Western Turner Syncline Iron Ore Project

Proposal

Environmental Review document

Hamersley Iron Pty Limited

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Final

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1 PROPONENT AND KEY PROPOSAL CHARACTERISTICS

The Western Turner Syncline iron ore mine (**WTS Project**) is located approximately 20 kilometres (**km**) north-west of the existing Tom Price mine and 20 km west of the town of Tom Price (Figure 1-1).

The WTS Project has been approved over two phases and has the following approvals under Part IV of the *Environmental Protection Act 1986* (**EP Act**):

- Ministerial Statement (**MS**) 807 which authorises above water table (**AWT**) iron ore mining of the Section 10 Brockman deposit (**S10 BRK**) and was published on 17 September 2009 (refer to Figure 1-2 for spatial extent of MS 807).
- MS 946 which authorises AWT and below water table (**BWT**) mining of WTS Stage 2 (**Stage 2 -** the B1 and S17 deposits) and was published on 22 August 2013 (refer to Figure 1-2 for the spatial extent of MS 946).

S10 BRK and Stage 2 have been developed in accordance with the requirements of the *Iron Ore (Hamersley Range) Agreement Act 1963* and the EP Act.

This Proposal is required to sustain current production at WTS by developing the Section 10 Hub. This Proposal also presents an opportunity to create one contemporised MS to manage all aspects of the WTS Project.

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

- **Section 10 Hub** – includes AWT and BWT extension of S10 BRK; AWT mining of S10 BRK West; and AWT and BWT mining of S10 Marra Mamba East and West pits (**MME** and **MMW**). These additional pits and associated waste dump areas and discharge point are depicted in Figure 1-3 and Figure 2-1.
- **Proposal** – the activities required to develop the Section 10 Hub which are considered additional to those aspects approved under MS 807 and MS 946.
- **Proposal Area** – the conceptual footprint of the proposed Section 10 Hub.
- **WTS Development Envelope** – as depicted in Figure 1-2, S10 BRK and Stage 2 each have their own Development Envelope. This Proposal seeks to combine these envelopes to form a single WTS Development Envelope (as reflected in Figure 1-3).
- **WTS Project** – the WTS Project which, upon approval, will include all iron ore deposits at WTS (B1, Section 17 and the Section 10 Hub {BRK; BRK West; MME; and MMW}) and associated infrastructure required to mine, process and transport the iron ore to Tom Price mine within the WTS Development Envelope. Subject to acceptance of this Proposal by the Minister it is requested that a new Ministerial Statement for the WTS Project be published (which will supersede MS 807 and MS 946).

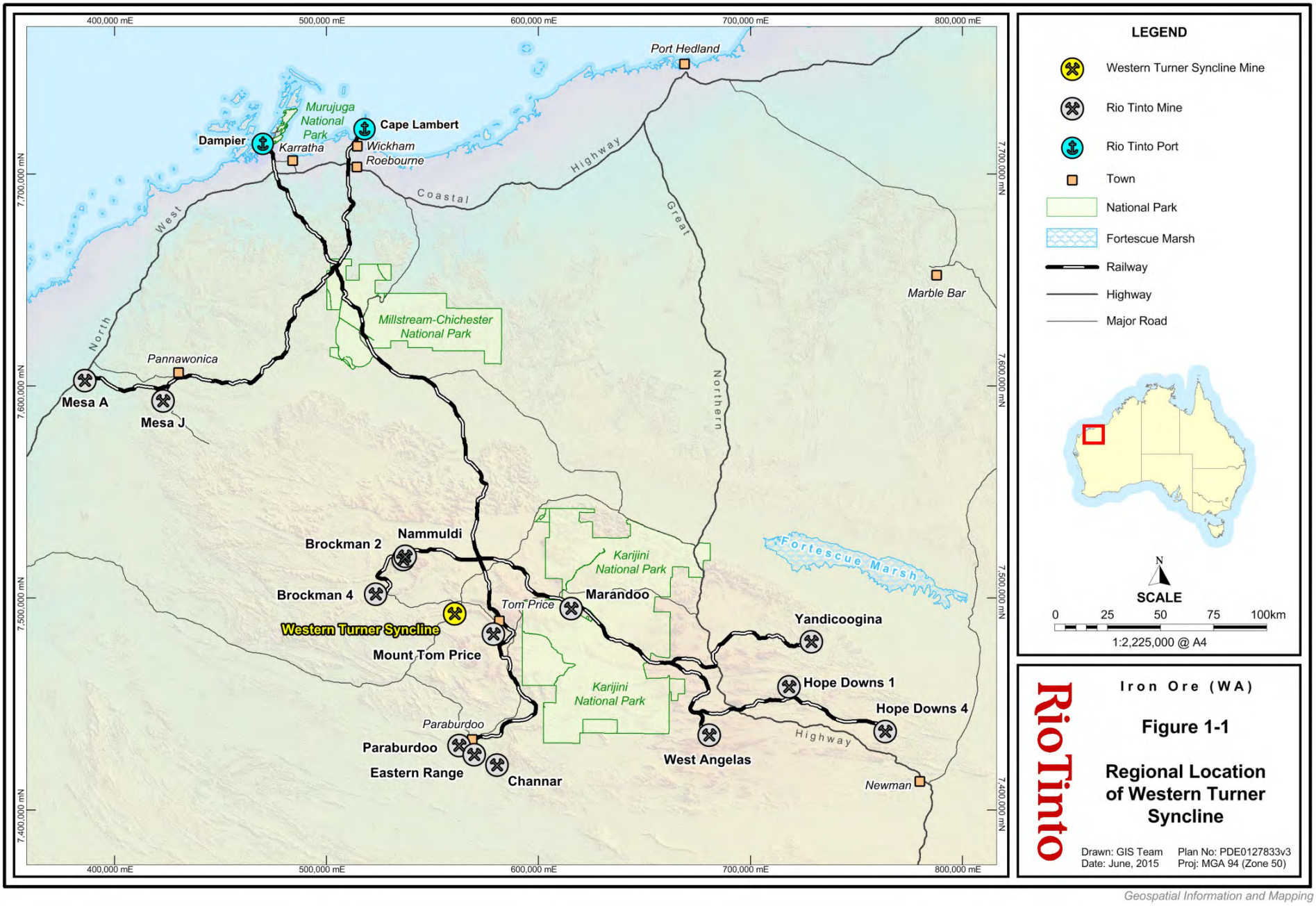

Figure 1-1: **Regional Location of Western Turner Syncline**

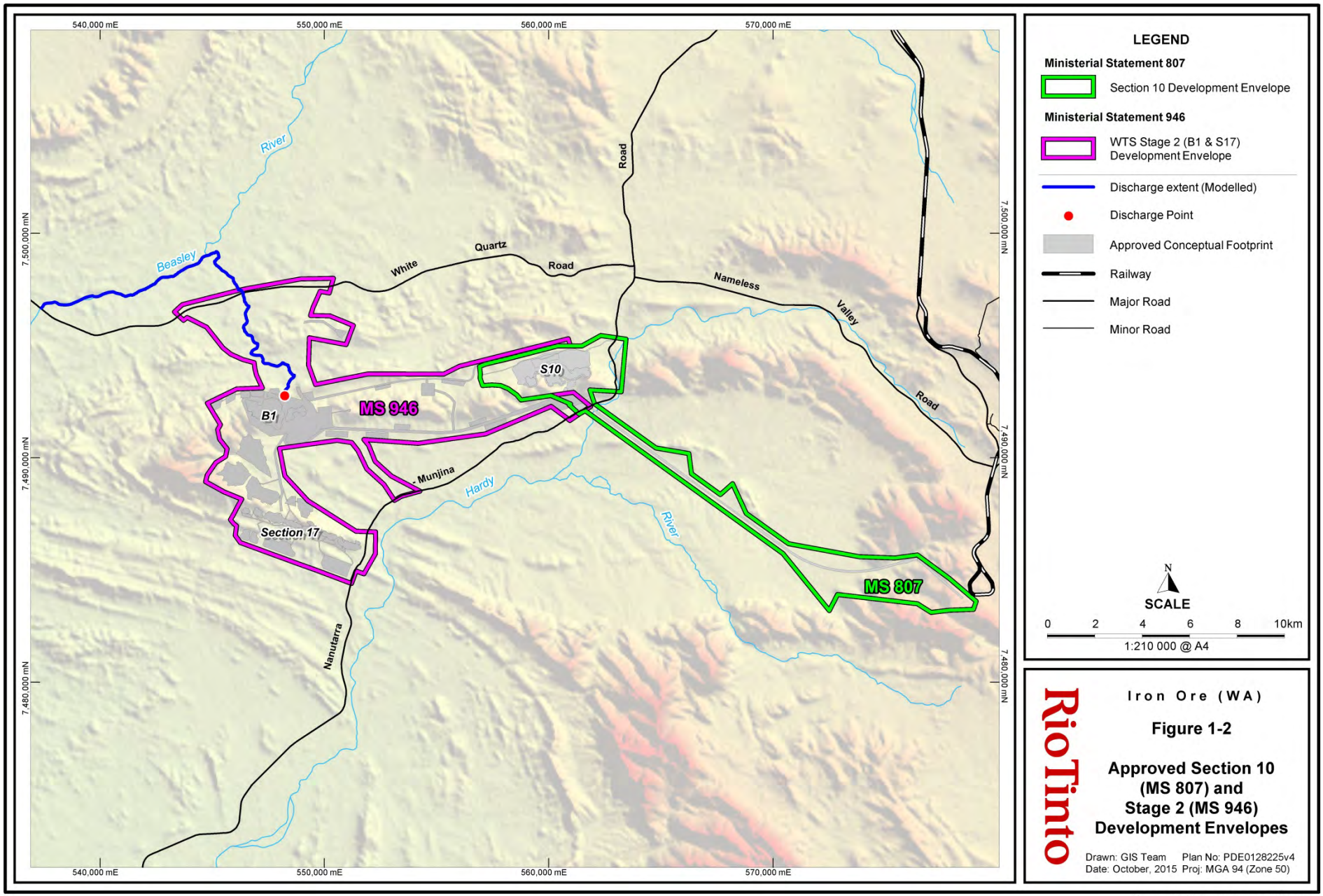

Figure 1-2: **Approved Section 10 (MS 807) and Stage 2 (MS 946) Development Envelopes**

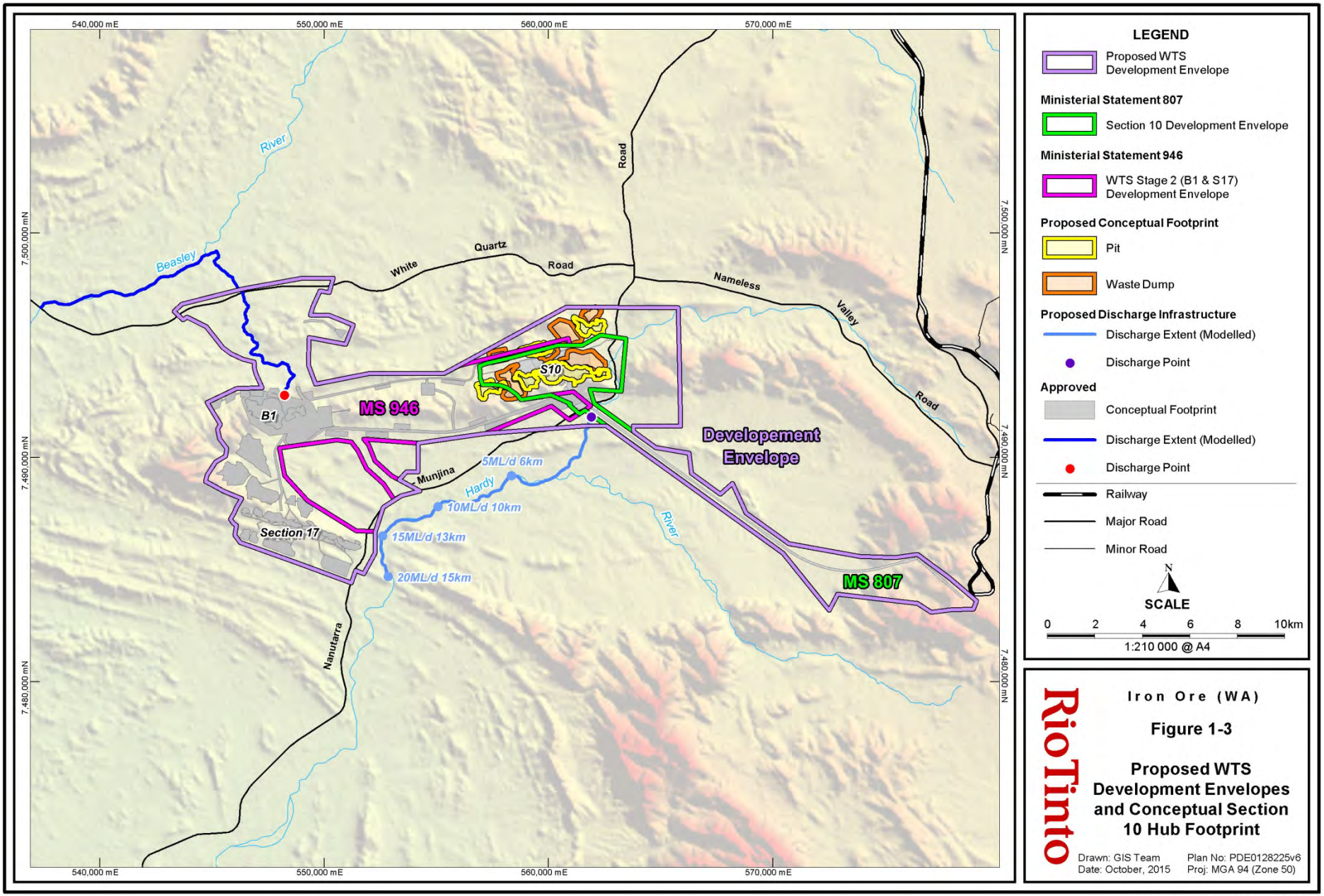

Figure 1-3: **Proposed WTS Development Envelope and Conceptual Section 10 Hub Footprint**

1.1 THE PROPONENT

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1.2 KEY PROPOSAL CHARACTERISTICS

This Environmental Review (**ER**) document is to support a formal referral (Appendix 1) under Section 38 of the EP Act for the following:

- Development of the Section 10 Hub in order to facilitate the following:
  - AWT/BWT extension of the existing S10 BRK deposit;
  - AWT mining of S10 BRK West;
  - AWT/BWT mining of MME and MMW deposits to the north of S10 BRK; and
  - Surface discharge of surplus water, from dewatering, into the northern branch of the Hardey River.
- Statement rationalisation to combine the existing WTS Ministerial Statements into one new contemporised MS for the WTS Project. The existing MS 807 and MS 946 are provided in Appendix 2.

Further details regarding the Proposal are provided in Section 2 of this ER document.

Table 1-1 and Table 1-2 provide a summary of the proposed location and authorised extent of physical and operational elements of the WTS Project.

