# ENVIRONMENTAL SCOPING DOCUMENT

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| **PROPOSAL NAME:** | **JACKSON 5 AND BUNGALBIN EAST IRON ORE PROJECT** |
| **ASSESSMENT NUMBER:** | **2031** |
| **LOCATION:** | **APPROXIMATELY 100 KILOMETRES NORTH OF SOUTHERN CROSS, WESTERN AUSTRALIA** |
| **LOCAL GOVERNMENT AREA:** | **SHIRE OF YILGARN** |
| **PROPONENT:** | **POLARIS METALS PTY LTD** |
| **PUBLIC REVIEW PERIOD:** | **8 WEEKS** |
| **EPBC REFERENCE NO:** | **2015/7494** |

## 1. Introduction

The above proposal is being assessed by the Environmental Protection Authority (EPA) under Part IV of the *Environmental Protection Act 1986* (EP Act) at the level of Public Environmental Review (PER). This Environmental Scoping Document (ESD) sets out the requirements for the environmental review of the proposal. The purpose of an ESD is to:

- provide proposal-specific guidelines to direct the proponent on the preliminary key environmental factors or issues that are to be addressed during the environmental review and preparation of the environmental review report;
- identify the required work that needs to be carried out; and
- identify the timing of the environmental review.

The proponent must conduct the environmental review in accordance with this ESD and then report to the EPA in an environmental review report (PER document). As well as the proposal-specific requirements for the environmental review identified in this ESD, the PER document must also address the generic information requirements listed in section 10.2.4 of the EPA's *Environmental Impact Assessment (Part IV Divisions 1 and 2) Administrative Procedures 2012* (Administrative Procedures). When the EPA is satisfied that the PER document adequately



Approved by EPA Chairman Dr Paul Vogel 27 August 2015

addresses both of these requirements, the proponent will be required to release the document for a public review period of 8 weeks.

This ESD has been prepared by the EPA in consultation with the proponent, decision-making authorities (DMA's) and interested agencies consistent with EPA Environmental Assessment Guideline (EAG) 10 – *Scoping a proposal.* ESDs prepared by the EPA are not subject to public review. The ESD will be available on the EPA website (www.epa.wa.gov.au) upon endorsement and must be appended to the PER document.

Assessment under Bilateral Agreement

The proposal has been referred and determined to be a controlled action under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and is being assessed under the Bilateral Agreement between the Commonwealth of Australia and the State of Western Australia made under section 45 of that Act. The relevant matters of national environmental significance (MNES) for this proposal are:

- Critically endangered Ironstone Beard-heath (*Leucopogon* spectabilis);
- Vulnerable Bungalbin Tetratheca (*Tetratheca aphylla*); and
- Vulnerable Malleefowl (*Leipoa ocellata*).

This ESD is inclusive of work required to be carried out and reported on in the PER document in relation to MNES.

MNES that occur or have the potential to occur within the project area are to be identified and the potential impacts on these matters addressed within each relevant preliminary environmental factor as identified in Table 2. The PER document is also to contain a separate section which summarises the potential impacts on MNES and describes, to the extent practicable, any feasible alternatives to the proposed action and possible mitigation measures. Proposed offsets to address significant residual impacts on MNES are also to be discussed.

Schedule 4 of the *Environmental Protection and Biodiversity Conservation Regulations 2000* (EPBC Regulations) lists the matters to be addressed in a draft public environment report under the EPBC Act. These requirements should be addressed by the proponent in the PER document.

## 2. Background

Polaris Metals Pty Ltd (Polaris) is seeking to develop two iron ore mines in the Shire of Yilgarn, Western Australia (WA). The proposed mining developments would be located on banded iron formation (BIF) landforms within the Helena-Aurora Range. The proposal areas are located wholly within the Mt Manning-Helena-Aurora Ranges Conservation Park (Conservation Park) (Figure 1).

The Conservation Park was created in 2005 and is vested in the Conservation Commission of Western Australia and managed by the Department of Parks and Wildlife (Parks and Wildlife). Under section 56(1)(c) of the *Conservation and Land Management Act 1984* the purpose for reservation of the land as conservation park

is to fulfil so much of the demand for recreation by members of the public as is consistent with the proper maintenance and restoration of the natural environment, the protection of indigenous flora and fauna and the preservation of any feature of archaeological, historic or scientific interest.

In May 2014 Polaris referred its Jackson 5 (J5) and Bungalbin East proposal to the EPA under Section 38 of the EP Act and in January 2015 the EPA released its report and recommendations to the Minister for Environment (EPA Report 1537). The EPA concluded that the proposal could not be managed to meet the EPA's objectives for Landforms and Flora and Vegetation, and is environmentally unacceptable and should not be implemented.

Following consideration of the appeals, on 22 April 2015, the Minister for Environment remitted the proposal back to the EPA pursuant to Section 101(1)(d)(i) of the EP Act and directed that the EPA reassess the proposal more fully and more publicly. The reassessment of this proposal more fully and publicly will provide the Minister with more detailed information to enable a decision in relation to whether or not the proposal should be implemented.

The reassessment of the proposal is to be undertaken by way of a PER in accordance with the procedures set out in the EPA's Administrative Procedures and Sections 40 to 48 of the EP Act shall apply to the reassessment.

The proposal is expected to directly impact on landforms of the Helena-Aurora Range and their associated environmental values including direct and indirect impacts to EPBC Act listed flora species, threatened flora (Declared Rare Flora, DRF) listed under the *Wildlife Conservation Act 1950* (WC Act) and Priority flora. The proposal area occurs within the Helena and Aurora Ranges vegetation complexes (banded ironstone formation) Priority Ecological Community (Priority 1) (PEC).

Direct and indirect impacts are also expected from the proposal on terrestrial fauna species listed under the EPBC Act and listed as threatened fauna species under the WC Act.

The EPA considered this proposal at EPA Meeting No. 1078 on 21 May 2015. At this meeting the EPA determined that the PER document should be subject to an 8 week review period, and that the EPA would prepare the ESD. The EPA also determined the preliminary key environmental factors to be included in this ESD are: Flora and Vegetation; Landforms; Subterranean Fauna; Terrestrial Fauna; Hydrological Processes and Inland Waters Environmental Quality; Amenity; Heritage; Offsets; and Rehabilitation and Decommissioning. These are discussed further in Section 4 below.

## 3. The **proposal**

The subject of this ESD is a proposal by Polaris, to construct and operate two open-cut iron ore mines above the water table referred to as J5 and Bungalbin East. The proposal also includes the construction and operation of haul roads, waste rock dumps and associated mine infrastructure.

The proposal is located approximately 100 kilometres (km) north of Southern Cross in the Shire of Yilgarn, WA, between the existing approved Jackson 4 and Carina mine sites both of which Polaris is the proponent. The regional location of the proposal is shown in Figure 1.

The proposal would use the recently approved Jackson 4 mine haul road (Ministerial Statement 988), to haul ore from J5 and Bungalbin East to Polaris's existing Carina minesite (Ministerial Statement No's. 852 and 957) for crushing and screening in preparation for export. Ore would be processed and exported via existing facilities at the Mt Walton rail siding on the Trans-Australia Railway and the Kwinana Port.

The development of J5 and Bungalbin East would result in the clearing of approximately 720 hectares (ha) of native vegetation and extract an estimated 65 – 115 million tonnes of iron ore over the 15 – 20 year life of the mines.

Mine site water requirements for operational purposes (e.g. dust suppression, washdown, potable water) and are expected to be met by a single licenced bore at each mine site, no dewatering is required at either mine site.

The key characteristics of the proposal are set out in Table 1, in accordance with EPA EAG 1 – *Defining the key characteristics of a proposal.* The development envelope encompassing the physical elements of the proposal is delineated in Figure 2.

It should be noted that the key proposal characteristics may change as a result of implementation of the mitigation hierarchy by the proponent on account of the findings of studies and investigations conducted as part of the environmental review.

