Report and recommendations of the Environmental Protection Authority

Koodaideri Iron Ore and Infrastructure Project

Mount Bruce Mining Pty Limited

Report 1533

November 2014

Public Environmental Review
Environmental Impact Assessment Process Timelines

Date	Progress stages	Time (weeks)
30/07/2012	Level of assessment set	
14/12/2012	Final Environmental Scoping Document approved	**20**
22/7/2013	Public Environmental Review document (PER) released for public review	**31**
02/09/2013	Public review period for PER closed	**6**
16/05/2014	Final proponent response to PER issues raised	**37**
19/06/2014	EPA meeting	**5**
16/10/2014	Final additional information submitted on proposed conditions	**17**
12/11/2014	Provision of the EPA Report to Minister	**4**
18/11/2014	Publication of EPA report (3 working days after report to Minister)	**3 days**
02/12/2014	Close of appeals period	**2**

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 timeline objective in the completion of the assessment and provision of a report to the Minister.

Dr Paul Vogel
Chairman

13 November 2014

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Summary and recommendations

This report provides the Environmental Protection Authority's (EPA's) advice and recommendations to the Minister for Environment on the proposal by Mount Bruce Mining Pty Limited (Mount Bruce Mining), a wholly owned subsidiary of Rio Tinto, to construct and operate an open cut iron ore mine and associated infrastructure for the extraction, processing and transport of iron ore. The proposal is located approximately 110 kilometres (km) west-north-west of Newman in the Pilbara region of Western Australia.

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) Terrestrial Fauna;

(b) Subterranean Fauna;

(c) Flora and Vegetation;

(d) Hydrological Processes and Inland Waters Environmental Quality;

(e) Human Health;

(f) Rehabilitation and Closure – integrating factor; and

(g) 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 principle of waste minimisation.

Conclusion

The EPA has considered the proposal by Mount Bruce Mining to develop and operate the Koodaideri Iron Ore Mine and Infrastructure Project located approximately 110 km west-north-west of Newman in the Pilbara region (Figure 2).

The EPA has concluded that 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 4 and summarised in Section 5.

Recommendations

That the Minister for Environment:

1. notes that the proposal being assessed is for the development and operation of the Koodaideri Iron Ore Mine and Infrastructure Project located 110 km west-north-west of Newman in the Pilbara region;
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 4 and summarised in Section 5;
4. notes the EPA's other advice presented in Section 6; and
5. imposes the conditions and procedures recommended in Appendix 4 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 Mount Bruce Mining to develop the Koodaideri Iron Ore Mine and Infrastructure Project is approved for implementation. These conditions are presented in Appendix 4. Matters addressed in the conditions include the following:

(a) ensuring that the proposal is implemented in a manner that maintains the Pilbara Leaf-nosed Bat colony which resides within the K75W adit/cave system (conditions 6 and 7);

(a) ensuring that troglofauna are protected by excluding mining and infrastructure placement within a portion of troglofauna habitat (condition 6);

(b) ensuring that mine construction and operational activities are carried out in a manner that minimises impacts to the Northern Quoll (condition 8);

(c) ensuring that mining and infrastructure is sited in a manner that avoids the Declared Rare Flora, Hamersley Lepidium (condition 9);

(d) ensuring that the proposal is implemented so that it does not affect the viability of the Priority 1, *Sauropus* sp. Koodaideri detritals (condition 10);

(e) ensuring that mining activities do not impact the hydrological regime or water quality of the Koodaideri Spring Gorge (condition 11);

(f) ensuring the proposal does not increase the spread of asbestos in the environment, resulting in adverse effects on public health (condition 12);

(g) requiring the proponent close, decommission and rehabilitate the mine in an ecologically sustainable manner through the development and implementation of a Mine Closure Plan (condition 13); and

(h) 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 which contains habitat for the Northern Quoll and foraging habitat for the Pilbara Leaf-nosed Bat (condition 14).

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1. Introduction and background

This report provides the advice and recommendations of the Environmental Protection Authority (EPA) to the Minister for Environment on the key environmental factors and principles for the proposal by Mount Bruce Mining Pty Limited (Mount Bruce Mining), to construct and operate an open cut iron ore mine and associated infrastructure for the extraction, processing and transport of iron ore.

Mount Bruce Mining referred the proposal to the EPA on 29 May 2012. On 30 July 2012 the EPA set the level of assessment at Public Environmental Review (PER) with a six-week public review period. The PER document was released for public review between 22 July 2013 and 2 September 2013.

The project was determined to be a controlled action under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) on 9 July 2012 as it may impact on Matters of National Environmental Significance (MNES) – listed threatened species and communities (section 18 and 18A). The proposal is being assessed under the bilateral agreement between the Commonwealth and Western Australian governments.

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 and Section 7 presents the EPA's recommendations.

Appendix 6 contains a summary of submissions and the proponent's response to submissions and 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

Mount Bruce Mining proposes to construct and operate an open cut iron ore mine and ore processing operation with product transported to ports through connection with Rio Tinto's existing heavy freight railway network.

The proposal is located approximately 110 km west-north-west of Newman in the Pilbara region of Western Australia (Figure 1). The development envelope for the Koodaideri proposal is located seven kilometres from the mapped boundary of the Fortescue Marsh at its nearest point and five kilometres from its associated fringing vegetation. The Fortescue Marsh is a nationally and internationally important wetland. The proposal is partially located within an area which has been proposed for conservation tenure following the partial resumption of Western Australian pastoral leases proposed in 2015 (Marillana 2015 Area).

The proposal includes an open cut iron ore mine, ore processing areas, waste dumps, waste fines storage facility a railway corridor and an infrastructure corridor. The proposal will have an operational mine life of more than 30 years and will generate up to 70 million tonnes a year of product. The proposal is located within development envelopes covering 65,888 hectares (ha). Mining will take place predominantly above the watertable. The proposal comprises elements within three distinct development envelopes (Figure 2):

- **Mine/Plant Area development envelope**: mine pits K75W, K58W and K38W, waste dumps and stockpiles, Waste Fines Storage Facility (WFSF) and process related infrastructure;
- **Western Rail Corridor development envelope**: a 167 km length of railway and associated infrastructure such as service roads to enable transportation to ports through connection with Rio Tinto's existing heavy freight railway network. During initial stages only, ore may also be hauled by truck to Rio Tinto's Yandicoogina operation on existing road networks.
- **Southern Infrastructure Corridor development envelope**: links the proposal to Rio Tinto's Yandicoogina operation and contains the potential alignments for power, water, communication towers and road infrastructure.

Table 1: Key proposal characteristics

Summary of the Proposal		
Proposal title	Koodaideri Iron Ore Mine and Infrastructure Project	
Proponent name	Mount Bruce Mining Pty Limited	
Short description	The proposal is to construct and operate an open cut iron ore mine and associated infrastructure (railway, roads, administration buildings, accommodation camp, water supply infrastructure) for the extraction, processing and transport of iron ore. The proposal is located approximately 110 km west-north-west of Newman in the Pilbara region of Western Australia.	
Element	**Location**	**Proposed Extent**
Physical Elements		
Mine and associated infrastructure	Figure 2 and Figure 3	Clearing no more than 7,911 ha (including no more than 3,096 ha of the Marillana 2015 Area) within a 19,188 ha Mine/Plant Area development envelope.
Railway infrastructure	Figure 2	Clearing no more than 4,014 ha within a 34,697 ha Western Rail Corridor development envelope.
Power, water, communication towers and road infrastructure	Figure 2	Clearing no more than 246 ha within a 12,003 ha Southern Infrastructure Corridor development envelope.
Operational Elements		
Dewatering	Figure 3	The K58W mine pit will not be dewatered.
Water supply	Figure 2	Water for construction and operations phases (up to 18 GL per year) will be supplied by groundwater abstraction during construction and in-pit sump pumps, Waste Fines Storage Facility decant water and surplus water from Hamersley Iron Pty Limited's Yandicoogina mine during operation.
Surface water discharge		No off-site surface water discharges from mine pits (from dewatering) or from the Waste Fines Storage Facilities will occur, except under emergency circumstances (e.g. major rainfall or flood events).
Mineral waste disposal	Figure 3	Pits will be backfilled above pre-mining groundwater levels to prevent the formation of pit lakes.

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

Five public and eleven agency submissions were received during the public review period. Key issues raised relate to:

- potential changes to the hydrological regime and water quality of Koodaideri Spring;
- impacts to conservation significant vegetation and flora, including impacts to Threatened and Priority flora species and areas of significant vegetation;
- impacts to conservation significant fauna, including impacts to threatened fauna species and habitat, including troglofauna;
- risks associated with the Western Rail Corridor route through the Wittenoom Asbestos Management Area (WAMA) and potential effects on pastoral activities; and
- potential impacts from waste material, including Acid Mine Drainage and concern regarding potential future pit expansion (requiring further testing) and potential for acid forming sulfidic rock materials.

In assessing the proposal, the EPA notes that Mount Bruce Mining has actively sought to avoid, minimise and rectify environmental impacts through the design of the proposal by:

- avoiding direct disturbance to the Pilbara Leaf-nosed Bat maternal roost (K75W adit/cave system) and the Koodaideri Spring Gorge (Koodaideri Spring and associated creek and pools);
- avoiding the Declared Rare Flora species *Lepidium catapycnon* through a 50 metres (m) buffer around each individual;
- avoiding the formation of permanent pit lakes through the progressive backfilling of mine pits K75W and K38W to above pre-mining groundwater levels;
- minimising indirect impacts on Pilbara Leaf-nosed Bat through a proposed 100 m buffer around the K75W adit/cave system and conducting trials on the potential impacts of vibration on bat behaviour and health;
- minimising impacts on troglofauna habitat through proposed mining exclusion zones;
- minimising the abstraction of groundwater through the use of surplus mine dewater from the Yandicoogina operation; and
- minimising impacts to the Koodaideri Spring Gorge by proposing a 50 m buffer from the edge of the gorge containing the creek system and not dewatering mine pit K58W.

Since the release of the PER, the proponent has undertaken numerous studies to supplement the technical information provided in the PER and to address issues raised in submissions (Rio Tinto 2014).

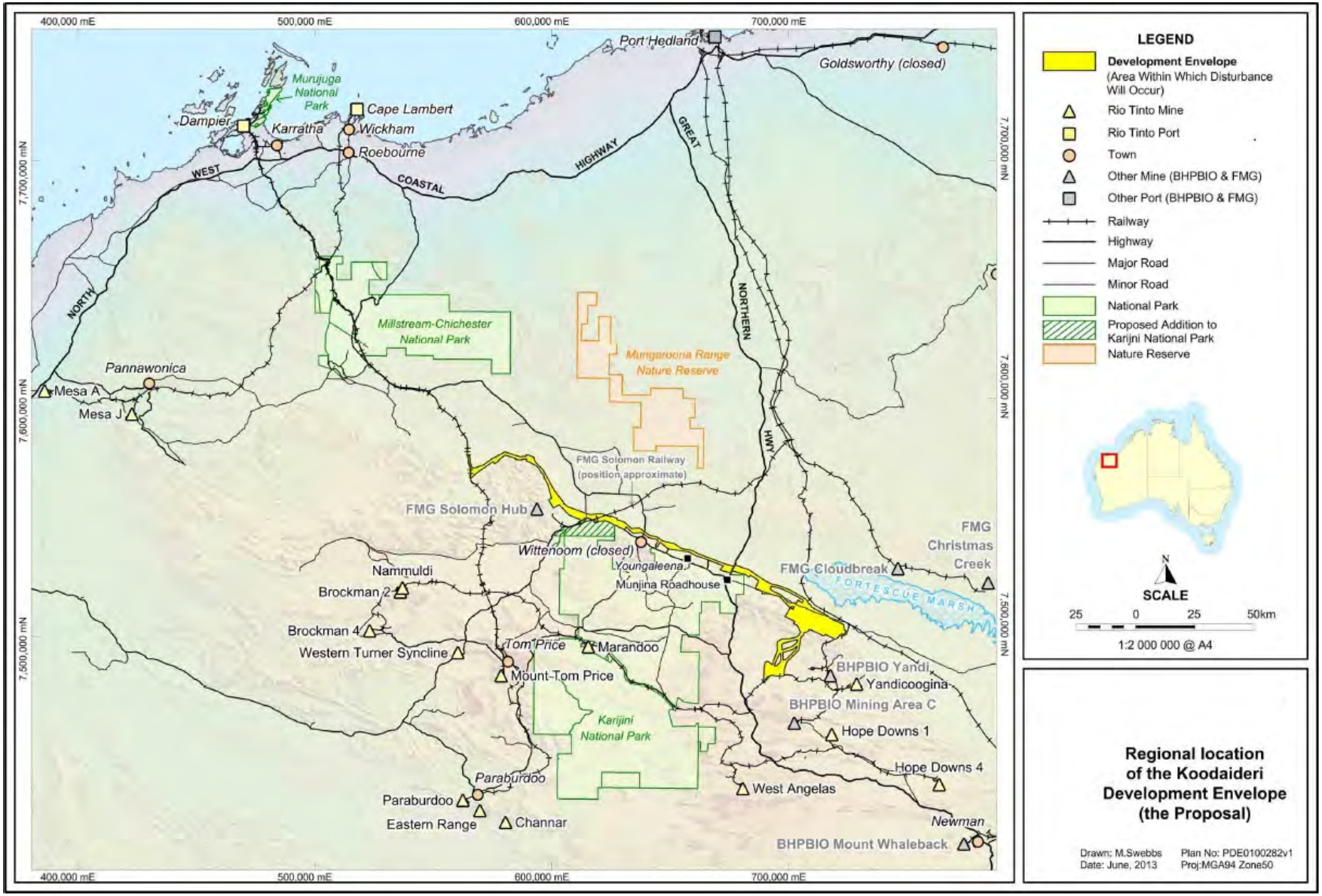

Figure 1: Regional location of the proposal

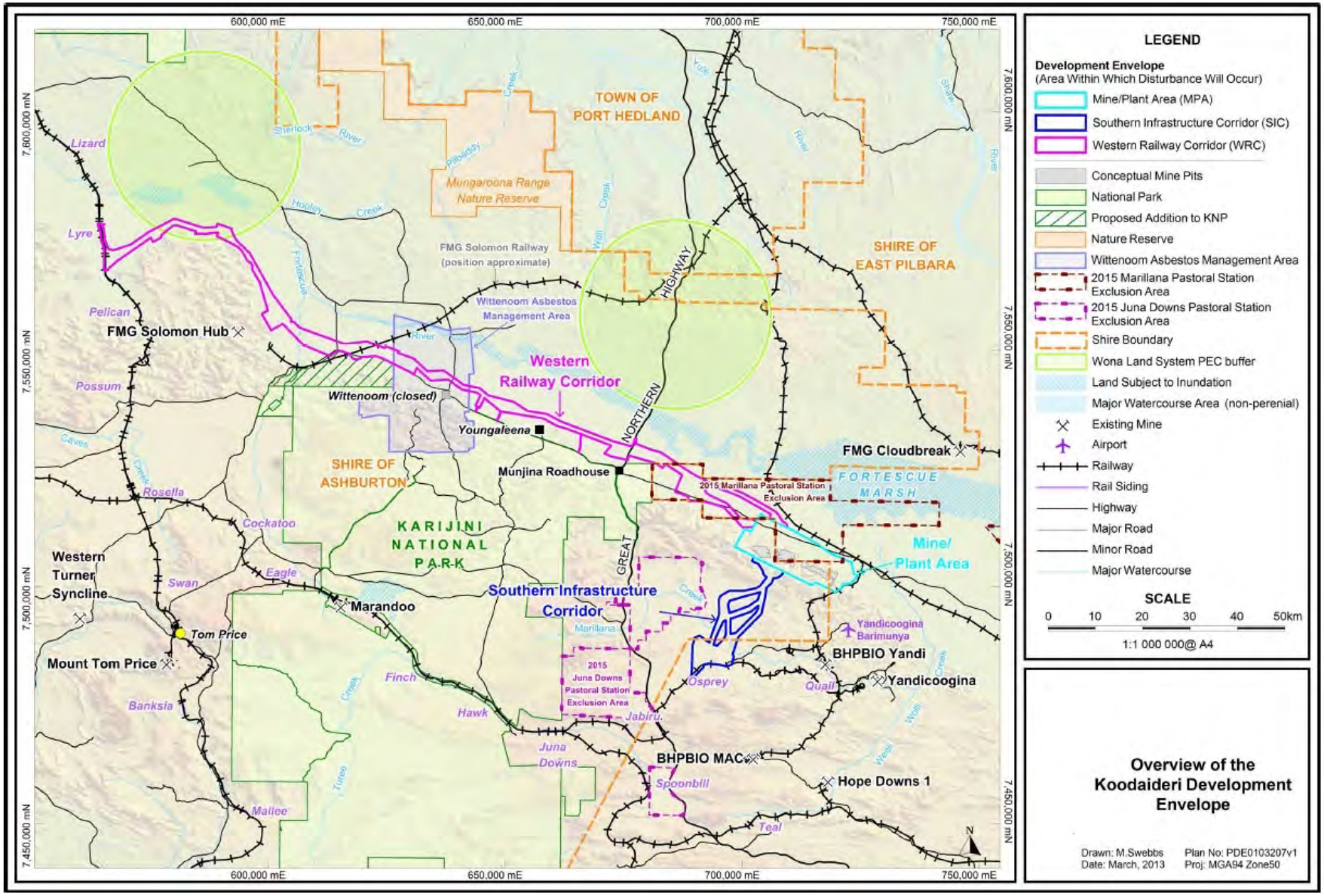

Figure 2: Proposal development envelopes

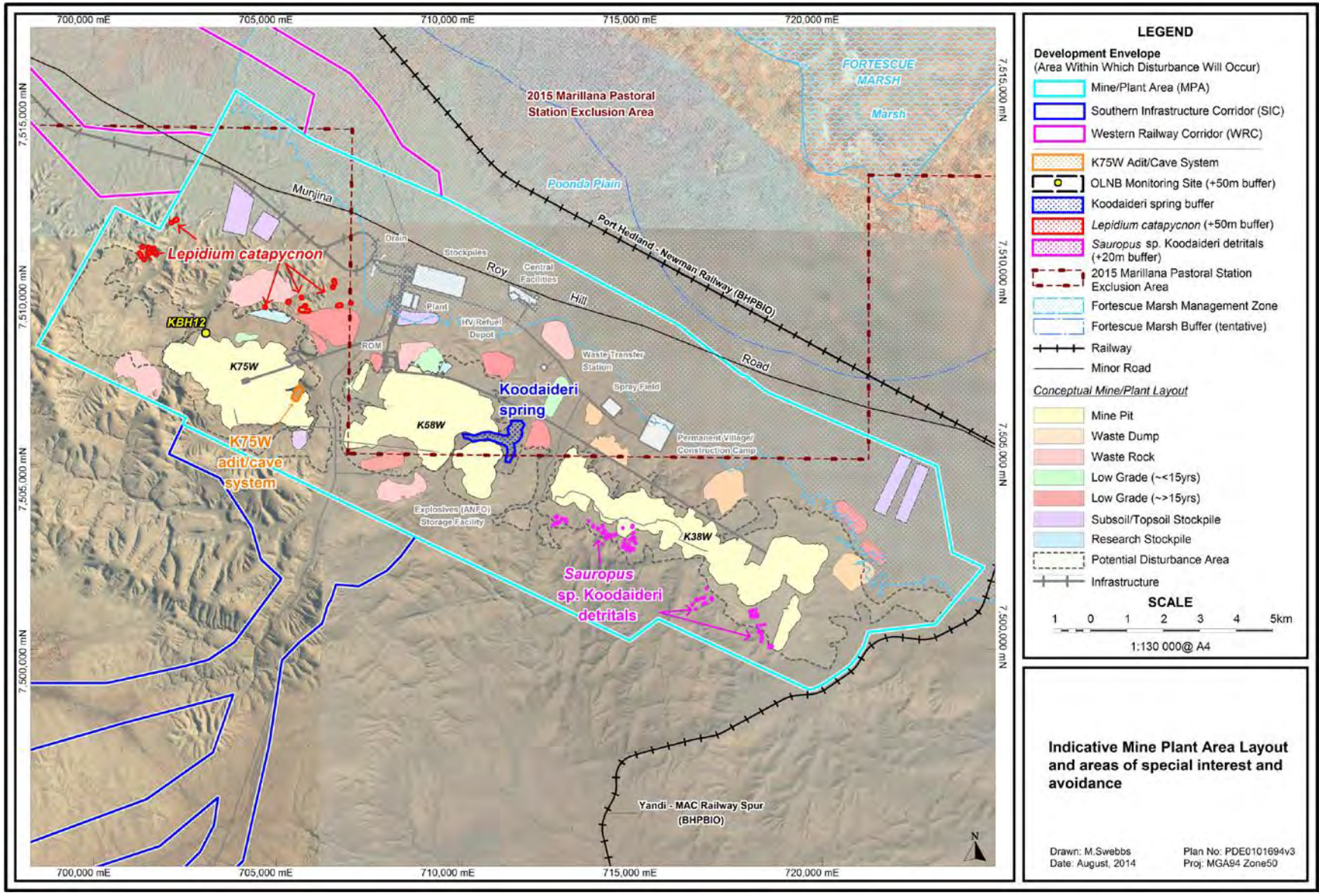

Figure 3: Mine/Plant Area development envelope and areas of interest

3. Key environmental factors and principles

Section 44 of the EP Act 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.

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

(a) Terrestrial Fauna – impacts on conservation significant species (including the Pilbara leaf-nosed Bat), from loss of habitat due to clearing and impacts from construction and operation activities;

(b) Subterranean Fauna – impacts to troglobitic (air-breathing) taxa through the removal of habitat within the Mine/Plant Area development envelope;

(c) Flora and Vegetation – direct impacts from clearing of vegetation within the development envelopes resulting in the loss of priority flora and 11,710 ha of 'good to excellent' quality vegetation;

(d) Hydrological Processes and Inland Waters Environmental Quality – reduction in surface water catchment for the Koodaderi Spring and its associated creek and impacts to water quality from acid and metalliferous drainage;

(e) Human Health – potential spread of asbestos through the construction of a 19 km long section of the railway within the Wittenoom Asbestos Management Area.

(f) Rehabilitation and Closure (integrating factor) – potential long term impacts from the clearing of vegetation, alteration of landforms, and water quality impacts from acid and metalliferous drainage to the surrounding groundwater resources; and

(g) Offsets (integrating factor) – to counterbalance the significant residual impacts to native vegetation in 'good to excellent' condition, including Priority 1 flora species (*Sauropus* sp. Koodaideri detritals) and loss of habitat for conservation significant fauna species.

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. The factors of Terrestrial Fauna and Subterranean Fauna were combined in the Environmental Scoping Document (ESD). However, because of the complexity of the issues relating to these factors, the EPA has evaluated them as separate factors in this report.

Details on the key environmental factors and their assessment are contained in Sections 3.1 - 3.7. 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.

As the EPA is assessing the proposal on behalf of the Commonwealth Government under the Bilateral Agreement, this 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 principle 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 and other advice (to key regulators) on the proposal.

3.1 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 proposal will impact fauna through the loss of habitat due to clearing. The proponent proposes to clear up to 11,710 ha of 'good to excellent' quality native vegetation, which includes habitat for conservation significant fauna. The main potential impacts are to conservation significant fauna (particularly the Pilbara Leaf-nosed Bat) within the Mine/Plant Area development envelope. Fauna may also be impacted by noise, dust, vibration and light from construction and operation activities.

Of the 233 vertebrate fauna species recorded during surveys, 12 species of conservation significance were identified (Table 21 of the PER, Rio Tinto 2013a). Those recorded during the surveys include the following species

protected under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and the Western Australian *Wildlife Conservation Act 1950* (WC Act):

- Pilbara Leaf-nosed Bat *(Rhinonicteris aurantius)* - Vulnerable under the EPBC Act, and Schedule 1 under the WC Act.
- Northern Quoll (*Dasyurus hallucatus*) - Endangered under the EPBC Act and Schedule 1 under the WC Act; and
- Pilbara Olive Python (*Liasis olivaceus barroni)* - Vulnerable under the EPBC Act and Schedule 1 under the WC Act;

Pilbara Leaf-nosed Bat

The Pilbara Leaf-nosed Bat has been subject to a large number of studies in the development envelope and surrounding area (Rio Tinto 2013a and 2014). Studies confirm that there is a large colony of at least 430 individuals in the K75W adit/cave system within the Mine/Plant Area development envelope. The adit/cave system comprises of a natural cave system which the bats access via a disused mining adit (Biota 2013a) (Figure 3).

K75W adit/cave system

The Department of Parks and Wildlife has advised that the adit/cave system is one of the 26 known maternal roosts in the Pilbara. The K75W adit/cave system is one of approximately 10 known roosts in the Hamersley range; there are no other confirmed diurnal roosts along the north-eastern Hamersley Range or the Southern Chichester Range adjacent to the Fortescue Marsh (Biota 2014a) (Figure 4). The colony is considered to be regionally significant and is likely to be an important contributor to the presence of the species in the central Pilbara, and important for maintaining the regional genetic diversity between the eastern and western Pilbara (Biota 2012a).

Mount Bruce Mining proposes to avoid mining the adit/cave system; however, mining will take place adjacent to the adit/cave system in pit K75W and there are potential indirect impacts from noise and vibration due to the proximity of the mining activity to the cave.

Mount Bruce Mining has undertaken a three dimensional (3D) (laser scanning) survey to determine the lateral extent of the adit/cave system. The proponent notes that the 3D laser survey could not map the minor chambers off the main chamber (Rio Tinto 2014) within which bats are considered to roost (Biota 2013c). The proponent has committed to investigating other geophysical methods for identifying the extent of any side chambers during 2014 (Rio Tinto 2014).

