Rio Tinto

Baby Hope Proposal

S38 Referral

Environmental Review document

Hamersley HMS Pty Limited

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Referral V1b

Disclaimer and Limitation

This report has been prepared by Rio Tinto Iron Ore (Rio Tinto), on behalf of Hamersley HMS Pty Limited, specifically for the Baby Hope Proposal. Neither the report nor its contents may be referred to without the express approval of Rio Tinto, unless the report has been released for referral and assessment of proposals.

Document Status					
Rev	**Author**	**Reviewer/s**	**Date**	**Approved for Issue**	
				To Whom	**Date**
A - E	M Taylor T. Souster	M. Brand Project Team	09/12/2014		
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1b	J. Jones	M. Brand	11/08/2015	OEPA	12/08/2015

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1 PROPONENT AND KEY PROPOSAL CHARACTERISTICS

The Hope Downs 1 Iron Ore Project (**HD1 Project**), located approximately 75 kilometres (**km**) northwest of Newman in the Pilbara region of Western Australia (Figure 1-1), has been developed in accordance with the requirements of the *Iron Ore (Hope Downs) Agreement Act 1992* and the *Environmental Protection Act 1986* (**EP Act**).

This Proposal is seeking approval to develop the Baby Hope deposit as an amendment to the existing HD1 Project.

The following terminology is used throughout this Environmental Review (**ER**) document:

- **HD1 Project** – components of the original proposal assessed and approved via Ministerial Statement (**MS**) 584 and MS 893.
- **Baby Hope Proposal** – the Baby Hope deposit and associated infrastructure as proposed in Section 2 of this ER document.
- **Baby Hope Area** – area within which all activities proposed in Section 1 of this ER Document will be undertaken.
- **Amended HD1 Project** - all components of the HD1 Project (that are currently authorised under MS 584 and MS 893) plus the changes that are described in this Proposal subject to approval by the Minister.

1.1 THE PROPONENT

Hope Downs is an unincorporated Joint Venture (50:50) between Hope Downs Iron Ore Pty Ltd (a member of the Hancock Prospecting Group) and Hamersley WA Pty Limited (a member of the Rio Tinto Group). The Hope Downs JV (**HDJV**) is managed by Hamersley HMS Pty Limited.

The Proponent for this Proposal is Hamersley HMS Pty Limited. The Rio Tinto Group (**Rio Tinto**) is managing the environmental impact assessment and approvals process on behalf of the Proponent.

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1.2 KEY PROPOSAL CHARACTERISTICS

This ER document is to support formal referral under s38 of the EP Act for development of the Baby Hope deposit and associated waste dumps, stockpiles, haul roads, associated infrastructure and the clearing of up to 1,000 ha of native vegetation. The s38 referral form is provided in Appendix 1.

It is proposed that Baby Hope is considered as an amendment to the existing HD1 Project, as such Table 1-1 and Table 1-2 provides a summary of the proposed location and authorised extent of physical and operational elements of only the Baby Hope Proposal.

Table 1-1: Summary of the Baby Hope Proposal

Project Title	Baby Hope Proposal
Proponent Name	Hamersley HMS Pty Limited
Short description	The Proposal is to develop and operate above water table Baby Hope pits and associated waste dumps and infrastructure as an amendment to the existing Hope Downs 1 iron ore mine approximately 75 km north-west of Newman, Western Australia.

Table 1-2: Location and Authorised Extent of Physical and Operational Elements of the Proposal

Element	Authorised Extent
Baby Hope Area	Clearing of up to 1,000 ha within the Baby Hope Area (1,662 ha).

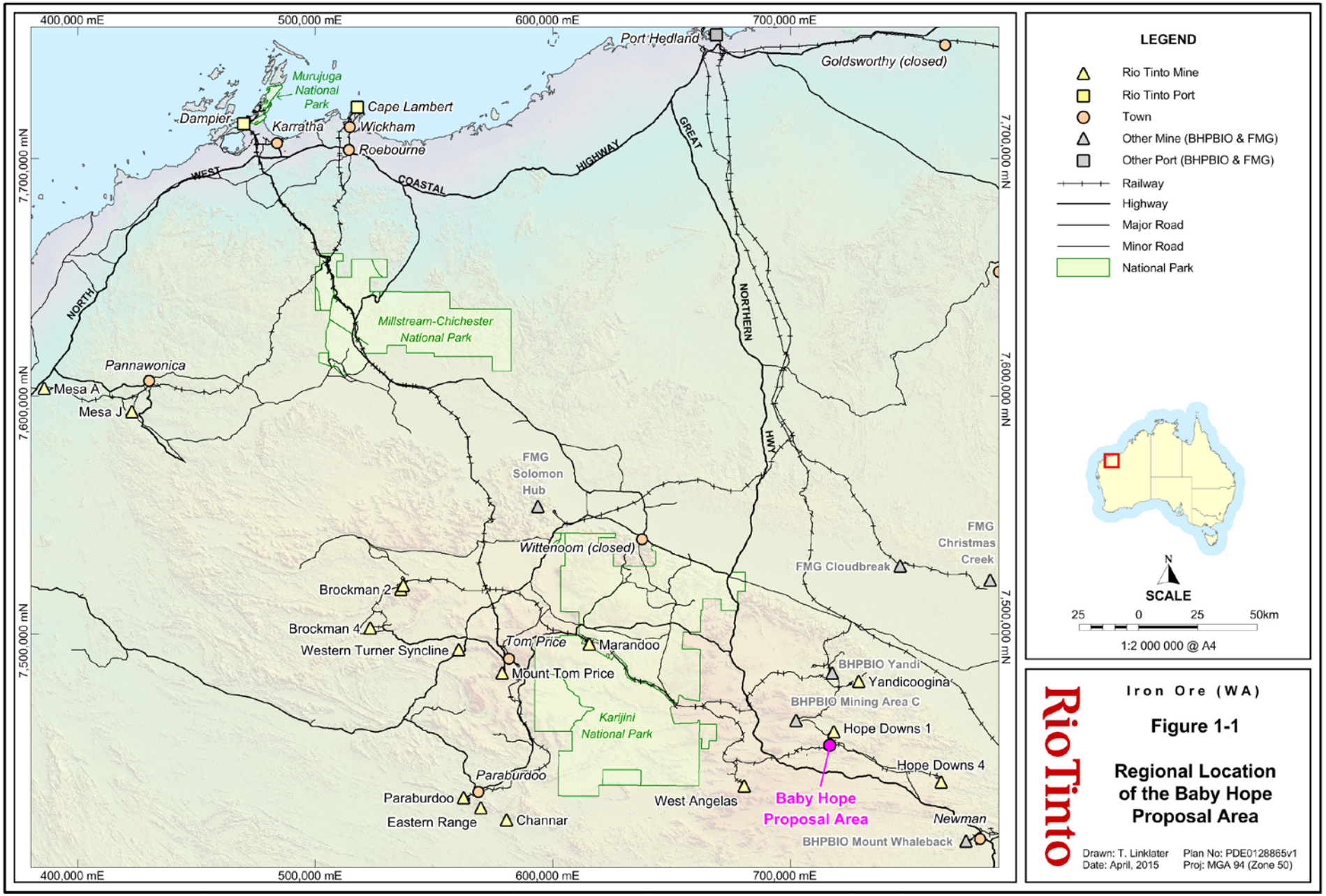

Figure 1-1: Regional Location of the Baby Hope Proposal Area

1.3 EXISTING HD1 OPERATION

The HD1 Project operates under sections 1 and 2 of Mineral Lease (**ML**) 282SA and is currently approved under the Iron Ore (Hope Downs) Agreement Act 1992 to produce lump and fines for the Pilbara Blend products at a nominal rate of 32 million tonnes per annum (**Mtpa**) from two major Marra Mamba ore bodies: Hope Downs 1 North (**HD1N**) and Hope Downs 1 South (**HD1S**) (refer to Figure 1-2).

A Public Environmental Review (**PER**) (HDMS 2000) for the HD1 Project was assessed in 2001 by the Environmental Protection Authority (**EPA**) under Part IV of the EP Act. The EPA provided its advice to the Minister for the Environment (**the Minister**) in Bulletin 1024 (EPA 2001) and Ministerial Statement 584 (**MS 584**) was issued in February 2002 allowing the HD1 Project to be implemented. In April 2012, MS 893 was issued to amend the MS 584 for inclusion of an additional condition relating to supplementation discharge.

The HD1 Project (as implemented) consists of:

- Open pit mining, ore processing, stockpiling and reclaiming of two ore bodies: Hope Downs 1 North and Hope Downs 1 South.
- Rail infrastructure between the Hope Downs mining area and an existing major rail network.
- Mine pit dewatering for the below watertable mineable ore.
- Infrastructure including roads (for general traffic, ore trucks, mine access, rail and conveyor access), wastewater treatment systems, building (administration, maintenance, workshops, storage and accommodation village), primary crusher, secondary dry screening and crushing, product stockpiles and dewatering pipeline.

The key characteristics, as per Schedule 1 of MS 584 and MS 893, are presented in Appendix 2 and Figure 1-2.

1.3.1 Environmental Factors Relevant to the HD1 Project

The environmental aspects considered by the EPA (EPA 2001) during the assessment of the HD1 Project (HDMS 2000) were:

- Weeli Wolli Spring;
- subterranean fauna; and
- rail connection route.

The EPA concluded (EPA 2001) that the HD1 Project was capable of being managed in an environmentally acceptable manner such that the EPA's objectives would be met, provided there was satisfactory implementation of the recommended conditions and the proponent's commitments.

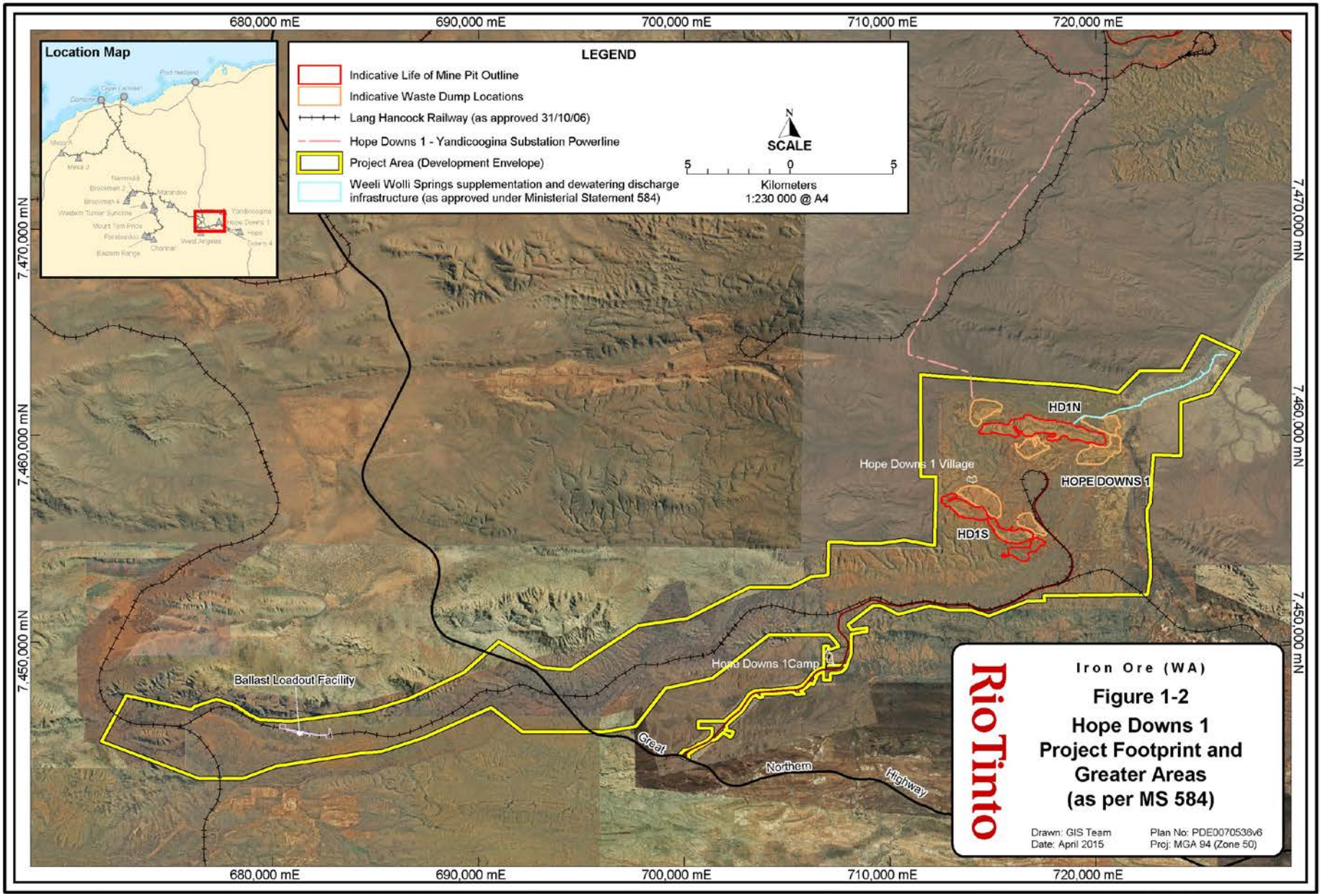

Figure 1-2: Hope Downs 1 Project Footprint Greater Areas (as per MS 584)

2 GENERAL DESCRIPTION OF PROPOSAL

Section 2 of this ER document details the following proposed actions:

- Development of the Baby Hope Proposal with three above water table pits; associated waste dumps; stockpiles; haul roads; and infrastructure.
- Clearing of up to 1,000 ha of native vegetation (including 68 ha of riparian vegetation) within the Baby Hope Area.

