



# Report and recommendations of the Environmental Protection Authority



## North Star Magnetite Project

Fortescue Metals Group Iron Bridge (Aus) Pty Ltd

Report 1514

June 2014

## Public Environmental Review Environmental Impact Assessment Process Timelines

Date	Progress stages	Time (weeks)
05/11/2012	Level of Assessment set (date appeals process completed)	
27/02/2013	Final ESD approved	<b>16</b>
09/09/2013	Public Environmental Review document (PER) released for public review	<b>28</b>
21/10/2013	Public review period for PER closed	<b>6</b>
02/12/2013	Proponent's Response to Submissions Received	<b>6</b>
20/12/2013	EPA requested additional information	<b>3</b>
16/05/2014	Proponent submitted final additional information on proposed conditions	<b>21</b>
18/06/2014	Provision of the EPA Report to the Minister	<b>5</b>
23/06/2014	Publication of EPA report (3 working days after report to Minister)	<b>3 days</b>
07/07/2014	Close of appeals period	<b>2</b>

### STATEMENT ON TIMELINES

Timelines for an assessment may vary according to the complexity of the project and are usually agreed with the proponent soon after the level of assessment is determined.

In this case, the Environmental Protection Authority met its agreed timeline objective for the completion of the assessment and provision of a recommendation to the Minister.



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Chairman

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## Summary and recommendations

This report provides the Environmental Protection Authority's (EPA) advice and recommendations to the Minister for Environment on the proposal by the Fortescue Metals Group Iron Bridge (FMGIB) to develop the North Star Magnetite open cut iron ore mine and associated infrastructure 110 kilometres (km) south-south-east of Port Hedland. The proposal includes a borefield and adjoining water pipeline 160 km north-east of the mine site and a slurry corridor connecting the mine to facilities in Port Hedland.

Section 44 of the *Environmental Protection Act 1986* (EP Act) requires the EPA to report to the Minister for Environment on the outcome of its assessment of a proposal. The report must set out:

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

The EPA may include in the report any other advice and recommendations as it sees fit.

The EPA is also required to have regard for the principles set out in section 4A of the EP Act.

### **Key environmental factors and principles**

The EPA decided that the following key environmental factors relevant to the proposal required detailed evaluation in the report:

- (a) Flora and Vegetation;
- (b) Terrestrial Fauna;
- (c) Subterranean Fauna;
- (d) Hydrological Processes and Inland Waters Environmental Quality; and
- (e) Offsets – integrating factor.

There were a number of other factors which were relevant to the proposal, but the EPA is of the view that the information set out in Appendix 3 provides sufficient evaluation.

The following principles were considered by the EPA in relation to the proposal:

- (a) The precautionary principle;
- (b) The principle of intergenerational equity;
- (c) The principle of the conservation of biological diversity and ecological integrity;

- (d) Principles relating to improved valuation, pricing and incentive mechanisms; and
- (e) The principles of waste minimisation.

## **Conclusion**

The EPA has considered the proposal by the FMGIB to develop the North Star Magnetite open cut iron ore mine and associated infrastructure.

The EPA has concluded that the proposal can be managed to meet the EPA's objectives provided there is satisfactory implementation by the proponent of the recommended conditions set out in Appendix 5 and summarised in Section 4.

## **Recommendations**

That the Minister for Environment:

1. notes that the proposal being assessed is for the development of the North Star Magnetite open cut iron ore mine and associated infrastructure, located 110 km south-south east of Port Hedland;
2. considers the report on the key environmental factors and principles as set out in Section 3;
3. notes the EPA has concluded that the proposal can be managed to meet the EPA's objectives, provided there is satisfactory implementation by the proponent of the recommended conditions set out in Appendix 5 and summarised in Section 5; and
4. imposes the conditions and procedures recommended in Appendix 5 of this report.

## **Conditions**

Having considered the information provided in this report, the EPA has developed a set of conditions that the EPA recommends be imposed if the proposal by the FMGIB to develop the North Star Magnetite open cut iron ore mine and associated infrastructure 110 kilometres (km) south-south-east of Port Hedland is approved for implementation. These conditions are presented in Appendix 5. Matters addressed in the conditions include the following:

- (a) ensuring that the project is implemented so that it does not affect the viability of *Pityrodia* sp. Marble Bar (conditions 6 and 7);
- (b) ensuring that linear infrastructure and the borefield is sited and constructed in a manner that avoids Declared Rare Flora (DRF), Priority 1 Listed Flora species (including *Pityrodia* sp. Marble Bar ) and Threatened Ecological Communities (TECs) where practicable, and minimises the impact to other conservation significant flora (conditions 8 and 9);
- (c) ensuring that the implementation of the proposal does not affect the viability of the Pilbara Leaf-nosed Bat, through a Mine Exclusion Zone around Cave 13. Removal of the Mine Exclusion Zone will be dependent on the proponent demonstrating that a viable portion of the colony at Cave 13 has successfully relocated to an alternative maternal roost site (condition 10);

- (d) ensuring that mine construction and operational activities are carried out in a manner that minimises impacts to the Northern Quoll (condition 11);
- (e) ensuring that mining activities do not impact the water quality or hydrological regime of Site 12 Pool (condition 12);
- (f) requiring that open trenches associated with construction of Linear Infrastructure are cleared of trapped fauna by fauna-rescue personnel at least twice daily (condition 13); and
- (g) requiring the proponent to contribute funds to a government-established conservation offset fund to mitigate for significant residual impacts on vegetation in 'good to excellent' condition (condition 14).

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## **Appendices**

1. List of submitters
2. References
3. Summary of identification of key environmental factors
4. Identified Decision making Authorities and Recommended Environmental Conditions
5. Summary of submissions and proponent's response to submissions



# 1. Introduction and background

This report provides the advice and recommendations of the EPA to the Minister for Environment on the key environmental factors and principles for the proposal by Fortescue Metals Group Iron Bridge (FMGIB) to construct and operate an open-cut iron ore mine and associated infrastructure, including a borefield and water supply pipeline, approximately 110 kilometres (km) south-south-east of Port Hedland.

The proposal includes an open cut iron ore mine, tailings storage facility, waste rock dump and borefield located in the West Canning Basin (located 160 km north-east of the proposal area), water pipeline infrastructure, and a slurry pipeline connecting the mine to facilities in Port Hedland. The proposal has a mine life of 45 years and will generate up to 15 million tonnes per annum of product.

FMGIB referred the proposal to the EPA on 10 October 2012. The EPA set the level of assessment at a Public Environmental Review (PER) with a six-week public comment period on 5 November 2012. The EPA approved the Environmental Scoping Document for the proposal on 27 February 2013. The proposal is also being assessed under the Bilateral Agreement between the State and Commonwealth. The PER was released for a six-week public comment period on 9 September 2013, closing on 21 October 2013.

The proposal was determined to be a controlled action under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) on 21 January 2013 as it may impact on Matters of National Environmental Significance (MNES) - listed threatened species and communities (sections 18 and 18A). The proposal is being assessed under the bilateral agreement between the Commonwealth and Western Australian Governments.

Prior to the implementation of the North Star Magnetite Project, the proponent intends to develop the North Star Hematite Project. The North Star Hematite Project is located within the boundaries of the proposed North Star Magnetite Project and is a stand-alone project in its own right. The North Star Hematite proposal includes an above water table iron ore mine and associated infrastructure at the North Star deposit, with a maximum extraction of 11.3 million tonnes of mag-hematite. The EPA determined the level of assessment for the North Star Hematite Project as Not Assessed – Public Advice Given on 6 August 2012. The hematite project was determined to be a controlled action under the EPBC Act in October 2012 and the Commonwealth Government issued an approval (with conditions) for the hematite project in June 2013.

Further details of the proposal are presented in Section 2 of this report. Section 3 discusses the key environmental factors and principles for the proposal. The conditions to which the proposal should be subject, if the

Minister determines that it may be implemented, are set out in Section 5. Section 6 provides other advice by the EPA.

Appendix 6 contains a summary of submissions and the proponent's response to submissions. It is included as a matter of information only and does not form part of the EPA's report and recommendations. Issues arising from this process, and which have been taken into account by the EPA, appear in the report itself.

## 2. The proposal

Fortescue Metals Group Iron Bridge (FMGIB) proposes to construct and operate an open-cut iron ore mine, and associated infrastructure, including a borefield and water supply pipeline, approximately 110 kilometres (km) south-south east of Port Hedland. It is proposed that the magnetite concentrate product will be transported to Port Hedland for export via a slurry pipeline (Figure 1).

The proposal has a mine life of 45 years and will generate up to 15 million tonnes per annum of product. The proposal will result in land disturbance of 5,141 hectares (ha) within three development envelopes covering 40,072 ha. FMGIB is also proposing to abstract 14 gigalitres per annum (GL/a) of water from the confined Wallal Aquifer located within the Canning Basin borefield (located approximately 160 km east of Port Hedland).

The proposal comprises elements within four distinct development envelopes, including:

- **Mine development envelope:** open-cut pit, waste rock dumps, tailing storage facility and process related infrastructure (Figure 2);
- **Water corridor development envelope (including borefield):** 190 km water supply pipeline to the mine area, power generators, pumping stations and access tracks (Figure 3); and
- **Slurry corridor development envelope:** connects the proposal to facilities in Port Hedland, and consists of a slurry pipeline and natural gas pipeline. Leak detectors (pressure sensors) will be deployed at various points along the slurry pipeline (Figure 4); and
- **Infrastructure corridor development envelope:** consisting of access roads, power transmission lines, and slurry and natural gas pipelines (Figure 5).

**Table 1 Key Proposal Characteristics**

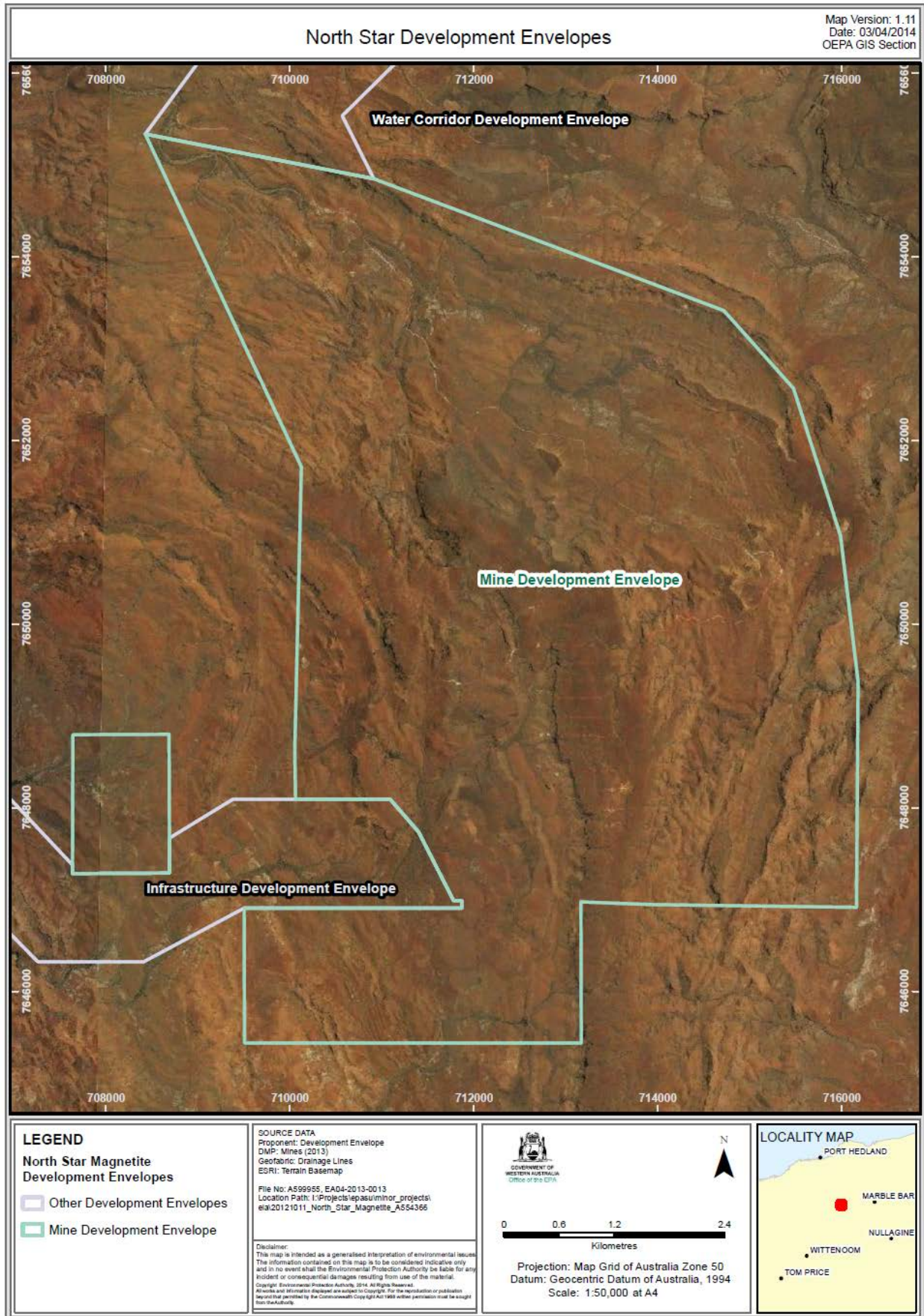
<b>Summary of the Proposal</b>	
Proposal Title	North Star Magnetite Project
Proponent Name	FMG Iron Bridge (Aust) Pty Ltd
Short Description	The proposal will involve the construction and operation of an open cut iron ore mine site and associated infrastructure (roads, administration buildings, accommodation camp, borefield, water supply pipeline, gas pipeline and slurry pipeline) approximately 110 km south-south-east of Port Hedland.

<b>Physical Elements</b>		
<b>Element</b>	<b>Location</b>	<b>Proposed Extent</b>
<p><b>Mine Development Envelope</b></p> <p>Open-cut mine pit, waste rock dumps, tailing storage facility and associated infrastructure.</p>	Figure 2	Clearing of no more than 3,493 ha within the mine development envelope of 4,970 ha.
<p><b>Water Corridor Development Envelope</b></p> <p>Borefield, water supply pipeline and associated infrastructure.</p>	Figure 3	<p>Clearing of no more than 886 ha within the water corridor development envelope of 28,696 ha.</p> <p>Abstraction at a rate of no more than 14 GL/a.</p>
<p><b>Slurry Corridor Development Envelope</b></p> <p>Slurry pipeline, natural gas pipeline, access road and associated infrastructure.</p>	Figure 4	Clearing of no more than 315 ha within the slurry corridor development envelope of 2,235 ha.
<p><b>Infrastructure Corridor Development Envelope</b></p> <p>Access roads, transmission pipelines, gas pipeline and slurry pipeline.</p>	Figure 5	Clearing of no more than 447 ha within the infrastructure corridor development envelope of 4,171 ha.

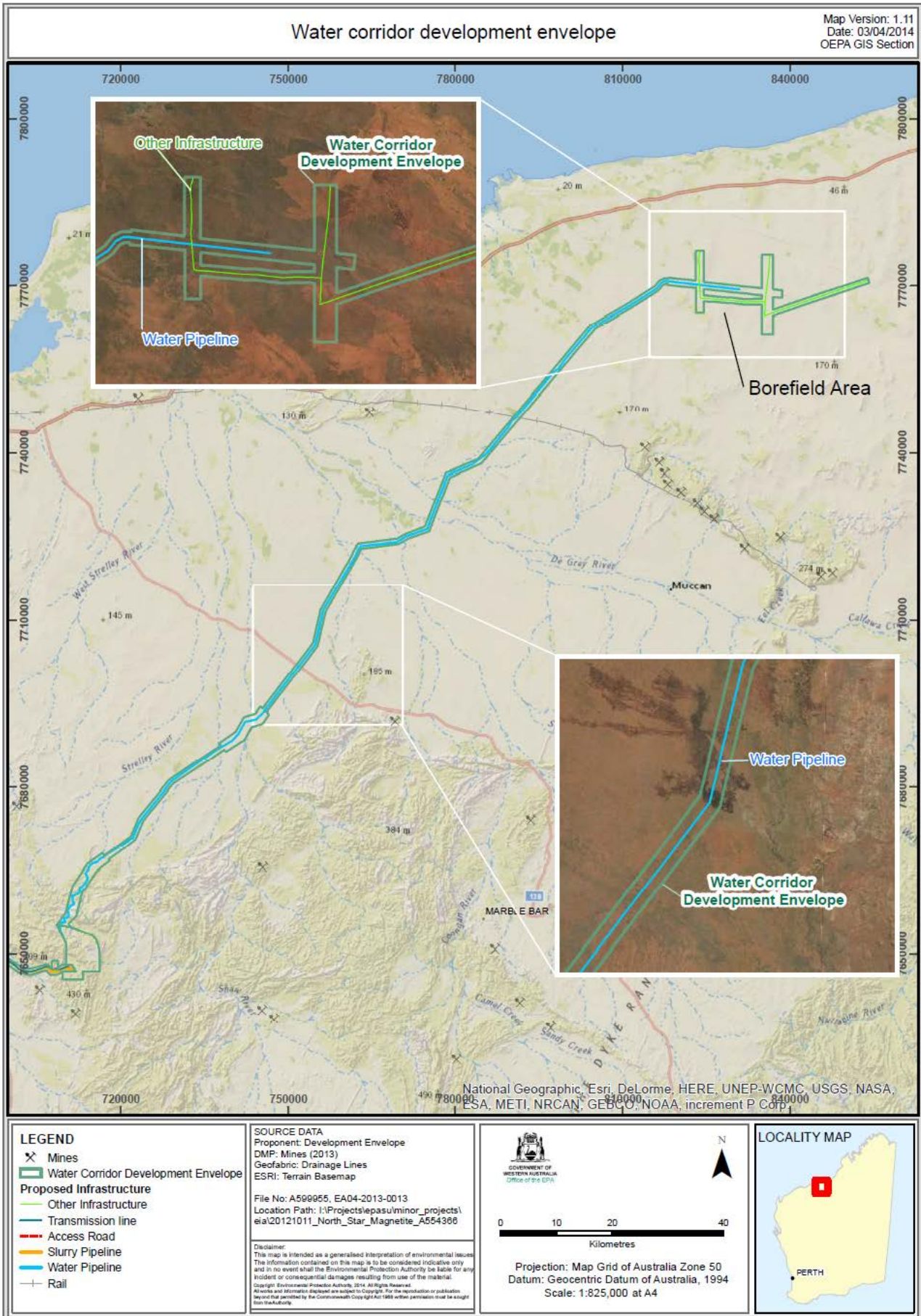
The potential impacts of the proposal initially predicted by the proponent in the PER document (FMG, 2013) and their proposed management are summarised in Table ES.2 (Executive Summary) of the proponent's document.