A seismic blasting trial was conducted using modified charge weights (Biota 2013c). The report concluded that there was very little evidence of any disturbance behaviour that could be associated with the trial blasts. Based on the results of the trial, the proponent considers that a 100 m buffer for the adit/cave system and a vibration level of no more than 10 mms^{-1} peak particle

velocity will be achievable and not cause a behavioural response in the colony (Rio Tinto 2014).

To minimise impacts to the bat colony within the adit/cave system, the proponent initially proposed a 50 m non-disturbance buffer and a 50 m non-mining buffer where infrastructure such as safety bunds, access roads and minor utilities could be constructed. After discussion with the EPA the proponent has since committed to a 100 m non-disturbance buffer around the known extent of the adit/cave system (Biota 2014d) (Figure 7). This buffer minimises potential impacts to the colony. To mitigate impacts to the colony the proponent has also committed to the design and implementation of a monitoring program to collect data on the roost condition and size of the population over time (Biota 2014d).

The EPA considers that consistent with conditions proposed for the recent North Star Magnetite Project proposal, a 100 m exclusion zone around the lateral extent of the adit/cave system is appropriate. This has been included in recommended condition 6.

The EPA notes from the seismic report (Biota 2013c) that monitoring of bat behaviour in the side chambers, where bats are thought to roost, was not possible during the seismic blasting trial. In addition the trial was not able to predict the long-term impacts on the population from blast noise. The EPA has recommended condition 7 which requires monitoring of bat behaviour and appropriate management responses, as activities move within 400 m of the K75W adit/cave system exclusion zone.

The EPA considers that until the full extent of the adit/cave system is known, drilling and blasting could compromise the adit/cave system (including unmapped side chambers) making it an unsuitable roost. Therefore the EPA recommends that the proponent's commitment to map the full extent of the adit/cave system is included in condition 7.

The EPA notes that the K75W adit/cave system is an important maternal roost and the population is dependent on the adit/cave. Should the confirmed lateral extent of the adit/cave system (as required by recommended condition 7) be considerably different than the current predicted extent, the EPA expects that the K75W adit/cave system exclusion zone required by recommended condition 6 would be amended accordingly through a formal change to conditions under s46 of the EP Act.

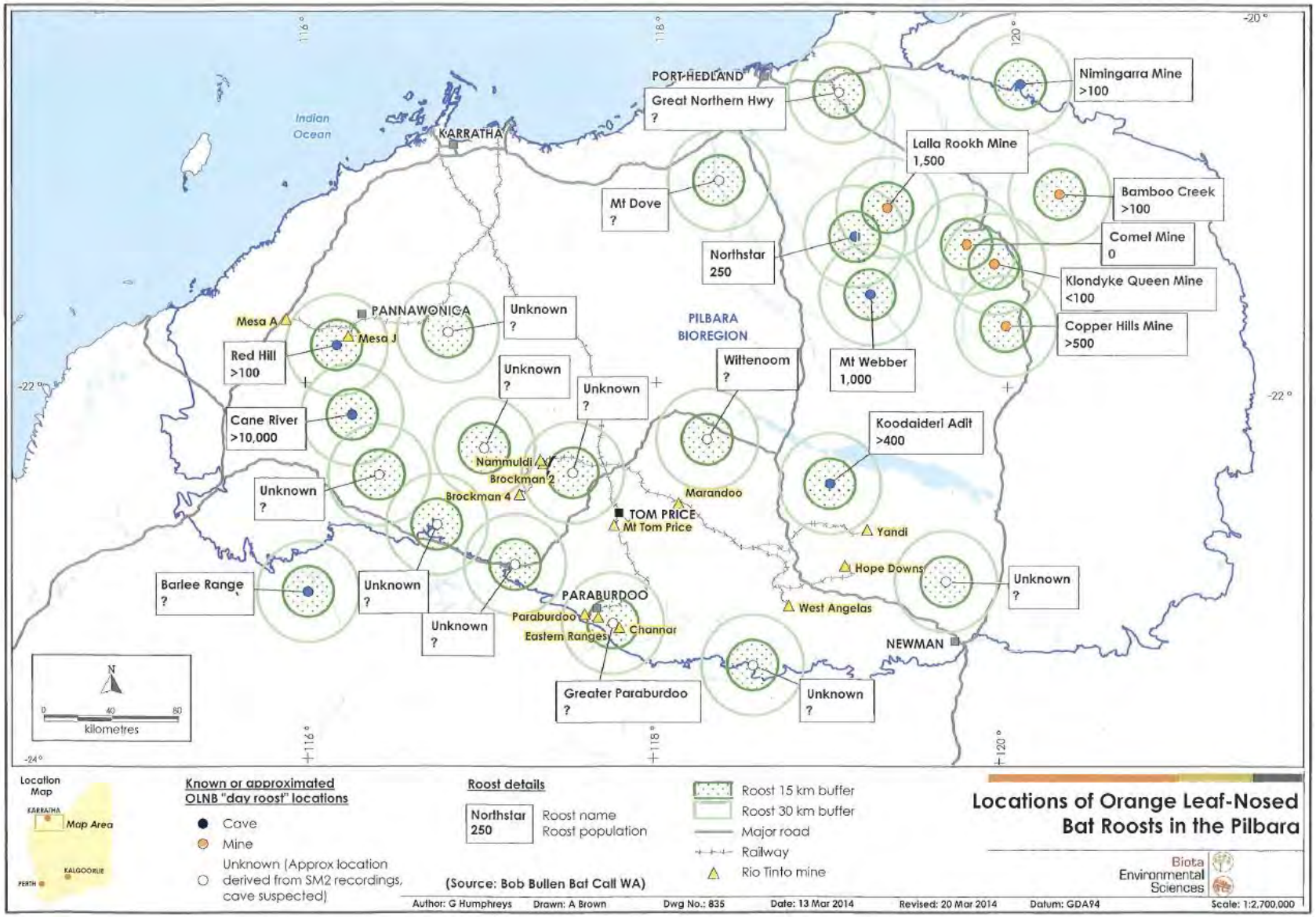

Figure 4: Regional map of Pilbara Leaf-nosed Bat roosts

Foraging habitat

The Foraging Habitat and Dispersal Assessment (Biota 2013b) determined that most foraging activity of the bat colony occurs within a 15 km radius of the adit/cave system during wet and dry season conditions with only two records of bats travelling further, approximately 30 km, in the wet season (Figure 5). The report noted that dry season records tended to be localised around very high value habitat such as the Koodaideri Spring Gorge (Koodaideri Spring, associated creek, pools and vegetation) which is therefore considered essential to the survival of the colony.

The report identified 29,885 ha of suitable foraging habitat within 15 km of the K75W adit/cave system (Biota 2013b) (Category 2 to 5 in Figure 6). The proponent proposes to avoid direct disturbance to 71 ha containing the adit/cave system (Category 5) and the 'very high value' foraging and drinking habitat of the Koodaideri Spring Gorge (Category 4). The proponent has committed to a 50 m non-mining buffer from the edge of the gorge containing the Koodaideri Spring (Figure 6).

The report (Biota 2013b) also identified two other important foraging areas to the west of K75W adit/cave system, KBH12 and KBH25 (Figure 5). KBH12 is located within a gorge about three kilometres from the adit/cave system within the Mine/Plant Area development envelope. KBH12 has been classified as having 'high' value (Category 3) foraging habitat. The proponent has committed to a 50 m buffer around KBH12 and will avoid disturbance to the gorge (Figure 7). The KBH25 site is located in 'very high' value habitat (Category 4) containing a semi-permanent pool and is about 11.7 km west of the adit/cave. This site is located outside the development envelope.

To protect these important foraging areas for the bat within the development envelope, the proponent's commitments to provide 50 m buffers around the Koodaideri Spring Gorge and KBH12 have been included as part of recommended condition 6.

Of the 29,814 ha of 'high' (Category 3) and 'moderate' (Category 2) foraging habitat, the proposal will disturb 6,134 ha (86 ha high quality and 6,048 ha moderate quality) or 21 per cent. This includes the proposed K58W pit area between the K75W adit/cave system and Koodaideri Spring Gorge (Rio Tinto 2014) and the proposed K75W pit area between the K75W adit/cave system and the KBH12 gorge.

The EPA notes that the Pilbara Leaf-nosed Bat forages close to the ground and is considered to forage during flight time to get to preferred foraging sites with permanent water such as the Koodaideri Spring Gorge located about six kilometres east of the adit/cave system (Figure 6). Therefore the bats may fly over the proposed K58W pit to and from the Koodaideri Spring Gorge.

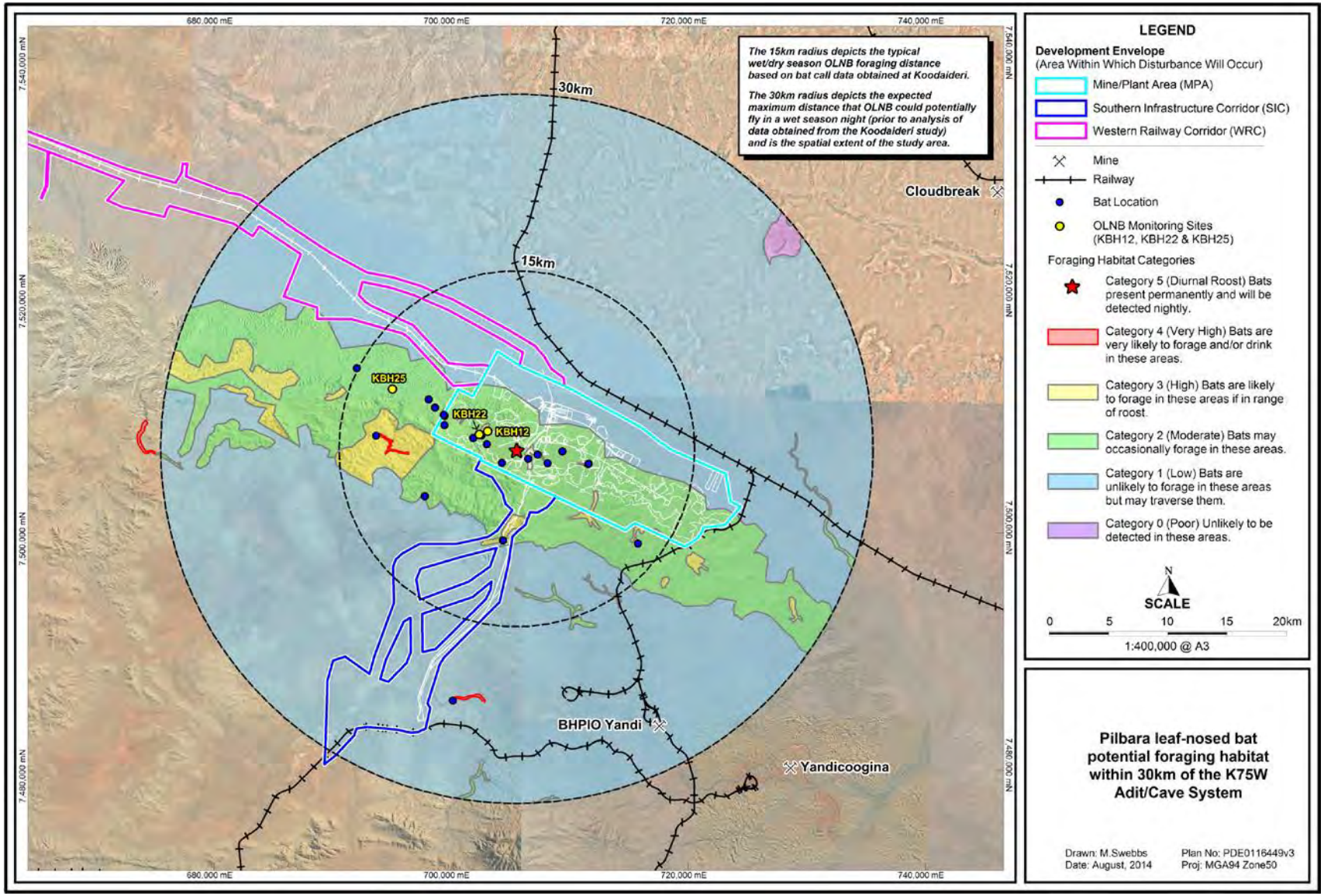

Figure 5: Pilbara Leaf-nosed Bat foraging habitat within 30 km of the K75W adit/cave system

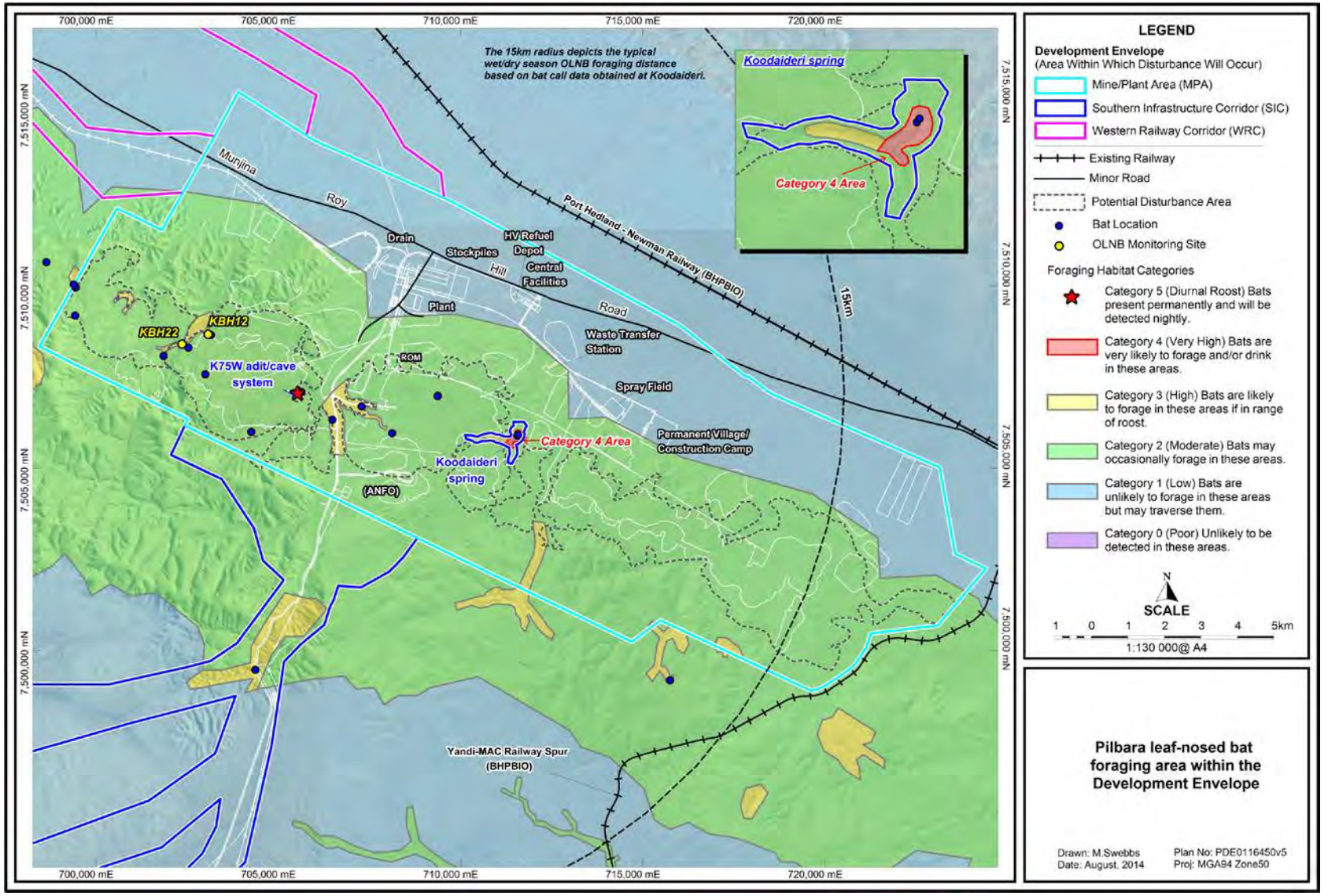

Figure 6: Pilbara Leaf-nosed Bat foraging habitat within the Mine/Plant Area development envelope

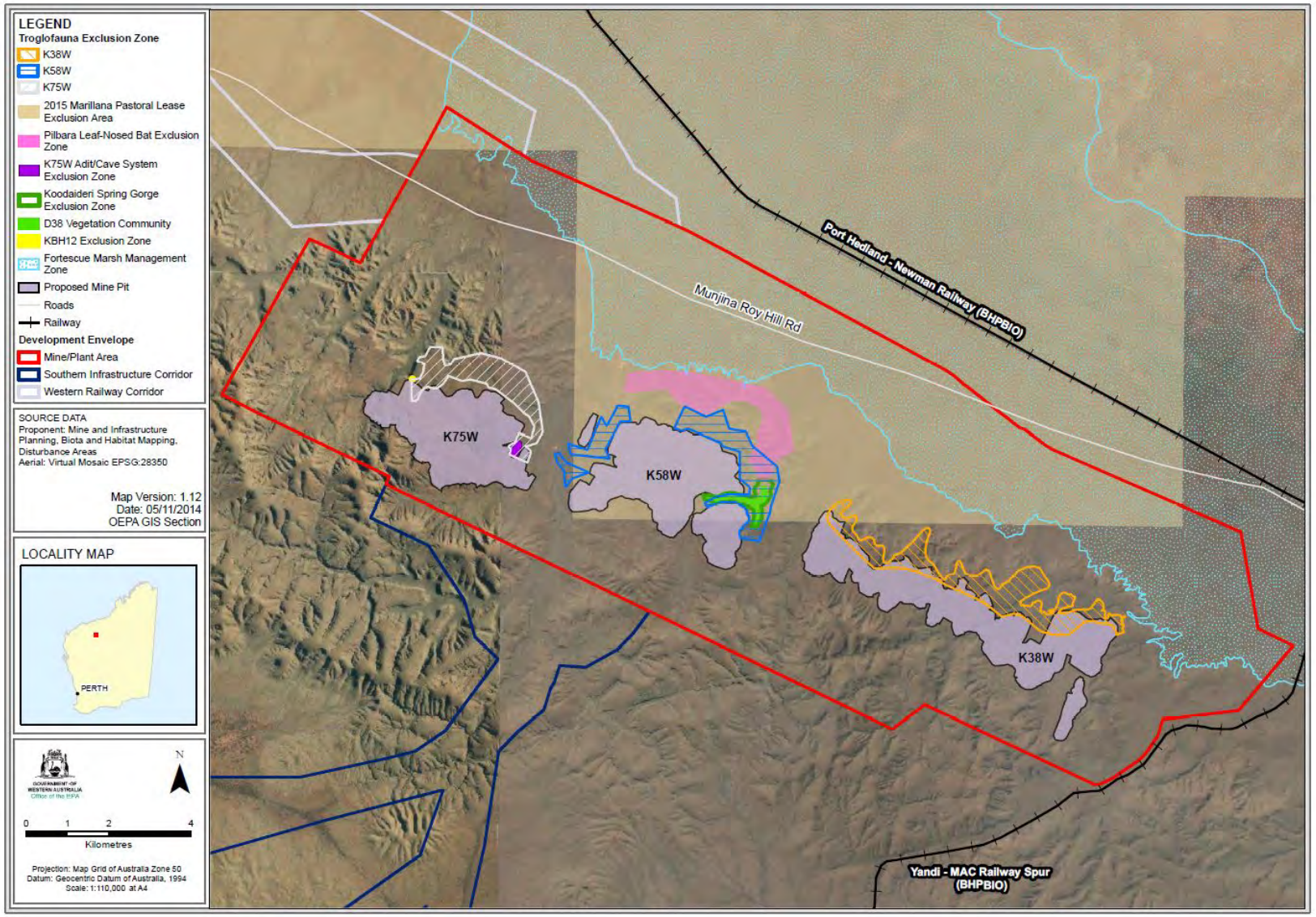

Figure 7: Exclusion zones for Pilbara Leaf-nosed Bat and troglofauna habitat

The proponent considers that bats may take a more circuitous route to the Koodaideri Spring Gorge along the northern edge of the range which provides better foraging habitat. This was based on Biota (2013b) advice that many of the higher bat call activity sites have been recorded from locations on the edge of gorges and range escarpments. Recent data from baseline monitoring of Koodaideri Spring Gorge also show that the earliest evening bat calls were from the most northerly monitoring sites.

Pilbara Leaf-nosed Bat experts advised the proponent that the colony could survive at Koodaideri during mining of the K58W deposit if the highest level of protection is afforded to the adit/cave system and Koodaideri Spring Gorge (Biota 2014d). They advised that provided mining operations started some distance away and progressed towards the cave and creek slowly the bats should adapt (Sue Churchill pers. comm. 16 May 2014).

To ensure there is sufficient foraging habitat between the adit/cave system and the Koodaideri Spring Gorge, the EPA has recommended a Pilbara Leaf-nosed Bat exclusion zone to the north of the proposed K58W pit along the edge of the range (Figure 7, condition 6). The EPA considers that no ground-disturbing activities should take place within the Pilbara Leaf-nosed Bat exclusion zone with the exception of a maximum of five per cent disturbance within the zone for linear infrastructure which will allow access to the K58W mine pit. The troglofauna exclusion zones north of the K75W and K58W pits recommended under condition 6 (Section 3.2), will also provide foraging habitat from the adit/cave system to the Koodaideri Spring Gorge and the gorge containing the KBH12 site.

To ensure that impacts on the Pilbara leaf-nosed bat are minimised, the EPA has recommended condition 7. This condition requires the proponent to design and implement clearing protocols, collect data on foraging activity as committed to by the proponent (Biota 2014d), and to develop and provide triggers and contingency actions if required.

The EPA recognises the measures that the proponent has undertaken and committed to take to avoid, minimise and rectify impacts to the Pilbara Leaf-nosed Bat. However, there still remains some uncertainty as to whether the reduced foraging habitat could support the current population of the bat colony. Therefore it is the EPA's opinion that there is a significant residual impact relating to the clearing of up to 6,134 ha foraging habitat for the Pilbara Leaf-nosed Bat (see Section 3.7 Offsets).

Indirect impacts from developing K58W pit

The Pilbara Leaf-nosed Bat may be impacted by dust, noise and light as well as loss of foraging habitat from the development of the K58W pit between the adit/cave system and the Koodaideri Spring Gorge.

Biota (2014a) has summarised expert opinion on the effects of dust, noise and light on the bat. Dust was considered to be the most significant indirect impact as excessive dust could affect the bats' sensitive ultrasonic echolocation and

vision capabilities. The report concluded that the bats are likely to alter their foraging routes to the Koodaideri Spring Gorge to avoid dust, noise and potentially light impacts. The expert advice noted that specific studies are required to determine these effects.

The EPA has recommended monitoring at the Koodaideri Spring Gorge and KBH12, and the monitoring of bats movements between the adit/cave system and Koodaideri Spring Gorge as part of condition 7, to ensure indirect impacts (dust, noise and light) from mining of the pits do not adversely impact the foraging activity of the bats. This condition also requires the development of triggers and implementation of contingency actions, if required.

Northern Quoll and Pilbara Olive Python

The Northern Quoll and Pilbara Olive Python inhabit similar rocky habitats with gorges and streams containing permanent pools. The proponent has identified 729 ha of potential habitat for both species which could provide denning habitat for the quoll. This 729 ha of habitat includes the Koodaideri Spring Gorge.

Surveys recorded the Pilbara Olive Python at the Koodaideri Spring Gorge. The python has not been recorded outside of this area. Most of the Northern Quoll recordings were at the Koodaideri Spring Gorge (Figure 8). This reflects the high value of the habitat at the Koodaideri Spring Gorge for both species. The proponent has committed to maintaining the 22 ha of very high quality habitat at the Koodaideri Spring Gorge. Of the 729 ha of potential habitat identified there is a predicted loss of 166 ha (or 23 per cent).

The EPA considers that the implementation of the proponent's Koodaideri Spring Adaptive Management Strategy under condition 11 as discussed in Section 3.4 (Hydrological Processes and Inland Waters Environmental Quality) will retain the proven Pilbara Olive Python habitat and minimise the loss of potential core habitat for the Northern Quoll.

The EPA has recommended condition 8 requiring the proponent to develop a Northern Quoll Management Plan. The objective of the plan is to ensure that the proposal is carried out in a manner that minimises the direct and indirect impacts to the endangered Northern Quoll.