**Table 1 Key Proposal Characteristics**

| **Summary of the proposal** | |
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| Proposal Title | Jackson 5 and Bungalbin East Iron Ore Project |
| Proponent Name | Polaris Metals Pty Ltd |
| Short Description | The proposal is to construct and operate two open-cut iron ore mines referred to as Jackson 5 (J5) and Bungalbin East within the Mount Manning area. The proposal is located approximately 100 kilometres north of Southern Cross in the Yilgarn region of Western Australia.<br>The proposal includes:<br>• two open-cut mines;<br>• two waste rock dumps;<br>• haul roads; and<br>• supporting mine infrastructure for both mines, such as run-of-mine (ROM) pad, site offices, workshop, laydown area, explosive magazine, borefield, |

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| | wastewater treatment plant, reverse osmosis plant, power supply, fuel storage, hazardous materials storage area and landfill. | |
| **Physical Elements** | | |
| **Element** | **Location** | **Proposed Extent** |
| J5 Mine pit | Figure 2 | Clearing no more than 64 hectares (ha) of native vegetation within a 4010 ha development envelope. |
| J5 Waste dump | Figure 2 | Clearing no more than 95 ha of native vegetation within a 4010 ha development envelope. |
| J5 Supporting Infrastructure | Figure 2 | Clearing no more than 60 ha of native vegetation within a 4010 ha development envelope. |
| J5 Haul Road | Figure 2 | Clearing no more than 58 ha of native vegetation within a 4010 ha development envelope. |
| Bungalbin East Mine pit | Figure 2 | Clearing no more than 148 ha of native vegetation within a 4010 ha development envelope. |
| Bungalbin East Waste dump | Figure 2 | Clearing no more than 156 ha of native vegetation within a 4010 ha development envelope. |
| Bungalbin East Supporting Infrastructure | Figure 2 | Clearing no more than 68 ha of native vegetation within a 4010 ha development envelope. |
| Bungalbin East Haul Road | Figure 2 | Clearing no more than 68 ha of native vegetation within a 4010 ha development envelope. |
| **Operational Elements** | | |
| **Element** | **Location** | **Proposed Extent** |
| J5 waste material | Figure 2 | Disposal of 26 million tonnes of waste. |
| Bungalbin East waste material | Figure 2 | Disposal of 160 million tonnes of waste |
| Water abstraction | No dewatering. The location of a water bore(s) is yet to be determined. | Extraction of no more than 2,160 kilolitres per day for operational purposes. |

## 4. Preliminary key environmental factors and scope of work

The EPA used the proponent's referral information in addition to the EPA's professional judgement to assist in identifying the preliminary key environmental factors as outlined in EPA EAG 8 – *Environmental principles, factors and objectives*. The preliminary key environmental factors for this proposal and the EPA's objective for each of those factors are identified in Table 2.

To provide context to the preliminary key environmental factors, Table 2 also identifies the aspects of the proposal that cause the factors to be preliminary key factors, and the potential impacts and risks likely to be relevant to the assessment. All of this in turn has informed the work required to be conducted in the environmental review.

Finally, Table 2 identifies the policy documents that establish how the EPA expects the environmental factors to be addressed in the environmental review and the PER document that follows. Impacts associated with proposals are to be considered at a local and regional scale, including evaluation of cumulative impacts, and provide details of proposed management/mitigation measures. This includes whether environmental offsets are required by application of the mitigation hierarchy, consistent with the Government of Western Australia (2014) WA Environmental Offsets Guidelines.

In addition to the preliminary key environmental factors, the proponent is also required to demonstrate in the PER that the proposal is consistent with the environmental principles in EAG 8.

## Table 2 Preliminary key environmental factors and required work

| Flora and Vegetation | |
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| **EPA objective** | To maintain representation, diversity, viability and ecological function at the species, population and community level. |
| **Relevant aspects** | • Clearing of native vegetation;<br>• Construction of mine infrastructure; and<br>• Operation of mine. |
| **Potential impacts and risks** | • Clearing of native vegetation;<br>• Indirect impacts on vegetation dependent on surface water due to alterations and disruptions to surface water flows;<br>• Indirect impacts on flora and vegetation from dust;<br>• Indirect impacts on flora and vegetation from fragmentation and change in microhabitats;<br>• Introduction and/or spread of introduced flora (weed) species into mining areas and adjacent native vegetation; and<br>• Altered fire regimes. |
| **Required work** | 1. Undertake a Level 2 flora and vegetation survey for the entire development envelope and any additional areas where vegetation may be indirectly impacted as a result of the proposal, or where local population information is required for conservation significant species and vegetation units. Surveys are to be undertaken in accordance with EPA Guidance Statement 51 and the Department of Environment and Conservation (now the Department of Parks and Wildlife) *Recommended interim protocol for flora surveys of banded ironstone formations of the Yilgarn Craton* and, where available species-specific survey guidelines for relevant species listed under the EPBC Act. A peer review of the vegetation and flora information by a suitably qualified professional will also be required. The peer reviewer should be selected in accordance with the criteria outlined in EPA Guidance Statement 51.<br>Should the proponent intend to rely on results from previous surveys a literature review and justification will be required to ensure those surveys are relevant, representative of the development envelope, provide suitably current information on populations and locations of flora of conservation significance, and condition of vegetation units and have been carried out using methods consistent with EPA Guidance.<br>2. Identify and map EPBC Act listed flora species, threatened flora (Declared Rare Flora - DRF), Priority flora and other conservation significant flora species and vegetation units (including those vegetation units associated with the Helena and Aurora Range vegetation complexes (BIF) Priority Ecological Community PEC)) and their areas to be cleared or indirectly impacted as defined in EPA Guidance Statement 51. Provide details of the methodology (including analysis) used in the identification and mapping of vegetation units. The vegetation units should be classified based on floristics, rather than structural vegetation features utilising the methodology of the recommended interim protocol above. Describe and map the condition of the vegetation.<br>The definition of conservation significant species or vegetation incorporates the assigned status from State and/or Commonwealth lists and/or the EPA's definition of significant species and vegetation in EPA Guidance Statement |

51. Significant species and vegetation are defined in EPA Guidance Statement 51 as species and vegetation that may be significant for a range of reasons other than listing under State or Commonwealth legislation as threatened, Priority and specially protected (e.g. endemic or restricted taxa, new taxa or affinities, taxa at the limits of their range, etc).

3. Provide a detailed description and figure(s) of the proposed clearing and impacts associated with the proposal.

4. Predict the residual impacts from the proposal on flora and vegetation, both direct and indirect, after considering and applying avoidance and minimisation measures. Impact predictions are to include, but not be limited to:

   a) The extent of impacts on conservation significant flora species (noting those flora species that have ranges either centred on BIF (specialist) or restricted to a single BIF range (endemic), including the number of plants in the affected populations, the percentage of plants in the affected populations, the number of plants and populations to be impacted in a 'worst case scenario', and the number of plants and populations known to occur outside the disturbance footprint at both a local and regional scale;

   b) The extent of impacts on the different vegetation units including those vegetation units associated with the Helena and Aurora Range vegetation complexes (BIF) PEC. Analysis should include local and regional distribution of vegetation units;

   c) Provision of information on the representation of conservation significant flora and vegetation units on the remaining, unmined, areas of the Helena-Aurora Range. Provide information on the tenure of those occurrences, such as managed for conservation or/and within an exploration licence, mining lease or other mining tenure;

   d) Discussion of the cumulative impacts of past, current and approved exploration and mining activities on the Helena-Aurora Range and surrounding area on the conservation significant flora and vegetation units utilising quantitative data from relevant local and regional surveys;

   e) Provision of information on the representation of impacted conservation significant flora species and vegetation communities in secure conservation tenure;

   f) Provision of information on the implications of the proposal on the genetic diversity and structuring of threatened or potentially threatened flora including, but not limited to, *Tetratheca aphylla* subsp. *aphylla, Lepidospema bungalbin and Acacia adinophylla* including consideration of the implications of the proposal on population dynamics and functionality (connectivity etc); and

   g) Analysis and collation of the information from all the relevant flora reports to address impacts (direct and indirect) and risk of mining related activities to the long term survival and population viability of threatened or potentially threatened flora including, but not limited to, *Tetratheca aphylla* subsp. *aphylla, Lepidospema bungalbin and Acacia adinophylla.* Indirect impacts include dust, changed microclimate, changed microhabitat, changed hydrology, changed ecosystem processes, including impacts to pollinators and reduced reproductive success, reduced genetic diversity, fragmentation, introduced weeds/disease, trampling by introduced fauna and changes to seed dispersal.