2.1 BABY HOPE DEPOSIT

The existing HD1 deposits (HD1N and HD1S) include a problematic clay-like goethetic material (**GOL**) that is resulting in downtime of the dry plant due to screen and chute blockages. The proportion of GOL is forecast to increase significantly over the remaining life of the deposits.

The key to maximising throughput rates is to blend this GOL with dry and low problematic material.

Sections 1 and 2 of ML 282SA include the following resources: Baby Hope; South West Bedded Hill Top; and Hope Downs 2. Of these, Baby Hope represents the closest undeveloped dry source suitable for blending and is therefore the scope of this Proposal.

Development of the Baby Hope deposit will require clearing of up to 1,000 ha to support development of the following (refer to Figure 2-1):

- Open pit above water table (**AWT**) mining over three pits as an amendment to the existing HD1 operation, with ore transported by haul trucks approximately 10 km to the existing HD1 processing facilities. Three mine voids will remain on closure of the Proposal.
- Pit and waste dump development which will be located outside the 1% Annual Exceedance Probability (**AEP**, 100 year ARI) floodplain of Pebble Mouse Creek. The management of surface water is discussed in Section 5.
- Transportation of waste rock by haul trucks to new external waste dumps. The likelihood of generating acid mine drainage is considered low as the potentially acid-forming (**PAF**) materials that have been encountered at Baby Hope are low in volume and self-neutralising.

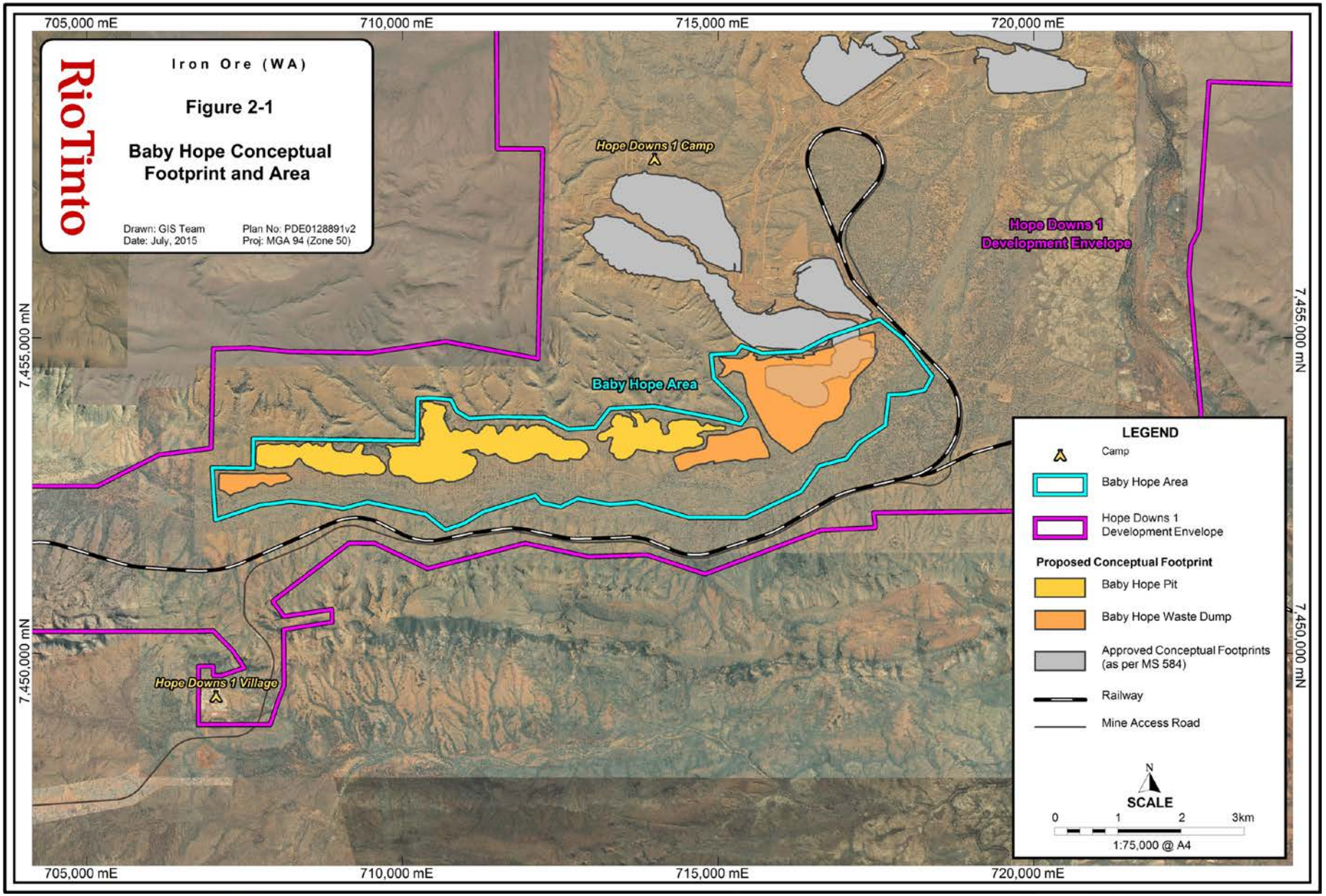

Figure 2-1: Baby Hope Conceptual Footprint and Area

2.2 TENURE

The Baby Hope deposit is located on Mining Lease 282SA (**AML282SA**) which was granted in 1996 under the *Iron Ore (Hope Downs) Agreement Act 1992*. The infrastructure associated with the Hope Downs 1 operation is located on Hope Downs Spur Railway Lease J717063 which was also granted pursuant to the Iron Ore (Hope Downs) Agreement Act 1992 (refer to Figure 2-2).

The leases are managed by Hamersley HMS Pty Limited as manager of the Hope Downs Joint Venture (**HDJV**), an unincorporated joint venture between Hamersley WA Pty Ltd and Hope Downs Iron Ore Pty Ltd. The current tenure is appropriate for all current and proposed mining and mining related infrastructure.

2.3 NATIVE TITLE AND AGREEMENTS

The Nyiyaparli People are the native title claimants and traditional owners of the land identified in this proposal. The Rio Tinto and Nyiyaparli People Claim Wide Participation Agreement was executed in 2011 with the Nyiyaparli People agreeing to Rio Tinto's Pilbara Iron Ore Business and its expansion in the Nyiyaparli People's country. This includes support for the grants of Interests and Approvals to Rio Tinto, or associated companies, generally anywhere within the extended boundaries of the claim areas of the Nyiyaparli People.

It is to be noted that whilst the specific land area identified in this Proposal is largely situated within the Nyiyaparli claim area, a small part of the clearing and the processing activity associated with this Proposal will occur within Banjima country.

The Banjima Native Title Determination was handed down by the Federal Court on 28 August 2013 and found that all of Rio Tinto's operations and interests within the claim area are valid under the Native Title Act. These operations in the Banjima Claim Area are presently subject to project-specific agreements and a Claim Wide Participation Agreement is currently being negotiated with the Banjima Common Law Holders.

The comprehensive agreements between Traditional Owners and Rio Tinto provide guidelines and requirement for communication and participation with traditional owners in respect to cultural heritage management, environmental management, life of mine planning, land access, employment and training, business development, and cultural awareness training.

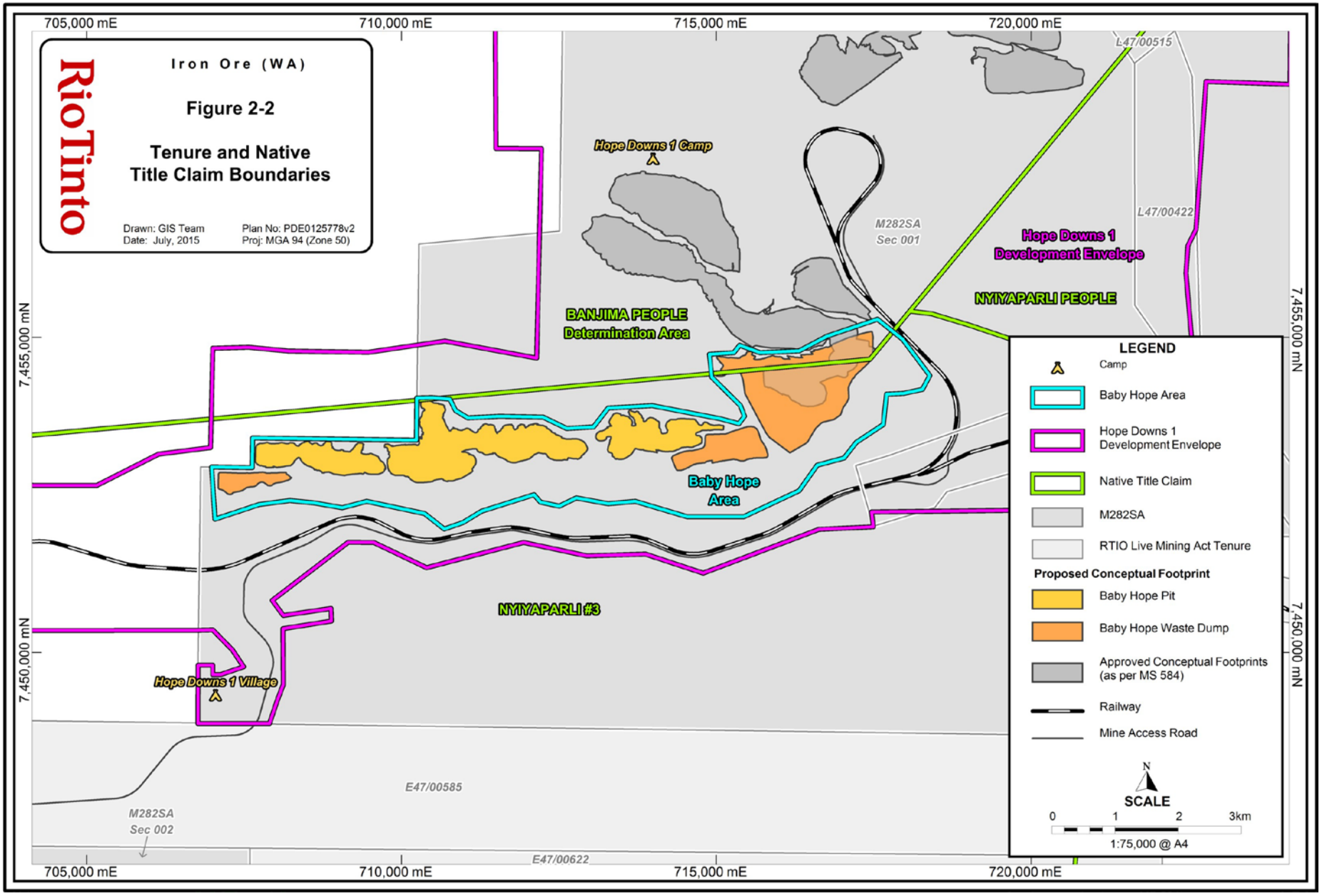

Figure 2-2: Tenure and Native Title Claim Boundaries

3 STAKEHOLDER CONSULTATION

Consultation with relevant stakeholders has been ongoing since operations commenced at HD1 and has included the following government agencies and non-government organisations:

- Government agencies:
  - Office of the Environmental Protection Authority (**OEPA**);
  - Department of Parks and Wildlife (**Parks and Wildlife**);
  - Department of Environment and Regulation (**DER**);
  - Department of Water (**DoW**);
  - Department of Mines and Petroleum (**DMP**);
  - Department of State Development (**DSD**);
  - Department of Aboriginal Affairs (**DAA**); and
  - Shire of East Pilbara.
- Traditional Owners:
  - Nyiyaparli Group; and
  - Banjima Group.
- Marillana Pastoral Station.

Consultation specific to this Proposal is provided below in Table 3-1.

