled soil/s until such time that it is used for rehabilitation purposes. • Strategies that take into consideration the optimal soil stockpile heights for achieving the soil outcomes. • Strategies for reinstatement of these soils so as to maximise the likelihood of achieving the soil outcomes. • An auditable record of soil movement including recovery, stockpiling and reinstatement. • Strategies for the establishment of post-mine completion land uses and areas, including the re-establishment of land for agriculture where practicable. • Progressive rehabilitation implemented for all domains as soon as practicable. **Iron Road Proposed Measurement Criteria** *Annual audit of soil movement records shows no measurable decline in soil quality or quantity.* **DSD Assessment of Draft Measurement Criteria** Additional or alternative measurement criteria could be adopted for this outcome. Amendments to the criteria are required to ensure that it meets the requirements of Regulation 65(2)(d) and includes all of the required elements of criteria. DSD considers that there are methodologies that are appropriate to demonstrate achievement of the outcome. Should a lease be granted, the measurement criteria would be finalised in the PEPR submission. (5) DSD considers the proposed draft measurement criteria to be an appropriate measurement to demonstrate achievement of the proposed outcome. **Iron Road proposed Leading Indicator Criteria** *None proposed* **DSD Assessment of Leading Indicator Criteria** (6) Should a lease be granted, the requirement for a leading indicator criteria would be finalised in the PEPR.

8.7.4 *Summary of the recommended regulatory response*

DSD has assessed that all potential impacts associated with soils and land quality during construction, operations and post-mine completion have been identified through this assessment and appropriate outcomes have been recommended for all potential impact events where the pre-control strategy consequence is greater than trivial. DSD has considered each of these outcomes and determined that they set an appropriate level of impact for sensitive receptors and the receiving environment during construction, operation and post-mine completion. DSD considers that these outcomes would be achievable following the successful implementation of control strategies and that suitable methods are available for measuring the achievement of these outcomes.

8.8 Waste disposal and management

8.8.1 *Description of environment*

This section addresses impacts associated with the commercial and industrial waste generated by mining operations. Wastes from processing (such as tailings) that are disposed of in the IWL are covered in the soils, groundwater, surface water, air quality and native vegetation chapters of the Proposal and this report.

The Eyre Peninsula generates approximately 250,000 tonnes per annum of waste. Kerbside collection is available in some townships including Wudinna, Kimba, Minnipa and Lock. There are 15 landfill facilities and 10 transfer stations on the Eyre Peninsula. The closest landfill facility to the proposed ML is the Wudinna landfill (approximately 21 km).

There are no waste facilities on the Eyre Peninsula which accept the following waste streams:

- quarantine waste
- restaurant grease trap waste and bilge waste
- grain dust
- chemical containers
- waste tyres
- asbestos.

DSD consider the sensitive receptors and associated environmental values for this environmental aspect to be:

- Wudinna landfill/capacity of existing waste management systems
- soil
- surface water
- groundwater.

DSD considers that the description of the existing environment in the Proposal is a suitable characterisation of the receiving environment that may be affected by mining operations.

8.8.2 *Views of affected parties*

The primary issues raised during the statutory public consultation are summarised below in Table 8.8 and are cross-referenced with the relevant Iron Road impact events. The cross referencing of the views of affected parties to Impact Event ID's enables a link between an issue raised and DSD's recommended regulatory response determined subsequently in this chapter. The Public Submission ID in the table below relates to the unique public submission number and the name of the submitter. If the submitter has requested privacy, then 'name and address withheld' is indicated in the table.

Table 8.8 – Impact events relating to issues raised during the statutory public consultation

Public submission ID	Issues raised	Where addressed – Impact Event ID
010 – Sampson	Potential impacts of transporting waste to the waste facility.	IM_8_01 IM_8_02 IM_8_04 IM_8_07 IM_8_08 IM_8_09
020 – Sampson	Concern regarding reduction in expected life of Wudinna DC landfill facility if it accepts waste from the mine.	IM_14_01
102 – TBRARA	Potential impacts of increased waste disposal at Wudinna Landfill facility.	IM_14_01

8.8.3 *Impact event assessment*

Section 8.0 of this report provides a description of DSD's process for assessing potential impact events. Appendix 3 of this report contains DSD's complete assessment of Iron Road's potential impact events, technical justifications and recommended regulatory responses. The following two tables in this section are based on DSD's complete assessment provided in Appendix 3.

Table 8.8.1 contains a summary of DSD's recommended regulatory responses for impact events that have been assessed by DSD to require: (1) environmental outcome(s) only (i.e. no other lease conditions/requirements), or (2) no environmental outcome.

Table 8.8.1 – Summary of impact events where DSD recommends (1) outcome(s) only, or (2) no outcome(s) (see Appendix 3 for DSD's complete assessment)

Impact Event ID	Iron Road impact event description	DSD recommends that should a lease be granted the following outcomes be a requirement of Schedule 6 of the lease
IM_14_01	*Increased waste stream volumes affecting the ongoing operation of existing waste management facilities (e.g. Wudinna landfill)*	The Tenement Holder must ensure that all commercial or industrial waste (which does not include tailings and waste rock) is disposed of in an EPA licensed facility.
IM_14_03	*Inappropriate handling of waste materials including the disposal of hazardous materials, sewerage and/or wastewater, contaminating soil and/or water resources*	The Tenement Holder must, ensure that: • There is no contamination of land and soils either on or off the Land as a result of mining operations; and • no contamination of land and soils either on or off the Land after mine completion occurs as a result of mining operations. Note: Should a lease be granted, the outcome above should be included under the 'Soils' sub heading in the lease document (rather than the 'Wastes' sub heading).

8.8.4 *Summary of the recommended regulatory response*

DSD has assessed that all potential impacts associated with waste disposal and management during construction, operations and post-mine completion have been identified through this assessment and appropriate outcomes have been recommended for all potential impact events where the pre-control strategy consequence is greater than trivial. DSD has considered each of these outcomes and determined that they set an appropriate level of impact for sensitive receptors and the receiving environment during construction, operation and post-mine completion. DSD considers that these outcomes would be achievable following the successful implementation of control strategies and that suitable methods are available for measuring the achievement of these outcomes.

8.9 Air quality

8.9.1 *Description of environment*

The proposed ML area is centrally located in Eyre Peninsula, in a rural environment, which is characterised by clean air. The Warramboo locality in the Eyre Peninsula has 'good air quality' or 'very good air quality' as defined by the EPA (2015). The existing air pollutant of significance in the locality is airborne particulate matter. Existing sources of particulates would include:

- marine (soluble salts)
- regional salt lakes (soluble salts and insoluble dust)
- roads (insoluble dust)
- agricultural activities (insoluble dust)
- fires (insoluble dust)
- vehicles.

Iron Road's baseline air quality monitoring undertaken on site between November 2013 and May 2015 found background dust deposition to be approximately 0.88 g/m^2/month. Sodium chloride (NaCl) was found to constitute approximately 75% of the soluble salts contained in deposited dust.

Dust generated by proposed mining operations is anticipated to be transported by prevailing winds, emitted by vehicles and plant, lifted from exposed surfaces and stockpiled material. The distance that airborne particles travel from the proposed ML depends on the size of the particle, the strength of the wind and meteorological conditions.

Iron Road identified 53 sensitive receptors (located where people live or work) within a distance of 5 km from the proposed ML boundary. Three of these dwellings were identified as being inside the proposed ML boundary.

DSD considers the sensitive receptors and associated environmental values for this environmental aspect to be:

- public health
- public amenity

- agricultural productivity
- native vegetation.

DSD considers that the description of the existing environment in the Proposal is a suitable characterisation of the receiving environment that may be affected by mining operations.

8.9.2 *Views of affected parties*

The primary issues raised during the statutory public consultation are summarised below in Table 8.9 and are cross-referenced with the relevant Iron Road impact events. The cross referencing of the views of affected parties to Impact Event ID's enables a link between an issue raised and DSD's recommended regulatory response determined subsequently in this chapter. The Public Submission ID in the table below relates to the unique public submission number and the name of the submitter. If the submitter has requested privacy, then 'name and address withheld' is indicated in the table.

Table 8.9 – Impact events relating to issues raised during the statutory public consultation

Public submission ID	Issues raised	Where addressed – Impact Event ID
030 - Mallee Hill Farming	• Fate of salt from salt water used for dust suppression	IRD response – see submission 27 issue 2 IM_15_05 PIM_15_06
031 - Name and address withheld	• Dust impacts to land adjacent to the mine	IRD response – see submission 10, issue 47 IM_15_05 PIM_15_06
032 - name and address withheld	• Dust impacts to farming	IRD response – see submission 25, issue 5 and response 8 for submission 32
035 - Veitch	• Dust impacts to crop and stock production – loss of value due to contamination by dust. Reduction of crop yields due to dust contamination. • Uncertainty regarding modelled predictions of dust impact on different crops – varied impact. • Quality of baseline data collected to date – capability to be used in future.	IM_15_04 IM_15_05 IM_15_06 IM_15_07 IM_15_08
046 – Wudinna Districts Tourism Association	• Need for appropriate management of environmental nuisance, including dust.	IM_15_11 IM_15_12 IM_15_13 IM_15_14 IM_15_15 IM_15_16
061 - Hegarty	• Dust impacts from IWL • SiO_2 impacts on human health • Increase in salt levels in paddocks (soil salt)	(IRD Response submission 61, issues 2 and 4) IM_15_04 IM_15_05

Public submission ID	Issues raised	Where addressed – Impact Event ID
		IM_15_06 IM_15_07 IM_15_08
065 – Skyden Farms	• Saline dust impacts on adjacent crops	IRD Response 65 – 2 IM_15_04 IM_15_05 IM_15_06 IM_15_07 IM_15_08
071 - name and address withheld	• Dust emissions from mine site during construction – impacts on human health • Dangerous contaminants in dust – potential for impact to human health • Potential for contamination of rainwater by dust sourced from mine • Compensation for damage to air conditioners due to mine dust • Salt dust contamination of adjacent crops – loss of production • Loss of wool clip value due to dust contamination • Dust monitoring	IRD Response submission 71 issue 2 and 6, and submission 25 issue 2, IM_15_04 IM_15_05 IM_15_06 IM_15_07 IM_15_08 IM_15_11 IM_15_12 IM_15_13 IM_15_14 IM_15_15 IM_15_16 IM_15_17
072 - Name and address withheld	• Worried about dust	IM_15_04 IM_15_05 IM_15_06 IM_15_07 IM_15_08 IM_15_11 IM_15_12 IM_15_13 IM_15_14 IM_15_15 IM_15_16
092 - Name and address withheld	• Dust contaminating grain • Contamination of rain water by dust • Dust impact to native vegetation (mortality)	IRD Response submission 92 issue 12 IM_15_04 IM_15_05 IM_15_06 IM_15_07 IM_15_08 IM_15_09 IM_15_10 IM_15_11 IM_15_12 IM_15_13 IM_15_14 IM_15_15 IM_15_16
093 - Name and address withheld	• Possibility of radioactive dust due to blasting • Heavy metal contamination of crops due to dust emissions from mine • Rainwater contamination by mine dust	IRD response submission 93 issue 2 (see response submission 92 issue 21) IM_15_04 IM_15_05 IM_15_06

Public submission ID	Issues raised	Where addressed – Impact Event ID
	• IWL dust blowing off site, contaminating adjacent areas with heavy metals.	IM_15_07 IM_15_08 IM_15_11 IM_15_12 IM_15_13 IM_15_14 IM_15_15 IM_15_16
096 - SIMGI	• Dust deposition on native vegetation • Contamination of rainwater due to dust • Dust on vegetation reducing photosynthesis • Reduced agricultural productivity due to dust deposition on crops.	IRD response submission 92 issues 19 and 22 IM_15_04 IM_15_05 IM_15_06 IM_15_07 IM_15_08 IM_15_09 IM_15_10
098 - Name and address withheld	• Unknown composition of mine dust • Salt contained in mine dust affecting crops • Compensation for loss of productivity due to salt deposition	IRD response submission 98 issues 11 and 13. IM_15_04 IM_15_05 IM_15_06 IM_15_07 IM_15_08 IM_15_11 IM_15_12 IM_15_13 IM_15_14 IM_15_15 IM_15_16
099 - name and address withheld	• Wind borne dust contaminating crops and pastures – threatening grain and livestock exports • Decrease in agricultural productivity and quality of yields • Decrease in land value due to a mine adjacent to agricultural land and dust deposition • Toxic dust deposition on soils – rendering soil infertile • Contamination of rainwater. • Human health impacts due to increased dust levels. • Nuisance dust from mine • Flora death due to dust deposition	IRD response Submission 99 issues 5, 6, 7 and 10. IM_15_04 IM_15_05 IM_15_06 IM_15_07 IM_15_08 IM_15_09 IM_15_10 IM_15_11 IM_15_12 IM_15_13 IM_15_14 IM_15_15 IM_15_16
102 - TBRARA	• Contamination of nearby farming land with dust • Fugitive dust containing free silica • Questioning baseline data collection standards and suitability for modelling. • Fugitive dust free silica contained in IWL and available to be blown off site with consequent health impacts.	IRD response submission 99 issues 55, 56, 57, 57, 59, 60 and 61. IM_15_04 IM_15_05 IM_15_06 IM_15_07 IM_15_08

Public submission ID	Issues raised	Where addressed – Impact Event ID
	• Long term impact of dust on native vegetation located beyond mine boundary. • Mine sourced dust containing salt, heavy metals impacting native vegetation. • Chemical composition of mine sourced dust – potential for toxic effects on flora. • Impacts to visual amenity due to dust • Health impacts due to fugitive dust	IM_15_09 IM_15_10 IM_15_11 IM_15_12 IM_15_13 IM_15_14 IM_15_15 IM_15_16

8.9.3 *Impact event assessment*

Section 8.0 of this report provides a description of DSD's process for assessing potential impact events. Appendix 3 of this report contains DSD's complete assessment of Iron Road's potential impact events, technical justifications and recommended regulatory responses. The following two tables in this section are based on DSD's complete assessment provided in Appendix 3.

Table 8.9.1 contains a summary of DSD's recommended regulatory responses for impact events that have been assessed by DSD to require: (1) environmental outcome(s) only (i.e. no other lease conditions/requirements), or (2) no environmental outcome.

Table 8.9.2 contains DSD's detailed assessment for impact events where DSD's recommended regulatory response includes the requirement for a combination of outcomes, strategies, criteria or conditions.

Table 8.9.1 – Summary of impact events where DSD recommends (1) outcome(s) only, or (2) no outcome(s) (see Appendix 3 for DSD's complete assessment)

Impact event ID	Iron Road Impact Event Description	DSD recommends that should a Lease be granted the following outcomes be a requirement of Schedule 6 of the Lease
IM_15_09 IM_15_10	*Dust from construction and mining operations (including closure) impacting native vegetation growth in areas surrounding the mining lease.* *Dust from mine post closure impacting native vegetation growth*	The Tenement Holder must during construction, operation and post-mine completion, ensure no loss of abundance or diversity of native vegetation on or off the Land through; • clearance, • dust/contaminant deposition, • fire, • reduction in water supply • salinisation, or • other damage, unless a significant environmental benefit has been approved in accordance with the relevant legislation. Note: Should a lease be granted, the outcome above should be included under the 'Native Vegetation' sub heading in the lease document (rather than the 'Air Quality' sub heading).

Table 8.9.2 – Assessment of impact events where DSD recommends a combination of outcomes, strategy, criteria or conditions (see Appendix 3 for DSD's complete assessment)

Impact Event ID	DSD assessment of the impact event, source/pathway/receptor, strategies, proposed outcome and draft criteria
IM_15_01 IM_15_02 IM_15_03	**Iron Road Impact Event** *Dust generation from mine construction results in poor visual amenity for local residents and local community* *Dust generation from mining operations results in poor visual amenity for local residents and local community* *Dust generation from the IWL post closure results in poor visual amenity for local residents and local community* **DSD Assessment of Source, Pathway, Receptor** Note: To avoid duplication, the assessment of all air quality nuisance and visual amenity impact events has been undertaken against PIM_15_01. PIM_15_01, PIM_15_02 and PIM_15_03 are impact events that relate to visual amenity impacts. PIM_15_15 and PIM_15_16 are impact events for dust deposition on public amenity and have been assessed against PIM_15_01. (1) DSD confirms that the Source(s), pathway(s) and receptor(s) would exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required. **Iron Road proposed Outcome** *No public nuisance impacts from dust generated by construction, mining or closure or post closure activities.* **DSD Assessment of Outcome, Strategies and Uncertainty** The MP (p. 15-13) proposes control and management strategies for potential air quality impacts. The Iron Road Impact Assessment Table (MP Appendix C) also proposes control strategies. The following is a summary of key strategies (see the MP for a full list): • All dust-generating material covered when being transported to and from the construction site. • Regular use of water sprays or suitable chemical wetting agent on susceptible earthen material loads, active stockpiles, particularly during dry or windy conditions (otherwise use covers where appropriate). • Vegetation retained on site where possible and rehabilitation of vegetation to occur as soon as practicable. Progressive rehabilitation of the integrated waste landform undertaken during the life of the mine. • Use of water trucks or chemical wettings agents where appropriate on unpaved roads or other exposed areas. • Should visible air quality impacts be clearly observed (e.g. visible dust plumes being emitted off-site), relevant work activities would be reduced or ceased to stop the impacts and alternative work methods implemented. • Monitoring programme to confirm compliance with the air quality criteria for the project. • Warnings or exceedance alarms from real-time dust monitoring at selected sites around the proposed mine site

Impact Event ID	DSD assessment of the impact event, source/pathway/receptor, strategies, proposed outcome and draft criteria
	• Active operation control informed by the air quality monitoring programme to manage dust emissions within the air quality criteria. • Continuous meteorological monitoring at the Warramboo site with telemetry capable equipment linked to a real-time reporting system that will be available on a public internet site. The proposed control strategies are assessed to be effective in demonstrating achievement of the outcome. (2) The outcome appropriately states the level of impact subsequent to controls. The outcome statement requires minor amendment. (3) The outcome is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. **DSD Recommended Regulatory Response – Outcome and Strategies** (4) DSD recommends that should a lease be granted the following outcome be a requirement of Schedule 6 of the lease: The Tenement Holder must during construction, operation and post-mine completion ensure no public nuisance impacts from air emissions and/or dust generated by mining operations. DSD recommends that should a lease be granted the following be a requirement of Schedule 6 of the lease: The Tenement Holder is required to address the following matters for the purposes of Regulation 65(2)(c) in relation to the air quality nuisance outcome; • progressive rehabilitation and stabilisation of disturbed areas undertaken throughout the life of mine to control dust emissions generated by wind erosion. • undertake continuous dust and meteorological monitoring to inform decisions for operational response and contingency measures to be implemented to prevent exceedance of compliance criteria. • in the event that monitoring shows the air quality measurement criteria, has been breached, the Tenement Holder must immediately cease the activity that resulted in the breach. **Iron Road Proposed Measurement Criteria** *Long term - compliance with the EPA adopted criteria for annual average dust deposition to [DSD: this should read "not exceed"] exceed 4 g/m2/month and no more than 2 g/m2/month above background.* *Short term – all dust complaints acknowledged and recorded immediately and closed out within 14 days to the satisfaction of the complainant or as agreed with the Director of Mines.* **DSD Assessment of Draft Measurement Criteria** Iron road has committed to including background/ambient dust measurements in addition to mine dust contributions in all measurements that are taken for compliance purposes. This is supported by DSD and recommended to be included as a requirement of the sixth schedule of the lease. PIM_15_01, PIM_15_02 and PIM_15_03 are impact events that relate to visual amenity impacts from dust. The receptor for these impact events is 'visual amenity for the public'. Iron Road proposes an annual average of dust deposition as the long-term criteria for this impact event. Dust deposition is a measure of the amount of dust that has been deposited at ground level over a given time period. Dust deposition is not a direct measure of the concentration of visible dust in the atmosphere. An appropriate measurement of visual amenity impacts from dust would be to directly measure the source of the impact, that is, the

Impact Event ID	DSD assessment of the impact event, source/pathway/receptor, strategies, proposed outcome and draft criteria
	concentration of visible dust in the air. The proposal to use an 'annual average' as the criteria is inappropriate as this frequency of measurement does not reflect that nuisance and amenity impacts that are likely to occur on much shorter time frames. Iron Road states that the pathway for this impact event is "Airborne emissions (TSP)". The MP (p.15-2, Table 15-3) states that Iron Road had originally proposed to adopt the measurement of TSP for their nuisance dust criteria (also supported by Jacobs in the MP Appendix K, p.24, Table 3-2). In Iron Road's Response Document, its commitment to adopt TSP as a measurement criteria for nuisance dust was retracted with the following statement: " … there being no direct relationship between annual average or even 24-hour TSP GLCs and nuisance dust impacts" (Response Document Attachment B p.30). Iron Road go on to say :" … in fact, most dust emission events that cause a complaint occur over timeframes of minutes, not hours or days. No scientific evidence supporting the use of TSP measurements to manage nuisance dust has been provided to Iron Road via their expert consultants or from any Government agency. Whilst TSP is of some use for impact assessment modelling, it is of no use for ongoing compliance monitoring" (Response Document Attachment B p.30). Iron Road also state that its "previous commitment to an investigation into correlations between PM10 and TSP is being with-drawn as this would not assist management of nuisance dust or human health" (Response Document Attachment B p.30). DSD disagrees with this position and recommends that a correlation between PM10 and TSP be developed through operational monitoring. Iron Road has not provided any scientific evidence to support the use of dust deposition as a measurement to determine the visual amenity impacts from dust. DSD considers that TSP measurements would be a more appropriate measure for the following reasons: (1) it was originally proposed by Iron Road in the mining proposal; (2) it is a direct measure of the source of the impact, that is the concentration of visual dust in the air; and (3) it can be continuously measured at time intervals of less than 10 minutes which aligns to the timeframes that visual impacts are likely to occur over. Dust deposition does not have these measurement attributes. PIM_15_15 and PIM_15_16 are impact events for dust deposition on public amenity. For these impact events, dust deposition is the source and mechanism for the impact. Examples of such impacts are dust deposition on: cars, houses, clothes washing, verandas, outdoor furniture etc. For these impact events, dust deposition is an appropriate measurement criteria; however, an 'annual average' is inappropriate as previously discussed. Complaints are not an effective methodology for the measurement of short-term nuisance impacts. Where practicable, criteria must be quantitative, not qualitative (see Mining Regulations 2011 – Section 65(6)). The potential nuisance impacts to human receptors will occur over short time periods, i.e. over minutes, hours and days. Hence, an appropriate criteria must include quantitative measurements over a short time period/frequency. In the Response Document, Iron Road has proposed to use PM10 as a leading indicator measurement for nuisance impacts from dust (including visual amenity). Iron Road has provided no scientific evidence to support that PM10 measurements are appropriate to demonstrate nuisance or visual amenity impacts from dust. PM10 instruments measure the concentration of PM10 dust in a volume of air. PM10 is a fraction of dust that has a particle size that is not visible to the human eye, and hence it is questioned how the measurement of PM10 concentration could be a 'direct' demonstration of visual amenity impacts from dust. DSD supports the use of PM10 concentration as a 'proxy' measurement for nuisance and visual amenity impacts; however, the relationship between PM10 and nuisance and visual amenity impacts must be verified by technical scientific evidence. Iron Road are also proposing visual monitoring of dust using video cameras. DSD supports this methodology for leading indicator criteria for nuisance/visual impacts from dust. DSD supports further technical investigations into if video camera measurements could be adopted for measurement criteria. The definition of measurement criteria is that it must demonstrate achievement of the environmental outcome and comply with all elements of Regulation 65(2)(d) and Regulation 65(6). DSD is supportive of one, all, or a combination of the following as criteria; Total suspended particulate matter (TSP), Total Dust Deposition (TDD), Directional Dust Deposition (DDD), Particulate Matter 10micron (PM10), visual measurement using a video camera; with the provision that the measurement criteria (including all aspects of Regulation 65(2)(d)) are based on technical scientific evidence (relevant to the mine site) which

Impact Event ID	DSD assessment of the impact event, source/pathway/receptor, strategies, proposed outcome and draft criteria
	demonstrates achievement of the outcome. DSD recommends that requirements be included in the sixth schedule of the lease in relation to measurement criteria. (5) DSD considers the proposed draft criteria to be an inappropriate measurement to demonstrate achievement of the proposed outcome. The reference to the EPA in the criteria is incorrect and does not reflect EPA's position. DSD considers that there are methodologies that are appropriate to demonstrate achievement of the outcome. Should a lease be granted, the measurement criteria would be finalised in the PEPR submission. DSD recommends that should a lease be granted the following criteria be a requirement of Schedule 6 of the lease: The Tenement Holder is required to address the following matters for the purposes of Regulation 65(2)(d) in relation to the air quality nuisance outcome; • The measurement criteria adopted for the air quality nuisance outcome must include one or more of the following: - Measurement of Total Dust Deposition (including both ambient and mine related dust) (TDD) using monitoring methodology, equipment and instruments that are recognised by a relevant International or Australian Standard. - TDD leaving the site does not exceed 4 g/m^2/month and no more than 2 g/m^2/month above background. - Measurement of TSP using monitoring equipment and instruments that are recognised by a relevant International or Australian Standard. - An appropriate TSP 24 hour average and annual average concentration is developed and applied to the criteria for the air quality nuisance outcome. - Directional Dust Deposition (DDD) (including both ambient and mine related dust) measured using monitoring equipment and instruments that are recognised by a relevant International or Australian Standard. • The measurement criteria adopted (including all aspects of Regulation 65(2)(d)) must be based on technical scientific evidence which demonstrates achievement of the outcome. • The Tenement Holder must undertake meteorological monitoring in accordance with relevant Australian standards to measure and record meteorological data including (but not limited to) wind speed and direction, temperature, humidity, atmospheric pressure, solar radiation, rainfall and evaporation. • The Tenement Holder must ensure that all adopted measurement criteria (TSP, TDD, DDD and/or PM10) and meteorological monitoring data acquired by the Tenement Holder is reported in real time to the public on an unrestricted internet site. The monitoring data must be retained and remain accessible on the unrestricted internet site for the life of the mine. **Iron Road proposed Leading Indicator Criteria** *A Trigger Action Response Plan (TARP) to be implemented which will include continuous PM10 (multiple sites) and TSP (Warramboo) monitoring to mitigate any short term amenity/nuisance potential impacts.* *Iron Roads Response document states that its "previous commitment to an investigation into correlations between PM10 and TSP is being with-drawn as this would not assist management of nuisance dust or human health" (Response Document Attach B p. 30).* *Iron Road new proposed Leading criteria from their response document is:*

Impact Event ID	DSD assessment of the impact event, source/pathway/receptor, strategies, proposed outcome and draft criteria
	"A TARP to be implemented which will include continuous PM10 (multiple sites) monitoring to provide an indicator of any short term amenity/nuisance potential impacts even though the measurement of PM10 is for the purpose of health protection. *In addition, a network of live streaming cameras will be mounted at strategic locations to visually monitor potentially dust generating activities which will provide instantaneous feedback to operators and transparent information for government regulators and the community."* **DSD Assessment of Leading Indicator Criteria** See the discussion against the Measurement Criteria in regards to the appropriateness of using PM10 as leading indicator for the nuisance outcome. A TARP is an appropriate leading indicator criteria. The TARP should include the following: - definition of appropriate measurement trigger levels (the leading criteria) - selection of appropriate trigger timeframes/frequencies to provide adequate time for additional controls to be implemented to ensure the measurement criteria is not triggered - appropriate controls/actions at each trigger level - if PM10 is proposed as a proxy for nuisance impacts, demonstrate that there is a correlation between PM10 and nuisance impacts. - The location of monitoring sites (6) DSD considers that there is a high level of reliance on control strategies to ensure achievement of the outcome, hence, leading indicator criteria is required.
IM_15_04 IM_15_05 IM_15_06 IM_15_07 IM_15_08	**Iron Road Impact Event** *Dust deposition from IWL (including salts, metals) on agricultural land on-lease resulting in reduced productivity (construction, operation and post-mine completion)* *Dust deposition from IWL (including salts, metals) on agricultural land off-lease resulting in reduced productivity(construction, operation and post-mine completion)* *Dust deposition from mining operations (other than IWL) on agricultural land on or off lease resulting in reduced productivity (construction, operation and post-mine completion).* **DSD Assessment of Source, Pathway, Receptor** Note: To avoid duplication, the assessment of all air quality impact events relating to agricultural land has been undertaken against PIM_15_04. (1) DSD confirms that the Source(s), pathway(s) and receptor(s) would exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required.

Impact Event ID	DSD assessment of the impact event, source/pathway/receptor, strategies, proposed outcome and draft criteria
	Iron Road proposed Outcome *No loss of productivity on properties surrounding the mine site from dust generated by construction, mining, closure or post closure activities, without independent verification and timely compensation.* **DSD Assessment of Outcome, Strategies and Uncertainty** The MP (p. 15-13) proposes control and management strategies for potential air quality impacts. The Iron Road Impact Assessment Table (MP Appendix C) also proposes control strategies. In addition to the control strategies listed against PIM_15_01, the following is a summary of additional key strategies (see the MP for a full list): • Productive land monitoring (to be developed with landholders and Minnipa research centre). • AQ Monitoring during construction and operation to verify results of modelling. The proposed control strategies are assessed to be effective in demonstrating achievement of the outcome. The MP (p. 15-33) provides an assessment of the potential impacts from dust on agriculture. In this section Iron Road details their intention to support a program for the monitoring of crop yields (YieldProphetTM). In addition, "Iron Road is considering a partnership with the Minnipa Agricultural Centre for a research project that determines the locally grown wheat species tolerance to dust and saline aerosols, despite air quality concentration predictions being below potential problem levels." The MP Appendix K (Background Air Quality Monitoring - 13 October 2015 - Jacobs) includes an assessment of potential salt deposition as a result of mining operations. DSD assesses that this assessment is appropriate. (2) The outcome appropriately states the level of impact subsequent to controls. The outcome statement requires amendment to accurately describe the receptors. The reference to timely compensation and independent verification is not appropriate in an outcome statement. (Note: S61 of the Mining Act 1971 provides a mechanism for compensation for impacts as a result of mining operations). (3) The outcome is achievable given the proposed controls and identified assumptions and uncertainty. **DSD Recommended Regulatory Response – Outcome and Strategies** <u>(4) DSD recommends that should a lease be granted the following outcomes be a requirement of Schedule 6 of the lease:</u> The Tenement Holder must during construction, operation and post-mine completion, ensure no impacts to agricultural productivity, including but not limited to; • reduction in crop yield; • reduction in grain quality; or • adverse health impacts to livestock; for third party land users on or off the Land as a result of air emissions and/or dust generated by mining operations, other than those agreed between the Tenement Holder and the affected user.

Impact Event ID	DSD assessment of the impact event, source/pathway/receptor, strategies, proposed outcome and draft criteria
	<u>DSD recommends that should a lease be granted the following be a requirement of Schedule 6 of the lease:</u> The Tenement Holder is required to address the following matters for the purposes of Regulation 65(2)(c) in relation to the air quality outcome for agriculture; • progressive rehabilitation and stabilisation of disturbed areas undertaken throughout the life of mine to control dust emissions generated by wind erosion • undertake continuous dust and meteorological monitoring to inform decisions for operational response and contingency measures to be implemented to prevent exceedance of compliance criteria • in the event that monitoring shows the air quality measurement criteria has been breached, the Tenement Holder must immediately cease the activity that resulted in the breach. **Iron Road Proposed Measurement Criteria** *Average annual dust deposition not to exceed 4 g/m2/month and no more than 2 g/m2/month above background.* *As per the Mining Act, compensation is duly paid to any loss (confirmed by an independent expert) of productivity of agricultural yields as a result of dust and/or saline aerosols from construction, operations and closure activities.* **DSD Assessment of Draft Measurement Criteria** The reference to compensation in a measurement criteria is not appropriate (note: s.61 of the *Mining Act 1971* provides a mechanism for compensation for impacts as a result of mining operations). Iron Road has conducted a literature review to investigate appropriate dust deposition compliance criteria that can be used to demonstrate achievement of the air quality agricultural productivity outcome. Measurement of dust deposition can be used as an appropriate methodology for this outcome, however, the dust deposition measurement criteria adopted (including all aspects of Regulation 65(2)(d)) must be based on technical scientific evidence. DSD supports Iron Roads investigations into the measurement of crop yields and productivity. The measurement of crop yields and productivity would be a more appropriate method for this measurement criteria as it directly measures the impact on the receptor. The definition of measurement criteria is that it must demonstrate achievement of the environmental outcome and comply with all elements of Regulation 65(2)(d) and Regulation 65(6). (5) DSD considers the proposed draft measurement criteria to be an inappropriate measurement to demonstrate achievement of the proposed outcome. DSD considers that there are methodologies that are appropriate to demonstrate achievement of the outcome. Should a lease be granted, the measurement criteria would be finalised in the PEPR submission. <u>DSD recommends that should a lease be granted the following criteria be a requirement of Schedule 6 of the lease:</u> The Tenement Holder is required to address the following matters for the purposes of Regulation 65(2)(d) in relation to the air quality outcome for agriculture; • The measurement criteria adopted (including all aspects of Regulation 65(2)(d)) must be based on technical scientific evidence which demonstrates achievement of the outcome.

Impact Event ID	DSD assessment of the impact event, source/pathway/receptor, strategies, proposed outcome and draft criteria
	• The Tenement Holder must ensure that all adopted measurement criteria and meteorological monitoring data acquired by the Tenement Holder is reported in real time to the public on an unrestricted internet site. The monitoring data must be retained and remain accessible on the unrestricted internet site for the life of the mine. **Iron Road proposed Leading Indicator Criteria** *A TARP to be implemented which will include monthly dust deposition from mining activities.* *Should a crop productivity monitoring program, such as YieldProphetTM or the like, be supported by surrounding landowners, then crop yields on properties within the proposed mine site are comparable with control sites during construction, operation and closure of the mine, measured annually.* **DSD Assessment of Leading Indicator Criteria** The measurement of crop productivity is supported, however, it should be used as the measurement criteria as well as the leading indicator criteria. A TARP is an appropriate leading indicator criteria. The TARP should include the following: - definition of appropriate measurement trigger levels (the leading criteria) - selection of appropriate trigger timeframes/frequencies to provide adequate time for additional controls to be implemented to ensure the measurement criteria is not triggered - appropriate controls/actions at each trigger level - if dust deposition is proposed as a proxy for agricultural impacts, further demonstration is required that there is a correlation between dust deposition and agricultural impacts. - The location of monitoring sites (6) DSD considers that there is a high level of reliance on control strategies to ensure achievement of the outcome, and hence, leading indicator criteria is required. Should a lease be granted, the leading indicator criteria would be finalised in the PEPR.
IM_15_11 IM_15_12 IM_15_13	**Iron Road Impact Event** *Fine particles in dust from construction activities adversely affect human health (construction, operation and post-mine completion).* *Fine particles in dust from mine site post closure adversely affects human health (i.e. from IWL) (post-mine completion).* **DSD Assessment of Source, Pathway, Receptor** Note: To avoid duplication, the assessment of all air quality impact events relating to human health has been undertaken against PIM_15_11. (1) DSD confirms that the Source(s), pathway(s) and receptor(s) would exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required. **Iron Road proposed Outcome**

Impact Event ID	DSD assessment of the impact event, source/pathway/receptor, strategies, proposed outcome and draft criteria
	No public health impacts from dust generated by construction, mining, closure or post closure activities. **DSD Assessment of Outcome, Strategies and Uncertainty** The MP (p. 15-13) proposes control and management strategies for potential air quality impacts. The Iron Road Impact Assessment Table (MP Appendix C) also proposes control strategies. In addition to the control strategies listed against PIM_15_01, the following is a summary of key strategies relevant to human health (see the MP for a full list): • Should visible air quality impacts be clearly observed (e.g. visible dust plumes being emitted off-site), relevant work activities would be reduced or ceased to stop the impacts and alternative work methods implemented. • Monitoring programme to confirm compliance with the air quality criteria for the project. • Warnings or exceedance alarms from real-time dust monitoring at selected sites around the proposed mine site • Active operation control informed by the air quality monitoring programme to manage dust emissions within the air quality criteria. • Continuous meteorological monitoring at the Warramboo site with telemetry capable equipment linked to a real-time reporting system that will be available on a public internet site. The proposed control strategies are assessed to be effective in demonstrating achievement of the outcome. The MP (p. 15-20) states the following in relation to the air impact assessment for the construction mine phase: "During construction, activities would be adjusted based on forecasting of unfavourable climatic conditions and real-time dust monitoring to manage air emissions within air quality criteria levels. The predicted air emissions for adjusted operations during the Construction phase are presented for the 24 hour average PM10 and PM2.5 concentrations. The modelling included adjusted operations for approximately 1340 hours, which is equivalent to 15.3% of the year, to achieve compliance with the PM10 and PM2.5 air quality criteria". The air impact assessment model requires that 'adjusted operations' be undertaken for 15.3% of the year (1340 hours) during construction in order to achieve compliance with the PM2.5 and PM10 air quality criteria. 'Adjusted operations' is described in the MP (Appendix K), but can be summarised as "the planned ceasing of activities at the mine triggered by an operational air monitoring system signalling a risk of exceedance of a Project standard" (MP Appendix K p. 63). The air impact assessment figures for construction (MP Figure 15-4 and 15-5) indicate that 'adjusted operations' are required to ensure compliance with the PM2.5 and PM10 concentrations at receptors (but not limited to) 48, 92, 93 and 97. For this reason, the importance of the control strategies listed above to ensure compliance is essential. The Trigger, Action, Response, Plan (TARP) is also essential to ensure there is a process that can trigger the cessation or adjustment of mining operations in a timely manner. It is recommended that these strategies be included as requirements in the sixth schedule of the lease. (2) The outcome appropriately states the level of impact subsequent to controls. (3) The outcome is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. **DSD Recommended Regulatory Response – Outcome and Strategies**

Impact Event ID	DSD assessment of the impact event, source/pathway/receptor, strategies, proposed outcome and draft criteria
	(4) DSD recommends that should a lease be granted the following outcome be a requirement of Schedule 6 of the lease: The Tenement Holder must during construction, operation and post-mine completion ensure no public health impacts from air emissions and/or dust generated by mining operations. DSD recommends that should a lease be granted the following be a requirement of Schedule 6 of the lease: The Tenement Holder is required to address the following matters for the purposes of Regulation 65(2)(c) in relation to the air quality health outcome; • Progressive rehabilitation and stabilisation of disturbed areas undertaken throughout the life of mine to control dust emissions generated by wind erosion. • Undertake continuous dust and meteorological monitoring to inform decisions for operational response and contingency measures to be implemented to prevent exceedance of compliance criteria. • In the event that monitoring shows the air quality measurement criteria, has been breached, the Tenement Holder must immediately cease the activity that resulted in the breach. **Iron Road Proposed Measurement Criteria** *Compliance with the Ambient Air Quality NEPM 24 hour average PM10 concentration of 50 g/m3.* *Compliance with the EPA Design Ground-Level Concentration (DGLC) for nitrogen dioxide (NO2) i.e. maximum hourly average NO2 DGLC 158 ug/m3.* DSD comment: Iron Road proposed new criteria for the air quality human health outcome in their Response Document. The new criteria is reflected in DSD's assessment and regulatory requirements. **DSD Assessment of Draft Measurement Criteria** Iron Road has committed to including background/ambient dust measurements in addition to mine dust contributions in all measurements that are taken for compliance purposes. This is supported by DSD and recommended to be included as a requirement of the sixth schedule of the lease. Notwithstanding Iron Road's commitment, DSD is supportive of investigations into the development of criteria which can measure non-mining related dust contributions which would then form part of the criteria for compliance or non-compliance. Iron Road proposed new criteria for the air quality human health outcome in their Response Document. The new criteria is appropriate and supported by DSD. The EPA have updated their Air Quality Policy during 2016 and it is recommended that the proposed compliance criteria for NOx be reviewed in line with the new policy. (5) DSD considers the proposed draft criteria to be an appropriate measurement to demonstrate achievement of the proposed outcome. DSD considers that there are methodologies that are appropriate to demonstrate achievement of the outcome. Should a lease be granted, the measurement criteria would be finalised in the PEPR submission. DSD recommends that should a lease be granted the following criteria be a requirement of Schedule 6 of the lease: The Tenement Holder is required to address the following matters for the purposes of Regulation 65(2)(d) in relation to the air quality human health outcome; • The measurement criteria for the air quality human health outcome must include:

Impact Event ID	DSD assessment of the impact event, source/pathway/receptor, strategies, proposed outcome and draft criteria
	PM10 - Measurement of PM10 dust concentration (including both ambient and mine related dust) using monitoring methodology, equipment and instruments that adhere to Australian Standard AS/NZS 3580.9.11, and any future updates or variants to that Standard. - the total PM10 dust concentration (including both ambient and mine related dust) leaving the site is less than 50 ug/m3 as a 24 hour (midnight to midnight) average of measurements taken at intervals of not more than 10 minutes; or - where the total PM10 dust concentration entering the site exceeds 50 ug/m3 as a 24 hour (midnight to midnight) average of measurements taken at intervals of not more than 10 minutes, the total PM10 dust leaving the site does not exceed the measured level entering the site during that period. - the total PM10 dust concentration (including both ambient and mine related dust) leaving the site is less than 25 ug/m3 as an annual average for any 12 month period. PM2.5 - Measurement of PM2.5 dust concentration (including both ambient and mine related dust) using monitoring methodology, equipment and instruments that are recognised by a relevant International or Australian Standard. - the total PM2.5 dust concentration (including both ambient and mine related dust) leaving the site is less than 25 ug/m3 as a 24 hour (midnight to midnight) average of measurements taken at intervals of not more than 10 minutes; or - where the total PM2.5 dust concentration entering the site exceeds 25 ug/m3 as a 24 hour (midnight to midnight) average of measurements taken at intervals of not more than 10 minutes, the total PM2.5 dust leaving the site does not exceed the measured level entering the site during that period. - the total PM2.5 dust concentration (including both ambient and mine related dust) leaving the site is less than 8ug/m3 as an annual average for any 12 month period. Nitrogen Oxides - Measurement of the relevant Nitrogen Oxides concentration (including both ambient and mine related dust) using monitoring methodology, equipment and instruments that are recognised by a relevant International or Australian Standard. - Compliance limits for Nitrogen Oxides must adhere to the Environment Protection (Air Quality) Policy 2016. • The measurement criteria adopted (including all aspects of Regulation 65(2)(d) and in particular the locations of monitoring) must be based on technical scientific evidence which demonstrates achievement of the outcome. • The Tenement Holder must undertake meteorological monitoring in accordance with relevant Australian standards to measure and record meteorological data including (but not limited to) wind speed and direction, temperature, humidity, atmospheric pressure, solar radiation, rainfall and evaporation. • The Tenement Holder must ensure that PM2.5, PM10 and NOx concentration data and meteorological monitoring data acquired by the Tenement Holder is reported in real time to the public on an unrestricted internet site. The monitoring data must be retained and remain accessible on the unrestricted internet site for the life of the mine.

Impact Event ID	DSD assessment of the impact event, source/pathway/receptor, strategies, proposed outcome and draft criteria
	Iron Road proposed Leading Indicator Criteria *A Trigger Action Response Plan (TARP) to be implemented which will include continuous PM10 (multiple sites) monitoring.* *Compliance with the Ambient Air Quality NEPM PM2.5 advisory reporting standards of 25 ug/m3 (24 hour average) and 8 ug/m3 (annual average). Should the revised NEPM include PM2.5 standards then these would be adopted as new Outcome Measurement Criteria.* **DSD Assessment of Leading Indicator Criteria** Iron Road proposed new criteria for the air quality human health outcome in their Response Document. PM2.5 has now been moved from leading criteria to measurement criteria. The new criteria is appropriate and supported by DSD. Iron Road should consider including PM2.5 in the TARP. A TARP is an appropriate leading indicator criteria. The TARP should include the following: - definition of appropriate measurement trigger levels (the leading criteria) - selection of appropriate trigger timeframes/frequencies to provide adequate time for additional controls to be implemented to ensure the measurement criteria is not triggered - appropriate controls/actions at each trigger level - The location of monitoring sites (6) DSD considers that there is a high level of reliance on control strategies to ensure achievement of the outcome, hence, leading indicator criteria is required.

8.9.4 *Summary of the recommended regulatory response*

DSD has assessed that all potential impacts associated with Air Quality during construction, operations and post-mine completion have been identified through this assessment and appropriate outcomes have been recommended for all potential impact events where the pre-control strategy consequence is greater than trivial. DSD has considered each of these outcomes and determined that they set an appropriate level of impact for sensitive receptors and the receiving environment during construction, operation and post-mine completion. DSD considers that these outcomes would be achievable following the successful implementation of control strategies and there are suitable methods available for measuring achievement of these outcomes.

8.10 Noise

8.10.1 *Description of environment*

Iron Road states that the proposed ML area has a quiet rural character dominated by natural noise sources such as wind, insects and birds, with intermittent human-induced noise from road traffic and agricultural machinery. The proposed mining operations will introduce new noise sources to the area, including blasting, excavation, materials handling, minerals processing, rail loading and train movements.

Iron Road took baseline noise measurements over a 1 week period during their exploration program at a site remote from interference from drilling activities to determine the noise levels in the district without mining activities. Noise levels varied between 16dB(A) at night to 42dB(A) during the daytime.

Iron Road identified sensitive receptors using a desktop assessment of aerial imagery with field and community verification. Iron Road considered dwellings, schools, hospitals, business premises or public recreational area to be sensitive receptors for noise. Other sensitive receptors were identified, including derelict or uninhabitable dwellings or buildings as these sites may have existing rights which would allow re-development. Sensitive receptors have been identified in Figure 16-4 of the Proposal.

Iron Road identified the quiet rural environment enjoyed by sensitive receptors as the key noise related environmental value.

The proposed ML is located in an area where sensitive receptors enjoy a high level of amenity due to minimal human-induced noise sources. Road traffic and agricultural machinery are the main sources of human-induced noise. The background noise levels vary and are dominated by natural noise sources.

DSD considers that the description of the existing environment in the Proposal is a suitable characterisation of the receiving environment which may be affected by mining operations.

8.10.2 *Views of affected parties*

The primary issues raised during statutory consultation are summarised below in Table 8.10 and are cross-referenced with the relevant Iron Road impact events. The cross referencing of the views of affected parties to Impact Event ID's enables a link between an issue raised and DSD's recommended regulatory response determined subsequently in this chapter. The Public Submission ID in the table below relates to the unique public submission number and the name of the submitter. If the submitter has requested privacy, then 'name and address withheld' is indicated in the table.

Table 8.10 – Impact events relating to issues raised during statutory consultation

Public Submission ID	Issues Raised	Where addressed – Impact Event ID
010 - Sampson	Adequacy of baseline studies Verification of modelling studies at sensitive receptor locations.	MP section 16.7.2 operational noise & Appendix L Noise and vibration assessment
031 - Name and address withheld	Stock response to noise – negative impact to lambing rates.	IM_16_07 IM_16_08 IM_16_01 IM_16_02 IM_16_03 IM_16_04 IM_16_05 IM_16_06 IM_16_09 IM_16_10 IM_16_11
061 - Hegarty	Increase in daytime and night time noise	IM_16_07 IM_16_08 IM_16_01 IM_16_02 IM_16_03 IM_16_04 IM_16_05 IM_16_06 IM_16_09 IM_16_10 IM_16_11
071 - Name and address withheld	Management strategies to ensure noise outputs remain within tolerances	IM_16_07 IM_16_08 IM_16_01 IM_16_02 IM_16_03 IM_16_04 IM_16_05 IM_16_06 IM_16_09 IM_16_10 IM_16_11

8.10.3 *Impact event assessment*

Section 8.0 of this report provides a description of DSD's process for assessing potential impact events. Appendix 3 of this report contains DSD's complete assessment of Iron Road's potential impact events, technical justifications and recommended regulatory responses. The following two tables in this section are based on DSD's complete assessment provided in Appendix 3.

Table 8.10.1 contains DSD's detailed assessment for impact events where DSD's recommended regulatory response includes the requirement for a combination of outcomes, strategies, criteria or conditions.

Table 8.10.1 – Assessment of impact events where DSD recommends a combination of outcomes, strategy, criteria or conditions (see Appendix 3 for DSD's complete assessment)

Impact Event ID	DSD assessment of the impact event, source/pathway/receptor, strategies, proposed outcome and draft criteria
IM_16_01 IM_16_02 IM_16_03 IM_16_04 IM_16_05 IM_16_06 IM_16_07 IM_16_08 IM_16_09 IM_16_10 IM_16_11	**Iron Road Impact Events** *All impact events relate to construction and operation:* *Noise impacts to local residents as a result of comingled waste rock and tailings falling from stackers* *Noise impacts to local residents as a result of processing plant operation* *Noise impacts to local residents as a result of stackers / conveyors / vehicles* *Noise impacts to local residents as a result of use of drill rigs* *Noise impacts to local residents as a result of train loading* *Noise impacts to local residents as a result of overburden clearance during construction* *Noise impacts to local residents as a result of infrastructure removal and decommissioning* *Noise impacts to local residents as a result of final landform shaping and earthworks activities (i.e. grading, spreading and ripping)* **DSD Assessment of Source, Pathway, Receptor** Note: To avoid duplication, the assessment of all noise impact events has been undertaken against PIM_16_01. For example, impacts from rail noise has also been assessed against this impact event. (1) DSD confirms that the Source(s), pathway(s) and receptor(s) would exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required. **Iron Road proposed Outcome** *Noise from construction, operation and closure activities meets the noise goals in the Environment Protection (Noise) Policy, as defined by the Wudinna District Council Development Plan at the date the ML was granted.* **DSD Assessment of Outcome, Strategies and Uncertainty** The MP (p. 16-9) proposes control and management strategies for potential noise impacts. The Iron Road Impact Assessment Table (MP Appendix C) also proposes control strategies. The following is a summary of key strategies (see the MP for a full list): • Noisy equipment or processes are to be located in strategic locations so that their impact on nearby sensitive receivers will be minimised • Noise reduction devices such as mufflers will be fitted and will operate effectively. • Equipment will be operated and materials handled in a way as to minimise the impact of noise. • Establishment of a mobile continuous noise monitoring station to be located at strategic sites, as required, to allow model validation and continuous review of the noise emissions from the proposed mine into the local environment. • Continuous meteorological monitoring as required to support the noise monitoring system • Real time reporting of noise measurements on a public internet site

Impact Event ID	DSD assessment of the impact event, source/pathway/receptor, strategies, proposed outcome and draft criteria
	• Operational procedures will be developed and implemented to avoid exceedances of noise limit criteria at the nearest noise sensitive receiver The Iron Road Response Document (Attachment B Issue #9 and Attachment C) also discusses noise. Iron Road provided additional information to address Issue #9 in Attachment C. This information indicates that noise levels at Receptor 48 will be 50 dB(A) at some times as a result of rail noise (noting that 50 dB(A) is the night time noise limit for Receptor). The control strategies proposed by Iron Road include a strategy for the alteration/amendment to operations in order to ensure compliance with the noise limits. Given that the specific operation that is causing the non-compliance can be ceased, this strategy will be effective in achieving the outcome. In addition, real time monitoring of noise limits and public reporting of this data will ensure transparency in relation to Iron Roads strategies to ensure that operations are being amended to ensure compliance. DSD has assessed the potential impact from waste rock and tailings being deposited in the IWL to receptors. The MP (Figures 16-7 and 16-8) shows noise modelling for operations. Receptor 97 is located close to the southern boundary of the proposed ML and has the potential to be impacted by noise generated from the construction of the IWL. The modelling indicates that noise impacts at receptor 97 will be lower than the noise compliance limits *(Environment Protection (Noise) Policy 2007)*. It is assessed that noise character (including noise from rock drop) should also be considered when measuring noise resulting from the placement of material on the IWL. It is recommended measuring noise character be included as a requirement of the sixth schedule of the lease. DSD assesses that the control strategies proposed will be effective in achieving the outcome. Strategies are recommended to be included in Schedule 6 of the Lease. It is recommended that continuous noise and meteorological monitoring (and real time reporting on the internet) are included as requirements for criteria in Schedule 6 of the Lease. (2) The outcome does not appropriately state the level of impact subsequent to controls. The outcome statement requires amendment to provide reference to amenity (impact on receptor). Amenity is used in the Environment Protection (Noise) Policy to describe the value that is being protected by the policy and hence must be included in the outcome. (3) The outcome is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. **DSD Recommended Regulatory Response – Outcome and Strategies** <u>(4) DSD recommends that should a lease be granted the following outcome be a requirement of Schedule 6 of the lease:</u> The Tenement Holder must during construction and operation, ensure noise emanating from mining operations is in accordance with the current amenity as defined by the Environment Protection (Noise) Policy and the Wudinna District Council Development Plan at the date that the Mining Tenement was granted, set out in the Seventh Schedule of this Tenement document. <u>DSD recommends that should a lease be granted the following be a requirement of Schedule 6 of the lease:</u> The Tenement Holder is required to address the following matters for the purposes of Regulation 65(2)(c) in relation to the Noise Outcome sixth schedule clause 31: • At a minimum, implement all noise mitigation strategies described in the Mining Proposal and Response Document.

Impact Event ID	DSD assessment of the impact event, source/pathway/receptor, strategies, proposed outcome and draft criteria
	• Undertake continuous noise and meteorological monitoring to inform decisions for operational response and contingency measures to be implemented to prevent exceedance of compliance criteria. • In the event that monitoring shows the noise measurement criteria has been breached, the Tenement Holder must immediately cease the activity that resulted in the breach. **Iron Road Proposed Measurement Criteria** *Noise generated from the mine site during mining operations and closure activities, measured for or at, sensitive receivers in accordance with the Environment Protection (Noise) Policy 2007, does not exceed the following noise limit (averaged over 15 minutes), at those sensitive receivers:* *- 57 dB(A) between the hours of 7am and 10pm and 50 dB(A) between the hours of 10pm and 7am within a Primary Production Zone (as delineated in the Wudinna District Council Development Plan at the time of granting the Lease).* *- 55 dB(A) between the hours of 7am and 10pm and 48 dB(A) between the hours of 10pm and 7am within a Settlement Zone (as delineated in the Wudinna District Council Development Plan at the time of granting the Lease).* *The above noise levels may only be exceeded if the Director of Mines:* *- is satisfied, on the basis of information provided to him by an acoustic engineer, that the noise from the mining operation will not cause an adverse impact at the sensitive receiver due to the existing influence of ambient noise, or the limited duration and/or frequency of occurrence of the activity; and* *- provides prior approval for the exceedance.* *Noise measurements will be 'adjusted' in accordance with the relevant EP noise policy by the inclusion of a penalty for each characteristic where tonal/modulating/impulsive/low frequency characteristics are present.* **DSD Assessment of Draft Measurement Criteria** (5) DSD considers the proposed draft measurement criteria to be an appropriate measurement to demonstrate achievement of the proposed outcome. DSD considers that there are methodologies that are appropriate to demonstrate achievement of the outcome. Should a lease be granted, the measurement criteria would be finalised in the PEPR submission. <u>DSD recommends that should a lease be granted the following criteria be a requirement of Schedule 6 of the lease:</u> The Tenement Holder is required to address the following matters for the purposes of Regulation 65(2)(d) in relation to the Noise Outcome sixth schedule clause 31; The Tenement Holder must ensure that noise generated from mining operations on the Land: • Is measured, for or at, all sensitive receivers in accordance with the Environment Protection (Noise) Policy 2007, under the *Environment Protection Act 1993* of South Australia; and • does not exceed the following noise limits, at those sensitive receivers:

Impact Event ID	DSD assessment of the impact event, source/pathway/receptor, strategies, proposed outcome and draft criteria
	- 57 dB(A) between the hours of 7am and 10pm and 50 dB(A) between the hours of 10pm and 7am within a Primary Production Zone (as delineated in the Wudinna District Council Development Plan at the date that the Mining Tenement was granted, set out in the Seventh Schedule of this Tenement document); or - 55 dB(A) between the hours of 7am and 10pm and 48 dB(A) between the hours of 10pm and 7am within a Settlement Zone (as delineated in the Wudinna District Council Development Plan at the date that the Mining Tenement was granted, set out in the Seventh Schedule of this Tenement document). Mine noise measured at, or for, noise-affected premises must be adjusted in accordance with the relevant environment protection noise policy by the inclusion of a penalty for each characteristic where tonal/modulating/impulsive/low frequency characteristics are present as identified by an acoustic engineer. The Tenement Holder must undertake meteorological monitoring in accordance with relevant Australian standards to measure and record meteorological data including (but not limited to) wind speed and direction, temperature, humidity, atmospheric pressure, solar radiation, rainfall and evaporation. The Tenement Holder must monitor noise levels on a continuous basis and report that data and meteorological monitoring data acquired by the Tenement Holder in real time to the public on an unrestricted internet site. The monitoring data must be retained and remain accessible on the unrestricted internet site for the life of the mine. **Iron Road proposed Leading Indicator Criteria** *All noise complaints acknowledged in 48 hours and closed out within 14 days to the satisfaction of the complainant or as agreed with the Director of Mines.* *A Trigger Action Response Plan will be implemented which will include continuous noise monitoring.* **DSD Assessment of Leading Indicator Criteria** A Trigger Action Response Plan which includes noise leading indicator criteria is appropriate and is supported. (6) Should a lease be granted, the leading criteria would be finalised in the PEPR.

8.10.4 *Summary of the recommended regulatory response*

DSD has assessed that all potential impacts associated with Noise during construction, operations and post-mine completion have been identified through this assessment and appropriate outcomes have been recommended for all potential impact events where the pre-control strategy consequence is greater than trivial. DSD has considered each of these outcomes and determined that they set an appropriate level of impact for sensitive receptors and the receiving environment during construction, operation and post-mine completion. DSD considers that these outcomes would be achievable following the successful implementation of control strategies and there are suitable methods available for measuring achievement of these outcomes.

8.11 Air blast and vibration

8.11.1 *Description of environment*

Iron Road identified sensitive receptors for airblast and vibration (including noise) using a desktop assessment of aerial imagery with field and community verification. Iron Road considered dwellings, schools, hospitals, business premises or public recreational area to be sensitive receptors for noise. Other sensitive receptors were identified, including derelict or uninhabitable dwellings or buildings as these sites may have existing rights which would allow re-development. Sensitive receptors have been identified in Figure 16-4 of the Proposal.

Iron Road identified 53 sensitive receptors (located where people live or work) within a distance of 5km from the proposed ML boundary and 3 dwellings of which were identified to be located inside the proposed ML boundary.

DSD considers the sensitive receptors and associated environmental values for this environmental aspect to be:

- public safety
- human comfort
- third party property (including stock)
- adjacent land use
- aircraft

DSD considers that the description of the existing environment in the Proposal is a suitable characterisation of the receiving environment which may be affected by mining operations.

8.11.2 *Views of affected parties*

The primary issues raised during statutory consultation are summarised below in Table 8.11 and are cross-referenced with the relevant Iron Road impact events. The cross referencing of the views of affected parties to Impact Event ID's enables a link between an issue raised and DSD's recommended regulatory response determined subsequently in this chapter. The Public Submission ID in the table below relates to the unique public submission number and the name of the submitter. If the submitter has requested privacy, then 'name and address withheld' is indicated in the table.

Table 8.11 – Impact events relating to issues raised during statutory consultation

Public submission ID	Issues raised	Where addressed – Impact Event ID
010 – Sampson	Impact of blasting results being within standards but above background and impacting upon human comfort.	IM_17_01
031 – name and address withheld	Impact of blasting upon the Warramboo cemetery.	PIM_17_03

Public submission ID	Issues raised	Where addressed – Impact Event ID
032 – name and address withheld	Impact of blasting upon the Warramboo cemetery.	PIM_17_03
065 – Skyden Farms	Impacts of blasting on old stone buildings and residences.	PIM_17_03
067 – Murphy	Impact of blasting upon the Warramboo cemetery. Impacts of blasting on old stone buildings and residences.	PIM_17_03 PIM_17_03
072 - name and address withheld	Impacts of blasting on old stone buildings and residences.	PIM_17_03
078 - name and address withheld	Impact of blasting results being within standards but above background and impacting upon human comfort.	IM_17_01

8.11.3 *Impact event assessment*

Section 8.0 of this report provides a description of DSD's process for assessing potential impact events. Appendix 3 of this report contains DSD's complete assessment of Iron Road's potential impact events, technical justifications and recommended regulatory responses. The following two tables in this section are based on DSD's complete assessment provided in Appendix 3.

Table 8.11.1 contains a summary of DSD's recommended regulatory responses for impact events that have been assessed by DSD to require: (1) environmental outcome(s) only (i.e. no other lease conditions/requirements), or (2) no environmental outcome.

Table 8.11.2 contains DSD's detailed assessment for impact events where DSD's recommended regulatory response includes the requirement for a combination of outcomes, strategies, criteria or conditions.

Table 8.11.1 – Summary of impact events where DSD recommends (1) outcome(s) only, or (2) no outcome(s) (see Appendix 3 for DSD's complete assessment)

Impact event ID	Iron Road Impact Event Description	DSD recommends that should a Lease be granted the following outcomes be a requirement of Schedule 6 of the Lease
PIM_17_02 PIM_17_03	*Vibration from construction and mining operations (excluding blasting) impacts on local residents (operations)* *Vibration from blasting operations impacts on off-lease structures (operations)*	DSD assesses that the evidence for the lack of a linkage between the source, pathway and receptor supports the requirement for no outcome. No outcomes are required.

Table 8.11.2 – Assessment of impact events where DSD recommends a combination of outcomes, strategy, criteria or conditions (see Appendix 3 for DSD's complete assessment)

Impact Event ID	DSD assessment of the impact event, source/pathway/receptor, strategies, proposed outcome and draft criteria
IM_17_01 IM_17_02	**IRD Impact Event** *Vibrations from blasting operations impact on local residents. (operations)* *Noise (air blast) impact to local residents as a result of blasting operations (operations)* **DSD Assessment of Source, Pathway, Receptor** The MP (p. 17-4) includes a description of the sensitive receptors used in the assessment of potential impacts from Airblast and Vibration. It is stated that "Any residential buildings within the proposed mine site were not taken into account in the noise and vibration assessment as the intent is for Iron Road or a subsidiary company to own all of the land within the mine site boundary prior to commencing works." The receptor for this impact event is 'local residents'. At the time of DSD's assessment of the mining application, the land access and land use for all areas within the proposed ML had not been finalised. Iron Road proposes to maximise the land available within the proposed ML for agricultural use (see Land use impact event PIM_21_01). Given that there is the potential for multiple land use within the Lease, there is uncertainty in relation to how close human receptors will be in relation to the open pit. Hence, for this impact event, DSD has considered that there is the potential for receptors within the lease boundary. There is no impact event that considers impacts from blasting on aircraft. The MP (p. 21-13) states that 'the use of aircraft for agricultural purposes has not been observed within the local study area'. Regional airports are located on the Eyre Peninsula, including at Wudinna. There is uncertainty in regards to the potential use of aircraft in proximity to the open pit, hence, it is assessed that an outcome is required for this impact event. (1) DSD confirms that the Source(s), pathway(s) and receptor(s) would exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required. **IRD proposed Outcome** *No adverse impact on public amenity from vibration or air overpressure caused by blasting.* **DSD Assessment of Outcome, Strategies and Uncertainty** The MP (p. 17-6) sets out control and management strategies for airblast and vibration which include: - Blasting procedures will be developed and implemented in accordance with AS2187.2-2006 - Initial noise and ground vibration monitoring will be performed to confirm compliance of blasting operation with the airblast and ground vibration criteria. The use of the word 'initial' implies that all blasts will not be monitored. This is not supported and it is required that all blasts will be monitored for compliance. A sixth schedule lease requirement is recommended in relation to development of strategies to ensure achievement of the blasting outcome. The strategies are appropriate and will be effective in ensuring achievement of the outcome.

Impact Event ID	DSD assessment of the impact event, source/pathway/receptor, strategies, proposed outcome and draft criteria
	Refer to the public safety section for an assessment of impacts to the public from flyrock (see PIM_07_22). (2) The outcome appropriately states the level of impact subsequent to controls. The outcome statement requires amendment to accurately reflect that the receptors for vibration impacts are human comfort and third party property. (3) The outcome is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. **DSD Recommended Regulatory Response – Outcome and Strategies** <u>(4) DSD recommends that should a lease be granted the following outcome be a requirement of Schedule 6 of the lease:</u> The Tenement Holder must during construction and operation, ensure that there are no adverse impacts to: • public safety, • human comfort, • third party property (including stock), • adjacent land use, • aircraft, or • other receptors, from airblast, flyrock and vibration caused by blasting. <u>DSD recommends that should a lease be granted the following be a requirement of Schedule 6 of the lease:</u> The Tenement Holder is required to address the following matters for the purposes of Regulation 65(2)(c) in relation to the blasting outcome; • Notify property owners or residents adjacent to and within the Land, subject to their consent, of all blasts no less than forty eight hours in advance of those blasts; • Develop strategies for the management of impacts from blasting, including the determination and requirement of blast exclusion zones, in accordance with relevant standards including the Australian Standard AS 2187.2; • Develop strategies for establishing and implementing a blast exclusion zone between any third party property or land use, and the designated blast area, for all blasting events during mining operations; • If required, develop strategies to ensure that a blast exclusion zone is maintained between the public and the designated blast area, for all blasting events during mining operations. • Develop a blasting protocol and blasting schedule in consultation with owners and residents of land within and adjacent the Land to reflect the needs of the adjacent land use practices. **IRD Proposed Measurement Criteria** *Vibration levels as a result of blasting activities are less than 5 mm/s peak particle velocity at the nearest sensitive receptor for 95 per cent of blasts per year, with a maximum of 10 mm/s peak particle velocity for any one blast, in accordance with Australian Standard AS2187.2.2006 Use of explosives.*

Impact Event ID	DSD assessment of the impact event, source/pathway/receptor, strategies, proposed outcome and draft criteria
	DSD Assessment of Draft Measurement Criteria Should a lease be granted, the measurement criteria would be finalised in the PEPR submission. (5) DSD considers that there are methodologies that are appropriate to demonstrate achievement of the outcome. DSD recommends that should a lease be granted the following criteria be a requirement of Schedule 6 of the lease: The Tenement Holder is required to address the following matters for the purposes of Regulation 65(2)(d) in relation to the blasting outcome; • All blasts must be monitored and measured for vibration and airblast overpressure; • Blasting criteria is set in accordance with the Australian Standard AS 2187.2; • Measurements taken to demonstrate achievement of the blasting outcome must be taken in accordance with Australian Standard AS2187.2. **IRD proposed Leading Indicator Criteria** *All complaints acknowledged in 48 hours and closed out within 14 days to the satisfaction of the complainant or as agreed with the Director of Mines.* **DSD Assessment of Leading Indicator Criteria** (6) Should a lease be granted, the leading criteria would be finalised in the PEPR.

8.11.4 *Summary of the recommended regulatory response*

DSD has assessed that all potential impacts associated with Airblast and Vibration during construction, operations and post-mine completion have been identified through this assessment and appropriate outcomes have been recommended for all potential impact events where the pre-control strategy consequence is greater than trivial. DSD has considered each of these outcomes and determined that they set an appropriate level of impact for sensitive receptors and the receiving environment during construction, operation and post-mine completion. DSD considers that these outcomes would be achievable following the successful implementation of control strategies and there are suitable methods available for measuring achievement of these outcomes.

8.12 Surface water

8.12.1 *Description of environment*

Rainfall data is available from Warramboo, Kyancutta and Koongawa with a representative mean annual rainfall calculated at 325.4 mm for the proposed ML area. Rainfall is predominantly during the winter months; however, summer storms can occur along with intense rainfall events. Evaporation rates are highest in summer and exceed average rainfall for all months of the year. Soil permeability varies across the proposed ML area with the majority of the soils being of medium permeability.

There are no streams or creek lines within the proposed ML area. Following rainfall most water infiltrates directly into the soil with some water pooling in the swales between sand dunes. Use of surface water in the area is limited to rain feeding crops and surface water collected in swales is not used due to salinity. There are a number of shallow salt lakes surrounding the proposed ML area, shown in the below diagram. These lakes are likely to be dependent upon surface water for periods of inundation.

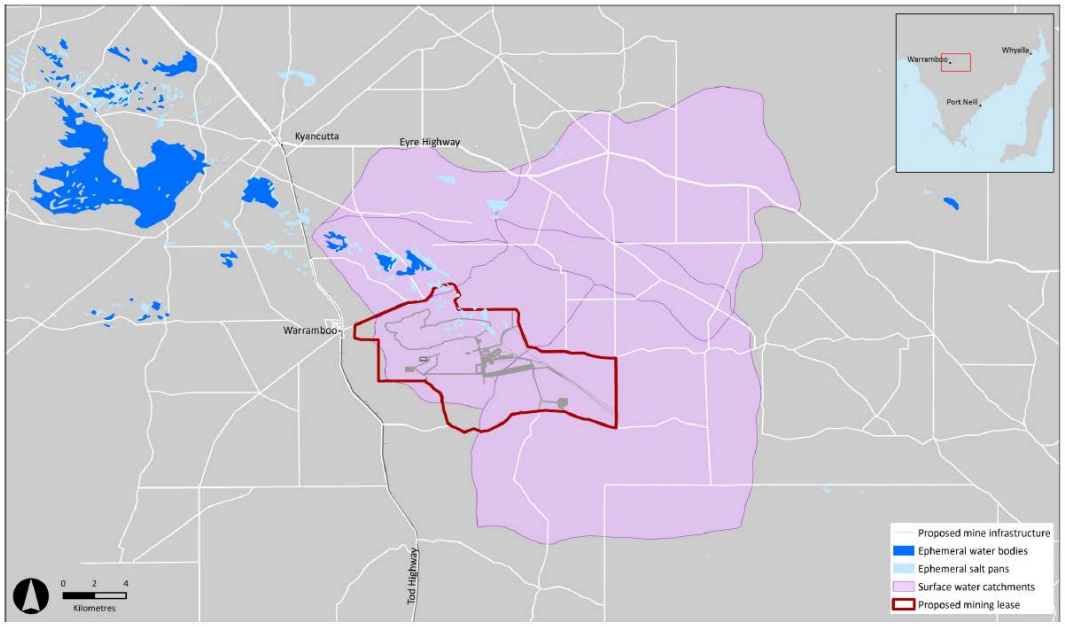

Figure 8.2 – Shallow salt lakes surrounding the proposed ML area

DSD considers the following as environmental values that may potentially be impacted by mining operations in relation to surface water:

- Native vegetation (especially vegetation located within shallow salt lakes)
- Agriculture
- Local surface water hydrology

DSD considers that the description of the existing environment in the Proposal is a suitable characterisation of the receiving environment which may be affected by mining operations.

8.12.2 *Views of affected parties*

The primary issues raised during statutory consultation are summarised below in Table 8.12 and are cross-referenced with the relevant Iron Road impact events. The cross referencing of the views of affected parties to Impact Event ID's enables a link between an issue raised and DSD's recommended regulatory response determined subsequently in this chapter. The Public Submission ID in the table below relates to the unique public submission number and the name of the submitter. If the submitter has requested privacy, then 'name and address withheld' is indicated in the table.

Table 8.12 – Impact events relating to issues raised during statutory consultation

Public submission ID	Issues raised	Where addressed – Impact Event ID
003 – Wetherby	Impact of surface water eroding topsoil/washing into IWL.	PIM_18_01
010 – Sampson	Impact of intense rainfall events on IWL increasing erosion. Impact of bunding failure surrounding IWL. Impact of surface water runoff from IWL moving saline water onto agricultural land.	PIM_18_01 IM_18_03 IM_18_02 PIM_18_03
018 – name and address withheld	Impact of surface water runoff from IWL moving saline water onto agricultural land.	PIM_18_03 IM_18_04
025 – O'Brien	Impact of surface water runoff from areas where saline water has been used impacting on surrounding land.	PIM_18_03 IM_18_04
027 – Triple B Nominees	Impact of surface water runoff from areas where saline water has been used impacting on surrounding land.	PIM_18_03 IM_18_04
028 - name and address withheld	Impact of surface water runoff from areas where saline water has been used impacting on surrounding land.	PIM_18_03 IM_18_04
068 – Murphy	Impact of rainfall events on IWL increasing erosion. Impact of surface water runoff from areas where saline water has been used impacting on surrounding land.	PIM_18_01 IM_18_03 PIM_18_03 IM_18_04
098 - name and address withheld	Impact of surface water runoff from areas where saline water has been used impacting on surrounding land. Impact of runoff from IWL introducing saline water and other contaminants to surrounding land.	PIM_18_03 IM_18_04 IM_18_01 IM_18_04
102 – TBRARA	Impact of surface water runoff from areas where saline water has been used impacting on surrounding land. Impact of rainfall leaching acid from IWL impacting upon soil quality.	PIM_18_03 IM_18_04 IM_18_01
104 – SIMGI	Impact of surface water runoff from areas where saline water has been used impacting on surrounding land.	PIM_18_03 IM_18_04

8.12.3 *Impact event assessment*

Section 8.0 of this report provides a description of DSD's process for assessing potential impact events. Appendix 3 of this report contains DSD's complete assessment of Iron Road's potential impact events, technical justifications and recommended regulatory responses. The following two tables in this section are based on DSD's complete assessment provided in Appendix 3.

Table 8.12.1 contains a summary of DSD's recommended regulatory responses for impact events that have been assessed by DSD to require: (1) environmental outcome(s) only (i.e. no other lease conditions/requirements), or (2) no environmental outcome.

Table 8.12.2 contains DSD's detailed assessment for impact events where DSD's recommended regulatory response includes the requirement for a combination of outcomes, strategies, criteria or conditions.

Table 8.12.1 – Summary of impact events where DSD recommends (1) outcome(s) only, or (2) no outcome(s) (see Appendix 3 for DSD's complete assessment)

Impact Event ID	Iron Road impact event description	DSD recommends that should a lease be granted the following outcomes be a requirement of Schedule 6 of the lease
PIM_18_01 PIM_18_03 PIM_18_04 PIM_18_05	*Sedimentation of surface water via erosion of IWL results in reduction in water quality (operation and post-mine completion)* *Saline runoff from mine infrastructure (roads and IWL) impacts surface water quality (operation)* *Interaction of surface water with pit shell results in poor water quality in pit lake (post-mine completion)* *Altered hydrological / hydrogeological regime impacts inundation periods at Lake Warramboo complex (operation and post-mine completion)*	DSD assesses that the evidence for the lack of a linkage between the source, pathway and receptor supports the requirement for no outcome. DSD agrees that surface water itself is not a receptor. No outcomes are required.

Table 8.12.2 – Assessment of impact events where DSD recommends a combination of outcomes, strategy, criteria or conditions (see Appendix 3 for DSD's complete assessment)

Impact Event ID	DSD assessment of the impact event, source/pathway/receptor, strategies, proposed outcome and draft criteria
IM_18_01 PIM_18_06 IM_18_02 IM_18_03 IM_18_04	**IRD Impact Event** *Contamination of surface water from acid metalliferous drainage on agricultural land. (post-mine completion)* *Interrupted or generated surface flows as a result of mine site facilities results in changes to local surface water. (operation)* *Flooding or release of contaminated surface water results in spread of contaminants and impacts on productive land or vegetation (operation and post-mine completion)* *Changes to surface water flows result in erosion and impacts on productive land or vegetation (operation and post-mine completion)* *Deposition of saline materials running off integrated waste landform results in salinisation of surface soils off the ML (operation and post-mine completion)* **DSD Assessment of Source, Pathway, Receptor** IM_18_01 Refer to PIM_13_07 and PIM_13_08 for an assessment of impacts from PAF, ASS and other contaminants on soils. The receptor in this impact event is 'agricultural land'. The pathway is through contamination of surface water which runs off into agricultural land. PIM_18_06 Refer to PIM_18_02 for an assessment of the potential for contaminated surface water to leave the lease. The MP Appendix H is the Hydrology and Surface water study (RPS - 8/10/2015) and provides the following conclusions and recommendations: • "Five swales have been identified in the proximity of the open pits and processing facilities ... Construction of drains to prevent ponding, subsequent increasing infiltration to the open pits, nuisance effects on surface infrastructure and geotechnical instability of the pit walls will be necessary to manage risks." (RPS 2015 pg 7 of 74) • "The IWL and the mine pits themselves could potentially modify small to medium sized drainage catchments." (RPS 2015 pg 7 of 74) • "The IWL will be constructed progressively and will cover five sub-catchments that naturally drain to swales along the southern mine lease boundary and one that partially drains internally. Completion of minor earthwork to create bunds along low points in swales in this area will be sufficient to mitigate any risks of water moving beyond the mine lease boundary prior to IWL construction." (RPS 2015 pg 7 of 74) The RPS report indicates that there will be sufficient change to local surface water hydrology to require surface water infrastructure to be designed, constructed and maintained during construction, operation and post-mine completion. An outcome is required for this impact event. IM_18_02 Refer to PIM_18_02 for an assessment of the potential for contaminated surface water to leave the lease.

Impact Event ID	DSD assessment of the impact event, source/pathway/receptor, strategies, proposed outcome and draft criteria
	Refer to PIM_13_07 and PIM_13_08 for an assessment of impacts from PAF, ASS and other contaminants on soils. IM_18_03 & IM_18_04 Refer to PIM_18_02 for an assessment of the potential for contaminated surface water to leave the lease. (1) DSD confirms that the Source(s), pathway(s) and receptor(s) would exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required. **IRD proposed Outcome** *No impacts to agricultural productivity for third party land users on or off the lease during construction, operation and post-mine completion, including:* • *reduction in crop yield* • *reduction in grain quality* • *adverse health impacts to livestock* *other than those agreed between the tenement holder and the affected user.* *No adverse impacts on soil quality or quantity that could compromise the post mining land use within the ML or existing land use outside the mining lease.* **DSD Assessment of Outcome, Strategies and Uncertainty** The MP (p. 18-11) states the proposed control and management strategies for surface water. The MP (p. 18-12) provides an impact assessment for the potential contamination of Surface water from chemicals, hydrocarbons and PAF. The MP (p. 18-13) provides an impact assessment for the potential disturbance of existing Surface water flow regimes (relates to subsequent impact events). The MP (p. 18-14) provides an impact assessment for the potential salinisation of Surface water (relates to subsequent impact events). Proposed strategies stated in Iron Roads impact assessment table (MP Appendix C) are "buffering potential in other waste rock and a bund around the IWL if needed". The MP Appendix H is the Hydrology and Surface water study (RPS - 8/10/2015) and provides the following conclusions and recommendations: • "Five swales have been identified in the proximity of the open pits and processing facilities, namely swales S9, S10, S16, S19 and S20 (see Figure 7). Construction of drains to prevent ponding, subsequent increasing infiltration to the open pits, nuisance effects on surface infrastructure and geotechnical instability of the pit walls will be necessary to manage risks." (RPS pg 7 of 74) • "The Integrated Waste Landform (IWL) and the mine pits themselves could potentially modify small to medium sized drainage catchments." (RPS pg 7 of 74) • "The IWL will be constructed progressively and will cover five sub-catchments that naturally drain to swales along the southern mine lease boundary and one that partially drains internally. Completion of minor earthwork to create bunds along low points in swales in this area will be sufficient to mitigate any risks of water moving beyond the mine lease boundary prior to IWL construction." (RPS pg 7 of 74)

Impact Event ID	DSD assessment of the impact event, source/pathway/receptor, strategies, proposed outcome and draft criteria
	• "Construction of a broad collection drain along the perimeter of the IWL will ensure that any runoff from the revegetated batter on the first lift of the IWL will be contained on site and dissipated at natural low points in a similar process to what happens with other swales in pre-mining condition (i.e. infiltration and evaporation)." (RPS pg 8 of 74) • "The storage volume available within low points along this drain will also be complemented by the bunds that are proposed for containing swale storage prior to construction of the waste landform. The actual storage volume available will need to be determined on a rolling basis as the IWL is constructed. This is because the volume of runoff and the storage location will change regularly during mine operation". (RPS pg 8 of 74) • "The volumes of water expected under a range of scenarios have been calculated and are manageable." (RPS pg 8 of 74) • "It is recommended as good practice that a minimum degree of erosion protection be provided in any IWL drains and service roads. Similar protection is recommended for the bund around the open pit excavation, in particular the 325 m section of the southern side of Murphys Pit in contact with swales S19 and S20. The typical protection works should consist of a layer of rock (75 to 150mm equivalent diameter) with separating geotextile underlying it. The design requirements for the drainage protection are described in Section 6." (RPS pg 8 of 74) • "The only areas of the IWL that will generate runoff on the mine lease boundary side will be the outside batters which will be covered with a topsoil layer to support revegetation (as shown in Figure 25). Any runoff arising from this outside batter will move toward the ML buffer zone and potentially off-lease without intervention. The volume of water running off from this area (approx. 10,300m x ~250m = 257 ha), when the first lift of the IWL is fully developed, has been determined for a dry, average and wet scenario, as shown in Table 18." (RPS pg 58 of 74) • "These runoff volumes, generally around 20 - 25 ML/month in the average winter months but peaking at 81 ML/month (June 1968), will be contained within a level, dyked batter toe collection sump at the base of the first lift of the IWL. This collection sump will extend the full length of the IWL batter, a length of around 10,300m. The progressive construction of the IWL means that the storage volume in the sump will need to be available as the project progresses. Intermittent dykes will prevent any movement of water along the sump, with suggested intervals of 1,000m. The runoff retained within the collection sump is assumed to dissipate via evaporation in the same way that swales operate for pre-mining conditions". (RPS pg 59 of 74) • "To contain this volume the typical collection sump dimensions will need to be in the order of 15m wide and 1.5m deep (1v:2h batters; depth inclusive of 0.2m freeboard) in order to provide enough winter storage for the wet year winter period. It is assumed that this volume will dissipate quickly without ongoing rainfall." (RPS pg 59 of 74) • "Regular operational decisions will need to be made as the IWL is constructed to manage available storage volumes within the mine lease." (RPS pg 59 of 74) All conclusions and recommendations from the RPS report must be actioned and these are to be included as requirements of the sixth schedule of the lease. The RPS report describes significant surface water infrastructure that is required to ensure that surface water does not impact on adjacent land. This is particularly the case to the south of the IWL where surface water infrastructure will also be required to prevent impacts to a road. The strategies put forward by RPS are appropriate and effective. The mine phase for this impact event includes 'post-mine completion'. The MP (P. 18-13) states the "at completion... run off will be directed into the mine pit and combine with saline groundwater in the pit. As this alteration in flow does not impact upon any receptors dependent on surface water, the impact to

Impact Event ID	DSD assessment of the impact event, source/pathway/receptor, strategies, proposed outcome and draft criteria
	surface water flows are considered to be negligible". There is insufficient detail in regards to the closure design for surface water infrastructure, how the infrastructure will perform in the long term and if any ongoing maintenance of this infrastructure is required. (2) The outcome appropriately states the level of impact subsequent to controls. A new outcome is required to reflect the broader receptor of third party land use and property. (3) The outcome is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. **DSD Recommended Regulatory Response – Outcome and Strategies** <u>(4) DSD recommends that should a lease be granted the following be conditions of Schedule 2 of the lease:</u> The Tenement Holder must: • Ensure no surface water contaminated (including sedimentation) as a result of mining operations leaves the Land. The Tenement Holder must: • Ensure that, apart from water contained in the pit void: - no surface water contaminated (including sedimentation) prior to mine completion remains within the Land after mine completion; and - no contamination of surface water (including sedimentation) occurs after mine completion as a result of mining operations within the Land. The Tenement Holder must ensure: • mining operations do not cause inundation (by water) of third party property and infrastructure off the Land (to a greater extent than would be expected to occur prior to mining operations commencing) • mining operations do not cause inundation (by water) of third party property and infrastructure on the Land (to a greater extent than would be expected to occur prior to mining operations commencing) unless the Tenement Holder has obtained a Waiver of Exemption under the Act to undertake mining activities (inclusive of inundation) on that particular land; and • inundation of third party property and infrastructure by water (to a greater extent than would be expected to occur prior to mining operations commencing) after mine completion is not caused by mining operations. <u>DSD recommends that should a lease be granted the following outcome be a requirement of Schedule 6 of the lease:</u> The Tenement Holder must during construction, operation and post-mine completion, ensure no impacts to agricultural productivity, including but not limited to; • reduction in crop yield; • reduction in grain quality; or

Impact Event ID	DSD assessment of the impact event, source/pathway/receptor, strategies, proposed outcome and draft criteria
	• adverse health impacts to livestock; for third party land users on or off the Land as a result of surface water contamination and/or inundation from mining operations, other than those agreed between the Tenement Holder and the affected user. <u>DSD recommends that should a lease be granted the following be a requirement of Schedule 6 of the lease:</u> The Tenement Holder is required to address the following matters for the purposes of Regulation 65(2)(c) in relation to the surface water outcome: • Address all conclusions, actions and recommendations included in Appendix H of the Mining Proposal ("CEIP - Hydrology and Surface Water Management Study - 8/10/2015 (RPS)"); The Tenement Holder must ensure that: - mining operations do not cause inundation (by water) of third party property and infrastructure on the Land (to a greater extent than would be expected to occur prior to mining operations commencing) unless the Tenement Holder has obtained a Waiver of Exemption under the Act to undertake mining activities (inclusive of inundation); and - inundation of third party property and infrastructure by water (to a greater extent than would be expected to occur prior to mining operations commencing) after mine completion is not caused by mining operations. • Ensure no surface water contaminated (including sedimentation) as a result of mining operations leaves the Land; • Ensure that, apart from water contained in the pit void: - no surface water contaminated (including sedimentation) prior to mine completion remains within the Land after mine completion; and - no contamination of surface water (including sedimentation) occurs after mine completion as a result of mining operations within the Land. • Design and construct surface water infrastructure, including IWL surface water controls, to ensure achievement of the surface water outcome post-mine completion and in the long term. • A plan for establishing appropriate mechanisms to ensure effective transfer of responsibility for any maintenance of surface water infrastructure post-mine completion. **IRD Proposed Measurement Criteria** *Survey demonstrates no surface water runoff from the IWL is leaving the ML boundary.* **DSD Assessment of Draft Measurement Criteria** Additional measurement criteria could also be considered for this outcome. Amendments to the criteria are required to ensure that it meets the requirements of Regulation 65(2)(d) and includes all of the required elements of criteria. DSD considers that there are methodologies that are appropriate to demonstrate achievement of the outcome.