5. Demonstrate how the EPA's objective for this factor can be met.

6. Identify management and mitigation measures for the proposal to ensure residual impacts are not greater than predicted. The PER is to include:

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| | a) A description of the management and mitigation measures for flora and vegetation; and<br>b) A conservation significant species and communities management plan including environmental outcomes/objectives; other key regulatory requirements; management actions; monitoring (including objectives, survey techniques, methodology, frequency, location, rationale and analysis techniques); trigger criteria; contingency actions; review; reporting; and consultation.<br>7. Provide information (peer reviewed or an independent report) from a relevant expert on the outcomes of the proponent's past and current threatened flora (DRF) and conservation significant flora and community management, rehabilitation and restoration practices. Relevant surrogates (other operations' management, information and species) may also apply. Information should include, but not be limited to:<br>a) The outcomes of research projects;<br>b) The implementation of plans;<br>c) The current status of any attempts to establish or improve populations of the species in the wild; and<br>d) Implications of findings for other potential BIF specialist flora species.<br>8. Complete the EPA Checklist for documents submitted for Environmental Impact Assessment on terrestrial biodiversity. |
| **Relevant policy** | DEC (2006) *Recommended Interim Protocol for Flora Surveys of Banded Ironstone Formations of the Yilgarn Craton.* Unpublished. Department of Environment and Conservation, Perth, Western Australia.<br>DoE (2008). Approved Conservation Advice for *Tetratheca aphylla* (Bungalbin Tetratheca).<br>DoE (2010) Approved Conservation Advice for *Leucopogon spectabilis* (Ironstone Beard-heath), Canberra, ACT.<br>EPA (2003) *Position Statement 3: Terrestrial Biological Surveys as an Element of Biodiversity Protection.* Perth, Western Australia.<br>EPA (2004) *Guidance Statement No. 51: Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment in Western Australia.* Perth, Western Australia.<br>EPA Checklist for documents submitted for Environmental Impact Assessment on marine and terrestrial biodiversity. |
| **Landforms** | |
| **EPA objective** | To maintain the variety, integrity, ecological functions and environmental values of landforms. |
| **Relevant aspects** | • Mining excavation and earthworks. |
| **Potential impacts and risks** | • Structural alteration of landform(s) (temporarily or permanently);<br>• Impacts to the ecological function of the landform(s) (temporarily or permanently); and<br>• Impacts to the environmental values of the landform(s) it supports (temporarily or permanently). |

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| **Required** work | 9. For the purpose of characterising the significance of landforms and assessing the potential impacts of the proposal on landforms, including from cumulative impacts, the EPA has identified the affected landform (Figure 3), the local assessment unit (Figure 4) and the regional context (Figure 5).<br>10. Characterise the significance of the affected landforms in a local and regional context and the local assessment unit in a regional context, having regard to the following (include relevant maps, figures and aerial photography):<br>a) Variety – are the landforms considered particularly good or important examples of their type? How adequately are these types of landforms represented in the local and regional area? How do these landforms differ from other examples at these scales?<br>b) Integrity – are the landforms intact, being largely complete or whole and in good condition? To what extent have the landforms, and the environmental values they support, been impacted by previous activities or development? For example; have part of the landforms been removed?<br>c) Ecological importance – do the landforms have a role in maintaining existing ecological and physical processes? For example; do the landforms have important textural features like caves, monoliths or outcropping that provide a microclimate, source of water flow or shade that support ecological functions and environmental values of the landforms?<br>d) Scientific importance – do the landforms provide evidence of past ecological or biological processes or are they an important geomorphological or geological site? Are the landforms of recognised scientific interest as a reference site or an example where important natural processes are operating; and<br>e) Rarity – are the landforms rare or relatively rare; being one of the few of its type at a local and regional level?<br>11. Identify the environmental values of the affected landforms and note which of these environmental values will be addressed through other preliminary key environmental factors identified in this ESD. Identify and discuss any environmental values which are entirely dependent on the landforms.<br>12. Identify the current land tenure of each of the landforms within the local assessment unit and the level of protection the land tenure affords, from any loss of landform integrity.<br>13. Identify and describe the aspects of the proposal which may potentially affect the landforms within the local assessment unit, including both direct and indirect impacts and for construction, operation and closure.<br>14. Based on the findings above identify, map (3 dimensionally) and describe the areas:<br>a) That will be altered, both temporarily (define timescales) and permanently; and<br>b) That will remain as a structural impact on the landforms.<br>15. Predict the impacts from the proposal, both direct and indirect, on the landforms within the local assessment unit after considering and applying avoidance and minimisation measures. Impact predictions are to include, but not be limited to:<br>a) The likely extent, severity and duration of direct and indirect impacts on the landforms; and<br>b) The direct and indirect impacts to variety, integrity, ecological functions |

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| | and environmental values of the landforms.<br>16. Evaluate the cumulative impacts on the landforms (both individually and collectively) within the local assessment unit from the proposal and other currently approved exploration and developments. Provide information on any other reasonably foreseeable developments in the local assessment unit. Include relevant maps, figures and aerial photography.<br>17. Demonstrate how the EPA's objective for this factor can be met.<br>18. Identify management and mitigation measures for the proposal to demonstrate and ensure residual impacts are not greater than predicted (e.g. measures to stabilise the affected landforms during mining activities). This is to include a monitoring and management program to avoid and minimise indirect impacts and identify feasible contingencies.<br>19. Describe measures and actions to minimise permanent impacts to the structure of the affected landforms within the local assessment unit. Provide evidence to demonstrate that the proposed measures and actions are feasible and achievable.<br>20. A peer review of the landforms section of the PER, including any technical studies, by a suitably qualified professional is also required. |
| **Relevant policy** | EPA (2015) *Environmental Assessment Guideline for Environmental principles, factors and objectives.* Perth, Western Australia.<br>EPA (2015) *Environmental Protection Bulletin No. 23 Guidance on the EPA Landforms factor.* Perth, Western Australia. |
| **Subterranean Fauna** | |
| **EPA objective** | To maintain representation, diversity, viability and ecological function at the species, population and assemblage level. |
| **Relevant aspects** | • Clearing and excavation;<br>• Water abstraction;<br>• Waste generation, storage and disposal;<br>• Vibration; and<br>• Haulage and stockpiling of ore. |
| **Potential impacts and risks** | • Mortality and loss of habitat from excavation;<br>• Impacts to subterranean fauna from abstraction of groundwater; and<br>• Impacts to habitat from ground disturbance, stockpiling and surface contamination. |
| **Required work** | 21. In accordance with EPA EAG 12 and Guidance Statement 54a:<br>a) conduct a desktop study, incorporating existing regional subterranean fauna surveys and databases; and<br>b) if the area is prospective for subterranean fauna, undertake a Level 2 survey, this should include sampling inside and outside the impact areas. Consider cumulative impacts.<br>22. Where results from previous surveys are relied on for context, justification should be provided to demonstrate that they are relevant and consistent with EPA Guidance.<br>23. Provide figure(s) showing the local extent of subterranean fauna habitat in relation to the proposal and species distributions. Provide a detailed |