Table 1-1: Summary of the WTS Proposal

Proposal Title	Western Turner Syncline Iron Ore Project
Proponent Name	Hamersley Iron Pty Limited
Short Description	Development of above and below water table iron ore deposits and associated infrastructure at Western Turner Syncline and an infrastructure corridor connecting the mining operation to the existing Tom price mine ore-processing facilities. Surplus water management options for mining below water table include use on site and controlled discharge to the environment.

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

Column 1	Column 2	Column 3
Element	**Location**	**Authorised Extent**
Development Envelope	Figure 2-1	Clearing of no more than 4,350 ha within the Development Envelope of 15,836 ha. Mining and related infrastructure includes: • B1, S17 and the Section 10 Hub deposits; • external waste dumps; • light and heavy vehicle access/haul roads; • conveyor; • power and communication lines; • borrow pits; and • water pipes.
Dewatering	Figure 2-1	Up to 18.3 GL/annum.
Surplus water management	Figure 2-1	Surplus water management options include use on site and discharge to the environment. Controlled surface discharge to extend along: • Beasley River, no further than 20 km downstream of the discharge point under natural no-flow conditions. • Hardey River, no further than 15 km downstream of the discharge point under natural no-flow conditions.
Backfilling of mine pits	Figure 2-1	Mining at WTS will leave mine voids on closure, of which the following extend into the groundwater table: • The S10 BRK Main and the B1 Main pits; which will not be backfilled, resulting in the formation of two pit lakes. • Section 17 (pits 3 and 8) and Section 10 MME and MMW Pits; which will be backfilled to prevent the formation of permanent pit lakes.

1.3 EXISTING WTS OPERATIONS

S10 BRK was referred to the Environmental Protection Authority (**EPA**) under Part IV of EP Act in January 2008 and was assessed at the level of Environmental Protection Statement (**EPS**). The Minister for the Environment (the **Minister**) approved implementation of S10 BRK, subject to the conditions of MS 807, on 17 September 2009. Approval to remove constraints on water supply source, production duration, and production rates in Schedule 1 of MS 807 was granted on 10 December 2013 under Section 45C of the EP Act.

Stage 2 was referred to the EPA in May 2012 and was assessed at the level of Assessment on Proponent Information (**API**). The Minister approved implementation of Stage 2, subject to the conditions of MS 946, on 22 August 2013 and no changes to MS 946 have been sought to-date.

The key characteristics of S10 BRK and Stage 2 are provided in Schedule 1 of MS 807 and MS 946 respectively (Appendix 2).

S10 BRK (as implemented) and Stage 2 (as approved and under construction) consist of the following:

- Open cut mining of iron ore by conventional drill, blast, load, and haul techniques.
- AWT mining of the Brockman deposit at Section 10 commenced in 2010. BWT production of Stage 2 (from the B1 deposit) commenced in mid 2015.
- Discharge of surplus water from Stage 2 is to a tributary of the Beasley River and will not extend further than 20 km from the nominated discharge point under natural no-flow conditions.
- Associated mine infrastructure (including waste dumps, topsoil stockpiles, ore stockpiles, haul road and conveyor, offices, mine access roads, workshops, fuel storage facilities and utilities including power and water supply) and other support facilities/activities as required (including investigative and monitoring activities).
- Transportation of ore to Tom Price mine for processing at a central processing facility via the existing overland conveyor. The existing haul road from Tom Price mine to S10 BRK, which runs parallel to the S10 overland conveyor, is the main access for heavy vehicles (including haulage of ore and transport of explosives). Processed ore is transported from Tom Price mine via the existing Rio Tinto railway network to existing Rio Tinto port facilities located at Cape Lambert and Dampier.
- Production bores within and adjacent to the S10 BRK and the Stage 2 operations to dewater the ore bodies and to supply the construction and operational water.

1.3.1 Environmental Factors Relevant to the Existing WTS Projects

The environmental aspects considered by the EPA during the assessment of S10 BRK (EPA 2008) were:

- Flora and Vegetation;
- Terrestrial and Subterranean Fauna;
- Surface water flows; and
- Rehabilitation and Closure.

The environmental aspects considered by the EPA during the assessment of Stage 2 (EPA 2012) were:

- Flora and Vegetation;
- Hydrological Processes;
- Rehabilitation and Closure; and
- Offsets.

The EPA concluded (EPA 2008; EPA 2012) that the two proposals were 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.

As of 31 December 2014, approximately 596 ha and 259 ha has been cleared to support construction and operation of S10 BRK (MS 807) and Stage 2 (MS 946) respectively (refer to Table 2-1).

1.4 TENURE

The WTS Project is located in the Shire of Ashburton (Pilbara Region) and is approximately 20 km from the town of Tom Price which accommodates the operational workforce.

1.4.1 Land Use

The predominant land uses in the vicinity of the WTS Project are pastoral grazing and mineral exploration and mining.

The WTS Project is located approximately 18 km from the nearest boundary of the Karijini National Park and is located near the Nanutarra Munjina public road; however there are no significant tourism features in the area that would be impacted.

1.4.2 Tenure

The WTS Project is located on Mineral Lease 4SA (**ML4SA**), which was granted in 1965 under the *Iron Ore (Hamersley Range) Agreement Act 1963* (**Hamersley Range State Agreement**). The Hamersley Range State Agreement provides rights of renewal of ML4SA for further periods of 21 years; the current expiry date of ML4SA is 24 March 2028.

Some of the infrastructure associated with S10 BRK and Stage 2 is located on a number of Miscellaneous Licences (**L**) and General Purpose Leases (**GPL**) that were granted under the *Mining Act 1978* (**Mining Act**), and the provisions of the Hamersley Range State Agreement, issued for the associated mining infrastructure including (but not limited to) workshops, ore transfer pads, conveyor, powerline and pipeline(s). Miscellaneous Licence applications have been submitted for the proposed discharge outlet into the northern branch of the Hardey River.

The ML4SA and other Mining Act tenements (Figure 1-4) are held by the Proponent and are appropriate forms of tenure for all current and proposed mining and mining related infrastructure and activities.

A portion of the WTS Development Envelope co-exists with Rocklea Station and the Hardey River pipeline and borefield Leases, which are held by the Proponent, and have been granted under the *Land Administration Act 1997*.

1.5 NATIVE TITLE AND AGREEMENTS

The WTS Project lies within Eastern Guruma and Yinhawangka country.

The Proponent has land access agreements with both groups with established consultation frameworks and ongoing engagement on relevant aspects of our operations. These comprehensive agreements commit to working together with Eastern Guruma, Yinhawangka and other Traditional Owners on country to manage and maintain the areas in which the Proponent operates and set clear guidelines for processes such as land access, tenure acquisition, heritage surveys and environmental management, mining benefits payments, reporting and communication requirements.

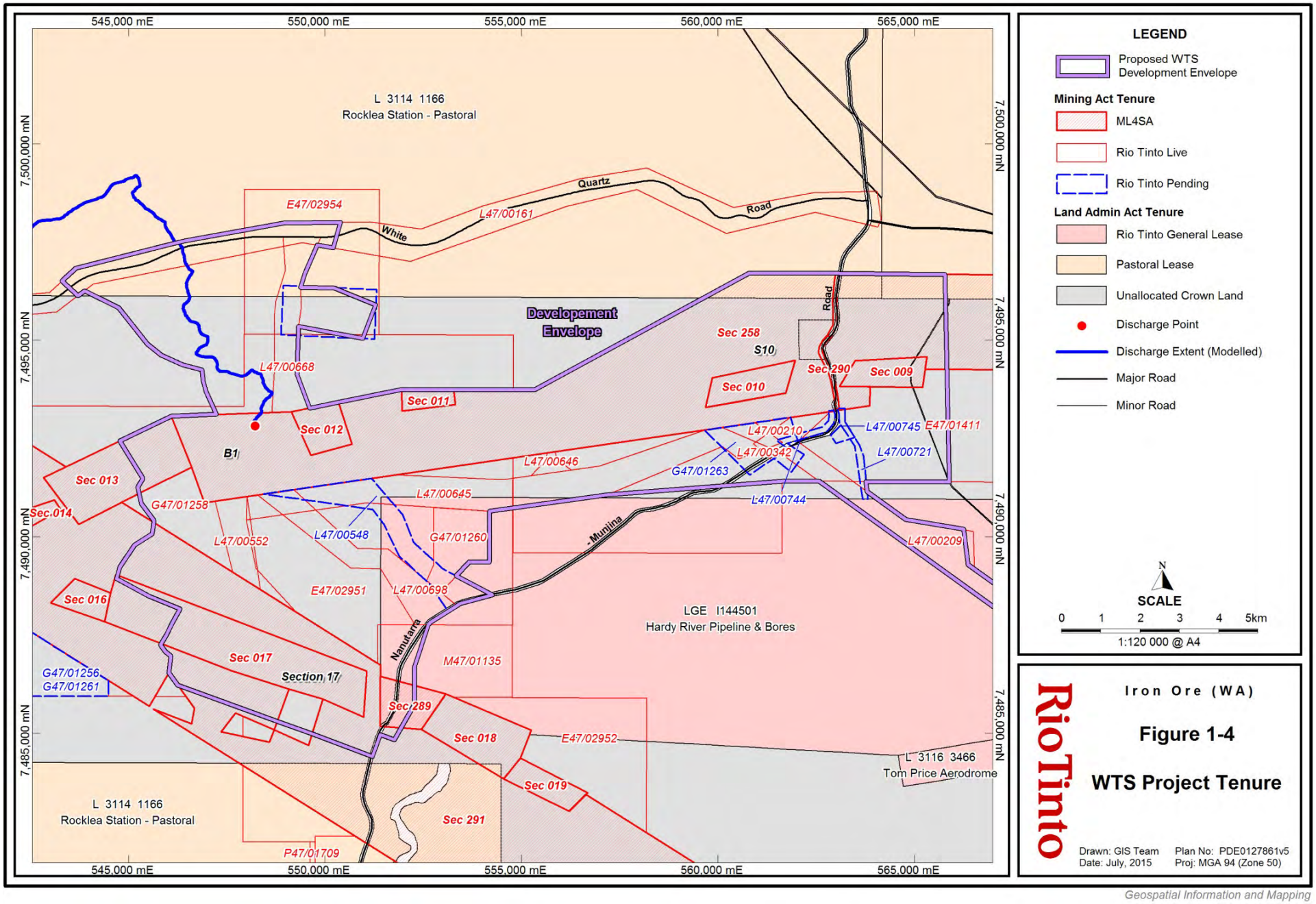

Figure 1-4: **WTS Project Tenure**

2 GENERAL DESCRIPTION OF PROPOSAL

This section details the following proposed actions:

- update the WTS Development Envelope;
- consolidation of clearing for the WTS Project;
- development of the Section 10 Hub; and
- administrative changes to Schedule 1 of the WTS Project.

The Proponent is also seeking to consolidate the existing Ministerial Statements for the WTS Project and, subject to approval, considers the new Statement published should supersede the existing WTS Statements.

2.1 WTS DEVELOPMENT ENVELOPE

As a result of this Proposal, there is an opportunity to replace the two existing Development Envelopes (Figure 1-2) with one overall Development Envelope (of 15,836 ha) for the WTS Project (as depicted in Figure 1-3).

This approach is consistent with the EPA's position taken towards recent comparable proposals and is in line with the EPA's Environmental Assessment Guideline No. 1 (EAG 1) (EPA 2012a) which allows for clearing of a proposal to be defined within a broader development envelope provided that appropriate biological surveys and an environmental impact assessment has been conducted for the entire area.

2.2 CONSOLIDATION OF APPROVED CLEARING FOR THE WTS PROJECT

Table 2-1 summarises the existing clearing limits approved under Part IV and Part V of the EP Act within the WTS Development Envelope. The clearing completed to date against these approvals is also presented in Table 2-1.

The combined approved clearing limit within the proposed WTS Development Envelope is therefore 3,600 ha. Subject to approval of this Proposal the native vegetation clearing permit (**NVCP**) 4581 (as listed in Table 2-1) will be surrendered. This will allow for consolidation and simplification of the annual environmental reporting for the Proponent and relevant government agencies.

Table 2-1: Estimate of Total Clearing Approved and Completed as of 2014

Element	Approved Limit	Reported Clearing as of end 2014*
CPS 4581	150 ha	0
MS 807	750 ha	595.73 ha
MS 946	2,700 ha[1]	259.19 ha
Total	**3,600 ha**	**854.92 ha**

[1] The 2,700 ha approved under MS 946 is subject to a contemporary offset condition.

2.2.1 Proposed Additional Clearing

The Proponent requires 750 ha of additional clearing to support development of this Proposal and to sustain production at WTS. This Proposal includes the clearing of native vegetation considered to be in Good to Excellent condition.

Subject to approval of this Proposal the overall clearing limit for the WTS Project will be 4,350 ha.

2.3 DEVELOPMENT OF SECTION 10 HUB

This Proposal seeks approval to develop the Section 10 Hub which will require additional clearing of up to 750 ha to support the following (refer to Figure 2-1 for a conceptual layout of the Section 10 Hub):

- AWT and BWT extension of the existing S10 BRK pit;
- development of AWT S10 BRK West pit;
- development of AWT/BWT MME and MMW pits; and
- surface discharge of surplus water from dewatering into the northern branch of the Hardey River.

Dewatering and water management associated with the S10 Hub and broader WTS Project is discussed in Sections 3.