Table 3-1: Stakeholder Consultation Relevant to this Proposal

Stakeholder	Date / Description of communication	Topics/Issues Raised	Proponent Response/Outcome
Office of the Environmental Protection Authority (OEPA)	11 February 2015 Pre-referral meeting.	• Submission, format and content of the ER Document: o proposal update; o presentation of outcomes of biological surveys; and o key preliminary environmental factors.	OEPA requested a technical meeting to discuss the preliminary key environmental factors in more detail.
	05 March 2015 Technical pre-referral meeting.	• The biological work (flora and vegetation and fauna) undertaken to support the proposal was discussed in relation to the relevant EPA Guidance notes. • The OEPA sought further information regarding potential impacts to troglofauna.	The Proponent has subsequently completed a second phase of troglofauna sampling and the results will be available to support the environmental impact assessment of the Proposal.
	9 June 2015 Pre-referral review of ER document	The OEPA provided general comments regarding the style and language of the draft ER document and provided advice on meeting the requirements of EAG 14, EAG 9 and EAG 8. The OEPA confirmed that the troglofauna survey methodology of the first phase of Targeted Fauna sampling met the requirements to enable an adequate assessment of impacts to troglofauna. The OEPA was not able to provide comment on the significance of the proposals impact to troglofauna until the results of the second phase of sampling were made available.	The ER document has been refined to address the OEPA general comments. The second phase Troglofauna report is provided as Appendix 5 to support formal referral of the Proposal.
Department of Environmental Regulation (DER)	16 March 2015 Email/telephone consultation.	• The Proponent provided detailed information regarding the scope of the Proposal and the preliminary key environmental factors. • The Proponent suggested a technical meeting with DER. • No formal comment has been received from DER.	
Department of State Development (DSD)	19 June 2014 and 14 October 2014 Regular DSD/Rio Tinto meetings.	• The Proponent provided information regarding the scope of the Proposal. • The Proposal was noted by DSD.	
Department of Aboriginal Affairs (DAA)	29 April 2015 Regular Rio Tinto/DAA meetings	The Proponent provided information regarding the scope of the Proposal.	The Proponent will consult with DAA regarding any planned submissions for approval under s18 of the *Aboriginal Heritage Act 1972* to disturb any heritage sites that cannot be avoided.

Stakeholder	Date / Description of communication	Topics/Issues Raised	Proponent Response/Outcome
Department of Parks and Wildlife (Parks and Wildlife)	February 2015 Email/phone consultation.	• The Proponent provided information regarding the scope of the Proposal and the preliminary key environmental factors. • Parks and Wildlife requested more detailed information to review prior to formal referral of the Proposal.	Noted by the Proponent.
	16 March 2015 Email consultation.	• Additional information was provided to Parks and Wildlife regarding the biological surveys undertaken and the keys findings of each. • The Proponent suggested a technical meeting with Parks and Wildlife.	A meeting was confirmed for 17 April 2015.
	17 April 2015 Regular Rio Tinto/Parks and Wildlife meetings.	• The Proponent presented detailed information regarding flora and vegetation and fauna and informed Parks and Wildlife that a second phase of troglofauna sampling was underway and that the results would be made available during the EIA process. • Parks and Wildlife requested the draft ER document to review.	The draft ER document was provided to Parks and Wildlife on 28 April 2015 with an agreed 4 week review period. The Proponent will address all queries raised by Parks and Wildlife in a subsequent version of the ER document prior to formal referral of the Proposal.
	22 May 2015 Written feedback from Parks and Wildlife	Parks and Wildlife provided comments regarding matters relevant to the *Department's Wildlife Conservation Act 1950* related responsibilities. Based on the information provided, Parks and Wildlife consider that the Proposal will impact directly and/or indirectly on conservation significant values, however these impacts are unlikely to be significant and should be able to be avoided or minimised through appropriate management measures. No comment is provided on Parks and Wildlife's *Conservation and Land Management Act 1984* responsibilities as the Proposal is not located on existing or proposed Parks and Wildlife-managed lands.	Noted by the Proponent and the OEPA. A copy of the formal referral and supporting technical reports will be provided to Parks and Wildlife upon formal referral of the Proposal.
Department of Water (DoW)	11 November 2014 Email/telephone consultation.	• The Proponent provided information regarding the scope of the Proposal. • DoW confirmed a site visit to Hope Downs 1 on the 25 November 2014 where they hoped to discuss the Proposal further.	Noted by the Proponent.
	25 November 2014 Hope Downs 1 site visit.	• DoW attended the Tier 2 Weeli Wolli site meeting. An overview of the Baby Hope Proposal was provided. • DoW did not raise any specific concerns with the Proposal and were satisfied that impacts to surface water could be easily managed under the existing RiWI Act licences.	

Stakeholder	Date / Description of communication	Topics/Issues Raised	Proponent Response/Outcome
	16 March 2015 Follow up consultation.	• The Proponent provided more detailed information regarding the scope of the Proposal and the preliminary key environmental factors. • The Proponent suggested a technical meeting with DoW. • No formal comment has been received from DoW.	
	19 June 2015 Written feedback from DoW.	DoW provided comments regarding matters relevant to Hydrological processes – Surface Water: • DoW considered the modelling to be satisfactory for the level of detail required however requested a sensitivity analysis to be undertaken to provide more confidence. • DoW considered all other detail and modelling to be satisfactory for the level of detail required. • DoW provided comments regarding minor concerns to be addressed in an updated referral.	Noted by the Proponent and the OEPA. The ER document and the supporting technical report (appendix 6) have been updated to address DoW's concerns and comments. A copy of the formal referral and supporting technical reports will be provided to DoW upon formal referral of the Proposal.
Department of Mines and Petroleum (DMP)	27 October 2014 Email consultation.	• The Proponent contacted DMP to discuss the Baby Hope Proposal and to confirm the DMP preferred consultation process for the Proposal.	DMP requested a presentation of the Proposal prior to receiving the draft ER document.
	17 February 2015 Follow up consultation and presentation.	• The Proponent provided information regarding the scope of the Proposal. • The preliminary key environmental factors were discussed and the Proponents proposed approach to closure. • No specific issues were raised by the DMP. • The DMP requested a copy of the draft ER document prior to formal referral of the Proposal.	The draft ER document was provided to DMP on 1 May 2015 for their review and comment.
	12 June 2015 Written feedback from DMP.	DMP provided comments regarding matters relevant to the *Mining Act 1978*. DMP provided comments on both the draft ER document and the draft Mine Closure Plan.	Noted by the Proponent and the OEPA. The Proponent has revised the ER document to address the DMPs concerns. A copy of the formal referral and supporting technical reports will be provided to DMP. The Baby Hope Mine Closure Plan is being revised to address all queries raised by DMP.

Stakeholder	Date / Description of communication	Topics/Issues Raised	Proponent Response/Outcome
Shire of East Pilbara	23 April 2015 Rio Tinto Iron Ore update to Shire.	• The Proponent provided information regarding the scope of the Proposal. • No specific issues were raised by the Shire.	
Nyiyaparli Traditional Owners. John Cross from Karlka Aboriginal Corporation, Nyiyaparli members Denise Puline and Susie Yuline.	12 November 2014 Bi-annual LIC meeting at Hope Downs 4.	The Proponent provided information regarding the scope of the Proposal.	Established and ongoing engagement with the Nyiyaparli People through the Nyiyaparli Local Implementation Committee (held twice a year) will continue to ensure interests and concerns are identified and addressed throughout the Proposal.
Nyiyaparli Traditional Owners. Attended by key Nyiyaparli elders	18 March 2015 Bi-annual LIC meeting at Karlka's Office in Port Hedland.		

4 ENVIRONMENTAL STUDIES AND SURVEY EFFORT

In preparation of the Proposal, publically available baseline environmental information was collated and reviewed by Biota and the Proponent.

The surrounding area has been the subject of EPA assessment and approval for the following projects:

- Hope Downs 1, Ministerial Statement 584 and 893; and
- Hope Downs 4, Ministerial Statement 854.

The environmental survey work completed for these projects provides regional context and some local information relevant to this Proposal. These reports are referred to in Table 4-1 and are available upon request.

The Proponent has also undertaken a series of studies and surveys to confirm specific aspects of baseline environmental information and likely impacts associated with the Proposal. These studies are provided in Appendix 3 to Appendix 5 and include:

- Baby Hope Flora and Vegetation Survey (Biota 2014a);
- Baby Hope Targeted Fauna Survey (Biota 2014b); and
- Baby Hope Second Phase Troglofauna Survey (Biota 2015).

Further details regarding the areas surveyed, timing of the surveys, standards used and limitations encountered are provided in Table 4-1.

Table 4-1: Summary of relevant environmental surveys

Factor	Consultant	Survey name	Survey area, type and timing	Standard/Guidance and limitations	Appendix
Flora and Vegetation	Mattiske	Flora and Vegetation of the Hope Downs 1 Area. Mattiske 2009a.	Covers 20% of the Baby Hope Development Envelope. June 2009.	Study merged data from previous studies on the southern Yandicoogina railway option (Mattiske 1995a) with more recent studies on the infrastructure areas to the north and east of the HD4 mine (Mattiske 2008a, 2008b) and Weeli Wolli Creek (Mattiske 2009b).	-
	Biota	Southern Flank to Jinidi Level 2 Flora and Vegetation Survey. Biota 2012.	Covers 81.8% of the Baby Hope Development Envelope. March 2011 and August 2011.	EPA Position Statement No. 3. EPA Guidance Statement No. 51. Limitation: No systematic searches for conservation significant flora.	-
	Biota	Baby Hope Flora and Vegetation Survey. Biota 2014a.	Desktop review and single phase field survey. October 2014.	EPA Position Statement No. 3. EPA Guidance Statement No. 51. Limitation: Conditions at the time of survey did not support systematic searches for conservation significant flora or weeds.	Appendix 3.
Terrestrial Fauna and Subterranean Fauna	Biota	Hope Downs Section 45C Targeted Fauna Review. Biota 2009.	Desktop and targeted fauna survey.	EPA Guidance Statements 3, 56, 54a, 20, consideration of subterranean fauna in environmental impact assessment and EPA and Parks and Wildlife Technical Guide for Terrestrial Vertebrate Fauna Surveys.	-
	Biota	Hope Downs Project Life of Mine Targeted Fauna Survey. Biota 2011.	Desktop review and Single phase field survey. June 2010.	EPA Guidance Statements 54, 54a, 20, consideration of subterranean fauna in in environmental impact assessment.	-
	Biota	Baby Hope Deposit Targeted Fauna Survey. Biota 2014b.	Desktop review and single phase field survey. September 2013.	EPA Guidance Statements 3, 56, 54a, 20, consideration of subterranean fauna in environmental impact assessment and EPA and Parks and Wildlife Technical Guide for Terrestrial Vertebrate Fauna Surveys. Limitation: not all sections of the study area were equally ground-truthed and some parts of the area were inaccessible by vehicle. Mapping of hydrated geological units was not available at the time of the study, use of preliminary cross-sections and selected drill log data assisted with offsetting this limitation.	Appendix 4.
	Biota	Baby Hope Second Phase Troglofauna Survey. Biota 2015a.	Desktop review and second phase troglofauna field survey. March 2015.	EPA Guidance Statements 3, 56, 54a, 20, consideration of subterranean fauna in environmental impact assessment. Limitation: Two of the taxa, *Palpigradi* sp. and *Diplura* sp., were unable to be identified due to poor resolution of their wider taxonomic framework. This limited the conclusiveness of some of the findings for these taxa in regards to both taxonomic placement and ecological status.	Appendix 5.

5 ASSESSMENT OF PRELIMINARY KEY ENVIRONMENTAL FACTORS

This ER document has been provided to the OEPA to support the referral of the Baby Hope Proposal and has been prepared in accordance with the EPA's Environmental Assessment Guidelines (**EAGs**) specifically: Defining the Key Characteristics of a Proposal *Environmental Protection Act 1986* (**EAG 1**) (EPA 2012b); and EAG for Environmental Factors and Objectives (**EAG 8**) (EPA 2015).

Subject to approval, a new Ministerial Statement will be issued for the Baby Hope Proposal. It is intended that the Proposal will be integrated into the existing Environmental Management System (**EMS**) in order to meet the EPA's objectives for relevant environmental factors.

5.1 PRELIMINARY KEY ENVIRONMENTAL FACTORS

The Proponent has identified the following preliminary key environmental factors relevant to this Proposal; the outcome is presented in Table 5-1.

Table 5-1: Significance Framework for Environmental Factors for the Baby Hope Proposal (from EAG 8)

Factor	Environmental Aspect	Impact
Flora and Vegetation	Mine pit excavation and waste dumps. Access tracks and infrastructure.	Clearing of native vegetation.
Subterranean Fauna	Mine pit excavation.	Removal of potential troglofauna habitat.
Hydrological processes – surface water	Mine pit excavation and waste dumps.	Surface runoff. Potential cumulative impacts to local catchments.

Residual Impact and Rehabilitation and Decommissioning are Integrating Factors of relevance to the Baby Hope Proposal and are also addressed in Section 5 of this ER document.