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| | description of impacts associated with the proposal.<br>24. Predict the residual impacts from the proposal on subterranean fauna, including direct, indirect and cumulative, after considering and applying avoidance and minimisation measures.<br>25. Demonstrate how the EPA's objective for this factor can be met.<br>26. Identify management measures and monitoring for the proposal to ensure residual impacts are not greater than predicted. |
| **Relevant policy** | EPA (2013) *Environmental Assessment Guideline 12: Consideration of subterranean fauna in environmental impact assessment in Western Australia*. Perth, Western Australia.<br>EPA (2007) *Guidance Statement No. 54a: Sampling methods and survey considerations for subterranean fauna in Western Australia*. Perth, Western Australia.<br>EPA Checklist for documents submitted for Environmental Impact Assessment on marine and terrestrial biodiversity. |
| **Terrestrial Fauna** | |
| **EPA objective** | To maintain representation, diversity, viability and ecological function at the species, population and assemblage level. |
| **Relevant aspects** | • Clearing of fauna habitat;<br>• Excavation, haulage and stockpiling of ore;<br>• Dust suppression;<br>• Lighting;<br>• Vehicle movements; and<br>• Noise and vibration. |
| **Potential impacts and risks** | • Death or displacement of fauna species;<br>• Loss or fragmentation or change in quality/condition of fauna habitat;<br>• Disruption to nutrient and water collection, run off and hydrological regimes;<br>• Attraction of fauna to areas used for storage of water or food wastes;<br>• Changes to feral animal populations;<br>• Increased risk of collision with vehicles;<br>• Introduction and spread of weeds;<br>• Dust;<br>• Noise and vibration;<br>• Lighting; and<br>• Loss of habitat from altered fire regimes. |
| **Required work** | 27. In accordance with EPA Guidance Statement 56, the EPA/DEC Technical Guide - *Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessment*:<br>a) Carry out a desktop assessment of previous surveys, justification should be provided to demonstrate that they are relevant and consistent with the EPA Guidance; |

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| | b) Conduct a Level 1 fauna survey including local and regional mapping of habitats (including rare or unusual habitat types) inside and outside of the development envelope. Where existing local information is inadequate or incomplete, comprehensive Level 2 fauna surveys may be required;<br>c) Prepare a comprehensive listing of fauna species likely to occur in habitats to be directly or indirectly impacted;<br>d) Provide figure(s) showing the likely extent of loss of the habitat types from both direct and indirect impacts; and<br>e) Conduct targeted Level 2 surveys within the development envelope and immediate surrounds, to identify potential impacts to conservation significant fauna species listed under the WC Act and the EPBC Act. Include mapping of the locations of any conservation significant fauna in relation to the proposal.<br>28. In accordance with EPA Guidance Statement 20, assess the likelihood of the habitats to support short range endemic invertebrate species. If the area is prospective for these species, undertake short range endemic invertebrate fauna sampling as per Guidance Statement 20. Include mapping of the locations of any short range endemic invertebrate species in relation to the proposal. Consider cumulative impacts.<br>29. Where the results from previous surveys are relied on for context, justification should be provided to demonstrate that they are relevant, representative of the development envelope, and were carried out using methods consistent with EPA Guidance.<br>30. Provide a detailed description and figure(s) of the proposal impacts on terrestrial fauna, including an analysis of the likely loss of fauna habitat, including percentages of habitat types to be impacted.<br>31. Predict the residual impacts from the proposal on terrestrial fauna, including short range endemic fauna, for direct, indirect and cumulative impacts, after considering and applying avoidance and minimisation measures.<br>32. Demonstrate how the EPA's objective for this factor can be met.<br>33. Identify management measures, monitoring and feasible contingencies for the proposal to ensure residual impacts are not greater than predicted. |
| **Relevant policy** | Department for Environment and Heritage, South Australia (2007). National recovery plan for Malleefowl (*Leipoa ocellata*). Adelaide, South Australia.<br>DoE (2010). Survey guidelines for Australia's threatened birds. Canberra, ACT.<br>EPA (2000) *Position Statement 3: Terrestrial Biological Surveys as an Element of Biodiversity Protection.* Perth, Western Australia.<br>EPA (2004) *Guidance Statement No. 56: Terrestrial Fauna Surveys for Environmental Impact Assessment in Western Australia.* Perth, Western Australia.<br>EPA (2009) *Guidance Statement No. 20: Sampling of Short Range Endemic Invertebrate Fauna for Environmental Impact Assessment in Western Australia.* Perth, Western Australia.<br>EPA and DEC (2010) *Technical Guide - Terrestrial Vertebrate Fauna Surveys for Environmental Impact* Assessment. Technical report of the Environmental Protection Authority and the Department of Environment and Conservation.<br>EPA Checklist for documents submitted for Environmental Impact Assessment on marine and terrestrial biodiversity. |

| Hydrological Processes and Inland Waters Environmental Quality | |
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| **EPA objective** | To maintain the hydrological regimes of groundwater and surface water so that existing and potential uses, including ecosystem maintenance, are protected.<br><br>To maintain the quality of groundwater and surface water, sediment and biota so that the environmental values, both ecological and social, are protected. |
| **Relevant aspects** | • Altered hydrological regimes and water quality from mining activities; and<br>• Abstraction of groundwater. |
| **Potential impacts and risks** | • Impacts to natural surface water flows and contamination of surface water as a result of placement, design and operation of the mine and associated infrastructure;<br>• Alteration of surface water flows may result in changes to natural erosion and deposition patterns which could increase the turbidity of surface water;<br>• If required disposal of surplus mine dewater has the potential to impact surface water resources;<br>• Alteration of the hydrology of creeks from groundwater abstraction and reinjection if there is a connection with the groundwater;<br>• Alteration of groundwater flows, volumes and quality, due to groundwater abstraction; and<br>• Impacts to any groundwater dependent ecosystems and subterranean fauna, as a result of groundwater drawdown. |
| **Required work** | 34. Characterise the baseline hydrological and hydrogeological regimes and water quality, both in a local and regional context, including, but not limited to, water levels, water chemistry, stream flows, flood patterns, and water quantity and quality.<br>35. Identify the location of abstraction bores for mine site water requirements and identify and discuss any associated impacts of groundwater abstraction including from drawdown.<br>36. Develop a conceptual model of the surface water.<br>37. Provide a detailed description of the design and location of the proposal with the potential to impact surface water, including the extent of discharges of the proposed waste facilities. Provide information on the impacts to surface water from the backfilling options.<br>38. Undertake hydrological investigations to determine the effects of any proposed surface discharge and modified drainage will have on the surface water quality and quantity of the area, potential erosion and sediment transport within and adjacent to the proposal, taking into account cumulative impacts and a range of climatic scenarios including probable maximum precipitation.<br>39. Predict the residual impacts on hydrological processes and inland waters environmental quality, for direct, indirect and cumulative impacts, after considering avoidance and minimisation measures.<br>40. Demonstrate how the EPA's objectives for these factors can be met.<br>41. Identify management, mitigation and monitoring methods to be implemented for the proposal to ensure residual impacts are not greater than predicted. This should include, but not be limited to:<br>a) A description of the management and mitigation measures for |

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| | hydrological processes and inland waters environmental quality; and<br>b) An environmental management plan(s) including environmental outcomes/objectives; other key regulatory requirements; management actions; monitoring (including methodology, frequency, location and rationale); trigger criteria; contingency actions; review; reporting; and consultation. |
| **Relevant policy** | Department of Water (2013) *Western Australia Water in Mining Guideline. Water licensing delivery report series. Report No. 12.* Perth, Western Australia.<br>EPA (2004) *Position Statement No. 4: Environmental Protection of Wetlands.* Perth, Western Australia.<br>*Rights in Water and Irrigation Act 1914.* |
| **Amenity** | |
| **EPA objective** | To ensure that impacts to amenity are reduced as low as reasonably practicable. |
| **Relevant aspects** | • Clearing of native vegetation; and<br>• Mining construction, operation and closure. |
| **Potential impacts and risks** | • Impacts to amenity values (including visual landscape, scenic and visual aesthetic values and recreational tourism) in a conservation park;<br>• Impacts on prominent and important landform features relative to this landscape character type; and<br>• Impacts to the social values (e.g. aesthetics or active use) of the landform(s) it supports (temporarily or permanently) including access; noise and vibrations; dust emissions; and light pollution. |
| **Required work** | 42. Characterise the land use and amenity values of the Conservation Park particularly noting the sensitive receptors and important areas for human use that could be affected by noise, dust and light-spill emissions, visual amenity issues and alterations to the landforms from mining. Include relevant maps to show the locations of the sensitive receptors likely to be affected by the proposal.<br>43. Characterise the environment by providing baseline data on noise, dust and light-spill emissions at sensitive receptor sites, as identified above, that could be affected by noise, dust and light-spill emissions.<br>44. Characterise the environment by providing a description of the visual landscape character and scenic quality values and provide maps of the visual landscape units that may potentially be visually affected. This should include, but not be limited to: landforms; vegetation; any waterways and can be undertaken by way of 3 dimensional modelling and/or photographs.<br>45. Identify and discuss the potential sources and impacts of noise, dust and light-spill and alteration to landforms from the proposal.<br>46. Design and undertake a visual impact assessment (VIA) for before, during and after the proposed mining activities, to assess the impacts of the proposal on visual amenity in accordance with the Western Australian Planning Commission (2007) *Visual Landscape Planning in Western Australia: a manual for evaluation, assessment, siting and design,* and in consultation with Parks and Wildlife.<br>47. The VIA will identify and describe the aspects of the proposal which may potentially affect the visual landscape character and scenic quality values both temporarily and permanently, using agreed (by EPA, in consultation with Parks and Wildlife) reference and vantage points of surrounding areas |