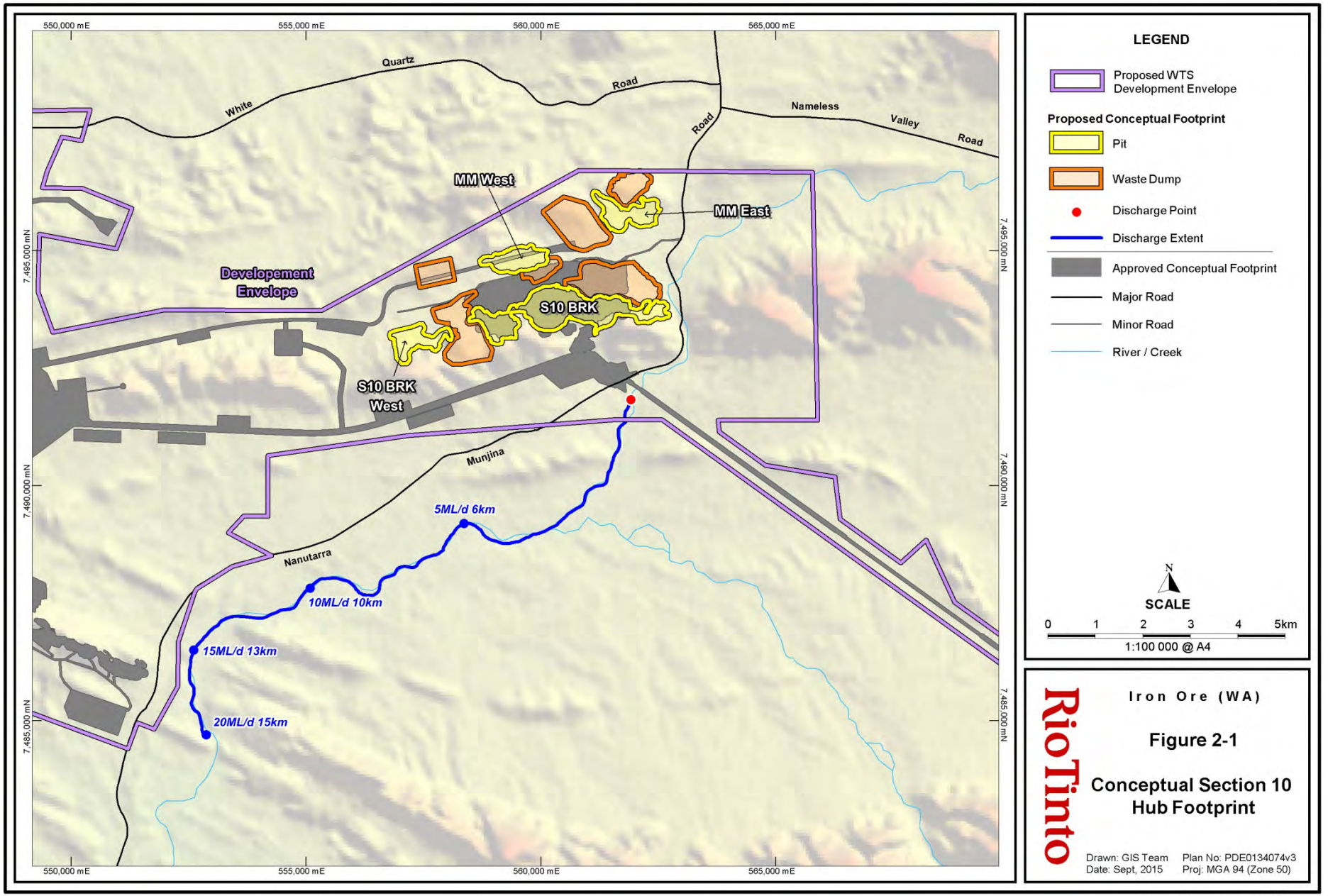

Figure 2-1: **Conceptual Section 10 Hub Footprint**

2.4 ADMINISTRATIVE CHANGES TO SCHEDULE 1 OF THE WTS PROJECT

The Proponent considers that elements that provide contextual information about the WTS Project are not key characteristics. This is consistent with the EPA Guidance for Defining the Key Characteristics of a Proposal (EPA 2012a).

The Proponent understands the need for broader contextual information about the WTS Project however this type of information differs from the "key elements of the proposal for which the proponent is seeking approval that are likely to have a significant impact on the environment" (EPA 2012a).

Based on this, the Proponent considers that the key elements which remain relevant to MS 807 and MS 946 are: clearing of vegetation; dewatering (abstraction); surplus water discharge; and closure. Therefore these aspects should be retained in a revised Schedule 1 for the WTS Project and all other elements are proposed to be removed.

These proposed changes are presented below in Table 2-2 and are provided in a consolidated Schedule 1 for the WTS Project (Appendix 16). The rationalisation to support the proposed changes to conditions and Schedule 1 for the WTS Project is presented in Appendix 17.

The Proponent considers that the above proposed changes are administrative and that the intent of, and commitments within, the original environmental impact assessment and approval for S10 BRK and Stage 2 remain relevant to the WTS Project.

Table 2-2: Proposed changes (italicised) to the Key Elements and Extents of the WTS Project

Element	Description (MS 807; as implemented)	Description (MS 946; as implemented)	Proposed Description
Mine/Plant	Mining above watertable Footprint up to 530 hectares	Clearing of no more than 2,700 ha within the development envelope of 8,430 ha.	*Clearing of no more than 4,350 ha within the WTS Development Envelope of 15,836 ha.* Mine and related infrastructure include the following: • B1, S17 and Section 10 Hub deposits; • external waste dumps; • light and heavy vehicle access/haul roads; • conveyor; • power and communication lines; • borrow pits; and • water pipes.
Linear Infrastructure	Infrastructure containing: • Light and heavy vehicle access/haul roads; • Covered ore conveyor; • Power and communication lines; • Borrow pits; and • Water pipes. Length approximately 20 kms, from mine site to Mt Tom Price ore processing facilities. Maximum footprint of 220 ha, including borrow pits	No longer applicable.	Merged into one WTS Development and captured above.
Dewatering	-	B1 Deposit: Abstraction of no more than 11 GL/annum. Section 17: Minor dewatering at pits 3 and 8, with no groundwater drawdown impacts beyond the development envelope.	*Abstraction of no more than 18.3 GL/annum.*

Element	Description (MS 807; as implemented)	Description (MS 946; as implemented)	Proposed Description
Surplus water disposal	-	Surplus dewater use through the following options: • Use on site; • Transfer to other assets for beneficial use; • Controlled discharge to surface drainage, including the local watercourse to the north of B1 and the Beasley River. Dewater discharge to extend no further than 20 km along the designated watercourses from the discharge point.	*Surplus water disposal through controlled discharge to surface drainage of the Beasley River and the Hardey River.* *Surplus water discharge wetting front to extend no further than 20 km along the Beasley River and 15 km along the Hardey River from the designated discharge points under natural no-flow conditions.*
Backfilling	-	Mine pits are to be backfilled so the final surface levels are at a higher elevation than the predicted post development groundwater levels to prevent the formation of pit lakes.	*Mining at WTS will leave mine voids on closure, of which the following extend into the groundwater table:* • *The S10 BRK Main and the B1 Main pits; which will not be backfilled resulting in formation of pit lakes.* • *Section 17 (pits 3 and 8) and Section 10 MME and MMW Pits; which will be backfilled to prevent the formation of permanent pit lakes.*

3 DEWATERING AND SURPLUS WATER MANAGEMENT

This section describes the proposed orebody dewatering, site water balance and surplus water management strategy that forms part of this Proposal and ultimately the WTS Project.

Abstraction for dewatering and discharge of surplus water to Beasley River is approved for Stage 2 via MS 946. This Proposal is seeking to expand on this aspect within the proposed Section 10 Hub, as follows:

- BWT mining and dewatering of the existing S10 BRK pit and the proposed MME and MMW pits.
- Discharge of surplus water from dewatering (from the Section 10 Hub) to the northern branch of the Hardey River.

3.1 DEWATERING

3.1.1 Approved Dewatering for Stage 2

MS 946 provides approval for dewatering of up to 11 GL/annum for the B1 deposit and minor dewatering of Section 17 (with no drawdown impacts to extend beyond the Stage 2 Project area). The following was assessed and approved by MS 946 and is still relevant for Stage 2:

- The B1 ore body aquifer is isolated from the regional groundwater system by low permeability geological units, and hence the total volume of dewatering and the spatial extent of groundwater drawdown, is relatively limited.
- The aquifer is predicted to recover to near pre-mining water levels within approximately 60 years after cessation of dewatering.
- No significant populations or species of stygofauna that may be affected by groundwater drawdown have been recorded in the vicinity of the B1 deposit.
- Groundwater drawdown during dewatering of the B1 deposit is not expected to impact potentially groundwater dependent vegetation in the Stage 2 Project area.

No change to the approved dewatering limit for Stage 2 is required as a result of this Proposal.

3.1.2 Proposed Dewatering for the Section 10 Hub

Dewatering is required to support development of the Section 10 Hub with the majority of dewatering required at the MME deposit.

Peaks in abstraction rates are generally encountered when new below water table pits are first developed (i.e. dewatering commences in a new area of the aquifer), when vertical mining rates increase, or when a part of the aquifer with increased permeability is encountered. Consequently the timing and scale of the peaks in abstraction are largely influenced by the mining schedule and the nature of the aquifer being dewatered and will vary according to operational circumstances.

Dewatering predicted for the Section 10 Hub is presented below in Table 3-1.

Table 3-1: Proposed Section 10 Hub Dewatering Volumes and Schedule

Year	Pit/s	Dewatering Volume (ML/day)	Dewatering Volume (GL/a)
2017-2022	MME (eastern section) and S10 BRK	15-20	5.4 – 7.3
2022-2023	MME (western section)and S10 BRK	6-10	2.2 – 3.6
2023-2024	MMW	7.4	2.7

Based on these dewatering predictions and the mine schedule, a conservative maximum total dewatering rate of 7.3 GL per annum (annualised rate of 20 ML/day) forms the basis of this Proposal. Details regarding the proposed dewatering strategy for the Section 10 Hub and broader WTS Project are provided in Appendix 3.

Predicted dewatering volumes at MMW may decrease through further optimisation of the groundwater models. In addition, the proposed dewatering activities at MME and historical pumping of the Mount Lionel borefield may also result in a reduced dewatering requirement for MMW.

The WTS Stage 2 dewatering is approved via Ministerial Statement 946, and the modelled dewatering indicated a localised drawdown response that does not interact with the proposed Section 10 dewatering drawdown. The dewatering at B1 commenced in August 2014 and monitoring to date reflects the predicted localised response.

3.1.3 Total Dewatering for the WTS Project

Subject to approval of this Proposal, the WTS Project will require a total annual dewatering rate of 18.3 GL which is based on the approved Stage 2 dewatering limit combined with the modelled dewatering volumes for the Section 10 Hub, as presented below in Table 3-2.

Table 3-2: Modelled Dewatering for the WTS Project

Deposit	Modelled Dewatering Volume (GL/annum)
Stage 2 (B1 and S17)	11
Section 10 Hub	7.3
Total	**18.3**

Figure 3-1 depicts the modelled drawdown contours following the proposed dewatering of the Section 10 Hub.

3.1.4 Dewatering and Drawdown Management

The Mount Lionel borefield is located approximately 2 km to the east of the MMW deposit and has been in operation since 1976, resulting in a groundwater level drawdown of over 40 m in some places including at the northern branch of the Hardey River. Dewatering for the B1 deposit commenced in August 2014, and the surplus water is discharged to an unnamed tributary of the Beasley River (as approved by MS 946).

A riparian vegetation survey conducted in 2013 (Biota 2013b; Appendix 5) compared the baseline riparian flora and vegetation in the Beasley and Hardey River tributaries in the WTS locality and found that the:

- Vegetation condition was similar.

- Diameter to breast height (**DBH**) values for *Eucalyptus victrix* was comparable.
- Mean DBH values for *Eucalyptus camaldulensis* subsp. *refulgens* was much greater for the trees recorded along the Hardey River compared to the Beasley River.
- EcEvAci vegetation type (*Eucalyptus camaldulensis* subsp. *refulgens*, *E. victrix* woodland over *Acacia citrinoviridis*; tall open scrub broad and shallow creeks with poorly defined channels) was similar in the Beasley and the Hardey Rivers.
- ExAciTeCEc vegetation type (*Eucalyptus xerothermica* low open woodland over *Acacia citrinoviridis* tall shrubland over *Triodia epactia* open hummock grassland with **Cenchrus ciliaris* open tussock grassland; narrow creeks with a distinct channel) were in a better condition and more diverse in the Hardey River.

Based on this assessment, it is has been determined that specific commitments to manage drawdown is not required for this Proposal and that any potential impacts to the riparian vegetation of Hardey River can be adequately managed through the existing and updated WTS Riparian Vegetation and Monitoring Management Plan (Appendix 15).

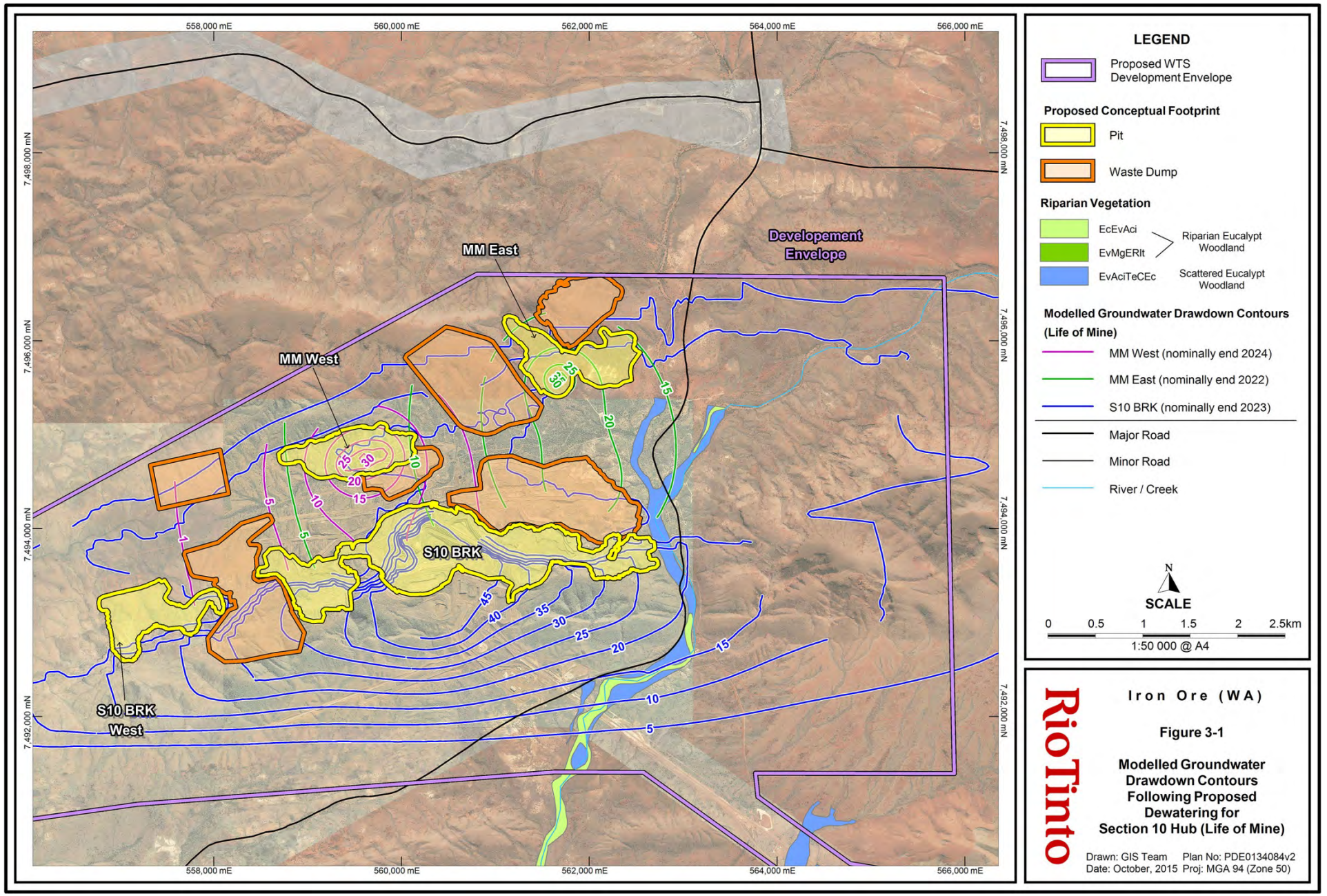

Figure 3-1: **Modelled Groundwater Drawdown Contours Following Proposed Dewatering for Section 10 Hub**