The Proponent considers that the Proposal will not result in any significant impact to the remaining environmental factors identified in EAG8. These factors are either not expected to be significantly impacted or can be suitably managed using existing legislation and have therefore been classed as 'other environmental factors' (refer Section 6).

The following tables (Table 5-2, Table 5-3 and Table 5-4) provide information specific to these preliminary key environmental factors, including:

- an outline of the policy context against which the significance of the impacts can be assessed;
- a summary of the potential direct, indirect and cumulative impacts on the environment;
- a summary of the proposed mitigation measures;
- details of how the proposed mitigation measures can be regulated; and
- an assessment on whether the EPA objectives will be met.

Table 5-2: Flora and Vegetation: Description of Factor, Impact Assessment, and Management

Inherent impact	Environmental aspect	Mitigation to address residual impacts	Regulatory mechanisms to ensure mitigation	Outcome to demonstrate that proposal meets EPA objective
EPA Objective: *To maintain representation, diversity, viability and ecological function at the species, population and community level.*				
• No TECs or PECs and no DRF or plant species listed under the EPBC Act recorded within the Baby Hope Area. • Five Priority flora recorded within the Baby Hope Area, all occur relatively broadly throughout the Pilbara and are not restricted to the HD1 locality (Biota 2014a) (Figure 5-1): o *Eremophila* sp. Hamersley Range (K. Walker KW 136) (P1); o *Hibiscus* sp. Gurinbiddy Range (M.E. Trudgen MET 15708) (P2); o *Eremophila magnifica* subsp. *velutina* (P3); o *Goodenia lyrata* (P3); and o *Eremophila magnifica* subsp. *magnifica* (P4). • Good quality intact native vegetation, generally in Good to Excellent condition (Biota 2014a) with the following identified vegetation of local elevated value (Figure 5-1): o **Valley Floor Mulga (D5 -AanTpCHf)**: *Acacia* 'aneura' low open woodland to low woodland over *Triodia pungens* scattered hummock grassland with *Chrysopogan fallax* scattered tussock grasses (~8% of the Baby Hope Area). This vegetation type is not formally listed as a TEC or PEC which indicates the low level of perceived conservation significance. o **Scattered Riparian Eucalypts on major Ephemeral Water Course (D1 Ev)**: *Eucalptus victrix* scattered trees (~0.8% of the Baby Hope Area). o **Scattered Riparian Eucalypts on major Ephemeral Water Course (D2 EvAci)**: *Eucalptus vitrix* scattered trees over *Acacia citrinoviridis* low woodland (~3.2% of the Baby Hope Area). o **Gorges and Gullies (G1 -CfEltHtCYaERImTp)**: *Corymbia ferriticola*, *Eucalyptus leucophloia* subsp. *leucophloia* low open woodland over *Themeda triandra, Cymbopogon ambiguus, Eriachne mucronata* very open tussock grassland with *Triodia pungens* scattered hummock grasses (~ 0.6% of the Baby Hope Area).				
<u>Potential Impact 1</u> Impact to up to 1,000 ha of native vegetation considered to be in Good to Excellent condition, supporting the following: • One P1, one P2, two P3 and one P4 flora species. • Four vegetation units of local elevated value.	<u>Aspect 1</u> Clearing of native vegetation.	<u>Management of Aspect 1</u> • Mitigation hierarchy in proposal design: o **Avoid**: where practicable, impacts to known P1 flora locations will be avoided through use of restriction and avoidance areas. o **Avoid**: Pits and waste dumps will be developed outside of the 1% AEP (100 year ARI) floodplain to avoid impacts to Pebble Mouse Creek. o **Minimise**: Clearing will be minimised to that required for safe construction and operation.	<u>Regulation of Aspect 1</u> • Subject to approval, a new MS for the Baby Hope Proposal with a specified clearing limit, a defined Proposal Area, and a condition relating to Offsets and Rehabilitation. • *Wildlife Conservation Act 1950 (WA)* can address impacts to protected flora if found.	After the application of management and mitigation measures, the Proposal is expected to result in the progressive removal of up to 1,000 ha of vegetation over the life of the Proposal. The Proposal is not expected to alter the conservation status or viability of Priority Flora species or have a significant effect on the representation of vegetation at a local or regional level.

Inherent impact	Environmental aspect	Mitigation to address residual impacts	Regulatory mechanisms to ensure mitigation	Outcome to demonstrate that proposal meets EPA objective
		Some of the existing HD1 pits will be backfilled to accommodate the establishment of Baby Hope waste dumps and low grade stockpiles – therefore minimising new clearing required to support development of the Baby Hope Proposal. o **Rehabilitate**: Disturbed areas will be rehabilitated using local native vegetation species. o **Offset**: Provision of an environmental offset for unavoidable clearing of native vegetation in Good to Excellent condition. • Clearing will be limited to the Baby Hope Area and will be managed through internal ground disturbance procedures. • The Proposal design has minimised planned clearing to areas necessary for safe construction and operation. • Known locations of Priority flora have been recorded in the internal GIS database and will be avoided as far as practicable. • Disturbed areas will be progressively rehabilitated with native flora species where possible. • The occurrence of new weed species and the spread of existing weeds will be controlled through the implementation of industry standard weed control and hygiene measures.	• *Iron Ore (Hope Downs) Agreement Act 1992* requires the Proposal to be implemented as approved.	No TECs, PECs ESAs or DRF species will be affected by the Proposal as none have been recorded within the Development Envelope. The residual, unavoidable impacts on flora and vegetation from this Proposal will be addressed via the provision of an offset in accordance with EPA requirements. The Proponent therefore considers that the Proposal can meet the EPA's objective for Flora and Vegetation.

Inherent impact	Environmental aspect	Mitigation to address residual impacts	Regulatory mechanisms to ensure mitigation	Outcome to demonstrate that proposal meets EPA objective
Impact 2 Riparian vegetation units D1 (14 ha) and D2 (54 ha) which represent 4.4% of the total riparian vegetation of the catchments upstream of the Weeli Wolli Spring PEC (Figure 5-1 and Figure 5-2) (the 5 km Parks and Wildlife PEC buffer is 200 m from the south eastern boundary of the study area. However, the closest stand of the actual PEC is approximately 5.2 km southeast).	Aspect 2 Clearing of up to 68 ha of riparian vegetation within the maximum clearing limit of 1,000 ha.	Management of Aspect 2 • Clearing will only occur within the approved Baby Hope Area. • Impacts to riparian vegetation will be limited to vegetation units D1 and D2 which are of local value. • All major infrastructure will be located outside the 1% AEP (1:100 ARI) floodplain of Pebble Mouse Creek.	Regulation of Aspect 2 Bed and Banks Permits under the *Rights in Water and Irrigation Act 1914* as applicable. Subject to approval, a new MS for the Baby Hope Proposal with a specified clearing limit of 1,000 ha which includes 68ha of riparian vegetation.	
Impact 3 Spread of existing weeds and/or introduction of new weeds that compete with native vegetation.	Aspect 3 Vehicle and earth movements.	Management of Aspect 3 Weed hygiene procedures for mining machinery entering and leaving the Baby Hope Area will be implemented.	Regulation of Aspect 3 Weed management will be in accordance with the requirements of the *Agriculture and Related Resources Protection Act 1976.*	
Impact 4 Cumulative impacts to flora and vegetation	Aspect 4 Clearing of vegetation	Management of Aspect 4 The Proposal will be developed and operated as part of the existing HD1 Project. Marillana Station is the closest neighbour to the Baby Hope Area. The Proposal does not intersect vegetation of elevated conservation significance. All vegetation units and Priority Flora species that may be disturbed by this Proposal are well represented in the Pilbara bioregion. Therefore no significant cumulative impacts are predicted.	Regulation of Aspect 4 • Subject to approval, a new MS for the Baby Hope Proposal with a specified clearing limit, a defined Proposal Area, and a condition relating to Offsets and Rehabilitation. • *Wildlife Conservation Act 1950 (WA)* can address impacts to protected flora if found. • *Iron Ore (Hope Downs) Agreement Act 1992* requires the Proposal to be implemented as approved.	

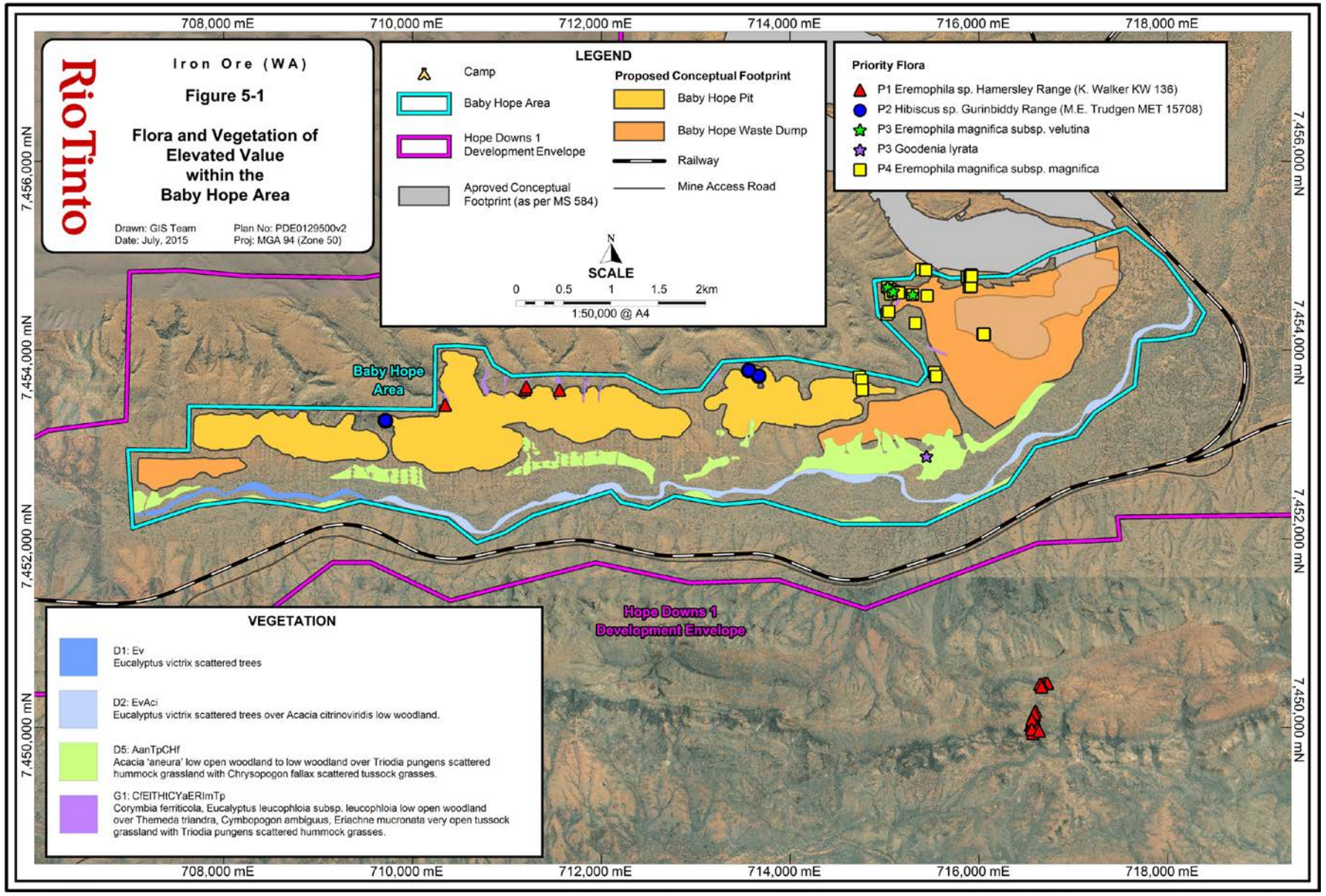

Figure 5-1: Flora and Vegetation of Elevated Value within the Baby Hope Area[1]

[1] Where the Baby Hope footprint overlaps with the existing approved conceptual footprint (as per MS 584) it assumes an independent clearing area of 1000 ha for Baby Hope and ignores any existing approved conceptual footprint