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| | including travel routes and use area's viewer positions and perceptions.<br>48. A peer review of the VIA information by a suitably qualified individual with appropriate experience and expertise is also required.<br>49. Predict the residual amenity impacts from the proposal on the landscape sensitive receptors and important areas for human useafter considering and applying avoidance and minimisation measures. Impact predictions are to include, but not be limited to:<br>a) The likely extent, severity and duration of the impacts from noise, dust, light-spill, and alterations to the landscape, landform and to amenity; and<br>b) Simulations/modelling of the predicted residual impacts from the proposal, including changes to the landscape from the agreed reference and vantage points. Include the cumulative impacts on amenity from the proposal and other currently approved developments.<br>50. Demonstrate how the EPA's objective for this factor can be met.<br>51. Identify management and mitigation measures for the proposal including closure and rehabilitation outcomes to ensure residual impacts are not greater than predicted. The PER is to include:<br>a) A description of the management and mitigation measures;<br>b) Develop management zones, prescriptions and strategies for managing visual landscape character relative to each stage of the proposed operation; and<br>c) Environmental management plans outlining the environmental outcomes/objectives; other key regulatory requirements; management actions; monitoring (including methodology, frequency, location and rational); trigger criteria; contingency actions; review; reporting; and consultation. |
| **Relevant policy** | Department of Environment and Conservation (2011) *A guideline for managing the impacts of dust and associated contaminants from land development sites, contaminated sites remediation and other related activities.* Perth Western Australia.<br>*Environmental Protection (Noise) Regulations 1997.*<br>EPA (2014) *Environmental Assessment Guideline 13 for Consideration of environmental impacts from noise.* Perth Western Australia.<br>*National Environmental Protection (Ambient Air Quality) Measure (2003).*<br>Western Australian Planning Commission (2007) *Visual Landscape Planning in Western Australia: a manual for evaluation, assessment, siting and design.* Perth, Western Australia.<br>Western Australian Planning Commission (2009) *State Planning Policy 5.4 Road and Rail Transport Noise and Freight Considerations in Landuse Planning.* |
| **Heritage** | |
| **EPA objective** | To ensure that historical and cultural associations, and natural heritage, are not adversely affected. |
| **Relevant aspects** | • Clearing of vegetation and site works;<br>• Water abstraction;<br>• Alterations to surface water flows;<br>• Excavation, haulage and stockpiling of ore and overburden; |

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| | • Overtopping of water storage facilities; and<br>• Vehicle movements; and<br>• Alteration of landforms which may contain Aboriginal heritage sites. |
| **Potential impacts and risks** | • Disturbance to Aboriginal heritage sites and/or cultural associations within the area;<br>• Temporary and/or permanent constraint on traditional cultural activities; and<br>• Alteration of Aboriginal heritage and cultural values associated with the Conservation Park. |
| **Required work** | 52. Characterise the heritage and cultural values of the proposal area and any other areas that may be indirectly impacted to identify sites of significance and their relevance within a wider regional context.<br>53. Conduct appropriate Aboriginal heritage survey and/or consultation with relevant Aboriginal groups to identify Aboriginal sites and values, and identify concerns in regard to environmental impacts as they affect heritage matters.<br>54. Provide a detailed description and figure(s) of the proposed disturbance and impacts to heritage associated with the proposal.<br>55. Describe and assess the impacts of the proposal on heritage sites and/or cultural associations associated with the implementation of the proposal, including those resulting from changes to the environment which may impact on cultural and heritage significance. The assessment should be conducted in accordance with EPA Guidance Statement 41.<br>56. Predict the residual impacts on heritage, for direct, indirect and cumulative impacts after considering avoidance and minimisation measures.<br>57. Demonstrate how the EPA's objective for this factor can be met.<br>58. Outline the outcomes/objectives, management, monitoring, trigger and contingency actions to ensure impacts to heritage (direct and indirect) are not greater than predicted. |
| **Relevant policy** | *Aboriginal Heritage Act 1972.*<br>Department of Aboriginal Affairs and Department of Premier and Cabinet (DAA & DPC) (2013) *Aboriginal Heritage - Due Diligence Guidelines, Version 3.0*, Perth, Western Australia.<br>EPA (2004) *Guidance for the Assessment of Environmental Factors No. 41: Assessment of Aboriginal Heritage*. Perth, Western Australia. |
| **Offsets (Integrating Factor)** | |
| **EPA objective** | To counterbalance any significant residual environmental impacts or uncertainty through the application of offsets. |
| **Relevant aspects** | • Residual environmental impacts will be determined through the assessment in alignment with the WA Environmental Offsets Guidelines. |
| **Potential impacts and risks** | • Residual environmental impacts will be determined through the assessment in alignment with the WA Environmental Offsets Guidelines. |
| **Required work** | 59. Describe the residual impacts for the proposal and analyse these impacts to identify and detail any that are significant.<br>60. If the proposal is likely to have any significant residual environmental |

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| | impacts, identify environmental offsets, consistent with the requirements in the:<br>- WA Environmental Offsets Guidelines, which includes the use of the WA Environmental Offsets template; and<br>- EPA Environmental Protection Bulletin No.1: Environmental Offsets. |
| **Relevant policy** | DoE (2012) *Environment Protection and Biodiversity Conservation Act 1999 Environmental Offsets Policy.* Canberra, ACT.<br>EPA (2014) *Environmental Protection Bulletin No. 1: Environmental offsets.* Perth, Western Australia.<br>Government of Western Australia (2011) *WA Environmental Offsets Policy.* Perth, Western Australia.<br>Government of Western Australia (2014) *WA Environmental Offsets Guidelines.* Perth, Western Australia.<br>WA *Environmental Offsets template* (230914). |
| **Rehabilitation and decommissioning (Integrating Factor)** | |
| **EPA objective** | To ensure that premises are decommissioned and rehabilitated in an ecologically sustainable manner. |
| **Relevant aspects** | • Clearing of vegetation and site works;<br>• Ecavation; and<br>• Waste rock disposal. |
| **Potential impacts and risks** | • Permanent impacts to landform(s) and associated natural hydrology, flora and fauna;<br>• Acid and/or metalliferous drainage (AMD);<br>• Unsuccessful rehabilitation of flora and vegetation in cleared/developed areas;<br>• Impact on soils from compaction and erosion;<br>• Impediment of rehabilitation success due to the spread of weeds; and<br>• Other threatening processes (ie trampling by livestock, increased risk of fire) impeding rehabilitation success. |
| **Required work** | 61. Provide an assessment on the physical and chemical characteristics of soil and soil profiles to be disturbed by the proposal, with particular focus on the ability to use such soil materials in post-mining rehabilitation works.<br>62. In consultation with the Department of Mines and Petroleum (DMP), provide a risk assessment and report on the waste characteristics (volume, chemical and physical properties) of waste rock material generated as part of the proposal. The risk assessment should use existing geological drilling data from the proposal area, in conjunction with geomorphological/soil distribution relationships from relevant local and regional deposits. The worst-case volume of problematic material requiring management must be established and appropriate management strategies discussed. The proposed waste landform design should be based on the outcomes of the waste characterisation risk assessment to ensure the final design will achieve desired long term stability, ecosystem function and visual amenity as identified in completion criteria and ensure that the final landform design is non-polluting (i.e. any AMD materials are appropriately encapsulated within |