3.2 SURPLUS WATER MANAGEMENT

3.2.1 Conceptual Water Balance

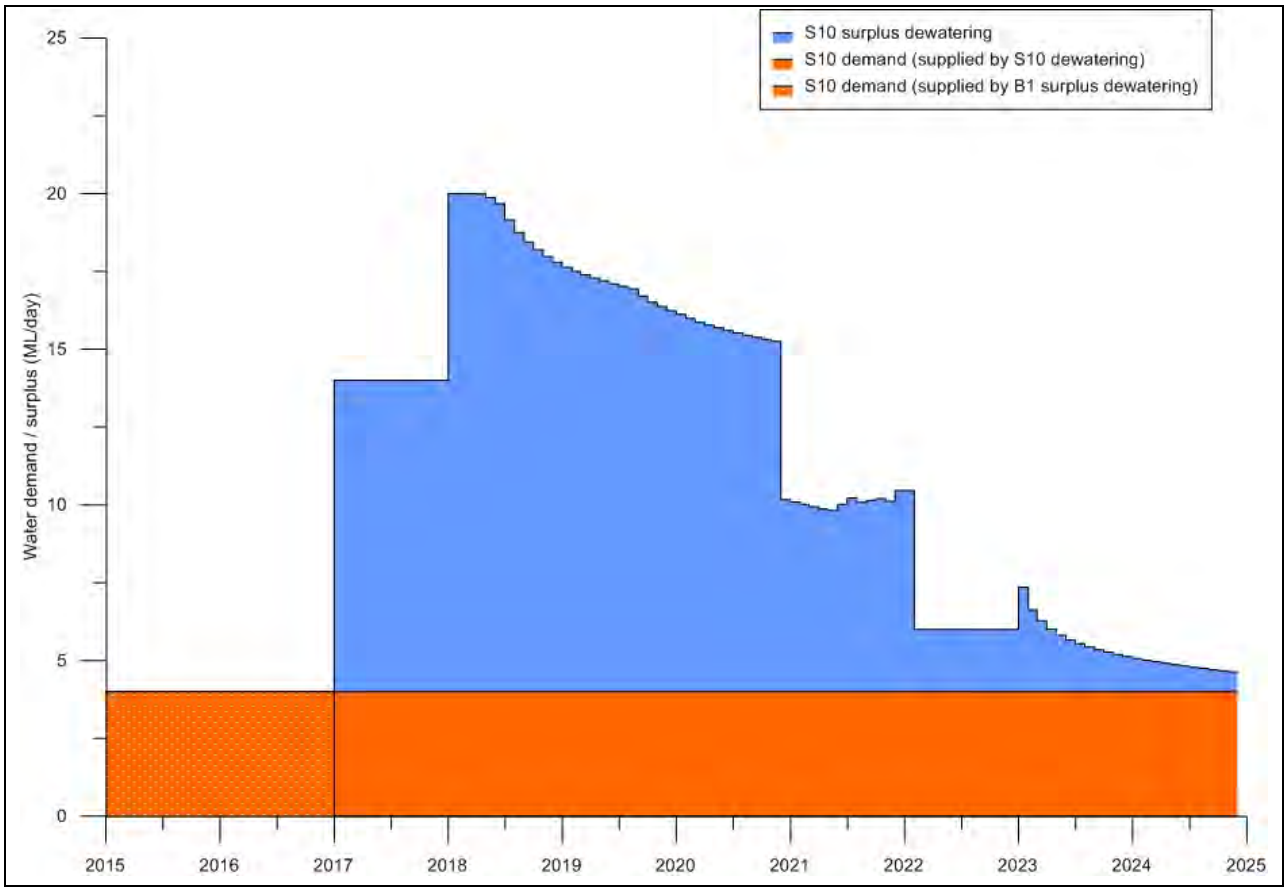

Figure 3-2: Conceptual Water Balance for the Section 10 Hub

The volumes indicated in Figure 3-2 are based on hydrogeological and water use modelling for the WTS Project. These volumes are intentionally conservative and they are subject to change as the hydrogeological conceptualisation of the Section 10 Hub progresses to further investigation of the orebody and then actual dewatering.

Such changes are common and are often implemented in response to factors such as: conditions encountered during mining; grade requirements; ore quality; market conditions; performance of the dewatering system; and water usage on site. These factors will continue to influence the dewatering volumes during the life of the WTS Project, making it difficult to predict exactly how much water will be abstracted, used or discharged at any point in time. However, a maximum peak has been estimated which accommodates these variable factors.

The environmental approvals process under Part IV of the EP Act is such that a reasonable prediction of abstraction and discharge volumes is required to be presented by the Proponent based on technically-sound information that is available at the time. This is so that the scale of any resultant environmental impacts can be realistically assessed and addressed and a limit can be applied to the authorised abstraction and/or discharge volumes in Schedule 1 of the associated Ministerial Statement.

The Proponent considers that a conservative upper limit on abstraction and discharge is appropriate given that the prediction of these volumes:

1) is the result of modelling;

2) is required to apply to an operation in the long term; and

3) can be influenced by a number of factors during the implementation of a project.

Adoption of a conservative limit allows flexibility in managing the dewatering program to maximise efficiency without an artificial constraint on abstraction volumes. It also allows assessment and regulation of the maximum potential impact.

In the long term, an efficient, targeted dewatering program produces less water overall than an inefficient system, run at a sub-optimal abstraction rate. Where water is abstracted at an insufficient rate, an orebody aquifer may be allowed to continually refill and will therefore require dewatering over a longer period of time in order to mine the same pits, resulting in a greater volume of water abstracted over the life of the mine.

Therefore, this Proposal includes a conservative abstraction limit of 7.3 GL/annum (based on 20 ML/day) for the Section 10 Hub, which is considered to represent a realistic limit that allows for fluctuation in the actual peak abstraction, although for the majority of years the abstraction is expected to be substantially lower. A similar approach to setting conservative abstraction limits was adopted for WTS Stage 2 (MS 946 published on 21 August 2013), Nammuldi-Silvergrass Expansion (MS 925 published on 11 January 2013) and the Brockman 4 Revised Proposal (MS 1000 published on 11 March 2015).

Whilst water use at the WTS Project is expected to be constant at about 1.5 GL/a (based on 4 ML/day), there will be operational factors that may affect requirements on a day to day basis that result in more than or less than this volume being used. The processing plant and dust suppression together account for the greatest on-site consumption of water. During periods of rainfall the requirement for dust suppression on haul roads and other open areas is significantly reduced and consequently so is the demand for water. In the event of a plant shutdown, water use is similarly reduced. These are normal occurrences in the operation of a mine where short-term water demand may fall. Under such circumstances mine dewatering continues in order to allow continued access to below water table ore and therefore when demand falls there is a corresponding short-term increase in the surplus water volume that requires management. This variability has been accounted for in the modelled surplus dewatering discharge extent.

Therefore, this Proposal includes a conservative volume of 7.3 GL/a (based on 20 ML/day) of water from dewatering the Section 10 Hub.

3.2.2 Consideration of Options for Section 10 Hub Surplus Water Management

The Proponent's management of surplus water follows environmental and water use standards that align with the Western Australian Department of Water (**DoW**) preferred options for surplus water use (DoW 2013), which include the following:

- use on site;
- transfer to another site or industrial location;
- reintroduction to aquifer(s);
- controlled discharge to natural watercourses (e.g. irrigation, storage and periodic discharge); and
- uncontrolled discharge to watercourses.

Selection of the preferred surplus water management option involved the consideration of a number of alternatives (Table 3-3) in accordance with the DoW list of water use options published in the WA Water in Mining Guidelines (DoW 2013). A number of alternatives that were considered have been excluded due to the potential environmental impacts, prohibitively high costs, or because they represent a substantial technical risk to the Proposal.

The preferred management option for the surplus water generated from the Section 10 Hub was selected based on consideration of the relatively small volumes of water, the variable supply, the logistics and costs associated with transfer and/or use by another site or third party and the flexibility afforded by the absence of user-defined constraints.

On this basis, this Proposal is seeking approval for surface discharge to the northern branch of the Hardey River. This is discussed further in Section 3.2.3.

Table 3-3: Consideration of Surplus Water Management Options

No.	Options	Advantages	Disadvantages
1.	**Reintroduction to Aquifer(s)**		
a	Passive recharge via a disused pit	• Water can be returned to the local groundwater system, to increase groundwater recovery times and facilitate closure (pit lake). • Potential acid forming material exposed on the face or near surface can be saturated, suppressing acid mine drainage production and reducing closure risk.	• Mining at WTS is ongoing and therefore no pit will be available to accept surplus water at the commencement of dewatering. • Use of a mined out pit for passive recharge could limit backfilling and increase external waste dump requirements. • Deposits are hydrogeologically connected which would result in recycling of water and an overall increase in dewatering volumes. • Discharge within extent of the main drawdown would result in recycling of water and greater pumping required to lower water table. • Infiltration rates are likely to be lower than alluvial aquifers and once full may only be able to receive an additional 1-3GL/a.
b	Aquifer reinjection	Replenishment of a nearby longstanding water supply borefield. The Hardey River Borefield has been in operation since 1966 and the Mount Lionel Borefield since 1976, both supply Tom Price mine.	• There is a significant iron ore prospectivity in the WTS area including detritals, Brockman Iron Formation and Marra Mamba Formation targets (that form part of this Proposal), and reinjection near these resources would increase dewatering requirements and potentially costs through re-handling of the water. • Available information on the Wittenoom Formation aquifer in the vicinity of Section 10 indicates the aquifer is not homogeneous and may not have the capacity to accept significant volumes of water. • The existing production bores in the Hardey River Borefield are not high producing bores (<0.5 ML/d) and the aquifer consists of mainly weathered shales and goethite and is not considered a significant aquifer. • Given the existing infrastructure is still required at the Hardey River Borefield, if reinjection was to occur up to 40 new bores would be required to handle the predicted peak of surplus water. This would result in additional ground disturbance and significant capital expenditure to install the required infrastructure and significant operating costs to maintain it.
c	Reinjection into creek alluvium	May reduce impact on riparian vegetation resulting from perennial flows within the creek.	• Installation of reinjection infrastructure is likely to result in significant disturbance to the creek bed. • Studies into the permeability of the creek alluvium have not been undertaken and it is uncertain whether this option is possible. This would require additional disturbance to the creek bed in order to undertake the hydrogeological drilling test work. • The volume of alluvial material is unknown; therefore the volume of water that could be reinjected without surface expression is also unknown. • Due to the cyclonic weather patterns in the Pilbara and the flooding that occurs infrastructure could be damaged and require replacement periodically resulting in significant cost and operational delays. • Creek discharge is a less complicated, more cost effective method that facilitates passive recharge, and has not been shown to cause significant detrimental environmental outcomes.

No.	Options	Advantages	Disadvantages
2.	**Transfer to Another Site or Industrial Use**		
a	Transferring surplus water to third party users.	Beneficial use of water.	• Any nearby third party user identified in the future would likely source water from a mine with larger, more reliable volumes of surplus water such as Nammuldi-Silvergrass or Marandoo. • Contractual difficulties associated with inability to guarantee supply to a third party (e.g. if less water or unreliable supply of water is available from dewatering). • Difficulties attracting a third party user as the water supply will not be available in the long-term. • No third party user of such volumes of water known in proximity, therefore transfer to a third party would require that water be moved a significant distance resulting in high piping and pumping costs for a relatively small volume of water. • Clearing footprint associated with piping infrastructure for off-site secondary use would be significant for a relatively small volume of water and short duration of supply.
b	Transfer off-site for secondary use by Rio Tinto's other operations.	• Beneficial use of water. • Avoids the need for other operations to source water locally.	• Currently the Proponent has no local operation that cannot meet its own water demand. • Capital and operational expenditure for the installation and operation of piping and pumping further afield would be significant for a relatively small volume of water and short duration. • Clearing footprint associated with piping infrastructure for off-site secondary use would be significant for a relatively small volume of water and short duration of supply.
c	Transfer for incorporation into the West Pilbara Water Supply Scheme (**WPWSS**).	Water can be used for public water supply.	• The Bungaroo borefield and water pipeline is over 100 km away and will require significant additional clearing footprint for pipeline, across tenure that the Proponent currently does not have access to. • High capital and operational expenditure associated with piping and pumping for a relatively small volume of water.
d	Transfer off-site for secondary use by Rio Tinto agricultural operations.	Beneficial use of water.	• The Nammuldi and Hamersley agricultural projects are approximately 50 km to the north and east of the WTS area respectively. Supply to these agriculture projects would offset surplus water from the Nammuldi-Silvergrass and Marandoo Projects and result in: additional discharge to the local water courses for each of those projects; significant additional clearing footprint for pipeline; and access to third party tenure. • The volume of water available from this Proposal is insufficient to warrant cost and the complexity of approvals and footprint impacts for a new agriculture project. • High capital and operational expenditure associated with piping and pumping for a relatively small volume of water.
e	Supply Tom Price town.	Water can be used as public water supply.	• Tom Price town currently receives the majority of its demand from an existing borefield. There are no significant increases in water demand predicted for the Tom price town and therefore it cannot be considered as a practical water user for the WTS Project.

No.	Options	Advantages	Disadvantages
3	**Discharge to Single Natural Watercourse**		
a	Beasley River tributary at existing approved discharge point.	• Additional volume of surplus water requiring discharge for the Proposal would be contained within the 20km discharge extent authorised under MS 946. • Limits the impact footprint resulting from additional surplus water discharge to that already approved under MS 946.	• The current pipeline that transports water from B1 borefield to Section 10 has a capacity of ~8ML/day. In addition to the pipeline reversal, a duplicated pipeline (approximately 12 km in length) will be required to carry the maximum discharge during the peak abstraction period and ensure contingency water supply to Section 10. This would result in high capital and operational expenditure to manage discharge for a short duration. Additional clearing from additional pumps would result from the duplication of the pipeline. • The current pipeline that transports water from B1 borefield to Section 10 is the most reliable source of water to the existing Section 10 operation as the majority of the bores at Section 10 and Mt Lionel borefield have been turned off and the remaining bores at the Mt Lionel borefield supplies Tom Price mine. The reversal of the existing pipeline will risk reliable water supply which would affect operations. • As the BWT Section 10 BRK and MME/MMW pits are proposed to be developed over the same period, there could be an increased spatial and temporal duration of waterlogging on the Beasley and its tributary resulting in prolonged detrimental impacts.
4	**Discharge to Multiple Local Watercourses**		
a	Beasley River and northern branch of the Hardey River tributaries.	• Greater flexibility in control of discharges therefore minimising the scale of impacts within each receiving environment. • No locations with exceptional environmental value. • Use of multiple water courses simplifies logistics for construction and operation of the pipeline based on proximity to the operating mine sites. • Reduced duration of continual discharge to individual creek, limiting impact on vegetation to have known resilience to changes in flow regimes. • No additional impacts to Beasley River would be required.	• Increase in spatial extent of watercourses affected by surplus water discharge and increased land disturbance. • Increased resources required to monitor and manage multiple water courses.

3.2.3 Discharge to Hardey River

This Proposal is seeking approval to discharge surplus water into the Hardey River. A detailed assessment of this proposed discharge is provided in Appendix 4.