Impact Event ID	DSD assessment of the impact event, source/pathway/receptor, strategies, proposed outcome and draft criteria
	Should a lease be granted, the measurement criteria would be finalised in the PEPR submission. (5) DSD considers the proposed draft measurement criteria to be an appropriate measurement to demonstrate achievement of the proposed outcome. **IRD proposed Leading Indicator Criteria** *None proposed* **DSD Assessment of Leading Indicator Criteria** (6) Should a lease be granted, the requirement for a leading indicator criteria would be finalised in the PEPR.

8.12.4 *Summary of the recommended regulatory response*

DSD has assessed that all potential impacts associated with Surface Water during construction, operations and post-mine completion have been identified through this assessment and appropriate outcomes have been recommended for all potential impact events where the pre-control strategy consequence is greater than trivial. DSD has considered each of these outcomes and determined that they set an appropriate level of impact for sensitive receptors and the receiving environment during construction, operation and post-mine completion. DSD considers that these outcomes would be achievable following the successful implementation of control strategies and there are suitable methods available for measuring achievement of these outcomes.

8.13 Groundwater

8.13.1 *Description of environment*

The groundwater study for the proposed ML is constrained to the immediate area/region of the proposed mine. It should be noted that a borefield to supply water to the mine is proposed as a part of the infrastructure development application under the *Development Act 1993* and is described in the EIS. The potential impacts from the water supply borefield are not within the scope of this assessment.

The Eyre Peninsula's groundwater is influenced by four geological elements:

- Quaternary – dunes with calcrete horizons underneath.
- Tertiary – clays and silts acting as aquitards or confining layers and unconfined layers made up of coarse fluvial and marine facies.
- Jurassic – the Polda trough approximately 30km to the southwest of the proposed mine
- Archean – basement rock. Weathered gneiss and clays underlain by fractured metamorphic rocks consisting of magnetite, gneiss and schist.

Local to the area of the proposed mining lease, groundwater in the Tertiary sediment aquifer and the Archean basement fractured rock aquifer has been interpreted to flow to the southwest, trending to the south. Groundwater recharge is inferred to originate from an area between Pinkawillinie and Hambidge Conservation Parks. More immediate to the proposed ML area, shallow groundwater discharges to salt lakes where water is lost through evaporation.

Salinity in the tertiary aquifer ranges from 35,000 to 53,000 mg/L whilst groundwater salinity in the fractured basement aquifer ranges from 113,000 to 150,000 mg/L. Iron Road state that they cannot find evidence the existence of any bores containing groundwater suitable for agricultural purposes within 20 km of the proposed mining lease.

The IWL is anticipated to contribute 50 mm/yr to groundwater during construction and following progressive rehabilitation, seepage is predicted to reduce to 6 mm/yr.

Post-mine completion, the mine open pit is proposed to remain open and a hypersaline pit lake is expected to form, stabilising at 350 m below ground level. Studies have concluded that the pit lake is expected to become hypersaline and not acidified due to acid neutralising capacity of the pit walls surrounding the discontinuous PAF zones. After 1000 years, it is expected that the cone of depression will stabilise and extend no more than 10 km from the mine open pit.

Iron Road has identified the following as environmental values that have the potential to be impacted by mining operations in relation to groundwater:

- Groundwater dependent ecosystems – Lake Warramboo and associated salt lakes,
- Agriculture

DSD considers that the description of the existing environment in the Proposal is a suitable characterisation of the receiving environment which may be affected by mining operations.

8.13.2 *Views of affected parties*

The primary issues raised during statutory consultation are summarised below in Table 8.13 and are cross-referenced with the relevant Iron Road impact events. The cross referencing of the views of affected parties to Impact Event ID's enables a link between an issue raised and DSD's recommended regulatory response determined subsequently in this chapter. The Public Submission ID in the table below relates to the unique public submission number and the name of the submitter. If the submitter has requested privacy, then 'name and address withheld' is indicated in the table.

Table 8.13 – Impact events relating to issues raised during statutory consultation

Public submission ID	Issues raised	Where addressed – Impact Event ID
017 - name and address withheld	• Cross contamination from local hyper saline ground water into Polder basin	PIM_19_09 PIM_19_10
023 - name and address withheld	• Replacement of Eyre Peninsula groundwater supplies after extraction for CEIP	This is addressed in the EIS review.
025 - O'Brien	• Cross contamination from local hyper saline ground water into Polder basin	PIM_19_09 PIM_19_10
027 – Triple B Nominees	• Cross contamination from local hyper saline ground water into Polder basin • Seepage of salt water into ground	PIM_19_09 PIM_19_10 IM_19_04 IM_19_05
058 - name and address withheld	• Seepage of salt water into ground	IM_19_04 IM_19_05
082 - Fechner	• Mine dewatering cone of depression for groundwater will alleviate local dryland salinity.	PIM_19_03 IM_19_02
096 - SIMGI	• Groundwater rise due to seepage from IWL	IM_19_04 IM_19_05
098 - name and address withheld	• Permanent groundwater drawdown around pit will have a negative effect on wetland vegetation surrounding the mine	PIM_19_03 PIM_19_15
102 - TBRARA	• Querying basis for conclusion that mine pit lake will take approximately 1000 years to stabilise. • Cumulative impacts of mine dewatering and Kielpa borefields and requirements for environmental flows reliant on groundwater. • Mine dewatering expected to impact local GDEs – no studies to investigate extent of impact to GDEs.	PIM_19_09 PIM_19_10 PIM_19_03 PIM_19_15

8.13.3 *Impact event assessment*

Section 8.0 of this report provides a description of DSD's process for assessing potential impact events. Appendix 3 of this report contains DSD's complete assessment of Iron Road's potential impact events, technical justifications and recommended regulatory responses. The following two tables in this section are based on DSD's complete assessment provided in Appendix 3.

Table 8.13.1 contains a summary of DSD's recommended regulatory responses for impact events that have been assessed by DSD to require: (1) environmental outcome(s) only (i.e. no other lease conditions/requirements), or (2) no environmental outcome.

Table 8.13.2 contains DSD's detailed assessment for impact events where DSD's recommended regulatory response includes the requirement for a combination of outcomes, strategies, criteria or conditions.

Table 8.13.1 – Summary of impact events where DSD recommends (1) outcome(s) only, or (2) no outcome(s) (see Appendix 3 for DSD's complete assessment)

Impact Event ID	Iron Road impact event description	DSD recommends that should a lease be granted the following outcomes be a requirement of Schedule 6 of the lease
PIM_19_01 PIM_19_04 PIM_19_05 PIM_19_09 PIM_19_10 PIM_19_11 PIM_19_12 PIM_19_13 PIM_19_14 PIM_19_15 PIM_19_16	*Lowered groundwater table on-lease as a result of pit dewatering results in loss of agricultural values (existing bore users and agricultural land).(operational)* *Lowered groundwater table off-lease as a result of pit dewatering results in loss of agricultural values (existing bore users and agricultural land) (operational)* *Lowered groundwater table as a result of evaporation from the pit following mine closure results in loss of environmental values (post-mine completion)* *Reduced quality of regional 'fresh' groundwater resources (e.g. Polda Basin) as a result of salinization of local GW via evaporation (operational)* *Reduced quantity of regional 'fresh' GW resources (e.g. Polda Basin) as a result of GW extraction or dewatering at the mine (operational)* *Infiltration and seepage from IWL leads to salinisation of GW and further salinisation of productive land (operational)* *Contamination of groundwater from metalliferous drainage or elemental toxicities from IWL results in impacts on*	DSD assesses that the evidence for the lack of a linkage between the source, pathway and receptor supports the requirement for no outcome. No outcomes are required.

Impact Event ID	Iron Road impact event description	DSD recommends that should a lease be granted the following outcomes be a requirement of Schedule 6 of the lease
	productive land (operational and post-mine completion) *Acid metalliferous drainage impacting on groundwater results in impacts on productive land (operational and post-mine completion)* *Changes to groundwater processes due to soil compaction under IWL result in impacts on productive land (operational and post-mine completion)* *Altered hydrological / hydrogeological regime impacts inundation periods at Lake Warramboo complex (operational and post-mine completion)* *Lowered groundwater table as a result of pit dewatering results in loss of environmental values (GDEs) (operational and post-mine completion)*	

Table 8.13.2 – Assessment of impact events where DSD recommends a combination of outcomes, strategy, criteria or conditions (see Appendix 3 for DSD's complete assessment)

Impact Event ID	DSD assessment of the impact event, source/pathway/receptor, strategies, proposed outcome and draft criteria
IM_19_04 IM_19_05	**IRD Impact Event** *High levels of permeability in IWL leads to localised elevated groundwater table outside of ML and impacts on productive land. (operation and post-mine completion)* *High levels of permeability in IWL leads to localised elevated groundwater table within ML and impacts on productive land (operation and post-mine completion)* **DSD Assessment of Source, Pathway, Receptor** The receptor for this impact event is 'productive agricultural land' outside of the proposed mining lease. (1) DSD confirms that the Source(s), pathway(s) and receptor(s) would exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required. **IRD proposed Outcome** *No impacts to agricultural productivity for third party land users as a result of groundwater recharge from the IWL, including:* • *Reduction in crop yield;* • *reduction in grain quality; or* • *adverse health impacts to livestock* *other than where agreed between the tenement holder and the affected user.* **DSD Assessment of Outcome, Strategies and Uncertainty** The MP (p. 19-33) describes the proposed control and management strategies for groundwater. The MP (p. 19-35) described the assessment of impacts on agriculture caused by the potential for recharge from the IWL to increase groundwater levels and salinity. The Iron Road impact assessment table (MP Appendix C) states the following, "seepage modelling indicates a low level of seepage which results in a small elevation of local groundwater table (33-50 mm per year) for life of mine." The following additional control strategies are proposed, "groundwater in region of IWL is between 13 m and 15 m below ground level" and "undertake groundwater monitoring once IWL established to verify seepage rates and impact on groundwater level". Post-mine completion, the groundwater modelling predicts that the open pit will act as a permanent sink. Seepage from the IWL post-mine completion will be directed to the pit. It is recommended that groundwater monitoring (as proposed by Iron Road) is included as a requirement of the sixth schedule of the lease. The Iron Road Response Document (Attachment B) Issue #14 also includes a discussion on relevant to this impact event.

Impact Event ID	DSD assessment of the impact event, source/pathway/receptor, strategies, proposed outcome and draft criteria
	(2) The outcome appropriately states the level of impact subsequent to controls. An additional outcome is required to reflect that the receptor includes all third party land use and property (see regulatory response). (3) The outcome is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. **DSD Recommended Regulatory Response – Outcome and Strategies** <u>(4) DSD recommends that should a lease be granted the following outcomes be a requirement of Schedule 6 of the lease:</u> The Tenement Holder must during construction, operation and post-mine completion, ensure no impacts to agricultural productivity, including but not limited to; • reduction in crop yield; • reduction in grain quality; or • adverse health impacts to livestock; for third party land users on or off the Land as a result of groundwater recharge from the IWL, other than those agreed between the Tenement Holder and the affected user. <u>DSD recommends that should a lease be granted the following be a requirement of Schedule 6 of the lease:</u> The Tenement Holder is required to address the following matters for the purposes of Regulation 65(2)(c) in relation to the groundwater outcome; • Undertake groundwater monitoring at appropriate locations once the IWL is established and during operations to validate the groundwater model and IWL seepage rates. **IRD Proposed Measurement Criteria** *Groundwater level rise due to seepage from the IWL is less than 2 metres above background, taking into account seasonal variation.* *Post closure, groundwater monitoring demonstrates that drawdown from the pit is negating any increase in groundwater level from IWL seepage.* **DSD Assessment of Draft Measurement Criteria** Amendments to the criteria are required to ensure that it meets the requirements of Regulation 65(2)(d) and includes all of the required elements of criteria. DSD recommends that the location of groundwater monitoring bores and the groundwater level used to demonstrate achievement of the outcome (ie: 2 m) is reviewed against groundwater modelling data to ensure that the locations and level are appropriate. The completion criteria requires amendment to meet the requirements of Regulation 65(2)(d).

Impact Event ID	DSD assessment of the impact event, source/pathway/receptor, strategies, proposed outcome and draft criteria
	DSD considers that there are methodologies that are appropriate to demonstrate achievement of the outcome. Should a lease be granted, the measurement criteria would be finalised in the PEPR submission. (5) DSD considers the proposed draft measurement criteria requires amendment to demonstrate achievement of the proposed outcome. **IRD proposed Leading Indicator Criteria** IM_19_04 *Groundwater monitoring results outside of the proposed ML boundary are in line with model predictions and seasonal variations.* IM_19_05 *Groundwater monitoring results within the proposed ML boundary are in line with model predictions and seasonal variations.* **DSD Assessment of Leading Indicator Criteria** (6) Should a lease be granted, the requirement for a leading indicator criteria would be finalised in the PEPR.

8.13.4 *Summary of the recommended regulatory response*

DSD has assessed that all potential impacts associated with Groundwater during construction, operations and post-mine completion have been identified through this assessment and appropriate outcomes have been recommended for all potential impact events where the pre-control strategy consequence is greater than trivial. DSD has considered each of these outcomes and determined that they set an appropriate level of impact for sensitive receptors and the receiving environment during construction, operation and post-mine completion. DSD considers that these outcomes would be achievable following the successful implementation of control strategies and there are suitable methods available for measuring achievement of these outcomes.

8.14 Visual amenity

8.14.1 *Description of environment*

The topography of the central Eyre Peninsula is dominated by north-west to south-east trending sand dune covered plains with several hilly areas. Iron Road undertook a Landscape and Visual Impact Assessment (LVIA) which identified areas where the mine would be visible due to the topography. The LVIA identified the following study area where there was a potential for impacts.

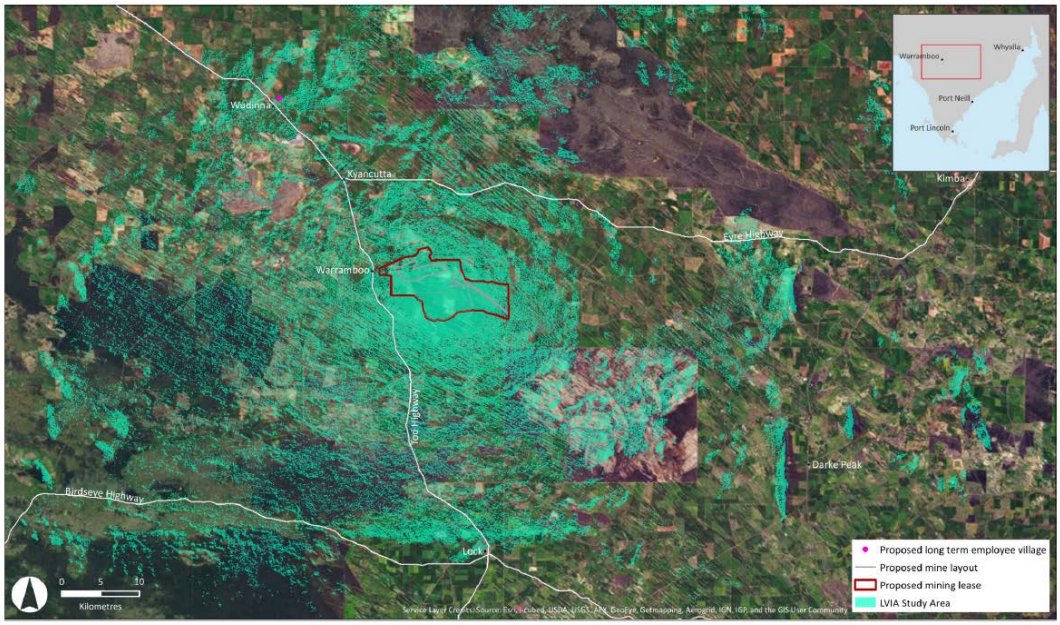

Figure 8.3 – LVIA study area showing proposed mining lease

This study area was then assessed on the basis of:

- Distance from the proposed mine
- Existing level of visual amenity at the viewpoint
- Exposure of the viewpoint.

This created a weighted viewpoint assessment from which a number of points were selected to create a visual representation of what operations would be seen from each point.

Iron Road has also assessed the impact on visual amenity for a number of nearby residences which have not been identified due to privacy reasons.

Iron Road has identified the following sensitive receptors for visual amenity:

- Users of major roads
  - Tod Highway
  - Eyre Highway
- Users of conservation areas
  - Hambidge Wilderness Protection Area
  - Darke Range
  - Mount Wudinna
- People within townships
  - Warramboo
  - Wudinna

    - Kyancutta
    - Lock
- Users of Groecke's Hill (Matthews Road, near the intersection with Mays Road)
- Private residences on land adjoining the proposed mining lease.

DSD considers that the description of the existing environment in the Proposal is a suitable characterisation of the receiving environment which may be affected by mining operations.

8.14.2 *Views of affected parties*

The primary issues raised during statutory consultation are summarised below in Table 8.14 and are cross-referenced with the relevant Iron Road impact events. The cross referencing of the views of affected parties to Impact Event ID's enables a link between an issue raised and DSD's recommended regulatory response determined subsequently in this chapter. The Public Submission ID in the table below relates to the unique public submission number and the name of the submitter. If the submitter has requested privacy, then 'name and address withheld' is indicated in the table.

Table 8.14 – Impact events relating to issues raised during statutory consultation

Public submission ID	Issues raised	Where addressed – Impact Event ID
003 – Wetherby	Concern Eyre Peninsula will become a moonscape.	IM_20_01- IM_20_06
010 – Sampson	Impact of light spill at residence. Visual impact of the IWL from residence.	IM_20_07 IM_20_02, IM_20_03
035 – Veitch	Impact of light spill at residence. Visual impact of the IWL from residence. Visual impact of landscape change (from IWL and pit) following closure.	IM_20_07 IM_20_02, IM_20_03
061 – Heagarty	Visual impact of the IWL from residence.	IM_20_02, IM_20_03
072 – name and address withheld	Impact of light spill at residence.	IM_20_07
099 – name and address withheld	Impact of light spill at residence.	IM_20_07

8.14.3 *Impact event assessment*

Section 8.0 of this report provides a description of DSD's process for assessing potential impact events. Appendix 3 of this report contains DSD's complete assessment of Iron Road's potential impact events, technical justifications and recommended regulatory responses. The following two tables in this section are based on DSD's complete assessment provided in Appendix 3.

Table 8.14.1 contains DSD's detailed assessment for impact events where DSD's recommended regulatory response includes the requirement for a combination of outcomes, strategies, criteria or conditions.

Table 8.14.1 – Assessment of impact events where DSD recommends a combination of outcomes, strategy, criteria or conditions (see Appendix 3 for DSD's complete assessment)

Impact Event ID	DSD assessment of the impact event, source/pathway/receptor, strategies, proposed outcome and draft criteria
IM_20_01 IM_20_02 IM_20_03 IM_20_04 IM_20_05 IM_20_06	**IRD Impact Event** *Reduced visual amenity from surrounding roads as a result of the mine development. (construction, operation and post-mine completion)* *Reduced visual amenity from nearby townships as a result of the mine development. (construction, operation and post-mine completion)* *Reduced visual amenity from private properties as a result of the mine development. (construction, operation and post-mine completion)* *Reduced visual amenity from surrounding roads as a result of loss of vegetation from the ML. (construction, operation)* *Reduced visual amenity from nearby townships as a result of loss of vegetation from the ML. (construction, operation)* *Reduced visual amenity from private properties as a result of loss of vegetation from the ML. (construction, operation)* **DSD Assessment of Source, Pathway, Receptor** (1) DSD confirms that the Source(s), pathway(s) and receptor(s) would exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required. **IRD proposed Outcome** *The form, contrasting aspects and reflective aspects of mining structures are visually softened to blend in with the surrounding landscape and, where the mine is visually dominant from a surrounding road, township or residence, the view is softened through the use of screening vegetation.* **DSD Assessment of Outcome, Strategies and Uncertainty** IM_20_01 - IM_20_04 The proposed strategies to manage the visual aesthetic of mining structures are readily achievable given established practices within industry. Successful achievement of the outcome requires concurrent application of a number of strategies. The MP (p. 20-22) states the proposed control and management strategies for Visual Amenity and DSD has assessed them to be appropriate. The following control measures are proposed in this table, "Significant distances exist from sensitive receptors to proposed mine lease boundary to infrastructure, targeted screening vegetation and revegetated IWL will screen mining infrastructure over time". DSD does not agree that there is a significant distance to surrounding roads and residential receptors to the south of the IWL (see MP p. 2-5, Figure 2-2). It is recommended that strategies for the management of visual amenity are developed in consultation with affected parties and that this be a requirement of the sixth schedule of the lease. IM_20_05 & IM_20_06 The proposed strategies to manage the visual aesthetic of mining structures are readily achievable given established practices within industry. Successful achievement of the outcome requires concurrent application of a number of strategies.

Impact Event ID	DSD assessment of the impact event, source/pathway/receptor, strategies, proposed outcome and draft criteria
	The MP (p. 20-22) states the proposed control and management strategies for Visual Amenity and DSD has assessed them to be appropriate. The following control measures are proposed in this table, "Limited vegetation in landscape, screening vegetation and revegetation following mining". It is recommended that strategies for the management of visual amenity are developed in consultation with affected parties and that this be a requirement of the sixth schedule of the lease. (2) The outcome appropriately states the level of impact subsequent to controls. The outcome statement requires amendment to remove the reference to a management strategy (screening vegetation). (3) The outcome, without reference to the management strategy, is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. **DSD Recommended Regulatory Response – Outcome and Strategies** (4) DSD recommends that should a lease be granted the following outcome be a requirement of Schedule 6 of the lease: The Tenement Holder must during construction, operation and post-mine completion, ensure that the form, contrasting aspects and reflective aspects of mining operations are visually softened to blend in with the surrounding landscape. DSD recommends that should a lease be granted the following be a requirement of Schedule 6 of the lease: The Tenement Holder is required to address the following matters for the purposes of Regulation 65(2)(c) in relation to the visual amenity outcome; Develop and implement strategies in consultation with affected parties for the management of visual amenity which should include (but not limited to): • Unless the Director of Mines (or other authorised officer) has approved (in writing) an alternative agreement between the Tenement Holder and a land owner relating to the removal of infrastructure, the Tenement Holder must ensure that all infrastructure is decommissioned and removed from the Land at mine completion; • Screening of prominent built structures and use of non-reflective, natural coloured materials; • Establishing vegetation and mature trees to screen built infrastructure and minimise views into the site (where agreed with landowners); • Positioning and design of permanent mine landforms or other earthen bunds to screen activities (where agreed with landowners); • Shape permanent mine landforms to soften the visual impact and reflect surrounding landscape; • Prompt rehabilitation of disturbed areas once no longer required for mining operations, utilising every available opportunity provided by the mine plan; • Progressive rehabilitation of the IWL; • Vegetate external faces of permanent mine landforms to reduce the impact of changes in landscape colour. **IRD Proposed Measurement Criteria** *Post construction audits of buildings and the IWL, confirm they are in line with the design parameters in the PEPR.*

Impact Event ID	DSD assessment of the impact event, source/pathway/receptor, strategies, proposed outcome and draft criteria
	Monitoring of screening vegetation confirms it has been established in accordance with the design parameters in the PEPR. *Ecosystem Function Analysis at representative sites on rehabilitated areas demonstrates that rehabilitation will achieve sustainability thresholds.* **DSD Assessment of Draft Measurement Criteria** (5) DSD considers that there are methodologies that are appropriate to demonstrate achievement of the outcome. Should a lease be granted, the measurement criteria would be finalised in the PEPR submission. **IRD proposed Leading Indicator Criteria** *None proposed* **DSD Assessment of Leading Indicator Criteria** (6) Should a lease be granted, the requirement for a leading indicator criteria would be finalised in the PEPR.
IM_20_07	**IRD Impact Event** *Lighting during operation (e.g. stacking) impacts local residents. (construction and operation)* **DSD Assessment of Source, Pathway, Receptor** (1) DSD confirms that the Source(s), pathway(s) and receptor(s) would exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required. **IRD proposed Outcome** *No public nuisance impacts from light spill generated by mining operations.* **DSD Assessment of Outcome, Strategies and Uncertainty** The MP (p. 20-24) states the assessment of impacts from Light Spill. The following control measures are proposed in this table, "Directional lighting and measures to reduce light spill, screening vegetation and community feedback on areas requiring more attention". There are residential receptors in close proximity to the proposed mine (see MP p. 2-5, Figure 2-2). It is recommended that strategies for the management of light spill are developed in consultation with affected parties and that this be a requirement of the sixth schedule of the lease. It is recommended that adherence to Australian Standard AS 4282-1997 Control of the obtrusive effects of outdoor lighting is a requirement of the sixth schedule of the lease. (2) The outcome appropriately states the level of impact subsequent to controls. The outcome requires minor amendment to reflect adjacent land use as the receptor. Public nuisance is captured by a residential 'land use'. (3) The outcome is assessed to be achievable given the proposed controls and identified assumptions and uncertainty.

Impact Event ID	DSD assessment of the impact event, source/pathway/receptor, strategies, proposed outcome and draft criteria
	DSD Recommended Regulatory Response – Outcome and Strategies (4) DSD recommends that should a lease be granted the following outcome be a requirement of Schedule 6 of the lease: The Tenement Holder must during construction and operation, ensure that there are no adverse impacts to third party land use as a result of light spill caused by mining operations. DSD recommends that should a lease be granted the following be a requirement of Schedule 6 of the lease: The Tenement Holder is required to address the following matters for the purposes of Regulation 65(2)(c) in relation to the light spill outcome; • Adhere to Australian Standard AS 4282-1997 Control of the obtrusive effects of outdoor lighting; and • Develop and implement strategies in consultation with affected parties for the management of Light Spill. **IRD Proposed Measurement Criteria** *Post construction site inspections show that fixed lighting meets the requirements of AS 4282-1997 Control of the obtrusive effects of outdoor lighting.* **DSD Assessment of Draft Measurement Criteria** (5) DSD considers that there are methodologies that are appropriate to demonstrate achievement of the outcome. Should a lease be granted, the measurement criteria would be finalised in the PEPR submission. **IRD proposed Leading Indicator Criteria** *None proposed.* **DSD Assessment of Leading Indicator Criteria** (6) Should a lease be granted, the requirement for a leading indicator criteria would be finalised in the PEPR.

8.14.4 *Summary of the recommended regulatory response*

DSD has assessed that all potential impacts associated with Visual Amenity during construction, operations and post-mine completion have been identified through this assessment and appropriate outcomes have been recommended for all potential impact events where the pre-control strategy consequence is greater than trivial. DSD has considered each of these outcomes and determined that they set an appropriate level of impact for sensitive receptors and the receiving environment during construction, operation and post-mine completion. DSD considers that these outcomes would be achievable following the successful implementation of control strategies and there are suitable methods available for measuring achievement of these outcomes.

8.15 Land use and tenure

8.15.1 *Description of environment*

Iron Road provided an overview of the existing environmental values relevant to land use and tenure within the proposed ML and the surrounding areas. Existing land use and tenure arrangements are summarised and Iron Road identifies how changes to land use practices during construction, operation and post-mine completion may impact on existing environmental values.

The land within the proposed ML covers an area of 8,458 ha and is held under freehold tenure. This land includes portions of four road reserves which are under the care, control and management of the Wudinna District Council (DC).

The current use of the land located within the proposed ML is dryland farming, including mixed crops such as wheat and barley. The area forms part of the Western Eyre Peninsula Agricultural District which was responsible for a total crop production of 932,850 tonnes in the 2013/14 season (PIRSA 2014).

The land is currently utilised for ongoing agricultural activity, including grazing and mixed crops such as wheat and barley. An area of remnant native vegetation, Vegetation Heritage Agreement 869 under the *Native Vegetation Act 1991* is within the area of the proposed mining lease. There are also scattered remnants of native vegetation on dune tops within the land that is cropped. Hambidge Wilderness Protection Area is approximately 3.8km southeast of the proposed mining lease.

Iron Road has had regard to relevant development plans, land tenure and land use information held on the South Australian government land information systems. Information gained from databases was validated with field visits and local knowledge.

Iron Road state that agricultural production is the predominant land use within the proposed ML as it is for the local region. Within and around the proposed ML are 53 residential properties with 3 dwellings identified as being within the proposed ML boundary. Warramboo Township is located 750m west of the proposed ML boundary.

DSD considers that the description of the existing environment (land use and tenure) in the Proposal is a suitable characterisation of the receiving environment which may be affected by mining operations.

8.15.2 *Views of affected parties*

The primary issues raised during statutory consultation are summarised below in Table 8.15 and are cross-referenced with the relevant Iron Road impact events. The cross referencing of the views of affected parties to Impact Event ID's enables a link between an issue raised and DSD's recommended regulatory response determined subsequently in this chapter. The Public Submission ID in the table below relates to the unique

public submission number and the name of the submitter. If the submitter has requested privacy, then 'name and address withheld' is indicated in the table.

Iron Road's consultation has highlighted the following concerns related to land use:

- Loss of property and livelihood
- The reduction of agricultural production on the Eyre Peninsula
- Residential land supply in Wudinna
- The state of the land following closure
- Loss of amenity and impacts to a rural lifestyle

Table 8.15 – Impact events relating to issues raised during statutory consultation

Public submission ID	Issues raised	Where addressed – Impact Event ID
001-Nield	Impacts to agricultural production on adjacent land Loss of productive agricultural land	IM_21_01 IM_21_05
003-Wetherby	Impacts to agricultural production on adjacent land Loss of productive agricultural land	IM_21_01 IM_21_05
010-Sampson	Impacts to agricultural production on adjacent land Impacts due to IWL failure Impacts due to IWL on adjacent land	IM_21_03 IM_21_04 IM_21_05
020-Sampson	Shading of adjacent agricultural land Impacts to agricultural production on adjacent land	IM_21_03 IM_21_04
022 – name and address withheld	Loss of productive agricultural land	IM_21_01 IM_21_05
028 – Name and address withheld	Loss of productive agricultural land	IM_21_01 IM_21_05
031 – Name and address withheld	Loss of productive agricultural land	IM_21_01 IM_21_05
071 – Name and address withheld	Impacts to agricultural production on adjacent land Loss of productive agricultural land	IM_21_01 IM_21_05
077-Nield	Impacts to agricultural production on adjacent land Loss of productive agricultural land	IM_21_01 IM_21_05
092 - Name and address withheld	Impacts to agricultural production on adjacent land Loss of productive agricultural land	IM_21_01 IM_21_05
093 - Name and address withheld	Impacts to agricultural production on adjacent land Loss of productive agricultural land	IM_21_01 IM_21_05
096 - SIMGI	Impacts to agricultural production on adjacent land Loss of productive agricultural land	IM_21_01 IM_21_05
102 – TBRARA	Impacts to agricultural production on adjacent land Loss of productive agricultural land	IM_21_01 IM_21_05

8.15.3 *Impact event assessment*

Section 8.0 of this report provides a description of DSD's process for assessing potential impact events. Appendix 3 of this report contains DSD's complete assessment of Iron Road's potential impact events, technical justifications and recommended regulatory responses. The following two tables in this section are based on DSD's complete assessment provided in Appendix 3.

Table 8.15.1 contains a summary of DSD's recommended regulatory responses for impact events that have been assessed by DSD to require: (1) environmental outcome(s) only (i.e. no other lease conditions/requirements), or (2) no environmental outcome.

Table 8.15.2 contains DSD's detailed assessment for impact events where DSD's recommended regulatory response includes the requirement for a combination of outcomes, strategies, criteria or conditions.

Table 8.15.1 – Summary of impact events where DSD recommends (1) outcome(s) only, or (2) no outcome(s) (see Appendix 3 for DSD's complete assessment)

Impact Event ID	Iron Road impact event description	DSD recommends that should a Lease be granted the following outcomes be a requirement of Schedule 6 of the Lease
IM_21_01	*Reduced area of productive land available for agriculture as a result of mine (construction, operation and post-mine completion)*	The Tenement Holder must during construction, operation and post-mine completion, ensure that there are no adverse impacts to third party land use or property, adjacent to and on the Land, as a result of mining operations, other than those agreed between the Tenement Holder and the affected user.
IM_21_02	*Post mining land use is not acceptable to stakeholders (post-mine completion)*	The Tenement Holder must ensure that the Land is progressively and finally rehabilitated to support the future land use. Before mine completion, the Tenement Holder must satisfy the Director of Mines (or other authorised officer) that where practicable, the pre-mining land use can be recommenced post-mine completion.
IM_21_03	*Loss of IWL stability results in slumping onto surrounding productive land or vegetation (operation and post-mine completion)*	The Tenement Holder must during construction, operation and post-mine completion, ensure that there are no adverse impacts to third party land use or property, adjacent to and on the Land, as a result of mining operations, other than those agreed between the Tenement Holder and the affected user. Note: Recommendations for strategies to ensure IWL stability are addressed against Soil outcomes (see PIM_13_04).

Table 8.15.2 – Assessment of impact events where DSD recommends a combination of outcomes, strategy, criteria or conditions (see Appendix 3 for DSD's complete assessment)

Impact Event ID	DSD assessment of the impact event, source/pathway/receptor, strategies, proposed outcome and draft criteria
IM_21_04	**IRD Impact Event** *Loss of IWL stability results in slumping onto surrounding productive land or vegetation (operation and post-mine completion)* **DSD Assessment of Source, Pathway, Receptor** Note: PIM_21_04 and PIM_21_05 consider potential impacts from IWL stability on land use. For the purpose of this assessment, lease requirements for the IWL in relation to stability have been consolidated against PIM_13_04 in the Soils Section. (1) DSD confirms that the Source(s), pathway(s) and receptor(s) would exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required. **IRD proposed Outcome** *Landform is geotechnically stable and safe* **DSD Assessment of Outcome, Strategies and Uncertainty** The assessment of this impact event is on p. 21-16 of the MP. "Ongoing rehabilitation trials and long term erosion modelling" are proposed as strategies which are appropriate. The requirement for rehabilitation trials will be assessed against outcomes for the IWL in the Soil section. Recommendations for additional strategies to ensure IWL stability are addressed against Soil outcomes (see PIM_13_04). The MP (p. 21-15) includes control and management strategies for land use and tenure, which include strategies for IWL stability. The assumption and uncertainty has been assessed as High due to the fact that the IWL design is conceptual. The requirement for detailed designs to ensure geotechnical stability of the IWL and cover are assessed against outcomes for the IWL in the soil and public safety sections. The requirement for peer review of the geotechnical design of the IWL has been included as a second schedule lease condition. Rehabilitation Trials for the IWL are proposed and are appropriate. QA/QC has also been proposed as a criteria which is also appropriate. The requirement for rehabilitation trials and QA/QC are assessed against outcomes for the IWL in the soil and public safety sections. Recommendations for strategies to ensure IWL stability are addressed against Soil outcomes (see PIM_13_04). (2) The outcome statement is a strategy. A new outcome (see regulatory response below) is required to accurately reflect the receptor (which is future land use). The strategy of ensuring geotechnical stability in the long term will be critical in achieving the future land use and public safety outcomes. The reference to 'vegetation' as a receptor is addressed by the outcome referring to land use. Potential impacts to vegetation are also addressed by the native vegetation outcomes. (3) The outcome recommended by DSD below is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. **DSD Recommended Regulatory Response – Outcome and Strategies** (4) DSD recommends that should a lease be granted the following outcomes be a requirement of Schedule 6 of the lease:

Impact Event ID	DSD assessment of the impact event, source/pathway/receptor, strategies, proposed outcome and draft criteria
	The Tenement Holder must during construction, operation and post-mine completion, ensure that there are no adverse impacts to third party land use or property, adjacent to and on the Land, as a result of mining operations, other than those agreed between the Tenement Holder and the affected user. The Tenement Holder must ensure that the Land is progressively and finally rehabilitated to support the future land use. <u>DSD recommends that should a lease be granted the following be a requirement of Schedule 6 of the lease:</u> The Tenement Holder is required to address the following matters for the purpose of Regulation 65(2)(c) in relation to the future land use outcomes: • The Tenement Holder must ensure that post-mine completion, all final mine landforms (including the IWL) will be chemically and physically stable in the long term. • Strategies for the establishment of post-mine completion land uses and areas, including the re-establishment of land for agriculture, must be consistent with the ML Proposal. Note: Recommendations for additional strategies to ensure IWL stability are addressed against Soil outcomes (see PIM_13_04). **IRD Proposed Measurement Criteria** *Ecosystem Function Analysis at representative sites on rehabilitated areas demonstrates that rehabilitation will achieve sustainability thresholds.* *Landform modelling based on established integrated waste landform material parameters and geometry confirm alignment with outcomes from conceptual modelling.* *Independent audit at mine completion of quality assurance data confirms the IWL has been constructed to design specifications.* **DSD Assessment of Draft Measurement Criteria** (5) DSD considers that there are methodologies that are appropriate to demonstrate achievement of the outcome. Should a lease be granted, the measurement criteria would be finalised in the PEPR submission. **IRD Proposed Leading Indicator Criteria** *None proposed* **DSD Assessment of Leading Indicator Criteria** (6) Should a lease be granted, the requirement for a leading indicator criteria would be finalised in the PEPR.
IM_21_05	**IRD Impact Event** *Land quality reduced off-lease as a consequence of microclimatic changes adjacent IWL (wind, shade) (operation and post-mine completion)* **DSD Assessment of Source, Pathway, Receptor** The impact event refers to 'wind', however, the evidence provided by Iron Road relates to 'shading' (MP p. 21-17, 21-18 and 21-19). DSD has only considered 'shading' as the pathway for impact from the IWL to the adjoining agricultural land use. Refer to PIM_13_11 for an additional impact event that refers to on-lease impacts.

Impact Event ID	DSD assessment of the impact event, source/pathway/receptor, strategies, proposed outcome and draft criteria
	(1) DSD confirms that the Source(s), pathway(s) and receptor(s) would exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required. **IRD proposed Outcome** *No impacts to agricultural productivity for third party land users as a result of mining operations, including:* • *reduction in crop yield;* • *reduction in grain quality; or* • *adverse health impacts to livestock* *other than where agreed between the tenement holder and the affected user.* **DSD Assessment of Outcome, Strategies and Uncertainty** The MP (p. 21-17 and Figures 21-4 and 21-5) summarises the assessment for impacts to land use from shading from the IWL. The impact assessment shows that shading will have impact the amount of sunlight available to properties adjacent to the IWL (both on and off the proposed lease). The environmental outcome proposed by Iron Road commits to 'no impacts to agricultural productivity, including, crop yield, grain quality and livestock' other than those impacts agreed with the affected users. This outcome is appropriate and achievable given that any impact must be agreed with affected users. The 'IWL design' has been stated by Iron Road as a key control strategy. As the IWL progresses from a conceptual design to a detailed design, it is recommended that shading be further considered. A sixth schedule lease condition is recommended in regards to shading. (2) The outcome appropriately states the level of impact subsequent to controls. (3) The outcome is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. **DSD Recommended Regulatory Response – Outcome and Strategies** <u>(4) DSD recommends that should a lease be granted the following outcomes be a requirement of Schedule 6 of the lease:</u> The Tenement Holder must during construction, operation and post-mine completion, ensure no impacts to agricultural productivity, including but not limited to; • reduction in crop yield; • reduction in grain quality; or • adverse health impacts to livestock; for third party land users on or off the Land as a result of shading from mining operations, other than those agreed between the Tenement Holder and the affected user. <u>DSD recommends that should a lease be granted the following be a requirement of Schedule 6 of the lease:</u> The Tenement Holder is required to address the following matters for the purposes of Regulation 65(2)(c) in relation to the shading outcome; Develop strategies for the design of the IWL to ensure impacts from shading to agricultural productivity for third party land users on or off the Land are as low as reasonably practicable.

Impact Event ID	DSD assessment of the impact event, source/pathway/receptor, strategies, proposed outcome and draft criteria
	IRD Proposed Measurement Criteria *Crop yields on areas outside of the proposed ML are comparable with adjacent properties or compensation is duly paid.* **DSD Assessment of Draft Measurement Criteria** DSD considers that there are methodologies that are appropriate to demonstrate achievement of the outcome. Should a lease be granted, the measurement criteria would be finalised in the PEPR submission. (5) The measurement of compensation as a criteria is not appropriate. The measurement of crop yield and quality is appropriate as this directly measures the impact on the receptor. **IRD Proposed Leading Indicator Criteria** None Proposed **DSD Assessment of Leading Indicator Criteria** (6) Should a lease be granted, the requirement for a leading indicator criteria would be finalised in the PEPR.

8.15.4 *Summary of the recommended regulatory response*

DSD has assessed that all potential impacts associated with Land Use and Tenure during construction, operations and post-mine completion have been identified through this assessment and appropriate outcomes have been recommended for all potential impact events where the pre-control strategy consequence is greater than trivial. DSD has considered each of these outcomes and determined that they set an appropriate level of impact for Land Use/Tenure and the receiving environment during construction, operation and post-mine completion. DSD considers that these outcomes would be achievable following the successful implementation of control strategies and there are suitable methods available for measuring achievement of these outcomes.

8.16 Summary of recommended regulatory response

DSD has assessed that all potential impacts to sensitive receptors and the receiving environment for all environmental aspects during construction, operations and post-mine completion have been identified through this assessment and appropriate outcomes have been recommended for all impact events where the primary consequence is higher than trivial.

DSD has considered each of these outcomes and determined that they also set an appropriate level of impact for sensitive receptors and the receiving environment during construction, operation and post-mine completion. DSD considers that these outcomes would be achievable following the successful implementation of control strategies and that there are suitable methods available for measuring achievement of these outcomes.

A complete list of the recommended regulatory response resulting from the environmental assessment is provided in **Appendix 2** of this report.

8.17 Other regulatory terms and conditions

DSD has assessed all potential impacts to the environment during construction, operations and post-mine completion and appropriate environmental outcomes have been recommended for all primary impact events where the severity of the primary consequence is greater than trivial. DSD has determined each of these environmental outcomes to be both achievable and measurable.

DSD considers that additional terms and conditions are necessary for inclusion on the mineral lease which are required to ensure achievement of the environmental outcomes.

DSD recommends that should a lease be granted the following be prescribed as terms and conditions of the **Mineral Lease:**

FIRST SCHEDULE

RECOMMENDED ADDITIONAL TERMS

Explanatory note: A term is a clause that gives a right to a Mining Tenement.

Authorised Mining Operations

1. The grant of the Mining Tenement authorises mining operations (only) for the recovery of Iron Ore – Magnetite.
2. The grant of the Mining Tenement authorises mining operations (only) that are consistent with the mining operations described in the Mining Lease Proposal document dated 5 November 2015 and subsequent Response Document dated October 2016.

SECOND SCHEDULE

RECOMMENDED ADDITIONAL CONDITIONS

Explanatory note: A condition is a clause that imposes a restriction on a Mining Tenement.

Land Access

1. For the purposes of this Additional Condition:
   1.1. 'Preliminary mining operations' means: -
      1.1.1. Baseline environmental data collection (particularly if this is required for the development of measurement criteria):
      1.1.2. Ongoing environmental impact assessments (particularly if this is required for the development of measurement criteria);
      1.1.3. Site works to support any metallurgical test work or trials;
      1.1.4. Geotechnical and soil investigations to support the detailed design of the IWL or other infrastructure;
      1.1.5. Additional mineral resource definition and sterilisation investigations; or
      1.1.6. Any other activity determined in writing by the Director of Mines (including an activity that is defined below as a principal mining operation).
   1.2. 'Principal mining operations' means: -
      1.2.1. Pre-strip and mining of the open pits;
      1.2.2. Preparation and construction of the IWL;
      1.2.3. Construction of the ore processing facility;
      1.2.4. Construction of the concentrate handling facility;
      1.2.5. Construction of the rail infrastructure on the Land;
      1.2.6. Any pre-strip or early earthworks relating to any of the above activities; or
      1.2.7. Any variation to this definition as determined in writing by the Director of Mines.
   1.3. The Tenement Holder may carry out preliminary mining operations on any exempt land after it has obtained a waiver of exemption (whether by agreement with every person who has the benefit of the exemption, or by a court order, or a combination of a waiver by agreement and court order) from every person who has the benefit of the exemption in respect of the particular exempt land on which the Tenement Holder wishes to perform the preliminary mining operations.
   1.4. The Tenement Holder must not carry out any principal mining operations unless the Tenement Holder has obtained waivers of exemption (whether by agreement with every person who has the

benefit of the exemption, or by a court order, or a combination of a waiver by agreement and court order) in respect of all the exempt land unless the Director of Mines is satisfied that no mining operations would be required to occur in respect of any particular exempt land for the life of the project.

Explanatory note: The Tenement Holder can carry out principal mining operations on land that is exempt due to a feature located outside of the Land (see subsection 9(1)(d) of the Act) provided the Tenement Holder has a waiver or waivers for that land. If the Tenement Holder does not need to perform mining operations on land that is exempt due to a feature located outside of the Land (see subsection 9(1)(d) of the Act), no waiver would be necessary.

Surface Water

2. The Tenement Holder must:
   2.1. Ensure no surface water contaminated (including sedimentation) as a result of mining operations leaves the Land.
3. The Tenement Holder must:
   3.1. Ensure that, apart from water contained in the pit void:
      3.1.1. no surface water contaminated (including sedimentation) prior to mine completion remains within the Land after mine completion; and
      3.1.2. no contamination of surface water (including sedimentation) occurs after mine completion as a result of mining operations within the Land.
4. The Tenement Holder must ensure:
   4.1. mining operations do not cause inundation (by water) of third party property and infrastructure off the Land (to a greater extent than would be expected to occur prior to mining operations commencing);
   4.2. mining operations do not cause inundation (by water) of third party property and infrastructure on the Land (to a greater extent than would be expected to occur prior to mining operations commencing) unless the Tenement Holder has obtained a Waiver of Exemption under the Act to undertake mining activities (inclusive of inundation) on that particular land; and
   4.3. inundation of third party property and infrastructure by water (to a greater extent than would be expected to occur prior to mining operations commencing) after mine completion is not caused by mining operations.

   Explanatory note: The Mining Act 1971 and this mining lease do not authorize any activities outside of the mining lease boundaries. If third party property or infrastructure outside of the lease boundaries is inundated by water due to the mining operations, the general law will apply as between the Tenement Holder and the third party.

Soils and Land Use – PAF

5. The extraction of NAF and PAF from the Land, and placement of NAF and PAF in the IWL must be audited by a suitably qualified independent expert approved by the Director of Mines (or other authorised officer) on a three monthly basis, or at a frequency as the Director of Mines (or other authorised officer) may specify by notice in writing. The expert must prepare a report of the findings of the audit and this report must be provided to the Director of Mines (or other authorised officer) within one month of completion of the audit.

Integrated Waste Landform (IWL)

6. The IWL construction and operation must be audited by a suitably qualified independent expert approved by the Director of Mines (or other authorised officer), against the design and plans that have been adopted for the IWL construction and operation:
   6.1. for the initial stage of IWL foundation preparation and construction; and
   6.2. for each subsequent stage of IWL foundation preparation and construction ; and
   6.3. on an annual basis for construction and operations (including the construction of the cover system) or at a frequency as the Director of Mines (or other authorised officer) may specify by notice in writing.
   6.4. The expert must prepare reports of the findings of each audit.
   6.5. The initial expert report for IWL foundation preparation and construction audit must be provided to the Director of Mines (or other authorised officer) prior to the initial placement of tailings and waste in the IWL.
   6.6. Subsequent reports must be provided to the Director of Mines (or other authorised officer) within one month of completion of the audit and all reports will be made publically available.

Additional Information in the Program

7. In accordance with section 70B(2)(d) of the Act it is a condition of the grant of the Mining Tenement that a proposed PEPR submitted in accordance with Part 10A of the Act must include reports from suitably qualified independent experts on the following matters:
   7.1. The capacity of the Tenement Holder to achieve compliance with the Act and the Program in light of its management systems, personnel, policies, procedures, practices and resources.
   7.2. The effectiveness of the proposed strategies in the proposed PEPR achieving the environmental outcomes identified in the proposed PEPR, including but not limited to reports from:

7.2.1. An Independent Geotechnical Engineering Expert (i.e.: for IWL and mine waste design and construction methodology).

7.2.2. An Independent Mine Waste Cover System Expert (i.e.: for IWL and mine waste cover systems design).

7.2.3. An Independent Geomorphology Expert (i.e.: for Landform design, soil and erosion management).

7.2.4. An Independent Hydrology Expert (i.e.: for Surface water management).

7.2.5. An Independent Chemical, Process or Metallurgical Engineering Expert (i.e.: for tailings dewatering design, waste/tailings mixture ratio and density necessary for geotechnical stability of the IWL and timely construction of the IWL cover system).

7.2.6. An Independent Environmental Geochemist Expert (i.e.: for PAF material and acid metalliferous drainage management).

7.3. The reports in Condition 7.2 must include identification of any risks, assumptions and uncertainties associated with the relevant strategies.

Transparency

8. The Tenement Holder agrees to the approved PEPR and any compliance reports and reportable incident reports, submitted in accordance with the Regulations, being made available for public inspection.

Notification of cessation of operations

9. Within 30 days of becoming aware of any event or decision which is likely to give rise to the cessation of mining operations for a period of more than seven days and prior to the cessation of mining operations, the tenement holder must notify the Director of Mines (or other authorised officer) in writing of the event or decision. The notice must specify the date upon which the mining operations are expected to cease, or have ceased and an estimate of the period of cessation.

Decommissioning and Rehabilitation Plan (DRP)

10. The Tenement Holder must comply with a DRP approved in accordance with **Condition 11** or **12** when decommissioning or rehabilitating the tenement.

11. Unless the Director of Mines (or other authorised officer) otherwise directs, a DRP must be submitted to the Director of Mines (or other authorised officer) for approval within 30 days of any decision or event that is likely to give rise to the permanent cessation of mining operations, and that DRP must:

11.1. set out the activities and scheduling required for the carrying out of the rehabilitation works specified in the approved PEPR;

11.2. be prepared in accordance with any guidelines provided by the Director of Mines (or other authorised officer).

12. If, in the opinion of the Director of Mines (or other authorised officer), mining operations on the tenement have substantially ceased for two years or more, the Director of Mines (or other authorised officer) may:

    12.1. require that the Tenement Holder submits a DRP for approval dealing with the requirements set out in **Condition 11**; and/or

    12.2. direct the Tenement Holder to rehabilitate the tenement in accordance with the approved PEPR and/or any DRP.

Social Management Plan (SMP)

13. The Tenement Holder must prepare, implement and maintain a SMP within 12 months from the date of the grant of the Mining Tenement (in consultation with relevant State Government agencies and key community stakeholders) that addresses (but is not limited to):

    13.1. All strategies, initiatives and commitments described in Chapter 22 of the Mining Lease Proposal;

    13.2. A process for reviewing and updating the SMP on a regular basis; and

    13.3. Anything further that the Director of Mines (or other authorised officer) directs in writing.

    13.4. The Tenement Holder must make the SMP publicly available.

    13.5. The implementation and maintaining of the SMP must be audited by a suitably qualified independent expert on an annual basis, or at a frequency as the Director of Mines (or other authorised officer) may specify by notice in writing.

    13.6. The expert must prepare a report of the findings of the audit and this report must be made publically available within one month of completion of the audit.

Community Engagement Plan (CEP)

14. The Tenement Holder must prepare, implement and maintain (to the satisfaction of the Director of Mines or other authorised officer) a CEP that:

    14.1. Sets out the purpose, objectives and parameters of engagement with the community;

    14.2. Identifies all community stakeholders likely to be affected by mining operations;

    14.3. Sets out the tools and techniques that the Tenement Holder intends to use for;

        14.3.1. identifying community attitudes and expectations;

        14.3.2. providing information to the community;

14.3.3. receiving feedback from the community;

14.3.4. analysing community feedback and considering community concerns or expectations; and

14.3.5. registering, documenting and responding to communications from members of the community;

14.4. Outlines an action plan to commence the proposed engagement activities; and

14.5. Addresses any further matters that the Director of Mines (or other authorised officer) advises in writing.

15. The CEP must be submitted to the Director of Mines (or other authorised officer) for approval within three months of the grant of the Lease.

Communications Protocol

16. The Tenement Holder must develop (to the satisfaction of the Director of Mines (or other authorised officer)) a communication and operating protocol between itself and owners of land adjacent to and on the Land (subject to the agreement of the owners of land) prior to the commencement of mining operations that includes the following matters:

16.1. Interaction with landholder operations;

16.2. Emergency procedures;

16.3. Communications and issue management processes;

16.4. Land management;

16.5. Dispute resolution;

16.6. Ongoing communication about the Tenement Holder's operations;

16.7. Receiving and considering feedback;

16.8. Safety procedures;

16.9. Access protocols; and

16.10. Any matters identified by the Director of Mines (or other authorised officer) in writing.

17. The Tenement Holder must maintain and adhere to the protocol to the satisfaction of the Director of Mines (or other authorised officer) for the term of the Lease.

Complaints Register

18. The Tenement Holder must operate a 24 hour per day, seven day per week, telephone complaints line for the purpose of receiving complaints from members of the public in relation to mining operations.

19. The Tenement Holder must take reasonable measures to notify the public of the complaints line telephone number and the fact that it is a complaints line.

20. The Tenement Holder must establish and maintain a public complaints register. The public complaints register must, as a minimum, record the following detail in relation to each complaint received in which it is alleged that environmental harm (including an environmental nuisance) has been caused by the mining operations:

    20.1. the date and time at which the complaint was received;

    20.2. all personal details of the complainant which were provided by the complainant or, if no such details were provided, a note to that effect;

    20.3. the subject-matter of the complaint;

    20.4. the action taken by the Tenement Holder in relation to the complaint, including any follow-up contact with the complainant; and

    20.5. if no action was taken by the Tenement Holder, the reasons why no action was taken.

21. All records in respect of the public complaints must be maintained for a period of at least seven years.

22. The Tenement Holder must make the public complaints register publically available except for the name and contact details of each complainant.

Notification of Insolvency Events

23. The Tenement Holder shall notify the Minister immediately after becoming aware of the Tenement Holder being placed into Administration.

Other Legislation

24. The Tenement Holder must comply with all State and Commonwealth legislation and regulations applicable to the activities undertaken pursuant to this Lease including (but not limited to) the:

    24.1. *Environment Protection and Biodiversity Conservation Act 1999*;

    24.2. *Development Act 1993*;

    24.3. *Dangerous Substances Act 1979*;

    24.4. *National Parks and Wildlife Act 1972*;

    24.5. *Natural Resources Management Act 2004*;

    24.6. *Public and Environmental Health Act 1987*;

    24.7. *Aboriginal Heritage Act 1988*;

24.8. *Heritage Places Act 1993*;

24.9. *Work Health and Safety Act 2012*;

24.10. *Environment Protection Act 1993*;

24.11. *Native Vegetation Act 1991*;

24.12. *Mines and Works Inspection Act 1920*; and

24.13. *Road Traffic Act 1961*.

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9 Other endorsements required

The following South Australian endorsements are required for the purpose of considering whether or not to grant a mining lease:

9.1 Native Title (South Australia) Act

The application submitted by Iron Road is over freehold land only and thus the Native Title has been extinguished over this land. The *Native Title (South Australia) Act 1994* does not apply in this instance.

The following subsequent endorsements are required where relevant, should a lease be granted:

9.2 Development Act

This application is made pursuant to the *Mining Act 1971* and is excluded from the definition of 'development' pursuant to the *Development Act 1993*. The appropriate authority is the Minister administering the *Mining Act 1971*.

Subsequent applications have been made under the *Development Act 1993* for the additional infrastructure required for the CEIP, that is, a port, infrastructure corridor and an accommodation village.

9.3 Environment Protection Act

The *Environment Protection Act 1993* provides for the protection of the environment and is administered by the Environment Protection Authority (EPA). Iron Road is required to meet all obligations of the *Environment Protection Act 1993* and associated Regulations and Policies.

Iron Road should consult with the EPA in relation to Licence requirements. Iron Road may require the following EPA Authorisations/Licences for the project (but not limited to):

- Works Approval (Section 35) for the construction of a building or structure or the installation of any plant or equipment for use for a prescribed activity of environmental significance
- License for Prescribed activities of environmental significance (Section 36) for relevant activities listed under Schedule 1 of the *Environment Protection Act 1993*.

9.4 Natural Resources Management Act

The *Natural Resources Management Act 2004* promotes sustainable and integrated management of the state's natural resources and provides for their protection. The regulating agency for this act is the Department of Environment, Water and Natural Resources (DEWNR).

Where necessary, Iron Road may require permits and licences for the project, as determined by the local Natural Resources Management (NRM) Board of the Eyre Peninsula.

9.5 National Parks and Wildlife Act

The *National Parks and Wildlife Act 1972* was designed to allow for the establishment and maintenance of a system of reserves, as well as the protection of threatened species of flora and fauna. This Act identifies and protects certain species located within conservation parks and reserves, as well as any species listed under Schedules 7, 8 and 9 of this Act.

9.6 Native Vegetation Act

The *Native Vegetation Act 1991* promotes the conservation, protection and enhancement of native vegetation in the state with specific focus on remnant native vegetation. This act is regulated by DEWNR. To allow clearance of native vegetation for the proposed project Iron Road must submit an application and plan to provide a Significant Environmental Benefit (SEB) in accordance with the *Native Vegetation Regulations 2003* and 'Guidelines for a native vegetation Significant Environmental Benefit policy for the clearance of native vegetation associated with the minerals and petroleum industry 2005'. This plan can be submitted as part of the PEPR and approved by DSD under delegation from the Native Vegetation Council. Preparation and assessment of this plan will be undertaken in consultation with DEWNR.

9.7 Aboriginal Heritage Act and Heritage Places Act

The *Aboriginal Heritage Act 1988* and the *Heritage Places Act 1993* promote the conservation and protection of heritage objects, artefacts and sites. Iron Road must operate in accordance with these acts at all times. Authorisation to move heritage objects and artefacts to ensure protection must be obtained where required.

9.8 Environment Protection and Biodiversity Conservation Act

The following Commonwealth legislative requirement was applicable to the mining component of the CEIP:

The Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) enables the Australian Government to join with the states and territories to provide a national scheme of environment protection and biodiversity conservation. Under the EPBC Act, actions that are likely to have a significant impact on a matter of national significance are assessed. The Australian Government's Department for Environment (DoE) is responsible for administering the EPBC Act.

Iron Road submitted a referral to the Commonwealth DoE pursuant to the EPBC Act on 29 September 2014 in relation to the proposed mine component of the CEIP. On 28 October 2014, the DoE determined that the proposed mine was not a controlled action, therefore no approvals are required under the EPBC Act by Iron Road in respect to the mine component of the CEIP.

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10 Conclusion

Detailed assessments of the socio-economic benefits and environmental impacts have been provided in Chapter 6 and Chapter 8 of this report. The benefits from the CEIP would include economic growth, job creation both for the mine and service industry, as well as improved local infrastructure and services to the community.

Primary impacts associated with the project have been identified by Iron Road and stakeholders including community members and community groups. DSD and other relevant South Australian Government agencies have separately identified impacts of the proposed mining project. These impact events have been assessed in detail in Chapter 8 of this report.

Impacts considered by DSD to be of significance due to the nature, scale and location of the operations include noise, air quality, visual amenity, impacts associated with management of mine waste in the IWL, impacts to third party land use and property (including agriculture) and public safety. Based on the information provided in the Proposal and subsequent Response Document, DSD considers that the potential impacts of the proposed operations can be managed to an appropriate level, and would be balanced by potential socio-economic benefits created by the project.

The assessment has concluded that the CEIP mine, as described in the Proposal, can be undertaken in an environmentally responsible manner, with effective mitigation and management strategies available for controlling impacts and ensuring that the project can be undertaken in a manner that provides a net-benefit for the local, regional and broader South Australian community.

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11 Recommendations

The DSD assessment recommends:

1) That in accordance with the requirements of the Act, the Minister for Mineral Resources and Energy (or his delegate) considers, on the basis of the Mining Proposal, the results of public statutory consultation, the Response Document and this Assessment Report, whether or not to grant a mineral lease for the proposed Central Eyre Iron Project.
2) That if a decision is made to grant the mineral lease for which Iron Road has applied, the body of recommended terms, conditions, requirements and clauses identified in Appendix 2 of this Assessment Report become legal requirements of mineral lease.

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12 References

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GLOSSARY

Glossary

Word/Acronym	Definition
24 – hour average	The average of all values collected (e.g. Dust deposition) for each hour of a 24 hour period.
ABS	Australian Bureau of Statistics
the Act	*Mining Act 1971*
AHD	Australian Height Datum
AMD	Acid and Metalliferous Drainage
ANCOLD	Australian National Committee on Large Dams
ANFO	Ammonium nitrate/fuel oil (type of explosive)
Annoying noise character	Noises that are impulsive, low frequency, modulating or tonal can be considered to have an annoying character.
ANZECC	Australian and New Zealand Environment and Conservation Council.
Application area	The area defined by the extents of Mineral Claim 4383
AQ	Air Quality
ARI	Average Recurrence Interval – the average or expected value of the period between exceedance of a given rainfall total accumulated over a given duration.
ASRIS	Australian Soil Resource Information System – a GIS database of soil information.
ASS	Acid sulphate soils
ASX	Australian Securities Exchange
Australian Standards	Publications from Standards Australia, a non-government body that produces and promotes a standardised set of methods, levels and other activities.
BAM	Beta Attenuation Monitoring – an air monitoring technique employing the absorption of beta radiation by solid particles extracted from air flow
Barngala people	The registered Native Title claimant for the area
Blast exclusion zone	An area surrounding blasting activities in which impacts to receptors are expected and should be managed for safety reasons. DSD considers the blast exclusion zone to constitute mining activities under the definition in the *Mining Act 1971*.

Word/Acronym	Definition
BoM	Bureau of Meterology
Buffer zone	An area surrounding an activity in which impacts are expected. Buffer zones are usually applied by ensuring an adequate area is left between activities and receptors.
Caveat	A notice, usually in the form of an entry in a register, to the effect that no action of a certain kind may be taken without first informing the person who gave the notice.
CCC	Central Eyre Iron Project Community Consultative Committee
CEIP	Central Eyre Iron Project
CEP	Community Engagement Plan
Clearance (of native vegetation)	Clearance of native vegetation is defined under the *Native Vegetation Act 1991* as including all of the following: • The killing or destruction of native vegetation • The removal of native vegetation • The severing of branches, limbs, stems or trunks of native vegetation • The burning of native vegetation • Any other substantial damage to native vegetation
Closure	A whole of mine life process, (which involves the reduction of assumptions in the closure design/management strategies providing confidence in design) including progressive implementation, which typically culminates in the achievement of agreed environmental outcomes and tenement surrender. The process includes decommissioning and rehabilitation.
Completion	The goal of mine closure. A completed mine has been rehabilitated to an extent that mining lease ownership can be surrendered and responsibility accepted by the next land user. (Note: The definitions above have been derived from DSD's PEPR Guideline MG2b).
Controlled action	This is a determination made under the Commonwealth EBPC Act on whether a proposed action is likely to have a significant impact on a matter of national environmental significance.
Council Development Plan Zones	These are zones described in the local council's development plan which describe the main and intended land use of the zone and what activity should occur within the zone.
DA	Development Application
dB(A)	A-weighted decibels – This is a unit of sound that is 'weighted' or calibrated to what the human ear can perceive.
DC	District Council
Development Act	*Development Act 1993*
DEWNR	Department of Environment, Water and Natural Resources
DIDO	Drive-in drive-out
Director of Mines	The Director of Mines is a statutory position, authorised under the *Mining Act 1971*.
DSD	Department of State Development
DoE	The Commonwealth Department of the Environment.
DPC	Department of Premier and Cabinet
DPTI	Department for Planning, Transport and Infrastructure
DRP	Decommissioning and Rehabilitation Plan
EC	Electrical Conductivity (measure of salinity)

Word/Acronym	Definition
EFA	Ecosystem Function Analysis – a monitoring tool commonly used to demonstrate the effectiveness of mine rehabilitation.
EIA	Economic Impact Assessment
EIS	Environmental Impact Statement – a document submitted to support the Development Application.
EMS	Environmental Management System
EPA	Environment Protection Authority
EPBC Act	*Environment Protection and Biodiversity Conservation Act 2000*
Exempt Land	Exempt land is defined under the *Mining Act 1971* and includes cultivated fields, land within 400 m of a residence or within 150 m of a building or structure with a value of greater than $200 and used for a commercial purpose.
EYB	Eyre Yorke Block
FIFO	Fly-in fly-out
Flyrock exclusion zone	See blasting exclusion zone
FTE	Full time equivalent
GAI	Global Average Index
GDE	Groundwater Dependent Ecosystem
Geological monument	Exposures or outcrops of rocks that provide significant scientific data.
GIS	Geographical Information System
GL/a	Gigalitres per annum
GNP	Gross National Product
GOS	Gross Operating Surplus
GRP	Gross Regional Product
GW	Groundwater
HDPE	High Density Polyethylene
Heavy metals	Term used for any metal or metalloid that can cause environmental concern.
HA 869	Heritage Agreement 869 located within the proposed ML (see the Proposal p. 21-7)
IBRA	Interim Biogeographic Regionalisation for Australia
ILUA	Indigenous Land Use Agreement
IM	Impact Event (these correspond to Iron Road's impact numbers).
Iron Road	IRD Mining Operations Pty Ltd (the applicant)
IWL	Integrated Waste Landform
JORC	Joint Ore Reserves Committee (professional body which has developed a standard code for reporting reserves and resources)
L_{A90}	A-weighted noise level exceeded 90% of the 10 minute measurement period. This descriptor is used to represent background noise level.
L_{Aeq}	The equivalent (continuous) noise level is defined as the equivalent steady noise level which, in a given period of time, would contain the same noise energy as the time varying noise during the same time period.

Word/Acronym	Definition
Land	Means the land over which the proposed Lease would be granted and would be described in the Mineral Lease Document
LIC	Leading Indicator Criteria – 'early warning' measurement criteria for outcomes where there is a high level of reliance on control strategies to reduce risk to the environment.
LFA	Landscape Function Analysis – a monitoring tool commonly used to demonstrate the effectiveness of mine rehabilitation.
LGA	Local government area
LVIA	Landscape and Visual Impact Assessment
MC	Mineral Claim
Measurement Criteria	The manner in which the achievement of the outcome is to be demonstrated.
Mining Operations	Mining operations are defined under the *Mining Act 1971* and include construction, operation and rehabilitation of land.
Ministerial Determination MD006	A legislative requirement outlining the minimum requirements to be included in a mining lease proposal or management plan.
ML	Mineral Lease - a lease authorising the extraction and sale of minerals in accordance with the *Mining Act 1971* and associated legislation. This does not include extractive minerals.
MLA	Mining Lease Application
MLP or MP	Mining Lease Proposal or Mining Proposal – a documented submitted to support the mining lease application and contains the information outlined in Ministerial Determination 006.
MPTRA	Mining Protection Tenement Regulation Area – the area covered by Schedule 20 of the Development Regulations 2008.
MRL	Maximum Residue Limits – a standard produced by the Commonwealth government detailing the maximum levels of contaminants that can be included in food both for humans and livestock.
Mtpa	Million tonnes per annum
NEPM	National Environment Protection Measures – a series of standards created by that National Environment Protection Council authorised under the Commonwealth government.
Noise EPP	Environment Protection (Noise) Policy 2007
NAF	Non-acid forming material
NO_X	Nitrogen Oxides
NRM	Natural Resource Management
NVMP	Native Vegetation Management Plan – This is a legislative requirement if clearance is required which provides for the provision of a SEB. The NVMP is to be developed in accordance with Guidelines For a Native Vegetation Significant Environmental Benefit Policy For the clearance of native vegetation associated with the minerals and petroleum industry (Department of Water, Land and Biodiversity Conservation 2005).
Outcome	A statement on the likely level of environmental impact from proposed mining operations on a receptor subsequent to control strategies.
PAF	Potentially acid forming material
Pathway	This is how an impact travels or is transferred from the source of the impact to the receptor.
PEPR	Program for Environment Protection and Rehabilitation – the operational approval document required under Part 10A of the *Mining Act 1971*, to be

Word/Acronym	Definition
	submitted within 12 months of lease grant and prior to commencement of operations.
PFS	Pre-Feasibility Study
PIM	Potential Impact Event (these correspond to Iron Road's potential impact numbers).
PIRSA	Primary Industries and Resources South Australia
PL	Petroleum Licence
PM_{10}	the fraction of particulates in air 10 micrometres or less in aerodynamic diameter
$PM_{2.5}$	the fraction of particulates in air 2.5 micrometres or less in aerodynamic diameter
PPM	Parts per million – measurement of concentration
Primary Risk	This refers to the risk of an impact event occurring prior to implementation of control strategies
The Proposal	Iron Road's CEIP Mining Proposal, including supporting appendices (circulated for public comment on 19 November 2015)
Public Consultation	In accordance with section 35A of the *Mining Act 1971* a lease application must be available for public comment for a period of at least 14 days. The Minister must have regard to any submissions received from this consultation in determining whether to grant or refuse an application and any conditions that apply.
Public Submissions	Public submissions received during the public consultation period from 19 November 2015 to 2 February 2016
QA/QC	Quality assurance and quality control
Real time monitoring	Monitoring where results are received and analysed at the same time as being collected allowing changes to operations to be made quickly to rectify any non-compliance.
Receptor	The receptor is the aspect of the environment that will be impacted. Environment is defined under the *Mining Act 1971* and includes public health, safety amenity, built, natural and cultural environment.
Regional Development Authority	An initiative of the commonwealth and state governments and local councils with the aim of enhancing regional development.
the Regulations	Mining Regulations 2011
Residual Risk	This refers to the risk of an impact event occurring post implementation of control strategies.
Response Document	The Iron Road document submitted in October 2016 (at the request of DSD) which provides a response to the issues raised during Public Consultation.
ROM	Run of Mine
RTNG	Road Traffic Noise Guidelines (produced by DPTI).
SAG mill	Semi-autogenous grinding mill – a type of crushing machinery.
SANTS	South Australian Native Title Services Ltd
Scattered trees	Single native tress with little or no native understory.
Schedule 20	A schedule of the Development Regulations 2008 which outline areas of significance for the State. The application and submissions made under that application for any proposed mine under the *Mining Act 1971* that falls within this area must be referred to the Minister for Planning.
SEB	Significant Environmental Benefit – In order to compensate for the clearance of native vegetation the person clearing the land must replace

Word/Acronym	Definition
	the immediate environmental value lost and achieve a net gain that improves the condition of the regional environment or biodiversity. Details of how an SEB will be provided are outlined in the NVMP.
SED	State Electoral Division
SIA	Social Impact Assessment
SIMGI	Stop Invasive Mining Group Inc.
SMP	Social Management Plan
South Australia's Strategic Plan	This is a publically available document which identifies the overarching principles of the state of South Australia. The seven strategic priorities focus and drive the work of government.
Ss	Specific storage – a physical property that characterises the capacity of an aquifer to release groundwater
TARP	Trigger Action Response Plan
TCLP	Toxicity Characteristic Leaching Procedure - a soil sample extraction method for chemical analysis employed as an analytical method to simulate leaching through a landfill
TDD	Total Dust Deposition
TDS	Total Dissolved Solids - a measure of the combined content of all inorganic and organic substances contained in water
TEOM	A type of air quality monitor that measures properties of particulates in the ambient air
TJ/yr	Terajoules per year – units of electricity use.
TRC	Tenement Review Committee
Trivial	For the purpose of this assessment trivial is defined as an insignificant consequence.
TSF	Tailings Storage Facility
TSP	Total Suspended Particulates
TBRARA	Tumby Bay Residents & Ratepayers Assoc. Inc.
Viewshed analysis	An analysis of what will be visible from a particular location, taking into consideration topography.
Waiver of Exemption	A document signed by the owner of exempt land (as set out in s.9 of the *Mining Act 1971*) allowing a company to mine on exempt land, conditions may be attached to this Waiver. The waiver is submitted to the Mining Registrar and registered.
Wardens Court	The courts or tribunals exercising jurisdiction in mining matters in South Australia.
WH&S	Work Health and Safety
WPA	Wilderness Protection Area

APPENDIXES

Appendix 1 Lease schedules information sheet

EXPLANATION OF THE TENEMENT DOCUMENT SCHEDULES

Purpose of a tenement document
Tenement documents are generated when, following a formal application process and detailed assessment by the Department of State Development in accordance with the *Mining Act 1971*, the Minister decides to grant a mining tenement.

Should the Minister choose to grant mining tenements for Iron Road's proposed Central Eyre Iron Project, tenement documents will be created to inform the tenement holder and the general public, about the specific details of the Central Eyre Iron Project tenements.

A tenement document does not set out all of the things that a tenement holder must do; the *Mining Act 1971* (the Act) and the Mining Regulations 2011 (the Regulations) – along with other relevant legislation – set out the requirements with which tenement holders must comply. A tenement document does, however, provide the specific terms, conditions, requirements and clauses for ensuring the acceptable conduct of mining operations on any given mining tenement.

Tenement documents are different for each type of mining tenement (e.g. Mineral Lease, Extractive Minerals Lease, and Miscellaneous Purposes Licence), but share the same components and approach.

Content and Format of Tenement Documents
Appendix 2 of this Assessment Report details the recommended terms, conditions requirements and clauses that have been identified through the assessment of the Central Eyre Iron Project ML proposal. If a decision is made to grant mining tenements, the content of this Appendix will become formal 'Schedules' of the mineral lease.

To ensure clarity of the requirements of the Act, the Schedules separate conditions that have historically been provided in two Schedules in tenement documents, into three Schedules.

The First Schedule of terms describe the tenement holder's specific rights, the Second Schedule of conditions imposes specific restrictions, and the Sixth Schedule of clauses sets out the required content to be provided in the Program for Environment Protection and Rehabilitation (PEPR).

If granted, the Central Eyre Iron Project will have a mineral lease tenement document. The tenement document will be provided in the form of a small booklet, which must be read in entirety, and in the context of the Act and Regulations, in order to understand the complete regulatory obligations imposed by the Minister on the tenement holder.

Mining operations and environment protection and rehabilitation
Amendments to the Act in 2011 introduced in Part 10A, an environment protection and rehabilitation regime that is centred on PEPRs.

Tenement documents reflect this environmental focus in two significant ways. First, the body of a tenement document contains extensive restatements about the PEPR and the process for its approval. Secondly, the types of environmental outcomes, criteria and strategies that need to be addressed in a PEPR are included in the tenement document, particularly in the Sixth Schedule.

The grant of a mining tenement does not authorise the conduct of mining operations. Mining operations cannot commence until the tenement holder has submitted a 'Proposed PEPR' for approval and, following assessment, the Minister has approved the PEPR.

The Minister can only and will only approve a 'Proposed PEPR' if:

- It is consistent with the ML proposal;
- It contains all of the information that the Act or Regulations say it must;
- All additional conditions about the PEPR are complied with;
- It addresses strategies and criteria to be adopted to measure environmental outcomes listed in the Sixth Schedule; and
- Access has been authorised to all land relevant for the operations described in the PEPR, in accordance with the Act.

Appendix 2 Recommended Mineral Lease schedules

FIRST SCHEDULE

RECOMMENDED ADDITIONAL TERMS

Explanatory note: A term is a clause that gives a right to a Mining Tenement.

Authorised Mining Operations

1. The grant of the Mining Tenement authorises mining operations (only) for the recovery of Iron Ore – Magnetite.

2. The grant of the Mining Tenement authorises mining operations (only) that are consistent with the mining operations described in the Mining Lease Proposal document dated 5 November 2015 and subsequent Response Document dated October 2016.

SECOND SCHEDULE

RECOMMENDED ADDITIONAL CONDITIONS

Explanatory note: A condition is a clause that imposes a restriction on a Mining Tenement.

Land Access

1. For the purposes of this Additional Condition:
   1.1. 'Preliminary mining operations' means: -
      1.1.1. Baseline environmental data collection (particularly if this is required for the development of measurement criteria):
      1.1.2. Ongoing environmental impact assessments (particularly if this is required for the development of measurement criteria);
      1.1.3. Site works to support any metallurgical test work or trials;
      1.1.4. Geotechnical and soil investigations to support the detailed design of the IWL or other infrastructure;
      1.1.5. Additional mineral resource definition and sterilisation investigations; or
      1.1.6. Any other activity determined in writing by the Director of Mines (including an activity that is defined below as a principal mining operation).
   1.2. 'Principal mining operations' means: -
      1.2.1. Pre-strip and mining of the open pits;
      1.2.2. Preparation and construction of the IWL;
      1.2.3. Construction of the ore processing facility;
      1.2.4. Construction of the concentrate handling facility;
      1.2.5. Construction of the rail infrastructure on the Land;
      1.2.6. Any pre-strip or early earthworks relating to any of the above activities; or
      1.2.7. Any variation to this definition as determined in writing by the Director of Mines.
   1.3. The Tenement Holder may carry out preliminary mining operations on any exempt land after it has obtained a waiver of exemption (whether by agreement with every person who has the benefit of the exemption, or by a court order, or a combination of a waiver by agreement and court order) from every person who has the benefit of the exemption in respect of the particular exempt land on which the Tenement Holder wishes to perform the preliminary mining operations.
   1.4. The Tenement Holder must not carry out any principal mining operations unless the Tenement Holder has obtained waivers of exemption (whether by agreement with every person who has the

benefit of the exemption, or by a court order, or a combination of a waiver by agreement and court order) in respect of all the exempt land unless the Director of Mines is satisfied that no mining operations would be required to occur in respect of any particular exempt land for the life of the project.

Explanatory note: The Tenement Holder can carry out principal mining operations on land that is exempt due to a feature located outside of the Land (see subsection 9(1)(d) of the Act) provided the Tenement Holder has a waiver or waivers for that land. If the Tenement Holder does not need to perform mining operations on land that is exempt due to a feature located outside of the Land (see subsection 9(1)(d) of the Act), no waiver would be necessary.

Surface Water

2. The Tenement Holder must:
   2.1. Ensure no surface water contaminated (including sedimentation) as a result of mining operations leaves the Land.
3. The Tenement Holder must:
   3.1. Ensure that, apart from water contained in the pit void:
      4.3.1. no surface water contaminated (including sedimentation) prior to mine completion remains within the Land after mine completion; and
      4.3.2. no contamination of surface water (including sedimentation) occurs after mine completion as a result of mining operations within the Land.
4. The Tenement Holder must ensure:
   4.1. mining operations do not cause inundation (by water) of third party property and infrastructure off the Land (to a greater extent than would be expected to occur prior to mining operations commencing);
   4.2. mining operations do not cause inundation (by water) of third party property and infrastructure on the Land (to a greater extent than would be expected to occur prior to mining operations commencing) unless the Tenement Holder has obtained a Waiver of Exemption under the Act to undertake mining activities (inclusive of inundation) on that particular land; and
   4.3. inundation of third party property and infrastructure by water (to a greater extent than would be expected to occur prior to mining operations commencing) after mine completion is not caused by mining operations.

   Explanatory note: The Mining Act 1971 and this mining lease do not authorize any activities outside of the mining lease boundaries. If third party property or infrastructure outside of the lease boundaries is inundated by water due to the mining operations, the general law will apply as between the Tenement Holder and the third party.

Soils and Land Use – PAF

5. The extraction of NAF and PAF from the Land, and placement of NAF and PAF in the IWL must be audited by a suitably qualified independent expert approved by the Director of Mines (or other authorised officer) on a three monthly basis, or at a frequency as the Director of Mines (or other authorised officer) may specify by notice in writing. The expert must prepare a report of the findings of the audit and this report must be provided to the Director of Mines (or other authorised officer) within one month of completion of the audit.

Integrated Waste Landform (IWL)

6. The IWL construction and operation must be audited by a suitably qualified independent expert approved by the Director of Mines (or other authorised officer), against the design and plans that have been adopted for the IWL construction and operation:
   6.1. for the initial stage of IWL foundation preparation and construction; and
   6.2. for each subsequent stage of IWL foundation preparation and construction ; and
   6.3. on an annual basis for construction and operations (including the construction of the cover system) or at a frequency as the Director of Mines (or other authorised officer) may specify by notice in writing.
   6.4. The expert must prepare reports of the findings of each audit.
   6.5. The initial expert report for IWL foundation preparation and construction audit must be provided to the Director of Mines (or other authorised officer) prior to the initial placement of tailings and waste in the IWL.
   6.6. Subsequent reports must be provided to the Director of Mines (or other authorised officer) within one month of completion of the audit and all reports will be made publically available.

Additional Information in the Program

7. In accordance with section 70B(2)(d) of the Act it is a condition of the grant of the Mining Tenement that a proposed PEPR submitted in accordance with Part 10A of the Act must include reports from suitably qualified independent experts on the following matters:
   7.1. The capacity of the Tenement Holder to achieve compliance with the Act and the Program in light of its management systems, personnel, policies, procedures, practices and resources.
   7.2. The effectiveness of the proposed strategies in the proposed PEPR achieving the environmental outcomes identified in the proposed PEPR, including but not limited to reports from:

7.2.1. An Independent Geotechnical Engineering Expert (i.e.: for IWL and mine waste design and construction methodology).