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| | the waste dump or buffered by other waste).<br>63. Undertake a literature review and provide evidence of successful best practice mining rehabilitation procedures, including a review of learnings from the rehabilitation at other banded iron formation environments in the Yilgarn Craton.<br>64. Prepare a Rehabilitation and Mine Closure Plan consistent with the DMP and EPA (2015) *Guidelines for Preparing Mine Closure Plans.* The Plan should include but not be limited to:<br>a) Closure objectives and completion criteria addressing post mining landforms and soil profile design, native vegetation and habitat for conservation significant flora and fauna and base the conclusions on the availability of suitable substrates; and<br>b) Establish and measure vegetation and fauna reference and analogue sites to inform completion criteria.<br>65. Demonstrate that the proposal has been designed to avoid and minimise impacts including the placement of any access roads and infrastructure within vegetated areas has had regard to utilising existing areas of disturbance.<br>66. Describe the techniques of rehabilitation proposed, including but not limited to:<br>a) Topsoil management;<br>b) Retention or reuse of vegetative material;<br>c) Return of species and communities consistent with the pre-existing composition of the affected area, where this is likely to be feasible and the standards that will apply; and<br>d) Identify a timeframe for establishment of the intended species and vegetation units; and<br>e) Minimise permanent impacts to the structure of the landform and landscape aesthetic values identified in the VIA and methodologies for managing visual impact.<br>67. Identify completion criteria, including criteria for reconstructed soils and soil profiles (identification and profile reconstruction), landform stability, drainage/erosion control and species and communities.<br>68. Detail and justify the options for disposal of waste rock including backfilling. Confirm the extent of backfilling to occur. Consider the implications of backfilling or not in all relevant sections of the PER.<br>69. Demonstrate how the EPA's objective for this factor can be met. |
| **Relevant policy** | DMP and EPA (2015) *Guidelines for Preparing Mine Closure Plans.* Department of Mines and Petroleum and Environmental Protection Authority.<br>EPA (2006) *Guidance Statement No. 6: Rehabilitation of Terrestrial Ecosystems.* Perth, Western Australia. |

## 5. Stakeholder consultation

The EPA expects that the proponent will consult with stakeholders who are interested in, or affected by, the proposal. This includes DMAs, other relevant State and Federal government departments and local government authorities, environmental non-government organisations and the local community.

The proponent must document the stakeholder consultation undertaken and the outcomes, including any adjustments to the proposal and any future plans for consultation. This is to be addressed in a specific section of the PER document and, in addition, key outcomes of consultation are to be reported against the preliminary key environmental factors as relevant.

It is expected that as a part of the consultation with DMA's there will be discussion around each agency's specific regulatory approvals, and a demonstration that other factors can be managed by another regulatory body.

## 6. Peer review

Where a peer review is required it will be undertaken in accordance with the following:

a) The peer review must be undertaken by a suitably qualified and experienced professional;

b) The peer review is conducted at the expense of the proponent; and

c) Peer reviewer/s will be identified by the proponent and be approved by a body independent of the author and the report commissioners (in this case, the EPA is the independent body); and

d) The terms of reference of the peer review is agreed by the EPA.

## 7. Other factors or matters

During assessment of proposals, other factors or matters will be identified as relevant to the proposal, but not of significance to warrant further assessment by the EPA, or impacts can be regulated by other statutory processes to meet the EPA's objectives.

These factors do not require further work as part of the environmental review, or detailed discussion and evaluation in the PER document, although they must be included in the PER document in a summarised, tabular format noting that the PER document will be subject to public review.

It is also important that the proponent be aware that other factors or matters may be identified during the course of the environmental review that were not apparent at the time that this ESD was prepared. If this situation arises, the proponent must consult with the EPA to determine whether these factors and/or matters are to be addressed in the PER document, and if so, to what extent.

## 8. Agreed assessment timeline

Table 3 sets out the timeline for the assessment of the proposal agreed between the EPA and the proponent. Proponents are expected to meet the agreed timeline, and in doing so, provide adequate, quality information to inform the assessment.

**Table 3 Assessment Timeline**

| Key Stages of Assessment | Agreed Completion Date |
|---|---|
| EPA approval of ESD | 20 August 2015 |
| Proponent submits first adequate draft PER document | 31 March 2016 |
| Office of the Environmental Protection Authority (OEPA) provides comment on first adequate draft PER document (6 weeks) | 12 May 2016 |
| Proponent submits adequate revised draft PER document | 2 June 2016 |
| EPA authorises release of PER document for public review (2 weeks) | 16 June 2016 |
| Proponent releases authorised PER document for public review | 20 June 2016 |
| Public review of PER document (8 weeks) | 15 August 2016 |
| EPA provides Summary of Submissions (3 weeks) | 5 September 2016 |
| Proponent provides Response to Submissions | 19 September 2016 |
| OEPA reviews the Response to Submissions (4 weeks) | 17 October 2016 |
| OEPA assesses proposal for consideration by EPA (7 weeks) | 5 December 2016 |
| Preparation and finalisation of EPA assessment report (including two weeks consultation on draft conditions with proponent and key Government agencies) (5 weeks) | 23 January 2017 *(2 weeks added for Xmas period)* |

If any stage in the agreed timeline is not met or inadequate information is submitted by the proponent, the timing for the completion of subsequent stages of the process will be revised. Equally, where the EPA is unable to meet an agreed completion date in the timeline, the proponent will be advised and the timeline revised.

The proponent should refer to EPA's EAG 6 – *Timelines for environmental assessment of proposals* for information regarding the responsibilities of proponents and the EPA for achieving timely and effective assessment of proposals.

## 9. Decision-making authorities

At this stage, the EPA has identified the authorities listed in Table 4 as DMAs for the proposal. Additional DMAs may be identified during the course of the assessment.

**Table 4 Decision-making authorities**

| Decision-making authority | Relevant legislation |
|---|---|
| Minister for Aboriginal Affairs | *Aboriginal Heritage Act 1972*<br>S18 approval |
| Minister for Environment | *Wildlife Conservation Act 1950*<br>Licence to take protected flora and fauna |
| Minister for Mines and Petroleum | *Mining Act 1978* |
| Minister for Water | *Rights in Water and Irrigation Act 1914*<br>Water extraction licence |
| Department of Environment Regulation | *Environmental Protection Act 1986*<br>Works approvals and licences |
| Department of Mines and Petroleum | *Mining Act 1978*<br>Approval of mining proposal<br><br>*Dangerous Goods Safety Act 2004;*<br>Storage and handling of hazardous materials<br><br>*Mines Safety and Inspection Act 1994* |

## 10. Parallel processing

The EP Act constrains DMAs from making any decision that could have the effect of causing or allowing the proposal to be implemented. However, the proponent is encouraged to pursue other approvals in parallel with the EPA's assessment noting that the constraint only relates to making an approval decision.

## 11. PER document

When the EPA is satisfied with the standard of the PER document (refer to section 4.4 of EAG 6) it will provide written authorisation for the release of the document for public review. The proponent must not release the PER document for public review until this authorisation is provided.

The proponent is responsible for advertising the release and availability of the PER document in accordance with instructions that will be issued to the proponent by the EPA. The EPA must be consulted on the timing and details for advertising.

## 12. References


Environmental Protection Authority (2012) *Environmental Assessment Guideline (EAG) 1 - Defining the key characteristics of a proposal.* Perth, WA.