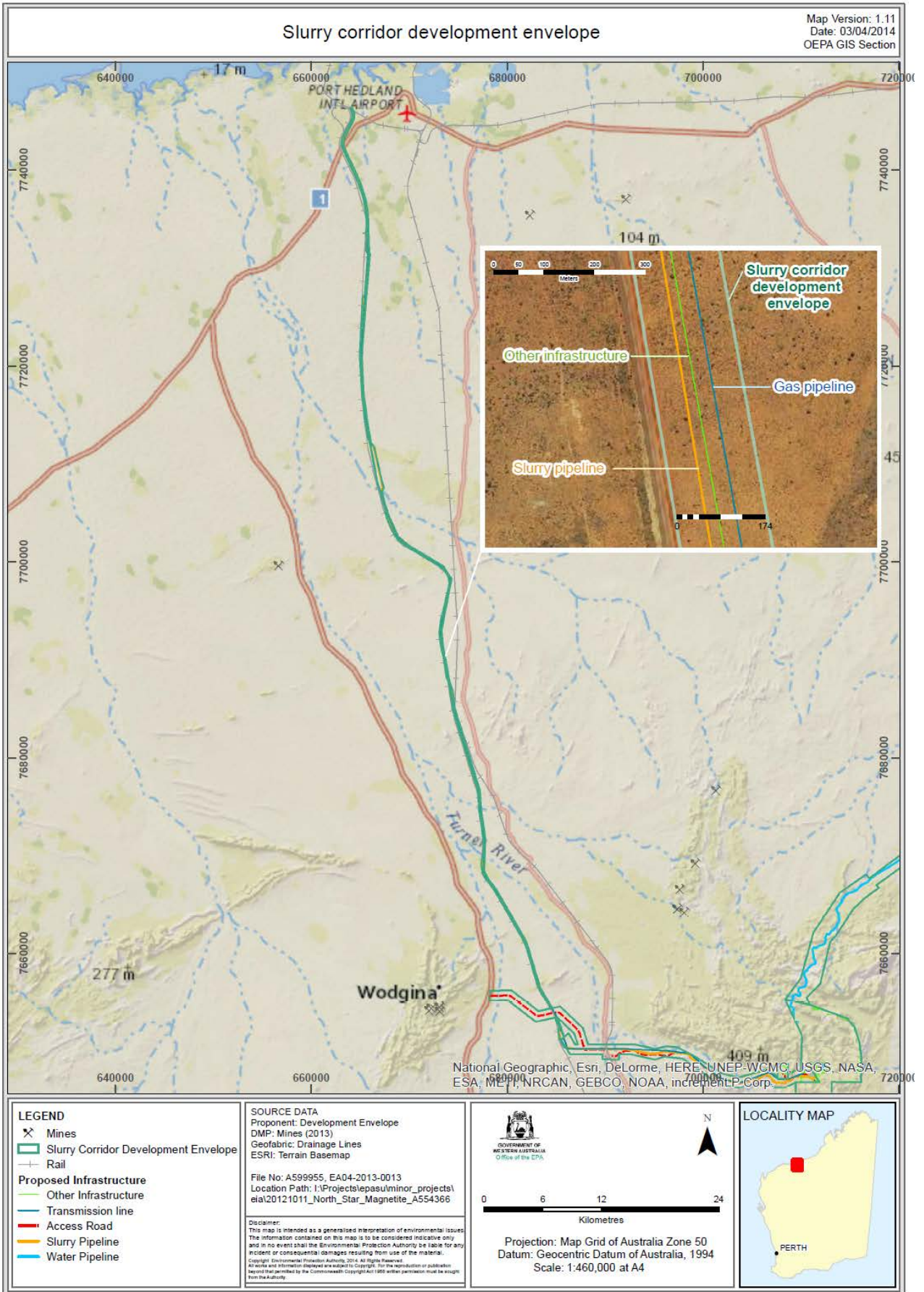
Figure 1 Proposal location



**Figure 2 Mine development envelope**



**Figure 3 Water corridor development envelope (including borefield area)**



**Figure 4 Slurry corridor development envelope**



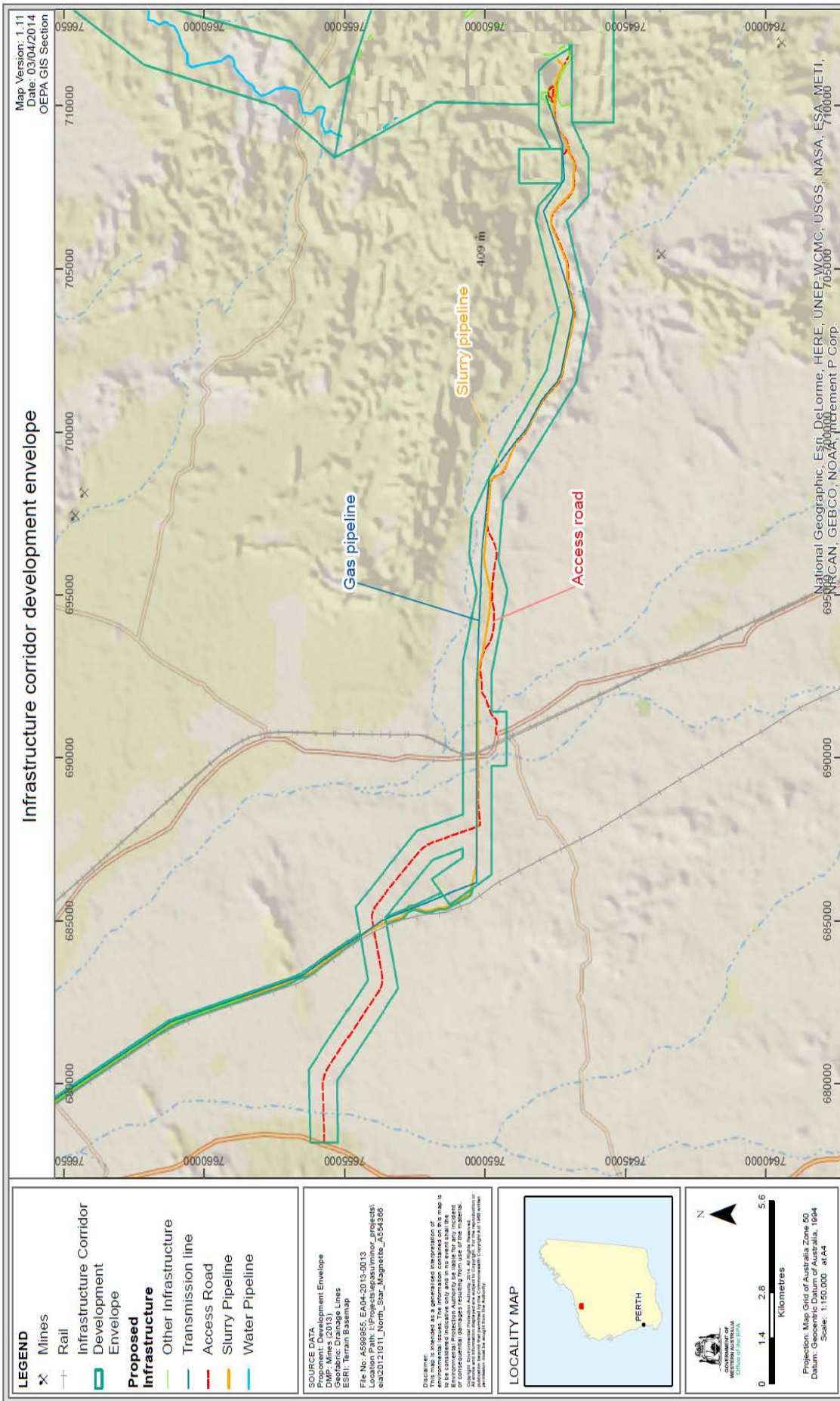


Figure 5 Infrastructure corridor development envelope

### 3. Key environmental factors and principles

Section 44 of the *Environmental Protection Act 1986* requires the EPA to report to the Minister for Environment on the key environmental factors relevant to the proposal and the conditions and procedures, if any, to which the proposal should be subject. In addition, the EPA may make recommendations as it sees fit.

The identification process for the key factors selected for detailed evaluation in this report is summarised in Appendix 3. The reader is referred to Appendix 3 for the evaluation of factors not discussed below. A number of these factors such as air quality, human health and closure and rehabilitation are relevant to the proposal, but the EPA is of the view that the information set out in Appendix 3 provides sufficient evaluation.

It is the EPA's opinion that the following key environmental factors for the proposal require detailed evaluation in this report:

- (a) Flora and Vegetation;
- (b) Terrestrial Fauna;
- (c) Subterranean Fauna;
- (d) Hydrological Processes and Inland Waters Environmental Quality;  
and
- (e) Offsets – integrating factor.

The above key factors were identified from the EPA's consideration and review of all environmental factors generated from the PER document and the submissions received, in conjunction with the proposal characteristics. Although Inland Waters Environmental Quality was not specified as a separate factor in the ESD, water quality elements were included in the potential impacts and work required. Therefore, the EPA has included it as a key factor for evaluation in the EPA report.

Details on the key environmental factors and their assessment are contained in Sections 3.1 - 3.5. The description of each factor shows why it is relevant to the proposal and how it will be affected by the proposal. The assessment of each factor is where the EPA decides whether or not a proposal meets the environmental objective set for that factor.

Rehabilitation and Closure was included in the 'Other Environmental Factors' section of the Environmental Scoping Document. Consistent with Environmental Protection Bulletin No.19 *EPA involvement in mine closure* and based on advice received from the Department of Mines and Petroleum (DMP) to date, the EPA considers that the factor of Rehabilitation and Closure can be effectively regulated by the DMP under the *Mining Act 1978* and through the joint DMP/EPA *Guidelines for Preparing Mine Closure Plans*. However, the EPA has provided other advice on Rehabilitation and Closure.

As the EPA is assessing the proposal on behalf of the Commonwealth Government under the Bilateral Agreement, the EPA's Report also includes a separate section dealing with Matters of National Environmental Significance (MNES).

The following principles were considered by the EPA in relation to the proposal:

- (a) The precautionary principle;
- (b) The principle of intergenerational equity;
- (c) The principle of the conservation of biological diversity and ecological integrity;
- (d) Principles relating to improved valuation, pricing and incentive mechanisms; and
- (e) The principles of waste minimisation.

The EPA has also considered how the proponent has applied the mitigation hierarchy (avoid, minimise, mitigate and rectify) to the proposal. The extent to which the proponent has applied the mitigation hierarchy for the key environmental factors for the proposal is reflected in the recommended environmental conditions for the proposal.

### **3.1 Flora and vegetation**

#### ***Objective***

The EPA's environmental objective for this factor is *to maintain representation, diversity, viability and ecological function at the species, population and community level.*

The proposal will have a direct impact on flora and vegetation through the clearing of 5,141 ha of native vegetation across the four development envelopes of the proposal (Table 1).

#### ***Vegetation***

The proponent has surveyed over 230,000 ha during their flora and vegetation surveys. A total of 86 vegetation communities were identified and recorded across the four development envelopes. The proponent's survey work did not record any Threatened Ecological Communities (TECs) or Priority Ecological Communities (PECs) within the proposal's development envelopes.

As stated above, the proposal will result in the clearing of 5,141 ha of native vegetation. Of this, 4,776 ha have been described as ranging from 'good to excellent' condition.

An initial analysis of the extent of vegetation clearing presented in the proponent's PER indicated that a number of vegetation units would result in the clearing of greater than 70% of their mapped extent. There were also

numerous other vegetation communities where the impact was over 50% of the known extent. This became a key concern to the EPA as the impacts associated with vegetation clearing could potentially not meet the EPA's objective for this factor.

The proponent maintained a view that all vegetation communities were considered to be well represented in the region (ecologia Environment, 2012a). The proponent also concluded that the actual extent of each vegetation community is likely to be much higher than that mapped during surveys of the project area.

The EPA requested that the proponent undertake further mapping work and analysis to justify their conclusions in the PER. The EPA understands from the proponent that the vegetation mapping reported in the PER was restricted to the margins of the development envelopes instead of using the entire vegetation mapping available in the proponent's vegetation database, which included extensive mapping over the entire Pilbara Region. As a result of incorporating the additional survey results conducted by the proponent for other proposals, the vegetation communities were able to be presented to the EPA in a local and regional context.

This resulted in three communities potential remaining at risk of being cleared in excess of 70% of their mapped extent:

- 89% loss of 'SpTi,' (*Triodia* open hummock grassland *Solanum phlomoides*);
- 76% loss of 'AoTw,' (*Acacia* open shrubland *Acacia orthocarpa* open tall shrubland, over *Triodia wiseana*); and
- 71% loss 'AtTw.' (*Acacia orthocarpa* high open shrubland to high shrubland over *Triodia wiseana* mid-dense hummock grassland).

The proponent undertook further analysis of analogous vegetation communities found in other flora and vegetation surveys conducted by Biota (2004) for FMG's Stage A rail corridor. This effectively reduced the impacts on these three communities to:

- SpTi: was assessed to be analogous with community Ti, as both are open hummock grasslands, differing only in associated species in the shrub and herb strata, therefore reducing the impact to 21%.
- AoTw: was assessed to be analogous with Aps3 vegetation community mapped by Biota (2004) for the FMG Stage A Rail Corridor. 1,364 ha of this community was mapped, therefore reducing the impact to 23% of the AoTw/Aps3 community.
- AtTw: the proponent carried out a quantitative comparison with vegetation surveys undertaken by Atlas Iron for the Wodgina Project. It was demonstrated that community AtTw is a match for Outback Ecology units 2b and 2c, therefore reducing the impact to a total of 59%.

Considering the above, the vegetation communities mapped within the proposal envelope are generally wide spread throughout the Pilbara region. The proponent has also committed to conducting further flora and vegetation survey work in the Pilbara region to expand their flora and vegetation databases.

### **Flora**

The proponent carried out Level 2 flora surveys in April 2011 and August 2011. No Declared Rare Flora (DRF) species under the *Wildlife Conservation Act 1950* (WC Act) or Threatened species under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) were recorded within the Mine Development Envelope. Of eight Priority listed flora species identified during the proponent's surveys only *Pityrodia* sp. Marble Bar (P1) and *Goodenia nuda* (P4) were recorded within the Mine Development Envelope.

*Goodenia nuda* is well distributed through the Pilbara with populations identified in the vicinity of Port Hedland, Newman and Onslow (FMG, 2013). In contrast, *Pityrodia* sp. Marble Bar habitat is restricted to the southern aspects of steep rocky slopes within the Capricorn Land System (approximately 500,000 ha within the Pilbara region).

#### *Current status of Pityrodia sp. Marble Bar*

While no DRF species were recorded, the EPA received advice from the Department of Parks and Wildlife that *Pityrodia* sp. Marble Bar currently qualifies for listing as DRF. Therefore, the EPA considered that the main issue relating to flora was the cumulative impact to *Pityrodia* sp. Marble Bar through land clearing within the Mine Development Envelope and clearing proposed for the nearby Atlas Iron Abydos Project Stage 2.

A targeted flora survey for *Pityrodia* sp. Marble Bar was carried out by the proponent, which extended throughout the proposal's study area and eastwards following the Capricorn Land System. The flora study overlapped actively explored areas of the Atlas Iron Abydos Project and the Venturex Sulphur Springs Project. Independent flora and vegetation surveys conducted for both these proposals found the presence of *Pityrodia* sp. Marble Bar within their project areas and surrounds. The EPA has examined all flora surveys conducted in the area to determine the regional distribution of the species (Figure 6) and calculated that there are 1,934 known individuals of *Pityrodia* sp. Marble Bar.

#### *Impacts to Pityrodia sp. Marble Bar*

The proponent has indicated that 158 individuals of *Pityrodia* sp. Marble Bar are located within the Mine Development Envelope and cannot be avoided (Figure 6). This will have the effect of losing up to 8% of the known population of *Pityrodia* sp. Marble Bar.

A further 225 individuals are located within the Water Corridor Development Envelope and could potentially be impacted through land clearing to

accommodate the water supply pipeline. However, the proponent has committed to avoiding *Pityrodia* sp. Marble Bar where possible (FMG, 2013). It is the proponent's view that this population can be avoided given the flexibility in determining the route for pipeline infrastructure within the Water Corridor. The proponent has also indicated that it is unlikely that the route for the pipeline infrastructure will traverse areas of steep rocky slopes that *Pityrodia* sp. Marble Bar colonise.

The EPA notes that Atlas Iron has identified 143 individuals of *Pityrodia* sp. Marble Bar within their mine development envelope. For this project alone, this represents a loss of 7% of *Pityrodia* sp. Marble Bar in the region, and represents a cumulative loss of 301 individuals (15.6%) when combined with the predicted loss (158 individuals) within the North Star mine development envelope.

Advice from the DMP suggests that it is unlikely that the Venturex Sulphur Springs Project (for which a native vegetation clearing permit has already been issued) will impact on any individuals of *Pityrodia* sp. Marble Bar. When the original surveys were undertaken, the proposal was for an open cut mine. The current proponent revised the proposal to an underground mine with minimal land disturbance (20-30 ha) as tailings will be returned to the underground mine.

Therefore, the North Star and Abydos Stage 2 proposals would result in a reduction in the known population size by 301 individuals from 1934 to 1633 (15.6%). Of this, the North Star proposal would result in a reduction of 158 individuals (8.2%), assuming loss in the North Star Mine Development Envelope only. The Abydos stage 2 proposal would result in a reduction of 143 individuals (7.4%).

The Department of Parks and Wildlife also advises that *Pityrodia* sp. Marble Bar occurs only on specialist habitat in a linear arrangement along south-facing steep, rocky conglomerate and granite slopes. Department of Parks and Wildlife has advised the EPA that the proposed clearing may impact the connectivity of the eastern and western populations of the species.

#### *Assessment against the EPA's objective*

The proponents for both proposals have indicated that not all areas of suitable habitat for *Pityrodia* sp. Marble Bar within the area of each proposal have been surveyed. Figure 7 shows areas of suitable habitat that have not yet been surveyed. These areas were inaccessible either due to terrain and/or lack of access to other proponents' tenure. This suggests that further survey effort carried out for both proposals in the region may locate additional individuals of this species, reducing the cumulative impact on the population of the species. The botanical consultants for both proponents state that additional populations are likely to be found in these areas yet to be surveyed (ecologia Environmental, 2012 and Woodman, 2013), however it is considered likely that the populations are small (Woodman, 2013).

The EPA also notes that most of the habitat surveyed for the Abydos proposal by Woodman in 2013 had been burnt within six months, with the fire apparently of high intensity. However, *Pityrodia* sp. Marble Bar was found to have re-sprouted rapidly from a woody rootstock after the fire, with most individuals attaining a height that made identification easy, even from some distance away. Seedlings were also observed at a number of locations adjacent to re-sprouting individuals (Woodman, 2013).

Therefore, it is the EPA's opinion, based on advice provided by the Department of Parks and Wildlife and the proponents' botanical consultants, that it is possible that more individuals of *Pityrodia* sp. Marble Bar would be located through further survey, but it is unlikely that sufficient populations would be found so that the species would no longer qualify as DRF.

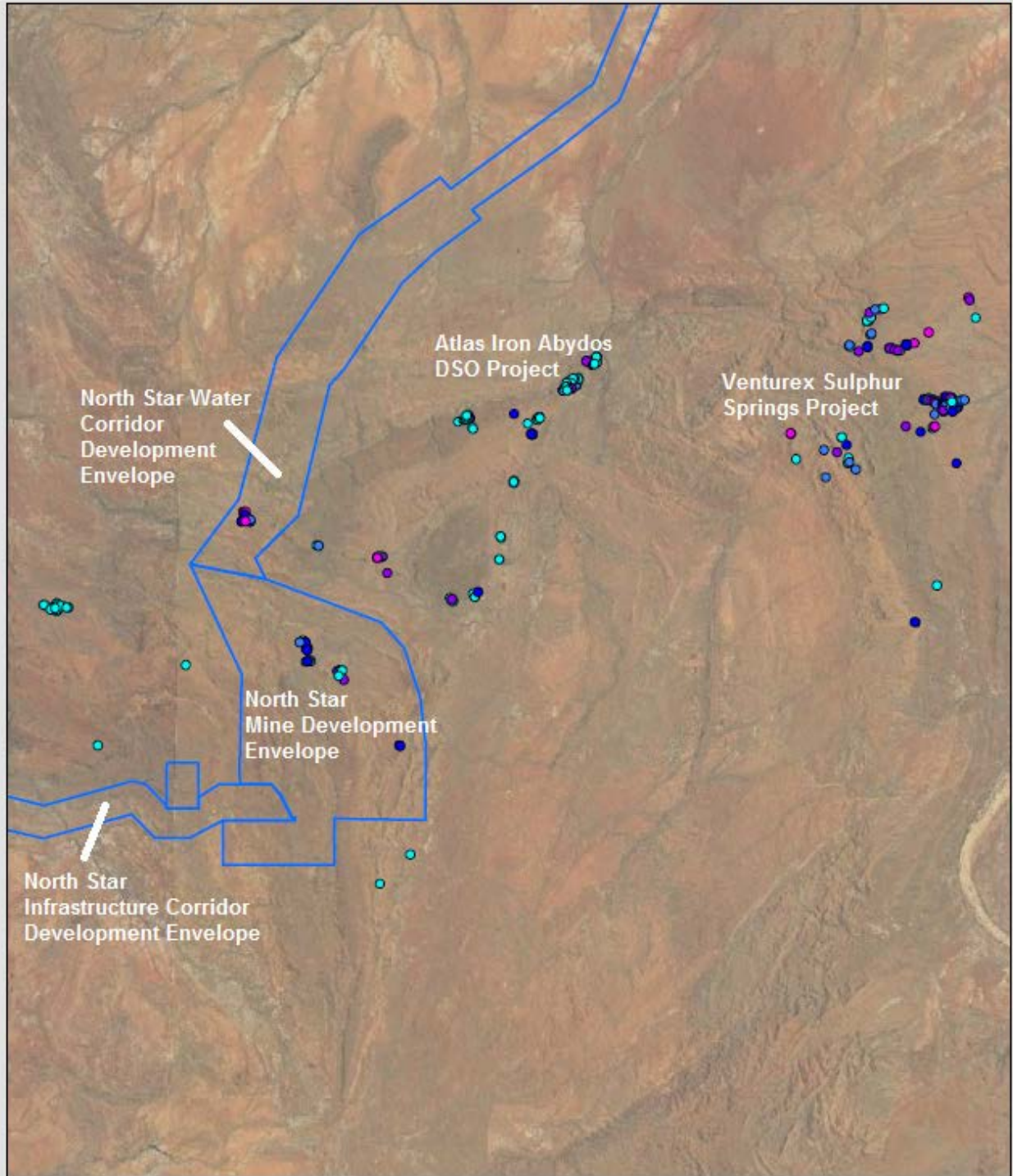
The EPA is of the view that any loss of individuals of a species that qualifies as DRF may adversely impact the viability of the species. To meet the Flora and Vegetation objectives, the EPA has recommended condition 6 requiring the proponent to develop and implement a *Pityrodia* sp. Marble Bar Mine Infrastructure Plan, to demonstrate that that mine and associated infrastructure within the Mine Development Envelope will be located to minimise the direct and indirect loss of *Pityrodia* sp. Marble Bar.

To clarify the conservation status of *Pityrodia* sp. Marble Bar, the EPA has recommended condition 7 requiring a regional survey, to determine whether further populations exist. In the event that the Minister for Environment declares *Pityrodia* sp. Marble Bar as Rare Flora, the implementation of the proposal would result in a significant residual impact. To address the potential significant residual impact, the EPA has recommended conditions 7-8 to 7-11, requiring the proponent to prepare and submit a *Pityrodia* sp. Marble Bar Research and Conservation Plan. The intent of the Plan is to undertake actions such as seeding and germplasm collection, and translocation trials, including actions that determine the likelihood of successful re-establishment during mine rehabilitation.

The EPA has also recommended conditions 8 and 9 to ensure that the *Pityrodia* sp. Marble Bar, as well as other conservation significant flora and vegetation located within the corridor development envelopes are avoided, where practicable. This will limit the impact to *Pityrodia* sp. Marble Bar from the North Star proposal to up to 8% loss of the known population.

North Star Magnetite Project A554366  
 Recorded Locations and Abundances of *Pityrodia* sp. Marble Bar

Map Version: 1.10  
 Date: 07/01/2013  
 OEPA GIS Section



<p><b>LEGEND</b></p> <p><i>Pityrodia</i> sp. Marble Bar  <b>Abundance</b></p> <ul style="list-style-type: none"> <li>● 1 - 2</li> <li>● 3 - 5</li> <li>● 6 - 10</li> <li>● 11 - 20</li> <li>● 21 - 40</li> </ul> <p>▭ Development Envelope</p>	<p><b>SOURCE DATA</b></p> <p>SLIP: Virtual Mosaic EPSG:28350</p> <p>File No: 20131008NorthStarMagnetite_A599955                  Location Path: I:\Projects\epas\minor_projects\elb\20121011_North_Star_Magnetite_A554366</p> <p><small>Disclaimer:                  This map is intended as a generalised interpretation of environmental issues. The information contained on this map is to be considered indicative only and is not meant to be used as a basis for any decision or consequential decisions resulting from use of the material.                  Copyright Environmental Protection Authority 2013. All Rights Reserved.                  All rights and information contained herein are subject to Copyright. For the reproduction or publication of this material permission must be sought from the Authority.</small></p>	 <p>0 2.25 4.5 9                  Kilometers</p> <p>Projection: Map Grid of Australia Zone 50                  Datum: Geocentric Datum of Australia, 1994                  Scale: 1:170,000</p>	<p><b>LOCALITY MAP</b></p>  <p>PERTH</p>
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Figure 6 Surveyed distribution of *Pityrodia* sp. Marble Bar





### **Linear and borefield infrastructure**

Linear infrastructure includes pipelines and road infrastructure located within the Water Corridor Development Envelope (including borefield), Slurry Corridor Development Envelope and Infrastructure Corridor Development Envelope. The proponent proposes to construct three pipelines as part of the proposal:

- 190 km (approximately) buried water supply pipeline from the West Canning Basin to the mine site;
- 130 km (approximately) buried slurry pipeline pumping product from the processing plant at the mine to a purpose built port facility in Port Hedland; and
- 116 km (approximately) gas supply pipeline from the mine area to the existing Dampier Bunbury Natural Gas Pipeline. The final design will determine whether the pipeline is buried or not.