7.2.2. An Independent Mine Waste Cover System Expert (i.e.: for IWL and mine waste cover systems design).

7.2.3. An Independent Geomorphology Expert (i.e.: for Landform design, soil and erosion management).

7.2.4. An Independent Hydrology Expert (i.e.: for Surface water management).

7.2.5. An Independent Chemical, Process or Metallurgical Engineering Expert (i.e.: for tailings dewatering design, waste/tailings mixture ratio and density necessary for geotechnical stability of the IWL and timely construction of the IWL cover system).

7.2.6. An Independent Environmental Geochemist Expert (i.e.: for PAF material and acid metalliferous drainage management).

7.3. The reports in Condition 7.2 must include identification of any risks, assumptions and uncertainties associated with the relevant strategies.

Transparency

8. The Tenement Holder agrees to the approved PEPR and any compliance reports and reportable incident reports, submitted in accordance with the Regulations, being made available for public inspection.

Notification of cessation of operations

9. Within 30 days of becoming aware of any event or decision which is likely to give rise to the cessation of mining operations for a period of more than seven days and prior to the cessation of mining operations, the tenement holder must notify the Director of Mines (or other authorised officer) in writing of the event or decision. The notice must specify the date upon which the mining operations are expected to cease, or have ceased and an estimate of the period of cessation.

Decommissioning and Rehabilitation Plan (DRP)

10. The Tenement Holder must comply with a DRP approved in accordance with **Condition 11** or **12** when decommissioning or rehabilitating the tenement.

11. Unless the Director of Mines (or other authorised officer) otherwise directs, a DRP must be submitted to the Director of Mines (or other authorised officer) for approval within 30 days of any decision or event that is likely to give rise to the permanent cessation of mining operations, and that DRP must:

    11.1. set out the activities and scheduling required for the carrying out of the rehabilitation works specified in the approved PEPR;

11.2. be prepared in accordance with any guidelines provided by the Director of Mines (or other authorised officer).

12. If, in the opinion of the Director of Mines (or other authorised officer), mining operations on the tenement have substantially ceased for two years or more, the Director of Mines (or other authorised officer) may:

    12.1. require that the Tenement Holder submits a DRP for approval dealing with the requirements set out in **Condition 11**; and/or

    12.2. direct the Tenement Holder to rehabilitate the tenement in accordance with the approved PEPR and/or any DRP.

Social Management Plan (SMP)

13. The Tenement Holder must prepare, implement and maintain a SMP within 12 months from the date of the grant of the Mining Tenement (in consultation with relevant State Government agencies and key community stakeholders) that addresses (but is not limited to):

    13.1. All strategies, initiatives and commitments described in Chapter 22 of the Mining Lease Proposal;

    13.2. A process for reviewing and updating the SMP on a regular basis; and

    13.3. Anything further that the Director of Mines (or other authorised officer) directs in writing.

    13.4. The Tenement Holder must make the SMP publicly available.

    13.5. The implementation and maintaining of the SMP must be audited by a suitably qualified independent expert on an annual basis, or at a frequency as the Director of Mines (or other authorised officer) may specify by notice in writing.

    13.6. The expert must prepare a report of the findings of the audit and this report must be made publically available within one month of completion of the audit.

Community Engagement Plan (CEP)

14. The Tenement Holder must prepare, implement and maintain (to the satisfaction of the Director of Mines or other authorised officer) a CEP that:

    14.1. Sets out the purpose, objectives and parameters of engagement with the community;

    14.2. Identifies all community stakeholders likely to be affected by mining operations;

    14.3. Sets out the tools and techniques that the Tenement Holder intends to use for;

        14.3.1. identifying community attitudes and expectations;

        14.3.2. providing information to the community;

14.3.3. receiving feedback from the community;

14.3.4. analysing community feedback and considering community concerns or expectations; and

14.3.5. registering, documenting and responding to communications from members of the community;

14.4. Outlines an action plan to commence the proposed engagement activities; and

14.5. Addresses any further matters that the Director of Mines (or other authorised officer) advises in writing.

15. The CEP must be submitted to the Director of Mines (or other authorised officer) for approval within three months of the grant of the Lease.

Communications Protocol

16. The Tenement Holder must develop (to the satisfaction of the Director of Mines (or other authorised officer)) a communication and operating protocol between itself and owners of land adjacent to and on the Land (subject to the agreement of the owners of land) prior to the commencement of mining operations that includes the following matters:

16.1. Interaction with landholder operations;

16.2. Emergency procedures;

16.3. Communications and issue management processes;

16.4. Land management;

16.5. Dispute resolution;

16.6. Ongoing communication about the Tenement Holder's operations;

16.7. Receiving and considering feedback;

16.8. Safety procedures;

16.9. Access protocols; and

16.10. Any matters identified by the Director of Mines (or other authorised officer) in writing.

17. The Tenement Holder must maintain and adhere to the protocol to the satisfaction of the Director of Mines (or other authorised officer) for the term of the Lease.

Complaints Register

18. The Tenement Holder must operate a 24 hour per day, seven day per week, telephone complaints line for the purpose of receiving complaints from members of the public in relation to mining operations.

19. The Tenement Holder must take reasonable measures to notify the public of the complaints line telephone number and the fact that it is a complaints line.

20. The Tenement Holder must establish and maintain a public complaints register. The public complaints register must, as a minimum, record the following detail in relation to each complaint received in which it is alleged that environmental harm (including an environmental nuisance) has been caused by the mining operations:

    20.1. the date and time at which the complaint was received;

    20.2. all personal details of the complainant which were provided by the complainant or, if no such details were provided, a note to that effect;

    20.3. the subject-matter of the complaint;

    20.4. the action taken by the Tenement Holder in relation to the complaint, including any follow-up contact with the complainant; and

    20.5. if no action was taken by the Tenement Holder, the reasons why no action was taken.

21. All records in respect of the public complaints must be maintained for a period of at least seven years.

22. The Tenement Holder must make the public complaints register publically available except for the name and contact details of each complainant.

Notification of Insolvency Events

23. The Tenement Holder shall notify the Minister immediately after becoming aware of the Tenement Holder being placed into Administration.

Other Legislation

24. The Tenement Holder must comply with all State and Commonwealth legislation and regulations applicable to the activities undertaken pursuant to this Lease including (but not limited to) the:

    24.1. *Environment Protection and Biodiversity Conservation Act 1999*;

    24.2. *Development Act 1993*;

    24.3. *Dangerous Substances Act 197*9;

    24.4. *National Parks and Wildlife Act 1972*;

    24.5. *Natural Resources Management Act 2004*;

    24.6. *Public and Environmental Health Act 1987*;

    24.7. *Aboriginal Heritage Act 1988*;

    24.8. *Heritage Places Act 1993*;

24.9. *Work Health and Safety Act 2012*;

24.10. *Environment Protection Act 1993*;

24.11. *Native Vegetation Act 1991*;

24.12. *Mines and Works Inspection Act 1920*; and

24.13. *Road Traffic Act 1961*.

SIXTH SCHEDULE

RECOMMENDED ENVIRONMENTAL OUTCOMES AND ASSOCIATED CRITERIA AND STRATEGIES PURSUANT TO REGULATION 65 OF THE MINING REGULATIONS 2011

Explanatory note: The Sixth Schedule includes clauses which set out the requirements for content that would be provided in a PEPR.

Public Safety Outcomes

1. The Tenement Holder must during construction and operation, ensure that unauthorised entry to the Land does not result in public injuries and or deaths that could have been reasonably prevented.
2. The Tenement Holder must during construction and operation, ensure that there are no public injuries and or deaths as a result of uncontrolled fires caused by mining operations that could have been reasonably prevented.

Public Safety Outcome – Post-Mine Completion

3. The Tenement Holder must demonstrate that post-mine completion, the risks to the health and safety of the public so far as it may be affected by mining operations are as low as reasonably practicable.

Public Safety Strategies – Post-Mine Completion

4. The Tenement Holder is required to address the following matters for the purpose of Regulation 65(2)(c) in relation to the Public Safety Outcome – Post-Mine Completion **sixth schedule clause 3**:
    - 4.1. Develop strategies to ensure final landform design for the open pit void meets the outcome for protection of public safety post-mine completion and in the long term to address the following potential hazards (but not limited to):
        - 4.1.1. The risk of falling;
        - 4.1.2. The risk of drowning;
        - 4.1.3. The risk of vehicle incidents/accidents; and
        - 4.1.4. Ground instability.
    - 4.2. Quality control arrangements for all stages of construction and operation of the IWL including supervision by appropriately qualified and experienced persons, documented procedures, quality control testing and record keeping.

Traffic Outcomes

5. The Tenement Holder must during construction, operation and post-mine completion ensure travel delays to the public as a result of the transport of mining modules, mine related traffic, road closures and road realignments are as low as reasonably practicable.

6. The Tenement Holder must during construction and operation, ensure that no public impacts off the Land are caused by noise, dust and/or dragout associated with mine related traffic.
7. The Tenement Holder must during construction and operation, ensure that there are no traffic accidents involving the public and mine related traffic that could have been reasonably prevented by the Tenement Holder.
8. The Tenement Holder must during construction and operation, ensure no unauthorised damage to public or private property and infrastructure, including road pavements, as a result of traffic movements from mining operations.

Aboriginal Heritage

9. The Tenement Holder must during construction and operation, ensure that there is no disturbance to Aboriginal heritage sites, objects or remains unless prior approval under the relevant legislation is obtained.

Fauna Outcomes

10. The Tenement Holder must during construction, operation and post-mine completion, ensure that there are no native fauna injuries or deaths due to mining operations that could reasonably have been prevented.

Native Vegetation Outcome - Clearance

11. The Tenement Holder must during construction, operation and post-mine completion, ensure no loss of abundance or diversity of native vegetation on or off the Land through;
    11.1. clearance,
    11.2. dust/contaminant deposition,
    11.3. fire,
    11.4. reduction in water supply
    11.5. salinisation, or
    11.6. other damage,

unless a significant environmental benefit has been approved in accordance with the relevant legislation.

Native Vegetation Strategies - Clearance

12. The Tenement Holder is required to address the following matters for the purposes of Regulation 65(2)(c) of the Regulations in relation to the Native Vegetation Outcome – Clearance **sixth schedule clause 11**;
    12.1. Undertake groundwater monitoring at appropriate locations once the IWL is established and during operations to validate the groundwater model and IWL seepage rates.

Weeds and Pests Outcomes

13. The Tenement Holder must during construction, operation and post-mine completion, ensure no introduction of new species of weeds, plant pathogens or pests (including feral animals), nor sustained increase in abundance of existing weed or pest species in the Land.

Soils and Land Use Outcome – Soil Quality and Quantity

14. The Tenement Holder must during construction, operation and post-mine completion ensure that the existing (pre-mining) soil quality and quantity is maintained.

Soils and Land Use Strategies – Soil Quality and Quantity

15. The Tenement Holder is required to address the following matters for the purposes of Regulation 65(2)(c) in relation to the Soils and Land Use Outcome – Soil Quality and Quantity **sixth schedule clause 14**:
    15.1. Strategies to achieve recovery of topsoil and subsoil from areas to be disturbed by mining operations.
    15.2. Strategies for maintaining the quality and quantity of stockpiled soil/s until such time that it is used for rehabilitation purposes.
    15.3. Strategies that take into consideration the optimal soil stockpile heights for achieving the soil outcomes.
    15.4. Strategies for reinstatement of these soils so as to maximise the likelihood of achieving the soil outcomes.
    15.5. An auditable record of soil movement including recovery, stockpiling and reinstatement.
    15.6. Strategies for the establishment of post-mine completion land uses and areas, including the re-establishment of land for agriculture where practicable.
    15.7. Progressive rehabilitation implemented for all domains as soon as practicable.

Soils and Land Use Outcome – Salinity

16. The Tenement Holder must during construction, operation and post-mine completion, ensure no impacts to agricultural productivity, including but not limited to;
    16.1. reduction in crop yield;
    16.2. reduction in grain quality; or
    16.3. adverse health impacts to livestock;

for third party land users on or off the Land as a result of saline water used in mining operations, other than those agreed between the Tenement Holder and the affected user.

Soils and Land Use Outcome – IWL

17. The Tenement Holder must during construction, operation and post-mine completion, ensure no impacts to agricultural productivity, including but not limited to;
    17.1. reduction in crop yield;
    17.2. reduction in grain quality; or
    17.3. adverse health impacts to livestock;

    for third party land users on or off the Land as a result of contamination and/or sediments from mining operations, other than those agreed between the Tenement Holder and the affected user.

Soils and Land Use Strategies – IWL

18. The Tenement Holder is required to address the following matters for the purposes of Regulation 65(2)(c) in relation to the Soils and Land Use Outcome – IWL **sixth schedule clause 17**:
    18.1. Complete all future works listed in Section 5 of Appendix S of the Mining Proposal ("Conceptual Integrated Waste Landform Design for Rehabilitation and Closure - October 2015 (MWH")).
    18.2. Characterisation of all materials to be used within the IWL and the cover system, including dispersive soils.
    18.3. A program of testwork to determine the performance and properties (including (but not limited to) density and particle size distribution) of representative samples of the combined crushed waste rock and filtered tailings material (in the appropriate representative mixing ratios) that will be placed in the IWL. The results of the testwork are to inform the design of the IWL.
    18.4. A program for determining the erodibility of the waste rock/tailings mix to ensure that no erodible waste rock/tailings mix is placed immediately underneath subsoil on external batters. The results of the program are to inform the design of the IWL.
    18.5. Develop a detailed waste, tailings and soil material balance to ensure the capacity required by the IWL and in-pit dumps are accurately determined and that the amount of soil required for the cover system is accurately determined.
    18.6. The design for the construction, operation and rehabilitation of in-pit dumps is based on (but not limited to) the technical information required by this lease clause and the design is demonstrated to be effective in achieving all relevant outcomes.
    18.7. The design for the construction, operation and rehabilitation of the IWL is based on (but not limited to) the technical information required by this lease clause and the design is demonstrated to be effective in achieving all relevant outcomes.

18.8. The design, construction and maintenance of mine waste cover systems including, but not limited to, a detailed cover system design, construction methodology, cover system modelling and erosion modelling.
18.9. Provision of a program of works for field trials and collection of site specific data to validate/calibrate the model(s).
18.10. Field trials for the cover system, rehabilitation and revegetation will commence as soon as practicable after commencement of operations.
18.11. Quality control arrangements for all stages of construction and operation of the IWL and cover system, including supervision by appropriately qualified and experienced persons, documented procedures, quality control testing and record keeping.
18.12. Strategies for achieving and maintaining design tailings discharge densities, moisture content and IWL consolidation rates to ensure geotechnical stability of the IWL and timely construction of the IWL cover system.
18.13. Tailings discharge density and moisture content trigger limits and remedial actions to ensure design densities and moisture contents are achieved. The remedial actions must include strategies for managing the site water balance should the design tailings dewatering moisture content not be achieved (ie: increased water reporting to the IWL and an increased need for water supply).

Soils and Land Use Outcomes – PAF

19. The Tenement Holder must, ensure that:
19.1. There is no contamination of land and soils either on or off the Land as a result of mining operations; and
19.2. no contamination of land and soils either on or off the Land post-mine completion occurs as a result of mining operations.

Soils and Land Use Strategies – PAF

20. The Tenement Holder is required to address the following matters for the purposes of Regulation 65(2)(c) in relation to the Soils and Land Use Outcomes – PAF **sixth schedule clause 19**:
20.1. Complete all Actions listed in Section 5 of Appendix S of the Mining Proposal ("Appendix E - Oxide Zone Geochemistry Review and IWL Management - Sept 2015 (MWH)").
20.2. Determine a sulphur cut-off grade for PAF material through further testing for each waste unit.
20.3. Block modelling the sulphur distribution of all waste and ore to be mined for the purpose of determining the distribution and estimating the volume of NAF and PAF using the sulphur cut-off grade.

20.4. Integration of the sulphur model with the geological model to provide confidence in the definition of PAF boundaries, potential zones of high neutralising capacity and potential geological controls on mineralisation.
20.5. Procedures for regularly updating the models with new geological and sulphur assay data collected in the course of mine production operations.
20.6. Procedures for ensuring PAF and NAF boundaries derived from the sulphur cutoff and the sulphur block model are included in open pit mine plans.
20.7. Procedures for assaying the sulphur content of drill cuttings or excavated material, produced during the course of blast hole drilling or mining, for verifying PAF and NAF information against mine plans to provide a final check that all PAF and NAF materials have been correctly identified.
20.8. Procedures and recording systems for selective mining of the identified PAF and NAF materials and placement in accordance with the IWL design.
20.9. IWL designed and constructed for the selective placement of the total volume of PAF material with it effectively co-disposed with NAF and/or encapsulated by NAF.
20.10. A program for determining the erodibility of the waste rock/tailings mix to ensure that no erodible waste rock/tailings mix is placed immediately underneath subsoil on external batters.
20.11. IWL designed to ensure PAF material is not exposed as a result of potential open pit wall failure post mine completion.
20.12. Strategies included in any guidelines provided by the Director of Mines (or other authorised officer).

Waste Outcome

21. The Tenement Holder must ensure that all commercial or industrial waste (which does not include tailings and waste rock) is disposed of in an EPA licensed facility.

Air Quality Outcome – Nuisance

22. The Tenement Holder must during construction, operation and post-mine completion ensure no public nuisance impacts from air emissions and/or dust generated by mining operations.

Air Quality Strategies – Nuisance

23. The Tenement Holder is required to address the following matters for the purposes of Regulation 65(2)(c) in relation to the Air Quality Outcome - Nuisance **sixth schedule clause 22**;

23.1. Progressive rehabilitation and stabilisation of disturbed areas undertaken throughout the life of mine to control dust emissions generated by wind erosion.
23.2. Undertake continuous dust and meteorological monitoring to inform decisions for operational response and contingency measures to be implemented to prevent exceedance of compliance criteria.
23.3. In the event that monitoring shows the air quality measurement criteria has been breached, the Tenement Holder must immediately cease the activity that resulted in the breach.

Air Quality Criteria – Nuisance

24. The Tenement Holder is required to address the following matters for the purposes of Regulation 65(2)(d) in relation to the Air Quality Outcome - Nuisance **sixth schedule clause 22**;
24.1. The measurement criteria adopted for the air quality nuisance outcome must include one or more of the following:
24.1.1. Measurement of Total Dust Deposition (including both ambient and mine related dust) (TDD) using monitoring methodology, equipment and instruments that are recognised by a relevant International or Australian Standard.
24.1.2. TDD leaving the site does not exceed 4g/m2/month and no more than 2 g/m2/month above background.
24.1.3. Measurement of TSP using monitoring equipment and instruments that are recognised by a relevant International or Australian Standard.
24.1.4. An appropriate TSP 24 hour average and annual average concentration is developed and applied to the criteria for the air quality nuisance outcome.
24.1.5. Directional Dust Deposition (including both ambient and mine related dust) (DDD) measured using monitoring equipment and instruments that are recognised by a relevant International or Australian Standard.
24.2. The measurement criteria adopted (including all aspects of Regulation 65(2)(d)) must be based on technical scientific evidence which demonstrates achievement of the outcome.
24.3. The Tenement Holder must undertake meteorological monitoring in accordance with relevant Australian standards to measure and record meteorological data including (but not limited to) wind speed and direction, temperature, humidity, atmospheric pressure, solar radiation, rainfall and evaporation.
24.4. The Tenement Holder must ensure that all adopted measurement criteria (TSP, TDD, DDD and/or PM10) and meteorological monitoring data acquired by the Tenement Holder is reported in real time to the public on an unrestricted internet site. The monitoring

data must be retained and remain accessible on the unrestricted internet site for the life of the mine.

Air Quality Outcome – Agricultural Productivity

25. The Tenement Holder must during construction, operation and post-mine completion, ensure no impacts to agricultural productivity, including but not limited to;
    25.1. reduction in crop yield;
    25.2. reduction in grain quality; or
    25.3. adverse health impacts to livestock;

for third party land users on or off the Land as a result of air emissions and/or dust generated by mining operations, other than those agreed between the Tenement Holder and the affected user.

Air Quality Strategies– Agricultural Productivity

26. The Tenement Holder is required to address the following matters for the purposes of Regulation 65(2)(c) in relation to the Air Quality Outcome - Agricultural Productivity **sixth schedule clause 25**;
    26.1. Progressive rehabilitation and stabilisation of disturbed areas undertaken throughout the life of mine to control dust emissions generated by wind erosion.
    26.2. Undertake continuous dust and meteorological monitoring to inform decisions for operational response and contingency measures to be implemented to prevent exceedance of compliance criteria.
    26.3. In the event that monitoring shows the air quality measurement criteria has been breached, the Tenement Holder must immediately cease the activity that resulted in the breach.

Air Quality Criteria – Agricultural Productivity

27. The Tenement Holder is required to address the following matters for the purposes of Regulation 65(2)(d) in relation to the Air Quality Outcome - Agricultural Productivity **sixth schedule clause 25**;
    27.1. The measurement criteria adopted (including all aspects of Regulation 65(2)(d)) must be based on technical scientific evidence which demonstrates achievement of the outcome.
    27.2. The Tenement Holder must ensure that all adopted measurement criteria and meteorological monitoring data acquired by the Tenement Holder is reported in real time to the public on an unrestricted internet site. The monitoring data must be retained and remain accessible on the unrestricted internet site for the life of the mine.

Air Quality Outcome – Public Health

28. The Tenement Holder must during construction, operation and post-mine completion ensure no public health impacts from air emissions and/or dust generated by mining operations.

Air Quality Strategies – Public Health

29. The Tenement Holder is required to address the following matters for the purposes of Regulation 65(2)(c) in relation to the Air quality Outcome – Public Health **sixth schedule clause 28**;

29.1. Progressive rehabilitation and stabilisation of disturbed areas undertaken throughout the life of mine to control dust emissions generated by wind erosion.

29.2. Undertake continuous dust and meteorological monitoring to inform decisions for operational response and contingency measures to be implemented to prevent exceedance of compliance criteria.

29.3. In the event that monitoring shows the air quality measurement criteria has been breached, the Tenement Holder must immediately cease the activity that resulted in the breach.

Air Quality Criteria – Public Health

30. The Tenement Holder is required to address the following matters for the purposes of Regulation 65(2)(d) in relation to the Air quality Outcome – Public Health **sixth schedule clause 28**;

30.1. The measurement criteria for the air quality human health outcome must include:

PM10

30.1.1. Measurement of PM10 dust concentration (including both ambient and mine related dust) using monitoring methodology, equipment and instruments that adhere to Australian Standard AS/NZS 3580.9.11, and any future updates or variants to that Standard.

30.1.2. the total PM10 dust concentration (including both ambient and mine related dust) leaving the site is less than 50ug/m3 as a 24 hour (midnight to midnight) average of measurements taken at intervals of not more than 10 minutes; or

30.1.3. where the total PM10 dust concentration entering the site exceeds 50ug/m3 as a 24 hour (midnight to midnight) average of measurements taken at intervals of not more than 10 minutes, the total PM10 dust leaving the site does not exceed the measured level entering the site during that period.

30.1.4. the total PM10 dust concentration (including both ambient and mine related dust) leaving the site is less than 25ug/m3 as an annual average for any 12 month period.

PM2.5

30.1.5. Measurement of PM2.5 dust concentration (including both ambient and mine related dust) using monitoring methodology, equipment and instruments that are recognised by a relevant International or Australian Standard.

30.1.6. the total PM2.5 dust concentration (including both ambient and mine related dust) leaving the site is less than 25ug/m3 as a 24 hour (midnight to midnight) average of measurements taken at intervals of not more than 10 minutes; or

30.1.7. where the total PM2.5 dust concentration entering the site exceeds 25ug/m3 as a 24 hour (midnight to midnight) average of measurements taken at intervals of not more than 10 minutes, the total PM2.5 dust leaving the site does not exceed the measured level entering the site during that period.

30.1.8. the total PM2.5 dust concentration (including both ambient and mine related dust) leaving the site is less than 8ug/m3 as an annual average for any 12 month period.

Nitrogen Oxides

30.1.9. Measurement of the relevant Nitrogen Oxides concentration (including both ambient and mine related dust) using monitoring methodology, equipment and instruments that are recognised by a relevant International or Australian Standard.

30.1.10. Compliance limits for Nitrogen Oxides must adhere to the Environment Protection (Air Quality) Policy 2016.

30.2. The measurement criteria adopted (including all aspects of Regulation 65(2)(d) and in particular the locations of monitoring) must be based on technical scientific evidence which demonstrates achievement of the outcome.

30.3. The Tenement Holder must undertake meteorological monitoring in accordance with relevant Australian standards to measure and record meteorological data including (but not limited to) wind speed and direction, temperature, humidity, atmospheric pressure, solar radiation, rainfall and evaporation.

30.4. The Tenement Holder must ensure that PM2.5, PM10 and NOx concentration data and meteorological monitoring data acquired by the Tenement Holder is reported in real time to the public on an

unrestricted internet site. The monitoring data must be retained and remain accessible on the unrestricted internet site for the life of the mine.

Noise Outcome

31. The Tenement Holder must during construction and operation, ensure noise emanating from mining operations is in accordance with the current amenity as defined by the Environment Protection (Noise) Policy and the Wudinna District Council Development Plan at the date that the Mining Tenement was granted, set out in the Seventh Schedule of this Tenement document.

Noise Strategies

32. The Tenement Holder is required to address the following matters for the purposes of Regulation 65(2)(c) in relation to the Noise Outcome **sixth schedule clause 31**:
    32.1. At a minimum, implement all noise mitigation strategies described in the Mining Proposal and Response Document.
    32.2. Undertake continuous noise and meteorological monitoring to inform decisions for operational response and contingency measures to be implemented to prevent exceedance of compliance criteria.
    32.3. In the event that monitoring shows the noise measurement criteria has been breached, the Tenement Holder must immediately cease the activity that resulted in the breach.

Noise Criteria

33. The Tenement Holder is required to address the following matters for the purposes of Regulation 65(2)(d) in relation to the Noise Outcome **sixth schedule clause 31**;
    33.1. The Tenement Holder must ensure that noise generated from mining operations on the Land:
        33.1.1. Is measured, for or at, all sensitive receivers in accordance with the Environment Protection (Noise) Policy 2007, under the Environment Protection Act 1993 of South Australia; and
        33.1.2. does not exceed the following noise limits, at those sensitive receivers:
            33.1.2.1. 57 dB(A) between the hours of 7am and 10pm and 50 dB(A) between the hours of 10pm and 7am within a Primary Production Zone (as delineated in the Wudinna District Council Development Plan at the date that the Mining Tenement was granted, set out in the Seventh Schedule of this Tenement document); or
            33.1.2.2. 55 dB(A) between the hours of 7am and 10pm and 48 dB(A) between the hours of 10pm and 7am within a Settlement Zone (as delineated in the Wudinna District

Council Development Plan at the date that the Mining Tenement was granted, set out in the Seventh Schedule of this Tenement document).

33.1.3. Mine noise measured at, or for, noise-affected premises must be adjusted in accordance with the relevant environment protection noise policy by the inclusion of a penalty for each characteristic where tonal/modulating/impulsive/low frequency characteristics are present as identified by an acoustic engineer.

33.1.4. The Tenement Holder must undertake meteorological monitoring in accordance with relevant Australian standards to measure and record meteorological data including (but not limited to) wind speed and direction, temperature, humidity, atmospheric pressure, solar radiation, rainfall and evaporation.

33.1.5. The Tenement Holder must monitor noise levels on a continuous basis and report that data and meteorological monitoring data acquired by the Tenement Holder in real time to the public on an unrestricted internet site. The monitoring data must be retained and remain accessible on the unrestricted internet site for the life of the mine.

Blasting Outcome

34. The Tenement Holder must during construction and operation, ensure that there are no adverse impacts to:
    34.1. public safety,
    34.2. human comfort,
    34.3. third party property (including stock),
    34.4. adjacent land use,
    34.5. aircraft, or
    34.6. other receptors,

from airblast, flyrock and vibration caused by blasting.

Blasting Strategies

35. The Tenement Holder is required to address the following matters for the purposes of Regulation 65(2)(c) in relation to the Blasting Outcome **sixth schedule clause 34**;

35.1. Notify property owners or residents adjacent to and within the Land, subject to their consent, of all blasts no less than forty eight hours in advance of those blasts;

35.2. Develop strategies for the management of impacts from blasting, including the determination and requirement of blast exclusion zones, in accordance with relevant standards including the Australian Standard AS 2187.2;

35.3. Develop strategies for establishing and implementing a blast exclusion zone between any third party property or land use, and

the designated blast area, for all blasting events during mining operations;

35.4. If required, develop strategies to ensure that a blast exclusion zone is maintained between the public and the designated blast area, for all blasting events during mining operations.

35.5. Develop a blasting protocol and blasting schedule in consultation with owners and residents of land within and adjacent the Land to reflect the needs of the adjacent land use practices.

Blasting Criteria

36. The Tenement Holder is required to address the following matters for the purposes of Regulation 65(2)(d) in relation to the Blasting Outcome **sixth schedule clause 34**;

36.1. All blasts must be monitored and measured for vibration and airblast overpressure;

36.2. Blasting criteria is set in accordance with the Australian Standard AS 2187.2;

36.3. Measurements taken to demonstrate achievement of the blasting outcome must be taken in accordance with Australian Standard AS2187.2.

Surface Water Outcome – Agricultural Productivity

37. The Tenement Holder must during construction, operation and post-mine completion, ensure no impacts to agricultural productivity, including but not limited to;

37.1. reduction in crop yield;

37.2. reduction in grain quality; or

37.3. adverse health impacts to livestock;

for third party land users on or off the Land as a result of surface water contamination and/or inundation from mining operations, other than those agreed between the Tenement Holder and the affected user.

Surface Water Strategies – Agricultural Productivity

38. The Tenement Holder is required to address the following matters for the purposes of Regulation 65(2)(c) in relation to the Surface Water Outcome – Agricultural Productivity **sixth schedule clause 37**:

38.1. Address all conclusions, actions and recommendations included in Appendix H of the Mining Proposal ("CEIP - Hydrology and Surface Water Management Study - 8/10/2015 (RPS)");

38.2. The Tenement Holder must ensure that:

38.2.1. Mining operations do not cause inundation of third party property and infrastructure by water (to a greater extent than would be expected to occur prior to mining operations commencing) unless the Tenement Holder has obtained a Waiver of Exemption under the Act to undertake mining activities (inclusive of inundation); and

38.2.2. Inundation of third party property and infrastructure by water (to a greater extent than would be expected to occur prior to mining operations commencing) after mine completion is not caused by mining operations.

38.3. Ensure no surface water contaminated (including sedimentation) as a result of mining operations leaves the Land;

38.4. Ensure that, apart from water contained in the pit void:

38.4.1. no surface water contaminated (including sedimentation) prior to mine completion remains within the Land after mine completion; and

38.4.2. no contamination of surface water (including sedimentation) occurs after mine completion as a result of mining operations within the Land.

38.5. Design and construct surface water infrastructure, including IWL surface water controls, to ensure achievement of the surface water outcome post-mine completion and in the long term.

38.6. A plan for establishing appropriate mechanisms to ensure effective transfer of responsibility for any maintenance of surface water infrastructure post-mine completion.

Groundwater Outcome

39. The Tenement Holder must during construction, operation and post-mine completion, ensure no impacts to agricultural productivity, including but not limited to;

39.1. reduction in crop yield;

39.2. reduction in grain quality; or

39.3. adverse health impacts to livestock;

for third party land users on or off the Land as a result of groundwater recharge from the IWL, other than those agreed between the Tenement Holder and the affected user.

Groundwater Strategies

40. The Tenement Holder is required to address the following matters for the purposes of Regulation 65(2)(c) in relation to the Groundwater Outcome **sixth schedule clause 39**;

40.1. Undertake groundwater monitoring at appropriate locations once the IWL is established and during operations to validate the groundwater model and IWL seepage rates.

Visual Amenity Outcome

41. The Tenement Holder must during construction, operation and post-mine completion, ensure that the form, contrasting aspects and reflective aspects of mining operations are visually softened to blend in with the surrounding landscape.

Visual Amenity Strategies

42. The Tenement Holder is required to address the following matters for the purposes of Regulation 65(2)(c) in relation to the Visual Amenity Outcome **sixth schedule clause 41**;
    42.1. Develop and implement strategies in consultation with affected parties for the management of visual amenity which should include (but not limited to):
        42.1.1. Unless the Director of Mines (or other authorised officer) has approved (in writing) an alternative agreement between the Tenement Holder and a land owner relating to the removal of infrastructure, the Tenement Holder must ensure that all infrastructure is decommissioned and removed from the Land at mine completion;
        42.1.2. Screening of prominent built structures and use of non-reflective, natural coloured materials;
        42.1.3. Establishing vegetation and mature trees to screen built infrastructure and minimise views into the site (where agreed with landowners);
        42.1.4. Positioning and design of permanent mine landforms or other earthen bunds to screen activities (where agreed with landowners);
        42.1.5. Shape permanent mine landforms to soften the visual impact and reflect surrounding landscape;
        42.1.6. Prompt rehabilitation of disturbed areas once no longer required for mining operations, utilising every available opportunity provided by the mine plan;
        42.1.7. Progressive rehabilitation of the IWL;
        42.1.8. Vegetate external faces of permanent mine landforms to reduce the impact of changes in landscape colour.

Visual Amenity Outcome – Light Spill

43. The Tenement Holder must during construction and operation, ensure that there are no adverse impacts to third party land use as a result of light spill caused by mining operations.

Visual Amenity Strategies – Light Spill

44. The Tenement Holder is required to address the following matters for the purposes of Regulation 65(2)(c) in relation to the Visual Amenity Outcome - Light Spill **sixth schedule clause 43**;
    44.1. Adhere to Australian Standard AS 4282-1997 Control of the obtrusive effects of outdoor lighting; and
    44.2. Develop and implement strategies in consultation with affected parties for the management of Light Spill.

Land Use Outcomes

45. The Tenement Holder must during construction, operation and post-mine completion, ensure that there are no adverse impacts to third party land use or property, adjacent to and on the Land, as a result of mining operations, other than those agreed between the Tenement Holder and the affected user.

Land Use Outcomes – Mine Closure

46. The Tenement Holder must ensure that the Land is progressively and finally rehabilitated to support the future land use.
47. Before mine completion, the Tenement Holder must satisfy the Director of Mines (or other authorised officer) that where practicable, the pre-mining land use can be recommenced post-mine completion.

Land Use Strategies – Mine Closure

48. The Tenement Holder is required to address the following matters for the purpose of Regulation 65(2)(c) in relation to the Land Use Outcomes – Mine Closure **sixth schedule clauses 46 and 47**:
    48.1. The Tenement Holder must ensure that post-mine completion, all final mine landforms (including the IWL) will be chemically and physically stable in the long term.
    48.2. Strategies for the establishment of post-mine completion land uses and areas, including the re-establishment of land for agriculture, must be consistent with the Mining Lease Proposal.

Land Use Outcome – Shading

49. The Tenement Holder must during construction, operation and post-mine completion, ensure no impacts to agricultural productivity, including but not limited to;
    49.1. reduction in crop yield;
    49.2. reduction in grain quality; or
    49.3. adverse health impacts to livestock;

for third party land users on or off the Land as a result of shading from mining operations, other than those agreed between the Tenement Holder and the affected user.

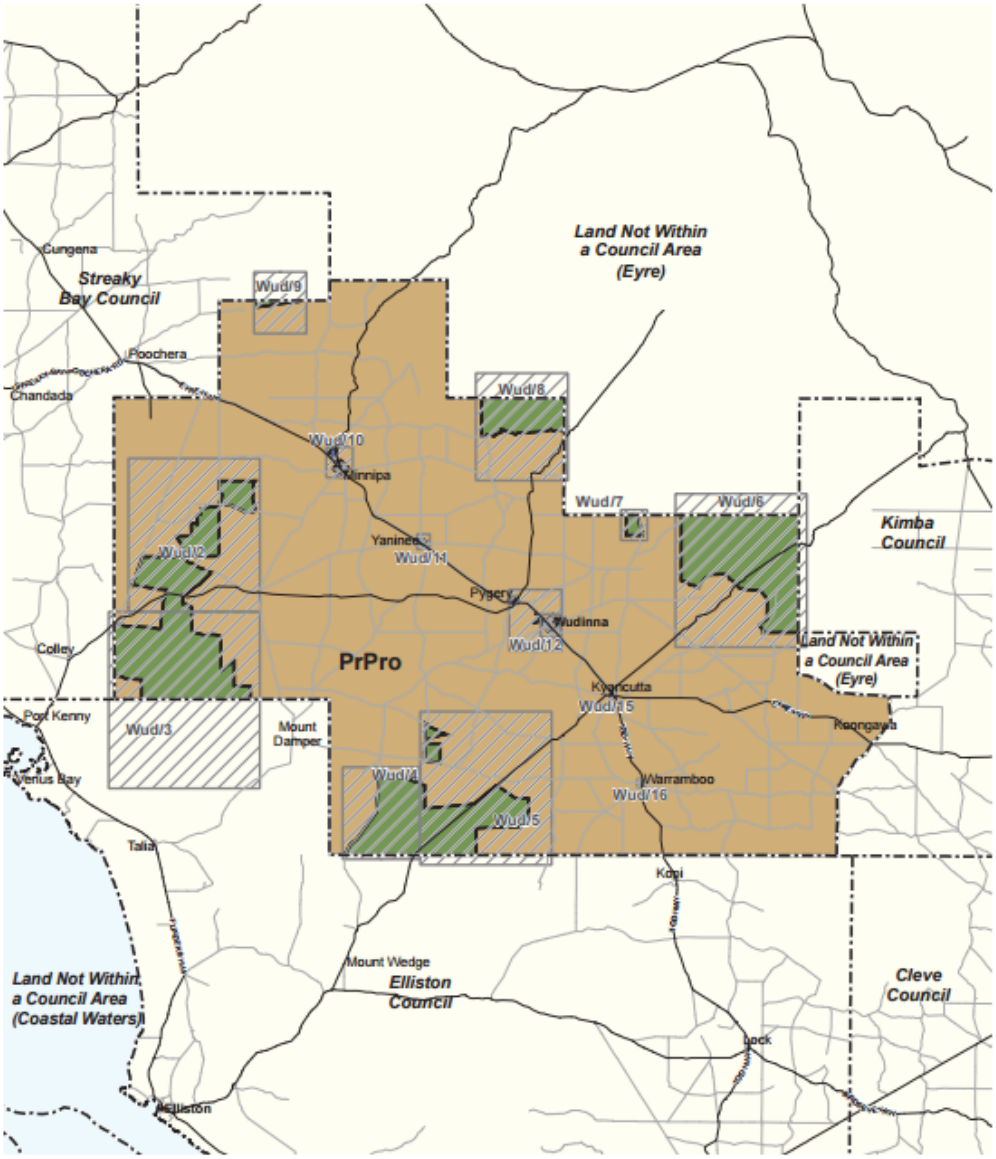
Land Use Strategies – Shading

50. The Tenement Holder is required to address the following matters for the purposes of Regulation 65(2)(c) in relation to the Land Use Outcome - Shading **sixth schedule clause 49**;
    50.1. Develop strategies for the design of the IWL to ensure impacts from shading to agricultural productivity for third party land users on or off the Land are as low as reasonably practicable.

SEVENTH SCHEDULE

WUDINNA DISTRICT COUNCIL DEVELOPMENT PLAN

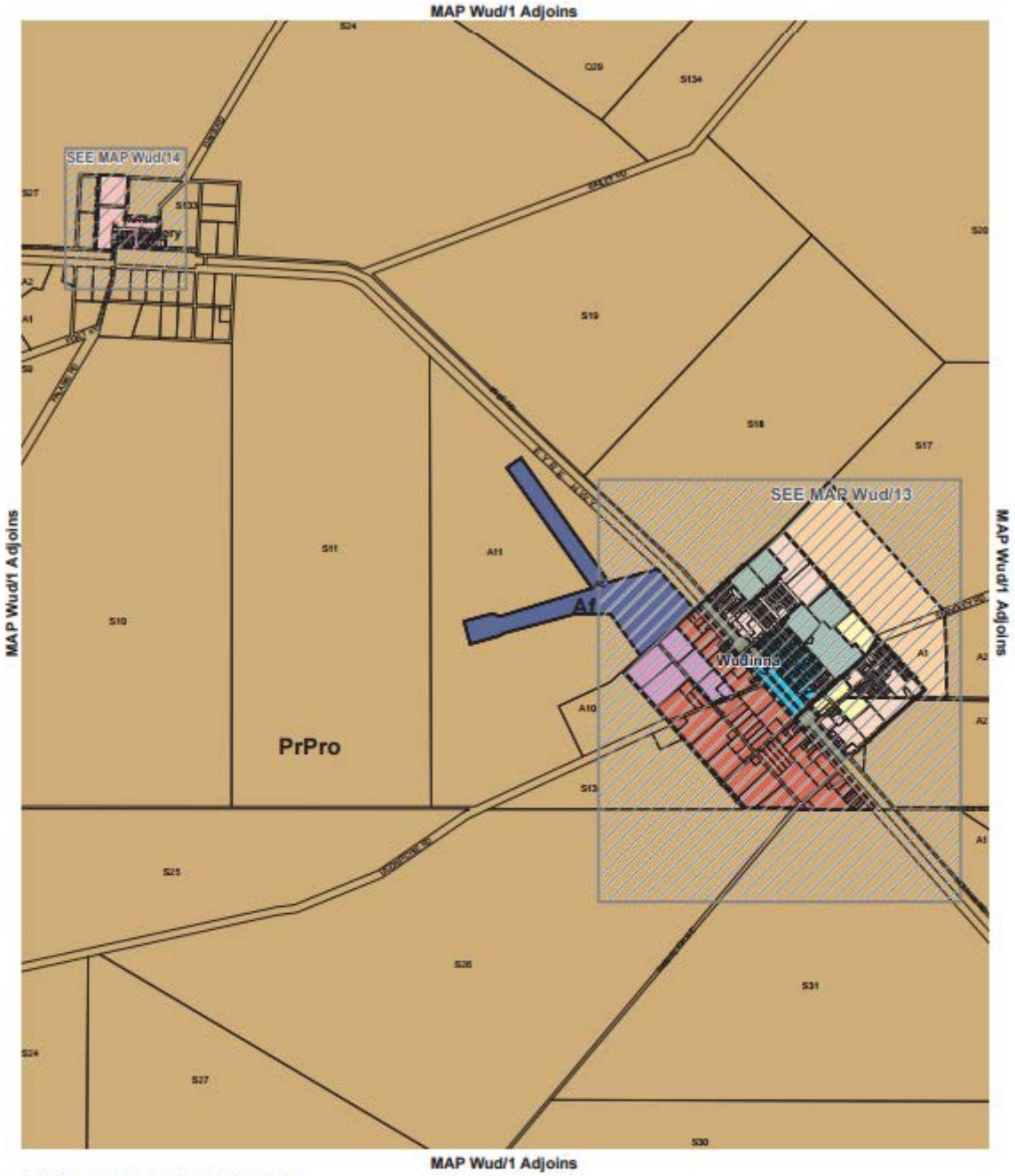
AT DATE OF GRANT OF THIS MINERAL LEASE



Zone Map Wud/1

WUDINNA COUNCIL

Consolidated - 25 October 2012



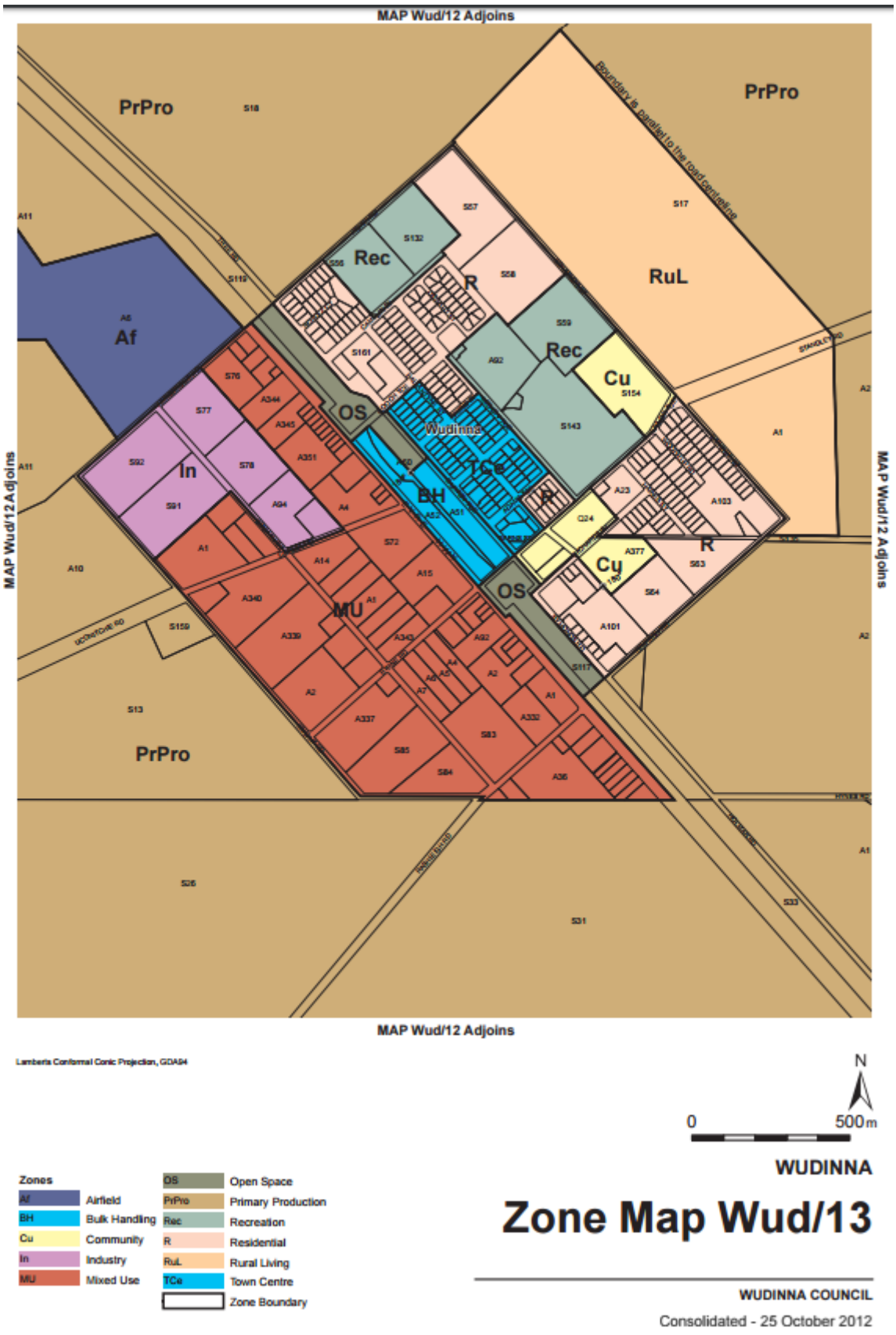
Zone Map Wud/12

Zones

- Al — Airfield
- PrPro — Primary Production
- Zone Boundary

WUDINNA COUNCIL

Consolidated - 25 October 2012


MAP Wud/12 Adjoins
PrPro
PrPro
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Cu Community
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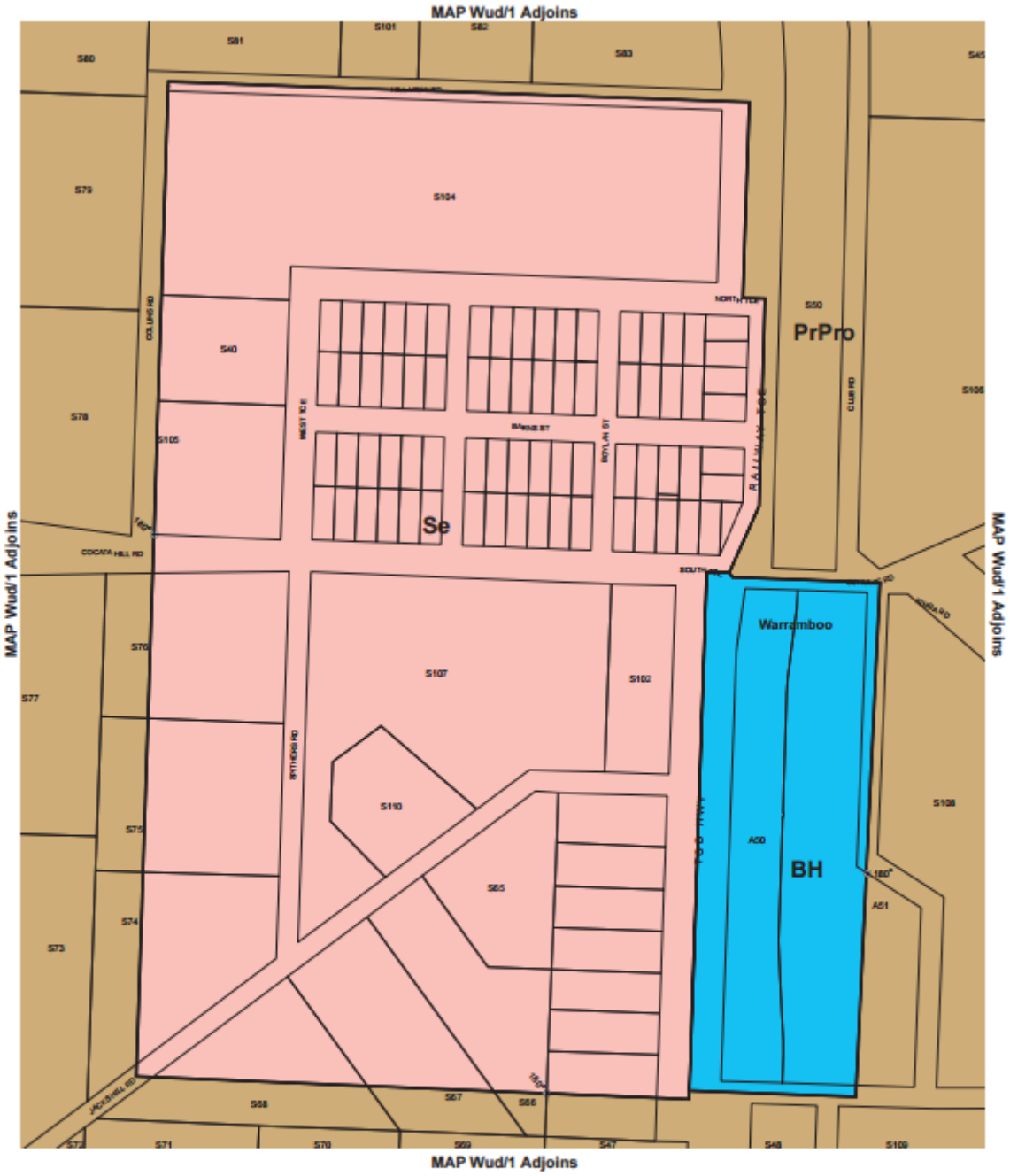
MU Mixed Use
OS Open Space
PrPro Primary Production
Rec Recreation
R Residential
RuL Rural Living
TCe Town Centre
Zone Boundary
WUDINNA
Zone Map Wud/13
WUDINNA COUNCIL
Consolidated - 25 October 2012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S109
S108
A50
A51
COLLINS RD
COCATA HILL RD
RITCHENS RD
JACKSHILL RD
RAILWAY TCE
CLEM RD
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WARRAMBOO
Zone Map Wud/16
Zones
BH Bulk Handling
PrPro Primary Production
Se Settlement
Zone Boundary
WUDINNA COUNCIL
Consolidated - 25 October 2012

MINERAL LEASE DEFINITIONS

Definitions

In this Tenement Document, the following words have the following meanings:

1. "**acoustic engineer**" means a person eligible for membership of both the Institution of Engineers Australia and the Australian Acoustical Society;
2. **"Act"** means the Mining Act 1971 of South Australia;
3. **"Additional Terms and Conditions"** means the Additional Terms and Conditions authorised by section 34(4) of the Act and set out in the First and Second Schedules of this Tenement Document respectively;
4. "**ANCOLD**" means Australian National Committee on Large Dams;
5. **"Applicant"** means the person or persons who applied for the Mining Tenement;
6. **"Approved PEPR"** means the Program for Environment Protection and Rehabilitation under Part 1 OA of the Act, which has received ministerial approval;
7. "**Basement fractured rock aquifer**" means the single confined fractured rock aquifer within Proterozoic age basement rocks;
8. **"Business Day"** means any day that is not a Saturday, Sunday or a public holiday in South Australia;
9. **"CEP"** means Community Engagement Plan;
10. **"Contamination" and "contaminated"** mean the presence of chemical substances in concentrations greater than the background concentrations (if any), where the presence of the chemical substances in the greater concentrations has resulted in
    - Actual or potential harm to the health or safety of human beings that is not trivial, or
    - Actual or potential harm to water that is not trivial, or
    - Other actual or potential environmental harm that is not trivial;
11. **"DDD"** means Directional Dust Deposition (including both ambient and mine related dust);
12. "**DRP**" means Decommissioning and Rehabilitation Plan;
13. **"Environmental Values (ground and surface water)"** means the environmental values recognised in the *'Australian and New Zealand Guidelines for Fresh and Marine Water Quality, October 2000, Paper No 4'.*

Explanatory Note: This Paper is available on line at:
http://www.environment.gov.au/water/publications/quality/australian-and-new-zealand-guidelines-fresh-marine-water-quality-volume-1

14. **"EPA"** means the Environment Protection Authority under the Environment Protection Act 1993 of South Australia;

15. **“Freeboard”** means the difference in height between the level of the supernatant pond and the lowest point of the tailings dam embankment.
16. **“IWL”** means the Integrated Waste Landform.
17. “**MAR**” means Managed Aquifer Recharge and for the purpose of the Mining Tenement is the intentional recharge of water into an aquifer either by injection or infiltration;
18. **"Mine completion"** means the Land has been rehabilitated to an extent that the Minister could approve an application for surrender of the Mining Tenement on the basis that the Tenement holder has complied with sub-regulation 45(1) of the Regulations and there is no obstacle under sub-regulation 45(3) of the Regulations;
19. **"mineral lease"** means the Mining Tenement granted to the Tenement Holder as referred to in paragraph 1 of this Tenement Document;
20. **"Mineral(s)"** means the Mineral(s) referred to on the front page of this Mineral Lease and in the First Schedule;
21. **"Mining Tenement"** means the mineral lease granted to the Tenement Holder as referred to in paragraph 1 of this Tenement Document;
22. **"Minister"** means the Minister for Mineral Resources and Energy (or any substituted Minister);
23. “**NAF**” means non-acid forming waste rock;
24. **“PAF”** means potentially acid forming waste rock;
25. **"PEPR"** means Program for Environment Protection and Rehabilitation;
26. **“PM 10”** means the fraction of particulates in air 10 micrometres or less in aerodynamic diameter;
27. **“PM 2.5”** means the fraction of particulates in air 2.5 micrometres or less in aerodynamic diameter;
28. **"Proposed PEPR"** means the document required by regulation 65(10) of the Regulations to be submitted for ministerial approval within twelve (12) months of the date of grant of the Mining Tenement;
29. **“Real time monitoring”** means the system for making monitored environmental parameters, acquired by the Tenement Holder, available immediately to stakeholders in an easily understood format;
30. **"Regulations"** means the Mining Regulations 2011 of South Australia;
31. **“Significant Environmental Benefit”** means a benefit provided as a requirement of authorisation to clear native vegetation under the *Native Vegetation Regulations 2003*.
32. **"site"** means the Land;
33. **“SMP”** means Social Management Plan;
34. **“TDD”** means the Total Dust Deposition (including both ambient and mine related dust);
35. **"Tenement Document"** means this document;
36. **"Tenement Holder"** means the person, or persons, to whom this the Mining Tenement is granted and includes;

- If the Tenement Holder is a natural person the executors, administrators and assigns of that person;
- If the Tenement Holder is a body corporate the successors, administrators or permitted assigns thereof.

Explanatory Note: "The Tenement Holder" has the same meaning as "the mining operator" as defined by section 6 of the Act.

37. **"the Land"** means the land over which this Mining Tenement is granted and which is described in paragraphs 5 and 6 of this Tenement Document and in the Third Schedule of this Tenement Document;
38. **"the Program"** means the Approved PEPR as defined above;
39. **"third party land users"** means the owner of land (as defined by the Act) and any persons lawfully occupying land with the licence of the owner, or the consent of the owner and "third party land use" has a corresponding meaning;
40. **“Third party property and infrastructure”** means property and infrastructure that is not owned by the Tenement Holder.
41. **“TSF”** means the Tailings Storage Facility;
42. **“TSP”** means Total Suspended Particulate matter;
43. **“Weeds”** means any invasive plant that threatens native vegetation in the local area or any species recognised as invasive in South Australia.
44. **“WRD”** means the Waste Rock Dump.

Appendix 3 DSD assessment of Iron Road CEIP impacts and risks register

DSD Assessment of Iron Road CEIP Impacts and Risks Register - December 2016

Line number	Description of Potential Impact Event	Mine Life Phase	Potential Impact Event ID	Source	Pathway	Receptor	Outcome required? i.e. is receptor reasonably expected to be adversely impacted by the source?	Evidence for linkage or lack of linkage	DSD Source, Pathway, Receptor Assessment	Description of Grouped Environmental Impact	Impact ID	Factors that limit / mitigate impact (control measures)	Significance of expected impact 1 = Negligible 2 = Low, 3 = Med 4 = High
1	Member of public falls into pit	Operation, Closure	PIM_07_01	Unauthorised entry of member of public to mine site	slips, trips, falls	Member of public / tourist	Yes	Possible result of unauthorised entry	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required. DSD classifies closure to be a part of the operations mine phase. Progressive rehabilitation and mine closure is not a phase that discretely happens after production has finished, rather it is a process that must occur through out the full life cycle of the mine. DSD classifies 'post-mine completion' to be a mine phase. This assessment applies to all impact events in this table and this wording is not repeated moving forward.	Injury / fatality on mining lease or associated infrastructure	IM_07_00	Restriction on public access to minesite with security gatehouse	1
2	Member of public falls into pit or pit lake	Post Closure	PIM_07_02	Member of public accessing mine site	slips, trips, falls, drowning	Member of public / tourist	Yes	Open pits are a known hazard. If a member of the public was able to access the pit lake, it is conceivable that they could fall into the lake.	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required.	Injury / fatality on mining lease or associated infrastructure	IM_07_01	Fencing and barrier. Benching in the pit, meaning that anyone falling into the pit would land on a bench rather than falling to the pit lake.	1
3	IWL results in a light plane hazard	Operation, Closure, Post Closure	PIM_07_03	Integrated Waste Landform	Physical obstruction	Light aircraft occupants	No	As a distinctive feature in the landscape, the IWL presents no greater hazard than any other similar landform and is considered to pose a negligible risk.	(1) DSD assesses that the evidence for the lack of a linkage between the source, pathway and receptor supports the requirement for no outcome.	NA	NA	NA	NA
4	Collapse of IWL as a result of surface water erosion causes injury or fatality to member of public	Construction, operation, closure	PIM_07_04	Surface water erosion	Loss of stability in IWL	Member of public	Yes	Surface water can result in gully, sheet or tunnel erosion or landslips	(1) DSD confirms that the Source, Pathway and Receptor exist. For construction, operation and closure, a receptor is not created by authorised access to the mine site by members of the public. Authorised access to the mine site by members of the public will be regulated by SafeworkSA. A receptor is created by unauthorised access by members of the public to the mine site (IWL). Members of the public adjacent to the mine site are also receptors. DSD classifies closure to be a part of the operations mine phase. Progressive rehabilitation and mine closure is not a phase that discretely happens after production has finished, rather it is a process that must occur through out the full life cycle of the mine. For post-mine completion, see the assessment for impact event PIM_07_09 below. The public will be a receptor regardless of the means of access to the site. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is	Injury/fatality due to collapse of IWL during construction, operation or closure	IM_07_02	Public access during construction, operation and closure restricted to viewing platform/area. Validation of construction of IWL to design (QA/QC)	1
5	Collapse of IWL as a result of wind erosion causes injury or fatality to member of public	Construction, operation, closure	PIM_07_05	Wind erosion	Loss of stability in IWL	Member of public	Yes	Wind erosion could result in undermining of structures	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required.	Injury/fatality due to collapse of IWL during construction, operation or closure	IM_07_03	Public access during construction, operation and closure restricted to viewing platform/area. Validation of construction of IWL to design (QA/QC)	1
6	Collapse of IWL as a result of poor consolidation of material causes injury or fatality to member of public	Construction, operation, closure	PIM_07_06	Poor consolidation of material in IWL	Loss of stability in IWL	Member of public	Yes	Poor consolidation could result in collapse of a section of the IWL	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required.	Injury/fatality due to collapse of IWL during construction, operation or closure	IM_07_04	Public access during construction, operation and closure restricted to viewing platform/area. Validation of construction of IWL to design (QA/QC)	1
7	Collapse of IWL as a result of poor geomorphological design causes injury or fatality to member of public	Construction, operation, closure	PIM_07_07	Poor geomorphological design of IWL	Loss of stability in IWL	Member of public	Yes	Poor design could result in the sides of the IWL being unstable and collapsing	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required.	Injury/fatality due to collapse of IWL during construction, operation or closure	IM_07_05	Public access during construction, operation and closure restricted to viewing platform/area. Validation of construction of IWL to design (QA/QC)	1
8	Collapse of IWL as a result of seismic event causes injury or fatality to member of public	Construction, operation, closure	PIM_07_08	Seismic event	Loss of stability in IWL	Member of public	Yes	A significant seismic event could trigger collapse of part of the IWL	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required.	Injury/fatality due to collapse of IWL during construction, operation or closure	IM_07_06	Public access during construction, operation and closure restricted to viewing platform/area. Validation of construction of IWL to design (QA/QC)	1
9	Collapse of IWL as a result of surface water erosion causes injury or fatality to member of public	Post closure	PIM_07_09	Surface water erosion	Loss of stability in IWL	Member of public	Yes	Surface water can result in gully or tunnel erosion or landslips	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required.	Injury/fatality due to collapse of IWL post closure	IM_07_07	IWL designed to be stable structure. Validation of construction of IWL to design (QA/QC). Arrangements made prior to mine completion for any ongoing maintenance required.	1

DSD Assessment of Iron Road CEIP Impacts and Risks Register - December 2016

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10	Collapse of IWL as a result of wind erosion causes injury or fatality to member of public	Post closure	PIM_07_10	Wind erosion	Loss of stability in IWL	Member of public	Yes	Wind erosion could result in undermining of structures	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required.	Injury/fatality due to collapse of IWL post closure	IM_07_08	IWL designed to be stable structure. Validation of construction of IWL to design (QA/QC). Arrangements made prior to mine completion for any ongoing maintenance required.	1	
11	Collapse of IWL as a result of poor consolidation of material causes injury or fatality to member of public	Post closure	PIM_07_11	Poor consolidation of material in IWL	Loss of stability in IWL	Member of public	Yes	Poor consolidation could result in collapse of a section of the IWL	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required.	Injury/fatality due to collapse of IWL post closure	IM_07_09	IWL designed to be stable structure. Validation of construction of IWL to design (QA/QC). Arrangements made prior to mine completion for any ongoing maintenance required.	1	
12	Collapse of IWL as a result of poor geomorphological design causes injury or fatality to member of public	Post closure	PIM_07_12	Poor geomorphological design of IWL	Loss of stability in IWL	Member of public	Yes	Poor design could result in the sides of the IWL being unstable and collapsing	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required.	Injury/fatality due to collapse of IWL post closure	IM_07_10	IWL designed to be stable structure. Validation of construction of IWL to design (QA/QC). Arrangements made prior to mine completion for any ongoing maintenance required.	1	
13	Collapse of IWL as a result of seismic event causes injury or fatality to member of public	Post closure	PIM_07_13	Seismic event	Loss of stability in IWL	Member of public	Yes	A significant seismic event could trigger collapse of part of the IWL	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required.	Injury/fatality due to collapse of IWL post closure	IM_07_11	IWL designed to be stable structure. Validation of construction of IWL to design (QA/QC). Arrangements made prior to mine completion for any ongoing maintenance required.	1	
14	Mine viewing platform fails causing injury to member of public	Operation, Closure,	PIM_07_14	Viewing platform	Incorrect construction/maintenance	Member of public	Yes	Collapse of platform could result in injury	(1) DSD confirms that the Source, Pathway and Receptor exist. For operation and closure, a receptor is not created by authorised access to the mine site by members of the public. Authorised access to the mine site by members of the public will be regulated by SafeworkSA. A receptor is created by unauthorised access by members of the public to the mine site (IWL). Members of the public adjacent to the mine site are also receptors. For post-mine completion, see the assessment for impact event PIM_07_15 below. The public will be a receptor regardless of the means of access to the site. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required.	Injury / fatality on mining lease or associated infrastructure	IM_07_12	Appropriate design and maintenance. Validation of construction to design.	1	
15	Mine viewing platform fails causing injury to member of public	Post Closure	PIM_07_15	Viewing platform	Incorrect construction/maintenance	Member of public	Yes	Collapse of platform could result in injury	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required.	Injury / fatality on mining lease or associated infrastructure	IM_07_13	Appropriate design. Validation of construction to design. Arrangements made for ongoing maintenance.	1	
16	Unauthorised access to IWL results in injury to member of public	Construction, operation, closure	PIM_07_16	Hazardous slopes or surfaces on IWL	Fall or vehicle or other type of accident	Member of public	Yes	Member of public could be exposed to a number of hazards, e.g. moving vehicles and equipment, fall hazards etc.	(1) DSD confirms that the Source, Pathway and Receptor exist. For construction, operation and closure, a receptor is not created by authorised access to the mine site by members of the public. Authorised access to the mine site by members of the public will be regulated by SafeworkSA. A receptor is created by unauthorised access by members of the public to the mine site (IWL). Members of the public adjacent to the mine site are also receptors. For post-mine completion, see the assessment for impact event PIM_07_17 below. The public will be a receptor regardless of the means of access to the site. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required.	Injury / fatality on mining lease or associated infrastructure	IM_07_14	Security fencing, access control and security presence	1	

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17	Unauthorised access to IWL results in injury to member of public	Post closure	PIM_07_17	Hazardous slopes or surfaces on IWL	Fall or vehicle or other type of accident	Member of public	Yes	Areas of the IWL may have fall hazards or be still stabilising	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required.	Injury / fatality on mining lease or associated infrastructure	IM_07_15	IWL designed to be stable structure. Validation of construction of IWL to design (QA/QC). Arrangements made prior to mine completion for any ongoing maintenance required.	1	
18	Health impacts to local community as a result of disturbance of contaminated land	Construction Operation	PIM_07_19	Potential existing contamination as a result of historical usage of site	Excavation / general construction activities	local community	Yes	Phase 1 ESA indicates that potential for significant site contamination is low. Existing site contamination may occur in isolated areas	(1) DSD confirms that the Source, Pathway and Receptor exist. For construction, operation and closure, a receptor is not created by authorised access to the mine site by members of the public. Authorised access to the mine site by members of the public will be regulated by SafeworkSA. A receptor is created by unauthorised access by members of the public to the mine site (IWL). Members of the public adjacent to the mine site are also receptors. For this impact event, the mechanism for the local community being exposed to disturbed contaminated land on the site is likely to be through unauthorised access to the mine. Mobilisation of the contamination through the air or water will be addressed through other impact events, strategies and environmental outcomes. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required.	Health impacts from contamination	IM_07_16	Further investigation if potential hazard identified and remedial action if required, employee awareness training	1	
19	Health impacts to local community as a result of contamination of soils and or groundwater	Construction Operation	PIM_07_20	Hydrocarbon and other chemical use on site	Soil, groundwater or surface water contamination	local community	Yes	Contaminants have different levels of risk to humans	(1) DSD assesses that there is the lack of a linkage between the source, pathway and receptor and hence no outcome is required. Impact events that relate to potential impacts on soil and groundwater from hydrocarbons and other chemicals are credible and are assessed elsewhere. There is no potential pathway for the local community to be impacted from contamination of soil and groundwater from within the mine site. There is a commitment from the company to ensure that soils and groundwater are protected (after the implementation of controls) which ensures the protection of health of impacts to the local community in relation to this impact event.	Health impacts from contamination	IM_07_17	Bunding, spill response procedures, clean up kits etc. available.	1	
20	Fire originating in mining lease results in injuries or fatalities to members of the public	Construction, operation, closure	PIM_07_21	Use of equipment and machinery	Spread of fire	Local and regional community	Yes	Vehicles and equipment can cause fires	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required.	Fire from mining lease	IM_07_18	Equipment maintenance, provision of fire suppression equipment, staff awareness, stop work procedures for high risk activities on high fire danger days	1	
21	Member of the public is injured by fly rock or air blast from blasting	Operation	PIM_07_22	Mine blasting	Air	Member of public	No	Assessment of mine blasting shows that any impacts from air blast would meet Australian Standards at the nearest sensitive receivers by a significant margin. Flyrock management will be necessary to ensure in pit conveyors are not damaged. Modelling indicates flyrock is not like to travel more than 50 m. As the open pit is at least 500 m from the proposed ML boundary, there is a considerable margin of safety. In addition, blasting would not occur until after overburden removal meaning the pit wall will also act as a partial barrier (and increasingly so as the pit deepens). Consequently, it is not credible that harm could occur to the public.	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required. Assessment: The MP (page 7-5) includes a description of the potential impact from fly rock on members of the public. The receptor for this impact event is 'local residents'. At the time of DSD's assessment of the mining application, the land access and land use for all areas within the proposed mining lease had not been finalised. Iron Road proposes to maximise the land available within the proposed mining lease for agricultural use (see Land use impact event PIM_21_01). Given that there is the potential for multiple land use within the Lease, there is uncertainty in relation to how close human receptors will be in relation to the open pit. Hence, for this impact event, DSD has considered there is the potential for receptors to exist within the lease boundary and therefore an outcome is required. There is no impact event that considers impacts from blasting on aircraft. The MP (page 21-13) states that 'the use of aircraft for agricultural purposes has not been observed within the local study area'. Regional airports are located on the Eyre Peninsula, including at Wudinna. There is uncertainty in regards to the potential use of aircraft in proximity to the open pit, hence, it is assessed that an outcome is required for this impact event.	NA	NA	NA	NA	
21a	Provision of additional emergency services facilities/vehicles	Operation	PIM_07_23	Additional emergency services/facilities for mine employees	Potential use by community	Local community	Yes	Vehicles and facilities will be provided at mine site	(1) DSD acknowledges that this impact event has the potential to create a benefit for the local community. No environmental outcome is required.	Onsite emergency services	IM_07_19			
22	Deterioration of roads and Increased road maintenance requirements as a result of mine traffic during construction	Construction	PIM_8_01	Mine construction traffic	Traffic movement	Road pavements	Yes	Increased traffic movement will increase deterioration of road pavement	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required.	Impacts on road infrastructure	IM_8_01	Pavement monitoring, management and rehabilitation measures	2	
23	Deterioration of roads and increased road maintenance requirements as a result of mine traffic during operation	Operation, Closure	PIM_8_02	Mine traffic	Traffic movement	Road pavements	Yes	Increased traffic movement will increase deterioration of road pavement	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required.	Impacts on road infrastructure	IM_8_02	Pavement monitoring, management and rehabilitation measures	1	
24	Road closures and realignments at mine result in increased travel times for local community	Construction, Operation, Closure	PIM_8_03	Road closures	Road closures	Local community and farming traffic	Yes	Road closures will require local and farm traffic to use other routes	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required. The mine phase of 'post-mine completion' must be included in this impact event. Potential impacts 'post-mine completion' must be considered as strategies to mitigate impacts during construction and operation may be different to the strategies post-mine completion. This is the case if travel times are managed by allowing access to the mine site during operations which may change post-mine completion.	Impacts on local traffic movement	IM_8_03	Community information on road closures and alternative routes. Consultation with affected farmers and provision of alternative access arrangements where practicable	3	

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25	Dragout from mine traffic results in a safety hazard for local traffic	Construction, Operation, Closure	PIM_8_04	Mine traffic	Dust or loss of traction	Local traffic	Yes	Known hazard	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required.	Impact on road safety	IM_8_04	Maintenance of mine roads.	1	
26	Transport of mine modules results in traffic delays for road users in the region	Construction	PIM_8_05	Transport of mine modules	Temporary road closures	Regional traffic using or intersecting haul route	Yes	Slow speed of transporters will create traffic delays	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required.	Impacts on local traffic movement	IM_8_05	Community awareness. Use of large modules to minimise number of trips. Traffic management procedures. Transport of modules at night. Minimise movements during harvest season.	2	
26a	Transport of mine modules results in safety risks for road users in the region	Construction	PIM_8_06	Transport of mine modules	Temporary road closures	Regional traffic using or intersecting haul route	Yes	Slow speed of transporters will create traffic delays and potentially result in accidents	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required.	Impacts on road safety	IM_8_06	Community awareness. Use of large modules to minimise number of trips. Slow speed of module transporters. Traffic management procedures. Transport of modules at night. Minimise movements during harvest season.	1	
27	Mine traffic increases road safety risk for local residents and other road users	Construction, Operation, Closure	PIM_8_07	Mine traffic	Road accidents	Local community and other road users	Yes	The mine will generate additional traffic	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required.	Impacts on road safety	IM_8_07	Contract workforce expected to remain within mining lease. Driver training and awareness.	1	
28	Impacts on existing Level of Service on roads and intersections as a result of increased road traffic from mine construction	Construction	PIM_8_08	Mine construction traffic	Traffic movement	Existing level of road service	Yes	Increased traffic will result in increased number of vehicles on roads and therefore potentially impact Level of Service	(1) In the MP, 'Level of Service' is defined on page (8-1) and is used to 'represent service measures such as speed, travel time, freedom to manoeuvre and convenience' (MP page 8-20). For the purpose of this assessment, as a key component of 'Level of Service' relates to 'travel speed and times' experienced, this impact event will be assessed as if the receptor is 'travel times'. DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required.	Impacts on local traffic movement	IM_8_08	Minimise construction traffic via large modules	1	
29	Impacts on existing Level of Service on roads and intersections as a result of increased road traffic from mine operation	Operation, Closure	PIM_8_09	Mine traffic	Traffic movement	Existing level of road service	Yes	Increased traffic will result in increased number of vehicles on roads and therefore potentially impact Level of Service	(1) In the MP, 'Level of Service' is defined on page (8-1) and is used to 'represent service measures such as speed, travel time, freedom to manoeuvre and convenience' (MP page 8-20). For the purpose of this assessment, as a key component of 'Level of Service' relates to 'travel speed and times' experienced, this impact event will be assessed as if the receptor is 'travel times'. DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required.	Impacts on local traffic movement	IM_8_09	Minimise operational traffic through use of buses, and mine workforce remaining within mining lease	1	
30	Delay to the operation of school bus routes as a result of increased traffic and road closures	Operation, Closure	PIM_8_10	Mine traffic	Traffic movement	School buses	Yes	The mine will generate traffic and close roads	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required.	Impacts on local traffic movement	IM_8_10	Council and school awareness of proposed alterations	1	
31	Aboriginal site, object or remain is damaged, disturbed or interfered with	Construction, operation	PIM_9_01	Ground disturbing activity	Physical ground disturbance	Persons who speak for Aboriginal heritage in the area (Barngarla)	Yes	Despite database reviews revealing no registered sites of indigenous heritage significance on the ML, liaison with Barngarla not identifying any sites of significance, and extensive farming practices across the ML, it is still a possibility that artefacts could exist at the site.	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required.	Disturbance of Aboriginal heritage sites	IM_9_01	Heritage surveys prior to ground disturbance, flagging any identified no-go zone areas with TO.	1	
32	Disturbance to non-identified sites/items of non-Aboriginal heritage significance	Construction, operation	PIM_10_01	Ground disturbing activity	Physical ground disturbance	Site/item of heritage significance	No	Database reviews and consultation with the local community and Wudinna Council have not identified any non-Aboriginal sites of heritage significance. Consequently, there is no reasonable expectation that adverse impacts on sites of significance could occur.	(1) DSD assesses that the evidence for the lack of a linkage between the source, pathway and receptor supports the requirement for no outcome.	NA	NA	NA	NA	
33	Warramboo cemetery affected by vibration from blasting operations	Operation	PIM_10_02	Blasting	Vibration	Warramboo cemetery	No	Modelling of vibration demonstrates that damage to the cemetery is not reasonably expected to occur as a result of blasting.	(1) DSD assesses that the evidence for the lack of a linkage between the source, pathway and receptor supports the requirement for no outcome.	NA	NA	NA	NA	
34	Clearance of vegetation results in reduction of habitat for fauna (not conservation significant)	Construction, operation	PIM_11_01	Vegetation clearance	Ground disturbing activity (GDA)	Habitat for native fauna (not conservation significant)	Yes	Clearing of habitat will be required	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required.	Reduction in habitat	IM_11_01	All clearance of native vegetation authorised and SEB provided	2 (area of habitat removal small in comparison to available habitat for fauna)	

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35	Clearance of vegetation results in reduction of habitat for conservation significant fauna	Construction, operation	PIM_11_02	Vegetation clearance	GDA	Habitat for native fauna (conservation significant)	Yes	Clearing of habitat will be required	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required.	Reduction in habitat	IM_11_02	All clearance of native vegetation authorised and SEB provided	2 (area of habitat removal small in comparison to available habitat for fauna)	
36	Vegetation clearance results in direct mortality of native fauna (not conservation significant)	Construction, operation	PIM_11_03	Vegetation clearance	GDA, Movement of equipment and falling trees	Native fauna (not conservation significant)	Yes	Clearing activities may result in direct mortality of localised individual fauna i.e. not populations	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required.	Fauna mortality	IM_11_03	All clearance of native vegetation authorised and SEB provided. Pre-clearance relocation of fauna where practicable.	2	
37	Vegetation clearance results in direct mortality of native fauna (conservation significant)	Construction, operation	PIM_11_04	Vegetation clearance	GDA, Movement of equipment and falling trees	Native fauna (conservation significant)	Yes	Clearing activities may result in direct mortality of fauna	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required.	Fauna mortality	IM_11_04	All clearance of native vegetation authorised and SEB provided. Pre-clearance relocation of fauna where practicable.	2	
38	Direct mortality or injury of conservation significant species as a result of vehicle strike	Construction, Operation, Closure	PIM_11_05	Vehicles	Vehicles travelling within mine lease	Native fauna	Yes	Interactions between vehicles and fauna can be expected	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required.	Fauna mortality	IM_11_05	Driving with due care, speed limit reduced within the mining lease	2	
39	Direct mortality or injury of fauna (non-conservation significant) as a result of vehicle strike	Construction, Operation, Closure	PIM_11_06	Vehicles	Vehicles travelling within mine lease	Native fauna	Yes	Interactions between vehicles and fauna can be expected	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required.	Fauna mortality	IM_11_06	Driving with due care, speed limit reduced within the mining lease	2	
40	Increased populations of pest animal species as a result of mining operations (e.g. attracted to landfills, putrescible waste) results in increased competition with, or predation upon, native fauna	Construction, Operation	PIM_11_07	Pest animals attracted to putrescible waste materials	Competition or predation	Native fauna	Yes	Pest animals are known to be attracted to putrescible waste	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required.	Increase in pest species	IM_11_07	Appropriate waste hygiene and disposal practices	2	
41	Increased populations of pest animal species as a result of mining operations (e.g. attracted to landfills, putrescible waste) impacts surrounding agricultural practices (e.g. mice, foxes)	Construction, Operation	PIM_11_08	Pest animals attracted to putrescible waste materials	Predation	On and off-lease cropping land or stock	Yes	Pest animals are known to be attracted to putrescible waste	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required.	Increase in pest species	IM_11_08	Appropriate waste hygiene and disposal practices	2	
42	Native fauna attracted to putrescible waste leads to increased interaction with humans, resulting in elevated levels of fauna mortality	Construction, Operation	PIM_11_09	Native fauna attracted to putrescible waste materials	Interaction with humans and vehicle activity	Native fauna	Yes	Native fauna are known to be attracted to putrescible waste	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required.	Fauna mortality	IM_11_09	Appropriate waste hygiene and disposal practices	2	
43	Introduction and establishment of new pest species (e.g. Portuguese White Snail) impacts on native fauna and/or productive land	Construction, Operation, Closure	PIM_11_10	Unclean vehicles, favourable habitat, decrease or lack of natural predators	Competition or predation	Native fauna, productive land	Yes	Known potential impact from other mining projects	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required.	Increase in pest species	IM_11_10	sanitary control measures, e.g. wheel washing entering or leaving site, checking loads	2	
44	Lighting at mine site results in altered behaviour patterns of fauna (e.g. bat species)	Construction, Operation	PIM_11_11	Mine site lighting	phototrophic behaviours, attraction of insectivorous species	Native fauna	Yes	Lighting is known to cause behavioural change in some species	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required.	Behavioural change	IM_11_11	Design lighting to minimise light spill	2	
45	Noise / vibration/ disturbance at mine site result in altered behaviour patterns of fauna	Construction, Operation	PIM_11_12	Noise generated from mining operations, including blasting	Soundwave transmission	Native fauna	Yes	Noise/vibration is known to cause behavioural change in some species	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required.	Behavioural change	IM_11_12	Maintenance of machinery. Adaptation to noise over time.	2	
46	Fauna captured in temporary open trenches and excavations resulting in potential mortality	Construction	PIM_11_13	Construction activities	Mobility of fauna	Native fauna	Yes	Fauna trapped in trenches can suffer heat stress, dehydration and other impacts	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required.	Fauna mortality	IM_11_13	Ramps in excavations. Inspection of trenches by fauna handler	2	
47	Loss of habitat at Lake Warramboo Complex to the north of the ML as a result of reduced GW elevation due to pit dewatering	Operation, Closure, post closure	PIM_11_14	Dewatering of pit	Groundwater depression	Habitat values of Lake Warramboo complex	No	Ecological values at Lake Warramboo are currently threatened by elevated groundwater level. Consequently, lowering of groundwater will not cause increased harm and may be a benefit	(1) DSD assesses that the evidence for the lack of a linkage between the source, pathway and receptor supports the requirement for no outcome.	NA	NA	NA	NA	