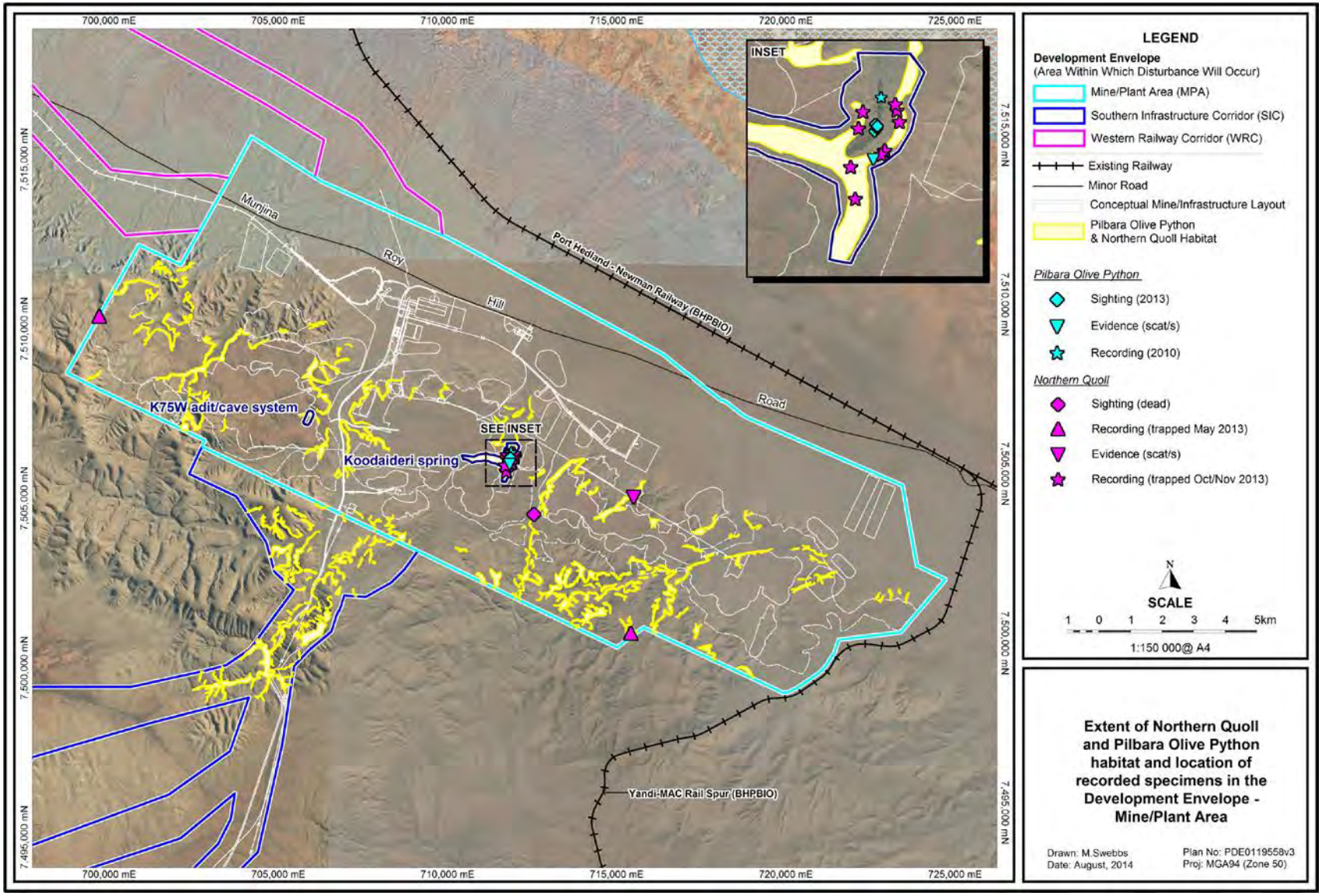

Figure 8: Northern Quoll and Pilbara Olive Python recordings and potential habitat

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 166 ha of known habitat for the Northern Quoll (located with the foraging habitat for the Pilbara Leaf-nosed Bat) remains (see Section 3.7: Offsets).

Summary

Having particular regard to:

- the work done by the proponent to assess potential impacts on the Pilbara Leaf-nosed Bat;
- the avoidance of the K75W adit/cave system;
- the minimisation of clearing of bat habitat and foraging areas;
- the avoidance of the Koodaideri Spring Gorge which is core habitat for the Northern Quoll and Pilbara Olive Python, and very high value foraging habitat for the Pilbara Leaf-nosed Bat;
- the avoidance of KBH12 and associated high quality gorge habitat;
- expert opinion that the Pilbara Leaf-nosed Bat is likely to change its foraging route to avoid dust, noise and light impacts; and
- the significant residual impact and risk associated with loss of up to 11,710 ha of 'good to excellent' quality native vegetation, including up to 6,134 ha of foraging habitat for the Pilbara Leaf-nosed Bat (which also includes 166 ha potential habitat for the Northern Quoll),

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

- condition 6 is imposed requiring exclusion zones to retain key habitats (K75W adit/cave system, Koodaideri Spring Gorge and KBH12) and retain bat foraging habitat between these sites;
- condition 7 is imposed to manage potential impacts on the Pilbara Leaf-nosed Bat;
- condition 8 is imposed to minimise impacts to the Northern Quoll;
- condition 11 is imposed to manage potential water-related impacts to the Koodaideri Spring Gorge;
- condition 13 is imposed to counterbalance the significant residual impacts of the loss 'good to excellent' quality native vegetation, including bat foraging habitat and potential habitat for the Northern Quoll.

3.2 Subterranean 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 proposal has the potential cause the loss of troglobitic taxa (air-breathing subterranean fauna) through the removal of habitat within the Mine/Plant Area development envelope.

The proponent has undertaken numerous troglofauna surveys. The completed survey effort for subterranean fauna at Koodaideri exceeds the minimum requirements as outlined in the EPA's *EAG 12: Consideration of Subterranean Fauna in Environmental Impact Assessment* (EPA 2013) and *Draft Guidance Statement 54a: Sampling Methods and Survey Considerations for Subterranean Fauna* (EPA 2007). These surveys identified 15 troglobitic taxa.

Of the 15 species found during the surveys, nine were found only within the indicative pit boundaries (Figure 3). Each of the three pits contained species that were only found in that pit (Figure 9). The taxa include schizomid taxa (a number of lineages of *Draculoides* sp.), and pseudoscorpion taxa (*Indohya* sp and *Lagynochthonius* sp.). The surveys identified considerable species richness and showed that species are likely to be restricted and locally endemic.

The proponent also undertook a troglobitic fauna habitat assessment (Biota 2014b) (Figure 9). This assessment concluded that primary habitat is likely to extend contiguously for at least 3.8 km to the west of the Mine/Plant Area development envelope. The distribution of individual species suggests that species would probably be limited to the local landform extents that approximately correspond to the proposed K75W, K58W and K38W pits and their adjoining areas of contiguous habitat (Figure 9).

The proponent proposed a number of mining exclusion zones adjacent to the proposed mining pits in which surface infrastructure could be located. Based on mining exclusion zones proposed by the proponent, the EPA has recommended exclusion zones adjacent to the proposed K75W, K58W and K38W pits (Figures 10 to 12 and condition 6) which it considers will provide contiguous and consolidated habitat to protect troglofauna within the Mine/Plant Area development envelope.

The EPA considers that indirect impacts to troglofauna habitat through the reduction of rain water and nutrient infiltration can be managed through the restriction of ground disturbance for infrastructure (including linear infrastructure, run of mine pads and stock piles) to 10 per cent of the area of each of the K75W and K58W exclusion zones. The EPA recommends that there is no disturbance within the K38W exclusion zone, as surveys to date

have only been conducted within the proposed mine pit area and the habitat mapped for K38W is not as extensive north of the proposed mine pit, compared to the habitat mapped north of the K75W and K58W mine pits.

The proponent considers that troglofauna can exist under waste dumps and stockpiles based on a survey conducted at Pilbara Iron's Mesa K mine (Biota 2007). As such, the proponent intends to use the stockpiles located in the K75W and K58W exclusion zones as "research stockpiles". Troglofauna sampling will be undertaken prior to and after the placement of stockpiles to obtain data to assess whether there are any changes in troglofauna as a result of the placement of stockpiles. The EPA supports these trials to improve the understanding of the impacts of mining activities on troglofauna.

If the Minister for Environment approves the implementation of the proposal and the proponent later provides evidence that species found only in the pits exist outside the proposal development envelope, or sufficient troglofauna habitat occurs outside the development envelope, then they could submit an application under s46 of the EP Act to amend the conditions on the Ministerial Statement to reduce the exclusion zones.

Summary

Having particular regard to:

- the high level of survey effort;
- the troglobitic fauna habitat assessment indicating that troglofauna habitat exists beyond the indicative pit boundaries; and
- the distribution of individual species suggesting that species would probably be limited to the proposed K75W, K58W and K38W pits and their adjoining areas of contiguous habitat,

the EPA considers that the proposal can be managed to meet the EPA's objective for Subterranean Fauna provided that condition 7 is imposed requiring exclusion zones to retain troglofauna habitat.

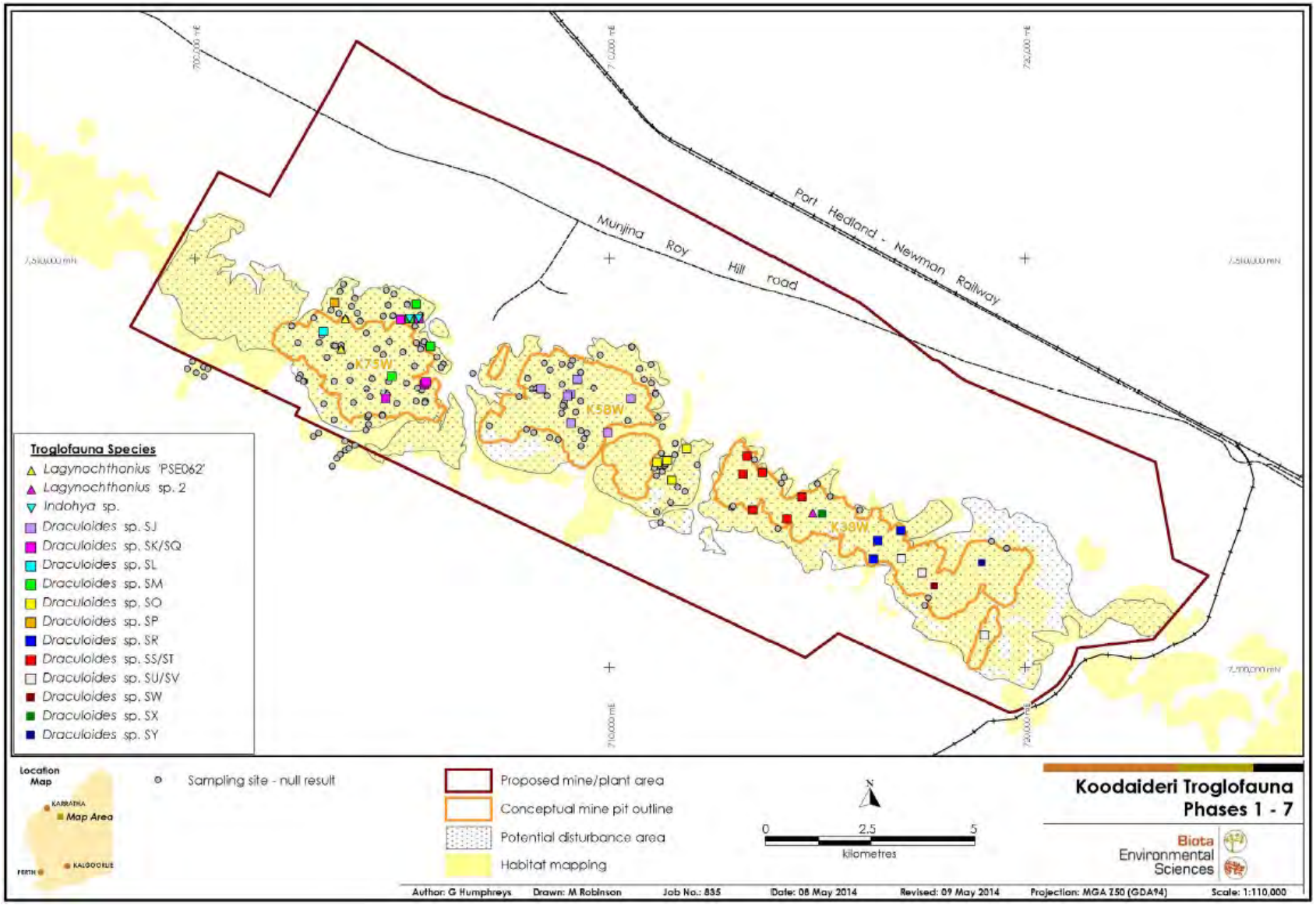

Figure 9: Distribution of recorded Koodaideri troglofauna species and troglofauna habitat

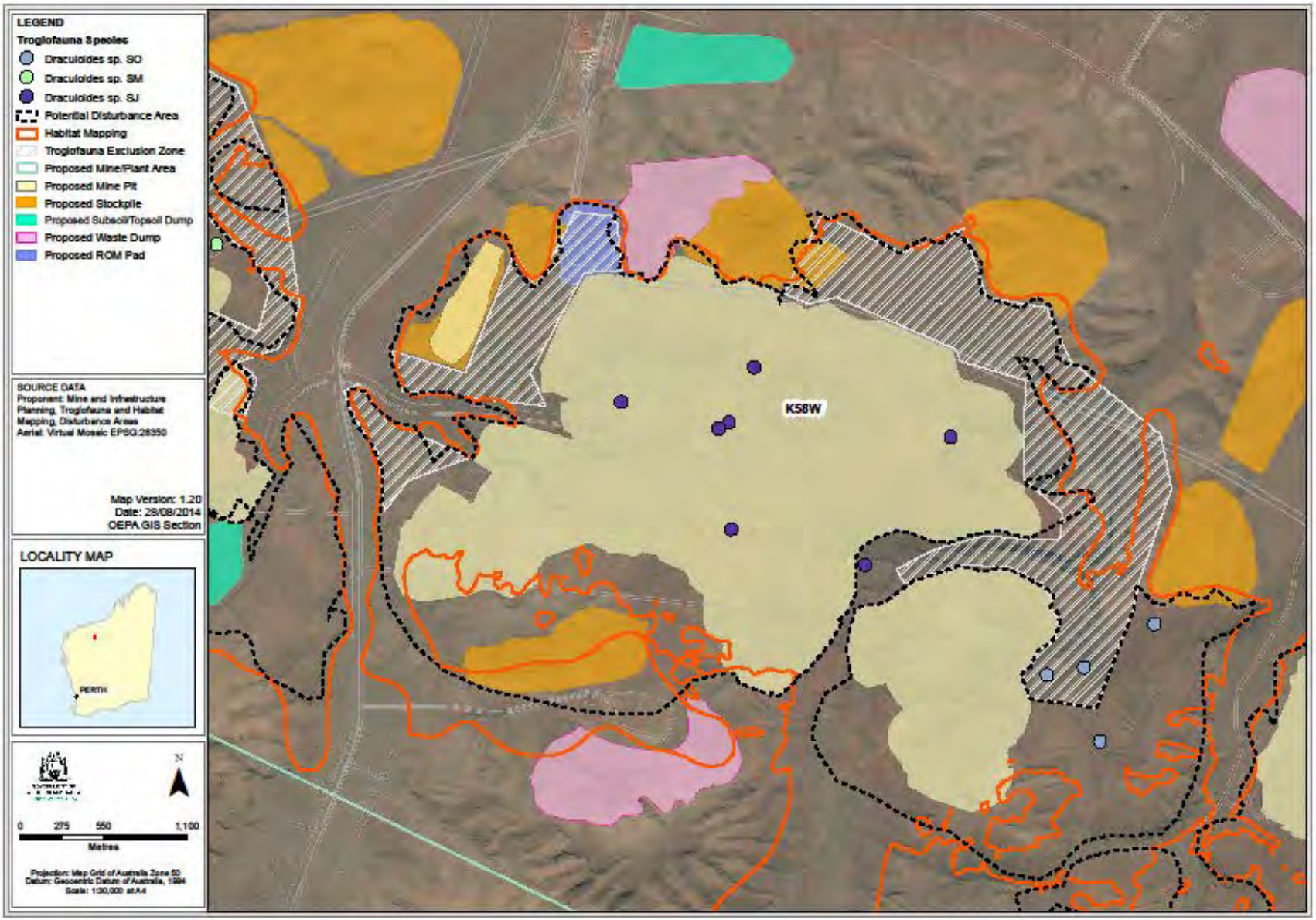

Figure 10: Exclusion zone for K58W troglofauna habitat

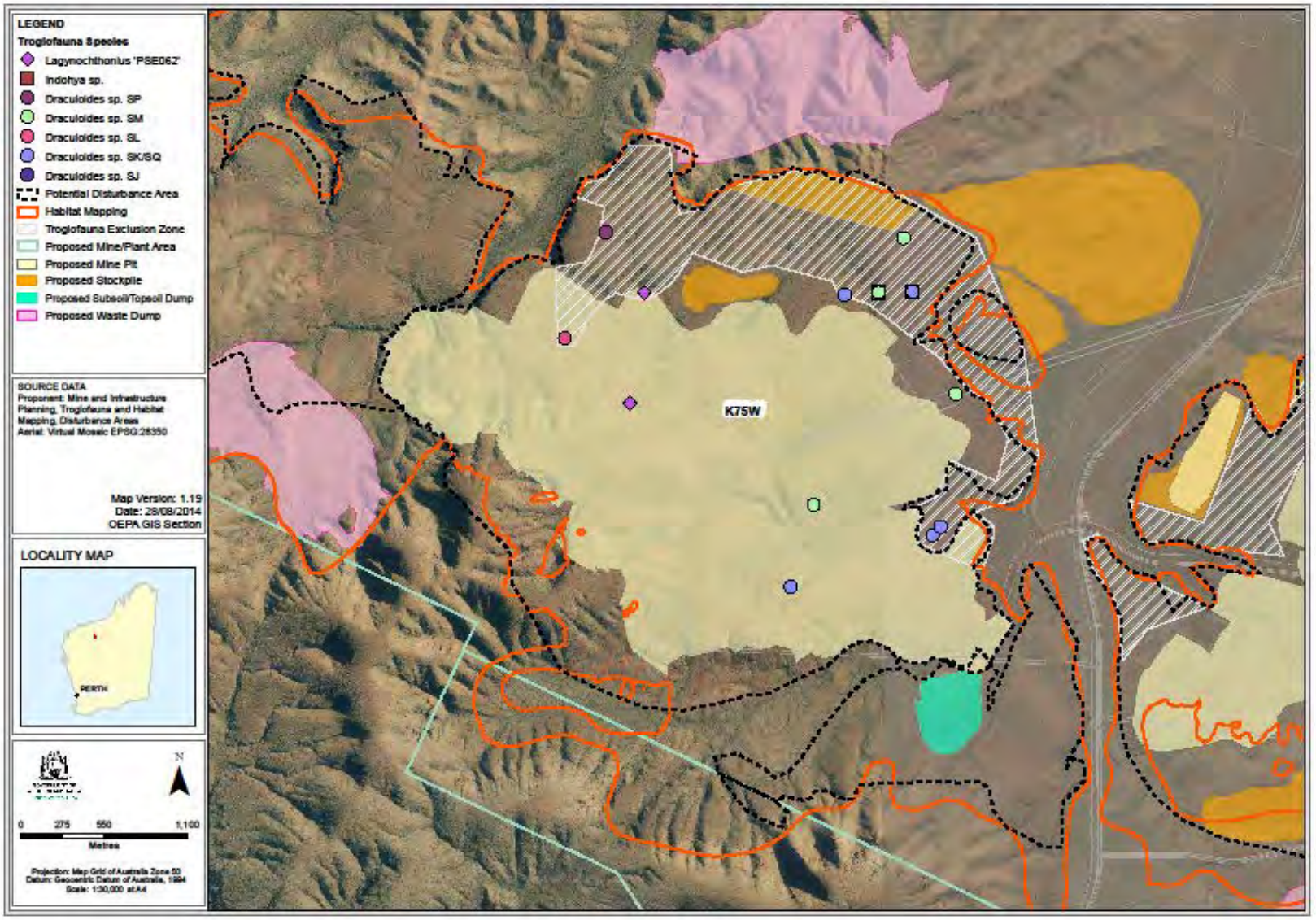

Figure 11: Exclusion zone for K75W troglofauna habitat

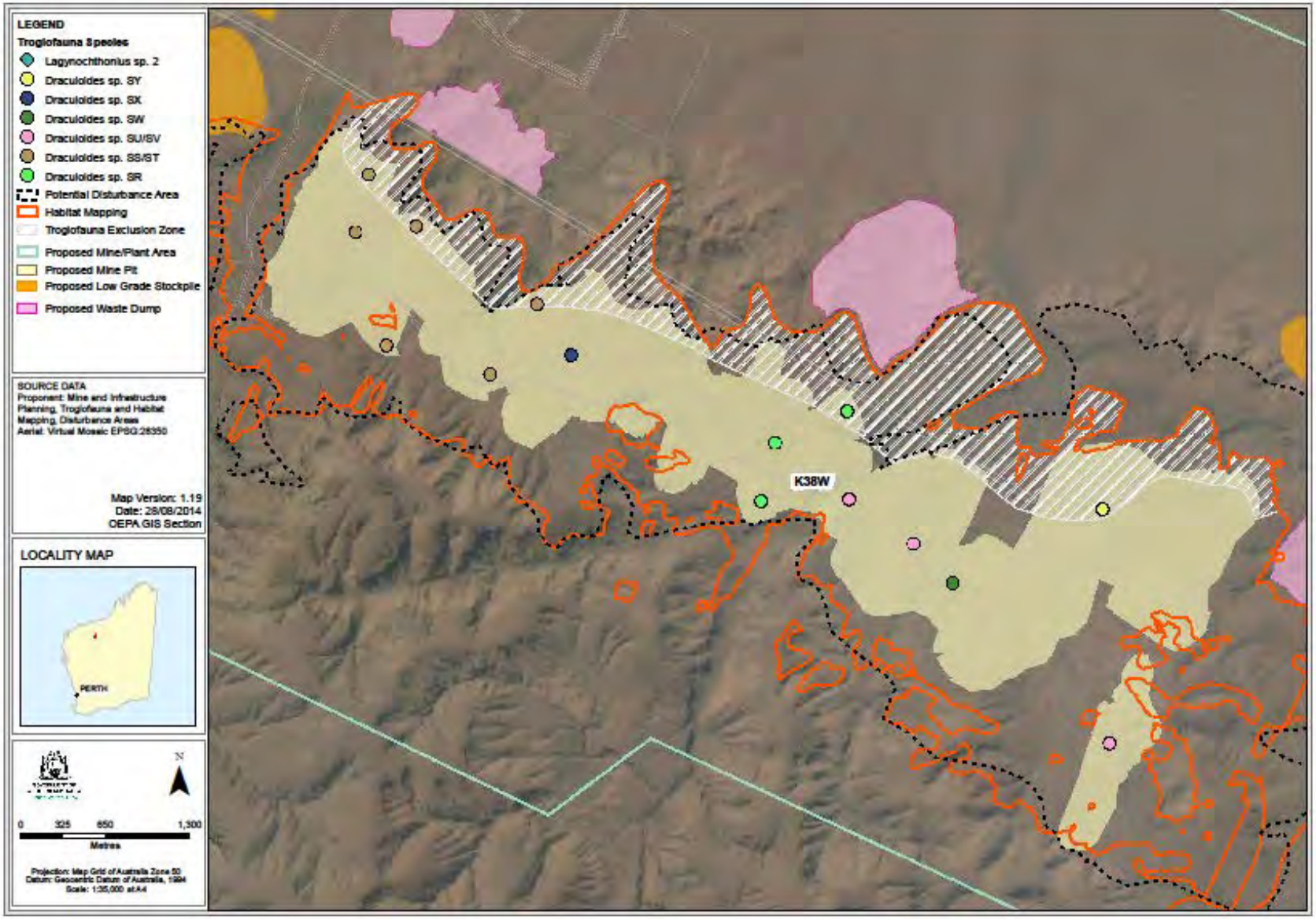

Figure 12: Exclusion zone for K38W troglofauna habitat

3.3 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 12,171 ha of native vegetation across the three development envelopes of the proposal (Table 1).

Level 2 surveys conducted between 2010 and 2013 identified 758 taxa from 203 genera belonging to 60 families, including 18 introduced flora taxa. Of these taxa, Hamersley Lepidium (*Lepidium catapycnon*) is listed as a Vulnerable species under the EPBC Act and is listed as a Declared Rare Flora (DRF) under the WC Act. In addition 15 taxa were identified as listed Priority flora species.

Flora

Hamersley Lepidium

Of the proposal development envelopes, Hamersley Lepidium was only recorded within the Mine/Plant Area development envelope. The proponent has designed the indicative mine layout in the development envelope to avoid direct impact to known and recorded populations of Hamersley Lepidium (Figure 13). In recent surveys additional individuals were identified in the populations adjacent to the K75W waste dump (Biota 2014c). As a consequence the proponent has modified this dump, reducing the footprint by just over 18 ha. The proponent also intends to minimise the size of the waste dumps during the proposal through backfilling of mine voids.

The proponent has committed to avoiding all known populations of Hamersley Lepidium within the Mine/Plant Area development envelope and has proposed a 50 m no-disturbance buffer around recorded individuals (Rio Tinto 2014) (Figure 13). The EPA considers that this approach is appropriate to protect individuals of the species and has therefore recommended condition 9 to ensure there is no disturbance within a 50 m buffer around known individuals of Hamersley Lepidium (Figure 13).