During the Level 1 flora surveys conducted within these development envelopes, four Priority listed flora taxa were recorded in the Water Corridor Development Envelope and five Priority listed flora taxa have been previously recorded from the Slurry Corridor Development Envelope (Biota, 2012). There is the potential for a number of priority flora species to be impacted through clearing for linear infrastructure and borefield components. However, the proponent states that the final alignment will be designed to minimise impacts to conservation significant flora and vegetation.

The EPA is aware that large sections of the Water Corridor Development Envelope (including Borefield Area), have not been surveyed. Also, targeted flora surveys have not been conducted in the Water Corridor Development Envelope and the Slurry Corridor Development Envelope. The EPA has recommended condition 8-1 requiring the proponent to develop and implement a Conservation Significant Flora and Vegetation Survey Plan(s). The aim of the Plan is to identify the location of any conservation significant flora and vegetation the development envelopes prior to determining the alignment of linear infrastructure and placement of the borefield.

Given that uncertainty exists regarding the location and layout of the proposed linear and borefield infrastructure, and lack of targeted surveys for conservation significant flora, the EPA has recommended condition 9. This condition requires the proponent to develop a Linear Infrastructure and Borefield Alignment Plan(s) to identify the location and layout of pipeline infrastructure and borefield components. This will ensure the construction is carried out in a manner that avoids DRF, TECs and Priority 1 listed flora (including *Pityrodia* sp. Marble Bar), where practicable and minimises impacts to other conservation significant flora.

To avoid and minimise the impacts to flora and vegetation in the infrastructure corridors, the proponent has or will undertake the following measures:

- avoid *Pityrodia* sp. Marble Bar where possible to limit the impact on the species to 8% of the known population;

- design linear pipeline infrastructure within the Water Corridor Development Envelope to avoid DRF, TECs and Priority 1 listed flora, where practicable, and minimise the impact to other conservation significant flora;
- implement clearing controls to ensure disturbance is limited to 5,141 ha; and
- undertake progressive rehabilitation of cleared areas not required for operations.

It is the EPA's opinion that a significant residual impact relating to clearing of up to 4,776 ha of 'good to excellent' condition native vegetation (and its associated environmental values) that is located within the Chichester IBRA subregion remains when considering this proposal in the context of cumulative impacts from other proposals (including approved proposals) in the Pilbara (see Section 3.5 Offsets). The EPA also considers that a significant residual impact will remain for the loss of up to 8% of the *Pityrodia* sp. Marble Bar species should the Minister for Environment declare the species as Rare Flora.

### **Summary**

Having particular regard to:

- the measures that the proponent has committed to take to avoid, minimise and rectify impacts to flora and vegetation, in particular to the species *Pityrodia* sp. Marble Bar that qualifies as Declared Rare Flora;
- the likely level of restoration of ecological values and functions that would be achieved through best practice rehabilitation; and
- the significant residual impacts associated with the clearing of up to 4,776 ha of 'good to excellent' condition native vegetation that is located within the Chichester IBRA subregion and the loss of up to 8% of the flora species *Pityrodia* sp. Marble Bar if it is declared as Rare Flora,

the EPA considers that the proposal can be managed to meet the EPA's objective for Flora and Vegetation provided that:

- elements of the proposal are limited to the recommended authorised extent defined in Schedule 1 of the recommended environmental conditions in Appendix 5;
- conditions 6 and 7 are imposed to ensure that the mine infrastructure is designed, constructed and implemented to minimise impacts to *Pityrodia* sp. Marble Bar and to require additional surveys to confirm the conservation status of the species;
- conditions 8 and 9 are imposed to ensure that linear infrastructure and the borefield is located to avoid DRF, Priority 1 Listed Flora species and TECs, where practicable; and

- condition 14 is imposed to counterbalance the significant residual impacts of the clearing of up to 4,776 ha of 'good to excellent' condition native vegetation and the the loss of up to 8% of the flora species *Pityrodia* sp. Marble Bar, should it be declared as Rare Flora.

## 3.2 Terrestrial Fauna

### **Objective**

The EPA's environmental objective for this factor is *to maintain representation, diversity, viability and ecological function at the species, population and assemblage level.*

The main potential impacts on terrestrial fauna are direct impacts through the clearing of fauna habitat, particularly critical roosting habitat for the Pilbara Leaf-nosed Bat.

The proponent has carried out Level 1 fauna surveys, echolocation surveys for bats and targeted vertebrate fauna surveys. Table 3 details the conservation significant species that were recorded during the surveys.

**Table 2 Conservation significant fauna species recorded**

<b>Species</b>	<b>EPBC Act</b>	<b>WC Act/DPaW Listing</b>
Pilbara Leaf-nosed Bat ( <i>Rhinoicteris aurantia</i> )	Vulnerable	Fauna that is rare or likely to be extinct
Northern Quoll ( <i>Dasyurus hallucatus</i> )	Endangered	Fauna that is rare or likely to be extinct
Pilbara Olive Python ( <i>Liasis olivaceus barroni</i> )	Vulnerable	Fauna that is rare or likely to be extinct
Greater Bilby ( <i>Macrotis lagotis</i> )	Vulnerable	Fauna that is rare or likely to be extinct
Western Pebble Mound Mouse ( <i>Pseudomys chapmani</i> )	-	Priority 4
Long-tailed Dunnart ( <i>Sminthopsis longicaudata</i> )	-	Priority 4
Ghost Bat ( <i>Macroderma gigas</i> )	-	Priority 4

The rocky ridges, breakaways and rocky gorges are associated with conservation significant fauna habitat due to its suitability as foraging, denning/roosting and/or breeding habitat for these species.

### **Mine area**

The EPA considers that land clearing and mining activities are the key threat to conservation significant fauna within the Mine Development Envelope, especially the potential impacts to the Pilbara Leaf-nosed Bat (PLNB), Northern Quoll and Pilbara Olive Python.

### *Pilbara Leaf-nosed Bat*

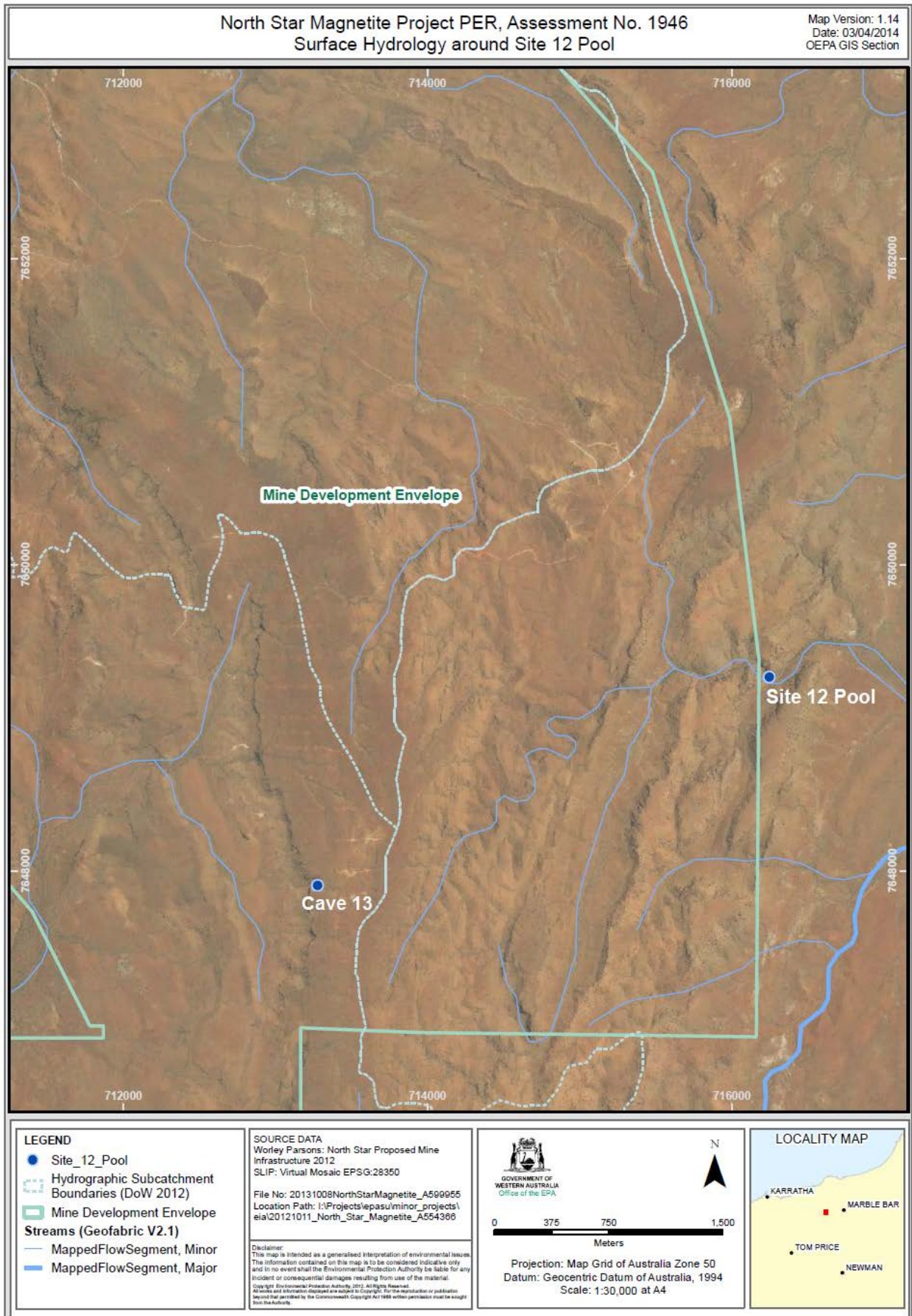
The proponent engaged Bat Call WA to undertake a targeted survey for Pilbara Leaf-nosed Bat (PLNB) in April 2013. The survey aimed to confirm the use of several study area caves as either day or maternal roosts. The species requires specific conditions within a cave system to allow roosting, including a specific micro-climate of high temperatures and humidity due to their poor ability to thermo-regulate and retain water (DotE, 2014).

The proponent's targeted survey identified a large colony of approximately 200-250 individuals of PLNB located at Cave 13, within the Mine Development Envelope (Figure 8). The proponent has stated that Cave 13 is a maternal roost cave and is located within the Mine Development Envelope and subsequently cannot be avoided and will be removed as a result of the proposal.

The EPA understands that Cave 13 consists of a regionally significant colony of PLNB in the Eastern Pilbara district, and is one of a few known cave systems that provide the required micro-climate for the survival of the species. This has been confirmed by the Department of Parks and Wildlife who have recorded only a few known natural diurnal roosts in the Eastern Pilbara district, and less than 26 known across the entire Pilbara region. The proponent's consultant has stated that, at most, 30 suitable caves are likely to be found in the Pilbara region (Bullen pers. comm., 2014). Five of the caves in the Eastern Pilbara district are considered to be artificial, consisting of disused historic mine shafts. These are mostly in poor condition with evidence of several collapses, and may be lost over time (DotE, 2014).

The proponent has plotted all known PLNB roost locations in the east Pilbara (Figure 9), including the type of roost and population size (if known). The proponent is of the view that the bats have two distinct range areas; a 20 km dry season range and up to a 50 km range in the wet season when warm, humid conditions reduce the risk of bats being affected by dehydration. The EPA understands that during the wet season the North Star colony's range overlaps the maternal roosts of Mt Webber (population of approximately 1000 individuals) and Lalla Rookh Mine (population of approximately 1500 individuals) which enables interactions and breeding to occur.

The EPA understands that PLNBs will actively search for new habitat that has a suitable micro-climate in an attempt to extend their foraging range. The utilisation of five disused mine shafts in the region is an example of this. This presents an opportunity for the PLNB colony to relocate and establish itself in an alternative artificial or natural cave located within its natural foraging range. The proponent has concluded that suitable roost caves may potentially occur within the wet season range of the colony that utilises Cave 13).



**Figure 8 Conservation significant habitat locations, including Pilbara Leaf-nosed Bat Cave 13 and Pilbara Olive Python Site 12 Pool**

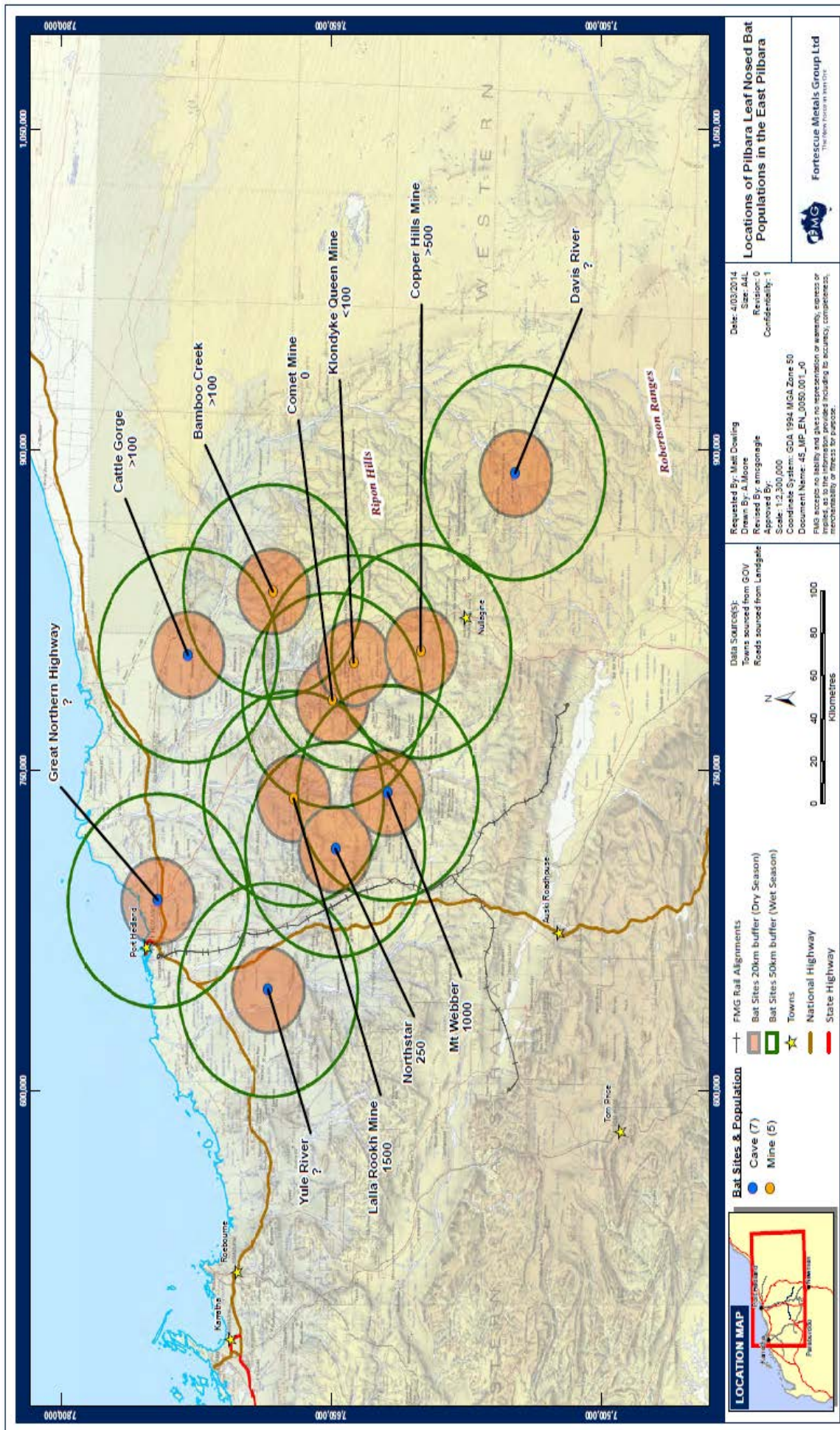


Figure 9 Regional Map of Pilbara Leaf-nosed Bat roost locations

Considering the proponent's conclusions, the EPA is of the view that the wet season would be the most likely period for the PLNB to relocate between caves. However it is also the period that female PLNB are supporting dependent young (Armstrong, 2001). Due to the lack of scientific information as to whether the PLNB will abandon their young, or assist with their relocation, there is uncertainty as to whether this will limit the potential for the North Star colony to relocate during the wet season.

The Department of Parks and Wildlife has advised that the extent of the foraging range of the PLNB is at most 30 km from the roost site. Based on this advice there is further uncertainty of the PLNB's ability to relocate during the wet and dry seasons as the nearest known roost caves are at a distance greater than 30 km, as well as the dry season range of 20 km that has been determined by the proponent's consultant.

Noting the above, the EPA considers that losing the North Star PLNB cave and associated colony could affect the viability of the species, and subsequently not meet the EPA's objectives for this factor. Therefore, the EPA is of the view that all natural known roost caves in the Pilbara region are habitat critical to the viability of the PLNB.

To meet the EPA's objective, and to be consistent with advice from the Department of Parks and Wildlife and the DotE, the EPA has recommended condition 10 to protect Cave 13 and its colony. Condition 10 requires a Mine Exclusion Zone of 100 m from the predicted lateral extent of Cave 13. The proponent has predicted the lateral extent of Cave 13 based on preliminary expert opinion and analysis of available geological information. To confirm the lateral extent of Cave 13, the EPA has recommended condition 10-4, which requires the proponent to prepare a Cave 13 Structural Report.

The Structural Report will require a thorough evaluation of the geology surrounding Cave 13, including evidence of geological barriers, such as fault-lines, restricting the lateral extent of Cave 13. Also, expert advice will be required in the report to confirm the likely extent of Cave 13. Should the geological information or expert advice contained within the Structural Report indicate that the lateral extent is greater than that initially predicted, the EPA expects that the Mine Exclusion Zone required by recommended condition 10-2 would be amended accordingly through a formal change to conditions under s46 of the EP Act.

While there is currently a lack of scientific certainty regarding the ability of the Cave 13 PLNB colony to relocate to another roost site, it is the EPA's opinion that there is a possibility that a viable portion of the Cave 13 PLNB colony could relocate to another roost (either natural or artificial). The EPA understands from the proponent that, according to the current mine plan, it may be approximately seven years from the start of mining before the proponent would access the resource in the vicinity of Cave 13. The proponent has committed to implement a Bat Research and Artificial Cave Plan. The Plan aims to create artificial habitat within close proximity of Cave 13, consisting of a suitable micro-climate to enable roosting to occur.



Therefore the EPA has recommended condition 10-3 which provides the proponent with an opportunity to demonstrate that a viable portion of the PLNB population from Cave 13 (defined through future research to establish a greater understanding of the PLNB species, as well as expert advice from the Department of Parks and Wildlife) has relocated and established itself. In that event, on written advice from the Minister for Environment, ground-disturbing activity would be permitted within the Mine Exclusion Zone required by condition 10-2.

#### *Northern Quoll*

The proposal may have a direct impact on a resident breeding population of Northern Quoll (approximately 20 individuals), through the direct removal, and fragmentation of significant habitat (denning, foraging and dispersal). This permanent loss of significant habitat in the local area has the potential to isolate portions of the local population and reduce local genetic diversity.

The proponent has prepared an EPBC Threatened Species Management Plan to the satisfaction of the DotE for the North Star Hematite Project that includes specific management measures for the Northern Quoll. The proponent proposes to update this plan for the North Star Magnetite Project through consultation with the DotE and the Department of Parks and Wildlife. The main changes are likely to focus on the protection of rocky ridge habitat outside the direct disturbance footprint.

In addition to this, on advice from the Department of Parks and Wildlife, the EPA has recommended condition 11 requiring the proponent to develop a Northern Quoll Management Plan. The aim of the plan is to develop a monitoring program and management responses to ensure the impacts to the Northern Quoll are reduced to as low as practicable. Key aspects of the plan include detailing management measures to protect Northern Quoll habitat adjacent to the mine pit, monitoring the population for adverse impacts, and developing associated contingency responses, such as translocation.

#### *Pilbara Olive Python*

The proponent's fauna surveys recorded four individuals of the Pilbara Olive Python at Site 12 Pool, located outside the eastern edge of the Mine Development Envelope (Figure 8). The EPA considers that the survey results for Site 12 Pool show an unusually high number of individuals for this species and suggests that this pool is particularly important habitat for this species. The EPA is of the view that potential impacts to the pool may occur from decreased flow rates and deteriorating water quality through modifying the upper catchment within the Mine Development Envelope. Section 3.4 Hydrological Processes and Inland Waters Environmental Quality provides the assessment of potential impacts to the pool (and the recommended condition to maintain the existing water quality and quantity in the pool).

### ***Linear infrastructure - trapped fauna***

The proposal has the potential to impact fauna through the creation of trenches during the construction of the buried linear infrastructure (water supply pipeline, slurry pipeline and possibly the gas supply pipeline).

The proponent undertook a Level 1 Fauna survey of the Water Corridor Development Envelope in October 2011. No fauna species listed under the *Wildlife Conservation Act 1950* (WC Act) were recorded during the proponent's survey work. The proponent's surveys determined that it is likely that habitat in this envelope supports the presence of the Western Pebble-mound Mouse (Priority 4) and Dampierland Plain Slider reptile species (Priority 2). No surveys were carried out for Matters of National Environmental Significance, however diggings considered to be made by the Greater Bilby were identified.

No fauna surveys were carried out in the Slurry Corridor Development Envelope. However, it is understood from previous surveys carried out in the area that conservation significant habitat exists that is likely to support the Northern Quoll, Greater Bilby, Pebble Mound Mouse and Olive Python. Conservation significant habitat in this development envelope is considered to be areas of granite outcrops, breakaways and boulder piles.

The EPA has recommended condition 13 'Trapped Fauna' to minimise impacts to terrestrial fauna as a result of trenches dug for linear infrastructure. The condition requires the proponent to clear the trenches of fauna on a regular basis.

To minimise the impacts to terrestrial fauna the proponent has or will undertake the following measures:

- avoid where possible, habitat for other conservation significant fauna, conservation significant plants, and vegetation associated with watercourses, particularly along infrastructure corridors;
- update the EPBC Threatened Species Management Plan to ensure foraging and denning habitat for the Northern Quoll adjacent to the proposal area is protected;
- bury linear infrastructure to avoid creating a barrier to species movement; and
- check trenches for conservation significant fauna.

The EPA recognises the measures that the proponent has undertaken and committed to take to avoid, minimise and rectify impacts to terrestrial fauna. However, it is the EPA's opinion that significant residual impacts relating to the clearing of up to 4,776 ha of 'good to excellent' condition native vegetation, including habitat for conservation significant species remains (see Section 3.5 Offsets).