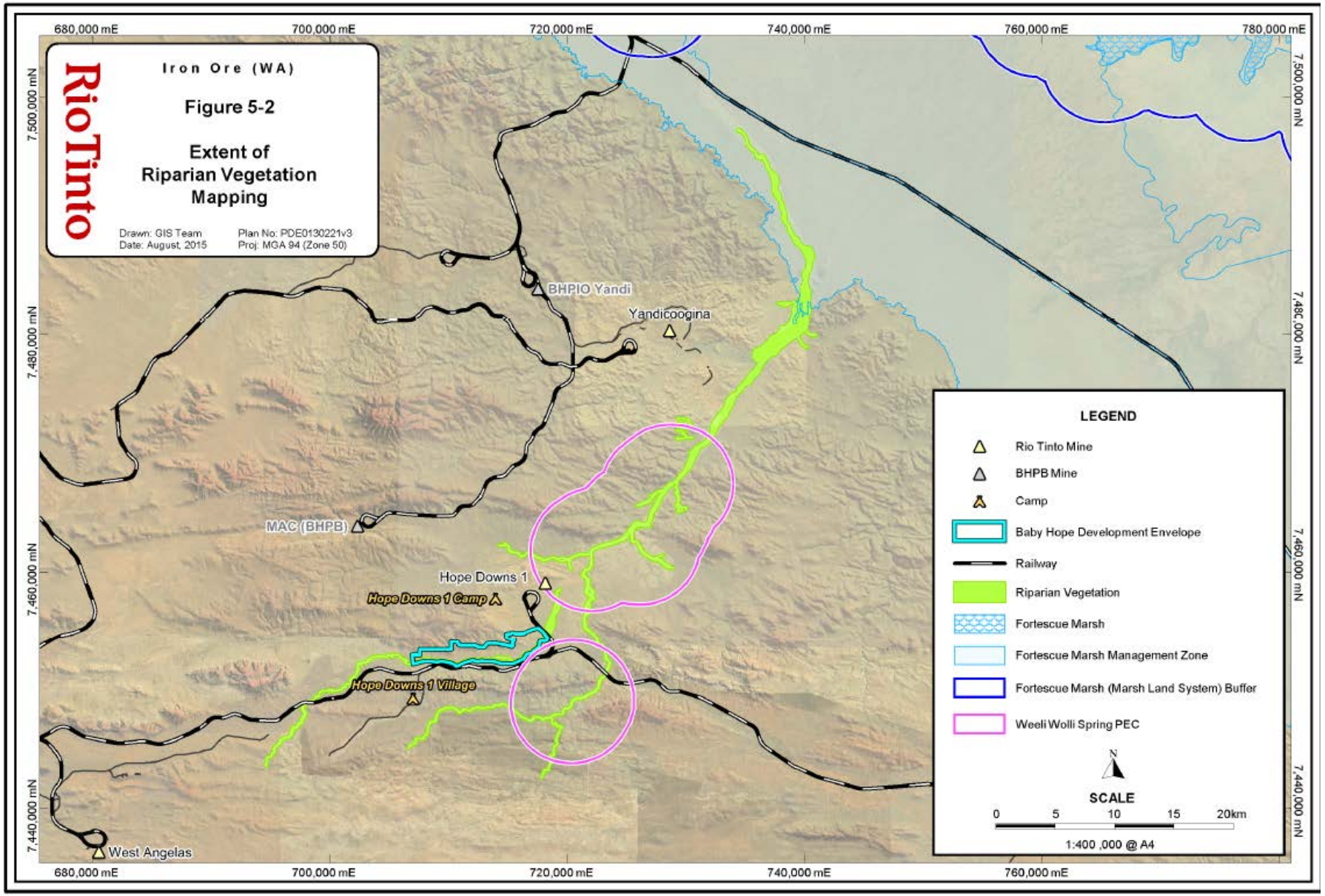

Figure 5-2: Extent of Riparian Vegetation Mapping

Table 5-3: Subterranean Fauna: Description of Factor, Impact Assessment and Management

Inherent impact	Environmental aspect	Mitigation to address residual impacts	Regulatory mechanisms to ensure mitigation	Outcome to demonstrate that proposal meets EPA objective
EPA Objective: *To maintain representation, diversity, viability and ecological function at the species, population and assemblage level.*				
• Stygofauna will not be impacted as a result of development of this Proposal as the mining is above water table only and there will be no impacts to the hydrological regime. • Potential troglofauna habitat units in the Baby Hope Area are identified as Marra Mamba banded iron formation (**Hm**) and colluvium (**Czc**) (refer to Figure 5-3). • Nineteen potentially troglobitic fauna specimens were recorded from Phase 1 and Phase 2 sampling for Baby Hope, representing nine species from four orders: Palpigradi, Pseudoscorpions, Diplura, and Schizomida o The Diplura specimens were unable to be identified further due to poor resolution of their wider taxonomic framework. However Biota recorded multiple Diplura specimens outside of the Baby Hope Area and therefore is not considered further. o The singleton Pseudoscorpion (*Lagynochthonius* sp.'PSE096') was not recorded from within of the Baby Hope Area and therefore will not be impacted by the Proposal. o The Palpigradi was unable to be identified further due to poor resolution of their wider taxonomic framework. However, review of the habitat mapping suggests that suitable subterranean habitat extends 4km to the west and east of the Baby Hope Area; therefore it is considered likely that this species may occur outside of the Baby Hope Area. o Genetic analysis (Helix 2015) of the 13 Schizomida specimens (5 from Phase 1 and 8 from Phase 2) revealed that six distinct genetic lineages from the Baby Hope and HD1 areas: – *Draculoides* sp. CI1 – collected from a great range (~1,518 ha) from three locations (in and outside of the Baby Hope Area) in three geological units (Hm, Czc, and Qa). – *Draculoides* sp. BHD1 – this species was not recorded within the Baby Hope Area and therefore will not be impacted by the Proposal. – *Draculoides* sp. BHD2 - two specimens detected from two drill holes within the Baby Hope Area only. Given that the *Draculoides* sp. BHD2 was recorded twice, with a 2km distance between records and within the same geology (Czm), Biota (2015) considers that the species is likely to occur in areas of contiguous habitat surrounding the Baby Hope Area. – *Draculoides* sp. BHD3 - this species was not recorded within the Baby Hope Area and therefore will not be impacted by the Proposal. – *Draculoides* sp. BHD4 – this was recorded both in and outside of the Baby Hope Area and therefore will not be significantly impacted by the Proposal. – *Draculoides* sp. BHD5 - this species was not recorded within the Baby Hope Area and therefore will not be impacted by the Proposal. • Reviews of geological information suggest that troglofauna habitat in the Baby Hope Area is represented stratigraphically by hydrated zones in the profile, which spatially occur within surface geology units mapped locally as the valley fill unit Czc and the Hm. In order to provide a spatial analysis, Biota (2015) merged these two units to map potential troglofauna habitat within the Baby Hope Area and surrounds. This spatial analysis revealed good alignment between the distribution of the potential troglofauna habitat and the locations where troglofauna have been confirmed to occur to date, with all records coming from within the potential habitat polygon. Both the local-scale habitat mapping and the regional scale geology units strongly suggest suitable habitat extends approximately 4 km beyond the Baby Hope Area (Figure 5-3).				

Inherent impact	Environmental aspect	Mitigation to address residual impacts	Regulatory mechanisms to ensure mitigation	Outcome to demonstrate that proposal meets EPA objective

Direct loss/degradation of habitat from excavation of pits.	Development of open AWT pits.	• Mitigation hierarchy in proposal design:
		  o **Minimise**: Clearing will be minimised to that required for safe construction and operation.
		  o **Rehabilitate**: Disturbed areas will be rehabilitated using local native vegetation species.
		• Clearing for the pits will be managed through internal ground disturbance procedures.
		• Boundaries of areas to be cleared or disturbed will be identified by GPS coordinates and maps of boundaries will be provided to dozer operators.
		• Incorporate surface water management and erosion protection into Proposal planning and design to minimise disruption to watercourses and riparian vegetation.
		• Spill clean-up material readily available at work sites and on mobile service trucks of vehicles, where hydrocarbons and chemicals are stored and/or used.
		• A spill response procedure will be implemented prior to construction.
		• No dewatering is proposed.
		• Rehabilitation plans detailing landforms, materials management and rehabilitation prescriptions will be prepared and implemented.
			• Existing Ministerial Statement for HD1 (MS 584)
			• Subject to approval, a new MS for the Baby Hope Proposal with a specified clearing limit, a defined Proposal Area, and a condition relating to Offsets and Rehabilitation.
			• *Wildlife Conservation Act 1950 (WA)* can address impacts to protected fauna if found.
			• *Iron Ore (Hope Downs) Agreement Act 1992* requires the Proposal to be implemented as approved.
				The Proposal is expected to result in the unavoidable progressive removal of up to 287 ha of potential troglofauna habitat via mining over the life of the Proposal.
				Survey work and assessment has shown that excavation works associated with mine pit development will not impact on troglofauna habitat parameters (temperature, humidity, vibrations) in the immediate vicinity of the proposed Baby Hope pits.
				There is also evidence of connection of the troglofauna community and habitats at the wider local scale of Baby Hope and HD1.
				Other legislation will assist to ensure that potential indirect impacts on troglofauna habitat are appropriately managed.
				The Proponent therefore considers that the Proposal can meet the EPA's objectives for subterranean fauna.