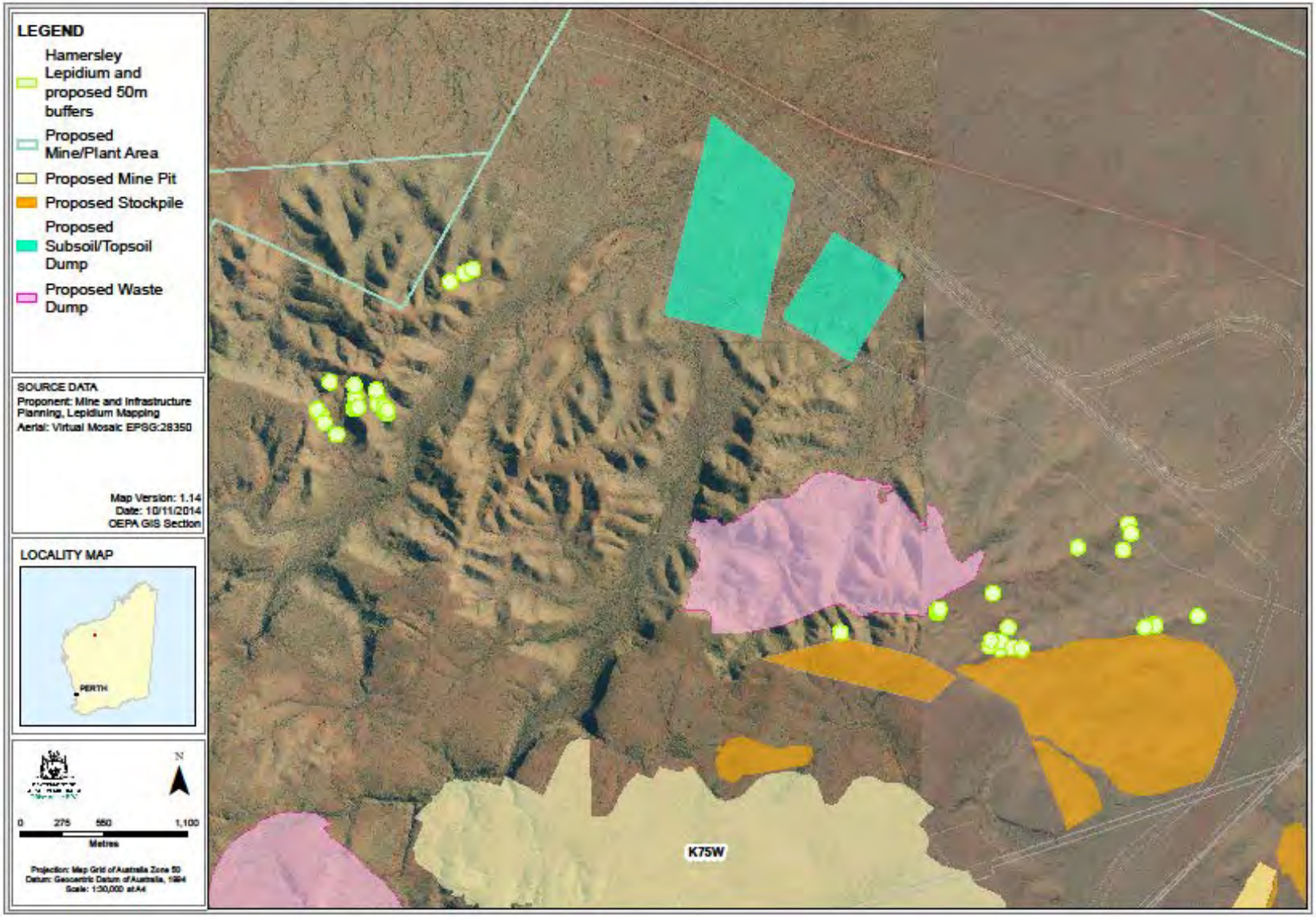

Figure 13: Distribution of Hamersley Lepidium and proposed buffers in the Mine/Plant Area development envelope

Sauropus *sp. Koodaideri detritals (J. Naaykens and J. Hurter JH 11213)*

Of the 15 Priority flora species identified during surveys, 11 were located within the development envelope. Four of the 11 would be avoided by the proposed disturbance footprint and impacts to six would be minimal due to their local and regional distribution. The exception to this is *Sauropus* sp. Koodaideri detritals (J. Naaykens and J. Hurter JH 11213).

In July 2013, *S.* sp. Koodaideri detritals was listed as Priority 1. This species is currently proposed to be described as *Synostemon hammersleyensis* I. Telford & Naaykens (Phyllanthaceae). The PER (2013a) noted that the taxon was only known from 596 individuals (including 464 within the Mine/Plant Area development envelope). A potential direct impact to nine individuals from the mine pit and 391 individuals from the potential disturbance area (Figure 3), would therefore have led to a loss of up to 67 per cent of the known population of the species. Additional surveys have been undertaken since the release of the PER. These surveys identified a total of 4,341 individuals (including 505 within the Mine/Plant Area development envelope) (Figure 14). As a result, the loss of individuals of the taxon has reduced to approximately nine per cent. Within the Mine/Plant Area development envelope, *S.* sp. Koodaideri detritals is located within and south of the indicative K38W mine pit (Figure 14).

The Department of Parks and Wildlife has advised that this species is likely to qualify for listing as DRF and further surveys would be required to confirm the status of *S.* sp. Koodaideri detritals. None of the known individuals of *S.* sp. Koodaideri detritals occurs in secure reserves.

In the targeted survey report (Rio Tinto 2013b), the proponent noted that one of the predicted habitat areas in the Karijini National Park was surveyed and no individuals were located. Based on 8,650 ha of potential unsurveyed habitat, the proponent extrapolated that there may be a further 15,000 to 20,000 individuals. However, this same report states that that suitable habitat is not fully understood and may be based on as yet undefined environmental gradients or ecological barriers and it remains uncertain if the species occurs in significant numbers beyond the eastern and western boundaries of its current distribution. The report recommended that further surveys are undertaken to identify further individuals, give confidence in the likely habitat, and to confirm the presence/absence of these species within the Karijini National Park.

The EPA notes that the proponent's Flora and Vegetation Management Plan requires seed collection from individuals and populations to be cleared, for future use in rehabilitation and genetic studies of populations of *S.* sp. Koodaideri detritals after further work confirming the full distribution of populations has been completed.

The EPA considers that any loss of individuals of a species that qualifies as DRF may adversely impact the viability of the species. To clarify the conservation status of *S.* sp. Koodaideri detritals, the EPA has recommended

condition 10, requiring a regional survey to determine whether further populations exist. In the event that the Minister for Environment declares *S.* sp. Koodaideri detritals 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 10-9 to 10-12, requiring the proponent to prepare and submit a *S.* sp. Koodaideri detritals Conservation and Research Plan (similar to the condition for the recent North Star proposal for *Pityrodia* sp. Marble Bar). 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 proponent has committed to a 20 m no-disturbance buffer around individuals of *S.* sp. Koodaideri detritals that are not proposed to be cleared within the Mine/Plant Area development envelope (Figure 15). The EPA has recommended this be incorporated into condition 10. Should *S.* sp. Koodaideri detritals be declared as DRF, the EPA expects that the buffer be increased to 50 m through a formal change to conditions under s46 of the EP Act. The buffer area would then be consistent with the recommended buffer for the DRF species Hamersley Lepidium in condition 9.

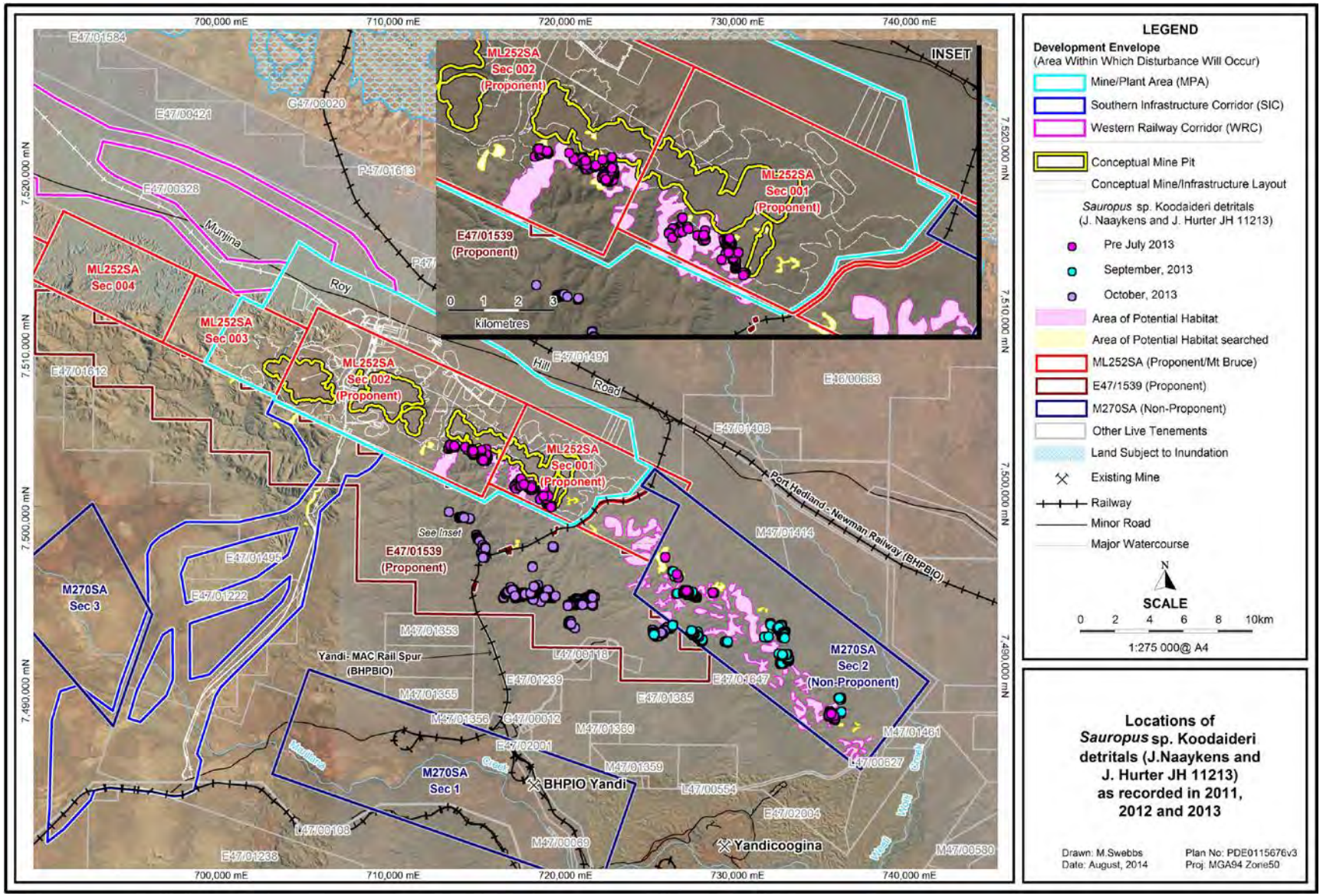

Figure 14: Known locations of *Sauropus* sp. Koodaideri detritals

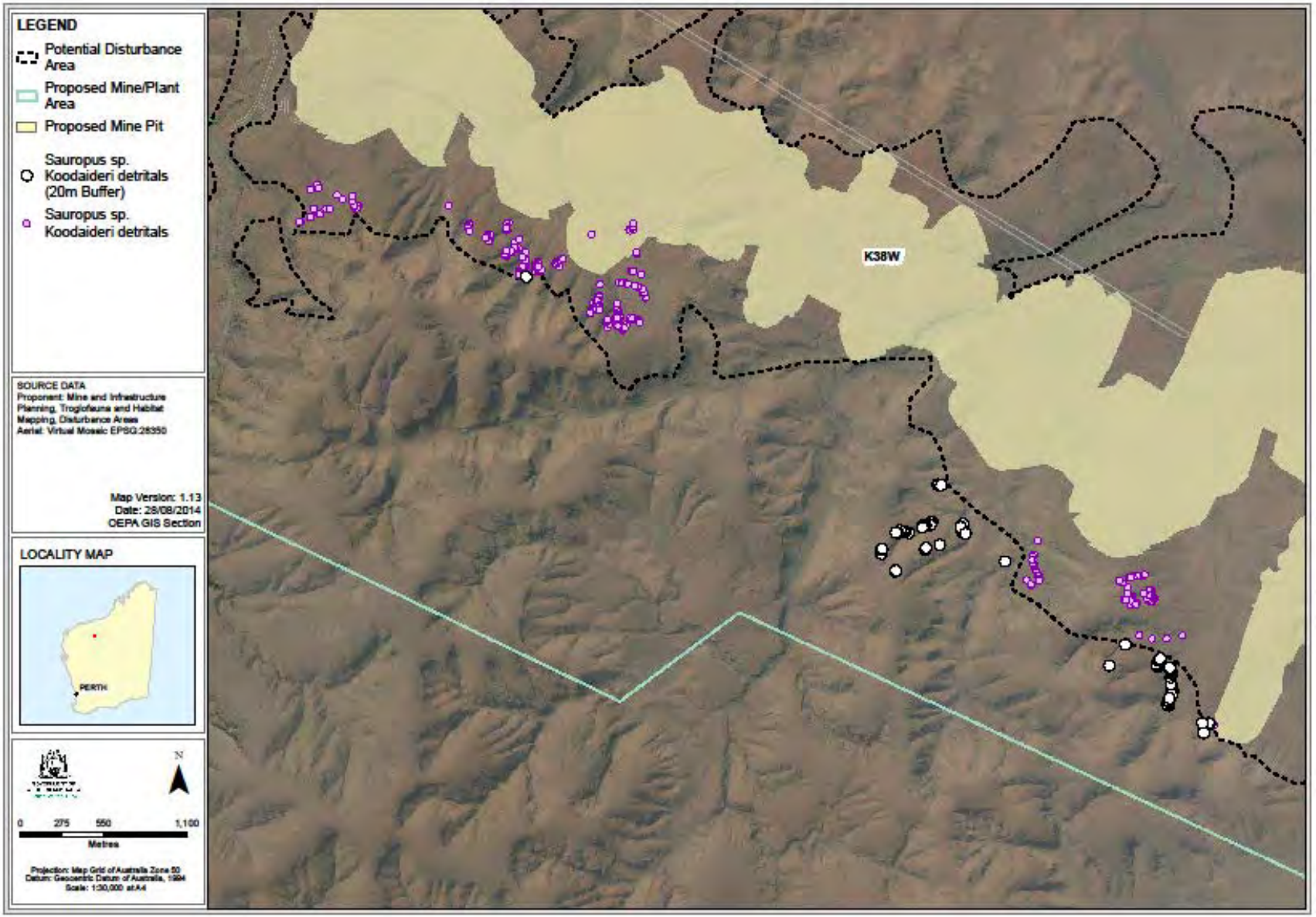

Figure 15: *Sauropus* sp. Koodaideri detritals and buffers within the Mine/Plant Area development envelope

Vegetation

As stated above, the proposal would result in the clearing of 12,171 ha of native vegetation. Of this 11,710 ha has been described as ranging from 'good to excellent' condition.

The proposed development envelope intersects the 2015 Marillana Pastoral Station Exclusion Area (Marillana 2015 Area) (Figure 2) which is one of the areas that have been identified for conservation tenure following the renewal of WA pastoral leases in 2015. The Marillana 2015 Area covers 75,277 ha, of which 12,786 ha (17 per cent) is located within the proponent's Mine/Plant Area development envelope and a maximum of 3,096 ha (four per cent) would be directly impacted by the proposal. The proponent has indicated that they would aim to minimise this impact by reducing borrow pit areas where possible and decreasing the impact to 2,174 ha (2.8 per cent).

The Western Rail Corridor development envelope intersects an area of approximately 110 ha of the ex-Mount Florence pastoral lease (Figure 2) which is managed by the Department of Parks and Wildlife for conservation pending formal addition to Karijini National Park. The proponent intends to avoid impacts to the proposed Mt Florence Conservation Reserve. However, in the event that any railway infrastructure or bores need to be located within that area as they cannot be located elsewhere, the proponent would consult with the Department of Parks and Wildlife.

Of the 110 vegetation units mapped and described during surveys (Biota 2012), vegetation unit D38 is considered to be the most significant. Vegetation unit D38 is associated with the Koodaideri Spring Gorge (Figure 7) The Koodaideri Spring Gorge is considered to be of particular note as creek features are uncommon in the region (Biota 2012b). Unit D38 provides key habitat for a number of fauna species including the Pilbara Leaf-nosed Bat, Pilbara Olive Python and Northern Quoll (Section 3.1, Terrestrial Fauna). The proponent proposes to avoid clearing of unit D38 and impose a 50 m buffer from the edge of the gorge containing the Koodaideri Spring and its associated vegetation. As discussed in Section 3.1, the EPA has recommended the implementation of the proponent's commitment to provide a 50 m buffer around the Koodaideri Spring Gorge as part of condition 6.

The impacts of altered surface water and groundwater as a result of the proposal on the Koodaideri Spring Gorge are discussed in the hydrological processes section (Section 3.4). This section concludes that impacts are unlikely to alter the hydrology significantly from natural variation. As a consequence, a reduction in the extent of vegetation in unit D38 is unlikely.

To ensure the EPA's objective for this factor is met, the EPA requires that the proponent implement the Koodaideri Spring Adaptive Management Plan (condition 11). The management plan requires the proponent to verify modelling and ensure that there would be no impacts to the Koodaideri Spring Gorge and vegetation unit D38 as a result of the implementation of the proposal. The management plan also requires the monitoring and management of vegetation health and extent.

The EPA considers that the proponent has adequately demonstrated how it has avoided and minimised impacts to flora and vegetation thought the design of the proposal and associated infrastructure. However, there remains a significant residual impact related to the clearing of 11,710 ha of vegetation in 'good to excellent' condition, particularly when considering this proposal in the context of cumulative impacts from other proposals (including approved proposals) in the Pilbara (see Section 3.6, Offsets). The EPA also considers that a significant residual impact will remain for the loss of up to nine per cent of the *Sauropus* sp. Koodaideri detritals species should the Minister for Environment declare the species as Rare Flora.

Summary

Having particular regard to:

- the proponent's design of the indicative mine layout to avoid disturbance to the DRF Hamersley Lepidium through the proposed 50 m buffer around individuals;
- the commitment by the proponent to a 20 m no-disturbance buffer around individuals of *Sauropus*. sp. Koodaideri detritals (that may qualify as DRF) that are not proposed to be cleared within the Mine/Plant Area development envelope;
- the proponent's intention to minimise clearing within proposed conservation reserves;
- the proponent's commitment to avoid clearing of vegetation unit D38 and a 50 m buffer around the Koodaideri Spring Gorge; and
- the significant residual impacts associated with the clearing of up to 11,710 ha of 'good to excellent' condition native vegetation that is located within the Fortescue and Hamersley IBRA subregions and the loss of up to 9 per cent of the flora species *Sauropus* sp. Koodaideri detritals if it is declared as Rare Flora,

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

- the extent of clearing of vegetation is limited to the authorised extent as defined within Table 2 of Schedule 1 of the recommended environmental conditions;
- condition 9 is imposed to ensure that disturbance to Hamersley Lepidium is avoided;
- condition 10 is imposed to minimise impacts on *Sauropus* sp. Koodaideri detritals, require additional surveys to confirm the conservation status of the species and require a conservation and research plan if the species is listed as DRF;
- condition 11 is imposed to ensure that there are no impacts to vegetation unit D38 (the Koodaideri Spring Gorge) attributable to the proposal; and
- condition 14 is imposed to counterbalance the significant residual impacts of the loss of up to 11,710 ha of vegetation in 'good to excellent' condition.

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.*

The proposal has the potential to impact the Koodaideri Spring Gorge (including Koodaideri Spring and associated unnamed creek and pools), through the removal of 40 per cent of the surface water catchment. There is also the potential for impacts to water quality from acid and metalliferous drainage. Dewatering of mine pits K75W and K38W is minimal and unlikely to cause local or regional impacts to groundwater resources.

Koodaideri Spring Gorge

The Marillana 2015 Area contains the Koodaideri Spring Gorge. The environmental values of the Koodaideri Spring Gorge associated with terrestrial fauna and vegetation (Sections 3.1 and 3.3) are based on the near permanence of the free-flowing water. Surveys have shown that the water in the Koodaideri Spring is fresh and of a higher quality than freshwater drinking standards. The unnamed creek has high aquatic invertebrate species richness relative to most Pilbara creeks. The presence of several species with strong groundwater affinities indicates good connectivity with regional as well as colluvial/alluvial groundwater (Bennelongia 2013).

The largest contributor of water to the unnamed creek is groundwater-fed pools. The bottom of these pools intersects the groundwater aquifer contained in the alluvial/colluvial gravels located along the creek bed, and the fractured rock of the oxidised Mount McRae Shale Formation and Dales Gorge Member (Figure 16). Groundwater recharge of this aquifer occurs during rainfall events mainly through the alluvial/colluvial gravels as demonstrated by the high infiltration rate of approximately 25 millimetres per hour.

Secondary contributors to the unnamed creek include surface water flow and the groundwater fed Koodaideri Spring. Surface water flow is infrequent and results from high and extended rainfall events. Koodaideri Spring has a low but relatively constant flow rate.

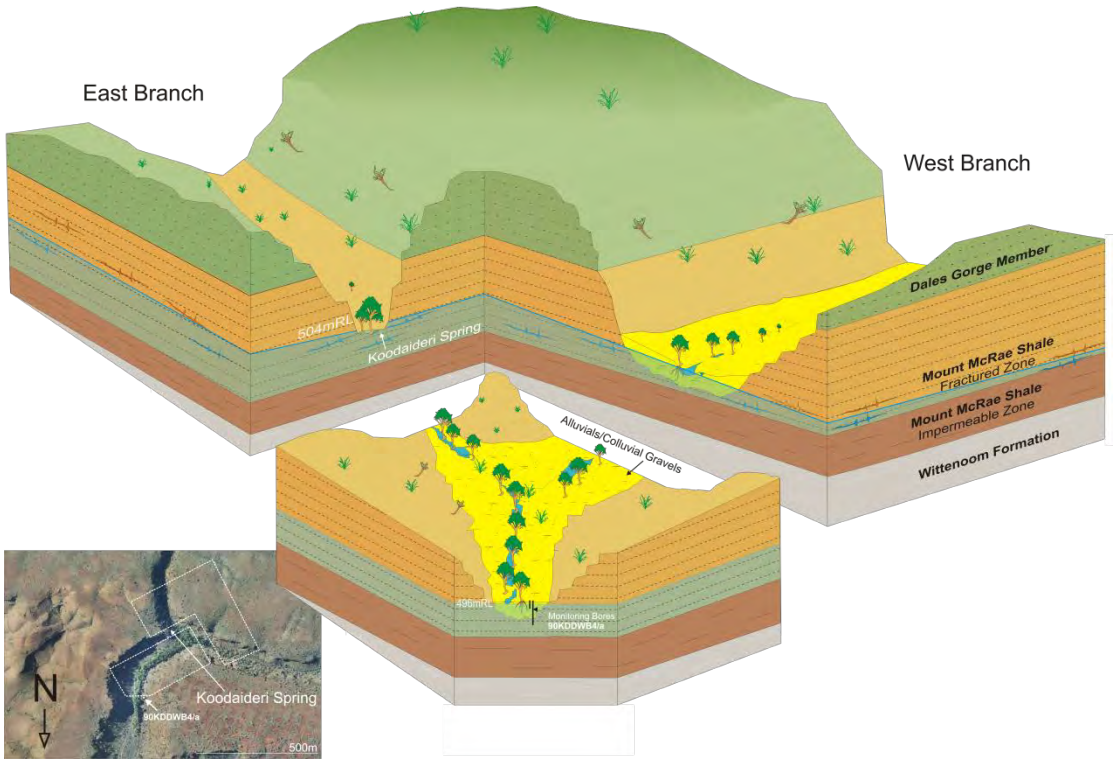

Figure 16: Hydrological setting of Koodaideri Spring Gorge

The proponent has designed the mine layout to avoid direct impacts to the Koodaideri Spring Gorge and has committed to a 50 m buffer set-back from the top edge of the gorge (Figure 7). This would maintain some of the pre-mining surface water pathways and maintain the physical habitat of the system. As the pools and spring are groundwater-fed the proponent has committed to reducing indirect impacts by avoiding dewatering of the K58W pit.

Mining of the K58W deposit would reduce the local surface water catchment of the unnamed creek from 9.3 km^2 to 5.6 km^2 post-mining. This is equal to a 40 per cent reduction in surface water catchment (Rio Tinto 2013c).

The proponent undertook various modelling scenarios (Rio Tinto 2013c) to determine the impacts to the Koodaideri Spring Gorge from mining. This modelling indicated that there would be a reduction of peak flow/flood events (95 per cent reduction of the East Branch and 42 per cent reduction of the West Branch for the 100-year flood event). However, surface flow would still occur over the same length of time and over a similar area along the alluvial/colluvial gravels of the Koodaideri Spring Gorge and therefore recharge of the aquifer would still occur along the gorge. Modelling indicated that pre- and post-development rises in groundwater levels following flow events would be similar to those observed between February 2012 and February 2013 with a maximum absolute reduction of 0.04 m groundwater level rise.

The proponent has prepared a Koodaideri Spring Adaptive Management Plan for the Koodaideri Spring Gorge. The objective of this plan is to protect the ecological values of the Koodaideri Spring Gorge and to prevent degradation of habitat

associated with the system. To achieve this objective, one of the targets of this plan is to ensure the surface water flow regime stays within the historical range to support environmental values downstream of Koodaideri Spring.

Baseline monitoring began in October 2013 (Rio Tinto 2014). This monitoring would be used to set trigger levels which, if reached, would require the implementation of contingency measures. The EPA notes that the trigger levels and contingency measures in the management plan would be developed with ongoing input from the Department of Water (DoW) and the Department of Parks and Wildlife.

As discussed in Section 3.3, Flora and Vegetation, the EPA's recommended condition 11 would require the proponent to implement the Koodaideri Spring Adaptive Management Plan. The management plan requires the proponent to verify hydrological modelling to ensure the hydrological values of the Koodaideri Spring Gorge and the associated vegetation and fauna values are protected.