## **Summary**

Having particular regard to:

- the measures that the proponent has committed to take to avoid, where possible, habitat for conservation significant fauna, conservation significant plants, and vegetation associated with watercourses, particularly along infrastructure corridors;
- the proponent's commitment to update the EPBC Threatened Species Management Plan to ensure foraging and denning habitat for the Northern Quoll adjacent to the proposal area is protected;
- the proponent committing to burying infrastructure and inspecting trenches for trapped fauna on a regular basis, to minimise impacts in infrastructure corridors; and
- the significant residual impacts relating to the loss of habitat due to the clearing of up to 4,776 ha of 'good to excellent' condition native vegetation,

the EPA considers that the proposal can be managed to meet the EPA's objective for Terrestrial Fauna provided that:

- condition 10 is imposed to maintain the PLNB Cave 13 roost and colony, through the implementation of a Mine Exclusion Zone surrounding the cave, which may only be disturbed if the Minister for Environment is satisfied that a viable portion of the Cave 13 PLNB colony has relocated to an alternate (natural or artificial) roost;
- condition 11 is imposed requiring the proponent to develop a Northern Quoll Management Plan;
- condition 12 is imposed requiring the monitoring of water quality and quantity in the Site 12 Pool (habitat for the Pilbara Olive Python) and the development of management measures and contingency actions;
- condition 13 is imposed requiring the proponent to implement standard trench management procedures; and
- condition 14 is imposed to counterbalance the significant residual impacts relating to the loss of conservation significant fauna habitat due to the clearing of up to 4,776 ha of 'good to excellent' condition native vegetation.

### **3.3 Subterranean fauna**

The EPA's environmental objective for this factor is *to maintain representation, diversity, viability and ecological function at the species, population and assemblage level.*

The proponent undertook baseline survey work for stygofauna and troglofauna over two consecutive phases during the wet (March) and dry (June to July) seasons in 2011 (Subterranean Ecology, 2012a). The

proponent's survey work pre-dates the release of EAG 12 *Consideration of subterranean fauna in environmental impact assessment in WA* and was undertaken in accordance with EPA Guidance Statement 54 and Draft Guidance Statement 54a.

The survey confirmed the presence of troglafauna and stygofauna within the project area with the occurrence of at least 17 stygofauna species and 11 troglafauna species (Subterranean Ecology, 2012a).

### ***Mine Development Envelope***

The proponent's surveys did not record any stygofauna. Excavation of the mine pit will result in the removal of troglafauna habitat. Six of the 11 species of troglafauna identified during the baseline surveys from the Mine Development Envelope have only been recorded from the mine pit and could be directly impacted:

- *Blattidae sp. AB\_NS*
- *Nocticola sp. S5\_NS*
- *Noctocola sp. NS2*
- *Meenoplidae sp. NS*
- *Polyxenidae sp. NS*
- *Curculionidae sp. NS*

The EPA is of the view that with the exception of *Curculionidae sp. NS*, all other species were either also found outside of the Mine Development Envelope or belong to groups not usually range restricted, and therefore are not considered to be short range endemic (SRE) species.

The proponent has suggested that *Anillini sp. NS* is a suitable biological surrogate for *Curculionidae sp. NS*, as both species belong to the same order and share similar dispersal capabilities. The proponent's survey work identified *Anillini sp. NS* in two separate locations six kilometres apart within the Mine Development Envelope. Given that *Curculionidae sp. NS* and *Anillini sp. NS* both have limited dispersal capabilities it is appropriate to assert that there is continuous habitat connectivity between the two locations. Consistent with EAG 12, the EPA's opinion is that *Curculionidae sp. NS* is likely to have a wider distribution within the locality.

The proponent asserts that the North Star geology is continuous for approximately 12 km south along the North Star plateau and does not have any horizontal stratification. Also, the EPA understands that there are no geological barriers to species distribution. Therefore, the EPA is of the view that habitat at North Star is extensive and continuous and that *Curculionidae sp. NS* is likely to occur in habitat outside of the pit envelope. Therefore, given the absence of obvious topographic barriers, *Curculionidae sp. NS* is unlikely to have a range restricted to the proposed mine pit and its range would probably extend south along the banded iron formation.

### **Infrastructure development envelopes**

Subterranean fauna surveys of the proposed Canning Basin Borefield were conducted during February and March 2012. The survey recorded one specimen of an aphanoneuran worm belonging to the family *Aelosomatidae* from a sub-artesian bore tapping the Wallal Sandstone aquifer in the Canning Basin Borefield area (Subterranean Ecology, 2012b).

Other surveys of the Wallal aquifer have recorded no or very few stygofauna (FMG, 2012). From examining the results of this survey and due to the confined nature of the Wallal Aquifer, the EPA is of the view that there is a low likelihood of diverse and abundant stygofauna being present.

Subterranean fauna surveys of the proposed Slurry Corridor Development Envelope were conducted in 2008 as part of FMG's rail corridor proposal. Three species belonging to the order Podocopida seed shrimp were only found within the Infrastructure Development Corridor in the alluvial aquifer associated with the Turner River and have not been found in other surveys in the Pilbara.

The proponent does not anticipate there being any impacts to stygofauna within the Infrastructure Corridor Development Envelope as the infrastructure will largely be located at a depth above the watertable. The EPA understands that there are no plans to use the alluvial aquifer within the Turner River as a source of water for the proposal. Water for construction will be sourced from existing licensed bores within Fortescue's rail corridor and water for operations will be sourced from the Canning Basin borefield.

### **Summary**

Having particular regard to:

- no stygofauna being found in the Mine Development Envelope;
- only one troglofauna species (*Curculionidae sp. NS*) being considered to be restricted and use of the biological surrogate *Anillini sp. NS* indicating that *Curculionidae sp. NS* is likely to occur in habitat outside of the mine development envelope;
- the habitat at North Star being extensive and continuous;
- the confined nature of the Wallal Aquifer indicating there is a low likelihood of diverse and abundant stygofauna being present; and
- avoidance of stygofauna communities in the slurry and infrastructure corridor,

the EPA considers that the proposal can be managed to meet the EPA's objective for Subterranean Fauna without requiring a condition for this factor, provided that the elements of the proposal are limited to the recommended authorised extent defined in Schedule 1 of the recommended environmental conditions in Appendix 5.

### **3.4 Hydrological processes and inland waters environmental quality**

The EPA's environmental objectives for these factors are:

- Hydrological processes - *to maintain the hydrological regimes of groundwater and surface water so that existing and potential uses, including ecosystem maintenance, are protected.*
- Inland waters environmental quality - *to maintain the quality of groundwater and surface water, sediment and biota so that the environmental values, both ecological and social, are protected.*

#### ***Water Corridor Development Envelope***

Abstraction of up to 14 GL/a of water will be required for the operational phase of the mine. This will be sourced from Wallal Aquifer located in the Canning Basin 160 km east of Port Hedland.

There are competing interests in developing the Canning Basin as a water supply, particularly for the town of Port Hedland. Currently, two pastoral stations (Pardoo Station and Wallal Downs Station) have licensed allocations from the Wallal Aquifer as a water supply for their horticulture projects. As the Wallal Aquifer is confined, it is unlikely to support groundwater dependent ecosystems and the potential impact of the proponent's abstraction is likely to be on the availability of water for other users.

In December 2013, the DoW determined that it had sufficient information to formally revise the allocation limit of the West Canning Wallal aquifer upwards, subsequently allowing the proponent's licence to be granted. The new allocation limit would facilitate the volumes requested by the proponent for the North Star water licence application.

Advice received from the DoW has stated that they are confident that there is enough groundwater in the West Canning Wallal aquifer for the FMG North Star licence application. The DoW is of the view that impacts associated with the proposal can be adequately managed through water licensing under the *Rights in Water and Irrigation Act 1914* (RIWI Act).

In view of the measures proposed by the proponent and the regulation by the DoW through the RIWI Act, the EPA considers that its objectives for this factor can be met and has not recommended a condition for this factor.

#### ***Mine Development Envelope***

Fauna surveys conducted by the proponent recorded a high number of Pilbara Olive Python (see Section 3.2 Terrestrial Fauna) within Site 12 Pool (Figure 8), which is located in close proximity to the Mine Development Envelope. The EPA is of the view that the presence of a high number of Pilbara Olive Python indicates that the pool is regionally significant and should be maintained to ensure water quality and quantity is not diminished. The EPA is also of the

view that potential impacts to Site 12 Pool may occur from decreased flow rates and deteriorating water quality through modifying the upper catchment.

Activities, such as the storage of waste material, in the Mine Development Envelope located within the upper catchment may affect the catchment's runoff characteristics leading to decreased infiltration rates and volumes of runoff into Site 12 Pool. Geochemical modelling has also shown that 6% of the waste rock material that is proposed to be disposed of within the mine development envelope is considered to be Potentially Acid Forming (PAF). Leachate from this rock type has the potential to impact the Pool's pH through the influx of solutes.

The proponent has committed to implementing an Acid Mine Drainage Management Plan as part of the proposal. The objective of this plan will be to manage waste rock to ensure that the structure is a stable, non-polluting landform (FMG, 2013). To maintain the water quality and quantity of Site 12 Pool, the EPA has recommended condition 12 which requires the monitoring of water quality and quantity in the pool and the development of triggers and implementation of contingency actions if required.

### **Summary**

Having particular regard to:

- the DoW's confirmation that water is available for North Star's water supply and that the DoW can regulate the potential impacts associated with the proposal through water resource licensing under the *Rights in Water and Irrigation Act 1914*; and
- the potential impacts to water quality and quantity in Site 12 Pool, which is habitat for the conservation significant Pilbara Olive Python,

the EPA considers that the proposal can be managed to meet the EPA's environmental objective for Hydrological Processes and Inland Waters Environmental Quality provided that:

- groundwater abstraction is limited to the recommended authorised extent defined in Schedule 1 of the recommended environmental conditions in Appendix 5; and
- condition 12 is imposed requiring the proponent to monitor water quality and quantity in Site Pool 12 and develop trigger levels and implement contingency actions, if required.

### 3.5 Offsets – integrating factor

The EPA’s environmental objective for this factor is to *counterbalance any significant residual environmental impacts or uncertainty through the application of offsets.*

The proponent has committed to mitigate the impacts of its proposal to significant environmental values through:

- avoiding, where possible, habitat for conservation significant fauna, conservation significant plants and vegetation associated with watercourses, particularly along infrastructure corridors;
- monitoring conservation significant species use of the area throughout the life of the mine;
- continuing the bat vibration study to determine safe working distances from bat caves; and
- progressively rehabilitating the site in accordance with the Mine Closure Plan.

The EPA has identified a substantial increase in the number of applications for and amount of clearing of native vegetation in the Pilbara Interim Biogeographic Regionalisation for Australia (IBRA) region. This increase, combined with the predicted future activities requiring clearing in the Pilbara bioregion, as well as other impacts from pastoralism and fires, is likely to have a significant impact on environmental values. As a result, the EPA has determined that a proactive approach to limiting these impacts is required.

The disturbance to vegetation in ‘good to excellent’ condition by IBRA region and subregion as a result of the proposal is shown in Table 3.

**Table 3 Disturbance to vegetation in good to excellent condition by IBRA sub-region**

IBRA Region	IBRA Subregion	‘Good to Excellent’ condition native vegetation (ha)
Great Sandy Desert	McLarty	252
Dampierland	Pindanland	6
Pilbara	Roebourne	69
Pilbara	Chichester	up to 4,449
<b>Total</b>		<b>up to 4,776</b>

The clearing of native vegetation in ‘good to excellent condition’ in the Pilbara IBRA bioregion is considered to be significant when considered in a cumulative context. The clearing of this vegetation also results in the loss of habitat for conservation significant species.



While the Chichester subregion is poorly represented in the conservation reserve system, it is also under less threat compared with the Fortescue subregion. The EPA recommends that the following rate is applied to the Chichester subregion:

- \$750 per hectare for the clearing of 'good to excellent' condition native vegetation;
- \$1,500 per hectare for the clearing of native vegetation in 'good to excellent condition' which also has other environmental values.

Similar to previous assessments by the EPA, impacts to the Roebourne subregion have not been considered to be significant as this region incorporates the coastal strip, which is not subject to the same development pressures as the inland subregions. The clearing of native vegetation in 'good to excellent condition' outside of the Pilbara IBRA region (i.e. in the Dampierland IBRA region and Great Sandy Desert IBRA region) is also not considered significant.

Following the implementation of all mitigation measures, the proposal would have the following significant residual impacts from the clearing and direct disturbance of up to 4,449 ha of native vegetation in 'good to excellent' condition in the Chichester subregion, including:

- the loss of up to 45 ha of denning habitat for the Northern Quoll;
- the loss of up to 465 ha of foraging habitat for the Northern Quoll;
- the loss of up to 45 ha of Pilbara Olive Python habitat; and
- the loss of up to 45 ha of night roosts and foraging habitat for the Pilbara Leaf-nosed bat.

Conservation areas in the Pilbara bioregion total approximately eight per cent of the area, with the remainder mostly Crown Land, covered with mining tenements and pastoral leases. As such, the potential for traditional land acquisition and management offsets are limited. The EPA has determined that a possible solution is the establishment of a strategic regional conservation initiative for the Pilbara. The State Government is currently considering whether to establish this conservation initiative.

The strategic regional conservation initiative would pool funding from various offset requirements and then fund on-ground management and other actions to deal with key threatening processes and knowledge gaps across the Pilbara bioregion. One benefit of this is that the actions undertaken will benefit a range of species and ecosystems, including those identified as Matters of National Environmental Significance. Another benefit of this approach is that it limits the tenure issue by foregoing the requirement to acquire land for conservation purposes as the primary offset strategy.

## Summary

Having particular regard to the significant residual impacts of the proposal through the clearing of up to 4,776 ha of native vegetation which results in:

- the loss of up to 45 ha of denning habitat for the Northern Quoll;
- the loss of up to 465 ha of foraging habitat for the Northern Quoll;
- the loss of up to 45 ha of Pilbara Olive Python habitat; and
- the loss of up to 45 ha of night roosts and foraging habitat for the Pilbara Leaf-nosed bat,

it is the EPA's opinion that the proposal can be managed to meet the EPA's objective for this factor provided that recommended condition 14 is imposed, which addresses offsets for the significant residual impacts of the proposal.

## 3.6 Environmental principles

In preparing this report and recommendations, the EPA has had regard for the object and principles contained in s4A of the *Environmental Protection Act (1986)*. Appendix 3 contains a summary of the EPA's consideration of the principles.

## 4. Matters of National Environmental Significance

This proposal was determined by the DoE (Formerly Department of Sustainability, Environment, Water, Populations and Communities) to be a controlled action on 21 January 2013. The decision was principally due to the clearing of suitable roosting, foraging and denning habitat for threatened species and communities listed under the EPBC Act.

This proposal is being assessed by way of an accredited process with the EPA under a bilateral agreement made under section 45 of the EPBC Act. The bilateral agreement allows the State Government of Western Australia to use the PER process to assess this action under the EPBC Act on behalf of the Commonwealth Government Minister for Environment.

The assessment report on the proposed action prepared by the EPA and provided to the WA Minister for Environment is forwarded to the Commonwealth Minister for Environment, who will then make a decision as to whether or not the proposal should be approved under the EPBC Act. This is separate from any State Government approval that may be required.

Surveys and investigations undertaken for the PER assessment identified several species protected under the EPBC Act as being present, or having the potential to be present, within or adjacent to the development envelopes.

EPBC Act listed threatened species identified as having the potential to be impacted by the proposal are:

- Pilbara Leaf-nosed Bat (*Rhinioncteris aurantia*) – Vulnerable
- Northern Quoll (*Dasyurus hallucatus*) – Endangered
- Pilbara Olive Python (*Liasis olivaceus barroni*) – Vulnerable
- Greater Bilby (*Macrotis lagotis*) - Vulnerable

#### *Pilbara Leaf-nosed Bat*

A large colony of approximately 200-250 individuals of Pilbara Leaf-nosed Bat (PLNB) were found to exist within the Mine Development Envelope at Cave 13. The EPA understands that the DotE considered the Significance Impact Guidelines (SIG) in assessing the significance of the impact of removing the Cave 13. The EPA understands that the SIG states that habitat can be critical to the survival of a species if it is necessary for roosting, breeding and long-term maintenance of the species. The SIG also defines 'important populations' as populations that are necessary for a species' long term survival and recovery.

Based on the above, the DotE has provided advice to the EPA that Cave 13 is likely to be critical habitat supporting a population that is 'important' as it provides a key source for breeding and dispersal. The DotE is of the view that the PLNB maternity roost site identified for removal (Cave 13) should be avoided. DotE has also stated that the EPA should provide for an exclusion zone around Cave 13 of sufficient size to ensure that the bat population can continue to use the cave as a maternity roost for the life of the mine. The only circumstance under which the exclusion zone should be removed is if the proponent can demonstrate that the PLNB population residing within Cave 13 has successfully migrated to an alternative maternal roost site (naturally occurring or artificial) within a 30 km radius of Cave 13.

As discussed in Section 3.2 Terrestrial Fauna, the EPA has recommended condition 10, which requires a Mine Exclusion Zone of 100 m from the predicted lateral extent of Cave 13. The condition also provides the proponent with the opportunity to demonstrate that a viable portion of the PLNB colony from Cave 13 has relocated and established itself in an alternative (natural or man-made) site. If the proponent can demonstrate this, then ground-disturbing activity would be permitted within the Mine Exclusion Zone.

#### *Northern Quoll*

Mining activities within the Mine Development Envelope may potentially impact a resident breeding population of Northern Quoll, through the direct removal, and fragmentation of significant habitat, including the loss of up to 45 ha of denning habitat and the loss of up to 465 ha of foraging habitat. The EPA has recommended condition 11 requiring the proponent to develop a Northern Quoll Management Plan, to minimise impacts to the Northern Quoll.

### *Pilbara Olive Python*

Survey results show that four individuals of the Pilbara Olive Python were recorded at Site 12 Pool. This is an unusually high number of individuals for this species and suggests that this pool is particularly important for the species. The location of mine infrastructure within the mine development envelope in the upper catchment may affect the water quality and quantity of Site 12 Pool. To maintain the water quality and quantity of Site 12 Pool, the EPA has recommended condition 12 which requires the monitoring of water quality and quantity in the Pool and the development of triggers and implementation of contingency actions if required.

The proponent's fauna surveys did not record the presence of the Greater Bilby, however suspected bilby activity was noted from diggings. It is considered highly likely that suitable habitat for the Greater Bilby will be found in the water corridor development envelope and slurry corridor development envelope. Potential impacts to fauna in these envelopes may occur through the creation of trenches during the construction of the buried linear infrastructure. However, buried infrastructure will occur over a relatively small area and the impacts will be short-term, only occurring while trenches are being constructed. The EPA has recommended condition 13 which requires the proponent to implement standard trench management procedures to reduce the impact to threatened species listed under the EPBC Act.

To manage impacts to EPBC listed fauna species, the proponent has committed to updating the existing EPBC Listed Species Management Plan for the Hematite Project to address the impacts associated with the North Star Magnetite proposal. The main changes to the document are likely to be focused on the protection of critical habitat such as rocky ridge habitat outside the direct disturbance footprint.

### **Summary**

The authorised extent of clearing of native vegetation will be limited to 5,141 ha within the development envelope. The EPA has also recommended the following conditions to minimise the impacts on conservation significant fauna:

- condition 10 requiring a Mine Exclusion Zone around the Pilbara Leaf-nosed Bat Cave 13 roost;
- condition 11 requiring the proponent to develop a Northern Quoll Management Plan; and
- condition 12 requiring the monitoring of water quality and quantity in the Site 12 Pool (habitat for the Pilbara Olive Python) and the development of management measures and contingency actions; and
- condition 13 requiring proponent to implement standard trench management procedures.

Impacts from the proposal on the above-listed species are therefore not expected to result in an unacceptable or unsustainable impact on the conservation status of listed species. However, there will be significant residual impacts from the loss of habitat (including for the Pilbara Leaf-nosed Bat) due to clearing of 'good to excellent' vegetation within the mine development envelope. Therefore, the EPA has also recommended offsets in condition 14, in the form of funds for the clearing of 'good to excellent' condition native vegetation in the Pilbara.

## 5. Conditions

Section 44 of the *Environmental Protection Act 1986* requires the EPA to report to the Minister for Environment on the key environmental factors relevant to the proposal and on the conditions and procedures to which the proposal should be subject, if implemented. In addition, the EPA may make recommendations as it sees fit.

### 5.1 Recommended conditions

Having considered the information provided in this report, the EPA has developed a set of conditions that the EPA recommends be imposed if the proposal by FMGIB to develop the North Star Magnetite open cut iron ore mine and associated infrastructure 110 km south-south-east of Port Hedland is approved for implementation. These conditions are presented in Appendix 5. Matters addressed in the conditions include the following:

- (a) ensuring that the project is implemented so that it does not affect the viability of *Pityrodia* sp. Marble Bar (conditions 6 and 7);
- (b) ensuring that linear infrastructure and the borefield is sited and constructed in a manner that avoids Declared Rare Flora (DRF), Priority 1 Listed Flora species (including *Pityrodia* sp. Marble Bar ) and Threatened Ecological Communities (TECs), and minimises the impact to other conservation significant flora (conditions 8 and 9);
- (c) ensuring that the implementation of the proposal does not affect the viability of the Pilbara Leaf-nosed Bat, through a Mine Exclusion Zone around Cave 13, or demonstration by the proponent that a viable portion of the colony at Cave 13 has successfully relocated to an alternative maternal roost site (condition 10);
- (d) ensuring that mine construction and operational activities are carried out in a manner that minimise the impacts to the Northern Quoll (condition 11);
- (e) ensuring that mining activities do not impact the water quality or hydrological regime of Site 12 Pool (condition 12);
- (f) requiring that open trenches associated with construction of linear infrastructure are cleared of trapped fauna by fauna-rescue personnel at least twice daily (condition 13); and

- (g) requiring the proponent to contribute funds to a government-established conservation offset fund to mitigate for significant residual impacts on vegetation in 'good to excellent' condition (condition 14).

## **5.2 Consultation**

In developing these conditions, the EPA consulted with the proponent, the Department of Environmental Regulation, the Department of Parks and Wildlife, the Department of the Environment (Commonwealth), the Department of Mines and Petroleum and the Department of Water in respect of matters of fact and matters of technical or implementation significance.

## **6. Other advice**

### ***Rehabilitation and closure***

In its annual report for 2012–2013, the EPA noted that rehabilitation in the Pilbara region is a challenge due to the unique environment and biodiversity. The increasing number of large-scale proposals has led the EPA to review its current approach to assessing and conditioning rehabilitation of mining proposals in the Pilbara (EPA, 2013).