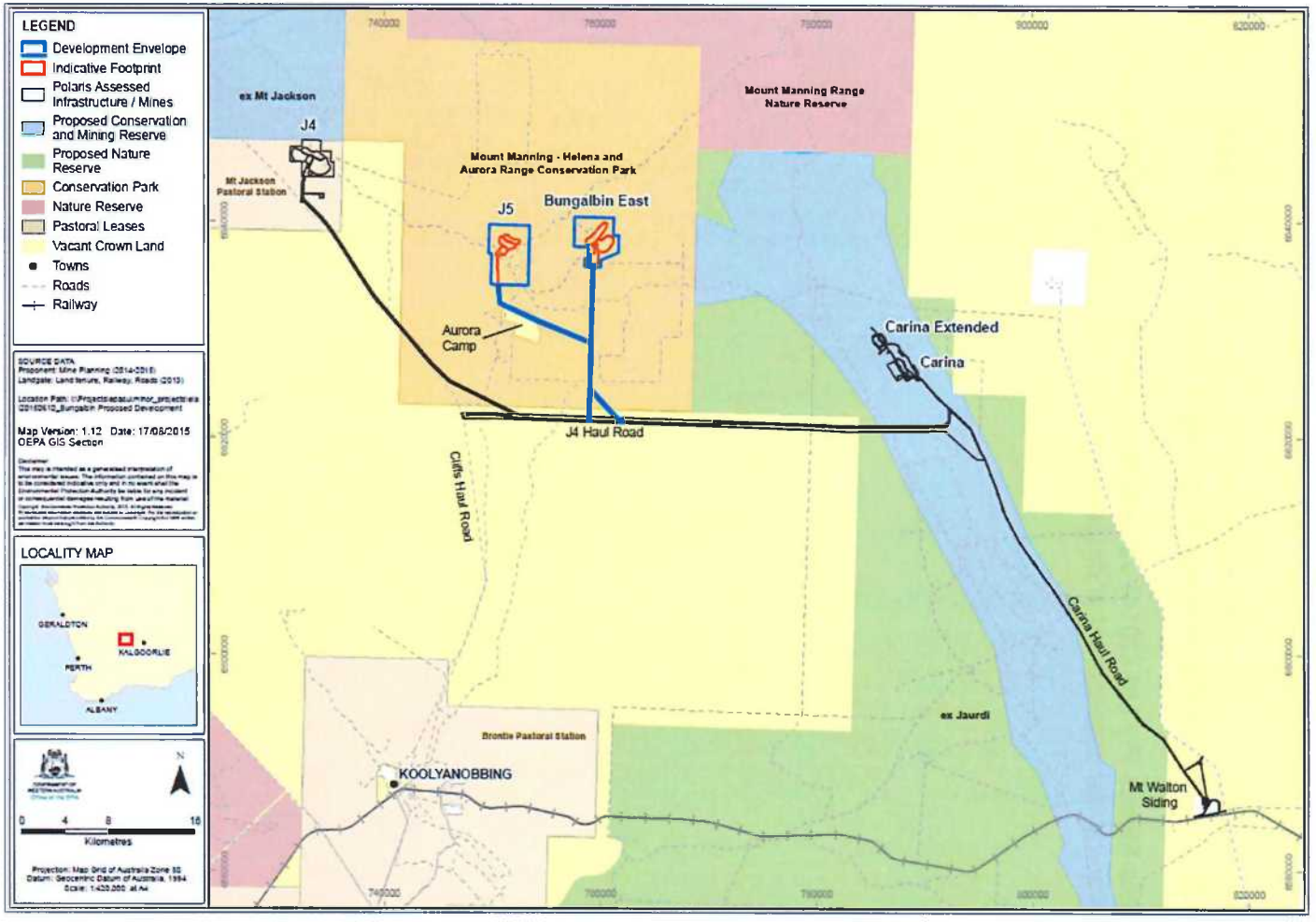
Environmental Protection Authority (2012) *Environmental Impact Assessment (Part IV Divisions 1 and 2) Administrative Procedures 2012.* No 223. 7 December 2012. Western Australian Government Gazette. Perth, WA.

Environmental Protection Authority (2013) *Environmental Assessment Guideline (EAG) 10 – Scoping a proposal.* Perth, WA.

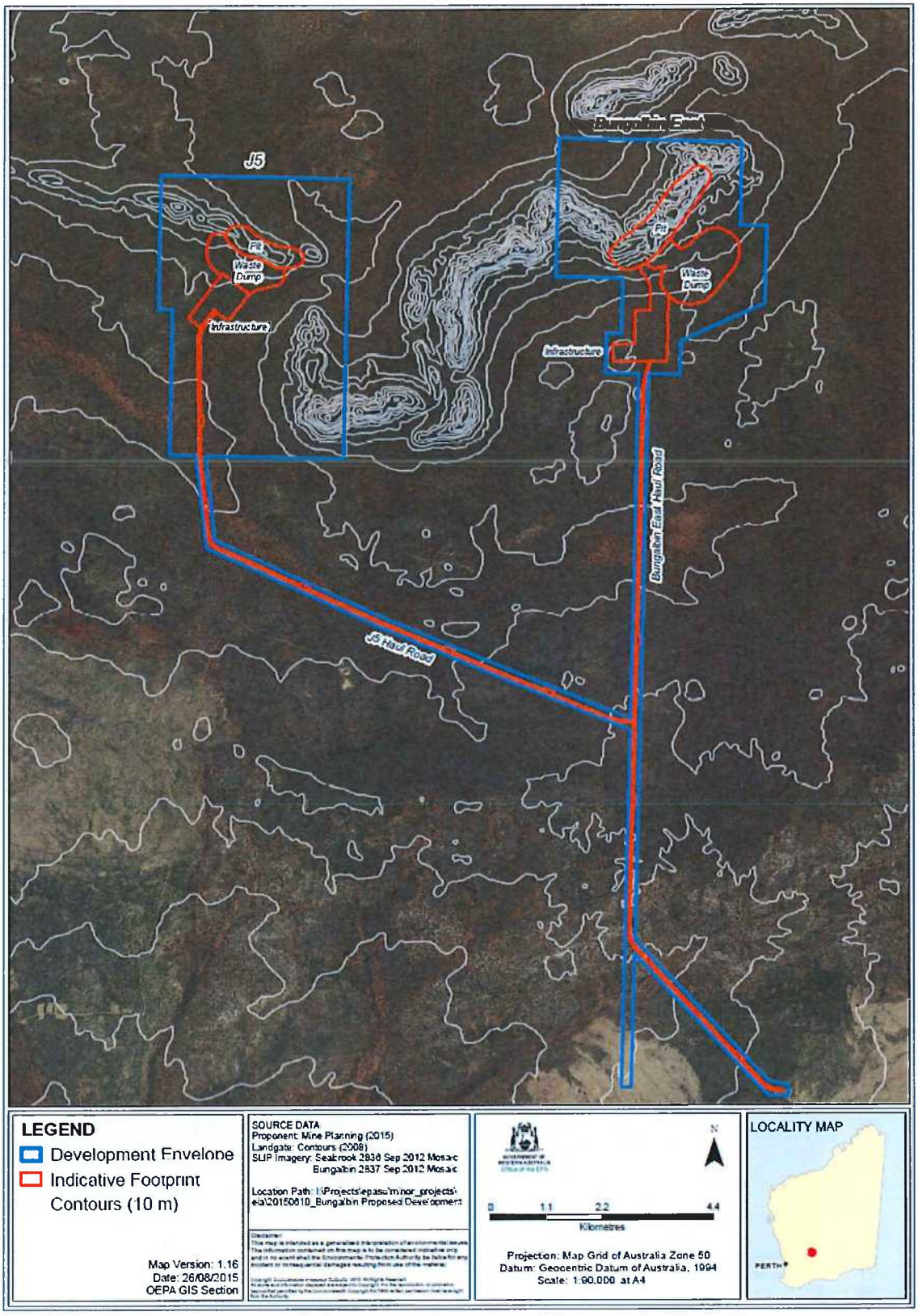
Environmental Protection Authority (2015) *Environmental Protection Bulletin No. 23 Guidance on the EPA Landforms factor.* Perth, WA.

Polaris Metals Pty Ltd (2014) *J5 and Bungalbin East Iron Ore Project – towards and environmental assessment of proposed mining.* May 2014.