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48	Establishment of microhabitats on IWL for native fauna (rocky outcrops, etc.)	Operation, Closure, post closure	PIM_11_15	Integrated Waste Landform	Soil and landform	Native fauna	Yes	SEB requirements will ensure appropriate fauna habitat	(1) DSD acknowledges that this impact event has the potential to increase the habitat for native fauna. No environmental outcome is required. Note: A Significant Environmental Benefit (SEB) is required under the Native Vegetation Act 1991 to offset the impact of the approved clearance of native vegetation.	Increase in habitat	IM_11_14	Suitable design to maximise habitat value	**Benefit**
49	Establishment of fauna habitat through rehabilitation, landscaping and screening on and adjacent ML	Operation, Closure	PIM_11_16	Landscaping, screening and rehabilitation of disturbed land	Vegetation, soil and landforms	Native fauna	Yes	Native fauna are currently using this type of habitat	(1) DSD acknowledges that this impact event has the potential to increase the habitat for native fauna. No environmental outcome is required. Note: A Significant Environmental Benefit (SEB) is required under the Native Vegetation Act 1991 to offset the impact of the approved clearance of native vegetation.	Increase in habitat	IM_11_15	Revegetation design, species selection and revegetation success	**Benefit**
50	Establishment of fauna habitat through rehabilitation and revegetation requirements of the SEB offset (outside of ML)	Operation, Closure	PIM_11_17	SEB Offset	Rehabilitation and revegetation	Native fauna	Yes	SEB requirements will ensure appropriate fauna habitat	(1) DSD acknowledges that this impact event has the potential to increase the habitat for native fauna. No environmental outcome is required. Note: A Significant Environmental Benefit (SEB) is required under the Native Vegetation Act 1991 to offset the impact of the approved clearance of native vegetation.	Increase in habitat	IM_11_16	Revegetation design, species selection and revegetation success	**Benefit**
52	Direct mortality of fauna as a result of falling into pit lake	Closure, post closure	PIM_11_18	Open pit	Access to open pit	Native fauna	Yes	Known from other mines	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required.	Fauna mortality	IM_11_17	Barriers surrounding open pit. QA/QC of pit design and assessment of final stability.	1
53	Poor water quality in pit lake results in fauna mortality or reduced fecundity	Closure, post closure	PIM_11_19	Water in open pit	Groundwater	Native fauna	No	Pit water will be hypersaline with a similar chemistry to existing salt lakes	(1) DSD assesses that the evidence for the lack of a linkage between the source, pathway and receptor supports the requirement for no outcome.	NA	NA	NA	NA
54	Fires caused by mining operations result in injury or death to fauna and/or loss of habitat	Construction, operation, closure	PIM_11_20	Machinery and vehicles used in mining operations	Fire	Native fauna	Yes	Sparks from machinery and vehicles can cause fires	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required.	Fauna mortality	IM_11_18	Limited habitat on site Fire prevention and control measures	1
55	Introduction or spread of weeds and/or pathogens as a result of the mine development	Construction, Operation, closure	PIM_11_21	Unclean mining equipment entering/leaving mining lease	Vehicles and other mining equipment	Mine-lease environment Native vegetation	Yes	Known risk from other mining operations	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required.	Reduction in habitat	IM_11_19	Located in agricultural environment where weeds are already present. Inspection of equipment entering minesite and cleaning, where necessary. Weed control program.	1
56	Clearance of vegetation resulting in loss of conservation listed species and communities	Construction	PIM_12_01	Vegetation clearance	Vegetation clearance	Mine-lease environment Native vegetation	Yes	Conservation listed species potentially present	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required.	Vegetation Clearance	IM_12_01	SEB requirements Limited occurrence of listed species on site Reduced footprint due to IWL Marking of vegetation areas to be retained	2
57	Clearance of vegetation resulting in loss of locally indigenous species and communities	Construction	PIM_12_02	Vegetation clearance	Vegetation clearance	Mine-lease environment Native vegetation	Yes	Indigenous species present and will be affected by clearing	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required.	Vegetation Clearance	IM_12_02	SEB requirements Limited occurrence of listed species on site Marking of vegetation areas to be retained	2
58	Introduction or spread of weeds and/or pathogens as a result of the mine development	Construction, Operation, closure	PIM_12_03	Unclean mining equipment entering/leaving mining lease	Vehicles and other mining equipment	Mine-lease environment Native vegetation	Yes	Known risk from other mining operations	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required.	Spread of weeds/pathogens	IM_12_03	Located in agricultural environment where weeds are already present. Inspection of equipment entering minesite and cleaning, where necessary. Weed control program.	1
59	Introduction or spread of weeds on IWL dues to use of agricultural topsoil salvaged from existing farmland	Closure, Post closure	PIM_12_04	Agricultural topsoil salvaged from existing farmland	Placement on IWL	Potential ecological values and post mining land uses	Yes	Weeds are known to be present in soils currently on site	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required.	Spread of weeds/pathogens	IM_12_04	Weed control on stockpiles. Weed control following placement on IWL	1
60	Poor revegetation and regeneration as a result of landform design not providing adequate surface growth medium	Post closure	PIM_12_05	Landform cover design	Inability of surface cover materials to support growth	Potential ecological values	Yes	Tailings and waste rock provide a poor growing medium and a cover will be required. Successful regeneration depends on the adequacy of this cover.	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required. The mine phase is post-mine completion and the receptor has been stated as 'potential ecological values'. This is a valid receptor, however, for the purposes of this assessment, DSD will consider the receptor to be 'future land use' post-mine completion. The impact event considers a 'failure' of rehabilitation which will result in an impact to the future land use.	Unsuccessful rehabilitation	IM_12_05	No contaminants in waste rock and tailings that would prevent vegetation growth other than salt. Cover will use retained topsoil and be an appropriate depth.	1

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61	Poor revegetation and regeneration on IWL as a result of wind erosion of surface materials reducing surface growth medium	Post closure	PIM_12_06	Wind	Erosion of surface materials	Potential ecological values	yes	Wind could erode surface materials before vegetation is established	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required. The mine phase is post-mine completion and the receptor has been stated as 'potential ecological values'. This is a valid receptor, however, for the purposes of this assessment, DSD will consider the receptor to be 'future land use' post-mine completion. The impact event considers a 'failure' of rehabilitation which will result in an impact to the future land use.	Unsuccessful rehabilitation	IM_12_06	Appropriate mix of cover material to resist erosion. Provide adequate cover material to allow for some erosion. Mulching and encouragement of rapid revegetation.	1	
62	Poor revegetation and regeneration on IWL as a result of surface water erosion reducing surface growth medium	Post closure	PIM_12_07	Rain	Erosion of surface materials	Potential ecological values	Yes	Rain events could erode surface materials before vegetation is established	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required. The mine phase is post-mine completion and the receptor has been stated as 'potential ecological values'. This is a valid receptor, however, for the purposes of this assessment, DSD will consider the receptor to be 'future land use' post-mine completion. The impact event considers a 'failure' of rehabilitation which will result in an impact to the future land use.	Unsuccessful rehabilitation	IM_12_07	Appropriate mix of cover material to resist erosion. Provide adequate cover material to allow for some erosion. Mulching and encouragement of rapid revegetation.	1	
63	Poor revegetation and regeneration on IWL due to saline material in landform	Post closure	PIM_12_08	Saline materials in landform	Salt migration into cover materials	Potential ecological values	Yes	Salt could migrate into the cover material and affect vegetation	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required. The mine phase is post-mine completion and the receptor has been stated as 'potential ecological values'. This is a valid receptor, however, for the purposes of this assessment, DSD will consider the receptor to be 'future land use' post-mine completion. The impact event considers a 'failure' of rehabilitation which will result in an impact to the future land use.	Unsuccessful rehabilitation	IM_12_08	Capillary break	1	
64	Poor germination reduces rehabilitation success on IWL due to absence of natural fire regimes	Post closure	PIM_12_09	Absence of natural fire regimes	Poor germination	Potential ecological values	Yes	Some species rely in fire to stimulate seed germination	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required. The mine phase is post-mine completion and the receptor has been stated as 'potential ecological values'. This is a valid receptor, however, for the purposes of this assessment, DSD will consider the receptor to be 'future land use' post-mine completion. The impact event considers a 'failure' of rehabilitation which will result in an impact to the future land use.	Unsuccessful rehabilitation	IM_12_09	Treatment of seed if required	1	
65	Loss of native vegetation within ML and Hambidge as a result of fire from mining activities	Construction, Operation	PIM_12_10	Fire	Direct loss of vegetation	Potential ecological values,	Yes	Species will be lost from the site if they are destroyed by fire before they have had a chance to seed.	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required. The receptor for this impact is native vegetation rather than potential ecological values.	Unsuccessful rehabilitation	IM_12_10	Low record of fires in area. Provide for fuel breaks to reduce fire risk Fire control measures on site.	1	
66	Loss of revegetation on IWL due to poor species / community selection	Closure, Post closure	PIM_12_11	Poor species/community selection	Failure of revegetation	Potential ecological values	Yes	Given the higher elevation and different site conditions on the IWL, it cannot be assumed species currently present on site will be suitable.	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required. The mine phase is post-mine completion and the receptor has been stated as 'potential ecological values'. This is a valid receptor, however, for the purposes of this assessment, DSD will consider the receptor to be 'future land use' post-mine completion. The impact event considers a 'failure' of rehabilitation which will result in an impact to the future land use.	Unsuccessful rehabilitation	IM_12_11	Appropriate research	1	
67	Poor revegetation and regeneration as a result of landform design not providing adequate moisture retention	Operation Closure Post Closure	PIM_12_12	Landform cover design	Inadequate cover profile design to provide water availability etc.	Potential ecological values	Yes	Well documented evidence for plants requiring soil moisture levels above certain levels for successful regeneration	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required. The mine phase is post-mine completion and the receptor has been stated as 'potential ecological values'. This is a valid receptor, however, for the purposes of this assessment, DSD will consider the receptor to be 'future land use' post-mine completion. The impact event considers a 'failure' of rehabilitation which will result in an impact to the future land use.	Unsuccessful rehabilitation	IM_12_12	Appropriate research and design of cover	1	
68	Vegetation communities at Lake Warramboo complex impacted by altered hydrological regime as a result of pit dewatering	Operation, Closure, Post closure	PIM_12_13	Landform seepage	altered natural GW flows	Vegetation at Lake Warramboo	No	Ecological values at Lake Warramboo are supported by seasonal inundation. Areas dependent on the saline aquifer are devoid of vegetation. Consequently, a sensitive receptor is not considered to be present.	(1) DSD assesses that the evidence for the lack of a linkage between the source, pathway and receptor supports the requirement for no outcome.	NA	NA	NA	NA	
69	Poor revegetation or regeneration success as a result of degradation of topsoils and seedbanks during stockpiling	Operation Closure	PIM_12_14	Stockpiling procedure	Physical and chemical changes that affect seed viability	Potential ecological values	Yes	Results of poorly managed stockpiles documented	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required. The mine phase is operation (including closure) and the receptor has been stated as 'potential ecological values'. This is a valid receptor, however, for the purposes of this assessment, DSD will consider the receptor to be 'future land use' post-mine completion. The impact event considers a 'failure' of soil stockpiling (quality) which will result in an impact to the future land use. Similar impact events are put forward and assessed in the Soils Section.	Unsuccessful rehabilitation	IM_12_13	Stockpile management plans, limitations in height and duration of stockpiled materials Management of soil processes, microrhyzea	1	

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70	Impacts on Hambidge WPA as a result of saline GW elevation due to seepage from the landform	Operation Closure Post Closure	PIM_12_15	Rainfall and existing moisture within waste rock and tailings	GW elevation as a result of seepage from IWL	Local and regional native vegetation reserves	Yes	GW beneath Hambidge CP is the same aquifer as beneath the IWL, approx. 15mbgl	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required.	Vegetation Clearance	IM_12_14	Seepage modelling indicates a low level of seepage which results in a small elevation of local GW table (33-50ml per year) for life of mine. Following closure GW levels quickly revert to previous. GW level beneath Hambidge is 15mbgl and it is a significant distance from the ML	1	
71	Revegetation success on mining lease reduced as a result of unstable soils	Closure, Post closure	PIM_12_16	Unstable sandy soils	Wind	Potential ecological values	Yes	unstable soils known to impact susceptible vegetation	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required. The mine phase is post-mine completion and the receptor has been stated as 'potential ecological values'. This is a valid receptor, however, for the purposes of this assessment, DSD will consider the receptor to be 'future land use' post-mine completion. The impact event considers a 'failure' of rehabilitation which will result in an impact to the future land use.	Unsuccessful rehabilitation	IM_12_15	Stabilisation of soils on site through establishment of grass cover on non-native vegetation areas.	1	
72	Vegetation stress or mortality due to dust deposition from mining activities	Construction, Operation	PIM_12_17	Dust from materials handling during mining operations	Wind	Remnant vegetation on mining lease	Yes	High levels of dust known to affect vegetation	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required. The receptor for this impact is remnant native vegetation on the mining lease and not agricultural vegetation.	Vegetation Clearance	IM_12_16	In pit crushing and conveying. Stabilisation of stockpiles.	1	
73	Changes to surface water flow as a result of mining operations impacts on vegetation	Construction, operation, closure, post closure	PIM_12_18	Earthworks and reshaping of natural surface	Surface water flows	Remnant vegetation on and off mining lease	No	No natural drainage lines on site and limited overland flow during rain events. Vegetation reliant on interception of rain within root zone rather than surface water flow. (Ch 20)	(1) DSD assesses that the evidence for the lack of a linkage between the source, pathway and receptor supports the requirement for no outcome.	NA	NA	NA	NA	
74	Unauthorised off-road vehicle use impacts on vegetation	Construction, operation, closure	PIM_12_19	Off-road vehicle use	Direct disturbance	Remnant vegetation on and off mining lease	Yes	Off-road vehicle use known to damage vegetation	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required. The receptor for this impact is remnant native vegetation on and off the mining lease.	Vegetation clearance	IM_12_17	Limited vegetation on site Control of access to mine site Staff awareness of vehicle use restrictions and penalties for non-compliance	1	
75	SEB offset delivering in region	Construction, operation, closure, post-closure	PIM_12_20	Provision of SEB	Revegetation/restoration activities	Regional biodiversity values	Yes	Known that offsets can be developed to provide SEB	(1) No environmental outcome is required. Note: A Significant Environmental Benefit (SEB) is required under the Native Vegetation Act 1991 to offset the impact of the approved clearance of native vegetation.	Offset activities	IM_12_18		**Benefit**	
75a	Increase in vertebrate pests and / or abundance of native fauna species results in degradation of vegetation and threatened flora	Construction, operation, closure	PIM_12_21	Grazing, burrowing and other activities by fauna	Grazing, burrowing and other activities by fauna	Vegetation and threatened flora	Yes	Ample evidence to show impacts of pest species on vegetation	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required.	Pests	IM_12_19	Control of pest species. Minimal vegetation on site with most in poor condition	1	
76	Damage to revegetation and regeneration of vegetation on IWL caused by geotechnical failure of the IWL	Closure	PIM_12_22	Geotechnical failure	Damage to revegetation/ regeneration areas	Potential ecological values	Yes	A major failure (e.g. landslide) could disturb revegetation areas	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required. The mine phase is closure and the receptor has been stated as 'potential ecological values'. This is a valid receptor, however, for the purposes of this assessment, DSD will consider the receptor to be 'future land use'. The impact event considers a 'failure' of rehabilitation which will result in an impact to the future land use.	Unsuccessful rehabilitation	IM_12_20	Modelling indicates IWL will be stable	1	
77	Migration of salts into cover profile of IWL leads to deterioration of soil quality	Post closure	PIM_13_01	salts within landform materials	capillary action through landform matrix	Soils on IWL and vegetation	Yes	Known to result in soil salinisation	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required. The mine phase is post-mine completion and the receptor has been stated as 'soils on IWL and vegetation' post mine rehabilitation. This is a valid receptor, however, for the purposes of this assessment, DSD will consider the receptor to be 'future land use' post-mine completion. The impact event considers a 'failure' of the IWL cover (in particular the capillary break) which will result in an impact on soil quality, and ultimately to the future land use.	Reduced soil quality compromising rehabilitation objectives	IM_13_01	Design includes capillary break layer Performance can be field tested and any optimisations implemented Rates of change would be very slow allowing time for modifications if required	1	
80	Elevated soil salinity on mining lease due to use of saline water for dust suppression	Operation, Closure	PIM_13_02	Saline water used in dust suppression	Direct application and runoff	Soils on mining lease	Yes	Known to occur	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required.	Reduced soil/land quality on-lease compromising future land productivity	IM_13_02	Containment of runoff in drains, bunds and sediment basins	3	

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81	Elevated soil salinity off mining lease due to use of saline water for dust suppression	Operation	PIM_13_03	Saline water used in dust suppression	Spray drift or runoff	Soil off mining lease	Yes	Known to occur	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required.	Reduced soil/land quality off-lease compromising land productivity	IM_13_03	Containment of runoff in drains, bunds and sediment basins. Spraying of saline water from low height	1	
82	Deposition of sediments from erosion of slopes of IWL during operations affects productive land on mining lease	Operation Closure	PIM_13_04	Rainfall and water runoff or seepage	Deposition of sediments from erosion of slopes due to stormwater runoff or tunnel erosion	Productive land on mine	Yes	Erosion can occur on any slope	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required. Note: PIM_21_04 and PIM_21_05 also consider potential impacts from IWL stability on land use. For the purpose of this assessment, lease requirements for the IWL in relation to stability have been consolidated against PIM_13_04 in the Soils Section.	Reduced soil/land quality on-lease compromising future land productivity	IM_13_04	IWL does not contain hazardous material. Erosion would mostly occur in topsoil placed on slopes which is similar to surrounding land. Management and placement of dispersive material. Stabilisation of slopes through revegetation and slope design. Earthen bund to contain runoff if required.	1	
82a														
82b														
83	Deposition of sediments from erosion of slopes of IWL during operations affects productive land off mining lease	operation, closure	PIM_13_05	Rainfall and water runoff or seepage	Deposition of sediments from erosion of slopes due to stormwater runoff or tunnel erosion	Productive land off mining lease	Yes	Erosion can occur on any slope	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required.	Reduced soil/land quality off-lease compromising land productivity	IM_13_05	IWL does not contain hazardous material. Erosion would mostly occur in topsoil placed on slopes which is similar to surrounding land. Management and placement of dispersive material. Stabilisation of slopes through revegetation and slope design. Earthen bund to contain runoff if required.	1	
84	Deposition of sediments from erosion of slopes of IWL post closure affects productive land	Post Closure	PIM_13_06	Rainfall and water runoff or seepage	Deposition of sediments from erosion of slopes due to stormwater runoff or tunnel erosion	Productive land on and off lease	Yes	Erosion can occur on any slope	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required.	Reduced soil/land quality on-lease compromising future land productivity	IM_13_06	IWL does not contain hazardous material. Erosion would mostly occur in topsoil placed on slopes which is similar to surrounding land. Management and placement of dispersive material. Stabilisation of slopes through revegetation and slope design. Earthen bund to contain runoff if required.	1	

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85	Soils on site impacted due to contamination within existing materials (including PAF and ASS)	Construction, operation, closure	PIM_13_07	contaminants	Managing and placing materials	Mine Lease environment	Yes	There is some potential for small isolated areas of contained land on site	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required. The source for this impact event is stated as 'contaminants', including PAF and ASS. For this assessment, all potential contaminants are considered.	Reduced soil/land quality on-lease compromising future land productivity	IM_13_07	Small areas of potentially contaminated land, and very small proportion of PAF material	1	
86														
88	Soils off site impacted due to contamination within materials (including PAF and ASS)	Construction, operation, closure	PIM_13_08	contaminants	Managing and placing materials	off lease environment	No	Any contaminated land on the mining lease would be small and isolated and would not be placed on adjoining land. Due to the minimal amount of PAF/ASS on the mining lease and presence of buffering material, impacts offset could not be reasonably expected to occur.	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required. The IWL design is currently at a conceptual level. The current assessment of PAF undertaken by Iron Road (through consultant MWH) contains some assumption and uncertainty (see assessment of PIM_13_04 and PIM_13_07). Given the uncertainty, it is assessed that an outcome is required in relation to potential impacts to offsite land use and soils in relation to contamination (including PAF and ASS).	NA	NA	NA	NA	
89	Reduced soil quality, capacity as a result of material handling (e.g. stockpiling) compromises rehabilitation	Closure	PIM_13_09	Stockpiled topsoil	Removal and stockpiling of topsoil	Soil quality	Yes	Poor stockpiling practices known to reduce soil fertility	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required.	Reduced soil quality compromising rehabilitation objectives	IM_13_08	Stockpile management practices	1	
89a	Reduced soil quality, capacity as a result of material handling (e.g. stockpiling) compromises rehabilitation	Post closure	PIM_13_10	Stockpiled topsoil	Removal and stockpiling of topsoil	Soil quality	Yes	Poor stockpiling practices known to reduce soil fertility	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required.	Reduced soil quality compromising rehabilitation objectives	IM_13_09	Stockpile management practices	1	
90	Land quality reduced on-lease as a consequence of microclimatic changes adjacent IWL (wind, shade)	Operation, Closure, Post Closure	PIM_13_11	Integrated waste landform	Microclimatic changes	Mine lease environment Soil quality	No	Iron Road will be owner of land and therefore no third party stakeholder affected	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required. The impact event refers to 'wind', however, the evidence provided by Iron Road relates to 'shading' (MP page 21-17, 21-18 and 21-19). DSD has only considered 'shading' as the pathway for impact from the IWL to the adjoining agricultural land use. At the time of DSD's assessment of the mining application, the land access and land use for all areas within the proposed mining lease had not been finalised. Iron Road propose to maximise the land available within the proposed mining lease for agricultural use (see Land use impact event PIM_21_01). Given that there is the potential for multiple land use (and ownership) within the Lease, there is uncertainty in relation to the extent of agricultural land use within the proposed mining lease. Hence, an outcome is required for this impact event. Refer to PIM_21_06 for an additional impact event that refers to off-lease impacts.	NA	NA	NA	NA	
92	Compacted soil reducing productivity and / or vegetation growth	Post closure	PIM_13_12	Establishment of roads, foundations and hardstand areas	Compaction	Post mining land use	Yes	Known impact	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required. The receptor in this impact event is 'post mining land use'.	Reduced soil/land quality on-lease compromising future land productivity	IM_13_11	Soil management plans, deep ripping of soil for rehabilitation	2	
93	Contamination of land from spills, leaks and uncontrolled releases	Construction, Operation	PIM_13_13	Hydrocarbons and chemicals stored / used on Mining Lease	Uncontrolled releases (spills, leaks etc.)	Mine lease / adjoining properties	Yes	Potential for contamination to occur as a result of uncontrolled releases. At a local level, soil or groundwater contamination may reduce the ability of the mining lease to support agriculture, inhibit revegetation and limit future land uses. More broadly, soil or groundwater contamination can represent a threat to human health and biological processes.	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required. The receptor for this impact event is land (and soil) on and off the proposed mine lease.	Reduced soil/land quality on-lease compromising future land productivity	IM_13_12	Bunding Spill response plans, clean up kits etc. available.	1	
94	Disturbance of existing contaminated land by mining results in adverse health or amenity impacts on local residents	Construction, Operation	PIM_13_14	Potential existing contamination as a result of historical usage of site	Excavation / general construction activities	Local residents	No	Any contaminated land on the mining lease would be small and isolated and would not be placed in locations that would provide a pathway for effects on local residents	(1) DSD assesses that the evidence for the lack of a linkage between the source, pathway and receptor supports the requirement for no outcome. Refer to the assessment of public safety impact event PIM_07_19 and PIM_07_20.		NA	NA	NA	

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95	Loss of topsoil as a result of erosion	Construction, operation, closure	PIM_13_15	Exposed soils and stockpiles	Wind, water	Soil productivity	Yes	Known impact	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required.	Reduced soil/land quantity on-lease compromising future land productivity	IM_13_13	Stockpile management, revegetation of disturbed areas, erosion control measures.	1	
96	Increased waste stream volumes affecting the ongoing operation of existing waste management facilities (e.g. Wudinna landfill)	Construction, operation, closure	PIM_14_01	Mine construction, operation and closure activities	Land transport	Existing landfill	Yes	Known from other mines	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required. The receptor in this impact event is the existing EPA Licenced Landfill located in Wudinna. This EPA Licenced Landfill is not located on the proposed mine site.	Increased waste generation impacting capacity of existing landfill and requiring greater land use area	IM_14_01	Existing landfill zone has sufficient area for expansion	1	
97	Commercial opportunities for the provision of waste management services to Iron Road	Construction, operation, closure	PIM_14_02	Mine construction, operation and closure activities	Commercial contracts	Local business	Yes	Known from other mines.	(1) DSD acknowledges that this impact event has the potential to provide a benefit. No environmental outcome is required.	Increased local economic activity via innovative uses of waste materials	IM_14_02	Volume and nature of waste materials provide an economic opportunity	Benefit	
98	Inappropriate handling of waste materials including the disposal of hazardous materials, sewerage and/or wastewater, contaminating soil and/or water resources	Construction, operation, closure	PIM_14_03	Mine construction, operation and closure activities	Spills / poor storage	Soil quality (with indirect impacts on groundwater quality)	Yes	Potential for contamination to occur as a result of uncontrolled releases. At a local level, soil or groundwater contamination may reduce the ability of the mining lease to support agriculture, inhibit revegetation and limit future land uses. More broadly, soil or groundwater contamination can represent a threat to human health and biological processes.	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required.	Reduced soil/land quality on-lease compromising future land productivity	IM_14_03	Bunding and storage to standards, appropriate wastewater treatment plants Spill response plans, clean up kits etc. available.	1	
99	Dust generation from mine construction results in poor visual amenity for local residents and local community	Construction	PIM_15_01	Mine construction	Airborne emissions (TSP)	Local residents, Local Community	Yes	Modelling indicates potential dust lift off	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required. Note: To avoid duplication, the assessment of all air quality nuisance and visual amenity impact events has been undertaken against PIM_15_01. PIM_15_01, PIM_15_02 and PIM_15_03 are impact events that relate to visual amenity impacts. PIM_15_15 and PIM_15_16 are impact events for dust deposition on public amenity and have been assessed against PIM_15_01.	Visual amenity impacts from dust generation during construction	IM_15_01	Water carts, physical location is central to proposed mining lease, construction monitoring program	2	
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100	Dust generation from mining operations results in poor visual amenity for local residents and local community	Operation	PIM_15_02	Material handing (blasting, crushing, processing, conveying)	Airborne emissions (TSP)	Local residents, Local Community	Yes	Modelling indicates potential dust lift off	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required. Note: To avoid duplication, the assessment of all air quality nuisance and visual amenity impact events has been undertaken against PIM_15_01.	Visual amenity impacts from dust generation during operation	IM_15_02	Dust suppression via appropriate design, revegetation, water carts, moisture of deposited material, windbreaks via progressive rehabilitation	2	
101	Dust generation from the IWL post closure results in poor visual amenity for local residents and local community	Post Closure	PIM_15_03	Integrated Waste Landform	Airborne emissions (TSP)	Local residents, Local Community	Yes	Possible linkage if dust emitted from landform	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required. Note: To avoid duplication, the assessment of all air quality nuisance and visual amenity impact events has been undertaken against PIM_15_01.	Dust generation from IWL post closure	IM_15_03	Established wind-breaks via revegetation, appropriate design, rock mulch	2	
102	Dust deposition from IWL (including salts, metals) on agricultural land on-lease resulting in reduced productivity	Operation, Closure	PIM_15_04	Integrated Waste Landform	Dust generation from poor surface stabilisation	On-lease productive land	Yes	Modelling indicates TSP plume extending off-lease	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required. Note: To avoid duplication, the assessment of all air quality impact events relating to agricultural land has been undertaken against PIM_15_04.	Dust deposition from mining operations	IM_15_04	Wind-breaks via progressive revegetation, appropriate design, rock mulch, moisture of deposited materials. Water carts, aerial seeding, hydromulching are management options that will be field tested.	2	
103	Dust deposition from IWL (including salts, metals) on agricultural land off-lease resulting in reduced productivity	Operation, Closure	PIM_15_05	Integrated Waste Landform	Dust generation from poor surface stabilisation	Off-lease productive land	Yes	Modelling indicates TSP plume extending off-lease	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required. Note: To avoid duplication, the assessment of all air quality impact events relating to agricultural land has been undertaken against PIM_15_04.	Dust deposition from mining operations	IM_15_05	Wind-breaks via progressive revegetation, appropriate design, rock mulch, moisture of deposited materials. Water carts, aerial seeding, hydromulching are management options that will be field tested.	2	
104	Dust deposition from IWL (including salts, metals) on agricultural land on or off-lease resulting in reduced productivity	Post Closure	PIM_15_06	Integrated Waste Landform	Dust generation from poor surface stabilisation	Productive land surrounding IWL	Yes	Modelling indicates TSP plume extending off-lease	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required. Note: To avoid duplication, the assessment of all air quality impact events relating to agricultural land has been undertaken against PIM_15_04.	Dust deposition post closure	IM_15_06	Established wind-breaks via revegetation, appropriate design, rock mulch reduces wind lift off and dust deposition	2	
105	Dust deposition from mining operations (other than IWL) on agricultural land on or off lease resulting in reduced productivity	Construction, Operation, Closure	PIM_15_07	Mining Operations	airborne dust deposition	On and off-lease productive land, crops	Yes	Modelling indicates TSP plume extending off-lease	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required. Note: To avoid duplication, the assessment of all air quality impact events relating to agricultural land has been undertaken against PIM_15_04.	Dust deposition from mining operations	IM_15_07	Dust suppression via appropriate design, revegetation, water carts	2	
106	Dust deposition from rehabilitated mine site (other than IWL) on agricultural land resulting in reduced productivity	Post closure	PIM_15_08	Exposed areas of soil	airborne dust deposition	On and off-lease productive land, crops	Yes	Dust pick-up could occur on exposed surfaces if rehabilitation is not adequate	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required. Note: To avoid duplication, the assessment of all air quality impact events relating to agricultural land has been undertaken against PIM_15_04.	Dust deposition from mining operations	IM_15_08	Established wind-breaks via revegetation, appropriate design	2	

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107	Dust from construction and mining operations (including closure) impacting native vegetation growth in areas surrounding the mining lease	Construction, Operation, Closure	PIM_15_09	Mining Operations	airborne dust deposition	off-lease native vegetation	Yes	Modelling indicates TSP plume extending off-lease	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required. Refer to PIM_12_17 which also addresses potential impacts from dust on native vegetation.	Dust deposition from mining operations	IM_15_09	Dust suppression via appropriate design, revegetation, water carts	2	
108	Dust from mine post closure impacting native vegetation growth	Post closure	PIM_15_10	Exposed areas of soil	airborne dust deposition	Vegetation on and off lease	Yes	Dust pick-up could occur on exposed surfaces if rehabilitation is not adequate	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required. Refer to PIM_12_17 which also addresses potential impacts from dust on native vegetation.	Dust deposition post closure	IM_15_10	Established wind-breaks via revegetation, appropriate design	2	
109	Fine particles in dust from construction activities adversely affect human health	Construction	PIM_15_11	Mining construction	Airborne emissions	Local residents / Local community	Yes	Modelling shows detectable concentrations of PM10 and PM2.5 predicted to extend off the mining lease (Jacobs 2014)	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required. Note: To avoid duplication, the assessment of all air quality impact events relating to human health has been undertaken against PIM_15_11.	Human health impacts from dust from construction and mining operations	IM_15_11	Water carts, construction monitoring program	2	
109a														
110	Fine particles in dust from mining operations adversely affects human health	Operation, Closure	PIM_15_12	Mining Operations	airborne emissions	Local residents / Local community	Yes	Modelling shows detectable concentrations of PM10 and PM2.5 predicted to extend off the mining lease (Jacobs 2014)	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required. Note: To avoid duplication, the assessment of all air quality impact events relating to human health has been undertaken against PIM_15_11.	Human health impacts from dust from construction and mining operations	IM_15_12	Dust suppression via appropriate design, revegetation, water carts	2	
111	Fine particles in dust from mine site post closure adversely affects human health (i.e. from IWL)	Post Closure	PIM_15_13	Mine site landforms	airborne emissions	Local residents / Local community	Yes	Modelling shows detectable concentrations of PM10 and PM2.5 predicted to extend off the mining lease	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required. Note: To avoid duplication, the assessment of all air quality impact events relating to human health has been undertaken against PIM_15_11.	Human health impacts from dust post closure	IM_15_13	Dust suppression via appropriate design, established revegetation ground cover	2	
112	Bio-uptake of disturbed metals/toxins (including asbestos, radionuclides etc.) by vegetation, crops, native fauna, stock, people	Construction, Operation, Closure, Post Closure	PIM_15_14	Metals/toxins from mine site	airborne emissions and ingestion / absorption	vegetation, native fauna, stock, people	No	Lack of contaminants and hazardous metals in topsoils and sub-soils, overburden or ore body. Fibrous analysis testwork has confirmed no asbestos	(1) DSD assesses that the evidence for the lack of a linkage between the source, pathway and receptor supports the requirement for no outcome.	NA	NA	NA	NA	
113	Dust deposition from mining operations results in nuisance impacts on public amenity	Construction, Operation, Closure	PIM_15_15	Mining operations	airborne emissions	Local residents / Local community	Yes	Modelling indicates TSP plume extending off-lease	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required. Note: To avoid duplication, the assessment of all air quality nuisance and visual amenity impact events has been undertaken against PIM_15_01.	Nuisance impacts from dust on public amenity	IM_15_14	Dust suppression via appropriate design, revegetation, water carts	3	

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114	Dust deposition from the minesite post closure results in nuisance impacts on public amenity	Post closure	PIM_15_16	Mine site landforms	airborne emissions	Local residents / Local community	Yes	Dust pick-up could occur on exposed surfaces if rehabilitation is not adequate	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required. Note: To avoid duplication, the assessment of all air quality nuisance and visual amenity impact events has been undertaken against PIM_15_01.	Nuisance impacts from dust on public amenity	IM_15_15	Dust suppression via appropriate design, established revegetation ground cover	2
115	Nitrogen oxide emissions from blasting adversely affect human health	Construction, Operation	PIM_15_17	ANFO used in blasting	airborne emissions	Local residents / Local community	Yes	NOx is produced from fuel deficiencies in the explosive or detonation reactions that do not continue to completion.	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required. Note: To avoid duplication, the assessment of all air quality impact events relating to human health has been undertaken against PIM_15_11.	Human health impacts from NOx emissions from blasting	IM_15_16	Blast management plan, training, quality control, blast size and design	2
116	Air emissions from the processing plant, vehicles or other equipment result in nuisance impacts on public amenity or human health impacts	Operation	PIM_15_18	Processing plant, vehicles or equipment	airborne emissions	Local residents / Local community	No	Processing plant uses a physical separation process that does not result in stack emission of hazardous substances. Emissions from fuel use will not be sufficient to case any nuisance or health impacts.	(1) DSD assesses that the evidence for the lack of a linkage between the source, pathway and receptor supports the requirement for no outcome.	NA	NA	NA	NA
117	Noise impacts to local residents as a result of comingled waste rock and tailings falling from stackers	Operation	PIM_16_01	Falling rock from IWL stackers	Soundwave transmission	Local residents, mine camp residents	Yes	Known noise source from other mining operations	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required. Note: To avoid duplication, the assessment of all noise impact events has been undertaken against PIM_16_01. For example, impacts from rail noise has also been assessed against this impact event.	Noise from mining operations	IM_16_01	Distance to receptors Wind directions Altered drop height Moisture and particle size of tailings will have a softening effect	2
117a													
118	Noise impacts to local residents as a result of processing plant operation	Operation	PIM_16_02	processing plant operation	Soundwave transmission	Local residents, mine camp residents	Yes	Known noise source from other mining operations	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required. Note: To avoid duplication, the assessment of all noise impact events has been undertaken against PIM_16_01.	Noise from mining operations	IM_16_02	Distance to receptors Shielding of noise sources, shielding from growing IWL	2
119	Noise impacts to local residents as a result of stackers / conveyors / vehicles	Operation	PIM_16_03	stackers / conveyors / vehicles	Soundwave transmission	Local residents, mine camp residents	Yes	Known noise source from other mining operations	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required. Note: To avoid duplication, the assessment of all noise impact events has been undertaken against PIM_16_01.	Noise from mining operations	IM_16_03	Distance to receptors Shielding of noise sources, where practicable Maintenance of vehicles and equipment	2

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120	Noise impacts to local residents as a result of use of drill rigs	Operation	PIM_16_04	Drill rigs	Soundwave transmission	Local residents, mine camp residents	Yes	Known noise source from other mining operations	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required. Note: To avoid duplication, the assessment of all noise impact events has been undertaken against PIM_16_01.	Noise from mining operations	IM_16_04	Distance to receptors. Equipment design	2	
121	Noise impacts to local residents as a result of train loading	Operation	PIM_16_05	train loading	Soundwave transmission	Local residents, mine camp residents	Yes	Known noise source from other mining operations	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required. Note: To avoid duplication, the assessment of all noise impact events has been undertaken against PIM_16_01.	Noise from mining operations	IM_16_05	Distance to receptors Design of loading facilities	2	
122	Noise impacts to local residents as a result of train operation at the mine	Operation	PIM_16_06	Train operation	Soundwave transmission	Local residents, mine camp residents	Yes	Known noise source from other mining operations	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required. Note: To avoid duplication, the assessment of all noise impact events has been undertaken against PIM_16_01.	Noise from mining operations	IM_16_06	Distance to receptors Maintenance of rail line and rolling stock	2	
123	Noise impacts to local residents as a result of construction activities	Construction	PIM_16_07	Construction activities	Soundwave transmission	Local residents, mine camp residents	Yes	Known noise source from other mining operations	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required. Note: To avoid duplication, the assessment of all noise impact events has been undertaken against PIM_16_01.	Noise from construction	IM_16_07	Distance to receptors Maintenance of equipment	2	
124	Noise impacts to local residents as a result of overburden clearance during construction	Construction	PIM_16_08	Overburden clearance	Soundwave transmission	Local residents, mine camp residents	Yes	Known noise source from other mining operations	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required. Note: To avoid duplication, the assessment of all noise impact events has been undertaken against PIM_16_01.	Noise from construction	IM_16_08	Distance to receptors Maintenance of equipment Selection of equipment	2	

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125	Noise impacts to local residents as a result of overburden clearance during operation	Operation	PIM_16_09	Overburden clearance	Soundwave transmission	Local residents, mine camp residents	Yes	Known noise source from other mining operations	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required. Note: To avoid duplication, the assessment of all noise impact events has been undertaken against PIM_16_01.	Noise from mining operations	IM_16_09	Distance to receptors Maintenance of equipment Selection of equipment	2	
126	Noise impacts to local residents as a result of infrastructure removal and decommissioning	Closure	PIM_16_10	Infrastructure removal and decommissioning	Soundwave transmission	Local residents	Yes	Known noise source from other mining operations	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required. DSD considers the 'closure' mine phase to be a part of the 'operations' mine phase. Note: To avoid duplication, the assessment of all noise impact events has been undertaken against PIM_16_01.	Noise during closure / decommissioning	IM_16_10	Distance to receptors Maintenance of equipment Selection of equipment	2	
127	Noise impacts to local residents as a result of final landform shaping and earthworks activities (i.e. grading, spreading and ripping)	Closure	PIM_16_11	IWL shaping	Soundwave transmission	Local residents	Yes	Known noise source from other mining operations	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required. DSD considers the 'closure' mine phase to be a part of the 'operations' mine phase. Note: To avoid duplication, the assessment of all noise impact events has been undertaken against PIM_16_01.	noise during closure / decommissioning	IM_16_11	Distance to receptors Maintenance of equipment Selection of equipment	2	
128	Noise impacts from mine camp to local residents	Construction, Operation	PIM_16_12	Mine camp	Soundwave transmission	Local residents	No	Modelling indicates no noise from camp will reach receptors. Therefore, pathway does not exist.	(1) DSD assesses that the evidence for the lack of a linkage between the source, pathway and receptor supports the requirement for no outcome.	NA	NA	NA	NA	
129	Vibrations from blasting operations impact on local residents	operation	PIM_17_01	Blasting operations	Ground	Local residents	Yes	Known vibration source	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required. Assessment: The MP (page 17-4) includes a description of the sensitive receptors used in the assessment of potential impacts from Airblast and Vibration. It is stated that "Any residential buildings within the proposed mine site were not taken into account in the noise and vibration assessment as the intent is for Iron Road or a subsidiary company to own all of the land within the mine site boundary prior to commencing works." The receptor for this impact event is 'local residents'. At the time of DSD's assessment of the mining application, the land access and land use for all areas within the proposed mining lease had not been finalised. Iron Road propose to maximise the land available within the proposed mining lease for agricultural use (see Land use impact event PIM_21_01). Given that there is the potential for multiple land use within the Lease, there is uncertainty in relation to how close human receptors will be in relation to the open pit. Hence, for this impact event, DSD has considered that there is the potential for receptors within the lease boundary. There is no impact event that considers impacts from blasting on aircraft. The MP (page 21-13) states that 'the use of aircraft for agricultural purposes has not been observed within the local study area'. Regional airports are located on the Eyre Peninsula, including at Wudinna. There is uncertainty in regards to the potential use of aircraft in proximity to the open pit, hence, it is assessed that an outcome is required for this impact event.	Vibration from blasting	IM_17_01	Control of blast charge	2	
130	Vibration from construction and mining operations (excluding blasting) impacts on local residents	construction, operation, closure	PIM_17_02	Vibration from construction and mining operations	Ground, air	Local residents	No	Modelling indicates vibration at sensitive receptors will be insignificant (Appendix G)	(1) DSD assesses that the evidence for the lack of a linkage between the source, pathway and receptor supports the requirement for no outcome.	NA	NA	NA	NA	
131	Vibration from blasting operations impacts on off-lease structures	operation	PIM_17_03	Blasting operations	Ground, air	Local structures	No	Modelling indicates vibration at sensitive receptors will be well below levels that could case structural damage	(1) DSD assesses that the evidence for the lack of a linkage between the source, pathway and receptor supports the requirement for no outcome.	NA	NA	NA	NA	
132	Noise (air blast) impact to local residents as a result of blasting operations	Operation	PIM_17_04	Blasting operations	Soundwave transmission	Local residents, mine camp residents	Yes	Known noise source from other mining operations	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required. Assessment: The MP (page 17-4) includes a description of the sensitive receptors used in the assessment of potential impacts from Airblast and Vibration. It is stated that "Any residential buildings within the proposed mine site were not taken into account in the noise and vibration assessment as the intent is for Iron Road or a subsidiary company to own all of the land within the mine site boundary prior to commencing works." The receptor for this impact event is 'local residents'. At the time of DSD's assessment of the mining application, the land access and land use for all areas within the proposed mining lease had not been finalised. Iron Road propose to maximise the land available within the proposed mining lease for agricultural use (see Land use impact event PIM_21_01). Given that there is the potential for multiple land use within the Lease, there is uncertainty in relation to how close human receptors will be in relation to the open pit. Hence, for this impact event, DSD has considered that there is the potential for receptors within the lease boundary. There is no impact event that considers impacts from blasting on aircraft. The MP (page 21-13) states that 'the use of aircraft for agricultural purposes has not been observed within the local study area'. Regional airports are located on the Eyre Peninsula, including at Wudinna. There is uncertainty in regards to the potential use of aircraft in proximity to the open pit, hence, it is assessed that an outcome is required for this impact event.	High intensity, short duration noise bursts during operation	IM_17_02	Distance to receptors Control of blast size	2	
133	Sedimentation of surface water via erosion of IWL results in reduction in water quality	Operation, Closure	PIM_18_01	Erosion of IWL	Surface water runoff	natural ephemeral drainage systems	No	Lack of natural drainage systems in area. Water only temporarily pools in saline depressions which have poor water quality due to high salinity	(1) DSD assesses that the evidence for the lack of a linkage between the source, pathway and receptor supports the requirement for no outcome. DSD agrees that surface water itself is not a receptor.	NA	NA	NA	NA	

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134	Contamination of surface water from acid metalliferous drainage on agricultural land	Operation, Closure, Post closure	PIM_18_02	Acid generating minerals in mined materials	Surface water runoff	Agricultural land	Yes	Less than 2% of mined materials have elevated concentrations of sulphides. 10% of materials have neutralising capacity.	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required. Refer to PIM_13_07 and PIM_13_08 for an assessment of impacts from PAF, ASS and other contaminants on soils. The receptor in this impact event is 'agricultural land'. The pathway is through contamination of surface water which runs off into agricultural land.	Contamination of surface water from acid metalliferous drainage	IM_18_01	Buffering potential in other waste rock Bund around IWL if needed	1	
135	Saline runoff from mine infrastructure (roads and IWL) impacts surface water quality	Operation, Closure	PIM_18_03	Saline tailings/waste or cover materials	dissolved during runoff materials	natural ephemeral drainage systems	No	Surface water only pools for brief period after heavy rain events and represents a trivial environmental value.	(1) DSD assesses that the evidence for the lack of a linkage between the source, pathway and receptor supports the requirement for no outcome. DSD agrees that surface water itself is not a receptor.	NA	NA	NA	NA	
136	Interaction of surface water with pit shell results in poor water quality in pit lake	Post closure	PIM_18_04	Pit shell	Surface water runoff	Pit lake	No	There is no material in the pit that would represent a hazard for pit lake quality. Water in pit already highly saline	(1) DSD assesses that the evidence for the lack of a linkage between the source, pathway and receptor supports the requirement for no outcome.	NA	NA	NA	NA	
137	Altered hydrological / hydrogeological regime impacts inundation periods at Lake Warramboo complex	Operation, Closure	PIM_18_05	Mine site facilities	surface water drainage pattern	Lake Warramboo	No	Given the lack of natural drainage systems and overland flow to Lake Warramboo from the mine, there is no pathway for surface water changes at the minesite to impact Lake Warramboo	(1) DSD assesses that the evidence for the lack of a linkage between the source, pathway and receptor supports the requirement for no outcome.	NA	NA	NA	NA	
138	Interrupted or generated surface flows as a result of mine site facilities results in changes to local surface water	Construction, operation, closure, post closure	PIM_18_06	high impact rainfall events	surface flows	local surface hydrology	No	Surface water only pools for brief period after heavy rain events and represents a trivial environmental value.	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required. Refer to PIM_18_02 for an assessment of the potential for contaminated surface water to leave the lease. The MP Appendix H is the Hydrology and Surface water study (RPS - 8/10/2015) and provides the following conclusions and recommendations: • "Five swales have been identified in the proximity of the open pits and processing facilities ... Construction of drains to prevent ponding, subsequent increasing infiltration to the open pits, nuisance effects on surface infrastructure and geotechnical instability of the pit walls will be necessary to manage risks." (RPS pg 7 of 74) • "The IWL and the mine pits themselves could potentially modify small to medium sized drainage catchments." (RPS pg 7 of 74) • "The IWL will be constructed progressively and will cover five sub-catchments that naturally drain to swales along the southern mine lease boundary and one that partially drains internally. Completion of minor earthwork to create bunds along low points in swales in this area will be sufficient to mitigate any risks of water moving beyond the mine lease boundary prior to IWL construction." (RPS pg 7 of 74) The RPS report indicates that there will be sufficient change to local surface water hydrology to require surface water infrastructure to be designed, constructed and maintained during construction, operation and post-mine completion. An outcome is required for this impact event.	NA	NA	NA	NA	
139	Flooding or release of contaminated surface water results in spread of contaminants and impacts on productive land or vegetation	Construction, operation, closure, post closure	PIM_18_07	Hazardous materials stored on site	high impact rainfall events	Productive land or vegetation	Yes	Some hazardous material will be stored on site	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required. Refer to PIM_18_02 for an assessment of the potential for contaminated surface water to leave the lease. Refer to PIM_13_07 and PIM_13_08 for an assessment of impacts from PAF, ASS and other contaminants on soils.	Contamination of soil or vegetation due to flooding	IM_18_02	Appropriate storage and bunding of any hazardous material	1	
140	Changes to surface water flows result in erosion and impacts on productive land or vegetation	Construction, operation, closure, post closure	PIM_18_08	Earthworks that change surface water flows	surface flows	Productive land or vegetation	Yes	Funnelling of surface water can cause erosion	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required. Refer to PIM_18_02 for an assessment of the potential for contaminated surface water to leave the lease.	Changes to surface water flows result in erosion and impacts on productive land or vegetation	IM_18_03	Management of topography to avoid channelling	1	
141	Deposition of saline materials running off integrated waste landform results in salinisation of surface soils off the mining lease	Operation Closure Post Closure	PIM_18_09	Deposited saline material on landform slopes	Surface water runoff	Off-Lease productive land	Yes	Tailings and waste rock will contain saline water	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required. Refer to PIM_18_02 for an assessment of the potential for contaminated surface water to leave the lease.	Reduced soil/land quality off-lease compromising land productivity	IM_18_04	Buffer zone between outer edge of IWL and mine boundary. Earthen bund to contain run-off if required	1	

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142	Lowered GW table on-lease as a result of pit dewatering results in loss of agricultural values (existing bore users and agricultural land)	Operation, Closure	PIM_19_01	Pit dewatering	Groundwater	None.	No	Groundwater is unsuitable for any use other than industrial. No connection of crops with groundwater	(1) DSD assesses that the evidence for the lack of a linkage between the source, pathway and receptor supports the requirement for no outcome. The MP and Response document contains evidence that within and adjacent to the proposed mine, the groundwater quality is saline and there are no users of the groundwater for agricultural purposes. Hence, no outcome is required for groundwater quality or quantity.	NA	NA	NA	NA
143	Lowering of groundwater table as a result of pit dewatering results in increased agricultural production	Operation	PIM_19_02	Pit dewatering	Groundwater	Productive agricultural land	Yes	Areas of salt scalding currently exist due to elevated saline water table	(1) DSD acknowledges that this impact event has the potential to be a benefit. No environmental outcome is required.	Depressed GW table	IM_19_01		**Benefit**
144	Lowered GW table during mining and post closure results in reduction in salinity impacts to vegetation	Operation, closure, post closure	PIM_19_03	Pit dewatering and evaporation	Groundwater	Local vegetation and fauna habitat	Yes	Areas of salt scalding currently exist due to elevated saline water table	(1) DSD acknowledges that this impact event has the potential to be a benefit. No environmental outcome is required.	Depressed GW table	IM_19_02		**Benefit**
145	Lowered GW table off-lease as a result of pit dewatering results in loss of agricultural values (existing bore users and agricultural land)	Operation, Closure	PIM_19_04	Pit dewatering	Groundwater	None	No	Groundwater is unsuitable for any use other than industrial. No connection of crops with groundwater	(1) DSD assesses that the evidence for the lack of a linkage between the source, pathway and receptor supports the requirement for no outcome. The MP and Response document contains evidence that within and adjacent to the proposed mine, the groundwater quality is saline and there are no users of the groundwater for agricultural purposes. Hence, no outcome is required for groundwater quality or quantity.	NA	NA	NA	NA
146	Lowered GW table as a result of evaporation from the pit following mine closure results in loss of environmental values	Closure, post closure	PIM_19_05	Pit water evaporation	Groundwater	None	No	Groundwater is unsuitable for any use other than industrial. No connection of crops with groundwater	(1) DSD assesses that the evidence for the lack of a linkage between the source, pathway and receptor supports the requirement for no outcome. The MP and Response document contains evidence that within and adjacent to the proposed mine, the groundwater quality is saline and there are no users of the groundwater for agricultural purposes. Hence, no outcome is required for groundwater environmental values.	NA	NA	NA	NA
147	Lowered GW table as a result of evaporation from the pit following mine closure results in an increase in agricultural production	Closure, post closure	PIM_19_06	Pit water evaporation	Groundwater	Productive agricultural land	Yes	Areas of scalding currently exist due to shallow saline water table	(1) DSD acknowledges that this impact event has the potential to be a benefit. No environmental outcome is required.	Depressed GW table	IM_19_03	Groundwater depression will be localised	**Benefit**
148	High levels of permeability in IWL leads to localised elevated GW table outside of ML and impacts on productive land	Operation, Closure and Post Closure	PIM_19_07	Rainfall and moisture within waste rock and tailings	Seepage through landform	Productive agricultural land	Yes	seepage modelling indicates a low level of seepage which results in a small elevation of local GW table (33-50mm per year) for life of mine.	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required. The receptor for this impact event is 'productive agricultural land' outside of the proposed mining lease.	Elevated GW table	IM_19_04	Groundwater in region of IWL is between 13 and 15mbgl	1
149	High levels of permeability in IWL leads to localised elevated GW table within ML and impacts on productive land	Operation, Closure and Post Closure	PIM_19_08	Rainfall and moisture within waste rock and tailings	Seepage through landform	Productive agricultural land	Yes	seepage modelling indicates a low level of seepage which results in a small elevation of local GW table (33-50mm per year) for life of mine.	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required. The receptor for this impact event is 'productive agricultural land' within the proposed mining lease.	Elevated GW table	IM_19_05	Groundwater in region of IWL is between 13 and 15mbgl	1
150	Reduced quality of regional 'fresh' GW resources (e.g. Polda Basin) as a result of salinization of local GW via evaporation	Operation, Closure, post closure	PIM_19_09	Evaporation	Groundwater	Environmental value	No	No connectivity of hydrogeological units between Musgrave PWA and mine site	(1) DSD assesses that the evidence for the lack of a linkage between the source, pathway and receptor supports the requirement for no outcome.	NA	NA	NA	NA
151	Reduced quantity of regional 'fresh' GW resources (e.g. Polda Basin) as a result of GW extraction or dewatering at the mine	Operation, Closure, post closure	PIM_19_10	Pit dewatering, groundwater extraction	Groundwater	Environmental value	No	No connectivity of hydrogeological units between Musgrave PWA and mine site	(1) DSD assesses that the evidence for the lack of a linkage between the source, pathway and receptor supports the requirement for no outcome.	NA	NA	NA	NA
152	Infiltration and seepage from IWL leads to salinisation of GW and further salinisation of productive land	Operation, Closure	PIM_19_11	Existing and introduced saline material in landform	Dissolved salts, infiltration of and seepage to GW	Productive land	No	seepage modelling indicates a low level of seepage which results in a small elevation of local GW table (33-50mm per year) for life of mine. However, GW in region of IWL is between 13 and 15mbgl. Any salinisation of ground water is likely to be diluted to extent that impacts are insignificant at points where GW interacts with surface. Therefore, credible pathway does not exist.	(1) DSD assesses that the evidence for the lack of a linkage between the source, pathway and receptor supports the requirement for no outcome. Impact events PIM_19_07 and PIM_19_08 and the associated outcomes and requirements address impacts to agricultural land use from potential increase in the groundwater level from seepage from the IWL. This impact event refers specifically to 'further salinisation' and hence no outcome is required.	NA	NA	NA	NA
153	Contamination of groundwater from metalliferous drainage or elemental toxicities from IWL results in impacts on productive land	Operation, Closure, Post-closure	PIM_19_12	Metals or contaminants in tailings/waste	infiltration and seepage to GW	Productive land	No	No source due to lack of contaminants and metals in soils	(1) DSD assesses that the evidence for the lack of a linkage between the source, pathway and receptor supports the requirement for no outcome.	NA	NA	NA	NA
154	Acid metalliferous drainage impacting on groundwater results in impacts on productive land	Operation, Closure, Post-closure	PIM_19_13	Acid metalliferous drainage from sulfates in soils and bedrock	infiltration and seepage to GW	Productive land	**No**	Seepage modelling indicates a low level of seepage which results in a small elevation of local GW table (33-50mm per year) for life of mine. However, GW in region of IWL is between 13 and 15mbgl. Any impact from acid metalliferous drainage on ground water is likely to be diluted to extent that impacts are insignificant at points where GW interacts with surface. Therefore, credible pathway does not exist.	(1) DSD assesses that the evidence for the lack of a linkage between the source, pathway and receptor supports the requirement for no outcome.	NA	NA	NA	NA
155	Changes to groundwater processes due to soil compaction under IWL result in impacts on productive land	Operation, Closure, Post-closure	PIM_19_14	Soil compaction due to IWL	Aquifer transmissivity and/or gradients	Productive land	No	GW in region of IWL is between 13 and 15mbgl. Soil compaction at this level is likely to be insignificant. Consequently, a credible source of impact does not exist.	(1) DSD assesses that the evidence for the lack of a linkage between the source, pathway and receptor supports the requirement for no outcome.	NA	NA	NA	NA
156	Altered hydrological / hydrogeological regime impacts inundation periods at Lake Warramboo complex	Operation, Closure, Post-closure	PIM_19_15	Pit dewatering and pit lake evaporation post mining	Groundwater	Lake Warramboo complex	No	Lake Warramboo is considered to have degraded environmental values, and as a receptor is not expected to be negatively impacted by this pathway	(1) DSD assesses that the evidence for the lack of a linkage between the source, pathway and receptor supports the requirement for no outcome.	NA	NA	NA	NA
157	Lowered GW table as a result of pit dewatering results in loss of environmental values (GDEs)	Operation, Closure	PIM_19_16	Pit dewatering	Groundwater	None.	No	No GDEs existing within zone of influence which would be adversely impacted by GW drawdown	(1) DSD assesses that the evidence for the lack of a linkage between the source, pathway and receptor supports the requirement for no outcome.	NA	NA	NA	NA
158	Reduced visual amenity from surrounding roads as a result of the mine development	Construction, operation, closure, post closure	PIM_20_01	Landform, stockpiles, mine buildings, fencing and other structures	Sight-line	Local landholders, local community, members of public, tourists	yes	Mine will be visible from a number of vantage points	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required.	Reduced visual amenity	IM_20_01	Significant distances exist from sensitive receptors to proposed mine lease boundary to infrastructure. Targeted screening vegetation. Revegetated IWL will screen mining infrastructure over time.	3

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159	Reduced visual amenity from nearby townships as a result of the mine development	Construction, operation, closure, post closure	PIM_20_02	Landform, stockpiles, mine buildings, fencing and other structures	Sight-line	Local landholders, local community, members of public, tourists	yes	Mine will be visible from a number of vantage points	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required.	Reduced visual amenity	IM_20_02	Significant distances exist from sensitive receptors to proposed mine lease boundary to infrastructure. Targeted screening vegetation. Revegetated IWL will screen mining infrastructure over time.	3	
160	Reduced visual amenity from private properties as a result of the mine development	Construction, operation, closure, post closure	PIM_20_03	Landform, stockpiles, mine buildings, fencing and other structures	Sight-line	Local landholders, local community	yes	Mine will be visible from a number of vantage points	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required.	Reduced visual amenity	IM_20_03	Significant distances exist from sensitive receptors to proposed mine lease boundary to infrastructure. Targeted screening vegetation. Revegetated IWL will screen mining infrastructure over time.	3	
161	Reduced visual amenity from surrounding roads as a result of loss of vegetation from the ML	Construction, operation, closure, post closure	PIM_20_04	Loss of vegetation	Sight-line	Local landholders, local community, members of public, tourists	yes	Vegetation will be removed from the landscape	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required.	Reduced visual amenity	IM_20_04	Significant distances exist from sensitive receptors to proposed mine lease boundary to infrastructure. Targeted screening vegetation. Revegetated IWL will screen mining infrastructure over time.	1	
162	Reduced visual amenity from nearby townships as a result of loss of vegetation from the ML	Construction, operation, closure, post closure	PIM_20_05	Loss of vegetation	Sight-line	Local landholders, local community, members of public, tourists	yes	Vegetation will be removed from the landscape	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required.	Reduced visual amenity	IM_20_05	Limited vegetation in landscape Screening vegetation Revegetation following mining	1	
163	Reduced visual amenity from private properties as a result of loss of vegetation from the ML	Construction, operation, closure, post closure	PIM_20_06	Loss of vegetation	Sight-line	Local landholders, local community	yes	Vegetation will be removed from the landscape	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required.	Reduced visual amenity	IM_20_06	Limited vegetation in landscape Screening vegetation Revegetation following mining	1	
164	Lighting during operation (e.g. stacking) impacts local residents	Construction, operation, closure	PIM_20_07	Mine lighting	Sight-line	Local landholders, local community	yes	Lighting will be visible from surrounding properties	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required.	Public nuisance as a result of lighting	IM_20_07	Directional lighting and measures to reduce light spill Screening vegetation	2	

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165	Reduced area of productive land available for agriculture as a result of mine	Construction, Operation, Closure, Post Closure	PIM_21_01	Mining operations	Use of agricultural land	Local landholders and broader community	yes	Mine will be located on agricultural land - agricultural use may only be permitted to occur in part of the mine site	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required.	Loss of agricultural land	IM_21_01	Agricultural land lost is only a small proportion of that available on Eyre Peninsula (Ch 23)	1	
166	The establishment of tall structures restricts aerial agricultural practices resulting in lost agricultural productivity	Operation, Closure, Post Closure	PIM_21_02	Tall structures	Obstruction to aerial operations	Local landholders and local community	No	Aircraft have not been used for agricultural activities in the local study area	(1) DSD assesses that the evidence for the lack of a linkage between the source, pathway and receptor supports the requirement for no outcome.	NA	NA	NA	NA	
167	Post mining land use is not acceptable to stakeholders	Closure, Post Closure	PIM_21_03	Post mining land use	Failure to achieve post mining land use objectives	Local landholders and local community	Yes	Post mining land use objectives may not be achieved	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required.	Failure to achieve post mining land use objectives	IM_21_02	Ongoing rehabilitation trials. Consultation on post mining land use	1	
168	Loss of IWL stability results in slumping onto surrounding productive land or vegetation	Construction, Operation, Closure	PIM_21_04	Slumping of IWL	Direct disturbance	Local landholders	Yes	Slumping could occur due to poor design and/or erosion	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required. Note: PIM_21_04 and PIM_21_05 consider potential impacts from IWL stability on land use. For the purpose of this assessment, lease requirements for the IWL in relation to stability have been consolidated against PIM_13_04 in the Soils Section.	Loss of agricultural land	IM_21_03	IWL design. Erosion and pest animal control.	1	
168a	Loss of IWL stability results in slumping onto surrounding productive land or vegetation	Post Closure	PIM_21_05	Slumping of IWL	Direct disturbance	Local landholders	Yes	Slumping could occur due to poor design and/or erosion	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required. Note: PIM_21_04 and PIM_21_05 consider potential impacts from IWL stability on land use. For the purpose of this assessment, lease requirements for the IWL in relation to stability have been consolidated against PIM_13_04 in the Soils Section.	Loss of agricultural land	IM_21_04	IWL design. Erosion and pest animal control.	1	
168b	Land quality reduced off-lease as a consequence of microclimatic changes adjacent IWL (wind, shade)	Operation, Closure, Post Closure	PIM_21_06	Integrated waste landform	Microclimatic changes	Crops on adjoining land Soil quality/ local residents	Yes	Modelling indicates shading of a small area of land would occur	(1) DSD confirms that the Source, Pathway and Receptor exist. DSD assesses that the consequence of the potential impact is greater than trivial, hence, an outcome is required. The impact event refers to 'wind', however, the evidence provided by Iron Road relates to 'shading' (MP page 21-17, 21-18 and 21-19). DSD has only considered 'shading' as the pathway for impact from the IWL to the adjoining agricultural land use. Refer to PIM_13_11 for an additional impact event that refers to on-lease impacts.	Reduced soil/land quality off-lease compromising land productivity	IM_21_05	IWL design	3	
169	Direct employment opportunities during construction for local residents	Construction	PIM_22_01	Mine site construction	Employment with Iron Road or construction contractor(s)	Local communities	Yes	Construction workforce required	(1) DSD acknowledges that this impact event has the potential to be a benefit. No environmental outcome is required.	Employment opportunities locally and regionally	IM_22_01		**Benefit**	
170	Direct employment opportunities during construction for regional residents	Construction	PIM_22_02	Mine site construction	Employment with Iron Road or construction contractor(s)	Regional communities	Yes	Construction workforce required	(1) DSD acknowledges that this impact event has the potential to be a benefit. No environmental outcome is required.	Employment opportunities locally and regionally	IM_22_02		**Benefit**	
171	Direct employment opportunities during operation for local community	Operation	PIM_22_03	Mine site operation	Employment with Iron Road or operational contractor(s)	Local communities	Yes	Operational workforce required	(1) DSD acknowledges that this impact event has the potential to be a benefit. No environmental outcome is required.	Employment opportunities locally and regionally	IM_22_03		**Benefit**	
172	Direct employment opportunities during operation for regional residents	Operation	PIM_22_04	Mine site operation	Employment with Iron Road or operational contractor(s)	Regional communities	Yes	Operational workforce required	(1) DSD acknowledges that this impact event has the potential to be a benefit. No environmental outcome is required.	Employment opportunities locally and regionally	IM_22_04		**Benefit**	
173	Indirect employment opportunities during construction for local residents	Construction	PIM_22_05	Mine site construction	Employment with service provider which indirectly supports the mine construction as a result of population growth or requirement for new or additional services	Local communities	Yes	Employment opportunities expected in service industries	(1) DSD acknowledges that this impact event has the potential to be a benefit. No environmental outcome is required.	Employment opportunities locally and regionally	IM_22_05		**Benefit**	
174	Indirect employment opportunities during construction for regional residents	Construction	PIM_22_06	Mine site construction	Employment with service provider which indirectly supports the mine construction as a result of population growth or requirement for new or additional services	Regional communities	Yes	Employment opportunities expected in service industries	(1) DSD acknowledges that this impact event has the potential to be a benefit. No environmental outcome is required.	Employment opportunities locally and regionally	IM_22_06		**Benefit**	
175	Indirect employment opportunities during operation for local community	Operation	PIM_22_07	Mine site operation	Employment with service provider which indirectly supports the mine as a result of population growth or requirement for new or additional services	Local communities	Yes	Employment opportunities expected in service industries	(1) DSD acknowledges that this impact event has the potential to be a benefit. No environmental outcome is required.	Employment opportunities locally and regionally	IM_22_07		**Benefit**	
176	Indirect employment opportunities during operation for regional residents	Operation	PIM_22_08	Mine site operation	Employment with service provider which indirectly supports the mine as a result of population growth or requirement for new or additional services	Regional communities	Yes	Employment opportunities expected in service industries	(1) DSD acknowledges that this impact event has the potential to be a benefit. No environmental outcome is required.	Employment opportunities locally and regionally	IM_22_08		**Benefit**	
177	Direct business opportunities for local businesses	Construction, operation, closure	PIM_22_09	Construction and mining operations	Purchasing for construction and operation	Local/regional communities	Yes	Mining operations will require a range of services that can be supplied by local/regional businesses	(1) DSD acknowledges that this impact event has the potential to be a benefit. No environmental outcome is required.	Opportunities for local businesses	IM_22_09		**Benefit**	
178	Indirect business opportunities for local businesses	Construction, operation, closure	PIM_22_10	Construction and mining operations	Secondary purchasing	Local/regional communities	Yes	Mining operations will require a range of services that can be supplied by local/regional businesses	(1) DSD acknowledges that this impact event has the potential to be a benefit. No environmental outcome is required.	Opportunities for local businesses	IM_22_10		**Benefit**	

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179	Permanent displacement of some farming families and loss of productive agricultural land as a result of the mine	Construction	PIM_22_11	Purchase of farming properties	Loss of livelihood and attachment to land	Landholders on mine site	Yes	Some affected families have strong connection with the local area	(1) DSD considers that Iron Road has provided an adequate assessment of the likely social benefits and impacts of the CEIP. The MP (page 22-41 and Table 22-21) describes the proposed control and management strategies, initiatives and commitments in relation to potential social impacts and benefits. (2) DSD recommends that should a lease be granted the following be a condition of Schedule 2 of the lease: Social Management Plan (SMP) The Tenement Holder must prepare, implement and maintain a SMP within 12 months from the date of the grant of the Mining Tenement (in consultation with relevant State Government agencies and key community stakeholders) that addresses (but is not limited to): • All strategies, initiatives and commitments described in Chapter 22 of the Mining Lease Proposal; • A process for reviewing and updating the SMP on a regular basis; and • Anything further that the Director of Mines (or other authorised officer) directs in writing. The Tenement Holder must make the SMP publicly available. The implementation and maintaining of the SMP must be audited by a suitably qualified independent expert on an annual basis, or at a frequency as the Director of Mines (or other authorised officer) may specify by notice in writing. The expert must prepare a report of the findings of the audit and this report must be made publically available within 1 month of completion of the audit.	Impact on community wellbeing	IM_22_11	Reduction in mine footprint Negotiation of satisfactory agreements for purchase of properties. Access to counselling	3	
180	Increased demand for government and community services in Wudinna DC from construction workforce	Construction	PIM_22_12	Construction activities	Employees	Wudinna residents	Yes	Known from other projects	The assessment for PIM_22_11 also applies to PIM_22_12, including the requirement for a SMP.	Impact on government and community services	IM_22_12	Housing in camps	1	
181	Increased demand for government and community services in Wudinna DC from operational workforce	Operation, closure	PIM_22_13	Mining operations	Employees	Wudinna residents	Yes	Known from other projects	The assessment for PIM_22_11 also applies to PIM_22_13, including the requirement for a SMP.	Impact on government and community services	IM_22_13	Partnership with government	3	
182	Competition for local housing drives up house prices in Wudinna DC	Construction	PIM_22_14	Purchase of housing by employees	Increased housing demand	Wudinna residents	Yes	Mining has caused an inflation in house prices in other regions	The assessment for PIM_22_11 also applies to PIM_22_14, including the requirement for a SMP.	Impact on community wellbeing	IM_22_14	FIFO construction workforce and camp on minesite	2	
183	Competition for local housing drives up house prices in Wudinna DC	Operation, closure	PIM_22_15	Purchase of housing by employees	Increased housing demand	Wudinna residents	Yes	Mining has caused an inflation in house prices in other regions	The assessment for PIM_22_11 also applies to PIM_22_15, including the requirement for a SMP.	Impact on community wellbeing	IM_22_15	Development of accommodation village	2	
184	Decreased community cohesion and well-being	Construction, operation	PIM_22_16	Mining operations	Different age and interest profiles between mine workers and locals	Wudinna residents	Yes	Known from other projects	The assessment for PIM_22_11 also applies to PIM_22_16, including the requirement for a SMP.	Impact on community wellbeing	IM_22_16	Workforce education and awareness. Incentives for community participation.	3	
185	Increased community concerns about safety and security	Construction, operation	PIM_22_17	Mining operations	Workforce behaviour	Wudinna residents	Yes	Known from other projects	The assessment for PIM_22_11 also applies to PIM_22_17, including the requirement for a SMP.	Impact on community wellbeing	IM_22_17	Alcohol and drug policies. Enforcing workforce code of conduct.	3	
186	Mine employment results in labour shortages in other regional and local industries	Construction, operation	PIM_22_18	Employment requirements at mine	Recruitment in potentially limited labour pool	Other industries in region	Yes	Has occurred in other mining regions	The assessment for PIM_22_11 also applies to PIM_22_18, including the requirement for a SMP.	Employment opportunities locally and regionally	IM_22_18	Partnership with government to develop training programs. Promotion of employment opportunities outside region as well as within	3	
187	Positive changes from the increased population as a result of the operational workforce of the proposed mine including reversing population declines, providing expanded membership base for volunteer organisations and a critical population mass to support opportunities and services in the long term.	Operation	PIM_22_19	Direct and indirect employment	Increased population	Local community	Yes	Has occurred in other mining regions	(1) DSD acknowledges that this impact event has the potential to be a benefit. No environmental outcome is required.	Employment opportunities locally and regionally	IM_22_19		Benefit	
188	Wage and price inflation from the operation of the proposed mine places cost of living pressures on critical population groups such as women, the elderly and people on low or fixed incomes	Construction, operation	PIM_22_20	Operation of mine	Wage and price inflation	Critical population groups	Yes	Has occurred in other mining regions	The assessment for PIM_22_11 also applies to PIM_22_20, including the requirement for a SMP.	Impact on community wellbeing	IM_22_20	Strategies to enhance local employment and business opportunities, to facilitate the employment of women in the proposed mine, and to maintain housing supplies and affordability Promotion of employment opportunities outside region as well as within	3	
189	Permanent road closures on and adjoining the proposed mining lease result in additional travel time for local landholders and road users with impacts on amenity and lifestyle	Construction, Operation, Closure	PIM_22_21	Road closures	Road closures	Local community	Yes	Road closures will require local traffic to use other routes	The assessment for PIM_22_11 also applies to PIM_22_21, including the requirement for a SMP.	Impact on community wellbeing	IM_22_21	Community information on road closures and alternative routes	3	
190	A greater diversity of lifestyles and opportunities in a larger township and local employment and business opportunities leading to high household incomes in the long term	Operation	PIM_22_22	Operation of mine	Increased population and incomes	Local community	Yes	Has occurred in other mining regions	(1) DSD acknowledges that this impact event has the potential to be a benefit. No environmental outcome is required.	Impact on community wellbeing	IM_22_22	Partnership with government to develop training programs. Promotion of employment opportunities outside region as well as within	Benefit	
191	Closure of the mine causes social and economic disruption in the local area due to the loss of employment opportunities and economic and social benefits	Closure Post closure	PIM_22_23	Closure of mine	Loss of employment opportunities and economic and social benefits	Local community	Yes	Has occurred in other mining regions	The assessment for PIM_22_11 also applies to PIM_22_23, including the requirement for a SMP.	Impact on community wellbeing	IM_22_23	Cooperation with local and state government on closure planning and adjustment programs.	4	

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Line number	Proposed Outcome	DSD Assessment of Outcome, Strategies and Uncertainty	Recommended Regulatory Response - Outcomes and Strategies	Outcome measurement criteria	DSD Assessment of Draft Measurement Criteria	Leading indicator criteria (where required)	DSD Assessment of Leading Indicator Criteria
1	Unauthorised entry to the mining lease during construction, operation and closure does not result in public injuries and or deaths that could have been reasonably prevented.	(2) The outcome appropriately states the level of impact subsequent to controls. The outcome statement requires amendment to accurately reflect the applicable mine phases. DSD does not classify closure as a specific mine phase, however, we do classify 'post-mine completion' to be a specific mine phase. (3) The outcome is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. The Mining Proposal (MP) document (Page7-6) includes a detailed list of control strategies for preventing unauthorised access. The MP (page 7-8) states, 'during construction and operation, the mine will be fully fenced with access limited via secure gate houses'.	(4) DSD recommends that should a lease be granted the following outcome be a requirement of Schedule 6 of the lease: The Tenement Holder must during construction and operation, ensure that unauthorised entry to the Land does not result in public injuries and or deaths that could have been reasonably prevented.	Independent investigation of all incidents that result in injury or death to a member of the public are completed in 14 days, or as agreed with the Director of Mines (or other authorised officer), and demonstrate that the mine operator could not have reasonably prevented the incident (injury or death) from occurring.	(5) DSD considers the proposed draft measurement criteria to be an appropriate measurement to demonstrate achievement of the proposed outcome. Assessment: Amendments to the criteria are proposed in red. The criteria could be improved by including reference to a process which requires the learnings from the investigation to be incorporated into updated strategies in the PEPR. Should a lease be granted, the measurement criteria would be finalised in the PEPR.	Annual safety audit does not identify additional actions that could reasonably be taken to reduce risks to the public.	(6) DSD considers that there is a high level of reliance on control strategies to ensure achievement of the outcome, hence, leading indicator criteria is required. Assessment: DSD assesses that an annual audit of procedures and strategies to prevent unauthorised access to the mine site will support effectiveness of strategies and encourage continuous improvement. Should a lease be granted, the leading indicator criteria would be finalised in the PEPR.
2	Post mine completion, risks to the safety of the public from the open pit are as low as reasonably practicable.	(2) The outcome appropriately states the level of impact subsequent to controls. The outcome statement requires minor amendment. (3) The outcome is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. A fence is proposed to prevent access to the open pit and pit lake post mine completion. The longevity of a fence as a control strategy to prevent public access will require ongoing maintenance and an appropriate transfer of maintenance/liability post-mine completion. Passive engineering designs which do not require ongoing maintenance are more effective in the long term, for example, the proposal to ensure benches are constructed in the pit wall to prevent falls for the public, and other designs to enable safe egress from the pit lake. The Mining Proposal (MP) document (Page7-6) also refers to an earthen bund for preventing unauthorised access. This is an appropriate strategy, however, the details of the size and location of the bund will be required in a PEPR (should a lease be granted).	(4) DSD recommends that should a lease be granted the following outcome be a requirement of Schedule 6 of the lease: The Tenement Holder must demonstrate that post-mine completion, the risks to the health and safety of the public so far as it may be affected by mining operations are as low as reasonably practicable. DSD recommends that should a lease be granted the following be a requirement of Schedule 6 of the lease: The Tenement Holder is required to address the following matters for the purpose of Regulation 65(2)(c) in relation to the public safety outcomes: • Develop strategies to ensure final landform design for the open pit void meets the outcome for protection of public safety post-mine completion and in the long term to address the following potential hazards (but not limited to): - The risk of falling; - The risk of drowning; - The risk of vehicle incidents/accidents; and - Ground instability.	Independent audit of the physical stability of the pit and physical barrier (eg: bunding) and other control strategies (eg: benching in the pit, pit lake egress design), post closure, demonstrates risks to the public are as low as reasonably practicable.	(5) DSD considers the proposed draft measurement criteria to be an appropriate measurement to demonstrate achievement of the proposed outcome. Assessment: Amendments to the criteria are proposed in red. Should a lease be granted, the measurement criteria would be finalised in the PEPR submission.	None proposed	(6) Should a lease be granted, the requirement for a leading indicator criteria would be finalised in the PEPR.
3	NA	No Outcome required.	No Outcome required.	NA	No Outcome required.	NA	No Outcome required.
4	No loss of stability in the IWL during construction, operation and closure that results in public injuries and or deaths that could have been reasonably prevented.	(2) The outcome appropriately states the level of impact subsequent to controls. The outcome statement requires amendment to accurately reflect the applicable mine phases. DSD does not classify closure as a specific mine phase, however, we do consider 'post-mine completion' to be a specific mine phase. (3) The outcome is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. Assessment: For construction and operation (including closure), the control strategies to prevent unauthorised access to the mine site are provided on page 7-6 of the MP and are appropriate.	(4) DSD recommends that should a lease be granted the following outcome be a requirement of Schedule 6 of the lease: The Tenement Holder must during construction and operation, ensure that unauthorised entry to the Land does not result in public injuries and or deaths that could have been reasonably prevented.	Independent investigation of all incidents that result in injury or death to a member of the public are completed in 14 days, or as agreed with the Director of Mines (or other authorised officer), and demonstrate that the mine operator could not have reasonably prevented the incident (injury or death) from occurring.	(5) DSD considers the proposed draft measurement criteria to be an appropriate measurement to demonstrate achievement of the proposed outcome. Assessment: Amendments to the criteria are proposed in red. The criteria could be improved by including reference to a process which requires the learnings from the investigation to be incorporated into updated strategies in the PEPR. Should a lease be granted, the measurement criteria would be finalised in the PEPR.	Annual safety audit does not identify additional actions that could reasonably be taken to reduce risks to the public.	(6) DSD considers that there is a high level of reliance on control strategies to ensure achievement of the outcome, hence, leading indicator criteria is required. Assessment: DSD assesses that an annual audit of procedures and strategies to prevent unauthorised access to the mine site will support effectiveness of strategies and encourage continuous improvement. Should a lease be granted, the leading indicator criteria would be finalised in the PEPR.
5	No loss of stability in the IWL during construction, operation and closure that results in public injuries and or deaths that could have been reasonably prevented.	(2) The outcome appropriately states the level of impact subsequent to controls. The outcome statement requires amendment to accurately reflect the applicable mine phases. (3) The outcome is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. The Mining Proposal (MP) document (Page7-6) includes a detailed list of control strategies for preventing unauthorised access during construction and operation (including closure).	(4) DSD recommends that should a lease be granted the following outcome be a requirement of Schedule 6 of the lease: The Tenement Holder must during construction and operation, ensure that unauthorised entry to the Land does not result in public injuries and or deaths that could have been reasonably prevented.	Independent investigation of all incidents that result in injury or death to a member of the public are completed in 14 days, or as agreed with the Director of Mines (or other authorised officer), and demonstrate that the mine operator could not have reasonably prevented the incident (injury or death) from occurring.	(5) DSD considers the proposed draft measurement criteria to be an appropriate measurement to demonstrate achievement of the proposed outcome. Assessment: Amendments to the criteria are proposed in red. The criteria could be improved by including reference to a process which requires the learnings from the investigation to be incorporated into updated strategies in the PEPR. A draft completion criteria was not proposed by Iron Road. Should a lease be granted, the measurement criteria (including a completion criteria) would be finalised in the PEPR.	Annual safety audit does not identify additional actions that could reasonably be taken to reduce risks to the public.	(6) DSD considers that there is a high level of reliance on control strategies to ensure achievement of the outcome, hence, leading indicator criteria is required. Assessment: DSD assesses that an annual audit of procedures and strategies to prevent unauthorised access to the mine site will support effectiveness of strategies and encourage continuous improvement. Should a lease be granted, the leading indicator criteria would be finalised in the PEPR.
6	No loss of stability in the IWL during construction, operation and closure that results in public injuries and or deaths that could have been reasonably prevented.	(2) The outcome appropriately states the level of impact subsequent to controls. The outcome statement requires amendment to accurately reflect the applicable mine phases. (3) The outcome is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. Assessment: For construction and operation (including closure), the control strategies to prevent unauthorised access to the mine site (and potential impacts to the public from the IWL) are provided on page 7-6 of the MP and are appropriate.	(4) DSD recommends that should a lease be granted the following outcome be a requirement of Schedule 6 of the lease: The Tenement Holder must during construction and operation, ensure that unauthorised entry to the Land does not result in public injuries and or deaths that could have been reasonably prevented.	Independent investigation of all incidents that result in injury or death to a member of the public are completed in 14 days, or as agreed with the Director of Mines (or other authorised officer), and demonstrate that the mine operator could not have reasonably prevented the incident (injury or death) from occurring.	(5) DSD considers the proposed draft measurement criteria to be an appropriate measurement to demonstrate achievement of the proposed outcome. Assessment: Amendments to the criteria are proposed in red. The criteria could be improved by including reference to a process which requires the learnings from the investigation to be incorporated into updated strategies in the PEPR. Should a lease be granted, the measurement criteria would be finalised in the PEPR.	Annual safety audit does not identify additional actions that could reasonably be taken to reduce risks to the public.	(6) DSD considers that there is a high level of reliance on control strategies to ensure achievement of the outcome, hence, leading indicator criteria is required. Assessment: DSD assesses that an annual audit of procedures and strategies to prevent unauthorised access to the mine site will support effectiveness of strategies and encourage continuous improvement. Should a lease be granted, the leading indicator criteria would be finalised in the PEPR.
7	No loss of stability in the IWL during construction, operation and closure that results in public injuries and or deaths that could have been reasonably prevented.	(2) The outcome appropriately states the level of impact subsequent to controls. The outcome statement requires amendment to accurately reflect the applicable mine phases. (3) The outcome is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. Assessment: For construction and operation (including closure), the control strategies to prevent unauthorised access to the mine site (and potential impacts to the public from the IWL) are provided on page 7-6 of the MP and are appropriate.	(4) DSD recommends that should a lease be granted the following outcome be a requirement of Schedule 6 of the lease: The Tenement Holder must during construction and operation, ensure that unauthorised entry to the Land does not result in public injuries and or deaths that could have been reasonably prevented.	Independent investigation of all incidents that result in injury or death to a member of the public are completed in 14 days, or as agreed with the Director of Mines (or other authorised officer), and demonstrate that the mine operator could not have reasonably prevented the incident (injury or death) from occurring.	(5) DSD considers the proposed draft measurement criteria to be an appropriate measurement to demonstrate achievement of the proposed outcome. Assessment: Amendments to the criteria are proposed in red. The criteria could be improved by including reference to a process which requires the learnings from the investigation to be incorporated into updated strategies in the PEPR. Should a lease be granted, the measurement criteria would be finalised in the PEPR.	Annual safety audit does not identify additional actions that could reasonably be taken to reduce risks to the public.	(6) DSD considers that there is a high level of reliance on control strategies to ensure achievement of the outcome, hence, leading indicator criteria is required. Assessment: DSD assesses that an annual audit of procedures and strategies to prevent unauthorised access to the mine site will support effectiveness of strategies and encourage continuous improvement. Should a lease be granted, the leading indicator criteria would be finalised in the PEPR.
8	No loss of stability in the IWL during construction, operation and closure that results in public injuries and or deaths that could have been reasonably prevented.	(2) The outcome appropriately states the level of impact subsequent to controls. The outcome statement requires amendment to accurately reflect the applicable mine phases. (3) The outcome is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. Assessment: For construction and operation, the control strategies to prevent unauthorised access to the mine site (and potential impacts to the public from the IWL) are provided on page 7-6 of the MP and are appropriate.	(4) DSD recommends that should a lease be granted the following outcome be a requirement of Schedule 6 of the lease: The Tenement Holder must during construction and operation, ensure that unauthorised entry to the Land does not result in public injuries and or deaths that could have been reasonably prevented.	Independent investigation of all incidents that result in injury or death to a member of the public are completed in 14 days, or as agreed with the Director of Mines (or other authorised officer), and demonstrate that the mine operator could not have reasonably prevented the incident (injury or death) from occurring.	(5) DSD considers the proposed draft measurement criteria to be an appropriate measurement to demonstrate achievement of the proposed outcome. Assessment: Amendments to the criteria are proposed in red. The criteria could be improved by including reference to a process which requires the learnings from the investigation to be incorporated into updated strategies in the PEPR. Should a lease be granted, the measurement criteria would be finalised in the PEPR.	Annual safety audit does not identify additional actions that could reasonably be taken to reduce risks to the public.	(6) DSD considers that there is a high level of reliance on control strategies to ensure achievement of the outcome, hence, leading indicator criteria is required. Assessment: DSD assesses that an annual audit of procedures and strategies to prevent unauthorised access to the mine site will support effectiveness of strategies and encourage continuous improvement. Should a lease be granted, the leading indicator criteria would be finalised in the PEPR.
9	Post mine completion, risks to the safety of the public from loss of stability in the IWL are as low as reasonably practicable.	(2) The outcome appropriately states the level of impact subsequent to controls. The outcome statement requires minor amendment. (3) The outcome is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. Assessment: For post-mine completion, the closure design for the IWL page 7-6 of the MP states "the design parameters of the IWL will ensure it is geotechnically stable and safe". The MP (page 3-46 and Figure 3-20) states the final IWL landform will have outer slope angles ranging from 9 degrees to 18 degrees. The benches are not designed to have large falls, hence the risk to public safety from slips, trips and falls is mitigated. The IWL cover design will also be integral to mitigate surface water erosion. The design of the final IWL landform is a key control strategy to ensure the protection of the public post-mine completion, hence a second schedule lease condition is recommended to ensure this design will be independently peer reviewed for the PEPR (should a lease be granted). "Validation of construction of IWL to design (QA/QC)" is also a key control strategy which has been proposed by Iron Road and DSD recommends that this strategy be included in the sixth schedule of the lease. Strategies in relation to the IWL cover design are further assessed against outcomes in the Soils Section.	(4) DSD recommends that should a lease be granted the following be a condition of Schedule 2 of the lease: In accordance with section 70B(2)(d) of the Act it is a condition of the grant of the Mining Tenement that a proposed PEPR submitted in accordance with Part 10A of the Act must include reports from suitably qualified independent experts on the following matters: The effectiveness of the proposed strategies in the proposed PEPR achieving the environmental outcomes identified in the proposed PEPR, including but not limited to reports from: • An Independent Geotechnical Engineering Expert (i.e.: for IWL and mine waste design and construction methodology) • An Independent Mine Waste Cover System Expert (i.e.: for IWL and mine waste cover systems design) • An Independent Geomorphology Expert (i.e.: for Landform design, soil and erosion management) • An Independent Hydrology Expert (i.e.: for Surface water management) DSD recommends that should a lease be granted the following outcome be a requirement of Schedule 6 of the lease: The Tenement Holder must demonstrate that post-mine completion, the risks to the health and safety of the public so far as it may be affected by mining operations are as low as reasonably practicable. DSD recommends that should a lease be granted the following be a requirement of Schedule 6 of the lease: The Tenement Holder is required to address the following matters for the purpose of Regulation 65(2)(c) in relation to the public safety outcomes: • Quality control arrangements for all stages of construction of the IWL including supervision by appropriately qualified and experienced persons, documented procedures, quality control testing and record keeping.	Ecosystem Function Analysis at representative sites on rehabilitated areas demonstrates that rehabilitation will achieve sustainability thresholds. Landform modelling based on established IWL material parameters and geometry confirm alignment with outcomes from conceptual modelling.	(5) DSD recommends amendment to the proposed draft criteria to ensure an appropriate measurement to demonstrate achievement of the proposed outcome. Assessment: EFA will measure gully erosion, but does not comprehensively measure surface water erosion across the entire IWL which is the source of impact in this outcome. EFA relies on utilising "metric" sites to indicate how the rehabilitated site is performing relative to the metric site. Further quantitative measurement of erosion should be considered. The use of modelling is supported, however, validation of erosion modelling can also be utilised. An independent audit of the final IWL landform that demonstrates that it has been rehabilitated, constructed and is performing (over a period of time post closure) to achieve the mine completion outcome is also an appropriate criteria. DSD considers that there are methodologies that are appropriate to demonstrate achievement of the outcome. Should a lease be granted, the measurement criteria would be finalised in the PEPR submission.	None proposed	(6) Should a lease be granted, the leading indicator criteria would be finalised in the PEPR. Assessment: An annual audit of the quality assurance / quality control data for the construction of the IWL could be considered for leading indicator criteria.