The EPA notes that, for this proposal, the proponent has used the mitigation hierarchy and best-practice principles to reduce the impacts of rehabilitation and closure. However, the proposal will result in a pit lake at closure.

Preliminary assessment by the proponent suggests that the pit lake will not cause unacceptable environmental impacts. Pit lake water quality will be impacted by the quality of the inflowing groundwater, evaporation rate, geochemistry of the soils that make up the walls and basement of the pit lake, quality of any surface inflow and the depth and strength of stratification in the lake.

The EPA is of the view that the proponent has completed a suitable geochemical assessment of the site, in accordance with appropriate guidance on acid base accounting and kinetic testing. The geochemical report noted that most of the material does not contain trace metals above normal crustal levels and a small portion (6%) of the material may be potential acid forming material, while the rest of the material is non-acid forming. Kinetic testing of the potential acid forming material has found that it is unlikely to leach significant quantities of trace metals. For this reason, it does not appear that the walls of the pit will be significant sources of trace metals when a pit lake forms on the site.

The modelling of the pit lake has taken into account climate change and includes a sensitivity analysis of different input variables, including evaporation coefficient and groundwater salinity (TDS). The modelling indicates that the pit lake will become a sink and salinity will increase with time, as would be expected for a pit lake in the Pilbara. The modelling has

indicated that calcite (calcium carbonate) and dolomite (calcium magnesium bicarbonate) will be the key precipitates in the lake and, due to this domination of the lake by carbonates, the lake is likely to be fairly neutral.

It is the EPA's view that the proponent's Mine Closure Plan needs to ensure that sufficient temporal monitoring of the pit lake water quality takes place to validate the modelling predictions, which may take a considerable amount of time if the lake is deep and the rate of inflow relatively slow. Particular attention needs to be paid to the concentration of heavy metals in the water if the salinity is such that it might be frequented by birds and/or other biota. The EPA's view is that the water quality in the pit lake should not cause detrimental impacts if used as a source of drinking water by birds and/or other biota. If impacts to biota are predicted on the basis of the monitoring results then the Mine Closure Plan must require the proponent to undertake actions to mitigate these impacts. Possible options could be to fill in the pit to above the watertable or treatment of the water in the lake.

Another potential impact of a pit lake is density-driven outflow that could impact on the quality of the surrounding groundwater. The proponent has predicted that there will be no outflow from the pit lake based on water balance modelling, however this does not take into account density-driven outflow, which could occur if the density of the bottom water in the pit lake is significantly higher than the surrounding groundwater. The EPA advises the Department of Mines and Petroleum (DMP) that the Mine Closure Plan needs to ensure that monitoring of groundwater quality (at depths consistent with the total depth of the pit lake) is conducted if a risk assessment of worst case saline outflow shows that there is potential for impact to the environment from groundwater discharges to a surface waterbody and/or groundwater dependent vegetation are likely to intercept the saline groundwater.

The monitoring plan needs to consider that, if the basement of the aquifer slopes away from the pit in the opposite direction to the general groundwater flow, density-driven plumes can migrate against the general groundwater flow direction and monitoring wells should be located accordingly. In fractured media, density-driven outflow could occur at many depths so monitoring wells should be fully screened to allow capture of the dense water and sampling should be conducted at discreet depths based on the conductivity profile in the well. Modelling of density-driven outflow plume length needs to consider that the pit lake will be a source of dense water in perpetuity in most cases and impact zones could be considerable over time.

The EPA notes that further geochemical and water quality assessments are required at different stages of mining to prepare the site for closure. The EPA advises the DMP that further geochemical assessment of the dewatering drawdown cone, especially where the hanging wall unit may extend to the west of the pit, needs to occur prior to dewatering commencing. The EPA also notes that a significant proportion of the pit is above the watertable and dewatering will commence once this material has been mined.

The EPA advises that assessment of seepage from the pit walls where the hanging wall unit is located needs to occur during dewatering, through techniques such as wall washings and collection of seepage from the pit walls after rainfall events. This data along with the geochemical testing of the dewatering zone, if deemed relevant (i.e. contributes greater than 2% solutes/acidity to the lake), may be used in more advanced pit lake models prior to closure of the mine.

The EPA notes that the proponent will have a tailings storage facility (TSF) close to the mine pit. While it appears from the initial testing of tailings material that leaching of trace metals from the TSF at significant quantities will not occur, the water from the TSF may flow into the pit lake. Due to the size of the TSF, the difficulty of accurately modelling seepage in this environment (weathered and fractured rock) and the low risk it presents to water quality (e.g. initial leach tests indicate the material is unlikely to leach significant quantities of trace metals), the EPA advises the DMP that when the mine is approaching closure, the proponent needs to assess whether water from the TSF will flow into the pit lake and, if so, account for this in future, more advanced, pit lake models.

#### ***Terrestrial Fauna - Pilbara Leaf-nosed Bat***

The EPA has recommended condition 10 to mitigate the potential impacts to the PLNB colony due to mining activities. The intent of conditions 10-3 to 10-11 is to ensure the viability of the Pilbara Leaf-nosed Bat (*Rhinoicteris aurantia*) population is maintained through the relocation and establishment of a 'viable portion' of the colony at an alternative (either natural or artificial) site.

To satisfy the objective of condition 10, it is essential that an understanding of the term 'viable portion' is developed. The EPA recommends that during the timeframe (approximately seven years) prior to reaching the outer edge of the Mine Exclusion Zone, the proponent undertakes research into the PLNB population dynamics to better inform what constitutes a viable portion of a PLNB colony. The EPA expects that the Office of the EPA will seek advice from relevant bat experts, including from the Department of Parks and Wildlife in determining this.

The EPA notes that Cave 13 at North Star is an important maternal roost and that the viability of the North Star bat population is dependent on the cave. Should the confirmed lateral extent of the cave (as required by recommended condition 10-2) be greater than the current predicted extent, the EPA expects that the Mine Exclusion Zone required by recommended condition 10-2 would be amended accordingly through a formal change to conditions under s46 of the EP Act.



## 7. Recommendations

The EPA submits the following recommendations to the Minister for Environment: that the Minister:

- notes that the proposal being assessed is for the development of the North Star Magnetite open cut iron ore mine and associated infrastructure located 110 km south-south east of Port Hedland;
- considers the report on the key environmental factors and principles as set out in Section 3;
- notes the EPA has concluded the proposal can be managed to meet the EPA's objectives, provided there is satisfactory implementation by the proponent of the recommended conditions set out in Appendix 5 and summarised in Section 5; and
- imposes the conditions and procedures recommended in Appendix 5 of this report.



# **Appendix 1**

## **List of submitters**

**Organisations:**

Department of Aboriginal Affairs  
Department of Environmental Regulation  
Department of the Environment (Commonwealth)  
Department of Health  
Department of Parks and Wildlife  
Department of State Development  
Department of Water  
Wildflower Society of WA

**Individuals:**

C Jenkins  
Groundwater Consulting Services

# **Appendix 2**

## **References**

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Subterranean Ecology (2012a) *North Star Project: Subterranean Fauna Survey and Assessment*, prepared by FMG, 2012, Final Report.

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Woodman Environmental Consulting (2013) *Abydos Direct Shipping Ore Project Stage 2 Flora and Vegetation Studies*, prepared for Atlas Iron, 2013.

Worley Parsons (2012) *Surface Water Studies – North Star*, prepared for FMG, September 2012, Final Report.

## **Appendix 3**

**Summary of identification of key environmental factors and principles**

Preliminary Environmental Factors	Proposal Characteristics	Government Agency and Public Comments	Identification of Key Environmental Factors
<b>LAND</b>			
Flora and Vegetation	<p>The proposal will have a direct impact on flora and vegetation through the clearing of 5,141 ha of native vegetation across the four development envelopes. Of this, 4,776 ha have been described as ranging from ‘good to excellent’ condition.</p> <p>Clearing will be necessary to accommodate a mine pit, waste rock dump, tailings storage facility, mine infrastructure (including accommodation camp), and linear infrastructure (pipelines and access roads) and borefield.</p> <p>The proponent’s survey work did not record any Declared Rare Flora, Threatened Ecological Communities or Priority Ecological Communities within the proposal’s development envelopes.</p> <p>The key impact of concern includes the direct impact to <i>Pityrodia</i> sp. Marble Bar (Priority 1) through land clearing proposed within the Mine Development Envelope.</p>	<p>Submissions for this factor include:</p> <p><i>Office of the EPA/Wildflower Society of WA</i></p> <ul style="list-style-type: none"> <li>• The proposal is likely to impact a large proportion of the known extent of <i>Pityrodia</i> sp. Marble Bar.</li> <li>• The proponent did not adequately address the conservation significance of native vegetation within the disturbance footprint nor present the management measures that will be used to mitigate and avoid clearing of native vegetation.</li> <li>• The project has potentially high impacts on many vegetation communities. There are numerous vegetation communities where the impact is over 50% of the known extent.</li> </ul>	<p><b>Considered to be a key environmental factor and is discussed in Section 3.1</b></p>



Preliminary Environmental Factors	Proposal Characteristics	Government Agency and Public Comments	Identification of Key Environmental Factors
Terrestrial Fauna	<p>Conservation significant species identified as occurring or likely to occur in the project area include the Pilbara Leaf-nosed Bat, Northern Quoll and Pilbara Olive Python.</p> <p>The Commonwealth Department of the Environment declared the North Star Magnetite Project a controlled action due to the potential impacts to Threatened Fauna.</p> <p>The proposal will result in the removal of a regionally significant maternal roost cave for Pilbara Leaf-nosed Bat. There is also the impacts for direct removal, and fragmentation of denning, foraging and dispersal habitat for the Northern Quoll.</p> <p>Site 12 Pool's upper catchment will be modified resulting in a potential impact to habitat for the Pilbara Olive Python.</p>	<p>Submissions for this factor include:</p> <p><i>Office of the EPA/Department of Parks and Wildlife</i></p> <ul style="list-style-type: none"> <li>The proposal appears likely to impact on a regionally significant colony (roosting and possible maternal site) of the threatened Pilbara Leaf-nosed Bat.</li> <li>It appears that the proposal will have a direct impact on a resident breeding population (approximately 20 individuals) of the Northern Quoll, through the direct removal, and fragmentation of significant (denning, foraging and dispersal) habitat.</li> <li>A Targeted Level 2 Survey for Bilby is required. A report of the results and discussion of the impacts of the proposed development on the Bilby at the local and regional scale should be provided.</li> </ul>	<p><b>Considered to be a key environmental factor and is discussed in section 3.2.</b></p>

Preliminary Environmental Factors	Proposal Characteristics	Government Agency and Public Comments	Identification of Key Environmental Factors
Subterranean Fauna	<p>The proponent undertook baseline survey work for stygofauna and troglofauna over two consecutive phases during the wet (March) and dry (June to July) seasons in 2011.</p> <p>The survey confirmed the presence of troglofauna and stygofauna within the project area with the occurrence of at least 17 stygofauna species and 11 troglofauna species.</p> <p>Potential impacts to troglofauna may occur within the mine development envelope due to loss of habitat within the mine pit.</p> <p>No stygofauna were recorded within the mine pit. The proposal is unlikely to impact stygofauna within the development envelopes, as the Wallal Aquifer is confined and presents a low likelihood of supporting stygofauna, and there are no plans to use the alluvial aquifer within the Infrastructure Corridor Development Envelope as a source of water for the proposal.</p>	<p>Submissions for this factor include:</p> <p><i>Office of the EPA</i></p> <ul style="list-style-type: none"> <li>Five of the 11 species of troglofauna identified from the mine area have only been recorded from the mine pit envelope. Despite considerable sampling effort south of the mine pit area, these species were not recorded at other sites on the continuing banded iron formation outcrop.</li> <li>Three species belonging to the order Podocopida seed shrimp (Ostracoda sp. NS1, Ostracoda sp. NS2 and Ostracoda sp. NS3) were only found within the Infrastructure Development Corridor in the alluvial aquifer associated with the Turner River and have not been found in other surveys in the Pilbara.</li> </ul>	<p><b>Considered to be a key environmental factor and is discussed in Section 3.3.</b></p>

Preliminary Environmental Factors	Proposal Characteristics	Government Agency and Public Comments	Identification of Key Environmental Factors
<b>WATER</b>			
<p>Hydrological Processes and Inland Environmental Waters Quality</p>	<p>Potential impacts may occur as a result of abstraction of 14 GL/a of water from the West Canning Basin, including a drawdown cone of depression caused by pumping of groundwater.</p> <p>Potential impacts may occur to Site 12 Pool through modification of the upper catchment which is located within the Mine Development Envelope. Impacts may result from decreased flow rates and deteriorating water quality flows into the Pool. Site 12 Pool displays significant habitat for the Pilbara Olive Python and Northern Quoll.</p>	<p>Submissions for this factor include:</p> <p><i>Department of the Environment (Commonwealth)</i></p> <ul style="list-style-type: none"> <li>• Potential impacts to pools and surrounding vegetation/habitat for Matters of National Environmental Significance warrant detailed discussion.</li> </ul> <p><i>Office of EPA</i></p> <ul style="list-style-type: none"> <li>• Suitable buffer areas should also be considered to maintain the ecological function of all wetlands (including pools, creeks and springs) in the mine area.</li> </ul> <p><i>Public Submission</i></p> <ul style="list-style-type: none"> <li>• There should be an emphasis on minimising and maintaining drawdown impacts from its project, measured in the Wallal Aquifer at the Great Northern Highway, to below 1 m.</li> </ul>	<p><b>Considered to be a key environmental factor and is discussed in section 3.4.</b></p>

Preliminary Environmental Factors	Proposal Characteristics	Government Agency and Public Comments	Identification of Key Environmental Factors
<b>PEOPLE</b>			
Human Health	Potential impacts to human health may occur from dust emissions during mine construction and operations, specifically the release of asbestiform /fibrous minerals due to the mining of a magnetite ore body.	<p>Submissions for this factor include:</p> <p><i>Department of Health</i></p> <ul style="list-style-type: none"> <li>• Establish a 'Drinking Water Quality Management Plan', including (if applicable) the extraction points, water supply pipeline, the water treatment process and storage facilities.</li> <li>• Any treatment and application of pesticides must be applied in accordance with the Health (Pesticides) Regulations 2011. A Pest Management Plan should be adopted to ensure that pests are controlled, the use of pesticides are minimised, with minimal risk to public health.</li> <li>• DoH's Guidance Note on Public Health Risk Management of Asbestiform</li> </ul>	<p>The Department of Mines and Petroleum initially raised concerns relating to the potential release of asbestiform / fibrous minerals through the mining process.</p> <p>The proponent then carried out testing for fibrous materials and concluded that the geology at North Star does not support the formation of these materials.</p> <p>Should asbestos fibres be encountered at any stage during the mining process, FMG will implement its Fibrous Material Management Procedures.</p> <p>The proponent has indicated that they will consider DoH's new guidelines regarding the management of asbestiform minerals.</p> <p>The proponent has committed to complying with all applicable Acts and Regulations with regards to public health.</p> <p>The proponent notes the public comments regarding a pest management plan and considers that these issues are dealt with by Fortescue's existing Weed Management Plan, and Hydrocarbon and Chemical</p>

Preliminary Environmental Factors	Proposal Characteristics	Government Agency and Public Comments	Identification of Key Environmental Factors
		Minerals Associated with Mining (July 2013) should be taken into consideration.	<p>Management Plan.</p> <p><b>Not considered to be a key environmental factor.</b></p> <p><b>Factor does not require further EPA evaluation.</b></p>
Heritage	<p>The proposal may impact on aboriginal heritage sites as a result of land clearing and earthworks associated with construction and operation of the proposal, including:</p> <ul style="list-style-type: none"> <li>• damage to or demolition of identified Aboriginal heritage sites;</li> <li>• damage to or demolition of unknown Aboriginal heritage sites uncovered as a result of Project activities;</li> <li>• unauthorised access to heritage sites leading to degradation of these sites; and</li> <li>• changes in land use resulting in exclusion of Aboriginal people from areas of cultural significance.</li> </ul>	No public submissions were received for this factor.	<p>The proponent has indicated that Ground disturbing activity will only take place once a Ground Disturbance Permit (GDP) has been obtained. GDPs include heritage protection conditions where Aboriginal Sites are present, and are only approved for areas that have been subject to ethnographic and archaeological surveys.</p> <p>The proponent has stated that where disturbance of an Aboriginal heritage site(s) is unavoidable, consultation with Aboriginal site owners will be undertaken and a Section 18 application under the <i>Aboriginal Heritage Act 1972</i> will be completed.</p> <p><b>Not considered to be a key environmental factor.</b></p> <p><b>Factor does not require further EPA evaluation.</b></p>

Preliminary Environmental Factors	Proposal Characteristics	Government Agency and Public Comments	Identification of Key Environmental Factors
Amenity	<p>Impacts to Amenity associated with the proposal may occur from noise impacts associated with construction and operation of the mine.</p> <p>The nearest sensitive receptor to the mine development envelopes include:</p> <ul style="list-style-type: none"> <li>• mine accommodation camp located approximately 4.5 km west of the open pit and 2.3 km west of the power station;</li> <li>• the Woodstock Aboriginal Community approximately 30 km south of the mine area;</li> <li>• Panorama Homestead approximately 40 km to the north east; and</li> <li>• the closest sensitive receptor to the Canning Basin borefield is the Pardoo Roadhouse, approximately 15 km north west.</li> </ul>	No public submissions were received for this factor.	<p>Noise impacts to residences related to the proposal are regulated under the <i>Environment Protection (Noise) Regulations 1997</i> (Noise Regulations) to meet the EPA's objective for this factor.</p> <p>The proposal will comply with the Noise Regulations. Noise emissions will be minimised through implementation of best management, including:</p> <ul style="list-style-type: none"> <li>• noise monitoring will be undertaken during mining operations to determine if assigned levels are being exceeded;</li> <li>• noise attenuation will be fitted to plant and equipment where required; and</li> <li>• equipment and machinery will be maintained to manufacturers specifications such that noise emissions are minimised.</li> </ul> <p><b>Not considered to be a key environmental factor.</b></p> <p><b>Factor does not require further EPA evaluation.</b></p>
<b>AIR QUALITY</b>			
Air Quality	Dust will be generated through mechanical disturbances from blasting, vegetation clearing, earthmoving and vehicle movement on unsealed	Submissions for this factor include:  <i>Department of Environment</i>	Dust would be controlled by implementation of a range of management measures outlined in the PER (Section 13.1.6), including the implementing of the

Preliminary Environmental Factors	Proposal Characteristics	Government Agency and Public Comments	Identification of Key Environmental Factors
	surfaces. Dust may also be generated through transport and handling of ore and waste including processing and transport. Cleared areas can also generate dust during dry windy conditions.	<p><i>Regulation</i></p> <ul style="list-style-type: none"> <li>It should be reiterated that it is the proponent's responsibility to ensure that fugitive dust emissions are minimised, managed appropriately and to conduct regular recorded monitoring throughout the life of the project.</li> </ul>	<p><i>Fortescue Mine and Rail Dust Management Plan (45-PL-EN-0030).</i></p> <p><b>Not considered to be a key environmental factor.</b></p> <p><b>Factor does not require further EPA evaluation.</b></p>
<b>INTEGRATING FACTORS</b>			
Offsets	The proposal will result in the clearing of 5,141 ha of native vegetation, including habitat for conservation significant fauna. Of this, 4,776 ha have been described as ranging from 'good to excellent' condition.	<p>Submissions for this factor include:</p> <p><i>Office of the EPA</i></p> <ul style="list-style-type: none"> <li>A breakdown of clearing of good-to-excellent condition native vegetation by IBRA subregion and whether this clearing is temporary should be presented.</li> </ul>	<b>Considered to be a key environmental factor and is discussed in section 3.5.</b>

Preliminary Environmental Factors	Proposal Characteristics	Government Agency and Public Comments	Identification of Key Environmental Factors
Rehabilitation and Closure	The proposal will involve the loss of vegetation and habitat and disturbance of landforms, soil profiles and drainage features.	<p>Submissions for this factor include:</p> <p><i>Public Submission</i></p> <ul style="list-style-type: none"> <li>• What will be done if sufficient top soil volumes for closure aren't available from stripping disturbance areas?</li> </ul>	<p>The proponent is of the view that current estimates of topsoil and subsoil to be stripped from disturbed areas indicate that there are sufficient quantities. Should current estimates not meet rehabilitation requirements, the proponent has committed to investigate other strategies such as deeper stripping of subsoil in areas such as valley floors where soils are likely to be deeper.</p> <p>The proposal is subject to the mine closure provisions of the <i>Mining Act 1978</i> and therefore is able to be regulated by the DMP.</p> <p>The EPA has provided 'Other Advice' (Section 6) to assist DMP in regulating the potential impacts during rehabilitation and closure.</p> <p><b>Not considered to be a key environmental factor.</b></p> <p><b>The EPA has provided other advice on this factor.</b></p>



<b>PRINCIPLES</b>		
<b>Principle</b>	<b>Relevant Yes/No</b>	<b>If yes, Consideration</b>
<p>1. The precautionary principle  <i>Where there are threats of serious or irreversible damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.</i>  <i>In application of this precautionary principle, decisions should be guided by –</i>  <i>(a) careful evaluation to avoid, where practicable, serious or irreversible damage to the environment; and</i>  <i>(b) an assessment of the risk-weighted consequences of various options.</i></p>	Yes	<p>In considering this principle, the EPA notes the following:</p> <ul style="list-style-type: none"> <li>• Investigations of the biological and physical environment should provide background information to assess risks and identify measures to avoid or minimise impacts.</li> <li>• The assessment of these impacts and management is provided in Section 3 of this report.</li> <li>• Conditions have been recommended as considered necessary.</li> </ul>
<p>2. The principle of intergenerational equity  <i>The present generation should ensure that the health, diversity and productivity of the environment is maintained and enhanced for the benefit of future generations.</i></p>	Yes	<p>The proposal would result in the loss of vegetation and alteration of landforms that require rehabilitation. Vegetation and flora are relevant environmental factors discussed in this report and conditions have been recommended to ensure minimal impact, including a condition to offset residual impacts to clearing of 'good to excellent' vegetation.</p>
<p>3. The principle of the conservation of biological diversity and ecological integrity  <i>Conservation of biological diversity and ecological integrity should be a fundamental consideration.</i></p>	Yes	<p>The proposal would result in impacts on priority flora species and threatened fauna species. These impacts have the potential to affect biological diversity/integrity. Vegetation and flora and terrestrial fauna are key environmental factors discussed in this report.</p>

<p>4. Principles relating to improved valuation, pricing and incentive mechanisms</p> <p>(1) <i>Environmental factors should be included in the valuation of assets and services.</i></p> <p>(2) <i>The polluter pays principles – those who generate pollution and waste should bear the cost of containment, avoidance and abatement.</i></p> <p>(3) <i>The users of goods and services should pay prices based on the full life-cycle costs of providing goods and services, including the use of natural resources and assets and the ultimate disposal of any waste.</i></p> <p>(4) <i>Environmental goals, having been established, should be pursued in the most cost effective way, by establishing incentive structure, including market mechanisms, which enable those best placed to maximize benefits and/or minimize costs to develop their own solution and responses to environmental problems.</i></p>	<p>Yes</p>	<p>The proposal would require decommissioning and rehabilitation. The proponent should bear the cost of any potential pollution, containment, monitoring, management, decommissioning, rehabilitation and closure.</p>
<p>5. The principle of waste minimisation</p> <p><i>All reasonable and practicable measures should be taken to minimize the generation of waste and its discharge into the environment.</i></p>	<p>Yes</p>	<p>Other waste products created as a result of implementation of the proposal will be disposed of according to relevant regulations and legislation.</p>

## **Appendix 4**

### **Identified Decision-making Authorities and Recommended Environmental Conditions**

## Identified Decision-making Authorities

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

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

The following decision-making authorities have been identified for this consultation:

<b>Decision-making Authority</b>	<b>Approval</b>
1. Minister for Environment	<i>Wildlife Conservation Act 1950</i> Taking of flora and fauna
2. Minister for Water	<i>Rights in Water and Irrigation Act 1914</i> Water extraction licence
3. Minister for Mines and Petroleum	<i>Mining Act 1978</i> Program of works in miscellaneous licences
4. Minister for Aboriginal Affairs	<i>Aboriginal Heritage Act 1972</i>
5. Department of Environmental Regulation	<i>Environmental Protection Act 1986</i> Works approvals and licencing
6. Department of Mines and Petroleum	<p><b><i>Mining Proposal</i></b> <i>Mining Act 1978</i> Mining proposal in the mining lease</p> <p><b><i>Dangerous Goods</i></b> <i>Dangerous Goods Safety Act 2004</i> Chief Dangerous Goods Officer</p> <p><b><i>Mine Safety</i></b> <i>Mines Safety and Inspection Act 1994</i> District Inspector, Resources Safety Branch</p>

RECOMMENDED ENVIRONMENTAL CONDITIONS  
**STATEMENT THAT A PROPOSAL MAY BE IMPLEMENTED  
(PURSUANT TO THE PROVISIONS OF THE  
ENVIRONMENTAL PROTECTION ACT 1986)**

North Star Magnetite Project

**Proposal:** The proposal is to construct and operate an open-cut iron ore mine, and associated infrastructure, approximately 110 kilometres (km) south-south east of Port Hedland.