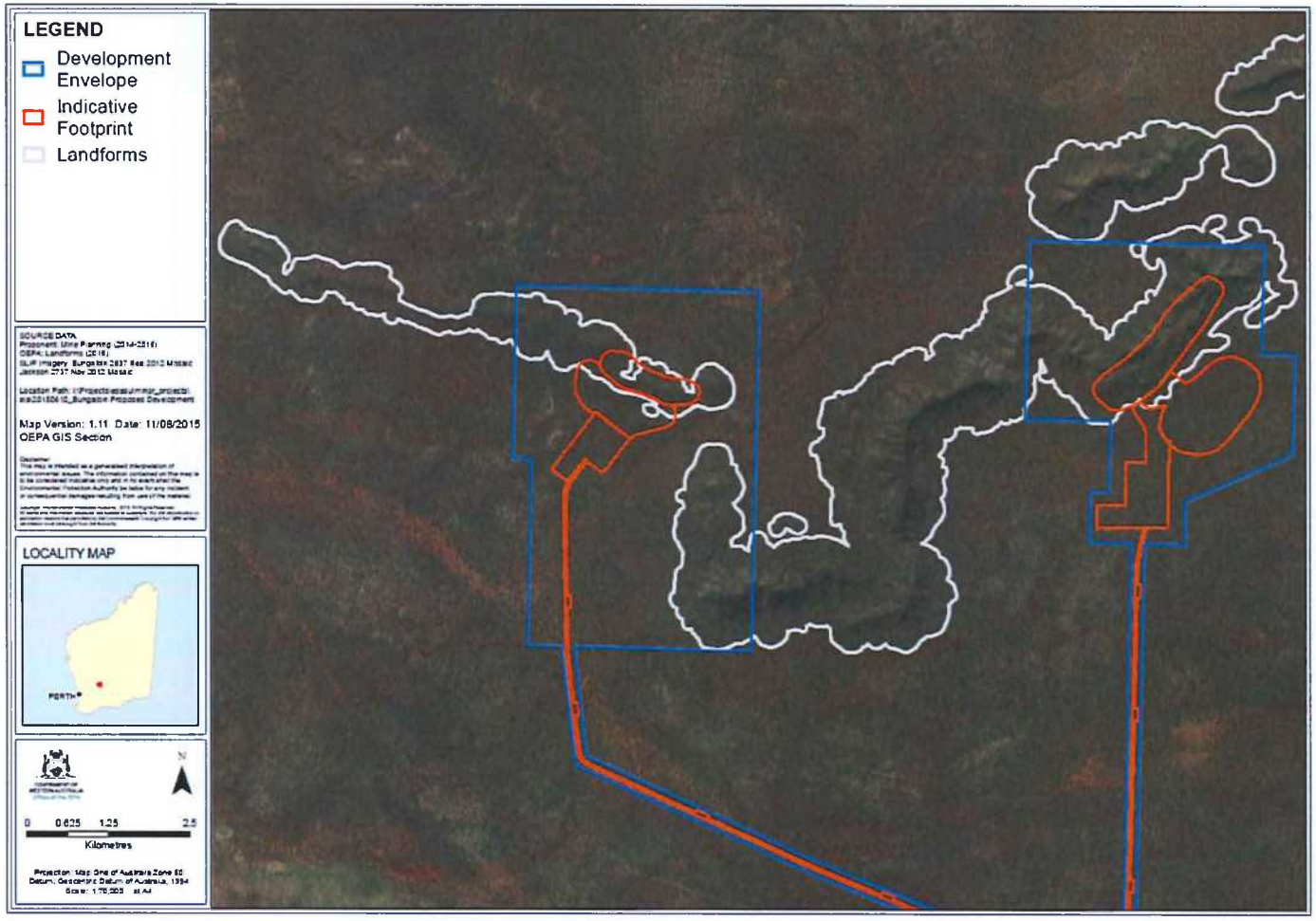
## Figure 1 – Regional location



## Figure 2 – Development Envelope and Indicative Footprints



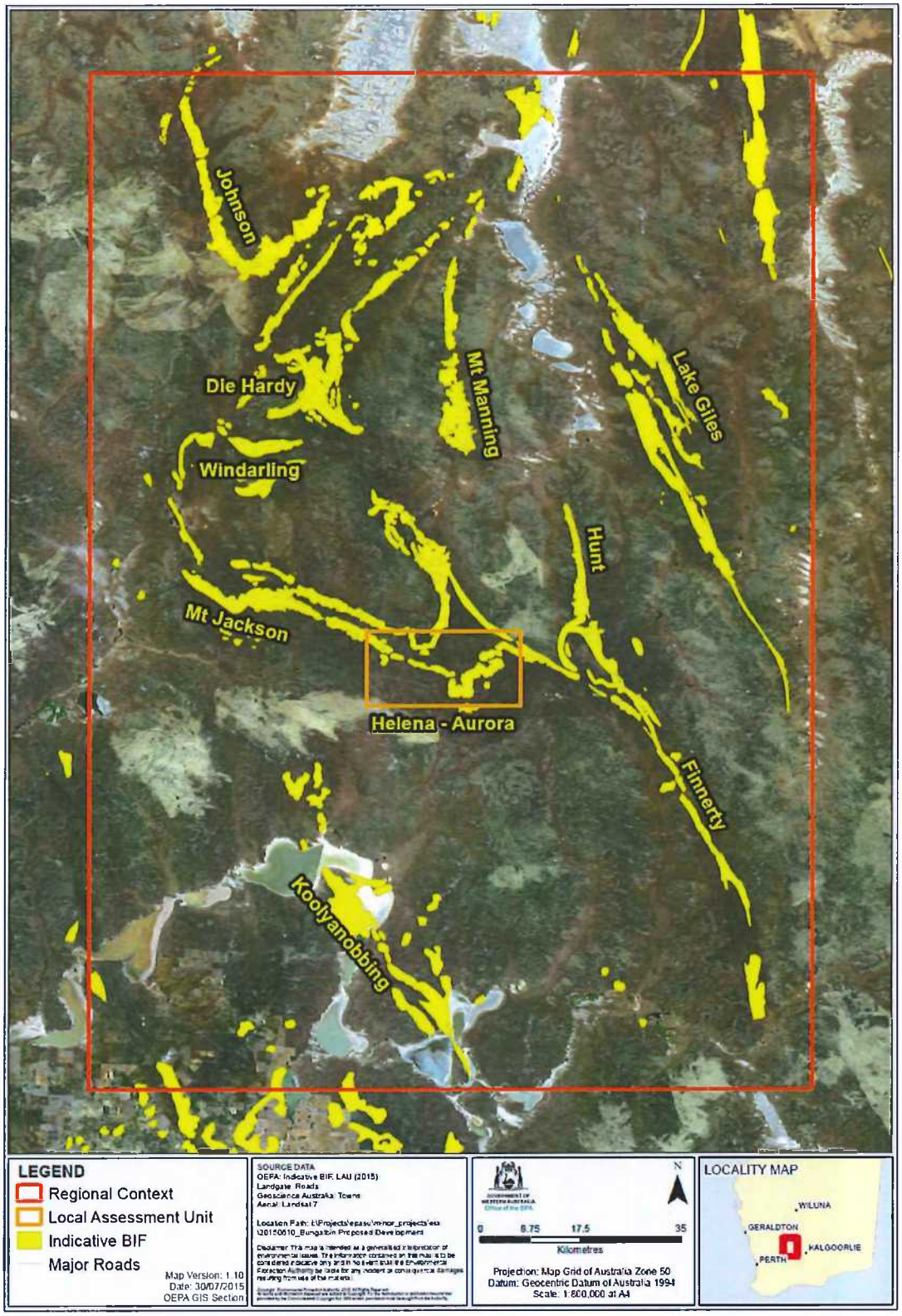
## Figure 3 – Potentially Affected Landforms




** Landform boundary is determined based on geology and morphology and is shown as the area with a slope of 5 degrees or greater and with an additional 50 metre area to allow for lower resolution source data.*

## Figure 4 – Local Assessment Unit

## Figure 5 – Mount Manning Area




** Indicative banded iron formation (BIF) (OEPA 2009): derived from geology (GSWA) and land systems (DAFWA) spatial data.*