Groundwater

Water demand associated with early works, construction and initial operations stages (six to 10 gigalitres per year (GL/year)) could be met from local groundwater aquifers within the proposal development envelopes. Water for operations (up to 18 GL/year) will be supplied by in-pit sump pumps, Waste Fines Storage Facility (WFSF) decant water, and surplus water from Rio Tinto's Yandicoogina operation (Rio Tinto 2013a). The EPA notes that the re-use of surplus water from Yandicoogina would minimise groundwater drawdown impacts at Koodaideri and groundwater discharge impacts to Marillana Creek as a result of the Yandicoogina operations.

Approximately 90 per cent of the ore body is located above groundwater level. The depth to groundwater across the ore body varies between 80 m below ground level (mBGL) to 100 mBGL. Dewatering of mine pits K75W and K38W will require drawdown of up to 30 m in the deepest sections of the K75W pit (i.e. 30 m over eight per cent of the surface area of the deposit) (Rio Tinto 2013a). Dewatering of the aquifers located within the mine pits is not expected to impact the Fortescue Valley aquifers as they are separated by the low permeability units of the Mount McRae Shale and the Mount Sylvia Formation (Parsons Brinckerhoff 2013).

Water quality

No off-site surface water discharges from mine pits (dewatering) or WFSFs would occur, except under emergency circumstances (e.g. major rainfall or flood events). Testing (Rio Tinto 2013a and 2013b) indicates that the current pit design has a low risk of acid and metalliferous drainage (AMD) as the un-oxidised Mount McRae Shale underlying the ore body would not be mined. Further detail on AMD is provided in Section 3.5, Rehabilitation and closure.

Summary

Having particular regard to:

- the design of the proposal and location of project elements to minimise hydrological impacts to the Koodaideri Spring Gorge;
- the findings of the proponent's modelling indicating that changes in water levels in the Koodaideri Spring Gorge due to mining would be minimal;
- the minimal amount of dewatering required and the proponent's commitment to avoid dewatering of the K58W pit to reduce indirect impacts to the Koodaideri Spring Gorge;
- minimising groundwater drawdown impacts at Koodaideri and ground water discharge impacts to Marillana Creek through using surplus dewater from the Yandicoogina operations;
- no discharge of surface water except in emergencies; and
- outcomes of the AMD testing and the proponents avoidance of the un-oxidised Mount McRae Shale,

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

- water supply including from abstraction is limited to 18 GL/year and surface water discharge is not permitted (except under emergency circumstances) as defined within Table 2 of Schedule 1 of the recommended environmental conditions; and
- condition 11 is imposed to ensure the Koodaideri Spring Adaptive Management Plan is implemented to protect the values of the Koodaideri Spring Gorge.

3.5 Human Health

Objective

The EPA's environmental objective for this factor is *to ensure that human health is not adversely affected.*

As part of this proposal an approximate 19 km portion of the proposed Western Rail Corridor development envelope would be located within the Wittenoom Asbestos Management Area (WAMA). The WAMA is classified as a contaminated site under the *Contaminated Sites Act 2003* which is administered by the Department of Environment Regulation (DER) (Figure 17). Construction within this portion of the Western Rail Corridor has the potential to disturb asbestos contaminated land. Alternative routes were considered by the proponent; however, the proponent considered that alternative routes pose a higher potential environmental impact to the Fortescue Marsh, fauna, and vegetation and flora.

The main potential source of asbestos is in creeklines as a result of erosion from existing waste dumps associated with past mining in Wittenoom. Asbestos may be exposed during construction of infrastructure in the Western Rail Corridor within the WAMA. Based on sampling for the trace line survey undertaken by Parsons Brinckerhoff (2013), the proponent has classified a 4.2 km section of the Western Rail Corridor as contaminated for management purposes (Figure 18). The proponent has outlined strategies to manage asbestos within the WAMA in two management plans (*Wittenoom Asbestos Management Area Plan* (Calibre 2014a) and *Trace Line Clearing Procedure* (Calibre 2014b)). Further plans will be prepared by the proponent for future proposed actions, e.g. railway construction and operation.

The proponent considers that construction activity for the Western Rail Corridor in the WAMA:

- is unlikely to increase asbestos fibre levels outside of the WAMA above existing levels;
- is not expected to increase asbestos fibre distribution as the main source (Wittenoom mine workings) remains static; and
- will only have an impact on the hydrologic regime in the immediate vicinity of the rail embankment.

The Department of Health (DoH) has confirmed that the strategies to manage asbestos within the WAMA as outlined in two management plans (*Wittenoom Asbestos Management Area Plan* and *Trace Line Clearing Procedure*) are acceptable. The EPA's opinion is that the risk of the proposal increasing the spread of asbestos in the environment from asbestos is low. However, to ensure that the construction of the proposal does not increase the spread of asbestos outside of the portion of the Western Rail Corridor within the WAMA, the EPA is taking a cautious approach by recommending the development and implementation of a management plan (condition 12). The management plan will be developed in accordance with the *Guidance Note on Public Health Risk Management of Asbestos Minerals Associated with Mining* (DoH 2013). The management plan will require monitoring and management of airborne asbestos fibres as well as fibres contained in sediment to ensure that the design and construction of the proposal does not increase the spread of asbestos in the environment, resulting in adverse effects on public health.

The EPA notes that there is the potential for workers to be exposed to asbestos during construction and operation of the railway. The EPA does not assess occupational safety and health issues as these are regulated under the Occupational Safety and Health Regulations 1996.

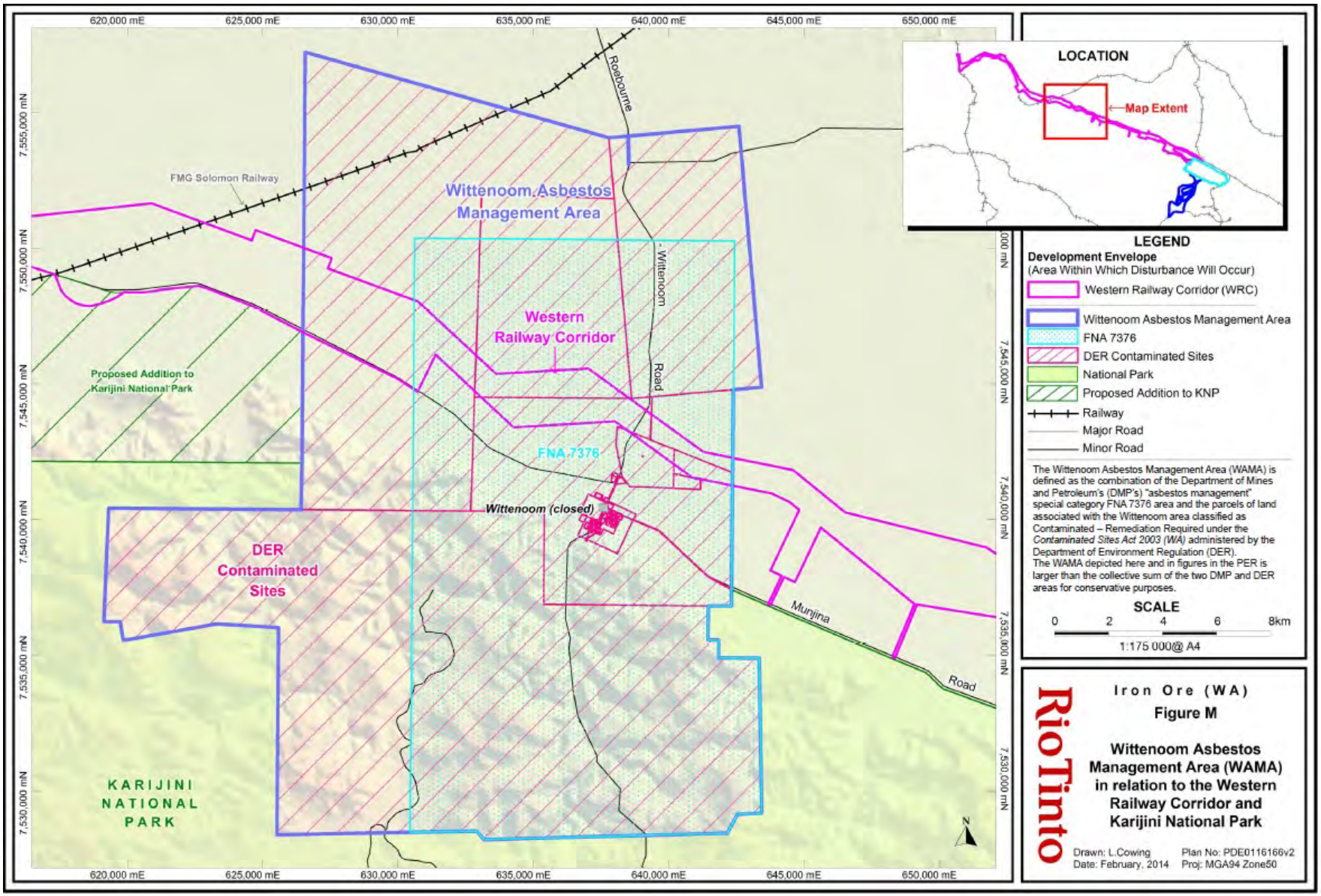

Figure 17: Western Rail Corridor crossing the Wittenoom Asbestos Management Area

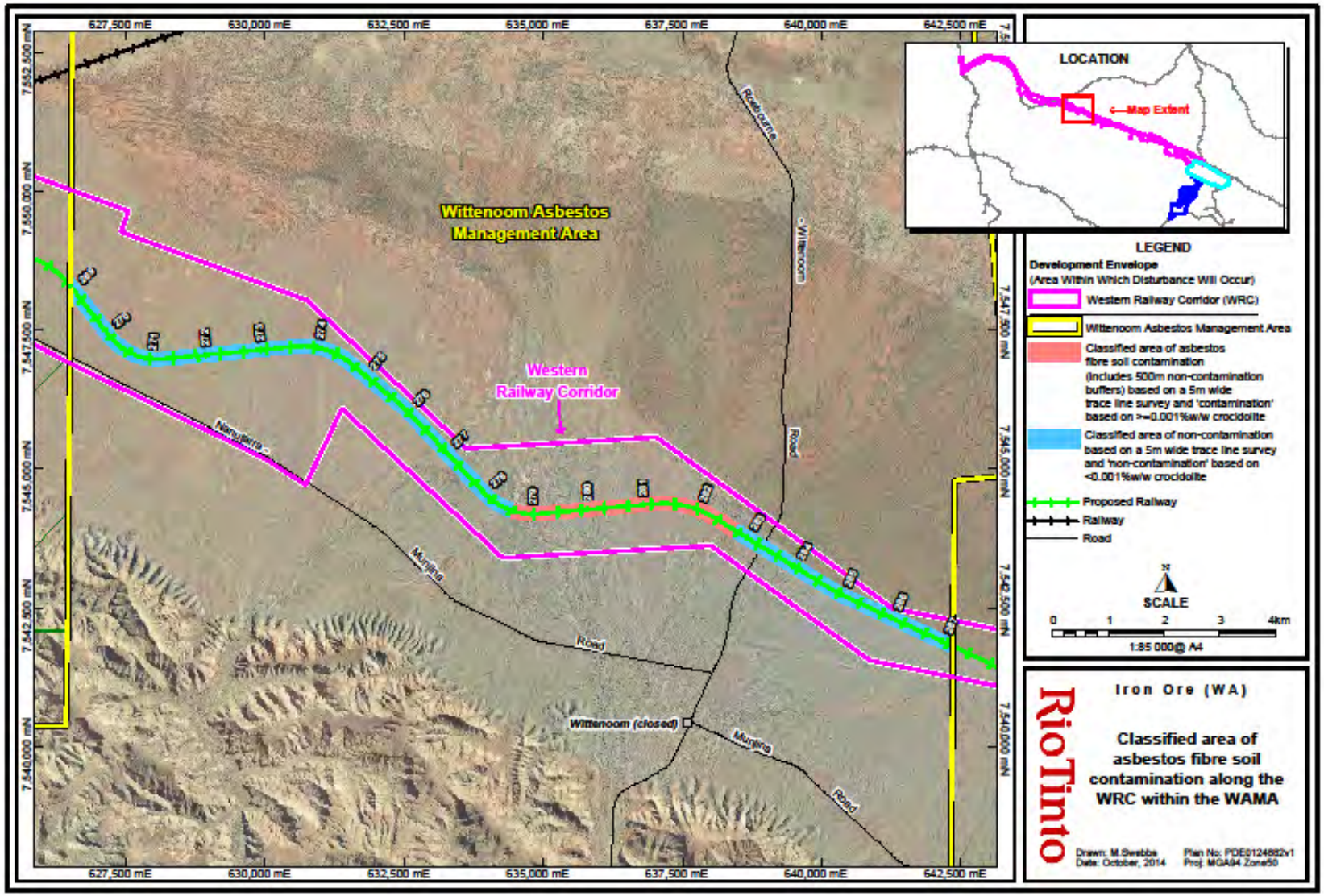

Figure 18: Section of existing asbestos contamination within the Western Rail Corridor

Summary

Having particular regard to:

- the proposed construction and operation of a railway within the WAMA;
- the acceptability of the proponent's approach to asbestos management within the WAMA to the DoH; and,
- the regulation of worker safety and health under the Occupational Safety and Health Regulations 1996,

the EPA considers that the proposal can be managed to meet the EPA's objective for Human Health provided that condition 12 is imposed to ensure that the proponent develops and implements an asbestos management plan to the satisfaction of the CEO, on advice of the DoH and the DER.

3.6 Rehabilitation and Closure – integrating factor

Objective

The EPA's environmental objective for this factor is *to ensure that premises can be closed, decommissioned and rehabilitated in an ecologically sustainable manner, consistent with agreed outcomes and land uses, and without unacceptable liability to the state.*

Due to the scale of the proposal (clearing of up to 12,171 ha and excavation of mine pits totalling over 10 km), the EPA considers that the main impact relating to closure is rehabilitation. There is also the potential for long-term water quality impacts from acid and metalliferous drainage (AMD).

The Koodaideri proposal is proposed to occur on tenements granted under the State Agreement Act (*Iron Ore (Mount Bruce) Agreement Act 1972*) and therefore not subject to the requirements of the *Mining Act 1978* regulated by the Department of Mines and Petroleum (DMP).

The proponent has prepared a draft closure plan which it considers to be consistent with the key elements and structure of the *DMP/EPA Guidelines for Preparing Mine Closure Plans* (DMP/EPA 2011). This document would evolve over the life of the mine with closure completion criteria becoming increasingly more detailed (Rio Tinto 2013a).

Rehabilitation

Rehabilitation of disturbed areas would be progressive throughout life of mine with most rehabilitation taking place post-mining. The proposal would disturb up to 12,171 ha of native vegetation, including 11,710 ha of vegetation in 'good to excellent' condition for which a significant residual impact remains (Section 3.3). The proposal would also disturb up to 3,096 ha of the Marillana 2015 Area. The proponent will need to focus on returning a higher level of ecological function and connection with the surrounding landscape within this area.

The proponent (Rio Tinto 2014) and the Department of Parks and Wildlife (DPaW 2013) have agreed that a management arrangement similar to that used for the Marandoo project and formalised under a condition could be used to accommodate the need for specific protocols and management of construction and operation phases of the mine within the proposed Department of Parks and Wildlife managed land.

The EPA considers that the Mine Closure Plan should be developed in consultation with, and to a standard acceptable to, the Department of Parks and Wildlife which is the future land manager of the Marillana 2015 Area.

Mine voids

The proponent has proposed to backfill the mine pits that will be dewatered (K75W and K38W) with waste rock to a level above the pre-mining watertable to prevent the formation of pit lakes.

The Koodaideri mine pits would be located on local topographic high points. Therefore, water that collects in the pits would be mainly from rainfall, with only minor contribution from surface catchment flows. Should there be sufficient rainfall to create temporary water bodies in the mine pits, similar water bodies would form at local low points in the surrounding area, as well as further in the surrounding landscape (Rio Tinto 2014). The EPA considers that should any temporary water bodies form in the Koodaideri mine pits, these would be consistent with surrounding areas and would not adversely affect fauna populations.

Acid and metalliferous drainage

The proponent's findings indicate that acid forming material and highest solute concentrations of trace elements are present in un-oxidised Mount McRae Shale.

The proponent's acid and metalliferous drainage (AMD) management strategy is to avoid exposing the un-oxidised Mount McRae Shale which is located beneath the mineralisation (Rio Tinto 2014). Should any sulfidic material be uncovered the proponent would encapsulate the material within in-pit dumps in accordance with the proponent's Mineral Waste Management Plan and Spontaneous Combustion and Acid Rock Drainage Management Plan (Rio Tinto 2014).

A small proportion of oxidised waste rock materials located near the ground surface could contain elevated sulfate, metal and metalloid concentrations in leachate even under near-neutral pH conditions. The proponent considers that most metals/metalloids would result in small loads within the first significant rainfall event, and would be exhausted during subsequent rainfall events. If encountered in significant quantities, material containing elevated sulfur would be encapsulated to limit dissolution (Rio Tinto 2014).

The EPA considers that the risk of AMD is low and can be readily managed through the development and implementation of a Mine Closure Plan. As the DMP and the Department of State Development (DSD) do not have the regulatory powers to require the preparation of a mine closure plan for this proposal, the EPA has recommended a Rehabilitation and Closure condition (condition 13). This condition requires the proponent to prepare a revised mine closure plan in consultation with the Department of Parks and Wildlife, that is consistent with the DMP/EPA *Guidelines for Preparing Mine Closure Plans* (DMP/EPA 2011) and any updates, on advice of the DMP. Condition 13 also provides for the periodic revision of the Mine Closure Plan every three years, or as specified by the CEO of the Office of the EPA.

Summary

Having particular regard to:

- the project occurring on State Agreement Act tenements;
- up to 12,171 ha of disturbed native vegetation requiring rehabilitation;
- the proponent committing to backfill mine voids to above the pre-mining watertable; and
- results of the waste testing indicating that any potential acid and metalliferous drainage is readily manageable,

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

- condition 13 is imposed to ensure that the proponent develops a mine closure plan consistent with the DMP/EPA *Guidelines for Preparing Mine Closure Plans* (DMP/EPA 2011), in consultation with the Department of Parks and Wildlife; and
- condition 14 is imposed to counterbalance the significant residual impacts of the loss of up to 11,710 ha of vegetation in 'good to excellent' condition.

3.7 Offsets – integrating factor

Objective

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 mitigated the impacts of its proposal to significant environmental values through:

- avoiding direct disturbance to the Pilbara Leaf-nosed Bat maternal bat K75W adit/cave system and the Koodaideri Spring Gorge (Koodaideri Spring and associated creek and pools);
- avoiding the Declared Rare Flora species Hamersley Lepidium;

- avoiding the formation of permanent pit lakes through the progressive backfilling of mine pits K75W and K38W to above the pre-mining groundwater levels;
- minimising indirect impacts on the Pilbara Leaf-nosed Bat by proposing a 100 m buffer around the K75W adit/cave system and conducting trials on the potential impacts of vibration on bat behaviour and health; and
- minimising impacts on troglofauna habitat by proposing mining exclusion zones;
- minimising the abstraction of groundwater through the use of surplus mine dewater from the Yandicoogina operation; and
- minimising impacts to the Koodaideri Spring Gorge by proposing a 50 m buffer from the edge of the gorge containing the creek system and not dewatering mine pit K58W.

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 11,710 ha of native vegetation in 'good to excellent' condition in the Pilbara IBRA region, including:

- loss of up to 166 ha of potential Northern Quoll habitat;
- the loss of up to 6,134 ha of foraging habitat for the Pilbara Leaf-nosed Bat; and
- the loss of up to nine per cent of the Priority 1 flora species *Sauropus* sp. Koodaideri detritals should the Minister for Environment declare it as Rare Flora.

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.

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 the traditional approach of land acquisition and management as offsets is 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 or an alternative offset arrangement providing an equivalent outcome.

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. Normal government processes to transfer land into the conservation estate can continue to take place outside the environmental impact assessment process.

The clearing of native vegetation in 'good to excellent' condition in the Fortescue and Hamersley IBRA subregions 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.

Clearing associated with the transport and infrastructure corridors can be split into two components – permanent clearing (e.g. a rail line and associated infrastructure) and temporary clearing (e.g. clearing to allow this rail line to be constructed). Rehabilitation of this temporary clearing will commence progressively and is expected to be substantially commenced within a few years of completion of the rail line. The temporary nature of the activities and the minimal soil disturbance means the rehabilitation should be highly effective. Therefore, the temporary clearing does not result in a significant residual impact.

Consistent with other proposals in this region, a contribution to this initiative will be applied at the appropriate rate per hectare for all clearing other than the temporary clearing within the Western Railway Corridor and Southern Infrastructure Corridor.

The EPA has recommended the following offset contribution rates apply:

- $1,500 per ha for the clearing of 'good to excellent' condition native vegetation within the Fortescue IBRA subregion which includes habitat for conservation significant species;
- $3,000 per ha for the clearing of native vegetation in 'good to excellent condition' within the Fortescue IBRA subregion which also has other additional significant environmental values; and
- $750 per ha for the clearing of 'good to excellent' condition native vegetation within the Hamersley IBRA subregion which includes habitat for conservation significant species.

The EPA recommends that the higher rate of offset contribution ($3,000 per hectare) be applied for the clearing of foraging habitat for the Pilbara Leaf-nosed Bat. This habitat will be lost from the clearing of vegetation in the K75W and K58W mine pits (Figure 19). As the bat K75W adit/cave system is located between the two mine pits, with water sources located beyond both conceptual mine pit boundaries, removal of habitat will impact on the bats' ability to traverse the distance to the water sources. Therefore, the EPA considers this impact to be an 'other additional significant environmental value' that warrants the higher offset rate.

As there is an impact to habitat for the Pilbara Leaf-nosed Bat, the EPA recommends that the additional portion of the offset contribution, from the higher rate, is specifically directed towards investment in improving the future viability of the bat populations in the Pilbara IBRA region.

The permanent clearing of 'good to excellent' condition native vegetation is used as the basis for calculating offsets contributions. The EPA considers that the impact to native vegetation also includes the loss of habitat for conservation significant species, in this case the Northern Quoll and Pilbara Leaf-nosed Bat. As such, the offsets applied must ensure that these species are directly benefited by the offset action, along with improvements to biodiversity more generally.

Consistent with the approach outlined above, the EPA has recommended condition 14 in the recommended environmental conditions, to address the significant residual impacts of the proposal.

3.8 Environmental principles

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

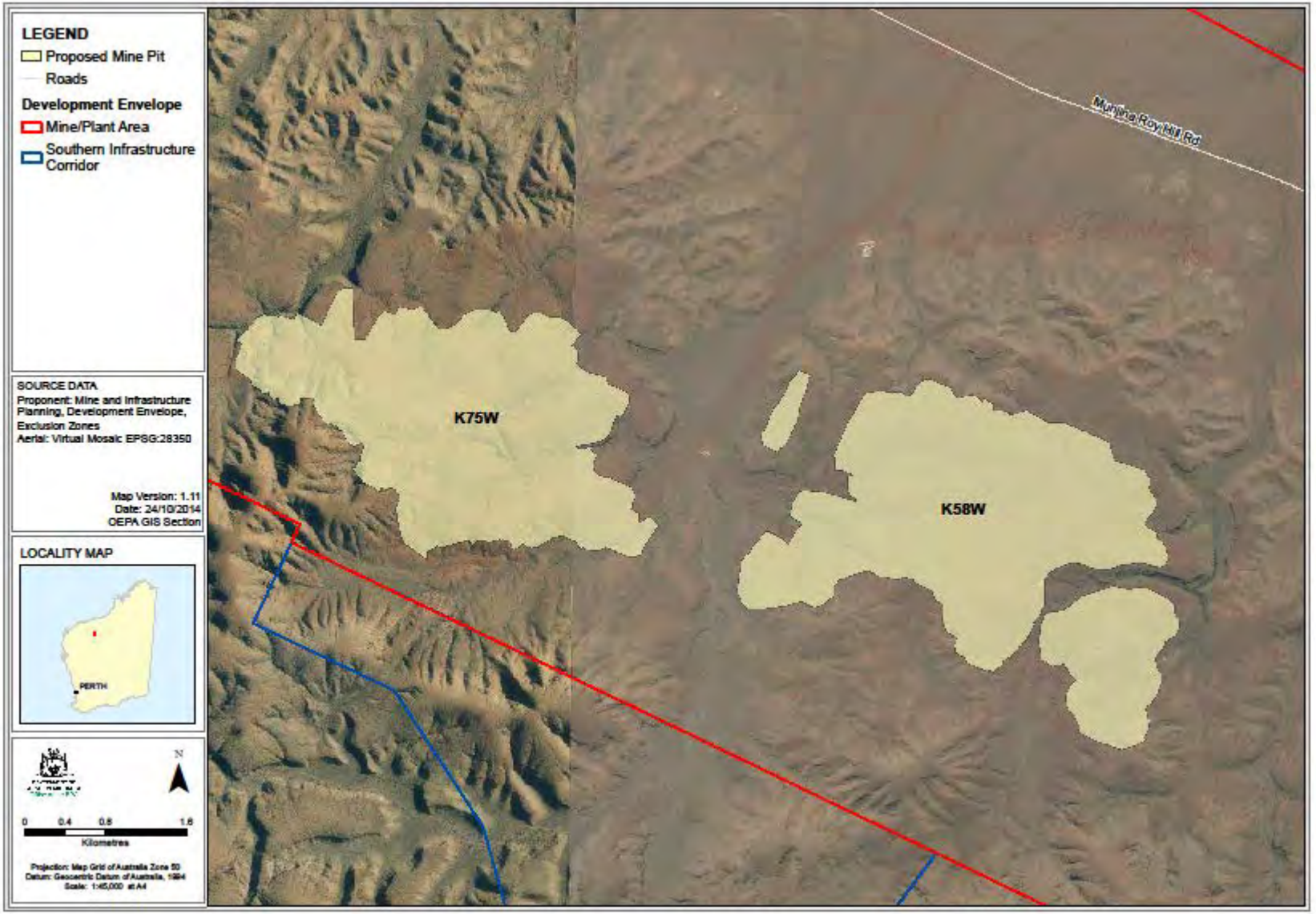

Figure 19: K75W and K58W mine pits containing Pilbara Leaf- nosed Bat foraging habitat

4. Matters of National Environmental Significance

This proposal was determined by the Department of the Environment (Formerly Department of Sustainability, Environment, Water, Populations and Communities) to be a controlled action on 9 July 2012. The decision was principally because of the clearing of suitable roosting, denning and foraging 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 WA 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 WA 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 (*Rhinonicteris aurantia*) – Vulnerable
- Northern Quoll (*Dasyurus hallucatus*) – Endangered
- Pilbara Olive Python (*Liasis olivaceus barroni*) – Vulnerable
- Hamersley Lepidium (*Lepidium catapycnon*) – Vulnerable

A large colony of at least 430 individuals of Pilbara Leaf-nosed Bat is located within an adit/cave system adjacent to the proposed K75W mine pit, is one of the 26 known maternal roosts in the Pilbara. The Mine/Plant Area development envelope also contains the Koodaideri Spring Gorge which is located about six kilometres to the east of the maternal adit/cave and has been identified as the key foraging habitat. No other colonies have been found in the area. The Koodaideri colony is likely to be regionally significant and an important contributor to the presence of the Pilbara Leaf-nosed Bat in the central Pilbara region.