**Proponent:** FMG Iron Bridge (Aust) Pty Ltd  
ACN 150 848 025

**Proponent Address:** 87 Adelaide Terrace  
East Perth WA 6004

**Assessment Number:** 1946

**Report of the Environmental Protection Authority Number:** 1514

This Statement authorises the implementation of the Proposal described and documented in Columns 1, 2 and 3 of Table 2 of Schedule 1. The implementation of the Proposal is subject to the following implementation conditions and procedures.

Note: Words and expressions used in these conditions shall have the same respective meanings as in the Act or as provided for in Table 3 of Schedule 1.

**1 Proposal Implementation**

1-1 When implementing the proposal, the proponent shall not exceed the authorised extent of the proposal as defined in Column 3 of Table 2 in Schedule 1, unless amendments to the proposal and the authorised extent of the Proposal has been approved under the EP Act.

**2 Contact Details**

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

### **3 Time Limit for Proposal Implementation**

- 3-1 The proponent shall not commence implementation of the proposal after the expiration of five (5) years from the date of this statement, and any commencement, within this five (5) year period, must be substantial.
- 3-2 Any commencement of implementation of the proposal, within five (5) years from the date of this statement, must be demonstrated as substantial by providing the CEO with written evidence, on or before the expiration of five (5) years from the date of this statement.

### **4 Compliance Reporting**

- 4-1 The proponent shall prepare and maintain a compliance assessment plan to the satisfaction of the CEO.
- 4-2 The proponent shall submit to the CEO the compliance assessment plan required by condition 4-1 at least six (6) months prior to the first compliance assessment report required by condition 4-6, or prior to implementation, whichever is sooner.

The compliance assessment plan shall indicate:

- (i) the frequency of compliance reporting;
  - (ii) the approach and timing of compliance assessments;
  - (iii) the retention of compliance assessments;
  - (iv) the method of reporting of potential non-compliances and corrective actions taken;
  - (v) the table of contents of compliance assessment reports; and
  - (vi) public availability of compliance assessment reports.
- 4-3 The proponent shall assess compliance with conditions in accordance with the compliance assessment plan required by condition 4-1.
  - 4-4 The proponent shall retain reports of all compliance assessments described in the compliance assessment plan required by Condition 4-1 and shall make those reports available when requested by the CEO.
  - 4-5 The proponent shall advise the CEO of any potential non-compliance within seven (7) days of that non-compliance being known.
  - 4-6 The proponent shall submit to the CEO the first compliance assessment report fifteen (15) months from the date of issue of this Statement addressing the twelve (12) month period from the date of issue of this Statement and then annually from the date of submission of the first compliance assessment report.

The compliance assessment report shall:

- (i) be endorsed by the proponent's Managing Director or a person delegated to sign on the Managing Director's behalf;
- (ii) include a statement as to whether the proponent has complied with the conditions;
- (iii) identify all potential non-compliances and describe corrective and preventative actions taken;
- (iv) be made publicly available in accordance with the approved compliance assessment plan; and
- (v) indicate any proposed changes to the compliance assessment plan required by condition 4-1.

## **5 Public Availability of Data**

5-1 Subject to condition 5-2, within a reasonable time period approved by the CEO of the issue of this statement and for the remainder of the life of the proposal the proponent shall make publicly available, in a manner approved by the CEO, all validated environmental data (including sampling design, sampling methodologies, empirical data and derived information products (e.g. maps)) relevant to the assessment of this proposal and implementation of this Statement.

5-2 If any data referred to in condition 5-1 contains particulars of:

- (i) a secret formula or process; or
- (ii) confidential commercially sensitive information;

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

## **6 Priority 1 *Pityrodia* sp. Marble Bar Mine Infrastructure Plan within Mine Development Envelope**

6-1 Prior to the disturbance of any individuals of *Pityrodia* sp. Marble Bar within the Mine Development Envelope, the proponent shall prepare and submit a *Pityrodia* sp. Marble Bar Mine Infrastructure Plan to the CEO.

6-2 The *Pityrodia* sp. Marble Bar Mine Infrastructure Plan required by condition 6-1 shall:

- (i) demonstrate that mine and associated infrastructure within the Mine Development Envelope will be located to avoid or minimise the direct and indirect loss of *Pityrodia* sp. Marble Bar, as far as practicable;

- (ii) include spatially accurate, rectified and geographically referenced data and maps showing the location of the mine and associated infrastructure within the Mine Development Envelope.
- 6-3 Prior to the disturbance of any individuals of *Pityrodia* sp. Marble Bar within the Mine Development Envelope the proponent shall implement the *Pityrodia* sp. Marble Bar Mine Infrastructure Plan required by condition 6-1.
- 6-4 Revisions to the *Pityrodia* sp. Marble Bar Mine Infrastructure Plan may be approved by the CEO.
- 6-5 The proponent shall implement revisions of the *Pityrodia* sp. Marble Bar Mine Infrastructure Plan approved under Condition 6-4.

## **7 Priority 1 *Pityrodia* sp. Marble Bar Regional Survey Plan**

- 7-1 The proponent shall ensure that ground disturbing activities do not affect the viability of *Pityrodia* sp. Marble Bar, through the implementation of conditions 7-2 to 7-9.
- 7-2 The proponent shall not disturb any individuals of *Pityrodia* sp. Marble Bar within the Mine Development Envelope prior to:
- (i) preparing and submitting a *Pityrodia* sp. Marble Bar Regional Survey Plan to the CEO; and
  - (ii) receiving written notice from the CEO, having consulted Department of Parks and Wildlife, that the *Pityrodia* sp. Marble Bar Regional Survey Plan meets the requirements of condition 7-4.
- 7-3 The objective of the *Pityrodia* sp. Marble Bar Regional Survey Plan is to clarify the conservation status of *Pityrodia* sp. Marble Bar.
- 7-4 The *Pityrodia* sp. Marble Bar Regional Survey Plan shall:
- (i) include a desktop assessment to confirm the number of individuals of *Pityrodia* sp. Marble Bar known in the Pilbara, prior to undertaking the *Pityrodia* sp. Marble Bar Regional Survey;
  - (ii) detail and describe the most suitable timing for the *Pityrodia* sp. Marble Bar Regional Survey, including the appropriate season(s) to undertake a robust survey of the regional distribution of *Pityrodia* sp. Marble Bar, to accurately detect and document the distribution and population size of the species; and
  - (iii) detail and describe an approach to spatially defining the population and providing a count of the total number of individuals located during the regional survey.



- 7-5 The proponent shall implement the approved *Pityrodia* sp. Marble Bar Regional Survey Plan required by Condition 7-2(i).
- 7-6 Revisions to the *Pityrodia* sp. Marble Bar Regional Survey Plan may be approved by the CEO.
- 7-7 The proponent shall report to the CEO the outcomes of the *Pityrodia* sp. Marble Bar Regional Survey as required by the *Pityrodia* sp. Marble Bar Regional Survey Plan or any revisions thereof approved by the CEO within 6 months of completion of the survey.
- 7-8 In the event that *Pityrodia* sp. Marble Bar is declared Rare Flora under the *Wildlife Conservation Act 1950*, the proponent shall:
- (i) prepare and submit a *Pityrodia* sp. Marble Bar Research and Conservation Plan to the CEO, and seek written approval from the CEO, on the advice of Department of Parks and Wildlife, that the *Pityrodia* sp. Marble Bar Research and Conservation Plan meets the requirements of condition 7-9.
- 7-9 The *Pityrodia* sp. Marble Bar Research and Conservation Plan identified in condition 7-8 (i) shall include:
- (i) details on research to be undertaken into the habitat, biology and conservation of the species;
  - (ii) details of suitable conservation measures such as seed collection and germplasm storage, seeding or translocation trials to be undertaken to determine the likelihood of successful establishment, during mine site rehabilitation or other suitable measures, for conservation of the species;
  - (iii) timeframes and responsibilities for the implementation of proposed conservation measures; and
  - (iii) a monitoring programme and criteria for determining the efficacy of proposed conservation measures.
- 7-10 The proponent shall implement the *Pityrodia* sp. Marble Bar Research and Conservation Plan.
- 7-11 The proponent shall submit a report to the CEO documenting the results of the *Pityrodia* sp. Marble Bar Research and Conservation Plan, identifying the findings of the research required by 7-9 (i), and the success of the conservation measures required by condition 7-9 (ii), within 6 months of completion of the measures set out in the approved plan.

## **8 Conservation Significant Flora and Vegetation - Linear Infrastructure and Borefield Alignment Survey(s)**

- 8-1 The proponent shall not undertake any ground disturbing activities for construction of the linear infrastructure and the borefield within the Water Corridor Development Envelope, the Slurry Corridor Development and the Infrastructure Corridor Development Envelope prior to preparing and submitting a Conservation Significant Flora and Vegetation Survey Plan(s) for each corridor development envelope, that meets the requirements of condition 8-3, to satisfaction of the CEO.
- 8-2 The objective of the Conservation Significant Flora and Vegetation Survey Plan(s) is to identify and spatially define the location of conservation significant flora and vegetation, including Declared Rare Flora (DRF), Priority 1 Listed Flora species and Threatened Ecological Communities (TECs).
- 8-3 The Conservation Significant Flora and Vegetation Survey Plan(s) shall:
- (i) identify and spatially map the corridor development envelope(s) that the survey(s) relate to, including the delineation of sections to be surveyed;
  - (ii) describe and detail the methodology for surveying the corridor development envelope(s), including the approach, timing and sequential staging of surveys along sections of the corridor, delineated pursuant to condition 8-3(i);
  - (iii) ensure that survey(s) are undertaken in accordance with EPA's Guidance Statement 51 - *Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment in Western Australia (June 2004)* or its revisions, to the requirements of the CEO on the advice of the Department of Parks and Wildlife;
  - (iv) identify and spatially define the locations of DRF, TECs and other conservation significant flora species and vegetation, within the sections of the specified corridor development envelope.
- 8-4 Prior to ground disturbing activities within the Water Corridor Development Envelope, the Slurry Corridor Development and the Infrastructure Corridor Development Envelope the proponent shall implement the Conservation Significant Flora and Vegetation Survey Plan(s) required by Condition 8-1.
- 8-5 Revisions to the Conservation Significant Flora and Vegetation Survey Plan(s) may be approved by the CEO on the advice of the Department of Parks and Wildlife.

8-6 The proponent shall implement revisions of the proponent shall implement revisions of the Conservation Significant Flora and Vegetation Survey Plan(s) approved under Condition 8-5.

## **9 Linear Infrastructure and Borefield Alignment Plan(s)**

9-1 The proponent shall ensure that linear infrastructure and the borefield within the Water Corridor Development Envelope, the Slurry Corridor Development and the Infrastructure Corridor Development Envelope are sited and constructed to avoid Declared Rare Flora (DRF), Priority 1 Listed Flora species and Threatened Ecological Communities (TECs) where practicable, and minimise the impact to other conservation significant flora or vegetation.

9-2 Prior to the commencement of any ground disturbing activities for the construction of linear infrastructure and borefield alignment the proponent shall prepare and submit a Linear Infrastructure and Borefield Alignment Plan(s), to the requirements of the CEO.

9-3 The Linear Infrastructure and Borefield Alignment Plan(s) shall:

- (i) identify and spatially map the Corridor Development Envelope that the plan(s) relates to;
- (ii) name and spatially map the section(s) of the corridor development envelope that are subject to construction activities, including their survey status, and survey outcomes;
- (iii) detail and provide the spatial alignment of the linear and/or borefield infrastructure within the surveyed section;
- (iv) demonstrate that linear infrastructure and/or the borefield within the section is sited and constructed to avoid DRF, TECs and Priority 1 Listed flora where practicable, and minimise the impact to other conservation significant flora or vegetation identified and spatially defined in the Conservation Significant Flora and Vegetation Survey Plan(s); and
- (v) when implemented, manage the construction of the linear infrastructure and borefield alignment to meet the requirements of Condition 9-1.

9-4 Prior to ground disturbing activities for the construction of the linear infrastructure and the borefield within the specific corridor development envelope sections, the proponent shall implement the Infrastructure and Borefield Alignment Plan(s).

9-5 Revisions to the Linear Infrastructure and Borefield Alignment Plan(s) may be approved by the CEO.

9-6 The proponent shall implement revisions of the Linear Infrastructure and Borefield Alignment Plan(s) approved under condition 9-5.

## **10 Terrestrial Fauna – Pilbara Leaf-nosed Bat**

10-1 The proponent shall implement the proposal in a manner that maintains the viability of the population of Pilbara Leaf-nosed Bat (*Rhinoicteris aurantia*) from Cave 13.

10-2 Subject to condition 10-3, there shall be no ground disturbing activity within the Mine Exclusion Zone, defined by a 100 metres buffer around the predicted lateral extent of Cave 13. The predicted lateral extent of Cave 13 and Mine Exclusion Zone are delineated in Figure 5 of Schedule 1, and the Mine Exclusion Zone is defined by the geographic coordinates in Schedule 2.

10-3 Where:

- (i) a Cave 13 Structural Report, detailing geological evidence and Pilbara Leaf-nosed Bat expert advice, confirming the lateral extent of Cave 13, has been prepared and submitted to the CEO in accordance with conditions 10-4 and condition 10-5;
- (ii) a Pilbara Leaf-nosed Bat Habitat Survey and Research Plan has been prepared by the proponent and approved by the CEO in accordance with conditions 10-6 and condition 10-8 respectively;
- (iii) the proponent has implemented the Pilbara Leaf-nosed Bat Habitat Survey and Research Plan and reported the outcomes of the implementation of the Pilbara Leaf-nosed Bat Habitat Survey and Research Plan to the CEO;
- (iv) the proponent has provided written confirmation, on the review and verification by the Department of Parks and Wildlife, to the CEO that a viable portion of the colony of Pilbara Leaf-nosed Bat from Cave 13 has relocated and established itself;
- (v) the Minister for Environment, on advice from the CEO, is satisfied that outcomes of the implementation of the Pilbara Leaf-nosed Bat Habitat Survey and Research Plan demonstrate that ground-disturbing activity in the area designated Mining Exclusion Zone will not affect the viability of the Pilbara Leaf-nosed Bat; and
- (vi) the proponent has received the prior written advice of the Minister for Environment that ground-disturbing activity may occur in the area designated Mining Exclusion Zone, as is specified in the Minister's advice,

then ground-disturbing activities may occur in the Mine Exclusion Zone as is specified in the written advice referred to in condition 10-3(v).

10-4 The proponent shall prepare and submit a Cave 13 Structural Report to the satisfaction of the CEO, on advice from the Department of Parks and Wildlife.

- 10-5 The Cave 13 Structural Report required by condition 10-4, shall include:
- (i) geological evidence of the lateral extent of the main chamber and off-chutes of Cave 13; and
  - (ii) advice from a Pilbara Leaf-nosed Bat expert on the most likely lateral extent of Cave 13.
- 10-6 The proponent shall prepare and submit a Pilbara Leaf-nosed Bat Habitat Survey and Research Plan and submit the Pilbara Leaf-nosed Bat Habitat Survey and Research Plan to the CEO.
- 10-7 The objectives of the Pilbara Leaf-nosed Bat Habitat Survey and Research Plan required by condition 10-3 are to:
- (i) provide evidence of alternative natural maternal roost site(s) for the Pilbara Leaf-nosed Bat existing within a 30 kilometre radius of Cave 13 which could support a viable portion of the colony of Pilbara Leaf-nosed Bat from Cave 13. The location of Cave 13 is shown in Figure 5 in Schedule 1 and defined by the geographic coordinates in Schedule 2; and
  - (ii) demonstrate to the satisfaction of the CEO that a viable portion of the colony of Pilbara Leaf-nosed Bat from Cave 13 has relocated and established itself in an alternative maternal roost site.
- 10-8 The Pilbara Leaf-nosed Bat Habitat Survey and Research Plan shall include:
- (i) a baseline monitoring survey of the Pilbara Leaf-nosed Bat population at Cave 13;
  - (ii) a survey plan to collect information on additional natural maternal roost site(s) or potential artificial roost site(s), and any associated Pilbara Leaf-nosed Bat activity, within a 30 kilometre radius of the Cave 13 as shown in Figure 6 and defined by the geographic coordinates in Schedule 2;
  - (iii) a research plan that details the conditions (including micro-climate) that are required for a maternal roost to allow roosting for the species;
  - (iv) a description of the potential perpetuity of the maternal roost site(s) identified by condition 10-8(iii), specifically detailing the structural stability, size and lateral extent, geological characteristics and micro-climate of the structure as well as its tenure;
  - (v) protocols and procedures to monitor Pilbara Leaf-nosed Bat behaviour, such as exiting the cave during daylight hours, as the proposal activities move into proximity of the Mine Exclusion Zone; and

- (vi) protocols and procedures to monitor the Pilbara Leaf-nosed Bat movement between Cave 13 and the alternative maternal roost site(s) identified.
- 10-9 After receipt of written advice from the CEO, having consulted with the Department of Parks and Wildlife, that the Pilbara Leaf-nosed Bat Habitat Survey and Research Plan satisfies conditions 10-7 and 10-8, the proponent shall implement the Pilbara Leaf-nosed Bat Habitat Survey and Research Plan.
- 10-10 Revisions to the Pilbara Leaf-nosed Bat Habitat Survey and Research Plan may be approved by the CEO.
- 10-11 The proponent shall report to the CEO on the outcomes of the implementation of the Pilbara Leaf-nosed Bat Survey and Research Plan. The report to the CEO shall include:
- (i) the location(s) of alternative maternal roost site(s);
  - (ii) a description of each of alternative maternal roost site(s) in terms of the structural stability, size and lateral extent, geological characteristics and micro-climate of the structure as well as its tenure;
  - (iii) outcomes of the monitoring undertaken in accordance with the Pilbara Leaf-nosed Bat Habitat Survey and Research Plan to assess behaviour and movement of Pilbara Leaf-nosed Bat individuals to other areas as proposal's activities move into proximity of the Mine Exclusion Zone;
  - (iv) evidence that a viable portion of the colony of Pilbara Leaf-nosed Bat from Cave 13, has relocated and established itself; and
  - (v) advice from the Department of Parks and Wildlife that a viable portion of the colony of Pilbara Leaf-nosed Bat from Cave 13 has relocated and established itself.

## **11 Terrestrial Fauna - Northern Quoll**

- 11-1 Prior to the commencement of ground disturbing activities within 50 metres of Northern Quoll foraging and denning habitat within the Mine Development Envelope, delineated as rocky ridge/breakaway/gorge habitat in Figure 7 of Schedule 1 and defined by the geographic coordinates in Schedule 2, the proponent shall prepare a Northern Quoll Management Plan in consultation with the Department of Parks and Wildlife, to the requirements of the CEO in order to demonstrate that Condition 11-2 has been met.
- 11-2 The objective of the Northern Quoll Management Plan is to ensure that the proposal is carried out in a manner that minimises the direct and indirect impacts to the Northern Quoll (*Dasyurus hallucatus*).

- 11-3 The Northern Quoll Management Plan shall include:
- (i) census data for the Northern Quoll population within the Mine Development Envelope as shown in Figure 1 of Schedule 1 and defined by the geographic coordinates in Schedule 2, based on available survey information;
  - (ii) spatial imagery detailing Northern Quoll foraging and denning habitat within the Mine Development Envelope;
  - (iii) detailed management measures to minimise direct and indirect loss of the habitat mapped pursuant to condition 11-3(ii);
  - (iv) protocols and procedures to monitor Northern Quoll presence, abundance and behaviour adjacent to the mine pit within the Mine Development Envelope identified by Conditions 11-3(ii) during construction and operation;
  - (v) detailed contingency responses, including modified operational procedures or translocation of animals out of impact zones, if monitoring required by condition 11-3(iv) show a decrease in Northern Quoll numbers or significant changes to Northern Quoll behaviour, to ensure condition 11-2 is met.
- 11-4 Prior to the commencement of ground disturbing activities within 50 metres of the mapped Northern Quoll foraging and denning habitat within the Mine Development Envelope, unless otherwise agreed by the CEO, the proponent shall implement the approved plan required by Condition 11-1.
- 11-5 Revisions to the Northern Quoll Management Plan may be approved by the CEO.
- 11-6 The proponent shall implement approved revisions of the Northern Quoll Management Plan required by Condition 11-5.