Whilst water usage at the WTS Project is expected to be constant at about ~ 1.5 GL/a (based on 4 ML/day), there will be operational factors that may affect requirements on a day to day basis that result in more than or less than this volume being used. As a result of this potential variance in daily water use, the Proponent has modelled the maximum surface water extents from five discharge scenarios which are presented in Table 3-4.

Table 3-4: Estimated Discharge Extent to Hardey River

Discharge Scenario		Maximum Wetting Front (km)
5 ML/d	1.8 GL/a	6
10 ML/d	3.6 GL/a	10
15 ML/d	5.5 GL/a	13
20 ML/d	7.3 GL/a	15
25 ML/d	9.1 GL/a	18

In order to provide greater operational flexibility this Proposal is seeking approval for the maximum discharge 7.3 GL/a (based on 20 ML/d) to Hardey River with an estimated 15 km wetting front (Figure 2-1).

It is considered that this discharge volume will be significantly smaller than the volume generated by the catchment during flood events. Based on model results, discharged water would be contained within the low flow channel, hence overtopping of the creek banks in dry conditions is not anticipated.

Flora and Vegetation of Hardey River

Flora and vegetation surveys were conducted in the Hardey River tributary and downstream in the Hardey River itself between 2007 and 2014 (Biota 2013a; Biota 2014a). Riparian vegetation monitoring transects will be set up along the Hardey River and its tributary as part of the WTS vegetation monitoring programme to support the proposed discharge associated with this Proposal.

The riparian flora and vegetation of the Hardey River are described in further detail in Section 6 and Appendix 5 (Biota 2013b). The following summarises the key features of vegetation associated with the tributary and the Hardey River that was surveyed:

- Does not contain any Threatened or Priority Ecological Communities (**TECs** or **PECs**) and no Declared Rare Flora (**DRF**) have been found, however Priority Flora occurs in the riparian vegetation.
- Considered to be of moderate conservation value consistent with fringing vegetation of major ephemeral watercourses in the Pilbara. Vegetation types dominated by Eucalypts (in particular *Eucalyptus victrix* and *E. camaldulensis*) are present.
- The riparian vegetation is considered to be under threat from grazing and invasion by weeds, as is typical of major ephemeral watercourses in the region, with several species of introduced flora present and infestations of weeds (in particular Buffel Grass) considered to be affecting the vegetation condition.

Aquatic Fauna

Aquatic fauna sampling and water quality monitoring have been undertaken in both the Beasley and Hardey river systems as part of the ongoing baseline monitoring program conducted by Wetland Research and Management (**WRM**) for surplus water discharge from the B1 deposit (Appendix 6, WRM 2014).

The sites sampled on the Hardey River system have shown that the composition of micro- and macro-invertebrates and fish taxa and overall species richness are lower compared to the Beasley River system; however both are comparable to other creek systems within the region and wider Pilbara (WRM 2015). Based on site inspections, both systems are known to have ephemeral pools and these may act as short-term refugia for fauna.

3.2.4 Discharge Water Quality

WRM was commissioned to conduct a groundwater and surface water quality review for the Stage 2 development and this Proposal (Appendix 7). To support some limitations in data availability at WTS, regional sites sampled for surface water quality between 2008 and 2013 were also reviewed for inclusion in the reference data (Table 3-5). The regional sites support aquatic faunal communities broadly similar to those recorded in the Beasley and Hardey rivers downstream of the approved Stage 2 and the proposed Section 10 Hub discharge point.

The baseline and reference data included values for major ions, electrical conductivity (**EC**), nutrients, hardness, alkalinity, pH, dissolved oxygen (**DO**) and a suite of metals. These are summarised in Table 3-5 (WRM 2015).

Table 3-5: Summary of Baseline and Reference Surface Water Quality

Area	Type	Sampling Period	Sampling Frequency*	No. of sites
WTS Section 10 Hardey River	Ephemeral pools adjacent Section 10. (Rio Tinto WTS sites).	Jan 2011 – Feb 2014.	Annual – wet season.	4
	Ephemeral pools downstream of Section 10. (WRM Hardey River downstream sites).	Apr 2011 to Aug 2013.	Bi-annual – dry and wet seasons.	3
WTS B1 Beasley River	Seasonal or ephemeral pools. (WRM Beasley River upstream, Beasley River downstream, Beasley River downstream of White Quartz Road sites).	Apr 2011 to Aug 2013.	Bi-annual – dry and wet seasons.	17
	Long-term pools. (WRM Beasley River Western Channel sites).	Apr 2013 to Aug 2013.	Bi-annual – dry and wet seasons.	4
Pilbara Regional Reference Nammuldi-Silvergrass, Marandoo, HD1 and HD4 areas.	Long-term, seasonal or ephemeral creeks/pools.	Mar 2008 to Apr 2014.	Bi-annual – dry and wet seasons.	134

Groundwater data from bores in the Stage 2 and Section 10 Hub area (Appendix 7) were used to provide an indication of the current quality of groundwater that may be discharged. Groundwater data collected intermittently included major ions, nutrients and dissolved metals, as well as pH, EC, alkalinity and hardness. Analysis assumed the orebody groundwater aquifers will comprise the primary source of

surplus water discharge and that there is unlikely to be substantial change in groundwater quality when discharged on to the surface.

Based on the water quality analysis, WRM (2015) concluded that the proposed surplus water discharge to Hardey River from the Section 10 Hub (and Beasley River from Stage 2) presents the following risk to aquatic fauna (fish and invertebrates):

- *Moderate-high risk* of temporary habitat loss from eutrophication due to elevated nitrate and phosphorus in the Stage 2 B1 orebody aquifer and elevated nitrate in the S10 orebody aquifer, relative to concentrations in surface waters of the Beasley and Hardey rivers.
- *Low-moderate risk* from direct toxicity due to elevated nitrate in the Stage 2 B1 orebody aquifer, relative to surface waters in the Beasley and Hardey rivers.
- *Low-moderate risk* from direct toxicity due to chromium enrichment in the Stage 2 B1 orebody aquifer, relative to surface waters in the Beasley and Hardey rivers.

Dewatering will also change the flow regime in the receiving rivers, at least in the short-term (i.e. the duration of dewatering). However, the majority of aquatic fauna and (by association) aquatic ecosystem functioning is considered to be at low risk, as increased flows are expected to benefit the majority of species, by increasing the 'carrying capacity' of the system for the short term (i.e.: for the duration of dewatering). It is expected that there will be short-term change in benthic invertebrate and zooplankton species assemblage composition due to altered flow regime (depending on the magnitude and frequency of surplus water discharge to the creek).

The responses to surplus water discharge from the Section 10 Hub are anticipated to be short-term, with fauna populations returning to pre-discharge ('baseline') condition on cessation of dewatering. There is low risk that biodiversity or genetic diversity would be permanently reduced or lost at the local or regional level. Three listed species occur in the area; Fortescue grunter *Leiopotheran aheneus*, the Pilbara emerald dragonfly *Hemicordulia koomina* and the Pilbara pin damselfly *Eurysticta coolawanya*. All three are currently listed as 'Lower Risk near Threatened' by IUCN (2013), and as a Priority 4 Species on the Parks and Wildlife Priority Fauna List (Parks and Wildlife 2014). However, given the wide occurrence of all three species throughout the Pilbara, surplus water discharge from the Section 10 Hub is considered to pose only a low risk as there is strong potential for re-colonisation from outside the footprint of the discharge area.

The Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC/ARMCANZ 2000) provides a framework for setting of site-specific trigger values, establishing sampling regimes and undertaking decision-making in the event that actions are triggered. This has been adopted at the Proponent's other sites (including WTS Stage 2) including the development of site specific trigger values will be established and reviewed in accordance with the ANZECC/ARMCANZ framework. Monitoring and management of water quality is considered to be a surrogate for protection of aquatic faunal communities.

Part V of the EP Act provides a regulatory mechanism to control the quality of surplus water discharge to a receiving environment.

4 STAKEHOLDER CONSULTATION

Stakeholder consultation to support the S10 BRK and Stage 2 approvals processes was undertaken in 2007 and 2012 respectively. Key stakeholders that were consulted included: WA State government agencies and departments; non-government organisations; the local shire; local community groups; and Traditional Owners. The key concerns around flora, fauna, hydrogeology, closure and rehabilitation, and Aboriginal sites were addressed in the respective EPS and API documents.

Key stakeholders identified for this Proposal include:

- Government agencies:
  - Office of the Environmental Protection Authority (**OEPA**);
  - Department of Parks and Wildlife (**Parks and Wildlife**) - Pilbara region, Perth Environmental Management Branch (**EMB**);
  - 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 Ashburton.
- Traditional Owners:
  - Eastern Guruma Group; and
  - Yinhawangka Group.

Stakeholder consultation undertaken to support this Proposal, and the Proponent's response to issues raised, are detailed in Table 4-1.

Table 4-1: Stakeholder Consultation Relevant to this Proposal

Stakeholder	Date / Description of communication	Topics/Issues Raised	Proponent Response/Outcome
Department of Mines and Petroleum (DMP)	30 October 2014 Rio Tinto/DMP Bi-monthly meeting	The Proponent provided information regarding the scope of the proposal. The existing Mining Act tenements were discussed and it was confirmed that the Proposal is all on Proponent's existing and/or pending tenure and that the tenure is appropriate for the proposed scope.	A Mining Proposal for the discharge pipeline and outlet will be submitted on grant of the pending Miscellaneous Licence.
	17 February 2015 Rio Tinto/DMP Bimonthly Meeting	The Proponent presented further detail regarding the Closure strategy for the WTS Project. This was noted by DMP.	N/A
	03 September 2015 Pre-referral review	A copy of the Draft ER Review document and Draft Closure Plan was provided to DMP for their review and comment. DMP provided the following comments/recommendations: **Operations** • Potential impacts on riparian vegetation and surface water quality **Closure** • Landform construction and monitoring methodology • Rehabilitation particularly achievement of a self-sustaining ecosystem and measures of success • Pit lake metrics • Transfer of liabilities • Soil characterisation • Climate change • Protection against maximum precipitation and flood events	The comments from DMP have been noted and the Closure Plan has been updated where required.

Stakeholder	Date / Description of communication	Topics/Issues Raised	Proponent Response/Outcome
Department of Parks and Wildlife (Parks and Wildlife)	04 December and 29 January 2015 Rio Tinto/Parks and Wildlife regular meetings	The Proponent discussed the Proposal and provided a high level summary of the results of the biological surveys, potential impacts, proposed approvals pathway and preliminary key environmental factors. Parks and Wildlife requested more detailed information regarding the biological results from surveys. Parks and Wildlife did not raise any concerns regarding the proposed approvals pathway.	Details of the flora and fauna results relevant to this Proposal were sent to Parks and Wildlife on 29 January 2015.
	14 August 2015 Pre-referral review	A copy of the Draft ER Review document and biological technical reports were provided to Parks and Wildlife for their review and comment. Parks and Wildlife requested additional information with regard to impact to the Priority 1 flora species *Hibiscus* sp. Mt Brockman (E Thoma ET 1354) from the Proposal on 14 September 2015. Parks and Wildlife provided the following advice via e-mail on 24 September 2015: • Avoid/minimise individuals of Priority 1 flora species *Hibiscus* sp. Mt Brockman (E Thoma ET 1354) and *Goodenia pedicellata* (currently under taxonomic review) wherever possible.	Additional information on the Priority 1 flora species was provided to Parks and Wildlife and Table 6-2 has been updated to reflect the clarification on *Hibiscus* sp. Mt Brockman (E Thoma ET 1354). While the *Goodenia pedicellata* is under taxonomic review, this Proposal treats it as a Priority 1 flora species.
Department of Environment Regulation (DER)	16 February 2015 Email correspondence with Ty Hibberd	Outline of the Proposal including the proposed discharge of surplus water to the Hardey River and the intention to seek approvals (if required) under Part V of the EP Act. DER responded that the Proposal is likely to trigger approval(s) under Part V of the EP Act and will advise further on receipt of the application enquiry form.	The Proponent has noted the DER requirements for approvals under Part V of the EP Act and will progress these should this Proposal be approved.
	14 August 2015 Pre-referral review	A copy of the Draft ER Review document and technical reports were provided to DER for their review and comment.	The Proponent did not receive comments prior to formal referral submission of this Proposal.

Stakeholder	Date / Description of communication	Topics/Issues Raised	Proponent Response/Outcome
Office of the Environmental Protection Authority (OEPA)	03 November 2014 Pre-referral meeting	The Proponent discussed the Proposal and provided a summary of the results of the biological surveys, potential impacts and preliminary key environmental factors for assessment. The OEPA recommended that management of surplus water was a key focus, and recommended early consultation with the Department of Water and review of the API Management Pty Ltd.'s Proposal to discharge into the Hardey River (in order to consider potential cumulative impacts). The Proponent also discussed the expected schedule for formal referral to the OEPA.	The Proponent met with the DoW in January 2015 and has also since received comments on the ER document (see below). Section 6 of the ER document refers to the cumulative impacts from this and other Proposals in the region, including the proposed discharge into the Hardey River by API Management Pty Ltd.
	13 March 2015 Technical meeting	The Proponent discussed the final scope and provided a more detailed summary of the biological surveys and potential impacts. The OEPA recommended further detail would be required for the future resource areas, and additional sampling would be required for the subterranean fauna at Section 10.	The Proponent has revised the scope of the Proposal to only include the deposits within the Section 10 Hub where sufficient technical information is currently available. An additional round of subterranean sampling has also been conducted.
	14 August 2015 Pre-referral review	A copy of the Draft ER Review document and Technical Appendices was provided to the OEPA for their review and comment. The OEPA provided the following advice/recommendations: • Amend Figure 1-3 to present proposed Development Envelope and conceptual Section 10 Hub footprint. • Provide further discussion in Section 3.1 regarding groundwater drawdown and potential impacts to riparian vegetation and any proposed management measures. • Update Table 6-5 to provide discussion regarding the predicted water quality over time of pit lakes and any management measures proposed.	These have been addressed in the ER document as requested.

Stakeholder	Date / Description of communication	Topics/Issues Raised	Proponent Response/Outcome
Department of Water (DoW)	12 January 2015 Pre-Referral Meeting	The Proponent discussed the Proposal and provided a high level summary of the groundwater and its abstraction and the proposed water management options including re-use and the proposal to discharge into the northern branch of the Hardey River. DoW requested information on the modelling used to predict the discharge flooding extent.	The modelling report was provided to DoW on 02 February 2015. The items of relevance to the DoW are discussed in Section 3 and the technical reports are appended to this ER document.
	14 August 2015 Pre-referral review.	A copy of the Draft ER Review document and Hydrological and Hydrogeological Technical reports was provided to DoW for their review and comment. DoW provided advice/recommendations on the following key topics: • Groundwater dependent ecosystems • Backfilling • Discharge to Hardey River • Discharge water quality • Stakeholder consultation • Hydrogeology	The comments from DoW have been addressed in the ER document as follows: • Section 3.1.4 "Dewatering and Drawdown Management" has been added; • Section 3.2.1 has been amended; • Appendix 15 (Riparian Vegetation Monitoring and Management Plan) has been amended; • This table has been updated based on the stakeholder comments and feedback as received to-date from the key stakeholders; and • Figure 3-1 has been amended and regional groundwater interactions are briefly discussed in Section 3.1.2.
Department of State Development (DSD)	Rio Tinto/DSD Monthly Meetings	DSD has been made aware of the WTS Project (specifically the Section 10 Hub) at the regular meetings (and presentations) between Rio Tinto and DSD. No specific issues have been raised by DSD.	The Proponent will seek approval from the Minister of State Development for the WTS Project, as per the scope of this Proposal, under the *Iron Ore (Hamersley Range) Agreement Act 1963.*
	16 March 2015	Notices in relation to the Proponent's intention to submit proposals for this Proposal were provided to the Minister of State Development.	
	19 March 2015	DSD was provided an overview of the Section 10 Hub. No specific issues were raised by DSD.	