The proponent has committed to protect both the K75W adit/cave system and the Koodaideri Spring Gorge. However, the proposal will result in the loss of up to 6,134 ha or 21 per cent of foraging habitat. The EPA has recommended condition 6 to protect the roost, key foraging areas and potential foraging habitat between the roost and key foraging areas. Recommended condition 7

requires the development of a Pilbara Leaf-nosed Bat Management Plan to minimise impacts to this species.

The Northern Quoll and Pilbara Olive Python have been recorded within the Mine/Plant Area development envelope, as shown in Figure 8. The proponent has identified 729 ha of potential habitat for both species. This habitat was considered in the PER (2013a) to potentially contain denning habitat which the Commonwealth Government classifies as 'critical to the survival' of the quoll (DSEWPaC 2011). This includes the Koodaideri Spring Gorge which is very high value habitat and is likely to provide denning habitat and primary foraging habitat for the quoll.

Clearing will result in the loss of up to 166 ha of potential habitat for these species; however, the Koodaideri Spring Gorge will be protected and a total of 563 ha (77 per cent) of potential core habitat within the development envelope will be retained. This habitat is considered to be contiguous with other adjoining similar habitat. The EPA has recommended condition 8 requiring the proponent to implement a Northern Quoll Management Plan and condition 11 requiring the proponent to implement a revised Koodaideri Spring Adaptive Management Strategy to protect the values of the spring. The objectives of the plans are to ensure that the proposal is carried out in a manner that minimises the direct and indirect impacts to the conservation significant species.

The EPA has also recommended offsets in condition 14, in the form of funds to a strategic conversation initiative (or Government alternative) for the Pilbara region. Funds provided to this strategic conservation initiative should be used to directly benefit the Pilbara Leaf-nosed Bat and Northern Quoll.

The proponent has committed to avoiding all known populations of Hamersley Lepidium within the Mine/Plant Area development envelope. The EPA has recommended condition 9 to ensure there is no loss of Hamersley Lepidium, which includes a 50 m no-disturbance buffer around known individuals.

Summary

The EPA has recommended that the location and authorised extent of clearing of native vegetation be limited to 12,171 ha within the development envelope. The EPA has also recommended the following conditions to minimise the impacts on conservation significant fauna:

- condition 6 is imposed to retain foraging habitat between the K75W adit/cave system and Koodaideri Spring Gorge;
- condition 7 is imposed to manage the impacts on the Pilbara Leaf-nosed Bat;
- condition 8 is imposed to minimise impacts to the Northern Quoll;
- condition 9 is imposed to ensure there is no impact to Hamersley Lepidium; and

- condition 11 is imposed to protect the values of the Koodaideri Spring Gorge habitat for the Pilbara Leaf-nosed Bat, Pilbara Olive Python and Northern Quoll.

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 due to clearing of 'good to excellent' vegetation in the Pilbara and the loss of Pilbara Leaf-nosed Bat foraging habitat and potential habitat 'critical for the survival of' the Northern Quoll within the Mine/Plant Area 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 Mount Bruce Mining to develop the Koodaideri Iron Ore Mine and Infrastructure Project is approved for implementation. These conditions are presented in Appendix 4. Matters addressed in the conditions include the following:

(a) ensuring that the proposal is implemented in a manner that maintains the Pilbara Leaf-nosed Bat colony which resides within the K75W adit/cave system (conditions 6 and 7);

(b) ensuring that troglofauna are protected by excluding mining and infrastructure placement within a portion of troglofauna habitat (condition 6);

(c) ensuring that mine construction and operational activities are carried out in a manner that minimises impacts to the Northern Quoll (condition 8);

(d) ensuring that mining and infrastructure is sited in a manner that avoids the Declared Rare Flora, Hamersley Lepidium (condition 9);

(e) ensuring that the proposal is implemented so that it does not affect the viability of the Priority 1, *Sauropus* sp. Koodaideri detritals (condition 10);

(f) ensuring that mining activities do not impact the hydrological regime or water quality of the Koodaideri Spring Gorge (condition 11);

(g) ensuring the proposal does not increase the spread of asbestos in the environment, resulting in adverse effects on public health (condition 12);

(h) requiring the proponent close, decommission and rehabilitate the mine in an ecologically sustainable manner through the development and implementation of a Mine Closure Plan (condition 13); and

(i) 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 which contains habitat for the Northern Quoll and foraging habitat for the Pilbara Leaf-nosed Bat (condition 14).

5.2 Consultation

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

6. Other advice

Pilbara Leaf-nosed Bat

The EPA notes that K75W adit/cave system is an important maternal roost and that the Koodaideri bat population is dependent on the adit/cave. The EPA recognises the work the proponent has undertaken to date, to determine the lateral extent of the adit/cave system, but notes that that the 3D laser survey could not map the minor chambers off the main chamber within which bats are considered to roost. Should the confirmed lateral extent of the adit/cave system (as required by recommended condition 7) be considerably different to the current predicted extent, the EPA expects that the K75W adit/cave system exclusion zone required by recommended condition 6 would be amended accordingly through a formal change to conditions under s46 of the EP Act.

Sauropus *sp. Koodaideri detritals*

The EPA considers that any loss of individuals of a species that qualifies as DRF may adversely impact the viability of the species. Should *Sauropus* sp. Koodaideri detritals be declared as Rare Flora, the EPA recommends that the proponent increase their proposed no-disturbance buffer from 20 m to 50 m, to be consistent with the proponent's proposed buffer for the DRF species Hamersley Lepidium.

Mine Development

The EPA notes the proposal will be implemented on State Agreement Act tenure and as such the Department of Mines and Petroleum (DMP) will not have the opportunity to assess the design and construction of the Waste Fines Storage Facility (WFSF) under the *Mining Act 1978*. However the WFSF can be regulated by the Department of Environment Regulation (DER) under Part V of the EP Act and Schedule 1 of the Environmental Protection Regulations 1987. The EPA therefore recommends that the DER seeks comments from the DMP on the design and construction of the WFSF.

7. Recommendations

The EPA submits the following recommendations to the Minister for Environment. That the Minister:

1. notes that the proposal being assessed is for the development and operation of the Koodaideri Iron Ore Mine and Infrastructure Project located 110 km west-north-west of Newman in the Pilbara region;
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 4 and summarised in Section 5;
4. notes the EPA's other advice presented in Section 6; and
5. imposes the conditions and procedures recommended in Appendix 4 of this report.

Appendix 1

List of submitters

Organisations:
Department of Aboriginal Affairs
Department of the Environment (previously Department of Sustainability, Environment, Water, Population and Communities)
Department of Environment Regulation
Department of Health
Department of Lands
Department of Mines and Petroleum
Department of Parks and Wildlife
Department of Regional Development
Department of State Development
Department of Water
Shire of Ashburton

Individuals:
Tony, Robyn and Jamie Richardson
Carol Jenkins
Rod Hipper
Two confidential/anonymous submissions

Appendix 2

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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
Land			
Terrestrial Fauna	The proposal would result in the clearing of up to 12,171 ha of potential habitat. The proposal has the potential to impact 12 species of conservation significance, including the Pilbara Leaf-nosed Bat, Northern Quoll and Pilbara Olive Python.	*Department of Parks and Wildlife* • A clear limit should be set for direct impacts to the Pilbara Leaf-nosed Bat and on direct or indirect impacts on the K75W cave/adit system should be set. Ideally the limit on impacts to the cave/adit population would be set at zero (no impact). • A buffer distance for the K75W cave/adit should be based on expert opinion and empirical data. No significant ground disturbing activities should occur within the buffer. Further investigations to clarify and map the full spatial extent of the K75W cave/adit system would be required to set an accurate buffer. *Department of Parks and Wildlife and Commonwealth Department of the Environment* • The following information regarding the Pilbara Leaf-nosed Bat foraging habitat should be provided: o a scientific expert prediction of the impact on the Pilbara Leaf-nosed Bat colony from removing of foraging/dispersal habitat within the development envelope; and o a clear explanation of measures proposed to minimise impacts.	**Considered to be a key environmental factor and is discussed in section 3.1.**

Preliminary Environmental Factors	Proposal Characteristics	Government Agency and Public Comments	Identification of Key Environmental Factors
		Department of the Environment • Further information should be provided on the Pilbara Leaf-nosed Bat colony including: o the cumulative effect of all potential impacts on the viability of the population; and o further justification of the 50 m buffer based on other mining projects in the region and evidence to indicated long term persistence of the species in mines with similar circumstances. • The value of the Northern Quoll habitat within the development envelope has been underestimated. The habitat has been classified as 'critical to the survival' of the species and the species is confirmed as occurring in the area.	
Subterranean Fauna	Potential loss of 15 troglobitic taxa, nine of which are potentially new species only known from within the proposed pit areas.	*Department of Parks and Wildlife* • Additional information should be provided to support an adequate level of confidence that the troglofauna taxa that are likely to be directly impacted by the current proposal occur or are likely to occur outside the proposed disturbance area.	**Considered to be a key environmental factor and is discussed in section 3.2.**
Flora and Vegetation	The proposal requires clearing of 12,171 ha of native vegetation and there are potential impacts to Declared Rare Flora and priority flora species.	*Department of Parks and Wildlife* • The direct loss of 67% of the Priority 1 species *Sauropus* sp. Koodaideri detritals (J. Naaykens & J. Hurter JHI213) and potential change in threat category of the taxon would not be supported by	**Considered to be a key environmental factor and is discussed in section 3.3.**

Preliminary Environmental Factors	Proposal Characteristics	Government Agency and Public Comments	Identification of Key Environmental Factors
	The proposed development envelope intersects pastoral station exclusion areas that have been identified for conservation tenure.	the department. *Department of Parks and Wildlife, Department of the Environment and Public* • Indirect impacts to the DRF Hamersley Lepidium resulting from activities relating to the formation and use of infrastructure (including waste dumps) should be considered and reported on by the proponent. *Public* • The compliance of flora surveys with *Guidance Statement No. 51: Terrestrial flora and vegetation surveys for environmental impact assessment in Western Australia* was questioned with regards to sampling intensity and survey timing. • Believes development alternatives for the location of the plant and supporting infrastructure should have been considered to reduce impacts to the Marillana 2015 Area. • Clarity was sought on buffer areas for areas of special protection.	

Preliminary Environmental Factors	Proposal Characteristics	Government Agency and Public Comments	Identification of Key Environmental Factors
Water			
Hydrological Processes	***Surface water*** The proposal could result in the removal of 40 per cent of the surface water catchment for the Koodaideri Spring and associated creek system.	***Surface water*** *Department of Parks and Wildlife* • The Koodaideri Spring is located within the Marillana 2015 area and supports high ecological values which should not be adversely impacted by the proposal. • A management and monitoring program for the Koodaideri Spring should be developed as the basis for managing the project to maintain the identified environmental and conservation values. • To inform management and monitoring programs baseline monitoring of the Koodaideri Spring should commence as soon as possible prior to mining. *Department of Mines and Petroleum and Department of Environment Regulation* • Concerns were raised with regards to the consideration of supplementation of the surface water supply for Koodaideri Spring with groundwater as a contingency measure.	**Considered to be a key environmental factor and is discussed in section 3.4.**

Preliminary Environmental Factors	Proposal Characteristics	Government Agency and Public Comments	Identification of Key Environmental Factors
		Department of Water • Further information is required regarding the detailed management of hydrological changes adjacent to the Koodaideri Spring and the specific supplementation strategies to mitigate the changes. *Department of Environment Regulation* • Further information should be provided on how projected changes to cyclone intensity will be incorporated into the project's infrastructure and site design, in order to reduce risks to the natural environment. *Public* • Local knowledge should be taken into account when designing the crossing of the Southern Fortescue River by the WRC. • A flood modelling study of the WRC should be conducted to so that the impacts can be assessed. • Technical information on the location, size, depth, management and rehabilitation of borrow pits is requested so that the impacts to surface water can be understood.	

Preliminary Environmental Factors	Proposal Characteristics	Government Agency and Public Comments	Identification of Key Environmental Factors
	Groundwater Dewatering will be undertaken at mine pits K75W and K38W. To maintain the ecological values of the Koodaideri Spring System proposed mine pit K58W will only be mined above groundwater level. Additional water required for the operation of the mine will be transported via pipeline from Rio Tinto's Yandigoogina mine.	***Groundwater*** *Public* • Dewatering modelling for the proposed mine pits should include the full potential disturbance area.	
Inland Waters Environmental Quality	Testing (Rio Tinto 2013a and 2013b) indicates that the current pit design has a low risk of acid and metalliferous drainage (AMD) as the un-oxidised Mount McRae Shale underlying the ore body would not be mined.	*Public* • An acid mine drainage risk assessment should be undertaken for the entire potential disturbance area.	**Considered to be a key environmental factor and is discussed in section 3.4.**
People			
Human Health	***Asbestos*** A 19 km portion of the proposed Western Rail Corridor development envelope is proposed to be located within the Wittenoom Asbestos	***Asbestos*** *Department of Lands, Department of State Development, Department of Health and the Shire of Ashburton* • The movement of heavy vehicles could disturb areas of contaminated soils (Joffre floodplain and	**Considered to be a key environmental factor and is discussed in section 3.5.**

Preliminary Environmental Factors	Proposal Characteristics	Government Agency and Public Comments	Identification of Key Environmental Factors
	Management Area. Construction within the Western Rail Corridor has the potential to disturb asbestos contaminated land.	Wittenoom Airport Reserve) remobilising fibres that may otherwise have been stabilised in the current site conditions. This could increase the susceptibility of the floodplain to erosion and potentially uncover a previously managed contamination risk. • The proposed WRC has potential to generate dust from passing trains through the WAMA once the rail line is operational. *Shire of Ashburton* • The proponent should ensure that there is absolute Council indemnity from any individual or collective claims brought on by those persons that may contract asbestoses as a result of the implementation of the WRC which is proposed to cross the WAMA. • A social assessment is needed.	
Heritage	A range of archaeological heritage places have been identified within the development envelope, including rock shelters, artefact scatters, and culturally-modified trees. To date archaeological places with additional high cultural significance have not	*Department of Aboriginal Affairs* • The Aboriginal Heritage Management Plan should include reference to the application of the State's *Aboriginal Heritage Due Diligence Guidelines*.	The proponent has committed to undertaking heritage surveys prior to ground disturbing activities in accordance with the protocols and agreements with Traditional Owners, the *Aboriginal Heritage Act 1972* and the Department of Aboriginal Affairs guidelines for heritage survey.

Preliminary Environmental Factors	Proposal Characteristics	Government Agency and Public Comments	Identification of Key Environmental Factors
	been identified within the Development Envelope. As at June 2013, a total of 260 km² (39.5%) of the development envelope has been covered by heritage survey.		Where practicable, infrastructure will be located to avoid significant heritage places. If the impact is unavoidable, the proponent will consult with the Department of Aboriginal Affairs and relevant Traditional Owners and ensure consent is obtained under Section 18 of the *Aboriginal Heritage Act 1972* prior to ground-disturbing activities being undertaken. **Not considered to be a key environmental factor.** **Factor does not require further EPA evaluation.**
Amenity	***Noise*** Noise levels resulting from rail transport have the potential to impact a number of sensitive receivers including the operations village (9 km from the railway) and Youngaleena Community (2.2 km from the railway). Modelled average railway noise levels for railway transport were below the criteria specified in *State*	***Noise*** *Department of Health* The proponent must ensure that the noise levels at the operation village are reduced below the required criterion by implementing the control measure recommended in the Noise Assessment and Conclusions section of the Koodaideri Environmental Noise Assessment (STV 2013b).	***Noise*** Rail noise impacts do not exceed the criteria specified in the SPP 5.4. Mine pit operation noise exceeds *Environmental Protection (Noise) Regulations 1997* at the Operations village. To ameliorate this noise the proponent proposes to apply Australian Standard AS2107:2000 to the accommodation buildings which

Preliminary Environmental Factors	Proposal Characteristics	Government Agency and Public Comments	Identification of Key Environmental Factors
	Planning Policy: Road and Rail Transport Noise and Freight Considerations in Land Use Planning (SPP 5.4) night-time noise target of 50 dB(A) for all sensitive receivers (SVT 2013a). Maximum average railway noise levels were below the night-time noise target of 50 dB(A) for all receivers. The operation of the mine would impact the sensitive receptor of the operations village. Modelling for the mine operation indicates that the noise under worst case scenario would reach 47.8 dB(A) which exceeds the noise target stipulated in the *Environmental Protection (Noise) Regulations 1997* for outdoor night time noise limits of 35 dB(A).		have recently achieved internal sound reduction results of 50 dB(A) which would in theory cancel out the worst case noise of 47.8 dB(A). Noise impacts can be managed under *Environmental Protection (Noise) Regulations 1997*, environmental licence conditions (issued under Part V of the EP Act), health and safety regulations and transportation noise regulations. **Not considered to be a key environmental factor.** **Factor does not require further EPA evaluation.**
	Dust The original railway centreline has been realigned into the northern half of the WRC to	***Dust*** *Department of Health* It should be made clear that it is the proponent's responsibility to ensure that fugitive dust emissions are	***Dust*** The proponent will manage dust impacts under the Construction Environmental Management Plan.

Preliminary Environmental Factors	Proposal Characteristics	Government Agency and Public Comments	Identification of Key Environmental Factors
	increase the distance separation from the Youngaleena community. Reducing the potential dust impacts (during construction) to the community.	minimised, managed appropriately and to conduct regular recorded monitoring throughout the life of the project.	**Not considered to be a key environmental factor.** **Factor does not require further EPA evaluation.**
Air			
Air Quality	The total greenhouse gas emissions estimated for the 30 year life of the proposal will be approximately 10.7 million tonnes (t) CO_2-e with a total average emission intensity of approximately 12.98 t CO_2-e/kt.	*Department of Environment Regulation* • The calculation of greenhouse gas emissions provided in the PER should be confirmed.	The proponent is committed to minimising emissions to levels as low as reasonably practicable through a wide range of management actions as listed in the PER (Section 18.3.2). The proponent will comply with relevant statutory requirements and legislation relating to greenhouse gas emissions. **Not considered to be a key environmental factor.** **Factor does not require further EPA evaluation.**
Integrating factors			
Rehabilitation and Closure	The proposal occurs on tenements granted under a State Agreement Act and is not	*Department of Environment Regulation* • The proponent should ensure that waste rock from mining activities is managed appropriately to	**Considered to be a key environmental factor and is discussed in section 3.6.**

Preliminary Environmental Factors	Proposal Characteristics	Government Agency and Public Comments	Identification of Key Environmental Factors
	subject to the *Mining Act 1978*. Rehabilitation of disturbed areas will be progressive throughout life of mine of with the majority of rehabilitation taking place post mining and will be compatible with post mining land use. Rehabilitation of the 2015 Marillana Pastoral Station Exclusion Area will be undertaken to a standard that is compatible with conservation reserves to an extent that is reasonably practicable. Progressive backfilling of the two dewatered mine pits K75W and K38W will be undertaken to prevent the formation of pit lakes. Geochemical characterisation testing carried out by the proponent has indicated that potential risk of acid and metalliferous drainage occurring is low.	minimise the risk of adverse environmental impacts from mine drainage. • A small proportion of oxidised waste rock materials located near the ground surface could contain elevated sulphate, metal and metalloid concentrations in leachate even under near-neutral pH conditions. An assessment of potential environmental receptors should be conducted to determine if the waste rock requires encapsulation or other management measures. *Department of Water* • Further information is required relating to the potential risk to groundwater and contingency actions for exposure of unoxidised Mount McRae Shale on pit walls. *Department of Parks and Wildlife* • If the proposal is considered acceptable closure outcomes in the Marillana 2015 area should be to a standard acceptable to DPaW, the future land manager.	

Preliminary Environmental Factors	Proposal Characteristics	Government Agency and Public Comments	Identification of Key Environmental Factors
Offsets	The proposal would result in significant residual impacts from the clearing of up to 12,171 ha of native vegetation, of which 11,710 ha is considered to be in 'good to excellent' condition, including the loss of potential Northern Quoll habitat and foraging habitat for the Pilbara Leaf-nosed Bat.	*Department of the Environment* • The PER indicates that there will be a significant residual impact on the Northern Quoll from the proposal. Therefore compensatory measures are required.	**Considered to be a key environmental factor and is discussed in section 3.6.**

PRINCIPLES		
Principle	**Relevant Yes/No**	**If yes, Consideration**
1. The precautionary principle *Where there are threats of serious or irreversible damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.* *In application of this precautionary principle, decisions should be guided by –* *(a) careful evaluation to avoid, where practicable, serious or irreversible damage to the environment; and* *(b) an assessment of the risk-weighted consequences of various options.*		
	Yes	• In considering this principle, the EPA notes that terrestrial fauna, subterranean fauna, vegetation and flora, hydrological processes and inland waters environmental quality could be impacted by this proposal. • Investigations of the biological and physical environment undertaken by the proponent have provided background information to assess risks and identify measures to avoid or minimise impacts, and where practical the proponent has proposed avoidance and minimisation measures. • The assessment of these impacts and management is provided in Section 3 of this report. • Conditions have been recommended as considered necessary.
2. The principle of intergenerational equity *The present generation should ensure that the health, diversity and productivity of the environment is maintained and enhanced for the benefit of future generations.*		
	Yes	The EPA notes that the proposal would result in the direct loss of up to 12,171 ha of vegetation, of which 3,096 ha will be lost from the Marillana 2015 area and the alteration of landforms

PRINCIPLES		
Principle	**Relevant Yes/No**	**If yes, Consideration**
		that require rehabilitation. Vegetation and flora are relevant environmental factors discussed in this report and conditions have been recommended to minimise impacts, including a condition to offset residual impacts to clearing of 'good to excellent' condition vegetation.
3. The principle of the conservation of biological diversity and ecological integrity *Conservation of biological diversity and ecological integrity should be a fundamental consideration.*		
	Yes	The proposal would result in impacts to State and Commonwealth listed flora and fauna species and a Priority flora species. In assessing the proposal, the EPA has considered these impacts and recommended conditions to minimise impacts, including a condition to offset residual impacts to clearing of 'good to excellent' condition vegetation.
4. Principles relating to improved valuation, pricing and incentive mechanisms *(1) Environmental factors should be included in the valuation of assets and services.* *(2) The polluter pays principles – those who generate pollution and waste should bear the cost of containment, avoidance and abatement.* *(3) The users of goods and services should pay prices based on the full life-cycle costs of providing goods and services, including the use of natural resources and assets and the ultimate disposal of any waste.* *(4) Environmental goals, having been established, should be pursued in the most cost effective way, by establishing incentive structure, including market mechanisms, which enable those best placed to maximize benefits and/or minimize costs to develop their own solution and responses to environmental problems.*		
	Yes	The EPA notes that the proposal would require decommissioning, rehabilitation and residual impact management. The proponent should bear the cost of any potential pollution, containment, monitoring, management,

PRINCIPLES		
Principle	**Relevant Yes/No**	**If yes, Consideration**
		decommissioning, rehabilitation and closure.
5. The principle of waste minimisation *All reasonable and practicable measures should be taken to minimize the generation of waste and its discharge into the environment.*		
	Yes	In considering this principle, the EPA notes that the majority of waste from the proposal is proposed to be used to backfill pits. Other waste products would be created as a result of implementation of the proposal, and will be disposed of according to relevant regulations and legislation.