## **12 Water Quality and Quantity at Site 12 Pool (Pilbara Olive Python habitat)**

- 12-1 Prior to the commencement of ground disturbing activities within the catchment of Site 12 Pool that is located within the Mine Development Envelope, as delineated in Figure 8 of Schedule 1 and defined by the geographic coordinates in Schedule 2, the proponent shall prepare a Water Quality and Quantity Monitoring Plan in consultation with the Department of Water, to the requirements of the CEO, to demonstrate that Condition 12-2 has been met.
- 12-2 The proponent shall ensure that the implementation of the proposal within the catchment of Site 12 Pool that is located within the Mine Development Envelope, as delineated in Figure 8 of Schedule 1 and defined by the geographic coordinates in Schedule 2, does not have a detrimental impact on the water quality or hydrological regime of Site 12 Pool, through the implementation of conditions 12-3 to 12-7.

- 12-3 The Water Quality and Quantity Monitoring Plan shall include:
- (i) the location of monitoring sites for monitoring water quality and quantity within Site 12 Pool;
  - (ii) baseline water quality and quantity survey data collected at monitoring sites identified pursuant to condition 12-3 (i);
  - (iii) protocols, procedures and frequency for monitoring and evaluating water quality and quantity at monitoring sites required under condition 12-3 (i);
  - (iv) specified trigger levels for all run-off (including rain water run-off) from the Mine Development Envelope (including pH, total acidity, total alkalinity, dissolved iron), with reference to *Managing Acid and Metalliferous Drainage (DITR, 2007)*, and turbidity (including impacts related to increased sedimentation); and
  - (v) a framework for development of management and contingency actions to be implemented for mitigating changes to the water quality and quantity in the event that any trigger levels referred to in condition 12-3 (iv) are not met.
- 12-4 Prior to the commencement of ground disturbing activities within the catchment of Site 12 Pool that is located within the Mine Development Envelope, unless otherwise agreed by the CEO, the proponent shall implement the approved plan required by Condition 12-1.
- 12-5 Revisions to the Water Quality and Quantity Monitoring Plan may be approved by the CEO.
- 12-6 The proponent shall implement approved revisions of the Water Quality and Quantity Monitoring Plan required by condition 12-5.
- 12-7 In the event that monitoring required by Condition 12-3(iii), indicates that the trigger levels developed pursuant to condition 12-3 (iv), are exceeded, or likely to be exceeded, due to surface or groundwater run-off from within the Mine Development Envelope, the proponent shall;
- (i) investigate to determine the likely cause(s) of the trigger levels required by condition 12-3 (iv) being exceeded; and
  - (ii) if the exceedence is likely to be the result of activities undertaken in implementing the proposal, implement management and/or contingency measures required by condition 12-3 (v) and continue implementation until trigger levels required by condition 12-3 (iv) are met, or until otherwise agreed by the CEO; and
  - (iii) provide a report that describes the investigation required by condition 12-7 (i) and measures required by condition 12-3 (v) to the CEO within 21 days of identification that criteria required by condition 12-3 (iv) has been exceeded.



### **13 Terrestrial Fauna - Trapped Fauna**

13-1 The proponent shall ensure that open trenches associated with construction of Linear Infrastructure in the Water Corridor Development Envelope, the Slurry Corridor Development and the Infrastructure Corridor Development Envelope are cleared of trapped fauna by fauna-rescue personnel at least twice daily. Details of all fauna recovered shall be recorded, consistent with condition 13-5. The first daily clearing shall be completed prior to any construction or backfilling or no later than three hours after sunrise, whichever event occurs first, and shall be repeated between the hours of 3:00pm and 6:00pm of that same day.

The open trenches shall also be cleared, and fauna details recorded, by fauna-rescue personnel no more than one hour prior to backfilling of trenches.

13-2 The fauna-rescue personnel shall obtain the appropriate licences required for fauna rescue under the *Wildlife Conservation Act 1950* and be trained in the following: fauna identification, capture and handling (including specially protected fauna and venomous snakes likely to occur in the area);

(ii) identification of tracks, scats, burrows and nests of conservation-significant species;

(iii) fauna vouchering (of deceased animals);

(iv) assessing injured fauna for suitability for release, rehabilitation or euthanasia;

(v) familiarity with the ecology of the species which may be encountered in order to be able to appropriately translocate fauna encountered; and

(vi) performing euthanasia.

13-3 Open trench lengths shall not exceed a length capable of being inspected and cleared by the fauna-rescue personnel within the required times as set out in condition 13-1.

13-4 Ramps providing egress points and/or fauna refuges providing suitable shelter from the sun and predators for trapped fauna are to be placed in the trench at intervals not exceeding 50 metres.

13-5 The proponent shall produce a report detailing fauna management within the open trenches associated with construction of the Linear Infrastructure in the Water Corridor Development Envelope, the Slurry Corridor Development and the Infrastructure Corridor Development Envelope. The report shall include the following:

(i) details of all fauna inspections;

- (ii) the number and type of fauna cleared from trenches;
- (iii) fauna mortalities; and
- (iv) all actions taken.

The report shall be provided to the CEO and the DPaW, 21 days after the completion of the construction of the Linear Infrastructure in the Water Corridor Development Envelope, the Slurry Corridor Development and the Infrastructure Corridor Development Envelope or at a timeframe agreed by the CEO.

#### **14 Offsets (Integrating Factor)**

- 14-1 In view of the significant residual impacts and risks as a result of implementation of the proposal, the proponent shall contribute funds for the clearing of 'good to excellent' condition native vegetation, including the loss of habitat for conservation significant species, in the Chichester IBRA subregion, and calculated pursuant to condition 14-2. This funding shall be provided to a government-established conservation offset fund or an alternative offset arrangement providing an equivalent outcome as determined by the Minister.
- 14-2 The proponent's contribution to the initiative identified in condition 14-1 shall be paid biennially, the first payment due on 31 May in the second year following the commencement of ground disturbance. The amount of funding will be made on the following basis and in accordance with the approved Impact Reconciliation Procedure required by condition 14-3:
- (i) \$750 AUD (excluding GST) per hectare of 'good to excellent' condition native vegetation cleared within the mine development envelope (delineated in Figure 1 and defined by the geographic coordinates in Schedule 2) within the Chichester IBRA subregion;
  - (ii) \$750 AUD (excluding GST) per hectare of 'good to excellent' condition native vegetation cleared within the water corridor development envelope and slurry corridor development envelope (delineated in Figures 2 and 3 and defined by the geographic coordinates in Schedule 2) within the Chichester IBRA subregion; and
- 14-3 The real value of contributions described in condition 14-2 (i) and 14-2 (ii) will be maintained through indexation to the Perth Consumer Price Index (CPI), with the first adjustment to be applied to the first contribution.
- 14-4 Should the proponent be required to provide an offset under a condition of approval of the Australian Government under the Environment Protection and Biodiversity Conservation Act 1999, the proponent may

write to the CEO seeking a reduction in the funding required under Condition 14-2.

- 14-5 The proponent shall prepare an Impact Reconciliation Procedure to the satisfaction of the CEO.
- 14-6 The Impact Reconciliation Procedure required pursuant to condition 14-5 shall:
- (i) include a methodology to identify clearing of 'good to excellent' condition native vegetation in the Chichester IBRA subregion;
  - (ii) require the proponent to submit spatial data identifying areas of 'good to excellent' condition native vegetation that has been cleared;
  - (iii) include a methodology for calculating the amount of clearing undertaken during each biennial time period;
  - (iv) include a methodology for calculating the amount of temporary vegetation clearing for the haul road and related infrastructure that has commenced rehabilitation within twelve months of final commissioning of the haul road;
  - (v) state the biennial time period commences on the 1 March prior to commencing ground disturbance and the due date for submitting the results of the Procedure for approval of the CEO as 31 March following the end of the first biennial period; and
  - (vi) identify that any areas cleared within the Water Corridor Development Envelope (Figure 2 of Schedule 1 and geographic coordinates in Schedule 2) and Slurry Corridor Development Envelope (Figure 3 of Schedule 1 and geographic coordinates in Schedule 2) that have not commenced rehabilitation within 12 months of final commissioning of each pipeline are to be considered part of the Water Corridor Development Envelope and Slurry Corridor Development Envelope and must be included in the area subject to condition 14-2.

## **15 Minor or Preliminary Activities**

- 15-1 Notwithstanding those conditions which constrain the undertaking of a specified activity prior to the proponent submitting a plan or report to the CEO and receiving written notice from the CEO that the plan or report meets the requirements of the condition, the CEO may consent, in writing, to the proponent undertaking specified minor and preliminary activity, provided the proponent demonstrates to the CEO that the specified minor and preliminary activity will not undermine the purpose or objectives of the plan or report. This condition does not apply to conditions relating to the submission baseline surveys or disturbance footprint plans.

## **16 Public Availability of Data, Plans, Programs and Surveys**

- 16-1 The proponent shall make all plans approved under these conditions, and all surveys which meet the requirements of these conditions, available to the public in a manner approved by the CEO.

## **17 Staging and Timing for the Submission of Programs**

- 17-1 Where these conditions require surveys, plans and compliance reports to be submitted prior to a specified activity being undertaken, if that activity is to be undertaken in stages or sections, then the surveys, plans and compliance reports may be submitted that relates only to (and prior to) the undertaking of the specified activity relating to that stage or section. Subsequent surveys, plans and compliance reports submitted for the subsequent stages or sections of that activity must update and consolidate the surveys, plans and compliance reports.

**Table 1: Summary of the Proposal**

Proposal Title	North Star Magnetite Project
Short Description	The proposal will involve the construction and operation of an open cut iron ore mine site and associated infrastructure (roads, administration buildings, accommodation camp, borefield and slurry pipeline) approximately 110 kilometres south-south-east of Port Hedland.

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

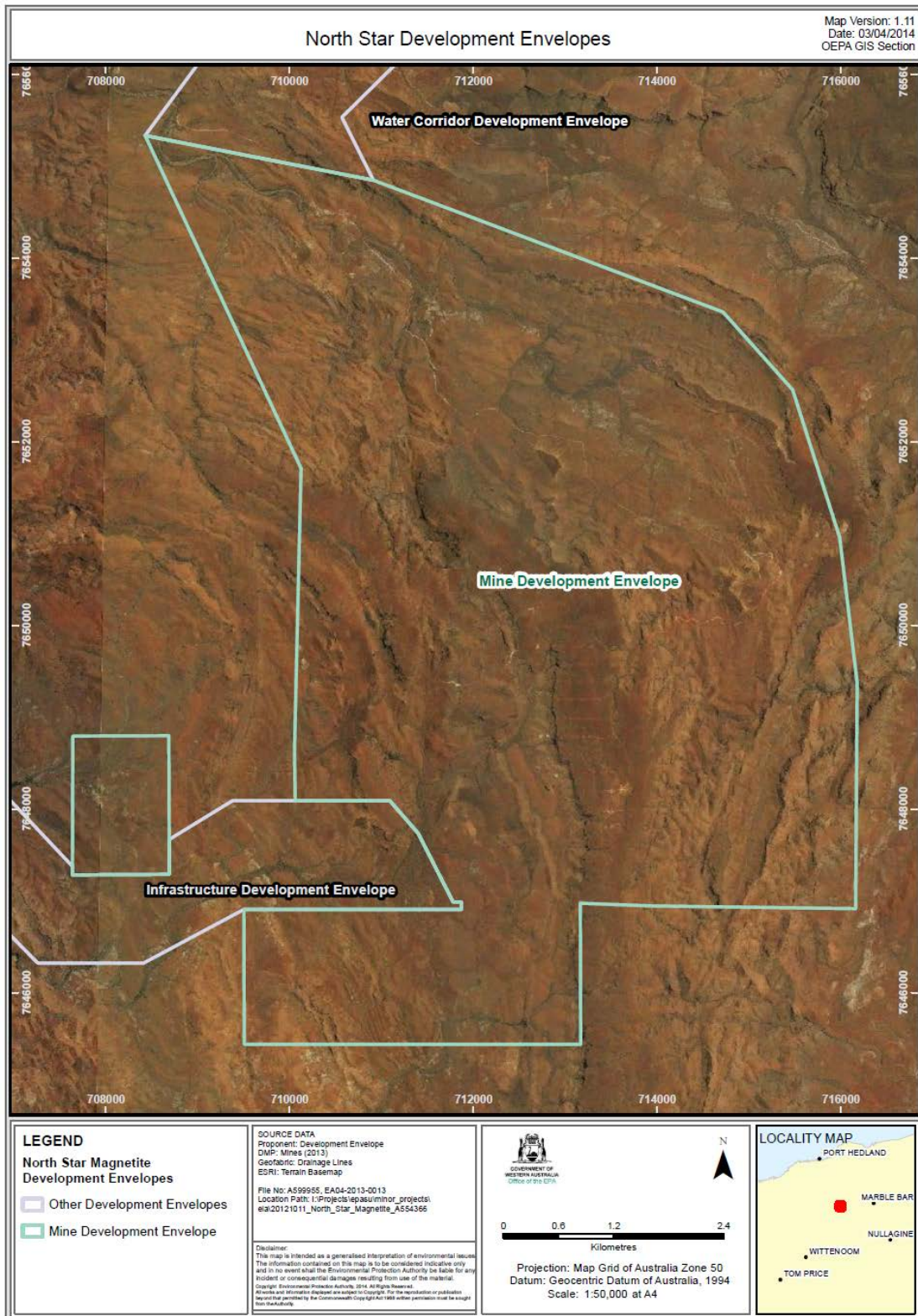
Column 1	Column 2	Column 3
Element	Location	Authorised Extent
<p><b>Mine Development Envelope</b></p> <p>Open-cut mine pit, waste rock dumps, tailing storage facility and associated infrastructure.</p>	Figure 1 of Schedule 1 and geographic coordinates as defined in Schedule 2	Clearing of no more than 3,493 ha within the mine development envelope of 4,970 ha.
<p><b>Water Corridor Development Envelope</b></p> <p>Borefield, water supply pipeline and associated infrastructure.</p>	Figure 2 of Schedule 1 and geographic coordinates as defined in Schedule 2	Clearing of no more than 886 ha within the water corridor development envelope of 28,696 ha.  Abstraction at a rate of no more than 14 GL/a.
<p><b>Slurry Corridor Development Envelope</b></p> <p>Slurry pipeline, natural gas pipeline, access road and associated infrastructure.</p>	Figures 3 of Schedule 1 and geographic coordinates as defined in Schedule 2	Clearing of no more than 315 ha within the slurry corridor development envelope of 2,235 ha.
<p><b>Infrastructure Development Corridor</b></p> <p>Access roads, transmission pipelines, gas pipeline and slurry pipeline.</p>	Figures 4 of Schedule 1 and geographic coordinates as defined in Schedule 2	Clearing of no more than 447 ha within the infrastructure corridor development envelope of 4,171 ha.

**Table 3: Abbreviations**

Abbreviation	Term
CPI	Consumer Price Index
ha	hectares
km	kilometre
GL/a	gigalitre per annum
CEO	The Chief Executive Officer of the Department of the Public Service of the State responsible for the administration of section 48 of the <i>Environmental Protection Act 1986</i> , or his delegate.
CPI	Consumer Price Index
DPaW	Department of Parks and Wildlife
EPA	Environmental Protection Authority
EP Act	<i>Environmental Protection Act 1986</i>
DoW	Department of Water
Capricorn Land System	Hills and ridges of sandstone and dolomite supporting shrubby hard and soft spinifex grasslands, covering approximately 530,000 ha of the Pilbara bioregion.
Mining Operations	As defined in section 8 of the <i>Mining Act 1978</i>
Linear Infrastructure	Relates to infrastructure such as pipelines and access roads
Fauna-rescue personnel	Means employees of the proponent who meet the requirements of condition 13-2 and whose responsibility it is to walk the open trench to recover and record fauna found within the trenches associated with the construction of the Linear Infrastructure.

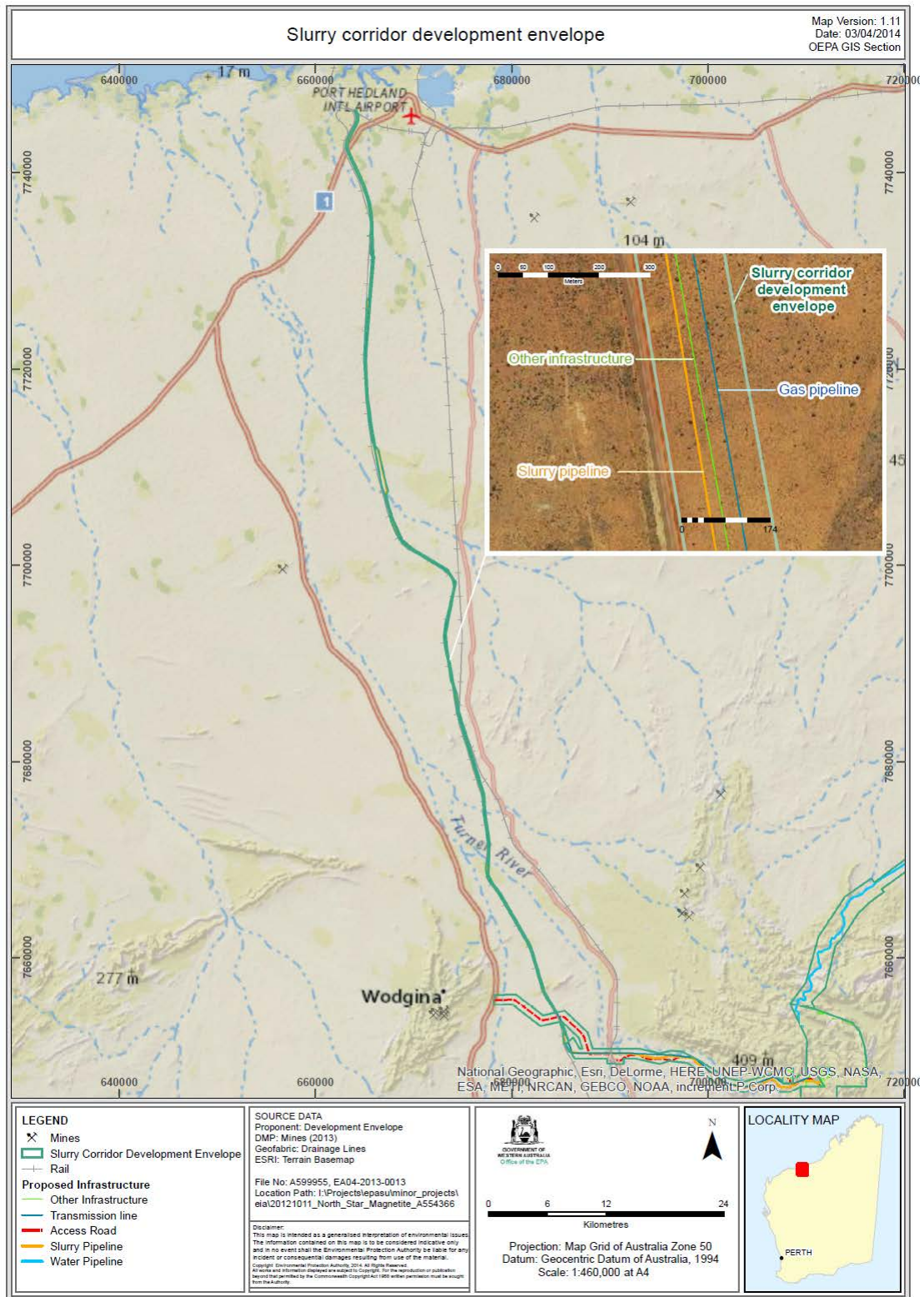
## **Figures (attached)**

- Figure 1 Mine development envelope
- Figure 2 Water corridor development envelope (including borefield)
- Figure 3 Slurry corridor development envelope
- Figure 4 Infrastructure corridor development envelope
- Figure 5 Predicted lateral extent of Cave 13 and Mine Exclusion Zone
- Figure 6 Cave 13 location and 30 km research area
- Figure 7 Northern Quoll denning and foraging habitat
- Figure 8 Site 12 Pool catchment boundary