Stakeholder	Date / Description of communication	Topics/Issues Raised	Proponent Response/Outcome
Department of Aboriginal Affairs (DAA)	December 2014	The Proponent met with DAA and provided a high level overview of the Proposal. DAA requested information on disturbance of sites.	The Proponent confirmed with DAA that a large portion of the Proposal area has already been surveyed and that surveys will be conducted prior to the commencement of any ground disturbance as per the Proponent's internal protocols. The Proponent is also reviewing designs to avoid areas of concern (including heritage sites) to avoid/minimise impact. The Proponent will continue to liaise with DAA and the Traditional Owners through its existing meeting forums to provide updates on the Proposal, the existing operations and where approvals may be required to disturb sites.
Eastern Guruma	October 2014, February 2015 and July 2015 – Ethnographic and Archaeological surveys	All archaeological and ethnographic surveys have been completed for the proposed Section 10 hub mine layout disturbance footprint. The discussions included: (i) proposal to seek approval to disturb recorded heritage sites that cannot be avoided, (ii) the proposed discharge into the northern branch of the Hardey River and (iii) mine closure. No major concerns or objections were raised.	An update on the technical queries will be presented by the Proponent representatives at the next Monitoring and Liaison meeting.
	23 March 2015 – Monitoring and Liaison Meeting	The Greater Tom Price area including the activities outlined in this Proposal was discussed at the Monitoring and Liaison meeting. A few sites of moderate significance (recorded during surveys with the Traditional Owners) that may potentially be disturbed were discussed. No major concerns were raised at the meeting.	As above.

5 ENVIRONMENTAL STUDIES AND SURVEY EFFORT

Publically available baseline environmental information was collated and reviewed by Biota and the Proponent.

Flora and vegetation, terrestrial fauna, and subterranean fauna surveys have been undertaken by Biota Environmental Sciences (**Biota**) across the WTS region since 2005, covering an area in excess of 35,000 ha. The combined coverage of these surveys has enabled a detailed and consistent understanding of the existing vegetation and flora, terrestrial fauna, and subterranean fauna in the region. Reports consolidating the survey data for WTS were provided to support the Stage 2 assessment in 2013 (Biota 2013a).

In addition, a number of targeted searches for DRF and Priority Flora have been conducted within the WTS Development Envelope which provides a considerable reference for the distribution of these species.

The environmental survey work completed for these two projects provides regional context and local information relevant to this Proposal. These reports are referred to in the more recent biological report undertaken to support this Proposal, are referenced in this ER document, and are available upon request.

Table 5-1 summarises the key surveys relevant to this Proposal.

Biota most recently conducted a single phase vegetation and flora, terrestrial fauna and subterranean fauna assessment in 2014, covering a survey area of approximately 9,500 ha which focussed on updating the 2007 survey data at S10 BRK and covers the maximum extent of the drawdown contours from the Section 10 and its adjacent Marra Mamba deposits (Appendix 8 to Appendix 11).

A number of internal and external studies have been conducted with regard to hydrogeology, surface water and closure for the WTS Project. The relevant reports are provided as Appendix 3, Appendix 4, and Appendix 14.

Table 5-1: Summary of Key Studies Relevant to this Proposal

Factor	Consultant	Survey name	Survey area, type and timing	Standard/Guidance and limitations	Appendix
Flora and Vegetation	Biota	*Western Turner Syncline Section 10 Below Water Table and Satellite Ore Bodies Flora and Vegetation Survey*	Desktop review of the development envelope and surrounds (~9,500 ha) (incorporates regional studies). Desktop review and single phase field survey (April 2014).	• EPA Position Statement No. 3: Terrestrial Biological Surveys as an Element of Biodiversity Protection (2002). • EPA Guidance Statement No. 51 – Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment in Western Australia (2004). • Limitation: No systematic search for rare flora.	8
	Biota	*Western Turner Syncline Section 10 Below Water Table Groundwater Dependent Vegetation Assessment*	Desktop review based on flora and vegetation mapping conducted between 2007 and 2014 (2015).	N/A (amalgamation and summary of previous survey reports).	9
	Biota	*West Turner Syncline Creek Survey : Hardey River Riparian Vegetation*	Desktop review and two phase pre-impact baseline riparian flora and vegetation surveys (2012-2013).	• EPA Position Statement No. 3: Terrestrial Biological Surveys as an Element of Biodiversity Protection (2002). • EPA Guidance Statement No. 51 – Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment in Western Australia (2004). • Limitation: Insufficient rainfall for collection of annual or cryptic perennial species.	-
Terrestrial Fauna and Subterranean Fauna	Biota	*Western Turner Syncline Section 10 Below Water Table and Satellite Ore Bodies Targeted Terrestrial Fauna Survey.*	Desktop review and Level 2 vertebrate and SRE fauna survey (targeted) (6,660 ha; April 2014).	• EPA Position Statement No. 3: Terrestrial Biological Surveys as an Element of Biodiversity Protection (2002). • EPA Guidance Statement No. 56 – Terrestrial Fauna Surveys for Environmental Impact Assessment in Western Australia (2004a) and Guidance Statement No. 20 "Sampling of Short Range Endemic Invertebrates Fauna for Environmental Impact Assessment in Western Australia" (2009). • Technical Guide: Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessment (2010). • Limitations: Single phase survey (adequate for target species); some areas inaccessible.	10
Terrestrial Fauna and Subterranean Fauna	Biota	*West Turner Syncline NES Species Assessment*	Desktop review, and Level 2 vertebrate and SRE fauna survey (1,922 ha; August-September 2012).	• EPA Position Statement No. 3: Terrestrial Biological Surveys as an Element of Biodiversity Protection (2002). • EPA Guidance Statement No. 56 – Terrestrial Fauna Surveys for Environmental Impact Assessment in Western Australia (2004a) and Guidance Statement No. 20 "Sampling of Short Range	-

Factor	Consultant	Survey name	Survey area, type and timing	Standard/Guidance and limitations	Appendix
				Endemic Invertebrates Fauna for Environmental Impact Assessment in Western Australia" (2009). • Technical Guide: Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessment (2010). • Limitations: Single phase survey; some areas inaccessible.	
	Biota	*West Turner Fauna Integration Report*	Integration of Level 2 fauna surveys at WTS (24,265 ha; July 2007-October 2012).	• EPA Position Statement No. 3: Terrestrial Biological Surveys as an Element of Biodiversity Protection (2002). • EPA Guidance Statement No. 56 – Terrestrial Fauna Surveys for Environmental Impact Assessment in Western Australia (2004a). • Technical Guide: Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessment (2010). • Limitations: Some areas inaccessible; Northern Quoll trapping work conducted prior to release of EPBC Act policy statement 3.25.	-
	Biota	*Western Turner Syncline Section 10 Below Water Table and Satellite Ore Bodies Subterranean Fauna Survey*	Desktop review, single phase field survey (24 sample sites; April-May 2014).	• EPA Guidance Statement No. 54 – Consideration of Subterranean Fauna in Groundwater and Caves in Environmental Impact Assessment in Western Australia (2003). • EPA Guidance Statement No. 54a – Sampling Methods and Survey Considerations for Subterranean Fauna in Western Australia (2007). • EPA EAG No. 12 Consideration of Subterranean Fauna in Environmental Impact Assessment in Western Australia (2013). • Limitations: Heavy turbidity in groundwater column, sampling limited to locations with drill holes (cluster).	11
	Biota	*Western Turner Syncline Section 10 Hub Subterranean fauna Survey*	Desktop review, two phase field survey: Phase 1 – May 2015 Phase 2 – August 2015 34 troglofauna sample sites and 11 stygofauna sample sites.	• EPA Guidance Statement No. 54 – Consideration of Subterranean Fauna in Groundwater and Caves in Environmental Impact Assessment in Western Australia (2003). • EPA Guidance Statement No. 54a – Sampling Methods and Survey Considerations for Subterranean Fauna in Western Australia (2007). • EPA EAG No. 12 Consideration of Subterranean Fauna in Environmental Impact Assessment in Western Australia (2013). • Limitation – availability of viable drill holes, depth to water table and presence of asbestos fibres.	12

Factor	Consultant	Survey name	Survey area, type and timing	Standard/Guidance and limitations	Appendix
Inland Waters Environmental Quality and Hydrological Processes	WRM	*Western Turner Syncline Stage 2 and S10 – Interim Operational Water Quality Guidelines for Dewatering Discharge.*	Desktop analysis of water quality results from surface and groundwater sampling 2008-2014 (2015).	• Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC/ARMCANZ 2000). • Pilbara water in mining guideline (DoW 2009).	7
	Rio Tinto	*Surplus Water Discharge Extent Assessment Western Turner Syncline Section 10.*	Summary report on modelling methodology and results of extent of impact of surplus water discharge along the Hardey River (2014c).	Pilbara water in mining guideline (DoW 2009).	-
	Rio Tinto	*2014 Greater Tom Price LoM – Western Turner Syncline Hydrogeology Input.*	Internal memo on assessment of groundwater levels and volumes based on mine plan as at December 2014 for WTS and Tom Price (2014a).	N/A	3
	Rio Tinto	*Preliminary Assessment of Dewatering Risk for prospectivity between B1 and Section 10, Western Turner Syncline.*	Desktop analysis of the proposed Development Envelope (2014b).	Limitations: Limited drill hole data for some prospective areas.	-
	WRM	*Baseline Aquatic Fauna & Water Quality Surveys.*	Desktop analysis and field sampling of water quality and aquatic fauna between 2011 and 2013 (2014a).	• Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC/ARMCANZ 2000). • AS/NZS 5667.1:1998 Water Quality – Sampling.	6
	WRM	*WTS2 – groundwater quality updated data.*	Desktop analysis of water quality results from surface and groundwater sampling 2008-2012 (2012).	• Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC/ARMCANZ 2000).	
Air Quality Amenity	Environmental Alliances	*Predicted Dust Levels From Western Turner Syncline Stage 2 (B1 & Section 17) Iron Ore Project (2012).*	Desktop analysis of existing data and modelling (2012).	• USEPA dust modelling guidelines	-

6 ASSESSMENT OF PRELIMINARY KEY ENVIRONMENTAL FACTORS

This Proposal includes a revision to the existing S10 BRK at WTS (as approved by MS 807).

This ER document has been provided to the OEPA to support the referral of the Proposal and has been prepared in accordance with the EPA's Environmental Assessment Guidelines (**EAGs**): specifically EAG for Defining the Key Characteristics of a Proposal (**EAG 1**) (EPA 2012a), EAG for Environmental Principles, Factors and Objectives (**EAG 8**) (EPA 2015a) and EAG for Application of a Significance Framework in the Environmental Impact Assessment Process (**EAG 9**) (EPA 2015b).

Subject to approval of this Proposal, MS 807 and MS 946 will be superseded and a new Ministerial Statement will be published for the WTS Project. It is intended that the Proposal will be managed in accordance with the existing legislative requirements and will continue to meet the EPA's objectives for relevant environmental factors.

6.1 PRELIMINARY KEY ENVIRONMENTAL FACTORS

The environmental factors and objectives adopted by the EPA are listed in EAG 8. The Proponent has identified the preliminary key environmental factors that are relevant to this Proposal and the outcome of the assessment is presented in Table 6-1.

Table 6-1: Significance Framework for Environmental Factors for the Proposal (from EAG 8)

Factor	Envelope	Environmental Aspect	Impact
Flora and Vegetation	Mine/Plant	Mining and associated activities – pit excavation, waste dump and stockpiling, access tracks and haul roads Dewatering and discharge	Clearing of native vegetation Dewatering and discharge into creek (potential to impact riparian vegetation and fauna habitat)
Subterranean Fauna	Mine/Plant	Mine pit excavation	Removal of potential subterranean fauna habitat
Hydrological Process and Inland Waters Environmental Quality	Mine/Plant	Dewatering and discharge	Dewatering and discharge into creek (potential to locally impact surface water quality and ephemeral system)
Rehabilitation and Decommissioning	Mine/Plant	Mining and associated activities – pit excavation, and waste dump and stockpiling Dewatering and discharge Pit lakes	Risk of acid and metalliferous drainage Unstable landforms Pit voids (wall stability, presence of open water body, water quality) may potentially represent a public health and ecological risk

The above assessment included consideration of existing legislative controls for each identified Key Environmental Factor.

The Proponent considers that the Proposal will not result in any significant impact to the remaining environmental factors identified in EAG 8. 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 7).

The following tables (Table 6-2, Table 6-3, Table 6-4 and Table 6-5) provide further 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 6-2: Flora and Vegetation: Description of Factor, Impact Assessment, and Management

Flora and Vegetation EPA Objective: *To maintain representation, diversity, viability and ecological function at the species, population and community level.*

- No vegetation of high conservation significance present. Five vegetation units considered to be of local elevated value (Figure 6-1 and Appendix 8):
  - **Creeklines and Floodplains** (units C10 and C11) - comprise dense to scattered riparian eucalypts (*Eucalyptus camaldulensis* and/or *E. victrix*) in major watercourses, and are considered under threat from cattle grazing, feral animals and invasive weeds. Similar vegetation occurs over a range of at least 200 km across the Pilbara (Biota 2014a).