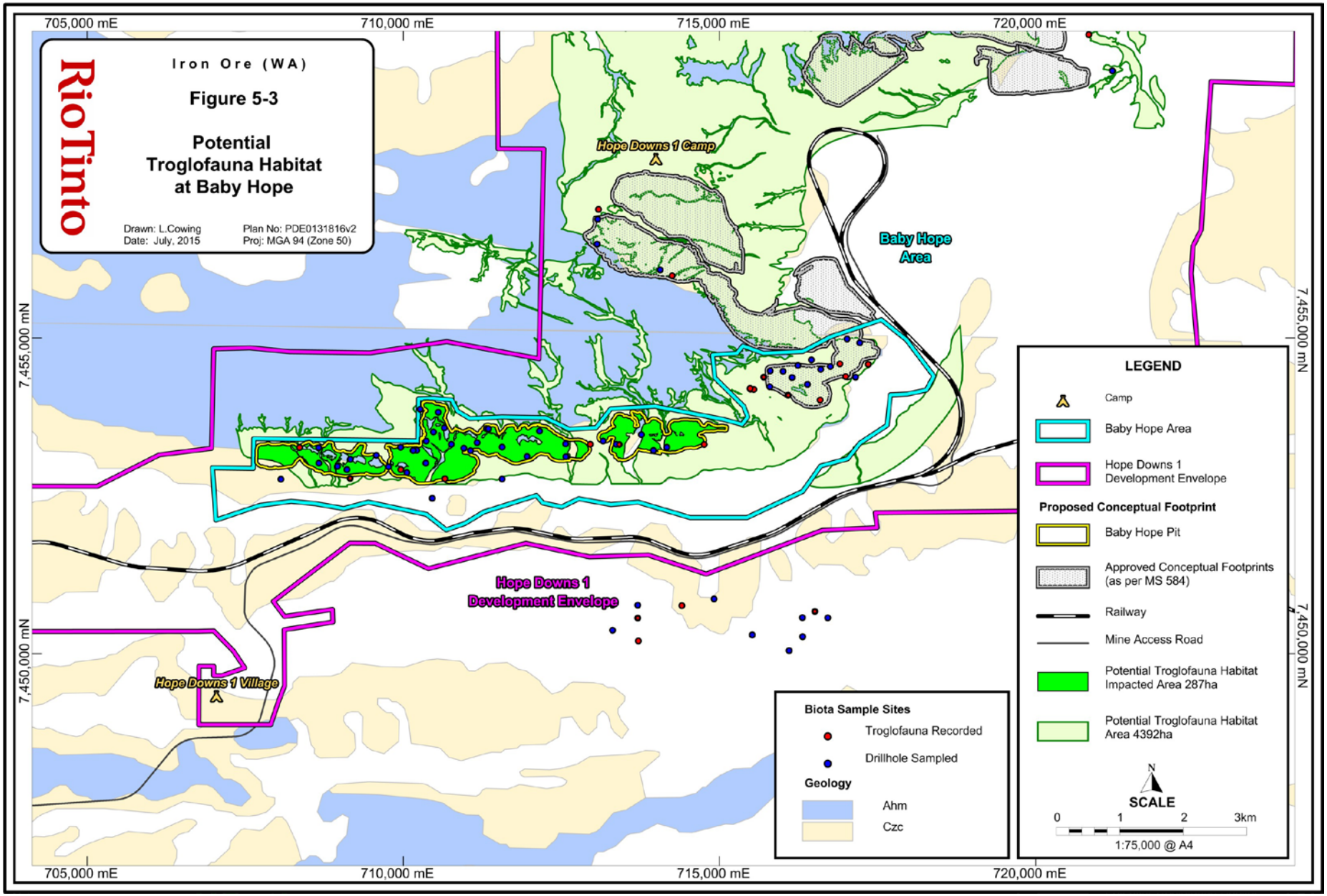

Figure 5-3: Potential Troglofauna Habitat at Baby Hope

Table 5-4: Hydrological Processes (Surface Water) Assessment

Inherent impact	Environmental aspect	Mitigation to address residual impacts	Regulatory mechanisms to ensure mitigation	Outcome to demonstrate that proposal meets EPA objective
EPA Objective: *To maintain the hydrological regimes of surface water so that existing and potential uses, including ecosystem maintenance, are protected.*				
• The Proposal is located on the northern flanks of a broad shallow valley between two low ranges of hills within the Hamersley Range. The ranges and valley are orientated in an east-west direction. • There is a major drainage line (Pebble Mouse Creek) flowing west to east through the valley (refer to Figure 5-4). The Pebble Mouse Creek catchment has a total catchment area of ~340km^2 to the confluence with Weeli Wolli Creek, of which 258km^2 is upstream of the Baby Hope Area. Pebble Mouse Creek is a generally well defined, meandering creek with minor braiding. The average width of the Pebble Mouse Creek low flow channel is 10 m with a depth of 1.5 m. This drainage line floods the alluvial plain during overbank flow events after significant rainfall (Appendix 6). • Drainage from the northern valley flanks is composed of numerous minor drainage lines that coalesce at the junction of the foothills and the pediment slope, before flowing into Pebble Mouse Creek. The combined catchment area of this system is approximately 15 km^2. • Weeli Wolli Spring, located 8.2 km downstream of the deposit, is protected under the *Aboriginal Heritage Act 1972* and the riparian vegetation supported by the spring is categorised as a PEC. As part of the HD1 Project (MS 584 and MS 893), the Proponent is required to prevent unacceptable impacts on Weeli Wolli Spring through management strategies including maintenance of spring flow by direct discharge of water to the spring during dewatering and protecting the environmental values as defined by the OEPA on advice of DEC (now Parks and Wildlife).. • Potential acid forming (**PAF**) material is present in low likelihoods within the Baby Hope deposit. This aspect is addressed in Rehabilitation and Decommissioning.				
<u>Impact 1</u> Truncation of surface water flows from intersected gullies that will result in the loss of less than 0.8% of the total runoff volume for the 1% AEP (100 year ARI) flow event of Pebble Mouse Creek.	<u>Aspect 1</u> Excavation of pit.	<u>Management of Aspect 1 and 2</u> • The Baby Hope pits will be developed outside of the 1% AEP (100 year ARI) floodplain to ensure there is no impact on the main flow channel of the Pebble Mouse Creek. • Surface water quality management is included within the existing HD1 Water Management Plan and this will be implemented to include the Proposal. No change is expected to the current HD1 surface water discharge requirements.	• Weeli Wolli Spring, located 8.2 km downstream of the deposit, is protected under the *Aboriginal Heritage Act 1972* and the riparian vegetation supported by the spring is categorised as a PEC which is protected under the *Wildlife Conservation Act 1950*. • As part of the HD1 Project (MS 584 and MS 893), the Proponent is committed to sustain spring flow that maintains the integrity of riparian vegetation supported by the creek system and protecting the	Development of the Proposal is not expected to result in significant change to surface water from that assessed and approved for HD1 via MS 584 and MS 893. The Proponent therefore considers that the Proposal can meet the EPA's Objective for this factor, in summary: • Appropriate management measures to avoid, minimise and mitigate potential impacts of the Proposal on surface water flows have been, and will continue to be, implemented. • Impacts to surface water flows will be localised, there will be no significant impacts on

Inherent impact	Environmental aspect	Mitigation to address residual impacts	Regulatory mechanisms to ensure mitigation	Outcome to demonstrate that proposal meets EPA objective
<u>Impact 2</u> Cumulative impacts to hydrological processes.	<u>Aspect 2</u> Disturbance to Weeli Wolli catchment as a result of development of the Baby Hope Proposal.	<u>Management of Aspect 2</u> The Proposal will truncate approximately 20km^2 or 1.3% of the total Weeli Wolli Creek catchment area to Weeli Wolli Creek. Hydraulic modelling has shown this truncation will result in the loss of less than 0.8% of the total runoff volume for the 1% AEP (100 year ARI) flow event of Pebble Mouse Creek. Some localised changes to surface water flows expected however; modelling indicates that Weeli Wolli Spring and the riparian vegetation it supports would not be detrimentally impacted by the altered hydrological regimes.	defined environmental values of Weeli Wolli Spring and Creek. • *Iron Ore (Hope Downs) Agreement Act 1992* requires the Proposal to be implemented as approved.	regional surface water and no impacts on Weeli Wolli Creek.

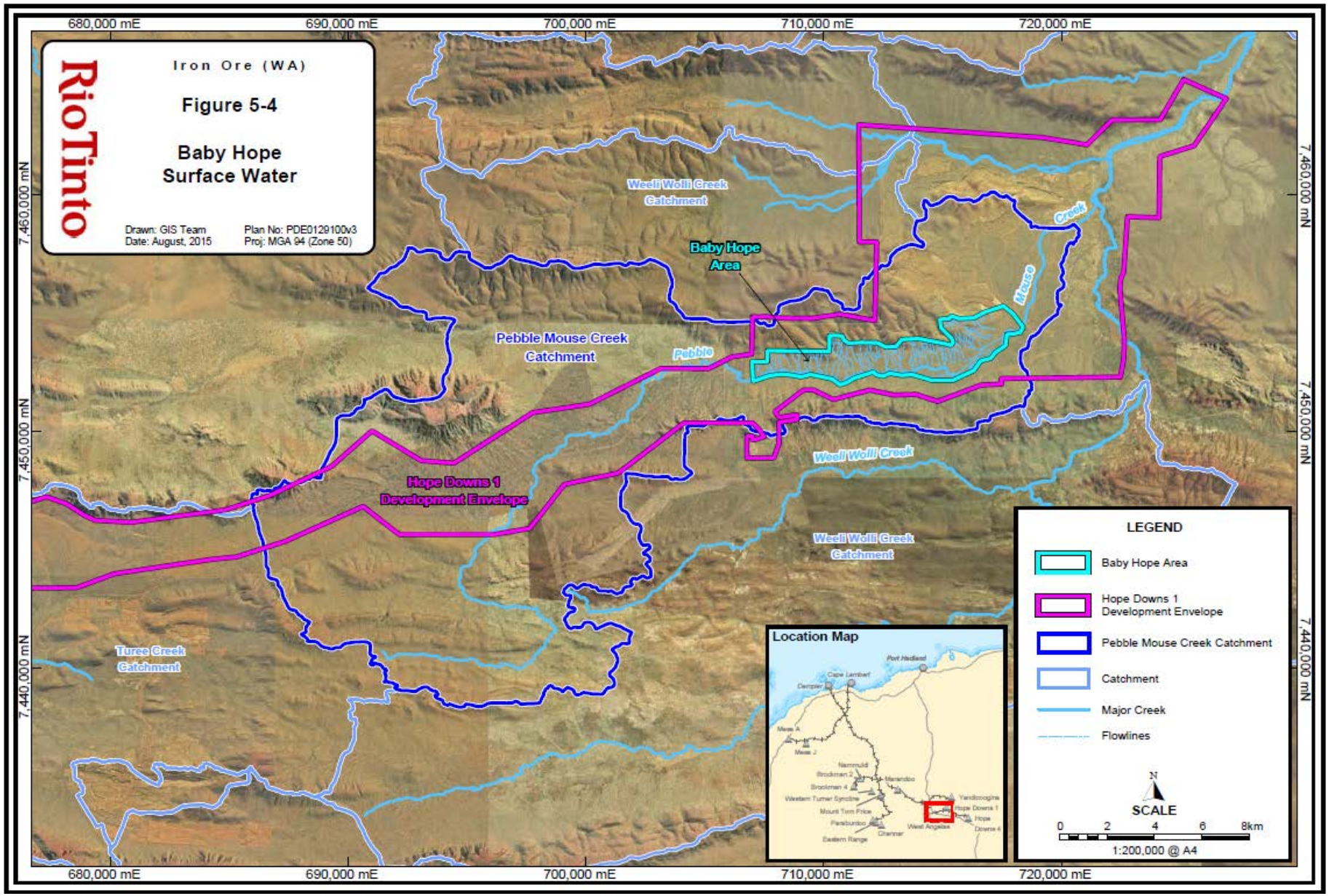

Figure 5-4: Baby Hope Surface Water

Table 5-5: Rehabilitation and Decommissioning

Inherent impact	Environmental aspect	Mitigation to address residual impacts	Regulatory mechanisms to ensure mitigation	Outcome to demonstrate that proposal meets EPA objective
EPA Objective: *To ensure that premises are decommissioned and rehabilitated in an ecologically sustainable manner.*				

- The goal of mine closure at Hope Downs 1, including Baby Hope, is to relinquish the site to the Government. A Baby Hope Closure Plan (Appendix 7) has been developed to meet the requirements of the Rio Tinto Closure Standard and the joint OEPA / DMP Guidelines for Preparing Mine Closure Plans (2011). The Baby Hope Closure Plan is also consistent with the HD1 operations closure plan obligations and commitments approved under MS 584 Schedule 2 proponent commitment 11.
- Options for post-mining land use are limited, with mining and pastoralism the only industries that have historically proven viable. Land use options under consideration for this Proposal include a change to pastoralism or return to a native ecosystem.
- The following closure objectives have been proposed for Baby Hope:
    - rehabilitated landforms are stable;
    - vegetation on rehabilitated land is native and self-sustaining;
    - mineral waste is appropriately managed to prevent contamination of surface and groundwater; and
    - measures to mitigate public health and safety hazards have been agreed with stakeholders and implemented.
- The anticipated closure outcome is as follows:
    - Infrastructure utilised for the development of Baby Hope and no longer required for other mining purposes will be removed. Three mine voids, developed outside of the Pebble Mouse Creek flood plain, will remain on closure.
    - The majority of the mineral waste will be transported to the exhausted HD1S pit and is expected to fill the southern portion of the HD1S pit to surface, and then extend above the lowest natural elevation of the pit crest, merging into the adjacent topography.
    - Mineral waste will also be returned to the Baby Hope pits opportunistically during the life of the mine. Two additional external waste dumps will also be required during operations, and are expected to remain on closure.
    - Waste dumps will be rehabilitated to be internally draining; as such, it may not be possible to reinstate local drainage lines and runoff from the hills to the north of the deposit. Surface water flow along Pebble Mouse Creek will not be disturbed by the development of Baby Hope, and will continue to flow past the Baby Hope deposit without disruption.
    - Revegetation will be undertaken across all disturbance areas and rehabilitated landforms. Selected species from vegetation communities within the surrounding area will be used for the revegetation of the waste dumps, backfill and other disturbance areas. Small areas within the pre-mining riparian vegetation corridor may be disturbed during mining to facilitate mine access. These areas will be rehabilitated to re-establish riparian ecosystem function.
    - Consistent with the HD1 closure, rock surfaces associated with the mine voids, such as pit walls, will not be rehabilitated.

Inherent impact	Environmental aspect	Mitigation to address residual impacts	Regulatory mechanisms to ensure mitigation	Outcome to demonstrate that proposal meets EPA objective
• Risk of Acid Mine Drainage (**AMD**). • Risk of exposing designated hazardous fibrous materials • Unstable landforms. • Inadequate rehabilitation and closure planning.	Excavation of pit. Construction of the Proposal.	• The likelihood of generating acid mine drainage is considered low as the potentially acid-forming (**PAF**) materials that have been encountered at Baby Hope are low in volume and self-neutralising. • When fibrous materials are encountered, management of the material will be guided by the Rio Tinto Iron Ore (WA) Fibrous Minerals Management Plan. This Plan includes: o undertaking risk assessments prior to entering or disturbing areas with potential fibrous risk, to ensure appropriate personal protection equipment is worn; and o encapsulating intersected / identified fibrous mineral waste in 2 m thickness of non-fibrous mineral waste, in a location where the material will not be disturbed on closure. • Topsoil will be stripped and stored onsite for use during rehabilitation. • Management procedures for the recovery, storage and utilisation of topsoil will be developed and implemented. • Topsoil is to be stored for the shortest time period possible to maintain viability of the seed bank and soil fertility. • Any areas cleared for construction purposes that are not required during operations will be rehabilitated. • Rehabilitation will be planned and prepared for in accordance with EPA Guidance Statement No. 6 Rehabilitation of Terrestrial Ecosystems (EPA 2006a), which sets out the general expectations about re-establishing biodiversity values where a site is to be rehabilitated back to native vegetation. • Rehabilitation plans detailing landforms, materials	• The Baby Hope Closure Plan has been developed to address closure of Baby Hope. The closure objectives for Baby Hope mirror those for the HD1 Project which were agreed with regulators in 2006. These objectives are: o Sustain phreatophytic vegetation and restore a self-sustaining spring flow at Weeli Wolli Spring within a reasonable period following mine closure. o Ensure that Weeli Wolli Spring flow is self-sustaining following mine closure and there is no unacceptable deterioration in groundwater quality. o Monitor phreatophytic vegetation in Weeli Wolli Creek (to quantify impacts from the operation). o Relinquishment of a tidy, safe and uncontaminated site to the community. o Construct landforms that are stable, free draining, non-polluting and aesthetically compatible with the surrounding landscape. o Establish sustainable endemic vegetation communities consistent with reconstructed landforms and surrounding	Closure of the Baby Hope Proposal will be managed subject to approval of the Baby Hope Closure Plan. The Proponent therefore considers that the Proposal can meet the EPA's Objective for this factor.