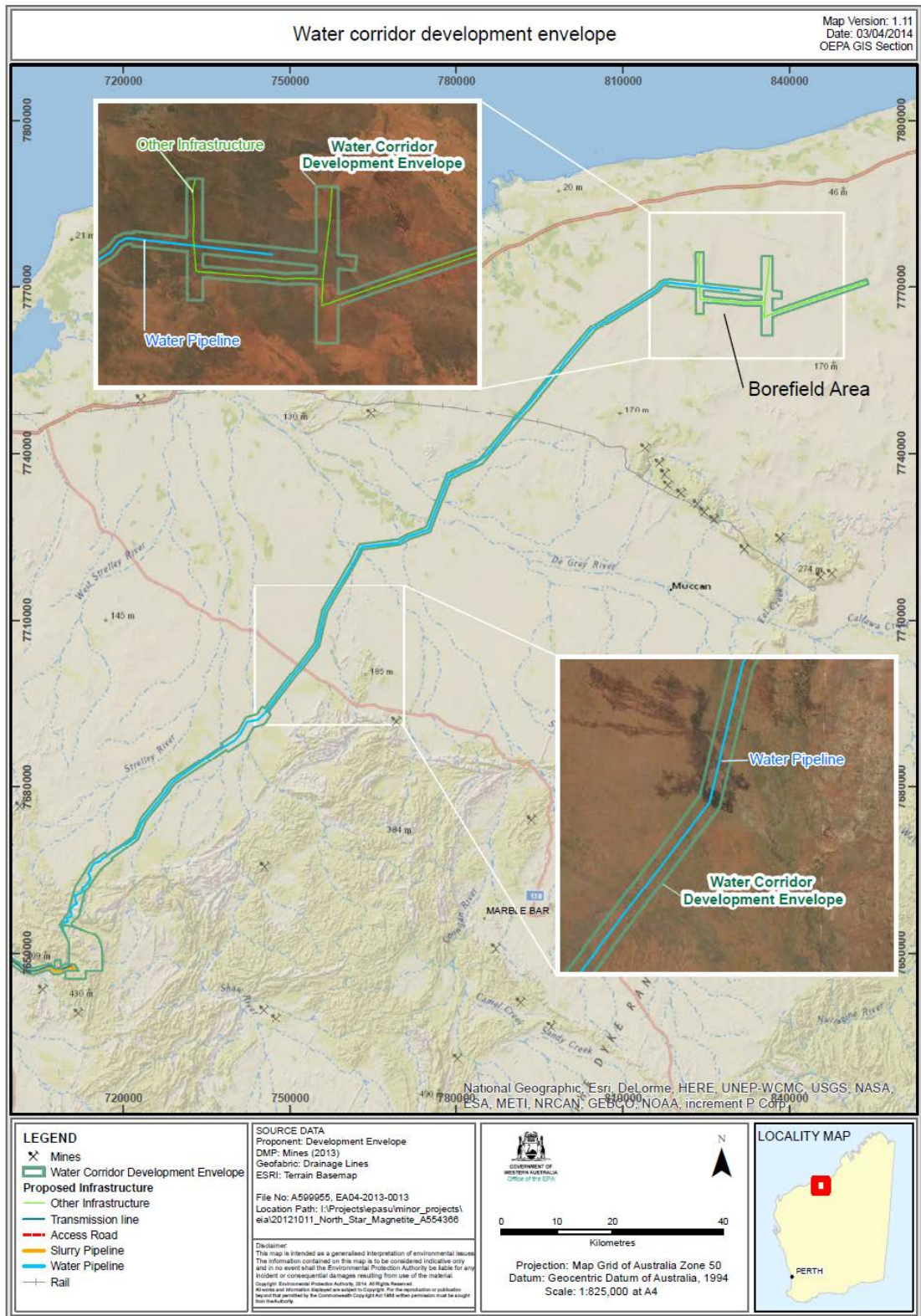


**Figure 1 Mine development envelope**





**Figure 2 Slurry corridor development envelope**



**Figure 3 Water corridor development envelope (including borefield)**

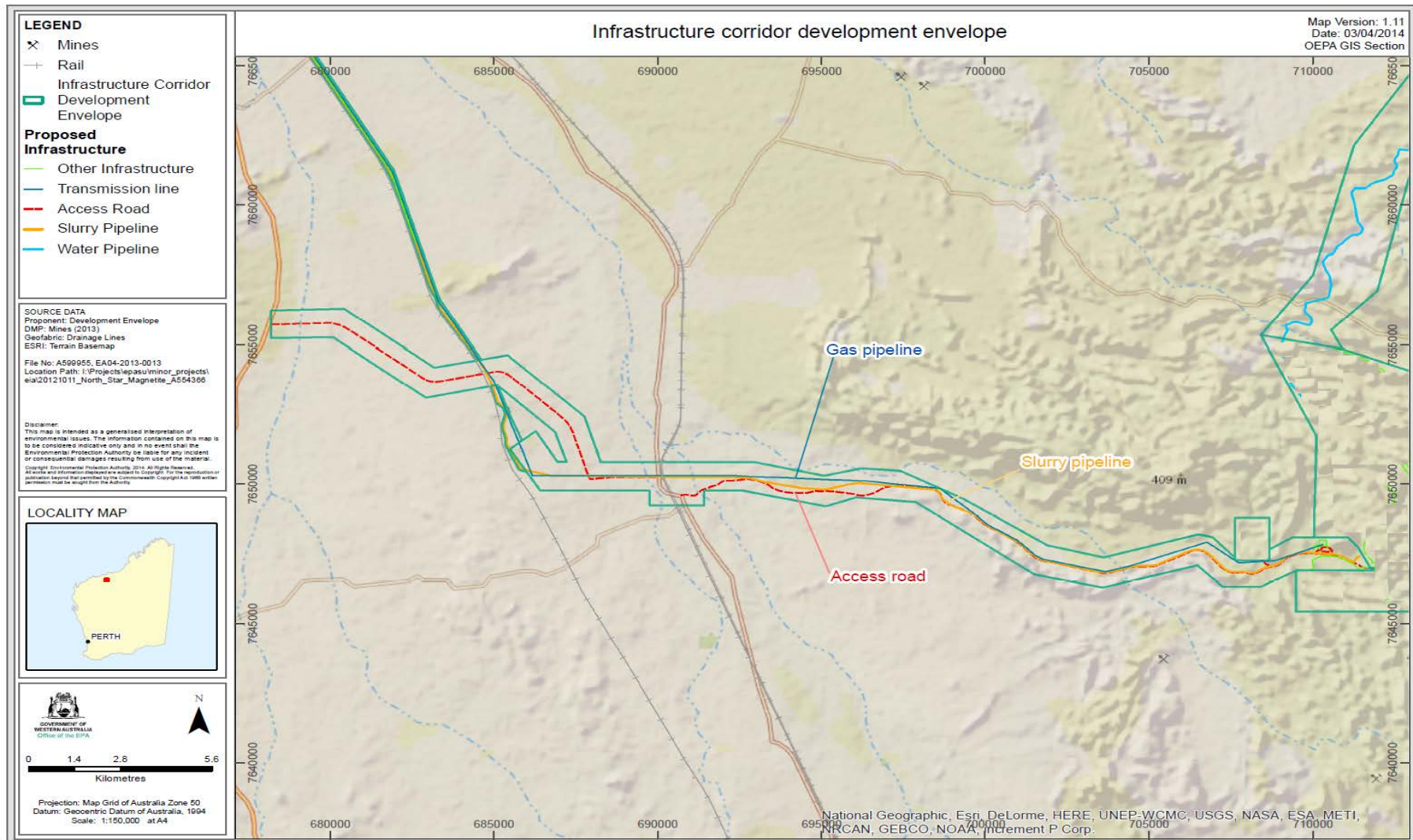
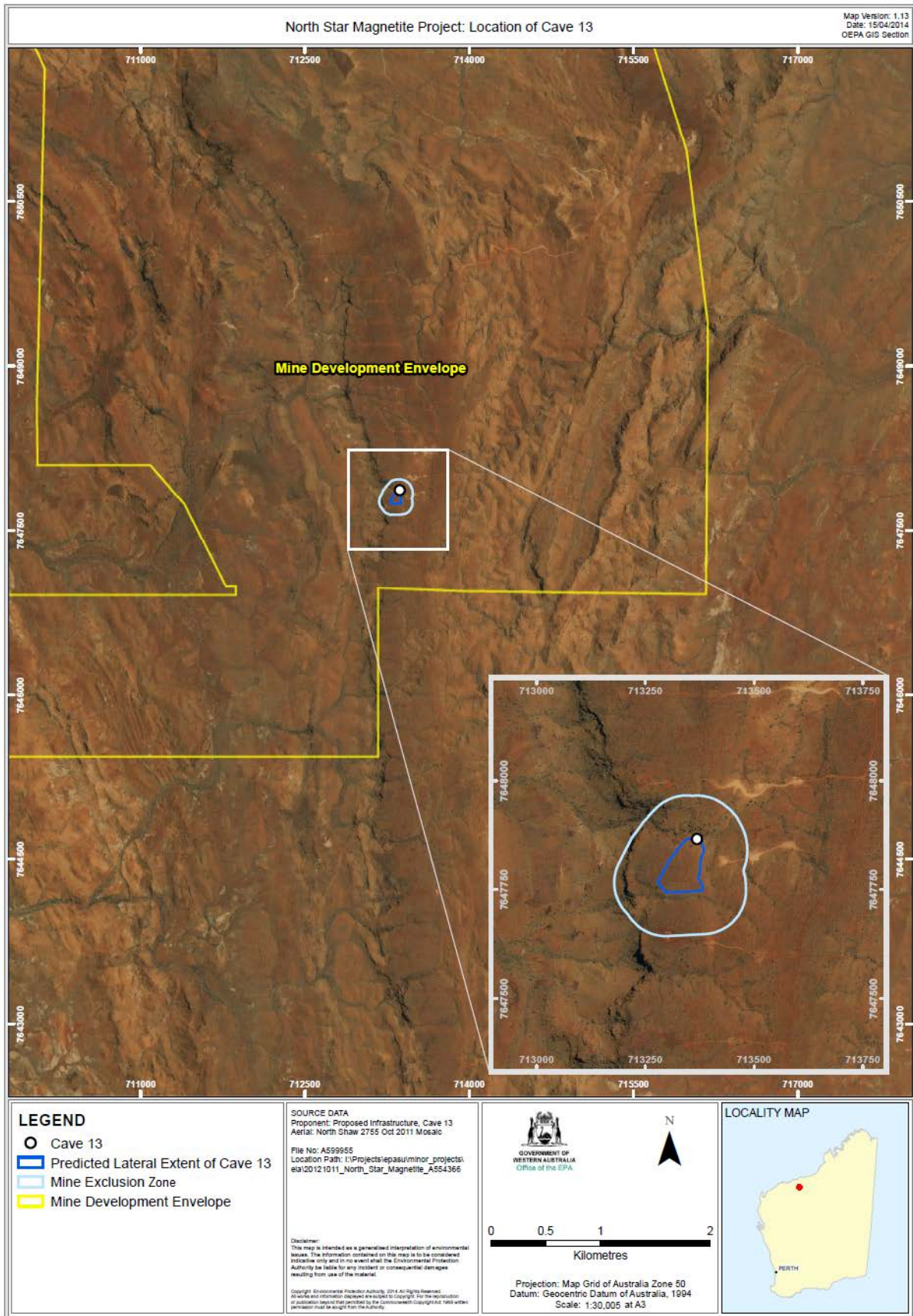
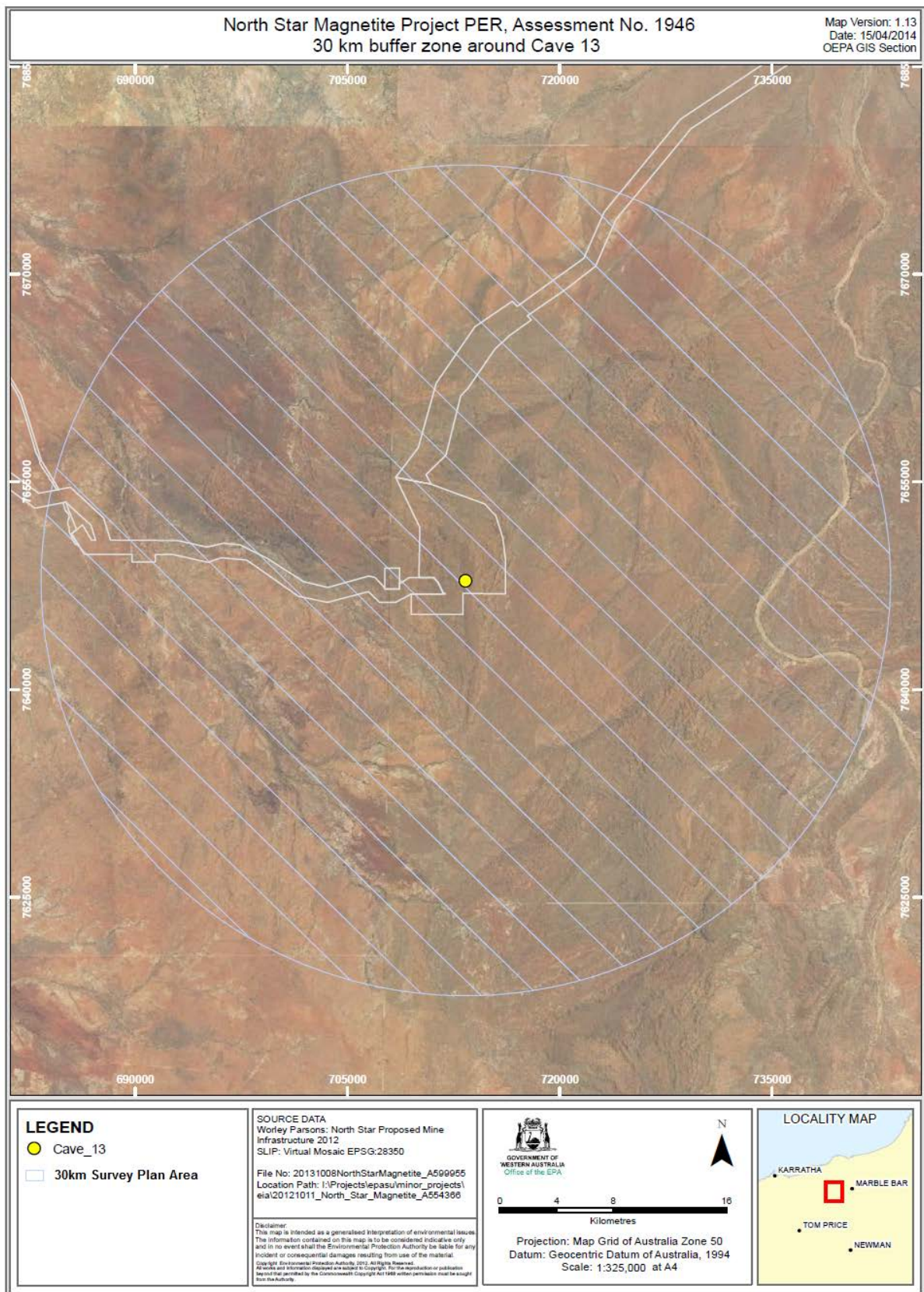


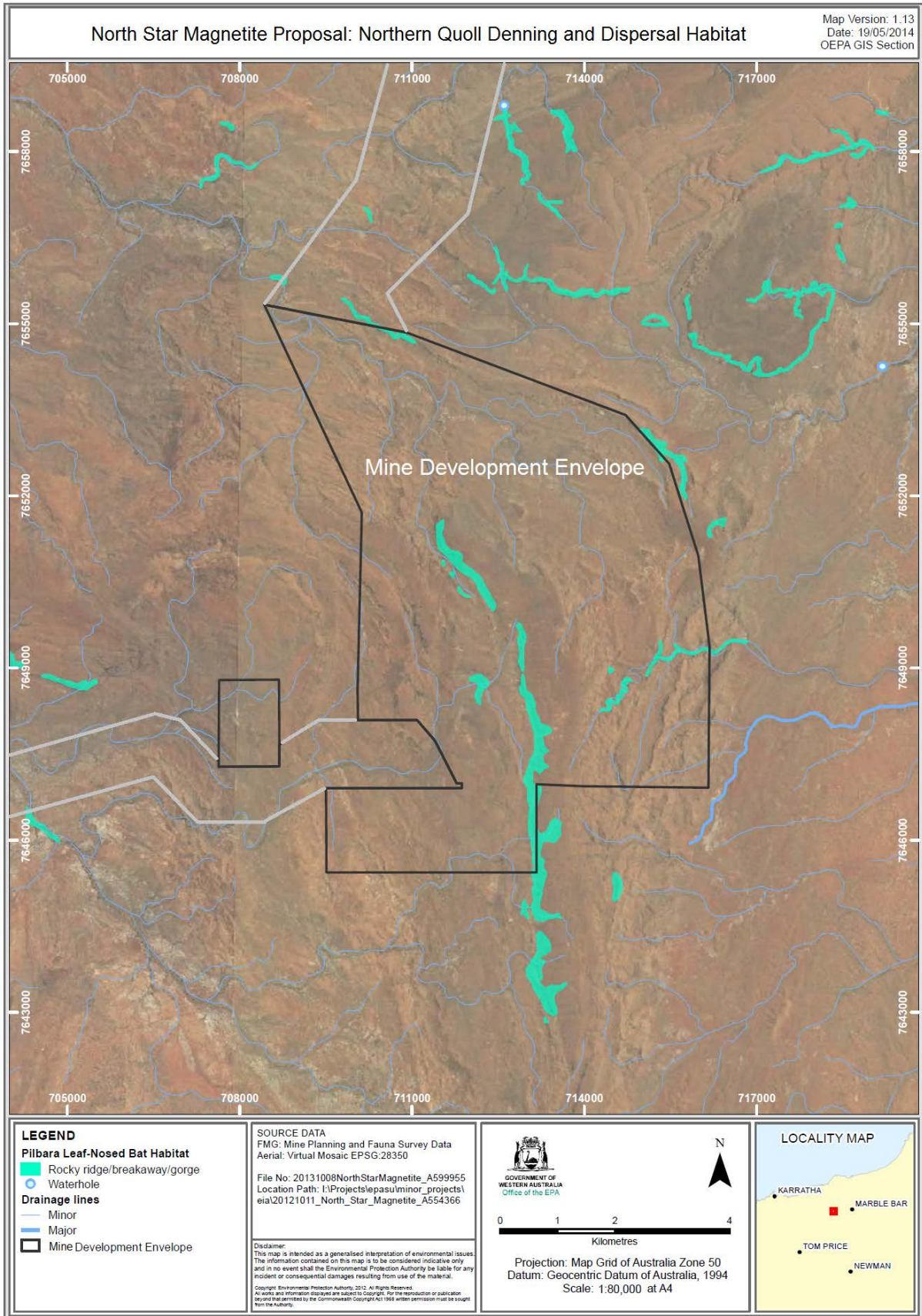
Figure 4 Infrastructure corridor development envelope



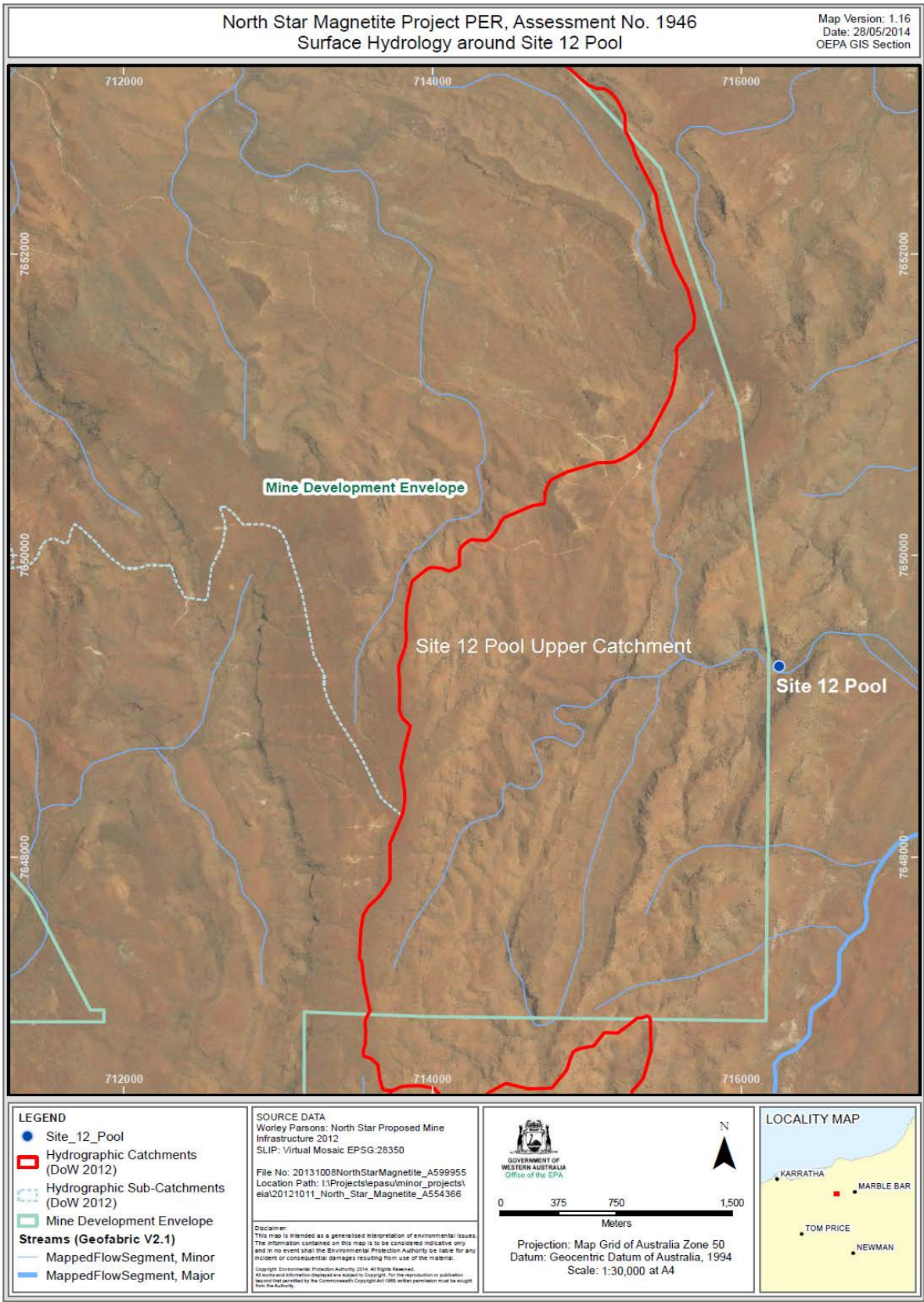
**Figure 5 Predicted lateral extent of Cave 13 and Mining Exclusion Zone**



**Figure 6 Cave 13 location and 30km survey plan area**



**Figure 7 North Quoll denning and foraging habitat**



**Figure 8 Site 12 Pool catchment boundary**

**NORTH STAR MAGNETITE PROJECT**

**Coordinates that define the Development Envelopes**

Coordinates defining the following are held by the Office of the EPA, dated 13 June 2014:

- Development envelopes (Figures 1 to 4)
- Predicted lateral extent of Cave 13 and Mining Exclusion Zone (Figure 5)
- Cave 13 location and 30km survey plan area (Figure 6)
- North Quoll denning and foraging habitat (Figure 7)
- Site 12 Pool catchment boundary



## Notes

The following notes are provided for information and do not form a part of the implementation conditions of the Statement:

- The proponent for the time being nominated by the Minister for Environment under section 38(6) of the *Environmental Protection Act 1986* is responsible for the implementation of the proposal unless and until that nomination has been revoked and another person is nominated.
- If the person nominated by the Minister, ceases to have responsibility for the proposal, that person is required to provide written notice to the Environmental Protection Authority of its intention to relinquish responsibility for the proposal and the name of the person to whom responsibility for the proposal will pass or has passed. The Minister for Environment may revoke a nomination made under section 38(6) of the *Environmental Protection Act 1986* and nominate another person.
- To initiate a change of proponent, the nominated proponent and proposed proponent are required to complete and submit *Post Assessment Form 1 – Application to Change Nominated Proponent*.
- The General Manager of the Office of the Environmental Protection Authority was the Chief Executive Officer of the Department of the Public Service of the State responsible for the administration of section 48 of the *Environmental Protection Act 1986* at the time the Statement was signed by the Minister for Environment.

# **Appendix 5**

## **Response to Submissions**

Provided on CD in hardcopies of this report and at [www.epa.wa.gov.au](http://www.epa.wa.gov.au)