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Line number	Proposed Outcome	DSD Assessment of Outcome, Strategies and Uncertainty	Recommended Regulatory Response - Outcomes and Strategies	Outcome measurement criteria	DSD Assessment of Draft Measurement Criteria	Leading indicator criteria (where required)	DSD Assessment of Leading Indicator Criteria
10	Post mine completion, risks to the safety of the public from loss of stability in the IWL are as low as reasonably practicable.	(2) The outcome appropriately states the level of impact subsequent to controls. The outcome statement requires minor amendment. (3) The outcome is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. Assessment: For post-mine completion, the closure design for the IWL page 7-6 of the MP states "the design parameters of the IWL will ensure it is geotechnically stable and safe". The IWL consolidation, cover design and revegetation will be integral to mitigate wind erosion. The design of the final IWL landform is a key control strategy to ensure the protection of the public post-mine completion, hence a second schedule lease condition is recommended to ensure this design will be independently peer reviewed for the PEPR (should a lease be granted). "Validation of construction of IWL to design (QA/QC)" is also a key control strategy which has been proposed by Iron Road and DSD recommends that this strategy be included in the sixth schedule of the lease.	(4) DSD recommends that should a lease be granted the following be a condition of Schedule 2 of the lease: In accordance with section 70B(2)(d) of the Act it is a condition of the grant of the Mining Tenement that a proposed PEPR submitted in accordance with Part 10A of the Act must include reports from suitably qualified independent experts on the following matters: The effectiveness of the proposed strategies in the proposed PEPR achieving the environmental outcomes identified in the proposed PEPR, including but not limited to reports from: • An Independent Mine Waste Cover System Expert (i.e.: for IWL and mine waste cover systems design) • An Independent Geomorphology Expert (i.e.: for Landform design, soil and erosion management) DSD recommends that should a lease be granted the following outcome be a requirement of Schedule 6 of the lease: The Tenement Holder must demonstrate that post-mine completion, the risks to the health and safety of the public so far as it may be affected by mining operations are as low as reasonably practicable. DSD recommends that should a lease be granted the following be a requirement of Schedule 6 of the lease: The Tenement Holder is required to address the following matters for the purpose of Regulation 65(2)(c) in relation to the public safety outcomes: • Quality control arrangements for all stages of construction of the IWL including supervision by appropriately qualified and experienced persons, documented procedures, quality control testing and record keeping.	Ecosystem Function Analysis at representative sites on rehabilitated areas demonstrates that rehabilitation will achieve sustainability thresholds. Landform modelling based on established IWL material parameters and geometry confirm alignment with outcomes from conceptual modelling.	(5) DSD recommends amendment to the proposed draft criteria to ensure an appropriate measurement to demonstrate achievement of the proposed outcome. Assessment: EFA will measure gully erosion, but does not comprehensively measure wind erosion across the entire IWL which is the source of impact in this outcome. EFA relies on utilising "metric" sites to indicate how the rehabilitated site is performing relative to the metric site. Further quantitative measurement of erosion should be considered. The use of modelling is supported, however, validation of erosion modelling can also be utilised. An independent audit of the final IWL landform that demonstrates that it has been rehabilitated, constructed and is performing (over a period of time post closure) to achieve the mine completion outcome is also an appropriate criteria. DSD considers that there are methodologies that are appropriate to demonstrate achievement of the outcome. Should a lease be granted, the measurement criteria would be finalised in the PEPR submission.	None proposed	(6) Should a lease be granted, the leading indicator criteria would be finalised in the PEPR. Assessment: An annual audit of the quality assurance / quality control data for the construction of the IWL could be considered for leading indicator criteria.
11	Post mine completion, risks to the safety of the public from loss of stability in the IWL are as low as reasonably practicable.	(2) The outcome appropriately states the level of impact subsequent to controls. The outcome statement requires minor amendment. (3) The outcome is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. Assessment: For post-mine completion, the closure design for the IWL page 7-6 of the MP states "the design parameters of the IWL will ensure it is geotechnically stable and safe". The design of the final IWL landform, including the consolidation of the material, is a key control strategy to ensure the protection of the public post-mine completion. Hence, a second schedule lease condition is recommended to ensure this design will be independently peer reviewed for the PEPR (should a lease be granted). "Validation of construction of IWL to design (QA/QC)" is also a key control strategy which has been proposed by Iron Road and DSD recommends that this strategy be included in the sixth schedule of the lease.	(4) DSD recommends that should a lease be granted the following be a condition of Schedule 2 of the lease: In accordance with section 70B(2)(d) of the Act it is a condition of the grant of the Mining Tenement that a proposed PEPR submitted in accordance with Part 10A of the Act must include reports from suitably qualified independent experts on the following matters: The effectiveness of the proposed strategies in the proposed PEPR achieving the environmental outcomes identified in the proposed PEPR, including but not limited to reports from: • An Independent Geotechnical Engineering Expert (i.e.: for IWL and mine waste design and construction methodology) DSD recommends that should a lease be granted the following outcome be a requirement of Schedule 6 of the lease: The Tenement Holder must demonstrate that post-mine completion, the risks to the health and safety of the public so far as it may be affected by mining operations are as low as reasonably practicable. DSD recommends that should a lease be granted the following be a requirement of Schedule 6 of the lease: The Tenement Holder is required to address the following matters for the purpose of Regulation 65(2)(c) in relation to the public safety outcomes: • Quality control arrangements for all stages of construction of the IWL including supervision by appropriately qualified and experienced persons, documented procedures, quality control testing and record keeping.	Ecosystem Function Analysis at representative sites on rehabilitated areas demonstrates that rehabilitation will achieve sustainability thresholds. Landform modelling based on established IWL material parameters and geometry confirm alignment with outcomes from conceptual modelling.	(5) DSD recommends amendment to the proposed draft criteria to ensure an appropriate measurement to demonstrate achievement of the proposed outcome. Assessment: EFA will not directly measure consolidation which is the source of impact in this outcome. EFA relies on utilising "metric" sites to indicate how the rehabilitated site is performing relative to the metric site. Quantitative measurement of consolidation should be considered. The use of modelling is supported, however, validation of the model should also be considered. An independent audit of the final IWL landform that demonstrates that it has been rehabilitated, constructed and is performing (over a period of time post closure) to achieve the mine completion outcome is also an appropriate criteria. DSD considers that there are methodologies that are appropriate to demonstrate achievement of the outcome. Should a lease be granted, the measurement criteria would be finalised in the PEPR submission.	None proposed	(6) Should a lease be granted, the leading indicator criteria would be finalised in the PEPR. Assessment: An annual audit of the quality assurance / quality control data for the construction of the IWL could be considered for leading indicator criteria.
12	Post mine completion, risks to the safety of the public from loss of stability in the IWL are as low as reasonably practicable.	(2) The outcome appropriately states the level of impact subsequent to controls. The outcome statement requires minor amendment. (3) The outcome is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. Assessment: For post-mine completion, the closure design for the IWL page 7-6 of the MP states "the design parameters of the IWL will ensure it is geotechnically stable and safe". The design of the final IWL landform, including the geomorphological design, is a key control strategy to ensure the protection of the public post-mine completion. Hence, a second schedule lease condition is recommended to ensure this design will be independently peer reviewed for the PEPR (should a lease be granted). "Validation of construction of IWL to design (QA/QC)" is also a key control strategy which has been proposed by Iron Road and DSD recommends that this strategy be included in the sixth schedule of the lease.	(4) DSD recommends that should a lease be granted the following be a condition of Schedule 2 of the lease: In accordance with section 70B(2)(d) of the Act it is a condition of the grant of the Mining Tenement that a proposed PEPR submitted in accordance with Part 10A of the Act must include reports from suitably qualified independent experts on the following matters: The effectiveness of the proposed strategies in the proposed PEPR achieving the environmental outcomes identified in the proposed PEPR, including but not limited to reports from: • An Independent Geomorphology Expert (i.e.: for Landform design, soil and erosion management) DSD recommends that should a lease be granted the following outcomes be a requirement of Schedule 6 of the lease: The Tenement Holder must demonstrate that post-mine completion, the risks to the health and safety of the public so far as it may be affected by mining operations are as low as reasonably practicable. DSD recommends that should a lease be granted the following be a requirement of Schedule 6 of the lease: The Tenement Holder is required to address the following matters for the purpose of Regulation 65(2)(c) in relation to the public safety outcomes: • Quality control arrangements for all stages of construction of the IWL including supervision by appropriately qualified and experienced persons, documented procedures, quality control testing and record keeping.	Ecosystem Function Analysis at representative sites on rehabilitated areas demonstrates that rehabilitation will achieve sustainability thresholds. Landform modelling based on established IWL material parameters and geometry confirm alignment with outcomes from conceptual modelling.	(5) DSD recommends amendment to the proposed draft criteria to ensure an appropriate measurement to demonstrate achievement of the proposed outcome. Assessment: EFA will not directly measure geomorphological performance which is the source of impact in this outcome. EFA relies on utilising "metric" sites to indicate how the rehabilitated site is performing relative to the metric site. The use of modelling is supported, however, validation of the model should also be considered. An independent audit of the final IWL landform that demonstrates that it has been rehabilitated, constructed and is performing (over a period of time post closure) to achieve the mine completion outcome is also an appropriate criteria. DSD considers that there are methodologies that are appropriate to demonstrate achievement of the outcome. Should a lease be granted, the measurement criteria would be finalised in the PEPR submission.	None proposed	(6) Should a lease be granted, the leading indicator criteria would be finalised in the PEPR. Assessment: An annual audit of the quality assurance / quality control data for the construction of the IWL could be considered for leading indicator criteria.
13	Post mine completion, risks to the safety of the public from loss of stability in the IWL are as low as reasonably practicable.	(2) The outcome appropriately states the level of impact subsequent to controls. The outcome statement requires minor amendment. (3) The outcome is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. Assessment: For post-mine completion, the closure design for the IWL page 7-6 of the MP states "the design parameters of the IWL will ensure it is geotechnically stable and safe". The design of the final IWL landform, including ensuring the design is appropriate to withstand seismic events in the longterm, are key control strategies to ensure the protection of the public post-mine completion. The MP (page 2-30) states that 'the mine site is located within an area not considered to be at significant risk of earthquakes'. The IWL design in the MP is conceptual and does not specifically address how seismic events have been considered in the design. A second schedule lease condition is recommended to ensure this design will be independently peer reviewed for the PEPR (should a lease be granted). "Validation of construction of IWL to design (QA/QC)" is also a key control strategy which has been proposed by Iron Road and DSD recommends that this strategy be included in the sixth schedule of the lease.	(4) DSD recommends that should a lease be granted the following be a condition of Schedule 2 of the lease: In accordance with section 70B(2)(d) of the Act it is a condition of the grant of the Mining Tenement that a proposed PEPR submitted in accordance with Part 10A of the Act must include reports from suitably qualified independent experts on the following matters: The effectiveness of the proposed strategies in the proposed PEPR achieving the environmental outcomes identified in the proposed PEPR, including but not limited to reports from: • An Independent Geotechnical Engineering Expert (i.e.: for IWL and mine waste design and construction methodology) DSD recommends that should a lease be granted the following outcome be a requirement of Schedule 6 of the lease: The Tenement Holder must demonstrate that post-mine completion, the risks to the health and safety of the public so far as it may be affected by mining operations are as low as reasonably practicable. DSD recommends that should a lease be granted the following be a requirement of Schedule 6 of the lease: The Tenement Holder is required to address the following matters for the purpose of Regulation 65(2)(c) in relation to the public safety outcomes: • Quality control arrangements for all stages of construction of the IWL including supervision by appropriately qualified and experienced persons, documented procedures, quality control testing and record keeping.	Ecosystem Function Analysis at representative sites on rehabilitated areas demonstrates that rehabilitation will achieve sustainability thresholds. Landform modelling based on established IWL material parameters and geometry confirm alignment with outcomes from conceptual modelling.	(5) DSD recommends amendment to the proposed draft criteria to ensure an appropriate measurement to demonstrate achievement of the proposed outcome. Assessment: EFA will not directly measure landform performance in relation to seismic events which is the source of impact in this outcome. EFA relies on utilising "metric" sites to indicate how the rehabilitated site is performing relative to the metric site. The use of modelling is supported, however, validation of the model should also be considered. An independent audit of the final IWL landform that demonstrates that it has been rehabilitated, constructed and is performing (over a period of time post closure) to achieve the mine completion outcome is also an appropriate criteria. DSD considers that there are methodologies that are appropriate to demonstrate achievement of the outcome. Should a lease be granted, the measurement criteria would be finalised in the PEPR submission.	None proposed	(6) Should a lease be granted, the leading indicator criteria would be finalised in the PEPR. Assessment: An annual audit of the quality assurance / quality control data for the construction of the IWL could be considered for leading indicator criteria.
14	Use by the public of the authorised mine viewing platform during construction, operation and closure does not result in public injuries and or deaths that could have been reasonably prevented.	(2) The outcome appropriately states the level of impact subsequent to controls. The outcome statement requires amendment to accurately reflect the applicable mine phases. DSD does not classify closure as a specific mine phase, however, we do consider 'post-mine completion' to be a specific mine phase. Authorised access to the mine site by the public is regulated by SafeworkSA, hence, the outcome requires amendment to reflect the source of the impact to be unauthorised entry by the public. (3) The outcome is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. Assessment: For construction and operation (including closure), the control strategies to prevent unauthorised access to the mine site are provided on page 7-6 of the MP and are appropriate.	(4) DSD recommends that should a lease be granted the following outcome be a requirement of Schedule 6 of the lease: The Tenement Holder must during construction and operation, ensure that unauthorised entry to the Land does not result in public injuries and or deaths that could have been reasonably prevented.	Independent investigation of all incidents that result in injury or death to a member of the public are completed in 14 days, or as agreed with the Director of Mines (or other authorised officer), and demonstrate that the mine operator could not have reasonably prevented the incident (injury or death) from occurring.	(5) DSD considers the proposed draft measurement criteria to be an appropriate measurement to demonstrate achievement of the proposed outcome. Assessment: Amendments to the criteria are proposed in red. The criteria could be improved by including reference to a process which requires the learnings from the investigation to be incorporated into updated strategies in the PEPR. Should a lease be granted, the measurement criteria would be finalised in the PEPR.	Annual safety audit does not identify additional actions that could reasonably be taken to reduce risks to the public.	(6) DSD considers that there is a high level of reliance on control strategies to ensure achievement of the outcome, hence, leading indicator criteria is required. Assessment: DSD assesses that an annual audit of procedures and strategies to prevent unauthorised access to the mine site will support effectiveness of strategies and encourage continuous improvement. Should a lease be granted, the leading indicator criteria would be finalised in the PEPR.
15	Post closure, risks to the public from use of the mine viewing platform are as low as reasonably practicable.	(2) The outcome appropriately states the level of impact subsequent to controls. The outcome statement requires minor amendment. (3) The outcome is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. Assessment: The mine viewing platform should be removed post closure, unless it can be demonstrated that the platform is integral to the future land use and that there is evidence of the transfer of liability and management of this infrastructure in the long term to ensure the protection of public safety.	(4) DSD recommends that should a lease be granted the following outcomes be a requirement of Schedule 6 of the lease: The Tenement Holder must demonstrate that post-mine completion, the risks to the health and safety of the public so far as it may be affected by mining operations are as low as reasonably practicable.	Evidence that arrangements are in place for the ongoing maintenance of the facility. Report by suitably qualified engineer prior to handover of responsibility demonstrates facility is structurally sound.	(5) DSD considers the proposed draft measurement criteria to be an appropriate measurement to demonstrate achievement of the proposed outcome. Assessment: In addition to evidence that there is an arrangement for the ongoing maintenance of the mine viewing platform, there must also be evidence that the future liability in regards to the viewing platform is also transferred to the future land owner/user. The report prepared by a suitably qualified engineer must also include recommendations for the ongoing maintenance of the mine viewing platform and this information must be provided to the future land owner/user. DSD considers that there are methodologies that are appropriate to demonstrate achievement of the outcome. Should a lease be granted, the measurement criteria would be finalised in the PEPR submission.	None proposed	(6) Should a lease be granted, the requirement for a leading indicator criteria would be finalised in the PEPR.
16	Unauthorised entry to the mining lease during construction, operation and closure does not result in public injuries and or deaths that could have been reasonably prevented.	(2) The outcome appropriately states the level of impact subsequent to controls. The outcome statement requires amendment to accurately reflect the applicable mine phases. DSD does not classify closure as a specific mine phase, however, we do consider 'post-mine completion' to be a specific mine phase. (3) The outcome is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. Assessment: For construction and operation (including closure), the control strategies to prevent unauthorised access to the mine site are provided on page 7-6 of the MP and are appropriate. The MP (page 7-8) states, 'during construction and operation, the mine will be fully fenced with access limited via secure gate houses'.	(4) DSD recommends that should a lease be granted the following outcome be a requirement of Schedule 6 of the lease: The Tenement Holder must during construction and operation, ensure that unauthorised entry to the Land does not result in public injuries and or deaths that could have been reasonably prevented.	Independent investigation of all incidents that result in injury or death to a member of the public are completed in 14 days, or as agreed with the Director of Mines (or other authorised officer), and demonstrate that the mine operator could not have reasonably prevented the incident (injury or death) from occurring.	(5) DSD considers the proposed draft measurement criteria to be an appropriate measurement to demonstrate achievement of the proposed outcome. Assessment: Amendments to the criteria are proposed in red. The criteria could be improved by including reference to a process which requires the learnings from the investigation to be incorporated into updated strategies in the PEPR. Should a lease be granted, the measurement criteria would be finalised in the PEPR.	Annual safety audit does not identify additional actions that could reasonably be taken to reduce risks to the public.	(6) DSD considers that there is a high level of reliance on control strategies to ensure achievement of the outcome, hence, leading indicator criteria is required. Assessment: DSD assesses that an annual audit of procedures and strategies to prevent unauthorised access to the mine site will support effectiveness of strategies and encourage continuous improvement. Should a lease be granted, the leading indicator criteria would be finalised in the PEPR.

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Line number	Proposed Outcome	DSD Assessment of Outcome, Strategies and Uncertainty	Recommended Regulatory Response - Outcomes and Strategies	Outcome measurement criteria	DSD Assessment of Draft Measurement Criteria	Leading indicator criteria (where required)	DSD Assessment of Leading Indicator Criteria
17	Post mine completion, risks to the safety of the public from loss of stability in the IWL are as low as reasonably practicable.	(2) The outcome appropriately states the level of impact subsequent to controls. The outcome statement requires minor amendment. (3) The outcome is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. Assessment: For post-mine completion, the closure design for the IWL page 7-6 of the MP states "the design parameters of the IWL will ensure it is geotechnically stable and safe". The MP (page 3-46 and Figure 3-20) states the final IWL landform will have outer slope angles ranging from 9 degrees to 18 degrees. The benches are not designed to have large falls, hence the risk to public safety from slips, trips and falls is mitigated. The design of the final IWL landform is a key control strategy to ensure the protection of the public post-mine completion, hence a second schedule lease condition is recommended to ensure this design will be independently peer reviewed for the PEPR (should a lease be granted). "Validation of construction of IWL to design (QA/QC)" is also a key control strategy which has been proposed by Iron Road and DSD recommends that this strategy be included in the sixth schedule of the lease.	(4) DSD recommends that should a lease be granted the following be a condition of Schedule 2 of the lease: In accordance with section 70B(2)(d) of the Act it is a condition of the grant of the Mining Tenement that a proposed PEPR submitted in accordance with Part 10A of the Act must include reports from suitably qualified independent experts on the following matters: The effectiveness of the proposed strategies in the proposed PEPR achieving the environmental outcomes identified in the proposed PEPR, including but not limited to reports from: • An Independent Geotechnical Engineering Expert (i.e.: for IWL and mine waste design and construction methodology) • An Independent Mine Waste Cover System Expert (i.e.: for IWL and mine waste cover systems design) • An Independent Geomorphology Expert (i.e.: for Landform design, soil and erosion management) • An Independent Hydrology Expert (i.e.: for Surface water management) DSD recommends that should a lease be granted the following outcome be a requirement of Schedule 6 of the lease: The Tenement Holder must demonstrate that post-mine completion, the risks to the health and safety of the public so far as it may be affected by mining operations are as low as reasonably practicable. DSD recommends that should a lease be granted the following be a requirement of Schedule 6 of the lease: The Tenement Holder is required to address the following matters for the purpose of Regulation 65(2)(c) in relation to the public safety outcomes: • Quality control arrangements for all stages of construction of the IWL including supervision by appropriately qualified and experienced persons, documented procedures, quality control testing and record keeping.	Ecosystem Function Analysis at representative sites on rehabilitated areas demonstrates that rehabilitation will achieve sustainability thresholds. Landform modelling based on established IWL material parameters and geometry confirm alignment with outcomes from conceptual modelling.	(5) DSD recommends amendment to the proposed draft criteria to ensure an appropriate measurement to demonstrate achievement of the proposed outcome. Assessment: EFA will not directly measure physical stability of the IWL which is the source of impact in this outcome. EFA relies on utilising "metric" sites to indicate how the rehabilitated site is performing relative to the metric site. The use of modelling is supported, however, validation of the model should also be considered. An independent audit of the final IWL landform that demonstrates that it has been rehabilitated, constructed and is performing (over a period of time post closure) to achieve the mine completion outcome is also an appropriate criteria. DSD considers that there are methodologies that are appropriate to demonstrate achievement of the outcome. Should a lease be granted, the measurement criteria would be finalised in the PEPR submission.	None proposed	(6) Should a lease be granted, the leading indicator criteria would be finalised in the PEPR. Assessment: An annual audit of the quality assurance / quality control data for the construction of the IWL could be considered for leading indicator criteria.
18	No adverse impacts to public health as a result of any contaminated material from the mining lease.	(2) The outcome appropriately states the level of impact subsequent to controls. The outcome statement requires amendment to accurately reflect the applicable mine phases. DSD does not classify closure as a specific mine phase, however, we do consider 'post-mine completion' to be a specific mine phase. Authorised access to the mine site by the public is regulated by SafeworkSA, hence, the outcome requires amendment to reflect the source of the impact to be unauthorised entry by the public. For this impact event, the mechanism for the local community being exposed to disturbed contaminated land on the site is likely to be through unauthorised access to the mine. Mobilisation of the contamination through the air or water will be addressed through other impact events, strategies and environmental outcomes. (3) The outcome is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. Assessment: For construction and operation (including closure), the control strategies to prevent unauthorised access to the mine site are provided on page 7-6 of the MP and are appropriate.	(4) DSD recommends that should a lease be granted the following outcome be a requirement of Schedule 6 of the lease: The Tenement Holder must during construction and operation, ensure that unauthorised entry to the Land does not result in public injuries and or deaths that could have been reasonably prevented.	Existing contaminated sites are remediated or treated to EPA standards within 14 days of their identification, or within a timeframe agreed by the Director of Mines.	(5) DSD considers the proposed draft measurement criteria to be a strategy for the remediation of any identified contaminated sites. This strategy will be applicable to other impact events and outcomes. Assessment: The following criteria should be considered: 'Independent investigation of all incidents that result in health impacts to a member of the public are completed in 14 days, or as agreed with the Director of Mines (or other authorised officer), and demonstrate that the mine operator could not have reasonably prevented the health impact from occurring.' DSD considers that there are appropriate methodologies to demonstrate achievement of the outcome. Should a lease be granted, the measurement criteria would be finalised in the PEPR submission.	Annual safety audit does not identify additional actions that could reasonably be taken to reduce risks to the public.	(6) DSD considers that there is a high level of reliance on control strategies to ensure achievement of the outcome, hence, leading indicator criteria is required. Assessment: DSD assesses that an annual audit of procedures and strategies to prevent unauthorised access to the mine site will support effectiveness of strategies and encourage continuous improvement. Should a lease be granted, the leading indicator criteria would be finalised in the PEPR.
19	No adverse impacts to public health as a result of any contaminated material from the mining lease.	No Outcome required.	No Outcome required.	All chemical and hydrocarbon spills greater than 20 L are remediated to meet EPA standards within 48 hours of the spill, or a longer time agreed by the Director of Mines.	No Outcome required.	Annual safety audit does not identify additional actions that could reasonably be taken to reduce risks to the public.	No Outcome required.
20	No public injuries and or deaths as a result of fires originating in the mining lease that could have been reasonably prevented.	(2) The outcome appropriately states the level of impact subsequent to controls. The outcome statement requires minor amendment. (3) The outcome is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. Assessment: The proposed environmental outcome is specific to injuries or death to the public due to fires originating on the Land. Proposed and industry standards are effective in preventing and controlling fire originating on the Land and as a result of mining operations. Assumptions are reasonable and acknowledge the potential for catastrophic consequences should an uncontrolled fire leave the Land.	(4) DSD recommends that should a lease be granted the following outcome be a requirement of Schedule 6 of the lease: The Tenement Holder must during construction and operation, ensure that there are no public injuries and or deaths as a result of uncontrolled fires caused by mining operations that could have been reasonably prevented.	Independent investigation of all incidents that result in injury or death to a member of the public are completed in 14 days, or as agreed with the Director of Mines (or other authorised officer), and demonstrate that the mine operator could not have reasonably prevented the incident (injury or death) from occurring.	(5) DSD considers the proposed draft measurement criteria to be an appropriate measurement to demonstrate achievement of the proposed outcome. Assessment: Amendments to the criteria are proposed in red. The criteria could be improved by including reference to a process which requires the learnings from the investigation to be incorporated into updated strategies in the PEPR. Should a lease be granted, the measurement criteria would be finalised in the PEPR.	Annual safety audit does not identify additional actions that could reasonably be taken to reduce risks to the public.	(6) DSD considers that there is a high level of reliance on control strategies to ensure achievement of the outcome, hence, leading indicator criteria is required. Assessment: DSD assesses that an annual audit of procedures and strategies to prevent unauthorised access to the mine site will support effectiveness of strategies and encourage continuous improvement. Should a lease be granted, the leading indicator criteria would be finalised in the PEPR.
21	NA	(2) A public safety outcome (see regulatory response) is required in relation to potential impacts from flyrock and airblast. (3) The outcome is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. Assessment: As no outcome was proposed, no specific control strategies were set out for flyrock. The MP (page 7-5) includes a description of the potential impact from fly rock on members of the public. The MP (page 17-6) does set out control and management strategies for airblast and vibration of which the following are applicable to flyrock and/or airblast: - Blasting procedures will be developed and implemented in accordance with AS2187.2-2006 A sixth schedule lease requirement is recommended in relation to development of strategies to ensure achievement of the blasting outcome in relation to flyrock (see the regulatory response). For a complete assessment of impacts as a result of blasting, also refer to the Airblast and Vibration section for an assessment of impacts to the public from Airblast and Vibration (see PIM_17_01 and 17_04).	(4) DSD recommends that should a lease be granted the following outcome be a requirement of Schedule 6 of the lease: The Tenement Holder must during construction and operation, ensure that there are no adverse impacts to: • public safety, • human comfort, • third party property (including stock), • adjacent land use, • aircraft, or • other receptors, from airblast, flyrock and vibration caused by blasting. DSD recommends that should a lease be granted the following be a requirement of Schedule 6 of the lease: The Tenement Holder is required to address the following matters for the purposes of Regulation 65(2)(c) in relation to the blasting outcome; • Notify property owners or residents adjacent to and within the Land, subject to their consent, of all blasts no less than forty eight hours in advance of those blasts; • Develop strategies for the management of impacts from blasting, including the determination and requirement of blast exclusion zones, in accordance with relevant standards including the Australian Standard AS 2187.2; • Develop strategies for establishing and implementing a blast exclusion zone between any third party property or land use, and the designated blast area, for all blasting events during mining operations; • If required, develop strategies to ensure that a blast exclusion zone is maintained between the public and the designated blast area, for all blasting events during mining operations. • A blasting protocol and blasting schedule will be developed in consultation with owners and residents of land within and adjacent the Land to reflect the needs of the adjacent land use practices.	NA	(5) DSD considers that there are methodologies that are appropriate to demonstrate achievement of the outcome. Should a lease be granted, the measurement criteria would be finalised in the PEPR submission. DSD recommends that should a lease be granted the following criteria be a requirement of Schedule 6 of the lease: The Tenement Holder is required to address the following matters for the purposes of Regulation 65(2)(d) in relation to the blasting outcome; • All blasts must be monitored and measured for vibration and airblast overpressure; • Blasting criteria is set in accordance with the Australian Standard AS 2187.2; • Measurements taken to demonstrate achievement of the blasting outcome must be taken in accordance with Australian Standard AS2187.2.	NA	(6) Should a lease be granted, the requirement for a leading indicator criteria would be finalised in the PEPR.
21a	NA - Benefit	No Outcome required.	No Outcome required.		No Outcome required.		No Outcome required.
22	No unauthorised damage to public infrastructure (e.g. pavement damage) as a result of mining operations	(2) The outcome appropriately states the level of impact subsequent to controls. The outcome statement requires minor amendment. (3) The outcome is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. Assessment: For construction and operation, the control strategies to prevent unauthorised damage to public infrastructure (including pavement) are provided on page 8-17 of the MP and are appropriate. "Monitoring of pavement condition" is also proposed in this table and is supported.	(4) DSD recommends that should a lease be granted the following outcome be a requirement of Schedule 6 of the lease: The Tenement Holder must during construction and operation, ensure no unauthorised damage to public or private property and infrastructure, including road pavements, as a result of traffic movements from mining operations.	Evidence that agreements are in place with DPTI and/or Council requirements regarding pavement or other infrastructure damage.	(5) DSD considers the proposed draft measurement criteria requires amendment to demonstrate achievement of the proposed outcome. Assessment: The MP (page 8-17) includes details of the content of a pavement monitoring, management and rehabilitation procedure. "Monitoring of pavement condition" is also proposed in this table and is supported. Measurement criteria could be developed based on the auditing of the performance of this procedure (and linked to the monitoring of pavement condition) to demonstrate that no unauthorised damage had occurred during the audit period. DSD considers that there are methodologies that are appropriate to demonstrate achievement of the outcome. Should a lease be granted, the measurement criteria would be finalised in the PEPR submission.	None proposed	(6) Should a lease be granted, the requirement for a leading indicator criteria would be finalised in the PEPR.
23	No unauthorised damage to public infrastructure (e.g. pavement damage) as a result of mining operations	(2) The outcome appropriately states the level of impact subsequent to controls. The outcome statement requires minor amendment. (3) The outcome is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. Assessment: For construction and operation, the control strategies to prevent unauthorised damage to public infrastructure (including pavement) are provided on page 8-17 of the MP and are appropriate. "Monitoring of pavement condition" is also proposed in this table and is supported.	(4) DSD recommends that should a lease be granted the following outcome be a requirement of Schedule 6 of the lease: The Tenement Holder must during construction and operation, ensure no unauthorised damage to public or private property and infrastructure, including road pavements, as a result of traffic movements from mining operations.	Evidence that agreements are in place with DPTI and/or Council requirements regarding pavement or other infrastructure damage.	(5) DSD considers the proposed draft measurement criteria requires amendment to demonstrate achievement of the proposed outcome. Assessment: The MP (page 8-17) includes details of the content of a pavement monitoring, management and rehabilitation procedure. "Monitoring of pavement condition" is also proposed in this table and is supported. Measurement criteria could be developed based on the auditing of the performance of this procedure (and linked to the monitoring of pavement condition) to demonstrate that no unauthorised damage had occurred during the audit period. DSD considers that there are methodologies that are appropriate to demonstrate achievement of the outcome. Should a lease be granted, the measurement criteria would be finalised in the PEPR submission.	None proposed	(6) Should a lease be granted, the requirement for a leading indicator criteria would be finalised in the PEPR.
24	Travel delays to the public as a result of road closures and realignments are as low as reasonably practicable	(2) The outcome appropriately states the level of impact subsequent to controls. The outcome statement requires minor amendment. (3) The outcome is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. Assessment: For construction and operation, the control strategies to mitigate travel delays are provided on page 8-17 of the MP and are appropriate. The Response Document (Attachment B, page 24) states, "Third party land users may be escorted across the ML if there is a clear need and this has been agreed in principle with an adjacent landowner. Any access to land by third parties will only be allowed following induction training and in accordance with agreed requirements." The proposed strategy to allow access to the mine site in order to reduce travel times for impacted land owners will be effective in mitigating impacts. DSD recommends a schedule 2 lease condition that requires a Communications Protocol which includes land access protocols to address the above strategy. Refer to the Assessment report for the full wording of this lease condition.	(4) DSD recommends that should a lease be granted the following be a condition of Schedule 2 of the lease: A Communications Protocol to be developed between the Tenement Holder and owners of land adjacent to and on the Land that includes access protocols. Refer to the Assessment Report for the full wording of this lease condition. DSD recommends that should a lease be granted the following outcome be a requirement of Schedule 6 of the lease: The Tenement Holder must during construction, operation and post-mine completion ensure travel delays to the public as a result of the transport of mining modules, mine related traffic, road closures and road realignments are as low as reasonably practicable.	Review undertaken in consultation with Wudinna Council confirms all road closures are necessary for mine safety and security and that all agreed upgrades of existing roads have been completed in the required timeframe	(5) DSD considers the proposed draft measurement criteria to be an inappropriate measurement to demonstrate achievement of the proposed outcome. Assessment: The proposed measurement criteria relies on Wudinna Council for demonstration of achievement which is not appropriate. The key strategies for mitigating increased travel time relate to communications with stakeholders and allowing access to the mine site. Measurement criteria could be developed based on the auditing of the processes and procedures for mitigating increased travel time to demonstrate achievement of the outcome. DSD considers that there are methodologies that are appropriate to demonstrate achievement of the outcome. Should a lease be granted, the measurement criteria would be finalised in the PEPR submission.	None proposed	(6) Should a lease be granted, the requirement for a leading indicator criteria would be finalised in the PEPR.

DSD Assessment of Iron Road CEIP Impacts and Risks Register - December 2016

Line number	Proposed Outcome	DSD Assessment of Outcome, Strategies and Uncertainty	Recommended Regulatory Response - Outcomes and Strategies	Outcome measurement criteria	DSD Assessment of Draft Measurement Criteria	Leading indicator criteria (where required)	DSD Assessment of Leading Indicator Criteria
25	No significant public amenity impacts off the mining lease caused by, noise, dust and/or dragout associated with mine related traffic.	(2) The outcome does not appropriately state the level of impact subsequent to controls. The outcome statement requires amendment to reflect that the receptor is public safety (not public amenity). (3) The outcome is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. Assessment: Dragout can be effectively monitored and managed to mitigate public safety impacts to other road users.	(4) DSD recommends that should a lease be granted the following outcome be a requirement of Schedule 6 of the lease: The Tenement Holder must during construction and operation, ensure that no public impacts off the Land are caused by noise, dust and/or dragout associated with mine related traffic.	Weekly inspection of entry/exit points demonstrates no build-up of dragout material is occurring. Compliance with dust and noise criteria as set out for relevant outcome	(5) DSD considers the proposed draft measurement criteria to be an appropriate measurement to demonstrate achievement of the proposed outcome. Assessment: Amendments to the criteria are required to ensure that it meets the requirements of Regulation 65(2)(d) and includes all of the required elements of criteria. For example, dragout could be measured and recorded using photo points which are compared to specific control or baseline data. Should a lease be granted, the measurement criteria would be finalised in the PEPR.	None proposed	(6) Should a lease be granted, the requirement for a leading indicator criteria would be finalised in the PEPR.
26	Transport of mine modules complies with DPTI permit requirements	(2) The proposed outcome does not appropriately state the level of impact subsequent to controls. The proposed outcome statement is currently a regulatory requirement and requires amendment to reflect the appropriate level of impact on the receptor (ie: road users). (3) The outcome is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. Assessment: For construction, the control strategies to mitigate travel delays are provided on page 8-17 of the MP and are appropriate.	(4) DSD recommends that should a lease be granted the following outcome be a requirement of Schedule 6 of the lease: The Tenement Holder must during construction, operation and post-mine completion ensure travel delays to the public as a result of the transport of mining modules, mine related traffic, road closures and road realignments are as low as reasonably practicable.	Evidence that the relevant permit/approval has been obtained	(5) DSD considers the proposed draft measurement criteria to be an inappropriate measurement to demonstrate achievement of the proposed outcome. Assessment: Obtaining a permitting/approval is a requirement to authorise the activity and does not demonstrate achievement of the outcome. The key strategies for mitigating increased travel time relate to communications with stakeholders, traffic management planning, minimise transporting modules during harvest. "Monitoring of success of traffic management procedures for each movement" is also proposed in this table. Measurement criteria could be developed based on the auditing of the processes and procedures for mitigating increased travel time (including monitoring) to demonstrate achievement of the outcome. DSD considers that there are methodologies that are appropriate to demonstrate achievement of the outcome. Should a lease be granted, the measurement criteria would be finalised in the PEPR submission.	None proposed	(6) Should a lease be granted, the requirement for a leading indicator criteria would be finalised in the PEPR.
26a	No traffic accidents occur involving the public and mine traffic that could have been reasonably prevented	(2) The outcome appropriately states the level of impact subsequent to controls. The outcome statement requires minor amendment. (3) The outcome is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. Assessment: Industry standard strategies for management of traffic in and around movement of heavy vehicles are well established. Proposed strategies, including community awareness and avoidance of times of high traffic movement will contribute to achievement of the outcome.	(4) DSD recommends that should a lease be granted the following outcome be a requirement of Schedule 6 of the lease: The Tenement Holder must during construction and operation, ensure that there are no traffic accidents involving the public and mine related traffic that could have been reasonably prevented by the Tenement Holder.	Independent investigation of all traffic accidents involving the public are completed in 14 days, or as agreed with the Director of Mines (or other authorised officer), and demonstrate that the mine operator could not have reasonably prevented the accident from occurring.	(5) DSD considers the proposed draft measurement criteria to be an appropriate measurement to demonstrate achievement of the proposed outcome. Assessment: Amendments to the criteria are proposed in red. DSD considers that there are methodologies that are appropriate to demonstrate achievement of the outcome. Should a lease be granted, the measurement criteria would be finalised in the PEPR submission.	None proposed	(6) Should a lease be granted, the requirement for a leading indicator criteria would be finalised in the PEPR.
27	No traffic accidents occur involving the public and mine traffic that could have been reasonably prevented	(2) The outcome appropriately states the level of impact subsequent to controls. The outcome statement requires minor amendment. (3) The outcome is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. Assessment: Industry standard strategies for management of traffic adjacent to a mine site are well established. A key strategy proposed includes the control of contractor traffic outside of the mine site (given that the contractor camp will be located on the mine site). Management and monitoring systems for this strategy will be important to ensure that it is effective in achieving the outcome.	(4) DSD recommends that should a lease be granted the following outcome be a requirement of Schedule 6 of the lease: The Tenement Holder must during construction and operation, ensure that there are no traffic accidents involving the public and mine related traffic that could have been reasonably prevented by the Tenement Holder.	Independent investigation of all traffic accidents involving the public are completed in 14 days, or as agreed with the Director of Mines (or other authorised officer), and demonstrate that the mine operator could not have reasonably prevented the accident from occurring.	(5) DSD considers the proposed draft measurement criteria to be an appropriate measurement to demonstrate achievement of the proposed outcome. Assessment: Amendments to the criteria are proposed in red. DSD considers that there are methodologies that are appropriate to demonstrate achievement of the outcome. Should a lease be granted, the measurement criteria would be finalised in the PEPR submission.	None proposed	(6) Should a lease be granted, the requirement for a leading indicator criteria would be finalised in the PEPR.
28	All road and intersection upgrades are conducted in accordance with technical standards provided in writing by the Department for Planning Transport and Infrastructure	(2) The proposed outcome does not appropriately state the level of impact subsequent to controls. The proposed outcome statement is currently a regulatory requirement and requires amendment to reflect the appropriate level of impact on the receptor (ie: road users). (3) The outcome is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. Assessment: For construction, the control strategies to mitigate travel delays are provided on page 8-17 of the MP and are appropriate. The key strategies for mitigating increased travel time relate to communications with stakeholders, traffic management planning, minimise construction traffic and the use of large construction modules for transportation. "Monitoring of traffic movements" is also proposed in this table. Table 8-6 of the MP provides a summary of the Level of Service assessment for the construction mine phase. The results of the assessment predict that the Level of Service will not be materially impacted during construction. The majority of Level of Service ratings for specific roads remain at an 'A' Score (the best level of service).	(4) DSD recommends that should a lease be granted the following outcome be a requirement of Schedule 6 of the lease: The Tenement Holder must during construction, operation and post-mine completion ensure travel delays to the public as a result of the transport of mining modules, mine related traffic, road closures and road realignments are as low as reasonably practicable.	Audit within 3 months of completion of work confirms technical standards met	(5) DSD considers the proposed draft measurement criteria to be an inappropriate measurement to demonstrate achievement of the proposed outcome. Assessment: Auditing the completion of road upgrade works does not demonstrate achievement of the outcome as it does not provide an indication of the impact on the receptor (ie: Level of Service or Travel times). The key strategies for mitigating increased travel time relate to communications with stakeholders, traffic management planning, minimise construction traffic and the use of large construction modules for transportation. "Monitoring of traffic movements" is also proposed in this table. Measurement criteria could be developed based on the auditing of the processes and procedures for mitigating increased travel time (including monitoring) to demonstrate achievement of the outcome. DSD considers that there are methodologies that are appropriate to demonstrate achievement of the outcome. Should a lease be granted, the measurement criteria would be finalised in the PEPR submission.	None proposed	(6) Should a lease be granted, the requirement for a leading indicator criteria would be finalised in the PEPR.
29	All road and intersection upgrades are conducted in accordance with technical standards provided in writing by the Department for Planning Transport and Infrastructure	(2) The proposed outcome does not appropriately state the level of impact subsequent to controls. The proposed outcome statement is currently a regulatory requirement and requires amendment to reflect the appropriate level of impact on the receptor (ie: road users). (3) The outcome is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. Assessment: For operation (including closure), the control strategies to mitigate travel delays are provided on page 8-17 of the MP and are appropriate. The key strategies for mitigating increased travel time relate to communications with stakeholders, traffic management planning, minimise operational traffic through use of buses, and mine workforce remaining within mining lease. "Monitoring of traffic movements" is also proposed in this table. Table 8-9 of the MP provides a summary of the Level of Service assessment for the operation mine phase. The results of the assessment predict that the Level of Service will not be materially impacted during operations. The majority of Level of Service ratings for specific roads remain at an 'A' Score (the best level of service).	(4) DSD recommends that should a lease be granted the following outcome be a requirement of Schedule 6 of the lease: The Tenement Holder must during construction, operation and post-mine completion ensure travel delays to the public as a result of the transport of mining modules, mine related traffic, road closures and road realignments are as low as reasonably practicable.	Audit within 3 months of completion of work confirms technical standards met	(5) DSD considers the proposed draft measurement criteria to be an inappropriate measurement to demonstrate achievement of the proposed outcome. Assessment: Auditing the completion of road upgrade works does not demonstrate achievement of the outcome as it does not provide an indication of the impact on the receptor (ie: Level of Service or Travel times). The key strategies for mitigating increased travel time relate to communications with stakeholders, traffic management planning, minimise operational traffic through use of buses, and mine workforce remaining within mining lease. "Monitoring of traffic movements" is also proposed in this table. Measurement criteria could be developed based on the auditing of the processes and procedures for mitigating increased travel time (including monitoring) to demonstrate achievement of the outcome. DSD considers that there are methodologies that are appropriate to demonstrate achievement of the outcome. Should a lease be granted, the measurement criteria would be finalised in the PEPR submission.	None proposed	(6) Should a lease be granted, the requirement for a leading indicator criteria would be finalised in the PEPR.
30	All road and intersection upgrades are conducted in accordance with technical standards provided in writing by the Department for Planning Transport and Infrastructure	(2) The proposed outcome does not appropriately state the level of impact subsequent to controls. The proposed outcome statement is currently a regulatory requirement and requires amendment to reflect the appropriate level of impact on the receptor (ie: road users). (3) The outcome is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. Assessment: Proposed outcome refers to achieving the technical standards specified by DPTI for road and intersection upgrades. Construction of intersections and roads to technical standards do not reflect the level of impact that the mine is expected to have on travel times for local school children who use the school bus. For operation (including closure), the control strategies to mitigate travel delays are provided on page 8-17 of the MP and are appropriate. The key strategies for mitigating increased travel time relate to: mine traffic being timed to avoid school buses, communications with stakeholders (councils and schools), traffic management planning, minimise operational traffic through use of buses, and mine workforce remaining within mining lease. "Monitoring of traffic movements" is also proposed in this table. Table 8-9 of the MP provides a summary of the Level of Service assessment for the operation mine phase. The results of the assessment predict that the Level of Service will not be materially impacted during operations. The majority of Level of Service ratings for specific roads remain at an 'A' Score (the best level of service).	(4) DSD recommends that should a lease be granted the following outcome be a requirement of Schedule 6 of the lease: The Tenement Holder must during construction, operation and post-mine completion ensure travel delays to the public as a result of the transport of mining modules, mine related traffic, road closures and road realignments are as low as reasonably practicable.	Audit within 3 months of completion of work confirms technical standards met	(5) DSD considers the proposed draft measurement criteria to be an inappropriate measurement to demonstrate achievement of the proposed outcome. Assessment: Auditing the completion of road upgrade works does not demonstrate achievement of the outcome as it does not provide an indication of the impact on the receptor (ie: Level of Service or Travel times). The key strategies for mitigating increased travel time relate to: mine traffic being timed to avoid school buses, communications with stakeholders (councils and schools), traffic management planning, minimise operational traffic through use of buses, and mine workforce remaining within mining lease. "Monitoring of traffic movements" is also proposed in this table. Measurement criteria could be developed based on the auditing of the processes and procedures for mitigating increased travel time (including monitoring) to demonstrate achievement of the outcome. DSD considers that there are methodologies that are appropriate to demonstrate achievement of the outcome. Should a lease be granted, the measurement criteria would be finalised in the PEPR submission.	None proposed	(6) Should a lease be granted, the requirement for a leading indicator criteria would be finalised in the PEPR.
31	The Tenement Holder must, in construction and operation, ensure there is no disturbance to Aboriginal heritage sites, objects or remains unless prior approval under the relevant legislation is obtained	(2) The outcome appropriately states the level of impact subsequent to controls. (3) The outcome is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. Assessment: Strategies for the identification and management of Aboriginal heritage sites, objects and remains are well established. The proposed control strategies include: Heritage surveys prior to ground disturbance, flagging any identified no-go zone areas with traditional owners, all contractors to undergo site induction, including cross-cultural awareness training.	(4) DSD recommends that should a lease be granted the following outcome be a requirement of Schedule 6 of the lease: The Tenement Holder must during construction and operation, ensure that there is no disturbance to Aboriginal heritage sites, objects or remains unless prior approval under the relevant legislation is obtained.	Evidence that: - appropriate authorisation has been obtained under the relevant legislation prior to the commencement of any activities that will disturb known Aboriginal objects and sites - if new Aboriginal objects or sites are discovered, work that may affect the objects or sites ceased until appropriate authorisation was provided.	(5) DSD considers the proposed draft measurement criteria to be an appropriate measurement to demonstrate achievement of the proposed outcome. Assessment: Amendments to the criteria are required to ensure that it meets the requirements of Regulation 65(2)(d) and includes all of the required elements of criteria. For example, more detail is required in regards to what form the 'evidence' will take, ie: will the evidence be recorded in a mine logbook or investigation/incident report. DSD considers that there are methodologies that are appropriate to demonstrate achievement of the outcome. Should a lease be granted, the measurement criteria would be finalised in the PEPR submission.	None proposed	(6) Should a lease be granted, the requirement for a leading indicator criteria would be finalised in the PEPR.
32	NA	No Outcome required.	No Outcome required.	NA	No Outcome required.	NA	No Outcome required.
33	NA	No Outcome required.	No Outcome required.	NA	No Outcome required.	NA	No Outcome required.
34	No loss of abundance or diversity of native vegetation on or off the lease during construction, operation and post mine completion through; • clearance, • dust/contaminant deposition, • fire, • reduction in water supply • salinisation, or • other damage, unless prior approval under the relevant legislation is obtained.	(2) The outcome appropriately states the level of impact subsequent to controls. (3) The outcome is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. Assessment: Standard industry strategies to ensure all clearance of native vegetation is authorised are well established. Assumptions are appropriate and uncertainty is low due to on ground survey of vegetation and fauna. Significant Environmental Benefit (Native Vegetation Act 1991) offset is intended to ensure no net loss of habitat (native vegetation) and enhance (benefit) biodiversity within the NRM region.	(4) DSD recommends that should a lease be granted the following outcome be a requirement of Schedule 6 of the lease: [Note: this outcome should be summarised under the native vegetation aspect and not the Fauna aspect] The Tenement Holder must during construction, operation and post-mine completion, ensure no loss of abundance or diversity of native vegetation on or off the Land through; • clearance, • dust/contaminant deposition, • fire, • reduction in water supply • salinisation, or • other damage, unless a significant environmental benefit has been approved in accordance with the relevant legislation.	Vegetation audit demonstrates the total area cleared or damaged does not exceed the approved clearance area in the SEB plan. Compliance with SEB plan.	(5) DSD considers the proposed draft measurement criteria to be an appropriate measurement to demonstrate achievement of the proposed outcome. Assessment: The draft criteria appropriately measures vegetation clearance and audits this against approved clearance (PEPR/native vegetation management plan) to demonstrate achievement of the outcome. Amendments to the criteria are required to ensure that it meets the requirements of Regulation 65(2)(d) and includes all of the required elements of criteria. DSD considers that there are methodologies that are appropriate to demonstrate achievement of the outcome. Should a lease be granted, the measurement criteria would be finalised in the PEPR submission.	None proposed	(6) Should a lease be granted, the requirement for a leading indicator criteria would be finalised in the PEPR.

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35	No loss of abundance or diversity of native vegetation on or off the lease during construction, operation and post mine completion through; • clearance, • dust/contaminant deposition, • fire, • reduction in water supply • salinisation, or • other damage, unless prior approval under the relevant legislation is obtained.	(2) The outcome appropriately states the level of impact subsequent to controls. (3) The outcome is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. Assessment: Standard industry strategies to ensure all clearance of native vegetation is authorised are well established. Assumptions are appropriate and uncertainty is low due to on ground survey of vegetation and fauna. Significant Environmental Benefit (Native Vegetation Act 1991) offset is intended to ensure no net loss of habitat (native vegetation) and enhance (benefit) biodiversity within the NRM region.	(4) DSD recommends that should a lease be granted the following outcome be a requirement of Schedule 6 of the lease: [Note: this outcome should be summarised under the native vegetation aspect and not the Fauna aspect] The Tenement Holder must during construction, operation and post-mine completion, ensure no loss of abundance or diversity of native vegetation on or off the Land through; • clearance, • dust/contaminant deposition, • fire, • reduction in water supply • salinisation, or • other damage, unless a significant environmental benefit has been approved in accordance with the relevant legislation.	Vegetation audit demonstrates the total area cleared or damaged does not exceed the approved clearance area in the SEB plan. Compliance with SEB plan.	(5) DSD considers the proposed draft measurement criteria to be an appropriate measurement to demonstrate achievement of the proposed outcome. Assessment: The draft criteria appropriately measures vegetation clearance and audits this against approved clearance (PEPR/native vegetation management plan) to demonstrate achievement of the outcome. Amendments to the criteria are required to ensure that it meets the requirements of Regulation 65(2)(d) and includes all of the required elements of criteria. DSD considers that there are methodologies that are appropriate to demonstrate achievement of the outcome. Should a lease be granted, the measurement criteria would be finalised in the PEPR submission.	None proposed	(6) Should a lease be granted, the requirement for a leading indicator criteria would be finalised in the PEPR.
36	No native fauna injuries or deaths that could reasonably have been prevented, due to construction, operation and closure activities	(2) The outcome appropriately states the level of impact subsequent to controls. (3) The outcome is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. Assessment: For construction and operation, the control strategies to mitigate fauna injuries and deaths are provided on page 11-26 of the MP and are appropriate. "Pre-clearance relocation of fauna where practicable" is also proposed in this table and is appropriate.	(4) DSD recommends that should a lease be granted the following outcome be a requirement of Schedule 6 of the lease: The Tenement Holder must during construction, operation and post-mine completion, ensure that there are no native fauna injuries or deaths due to mining operations that could reasonably have been prevented.	Investigations of all native fauna deaths or injuries recorded as a result of mine related activities ~~on the lease~~ demonstrate that the mine operator did not cause, or could not have reasonably prevented, the deaths or injuries occurring.	(5) DSD considers the proposed draft measurement criteria to be an appropriate measurement to demonstrate achievement of the proposed outcome. Assessment: Amendments to the criteria are proposed in red. Amendments to the criteria are required to ensure that it meets the requirements of Regulation 65(2)(d) and includes all of the required elements of criteria. DSD considers that there are methodologies that are appropriate to demonstrate achievement of the outcome. Should a lease be granted, the measurement criteria would be finalised in the PEPR submission.	None proposed	(6) Should a lease be granted, the requirement for a leading indicator criteria would be finalised in the PEPR.
37	Post mine completion, the risks to fauna from access to the open pit are as low as reasonably practicable.	(2) DSD assesses that the outcome proposed is in error as it relates to post-mine completion. DSD assumes that the outcome for the previous impact event was intended for this impact event. This outcome appropriately states the level of impact subsequent to controls. (3) The outcome is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. Assessment: For construction and operation, the control strategies to mitigate fauna injuries and deaths are provided on page 11-26 of the MP and are appropriate. "Pre-clearance relocation of fauna where practicable" is also proposed in this table and is appropriate.	(4) DSD recommends that should a lease be granted the following outcome be a requirement of Schedule 6 of the lease: The Tenement Holder must during construction, operation and post-mine completion, ensure that there are no native fauna injuries or deaths due to mining operations that could reasonably have been prevented.	Investigations of all native fauna deaths or injuries recorded as a result of mine related activities ~~on the lease~~ demonstrate that the mine operator did not cause, or could not have reasonably prevented, the deaths or injuries occurring.	(5) DSD considers the proposed draft measurement criteria to be an appropriate measurement to demonstrate achievement of the proposed outcome. Assessment: Amendments to the criteria are proposed in red. Amendments to the criteria are required to ensure that it meets the requirements of Regulation 65(2)(d) and includes all of the required elements of criteria. DSD considers that there are methodologies that are appropriate to demonstrate achievement of the outcome. Should a lease be granted, the measurement criteria would be finalised in the PEPR submission.	None proposed	(6) Should a lease be granted, the requirement for a leading indicator criteria would be finalised in the PEPR.
38	No native fauna injuries or deaths that could reasonably have been prevented, due to construction, operation and closure activities	(2) The outcome appropriately states the level of impact subsequent to controls. (3) The outcome is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. Assessment: For construction and operation (including closure), the control strategies to mitigate fauna injuries and deaths are provided on page 11-26 of the MP and are appropriate. "Driving with due care, speed limit reduced within the mining lease" is also proposed in this table and is appropriate.	(4) DSD recommends that should a lease be granted the following outcome be a requirement of Schedule 6 of the lease: The Tenement Holder must during construction, operation and post-mine completion, ensure that there are no native fauna injuries or deaths due to mining operations that could reasonably have been prevented.	Investigations of all native fauna deaths or injuries recorded as a result of mine related activities ~~on the lease~~ demonstrate that the mine operator did not cause, or could not have reasonably prevented, the deaths or injuries occurring.	(5) DSD considers the proposed draft measurement criteria to be an appropriate measurement to demonstrate achievement of the proposed outcome. Assessment: Amendments to the criteria are proposed in red. Amendments to the criteria are required to ensure that it meets the requirements of Regulation 65(2)(d) and includes all of the required elements of criteria. "Monitoring of vehicle strikes and further remedial actions if required" is also proposed as a strategy in this table and could be incorporated into the criteria. DSD considers that there are methodologies that are appropriate to demonstrate achievement of the outcome. Should a lease be granted, the measurement criteria would be finalised in the PEPR submission.	None proposed	(6) Should a lease be granted, the requirement for a leading indicator criteria would be finalised in the PEPR.
39	No native fauna injuries or deaths that could reasonably have been prevented, due to construction, operation and closure activities	(2) The outcome appropriately states the level of impact subsequent to controls. (3) The outcome is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. Assessment: For construction and operation (including closure), the control strategies to mitigate fauna injuries and deaths are provided on page 11-26 of the MP and are appropriate. "Driving with due care, speed limit reduced within the mining lease" is also proposed in this table and is appropriate.	(4) DSD recommends that should a lease be granted the following outcome be a requirement of Schedule 6 of the lease: The Tenement Holder must during construction, operation and post-mine completion, ensure that there are no native fauna injuries or deaths due to mining operations that could reasonably have been prevented.	Investigations of all native fauna deaths or injuries recorded as a result of mine related activities ~~on the lease~~ demonstrate that the mine operator did not cause, or could not have reasonably prevented, the deaths or injuries occurring.	(5) DSD considers the proposed draft measurement criteria to be an appropriate measurement to demonstrate achievement of the proposed outcome. Assessment: Amendments to the criteria are proposed in red. Amendments to the criteria are required to ensure that it meets the requirements of Regulation 65(2)(d) and includes all of the required elements of criteria. "Monitoring of vehicle strikes and further remedial actions if required" is also proposed as a strategy in this table and could be incorporated into the criteria. DSD considers that there are methodologies that are appropriate to demonstrate achievement of the outcome. Should a lease be granted, the measurement criteria would be finalised in the PEPR submission.	None proposed	(6) Should a lease be granted, the requirement for a leading indicator criteria would be finalised in the PEPR.
40	No introduction of new species of weeds or pests (including feral animals), or sustained increase in abundance of existing weed or pest species on the mining lease	(2) The outcome appropriately states the level of impact subsequent to controls. (3) The outcome is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. Assessment: For construction and operation, the control and management strategies for pest fauna are provided on page 11-27 of the MP and are appropriate.	(4) DSD recommends that should a lease be granted the following outcome be a requirement of Schedule 6 of the lease: The Tenement Holder must during construction, operation and post-mine completion, ensure no introduction of new species of weeds, plant pathogens or pests (including feral animals), nor sustained increase in abundance of existing weed or pest species in the Land.	Survey demonstrates: - no new weeds or feral animals have become established on the lease - there has not been a statistically significant increase in abundance of existing weed or pest species in the lease area, compared to baseline studies and accounting for seasonal variation (regional trends) and pit/IWL areas.	(5) DSD considers the proposed draft measurement criteria to be an appropriate measurement to demonstrate achievement of the proposed outcome. Assessment: Measurement criterion measures the status of the source and not the impact on the receptor. In this case, measurement of change at the source is appropriate as the relationship between weeds or pest species and native species or native fauna is commonly accepted. Amendments to the criteria are required to ensure that it meets the requirements of Regulation 65(2)(d) and includes all of the required elements of criteria. For example, the frequency of the survey will need to be specified. DSD considers that there are methodologies that are appropriate to demonstrate achievement of the outcome. Should a lease be granted, the measurement criteria would be finalised in the PEPR submission.	None proposed	(6) Should a lease be granted, the requirement for a leading indicator criteria would be finalised in the PEPR.
41	No introduction of new species of weeds or pests (including feral animals), or sustained increase in abundance of existing weed or pest species on the mining lease	(2) The outcome appropriately states the level of impact subsequent to controls. (3) The outcome is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. Assessment: For construction and operation, the control and management strategies for pest fauna are provided on page 11-27 of the MP and are appropriate.	(4) DSD recommends that should a lease be granted the following outcome be a requirement of Schedule 6 of the lease: The Tenement Holder must during construction, operation and post-mine completion, ensure no introduction of new species of weeds, plant pathogens or pests (including feral animals), nor sustained increase in abundance of existing weed or pest species in the Land.	Survey demonstrates: - no new weeds or feral animals have become established on the lease - there has not been a statistically significant increase in abundance of existing weed or pest species in the lease area, compared to baseline studies and accounting for seasonal variation (regional trends) and pit/IWL areas.	(5) DSD considers the proposed draft measurement criteria to be an appropriate measurement to demonstrate achievement of the proposed outcome. Assessment: Measurement criterion measures the status of the source and not the impact on the receptor. In this case, measurement of change at the source is appropriate as the relationship between weeds or pest species and native species or native fauna or agriculture is commonly accepted. Amendments to the criteria are required to ensure that it meets the requirements of Regulation 65(2)(d) and includes all of the required elements of criteria. For example, the frequency of the survey will need to be specified. DSD considers that there are methodologies that are appropriate to demonstrate achievement of the outcome. Should a lease be granted, the measurement criteria would be finalised in the PEPR submission.	None proposed	(6) Should a lease be granted, the requirement for a leading indicator criteria would be finalised in the PEPR.
42	No native fauna injuries or deaths that could reasonably have been prevented, due to construction, operation and closure activities	(2) The outcome appropriately states the level of impact subsequent to controls. (3) The outcome is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. Assessment: For construction and operation, the control strategies to mitigate fauna injuries and deaths are provided on page 11-26 and 11-27 of the MP and are appropriate.	(4) DSD recommends that should a lease be granted the following outcome be a requirement of Schedule 6 of the lease: The Tenement Holder must during construction, operation and post-mine completion, ensure that there are no native fauna injuries or deaths due to mining operations that could reasonably have been prevented.	Investigations of all native fauna deaths or injuries recorded as a result of mine related activities ~~on the lease~~ demonstrate that the mine operator did not cause, or could not have reasonably prevented, the deaths or injuries occurring.	(5) DSD considers the proposed draft measurement criteria to be an appropriate measurement to demonstrate achievement of the proposed outcome. Assessment: Amendments to the criteria are proposed in red. Amendments to the criteria are required to ensure that it meets the requirements of Regulation 65(2)(d) and includes all of the required elements of criteria. DSD considers that there are methodologies that are appropriate to demonstrate achievement of the outcome. Should a lease be granted, the measurement criteria would be finalised in the PEPR submission.	None proposed	(6) Should a lease be granted, the requirement for a leading indicator criteria would be finalised in the PEPR.
43	No introduction of new species of weeds or pests (including feral animals), or sustained increase in abundance of existing weed or pest species on the mining lease	(2) The outcome appropriately states the level of impact subsequent to controls. (3) The outcome is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. Assessment: For construction and operation, the control and management strategies for pest fauna are provided on page 11-27 of the MP and are appropriate.	(4) DSD recommends that should a lease be granted the following outcome be a requirement of Schedule 6 of the lease: The Tenement Holder must during construction, operation and post-mine completion, ensure no introduction of new species of weeds, plant pathogens or pests (including feral animals), nor sustained increase in abundance of existing weed or pest species in the Land.	Survey demonstrates: - no new weeds or feral animals have become established on the lease - there has not been a statistically significant increase in abundance of existing weed or pest species in the lease area, compared to baseline studies and accounting for seasonal variation (regional trends) and pit/IWL areas.	(5) DSD considers the proposed draft measurement criteria to be an appropriate measurement to demonstrate achievement of the proposed outcome. Assessment: Measurement criterion measures the status of the source and not the impact on the receptor. In this case, measurement of change at the source is appropriate as the relationship between weeds or pest species and native species or native fauna or agriculture is commonly accepted. Amendments to the criteria are required to ensure that it meets the requirements of Regulation 65(2)(d) and includes all of the required elements of criteria. For example, the frequency of the survey will need to be specified. DSD considers that there are methodologies that are appropriate to demonstrate achievement of the outcome. Should a lease be granted, the measurement criteria would be finalised in the PEPR submission.	None proposed	(6) Should a lease be granted, the requirement for a leading indicator criteria would be finalised in the PEPR.
44	No native fauna injuries or deaths that could reasonably have been prevented, due to construction, operation and closure activities	(2) The outcome appropriately states the level of impact subsequent to controls. (3) The outcome is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. Assessment: For construction and operation, the control strategies to mitigate fauna injuries and deaths are provided on page 11-26 and 11-27 of the MP and are appropriate.	(4) DSD recommends that should a lease be granted the following outcome be a requirement of Schedule 6 of the lease: The Tenement Holder must during construction, operation and post-mine completion, ensure that there are no native fauna injuries or deaths due to mining operations that could reasonably have been prevented.	Investigations of all native fauna deaths or injuries recorded as a result of mine related activities ~~on the lease~~ demonstrate that the mine operator did not cause, or could not have reasonably prevented, the deaths or injuries occurring.	(5) DSD considers the proposed draft measurement criteria to be an appropriate measurement to demonstrate achievement of the proposed outcome. Assessment: Amendments to the criteria are proposed in red. Amendments to the criteria are required to ensure that it meets the requirements of Regulation 65(2)(d) and includes all of the required elements of criteria. DSD considers that there are methodologies that are appropriate to demonstrate achievement of the outcome. Should a lease be granted, the measurement criteria would be finalised in the PEPR submission.	None proposed	(6) Should a lease be granted, the requirement for a leading indicator criteria would be finalised in the PEPR.
45	No native fauna injuries or deaths that could reasonably have been prevented, due to construction, operation and closure activities	(2) The outcome appropriately states the level of impact subsequent to controls. (3) The outcome is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. Assessment: For construction and operation, the control strategies to mitigate fauna injuries and deaths are provided on page 11-26 and 11-27 of the MP and are appropriate.	(4) DSD recommends that should a lease be granted the following outcome be a requirement of Schedule 6 of the lease: The Tenement Holder must during construction, operation and post-mine completion, ensure that there are no native fauna injuries or deaths due to mining operations that could reasonably have been prevented.	Investigations of all native fauna deaths or injuries recorded as a result of mine related activities ~~on the lease~~ demonstrate that the mine operator did not cause, or could not have reasonably prevented, the deaths or injuries occurring.	(5) DSD considers the proposed draft measurement criteria to be an appropriate measurement to demonstrate achievement of the proposed outcome. Assessment: Amendments to the criteria are proposed in red. Amendments to the criteria are required to ensure that it meets the requirements of Regulation 65(2)(d) and includes all of the required elements of criteria. DSD considers that there are methodologies that are appropriate to demonstrate achievement of the outcome. Should a lease be granted, the measurement criteria would be finalised in the PEPR submission.	None proposed	(6) Should a lease be granted, the requirement for a leading indicator criteria would be finalised in the PEPR.
46	No native fauna injuries or deaths that could reasonably have been prevented, due to construction, operation and closure activities	(2) The outcome appropriately states the level of impact subsequent to controls. (3) The outcome is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. Assessment: For construction and operation, the control strategies to mitigate fauna injuries and deaths are provided on page 11-26 and 11-27 of the MP and are appropriate.	(4) DSD recommends that should a lease be granted the following outcome be a requirement of Schedule 6 of the lease: The Tenement Holder must during construction, operation and post-mine completion, ensure that there are no native fauna injuries or deaths due to mining operations that could reasonably have been prevented.	Investigations of all native fauna deaths or injuries recorded as a result of mine related activities ~~on the lease~~ demonstrate that the mine operator did not cause, or could not have reasonably prevented, the deaths or injuries occurring.	(5) DSD considers the proposed draft measurement criteria to be an appropriate measurement to demonstrate achievement of the proposed outcome. Assessment: Amendments to the criteria are proposed in red. Amendments to the criteria are required to ensure that it meets the requirements of Regulation 65(2)(d) and includes all of the required elements of criteria. DSD considers that there are methodologies that are appropriate to demonstrate achievement of the outcome. Should a lease be granted, the measurement criteria would be finalised in the PEPR submission.	None proposed	(6) Should a lease be granted, the requirement for a leading indicator criteria would be finalised in the PEPR.
47	NA	No Outcome required.	No Outcome required.	NA	No Outcome required.	NA	No Outcome required.

DSD Assessment of Iron Road CEIP Impacts and Risks Register - December 2016

Line number	Proposed Outcome	DSD Assessment of Outcome, Strategies and Uncertainty	Recommended Regulatory Response - Outcomes and Strategies	Outcome measurement criteria	DSD Assessment of Draft Measurement Criteria	Leading indicator criteria (where required)	DSD Assessment of Leading Indicator Criteria
48	**NA - Benefit**	No Outcome required.	No Outcome required.		No Outcome required.		No Outcome required.
49	**NA - Benefit**	No Outcome required.	No Outcome required.		No Outcome required.		No Outcome required.
50	**NA - Benefit**	No Outcome required.	No Outcome required.		No Outcome required.		No Outcome required.
52	Post mine completion, the risks to fauna from access to the open pit are as low as reasonably practicable.	(2) The outcome appropriately states the level of impact subsequent to controls. (3) The outcome is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. Assessment: For post-mine completion, the control strategies to mitigate fauna injuries and deaths are provided on page 11-26 and 11-27 of the MP. A fence is proposed to prevent access to the open pit and pit lake post mine completion. The longevity of a fence as a control strategy to prevent public/fauna access will require ongoing maintenance and an appropriate transfer of maintenance/liability post-mine completion. "Barriers surrounding open pit and QA/QC of pit design and assessment of final stability" are proposed control strategies referenced in this table. An earthen bund/barrier to prevent fauna from falling into the pit or pit lake is appropriate, but not considered effective for all types of fauna. The control and management strategies proposed for the protection of public safety post-mine completion will also ensure the protection of fauna (see Impact Event PIM_07_02). For example, passive engineering designs which do not require ongoing maintenance are more effective in the long term, ie:, the proposal to ensure benches are constructed in the pit wall to prevent falls for the public and fauna, and other designs to enable safe egress from the pit lake.	(4) DSD recommends that should a lease be granted the following outcome be a requirement of Schedule 6 of the lease: The Tenement Holder must during construction, operation and post-mine completion, ensure that there are no native fauna injuries or deaths due to mining operations that could reasonably have been prevented.	Independent audit of the physical stability of the pit and physical barrier (eg: bunding) and other control strategies (eg: benching in the pit, pit lake egress design), post closure, demonstrates risks to fauna are as low as reasonably practicable.	(5) DSD considers the proposed draft measurement criteria to be an appropriate measurement to demonstrate achievement of the proposed outcome. Assessment: Amendments to the criteria are proposed in red. Should a lease be granted, the measurement criteria would be finalised in the PEPR submission.	None proposed	(6) Should a lease be granted, the requirement for a leading indicator criteria would be finalised in the PEPR.
53	NA			NA		NA	
54	No native fauna injuries or deaths that could reasonably have been prevented, due to construction, operation and closure activities	(2) The outcome appropriately states the level of impact subsequent to controls. (3) The outcome is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. Assessment: For construction and operation, the control strategies to mitigate fauna injuries and deaths are provided on page 11-26 and 11-27 of the MP and are appropriate. The control and management strategies that have been proposed to protect public safety in regards to fires caused by mining operations are also appropriate for the protection of fauna.	(4) DSD recommends that should a lease be granted the following outcome be a requirement of Schedule 6 of the lease: The Tenement Holder must during construction, operation and post-mine completion, ensure that there are no native fauna injuries or deaths due to mining operations that could reasonably have been prevented.	Investigations of all native fauna deaths or injuries recorded as a result of mine related activities ~~on the lease~~ demonstrate that the mine operator did not cause, or could not have reasonably prevented, the deaths or injuries occurring.	(5) DSD considers the proposed draft measurement criteria to be an appropriate measurement to demonstrate achievement of the proposed outcome. Assessment: Amendments to the criteria are proposed in red. Amendments to the criteria are required to ensure that it meets the requirements of Regulation 65(2)(d) and includes all of the required elements of criteria. DSD considers that there are methodologies that are appropriate to demonstrate achievement of the outcome. Should a lease be granted, the measurement criteria would be finalised in the PEPR submission.	None proposed	(6) Should a lease be granted, the requirement for a leading indicator criteria would be finalised in the PEPR.
55	No introduction of new species of weeds or pests (including feral animals), or sustained increase in abundance of existing weed or pest species on the mining lease	(2) The outcome appropriately states the level of impact subsequent to controls. (3) The outcome is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. For construction and operation (including closure), the control and management strategies for vegetation and weeds are provided on page 12-36, 12-37 and 12-38 of the MP and are appropriate.	(4) DSD recommends that should a lease be granted the following outcome be a requirement of Schedule 6 of the lease: The Tenement Holder must during construction, operation and post-mine completion, ensure no introduction of new species of weeds, plant pathogens or pests (including feral animals), nor sustained increase in abundance of existing weed or pest species in the Land.	Survey demonstrates: - no new weeds or feral animals have become established on the lease - there has not been a statistically significant increase in abundance of existing weed or pest species in the lease area, compared to baseline studies and accounting for seasonal variation (regional trends) and pit/IWL areas.	(5) DSD considers the proposed draft measurement criteria to be an appropriate measurement to demonstrate achievement of the proposed outcome. Assessment: Measurement criterion measures the status of the source and not the impact on the receptor. In this case, measurement of change at the source is appropriate as the relationship between weeds or pest species and native species or native fauna or agriculture is commonly accepted. Amendments to the criteria are required to ensure that it meets the requirements of Regulation 65(2)(d) and includes all of the required elements of criteria. For example, the frequency of the survey will need to be specified. DSD considers that there are methodologies that are appropriate to demonstrate achievement of the outcome. Should a lease be granted, the measurement criteria would be finalised in the PEPR submission.	None proposed	(6) Should a lease be granted, the requirement for a leading indicator criteria would be finalised in the PEPR.
56	No loss of abundance or diversity of native vegetation on or off the lease during construction, operation and post mine completion through; • clearance, • dust/contaminant deposition, • fire, • reduction in water supply • salinisation, or • other damage, unless prior approval under the relevant legislation is obtained.	(2) The outcome appropriately states the level of impact subsequent to controls. (3) The outcome is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. Assessment: For construction, the control and management strategies for vegetation and weeds are provided on page 12-36, 12-37 and 12-38 of the MP and are appropriate. Standard industry strategies to ensure all clearance of native vegetation is authorised are well established. Assumptions are appropriate and uncertainty is low due to on ground survey of vegetation. Significant Environmental Benefit (Native Vegetation Act 1991) offset is intended to ensure no net loss of habitat (native vegetation) and enhance (benefit) biodiversity within the NRM region. A Vegetation Heritage Agreement (HA 869) exists within the proposed mining lease (see MP page 21-7). Vegetation within the area of HA 869 is proposed to be cleared (see MP page 12-41). Iron Road state the following: "The HA 869 is binding on all current and future owners of the land; however, the Minister for Sustainability, Environment and Conservation may terminate HA 869 by agreement with the owner of the land and with consent from the Native Vegetation Council". The clearance of native vegetation can only be authorised through the relevant legislation and the provision of a significant environmental benefit.	(4) DSD recommends that should a lease be granted the following outcome be a requirement of Schedule 6 of the lease: The Tenement Holder must during construction, operation and post-mine completion, ensure no loss of abundance or diversity of native vegetation on or off the Land through; • clearance, • dust/contaminant deposition, • fire, • reduction in water supply • salinisation, or • other damage, unless a significant environmental benefit has been approved in accordance with the relevant legislation.	Vegetation audit (on and off lease, as required) on areas potentially affected by current mining activities demonstrates the total area cleared or damaged does not exceed the approved clearance area in the SEB plan. Compliance with SEB plan.	(5) DSD considers the proposed draft measurement criteria to be an appropriate measurement to demonstrate achievement of the proposed outcome. Assessment: The draft criteria appropriately measures vegetation clearance and audits this against approved clearance (PEPR/native vegetation management plan) to demonstrate achievement of the outcome. Amendments to the criteria are required to ensure that it meets the requirements of Regulation 65(2)(d) and includes all of the required elements of criteria. DSD considers that there are methodologies that are appropriate to demonstrate achievement of the outcome. Should a lease be granted, the measurement criteria would be finalised in the PEPR submission.	None proposed	(6) Should a lease be granted, the requirement for a leading indicator criteria would be finalised in the PEPR.
57	No loss of abundance or diversity of native vegetation on or off the lease during construction, operation and post mine completion through; • clearance, • dust/contaminant deposition, • fire, • reduction in water supply • salinisation, or • other damage, unless prior approval under the relevant legislation is obtained.	(2) The outcome appropriately states the level of impact subsequent to controls. (3) The outcome is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. Assessment: For construction, the control and management strategies for vegetation and weeds are provided on page 12-36, 12-37 and 12-38 of the MP and are appropriate. Standard industry strategies to ensure all clearance of native vegetation is authorised are well established. Assumptions are appropriate and uncertainty is low due to on ground survey of vegetation. Significant Environmental Benefit (Native Vegetation Act 1991) offset is intended to ensure no net loss of habitat (native vegetation) and enhance (benefit) biodiversity within the NRM region. A Vegetation Heritage Agreement (HA 869) exists within the proposed mining lease (see MP page 21-7). Vegetation within the area of HA 869 is proposed to be cleared (see MP page 12-41). Iron Road state the following: "The HA 869 is binding on all current and future owners of the land; however, the Minister for Sustainability, Environment and Conservation may terminate HA 869 by agreement with the owner of the land and with consent from the Native Vegetation Council". The clearance of native vegetation can only be authorised through the relevant legislation and the provision of a significant environmental benefit.	(4) DSD recommends that should a lease be granted the following outcome be a requirement of Schedule 6 of the lease: The Tenement Holder must during construction, operation and post-mine completion, ensure no loss of abundance or diversity of native vegetation on or off the Land through; • clearance, • dust/contaminant deposition, • fire, • reduction in water supply • salinisation, or • other damage, unless a significant environmental benefit has been approved in accordance with the relevant legislation.	Vegetation audit (on and off lease, as required) on areas potentially affected by current mining activities demonstrates the total area cleared or damaged does not exceed the approved clearance area in the SEB plan. Compliance with SEB plan.	(5) DSD considers the proposed draft measurement criteria to be an appropriate measurement to demonstrate achievement of the proposed outcome. Assessment: The draft criteria appropriately measures vegetation clearance and audits this against approved clearance (PEPR/native vegetation management plan) to demonstrate achievement of the outcome. Amendments to the criteria are required to ensure that it meets the requirements of Regulation 65(2)(d) and includes all of the required elements of criteria. DSD considers that there are methodologies that are appropriate to demonstrate achievement of the outcome. Should a lease be granted, the measurement criteria would be finalised in the PEPR submission.	None proposed	(6) Should a lease be granted, the requirement for a leading indicator criteria would be finalised in the PEPR.
58	No introduction of new species of weeds or pests (including feral animals), or sustained increase in abundance of existing weed or pest species on the mining lease	(2) The outcome appropriately states the level of impact subsequent to controls. (3) The outcome is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. For construction and operation (including closure), the control and management strategies for vegetation and weeds are provided on page 12-36, 12-37 and 12-38 of the MP and are appropriate.	(4) DSD recommends that should a lease be granted the following outcome be a requirement of Schedule 6 of the lease: The Tenement Holder must during construction, operation and post-mine completion, ensure no introduction of new species of weeds, plant pathogens or pests (including feral animals), nor sustained increase in abundance of existing weed or pest species in the Land.	Survey demonstrates: - no new weeds or feral animals have become established on the lease - there has not been a statistically significant increase in abundance of existing weed or pest species in the lease area, compared to baseline studies and accounting for seasonal variation (regional trends) and pit/IWL areas.	(5) DSD considers the proposed draft measurement criteria to be an appropriate measurement to demonstrate achievement of the proposed outcome. Assessment: Measurement criterion measures the status of the source and not the impact on the receptor. In this case, measurement of change at the source is appropriate as the relationship between weeds or pest species and native species or native fauna or agriculture is commonly accepted. Amendments to the criteria are required to ensure that it meets the requirements of Regulation 65(2)(d) and includes all of the required elements of criteria. For example, the frequency of the survey will need to be specified. DSD considers that there are methodologies that are appropriate to demonstrate achievement of the outcome. Should a lease be granted, the measurement criteria would be finalised in the PEPR submission.	None proposed	(6) Should a lease be granted, the requirement for a leading indicator criteria would be finalised in the PEPR.
59	No introduction of new species of weeds or pests (including feral animals), or sustained increase in abundance of existing weed or pest species on the mining lease	(2) The outcome appropriately states the level of impact subsequent to controls. (3) The outcome is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. For post-mine completion, the control and management strategies for vegetation and weeds are provided on page 12-36, 12-37 and 12-38 of the MP and are appropriate. "Weed control on stockpiles. Weed control following placement on IWL" are also proposed strategies from this table and will be important to ensure the outcome will be achieved in the long term.	(4) DSD recommends that should a lease be granted the following outcome be a requirement of Schedule 6 of the lease: The Tenement Holder must during construction, operation and post-mine completion, ensure no introduction of new species of weeds, plant pathogens or pests (including feral animals), nor sustained increase in abundance of existing weed or pest species in the Land.	Survey demonstrates: - no new weeds or feral animals have become established on the lease - there has not been a statistically significant increase in abundance of existing weed or pest species in the lease area, compared to baseline studies and accounting for seasonal variation (regional trends) and pit/IWL areas.	(5) DSD considers the proposed draft measurement criteria to be an appropriate measurement to demonstrate achievement of the proposed outcome. Assessment: Measurement criterion measures the status of the source and not the impact on the receptor. In this case, measurement of change at the source is appropriate as the relationship between weeds or pest species and native species or native fauna or agriculture is commonly accepted. Amendments to the criteria are required to ensure that it meets the requirements of Regulation 65(2)(d) and includes all of the required elements of criteria. For example, for a completion criteria, the frequency of the survey will need to be specified and will be different to the operational criteria. DSD considers that there are methodologies that are appropriate to demonstrate achievement of the outcome. Should a lease be granted, the measurement criteria would be finalised in the PEPR submission.	None proposed	(6) Should a lease be granted, the requirement for a leading indicator criteria would be finalised in the PEPR.
60	Designated rehabilitation sites are established self sustaining systems.	(2) The outcome statement is a strategy. A new outcome is required to accurately reflect the receptor (which is future land use). The strategy of ensuring successful rehabilitation in the long term will be critical in achieving the future land use outcomes. (3) The outcome is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. Assessment: The MP (page 12-46) discusses the impact of rehabilitation failure on planned future ecological values not being realised. Control and management strategies to ensure successful rehabilitation, particularly in relation to the IWL, are assessed in the Soil and Surface Water Sections. Lease requirements for the IWL are addressed against other outcomes (Soil and Surface Water).	(4) DSD recommends that should a lease be granted the following outcome be a requirement of Schedule 6 of the lease: The Tenement Holder must ensure that the Land is progressively and finally rehabilitated to support the future land use.	Ecosystem Function Analysis (or similar) of rehabilitation areas demonstrates they will achieve critical thresholds for sustainability	(5) DSD considers the proposed draft measurement criteria to be an appropriate measurement to demonstrate achievement of the proposed outcome. Assessment: EFA, LFA or similar measurement methodologies are capable of measuring an ecosystem's development over time. EFA and LFA require the use of a metric site to provide comparative measures for ecosystem performance across values measured. In the case of establishment of vegetation on the IWL, the metric or analogue site will have to be carefully chosen to enable best use of LFA/EFA to demonstrate development of the ecosystem to become self sustaining. DSD considers that there are methodologies that are appropriate to demonstrate achievement of the outcome. Should a lease be granted, the measurement criteria would be finalised in the PEPR submission.	Evidence of establishment of native plant species on designated rehabilitation areas 12 months after progressive rehabilitation. Evidence of recruitment of key plant species demonstrated at rehabilitation sites within 5 years of progressive rehabilitation.	(6) Should a lease be granted, the leading criteria would be finalised in the PEPR.