Inherent impact	Environmental aspect	Mitigation to address residual impacts	Regulatory mechanisms to ensure mitigation	Outcome to demonstrate that proposal meets EPA objective
		management and rehabilitation prescriptions will be prepared and implemented. • Comply with the requirements of the *Contaminated Sites Act 2003* if contamination occurs. • Soil stockpiles will be inspected for evidence of erosion and weeds and remediated accordingly. • The potential risk of exposing PAF is very low. • The post mining landform will consist of three mine void progressively backfilled during the operation. The Baby Hope Closure Plan is provided as Appendix 7, which documents the current closure knowledge base for Baby Hope and outlines the objectives that need to be met at closure, the strategies and plans to be employed to achieve them, and provides an indication of the criteria that will be used to assess closure success. The Baby Hope Closure Plan is not a static document. The Proponent will continue to revisit the Closure Plan on a regular basis to ensure that the objectives to which it is working towards remain relevant and aligned to stakeholder expectations, and to revise its strategies and plans where appropriate to achieve improved closure outcomes.	vegetation. • *Contaminated Sites Act 2003.* • Subject to approval, a new MS for the Baby Hope Proposal with a specified clearing limit, a defined Baby Hope Area, and a condition relating to Rehabilitation and Decommissioning. • Department of Mines and Petroleum (DMP) and Environmental Protection Authority (EPA) 2015 Guidelines for Preparing Mine Closure Plans.	

5.2 RESIDUAL IMPACTS: IMPACT ASSESSMENT AND MANAGEMENT

5.2.1 Determination of Significant Residual Impact

The WA Environmental Offsets Policy (Government of Western Australia 2011) and WA Environmental Offsets Guidelines (Government of Western Australia 2014) provide guidance to proponents on the approach needed to determine offset requirements for proposals.

Environmental aspects of the Proposal were assessed for potential significant residual impacts:

- The Proposal does not lie within a reserve or protected area.
- Vegetation mapping has been completed across the Proposal area and does not indicate the presence of any vegetation types that qualify for specific legislative protection (i.e. TECs). None of the vegetation types identified were considered to be sufficiently rare or restricted to warrant designating them as being of high conservation significance and are considered likely to be widely distributed and relatively well represented in the region.
- The majority of the vegetation communities were generally found to be in Good to Excellent condition despite evidence of weed invasion and cattle grazing.

5.2.2 Offset required for the Baby Hope Proposal

The EPA considers that the increased amount of clearing of native vegetation in the Pilbara Bioregion, combined with the predicted future activities requiring clearing and other impacts from pastoralism and fires, is likely to result in a significant impact on environmental values. Subsequently the EPA has determined that a proactive approach to limiting these impacts is required and that a possible solution is the establishment of a strategic regional conservation initiative for pooling of offset funds the Pilbara.

As a result, offsets for clearing of native vegetation considered in Good to Excellent condition have recently been consistently applied in the Pilbara Bioregion. Where there is an additional level of environmental value, a higher offset has been applied to account for this greater value. This approach has been applied to all mining proposals in the Fortescue, Hamersley and Chichester sub-regions since mid-2011.

An assessment of potential impacts of the Proposal following the mitigation process was undertaken in accordance with the WA Environmental Offsets Guidelines (Government of Western Australia 2014). It is expected that an offset will be required for clearing of native vegetation in Good to Excellent condition.

Further consideration of the potential significant residual impact is provided in Table 5-6.

Table 5-6: Potential Significant Residual Impact: Baby Hope Proposal

Existing environment /Impact	Mitigation			Significant Residual Impact	Offset Calculation Methodology				
	Avoid and minimise	Rehab Type	Likely Rehab Success		Type	Risk	Likely success	Time Lag	Offset Quantification
EPA objective: *To counterbalance any significant residual environmental impacts or uncertainty through the application of offsets.*									
1,000 ha of clearing of native vegetation considered to be in Good to Excellent condition	**Avoid**: The Proposal has been designed to avoid impact to the Pebble Mouse Creek. The extensive biological and heritage surveys completed within the Baby Hope Area ensure that areas identified as significant have been avoided. **Minimise:** Use of existing HD1 infrastructure and plant facilities will minimise clearing of undisturbed native vegetation. **Rehabilitation:** Where clearing is unavoidable, areas will be progressively rehabilitated with local native vegetation. The Closure Plan will be implemented to ensure that the Proposal can be closed in an ecologically sustainable manner, consistent with agreed outcomes and land uses.	Areas will be progressively rehabilitated with local native vegetation.	Can the environmental values be rehabilitated/Evidence? Operator experience in undertaking rehabilitation? Yes – the Proponent has completed several areas of successful rehabilitation. What is the type of vegetation being rehabilitated? Assorted vegetation assemblages associated with plains, hills, flow lines and terminal basin habitat types. Time lag? Progressive rehabilitation where practicable. Credibility of the rehabilitation proposed (evidence of demonstrated success) See previous rehabilitation from the Proponent.	Extent: 1,000 ha Quality: Good to Excellent condition Conservation Significance: N/A Land Tenure: N/A Time Scale: N/A According to the agreed significance framework, residual impact from clearing of native vegetation is considered by the EPA to be significant in the context of cumulative impacts in the Pilbara.	Provision of funds to a Pilbara Strategic Conservation Initiative.	N/A	N/A	N/A	In accordance with the EPA's established offset rates for the Pilbara, $750/ha of clearing of good to excellent condition native vegetation.

6 OTHER ENVIRONMENTAL FACTORS

The following factors, although not considered key, are relevant to this Proposal due to the proposed additional clearing and development of the satellite deposit:

- Terrestrial Fauna
- Heritage
- Air Quality

Table 6-1 outlines the consideration of these factors relevant to the Proposal.

The remaining environmental factors (Landforms, Terrestrial Environmental Quality, Inland Waters Environmental Quality, and Amenity) are also addressed in Table 6-1.

Table 6-1: Other Environmental Factors

Potential impact / Environmental aspect	Mitigation to address residual impacts	Mechanism for ensuring mitigation
Terrestrial Fauna - *To maintain representation, diversity, viability and ecological function at the species, population and assemblage level.*		
• Of the habitats present, the narrow and broad gorges are considered to be the landform unit representing the habitat of highest faunal value in the Baby Hope Area, but their attributes are typical of similar habitat types in the wider locality. • The gorges in the Baby Hope Area have the potential to provide habitat for both the northern quoll and Pilbara olive pythons, however neither species has been recorded within the Baby Hope Area. The orange leaf-nosed bat also has the potential to forage over the majority of the Baby Hope Area, but there is no evidence of any suitable roost sites for the species. • No threatened species recorded (or core habitat) under the EPBC Act. • Two P4 fauna species listed under the *Wildlife Conservation Act 1950* – the Western pebble-mound mouse and Australian bustard. • 10 potential SRE mygalomorph spiders (of the Nemesiidae family) were recorded by Biota (2014b). All of these specimens belong to the genus Aname, with three different morphotypes identified including 'Sock' Aname, 'Big Angry Red' Aname and 'Hooded' Aname. Subsequent molecular analysis of the specimens aimed at determining if they represented SRE taxa revealed that the three morphotypes belonged to three known Aname species (N1, N16 and N37). Based on current data Aname sp. N1 nor A. sp. N16 occupy minimum spanning areas > 10,000 km^2 (Biota 2012c). Therefore they are not considered SREs and are not of elevated conservation value. With the records from the Biota survey (2014b), Aname sp. N37 has a known distribution of 65 km^2, and qualifies as an SRE. The two confirmed specimens of this species were recorded from contextual sampling sites outside of the Baby Hope Area. A further two specimens of the same morphotype were collected from the same landform and land system from inside the Baby Hope Area, but these failed to yield a useable DNA sequence. Given the small distance involved and the similarity of habitats, it is possible that these two records also represent the SRE species Aname sp. N37.		
Direct loss/degradation of fauna habitat from clearing. The additional clearing will not affect regional population levels or the conservation status of any fauna species. Loss of individual fauna through interactions with vehicles and personnel	• Management measures as noted for Flora and Vegetation (Table 5-2) to minimise impacts to fauna habitat. • The requirements of the Wildlife Interaction Guideline will continue to be communicated to, and implemented by, all personnel. • Native animals encountered on-site will be given the opportunity to move on if there is no threat to personnel safety in doing so. • The proposed clearing will be constrained within the Baby Hope Area. • The Proposal does not intersect habitats of regional significance for rare and endangered fauna species. All of the habitat types that will be disturbed by this Proposal are well represented in the Pilbara bioregion. Therefore no significant cumulative impacts are predicted.	The Proponent considers that the Proposal can meet the EPA's Objective for this factor given that: • Potential impacts are not expected to be significant. • Land systems and ecological functions are not unique on a local or regional scale. • The Proposal will not affect regional population levels, the conservation status of any fauna species, or their core habitat.

Potential impact / Environmental aspect	Mitigation to address residual impacts	Mechanism for ensuring mitigation
Landforms - *To maintain the variety, integrity, ecological functions and environmental values of landforms.*		
• Alteration of existing landforms creates strong visual impact. • Alteration of landforms impacts upon significant ecological function or unique environmental values. • Topsoil loss, soil erosion and sedimentation from disturbed areas.	Implement the following industry standard controls: • Implementation of sediment and erosion control measures. • Rehabilitation plans detailing landforms, materials management and rehabilitation prescriptions will be prepared and implemented. • Post-closure landforms will be planned and constructed so that their shape, size, soil profiles, ability to support native vegetation and response to surface water flows are safe, stable and comparable to natural landforms in the area.	The Proponent considers that the Proposal can meet the EPA's Objective for this factor given that: • Land systems and ecological functions are not unique on a local or regional scale. • The nature of the orebody results in shallow mine pits that are above the water table. • Mine pits have been designed to minimise the area of disturbance.
Terrestrial Environmental Quality - *To maintain the quality of land and soils so that the environment values, both ecological and social, are protected.*		
• Disturbance of rock and soils. • General domestic waste. • Industrial wastes. • Hazardous wastes. • Hydrocarbon or chemical spills.	Implement the following industry standard controls: • Waste will be segregated and either removed from site via an authorised waste contractor or disposed of onsite to a landfill licensed under Part V of the EP Act. • Hydrocarbons and chemicals bunded and stored in accordance with *Dangerous Goods Safety (Storage and Handling for Non-explosives) Regulations 2007* and *AS1940: Storage and Handling of Flammable and Combustible Liquid* and the DER Part V Licence. • Re-fuelling bays at bulk fuel storage facilities equipped with concrete aprons or suitable lining (e.g. heavy duty plastic). • Spill clean-up material readily available at work sites and on mobile service trucks of vehicles, where hydrocarbons and chemicals are stored and/or used. • A spill response procedure will be implemented prior to construction.	• Dangerous Goods Safety Act 2004 (storage of hazardous materials). • Dangerous Goods Safety (Storage and Handling for Non-explosives) Regulations 2007. • Part V EP Act (Licence for landfill). • General provisions of the EP Act. The Proponent considers that the Proposal can meet the EPA's Objective for this factor given that the potential for impacts on this factor are relatively low and can be appropriately managed via existing legislation.

Potential impact / Environmental aspect	Mitigation to address residual impacts	Mechanism for ensuring mitigation
Inland Waters Environmental Quality - *To maintain the quality of groundwater and surface water, sediment and biota so that the environment values, both ecological and social, are protected.*		
• Generation of waste on site. • Hydrocarbon or chemical spills. • Surface water runoff from cleared areas. • Alteration of surface water flows. • Increased turbidity due to erosion caused by reduced vegetation cover or alteration of surface water flow paths. • Groundwater or surface water contamination via waste or hydrocarbon / chemical spills.	Implement the following industry standard controls: • Implement the existing HD1 Water Management Plan. • Manage waste and hydrocarbon / chemical spills as per management actions listed in the factor 'Terrestrial Environmental Quality'. • Manage surface water flows in accordance with the management actions listed in the factor 'Hydrological Processes'.	• *Dangerous Goods Safety Act 2004 (Storage of hazardous materials)*. • *Dangerous Goods Safety (Storage and Handling for Non-explosives) Regulations 2007*. • Part V EP Act (Approval and Licence for landfill). • General provisions of the EP Act. • *Contaminated Sites Act 2003.* The Proponent considers that the Proposal can meet the EPA's Objective for this factor given that the potential for impacts on this factor are relatively low and can be appropriately managed via existing legislation.
Amenity - *To ensure that impacts to amenity are reduced as low as reasonably practicable.*		
• Earthmoving activities. • Vehicle movements. • General construction and operation activities / traffic. • Use of machinery.	Implement the following industry standard controls: • Equipment used will be maintained in accordance with manufacturers' specifications and relevant standards. • Vehicle speeds will be restricted. • Internal combustion engines fitted with a suitable muffler in serviceable condition.	• *Environmental Protection (Noise) Regulations 1997*. • General provisions of the EP Act. • Part V DER Licence. The Proponent considers that the Proposal can meet the EPA's Objective for this factor given that the potential for impacts on this factor are relatively low given the remote location, and can be appropriately managed via existing legislation.