    Eucalyptus camaldulensis (EcEvAci) and *Eucalyptus victrix* (EvAciTeCEc) communities have both been classified as potential groundwater dependent vegetation (**GDV**) units but are considered tolerant (*E. camaldulensis* subsp. *refulgens*) or relatively tolerant (*E. victrix*) to waterlogging. Their area of extent within the Proposal area has been mapped as 231 ha and 183.2 ha respectively (Appendix 9, Biota 2014b). Approximately 90 ha of EcEvAci and 60 ha of EvAciTeCEc occur within the predicted groundwater drawdown by the end of mining, however given the average natural (pre-mining) depth of the groundwater in the S10 area (50 – 200m) it is considered that the natural water table is out of the range of these species and that they therefore do not rely on groundwater.
  - **Gullies** (units G1, G2 and G3) have value as refugia for fire-sensitive species and other species that prefer rocky, mesic habitats. Similar vegetation has been recorded within a 25 km radius of the Proposal area to the west, north and east, and equivalent gully habitat occurs over a range of 400 km through the Hamersley subregion.
- Vegetation is generally considered to be in Excellent condition except for the watercourses that have been impacted by cattle grazing and weed infestations.
- No Threatened Ecological Communities (**TECs**) or Priority Ecological Communities (**PECs**) present. No Declared Rare Flora (**DRF**) or plant species listed under the *Environment Protection and Biodiversity Conservation Act 1999* (**EPBC Act**) present. The *Lepidium catapycnon* is considered likely to occur but has not been recorded within the WTS development Envelope despite extensive surveys. The nearest records to WTS are 20 km to the north-west and 15 km to the south-west.
- No Threatened flora species were recorded from the WTS Development Envelope. Six Priority flora species have been recorded (Figure 6-1) within the WTS Development Envelope, however they all occur relatively broadly throughout the Pilbara and are not restricted to the WTS development Envelope:
  - One **P1** species: *Hibiscus* sp. Mt Brockman (E. Thoma ET 1354), 112 individuals could potentially be cleared for the Proposal however this is not likely to adversely affect the representation of the species as it is widely distributed in the Hamersley sub-region.
  - Four **P3** species: *Eremophila magnifica* subsp. *Velutina*; *Grevillea saxicola*; *Sida* sp. Barlee Range (S. van Leeuwen 1642); and *Solanum kentrocaule*.
  - One **P4** species: *Eremophila magnifica* subsp. *magnifica.*
- One species of interest, *Goodenia* sp. aff. *pedicellata,* was recorded from the WTS Development Envelope (previously recognised as *Goodenia* sp. East Pilbara (A. A. Mitchell PRP 727), and managed via Condition 6 in MS 807). This species is currently under taxonomic review and as such has not been included in the table below. However for this Proposal it is being treated as P1 status species *Goodenia pedicellata* which has a total population count of over 1419 individuals from 124 records within the Rio Tinto database and has been previously recorded from Ophthalmia to Western Turner Syncline (a range of 220 km). Clearing of the species will be avoided / minimised where possible.

Species	Total Population (individuals)*	Total Impact Approved Under Rio Tinto Ministerial Statements	Total Potentially Impacted by this Proposal	% Potentially Impacted by This Proposal
Hibiscus sp. Mt Brockman (E. Thoma ET 1354)	6423	1173	112	1.74
Eremophila magnifica subsp. *velutina*	4815	3964	53	1.10
Grevillea saxicola	1076	445	122	11.34
Sida sp. Barlee Range (S. van Leeuwen 1642)	9839	3309	194	1.97
Solanum kentrocaule	49	1	3	6.12
Eremophila magnifica subsp. *magnifica*	10093	6263	0	0

Inherent Impact	Environmental Aspect	Mitigation to Address Residual Impacts	Regulatory Mechanisms to Ensure Mitigation	Outcome to Demonstrate that Proposal Meets EPA Objective
Potential Impact 1 Impact of up to 750 ha (in addition to the 3,600 ha approved via MS 807, MS 946 and CPS 4581) of native vegetation considered to be in Good to Excellent condition, supporting the following: • One P1, four P3 and one P4 flora species; • One species of interest, the *Goodenia* sp. aff. *Pedicellata*; and • Five vegetation units of local elevated value.	Aspect 1 Additional clearing of native vegetation.	Management of Aspect 1 • Mitigation hierarchy in proposal design: o **Avoid**: where practicable, impacts to known P1 flora locations will be avoided where practicable through use of restriction and avoidance buffers. 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. o **Offset:** Provision of an environmental offset for unavoidable clearing of native vegetation in Good to Excellent condition. • Implement the existing Environmental Management System (**EMS**). • Clearing will only occur within the approved WTS Development Envelope and within the limits defined in Schedule 1. • Known locations of Priority Flora have been recorded in the internal GIS database and P1 species will be avoided as far as practicable. • The occurrence of new weed species and the spread of existing weeds will be controlled through the implementation of industry standard weed hygiene and control measures.	Regulation of Aspect 1 • Subject to approval, a new MS for the Proposal with specified clearing limit, a defined WTS Development Envelope and a condition relating to Offsets and Rehabilitation. • *Wildlife Conservation Act 1950* (WCA) can address impacts to protected flora if found. • *Iron Ore (Hamersley Range) Agreement Act 1963* requires the Proposal to be implemented as approved.	After the application of management and mitigation measures, the Proposal is expected to result in the progressive removal of an additional 750 ha of vegetation over the life of the Proposal. This is in addition to the 3,600 ha already approved for clearing under MS 807, MS 946 and CPS 4581. The Proposal is not expected to alter the conservation status or viability of any Priority Flora species or have a significant effect on the representation of vegetation at a local or regional level. No TECs, PECs, Environmentally Sensitive Areas (**ESA**s) 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 is expected to 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
Potential Impact 2 Spread of existing weeds and/or introduction of new weeds that compete with native vegetation.	Aspect 2 Vehicle and earth movements.	Management of Aspect 2 • Weed management has, and will continue to be undertaken as part of an annual weed control program and as otherwise required.	Regulation of Aspect 2 As per regulation for Aspect 1.	
Potential Impact 3 Potential for tree stress or death of riparian vegetation from discharge of surplus water up to 18km. Detrimental impacts may range from reduced growth and health, to tree death, with the degree of impact dependent on the species tolerance, complete or partial waterlogging of the root system, and the duration of waterlogging.	Aspect 3 Surface discharge of surplus water is required for the management of surplus water that cannot be used on-site. Surface discharge is proposed into the northern branch of the Hardey River.	Management of Aspect 3 Vegetation degradation as a result of hydrological changes will be minimised via management measures to reduce potential impacts on natural hydrological regimes, as summarised below: • The spatial and temporal extent of discharge is limited. • The existing WTS Discharge Monitoring and Management Plan has been updated (Appendix 15, now referred to as the WTS Riparian Vegetation Monitoring and Management Plan) in order to monitor and manage the potential impacts of the discharge to the northern branch of the Hardey River(and Beasley River) including the potential for waterlogging of riparian vegetation and spread of weeds.	Regulation of Aspect 3 • Updated existing condition (No. 6 of MS 946) to ensure that discharge from the WTS Proposal does not cause long term impacts to Beasley and Hardey Rivers.	
Potential 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 WTS operation. The location is remote with no neighbouring mining (other than the existing Tom Price mine). 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 Proposal with a specified clearing limit, a defined WTS Development Envelope and a condition relating to Closure and Rehabilitation.	

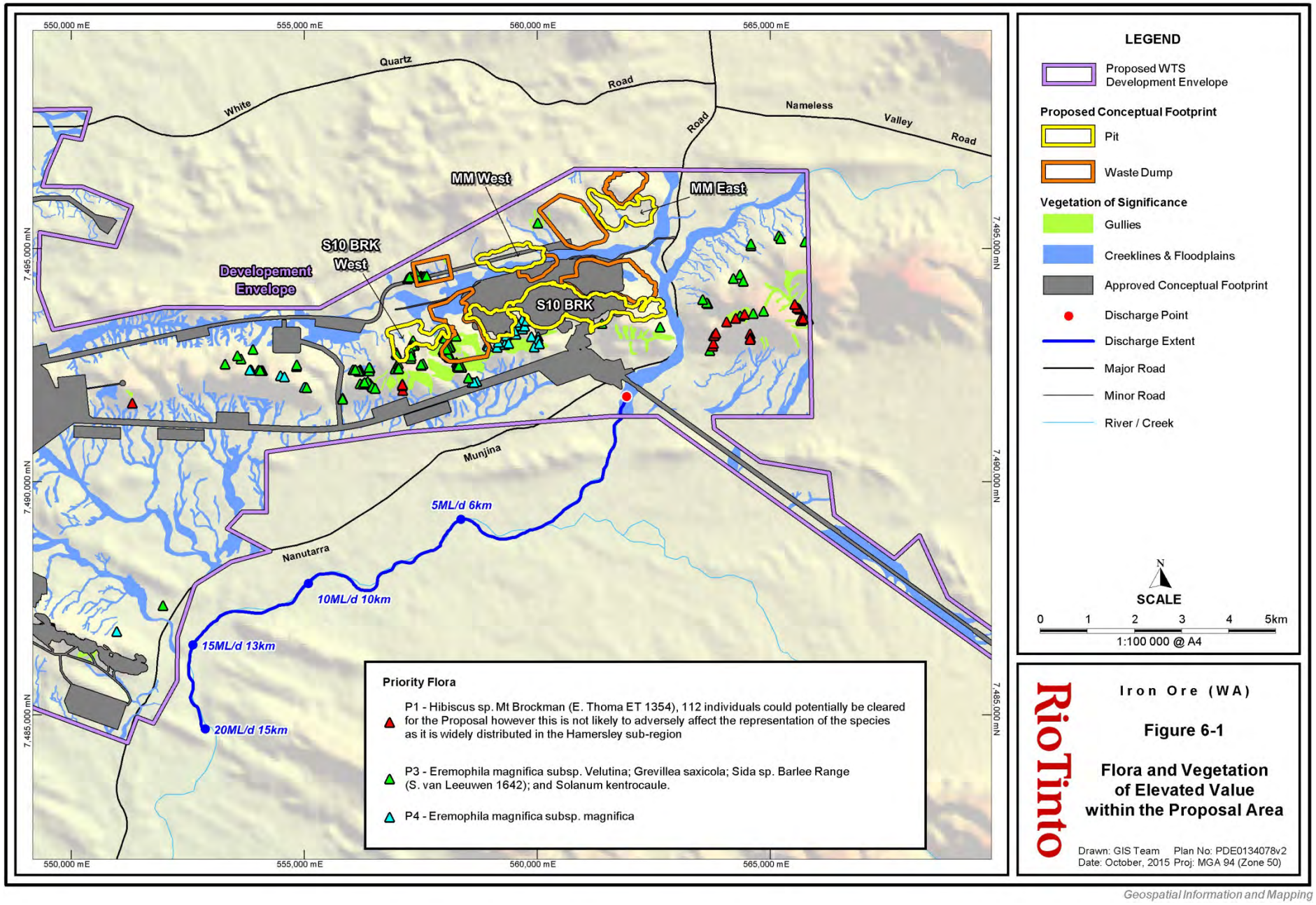

Figure 6-1: **Flora and Vegetation of Elevated Value within the Proposal Area**

Table 6-3: Subterranean Fauna: Description of Factor, Impact Assessment and Management

Subterranean Fauna EPA Objective: *To maintain representation, diversity, viability and ecological function at the species, population and assemblage level.*

- The subterranean sampling effort within the WTS Development Envelope comprises (Figure 6-2):
  - 58 stygofauna sites over five phases, 37 of which are within the Proposal Area.
  - 126 troglofauna sites over five phases, 65 of which are within the Proposal Area.
- No stygofauna have been collected within the WTS Development Envelope.
- Four troglobitic fauna have been collected collectively within the WTS Development Envelope:
  - Two troglobitic pseudoscorpions belonging to the genus Tyrannochthonius (Biota 2014d).
  - A *scolopendrid* centipede belonging to the genus Cryptops (family Cryptopidae) (Biota 2014d, 2015).
  - A *cryptops* sp. was recorded during the 2015 survey (Biota 2015).
- Biota subterranean field surveys to date have recorded little to suggest that subterranean communities of conservation value exist within the WTS Development Envelope (Biota 2014d). Habitat based assessments and genetic analysis of specimens have generally supported this view (Biota 2014d).

Inherent impact	Environmental aspect	Mitigation to address residual impacts	Regulatory mechanisms to ensure mitigation	Outcome to demonstrate that proposal meets EPA objective
Impact 1 Direct loss/degradation of habitat from excavation of pits.	Aspect 1 Development of open AWT/BWT pits.	Management of Aspect 1 • Mitigation hierarchy in proposal design: o **Avoid**: Hydrocarbon spills that could contaminate groundwater will be avoided through storage and transfer units meeting Australian and Proponent design standards and engineering features such as bunding and alarms. o **Minimise**: Clearing will be minimised to that required for safe construction and operation. • Clearing 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. • 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.	Regulation of Aspect 1 • Subject to approval, a new MS for the Proposal with a specified clearing limit, a defined WTS Development Envelope, and a condition relating to Closure and Rehabilitation. • *Wildlife Conservation Act 1950 (WCA)* can address impacts to protected fauna if found. • *Iron Ore (Hamersley Range) Agreement Act 1963* requires the Proposal to be implemented as approved.	The Proposal is expected to result in the unavoidable impacts to subterranean fauna as a result of excavation and dewatering. However, it is considered (Biota 2014d,2015) that the locally occurring Banded Iron Formation (BIF) is continuous throughout the WTS region and therefore there is potential for subterranean fauna habitat to be continuous throughout the area; any potential subterranean fauna occurring in the area are therefore less likely to have restricted distributions. Furthermore, survey work and assessment has shown that few subterranean communities of conservation value exist within the WTS Development Envelope. The Proponent therefore considers that the Proposal is expected to meet the EPA's objectives for subterranean fauna.

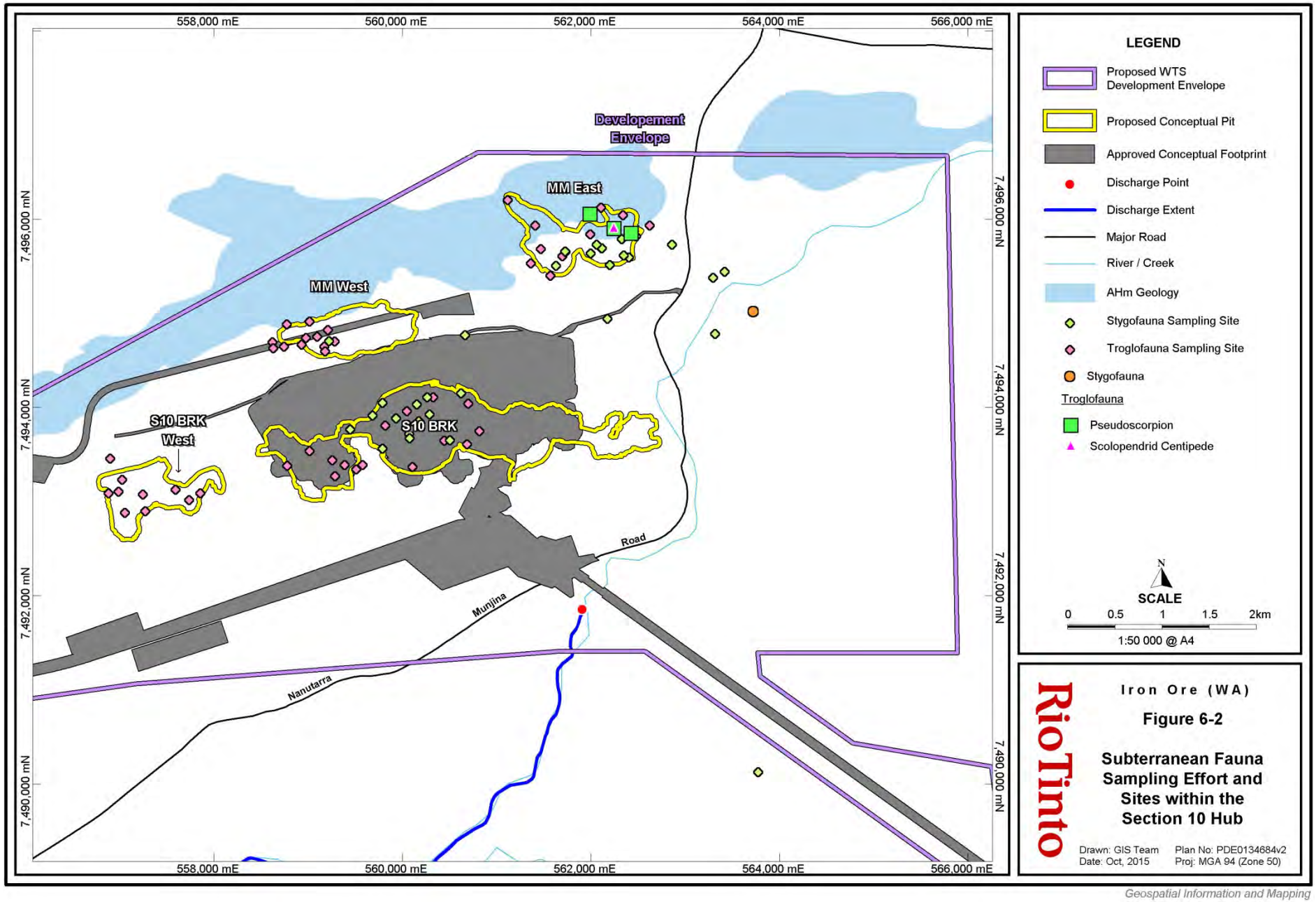

Figure 6-2: **Subterranean Fauna Sampling Effort and Sites within the Section 10 Hub**

Table 6-4: Hydrological Processes and Inland Water Environmental Quality (Groundwater, Surface Water and Aquatic Fauna): Description of Factor, Impact Assessment and Management

Hydrological Processes and Inland Waters Environmental Quality, EPA Objectives:

To maintain hydrological regimes of groundwater and surface water so that existing and potential uses, including ecosystem maintenance, are protected

To maintain the quality of groundwater and surface water, sediment and/or biota so that the environmental values, both ecological and social, are protected.