DSD Assessment of Iron Road CEIP Impacts and Risks Register - December 2016

Line number	Proposed Outcome	DSD Assessment of Outcome, Strategies and Uncertainty	Recommended Regulatory Response - Outcomes and Strategies	Outcome measurement criteria	DSD Assessment of Draft Measurement Criteria	Leading indicator criteria (where required)	DSD Assessment of Leading Indicator Criteria
61	Designated rehabilitation sites are established self sustaining systems.	(2) The outcome statement is a strategy. A new outcome is required to accurately reflect the receptor (which is future land use). The strategy of ensuring successful rehabilitation in the long term will be critical in achieving the future land use outcomes. (3) The outcome is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. Assessment: The MP (page 12-46) discusses the impact of rehabilitation failure on planned future ecological values not being realised. Control and management strategies to ensure successful rehabilitation, particularly in relation to the IWL and its cover design, are assessed in the Soil and Surface Water Sections. Lease requirements for the IWL are addressed against other outcomes (Soil and Surface Water).	(4) DSD recommends that should a lease be granted the following outcome be a requirement of Schedule 6 of the lease: The Tenement Holder must ensure that the Land is progressively and finally rehabilitated to support the future land use.	Ecosystem Function Analysis (or similar) of rehabilitation areas demonstrates they will achieve critical thresholds for sustainability	(5) DSD considers the proposed draft measurement criteria to be an appropriate measurement to demonstrate achievement of the proposed outcome. Assessment: EFA, LFA or similar measurement methodologies are capable of measuring an ecosystem's development over time. EFA and LFA require the use of a metric site to provide comparative measures for ecosystem performance across values measured. In the case of establishment of vegetation on the IWL, the metric or analogue site will have to be carefully chosen to enable best use of LFA/EFA to demonstrate development of the ecosystem to become self sustaining. DSD considers that there are methodologies that are appropriate to demonstrate achievement of the outcome. Should a lease be granted, the measurement criteria would be finalised in the PEPR submission.	Evidence of establishment of native plant species on designated rehabilitation areas 12 months after progressive rehabilitation. Evidence of recruitment of key plant species demonstrated at rehabilitation sites within 5 years of progressive rehabilitation.	(6) Should a lease be granted, the leading criteria would be finalised in the PEPR.
62	Designated rehabilitation sites are established self sustaining systems.	(2) The outcome statement is a strategy. A new outcome is required to accurately reflect the receptor (which is future land use). The strategy of ensuring successful rehabilitation in the long term will be critical in achieving the future land use outcomes. (3) The outcome is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. Assessment: The MP (page 12-46) discusses the impact of rehabilitation failure on planned future ecological values not being realised. Control and management strategies to ensure successful rehabilitation, particularly in relation to the IWL and its cover design, are assessed in the Soil and Surface Water Sections. Lease requirements for the IWL are addressed against other outcomes (Soil and Surface Water).	(4) DSD recommends that should a lease be granted the following outcome be a requirement of Schedule 6 of the lease: The Tenement Holder must ensure that the Land is progressively and finally rehabilitated to support the future land use.	Ecosystem Function Analysis (or similar) of rehabilitation areas demonstrates they will achieve critical thresholds for sustainability	(5) DSD considers the proposed draft measurement criteria to be an appropriate measurement to demonstrate achievement of the proposed outcome. Assessment: EFA, LFA or similar measurement methodologies are capable of measuring an ecosystem's development over time. EFA and LFA require the use of a metric site to provide comparative measures for ecosystem performance across values measured. In the case of establishment of vegetation on the IWL, the metric or analogue site will have to be carefully chosen to enable best use of LFA/EFA to demonstrate development of the ecosystem to become self sustaining. DSD considers that there are methodologies that are appropriate to demonstrate achievement of the outcome. Should a lease be granted, the measurement criteria would be finalised in the PEPR submission.	Evidence of establishment of native plant species on designated rehabilitation areas 12 months after progressive rehabilitation. Evidence of recruitment of key plant species demonstrated at rehabilitation sites within 5 years of progressive rehabilitation.	(6) Should a lease be granted, the leading criteria would be finalised in the PEPR.
63	Designated rehabilitation sites are established self sustaining systems.	(2) The outcome statement is a strategy. A new outcome is required to accurately reflect the receptor (which is future land use). The strategy of ensuring successful rehabilitation in the long term will be critical in achieving the future land use outcomes. (3) The outcome is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. Assessment: The MP (page 12-46) discusses the impact of rehabilitation failure on planned future ecological values not being realised. A capillary break in the cover design is also proposed as a control strategy. Control and management strategies to ensure successful rehabilitation, particularly in relation to the IWL and its cover design, are assessed in the Soil and Surface Water Sections. Lease requirements for the IWL are addressed against other outcomes (Soil and Surface Water).	(4) DSD recommends that should a lease be granted the following outcome be a requirement of Schedule 6 of the lease: The Tenement Holder must ensure that the Land is progressively and finally rehabilitated to support the future land use.	Ecosystem Function Analysis (or similar) of rehabilitation areas demonstrates they will achieve critical thresholds for sustainability	(5) DSD considers the proposed draft measurement criteria to be an appropriate measurement to demonstrate achievement of the proposed outcome. Assessment: EFA, LFA or similar measurement methodologies are capable of measuring an ecosystem's development over time. EFA and LFA require the use of a metric site to provide comparative measures for ecosystem performance across values measured. In the case of establishment of vegetation on the IWL, the metric or analogue site will have to be carefully chosen to enable best use of LFA/EFA to demonstrate development of the ecosystem to become self sustaining. DSD considers that there are methodologies that are appropriate to demonstrate achievement of the outcome. Should a lease be granted, the measurement criteria would be finalised in the PEPR submission.	Evidence of establishment of native plant species on designated rehabilitation areas 12 months after progressive rehabilitation. Evidence of recruitment of key plant species demonstrated at rehabilitation sites within 5 years of progressive rehabilitation.	(6) Should a lease be granted, the leading criteria would be finalised in the PEPR.
64	Designated rehabilitation sites are established self sustaining systems.	(2) The outcome statement is a strategy. A new outcome is required to accurately reflect the receptor (which is future land use). The strategy of ensuring successful rehabilitation in the long term will be critical in achieving the future land use outcomes. (3) The outcome is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. Assessment: The MP (page 12-46) discusses the impact of rehabilitation failure on planned future ecological values not being realised. Treatment of seed and IWL field trials are proposed as control strategies. Control and management strategies to ensure successful rehabilitation, particularly in relation to the IWL and its cover design, are assessed in the Soil and Surface Water Sections. Lease requirements for the IWL are addressed against other outcomes (Soil and Surface Water).	(4) DSD recommends that should a lease be granted the following outcome be a requirement of Schedule 6 of the lease: The Tenement Holder must ensure that the Land is progressively and finally rehabilitated to support the future land use.	Ecosystem Function Analysis (or similar) of rehabilitation areas demonstrates they will achieve critical thresholds for sustainability	(5) DSD considers the proposed draft measurement criteria to be an appropriate measurement to demonstrate achievement of the proposed outcome. Assessment: EFA, LFA or similar measurement methodologies are capable of measuring an ecosystem's development over time. EFA and LFA require the use of a metric site to provide comparative measures for ecosystem performance across values measured. In the case of establishment of vegetation on the IWL, the metric or analogue site will have to be carefully chosen to enable best use of LFA/EFA to demonstrate development of the ecosystem to become self sustaining. DSD considers that there are methodologies that are appropriate to demonstrate achievement of the outcome. Should a lease be granted, the measurement criteria would be finalised in the PEPR submission.	Evidence of establishment of native plant species on designated rehabilitation areas 12 months after progressive rehabilitation. Evidence of recruitment of key plant species demonstrated at rehabilitation sites within 5 years of progressive rehabilitation.	(6) Should a lease be granted, the leading criteria would be finalised in the PEPR.
65	No loss of abundance or diversity of native vegetation on or off the lease during construction, operation and post mine completion through; • clearance, • dust/contaminant deposition, • fire, • reduction in water supply • salinisation, or • other damage, unless prior approval under the relevant legislation is obtained.	(2) The outcome appropriately states the level of impact subsequent to controls. (3) The outcome is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. Assessment: For construction, the control and management strategies for vegetation (includes impacts caused by fire) are provided on page 12-36, 12-37 and 12-38 of the MP and are appropriate.	(4) DSD recommends that should a lease be granted the following outcome be a requirement of Schedule 6 of the lease: The Tenement Holder must during construction, operation and post-mine completion, ensure no loss of abundance or diversity of native vegetation on or off the Land through; • clearance, • dust/contaminant deposition, • fire, • reduction in water supply • salinisation, or • other damage, unless a significant environmental benefit has been approved in accordance with the relevant legislation.	Vegetation audit demonstrates the total area cleared or damaged does not exceed the approved clearance area in the SEB plan. Compliance with SEB plan. And 'Independent investigation of all incidents that result in unauthorised clearance of native vegetation are completed in 14 days, or as agreed with the Director of Mines (or other authorised officer), and demonstrate that the unauthorised clearance was not caused as a result of mining operations'.	(5) DSD considers the proposed draft measurement criteria to be an appropriate measurement to demonstrate achievement of the proposed outcome. Assessment: The draft criteria appropriately measures vegetation clearance and audits this against approved clearance (PEPR/native vegetation management plan) to demonstrate achievement of the outcome. Amendments to the criteria are required to ensure that it meets the requirements of Regulation 65(2)(d) and includes all of the required elements of criteria. As this impact event relates to unplanned clearance as a result of fire (both on and off the lease), the criteria should be amended to also include: 'Independent investigation of all incidents that result in unauthorised clearance of native vegetation are completed in 14 days, or as agreed with the Director of Mines (or other authorised officer), and demonstrate that the unauthorised clearance was not caused as a result of mining operations'. DSD considers that there are methodologies that are appropriate to demonstrate achievement of the outcome. Should a lease be granted, the measurement criteria would be finalised in the PEPR submission.	Evidence of establishment of native plant species on designated rehabilitation areas 12 months after progressive rehabilitation. Evidence of recruitment of key plant species demonstrated at rehabilitation sites within 5 years of progressive rehabilitation.	(6) The proposed leading indicator criteria does not relate to the clearance of native vegetation as a result of fire. Should a lease be granted, the requirement for a leading indicator criteria would be finalised in the PEPR.
66	Designated rehabilitation sites are established self sustaining systems.	(2) The outcome statement is a strategy. A new outcome is required to accurately reflect the receptor (which is future land use). The strategy of ensuring successful rehabilitation in the long term will be critical in achieving the future land use outcomes. (3) The outcome is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. Assessment: The MP (page 12-46) discusses the impact of rehabilitation failure on planned future ecological values not being realised. Appropriate research and IWL field trials are proposed as control strategies. Control and management strategies to ensure successful rehabilitation, particularly in relation to the IWL and its cover design, are assessed in the Soil and Surface Water Sections. Lease requirements for the IWL are addressed against other outcomes (Soil and Surface Water).	(4) DSD recommends that should a lease be granted the following outcome be a requirement of Schedule 6 of the lease: The Tenement Holder must ensure that the Land is progressively and finally rehabilitated to support the future land use.	Ecosystem Function Analysis (or similar) of rehabilitation areas demonstrates they will achieve critical thresholds for sustainability	(5) DSD considers the proposed draft measurement criteria to be an appropriate measurement to demonstrate achievement of the proposed outcome. Assessment: EFA, LFA or similar measurement methodologies are capable of measuring an ecosystem's development over time. EFA and LFA require the use of a metric site to provide comparative measures for ecosystem performance across values measured. In the case of establishment of vegetation on the IWL, the metric or analogue site will have to be carefully chosen to enable best use of LFA/EFA to demonstrate development of the ecosystem to become self sustaining. DSD considers that there are methodologies that are appropriate to demonstrate achievement of the outcome. Should a lease be granted, the measurement criteria would be finalised in the PEPR submission.	Evidence of establishment of native plant species on designated rehabilitation areas 12 months after progressive rehabilitation. Evidence of recruitment of key plant species demonstrated at rehabilitation sites within 5 years of progressive rehabilitation.	(6) Should a lease be granted, the leading criteria would be finalised in the PEPR.
67	Designated rehabilitation sites are established self sustaining systems.	(2) The outcome statement is a strategy. A new outcome is required to accurately reflect the receptor (which is future land use). The strategy of ensuring successful rehabilitation in the long term will be critical in achieving the future land use outcomes. (3) The outcome is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. Assessment: The MP (page 12-46) discusses the impact of rehabilitation failure on planned future ecological values not being realised. Appropriate research, cover design and IWL field trials are proposed as control strategies. Control and management strategies to ensure successful rehabilitation, particularly in relation to the IWL and its cover design, are assessed in the Soil and Surface Water Sections. Lease requirements for the IWL are addressed against other outcomes (Soil and Surface Water).	(4) DSD recommends that should a lease be granted the following outcome be a requirement of Schedule 6 of the lease: The Tenement Holder must ensure that the Land is progressively and finally rehabilitated to support the future land use.	Ecosystem Function Analysis (or similar) of rehabilitation areas demonstrates they will achieve critical thresholds for sustainability	(5) DSD considers the proposed draft measurement criteria to be an appropriate measurement to demonstrate achievement of the proposed outcome. Assessment: EFA, LFA or similar measurement methodologies are capable of measuring an ecosystem's development over time. EFA and LFA require the use of a metric site to provide comparative measures for ecosystem performance across values measured. In the case of establishment of vegetation on the IWL, the metric or analogue site will have to be carefully chosen to enable best use of LFA/EFA to demonstrate development of the ecosystem to become self sustaining. DSD considers that there are methodologies that are appropriate to demonstrate achievement of the outcome. Should a lease be granted, the measurement criteria would be finalised in the PEPR submission.	Evidence of establishment of native plant species on designated rehabilitation areas 12 months after progressive rehabilitation. Evidence of recruitment of key plant species demonstrated at rehabilitation sites within 5 years of progressive rehabilitation.	(6) Should a lease be granted, the leading criteria would be finalised in the PEPR.
68	NA	No Outcome required.	No Outcome required.	NA	No Outcome required.	NA	No Outcome required.
69	Designated rehabilitation sites are established self sustaining systems.	(2) The outcome statement is a strategy. A new outcome is required to accurately reflect the receptor (which is future land use). The strategy of ensuring successful rehabilitation in the long term will be critical in achieving the future land use outcomes. (3) The outcome is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. Assessment: The MP (page 12-46) discusses the impact of rehabilitation failure on planned future ecological values not being realised. Stockpile management plans, limitations in height and duration of stockpiled materials, management of soil processes, microrhyzea and IWL field trials are proposed as control strategies. Control and management strategies to ensure successful rehabilitation, particularly in relation to the IWL and its cover design, are assessed in the Soil and Surface Water Sections. Lease requirements for the IWL are addressed against other outcomes (Soil and Surface Water). An outcome for 'no impact to soil quality and quantity' is assessed and required against impact events in the Soils section.	(4) DSD recommends that should a lease be granted the following outcome be a requirement of Schedule 6 of the lease: The Tenement Holder must ensure that the Land is progressively and finally rehabilitated to support the future land use.	Ecosystem Function Analysis (or similar) of rehabilitation areas demonstrates they will achieve critical thresholds for sustainability	(5) DSD considers the proposed draft measurement criteria to be an appropriate measurement to demonstrate achievement of the proposed outcome. Assessment: EFA, LFA or similar measurement methodologies are capable of measuring an ecosystem's development over time. EFA and LFA require the use of a metric site to provide comparative measures for ecosystem performance across values measured. In the case of establishment of vegetation on the IWL, the metric or analogue site will have to be carefully chosen to enable best use of LFA/EFA to demonstrate development of the ecosystem to become self sustaining. DSD considers that there are methodologies that are appropriate to demonstrate achievement of the outcome. Should a lease be granted, the measurement criteria would be finalised in the PEPR submission.	Evidence of establishment of native plant species on designated rehabilitation areas 12 months after progressive rehabilitation. Evidence of recruitment of key plant species demonstrated at rehabilitation sites within 5 years of progressive rehabilitation.	(6) Should a lease be granted, the leading criteria would be finalised in the PEPR.

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Line number	Proposed Outcome	DSD Assessment of Outcome, Strategies and Uncertainty	Recommended Regulatory Response - Outcomes and Strategies	Outcome measurement criteria	DSD Assessment of Draft Measurement Criteria	Leading indicator criteria (where required)	DSD Assessment of Leading Indicator Criteria
70	No loss of abundance or diversity of native vegetation on or off the lease during construction, operation and post mine completion through; • clearance, • dust/contaminant deposition, • fire, • reduction in water supply • salinisation, or • other damage, unless prior approval under the relevant legislation is obtained.	(2) The outcome appropriately states the level of impact subsequent to controls. (3) The outcome is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. Assessment: The assessment of impacts to native vegetation from groundwater salinity is provided on page 12-51 of the MP. The Iron Road impact assessment table (MP Appendix C) proposed the following control strategies, "seepage modelling indicates a low level of seepage which results in a small elevation of local GW table (33-50ml per year) for life of mine, following closure GW levels quickly revert to previous, GW level beneath Hambidge is 15mbgl and it is a significant distance from the ML" and "undertake GW monitoring on ML boundary once IWL established to verify seepage rates." It is recommended that groundwater monitoring (as proposed by Iron Road) is included as a requirement of the sixth schedule of the lease. The Iron Road Response Document (Attachment B) Issue #14 also includes a discussion on this impact event.	<u>(4) DSD recommends that should a lease be granted the following outcome be a requirement of Schedule 6 of the lease:</u> The Tenement Holder must during construction, operation and post-mine completion, ensure no loss of abundance or diversity of native vegetation on or off the Land through; • clearance, • dust/contaminant deposition, • fire, • reduction in water supply • salinisation, or • other damage, unless a significant environmental benefit has been approved in accordance with the relevant legislation. <u>DSD recommends that should a lease be granted the following be a requirement of Schedule 6 of the lease:</u> The Tenement Holder is required to address the following matters for the purposes of Regulation 65(2)(c) in relation to the native vegetation outcome for impacts from IWL seepage; • Undertake groundwater monitoring at appropriate locations once the IWL is established and during operations to validate the groundwater model and IWL seepage rates.	Groundwater monitoring outside of the proposed mining lease boundary are in line with model predictions and seasonal variations.	(5) DSD considers the proposed draft measurement criteria requires amendments to ensure demonstration of achievement of the proposed outcome. Assessment: Amendments to the criteria are required to ensure that it meets the requirements of Regulation 65(2)(d) and includes all of the required elements of criteria. Measuring the groundwater level and quality outside of the proposed lease boundary can be used as an appropriate criteria to infer impacts to Hambidge WPA and is supported, however, the appropriate land access arrangements would need to be in place. Monitoring at the lease boundary could be used to infer potential impacts and is supported (it is noted that monitoring at the lease boundary is proposed in this table but is contradicted by the draft criteria which proposes monitoring off the lease). DSD recommends that the location of groundwater monitoring bores and any groundwater level used to demonstrate achievement of the outcome is reviewed against groundwater modelling data to ensure that the locations and level are appropriate. As this impact event relates to unplanned clearance as a result groundwater salinisation at Hambidge WPA, measurement could include monitoring of the impact on the receptor, ie: the vegetation condition at Hambidge WPA. DSD considers that there are methodologies that are appropriate to demonstrate achievement of the outcome. Should a lease be granted, the measurement criteria would be finalised in the PEPR submission.	Groundwater levels are in line with model expectations (refer to G/W chapter)	(6) Should a lease be granted leading indicator criteria would be finalised in the PEPR. Leading indicator criteria is recommended if the measurement criteria chosen monitors the source/pathway (groundwater). In this case, leading indicator criteria can provide a warning that a control strategy is failing or that an outcome may not be achieved in the future.
71	Designated rehabilitation sites are established self sustaining systems.	(2) The outcome statement is a strategy. A new outcome is required to accurately reflect the receptor (which is future land use). The strategy of ensuring successful rehabilitation in the long term will be critical in achieving the future land use outcomes. (3) The outcome is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. Assessment: The MP (page 12-46) discusses the impact of rehabilitation failure on planned future ecological values not being realised. Stabilisation of soils on site through establishment of grass cover on non-native vegetation areas and revegetation trials are proposed as control strategies. Control and management strategies to ensure successful revegetation are assessed in the Soil and Surface Water Sections.	<u>(4) DSD recommends that should a lease be granted the following outcome be a requirement of Schedule 6 of the lease:</u> The Tenement Holder must ensure that the Land is progressively and finally rehabilitated to support the future land use.	Ecosystem Function Analysis (or similar) of rehabilitation areas demonstrates they will achieve critical thresholds for sustainability	(5) DSD considers the proposed draft measurement criteria to be an appropriate measurement to demonstrate achievement of the proposed outcome. Assessment: EFA, LFA or similar measurement methodologies are capable of measuring an ecosystem's development over time. EFA and LFA require the use of a metric site to provide comparative measures for ecosystem performance across values measured. In the case of establishment of vegetation on the IWL, the metric or analogue site will have to be carefully chosen to enable best use of LFA/EFA to demonstrate development of the ecosystem to become self sustaining. DSD considers that there are methodologies that are appropriate to demonstrate achievement of the outcome. Should a lease be granted, the measurement criteria would be finalised in the PEPR submission.	Evidence of establishment of native plant species on designated rehabilitation areas 12 months after progressive rehabilitation. Evidence of recruitment of key plant species demonstrated at rehabilitation sites within 5 years of progressive rehabilitation.	(6) Should a lease be granted, the leading criteria would be finalised in the PEPR.
72	No loss of abundance or diversity of native vegetation on or off the lease during construction, operation and post mine completion through; • clearance, • dust/contaminant deposition, • fire, • reduction in water supply • salinisation, or • other damage, unless prior approval under the relevant legislation is obtained.	(2) The outcome appropriately states the level of impact subsequent to controls. (3) The outcome is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. Assessment: For construction and operation, the control and management strategies for vegetation (includes impacts caused by dust deposition) are provided on page 12-37 of the MP and are appropriate. (Note: the control and management strategies are referred to Chapter 15 (Air Quality)).	<u>(4) DSD recommends that should a lease be granted the following outcome be a requirement of Schedule 6 of the lease:</u> The Tenement Holder must during construction, operation and post-mine completion, ensure no loss of abundance or diversity of native vegetation on or off the Land through; • clearance, • dust/contaminant deposition, • fire, • reduction in water supply • salinisation, or • other damage, unless a significant environmental benefit has been approved in accordance with the relevant legislation.	Average annual dust deposition, including background, not to exceed 4 g/m2/month.	(5) DSD considers the proposed draft measurement criteria to be an inappropriate measurement to demonstrate achievement of the proposed outcome. Assessment: The impact event refers to the receptor as remnant native vegetation on the lease. Proposed measurement criterion does not measure actual unplanned clearance or impact to native vegetation (on the lease). Measurement criteria proposed for other clearance of native vegetation would be applicable to this impact. For example: 'Annual Vegetation audit demonstrates the total area cleared or damaged does not exceed the approved clearance area in the SEB plan.' If the use of dust deposition as a measurement criteria for impacts to native vegetation (on or off the lease) is proposed, evidence will be required to demonstrate that the dust deposition limits and frequency of measurement are appropriate and based on technical evidence. "Annual" measurement criteria frequency may not be effective to demonstrate achievement of the outcome and should be reviewed. DSD considers that there are methodologies that are appropriate to demonstrate achievement of the outcome. Should a lease be granted, the measurement criteria would be finalised in the PEPR submission.	Monthly dust deposition from mining activities not to exceed 4 g/m2/month.	(6) Should a lease be granted leading indicator criteria would be finalised in the PEPR.
73	NA	No Outcome required.	No Outcome required.	NA	No Outcome required.	NA	No Outcome required.
74	No loss of abundance or diversity of native vegetation on or off the lease during construction, operation and post mine completion through; • clearance, • dust/contaminant deposition, • fire, • reduction in water supply • salinisation, or • other damage, unless prior approval under the relevant legislation is obtained.	(2) The outcome appropriately states the level of impact subsequent to controls. (3) The outcome is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. Assessment: For construction and operation, the control and management strategies for vegetation (includes impacts caused by off-road vehicle use) are provided on page 12-50 of the MP. "Control of access to mine site and staff awareness of vehicle use restrictions and penalties for non-compliance" are also proposed strategies.	<u>(4) DSD recommends that should a lease be granted the following outcome be a requirement of Schedule 6 of the lease:</u> The Tenement Holder must during construction, operation and post-mine completion, ensure no loss of abundance or diversity of native vegetation on or off the Land through; • clearance, • dust/contaminant deposition, • fire, • reduction in water supply • salinisation, or • other damage, unless a significant environmental benefit has been approved in accordance with the relevant legislation.	Vegetation audit demonstrates the total area cleared or damaged does not exceed the approved clearance area in the SEB plan. Compliance with SEB plan. And 'Independent investigation of all incidents that result in unauthorised clearance of native vegetation are completed in 14 days, or as agreed with the Director of Mines (or other authorised officer), and demonstrate that the unauthorised clearance was not caused as a result of mining operations'.	(5) DSD considers the proposed draft measurement criteria to be an appropriate measurement to demonstrate achievement of the proposed outcome. Assessment: The draft criteria appropriately measures vegetation clearance and audits this against approved clearance (PEPR/native vegetation management plan) to demonstrate achievement of the outcome. Amendments to the criteria are required to ensure that it meets the requirements of Regulation 65(2)(d) and includes all of the required elements of criteria. As this impact event relates to unplanned clearance as a result of unauthorised off-road vehicle use, the criteria should be amended to also include: 'Independent investigation of all incidents that result in unauthorised clearance of native vegetation are completed in 14 days, or as agreed with the Director of Mines (or other authorised officer), and demonstrate that the unauthorised clearance was not caused as a result of mining operations'. DSD considers that there are methodologies that are appropriate to demonstrate achievement of the outcome. Should a lease be granted, the measurement criteria would be finalised in the PEPR submission.	None proposed	(6) Should a lease be granted, the requirement for a leading indicator criteria would be finalised in the PEPR.
75	NA - Benefit	No Outcome required.	No Outcome required.		No Outcome required.	None proposed	No Outcome required.
75a	No introduction of new species of weeds or pests (including feral animals), or sustained increase in abundance of existing weed or pest species on the mining lease	(2) The outcome appropriately states the level of impact subsequent to controls. (3) The outcome is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. Assessment: For construction and operation, the control and management strategies for pest fauna are provided on page 11-27 of the MP and are appropriate.	<u>(4) DSD recommends that should a lease be granted the following outcome be a requirement of Schedule 6 of the lease:</u> The Tenement Holder must during construction, operation and post-mine completion, ensure no introduction of new species of weeds, plant pathogens or pests (including feral animals), nor sustained increase in abundance of existing weed or pest species in the Land.	Survey demonstrates: - no new weeds or feral animals have become established on the lease - there has not been a statistically significant increase in abundance of existing weed or pest species in the lease area, compared to baseline studies and accounting for seasonal variation (regional trends) and pit/IWL areas.	(5) DSD considers the proposed draft measurement criteria to be an appropriate measurement to demonstrate achievement of the proposed outcome. Assessment: Measurement criterion measures the status of the source and not the impact on the receptor. In this case, measurement of change at the source is appropriate as the relationship between weeds or pest species and native species or native fauna or agriculture is commonly accepted. Amendments to the criteria are required to ensure that it meets the requirements of Regulation 65(2)(d) and includes all of the required elements of criteria. For example, the frequency of the survey will need to be specified. DSD considers that there are methodologies that are appropriate to demonstrate achievement of the outcome. Should a lease be granted, the measurement criteria would be finalised in the PEPR submission.	None proposed	(6) Should a lease be granted, the requirement for a leading indicator criteria would be finalised in the PEPR.
76	Designated rehabilitation sites are established self sustaining systems.	(2) The outcome statement is a strategy. A new outcome is required to accurately reflect the receptor (which is future land use). The strategy of ensuring successful rehabilitation in the long term will be critical in achieving the future land use outcomes. (3) The outcome is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. Assessment: The MP (page 12-46) discusses the impact of rehabilitation failure on planned future ecological values not being realised. IWL stability and IWL field trials are proposed as control strategies. Control and management strategies to ensure IWL stability are addressed in the land use, public safety section and soil sections. Requirements for IWL stability are addressed against other outcomes.	<u>(4) DSD recommends that should a lease be granted the following outcome be a requirement of Schedule 6 of the lease:</u> The Tenement Holder must ensure that the Land is progressively and finally rehabilitated to support the future land use.	Ecosystem Function Analysis (or similar) of rehabilitation areas demonstrates they will achieve critical thresholds for sustainability	(5) DSD considers the proposed draft measurement criteria to be an appropriate measurement to demonstrate achievement of the proposed outcome. Assessment: EFA, LFA or similar measurement methodologies are capable of measuring an ecosystem's development over time. EFA and LFA require the use of a metric site to provide comparative measures for ecosystem performance across values measured. In the case of establishment of vegetation on the IWL, the metric or analogue site will have to be carefully chosen to enable best use of LFA/EFA to demonstrate development of the ecosystem to become self sustaining. DSD considers that there are methodologies that are appropriate to demonstrate achievement of the outcome. Should a lease be granted, the measurement criteria would be finalised in the PEPR submission.	Evidence of establishment of native plant species on designated rehabilitation areas 12 months after progressive rehabilitation. Evidence of recruitment of key plant species demonstrated at rehabilitation sites within 5 years of progressive rehabilitation.	(6) Should a lease be granted, the leading criteria would be finalised in the PEPR.
77	Designated rehabilitation sites are established self sustaining systems.	(2) The proposed outcome statement is a strategy. A new outcome is required to accurately reflect the receptor (which is soil quality in the IWL cover and ultimately the future land use). (3) The outcome is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. Assessment: The MP (page 13-14) states the control and management strategies for soil and land quality. The following strategies are proposed within the impact assessment table, "design includes capillary break layer, performance can be field tested and any optimisations implemented, rates of change would be very slow allowing time for modifications if required". Control and management strategies to ensure an effective IWL cover are addressed against other outcomes.	<u>(4) DSD recommends that should a lease be granted the following outcome be a requirement of Schedule 6 of the lease:</u> The Tenement Holder must ensure that the Land is progressively and finally rehabilitated to support the future land use.	Independent audit at mine completion of quality assurance data confirms the IWL has been constructed to design specifications. Ecosystem Function Analysis (or similar) at representative sites on rehabilitated areas demonstrates that rehabilitation will achieve sustainability thresholds.	(5) DSD considers the proposed draft measurement criteria to be an inappropriate measurement to demonstrate achievement of the proposed outcome. Assessment: Proposed measurement criterion contains a significant lag given that it proposes to check that IWL has been built and constructed to design specifications at "mine completion". Audit should be undertaken at a time interval to allow for refinement and improvement of construction practices to ensure salt does not migrate into IWL cover. DSD considers that there are methodologies that are appropriate to demonstrate achievement of the outcome. Should a lease be granted, the measurement criteria would be finalised in the PEPR submission.	None proposed	(6) Should a lease be granted, the requirement for a leading indicator criteria would be finalised in the PEPR.
80	No adverse impacts on soil quality or quantity within the mining lease that could compromise the post mining land use	(2) The outcome appropriately states the level of impact subsequent to controls. The outcome statement requires minor amendment. (3) The outcome is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. Assessment: The MP (page 13-14) states the control and management strategies for soil and land quality and are appropriate. This impact event relates to saline water used for dust suppression on haul roads and cleared areas and the potential for this saline water to run off into undisturbed land. It does not relate to impacts on soil stockpiles which are to be used for rehabilitation. The key control strategy for this impact event is to control saline run off in sedimentation ponds, drainage channels and bunded areas (MP page 13-16).	<u>(4) DSD recommends that should a lease be granted the following outcome be a requirement of Schedule 6 of the lease:</u> The Tenement Holder must during construction, operation and post-mine completion ensure that the existing (pre-mining) soil quality and quantity is maintained.	Soil testing on undisturbed areas demonstrates salinity levels will not prevent the growth of crops on the land	(5) DSD considers the proposed draft measurement criteria to be an inappropriate measurement to demonstrate achievement of the proposed outcome. Assessment: Proposed measurement criteria monitors undisturbed soils only and does not measure the impact to all soils that could be potentially impacted. Amendments to the criteria are required to ensure that it meets the requirements of Regulation 65(2)(d) and includes all of the required elements of criteria. DSD considers that there are methodologies that are appropriate to demonstrate achievement of the outcome. Should a lease be granted, the measurement criteria would be finalised in the PEPR submission.	None proposed	(6) Should a lease be granted, the requirement for a leading indicator criteria would be finalised in the PEPR.

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Line number	Proposed Outcome	DSD Assessment of Outcome, Strategies and Uncertainty	Recommended Regulatory Response - Outcomes and Strategies	Outcome measurement criteria	DSD Assessment of Draft Measurement Criteria	Leading indicator criteria (where required)	DSD Assessment of Leading Indicator Criteria
81	No impacts to agricultural productivity for third party land users as a result of mining operations, including: • reduction in crop yield; • reduction in grain quality; or • adverse health impacts to livestock other than where agreed between the tenement holder and the affected user.	(2) The outcome appropriately states the level of impact subsequent to controls. The outcome statement requires amendment to accurately reflect the applicable mine phases. (3) The outcome is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. Assessment: The MP (page 13-14) states the control and management strategies for soil and land quality and are appropriate. This impact event relates to saline water used for dust suppression on haul roads and cleared areas and the potential for this saline water to impact on adjacent land use. The key control strategy for this impact event is to control saline run off in sedimentation ponds, drainage channels and bunded areas (MP page 13-16).	(4) DSD recommends that should a lease be granted the following outcomes be a requirement of Schedule 6 of the lease: Third party land user outcome - Saline water: The Tenement Holder must during construction, operation and post-mine completion, ensure no impacts to agricultural productivity, including but not limited to; • reduction in crop yield; • reduction in grain quality; or • adverse health impacts to livestock; for third party land users on or off the Land as a result of saline water used in mining operations, other than those agreed between the Tenement Holder and the affected user.	Soil testing on adjoining land demonstrates there is no statistically significant increase in the level of salinity	(5) DSD considers the proposed draft measurement criteria to be an inappropriate measurement to demonstrate achievement of the proposed outcome. Assessment: Proposed criteria measures the pathway rather than the ultimate receptor which is land use. If measurement was to take place at the sensitive receiver, crop yields, grain quality, livestock health would be monitored and demonstrated to not vary from an agreed metric or to be statistically different from previous records. Or it is demonstrated that an agreement has been reached between the tenement holder and the affected user. Amendments to the criteria are required to ensure that it meets the requirements of Regulation 65(2)(d) and includes all of the required elements of criteria. Salinity testing of soil could be utilised as a leading criteria indicating changing soil salinity that may lead to an early warning that a strategy is failing or the outcome may not be achieved. DSD considers that there are methodologies that are appropriate to demonstrate achievement of the outcome.	None proposed	(6) Should a lease be granted, the requirement for a leading indicator criteria would be finalised in the PEPR.
82	No impacts to agricultural productivity for third party land users as a result of mining operations, including: • reduction in crop yield; • reduction in grain quality; or • adverse health impacts to livestock other than where agreed between the tenement holder and the affected user.	(2) The outcome appropriately states the level of impact subsequent to controls. The outcome statement requires amendment to accurately reflect the applicable mine phases. (3) The outcome is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. Assessment: The MP (page 13-14) states the control and management strategies for soil and land quality and are appropriate. The following strategies are proposed in the impact assessment table "erosion would mostly occur in topsoil placed on slopes which is similar to surrounding land, management and placement of dispersive material, stabilisation of slopes through revegetation and slope design, earthen bund to contain runoff if required, characterisation of dispersive material, monitoring and field trails of rehabilitation". The MP states that "a native topsoil stockpile will be generated during construction to collect, store and protect the valuable native topsoil for progressive use throughout the production phase" (MP page 3-51).	(4) DSD recommends that should a lease be granted the following condition be a requirement of Schedule 2 of the lease: The IWL construction and operation must be audited by a suitably qualified independent expert approved by the Director of Mines (or other authorised officer), against the design and plans that have been adopted for the IWL construction and operation: • for the initial stage of IWL foundation preparation and construction; and • for each subsequent stage of IWL foundation preparation and construction ; and • on an annual basis for construction and operations (including the construction of the cover system) or at a frequency as the Director of Mines (or other authorised officer) may specify by notice in writing. The expert must prepare reports of the findings of each audit. The initial expert report for IWL foundation preparation and construction audit must be provided to the Director of Mines (or other authorised officer) prior to the initial placement of tailings and waste in the IWL. Subsequent reports must be provided to the Director of Mines (or other authorised officer) within 1 month of completion of the audit and all reports will be made publically available. In accordance with section 70B(2)(d) of the Act it is a condition of the grant of the Mining Tenement that a proposed PEPR submitted in accordance with Part 10A of the Act must include reports from suitably qualified independent experts on the following matters: The effectiveness of the proposed strategies in the proposed PEPR achieving the environmental outcomes identified in the proposed PEPR, including but not limited to reports from: • An Independent Geotechnical Engineering Expert (i.e.: for IWL and mine waste design and construction methodology) • An Independent Mine Waste Cover System Expert (i.e.: for IWL and mine waste cover systems design) • An Independent Geomorphology Expert (i.e.: for Landform design, soil and erosion management) • An Independent Hydrology Expert (i.e.: for Surface water infrastructure design and surface water management) • An Independent Chemical, Process or Metallurgical Engineering Expert (i.e.: for tailings dewatering design, waste/tailings mixture ratio and density necessary for geotechnical stability of the IWL and timely construction of the IWL cover system).	Monthly inspection confirms there is no visible sedimentation from runoff from the IWL outside the designated buffer. Should the crop productivity monitoring program (YieldProphetTM) be supported by surrounding landowners, then crop yields as determined by YieldProphet on properties within the proposed mining lease are comparable with control sites during construction, operation and closure of the mine, measured annually	(5) DSD considers the proposed draft measurement criteria to be an inappropriate measurement to demonstrate achievement of the proposed outcome. Assessment: Amendments to the criteria are required to ensure that it meets the requirements of Regulation 65(2)(d) and includes all of the required elements of criteria. Visible monitoring of sedimentation is not an effective measurement and other techniques should be adopted. Proposed measurement criterion utilises Yieldprophet methodology to measure crop performance (yield) against metric sites. This methodology is supported as it measures the impact on the receptor, however, insufficient detail is provided on the Yieldprophet methodology. The location of compliance sites and control sites will be critical for this methodology to be effective. The selection of compliance sites within the lease may not be effective in measuring potential impacts on adjacent land use (refer PIM_13_05 and PIM_13_06 for impact events relating to adjacent land use). Consultation with stakeholders will be essential for this measurement criteria. DSD considers that there are methodologies that are appropriate to demonstrate achievement of the outcomes. Should a lease be granted, the measurement criteria would be finalised in the PEPR submission.	Mine records demonstrate characterisation and placement on dispersive material is in accordance with IWL design specifications.	(6) Should a lease be granted, the leading criteria would be finalised in the PEPR.
82a		Key strategies to prevent erosion and deposition of sediments are as follows: • Characterisation of all materials to be used within the IWL and the cover system, including dispersive soils. • The design of the IWL outer slopes including slope angle, slope length and slope shape and structure (concave and benching). • The design of the IWL cover system including material selection, waste to soil ratios and profile thickness for topsoil and waste/subsoil. • Progressive rehabilitation of the IWL commencing immediately after completion of the first section of the IWL, including placement of the cover system and revegetation. • QA/QC during the construction of the IWL. • QA/QC during the placement of the cover system. • Performance monitoring of the cover system. The MP states that "revegetation and rehabilitation trials will commence as soon as the final landform height is reached, to determine the optimal mix of waste rock and soils and progressive rehabilitation will reduce the area of land exposed to surface water and wind erosion" (MP page 3-52). Field trials are supported, however, the early commencement of field trials will be essential to ensure the results of the trials can be utilised to inform progressive rehabilitation. Additional lab scale and pilot testing is also recommended in relation to material characterisation and performance of the IWL materials prior to operations. The MP (Appendix 5 - Conceptual IWL Design for Rehab and Closure) includes a detailed list of Future Works (Section 5 - page 70). All items in the Future works list must be completed. It is recommended that strategies in regards to the design, construction and rehabilitation of the IWL, including the cover, are included in the sixth schedule of the lease.	DSD recommends that should a lease be granted the following outcomes be a requirement of Schedule 6 of the lease: Third party land user outcome - contamination and/or sediment: The Tenement Holder must during construction, operation and post-mine completion, ensure no impacts to agricultural productivity, including but not limited to; • reduction in crop yield; • reduction in grain quality; or • adverse health impacts to livestock; for third party land users on or off the Land as a result of contamination and/or sediments from mining operations, other than those agreed between the Tenement Holder and the affected user.				
82b		The Response Document (Appendix B) Issue 21 provides a discussion in relation to the IWL capacity. The IWL as designed in the MP has a capacity to hold 54% of the total waste/tailings. Extra zone A (an extension of the IWL) and zone B (in pit) have been proposed for extra storage capacity. It is recommended that strategies in regards to the capacity of the IWL, including the cover system, are included in the sixth schedule of the lease. The Response Document (Appendix B) Issue 22 provides a discussion in relation to the combined waste rock and tailing density and the impact of changes to density on IWL capacity. It is recommended that strategies in regards to the combined waste rock and tailings density of the IWL are included in the sixth schedule of the lease. The Response Document (Appendix B) Issue 23 provides a discussion on the importance of (i) particle size distribution and (ii) the mixing ratio of waste rock and filtered tailings on IWL stability. It is recommended that strategies in regard to these matters are included in the sixth schedule of the lease. The Response Document (Appendix B) Issues 25 and 27 provides a discussion on the importance of the tailings moisture content on IWL stability and the site water balance. It is recommended that strategies in regard to this matter are included in the sixth schedule of the lease. The Response Document (Appendix B) Issue 26 provides a discussion on the effectiveness of tailings dewatering equipment (thickeners and filters) to achieve the required tailings moisture content. It is recommended that strategies in regard to this matter are included in the sixth schedule of the lease.	DSD recommends that should a lease be granted the following be a requirement of Schedule 6 of the lease: The Tenement Holder is required to address the following matters for the purposes of Regulation 65(2)(c) in relation to the IWL third party land use outcomes: • Complete all future works listed in Section 5 of Appendix S of the Mining Proposal ("Conceptual Integrated Waste Landform Design for Rehabilitation and Closure - October 2015 (MWH")). • Characterisation of all materials to be used within the IWL and the cover system, including dispersive soils. • A program of testwork to determine the performance and properties (including (but not limited to) density and particle size distribution) of representative samples of the combined crushed waste rock and filtered tailings material (in the appropriate representative mixing ratios) that will be placed in the IWL. The results of the testwork are to inform the design of the IWL. • A program for determining the erodibility of the waste rock/tailings mix to ensure that no erodible waste rock/tailings mix is placed immediately underneath subsoil on external batters. The results of the program are to inform the design of the IWL. • The detailed waste, tailings and soil material balance is developed to ensure the capacity required by the IWL and in-pit dumps are accurately determined and that the amount of soil required for the cover system is accurately determined. • The design for the construction, operation and rehabilitation of in-pit dumps is based on (but not limited to) the technical information required by this lease clause and the design is demonstrated to be effective in achieving all relevant outcomes. • The design for the construction, operation and rehabilitation of the IWL is based on (but not limited to) the technical information required by this lease clause and the design is demonstrated to be effective in achieving all relevant outcomes. • The design, construction and maintenance of mine waste cover systems including, but not limited to, a detailed cover system design, construction methodology, cover system modelling and erosion modelling and provision of a program of works for field trials and collection of site specific data to validate/calibrate the model(s). • Field trials for rehabilitation and revegetation will commence as soon as practicable after commencement of operations. • Field trials for the cover system will commence as soon as practicable after commencement of operations. • Quality control arrangements for all stages of construction of the IWL and cover system, including supervision by appropriately qualified and experienced persons, documented procedures, quality control testing and record keeping. • Strategies for achieving and maintaining design tailings discharge densities, moisture content and IWL consolidation rates to ensure geotechnical stability of the IWL and timely construction of the IWL cover system. • Tailings discharge density and moisture content trigger limits and remedial actions to ensure design densities and moisture contents are achieved. The remedial actions must include strategies for managing the site water balance should the design tailings dewatering moisture				
83	No impacts to agricultural productivity for third party land users as a result of mining operations, including: • reduction in crop yield; • reduction in grain quality; or • adverse health impacts to livestock other than where agreed between the tenement holder and the affected user.	See assessment for PIM_13_04.	See assessment for PIM_13_04.	Monthly inspection confirms there is no visible sedimentation from runoff from the IWL outside the designated buffer. Should the crop productivity monitoring program (YieldProphetTM) be supported by surrounding landowners, then crop yields as determined by YieldProphet on properties within the proposed mining lease are comparable with control sites during construction, operation and closure of the mine, measured annually	See assessment for PIM_13_04.	Mine records demonstrate characterisation and placement on dispersive material is in accordance with IWL design specifications.	See assessment for PIM_13_04.
84	Rehabilitated IWL is stabilised so that erosion from landform slopes will not result in adverse impacts on productive land	See assessment for PIM_13_04.	See assessment for PIM_13_04.	Ecosystem Function Analysis at representative sites on rehabilitated areas demonstrates that rehabilitation will achieve sustainability thresholds. Landform modelling based on established integrated waste landform material parameters and geometry confirm alignment with outcomes from conceptual modelling. Independent audit at mine completion of quality assurance data confirms the IWL has been constructed to design specifications.	(5) DSD considers the proposed draft measurement criteria to be an appropriate measurement to demonstrate achievement of the proposed outcome. Assessment: Amendments to the criteria are required to ensure that it meets the requirements of Regulation 65(2)(d) and includes all of the required elements of criteria. DSD considers that there are methodologies that are appropriate to demonstrate achievement of the outcome. Should a lease be granted, the measurement criteria would be finalised in the PEPR submission.	None proposed	(6) Should a lease be granted, the requirement for a leading indicator criteria would be finalised in the PEPR.

DSD Assessment of Iron Road CEIP Impacts and Risks Register - December 2016

Line number	Proposed Outcome	DSD Assessment of Outcome, Strategies and Uncertainty	Recommended Regulatory Response - Outcomes and Strategies	Outcome measurement criteria	DSD Assessment of Draft Measurement Criteria	Leading indicator criteria (where required)	DSD Assessment of Leading Indicator Criteria
85	No adverse impacts on soil quality or quantity within the mining lease that could compromise the post mining land use	(2) The outcome appropriately states the level of impact subsequent to controls. An additional outcome is required to ensure no contamination of land and soils. (3) The outcome is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. Assessment: The MP (page 13-14 and 13-15) states the control and management strategies for soil and land quality, in particular for PAF and ASS. The MP Appendix S (Appendix E - Oxide Zone Geochemistry Review and IWL Management - Sept 2015 (MWH)) includes a detailed list of Actions (Section 5 - page 38). All items in the Action list must be completed. The MWH report also indicates that the majority of PAF material is located in the oxide zones which will be extracted at specific times within the mine plan (see MWH report Plate 3-8). Key strategies to prevent contamination of soils, particularly from PAF and ASS are as follows: • "Storage of PAF material will not occur in the top 10m layer of the IWL, to demonstrate that it is well buried in the landform. The IWL will be designed in accordance with the GARD Guide" (MP Page 19-33). • "Separation of PAF material from the outer zones of the IWL and containment in neutralising material (with more detailed measures to be identified in the PEPR and an IWL Plan)" (MP Page 13-15). • An ASS management plan As PAF material will be extracted at different times during the mine plan, the sequencing of PAF material into the IWL will be important to ensure that appropriate and effective encapsulation and/or co-disposal can occur. The method that PAF material will be blended with either NAF waste rock and Tails is also important. It is recommended that strategies in regards to the identification and management of ASS and PAF material are included in the sixth schedule of the lease.	(4) DSD recommends that should a lease be granted the following condition be a requirement of Schedule 2 of the lease: The extraction of NAF and PAF from the Land, and placement of NAF and PAF in the IWL must be audited by a suitably qualified independent expert approved by the Director of Mines (or other authorised officer) on a 3 monthly basis, or at a frequency as the Director of Mines (or other authorised officer) may specify by notice in writing. The expert must prepare a report of the findings of the audit and this report must be provided to the Director of Mines (or other authorised officer) within 1 month of completion of the audit. In accordance with section 70B(2)(d) of the Act it is a condition of the grant of the Mining Tenement that a proposed PEPR submitted in accordance with Part 10A of the Act must include reports from suitably qualified independent experts on the following matters: The effectiveness of the proposed strategies in the proposed PEPR achieving the environmental outcomes identified in the proposed PEPR, including but not limited to reports from: • An Independent Environmental Geochemist Expert (i.e.: for PAF material and metalliferous drainage management) DSD recommends that should a lease be granted the following outcomes be a requirement of Schedule 6 of the lease: The Tenement Holder must, ensure that: • There is no contamination of land and soils either on or off the Land as a result of mining operations; and • no contamination of land and soils either on or off the Land after mine completion occurs as a result of mining operations. The Tenement Holder must during construction, operation and post-mine completion ensure that the existing (pre-mining) soil quality and quantity is maintained.	Mine records demonstrate all areas of PAF and ASS encountered are appropriately contaminated/or treated	(5) DSD considers the proposed draft measurement criteria to be an inappropriate measurement to demonstrate achievement of the proposed outcome. Assessment: It is assessed that the word 'contaminated' in the draft criteria is an error and should read 'contained'. Amendments to the criteria are required to ensure that it meets the requirements of Regulation 65(2)(d) and includes all of the required elements of criteria. DSD considers that there are methodologies that are appropriate to demonstrate achievement of the outcome. Should a lease be granted, the measurement criteria would be finalised in the PEPR submission.	None proposed	(6) Should a lease be granted, the requirement for a leading indicator criteria would be finalised in the PEPR.
86			DSD recommends that should a lease be granted the following be a requirement of Schedule 6 of the lease: The Tenement Holder is required to address the following matters for the purposes of Regulation 65(2)(c) in relation to the contamination and soil outcomes: • Complete all Actions listed in Section 5 of Appendix S of the Mining Proposal ("Appendix E - Oxide Zone Geochemistry Review and IWL Management - Sept 2015 (MWH)"). • Determine a sulphur cut-off grade for PAF material through further testing for each waste unit. • Block modelling the sulphur distribution of all waste and ore to be mined for the purpose of determining the distribution and estimating the volume of NAF and PAF using the sulphur cut-off grade. • Integration of the sulphur model with the geological model to provide confidence in the definition of PAF boundaries, potential zones of high neutralising capacity and potential geological controls on mineralisation. • Procedures for regularly updating the models with new geological and sulphur assay data collected in the course of mine production operations. • Procedures for ensuring PAF and NAF boundaries derived from the sulphur cutoff and the sulphur block model are included in open pit bench plans. • Procedures for assaying the sulphur content of drill cuttings or excavated material, produced during the course of blast hole drilling or mining, for verifying PAF and NAF information against mine plans to provide a final check that all PAF and NAF materials have been correctly identified. • Procedures and recording systems for selective mining of the identified PAF and NAF materials and placement in accordance with the IWL design. • IWL designed and constructed for the selective placement of the total volume of PAF material with it effectively co-disposed with NAF and/or encapsulated by NAF. • A program for determining the erodibility of the waste rock/tailings mix to ensure that no erodible waste rock/tailings mix is placed immediately underneath subsoil on external batters. • IWL designed to ensure PAF material is not exposed as a result of potential open pit wall failure post mine completion. • Strategies included in any guidelines provided by the Director of Mines.				
88	NA	See assessment for PIM_13_07.	See assessment for PIM_13_07.	NA	See assessment for PIM_13_07.	NA	See assessment for PIM_13_07.
89	No adverse impacts on soil quality or quantity within the mining lease that could compromise the post mining land use	(2) The outcome appropriately states the level of impact subsequent to controls. The outcome statement requires minor amendment. (3) The outcome is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. Assessment: The MP (page 13-14) states the control and management strategies for soil and land quality and are appropriate. Some key strategies to ensure soil quality are as follows (refer to the full list in the MP): • Development of a soil management programme • "Soil stockpiled at a height of no greater than 2m to minimise compaction" (MP Page 13-14) • "The use of saline water for dust suppression during the stripping of topsoil containing native seedbanks will be avoided where practicable to preserve any native seedbank that may occur" (MP Page 13-14 and Page 3-23) The MP (page 3-28) states that "agricultural topsoil stockpile will be a maximum height of 10m" which is inconsistent with the strategies stated on page 13-14. It is recommended that strategies in regards to maintaining soil quality and quantity are included in the sixth schedule of the lease.	(4) DSD recommends that should a lease be granted the following outcome be a requirement of Schedule 6 of the lease: The Tenement Holder must during construction, operation and post-mine completion ensure that the existing (pre-mining) soil quality and quantity is maintained. DSD recommends that should a lease be granted the following be a requirement of Schedule 6 of the lease: The Tenement Holder is required to address the following matters for the purposes of Regulation 65(2)(c) in relation to the soil quality and quantity outcomes: • Strategies to achieve recovery of topsoil and subsoil from areas to be disturbed by mining operations. • Strategies for maintaining the quality and quantity of stockpiled soil/s until such time that it is used for rehabilitation purposes. • Strategies that take into consideration the optimal soil stockpile heights for achieving the soil outcomes. • Strategies for reinstatement of these soils so as to maximise the likelihood of achieving the soil outcomes. • An auditable record of soil movement including recovery, stockpiling and reinstatement. • Strategies for the establishment of post-mine completion land uses and areas, including the re-establishment of land for agriculture where practicable. • Progressive rehabilitation implemented for all domains as soon as practicable.	Annual audit of soil movement records shows no measurable decline in soil quality or quantity	(5) DSD considers the proposed draft measurement criteria to be an appropriate measurement to demonstrate achievement of the proposed outcome. Assessment: Amendments to the criteria are required to ensure that it meets the requirements of Regulation 65(2)(d) and includes all of the required elements of criteria. DSD considers that there are methodologies that are appropriate to demonstrate achievement of the outcome. Should a lease be granted, the measurement criteria would be finalised in the PEPR submission.	None proposed	(6) Should a lease be granted, the requirement for a leading indicator criteria would be finalised in the PEPR.
89a	No adverse impacts on soil quality or quantity within the mining lease that could compromise the post mining land use	See assessment for PIM_13_09.	See assessment for PIM_13_09.	Ecosystem Function Analysis (or similar) demonstrate progress towards achieving closure criteria	(5) DSD considers the proposed draft measurement criteria to be an appropriate measurement to demonstrate achievement of the proposed outcome. Assessment: Additional or alternative measurement criteria could be adopted for this completion outcome. Amendments to the criteria are required to ensure that it meets the requirements of Regulation 65(2)(d) and includes all of the required elements of criteria. DSD considers that there are methodologies that are appropriate to demonstrate achievement of the outcome. Should a lease be granted, the measurement criteria would be finalised in the PEPR submission.	None proposed	(6) Should a lease be granted, the requirement for a leading indicator criteria would be finalised in the PEPR.
90	NA	(2) A new outcome is required (see the regulatory response). (3) The outcome is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. Assessment: The MP (page 21-17 and Figures 21-4 and 21-5) summarise the assessment for impacts to land use from shading from the IWL. The impact assessment shows that shading will have impact the amount of sunlight available to properties adjacent to the IWL (both on and off the proposed lease). For PIM_21_06: The environmental outcome proposed by Iron Road for 'off lease impacts' commits to 'no impacts to agricultural productivity, including, crop yield, grain quality and livestock' other than those impacts agreed with the affected users. This outcome is appropriate and achievable given that any impact must be agreed with affected users. The 'IWL design' has been stated by Iron Road as a key control strategy. As the IWL progresses from a conceptual design to a detailed design, it is recommended that shading be further considered. A sixth schedule lease condition is recommended in regards to shading.	(4) DSD recommends that should a lease be granted the following outcomes be a requirement of Schedule 6 of the lease: Third party land user outcome - Shading: The Tenement Holder must during construction, operation and post-mine completion, ensure no impacts to agricultural productivity, including but not limited to; • reduction in crop yield; • reduction in grain quality; or • adverse health impacts to livestock; for third party land users on or off the Land as a result of shading from mining operations, other than those agreed between the Tenement Holder and the affected user. DSD recommends that should a lease be granted the following be a requirement of Schedule 6 of the lease: The Tenement Holder is required to address the following matters for the purposes of Regulation 65(2)(c) of the Regulations in relation to the third party land use outcomes; • Develop strategies for the design of the IWL to ensure impacts from shading to agricultural productivity for third party land users on or off the		(5) The measurement of crop yield and quality is appropriate as this directly measures the impact on the receptor. DSD considers that there are methodologies that are appropriate to demonstrate achievement of the outcome. Should a lease be granted, the measurement criteria would be finalised in the PEPR submission.		(6) Should a lease be granted, the requirement for a leading indicator criteria would be finalised in the PEPR.
92	Designated rehabilitation sites are established self sustaining systems.	(2) The proposed outcome statement is a strategy. A new outcome is required to accurately reflect the receptor (which is soil quality and ultimately the future land use). (3) The outcome is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. Assessment: The MP (page 13-14) states the control and management strategies for soil and land quality. The following strategies are proposed within the impact assessment table, "Soil management plans, deep ripping of soil for rehabilitation and monitor success of revegetation on treated areas".	(4) DSD recommends that should a lease be granted the following outcome be a requirement of Schedule 6 of the lease: The Tenement Holder must ensure that the Land is progressively and finally rehabilitated to support the future land use.	Ecosystem Function Analysis (or similar) of rehabilitation areas demonstrates they will achieve critical thresholds for sustainability	(5) DSD considers the proposed draft measurement criteria to be an appropriate measurement to demonstrate achievement of the proposed outcome. Assessment: Amendments to the criteria are required to ensure that it meets the requirements of Regulation 65(2)(d) and includes all of the required elements of criteria. DSD considers that there are methodologies that are appropriate to demonstrate achievement of the outcome. Should a lease be granted, the measurement criteria would be finalised in the PEPR submission.	None proposed	(6) Should a lease be granted, the requirement for a leading indicator criteria would be finalised in the PEPR.
93	No adverse impacts on soil quality or quantity within the mining lease that could compromise the post mining land use	(2) The outcome appropriately states the level of impact subsequent to controls. An additional outcome is required to ensure no contamination of land and soils. (3) The outcome is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. Assessment: The MP (page 13-14 and 13-15) states the control and management strategies for soil and land quality, in particular for the storage and handling of hydrocarbons and chemicals, and are appropriate.	(4) DSD recommends that should a lease be granted the following outcomes be a requirement of Schedule 6 of the lease: The Tenement Holder must, ensure that: • There is no contamination of land and soils either on or off the Land as a result of mining operations; and • no contamination of land and soils either on or off the Land after mine completion occurs as a result of mining operations. The Tenement Holder must during construction, operation and post-mine completion ensure that the existing (pre-mining) soil quality and quantity is maintained.	All chemical and hydrocarbon spills greater than 20 L are remediated to meet EPA standards within 48 hours of the spill, or a longer time agreed by the Director of Mines	(5) DSD considers the proposed draft measurement criteria to be an appropriate measurement to demonstrate achievement of the proposed outcome. Additional measurement criteria addressing soil and site contamination may be required to support ensuring the mine site is not contaminated at mine completion. Assessment: Measurement criterion measures the appropriate response to a contamination incident. Performance is measured by ensuring remediation occurs. DSD considers that there are methodologies that are appropriate to demonstrate achievement of the outcome. Should a lease be granted, the measurement criteria would be finalised in the PEPR submission.	None proposed	(6) Should a lease be granted, the requirement for a leading indicator criteria would be finalised in the PEPR.
94	NA	No Outcome required.	No Outcome required.	NA	No Outcome required.	NA	No Outcome required.

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Line number	Proposed Outcome	DSD Assessment of Outcome, Strategies and Uncertainty	Recommended Regulatory Response - Outcomes and Strategies	Outcome measurement criteria	DSD Assessment of Draft Measurement Criteria	Leading indicator criteria (where required)	DSD Assessment of Leading Indicator Criteria
95	No adverse impacts on soil quality or quantity within the mining lease that could compromise the post mining land use	(2) The outcome appropriately states the level of impact subsequent to controls. The outcome statement requires minor amendment. (3) The outcome is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. Assessment: The MP (page 13-14) states the control and management strategies for soil and land quality and are appropriate. Some key strategies to ensure soil quantity are as follows (refer to the full list in the MP): • Development of a soil management programme • Stockpiles located away from surface water flows and trafficked areas • Vegetation cover over stockpiles maintained (where soil cannot be immediately reused) • Topsoil inventory developed and maintained • Progressive rehabilitation and progressive use of soils It is recommended that strategies in regards to maintaining soil quality and quantity are included in the sixth schedule of the lease.	~~(3) DSD recommends that should a lease be granted the following outcome be a requirement of Schedule 6 of the lease:~~ The Tenement Holder must during construction, operation and post-mine completion ensure that the existing (pre-mining) soil quality and quantity is maintained. DSD recommends that should a lease be granted the following be a requirement of Schedule 6 of the lease: The Tenement Holder is required to address the following matters for the purposes of Regulation 65(2)(c) in relation to the soil quality and quantity outcomes: • Strategies to achieve recovery of topsoil and subsoil from areas to be disturbed by mining operations. • Strategies for maintaining the quality and quantity of stockpiled soil/s until such time that it is used for rehabilitation purposes. • Strategies that take into consideration the optimal soil stockpile heights for achieving the soil outcomes. • Strategies for reinstatement of these soils so as to maximise the likelihood of achieving the soil outcomes. • An auditable record of soil movement including recovery, stockpiling and reinstatement. • Strategies for the establishment of post-mine completion land uses and areas, including the re-establishment of land for agriculture where practicable. • Progressive rehabilitation implemented for all domains as soon as practicable.	Annual audit of soil movement records shows no measurable decline in soil quality or quantity	(5) DSD considers the proposed draft measurement criteria to be an appropriate measurement to demonstrate achievement of the proposed outcome. Assessment: Additional or alternative measurement criteria could be adopted for this outcome. Amendments to the criteria are required to ensure that it meets the requirements of Regulation 65(2)(d) and includes all of the required elements of criteria. DSD considers that there are methodologies that are appropriate to demonstrate achievement of the outcome. Should a lease be granted, the measurement criteria would be finalised in the PEPR submission.	None proposed	(6) Should a lease be granted, the requirement for a leading indicator criteria would be finalised in the PEPR.
96	Wastes are managed in accordance with EPA licence requirements	(2) The outcome statement is a management strategy and does not appropriately state the level of impact. The outcome statement requires amendment to reflect that commercial or industrial waste from the mine site must be disposed of in an EPA licensed facility. The management of the waste capacity at the Wudinna Landfill site does not require an outcome under the Mining Act. (3) The outcome is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. Assessment: DSD supports the strategies proposed by Iron Road to ensure that the capacity for waste management at EPA Licenced facilities on the Eyre Peninsula are planned to meet future demand. DSD notes the following strategies: "Existing landfill zone has sufficient area for expansion" and Iron Road propose to "Monitor volumes of wastes produced and recycled to ensure capacity maintained". DSD also notes that page 14-9 of the MP includes a detailed assessment of the capacity of the Wudinna Landfill site. The results of this assessment indicate that the mine impact will reduce the capacity of the site from 70 years to 55 years.	(4) DSD recommends that should a lease be granted the following outcome be a requirement of Schedule 6 of the lease: The Tenement Holder must ensure that all commercial or industrial waste (which does not include tailings and waste rock) is disposed of in an EPA licensed facility.	Internal review confirms licence conditions are being met	(5) DSD considers the proposed draft measurement criteria to be an inappropriate measurement to demonstrate achievement of the proposed outcome. Assessment: An internal review confirming licence conditions are being met will not demonstrate achievement of the outcome. The draft criteria does not meet the requirements of Regulation 65(2)(d) which specifies the five elements of criteria. The following measurement criteria could be adopted for the outcome: "Receipts for the disposal of all Waste from the site are retained in the mine site records system, and demonstrate that all commercial or industrial waste (including contaminated soil) within the tenement was disposed of offsite in accordance with Environment Protection Act 1993 requirements". DSD considers that there are methodologies that are appropriate to demonstrate achievement of the outcome. Should a lease be granted, the measurement criteria would be finalised in the PEPR submission.	None proposed	(6) Should a lease be granted, the requirement for a leading indicator criteria would be finalised in the PEPR.
97	NA- Benefit	No Outcome required.	No Outcome required.		No Outcome required.		No Outcome required.
98	No adverse impacts on soil quality within the mining lease that could compromise the post mining land use	(2) The outcome appropriately states the level of impact subsequent to controls, ie: no adverse impacts on soil quality. The inclusion of the post mining land use in this outcome is not appropriate in relation to this impact event. Future land use will be addressed through other impact events. (3) The outcome is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. Assessment: Control and Management strategies for waste disposal and management are provided on page 14-7 of the MP.	(4) DSD recommends that should a lease be granted the following outcomes be a requirement of Schedule 6 of the lease: The Tenement Holder must, ensure that: • There is no contamination of land and soils either on or off the Land as a result of mining operations; and • no contamination of land and soils either on or off the Land after mine completion occurs as a result of mining operations.	All chemical and hydrocarbon spills greater than 20 L are remediated to meet EPA standards within 48 hours of the spill, or a longer time agreed by the Director of Mines Existing contaminated sites are remediated or treated to EPA standards within 14 days of their identification, or within a timeframe agreed by the Director of Mines.	(5) DSD considers the proposed draft measurement criteria to be an appropriate measurement to demonstrate achievement of the proposed outcome. Additional measurement criteria addressing soil and site contamination may be required to support ensuring the mine site is not contaminated at completion. Assessment: Measurement criterion measures the appropriate response to introduction of pollutant/contaminant to the pathway. Performance is measured by ensuring remediation occurs. DSD considers that there are methodologies that are appropriate to demonstrate achievement of the outcome. Should a lease be granted, the measurement criteria would be finalised in the PEPR submission.	None proposed	(6) Should a lease be granted, the requirement for a leading indicator criteria would be finalised in the PEPR.
99	No public nuisance impacts from dust generated by construction, mining or closure or post closure activities.	(2) The outcome appropriately states the level of impact subsequent to controls. The outcome statement requires minor amendment. (3) The outcome is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. Assessment: The MP (page 15-13) proposes control and management strategies for potential air quality impacts. The Iron Road Impact Assessment Table (MP Appendix C) also proposes control strategies. The following is a summary of key strategies (see the MP for a full list): • All dust-generating material covered when being transported to and from the construction site. • Regular use of water sprays or suitable chemical wetting agent on susceptible earthen material loads, active stockpiles, particularly during dry or windy conditions (otherwise use covers where appropriate). • Vegetation retained on site where possible and rehabilitation of vegetation to occur as soon as practicable. Progressive rehabilitation of the integrated waste landform undertaken during the life of the mine. • Use of water trucks or chemical wettings agents where appropriate on unpaved roads or other exposed areas. • Should visible air quality impacts be clearly observed (e.g. visible dust plumes being emitted off-site), relevant work activities would be reduced or ceased to stop the impacts and alternative work methods implemented. • Monitoring programme to confirm compliance with the air quality criteria for the project. • Warnings or exceedance alarms from real-time dust monitoring at selected sites around the proposed mine site • Active operation control informed by the air quality monitoring programme to manage dust emissions within the air quality criteria. • Continuous meteorological monitoring at the Warramboo site with telemetry capable equipment linked to a real-time reporting system that will be available on a public internet site. The proposed control strategies are assessed to be effective in demonstrating achievement of the outcome.	(4) DSD recommends that should a lease be granted the following outcome be a requirement of Schedule 6 of the lease: The Tenement Holder must during construction, operation and post-mine completion ensure no public nuisance impacts from air emissions and/or dust generated by mining operations. DSD recommends that should a lease be granted the following be a requirement of Schedule 6 of the lease: The Tenement Holder is required to address the following matters for the purposes of Regulation 65(2)(c) in relation to the air quality nuisance outcome; • Progressive rehabilitation and stabilisation of disturbed areas undertaken throughout the life of mine to control dust emissions generated by wind erosion. • Undertake continuous dust and meteorological monitoring to inform decisions for operational response and contingency measures to be implemented to prevent exceedance of compliance criteria. • In the event that monitoring shows the air quality measurement criteria, has been breached, the Tenement Holder must immediately cease the activity that resulted in the breach.	Long term - compliance with the ~~EPA adopted criteria for~~ annual average dust deposition to [DSD: this should read "not exceed"] exceed 4 g/m2/month and no more than 2 g/m2/month above background. Short term – all dust complaints acknowledged and recorded immediately and closed out within 14 days to the satisfaction of the complainant or as agreed with the Director of Mines.	(5) DSD considers the proposed draft criteria to be an inappropriate measurement to demonstrate achievement of the proposed outcome. The reference to the EPA in the criteria is incorrect and does not reflect EPA's position. DSD considers that there are methodologies that are appropriate to demonstrate achievement of the outcome. Should a lease be granted, the measurement criteria would be finalised in the PEPR submission. Assessment: Iron road has committed to including background/ambient dust measurements in addition to mine dust contributions in all measurements that are taken for compliance purposes. This is supported by DSD and recommended to be included as a requirement of the sixth schedule of the lease. PIM_15_01, PIM_15_02 and PIM_15_03 are impact events that relate to visual amenity impacts from dust. The receptor for these impact events is 'visual amenity for the public'. Iron road proposes an annual average of Dust Deposition as the long term criteria for this impact event. Dust deposition is a measure of the amount of dust that has been deposited at ground level over a given time period. Dust deposition is not a direct measure of the concentration of visible dust in the atmosphere. An appropriate measurement of visual amenity impacts from dust would be to directly measure the source of the impact, that is, the concentration of visible dust in the air. The proposal to use an 'annual average' as the criteria is inappropriate as this frequency of measurement does not reflect that nuisance and amenity impacts are likely to occur on much shorter time frames. Iron road states that the pathway for this impact event is "Airborne emissions (TSP)". The MP (page 15-2, Table 15-3) states that Iron Road had originally proposed to adopt the measurement of TSP for their nuisance dust criteria (also supported by Jacobs in the MP Appendix K, page 24, Table 3-2). In Iron Roads response document, their commitment to adopt TSP as a measurement criteria for nuisance dust was retracted with the following statement; "there being no direct relationship between annual average or even 24 hour TSP GLCs and nuisance dust impacts" (Response Document Attachment B page 30). Iron Road go on to say "in fact, most dust emission events that cause a complaint occur over timeframes of minutes, not hours or days. No scientific evidence supporting the use of TSP measurements to manage nuisance dust has been provided to Iron Road via their expert consultants or from any Government agency. Whilst TSP is of some use for impact assessment modelling, it is of no use for ongoing compliance monitoring" (Response Document Attachment B page 30). Iron road also state that their "previous commitment to an investigation into correlations between PM10 and TSP is being with-drawn as this would not assist management of nuisance dust or human health" (Response Document Attachment B page 30). DSD disagrees with this position and recommends that a correlation between PM10 and TSP be developed through operational	A Trigger Action Response Plan (TARP) to be implemented which will include continuous PM10 (multiple sites) and TSP (Warramboo) monitoring to mitigate any short term amenity/nuisance potential impacts. Iron Roads Response document states that their "previous commitment to an investigation into correlations between PM10 and TSP is being with-drawn as this would not assist management of nuisance dust or human health" (Response Document Attach B page 30). Iron Road new proposed Leading criteria from their response document is: "A TARP to be implemented which will include continuous PM10 (multiple sites) monitoring to provide an indicator of any short term amenity/nuisance potential impacts even though the measurement of PM10 is for the purpose of health protection. in addition, a network of live streaming cameras will be mounted at strategic locations to visually monitor potentially dust generating activities which will provide instantaneous feedback to operators and transparent information for government regulators and the	(6) DSD considers that there is a high level of reliance on control strategies to ensure achievement of the outcome, hence, leading indicator criteria is required. Assessment: See the discussion against the Measurement Criteria in regards to the appropriateness of using PM10 as leading indicator for the nuisance outcome. A TARP is an appropriate leading indicator criteria. The TARP should include the following: - definition of appropriate measurement trigger levels (the leading criteria) - selection of appropriate trigger timeframes/frequencies to provide adequate time for additional controls to be implemented to ensure the measurement criteria is not triggered - appropriate controls/actions at each trigger level - if PM10 is proposed as a proxy for nuisance impacts, demonstrate that there is a correlation between PM10 and nuisance impacts. - The location of monitoring sites
99a					Iron Road has not provided any scientific evidence to support the use of dust deposition as a measurement to determine the visual amenity impacts from dust. DSD considers that TSP measurements would be a more appropriate measure for the following reasons; (1) it was originally proposed by Iron Road in the mining proposal; (2) it is a direct measure of the source of the impact, that is the concentration of visual dust in the air; and (3) it can be continuously measured at time intervals of less than 10 minutes which aligns to the timeframes that visual impacts are likely to occur over. Dust deposition does not have these measurement attributes. PIM_15_15 and PIM_15_16 are impact events for dust deposition on public amenity. For these impact events, dust deposition is the source and mechanism for the impact. Examples of such impacts are dust deposition on: cars, houses, clothes washing, verandahs, outdoor furniture etc. For these impact events, dust deposition is an appropriate measurement criteria, however, an 'annual average' is inappropriate as previously discussed. Complaints are not an effective methodology for the measurement of short term nuisance impacts. Where practicable, criteria must be quantitative, not qualitative (See Mining Regulations 2011 - Section 65(6)). The potential nuisance impacts to human receptors will occur over short time periods, ie: over minutes, hours and days. Hence, an appropriate criteria must include quantitative measurements over a short time period / frequency. In the Response Document, Iron Road has proposed to use PM10 as a leading indicator measurement for nuisance impacts from dust (including visual amenity). Iron Road has provided no scientific evidence to support that PM10 measurements are appropriate to demonstrate nuisance or visual amenity impacts from dust. PM10 instruments measure the concentration of PM10 dust in a volume of air. PM10 is a fraction of dust that has a particle size that is not visible to the human eye, hence, it is questioned how the measurement of PM10 concentration could be a "direct" demonstration of visual amenity impacts from dust. DSD supports the use of PM10 concentration as a "proxy" measurement for nuisance and visual amenity impacts, however, the relationship between PM10 and nuisance and visual amenity impacts must be verified by technical scientific evidence. Iron road are also proposing visual monitoring of dust using video cameras. DSD supports this methodology for leading indicator criteria for nuisance/visual impacts from dust. DSD supports further technical investigations into if video camera measurements could be adopted for measurement criteria.		