Appendix 4

Identified Decision-Making Authorities and Recommended Environmental Conditions

Identified Decision-Making Authorities

Section 44(2) of the *Environmental Protection Act 1986* (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:

Decision-making Authority	Approval
1. Minister for State Development	*Iron Ore (Hamersley Range) Agreement Act 1963* *Iron Ore (Mount Bruce) Agreement 1972* Railway and Rail infrastructure Mining in ML252SA
2. Minister for Mines and Petroleum	*Mining Act 1978* and *Mining Regulations 1981* Granting of leases
3. Minister for Environment	*Wildlife Conservation Act 1950* Taking of flora and fauna
4. Minister for Water	*Rights in Water and Irrigation Act 1914* Interference with watercourse bed and banks
5. Minister for Lands	*Land Administration Act 1997* Activities in Marillana Station Exclusion Area S.91 Licences
6. Minister for Aboriginal Affairs	*Aboriginal Heritage Act 1972*
7. Shire of East Pilbara	*Relevant town planning scheme* *Local Government (Uniform Local Revision) Regulations 1996* Non-mining operations developments
8. Department of Mines and Petroleum	<u>Mining Proposal</u> *Mining Act 1978 and Mining Regulations 1981* Granting of licences and leases <u>Dangerous Goods</u> *Dangerous Goods Safety Act 2004* Storage and handling of hazardous materials Chief Dangerous Goods Officer
9. Department of Environment Regulation	*Environmental Protection Regulations 1987* *Environmental Protection Act 1986*, Part V Ore processing Waste water treatment plant

Note: In this instance, agreement is only required with DMAs 1 – 6 since these DMAs are Ministers.

Statement No. XXX

RECOMMENDED ENVIRONMENTAL CONDITIONS

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

KOODAIDERI IRON ORE MINE AND INFRASTRUCTURE PROJECT

Proposal: The proposal is to construct and operate an open cut iron ore mine and associated infrastructure for the extraction, processing and transport of iron ore.

Proponent: Mount Bruce Mining Pty Limited

Australian Company Number 008 714 010

Proponent Address: Mount Bruce Mining Pty Limited
152-158 St Georges Terrace
PERTH WA 6000

Assessment Number: 1933

Report of the Environmental Protection Authority Number: 1533

Pursuant to section 45 of the *Environmental Protection Act 1986* it has been agreed that the proposal described and documented in Table 2 of Schedule 1 may be implemented and that the implementation of the proposal is subject to the following implementation conditions and procedures:

Note: Words and expressions used in this Statement shall have the same respective meanings as in the Act or as provided for in Schedule 1 of this Statement.

1 Proposal Implementation

1-1 When implementing the proposal, the proponent shall not exceed the authorised extent of the proposal as defined in Table 2 in Schedule 1, unless amendments to the proposal and the authorised extent of the proposal have 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, submit and maintain a Compliance Assessment Plan to the CEO at least six (6) months prior to the first Compliance Assessment Report required by condition 4-6, or prior to implementation, whichever is sooner.

4-2 The Compliance Assessment Plan shall indicate:

(1) the frequency of compliance reporting;

(2) the approach and timing of compliance assessments;

(3) the retention of compliance assessments;

(4) the method of reporting of potential non-compliances and corrective actions taken;

(5) the table of contents of Compliance Assessment Reports; and

(6) public availability of Compliance Assessment Reports.

4-3 After receiving notice in writing from the CEO that the Compliance Assessment Plan satisfies the requirements of condition 4-2 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, or as agreed in writing by the CEO.

The Compliance Assessment Report shall:

(1) be endorsed by the proponent's Chief Executive Officer or a person delegated to sign on the Chief Executive Officer's behalf;

(2) include a statement as to whether the proponent has complied with the conditions;

(3) identify all potential non-compliances and describe corrective and preventative actions taken;

(4) be made publicly available in accordance with the approved Compliance Assessment Plan; and

(5) indicate any proposed changes to the Compliance Assessment Plan required by condition 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:

(1) a secret formula or process; or

(2) confidential commercially sensitive information;

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

6 Terrestrial Fauna (Pilbara Leaf-nosed Bat) and Subterranean Fauna (Troglofauna) Exclusion Zones

6-1 There shall be no ground disturbing activity within the following exclusion areas:

(1) K75W Adit/cave System Exclusion Zone, defined by a 100 metres buffer around the predicted lateral extent of the K75W Adit/cave System. The current K75W Adit/cave System Exclusion Zone is

delineated in Figure 2 of Schedule 1 and defined by the geographic coordinates in Schedule 2.

(2) Koodaideri Spring Gorge Exclusion Zone, as delineated in Figure 2 of Schedule 1 and defined by the geographic coordinates in Schedule 2.

(3) KBH12 Exclusion Zone, as delineated in Figure 2 of Schedule 1 and defined by the geographic coordinates in Schedule 2.

6-2 Ground disturbing activity shall be limited to linear infrastructure, to a maximum of 5% of the area of the K58W Pilbara Leaf-nosed Bat Exclusion Zone as delineated in Figure 2 of Schedule 1 and defined by the geographic coordinates in Schedule 2, to the satisfaction of the CEO.

6-3 There shall be no excavation or placement of waste dumps and tailings facilities within the following exclusion areas:

(1) K58W Troglofauna Exclusion Zone as delineated in Figure 2 of Schedule 1 and defined by the geographic coordinates in Schedule 2.

(2) K75W Troglofauna Exclusion Zone as delineated in Figure 2 of Schedule 1 and defined by the geographic coordinates in Schedule 2.

6-4 Placement of stockpiles, run of mine pads and linear infrastructure shall be limited to a maximum of 10% of the area of the K58W Troglofauna Exclusion Zone and 10% of the area of the K75W Troglofauna Exclusion Zone, to the satisfaction of the CEO.

6-5 K38W Troglofauna Exclusion Zone as delineated in Figure 6 of Schedule 1 and defined by the geographic coordinates in Schedule 2.

6-6 There shall be no excavation or placement of waste dumps, stockpiles and tailings facilities within the K38W Troglofauna Exclusion Zone as delineated in Figure 2 of Schedule 1 and defined by the geographic coordinates in Schedule 2.

7 Terrestrial Fauna – Pilbara Leaf-nosed Bat

7-1 The proponent shall ensure that the proposal is implemented in a manner that maintains the K75W Adit/cave System colony of the Pilbara Leaf-nosed Bat (*Rhinonicteris aurantia*).

7-2 Prior to the commencement of mining of the K75W pit the proponent shall prepare and submit a K75W Adit/cave System Structural Report confirming the lateral extent of the K75W Adit/cave System, to the requirements of the CEO, on advice from the Department of Parks and Wildlife.

7-3 The K75W Adit/cave System Structural Report required by condition 7-2, shall include:

(1) geophysical data, or other evidence acceptable to the CEO, of the lateral extent of the main chamber and other lateral passages and side chambers of the K75W Adit/cave System; and

(2) advice from an appropriate technical specialist (or specialists) on the most likely lateral extent of the K75W Adit/cave System.

7-4 Prior to ground-disturbing activities within the Mine/Plant Area Development Envelope, the proponent shall prepare and submit a Pilbara Leaf-nosed Bat Management Plan to the requirements of the CEO, on advice from the Department of Parks and Wildlife.

7-5 The objectives of the Pilbara Leaf-nosed Bat Management Plan required by condition 7-4 are to:

(1) ensure that the bat colony continues to use the important foraging locations of Koodaideri Spring Gorge and the gorge containing the KBH12 site, as delineated in Figure 2 of Schedule 1 and defined by the geographic coordinates in Schedule 2; and

(2) ensure that the population of the Pilbara Leaf-nosed Bat colony as defined in condition 7-6(1) remains in the K75W Adit/cave System as defined by condition 7-2.

7-6 The Pilbara Leaf-nosed Bat Management Plan shall include:

(1) a baseline survey utilising ultrasonic bat call detection methods to determine the population size of the Pilbara Leaf-nosed Bat colony which roosts within the K75W adit/cave system and delineate the baseline distribution of bat movement and foraging activity between the K75W Adit/cave System and the Koodaideri Spring Gorge and the gorge containing the KBH12 site;

(2) protocols and procedures to monitor activity levels of Pilbara Leaf-nosed Bats foraging at the Koodaideri Spring Gorge and the gorge containing the KBH12 site;

(3) protocols and procedures to monitor the Pilbara Leaf-nosed Bat movement and foraging activity between K75W adit/cave system and the Koodaideri Spring Gorge during the development of Pit K58W;

(4) protocols and procedures to monitor Pilbara Leaf-nosed Bat behaviour as the proposal's activities move to within 400 metres of the K75W Adit/cave System Exclusion Zone required by condition 6-1 during the development of Pit K75W;

(5) specific management protocols to enable the Pilbara Leaf-nosed Bat to adapt to impacts of construction and operation including a schedule of clearing of bat foraging habitat within the K58W mine pit and K75W mine pit taking into account the requirements of in 7-6(1), 7-6(2), 7-6(3) and 7-6(4).

(6) criteria to trigger implementation of management or contingency measures to prevent disturbance to the Pilbara Leaf-nosed Bat colony within the K75W Adit/cave System during drilling and blasting required for the development of Pit K75W.

(7) criteria to trigger implementation of management or contingency measures to respond to a reduction of Pilbara Leaf-nosed Bat foraging calls at the gorge containing the KBH12 site and the Koodaideri Spring Gorge to levels below baseline during mining of Pits K75W and K58W.

(8) management and or contingency measures to be implemented in the event that the trigger criteria required by condition 7-6(6) and/or condition 7-6(7) have been reached.

7-7 In the event that monitoring carried out under the Pilbara Leaf-nosed Bat Management Plan required by conditions 7-6(1), 7-6(2), 7-6(3) and 7-6(4) indicates trigger criteria required by condition 7-6(6) or 7-6(7) have been reached the proponent shall:

(1) investigate to determine the likely cause(s) of the criteria required by condition 7-6(6) and/or 7-6(7) being exceeded;

(2) if the exceedance is likely to be the result of activities undertaken in implementing the proposal, implement management and/or contingency measures required by condition 7-6(8) and continue implementation until criteria required by condition 7-6(6) and/or 7-6(7) are being met, or until otherwise agreed by the CEO; and

(3) provide a report that describes the investigation required by condition 7-7(1) and measures required by condition 7-7(2) to the CEO within 21 days of identification that criteria required by condition 7-6(6) and/or 7-6(7) has been exceeded.

7-8 After receipt of written advice from the CEO that the Pilbara Leaf-nosed Bat Management Plan satisfies conditions 7-5 and 7-6, the proponent shall implement the Pilbara Leaf-nosed Bat Management Plan.

7-9 Revisions to the Pilbara Leaf-nosed Bat Management Plan may be approved by the CEO.

7-10 The proponent shall implement approved revisions of the Pilbara Leaf-nosed Bat Management Plan required by condition 7-9.

7-11 The proponent shall report to the CEO on the outcomes of the implementation of the Pilbara Leaf-nosed Bat Management Plan. The report to the CEO shall include:

(1) the activity levels of Pilbara Leaf-nosed Bats using the Koodaideri Spring Gorge and the gorge containing the KBH12 site;

(2) an assessment of the stability of the K75W Adit/cave System;

(3) an assessment of the baseline and current population size of the K75W Adit/cave System Pilbara Leaf-nosed Bat colony;

(4) evidence that the population size of the K75W Adit/cave System colony of Pilbara Leaf-nosed Bat has been maintained within natural variation; and

(5) outcomes of the monitoring undertaken in accordance with the Pilbara Leaf-nosed Bat Management Plan to assess behaviour and movement of the Pilbara Leaf-nosed Bat as the proposal's activities move within 400 metres of the K75W Adit/cave System Exclusion Zone.

8 Terrestrial Fauna – Northern Quoll Management Plan

8-1 Prior to the commencement of ground-disturbing activities within 50 metres of Northern Quoll (*Dasyurus hallucatus*) foraging and denning habitat within the

Mine/Plant Area Development Envelope, Southern Infrastructure Corridor Development Envelope and the Western Rail Corridor Development Envelope, the proponent shall prepare and submit a Northern Quoll Management Plan in consultation with the Department of Parks and Wildlife, to the requirements of the CEO to demonstrate that condition 8-2 has been met.

8-2 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.

8-3 The Northern Quoll Management Plan shall include:

(1) census data for the Northern Quoll population within the Mine/Plant Area Development Envelope, Southern Infrastructure Corridor Development Envelope and the Western Rail Corridor Development Envelope, as delineated in Figure 1 of Schedule 1 and defined by the geographic coordinates in Schedule 2, based on available survey information;

(2) spatial imagery detailing Northern Quoll foraging and denning habitat within the Mine/Plant Area Development Envelope, Southern Infrastructure Corridor Development Envelope and the Western Rail Corridor Development Envelope;

(3) detailed management measures to minimise direct and indirect loss of the habitat mapped pursuant to condition 8-3(2);

(4) protocols and procedures to monitor Northern Quoll presence and abundance adjacent to the mine pit within the Mine/Plant Area Development Envelope identified by condition 8-3(2) during construction and operation;

(5) detailed contingency responses, including modified operational procedures or translocation of animals out of impact zones, if monitoring required by condition 8-3(4) show a decrease in Northern Quoll numbers attributable to the proposal, to ensure condition 8-2 is met.

8-4 Prior to the commencement of ground-disturbing activities within 50 metres of the mapped Northern quoll foraging and denning habitat required by condition 8-3(2), unless otherwise agreed by the CEO, the proponent shall implement the approved plan required by condition 8-1.

8-5 Revisions to the Northern Quoll Management Plan may be approved by the CEO.

8-6 The proponent shall implement approved revisions of the Northern Quoll Management Plan required by condition 8-5.

9 Flora – Hamersley Lepidium (*Lepidium catapycnon*)

9-1 The proponent shall ensure that there is no disturbance within the Hamersley Lepidium (*Lepidium catapycnon*) buffers within the Mine/Plant Area Development Envelope, as delineated in Figure 3 of Schedule 1 and defined by the geographic coordinates in Schedule 2.

10 Flora – Priority 1 *Sauropus* sp. Koodaideri detritals (J. Naaykens and J. Hurter JH 11213) Regional Survey and Conservation and Research Plan

10-1 The proponent shall ensure that ground-disturbing activities do not affect the viability of *Sauropus* sp. Koodaideri detritals (J. Naaykens and J. Hurter JH 11213) or its subsequent revised names, through the implementation of conditions 10-2 to 10-12.

10-2 The proponent shall not disturb any individuals of *Sauropus* sp. Koodaideri detritals (J. Naaykens and J. Hurter JH 11213) or its subsequent revised names prior to:

(1) preparing and submitting a *Sauropus* sp. Koodaideri detritals (J. Naaykens and J. Hurter JH 11213) Regional Survey Plan to the CEO; and

(2) receiving written notice from the CEO, having consulted Department of Parks and Wildlife, that the *Sauropus* sp. Koodaideri detritals (J. Naaykens and J. Hurter JH 11213) Regional Survey meets the requirements of condition 10-5.

10-3 The objective of the *Sauropus* sp. Koodaideri detritals (J. Naaykens and J. Hurter JH 11213) Regional Survey Plan is to clarify the conservation status of *Sauropus* sp. Koodaideri detritals.

10-4 The proponent shall ensure that there is no disturbance within the *Sauropus* sp. Koodaideri detritals buffers within the Mine/Plant Area Development Envelope, as delineated in Figure 4 of Schedule 1 and defined by the geographic coordinates in Schedule 2.

10-5 The *Sauropus* sp. Koodaideri detritals (J. Naaykens and J. Hurter JH 11213) Regional Survey Plan shall:

(1) include a Regional Survey to accurately detect and document the distribution and population size of the species; and

(2) 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.

10-6 The proponent shall implement the approved *Sauropus* sp. Koodaideri detritals (J. Naaykens and J. Hurter JH 11213) Regional Survey Plan required by condition 10-2(1).

10-7 Revisions to the *Sauropus* sp. Koodaideri detritals (J. Naaykens and J. Hurter JH 11213) Regional Survey Plan may be approved by the CEO.

10-8 The proponent shall report to the CEO the outcomes of the *Sauropus* sp. Koodaideri detritals (J. Naaykens and J. Hurter JH 11213) Regional Survey as required by the *Sauropus* sp. Koodaideri detritals (J. Naaykens and J. Hurter JH 11213) Regional Survey Plan or any revisions thereof approved by the CEO within 6 months of completion of the survey.

10-9 In the event that *Sauropus* sp. Koodaideri detritals (J. Naaykens and J. Hurter JH 11213) Regional Survey outcomes indicate that *Sauropus* sp. Koodaideri detritals (J. Naaykens and J. Hurter JH 11213) or its subsequent revised

names is declared Rare Flora under the *Wildlife Conservation Act 1950*, the proponent shall:

(1) prepare and submit a *Sauropus* sp. Koodaideri detritals (J. Naaykens and J. Hurter JH 11213) Conservation and Research Plan to the CEO; and

(2) seek written approval from the CEO, on the advice of Department of Parks and Wildlife, that the *Sauropus* sp. Koodaideri detritals (J. Naaykens and J. Hurter JH 11213) Conservation and Research Plan meets the requirements of condition 10-10.

10-10 The *Sauropus* sp. Koodaideri detritals (J. Naaykens and J. Hurter JH 11213) Conservation and Research Plan identified in condition 1-10-9(1) shall include:details of suitable conservation measures such as seed collection and germplasm storage, seeding or translocation trials to be undertaken in suitable habitat, or other suitable measures, for conservation of the species;

(2) details on research to be undertaken into the habitat, biology and conservation of the species;

(3) timeframes and responsibilities for the implementation of proposed conservation measures; and

(4) a monitoring program and criteria for determining efficacy of the proposed conservation measures.

10-11 The proponent shall implement the *Sauropus* sp. Koodaideri detritals (J. Naaykens and J. Hurter JH 11213) Conservation and Research Plan.

10-12 The proponent shall submit a report to the CEO documenting the results of the *Sauropus* sp. Koodaideri detritals (J. Naaykens and J. Hurter JH 11213) Conservation and Research Plan, identifying the success of the conservation measures required by condition 10-10(1) and the findings of the research required by 10-10(2), and the, within 6 months of completion of the measures set out in the approved plan.

11 Flora and Hydrological Processes – Koodaideri Spring Adaptive Management Plan

11-1 The proponent shall ensure that there are no adverse changes to the hydrology within the Koodaideri Spring Gorge Exclusion Zone, as delineated in Figure 2 of Schedule 1 and defined by the geographic coordinates in Schedule 2 attributable to the proposal.

11-2 The proponent shall implement the Koodaideri Spring Adaptive Management Plan prepared as part of Assessment 1933, dated May 2014 and continue implementation until otherwise agreed by the CEO.

11-3 The proponent may review and revise the Koodaideri Spring Adaptive Management Plan to the requirements of the CEO.

11-4 The proponent shall review and revise the Koodaideri Spring Adaptive Management Plan as and when directed by the CEO.

11-5 The proponent shall implement the latest approved revision of the Koodaideri Spring Adaptive Management Plan.

12 Human Health – Western Rail Corridor Asbestos Management Plan

12-1 The proponent shall ensure that the proposal is implemented in a manner so that the design and construction of the proposal in the portion of the Western Rail Corridor (WRC) Development Envelope that intersects the Wittenoom Asbestos Management Area (WAMA), as delineated in Figure 1 of Schedule 1 and defined by the geographic coordinates in Schedule 2, does not increase the spread of asbestos in the environment, resulting in adverse effects on public health.

12-2 Prior to commencement of ground-disturbing activities within the WAMA, the proponent shall prepare and submit an Asbestos Baseline Survey Plan, in consultation with the Department of Health, to the CEO. The Asbestos Baseline Survey Plan shall:

(1) when implemented, determine the concentration of airborne asbestos fibres, and the concentration of asbestos fibres in drainage line and adjacent landform sediments at specified locations within and outside the portion of the WRC Development Envelope contained within the WAMA;

(2) detail the proposed methodology for the Baseline Survey in accordance with the Department of Health's *Public Health Risk Management of Asbestos Minerals Associated with Mining* (2013) or its revisions;

(3) identify and spatially define the proposed monitoring sites, including control sites and rationale for the location of the sites;

(4) detail the proposed frequency and timing of monitoring;

12-3 After receiving notice in writing from the CEO that the Asbestos Baseline Survey Plan satisfies the requirements of 12-2, the proponent shall undertake the Asbestos Baseline Survey in accordance with the Asbestos Baseline Survey Plan.

12-4 On completion of the Asbestos Baseline Survey the proponent shall report to the CEO on the following:

(1) completion of the Asbestos Baseline Survey in accordance with the Asbestos Baseline Survey Plan; and

(2) the results of the Asbestos Baseline Survey.

12-5 After receiving notice in writing from the CEO that the Asbestos Baseline Survey was undertaken in accordance with the Asbestos Baseline Survey Plan and prior to commencement of ground-disturbing activities within the WAMA, the proponent shall prepare and submit an Asbestos Management Plan, in consultation with the Department of Health and the Department of Environment Regulation, to the CEO. The Asbestos Management Plan shall:

(1) specify management actions that will be implemented to ensure the management objective in condition 12-1 is achieved;

(2) provide a protocol or procedure for the review of the Asbestos Management Plan to ensure that the Asbestos Management Plan is meeting the objective specified in condition 12-1;

(3) provide a description of monitoring and control sites, including physical attributes, geographic locations, details of the baseline condition of what is to be monitored and rationale for the location of the sites;

(4) provide information on the key indicators of asbestos in the environment that will be monitored; airborne asbestos fibres and asbestos fibres in drainage line and adjacent landform sediments;

(5) describe protocols and procedures to monitor for airborne and sediment asbestos fibres presence and concentration at monitoring and control sites within and outside the WRC Development Envelope;

(6) include the monitoring methodologies consistent with the Department of Health's *Public Health Risk Management of Asbestos Minerals Associated with Mining* (2013) or its revisions;

(7) attach the methodology and results of the Asbestos baseline survey;

(8) specify criteria (trigger criteria) that will trigger the implementation of management and/or contingency actions to prevent the increased spread of asbestos fibres attributable to the design and construction of the proposal within the portion of the Western Rail Corridor (WRC) Development Envelope that intersects the WAMA; and

(9) specify management and/or contingency actions to be implemented in the event that the trigger criteria identified required by condition 12-5(8) have been reached.

12-6 After receiving notice in writing from the CEO that the Asbestos Management Plan satisfies the requirements of condition 12-5, the proponent shall:

(1) implement the management actions and monitor in accordance with the requirements of the Asbestos Management Plan; and

(2) implement the management actions and monitor in accordance with the requirements of the Asbestos Management Plan until the CEO has confirmed by notice in writing that it has been demonstrated that the objective in condition 12-1 is being and will continue to be met and therefore the implementation of the management actions and monitoring is no longer required.

12-7 In the event that the monitoring specified in the Asbestos Management Plan indicates that the trigger criteria specified in the Asbestos Management Plan have been reached the proponent shall:

(1) immediately implement the management and/or contingency actions specified in the Asbestos Management Plan and continue implementation of those actions until the trigger criteria are being met, or until the CEO has confirmed by notice in writing that it has been demonstrated that the objective in condition 12-1 is being and will continue to be met and implementation of the management and/or contingency actions is no longer required;

(2) investigate to determine the likely cause of the trigger criteria being reached and to identify any additional contingency actions required to prevent the trigger criteria being reached in the future; and

(3) provide a report to the CEO within 30 days of an event, referred to in condition 12-7, occurring. The report shall include:

(a) details of management and/or contingency actions implemented; and

(b) the findings of the investigation required by condition 12-7(2).

12-8 The proponent may review and revise the Asbestos Management Plan.

12-9 The proponent shall review and revise the Asbestos Management Plan as and when directed by the CEO.

12-10 The proponent shall implement the latest revision of the Asbestos Management Plan, which the CEO has confirmed by notice in writing, satisfies the requirements of condition 12-5.

13 Rehabilitation and Closure

13-1 The proponent shall ensure that the mine is closed, decommissioned and rehabilitated in an ecologically sustainable manner, consistent with agreed post-mining outcomes and land uses, and without unacceptable liability to the State of Western Australia.

13-2 Prior to the commencement of operations the proponent shall prepare and submit a revised Mine Closure Plan to the CEO. The Mine Closure Plan shall:

(1) when implemented, manage the implementation of the proposal to meet the requirements of condition 13-1;

(2) be prepared in accordance with the *Guidelines for Preparing Mine Closure Plans, June 2011* (Department of Mines and Petroleum and Environmental Protection Authority) or its revisions;

(3) detail the proposed frequency and timing of revisions; and

(4) be prepared in consultation with the Department of Parks and Wildlife and be to the requirements of the CEO on advice of the Department of Mines and Petroleum.

13-3 After receiving notice in writing from the CEO that the Mine Closure Plan satisfies the requirements of condition 13-2, the proponent shall:

(3) implement the Mine Closure Plan; and

(4) continue to implement the Mine Closure Plan until the CEO has confirmed by notice in writing that it has been demonstrated that the objective in condition 13-1 has been met and therefore the implementation of the management actions and monitoring is no longer required.

13-4 The proponent may review and revise the Closure Management Plan.

13-5 The proponent shall review and revise the Closure Management Plan at intervals not exceeding three years, or as otherwise specified by the CEO.

13-6 The proponent shall implement the latest revision of the Mine Closure Plan, which the CEO has confirmed by notice in writing, satisfies the requirements of condition13-2.

14 Offsets

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 proposed conservation reserve and 'good to excellent' condition native vegetation, including the loss of habitat for conservation significant species, 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 strategic regional conservation initiative identified in condition 14-1 shall be paid biennially, the first payment due 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:

(1) $1500 AUD (excluding GST) per hectare of 'good to excellent' condition native vegetation cleared within the Mine/Plant Area Development Envelope delineated in Figure 2 of Schedule 1 and defined by the geographic coordinates in Schedule 2;

(2) $3000 AUD (excluding GST) per hectare of all Pilbara Leaf-nosed Bat foraging habitat cleared within the K75W and K58W mine pits delineated in Figure 5 of Schedule 1 and defined by the geographic coordinates in Schedule 2;

(3) $1500 AUD (excluding GST) per hectare of 'good to excellent' condition native vegetation permanently cleared within the Rail Corridor Development Envelope and the Southern Infrastructure Corridor Development Envelope within the Fortescue IBRA subregion delineated in Figure 1 of Schedule 1 and defined by the geographic coordinates in Schedule 2; and

(4) $750 AUD (excluding GST) per hectare of 'good to excellent' condition native vegetation permanently cleared within the Rail Corridor Development Envelope within the Hamersley IBRA subregion delineated in Figure 1 of Schedule 1 and defined by the geographic coordinates in Schedule 2.