Potential impact / Environmental aspect	Mitigation to address residual impacts	Mechanism for ensuring mitigation
Air Quality and Atmospheric Gases- *To maintain air quality for the protection of the environment and human health and amenity and to minimise the emission of greenhouse and other atmospheric gases through the application of best practice.*		
• Dust generated from surface mining operations. • Dust lift from bare ground / cleared areas. • Construction and operational activities such as the mechanical disturbance of rock and soil, and use of vehicles on unsealed roads. • Use of machinery, gensets and light and heavy vehicles.	Implement the following industry standard controls: • Vegetation clearing will be progressive, and cleared construction areas not required for operations will be rehabilitated at the completion of the construction period. • Dust suppression will occur in areas that have high potential to generate dust, such as surface mining operational areas, areas that receive heavy traffic and key construction areas. • Vehicle speeds will be restricted. • The performance of dust suppression equipment will be maintained and monitored by regular site inspections. • Where practicable and cost effective, dust suppressants may be used to effectively minimise dust generation.	• General provisions of the EP Act. • GHG emissions are reported via the *National Greenhouse and Energy Reporting Act 2007 (Cwth).* • Existing Licence for Prescribed Premises (L8117/2006) issued under Part V of the EP Act for HD1 includes conditions for the management of dust emissions. The Proponent considers that the Proposal can meet the EPA's Objective for this factor given that: • The potential for impacts on this factor are relatively low, with dust being the main emission. • No sensitive receptors are in close proximity to the Proposal.
Heritage - *To ensure that historical and cultural associations, and natural heritage, are not adversely affected.*		
• Aboriginal Heritage surveys have been completed for the Proposal in accordance with the *Aboriginal Heritage Act 1972.* • Some of the archaeological sites identified may be impacted from clearing for development of the satellite deposit and associated infrastructure.	• Heritage surveys will continue to be conducted prior to any ground disturbance, as per the Proponent's protocols. • Proposal design has minimised planned clearing to areas necessary for safe construction and operation. Clearing will only occur within approval boundaries and maximum limit. • If sites cannot otherwise be avoided, the impacts will be managed in accordance with the *Aboriginal Heritage Act 1972* Section 18, and in consultation with Traditional Owners.	• *Aboriginal Heritage Act 1972.* • *Aboriginal and Torres Strait Islander Heritage Protection Act 1984.* • *Native Title Act 1993.* The Proponent considers that the Proposal can meet the EPA's Objective for this factor given that the potential for impacts on this factor can be appropriately managed via existing legislation.

7 PRINCIPLES OF ENVIRONMENTAL PROTECTION

This section describes how the objectives of the EP Act and the principles of Environmental Impact Assessment (**EIA**) have been addressed and how the Proposal meets the criteria for an Assessment of Proponent Information (**API**) (Category A) assessment as described in the *Environmental Impact Assessment (Part IV Divisions 1 and 2) Administrative Procedures 2012* (**2012 Administrative Procedures**) (EPA 2012b).

The principles of Ecologically Sustainable Development (**ESD**) are incorporated into the EP Act and the EAG8 (2015). These principles have been considered for the Proposal and are summarised below in Table 7-1.

Table 7-1: Environmental Principles of the Environmental Protection Act 1986

Principle	Consideration Given in Revised Proposal
1. 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 the application of the precautionary principle, decisions should be guided by: • Careful evaluation to avoid, where practicable, serious or irreversible damage to the environment. • An assessment of the risk-weighted consequences of various options.	The Proponent has undertaken comprehensive baseline studies and modelling of aspects of the Proposal that may affect the environment. Where significant potential environmental impacts were identified, management and mitigation measures have been, and will continue to be, implemented in design and operation of the Proposal in order to avoid or minimise these potential environmental impacts.
2. Intergenerational equity The present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations.	The Proponent's Iron Ore HSECQ Policy incorporates the principle of sustainable development and includes the following commitments: • Prioritising research and implementation programs through technology to reduce impacts to land, enhancing our contribution to biodiversity and improving our efficiency in water and energy use. • Identifying climate change improvement solutions through dedicated optimisation work programs. • Contributing to the health and well-being of local communities.
3. Conservation of biological diversity and ecological integrity. Conservation of biological diversity and ecological integrity should be a fundamental consideration.	Biological investigations are undertaken by the Proponent during the Proposal planning process to identify aspects of the environment that are of conservation significance. Where significant potential environmental impacts are identified, measures have been, and will continue to be, incorporated into Proposal design and management to avoid or minimise these impacts where practical. The Proponent's HSEQ Management System has well established rehabilitation procedures for restoring disturbed environments.

Principle	Consideration Given in Revised Proposal
4. Improved valuation, pricing and incentive mechanisms • Environmental factors should be included in the valuation of assets and services. • The polluter pays principle – those who generate pollution and waste should bear the cost of containment, avoidance or abatement. • 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 wastes. • Environmental goals, having been established, should be pursued in the most cost-effective way, by establishing incentives structures, including market mechanisms, which enable those best placed to maximise benefits and/or minimise costs to develop their own solutions and responses to environmental problems.	Environmental factors have been considered during the design phase of the Proposal, and will continue to be considered during the operational and closure phases of the Proposal. Proposal design and operational management will continue to investigate and implement opportunities to reduce impact to land, and improve efficiency in water and energy use, in accordance with the Proponent's HSECQ Policy.
5. Waste minimisation All reasonable and practicable measures should be taken to minimise the generation of waste and its discharge into the environment.	All reasonable and practicable measures are taken to minimise the generation of waste and its discharge into the environment through the existing EMS and procedures.

The environmental principles of the EPA (EAG8 2015) have been considered for the Proposal and are summarised below in Table 7-2.

Table 7-2: Environmental Principles of the EPA

Principle	Consideration Given in Proposal
Best Practice When designing proposals and implementing environmental mitigation and management actions, the contemporary best practice measures available at the time of implementation should be applied.	The Proponent ensures that proposed environmental impact is prevented, or minimised, as far as practicable, including implementing best practice measures where applicable.
Continuous Improvement The implementation of environmental practices should aim for continuous improvement in environmental performance.	Proponent operates under an HSEQ Management System which sets out a framework of adaptive management based on the Deming Cycle (Plan-Do-Check-Act).

8 CONCLUSION

Hamersley HMS Pty Limited is proposing to develop the Baby Hope above water table deposit as an amendment to the existing HD1 Project.

The Proposal will support ongoing production at HD1 by providing a suitable dry source or ore for blending with the problematic clay-like goethetic material that is present in the HD1N and HD1S pits. Waste rock will be managed via external waste dumps. The Proposal will mostly utilise existing infrastructure from the HD1 Project but will result in the development of three pits, supporting waste dumps, access roads and other supporting infrastructure.

Information gathered from biological surveys completed by Biota in 2014 and 2015 has been considered in relation to Proposal design and has been used to determine key and other environmental factors consistent with Environmental Assessment Guideline 8: for Environmental Factors and Objectives (EPA 2015). Those factors deemed to be potentially impacted by the Proposal have been classed as 'preliminary key environmental factors'. The factors that were either not expected to be significantly impacted or that can be suitably managed using existing legislation have been classed as 'other environmental factors'.

An Environmental Impact Assessment (**EIA**) has been completed on the following preliminary key environmental factors:

- *Flora and Vegetation* – to address the potential impacts resulting from the direct or indirect loss of flora and vegetation.
- *Subterranean Fauna* – to address the potential impacts to troglofauna resulting from the direct or indirect loss of troglofauna fauna habitat.
- *Hydrological processes (surface water)* – to address the potential impacts to surface water as a result of development of the Proposal.
- *Rehabilitation and Decommissioning* – to ensure that the Proposal is decommissioned in an ecologically sustainable manner.

A series of management actions have been proposed to ensure that potential environmental impacts to key and other factors are controlled so as to meet the EPA's Objectives. Based on the Proposal design and the information gathered during environmental studies, the Proposal is not expected to cause significant environmental impacts and the potential impacts identified are able to be effectively managed within existing condition setting frameworks and other legislation.

The Proponent has identified and consulted with key stakeholders in preparing the Proposal and conducting the EIA. The Proponent will continue to progress relevant stakeholder consultation as the Proposal proceeds into detailed design, construction and operational phases.

The key and other environmental factors have been assessed against EPA's Objectives and relevant guidelines. The Proposal has been prepared with design, layout and management controls identified to avoid, minimise or manage the potential environmental impacts using both industry standard and Proposal specific controls. Given the configuration of the Proposal to avoid significant impacts, location in relation to environmental assets and values, and the existing and proposed management actions and controls to protect the environment, the Proponent considers that the Proposal will meet the EPA's Objectives.

Figure 8-1 provides an overview of the environmental assessment considerations and conclusions of this Proposal and illustrates the Proponents view of the remaining level of uncertainty and the mitigation measures which will be adopted to provide confidence to the EPA that its objective for each preliminary key environmental factor will be met.

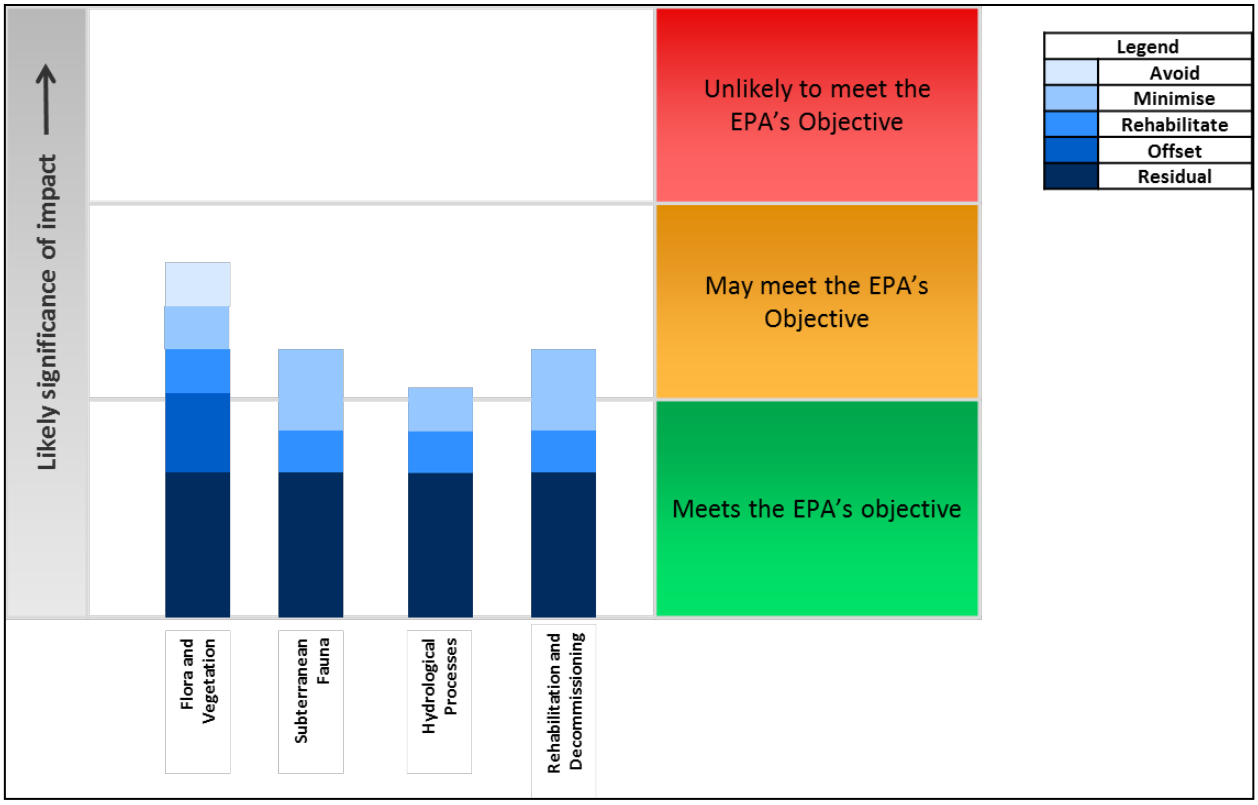

Figure 8-1: Conceptual Application of the EPA's Significance Framework

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10 APPENDICES

Appendix 1: **S38 Referral Form**

Appendix 2: **Ministerial Statement 584 and 893**

Appendix 3: **Vegetation and Flora Assessment (Biota 2014a)**

Appendix 4: **Targeted Terrestrial Fauna Assessment (Biota 2014b)**

Appendix 5: **Baby Hope Second Phase Troglofauna Survey (Biota 2015a)**

Appendix 6: **Baby Hope Hydrology (RTIO 2015)**

Appendix 7: **Baby Hope Closure Plan (RTIO 2014)**