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Line number	Proposed Outcome	DSD Assessment of Outcome, Strategies and Uncertainty	Recommended Regulatory Response - Outcomes and Strategies	Outcome measurement criteria	DSD Assessment of Draft Measurement Criteria	Leading indicator criteria (where required)	DSD Assessment of Leading Indicator Criteria
99b					The definition of measurement criteria is that it must demonstrate achievement of the environmental outcome and comply with all elements of Regulation 65(2)(d) and Regulation 65(6). DSD is supportive of one, all, or a combination of the following as criteria; Total suspended particulate matter (TSP), Total Dust Deposition (TDD), Directional Dust Deposition (DDD), Particulate Matter 10micron (PM10); with the provision that the measurement criteria (including all aspects of Regulation 65(2)(d)) are based on technical scientific evidence (relevant to the mine site) which demonstrates achievement of the outcome. DSD recommends that requirements be included in the sixth schedule of the lease in relation to measurement criteria. <u>DSD recommends that should a lease be granted the following criteria be a requirement of Schedule 6 of the lease:</u> The Tenement Holder is required to address the following matters for the purposes of Regulation 65(2)(d) in relation to the air quality nuisance outcome; • The measurement criteria adopted for the air quality nuisance outcome must include one or more of the following: · Measurement of Total Dust Deposition (including both ambient and mine related dust) (TDD) using monitoring methodology, equipment and instruments that are recognised by a relevant International or Australian Standard. · TDD leaving the site does not exceed 4g/m2/month and no more than 2 g/m2/month above background. · Measurement of TSP using monitoring equipment and instruments that are recognised by a relevant International or Australian Standard. · An appropriate TSP 24 hour average and annual average concentration is developed and applied to the criteria for the air quality nuisance outcome. · Directional Dust Deposition (including both ambient and mine related dust) (DDD) is to be measured using monitoring equipment and instruments that are recognised by a relevant International or Australian Standard. • The measurement criteria adopted (including all aspects of Regulation 65(2)(d)) are based on technical scientific evidence which demonstrates achievement of the outcome. • The Tenement Holder must undertake meteorological monitoring in accordance with relevant Australian standards to measure and record meteorological data including (but not limited to) wind speed and direction, temperature, humidity, atmospheric pressure, solar radiation, rainfall and evaporation. • The Tenement Holder must ensure that all adopted measurement criteria (TSP, TDD, DDD and/or PM10) and meteorological monitoring data acquired by the Tenement Holder is reported in real time to the public on an unrestricted internet site. The monitoring data must be retained and remain accessible on the unrestricted internet site for the life of the mine.		
100	No public nuisance impacts from dust generated by construction, mining or closure or post closure activities.	The outcomes and requirements for PIM_15_01 also apply to PIM_15_02.	The outcomes and requirements for PIM_15_01 also apply to PIM_15_02.	Long term - compliance with the EPA adopted criteria for annual average dust deposition to exceed 4 g/m2/month and no more than 2 g/m2/month above background. Short term – all dust complaints acknowledged and recorded immediately and closed out within 14 days to the satisfaction of the complainant or as agreed with the Director of Mines.	The outcomes and requirements for PIM_15_01 also apply to PIM_15_02.	A Trigger Action Response Plan (TARP) to be implemented which will include continuous PM10 (multiple sites) and TSP (Warramboo) monitoring to mitigate any short term amenity/nuisance potential impacts.	The outcomes and requirements for PIM_15_01 also apply to PIM_15_02.
101	No public nuisance impacts from dust generated by construction, mining or closure or post closure activities.	The outcomes and requirements for PIM_15_01 also apply to PIM_15_03.	The outcomes and requirements for PIM_15_01 also apply to PIM_15_03.	Long term - compliance with the EPA adopted criteria for annual average dust deposition to exceed 4 g/m2/month and no more than 2 g/m2/month above background. Short term – all dust complaints acknowledged and recorded immediately and closed out within 14 days to the satisfaction of the complainant or as agreed with the Director of Mines.	The outcomes and requirements for PIM_15_01 also apply to PIM_15_03.	A Trigger Action Response Plan (TARP) to be implemented which will include continuous PM10 (multiple sites) and TSP (Warramboo) monitoring to mitigate any short term amenity/nuisance potential impacts.	The outcomes and requirements for PIM_15_01 also apply to PIM_15_03.
102	No loss of productivity on properties surrounding the mine site from dust generated by construction, mining, closure or post closure activities, without independent verification and timely compensation.	(2) The outcome appropriately states the level of impact subsequent to controls. The outcome statement requires amendment to accurately describe the receptors. The reference to timely compensation and independent verification is not appropriate in an outcome statement. (Note: S61 of the Mining Act 1971 provides a mechanism for compensation for impacts as a result of mining operations). (3) The outcome is achievable given the proposed controls and identified assumptions and uncertainty. Assessment: The MP (page 15-13) proposes control and management strategies for potential air quality impacts. The Iron Road Impact Assessment Table (MP Appendix C) also proposes control strategies. In addition to the control strategies listed against PIM_15_01, the following is a summary of additional key strategies (see the MP for a full list): • Productive land monitoring (to be developed with landholders and Minnipa research centre). • AQ Monitoring during construction and operation to verify results of modelling. The proposed control strategies are assessed to be effective in demonstrating achievement of the outcome. The MP (page 15-33) provides an assessment of the potential impacts from dust on agriculture. In this section Iron Road details their intention to support a program for the monitoring of crop yields (YieldProphetTM). In addition, "Iron Road is considering a partnership with the Minnipa Agricultural Centre for a research project that determines the locally grown wheat species tolerance to dust and saline aerosols, despite air quality concentration predictions being below potential problem levels." The MP Appendix K (Background Air Quality Monitoring - 13 October 2015 - Jacobs) includes an assessment of potential salt deposition as a result of mining operations. DSD assesses that this assessment is appropriate.	<u>(4) DSD recommends that should a lease be granted the following outcomes be a requirement of Schedule 6 of the lease:</u> <u>Third party land user outcome - Air Quality:</u> The Tenement Holder must during construction, operation and post-mine completion, ensure no impacts to agricultural productivity, including but not limited to; • reduction in crop yield; • reduction in grain quality; or • adverse health impacts to livestock; for third party land users on or off the Land as a result of dust generated by mining operations, other than those agreed between the Tenement Holder and the affected user. <u>DSD recommends that should a lease be granted the following be a requirement of Schedule 6 of the lease:</u> The Tenement Holder is required to address the following matters for the purposes of Regulation 65(2)(c) in relation to the third party land use outcomes for air quality; • Progressive rehabilitation and stabilisation of disturbed areas undertaken throughout the life of mine to control dust emissions generated by wind erosion. • Undertake continuous dust and meteorological monitoring to inform decisions for operational response and contingency measures to be implemented to prevent exceedance of compliance criteria. • In the event that monitoring shows the air quality measurement criteria, has been breached, the Tenement Holder must immediately cease the activity that resulted in the breach.	Average annual dust deposition not to exceed 4 g/m2/month and no more than 2 g/m2/month above background. As per the Mining Act, compensation is duly paid to any loss (confirmed by an independent expert) of productivity of agricultural yields as a result of dust and/or saline aerosols from construction, operations and closure activities.	(5) DSD considers the proposed draft measurement criteria to be an inappropriate measurement to demonstrate achievement of the proposed outcome. DSD considers that there are methodologies that are appropriate to demonstrate achievement of the outcome. Should a lease be granted, the measurement criteria would be finalised in the PEPR submission. Assessment: The reference to compensation in a measurement criteria is not appropriate (note: S61 of the Mining Act 1971 provides a mechanism for compensation for impacts as a result of mining operations). Iron Road has conducted a literature review to investigate appropriate dust deposition compliance criteria that can be used to demonstrate achievement of the air quality agricultural productivity outcome. Measurement of dust deposition can be used as an appropriate methodology for this outcome, however, the dust deposition measurement criteria adopted (including all aspects of Regulation 65(2)(d)) must be based on technical scientific evidence. DSD supports Iron Roads investigations into the measurement of crop yields and productivity. The measurement of crop yields and productivity would be a more appropriate method for this measurement criteria as it directly measures the impact on the receptor. The definition of measurement criteria is that it must demonstrate achievement of the environmental outcome and comply with all elements of Regulation 65(2)(d) and Regulation 65(6). <u>DSD recommends that should a lease be granted the following criteria be a requirement of Schedule 6 of the lease:</u> The Tenement Holder is required to address the following matters for the purposes of Regulation 65(2)(d) in relation to the air quality third party land use outcome; • The measurement criteria adopted (including all aspects of Regulation 65(2)(d)) are based on technical scientific evidence which demonstrates achievement of the outcome. • The Tenement Holder must ensure that all adopted measurement criteria and meteorological monitoring data acquired by the Tenement Holder is reported in real time to the public on an unrestricted internet site. The monitoring data must be retained and remain accessible on the unrestricted internet site for the life of the mine.	A TARP to be implemented which will include monthly dust deposition from mining activities. Should a crop productivity monitoring program, such as YieldProphetTM or the like, be supported by surrounding landowners, then crop yields on properties within the proposed mine site are comparable with control sites during construction, operation and closure of the mine, measured annually.	(6) DSD considers that there is a high level of reliance on control strategies to ensure achievement of the outcome, hence, leading indicator criteria is required. Assessment: The measurement of crop productivity is supported, however, it should be used as the measurement criteria as well as the leading indicator criteria. A TARP is an appropriate leading indicator criteria. The TARP should include the following: - definition of appropriate measurement trigger levels (the leading criteria) - selection of appropriate trigger timeframes/frequencies to provide adequate time for additional controls to be implemented to ensure the measurement criteria is not triggered - appropriate controls/actions at each trigger level - if dust deposition is proposed as a proxy for agricultural impacts, further demonstration is required that there is a correlation between dust deposition and agricultural impacts. - The location of monitoring sites
103	No loss of productivity on properties surrounding the mine site from dust generated by construction, mining, closure or post closure activities, without independent verification and timely compensation.	The outcomes and requirements for PIM_15_04 also apply to PIM_15_05.	The outcomes and requirements for PIM_15_04 also apply to PIM_15_05.	Average annual dust deposition not to exceed 4 g/m2/month and no more than 2 g/m2/month above background. As per the Mining Act, compensation is duly paid to any loss (confirmed by an independent expert) of productivity of agricultural yields as a result of dust and/or saline aerosols from construction, operations and closure activities.	The outcomes and requirements for PIM_15_04 also apply to PIM_15_05.	A TARP to be implemented which will include monthly dust deposition from mining activities. Should a crop productivity monitoring program, such as YieldProphetTM or the like, be supported by surrounding landowners, then crop yields on properties within the proposed mine site are comparable with control sites during construction, operation and closure of the mine, measured annually.	The outcomes and requirements for PIM_15_04 also apply to PIM_15_05.
104	No loss of productivity on properties surrounding the mine site from dust generated by construction, mining, closure or post closure activities, without independent verification and timely compensation.	The outcomes and requirements for PIM_15_04 also apply to PIM_15_06.	The outcomes and requirements for PIM_15_04 also apply to PIM_15_06.	Average annual dust deposition not to exceed 4 g/m2/month and no more than 2 g/m2/month above background. As per the Mining Act, compensation is duly paid to any loss (confirmed by an independent expert) of productivity of agricultural yields as a result of dust and/or saline aerosols from construction, operations and closure activities.	The outcomes and requirements for PIM_15_04 also apply to PIM_15_06.	A TARP to be implemented which will include monthly dust deposition from mining activities. Should a crop productivity monitoring program, such as YieldProphetTM or the like, be supported by surrounding landowners, then crop yields on properties within the proposed mine site are comparable with control sites during construction, operation and closure of the mine, measured annually.	The outcomes and requirements for PIM_15_04 also apply to PIM_15_06.
105	No loss of productivity on properties surrounding the mine site from dust generated by construction, mining, closure or post closure activities, without independent verification and timely compensation.	The outcomes and requirements for PIM_15_04 also apply to PIM_15_07.	The outcomes and requirements for PIM_15_04 also apply to PIM_15_07.	Average annual dust deposition not to exceed 4 g/m2/month and no more than 2 g/m2/month above background. As per the Mining Act, compensation is duly paid to any loss (confirmed by an independent expert) of productivity of agricultural yields as a result of dust and/or saline aerosols from construction, operations and closure activities.	The outcomes and requirements for PIM_15_04 also apply to PIM_15_07.	A TARP to be implemented which will include monthly dust deposition from mining activities. Should a crop productivity monitoring program, such as YieldProphetTM or the like, be supported by surrounding landowners, then crop yields on properties within the proposed mine site are comparable with control sites during construction, operation and closure of the mine, measured annually.	The outcomes and requirements for PIM_15_04 also apply to PIM_15_07.
106	No loss of productivity on properties surrounding the mine site from dust generated by construction, mining, closure or post closure activities, without independent verification and timely compensation.	The outcomes and requirements for PIM_15_04 also apply to PIM_15_08. Note: Progressive rehabilitation and construction of the cover system after consolidation of the IWL will be critical control strategy to ensure achievement of this completion outcome.	The outcomes and requirements for PIM_15_04 also apply to PIM_15_08. Note: Progressive rehabilitation is included as a requirement for the lease against PIM_15_04.	Average annual dust deposition not to exceed 4 g/m2/month and no more than 2 g/m2/month above background. As per the Mining Act, compensation is duly paid to any loss (confirmed by an independent expert) of productivity of agricultural yields as a result of dust and/or saline aerosols from construction, operations and closure activities.	The outcomes and requirements for PIM_15_04 also apply to PIM_15_08. Note: The completion measurement criteria will need to be different from the operational measurement criteria, in particular the frequency of the measurement. Should a lease be granted, the completion measurement criteria would be finalised in the PEPR submission.	A TARP to be implemented which will include monthly dust deposition from mining activities. Should a crop productivity monitoring program, such as YieldProphetTM or the like, be supported by surrounding landowners, then crop yields on properties within the proposed mine site are comparable with control sites during construction, operation and closure of the mine, measured annually.	The outcomes and requirements for PIM_15_04 also apply to PIM_15_08.

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Line number	Proposed Outcome	DSD Assessment of Outcome, Strategies and Uncertainty	Recommended Regulatory Response - Outcomes and Strategies	Outcome measurement criteria	DSD Assessment of Draft Measurement Criteria	Leading indicator criteria (where required)	DSD Assessment of Leading Indicator Criteria
107	No loss of abundance or diversity of native vegetation on or off the lease during construction, operation and post mine completion through; • clearance, • dust/contaminant deposition, • fire, • reduction in water supply • salinisation, or • other damage, unless prior approval under the relevant legislation is obtained.	(2) The outcome appropriately states the level of impact subsequent to controls. (3) The outcome is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. Assessment: Standard industry strategies to ensure all clearance of native vegetation is authorised are well established. The MP (page 15-13) proposes control and management strategies for potential air quality impacts. The Iron Road Impact Assessment Table (MP Appendix C) also proposes control strategies.	(4) DSD recommends that should a lease be granted the following outcome be a requirement of Schedule 6 of the lease: The Tenement Holder must during construction, operation and post-mine completion, ensure no loss of abundance or diversity of native vegetation on or off the Land through; • clearance, • dust/contaminant deposition, • fire, • reduction in water supply • salinisation, or • other damage, unless a significant environmental benefit has been approved in accordance with the relevant legislation.	Average annual dust deposition not to exceed 4 g/m2/month and no more than 2 g/m2/month above background.	(5) DSD considers the proposed draft measurement criteria to be an appropriate measurement to demonstrate achievement of the proposed outcome. Assessment: The impact event refers to the receptor as native vegetation surrounding the lease. Proposed measurement criterion does not measure the actual impact to native vegetation (off the lease). Measurement criteria proposed for other clearance of native vegetation would be applicable to this impact. For example: 'Annual Vegetation audit demonstrates the total area damaged or impacted is not as a result of mining operations.' If the use of dust deposition as a measurement criteria for impacts to native vegetation (on or off the lease) is proposed, evidence will be required to demonstrate that the dust deposition limits and frequency of measurement are appropriate and based on technical evidence. "Annual" measurement criteria frequency may not be effective to demonstrate achievement of the outcome and should be reviewed. DSD considers that there are methodologies that are appropriate to demonstrate achievement of the outcome. Should a lease be granted, the measurement criteria would be finalised in the PEPR submission.	A TARP to be implemented which will include monthly dust deposition from mining activities. Regular visual inspection by an experienced ecologist.	(6) Should a lease be granted, the leading criteria would be finalised in the PEPR.
108	No loss of abundance or diversity of native vegetation on or off the lease during construction, operation and post mine completion through; • clearance, • dust/contaminant deposition, • fire, • reduction in water supply • salinisation, or • other damage, unless prior approval under the relevant legislation is obtained.	(2) The outcome appropriately states the level of impact subsequent to controls. (3) The outcome is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. Assessment: Standard industry strategies to ensure all clearance of native vegetation is authorised are well established. The MP (page 15-13) proposes control and management strategies for potential air quality impacts. The Iron Road Impact Assessment Table (MP Appendix C) also proposes control strategies.	(4) DSD recommends that should a lease be granted the following outcome be a requirement of Schedule 6 of the lease: The Tenement Holder must during construction, operation and post-mine completion, ensure no loss of abundance or diversity of native vegetation on or off the Land through; • clearance, • dust/contaminant deposition, • fire, • reduction in water supply • salinisation, or • other damage, unless a significant environmental benefit has been approved in accordance with the relevant legislation.	Average annual dust deposition not to exceed 4 g/m2/month and no more than 2 g/m2/month above background.	(5) DSD considers the proposed draft measurement criteria to be an appropriate measurement to demonstrate achievement of the proposed outcome. Assessment: The impact event refers to the receptor as native vegetation surrounding the lease. Proposed measurement criterion does not measure the actual impact to native vegetation (off the lease). Measurement criteria proposed for other clearance of native vegetation would be applicable to this impact. For example: 'Annual Vegetation audit demonstrates the total area damaged or impacted is not as a result of mining operations.' If the use of dust deposition as a measurement criteria for impacts to native vegetation (on or off the lease) is proposed, evidence will be required to demonstrate that the dust deposition limits and frequency of measurement are appropriate and based on technical evidence. "Annual" measurement criteria frequency may not be effective to demonstrate achievement of the outcome and should be reviewed. DSD considers that there are methodologies that are appropriate to demonstrate achievement of the outcome. Should a lease be granted, the measurement criteria would be finalised in the PEPR submission.	A TARP to be implemented which will include monthly dust deposition from mining activities. Regular visual inspection by an experienced ecologist.	(6) Should a lease be granted, the leading criteria would be finalised in the PEPR.
109	No public health impacts from dust generated by construction, mining, closure or post closure activities.	(2) The outcome appropriately states the level of impact subsequent to controls. (3) The outcome is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. Assessment: The MP (page 15-13) proposes control and management strategies for potential air quality impacts. The Iron Road Impact Assessment Table (MP Appendix C) also proposes control strategies. In addition to the control strategies listed against PIM_15_01, the following is a summary of key strategies relevant to human health (see the MP for a full list): • Should visible air quality impacts be clearly observed (e.g. visible dust plumes being emitted off-site), relevant work activities would be reduced or ceased to stop the impacts and alternative work methods implemented. • Monitoring programme to confirm compliance with the air quality criteria for the project. • Warnings or exceedance alarms from real-time dust monitoring at selected sites around the proposed mine site • Active operation control informed by the air quality monitoring programme to manage dust emissions within the air quality criteria. • Continuous meteorological monitoring at the Warramboo site with telemetry capable equipment linked to a real-time reporting system that will be available on a public internet site. The proposed control strategies are assessed to be effective in demonstrating achievement of the outcome.	(4) DSD recommends that should a lease be granted the following outcome be a requirement of Schedule 6 of the lease: The Tenement Holder must during construction, operation and post-mine completion ensure no public health impacts from air emissions and/or dust generated by mining operations. DSD recommends that should a lease be granted the following be a requirement of Schedule 6 of the lease: The Tenement Holder is required to address the following matters for the purposes of Regulation 65(2)(c) in relation to the air quality health outcome; • Progressive rehabilitation and stabilisation of disturbed areas undertaken throughout the life of mine to control dust emissions generated by wind erosion. • Undertake continuous dust and meteorological monitoring to inform decisions for operational response and contingency measures to be implemented to prevent exceedance of compliance criteria. • In the event that monitoring shows the air quality measurement criteria, has been breached, the Tenement Holder must immediately cease the activity that resulted in the breach.	Compliance with the Ambient Air Quality NEPM 24 hour average PM10 concentration of 50 g/m3. Compliance with the EPA Design Ground-Level Concentration (DGLC) for nitrogen dioxide (NO2) i.e. maximum hourly average NO2 DGLC 158 ug/m3. DSD comment: Iron Road proposed new criteria for the air quality human health outcome in their Response Document. The new criteria is reflected in DSD's assessment and regulatory requirements.	(5) DSD considers the proposed draft criteria to be an appropriate measurement to demonstrate achievement of the proposed outcome. DSD considers that there are methodologies that are appropriate to demonstrate achievement of the outcome. Should a lease be granted, the measurement criteria would be finalised in the PEPR submission. Assessment: Iron Road has committed to including background/ambient dust measurements in addition to mine dust contributions in all measurements that are taken for compliance purposes. This is supported by DSD and recommended to be included as a requirement of the sixth schedule of the lease. Notwithstanding Iron Road's commitment, DSD is supportive of investigations into the development of criteria which can measure non-mining related dust contributions which would then form part of the criteria for compliance or non-compliance. Iron Road proposed new criteria for the air quality human health outcome in their Response Document. The new criteria is appropriate and supported by DSD. The EPA have updated their Air Quality Policy during 2016 and it is recommended that the proposed compliance criteria for NOx be reviewed in line with the new policy. DSD recommends that should a lease be granted the following criteria be a requirement of Schedule 6 of the lease: The Tenement Holder is required to address the following matters for the purposes of Regulation 65(2)(d) in relation to the air quality human health outcome; • The measurement criteria for the air quality human health outcome must include: PM10 - Measurement of PM10 dust concentration (including both ambient and mine related dust) using monitoring methodology, equipment and instruments that adhere to Australian Standard AS/NZS 3580.9.11, and any future updates or variants to that Standard. - the total PM10 dust concentration (including both ambient and mine related dust) leaving the site is less than 50ug/m3 as a 24 hour (midnight to midnight) average of measurements taken at intervals of not more than 10 minutes; or - where the total PM10 dust concentration entering the site exceeds 50ug/m3 as a 24 hour (midnight to midnight) average of measurements taken at intervals of not more than 10 minutes, the total PM10 dust leaving the site does not exceed the measured level entering the site during that period. - the total PM10 dust concentration (including both ambient and mine related dust) leaving the site is less than 25ug/m3 as an annual average for any 12 month period.	A Trigger Action Response Plan (TARP) to be implemented which will include continuous PM10 (multiple sites) monitoring. Compliance with the Ambient Air Quality NEPM PM2.5 advisory reporting standards of 25 ug/m3 (24 hour average) and 8 ug/m3 (annual average). Should the revised NEPM include PM2.5 standards then these would be adopted as new Outcome Measurement Criteria.	(6) DSD considers that there is a high level of reliance on control strategies to ensure achievement of the outcome, hence, leading indicator criteria is required. Assessment: Iron Road proposed new criteria for the air quality human health outcome in their Response Document. PM2.5 has now been moved from leading criteria to measurement criteria. The new criteria is appropriate and supported by DSD. Iron Road should consider including PM2.5 in the TARP. A TARP is an appropriate leading indicator criteria. The TARP should include the following: - definition of appropriate measurement trigger levels (the leading criteria) - selection of appropriate trigger timeframes/frequencies to provide adequate time for additional controls to be implemented to ensure the measurement criteria is not triggered - appropriate controls/actions at each trigger level - The location of monitoring sites
109a		The MP (page 15-20) states the following in relation to the air impact assessment for the construction mine phase: "During construction, activities would be adjusted based on forecasting of unfavourable climatic conditions and real-time dust monitoring to manage air emissions within air quality criteria levels. The predicted air emissions for adjusted operations during the Construction phase are presented for the 24 hour average PM10 and PM2.5 concentrations. The modelling included adjusted operations for approximately 1340 hours, which is equivalent to 15.3% of the year, to achieve compliance with the PM10 and PM2.5 air quality criteria". The air impact assessment model requires that 'adjusted operations' be undertaken for 15.3% of the year (1340 hours) during construction in order to achieve compliance with the PM2.5 and PM10 air quality criteria. 'Adjusted operations' is described in the MP (Appendix K), but can be summarised as "the planned ceasing of activities at the mine triggered by an operational air monitoring system signalling a risk of exceedance of a Project standard" (MP Appendix K page 63). The air impact assessment figures for construction (MP Figure 15-4 and 15-5) indicate that 'adjusted operations' are required to ensure compliance with the PM2.5 and PM10 concentrations at receptors (but not limited to) 48, 92, 93 and 97. For this reason, the importance of the control strategies listed above to ensure compliance is essential. The Trigger, Action, Response, Plan (TARP) is also essential to ensure there is a process that can trigger the cessation or adjustment of mining operations in a timely manner. It is recommended that these strategies be included as requirements in the sixth schedule of the lease.			PM2.5 - Measurement of PM2.5 dust concentration (including both ambient and mine related dust) using monitoring methodology, equipment and instruments that are recognised by a relevant International or Australian Standard. - the total PM2.5 dust concentration (including both ambient and mine related dust) leaving the site is less than 25ug/m3 as a 24 hour (midnight to midnight) average of measurements taken at intervals of not more than 10 minutes; or - where the total PM2.5 dust concentration entering the site exceeds 25ug/m3 as a 24 hour (midnight to midnight) average of measurements taken at intervals of not more than 10 minutes, the total PM2.5 dust leaving the site does not exceed the measured level entering the site during that period. - the total PM2.5 dust concentration (including both ambient and mine related dust) leaving the site is less than 8ug/m3 as an annual average for any 12 month period. Nitrogen Oxides - Measurement of Nitrogen Oxides concentration (including both ambient and mine related dust) using monitoring methodology, equipment and instruments that are recognised by a relevant International or Australian Standard. - Compliance limits for Nitrogen Oxides must adhere to the Environment Protection (Air Quality) Policy 2016. • The measurement criteria adopted (including all aspects of Regulation 65(2)(d) and in particular the locations of monitoring) must be based on technical scientific evidence which demonstrates achievement of the outcome. • The Tenement Holder must undertake meteorological monitoring in accordance with relevant Australian standards to measure and record meteorological data including (but not limited to) wind speed and direction, temperature, humidity, atmospheric pressure, solar radiation, rainfall and evaporation. • The Tenement Holder must ensure that PM2.5, PM10 and NOx concentration data and meteorological monitoring data acquired by the Tenement Holder is reported in real time to the public on an unrestricted internet site. The monitoring data must be retained and remain accessible on the unrestricted internet site for the life of the mine.		
110	No public health impacts to local residents from dust generated by construction, mining or closure activities.	The outcomes and requirements for PIM_15_11 also apply to PIM_15_12.	The outcomes and requirements for PIM_15_11 also apply to PIM_15_12.	Compliance with the Ambient Air Quality NEPM 24 hour average PM10 concentration of 50 g/m3. Compliance with the EPA Design Ground-Level Concentration (DGLC) for nitrogen dioxide (NO2) i.e. maximum hourly average NO2 DGLC 158 ug/m3.	The outcomes and requirements for PIM_15_11 also apply to PIM_15_12.	A Trigger Action Response Plan (TARP) to be implemented which will include continuous PM10 (multiple sites) monitoring. Compliance with the Ambient Air Quality NEPM PM2.5 advisory reporting standards of 25 ug/m3 (24 hour average) and 8 ug/m3 (annual average). Should the revised NEPM include PM2.5 standards then these would be adopted as new Outcome Measurement Criteria.	The outcomes and requirements for PIM_15_11 also apply to PIM_15_12.
111	No public health impacts to local residents from dust generated by construction, mining or closure activities.	The outcomes and requirements for PIM_15_11 also apply to PIM_15_13.	The outcomes and requirements for PIM_15_11 also apply to PIM_15_13.	Compliance with the Ambient Air Quality NEPM 24 hour average PM10 concentration of 50 g/m3. Compliance with the EPA Design Ground-Level Concentration (DGLC) for nitrogen dioxide (NO2) i.e. maximum hourly average NO2 DGLC 158 ug/m3.	The outcomes and requirements for PIM_15_11 also apply to PIM_15_13.	A Trigger Action Response Plan (TARP) to be implemented which will include continuous PM10 (multiple sites) monitoring. Compliance with the Ambient Air Quality NEPM PM2.5 advisory reporting standards of 25 ug/m3 (24 hour average) and 8 ug/m3 (annual average). Should the revised NEPM include PM2.5 standards then these would be adopted as new Outcome Measurement Criteria.	The outcomes and requirements for PIM_15_11 also apply to PIM_15_13.
112	NA	No Outcome required.	No Outcome required.	NA	No Outcome required.	NA	No Outcome required.
113	No public nuisance impacts from dust generated by construction, mining or closure or post closure activities.	The outcomes and requirements for PIM_15_01 also apply to PIM_15_15.	The outcomes and requirements for PIM_15_01 also apply to PIM_15_15.	Long term - compliance with the EPA adopted criteria for annual average dust deposition to exceed 4 g/m2/month and no more than 2 g/m2/month above background. Short term – all dust complaints acknowledged and recorded immediately and closed out within 14 days to the satisfaction of the complainant or as agreed with the Director of Mines.	The outcomes and requirements for PIM_15_01 also apply to PIM_15_15.	A Trigger Action Response Plan (TARP) to be implemented which will include continuous PM10 (multiple sites) and TSP (Warramboo) monitoring to mitigate any short term amenity/nuisance potential impacts.	The outcomes and requirements for PIM_15_01 also apply to PIM_15_15.

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Line number	Proposed Outcome	DSD Assessment of Outcome, Strategies and Uncertainty	Recommended Regulatory Response - Outcomes and Strategies	Outcome measurement criteria	DSD Assessment of Draft Measurement Criteria	Leading indicator criteria (where required)	DSD Assessment of Leading Indicator Criteria
114	No public nuisance impacts from dust generated by construction, mining or closure or post closure activities.	The outcomes and requirements for PIM_15_01 also apply to PIM_15_16.	The outcomes and requirements for PIM_15_01 also apply to PIM_15_16.	Long term - compliance with the EPA adopted criteria for annual average dust deposition to exceed 4 g/m2/month and no more than 2 g/m2/month above background. Short term – all dust complaints acknowledged and recorded immediately and closed out within 14 days to the satisfaction of the complainant or as agreed with the Director of Mines.	The outcomes and requirements for PIM_15_01 also apply to PIM_15_16.	A Trigger Action Response Plan (TARP) to be implemented which will include continuous PM10 (multiple sites) and TSP (Warramboo) monitoring to mitigate any short term amenity/nuisance potential impacts.	The outcomes and requirements for PIM_15_01 also apply to PIM_15_16.
115	No public health impacts from dust generated by construction, mining, closure or post closure activities.	The outcomes and requirements for PIM_15_11 also apply to PIM_15_17.	The outcomes and requirements for PIM_15_11 also apply to PIM_15_17.	Long term - compliance with the EPA adopted criteria for annual average dust deposition to exceed 4 g/m2/month and no more than 2 g/m2/month above background. Short term – all dust complaints acknowledged and recorded immediately and closed out within 14 days to the satisfaction of the complainant or as agreed with the Director of Mines.	The outcomes and requirements for PIM_15_11 also apply to PIM_15_17. The proposed measurement criteria for this impact does not propose the measurement of NOx. The proposed draft criteria (dust deposition and complaints) for this outcome is inappropriate and is assumed as an error. The measurement criteria for PIM_15_11 does propose the measurement of NOx in accordance with EPA requirements and this is supported.	A Trigger Action Response Plan (TARP) to be implemented which will include continuous PM10 (multiple sites) and TSP (Warramboo) monitoring to mitigate any short term amenity/nuisance potential impacts.	The outcomes and requirements for PIM_15_11 also apply to PIM_15_17.
116	NA	No Outcome required.	No Outcome required.	NA	No Outcome required.	NA	No Outcome required.
117	Noise from construction, operation and closure activities meets the noise goals in the Environment Protection (Noise) Policy, as defined by the Wudinna District Council Development Plan at the date the Mining Lease was granted.	(2) The outcome does not appropriately state the level of impact subsequent to controls. The outcome statement requires amendment to provide reference to amenity (impact on receptor). Amenity is used in the Environment Protection (Noise) Policy to describe the value that is being protected by the policy and hence must be included in the outcome. (3) The outcome is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. Assessment: The MP (page 16-9) proposes control and management strategies for potential noise impacts. The Iron Road Impact Assessment Table (MP Appendix C) also proposes control strategies. The following is a summary of key strategies (see the MP for a full list): • Noisy equipment or processes are to be located in strategic locations so that their impact on nearby sensitive receivers will be minimised • Noise reduction devices such as mufflers will be fitted and will operate effectively. • Equipment will be operated and materials handled in a way as to minimise the impact of noise. • Establishment of a mobile continuous noise monitoring station to be located at strategic sites, as required, to allow model validation and continuous review of the noise emissions from the proposed mine into the local environment. • Continuous meteorological monitoring as required to support the noise monitoring system • Real time reporting of noise measurements on a public internet site • Operational procedures will be developed and implemented to avoid exceedances of noise limit criteria at the nearest noise sensitive receiver	(4) DSD recommends that should a lease be granted the following outcome be a requirement of Schedule 6 of the lease: The Tenement Holder must during construction and operation, ensure noise emanating from mining operations is in accordance with the current amenity as defined by the Environment Protection (Noise) Policy and the Wudinna District Council Development Plan at the date that the Mining Tenement was granted. DSD recommends that should a lease be granted the following be a requirement of Schedule 6 of the lease: The Tenement Holder is required to address the following matters for the purposes of Regulation 65(2)(c) in relation to the noise outcome: • At a minimum, implement all noise mitigation strategies described in the Mining Proposal and Response Document. • Undertake continuous noise and meteorological monitoring to inform decisions for operational response and contingency measures to be implemented to prevent exceedance of compliance criteria. • In the event that monitoring shows the noise measurement criteria, has been breached, the Tenement Holder must immediately cease the activity that resulted in the breach.	Noise generated from the mine site during mining operations and closure activities, measured for or at, sensitive receivers in accordance with the Environment Protection (Noise) Policy 2007, does not exceed the following noise limit (averaged over 15 minutes), at those sensitive receivers: - 57 dB(A) between the hours of 7am and 10pm and 50 dB(A) between the hours of 10pm and 7am within a Primary Production Zone (as delineated in the Wudinna District Council Development Plan at the time of granting the Lease). - 55 dB(A) between the hours of 7am and 10pm and 48 dB(A) between the hours of 10pm and 7am within a Settlement Zone (as delineated in the Wudinna District Council Development Plan at the time of granting the Lease). The above noise levels may only be exceeded if the Director of Mines: - is satisfied, on the basis of information provided to him by an acoustic engineer, that the noise from the mining operation will not cause an adverse impact at the sensitive receiver due to the existing influence of ambient noise, or the limited duration and/or frequency of occurrence of the activity; and - provides prior approval for the exceedance. Noise measurements will be 'adjusted' in accordance with the relevant EP noise policy by the inclusion of a penalty for each characteristic where tonal/modulating/impulsive/low frequency characteristics are present.	(5) DSD considers the proposed draft measurement criteria to be an appropriate measurement to demonstrate achievement of the proposed outcome. DSD considers that there are methodologies that are appropriate to demonstrate achievement of the outcome. Should a lease be granted, the measurement criteria would be finalised in the PEPR submission. DSD recommends that should a lease be granted the following criteria be a requirement of Schedule 6 of the lease: The Tenement Holder is required to address the following matters for the purposes of Regulation 65(2)(d) in relation to the noise outcome; The Tenement Holder must ensure that noise generated from mining operations on the Land: • Is measured, for or at, all sensitive receivers in accordance with the Environment Protection (Noise) Policy 2007, under the Environment Protection Act 1993 of South Australia; and • does not exceed the following noise limits, at those sensitive receivers: - 57 dB(A) between the hours of 7am and 10pm and 50 dB(A) between the hours of 10pm and 7am within a Primary Production Zone (as delineated in the Wudinna District Council Development Plan at the date that the Mining Tenement was granted); or - 55 dB(A) between the hours of 7am and 10pm and 48 dB(A) between the hours of 10pm and 7am within a Settlement Zone (as delineated in the Wudinna District Council Development Plan at the date that the Mining Tenement was granted). Mine noise measured at, or for, noise-affected premises must be adjusted in accordance with the relevant environment protection noise policy by the inclusion of a penalty for each characteristic where tonal/modulating/impulsive/low frequency characteristics are present as identified by an acoustic engineer. The Tenement Holder must undertake meteorological monitoring in accordance with relevant Australian standards to measure and record meteorological data including (but not limited to) wind speed and direction, temperature, humidity, atmospheric pressure, solar radiation, rainfall and evaporation. The Tenement Holder must monitor noise levels on a continuous basis and report that data and meteorological monitoring data acquired by the Tenement Holder in real time to the public on an unrestricted internet site. The monitoring data must be retained and remain accessible on the unrestricted internet site for the life of the mine.	All noise complaints acknowledged in 48 hours and closed out within 14 days to the satisfaction of the complainant or as agreed with the Director of Mines. A Trigger Action Response Plan will be implemented which will include continuous noise monitoring.	(6) Should a lease be granted, the leading criteria would be finalised in the PEPR. A Trigger Action Response Plan which includes noise leading indicator criteria is appropriate and is supported.
117a		The Iron Road Response Document (Attachment B Issue #9 and Attachment C) also discusses noise. Iron Road provided additional information to address Issue #9 in Attachment C. This information indicates that noise levels at Receptor 48 will be 50 dB(A) at some times as a result of rail noise (noting that 50 dB(A) is the night time noise limit for Receptor). The control strategies proposed by Iron Road include a strategy for the alteration/amendment to operations in order to ensure compliance with the noise limits. Given that the specific operation that is causing the non-compliance can be ceased, this strategy will be effective in achieving the outcome. In addition, real time monitoring of noise limits and public reporting of this data will ensure transparency in relation to Iron Roads strategies to ensure that operations are being amended to ensure compliance. DSD has assessed the potential impact from waste rock and tailings being deposited in the IWL to receptors. The MP (Figures 16-7 and 16-8) shows noise modelling for operations. Receptor 97 is located close to the southern boundary of the proposed mining lease and has the potential to be impacted by noise generated from the construction of the IWL. The modelling indicates that noise impacts at receptor 97 will be lower than the noise compliance limits. It is assessed that noise character (including noise from rock drop) should also be considered when measuring noise resulting from the placement of material on the IWL. It is recommended measuring noise character be included as a requirement of the sixth schedule of the lease. DSD assesses that the control strategies proposed will be effective in achieving the outcome. Strategies are recommended to be included in Schedule 6 of the Lease. It is recommended that continuous noise and meteorological monitoring (and real time reporting on the internet) are included as requirements for criteria in Schedule 6 of the Lease.						
118	Noise from construction, operation and closure activities meets the noise goals in the Environment Protection (Noise) Policy, as defined by the Wudinna District Council Development Plan at the date the Mining Lease was granted.	The outcomes and requirements for PIM_16_01 also apply to PIM_16_02.	The outcomes and requirements for PIM_16_01 also apply to PIM_16_02.	Noise generated from the mine site during mining operations and closure activities, measured for or at, sensitive receivers in accordance with the Environment Protection (Noise) Policy 2007, does not exceed the following noise limit (averaged over 15 minutes), at those sensitive receivers: - 57 dB(A) between the hours of 7am and 10pm and 50 dB(A) between the hours of 10pm and 7am within a Primary Production Zone (as delineated in the Wudinna District Council Development Plan at the time of granting the Lease). - 55 dB(A) between the hours of 7am and 10pm and 48 dB(A) between the hours of 10pm and 7am within a Settlement Zone (as delineated in the Wudinna District Council Development Plan at the time of granting the Lease). The above noise levels may only be exceeded if the Director of Mines: - is satisfied, on the basis of information provided to him by an acoustic engineer, that the noise from the mining operation will not cause an adverse impact at the sensitive receiver due to the existing influence of ambient noise, or the limited duration and/or frequency of occurrence of the activity; and - provides prior approval for the exceedance. Noise measurements will be 'adjusted' in accordance with the relevant EP noise policy by the inclusion of a penalty for each characteristic where tonal/modulating/impulsive/low frequency characteristics are present.	The outcomes and requirements for PIM_16_01 also apply to PIM_16_02.	All noise complaints acknowledged in 48 hours and closed out within 14 days to the satisfaction of the complainant or as agreed with the Director of Mines. A Trigger Action Response Plan will be implemented which will include continuous noise monitoring.	The outcomes and requirements for PIM_16_01 also apply to PIM_16_02.
119	Noise from construction, operation and closure activities meets the noise goals in the Environment Protection (Noise) Policy, as defined by the Wudinna District Council Development Plan at the date the Mining Lease was granted.	The outcomes and requirements for PIM_16_01 also apply to PIM_16_03.	The outcomes and requirements for PIM_16_01 also apply to PIM_16_03.	Noise generated from the mine site during mining operations and closure activities, measured for or at, sensitive receivers in accordance with the Environment Protection (Noise) Policy 2007, does not exceed the following noise limit (averaged over 15 minutes), at those sensitive receivers: - 57 dB(A) between the hours of 7am and 10pm and 50 dB(A) between the hours of 10pm and 7am within a Primary Production Zone (as delineated in the Wudinna District Council Development Plan at the time of granting the Lease). - 55 dB(A) between the hours of 7am and 10pm and 48 dB(A) between the hours of 10pm and 7am within a Settlement Zone (as delineated in the Wudinna District Council Development Plan at the time of granting the Lease). The above noise levels may only be exceeded if the Director of Mines: - is satisfied, on the basis of information provided to him by an acoustic engineer, that the noise from the mining operation will not cause an adverse impact at the sensitive receiver due to the existing influence of ambient noise, or the limited duration and/or frequency of occurrence of the activity; and - provides prior approval for the exceedance. Noise measurements will be 'adjusted' in accordance with the relevant EP noise policy by the inclusion of a penalty for each characteristic where tonal/modulating/impulsive/low frequency characteristics are present.	The outcomes and requirements for PIM_16_01 also apply to PIM_16_03.	All noise complaints acknowledged in 48 hours and closed out within 14 days to the satisfaction of the complainant or as agreed with the Director of Mines. A Trigger Action Response Plan will be implemented which will include continuous noise monitoring.	The outcomes and requirements for PIM_16_01 also apply to PIM_16_03.

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Line number	Proposed Outcome	DSD Assessment of Outcome, Strategies and Uncertainty	Recommended Regulatory Response - Outcomes and Strategies	Outcome measurement criteria	DSD Assessment of Draft Measurement Criteria	Leading indicator criteria (where required)	DSD Assessment of Leading Indicator Criteria
120	Noise from construction, operation and closure activities meets the noise goals in the Environment Protection (Noise) Policy, as defined by the Wudinna District Council Development Plan at the date the Mining Lease was granted.	The outcomes and requirements for PIM_16_01 also apply to PIM_16_04.	The outcomes and requirements for PIM_16_01 also apply to PIM_16_04.	Noise generated from the mine site during mining operations and closure activities, measured for or at, sensitive receivers in accordance with the Environment Protection (Noise) Policy 2007, does not exceed the following noise limit (averaged over 15 minutes), at those sensitive receivers: - 57 dB(A) between the hours of 7am and 10pm and 50 dB(A) between the hours of 10pm and 7am within a Primary Production Zone (as delineated in the Wudinna District Council Development Plan at the time of granting the Lease). - 55 dB(A) between the hours of 7am and 10pm and 48 dB(A) between the hours of 10pm and 7am within a Settlement Zone (as delineated in the Wudinna District Council Development Plan at the time of granting the Lease). The above noise levels may only be exceeded if the Director of Mines: - is satisfied, on the basis of information provided to him by an acoustic engineer, that the noise from the mining operation will not cause an adverse impact at the sensitive receiver due to the existing influence of ambient noise, or the limited duration and/or frequency of occurrence of the activity; and - provides prior approval for the exceedance. Noise measurements will be 'adjusted' in accordance with the relevant EP noise policy by the inclusion of a penalty for each characteristic where tonal/modulating/impulsive/low frequency characteristics are present.	The outcomes and requirements for PIM_16_01 also apply to PIM_16_04.	All noise complaints acknowledged in 48 hours and closed out within 14 days to the satisfaction of the complainant or as agreed with the Director of Mines. A Trigger Action Response Plan will be implemented which will include continuous noise monitoring.	The outcomes and requirements for PIM_16_01 also apply to PIM_16_04.
121	Noise from construction, operation and closure activities meets the noise goals in the Environment Protection (Noise) Policy, as defined by the Wudinna District Council Development Plan at the date the Mining Lease was granted.	The outcomes and requirements for PIM_16_01 also apply to PIM_16_05.	The outcomes and requirements for PIM_16_01 also apply to PIM_16_05.	Noise generated from the mine site during mining operations and closure activities, measured for or at, sensitive receivers in accordance with the Environment Protection (Noise) Policy 2007, does not exceed the following noise limit (averaged over 15 minutes), at those sensitive receivers: - 57 dB(A) between the hours of 7am and 10pm and 50 dB(A) between the hours of 10pm and 7am within a Primary Production Zone (as delineated in the Wudinna District Council Development Plan at the time of granting the Lease). - 55 dB(A) between the hours of 7am and 10pm and 48 dB(A) between the hours of 10pm and 7am within a Settlement Zone (as delineated in the Wudinna District Council Development Plan at the time of granting the Lease). The above noise levels may only be exceeded if the Director of Mines: - is satisfied, on the basis of information provided to him by an acoustic engineer, that the noise from the mining operation will not cause an adverse impact at the sensitive receiver due to the existing influence of ambient noise, or the limited duration and/or frequency of occurrence of the activity; and - provides prior approval for the exceedance. Noise measurements will be 'adjusted' in accordance with the relevant EP noise policy by the inclusion of a penalty for each characteristic where tonal/modulating/impulsive/low frequency characteristics are present.	The outcomes and requirements for PIM_16_01 also apply to PIM_16_05.	All noise complaints acknowledged in 48 hours and closed out within 14 days to the satisfaction of the complainant or as agreed with the Director of Mines. A Trigger Action Response Plan will be implemented which will include continuous noise monitoring.	The outcomes and requirements for PIM_16_01 also apply to PIM_16_05.
122	Noise from construction, operation and closure activities meets the noise goals in the Environment Protection (Noise) Policy, as defined by the Wudinna District Council Development Plan at the date the Mining Lease was granted.	The outcomes and requirements for PIM_16_01 also apply to PIM_16_06.	The outcomes and requirements for PIM_16_01 also apply to PIM_16_06.	Noise generated from the mine site during mining operations and closure activities, measured for or at, sensitive receivers in accordance with the Environment Protection (Noise) Policy 2007, does not exceed the following noise limit (averaged over 15 minutes), at those sensitive receivers: - 57 dB(A) between the hours of 7am and 10pm and 50 dB(A) between the hours of 10pm and 7am within a Primary Production Zone (as delineated in the Wudinna District Council Development Plan at the time of granting the Lease). - 55 dB(A) between the hours of 7am and 10pm and 48 dB(A) between the hours of 10pm and 7am within a Settlement Zone (as delineated in the Wudinna District Council Development Plan at the time of granting the Lease). The above noise levels may only be exceeded if the Director of Mines: - is satisfied, on the basis of information provided to him by an acoustic engineer, that the noise from the mining operation will not cause an adverse impact at the sensitive receiver due to the existing influence of ambient noise, or the limited duration and/or frequency of occurrence of the activity; and - provides prior approval for the exceedance. Noise measurements will be 'adjusted' in accordance with the relevant EP noise policy by the inclusion of a penalty for each characteristic where tonal/modulating/impulsive/low frequency characteristics are present.	The outcomes and requirements for PIM_16_01 also apply to PIM_16_06.	All noise complaints acknowledged in 48 hours and closed out within 14 days to the satisfaction of the complainant or as agreed with the Director of Mines. A Trigger Action Response Plan will be implemented which will include continuous noise monitoring.	The outcomes and requirements for PIM_16_01 also apply to PIM_16_06.
123	Noise from construction, operation and closure activities meets the noise goals in the Environment Protection (Noise) Policy, as defined by the Wudinna District Council Development Plan at the date the Mining Lease was granted.	The outcomes and requirements for PIM_16_01 also apply to PIM_16_07.	The outcomes and requirements for PIM_16_01 also apply to PIM_16_07.	Noise generated from the mine site during mining operations and closure activities, measured for or at, sensitive receivers in accordance with the Environment Protection (Noise) Policy 2007, does not exceed the following noise limit (averaged over 15 minutes), at those sensitive receivers: - 57 dB(A) between the hours of 7am and 10pm and 50 dB(A) between the hours of 10pm and 7am within a Primary Production Zone (as delineated in the Wudinna District Council Development Plan at the time of granting the Lease). - 55 dB(A) between the hours of 7am and 10pm and 48 dB(A) between the hours of 10pm and 7am within a Settlement Zone (as delineated in the Wudinna District Council Development Plan at the time of granting the Lease). The above noise levels may only be exceeded if the Director of Mines: - is satisfied, on the basis of information provided to him by an acoustic engineer, that the noise from the mining operation will not cause an adverse impact at the sensitive receiver due to the existing influence of ambient noise, or the limited duration and/or frequency of occurrence of the activity; and - provides prior approval for the exceedance. Noise measurements will be 'adjusted' in accordance with the relevant EP noise policy by the inclusion of a penalty for each characteristic where tonal/modulating/impulsive/low frequency characteristics are present.	The outcomes and requirements for PIM_16_01 also apply to PIM_16_07.	All noise complaints acknowledged in 48 hours and closed out within 14 days to the satisfaction of the complainant or as agreed with the Director of Mines. A Trigger Action Response Plan will be implemented which will include continuous noise monitoring.	The outcomes and requirements for PIM_16_01 also apply to PIM_16_07.
124	Noise from construction, operation and closure activities meets the noise goals in the Environment Protection (Noise) Policy, as defined by the Wudinna District Council Development Plan at the date the Mining Lease was granted.	The outcomes and requirements for PIM_16_01 also apply to PIM_16_08.	The outcomes and requirements for PIM_16_01 also apply to PIM_16_08.	Noise generated from the mine site during mining operations and closure activities, measured for or at, sensitive receivers in accordance with the Environment Protection (Noise) Policy 2007, does not exceed the following noise limit (averaged over 15 minutes), at those sensitive receivers: - 57 dB(A) between the hours of 7am and 10pm and 50 dB(A) between the hours of 10pm and 7am within a Primary Production Zone (as delineated in the Wudinna District Council Development Plan at the time of granting the Lease). - 55 dB(A) between the hours of 7am and 10pm and 48 dB(A) between the hours of 10pm and 7am within a Settlement Zone (as delineated in the Wudinna District Council Development Plan at the time of granting the Lease). The above noise levels may only be exceeded if the Director of Mines: - is satisfied, on the basis of information provided to him by an acoustic engineer, that the noise from the mining operation will not cause an adverse impact at the sensitive receiver due to the existing influence of ambient noise, or the limited duration and/or frequency of occurrence of the activity; and - provides prior approval for the exceedance. Noise measurements will be 'adjusted' in accordance with the relevant EP noise policy by the inclusion of a penalty for each characteristic where tonal/modulating/impulsive/low frequency characteristics are present.	The outcomes and requirements for PIM_16_01 also apply to PIM_16_08.	All noise complaints acknowledged in 48 hours and closed out within 14 days to the satisfaction of the complainant or as agreed with the Director of Mines. A Trigger Action Response Plan will be implemented which will include continuous noise monitoring.	The outcomes and requirements for PIM_16_01 also apply to PIM_16_08.

DSD Assessment of Iron Road CEIP Impacts and Risks Register - December 2016

Line number	Proposed Outcome	DSD Assessment of Outcome, Strategies and Uncertainty	Recommended Regulatory Response - Outcomes and Strategies	Outcome measurement criteria	DSD Assessment of Draft Measurement Criteria	Leading indicator criteria (where required)	DSD Assessment of Leading Indicator Criteria
125	Noise from construction, operation and closure activities meets the noise goals in the Environment Protection (Noise) Policy, as defined by the Wudinna District Council Development Plan at the date the Mining Lease was granted.	The outcomes and requirements for PIM_16_01 also apply to PIM_16_09.	The outcomes and requirements for PIM_16_01 also apply to PIM_16_09.	Noise generated from the mine site during mining operations and closure activities, measured for or at, sensitive receivers in accordance with the Environment Protection (Noise) Policy 2007, does not exceed the following noise limit (averaged over 15 minutes), at those sensitive receivers: - 57 dB(A) between the hours of 7am and 10pm and 50 dB(A) between the hours of 10pm and 7am within a Primary Production Zone (as delineated in the Wudinna District Council Development Plan at the time of granting the Lease). - 55 dB(A) between the hours of 7am and 10pm and 48 dB(A) between the hours of 10pm and 7am within a Settlement Zone (as delineated in the Wudinna District Council Development Plan at the time of granting the Lease). The above noise levels may only be exceeded if the Director of Mines: - is satisfied, on the basis of information provided to him by an acoustic engineer, that the noise from the mining operation will not cause an adverse impact at the sensitive receiver due to the existing influence of ambient noise, or the limited duration and/or frequency of occurrence of the activity; and - provides prior approval for the exceedance. Noise measurements will be 'adjusted' in accordance with the relevant EP noise policy by the inclusion of a penalty for each characteristic where tonal/modulating/impulsive/low frequency characteristics are present.	The outcomes and requirements for PIM_16_01 also apply to PIM_16_09.	All noise complaints acknowledged in 48 hours and closed out within 14 days to the satisfaction of the complainant or as agreed with the Director of Mines. A Trigger Action Response Plan will be implemented which will include continuous noise monitoring.	The outcomes and requirements for PIM_16_01 also apply to PIM_16_09.
126	Noise from construction, operation and closure activities meets the noise goals in the Environment Protection (Noise) Policy, as defined by the Wudinna District Council Development Plan at the date the Mining Lease was granted.	The outcomes and requirements for PIM_16_01 also apply to PIM_16_10.	The outcomes and requirements for PIM_16_01 also apply to PIM_16_10.	Noise generated from the mine site during mining operations and closure activities, measured for or at, sensitive receivers in accordance with the Environment Protection (Noise) Policy 2007, does not exceed the following noise limit (averaged over 15 minutes), at those sensitive receivers: - 57 dB(A) between the hours of 7am and 10pm and 50 dB(A) between the hours of 10pm and 7am within a Primary Production Zone (as delineated in the Wudinna District Council Development Plan at the time of granting the Lease). - 55 dB(A) between the hours of 7am and 10pm and 48 dB(A) between the hours of 10pm and 7am within a Settlement Zone (as delineated in the Wudinna District Council Development Plan at the time of granting the Lease). The above noise levels may only be exceeded if the Director of Mines: - is satisfied, on the basis of information provided to him by an acoustic engineer, that the noise from the mining operation will not cause an adverse impact at the sensitive receiver due to the existing influence of ambient noise, or the limited duration and/or frequency of occurrence of the activity; and - provides prior approval for the exceedance. Noise measurements will be 'adjusted' in accordance with the relevant EP noise policy by the inclusion of a penalty for each characteristic where tonal/modulating/impulsive/low frequency characteristics are present.	The outcomes and requirements for PIM_16_01 also apply to PIM_16_10.	All noise complaints acknowledged in 48 hours and closed out within 14 days to the satisfaction of the complainant or as agreed with the Director of Mines. A Trigger Action Response Plan will be implemented which will include continuous noise monitoring.	The outcomes and requirements for PIM_16_01 also apply to PIM_16_10.
127	Noise from construction, operation and closure activities meets the noise goals in the Environment Protection (Noise) Policy, as defined by the Wudinna District Council Development Plan at the date the Mining Lease was granted.	The outcomes and requirements for PIM_16_01 also apply to PIM_16_11.	The outcomes and requirements for PIM_16_01 also apply to PIM_16_11.	Noise generated from the mine site during mining operations and closure activities, measured for or at, sensitive receivers in accordance with the Environment Protection (Noise) Policy 2007, does not exceed the following noise limit (averaged over 15 minutes), at those sensitive receivers: - 57 dB(A) between the hours of 7am and 10pm and 50 dB(A) between the hours of 10pm and 7am within a Primary Production Zone (as delineated in the Wudinna District Council Development Plan at the time of granting the Lease). - 55 dB(A) between the hours of 7am and 10pm and 48 dB(A) between the hours of 10pm and 7am within a Settlement Zone (as delineated in the Wudinna District Council Development Plan at the time of granting the Lease). The above noise levels may only be exceeded if the Director of Mines: - is satisfied, on the basis of information provided to him by an acoustic engineer, that the noise from the mining operation will not cause an adverse impact at the sensitive receiver due to the existing influence of ambient noise, or the limited duration and/or frequency of occurrence of the activity; and - provides prior approval for the exceedance. Noise measurements will be 'adjusted' in accordance with the relevant EP noise policy by the inclusion of a penalty for each characteristic where tonal/modulating/impulsive/low frequency characteristics are present.	The outcomes and requirements for PIM_16_01 also apply to PIM_16_11.	All noise complaints acknowledged in 48 hours and closed out within 14 days to the satisfaction of the complainant or as agreed with the Director of Mines. A Trigger Action Response Plan will be implemented which will include continuous noise monitoring.	The outcomes and requirements for PIM_16_01 also apply to PIM_16_11.
128	NA	No Outcome required.	No Outcome required.	NA	No Outcome required.	NA	No Outcome required.
129	No adverse impact on public amenity from vibration or air overpressure caused by blasting.	(2) The outcome appropriately states the level of impact subsequent to controls. The outcome statement requires amendment to accurately reflect that the receptors for vibration impacts are human comfort and third party property. (3) The outcome is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. Assessment: The MP (page 17-6) sets out control and management strategies for airblast and vibration which include: - Blasting procedures will be developed and implemented in accordance with AS2187.2-2006 - Initial noise and ground vibration monitoring will be performed to confirm compliance of blasting operation with the airblast and ground vibration criteria. The use of the word 'initial' implies that all blasts will not be monitored. This is not supported and it is required that all blasts will be monitored for compliance. A sixth schedule lease requirement is recommended in relation to development of strategies to ensure achievement of the blasting outcome. The strategies are appropriate and will be effective in ensuring achievement of the outcome. Refer to the public safety section for an assessment of impacts to the public from flyrock (see PIM_07_22).	(4) DSD recommends that should a lease be granted the following outcome be a requirement of Schedule 6 of the lease: The Tenement Holder must during construction and operation, ensure that there are no adverse impacts to: • public safety, • human comfort, • third party property (including stock), • adjacent land use, • aircraft, or • other receptors, from airblast, flyrock and vibration caused by blasting. DSD recommends that should a lease be granted the following be a requirement of Schedule 6 of the lease: The Tenement Holder is required to address the following matters for the purposes of Regulation 65(2)(c) in relation to the blasting outcome; • Notify property owners or residents adjacent to and within the Land, subject to their consent, of all blasts no less than forty eight hours in advance of those blasts; • Develop strategies for the management of impacts from blasting, including the determination and requirement of blast exclusion zones, in accordance with relevant standards including the Australian Standard AS 2187.2; • Develop strategies for establishing and implementing a blast exclusion zone between any third party property or land use, and the designated blast area, for all blasting events during mining operations; • If required, develop strategies to ensure that a blast exclusion zone is maintained between the public and the designated blast area, for all blasting events during mining operations. • A blasting protocol and blasting schedule will be developed in consultation with owners and residents of land within and adjacent the Land to reflect the needs of the adjacent land use practices.	Vibration levels as a result of blasting activities are less than 5mm/s peak particle velocity at the nearest sensitive receptor for 95 per cent of blasts per year, with a maximum of 10 mm/s peak particle velocity for any one blast, in accordance with Australian Standard AS2187.2.2006 Use of explosives.	(5) DSD considers that there are methodologies that are appropriate to demonstrate achievement of the outcome. Should a lease be granted, the measurement criteria would be finalised in the PEPR submission. DSD recommends that should a lease be granted the following criteria be a requirement of Schedule 6 of the lease: The Tenement Holder is required to address the following matters for the purposes of Regulation 65(2)(d) in relation to the blasting outcome; • All blasts must be monitored and measured for vibration and airblast overpressure; • Blasting criteria is set in accordance with the Australian Standard AS 2187.2; • Measurements taken to demonstrate achievement of the blasting outcome must be taken in accordance with Australian Standard AS2187.2.		(6) Should a lease be granted, the leading criteria would be finalised in the PEPR.
130	NA	No Outcome required.	No Outcome required.	NA	No Outcome required.	NA	No Outcome required.
131	NA	No Outcome required.	No Outcome required.	NA	No Outcome required.	NA	No Outcome required.
132	No adverse impact on public amenity from vibration or air overpressure caused by blasting.	(2) The outcome appropriately states the level of impact subsequent to controls. The outcome statement requires amendment to accurately reflect the receptors for air blast impacts. (3) The outcome is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. Assessment: The MP (page 17-6) sets out control and management strategies for airblast and vibration which include: - Blasting procedures will be developed and implemented in accordance with AS2187.2-2006 - Initial noise and ground vibration monitoring will be performed to confirm compliance of blasting operation with the airblast and ground vibration criteria. The use of the word 'initial' implies that all blasts will not be monitored. This is not supported and it is required that all blasts will be monitored for compliance. A sixth schedule lease requirement is recommended in relation to development of strategies to ensure achievement of the blasting outcome. The strategies are appropriate and will be effective in ensuring achievement of the outcome. Refer to the public safety section for an assessment of impacts to the public from flyrock (see PIM_07_22).	(4) DSD recommends that should a lease be granted the following outcome be a requirement of Schedule 6 of the lease: The Tenement Holder must during construction and operation, ensure that there are no adverse impacts to: • public safety, • human comfort, • third party property (including stock), • adjacent land use, • aircraft, or • other receptors, from airblast, flyrock and vibration caused by blasting. DSD recommends that should a lease be granted the following be a requirement of Schedule 6 of the lease: The Tenement Holder is required to address the following matters for the purposes of Regulation 65(2)(c) in relation to the blasting outcome; • Notify property owners or residents adjacent to and within the Land, subject to their consent, of all blasts no less than forty eight hours in advance of those blasts; • Develop strategies for the management of impacts from blasting, including the determination and requirement of blast exclusion zones, in accordance with relevant standards including the Australian Standard AS 2187.2; • Develop strategies for establishing and implementing a blast exclusion zone between any third party property or land use, and the designated blast area, for all blasting events during mining operations; • If required, develop strategies to ensure that a blast exclusion zone is maintained between the public and the designated blast area, for all blasting events during mining operations. • A blasting protocol and blasting schedule will be developed in consultation with owners and residents of land within and adjacent the Land to reflect the needs of the adjacent land use practices.	Air overpressure levels as a result of blasting activities are less than 115 dB(Lin Peak) at the nearest sensitive receptor for 95 per cent of blasts per year, with a maximum of 120 dB (Lin Peak) for any one blast, in accordance with Australian Standard AS2187.2.2006 Use of explosives.	(5) DSD considers that there are methodologies that are appropriate to demonstrate achievement of the outcome. Should a lease be granted, the measurement criteria would be finalised in the PEPR submission. DSD recommends that should a lease be granted the following criteria be a requirement of Schedule 6 of the lease: The Tenement Holder is required to address the following matters for the purposes of Regulation 65(2)(d) in relation to the blasting outcome; • All blasts must be monitored and measured for vibration and airblast overpressure; • Blasting criteria is set in accordance with the Australian Standard AS 2187.2; • Measurements taken to demonstrate achievement of the blasting outcome must be taken in accordance with Australian Standard AS2187.2.	All complaints acknowledged in 48 hours and closed out within 14 days to the satisfaction of the complainant or as agreed with the Director of Mines.	(6) Should a lease be granted, the leading criteria would be finalised in the PEPR.
133	NA	No Outcome required.	No Outcome required.	NA	No Outcome required.	NA	No Outcome required.

DSD Assessment of Iron Road CEIP Impacts and Risks Register - December 2016

Line number	Proposed Outcome	DSD Assessment of Outcome, Strategies and Uncertainty	Recommended Regulatory Response - Outcomes and Strategies	Outcome measurement criteria	DSD Assessment of Draft Measurement Criteria	Leading indicator criteria (where required)	DSD Assessment of Leading Indicator Criteria
134	No impacts to agricultural productivity for third party land users on or off the lease during construction, operation and post mine completion, including: • reduction in crop yield • reduction in grain quality • adverse health impacts to livestock other than those agreed between the tenement holder and the affected user.	(2) The outcome appropriately states the level of impact subsequent to controls. A new outcome is required to reflect the broader receptor of third party land use and property. (3) The outcome is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. Assessment: The MP (page 18-11) states the proposed control and management strategies for surface water. The MP (page 18-12) provides an impact assessment for the potential contamination of Surface water from chemicals, hydrocarbons and PAF. The MP (page 18-13) provides an impact assessment for the potential disturbance of existing Surface water flow regimes (relates to subsequent impact events). The MP (page 18-14) provides an impact assessment for the potential salinisation of Surface water (relates to subsequent impact events). Proposed strategies stated in Iron Roads impact assessment table (MP Appendix C) are "buffering potential in other waste rock and a bund around the IWL if needed". The MP Appendix H is the Hydrology and Surface water study (RPS - 8/10/2015) and provides the following conclusions and recommendations: • "Five swales have been identified in the proximity of the open pits and processing facilities, namely swales S9, S10, S16, S19 and S20 (see Figure 7). Construction of drains to prevent ponding, subsequent increasing infiltration to the open pits, nuisance effects on surface infrastructure and geotechnical instability of the pit walls will be necessary to manage risks." (RPS pg 7 of 74) • "The Integrated Waste Landform (IWL) and the mine pits themselves could potentially modify small to medium sized drainage catchments." (RPS pg 7 of 74) • "The IWL will be constructed progressively and will cover five sub-catchments that naturally drain to swales along the southern mine lease boundary and one that partially drains internally. Completion of minor earthwork to create bunds along low points in swales in this area will be sufficient to mitigate any risks of water moving beyond the mine lease boundary prior to IWL construction." (RPS pg 7 of 74)	(4) DSD recommends that should a lease be granted the following be conditions of Schedule 2 of the lease: The Tenement Holder must: • Ensure no surface water contaminated (including sedimentation) as a result of mining operations leaves the Land. The Tenement Holder must: • Ensure that, apart from water contained in the pit void: - no surface water contaminated (including sedimentation) prior to mine completion remains within the Land after mine completion; and - no contamination of surface water (including sedimentation) occurs after mine completion as a result of mining operations within the Land. The Tenement Holder must ensure: - mining operations do not cause inundation (by water) of third party property and infrastructure off the Land (to a greater extent than would be expected to occur prior to mining operations commencing); - mining operations do not cause inundation (by water) of third party property and infrastructure on the Land (to a greater extent than would be expected to occur prior to mining operations commencing) unless the Tenement Holder has obtained a Waiver of Exemption under the Act to undertake mining activities (inclusive of inundation) on that particular land; and - inundation of third party property and infrastructure by water (to a greater extent than would be expected to occur prior to mining operations commencing) after mine completion is not caused by mining operations. DSD recommends that should a lease be granted the following outcome be a requirement of Schedule 6 of the lease: Third party land user outcome - Surface water: The Tenement Holder must during construction, operation and post-mine completion, ensure no impacts to agricultural productivity, including but not limited to; • reduction in crop yield; • reduction in grain quality; or • adverse health impacts to livestock; for third party land users on or off the Land as a result of surface water contamination and/or inundation from mining operations, other than those agreed between the Tenement Holder and the affected user.	Survey demonstrates no surface water runoff from the IWL is leaving the mining lease boundary	(5) DSD considers the proposed draft measurement criteria to be an appropriate measurement to demonstrate achievement of the proposed outcome. Assessment: Additional measurement criteria could also be considered for this outcome. Amendments to the criteria are required to ensure that it meets the requirements of Regulation 65(2)(d) and includes all of the required elements of criteria. DSD considers that there are methodologies that are appropriate to demonstrate achievement of the outcome. Should a lease be granted, the measurement criteria would be finalised in the PEPR submission.	None proposed	(6) Should a lease be granted, the requirement for a leading indicator criteria would be finalised in the PEPR.
		• "Construction of a broad collection drain along the perimeter of the IWL will ensure that any runoff from the revegetated batter on the first lift of the IWL will be contained on site and dissipated at natural low points in a similar process to what happens with other swales in pre-mining condition (i.e. infiltration and evaporation)." (RPS pg 8 of 74) • "The storage volume available within low points along this drain will also be complemented by the bunds that are proposed for containing swale storage prior to construction of the waste landform. The actual storage volume available will need to be determined on a rolling basis as the IWL is constructed. This is because the volume of runoff and the storage location will change regularly during mine operation". (RPS pg 8 of 74) • "The volumes of water expected under a range of scenarios have been calculated and are manageable." (RPS pg 8 of 74) • "It is recommended as good practice that a minimum degree of erosion protection be provided in any IWL drains and service roads. Similar protection is recommended for the bund around the open pit excavation, in particular the 325 m section of the southern side of Murphys Pit in contact with swales S19 and S20. The typical protection works should consist of a layer of rock (75 to 150mm equivalent diameter) with separating geotextile underlying it. The design requirements for the drainage protection are described in Section 6." (RPS pg 8 of 74) • "The only areas of the IWL that will generate runoff on the mine lease boundary side will be the outside batters which will be covered with a topsoil layer to support revegetation (as shown in Figure 25). Any runoff arising from this outside batter will move toward the mining lease buffer zone and potentially off-lease without intervention. The volume of water running off from this area (approx. 10,300m x ~250m = 257 ha), when the first lift of the IWL is fully developed, has been determined for a dry, average and wet scenario, as shown in Table 18." (RPS pg 58 of 74)	DSD recommends that should a lease be granted the following be a requirement of Schedule 6 of the lease: The Tenement Holder is required to address the following matters for the purposes of Regulation 65(2)(c) in relation to the third party property outcomes for surface water: • Address all conclusions, actions and recommendations included in Appendix H of the Mining Proposal ("CEIP - Hydrology and Surface Water Management Study - 8/10/2015 (RPS)"); • The Tenement Holder must ensure that: - Mining operations do not cause inundation of third party property and infrastructure by water (to a greater extent than would be expected to occur prior to mining operations commencing); and - Inundation of third party property and infrastructure by water (to a greater extent than would be expected to occur prior to mining operations commencing) after mine completion is not caused by mining operations; - Unless the Tenement Holder obtains a registered Waiver of Exemption under the Act to undertake mining activities (inclusive of inundation). • Ensure no surface water contaminated (including sedimentation) as a result of mining operations leaves the Land; • Ensure that, apart from water contained in the pit void: - no surface water contaminated (including sedimentation) prior to mine completion remains within the Land after mine completion; and - no contamination of surface water (including sedimentation) occurs after mine completion as a result of mining operations within the Land. • Design and construct surface water infrastructure, including IWL surface water controls, to ensure achievement of the third party land use outcomes post-mine completion and in the long term. • A plan for establishing appropriate mechanisms to ensure effective transfer of responsibility for any maintenance of surface water infrastructure post-mine completion.				
		• "These runoff volumes, generally around 20 - 25 ML/month in the average winter months but peaking at 81 ML/month (June 1968), will be contained within a level, dyked batter toe collection sump at the base of the first lift of the IWL. This collection sump will extend the full length of the IWL batter, a length of around 10,300m. The progressive construction of the IWL means that the storage volume in the sump will need to be available as the project progresses. Intermittent dykes will prevent any movement of water along the sump, with suggested intervals of 1,000m. The runoff retained within the collection sump is assumed to dissipate via evaporation in the same way that swales operate for pre-mining conditions". (RPS pg 59 of 74) • "To contain this volume the typical collection sump dimensions will need to be in the order of 15m wide and 1.5m deep (1v:2h batters; depth inclusive of 0.2m freeboard) in order to provide enough winter storage for the wet year winter period. It is assumed that this volume will dissipate quickly without ongoing rainfall." (RPS pg 59 of 74) • "Regular operational decisions will need to be made as the IWL is constructed to manage available storage volumes within the mine lease." (RPS pg 59 of 74) All conclusions and recommendations from the RPS report must be actioned and these are to be included as requirements of the sixth schedule of the lease. The RPS report describes significant surface water infrastructure that is required to ensure that surface water does not impact on adjacent land. This is particularly the case to the south of the IWL where surface water infrastructure will also be required to prevent impacts to a road. The strategies put forward by RPS are appropriate and effective. The mine phase for this impact event includes 'post-mine completion'. The MP (Page 18-13) states the "at completion... run off will be directed into the mine pit and combine with saline groundwater in the pit. As this alteration in flow does not impact upon any receptors dependent on surface water, the impact to surface water flows are considered to be negligible". There is insufficient detail in regards to the closure design for surface water infrastructure, how the infrastructure will perform in the long term and if any ongoing maintenance of this infrastructure is required.					
135	NA	No Outcome required.	No Outcome required.	NA	No Outcome required.	NA	No Outcome required.
136	NA	No Outcome required.	No Outcome required.	NA	No Outcome required.	NA	No Outcome required.
137	NA	No Outcome required.	No Outcome required.	NA	No Outcome required.	NA	No Outcome required.
138	NA	The outcomes and requirements for PIM_18_02 also apply to PIM_18_06.	The outcomes and requirements for PIM_18_02 also apply to PIM_18_06.	NA	The outcomes and requirements for PIM_18_02 also apply to PIM_18_06.	NA	The outcomes and requirements for PIM_18_02 also apply to PIM_18_06.
139	No adverse impacts on soil quality or quantity that could compromise the post mining land use within the mining lease or existing land use outside the mining lease.	The outcomes and requirements for PIM_18_02 also apply to PIM_18_07.	The outcomes and requirements for PIM_18_02 also apply to PIM_18_07.	Inspection of hazardous material storage areas following significant rain events	The outcomes and requirements for PIM_18_02 also apply to PIM_18_07.	None proposed	The outcomes and requirements for PIM_18_02 also apply to PIM_18_07.
140	No adverse impacts on soil quality or quantity that could compromise the post mining land use within the mining lease or existing land use outside the mining lease.	The outcomes and requirements for PIM_18_02 also apply to PIM_18_08.	The outcomes and requirements for PIM_18_02 also apply to PIM_18_08.	Post construction audits of all landforms and structures that may affect water flow confirm they have been constructed in accordance with design parameters.	The outcomes and requirements for PIM_18_02 also apply to PIM_18_08.	None proposed	The outcomes and requirements for PIM_18_02 also apply to PIM_18_08.
141	No impacts to agricultural productivity for third party land users as a result of mining operations, including: • Reduction in crop yield; • reduction in grain quality; or • adverse health impacts to livestock other than those agreed between the tenement holder and the affected user.	The outcomes and requirements for PIM_18_02 also apply to PIM_18_09.	The outcomes and requirements for PIM_18_02 also apply to PIM_18_09.	Soil testing on adjoining land demonstrates there is no statistically significant increase in the level of salinity	The outcomes and requirements for PIM_18_02 also apply to PIM_18_09.	None proposed	The outcomes and requirements for PIM_18_02 also apply to PIM_18_09.

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Line number	Proposed Outcome	DSD Assessment of Outcome, Strategies and Uncertainty	Recommended Regulatory Response - Outcomes and Strategies	Outcome measurement criteria	DSD Assessment of Draft Measurement Criteria	Leading indicator criteria (where required)	DSD Assessment of Leading Indicator Criteria
142	NA	No Outcome required.	No Outcome required.	NA	No Outcome required.	NA	No Outcome required.
143	**NA - Benefit**	No Outcome required.	No Outcome required.		No Outcome required.		No Outcome required.
144	**NA - Benefit**	No Outcome required.	No Outcome required.		No Outcome required.		No Outcome required.
145	NA	No Outcome required.	No Outcome required.	NA	No Outcome required.	NA	No Outcome required.
146	NA	No Outcome required.	No Outcome required.	NA	No Outcome required.	NA	No Outcome required.
147	**NA - Benefit**	No Outcome required.	No Outcome required.		No Outcome required.		No Outcome required.
148	No impacts to agricultural productivity for third party land users as a result of groundwater recharge from the IWL, including: • Reduction in crop yield; • reduction in grain quality; or • adverse health impacts to livestock other than where agreed between the tenement holder and the affected user.	(2) The outcome appropriately states the level of impact subsequent to controls. An additional outcome is required to reflect that the receptor includes all third party land use and property (see regulatory response). (3) The outcome is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. Assessment: The MP (page 19-33) describes the proposed control and management strategies for groundwater. The MP (page 19-35) described the assessment of impacts on agriculture caused by the potential for recharge from the IWL to increase groundwater levels and salinity. The Iron Road impact assessment table (MP Appendix C) states the following, "seepage modelling indicates a low level of seepage which results in a small elevation of local GW table (33-50mm per year) for life of mine." The following additional control strategies are proposed, "groundwater in region of IWL is between 13 and 15mbgl" and "undertake GW monitoring once IWL established to verify seepage rates and impact on GW level". Post-mine completion, the groundwater modelling predicts that the open pit will act as a permanent sink. Seepage from the IWL post-mine completion will be directed to the pit. It is recommended that groundwater monitoring (as proposed by Iron Road) is included as a requirement of the sixth schedule of the lease. The Iron Road Response Document (Attachment B) Issue #14 also includes a discussion on relevant to this impact event.	(4) DSD recommends that should a lease be granted the following outcomes be a requirement of Schedule 6 of the lease: Third party land user outcome - Groundwater: The Tenement Holder must during construction, operation and post-mine completion, ensure no impacts to agricultural productivity, including but not limited to; • reduction in crop yield; • reduction in grain quality; or • adverse health impacts to livestock; for third party land users on or off the Land as a result of groundwater recharge from the IWL, other than those agreed between the Tenement Holder and the affected user. DSD recommends that should a lease be granted the following be a requirement of Schedule 6 of the lease: The Tenement Holder is required to address the following matters for the purposes of Regulation 65(2)(c) in relation to the third party land use outcome for impacts from IWL seepage; • Undertake groundwater monitoring at appropriate locations once the IWL is established and during operations to validate the groundwater model and IWL seepage rates.	Groundwater level rise due to seepage from the IWL is less than 2 metres above background, taking into account seasonal variation. Post closure, groundwater monitoring demonstrates that drawdown from the pit is negating any increase in groundwater level from IWL seepage.	(5) DSD considers the proposed draft measurement criteria requires amendment to demonstrate achievement of the proposed outcome. Assessment: Amendments to the criteria are required to ensure that it meets the requirements of Regulation 65(2)(d) and includes all of the required elements of criteria. DSD recommends that the location of groundwater monitoring bores and the groundwater level used to demonstrate achievement of the outcome (ie: 2m) is reviewed against groundwater modelling data to ensure that the locations and level are appropriate. The completion criteria requires amendment to meet the requirements of Regulation 65(2)(d). DSD considers that there are methodologies that are appropriate to demonstrate achievement of the outcome. Should a lease be granted, the measurement criteria would be finalised in the PEPR submission.	Groundwater monitoring results outside of the proposed mining lease boundary are in line with model predictions and seasonal variations.	(6) Should a lease be granted, the requirement for a leading indicator criteria would be finalised in the PEPR.
149	No impacts to agricultural productivity for third party land users as a result of groundwater recharge from the IWL, including: • Reduction in crop yield; • reduction in grain quality; or • adverse health impacts to livestock other than where agreed between the tenement holder and the affected user.	The outcomes and requirements for PIM_19_07 also apply to PIM_19_08.	The outcomes and requirements for PIM_19_07 also apply to PIM_19_08.	Groundwater level rise due to seepage from the IWL is less than 2 metres above background, taking into account seasonal variation. Post closure, groundwater monitoring demonstrates that drawdown from the pit is negating any increase in groundwater level from IWL seepage.	The outcomes and requirements for PIM_19_07 also apply to PIM_19_08.	Groundwater monitoring results within the proposed mining lease boundary are in line with model predictions and seasonal variations.	The outcomes and requirements for PIM_19_07 also apply to PIM_19_08.
150	NA	No Outcome required.	No Outcome required.	NA	No Outcome required.	NA	No Outcome required.
151	NA	No Outcome required.	No Outcome required.	NA	No Outcome required.	NA	No Outcome required.
152	NA	No Outcome required.	No Outcome required.	NA	No Outcome required.	NA	No Outcome required.
153	NA	No Outcome required.	No Outcome required.	NA	No Outcome required.	NA	No Outcome required.
154	NA	No Outcome required.	No Outcome required.	NA	No Outcome required.	NA	No Outcome required.
155	NA	No Outcome required.	No Outcome required.	NA	No Outcome required.	NA	No Outcome required.
156	NA	No Outcome required.	No Outcome required.	NA	No Outcome required.	NA	No Outcome required.
157	NA	No Outcome required.	No Outcome required.	NA	No Outcome required.	NA	No Outcome required.
158	The form, contrasting aspects and reflective aspects of mining structures are visually softened to blend in with the surrounding landscape and, where the mine is visually dominant from a surrounding road, township or residence, the view is softened through the use of screening vegetation.	(2) The outcome appropriately states the level of impact subsequent to controls. The outcome statement requires amendment to remove the reference to a management strategy (screening vegetation). (3) The outcome, without reference to the management strategy, is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. Assessment: The proposed strategies to manage the visual aesthetic of mining structures are readily achievable given established practices within industry. Successful achievement of the outcome requires concurrent application of a number of strategies. The MP (page 20-22) states the proposed control and management strategies for Visual Amenity and are appropriate. The following control measures are proposed in this table, "Significant distances exist from sensitive receptors to proposed mine lease boundary to infrastructure, targeted screening vegetation and revegetated IWL will screen mining infrastructure over time". DSD does not agree that there is a significant distance to surrounding roads and residential receptors to the south of the IWL (see MP page 2-5, figure 2-2). It is recommended that strategies for the management of visual amenity are developed in consultation with affected parties and that this be a requirement of the sixth schedule of the lease.	(4) DSD recommends that should a lease be granted the following outcome be a requirement of Schedule 6 of the lease: The Tenement Holder must during construction, operation and post-mine completion, ensure that the form, contrasting aspects and reflective aspects of mining operations are visually softened to blend in with the surrounding landscape. DSD recommends that should a lease be granted the following be a requirement of Schedule 6 of the lease: The Tenement Holder is required to address the following matters for the purposes of Regulation 65(2)(c) in relation to the visual amenity outcome; Develop and implement strategies in consultation with affected parties for the management of visual amenity which should include (but not limited to): • Unless the Director of Mines (or other authorised officer) has approved (in writing) an alternative agreement between the Tenement Holder and a land owner relating to the removal of infrastructure, the Tenement Holder must ensure that all infrastructure is decommissioned and removed from the Land at mine completion; • Screening of prominent built structures and use of non-reflective, natural coloured materials; • Establishing vegetation and mature trees to screen built infrastructure and minimise views into the site (where agreed with landowners); • Positioning and design of permanent mine landforms or other earthen bunds to screen activities; • Shape permanent mine landforms to soften the visual impact and reflect surrounding landscape; • Prompt rehabilitation of disturbed areas once no longer required for mining operations, utilising every available opportunity provided by the mine plan; • Progressive rehabilitation of the IWL; • Vegetate external faces of permanent mine landforms to reduce the impact of changes in landscape colour.	Post construction audits of buildings and the IWL, confirm they are in line with the design parameters in the PEPR. Monitoring of screening vegetation confirms it has been established in accordance with the design parameters in the PEPR. Ecosystem Function Analysis at representative sites on rehabilitated areas demonstrates that rehabilitation will achieve sustainability thresholds.	(5) DSD considers that there are methodologies that are appropriate to demonstrate achievement of the outcome. Should a lease be granted, the measurement criteria would be finalised in the PEPR submission.	None proposed	(6) Should a lease be granted, the requirement for a leading indicator criteria would be finalised in the PEPR.