14-3 Prior to ground-disturbing activities the proponent shall prepare and submit an Impact Reconciliation Procedure to the satisfaction of the CEO.

14-4 The Impact Reconciliation Procedure required pursuant to condition 14-3 shall:

(1) include a methodology to identify clearing of 'good to excellent' condition native vegetation in the Pilbara bioregion;

(2) include a methodology for calculating the amount of clearing undertaken during each biennial time period;

(3) include a methodology for calculating the amount of temporary vegetation clearing for the railway and infrastructure corridors that has commenced rehabilitation within twelve months of final commissioning of the railway line or completion of infrastructure installation;

(4) require the proponent to submit spatial data identifying areas of ‘good to excellent’ condition native vegetation that has been cleared;

(5) require the proponent to submit spatial data identifying areas of all Pilbara Leaf-nosed Bat foraging habitat within the K75W and K58W mine pits prior to and after clearing;

(6) state dates for the commencement of the biennial time period and for the submission of results of the Impact Reconciliation Procedure, to the satisfaction of the CEO, and;

(7) identify that any areas cleared within the railway and infrastructure corridors delineated in Figure 1 of Schedule 1 and defined by the geographic coordinates in Schedule 2, in the Pilbara bioregion that have not commenced rehabilitation within 12 months of final commissioning of the railway line or completion of infrastructure installation and must be included in the area subject to condition 14-2.

14-5 The real value of contributions described in condition 14-2 will be maintained through indexation to the Perth Consumer Price Index (CPI), with the first adjustment to be applied to the first contribution.

14-6 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 14-1.

Schedule 1

Table 1: Summary of the Proposal

Proposal Title	Koodaideri Iron Ore Mine and Infrastructure Project
Short Description	The proposal is to construct and operate an open cut iron ore mine and associated infrastructure (railway, roads, administration buildings, accommodation camp, water supply infrastructure) for the extraction, processing and transport of iron ore. The proposal is located approximately 110 kilometres (km) west-north-west of Newman in the Pilbara region of Western Australia.

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

Column 1	**Column 2**	**Column 3**
Physical Element	**Location**	**Authorised Extent**
Mine and associated infrastructure	Figure 1 and Figure 2 and geographic coordinates as defined in Schedule 2	Clearing no more than 7,911 ha (including no more than 3,096 ha of the Marillana 2015 Area) within a 19,188 ha Mine/Plant Area Development Envelope.
Railway infrastructure	Figure 1 and geographic coordinates as defined in Schedule 2	Clearing no more than 4,014 ha within a 34,697 ha Western Rail Corridor Development Envelope.
Power, water, communication towers and road infrastructure	Figure 1 and geographic coordinates as defined in Schedule 2	Clearing no more than 246 ha within a 12,003 ha Southern Infrastructure Corridor Development Envelope.
Operational Element	**Location**	**Extent**
Dewatering	Figure 2	The K58W mine pit will not be dewatered.
Water supply	Figure 1	Water (up to 18 GL per year) will be supplied by groundwater abstraction during construction; and in-pit sump pumps, Waste Fines Storage Facility decant water and surplus water from Hamersley Iron Pty Limited's Yandicoogina mine during operation.
Surface water discharge		No off-site surface water discharges from mine pits (from dewatering) or from the Waste Fines Storage Facilities will occur, except under emergency circumstances (e.g. major rainfall or flood events).

Table 3: Abbreviations and Definitions

Acronym or Abbreviation	Term
CPI	Consumer Price Index
km	kilometre
ha	hectare
GL/a	gigalitres 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 *Environmental Protection Act 1986*, or delegate.
EPA	Environmental Protection Authority
EP Act	*Environmental Protection Act 1986*
Biennial	Every two years
GST	Goods and Services Tax
Approved Impact Reconciliation Procedure	The Impact Reconciliation Procedure for which the proponent has received written notification from the CEO that it meets the requirements of condition 14-4
Koodaideri Spring Gorge	Includes Koodaideri Spring, an unnamed creek and pools, its associated fauna habitat and vegetation including vegetation unit D38

Figures (attached)

Figure 1 Proposal development envelopes (this figure is a representation of the coordinates shown in Tables 1-4 of Schedule 2)

Figure 2 Mine Plant/Area development envelope including exclusion zones for Pilbara Leaf-nosed Bat habitat and troglofauna habitat (this figure is a representation of the coordinates shown in Tables 5-11 of Schedule 2)

Figure 3 *Lepidium catapycnon* (Hamersley Lepidium) buffers (this figure is a representation of the coordinates shown in Table 12 of Schedule 2)

Figure 4 *Sauropus* sp. Koodaideri detritals buffers (this figure is a representation of the coordinates shown in Table 13 of Schedule 2)

Figure 5 Pilbara Leaf- nosed Bat foraging habitat to be cleared within K75W and K58W mine pits (this figure is a representation of the coordinates shown in Table 14 of Schedule 2)

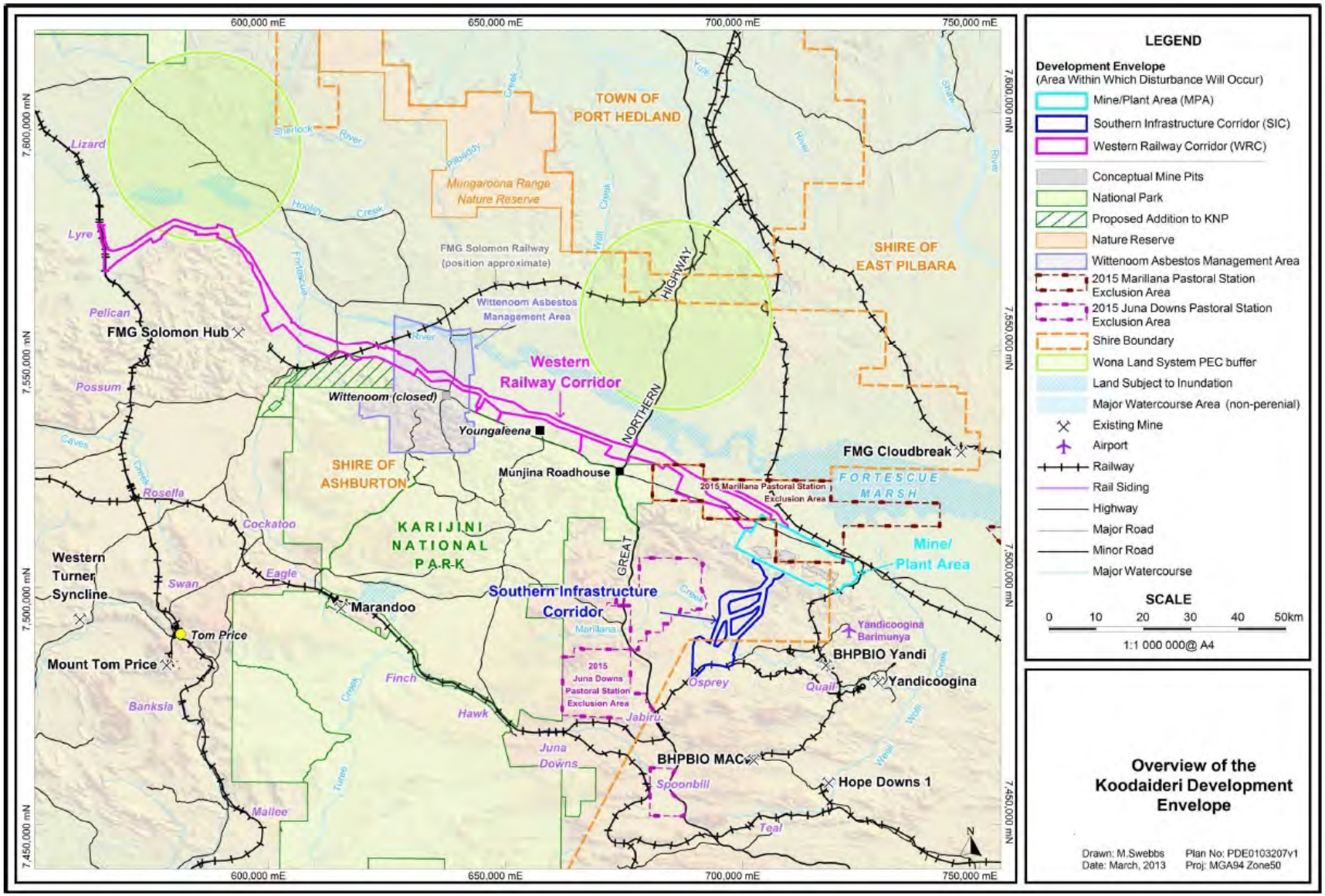

Figure 1: Proposal development envelopes

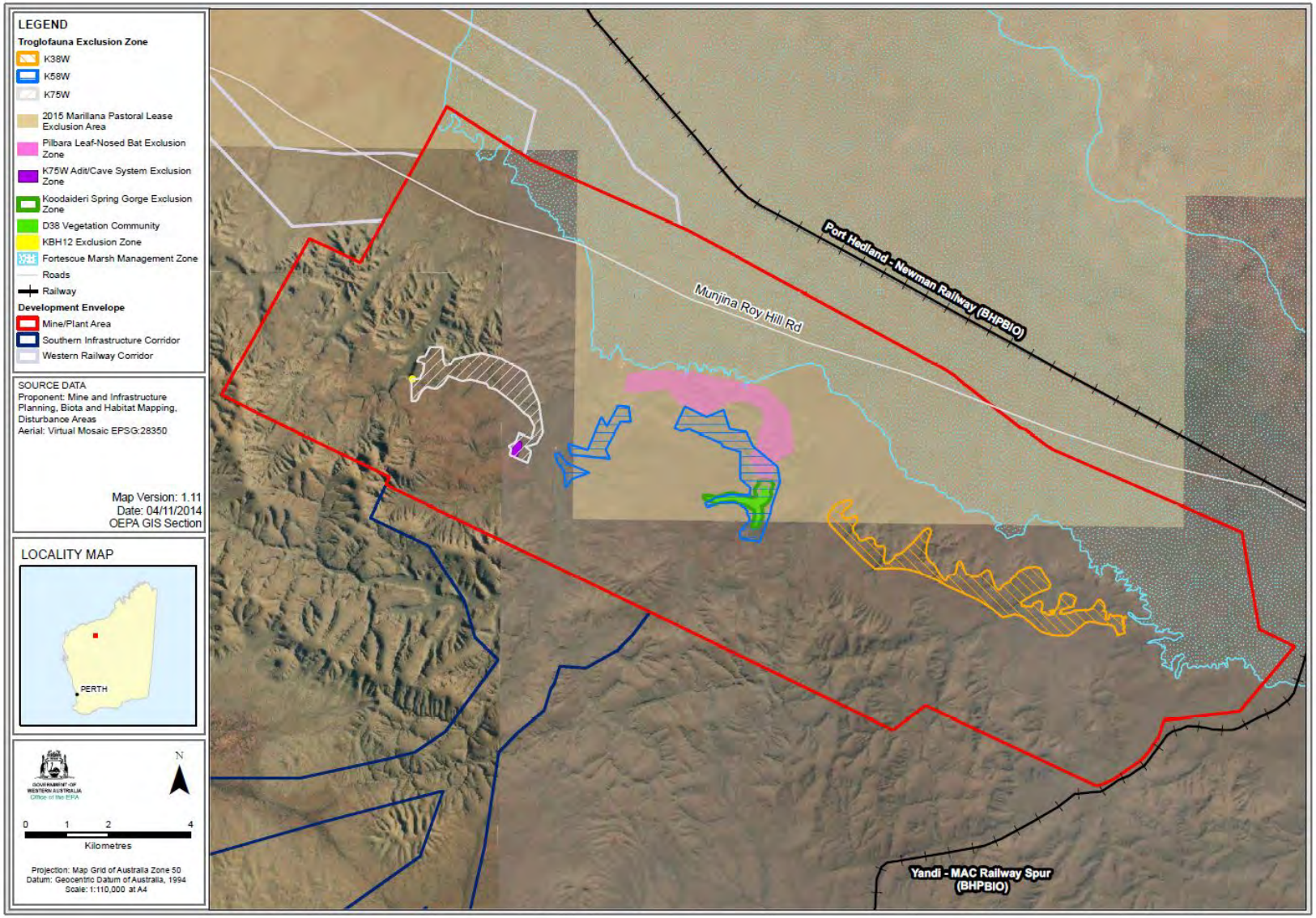

Figure 2: Mine/Plant Area development envelope including exclusion zones for Pilbara Leaf-nosed Bat habitat and troglofauna habitat

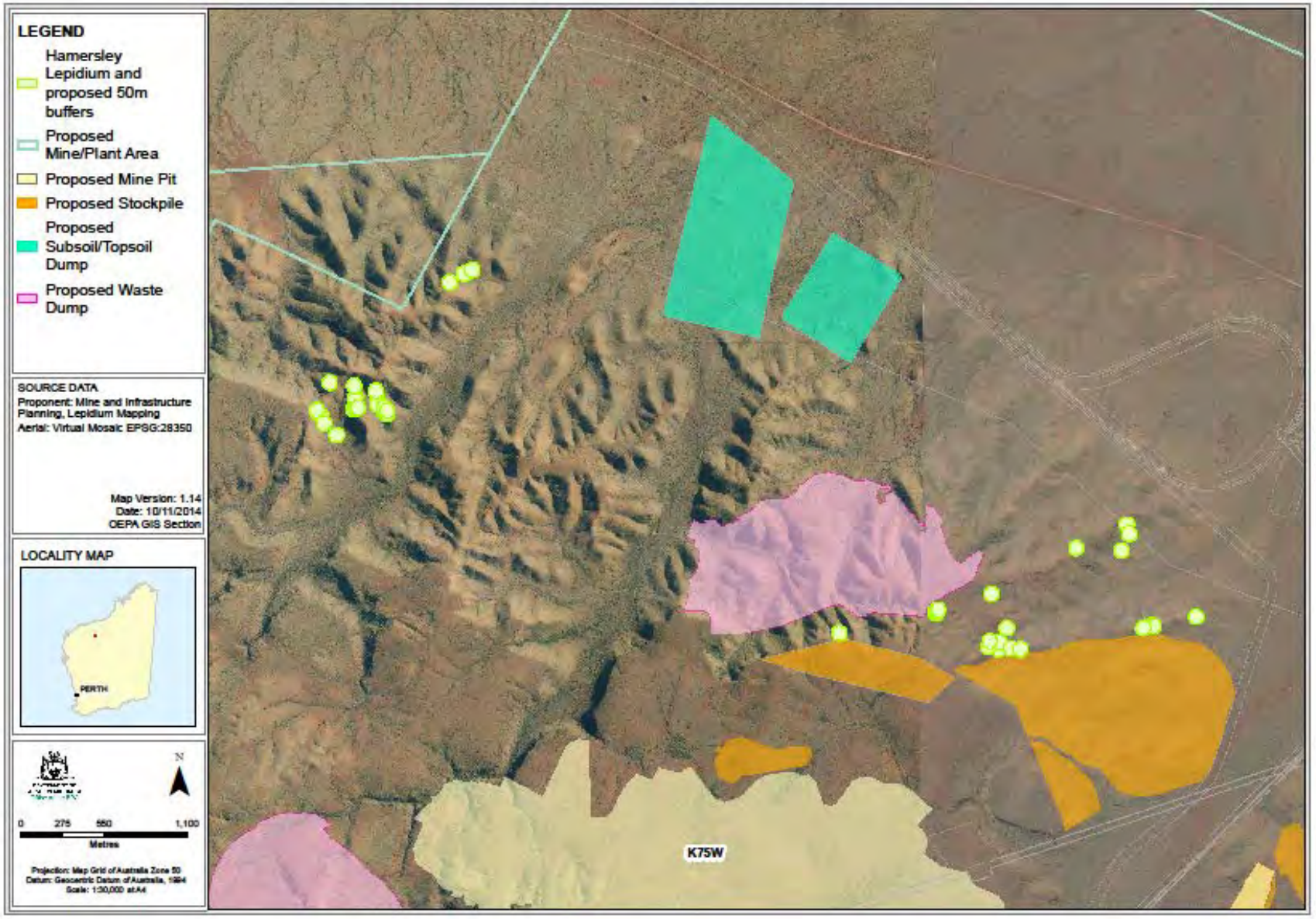

Figure 3: *Lepidium catapycnon* (Hamersley Lepidium) buffers

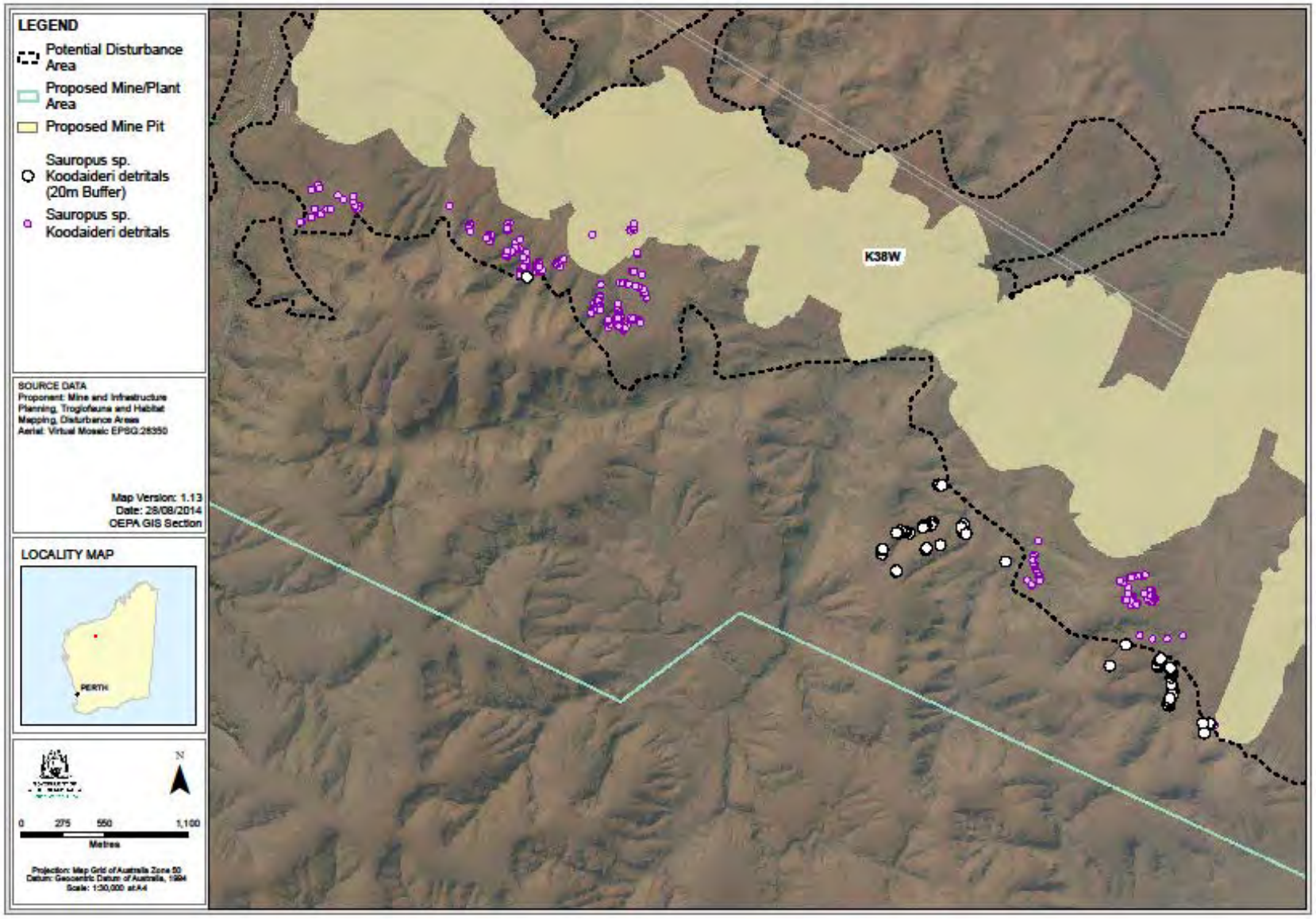

Figure 4 ***Sauropus*** **sp. Koodaideri detritals buffers**

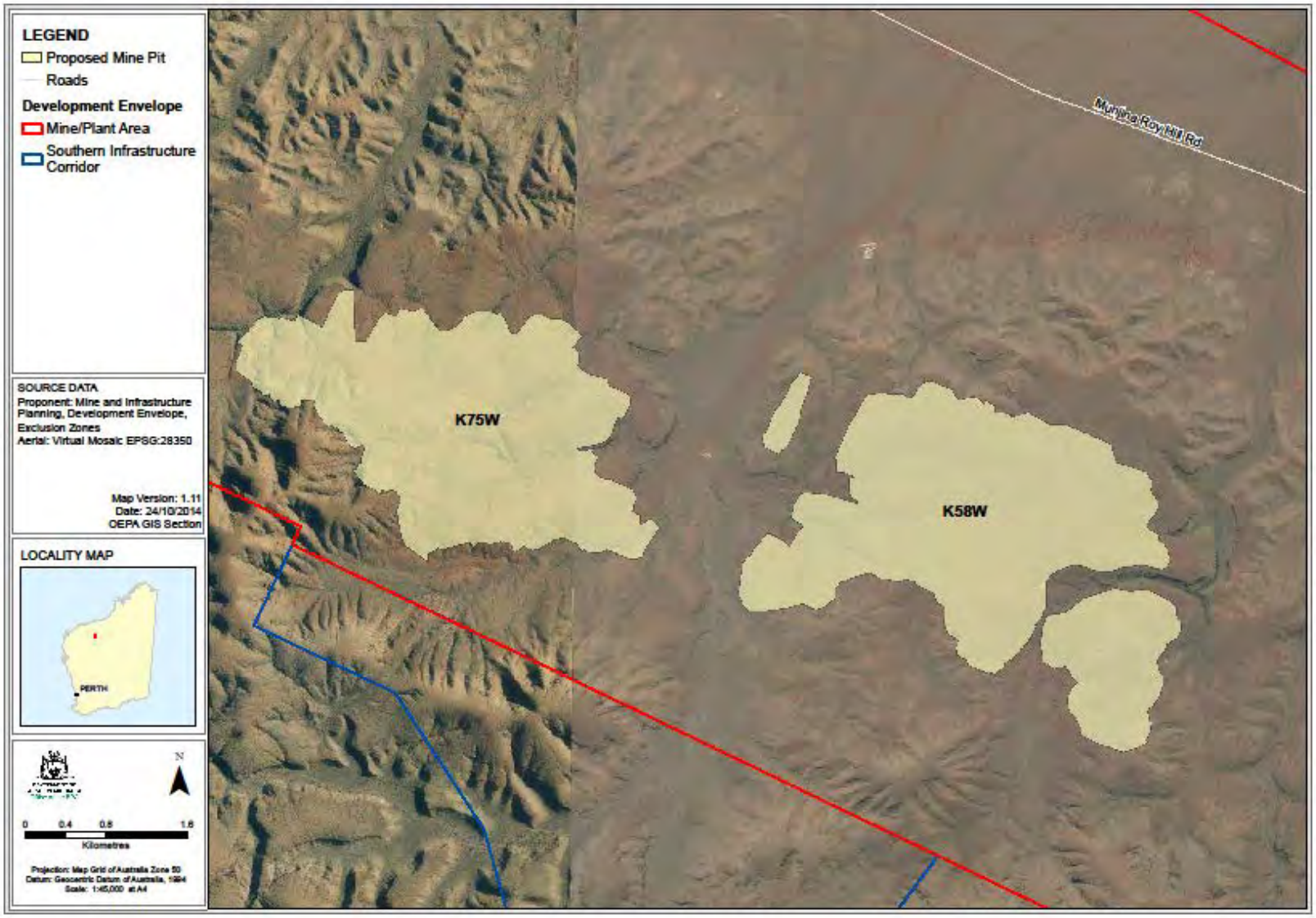

Figure 5: Pilbara Leaf- nosed Bat foraging habitat to be cleared within K75W and K58W mine pits

Schedule 2

Coordinates of the following are held by the Office of the EPA, dated 5 November 2014:

- Proposal development envelopes (Figure 1)
  - Mine/Plant Area
  - Western Railway Corridor
  - Southern Infrastructure Corridor
- Wittenoom Asbestos Management Area (Figure 1)
- Exclusion zones (Figure2)
  - K75W Adit/Cave System
  - Koodaideri Spring Gorge
  - KBH12
  - Pilbara Leaf-nosed Bat habitat
  - K58W Troglofauna habitat
  - K75W Troglofauna habitat
  - K38W Troglofauna habitat
- *Lepidium catapycnon* (Hamersley Lepidium) buffers (Figure 3)
- *Sauropus* sp. Koodaideri detritals buffers (Figure 4)
- Pilbara Leaf-nosed Bat foraging habitat to be cleared within K75W and K58W mine pits (Figure 5)

All coordinates are in whole metres, listed in Map Grid of Australia Zone 50 (MGA Zone 50), datum of Geodetic Datum of Australia 1994 (GDA94).

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Appendix 5

Summary of Submissions and
Proponent's Response to Submissions

(on CD in hardcopies of this report
and provided on the EPA's website at www.epa.wa.gov.au)