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Line number	Proposed Outcome	DSD Assessment of Outcome, Strategies and Uncertainty	Recommended Regulatory Response - Outcomes and Strategies	Outcome measurement criteria	DSD Assessment of Draft Measurement Criteria	Leading indicator criteria (where required)	DSD Assessment of Leading Indicator Criteria
159	The form, contrasting aspects and reflective aspects of mining structures are visually softened to blend in with the surrounding landscape and, where the mine is visually dominant from a surrounding road, township or residence, the view is softened through the use of screening vegetation.	(2) The outcome appropriately states the level of impact subsequent to controls. The outcome statement requires amendment to remove the reference to a management strategy (screening vegetation). (3) The outcome, without reference to the management strategy, is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. Assessment: The proposed strategies to manage the visual aesthetic of mining structures are readily achievable given established practices within industry. Successful achievement of the outcome requires concurrent application of a number of strategies. The MP (page 20-22) states the proposed control and management strategies for Visual Amenity and are appropriate. The following control measures are proposed in this table, "Significant distances exist from sensitive receptors to proposed mine lease boundary to infrastructure, targeted screening vegetation and revegetated IWL will screen mining infrastructure over time". DSD does not agree that there is a significant distance to surrounding roads and residential receptors to the south of the IWL (see MP page 2-5, figure 2-2). It is recommended that strategies for the management of visual amenity are developed in consultation with affected parties and that this be a requirement of the sixth schedule of the lease.	(4) DSD recommends that should a lease be granted the following outcome be a requirement of Schedule 6 of the lease: The Tenement Holder must during construction, operation and post-mine completion, ensure that the form, contrasting aspects and reflective aspects of mining operations are visually softened to blend in with the surrounding landscape. DSD recommends that should a lease be granted the following be a requirement of Schedule 6 of the lease: The Tenement Holder is required to address the following matters for the purposes of Regulation 65(2)(c) in relation to the visual amenity outcome; Develop and implement strategies in consultation with affected parties for the management of visual amenity which should include (but not limited to): • Unless the Director of Mines (or other authorised officer) has approved (in writing) an alternative agreement between the Tenement Holder and a land owner relating to the removal of infrastructure, the Tenement Holder must ensure that all infrastructure is decommissioned and removed from the Land at mine completion; • Screening of prominent built structures and use of non-reflective, natural coloured materials; • Establishing vegetation and mature trees to screen built infrastructure and minimise views into the site (where agreed with landowners); • Positioning and design of permanent mine landforms or other earthen bunds to screen activities; • Shape permanent mine landforms to soften the visual impact and reflect surrounding landscape; • Prompt rehabilitation of disturbed areas once no longer required for mining operations, utilising every available opportunity provided by the mine plan; • Progressive rehabilitation of the IWL; • Vegetate external faces of permanent mine landforms to reduce the impact of changes in landscape colour.	Post construction audits of buildings and the IWL, confirm they are in line with the design parameters in the PEPR. Monitoring of screening vegetation confirms it has been established in accordance with the design parameters in the PEPR. Ecosystem Function Analysis at representative sites on rehabilitated areas demonstrates that rehabilitation will achieve sustainability thresholds.	(5) DSD considers that there are methodologies that are appropriate to demonstrate achievement of the outcome. Should a lease be granted, the measurement criteria would be finalised in the PEPR submission.	None proposed	(6) Should a lease be granted, the requirement for a leading indicator criteria would be finalised in the PEPR.
160	The form, contrasting aspects and reflective aspects of mining structures are visually softened to blend in with the surrounding landscape and, where the mine is visually dominant from a surrounding road, township or residence, the view is softened through the use of screening vegetation.	(2) The outcome appropriately states the level of impact subsequent to controls. The outcome statement requires amendment to remove the reference to a management strategy (screening vegetation). (3) The outcome, without reference to the management strategy, is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. Assessment: The proposed strategies to manage the visual aesthetic of mining structures are readily achievable given established practices within industry. Successful achievement of the outcome requires concurrent application of a number of strategies. The MP (page 20-22) states the proposed control and management strategies for Visual Amenity and are appropriate. The following control measures are proposed in this table, "Significant distances exist from sensitive receptors to proposed mine lease boundary to infrastructure, targeted screening vegetation and revegetated IWL will screen mining infrastructure over time". DSD does not agree that there is a significant distance to surrounding roads and residential receptors to the south of the IWL (see MP page 2-5, figure 2-2). It is recommended that strategies for the management of visual amenity are developed in consultation with affected parties and that this be a requirement of the sixth schedule of the lease.	(4) DSD recommends that should a lease be granted the following outcome be a requirement of Schedule 6 of the lease: The Tenement Holder must during construction, operation and post-mine completion, ensure that the form, contrasting aspects and reflective aspects of mining operations are visually softened to blend in with the surrounding landscape. DSD recommends that should a lease be granted the following be a requirement of Schedule 6 of the lease: The Tenement Holder is required to address the following matters for the purposes of Regulation 65(2)(c) in relation to the visual amenity outcome; Develop and implement strategies in consultation with affected parties for the management of visual amenity which should include (but not limited to): • Unless the Director of Mines (or other authorised officer) has approved (in writing) an alternative agreement between the Tenement Holder and a land owner relating to the removal of infrastructure, the Tenement Holder must ensure that all infrastructure is decommissioned and removed from the Land at mine completion; • Screening of prominent built structures and use of non-reflective, natural coloured materials; • Establishing vegetation and mature trees to screen built infrastructure and minimise views into the site (where agreed with landowners); • Positioning and design of permanent mine landforms or other earthen bunds to screen activities; • Shape permanent mine landforms to soften the visual impact and reflect surrounding landscape; • Prompt rehabilitation of disturbed areas once no longer required for mining operations, utilising every available opportunity provided by the mine plan; • Progressive rehabilitation of the IWL; • Vegetate external faces of permanent mine landforms to reduce the impact of changes in landscape colour.	Post construction audits of buildings and the IWL, confirm they are in line with the design parameters in the PEPR. Monitoring of screening vegetation confirms it has been established in accordance with the design parameters in the PEPR. Ecosystem Function Analysis at representative sites on rehabilitated areas demonstrates that rehabilitation will achieve sustainability thresholds.	(5) DSD considers that there are methodologies that are appropriate to demonstrate achievement of the outcome. Should a lease be granted, the measurement criteria would be finalised in the PEPR submission.	None proposed	(6) Should a lease be granted, the requirement for a leading indicator criteria would be finalised in the PEPR.
161	The form, contrasting aspects and reflective aspects of mining structures are visually softened to blend in with the surrounding landscape and, where the mine is visually dominant from a surrounding road, township or residence, the view is softened through the use of screening vegetation.	(2) The outcome appropriately states the level of impact subsequent to controls. The outcome statement requires amendment to remove the reference to a management strategy (screening vegetation). (3) The outcome, without reference to the management strategy, is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. Assessment: The proposed strategies to manage the visual aesthetic of mining structures are readily achievable given established practices within industry. Successful achievement of the outcome requires concurrent application of a number of strategies. The MP (page 20-22) states the proposed control and management strategies for Visual Amenity and are appropriate. The following control measures are proposed in this table, "Significant distances exist from sensitive receptors to proposed mine lease boundary to infrastructure, targeted screening vegetation and revegetated IWL will screen mining infrastructure over time". DSD does not agree that there is a significant distance to surrounding roads and residential receptors to the south of the IWL (see MP page 2-5, figure 2-2). It is recommended that strategies for the management of visual amenity are developed in consultation with affected parties and that this be a requirement of the sixth schedule of the lease.	(4) DSD recommends that should a lease be granted the following outcome be a requirement of Schedule 6 of the lease: The Tenement Holder must during construction, operation and post-mine completion, ensure that the form, contrasting aspects and reflective aspects of mining operations are visually softened to blend in with the surrounding landscape. DSD recommends that should a lease be granted the following be a requirement of Schedule 6 of the lease: The Tenement Holder is required to address the following matters for the purposes of Regulation 65(2)(c) in relation to the visual amenity outcome; Develop and implement strategies in consultation with affected parties for the management of visual amenity which should include (but not limited to): • Unless the Director of Mines (or other authorised officer) has approved (in writing) an alternative agreement between the Tenement Holder and a land owner relating to the removal of infrastructure, the Tenement Holder must ensure that all infrastructure is decommissioned and removed from the Land at mine completion; • Screening of prominent built structures and use of non-reflective, natural coloured materials; • Establishing vegetation and mature trees to screen built infrastructure and minimise views into the site (where agreed with landowners); • Positioning and design of permanent mine landforms or other earthen bunds to screen activities; • Shape permanent mine landforms to soften the visual impact and reflect surrounding landscape; • Prompt rehabilitation of disturbed areas once no longer required for mining operations, utilising every available opportunity provided by the mine plan; • Progressive rehabilitation of the IWL; • Vegetate external faces of permanent mine landforms to reduce the impact of changes in landscape colour.	Post construction audits of buildings and the IWL, confirm they are in line with the design parameters in the PEPR. Monitoring of screening vegetation confirms it has been established in accordance with the design parameters in the PEPR. Ecosystem Function Analysis at representative sites on rehabilitated areas demonstrates that rehabilitation will achieve sustainability thresholds.	(5) DSD considers that there are methodologies that are appropriate to demonstrate achievement of the outcome. Should a lease be granted, the measurement criteria would be finalised in the PEPR submission.	None proposed	(6) Should a lease be granted, the requirement for a leading indicator criteria would be finalised in the PEPR.
162	The form, contrasting aspects and reflective aspects of mining structures are visually softened to blend in with the surrounding landscape and, where the mine is visually dominant from a surrounding road, township or residence, the view is softened through the use of screening vegetation.	(2) The outcome appropriately states the level of impact subsequent to controls. The outcome statement requires amendment to remove the reference to a management strategy (screening vegetation). (3) The outcome, without reference to the management strategy, is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. Assessment: The proposed strategies to manage the visual aesthetic of mining structures are readily achievable given established practices within industry. Successful achievement of the outcome requires concurrent application of a number of strategies. The MP (page 20-22) states the proposed control and management strategies for Visual Amenity and are appropriate. The following control measures are proposed in this table, "Limited vegetation in landscape, screening vegetation and revegetation following mining". It is recommended that strategies for the management of visual amenity are developed in consultation with affected parties and that this be a requirement of the sixth schedule of the lease.	(4) DSD recommends that should a lease be granted the following outcome be a requirement of Schedule 6 of the lease: The Tenement Holder must during construction, operation and post-mine completion, ensure that the form, contrasting aspects and reflective aspects of mining operations are visually softened to blend in with the surrounding landscape. DSD recommends that should a lease be granted the following be a requirement of Schedule 6 of the lease: The Tenement Holder is required to address the following matters for the purposes of Regulation 65(2)(c) in relation to the visual amenity outcome; Develop and implement strategies in consultation with affected parties for the management of visual amenity which should include (but not limited to): • Unless the Director of Mines (or other authorised officer) has approved (in writing) an alternative agreement between the Tenement Holder and a land owner relating to the removal of infrastructure, the Tenement Holder must ensure that all infrastructure is decommissioned and removed from the Land at mine completion; • Screening of prominent built structures and use of non-reflective, natural coloured materials; • Establishing vegetation and mature trees to screen built infrastructure and minimise views into the site (where agreed with landowners); • Positioning and design of permanent mine landforms or other earthen bunds to screen activities; • Shape permanent mine landforms to soften the visual impact and reflect surrounding landscape; • Prompt rehabilitation of disturbed areas once no longer required for mining operations, utilising every available opportunity provided by the mine plan; • Progressive rehabilitation of the IWL; • Vegetate external faces of permanent mine landforms to reduce the impact of changes in landscape colour.	Post construction audits of buildings and the IWL, confirm they are in line with the design parameters in the PEPR. Monitoring of screening vegetation confirms it has been established in accordance with the design parameters in the PEPR. Ecosystem Function Analysis at representative sites on rehabilitated areas demonstrates that rehabilitation will achieve sustainability thresholds.	(5) DSD considers that there are methodologies that are appropriate to demonstrate achievement of the outcome. Should a lease be granted, the measurement criteria would be finalised in the PEPR submission.	None proposed	(6) Should a lease be granted, the requirement for a leading indicator criteria would be finalised in the PEPR.
163	The form, contrasting aspects and reflective aspects of mining structures are visually softened to blend in with the surrounding landscape and, where the mine is visually dominant from a surrounding road, township or residence, the view is softened through the use of screening vegetation.	(2) The outcome appropriately states the level of impact subsequent to controls. The outcome statement requires amendment to remove the reference to a management strategy (screening vegetation). (3) The outcome, without reference to the management strategy, is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. Assessment: The proposed strategies to manage the visual aesthetic of mining structures are readily achievable given established practices within industry. Successful achievement of the outcome requires concurrent application of a number of strategies. The MP (page 20-22) states the proposed control and management strategies for Visual Amenity and are appropriate. The following control measures are proposed in this table, "Limited vegetation in landscape, screening vegetation and revegetation following mining". It is recommended that strategies for the management of visual amenity are developed in consultation with affected parties and that this be a requirement of the sixth schedule of the lease.	(4) DSD recommends that should a lease be granted the following outcome be a requirement of Schedule 6 of the lease: The Tenement Holder must during construction, operation and post-mine completion, ensure that the form, contrasting aspects and reflective aspects of mining operations are visually softened to blend in with the surrounding landscape. DSD recommends that should a lease be granted the following be a requirement of Schedule 6 of the lease: The Tenement Holder is required to address the following matters for the purposes of Regulation 65(2)(c) in relation to the visual amenity outcome; Develop and implement strategies in consultation with affected parties for the management of visual amenity which should include (but not limited to): • Unless the Director of Mines (or other authorised officer) has approved (in writing) an alternative agreement between the Tenement Holder and a land owner relating to the removal of infrastructure, the Tenement Holder must ensure that all infrastructure is decommissioned and removed from the Land at mine completion; • Screening of prominent built structures and use of non-reflective, natural coloured materials; • Establishing vegetation and mature trees to screen built infrastructure and minimise views into the site (where agreed with landowners); • Positioning and design of permanent mine landforms or other earthen bunds to screen activities; • Shape permanent mine landforms to soften the visual impact and reflect surrounding landscape; • Prompt rehabilitation of disturbed areas once no longer required for mining operations, utilising every available opportunity provided by the mine plan; • Progressive rehabilitation of the IWL; • Vegetate external faces of permanent mine landforms to reduce the impact of changes in landscape colour.	Post construction audits of buildings and the IWL, confirm they are in line with the design parameters in the PEPR. Monitoring of screening vegetation confirms it has been established in accordance with the design parameters in the PEPR. Ecosystem Function Analysis at representative sites on rehabilitated areas demonstrates that rehabilitation will achieve sustainability thresholds.	(5) DSD considers that there are methodologies that are appropriate to demonstrate achievement of the outcome. Should a lease be granted, the measurement criteria would be finalised in the PEPR submission.	None proposed	(6) Should a lease be granted, the requirement for a leading indicator criteria would be finalised in the PEPR.
164	No public nuisance impacts from light spill generated by mining operations.	(2) The outcome appropriately states the level of impact subsequent to controls. The outcome requires minor amendment to reflect adjacent land use as the receptor. Public nuisance is captured by a residential 'land use'. (3) The outcome is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. Assessment: The MP (page 20-24) states the assessment of impacts from Light Spill. The following control measures are proposed in this table, "Directional lighting and measures to reduce light spill, screening vegetation and community feedback on areas requiring more attention". There are residential receptors in close proximity to the proposed mine (see MP page 2-5, figure 2-2). It is recommended that strategies for the management of light spill are developed in consultation with affected parties and that this be a requirement of the sixth schedule of the lease. It is recommended that adherence to Australian Standard AS 4282-1997 Control of the obtrusive effects of outdoor lighting is a requirement of the sixth schedule of the lease.	(4) DSD recommends that should a lease be granted the following outcome be a requirement of Schedule 6 of the lease: Third party land use outcome - Light Spill: The Tenement Holder must during construction and operation, ensure that there are no adverse impacts to third party land use as a result of light spill caused by mining operations. DSD recommends that should a lease be granted the following be a requirement of Schedule 6 of the lease: The Tenement Holder is required to address the following matters for the purposes of Regulation 65(2)(c) in relation to the light spill outcome; • Adhere to Australian Standard AS 4282-1997 Control of the obtrusive effects of outdoor lighting; and • Develop and implement strategies in consultation with affected parties for the management of Light Spill.	Post construction site inspections show that fixed lighting meets the requirements of AS 4282-1997 Control of the obtrusive effects of outdoor lighting	(5) DSD considers that there are methodologies that are appropriate to demonstrate achievement of the outcome. Should a lease be granted, the measurement criteria would be finalised in the PEPR submission.		(6) Should a lease be granted, the requirement for a leading indicator criteria would be finalised in the PEPR.

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Line number	Proposed Outcome	DSD Assessment of Outcome, Strategies and Uncertainty	Recommended Regulatory Response - Outcomes and Strategies	Outcome measurement criteria	DSD Assessment of Draft Measurement Criteria	Leading indicator criteria (where required)	DSD Assessment of Leading Indicator Criteria
165	Agricultural production continues to occur on land within the mining lease where this does not compromise mining and associated activities.	(2) The proposed outcome refers to a strategy to ensure multiple land use within the proposed mining lease. This strategy is supported. The outcome statement requires amendment to accurately describe that third party land use should not be impacted within the proposed mining lease, unless agreed between the Tenement Holder and the affected land owner. (3) The outcome is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. Assessment: The assessment for this impact event is provided on page 21-15 of the MP. Potential impacts to third party land use within the tenement will also be regulated by other outcomes that could impact that land use (eg: air quality, groundwater, surface water outcomes etc).	(4) DSD recommends that should a lease be granted the following outcome be a requirement of Schedule 6 of the lease: Third party land use and property outcome: The Tenement Holder must during construction, operation and post-mine completion, ensure that there are no adverse impacts to third party land use or property, adjacent to and on the Land, as a result of mining operations, other than those agreed between the Tenement Holder and the affected user.	Annual review of land use on the mining lease during construction, operation and closure demonstrates it is not reasonably practicable (e.g. for security or safety reasons) to allow more land to be leased for agricultural purposes.	(5) DSD considers that there are methodologies that are appropriate to demonstrate achievement of the outcome. Should a lease be granted, the measurement criteria would be finalised in the PEPR submission.	None proposed	(6) Should a lease be granted, the requirement for a leading indicator criteria would be finalised in the PEPR.
166	NA	No Outcome required.	No Outcome required.	NA	No Outcome required.	NA	No Outcome required.
167	All land on the mining lease affected by mining and associated activities is progressively rehabilitated to achieve the agreed post mining land use.	(2) The outcome appropriately states the level of impact subsequent to controls. The outcome statement requires minor amendment. (3) The outcome is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. Assessment: The assessment of this impact event is on page 21-16 of the MP. "Ongoing rehabilitation trials and consultation on post mining land use" are proposed as strategies which are appropriate. The requirement for rehabilitation trials will be assessed against outcomes for the IWL and soil.	(4) DSD recommends that should a lease be granted the following outcomes be a requirement of Schedule 6 of the lease: The Tenement Holder must ensure that the Land is progressively and finally rehabilitated to support the future land use. Before mine completion, the Tenement Holder must satisfy the Director of Mines (or other authorised officer) that where practicable, the pre-mining land use can be recommenced post-mine completion.	Independent audit at mine completion demonstrates all reasonable actions have been taken to maximise the area of land on the mining lease that can be returned to agricultural use, where this use has been agreed with stakeholders. As progressive rehabilitation occurs, independent audit of rehabilitated portions of the mining lease confirm they are suitable for the agreed post mining land use. Independent audit at mine completion confirms all land in the mining lease is suitable for the agreed post mining land uses.	(5) DSD considers that there are methodologies that are appropriate to demonstrate achievement of the outcome. Should a lease be granted, the measurement criteria would be finalised in the PEPR submission.	None proposed	(6) Should a lease be granted, the requirement for a leading indicator criteria would be finalised in the PEPR.
168	No adverse impacts on adjacent land use or unauthorised damage to public or private property and infrastructure due to geotechnical failure of the integrated waste landform during construction, operation and closure.	(2) The outcome appropriately states the level of impact subsequent to controls. The outcome statement requires amendment to accurately reflect that the receptor (productive land, third party land use or third party property) can be located within the proposed lease or adjacent to it. The reference to 'vegetation' as a receptor is addressed by the outcome referring to land use. Potential impacts to vegetation are also addressed by the native vegetation outcomes. (3) The outcome is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. Assessment: The MP (page 21-15) includes control and management strategies for land use and tenure, which include strategies for IWL stability. The assumption and uncertainty has been assessed as High due to the fact that the IWL design is conceptual. The requirement for detailed designs to ensure geotechnical stability of the IWL and cover are assessed against outcomes for the IWL in the soil and public safety sections. The requirement for peer review of the geotechnical design of the IWL has been included as a second schedule lease condition. Rehabilitation Trials for the IWL are proposed and are appropriate. QA/QC has also been proposed as a criteria which is also appropriate. The requirement for rehabilitation trials and QA/QC are assessed against outcomes for the IWL in the soil and public safety sections. Recommendations for strategies to ensure IWL stability are addressed against Soil outcomes (see PIM_13_04).	(4) DSD recommends that should a lease be granted the following outcome be a requirement of Schedule 6 of the lease: Third party land use and property outcome: The Tenement Holder must during construction, operation and post-mine completion, ensure that there are no adverse impacts to third party land use or property, adjacent to and on the Land, as a result of mining operations, other than those agreed between the Tenement Holder and the affected user. Note: Recommendations for strategies to ensure IWL stability are addressed against Soil outcomes (see PIM_13_04).	Monthly review of quality assurance data confirms the integrated waste landform has been constructed to design specifications. Monthly physical examination of integrated waste landform shows slumping has not occurred onto adjoining land.	(5) DSD considers that there are methodologies that are appropriate to demonstrate achievement of the outcome. Should a lease be granted, the measurement criteria would be finalised in the PEPR submission.	None proposed	(6) Should a lease be granted, the requirement for a leading indicator criteria would be finalised in the PEPR.
168a	Landform is geotechnically stable and safe	(2) The outcome statement is a strategy. A new outcome is required to accurately reflect the receptor (which is future land use). The strategy of ensuring geotechnical stability in the long term will be critical in achieving the future land use and public safety outcomes. The reference to 'vegetation' as a receptor is addressed by the outcome referring to land use. Potential impacts to vegetation are also addressed by the native vegetation outcomes. (3) The outcome is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. Assessment: The assessment of this impact event is on page 21-16 of the MP. "Ongoing rehabilitation trials and long term erosion modelling" are proposed as strategies which are appropriate. The requirement for rehabilitation trials will be assessed against outcomes for the IWL in the Soil section. Recommendations for additional strategies to ensure IWL stability are addressed against Soil outcomes (see PIM_13_04).	(4) DSD recommends that should a lease be granted the following outcomes be a requirement of Schedule 6 of the lease: Third party land use and property outcome: The Tenement Holder must during construction, operation and post-mine completion, ensure that there are no adverse impacts to third party land use or property, adjacent to and on the Land, as a result of mining operations, other than those agreed between the Tenement Holder and the affected user. The Tenement Holder must ensure that the Land is progressively and finally rehabilitated to support the future land use. DSD recommends that should a lease be granted the following be a requirement of Schedule 6 of the lease: The Tenement Holder is required to address the following matters for the purpose of Regulation 65(2)(c) in relation to the future land use outcome: • The Tenement Holder must ensure that post-mine completion, all final mine landforms (including the IWL) will be chemically and physically stable in the long term. • Strategies for the establishment of post-mine completion land uses and areas, including the re-establishment of land for agriculture, must be consistent with the Mining Lease Proposal.	Ecosystem Function Analysis at representative sites on rehabilitated areas demonstrates that rehabilitation will achieve sustainability thresholds. Landform modelling based on established integrated waste landform material parameters and geometry confirm alignment with outcomes from conceptual modelling. Independent audit at mine completion of quality assurance data confirms the IWL has been constructed to design specifications.	(5) DSD considers that there are methodologies that are appropriate to demonstrate achievement of the outcome. Should a lease be granted, the measurement criteria would be finalised in the PEPR submission.	None proposed	(6) Should a lease be granted, the requirement for a leading indicator criteria would be finalised in the PEPR.
168b	No impacts to agricultural productivity for third party land users as a result of mining operations, including: • reduction in crop yield; • reduction in grain quality; or • adverse health impacts to livestock other than where agreed between the tenement holder and the affected user.	(2) The outcome appropriately states the level of impact subsequent to controls. (3) The outcome is assessed to be achievable given the proposed controls and identified assumptions and uncertainty. Assessment: The MP (page 21-17 and Figures 21-4 and 21-5) summarise the assessment for impacts to land use from shading from the IWL. The impact assessment shows that shading will have impact the amount of sunlight available to properties adjacent to the IWL (both on and off the proposed lease). The environmental outcome proposed by Iron Road commits to 'no impacts to agricultural productivity, including, crop yield, grain quality and livestock' other than those impacts agreed with the affected users. This outcome is appropriate and achievable given that any impact must be agreed with affected users. The 'IWL design' has been stated by Iron Road as a key control strategy. As the IWL progresses from a conceptual design to a detailed design, it is recommended that shading be further considered. A sixth schedule lease condition is recommended in regards to shading.	(4) DSD recommends that should a lease be granted the following outcomes be a requirement of Schedule 6 of the lease: Third party land user outcome - Shading: The Tenement Holder must during construction, operation and post-mine completion, ensure no impacts to agricultural productivity, including but not limited to; • reduction in crop yield; • reduction in grain quality; or • adverse health impacts to livestock; for third party land users on or off the Land as a result of shading from mining operations, other than those agreed between the Tenement Holder and the affected user. DSD recommends that should a lease be granted the following be a requirement of Schedule 6 of the lease: The Tenement Holder is required to address the following matters for the purposes of Regulation 65(2)(c) in relation to the third party land use outcomes for shading; • Develop strategies for the design of the IWL to ensure impacts from shading to agricultural productivity for third party land users on or off the	Crop yields on areas outside of the proposed mining lease are comparable with adjacent properties or compensation is duly paid.	(5) The measurement of compensation as a criteria is not appropriate. The measurement of crop yield and quality is appropriate as this directly measures the impact on the receptor. DSD considers that there are methodologies that are appropriate to demonstrate achievement of the outcome. Should a lease be granted, the measurement criteria would be finalised in the PEPR submission.	None proposed	(6) Should a lease be granted, the requirement for a leading indicator criteria would be finalised in the PEPR.
169	**NA - Benefit**	No Outcome required.	No Outcome required.		No Outcome required.		No Outcome required.
170	**NA - Benefit**	No Outcome required.	No Outcome required.		No Outcome required.		No Outcome required.
171	**NA - Benefit**	No Outcome required.	No Outcome required.		No Outcome required.		No Outcome required.
172	**NA - Benefit**	No Outcome required.	No Outcome required.		No Outcome required.		No Outcome required.
173	**NA - Benefit**	No Outcome required.	No Outcome required.		No Outcome required.		No Outcome required.
174	**NA - Benefit**	No Outcome required.	No Outcome required.		No Outcome required.		No Outcome required.
175	**NA - Benefit**	No Outcome required.	No Outcome required.		No Outcome required.		No Outcome required.
176	**NA - Benefit**	No Outcome required.	No Outcome required.		No Outcome required.		No Outcome required.
177	**NA - Benefit**	No Outcome required.	No Outcome required.		No Outcome required.		No Outcome required.
178	**NA - Benefit**	No Outcome required.	No Outcome required.		No Outcome required.		No Outcome required.

DSD Assessment of Iron Road CEIP Impacts and Risks Register - December 2016

Line number	Proposed Outcome	DSD Assessment of Outcome, Strategies and Uncertainty	Recommended Regulatory Response - Outcomes and Strategies	Outcome measurement criteria	DSD Assessment of Draft Measurement Criteria	Leading indicator criteria (where required)	DSD Assessment of Leading Indicator Criteria
179	Landowners directly affected by the proposed mine are regularly consulted in a transparent and respectful way and fair compensation is paid for acquisition of land.	No Outcome required.	No Outcome required.	Evidence that communication has occurred at agreed timeframes. Any complaints about Iron Road's conduct during negotiations are addressed within 30 days to the satisfaction of the affected parties or the Director of Mines. Annual review of land use on the mining lease during construction, operation and closure demonstrates it is not reasonably practicable (e.g. for security or safety reasons) to allow more land to be leased for agricultural purposes.	No Outcome required.	Not required	No Outcome required.
180	No reduction in community satisfaction with government and community services that can be attributed to Iron Road's operations.	No Outcome required.	No Outcome required.	Annual survey of community satisfaction with government and community services shows: - no sustained reduction in community satisfaction against a range of indicators to be specified in the social management plan, or - if there is a sustained decline in community satisfaction, independent investigation confirms this is due to reasons beyond Iron Road's control. The social management plan will define what represents a 'sustained reduction' for each indicator.	No Outcome required.	To be developed through social management plan. Example indicators are: - Range of services provided - Median times to access services - Waiting times for health services - Number of teachers, police officers, doctors and other healthcare professionals per head of population.	No Outcome required.
181	No reduction in community satisfaction with government and community services that can be attributed to Iron Road's operations.	No Outcome required.	No Outcome required.	Annual survey of community satisfaction with government and community services shows: - no sustained reduction in community satisfaction against a range of indicators to be specified in the social management plan, or - if there is a sustained decline in community satisfaction, independent investigation confirms this is due to reasons beyond Iron Road's control. The social management plan will define what represents a 'sustained reduction' for each indicator.	No Outcome required.	To be developed through social management plan. Example criteria are: - Range of services provided - Median times to access services - Waiting times for health services - Number of teachers, police officers, doctors and other healthcare professionals per head of population.	No Outcome required.
182	To the extent of Iron Road's influence, housing affordability is maintained in Wudinna DC.	No Outcome required.	No Outcome required.	Audit confirms Iron Road has built employee and contractor accommodation to the design capacity specified in the PEPR. Annual review confirms Iron Road has maintained accommodation availability within the range and in the timeframe specified in the social management plan.	No Outcome required.	Criteria to be further developed through social management plan based on monitoring of: - Median house price - Median residential rents - Number of vacant houses and new residential builds - Per cent of households paying greater than 30% of their income on housing costs.	No Outcome required.
183	To the extent of Iron Road's influence, housing affordability is maintained in Wudinna DC.	No Outcome required.	No Outcome required.	Audit confirms Iron Road has built employee and contractor accommodation to the design capacity specified in the PEPR. Annual review confirms Iron Road has maintained accommodation availability within the range and in the timeframe specified in the social management plan.	No Outcome required.	Criteria to be further developed through social management plan based on monitoring of: - Median house price - Median residential rents - Number of vacant houses and new residential builds - Per cent of households paying greater than 30% of their income on housing costs.	No Outcome required.
184	No compromise to community cohesion and well-being as a result of Iron Road's operations	No Outcome required.	No Outcome required.	No sustained decrease across a range of community cohesion and well-being indicators such as: - range of services provided - percentage of Iron Road workers living locally - contribution of Iron Road workers to the community through volunteer work - corporate support for community programs - social integration of Iron Road workers into the community - community health. below overall levels to be specified in the social management plan. The social management plan will define what represents a 'sustained reduction' for each indicator.	No Outcome required.	Regular survey of local residents indicates most residents consider Iron Road has had a positive impact on the community.	No Outcome required.
185	No compromise to community safety and security as a result of Iron Road's operations	No Outcome required.	No Outcome required.	Investigation of breaches of the Code of Conduct for Iron Road workers are completed within 14 days, or as agreed by the Director of Mines, and action taken as specified in Iron Road's disciplinary procedures.	No Outcome required.	No increase on a per capita basis in the number of callouts or complaints to police. No increase on a per capita basis in the number of breaches of the Iron Road Code of Conduct by employees. Regular community survey demonstrates no sustained increase in community fear of crime.	No Outcome required.
186	No compromise to the viability of other local and regional industries as a result of labour shortages caused by Iron Road.	No Outcome required.	No Outcome required.	Iron Road's commitments to support education and training programs are included in the social management plan and met within the specified timeframes.	No Outcome required.	Criteria to be developed in social management plan, such as: - recruitment times for a range of local businesses and service providers - staff turnover in local businesses and service providers - wage differentials	No Outcome required.
187	NA - Benefit	No Outcome required.	No Outcome required.		No Outcome required.		No Outcome required.
188	To the extent of Iron Road's influence, the cost of living in the Wudinna DC is maintained at an affordable level.	No Outcome required.	No Outcome required.	Evidence that Iron Road has contributed collaboratively with business and government on actions in the social management plan to control cost of living increases in the Wudinna DC	No Outcome required.	Criteria to be developed in social management plan based on: - monitoring of CPI increases - number of people on income support by age and gender.	No Outcome required.
189	Disruption to local traffic is as low as reasonably practicable	No Outcome required.	No Outcome required.	Review undertaken in consultation with Wudinna Council confirms all road closures are necessary for mine safety and security	No Outcome required.	None proposed	No Outcome required.
190	NA - Benefit	No Outcome required.	No Outcome required.		No Outcome required.		No Outcome required.
191	The Central Eyre Iron Project results in a positive social and economic legacy for the local community	No Outcome required.	No Outcome required.	Improvement in a range of social and economic indicators (to be developed in the social management plan) from the pre-mining to post mining situation.	No Outcome required.	None proposed	No Outcome required.

ASSESSMENT REPORT
2016

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SOUTH AUSTRALIA

Government of South Australia
Department of State Development

Assessment report for the application of a mineral lease from
IRD Mining Operations Pty Ltd for the Central Eyre Iron Project

Government of South Australia
Department of State Development

31st March 2017

Addendum to the Assessment Report

Explanatory Note on the Final Terms and Conditions of the IRD Mining Operations Pty Ltd Mineral Lease for the Central Eyre Iron Project

This explanatory note is an addendum to Department of State Development's Assessment Report for the Mining Lease Application for the Central Eyre Iron Project (CEIP). This document should be read in conjunction with the Assessment Report.

The assessment of potential impacts and project risks described in Chapter 8 of the Assessment Report includes recommendations for terms, conditions and requirements to be attached to the Mineral Lease, should the Minister for Mineral Resources and Energy decide to approve the Mining Lease Application submitted by IRD Mining Operations Pty Ltd (IRD) for the CEIP. Should the Minister decide to refuse the Mining Lease Application then the recommended terms, conditions and requirements will be redundant as no Mineral Lease would be granted.

As part of the Mineral Lease Application process, in accordance with Regulation 40 of the Mining Regulations 2011, IRD were provided an opportunity to make a submission on the proposed terms, conditions and requirements of the Mineral Lease in a draft Tenement Document.

During this period, IRD sought explanation and further clarification on a number of the proposed terms, conditions and requirements. The Department of State Development met with IRD to understand the issues raised by the company, and to provide explanations and clarification of the terms, conditions and requirements. The Department undertook a comprehensive review of each of the issues raised by IRD, and sought relevant advice from Government's technical experts.

The Government review of the Tenement Document identified a number of alterations that should be made to provide additional clarity for the applicant, for the community, and for Government. The review also identified opportunities for alterations intended to:

- more accurately express the intent of the Department's policy; and/or
- reflect changes to the Tenement Document that have been made in the intervening period including any formatting changes.

Importantly, the alterations have not reduced the level of protection afforded to the public or the environment through the terms, conditions and requirements applied.

Following the review, the Department proceeded to prepare a final proposed Tenement Document with a limited number of alterations as detailed in the following tables. These tables describe the original terms, conditions and requirements, the altered terms, conditions and requirements, and the purpose and effect of each change.

Further information on each term, condition and requirement and on the protection of the public and the environment from potential impacts from the proposed mine can be found in the Department's detailed Assessment Report, published at:
http://minerals.statedevelopment.sa.gov.au/ or http://ceipconsultation.sa.gov.au/

Explanatory Note on the Final Terms, Conditions and Requirements of the IRD Mining Operations Pty Ltd Mineral Lease

Alterations to Mineral Lease – Main Body			
Paragraph Number	**Condition in Assessment report or Regulation 40 proposed lease notification**	**Alteration to Condition** *(alterations shown in red)*	**Purpose and effect**
14	14.The Sixth Schedule of this Tenement Document sets out outcomes contemplated in regulation 65(2) of the Regulations, that the Tenement Holder is required to address in any program submitted in accordance with Part 10A of the Act. *Explanatory note: The Sixth Schedule may also contain strategies and criteria which the Department has formed the view would address the outcomes set out in that Schedule.*	14. The Sixth Schedule of this Tenement Document sets out outcomes contemplated in regulation 65(2) of the Regulations, that the Tenement Holder is required to address in any program submitted in accordance with Part 10A of the Act. *Explanatory note: The Sixth Schedule may also specify ~~contain~~ requirements for strategies and criteria ~~which the Department has formed the view would~~ relevant to ~~address~~ the outcomes set out in that Schedule.*	The alteration to this Explanatory Note has been made to ensure clarity in the interpretation of this condition.
37	37.Comply with regulation 98(1)(c), which concerns bankruptcy, insolvency and liquidation.	~~37. Comply with regulation 98(1)(c), which concerns bankruptcy, insolvency and liquidation.~~ 37. The Tenement Holder must comply with regulation 98(1)(c) and 98(2). 37.1. If the Tenement Holder is a natural person, he or she is required to notify the Mining Registrar of a declaration of bankruptcy within 14 days of the declaration. 37.2. If the Tenement Holder is a company, it is required to notify the Mining Registrar of its being placed under official management, or in liquidation or receivership within 14 days of any of those events.	Restatement of Regulations 98(1)(c) and 98(2).
Definition 39.4	39.4. **"ANCOLD"** means Australian National Committee on Large Dams;	~~39.4. **"ANCOLD"** means Australian National Committee on Large Dams;~~	This deletion has been made to ensure clarity as the term defined is not used in the tenement document.
Definition 39.7	39.7. **"Basement-fractured rock aquifer"** means the single confined fractured rock aquifer within Proterozoic age basement rocks;	~~39.7. **"Basement-fractured rock aquifer"** means the single confined fractured rock aquifer within Proterozoic age basement rocks;~~	This deletion has been made to ensure clarity as the term defined is not used in the tenement document.
Definition 39.13	39.13. **"Environmental Values (ground and surface water)"** means the environmental values	~~39.13. **"Environmental Values (ground and surface water)"** means the environmental values recognised in~~	This deletion has been made to ensure clarity as the term defined is not used in

Explanatory Note on the Final Terms, Conditions and Requirements of the IRD Mining Operations Pty Ltd Mineral Lease

Alterations to Mineral Lease – Main Body			
Paragraph Number	**Condition in Assessment report or Regulation 40 proposed lease notification**	**Alteration to Condition** *(alterations shown in red)*	**Purpose and effect**
	recognised in the *'Australian and New Zealand Guidelines for Fresh and Marine Water Quality, October 2000, Paper No 4'*. *Explanatory Note: This Paper is available on line at: http://www.environment.gov.au/water/quality/publications/australian-and-new-zealand-guidelines-fresh-marine-water-quality-volume-1*	~~the *'Australian and New Zealand Guidelines for Fresh and Marine Water Quality, October 2000, Paper No 4'. Explanatory Note: This Paper is available on line at: http://www.environment.gov.au/water/quality/publications/australian-and-new-zealand-guidelines-fresh-marine-water-quality-volume-1*~~	the tenement document.
Definition 39.15	39.15. **"Freeboard"** means the difference in height between the level of the supernatant pond and the lowest point of the tailings dam embankment;	~~39.15. **"Freeboard"** means the difference in height between the level of the supernatant pond and the lowest point of the tailings dam embankment;~~	This deletion has been made to ensure clarity as the term defined is not used in the tenement document.
Definition 39.18	39.18. **"MAR"** means Managed Aquifer Recharge and for the purpose of the Mining Tenement is the intentional recharge of water into an aquifer either by injection or infiltration;	~~39.18. **"MAR"** means Managed Aquifer Recharge and for the purpose of the Mining Tenement is the intentional recharge of water into an aquifer either by injection or infiltration;~~	This deletion has been made to ensure clarity as the term defined is not used in the tenement document.
Definition 39.29	39.29. **"the Program"** means the Approved PEPR as defined above;	~~39.29. **"the Program"** means the Approved PEPR as defined above;~~	This deletion has been made to ensure clarity.
Definition 39.31	39.31 **"Real time monitoring"** means the system for making monitored environmental parameters, acquired by the Tenement Holder, available immediately to stakeholders in an easily understood format;	**39.25"Real time"** means, in relation to a system for monitoring environmental parameters that the data acquired by the Tenement Holder is made immediately available (or as close to the time as is recorded as possible) to stakeholders in an easily understood format.	This alteration has been made to ensure clarity in the interpretation of the definition of "real time".
Definition 39.38	**39.38. "Tenement Holder"** means the person, or persons to whom the mining tenement was granted and includes: 39.38.1. If the Tenement Holder is a natural person the executors, administrators and assigns of that person;	39.32 **"Tenement Holder"** means the person, or persons to whom the mining tenement was granted and includes: 39.32.1. If the Tenement Holder is a natural person the executors, administrators, trustee in bankruptcy or ~~and permitted~~ assigns of that person; 39.32.2. If the Tenement Holder is a body corporate the successors, administrators or ~~permitted~~ assigns thereof.	This alteration has been made to ensure clarity in the interpretation of the definition of "Tenement Holder".

Explanatory Note on the Final Terms, Conditions and Requirements of the IRD Mining Operations Pty Ltd Mineral Lease

Alterations to Mineral Lease – Main Body			
Paragraph Number	**Condition in Assessment report or Regulation 40 proposed lease notification**	**Alteration to Condition** *(alterations shown in red)*	**Purpose and effect**
	39.38.2. If the Tenement Holder is a body corporate the successors, administrators or permitted assigns thereof. *Explanatory Note: "The Tenement Holder" has the same meaning as "the mining operator" as defined by section 6 of the Act*	*Explanatory Note: "The Tenement Holder" has the same meaning as "the mining operator" as defined by section 6 of the Act.*	
Definition 39.39	39.39. "**third party land users**" means the owner of land (as defined by the Act) and any persons lawfully occupying land with the licence of the owner, or the consent of the owner and "third party land use" has a corresponding meaning;	39.33. **"third party land users**" means the owner of land as defined by the Act (which includes native title holders and any persons lawfully occupying land with the licence of the owner, or the consent of the owner) and **"third party land use"** has a corresponding meaning;	This alteration has been made to ensure clarity in the interpretation of this definition by including specific reference to native title holders and defining that "third party land use" has a corresponding meaning.
Definition 39.41.	39.41. "TSF" means the Tailings Storage Facility;	~~39.41. **"TSF"** means the Tailings Storage Facility;~~	This deletion has been made to ensure clarity as the term defined is not used in the tenement document.
Definition 39.44.	39.44. "WRD" means Waste Rock Dump.	~~39.44. **"WRD"** means Waste Rock Dump.~~	This deletion has been made to ensure clarity as the term defined is not used in the tenement document.
40.1	40.1. Unless otherwise stated, any term which is used in this Tenement Document which has a specific meaning in the Act or the Regulations, has that same meaning in this Tenement Document;	40.1. Unless otherwise stated, any term which is used in this Tenement Document which has a ~~specific~~ defined meaning in the Act or the Regulations, has that same meaning in this Tenement Document;	This alteration has been made to ensure clarity in relation to this interpretation.
40.3	40.3. If the Mining Tenement is granted to more than one person, all of the persons to whom it is granted are all jointly and severally liable for compliance with the Act, the Regulations and this Tenement Document, including the Additional Terms and Conditions in the First and Second Schedules of this Tenement Document respectively;	40.3. If the Mining Tenement is granted to more than one person, all of the persons to whom it is granted are ~~all~~ jointly and severally liable for compliance with the Act, the Regulations and this Tenement Document, including the Additional Terms and Conditions in the First and Second Schedules of this Tenement Document respectively;	This alteration has been made to ensure clarity in relation to this interpretation.
40.4	40.4. If, by virtue of a dealing under section 83 of	40.4. If, by virtue of a dealing under section 83 of the Act,	This alteration has been made to ensure

Explanatory Note on the Final Terms, Conditions and Requirements of the IRD Mining Operations Pty Ltd Mineral Lease

Alterations to Mineral Lease – Main Body			
Paragraph Number	**Condition in Assessment report or Regulation 40 proposed lease notification**	**Alteration to Condition** *(alterations shown in red)*	**Purpose and effect**
	the Act, the Mining Tenement comes to be held by more than one person, they will all be jointly and severally liable for compliance with the Act, the Regulations and this Tenement Document including the Additional Terms and Conditions in the First and Second Schedules of this Tenement Document respectively;	the Mining Tenement comes to be held by more than one person, they will ~~all~~ be jointly and severally liable for compliance with the Act, the Regulations and this Tenement Document including the Additional Terms and Conditions in the First and Second Schedules of this Tenement Document respectively;	clarity in relation to this interpretation.

Explanatory Note on the Final Terms, Conditions and Requirements of the IRD Mining Operations Pty Ltd Mineral Lease

Alterations to Mineral Lease – First Schedule

Term Number	Term in Assessment Report	Alteration to Term *(alterations shown in red)*	Purpose and effect
Term 1	1.The grant of the Mining Tenement authorises mining operations (only) for the recovery of Iron Ore – Magnetite.	1.The grant of the Mining Tenement authorises mining operations ~~(only)~~ for the recovery of Iron Ore – Magnetite only.	This alteration has been made to ensure clarity in the interpretation of this Term.

Alterations to Mineral Lease – Second Schedule

Condition Number	Condition in Assessment Report	Alteration to Condition *(alterations shown in red)*	Purpose and effect
Land Access **Condition 1.2**	1.2.'Principal mining operations' means: - 1.2.1.Pre-strip and mining of the open pits; 1.2.2. Preparation and construction of the IWL; 1.2.3. Construction of the ore processing facility; 1.2.4. Construction of the concentrate handling facility; 1.2.5. Construction of the rail infrastructure on the Land; 1.2.6. Any pre-strip or early earthworks relating to any of the above activities; or 1.2.7. Any variation to this definition as determined in writing by the Director of Mines.	1.2. 'Principal mining operations' means: - 1.2.1. Pre-strip and mining of the open pits; 1.2.2. Preparation and construction of the IWL on the Land; 1.2.3. Construction of the ore processing facility on the Land; 1.2.4. Construction of the concentrate handling facility on the Land; 1.2.5. Construction of the rail infrastructure on the Land; 1.2.6. The provision of water and electricity and the construction of associated infrastructure on the Land; 1.2.7. Any pre-strip or early earthworks on the Land relating to any of the above activities; or 1.2.8. Any ~~variation to this definition as determined in writing by the Director of Mines.~~ other mining operation that is not a preliminary mining operation as defined in Condition 1.1; but does not include mining operations that fall within 1.2.1 to 1.2.7 to the extent that such mining operations fall within a determination under Condition 1.1.6.	This alteration has been made to ensure clarity in the interpretation of this condition in relation to the following matters: 1) The inclusion of "on the Land" is consistent with the definition included in the tenement document; 2) The inclusion of 1.2.6. and 1.2.8. provides for a more detailed and accurate definition of "principal mining operations".
Surface Water	2.1. Ensure no surface water contaminated (including sedimentation) as a result of mining operations leaves	2.1. Ensure no surface water contaminated (including by sedimentation) as a result of mining operations leaves the Land.	This alteration has been made to ensure clarity in the interpretation of this condition.

Explanatory Note on the Final Terms, Conditions and Requirements of the IRD Mining Operations Pty Ltd Mineral Lease

Alterations to Mineral Lease – Second Schedule			
Condition Number	**Condition in Assessment Report**	**Alteration to Condition** *(alterations shown in red)*	**Purpose and effect**
Conditions 2.1 3.1.1 3.1.2 4.2	the Land. 3.1.1. no surface water contaminated (including sedimentation) prior to mine completion remains within the Land after mine completion; 3.1.2. no contamination of surface water (including sedimentation) occurs after mine completion as a result of mining operations within the Land. 4.2 mining operations do not cause inundation (by water) of third party property and infrastructure on the Land (to a greater extent than would be expected to occur prior to mining operations commencing) unless the Tenement Holder has obtained a Waiver of Exemption under the Act to undertake mining activities (inclusive of inundation) on that particular land; and *Explanatory note: The Mining Act 1971 and this mining lease do not authorize any activities outside of the mining lease boundaries. If third party property or infrastructure outside of the lease boundaries is inundated by water due to the mining operations, the general law will apply as between the Tenement Holder and the third party.*	3.1.1. no surface water contaminated (including by sedimentation) prior to mine completion remains within the Land after mine completion; 3.1.2. no contamination of surface water (including by sedimentation) occurs after mine completion as a result of mining operations within the Land. 4.2 mining operations do not cause inundation (by water) of third party property and infrastructure on the Land (to a greater extent than would be expected to occur prior to mining operations commencing) unless the Tenement Holder has obtained a Waiver of Exemption under the Act to undertake mining ~~activities~~ operations (inclusive of inundation) on that particular land; and *Explanatory note: The Mining Act 1971 and this Mining Tenement do not authorize any ~~activities~~ mining operations outside of the mining lease boundaries. If third party property or infrastructure outside of the lease boundaries is inundated by water due to the mining operations, the general law will apply as between the Tenement Holder and the third party.*	
Soils and Land Use – PAF **Condition 5**	5. The extraction of NAF and PAF from the Land, and placement of NAF and PAF in the IWL must be audited by a suitably qualified independent expert approved by the Director of Mines (or other authorised officer) on a three monthly basis, or at a frequency as the Director of Mines (or other authorised officer) may specify by notice in writing. The expert must prepare a report of	5. The extraction of NAF and PAF from the Land, and placement of NAF and PAF in the IWL must be audited by an independent and suitably qualified ~~independent~~ expert approved by the Director of Mines (or other authorised officer) on a three monthly basis, or at a frequency as the Director of Mines (or other authorised officer) may specify by notice in writing. ~~The expert must prepare a report of the findings of the audit and this report must be provided to the~~	This alteration has been made to ensure clarity in the interpretation of this condition in relation to the independence of the expert and to provide flexibility for the applicant to apply for a longer period to provide the audit report.

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Alterations to Mineral Lease – Second Schedule			
Condition Number	**Condition in Assessment Report**	**Alteration to Condition** *(alterations shown in red)*	**Purpose and effect**
	the findings of the audit and this report must be provided to the Director of Mines (or other authorised officer) within one month of completion of the audit.	~~Director of Mines (or other authorised officer) within one month of completion of the audit.~~ 6. The expert must prepare a report of the findings of the audit and this report must be provided to the Director of Mines (or other authorised officer) within one month (or such longer period approved by the Director of Mines (or other authorised officer)) of completion of the audit.	
Integrated Waste Landform (IWL) **Conditions 6. 6.6**	6. The IWL construction and operation must be audited by a suitably qualified independent expert approved by the Director of Mines (or other authorised officer), against the design and plans that have been adopted for the IWL construction and operation: 6.6. Subsequent reports must be provided to the Director of Mines (or other authorised officer) within one month of completion of the audit and all reports will be made publically available	~~6.~~ 7. The IWL construction and operation must be audited by an independent and suitably qualified ~~independent~~ expert approved by the Director of Mines (or other authorised officer), against the design and plans that have been adopted for the IWL construction and operation: ~~6.6.~~ 10. Subsequent reports must be provided to the Director of Mines (or other authorised officer) within one month (or such longer period approved by the Director of Mines (or other authorised officer)) of completion of the audit and all reports will be made publically available.	This alteration has been made to ensure clarity in the interpretation of this condition in relation to the independence of the expert and to provide flexibility for the applicant to apply for a longer period to provide the audit report.
Additional Information in the Program **Condition 7.**	Additional Information in the Program 7. In accordance with section 70B(2)(d) of the Act it is a condition of the grant of the Mining Tenement that a proposed PEPR submitted in accordance with Part 10A of the Act must include reports from suitably qualified independent experts on the following matters: 7.1. The capacity of the Tenement Holder to achieve compliance with the Act and the Program in light of its management systems, personnel, policies, procedures, practices and resources. 7.2. The effectiveness of the proposed strategies in the proposed PEPR achieving the environmental outcomes identified in the proposed PEPR, including but not limited to reports from: 7.2.1. An Independent Geotechnical Engineering	Additional Information in the ~~Program~~ Proposed PEPR ~~7.~~ 11. In accordance with section 70B(2)(d) of the Act it is a condition of the grant of the Mining Tenement that a Proposed PEPR submitted in accordance with Part 10A of the Act must include reports on: ~~from suitably qualified independent experts on the following matters:~~ 11.1. The capacity of the Tenement Holder to achieve compliance with the Act and the ~~Program~~ Proposed PEPR in light of its management systems, personnel, policies, procedures, practices and resources. ~~7.2.~~ 11.2. The effectiveness of the proposed strategies in the Proposed PEPR in achieving the environmental outcomes identified in the Proposed PEPR~~, including but not limited to reports from:~~ in relation to, at least:	The alterations to this condition have been made to address the following matters: 1. Alteration to address a correction to wording to reflect the original recommended condition. 2. Provision for reports to be prepared by either an independent expert or a person previously approved by the Director of Mines. 3. Inclusion of the explanatory note to

Alterations to Mineral Lease – Second Schedule			
Condition Number	**Condition in Assessment Report**	**Alteration to Condition** *(alterations shown in red)*	**Purpose and effect**
	Expert (i.e. for IWL and mine waste design and construction methodology) 7.2.2. An Independent Mine Waste Cover System Expert (i.e. for IWL and mine waste cover systems design) 7.2.3. An Independent Geomorphology Expert (i.e. for Landform design, soil and erosion management) 7.2.4. An Independent Hydrology Expert (i.e. for Surface water management) 7.2.5. An Independent Chemical, Process or Metallurgical Engineering Expert (i.e.: for tailings dewatering design, waste/tailings mixture ratio and density necessary for geotechnical stability of the IWL and timely construction of the IWL cover system). 7.2.6. An Independent Environmental Geochemist Expert (i.e. for PAF material and metalliferous drainage management). 7.3 The reports in **Condition 7.2** must include identification of any risks, assumptions and uncertainties associated with the relevant strategies.	~~7.2.1~~ 11.2.1. ~~An Independent Geotechnical Engineering Expert~~ Geotechnical Engineering (i.e. for IWL and mine waste design and construction methodology) ~~7.2.2~~ 11.2.2. ~~An Independent Mine Waste Cover System Expert~~ Mine Waste Cover System (i.e. for IWL and mine waste cover systems design) ~~7.2.3~~ 11.2.3. ~~An Independent Geomorphology Expert~~ Geomorphology (i.e. for Landform design, soil and erosion management) ~~7.2.4.~~ 11.2.4. ~~An Independent Hydrology Expert~~ Hydrology (i.e. for Surface water management) ~~7.2.5.~~ 11.2.5. ~~An Independent Chemical, Process or Metallurgical Engineering Expert~~ Chemical, Process or Metallurgical Engineering (i.e.: for tailings dewatering design, waste/tailings mixture ratio and density necessary for geotechnical stability of the IWL and timely construction of the IWL cover system). ~~7.2.6.~~ 11.2.6. ~~An Independent Environmental Geochemist Expert~~ Environmental Geochemist (i.e. for PAF material and metalliferous drainage management). ~~7.3.~~ 11.3. Additionally ~~T~~the reports in **Condition ~~7.2~~ 11.2** must include identification of any risks, assumptions and uncertainties associated with the relevant strategies. 12. The reports required by **Condition 11** must be provided by an independent and suitably qualified expert or a person previously approved by the Director of Mines or other	provide clarity in relation to the intent that the reports produced must be objective.

Alterations to Mineral Lease – Second Schedule			
Condition Number	**Condition in Assessment Report**	**Alteration to Condition** *(alterations shown in red)*	**Purpose and effect**
		authorised officer. To apply for approval the Tenement Holder must: 12.1. Apply in writing; and 12.2. Provide the person's Curriculum Vitae showing their academic qualifications, publications (if any) and practical experience; and 12.3. The Terms of Engagement as between the person and the Tenement Holder or other document that identifies: 12.3.1. The assumptions, if any, the expert has been asked to make for the purpose of providing their report; 12.3.2. The list of materials provided to the expert for the purpose of providing their report; 12.3.3. The matters on which the expert is asked to report. *Explanatory note: The Department is seeking to ensure that if the reporting person is an employee of the Tenement Holder and/or not independent, that their report is objective.*	
Transparency **Condition 8.**	8. The Tenement Holder agrees to the approved PEPR and any compliance reports and reportable incident reports, submitted in accordance with the Regulations, being made available for public inspection.	~~8.~~ 13. The Tenement Holder agrees to the ~~a~~Approved PEPR and any compliance reports and reportable incident reports, submitted in accordance with the Regulations, being made available for public inspection.	This alteration has been made to ensure that the condition accurately reflects that "Approved PEPR" is a defined term.
Notification of Cessation of Operations **Condition**	9. Within 30 days of becoming aware of any event or decision which is likely to give rise to the cessation of mining operations for a period of more than seven days and prior to the cessation of mining operations, the Tenement Holder must notify the Director of Mines	~~9.~~ 14. Within 30 days of becoming aware of any event or decision which is likely to give rise to the cessation of mining operations for a period of more than seven days and where possible prior to the cessation of mining operations, the Tenement Holder must notify the Director of Mines ~~(or other authorised officer)~~ in writing of the event or decision.	This alteration has been made to ensure clarity in the interpretation of this condition.

Alterations to Mineral Lease – Second Schedule			
Condition Number	**Condition in Assessment Report**	**Alteration to Condition** *(alterations shown in red)*	**Purpose and effect**
9.	(or other authorised officer) in writing of the event or decision. The notice must specify the date upon which the mining operations are expected to cease, or have ceased and an estimate of the period of cessation.	The notice must specify the date upon which the mining operations are expected to cease, or have ceased and an estimate of the period of cessation.	
Decommissioning and Rehabilitation Plan (DRP) **Conditions** **10** **11** **12**	10. The Tenement Holder must comply with a DRP approved in accordance with **Condition 11** or **12** when decommissioning or rehabilitating the Mining Tenement. 11. Unless the Director of Mines (or other authorised officer) otherwise directs, a DRP must be submitted to the Director of Mines (or other authorised officer) for approval within 30 days of any decision or event that is likely to give rise to the permanent cessation of mining operations, and that DRP must: 11.1. set out the activities and scheduling required for the carrying out of the rehabilitation works specified in the approved PEPR; 11.2. be prepared in accordance with any guidelines provided by the Director of Mines (or other authorised officer). 12. If, in the opinion of the Director of Mines (or other authorised officer), mining operations on the Mining Tenement have substantially ceased for two years or more, the Director of Mines (or other authorised officer) may: 12.1. require that the Tenement Holder submits a DRP for approval dealing with the requirements set out in **Condition 11**; and/or 12.2. direct the Tenement Holder to rehabilitate the Mining Tenement in accordance with the approved PEPR and/or any DRP.	15. If the Tenement Holder decides to cease mining operations or an event occurs that is likely to give rise to the permanent cessation of mining operations, the Tenement Holder must develop a DRP and submit it to the Director of Mines (or other authorised officer) for approval within 30 days of the decision or event (or such longer period as approved by the Director of Mines (or other authorised officer)). 16. The DRP must: 16.1. set out the activities and scheduling required for the carrying out of the rehabilitation works specified in the approved PEPR; 16.2. be prepared in accordance with any guidelines provided by the Director of Mines (or other authorised officer). 17. The Tenement Holder must carry out decommissioning and rehabilitation in accordance with the approved DRP and the Approved PEPR. 18. If, in the opinion of the Director of Mines, mining operations have substantially ceased for a period of two consecutive years ~~or more,~~ the Director of Mines ~~(or other authorised officer)~~ may direct the Tenement holder: 18.1. to develop and submit a DRP (which must address the requirements of condition 16) for approval within 30 days of the direction or such longer period as the Director of Mines may allow; and/or 18.2. To carry out decommissioning and rehabilitation in accordance with the approved DRP and the Approved PEPR.	This alteration has been made to ensure clarity in the interpretation of this condition in relation to the circumstances that may trigger cessation of mining and provide flexibility for the applicant to apply for a longer period to provide the DRP.

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Condition Number	**Condition in Assessment Report**	**Alteration to Condition** *(alterations shown in red)*	**Purpose and effect**
Social Management Plan (SMP) **Conditions** **13** **14** **15**	13. The Tenement Holder must prepare, implement and maintain a SMP within 12 months from the date of the grant of the Mining Tenement (in consultation with relevant State Government agencies and key community stakeholders) that addresses (but is not limited to): 13.1. All strategies, initiatives and commitments described in Chapter 22 of the Mining Lease Proposal; 13.2. A process for reviewing and updating the SMP on a regular basis; and 13.3. Anything further that the Director of Mines (or other authorised officer) directs in writing. 14. The Tenement Holder must make the SMP publicly available. 15. The implementation and maintaining of the SMP must be audited by a suitably qualified independent expert on an annual basis, or at a frequency as the Director of Mines (or other authorised officer) may specify by notice in writing. 15.1. The expert must prepare a report of the findings of the audit and this report must be made publically available within one month of completion of the audit.	19. The Tenement Holder must prepare an SMP within 12 months from the date of the grant of the Mining Tenement, or within such longer period as the Director of Mines or other authorised officer may allow. 20. The SMP must be prepared in consultation with relevant State Government agencies and key community stakeholders. 21. The SMP must be implemented as soon as possible after its preparation. 22. The Tenement Holder must make the SMP publicly available. 23. The SMP must address: 23.1. The strategies, initiatives and commitments described in Chapter 22 of the Mining Lease Proposal; 23.2. Any issues that the Director of Mines (or other authorised officer) directs in writing from time to time; and 23.3. Any issues arising from consultation that are within the scope of the SMP or the Act and regulations generally. 24. The SMP must contain a process for an audit of the implementation of the SMP, and, if appropriate, an improvement review process to update the strategies, initiatives and issues. 24.1. The audit must be conducted by an independent and suitably qualified expert; 24.2. The audit must be conducted annually or such longer	This alteration has been made to ensure clarity in relation to the requirement for preparing the SMP, implementing the SMP and the specific matters that the SMP must address.

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Condition Number	**Condition in Assessment Report**	**Alteration to Condition** *(alterations shown in red)*	**Purpose and effect**
		period as the Director of Mines (or other authorised officer) may specify by notice in writing; 24.3. The expert must prepare a report of the findings of the audit and this report must be made publicly available within one month of completion of the audit; 24.4. If the audit recommends updating the strategies or initiatives the Tenement Holder must consult with relevant State Government agencies and key community stakeholders about those recommendations; and 24.5. If the recommendations are adopted by the Tenement Holder, the SMP must be updated, implemented and made publicly available as soon as possible.	
Communications Protocol **Condition 18**	18. The Tenement Holder must develop (to the satisfaction of the Director of Mines (or other authorised officer)) a communication and operating protocol between itself and owners of land adjacent to and on the Land (subject to the agreement of the owners of land) prior to the commencement of mining operations that includes the following matters: 18.1 Interaction with landholder operations; 18.2. Emergency procedures; 18.3 Communications and issue management processes; 18.4. Land management; 18.5. Dispute resolution; 18.6. Ongoing communication about the Tenement Holder's operations; 18.7. Receiving and considering feedback; 18.8. Safety procedures; 18.9. Access protocols; and	27. In this condition 'the relevant landowners' means the owners of land on and adjacent to the Land. 28. Before commencing mining operations, the Tenement Holder must develop a Communications Protocol. The purpose of the Communications Protocol is to facilitate communications about the practical matters that need to be discussed, as between the Tenement Holder and relevant landowners, so as to allow mining operations to be conducted efficiently and effectively whilst having regard to relevant landowners' use of their land. 28.1. In developing the Communications Protocol, the Tenement Holder must: 28.1.1. Contact the relevant landowners and seek their input for the Communications Protocol; and 28.1.2. Incorporate any such input to the extent it is possible to do so. 28.2. The practical matters that the Communications	This alteration has been made to ensure clarity in the interpretation of this condition.

Alterations to Mineral Lease – Second Schedule			
Condition Number	**Condition in Assessment Report**	**Alteration to Condition** *(alterations shown in red)*	**Purpose and effect**
	18.10. Any matters identified by the Director of Mines (or other authorised officer) in writing. 19. The Tenement Holder must maintain and adhere to the protocol to the satisfaction of the Director of Mines (or other authorised officer) for the term of the Mining Tenement.	Protocol must address include: 28.2.1. The interaction of mining operations and the land use activities of individual relevant landowners; 28.2.2. Land access protocols; 28.2.3. Land management arrangements; 28.2.4. Safety procedures; 28.2.5. Emergency procedures; and 28.2.6. Any additional practical matters identified by the Director of Mines (or other authorised officer), in writing, from time to time. 28.3. The Communications Protocol must contain processes for: 28.3.1. Relevant landowners to communicate changes to or updates about their land use; 28.3.2. The Tenement Holder to communicate updates about its mining operations; 28.3.3. Receiving and considering feedback from relevant landowners; 28.3.4. Dispute resolution; and 28.3.5. Any additional processes identified by the Director of Mines (or other authorised officer), in writing, from time to time. 29. The Tenement Holder must maintain and adhere to the Communications Protocol to the satisfaction of the Director of Mines (or other authorised officer) for the term of the Mining Tenement.	
Complaints Register **Conditions 20, 21**	20.The Tenement Holder must operate a 24 hour per day, seven day per week, telephone complaints line for the purpose of receiving complaints from members of the public in relation to mining operations. 21.The Tenement Holder must take reasonable measures to notify the public of the complaints line telephone number and the fact that it is a complaints	**Complaints ~~Register~~ Management** ~~20.~~ 30.The Tenement Holder must operate a 24 hour per day, seven day per week, telephone ~~complaints~~ line ~~dedicated~~ for the purpose of receiving complaints from members of the public in relation to mining operations. ~~21.~~ 31. The Tenement Holder must take reasonable measures to notify the public of the ~~complaints line~~	The condition has been altered to provide flexibility for the applicant to use the telephone line for purposes other than complaints. For example, the applicant could use the telephone line for complaints and feedback.

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Condition Number	**Condition in Assessment Report**	**Alteration to Condition** *(alterations shown in red)*	**Purpose and effect**
	line.	telephone number applicable to the telephone line established under **Condition 30** and of the fact that it is for the purpose of receiving complaints. ~~a complaints line.~~	
Notification of Insolvency Events **Condition 25**	25. The Tenement Holder shall notify the Minister immediately after becoming aware of the Tenement Holder being placed into Administration.	~~**Notification of Insolvency Events**~~ **Compliance with regulation 98(1)** ~~25. The Tenement Holder shall notify the Minister immediately after becoming aware of the Tenement Holder being placed into Administration.~~ 35. A notification required by regulation 98(1) must be in writing.	The condition has been altered to provide clarity in relation to the requirement for notifications made under Regulation 98(1) to be in writing.
Other Legislation 26	26.The Tenement Holder must comply with all State and Commonwealth legislation and regulations applicable to the activities undertaken pursuant to this Mining Tenement including (but not limited to) the: *26.1. Environment Protection and Biodiversity Conservation Act 1999;* *26.2. Development Act 1993;* *26.3. Dangerous Substances Act 1979;* *26.4. National Parks and Wildlife Act 1972;* *26.5. Natural Resources Management Act 2004;* *26.6. Public and Environmental Health Act 1987;* *26.7. Aboriginal Heritage Act 1988;* *26.8. Heritage Places Act 1993;* *26.9. Work Health and Safety Act 2012;* *26.10. Environment Protection Act 1993;* *26.11. Native Vegetation Act 1991;* *26.12. Mines and Works Inspection Act 1920;* and *26.13. Road Traffic Act 1961.*	36. The Tenement Holder must comply with all State and Commonwealth legislation and regulations applicable to the activities undertaken pursuant to this Mining Tenement including (but not limited to) the: *36.1. Environment Protection and Biodiversity Conservation Act 1999;* *36.2. Development Act 1993;* *36.3. Dangerous Substances Act 1979;* *36.4. National Parks and Wildlife Act 1972;* *36.5. Natural Resources Management Act 2004;* *36.6. Public and Environmental Health Act 1987;* *36.7. Aboriginal Heritage Act 1988;* *36.8. Heritage Places Act 1993;* *36.9. Work Health and Safety Act 2012;* *36.10. Environment Protection Act 1993;* *36.11. Native Vegetation Act 1991;* *36.12. Mines and Works Inspection Act 1920;* and *36.13. Road Traffic Act 1961.* 36.14. *Wilderness Protection Act 1992.*	Addition of Wilderness Protection Act 1992 to the list of legislation.

Alterations to Mineral Lease – Sixth Schedule			
Clause Number	**Requirement in Assessment Report**	**Alteration to Requirement** *(alterations shown in red)*	**Purpose and effect**
Schedule Heading	**SIXTH SCHEDULE** RECOMMENDED ENVIRONMENTAL OUTCOMES AND ASSOCIATED CRITERIA AND STRATEGIES PURSUANT TO REGULATION 65 OF THE MINING REGULATIONS 2011 *Explanatory note: The Sixth Schedule includes clauses which set out the requirements for content that would be provided in a PEPR.*	**SIXTH SCHEDULE** RECOMMENDED ENVIRONMENTAL OUTCOMES AND ASSOCIATED CRITERIA AND STRATEGIES PURSUANT TO REGULATION 65 OF THE MINING REGULATIONS 2011 *Explanatory note: The Sixth Schedule of this Tenement Document sets out outcomes contemplated in regulation 65(2) of the Regulations, that the Tenement Holder is required to address in any program submitted in accordance with Part 10A of the Act. The Sixth Schedule may also specify requirements for strategies and criteria relevant to the outcomes set out in that Schedule.*	The alteration to the Explanatory Note has been made to ensure clarity in relation to the purpose of the Sixth Schedule.
Public Safety Strategies – Post Mine Completion **Clause 4.**	4.The Tenement Holder is required to address the following matters for the purpose of Regulation 65(2)(c) in relation to the Public Safety Outcome – Post-Mine Completion **sixth schedule clause 3**; 4.1. Develop strategies to ensure final landform design for the open pit void meets the outcome for protection of public safety post-mine completion and in the long term to address the following potential hazards (but not limited to): 4.1.1. The risk of falling; 4.1.2. The risk of drowning; 4.1.3. The risk of vehicle incidents/accidents; and 4.1.4. Ground instability.	4.The Tenement Holder is required to address the following matters for the purpose of Regulation 65(2)(c) in relation to the Public Safety Outcome – Post-Mine Completion **sixth schedule clause 3**; 4.1. Develop strategies to ensure final landform design for the open pit void meets the outcome for protection of public safety post-mine completion and in the long term to address ~~the following~~ potential hazards including (but not limited to): 4.1.1. The risk of falling; 4.1.2. The risk of drowning; 4.1.3. The risk of vehicle incidents/accidents; and 4.1.4. Ground instability.	This alteration has been made to ensure clarity in the interpretation of this requirement.
Aboriginal Heritage Outcome	9. The Tenement Holder must during construction and operation, ensure that there is no disturbance to Aboriginal heritage sites, objects or remains unless	9. The Tenement Holder must during construction and operation, ensure that there is no disturbance to Aboriginal heritage sites, objects or remains unless it is authorised	This alteration has been made to ensure clarity in the interpretation of this requirement.

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Clause Number	**Requirement in Assessment Report**	**Alteration to Requirement** *(alterations shown in red)*	**Purpose and effect**
Clause 9.	prior approval under the relevant legislation is obtained.	~~prior approval~~ under the relevant legislation~~. is obtained.~~	
Soils and Land Use Strategies – IWL Clauses 18.1. and 18.4.	18.1. Complete all future works listed in Section 5 of Appendix S of the Mining Lease Proposal ("Conceptual Integrated Waste Landform Design for Rehabilitation and Closure - October 2015 (MWH")). 18.4.A program for determining the erodibility of the waste rock/tailings mix to ensure that no erodible waste rock/tailings mix is placed immediately underneath subsoil on external batters. The results of the program are to inform the design of the IWL.	18.1. ~~Complete a~~All future works listed in Section 5 of Appendix S of the Mining Lease Proposal ("Conceptual Integrated Waste Landform Design for Rehabilitation and Closure - October 2015 (MWH")). 18.4. A program for determining the erodibility of the waste rock/tailings mix to ensure that ~~no erodible~~ a waste rock/tailings mix of an appropriate erodibility is placed immediately underneath subsoil on external batters. The results of the program are to inform the design of the IWL.	This alteration has been made to ensure clarity in the interpretation of this requirement.
Soils and Land Use Strategies – PAF Clause 20.1.	20.1. Complete all Actions listed in Section 5 of Appendix S of the Mining Lease Proposal ("Appendix E - Oxide Zone Geochemistry Review and IWL Management - Sept 2015 (MWH)").	20.1. ~~Complete all~~ All Actions listed in Section 5 of Appendix S of the Mining Lease Proposal ("Appendix E - Oxide Zone Geochemistry Review and IWL Management - Sept 2015 (MWH)").	This alteration has been made to ensure clarity in the interpretation of this requirement.
Soils and Land Use Strategies – PAF Clause 20.1	20.10. A program for determining the erodibility of the waste rock/tailings mix to ensure that no erodible waste rock/tailings mix is placed immediately underneath subsoil on external batters.	20.10. A program for determining the erodibility of the waste rock/tailings mix to ensure that a waste rock/tailings mix of an appropriate erodibility is placed immediately underneath subsoil on external batters. The results of the program are to inform the design of the IWL.	This alteration has been made to ensure clarity in the interpretation of this requirement.
Air Quality Strategies - Nuisance Clause 23.3.	23.3. In the event that monitoring shows the air quality measurement criteria has been breached, the Tenement Holder must immediately cease the activity that resulted in the breach.	23.3. In the event that it has been established from monitoring data that ~~monitoring shows~~ the air quality measurement criteria has been breached, the Tenement Holder must immediately take steps to cease the activity that resulted in the ~~breach~~ non-compliance.	This alteration has been made to ensure clarity in the interpretation of this requirement. The clause has been altered to reflect that the applicant must immediately take steps to cease the activity. DSD acknowledges it may not be practicable to immediately cease the activity that is resulting in a non-compliance.

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Alterations to Mineral Lease – Sixth Schedule			
Clause Number	**Requirement in Assessment Report**	**Alteration to Requirement** *(alterations shown in red)*	**Purpose and effect**
Air Quality Criteria – Nuisance Clause 24.1.2.	24.1.2. TDD leaving the site does not exceed 4g/m2/month and no more than 2g/m2/month above background.	24.1.2. TDD ~~leaving the site~~ does not exceed 4g/m^2/month and no more than 2g/m^2/month above background.	This alteration has been made to provide clarity in relation to the following matters: 1.Measurement of TDD can either be measured at the sensitive receptor (provided the appropriate land access arrangements are in place), or 2. At other locations which are not at the sensitive receptor that would then be used to demonstrate that the outcome is being achieved at the receptor.
Air Quality Criteria – Nuisance Clause 24.3.	24.3. The Tenement Holder must undertake meteorological monitoring in accordance with relevant Australian Standards to measure and record meteorological data including (but not limited to) wind speed and direction, temperature, humidity, atmospheric pressure, solar radiation, rainfall and evaporation.	24.3. The Tenement Holder must undertake meteorological monitoring in accordance with relevant Australian Standards to measure and record meteorological data including (but not limited to) wind speed and direction, temperature, humidity, atmospheric pressure, ~~solar radiation,~~ rainfall and evaporation.	This alteration has been made to accurately reflect the relevant meteorological data required for the purpose of addressing Regulation 65(2)(d) for the stated environmental outcome.
Air Quality Strategies – Agricultural Productivity Clause 26.3.	26.3. In the event that monitoring shows the air quality measurement criteria has been breached, the Tenement Holder must immediately to cease the activity that resulted in the breach.	26.3. In the event ~~that monitoring shows the~~ that it has been established from monitoring data that the air quality measurement criteria has been breached, the Tenement Holder must immediately take steps to cease the activity that resulted in the ~~breach~~ non-compliance.	This alteration has been made to ensure clarity in the interpretation of this requirement. The clause has been altered to reflect that the applicant must immediately take steps to cease the activity. DSD acknowledges it may not be practicable to immediately cease the activity that is resulting in a non-compliance.
Air Quality	29.3. In the event that monitoring shows the air quality	29.3. In the event ~~that monitoring shows the~~ that it has been	This alteration has been made to

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Alterations to Mineral Lease – Sixth Schedule			
Clause Number	**Requirement in Assessment Report**	**Alteration to Requirement** *(alterations shown in red)*	**Purpose and effect**
Strategies – Public Health Clause 29.3.	measurement criteria has been breached, the Tenement Holder must immediately to cease the activity that resulted in the breach.	established from monitoring data that the air quality measurement criteria has been breached, the Tenement Holder must immediately take steps to cease the activity that resulted in the ~~breach~~ non-compliance.	ensure clarity in the interpretation of this requirement. The clause has been altered to reflect that the applicant must immediately take steps to cease the activity. DSD acknowledges it may not be practicable to immediately cease the activity that is resulting in a non-compliance.
Air Quality Criteria – Public Health Clause 30	30. The Tenement Holder is required to address the following matters for the purposes of Regulation 65(2)(d) in relation to the Air Quality Outcome – Public Health sixth schedule clause 28; 30.1. The measurement criteria for the air quality human health outcome must include: **PM10** 30.1.1. Measurement of PM10 dust concentration (including both ambient and mine related dust) using monitoring methodology, equipment and instruments that adhere to Australian Standard AS/NZS 3580.9.11, and any future updates or variants to that Standard. 30.1.2. the total PM10 dust concentration (including both ambient and mine related dust) leaving the site is less than 50ug/m3 as a 24 hour (midnight to midnight) average of measurements taken at intervals of not more than 10 minutes; or 30.1.3. where the total PM10 dust concentration entering the site exceeds 50ug/m3 as a 24 hour (midnight to midnight) average of measurements taken at intervals of not more than 10 minutes, the total PM10 dust leaving the site does not exceed the measured level entering the site during that period.	30. The Tenement Holder is required to address the following matters for the purposes of Regulation 65(2)(d) in relation to the Air Quality Outcome – Public Health **sixth schedule clause 28**; 30.1. The measurement criteria for the air quality human health outcome must include: **PM10** 30.1.1. Measurement of PM10 dust concentration (including both ambient and mine related dust), for or at, all sensitive receptors. ~~30.1.1.~~ 30.1.2. Measurement of PM10 dust concentration (including both ambient and mine related dust) using monitoring methodology, equipment and instruments that adhere to Australian Standard AS/NZS 3580.9.11, and any future updates or variants to that Standard. ~~30.1.2.~~ 30.1.3. the total PM10 dust concentration (including both ambient and mine related dust) ~~leaving the site~~ is less than 50ug/m^3 as a 24 hour (midnight to midnight) average of measurements taken at intervals of not more than 10 minutes; or ~~30.1.3~~. 30.1.4. where the total PM10 dust concentration entering the site exceeds 50ug/m^3 as a 24 hour (midnight to midnight) average of measurements taken at intervals of	This alteration has been made to provide clarity in relation to the following matters: 1. Measurement of PM10 dust can either be measured at the sensitive receptor (provided the appropriate land access arrangements are in place), or 2. At other locations which are not at the sensitive receptor that would then be used to demonstrate that the outcome is being achieved at the receptor.

Alterations to Mineral Lease – Sixth Schedule			
Clause Number	**Requirement in Assessment Report**	**Alteration to Requirement** *(alterations shown in red)*	**Purpose and effect**
	30.1.4. the total PM10 dust concentration (including both ambient and mine related dust) leaving the site is less than 25ug/m3 as an annual average for any 12 month period. **PM2.5** 30.1.5. Measurement of PM2.5 dust concentration (including both ambient and mine related dust) using monitoring methodology, equipment and instruments that are recognised by a relevant International or Australian Standard. 30.1.6. the total PM2.5 dust concentration (including both ambient and mine related dust) leaving the site is less than 25ug/m3 as a 24 hour (midnight to midnight) average of measurements taken at intervals of not more than 10 minutes; or 30.1.7. where the total PM2.5 dust concentration entering the site exceeds 25ug/m3 as a 24 hour (midnight to midnight) average of measurements taken at intervals of not more than 10 minutes, the total PM2.5 dust leaving the site does not exceed the measured level entering the site during that period. 30.1.8. the total PM2.5 dust concentration (including both ambient and mine related dust) leaving the site is less than 8ug/m3 as an annual average for any 12 month period. Nitrogen Oxides 30.1.9. Measurement of the relevant Nitrogen Oxides concentration (including both ambient and mine related dust) using monitoring methodology, equipment and instruments that are recognised by a relevant International or Australian Standard. 30.1.10. Compliance limits for Nitrogen Oxides must adhere to the Environment Protection (Air Quality)	not more than 10 minutes, the total PM10 dust ~~leaving the site~~ does not exceed the measured level entering the site during that period. ~~30.1.4~~ 30.1.5. the total PM10 dust concentration (including both ambient and mine related dust) ~~leaving the site~~ is less than 25ug/m^3 as an annual average for any 12 month period. **PM2.5** ~~30.1.5.~~ 30.1.6. Measurement of PM2.5 dust concentration (including both ambient and mine related dust) using monitoring methodology, equipment and instruments that are recognised by a relevant International or Australian Standard. ~~30.1.6.~~ 30.1.7. the total PM2.5 dust concentration (including both ambient and mine related dust) ~~leaving the site~~ is less than 25ug/m^3 as a 24 hour (midnight to midnight) average of measurements taken at intervals of not more than 10 minutes; or ~~30.1.7.~~ 30.1.8. where the total PM2.5 dust concentration entering the site exceeds 25ug/m^3 as a 24 hour (midnight to midnight) average of measurements taken at intervals of not more than 10 minutes, the total PM2.5 dust ~~leaving the site~~ does not exceed the measured level entering the site during that period. ~~30.1.8.~~ 30.1.9. the total PM2.5 dust concentration (including both ambient and mine related dust) ~~leaving the site~~ is less than 8ug/m^3 as an annual average for any 12 month period. **Nitrogen Oxides** ~~30.1.9.~~ 30.1.10. Measurement of the relevant Nitrogen Oxides concentration (including both ambient and mine related dust) using monitoring methodology, equipment and	

Alterations to Mineral Lease – Sixth Schedule			
Clause Number	**Requirement in Assessment Report**	**Alteration to Requirement** *(alterations shown in red)*	**Purpose and effect**
	Policy 2016. **Nitrogen Oxides** 30.1.9. Measurement of the relevant Nitrogen Oxides concentration (including both ambient and mine related dust) using monitoring methodology, equipment and instruments that are recognised by a relevant International or Australian Standard. 30.1.10.Compliance limits for Nitrogen Oxides must adhere to comply with the Environment Protection (Air Quality) Policy 2016.	instruments that are recognised by a relevant International or Australian Standard. ~~30.1.10.~~ 30.1.11.~~Compliance l~~Limits for Nitrogen Oxides must ~~adhere to~~ comply with the Environment Protection (Air Quality) Policy 2016.	
Air Quality Criteria – Public Health Clause 30.3.	30.3. The Tenement Holder must undertake meteorological monitoring in accordance with relevant Australian standards to measure and record meteorological data including (but not limited to) wind speed and direction, temperature, humidity, atmospheric pressure, solar radiation, rainfall and evaporation.	30.3. The Tenement Holder must undertake meteorological monitoring in accordance with relevant Australian standards to measure and record meteorological data including (but not limited to) wind speed and direction, temperature, humidity, atmospheric pressure, ~~solar radiation,~~ rainfall and evaporation.	This alteration has been made to accurately reflect the relevant meteorological data required for the purpose of addressing Regulation 65(2)(d) for the stated environmental outcome.
Noise Outcome 31.	31. The Tenement Holder must during construction and operation, ensure noise emanating from mining operations is in accordance with the current amenity as defined by the Environment Protection (Noise) Policy 2007 and the Wudinna District Council Development Plan at the date that the Mining Tenement was granted.	31. The Tenement Holder must during construction and operation, ensure noise emanating from mining operations is in accordance with the current amenity as defined by the Environment Protection (Noise) Policy 2007 and the Wudinna District Council Development Plan at the date that the Mining Tenement was granted, set out in the Seventh Schedule of this Tenement Document.	This alteration has been made to correct an unintended deletion of text from the original recommended condition.
Noise Strategies Clause 32.3.	32.3. In the event that monitoring shows the noise measurement criteria has been breached, the Tenement Holder must immediately cease the activity that resulted in the breach.	32.3. In the event ~~that monitoring shows the~~ that it has been established from monitoring data that the noise measurement criteria has been breached, the Tenement Holder must immediately take steps to cease the activity that resulted in the ~~breach~~non-compliance.	This alteration has been made to ensure clarity in the interpretation of this requirement. The clause has been altered to reflect that the applicant must immediately take steps to cease the activity. DSD acknowledges it

Alterations to Mineral Lease – Sixth Schedule			
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			may not be practicable to immediately cease the activity that is resulting in a non-compliance.
Surface Water Strategies – Agricultural Productivity Clauses 38.1, 38.2.3, 38.3, 38.4.1, 38.4.1 38.5	38.1. Address all conclusions, actions and recommendations included in Appendix H of the Mining Lease Proposal ("CEIP - Hydrology and Surface Water Management Study - 8/10/2015 (RPS)"); 38.2.3. Unless the Tenement Holder obtains a registered Waiver of Exemption under the Act to undertake mining activities (inclusive of inundation). 38.3. Ensure no surface water contaminated (including sedimentation) as a result of mining operations leaves the Land; 38.4. Ensure that, apart from water contained in the pit void: 38.4.1. no surface water contaminated (including sedimentation) prior to mine completion remains within the Land after mine completion; and 38.4.2. no contamination of surface water (including sedimentation) occurs after mine completion as a result of mining operations within the Land. 38.5. Design and construct surface water infrastructure, to ensure achievement of the surface water outcome post-mine completion and in the long term.	38.1. ~~Address a~~All conclusions, actions and recommendations included in Appendix H of the Mining Lease Proposal ("CEIP - Hydrology and Surface Water Management Study - 8/10/2015 (RPS)"); 38.2.3. Unless the Tenement Holder obtains a registered Waiver of Exemption under the Act to undertake mining ~~activities~~ operations (inclusive of inundation). 38.3. Ensure no surface water contaminated (including by sedimentation) as a result of mining operations leaves the Land; 38.4.1. no surface water contaminated (including by sedimentation) prior to mine completion remains within the Land after mine completion; and 38.4.2. no contamination of surface water (including by sedimentation) occurs after mine completion as a result of mining operations within the Land. 38.5. Design and construct surface water infrastructure, including IWL surface water controls, to ensure achievement of the surface water outcome post-mine completion and in the long term.	This alteration has been made to address the following matters: 1. ensure clarity in the interpretation of this requirement. 2. alteration to correct an unintended deletion of text from the original recommended condition.
Visual Amenity Strategies Clause 42.1.1.	42.1.1. Unless the Director of Mines (or other authorised officer) has approved (in writing) an alternative agreement between the Tenement Holder and a land owner relating to the removal of infrastructure, the Tenement Holder must ensure that	42.1.1. The Tenement Holder must ensure that all infrastructure is decommissioned and removed from the Land at mine completion unless the Director of Mines (or other authorised officer) has approved, in writing, for the infrastructure to remain;	This alteration has been made to ensure clarity in the interpretation of this requirement in relation to the following matters: 1) The Director of Mines

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Alterations to Mineral Lease – Sixth Schedule			
Clause Number	**Requirement in Assessment Report**	**Alteration to Requirement** *(alterations shown in red)*	**Purpose and effect**
42.1.3. 42.1.4.	all infrastructure is decommissioned and removed from the Land at mine completion; 42.1.3. Establishing vegetation and mature trees to screen built infrastructure and minimise views into the site (where agreed with landowners); 42.1.4. Positioning and design of permanent mine landforms or other earthen bunds to screen activities (where agreed with landowners);	42.1.3 Establishing vegetation ~~and mature trees~~ to screen built infrastructure and minimise views into the site. If the Tenement Holder believes that the screening vegetation would be more effective in providing screening, if established on land outside of the Mining Tenement (neighbouring land), the Tenement Holder may consult with the owner of the neighbouring land and if that person agrees to that establishment, and gives permission to the Tenement Holder to enter their land for that purpose, the Tenement Holder may plant the screening on that neighboring land. 42.1.4 Positioning and design of permanent mine landforms or other earthen bunds to screen activities ~~(where agreed with landholders)~~;	approval relates to infrastructure remaining on the Land rather than its removal; 2) The type and maturity of any vegetation can be determined by the applicant and set out in the PEPR with the provision that this strategy (in conjunction with other strategies) must be effective in achieving the relevant environmental outcomes; 3) Where screening vegetation is proposed to be located on land that is not owned by the applicant, permission from the owner of land is required.
Land Use Outcome Clause 45	45. The Tenement Holder must during construction, operation and post-mine completion, ensure that there are no adverse impacts to third party land use or property, adjacent to and on the Land, as a result of mining operations, other than those agreed between the Tenement Holder and the affected user.	45. The Tenement Holder must during construction, operation and post-mine completion, ensure that there are no adverse impacts to third party land use or property, adjacent to and on the Land, other than those agreed between the Tenement Holder and the affected user or determined by an appropriate court as evidenced in its order(s) (and the Tenement Holder must provide the Director of Mines (or other authorised officer) with a copy of the order(s), which shall be placed on the Mining Register).	This alteration has been made to ensure clarity in the interpretation of this requirement.