Hardey and Beasley Rivers

- The Hardey and Beasley River catchments are large systems: 4,924 km^2 and 2,032 km^2 respectively.
- The aquatic fauna taxa species richness for the Beasley and Hardey rivers is comparable to the region (WRM 2014; Appendix 6).
- Watercourses throughout the WTS area, including the Beasley and Hardey Rivers, are impacted by cattle and weeds.

Dewatering and Water Quality

- Groundwater is fresh and of acceptable quality but has elevated nitrate levels (WRM 2015; Appendix 7).
- Potential acid forming (**PAF**) material has been identified in S10 BRK, but pit designs will minimise the risk that mining will intersect Category 2 or 3 geochemically problematic mineral wastes (i.e. hot and cold black shales). Should any material be exposed accidentally and pose a significant risk to the environment then the site work practice to manage impacts will be implemented, including (but not limited to) covering the PAF material with an inert layer and monitoring water quality to ensure run-off from site meets acceptable levels.
- A pit lake will form in the S10 BRK main void following cessation of dewatering. The lake may reach steady state at 100 years with an estimated depth of 50 m and geochemical modelling predicts that the pit lake will be fresh and moderately alkaline (Appendix 13).
- The MMW and MME pits will be backfilled during operation and/or closure of the WTS Project. The MME pits will be backfilled to 540 mRL with no permanent pit lake resulting. The MMW pit will be backfilled to 545 mRL with no permanent pit lake resulting. The groundwater in the MM pits is connected to the regional aquifer which flows from east to west. Preliminary modelling suggests natural evaporation processes associated with the backfilled pits may create a local groundwater depression that extends approximately 100 m to the east and west of these pits. Modelling shows no permanent pit lakes will form; however ephemeral pit lakes may develop in the wet season.
- There are no groundwater-fed springs, pools or creeklines within the immediate vicinity of Section 10.

Surface Discharge and water flows

- Surplus water from WTS Stage 2 has been approved (MS 946) for discharge, up to 20 km, into the local tributary of the Beasley River. No change to Stage 2 dewatering or surplus water management is proposed.
- Surplus water from the Section 10 Hub is proposed to be discharged, up to 15 km, into the northern branch of the Hardey River (Figure 2-1). Dewatering of up to 7.3 GL/a will be required for the Section 10 Hub (Rio Tinto 2014a; Appendix 3).
- Modelling of surface hydrology of Hardey River indicates the following outcomes (Rio Tinto 2014c; Appendix 4):
  - No 'overbank flow' is likely to occur as discharge will be confined to the low flow channel within the creek bed. Creek banks will remain unsaturated.
  - The bedrock units are low permeability so discharge water will be retained within the surface alluvials.
  - API Management Pty Ltd sought approval in 2012 to discharge up to 1.5 GL/a to the Hardey River. The proposed mine is 40 km away from the WTS Project and the predicted wetting front of this Proposal will not join with the API Management Pty Ltd discharge (23 km separation). The combined discharge volume of both Proposals is ~10.6 GL/a.

Inherent impact	Environmental Aspect	Mitigation to Address Residual Impacts	Regulatory Mechanisms to Ensure Mitigation	Outcome to Demonstrate that Proposal Meets EPA Objective
Potential Impact 1 Stress, degradation or loss of groundwater dependent/riparian vegetation of moderate significance from falling groundwater levels or water logging as a result of dewatering and discharge, respectively.	Aspect 1 Groundwater abstracted to lower water levels to facilitate BWT mining and surplus water discharged into the tributaries of the Beasley and Hardey rivers.	Management of Aspect 1 • **Minimise**: Proposal design has incorporated consideration of surface water management, including minimising disruption to watercourses. The discharge outfall near the Section 10 Hub will be designed and constructed so as to reduce the velocity of the water at discharge and thereby minimise erosion of the channel. • Monitoring of water levels and abstraction rates during dewatering and ongoing validation of the hydrogeological and groundwater modelling. • Continued prioritisation of beneficial use of water extracted during dewatering, predominantly via operational utilisation. • The WTS Riparian Vegetation Monitoring and Management Plan (Appendix 15) has been updated to ensure that the associated environmental and conservation values associated with this Proposal are maintained.	Regulation of Aspect 1 • Appropriate monitoring and management of discharge water quality will be undertaken in accordance with the Part V operating licence. • Existing MS 946 and, subject to approval, a new MS for the WTS Proposal with a specified surplus water discharge extent limit, a defined WTS Development Envelope, and condition relating to Offsets, Riparian Vegetation, and Surface Discharge. • *Iron Ore (Hamersley Range) Agreement Act 1963* requires the Proposal to be implemented as approved.	The Proposal can be managed to meet the EPA environmental objective for these factors, in summary: • No TECs, PECs, ESAs or vegetation of high conservation significance or DRF have been recorded. • The spatial and temporal extent of surplus water discharge is relatively limited, and substantial areas of similar watercourses occur outside the discharge extent within the Beasley River and Hardey River catchments. • Monitoring and management of riparian vegetation and weeds will be undertaken in accordance with the WTS Riparian Vegetation Monitoring and Management Plans. • Appropriate management measure to avoid and minimise potential impacts of the Proposal on surface water will be implemented (and where applicable have been implemented during Proposal design). • Existing legislation and regulations to manage water abstraction and discharge, and management of hazardous materials and
Potential Impact 2 Erosion caused by the discharge outlet causes direct loss of vegetation or indirectly impacts vegetation/aquatic species through increased sedimentation	Aspect 2 Outlet into the creek to discharge surplus water that cannot be used beneficially on-site.	Management of Aspect 2 Proposal design has incorporated consideration of surface water management, including minimising disruption to watercourses. The discharge outfall near the Section 10 Hub will be designed and constructed so as to reduce the velocity of the water at discharge and thereby minimise erosion of the channel.	Regulation of Aspect 2 A Works Approval for the new discharge point will be obtained under Part V of the EP Act which regulates the construction and operation of the discharge pipeline and outlet.	
Potential Impact 3 Reduction in diversity and abundance of aquatic fauna within the discharge extent via:	Aspect 3 Groundwater abstracted to lower water levels to facilitate BWT mining and surplus water	Management of Aspect 3 As per the management of Aspect 1. • Monitoring of water levels and abstraction rates during dewatering and ongoing validation of the hydrogeological and groundwater modelling.	Regulation of Aspect 3 Appropriate monitoring and management of discharge water quality will be undertaken in accordance with	

Hydrological Processes and Inland Waters Environmental Quality, EPA Objectives: *To maintain hydrological regimes of groundwater and surface water so that existing and potential uses, including ecosystem maintenance, are protected* *To maintain the quality of groundwater and surface water, sediment and/or biota so that the environmental values, both ecological and social, are protected.*				
• Elevated nutrient concentrations potentially causing eutrophication. • Change in aquatic fauna assemblages from species adapted to ephemeral pools to species adapted to more permanent water bodies.	discharged into the tributaries of the Beasley and Hardey rivers.	• Continued prioritisation of beneficial use of water extracted during dewatering, predominantly via operational utilisation. • Proposal design has incorporated consideration of surface water management, including minimising disruption to watercourses. The discharge outfall near the Section 10 Hub will be designed and constructed so as to reduce the velocity of the water at discharge and thereby minimise erosion of the channel. The WTS Riparian Vegetation Monitoring and Management Plan (Appendix 15) has been updated to ensure that the associated environmental and conservation values associated with this Proposal are maintained.	the Part V operating licence.	waste materials.
<u>Potential Impact 4</u> Groundwater or surface water contamination via waste or hydrocarbon /chemical spills	<u>Aspect 4</u> General construction and operational activities that generate waste and require re-fuelling or maintenance.	<u>Management of Aspect 4</u> 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.	<u>Regulation of Aspect 4</u> • *Dangerous Goods Safety Act 2004* (Storage of Hazardous Materials) • Dangerous Goods Safety (Storage and Handling for Non-explosives) Regulations 2007 • Part V of the EP Act	

Table 6-5: Rehabilitation and Decommissioning: Description of Factor, Impact Assessment, and Management

Rehabilitation and Decommissioning EPA Objective: *To ensure that premises are decommissioned and rehabilitated in an ecologically sustainable manner.*

- The WTS Mine Closure Plan (**MCP**) has been updated to include the proposed Section 10 Hub within the WTS Development Envelope.

  The WTS MCP (Appendix 14) documents the current closure knowledge base for WTS 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 S10 BRK pit lake is expected to recover to a quasi-steady state level (90% recorded) of around530 m RL, a depth of 50 m, after 100 years. This is approximately 15 m below the pre-mining water table. The S10 BRK pit lake will be a groundwater sink of fresh and moderately alkaline water with pH values around 8 and total dissolved solids around 690 mg/L. This is considered to be acceptable to the key stakeholders.

- The following closure objectives have been developed for the WTS Proposal:
  - Erosion does not threaten the long term stability of constructed landforms.
  - Potential contaminants are managed such that no adverse impact to soil, surface water or groundwater is predicted.
  - Vegetation on rehabilitated land is native and self-sustaining.
  - The prevalence of invasive species is similar to that in nearby reference sites.
  - Pit lakes do not represent a significant public liability, health or ecological risk.
  - Measures to mitigate public safety hazards have been agreed with stakeholders and have been implemented.

- The anticipated closure outcome for the Section 10 Hub includes the following:
  - A fresh and moderately alkaline pit lake is expected to develop in the S10 BRK main pit. The pit lake will be located at the base of a deep pit surrounded by rugged topography, with limited connection to the surrounding environment. Egress from the lakes will be possible via the former haul roads; although access to the lake areas will be discouraged through the use of suitable barricades.
  - The other pits at Section 10 that extend below the pre-mining groundwater table will be backfilled to prevent the formation of permanent lakes. Backfill material will be sourced from the top lift(s) of the adjacent mineral waste dumps, if not backfilled during the operating life of the mine.
  - The WTS mine plan aims to avoid exposure of PAF materials within the S10 Hub and the B1 mine area. However PAF material will be intersected at S17 and the exposed materials on the pit walls and floor will be covered with mineral waste. Mining of S17 is approved via MS 946 and closure requirements are managed in accordance with the WTS Mine Closure Plan.
  - Pit wall erosion and/or collapse of the eastern wall of the eastern portion of the MME pit could, over the long term, encroach into the adjacent creek floodplain and / or riparian vegetation. This location will be stabilised to prevent encroachment into the environment using a buttress created from waste material.
  - On closure, infrastructure will be removed and all disturbed areas outside of the mine voids, including waste dumps, will be rehabilitated to create stable landforms and vegetated with native species of local provenance.

Inherent Impact	Environmental Aspect	Mitigation to Address Residual Impacts	Regulatory Mechanisms to Ensure Mitigation	Outcome to Demonstrate that Proposal Meets EPA Objective
Impact 1 Localised adverse impacts to soil and groundwater quality.	**Aspect 1** PAF material, predominantly of low-moderate geochemical risk, is present in low volumes in the S10 BRK pit. Mining could expose the PAF, causing acid and metalliferous drainage (**AMD**), and potentially impact soil and groundwater quality.	**Management of Aspects 1, 2 and 3** Based on the key closure issues for this Proposal, the following mitigation will be applied to ensure closure objectives are met: • Pit designs have been developed for Section 10 BRK which allows the ore to be mined without intersecting Category 2 or 3 geochemically problematic mineral wastes (also known as hot and cold black shales). • Waste dump designs will be based on the physical and chemical properties of waste material. Sufficient volumes of competent waste to enable design/construction of waste dumps that are stable and not susceptible to excessive erosion. Sufficient volumes of inert waste material to enable design/construction of waste dumps that encapsulate the lower volumes of waste rock that poses a potential AMD risk. • Waste dumps and other areas of disturbance will be shaped to create stable landforms and vegetated with native species of local provenance. • Backfill of the MME and MMW pits to suppress the groundwater table in order to prevent the formation of permanent pit lakes. • Pit walls will be stabilised to prevent encroachment into the local creek floodplain, where applicable. • Abandonment bunds will be used to limit access to the pit lake and appropriate signage will be installed to identify the risk to the public. • The MCP is not a static document. The Proponent will continue to review and revised the WTS MCP 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.	**Regulation of Aspects 1, 2 and 3** Existing MSs 807 and 946, and (subject to approval) a new MS for the Proposal includes a specified clearing limit, defined Development Envelopes and a condition relating to Rehabilitation and Decommissioning.	The Proposal can be managed to meet the EPA environmental objective for this factor through implementation of the WTS MCP.
Impact 2 Public health risk due to unstable landforms that are accessible by the public.	**Aspect 2** Waste dumps, if not designed/planned, executed and rehabilitated adequately could result in unstable landforms.			
Impact 3 Pit voids (wall stability, presence of open water body, water quality) may potentially represent a public health and ecological risk.	**Aspect 3** Pit lakes may pose a general health and safety risk to the public.			

6.2 RESIDUAL IMPACTS: IMPACT ASSESSMENT AND MANAGEMENT

6.2.1 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 WTS Development Envelope and does not indicate the presence of any vegetation types that qualify for specific legislative protection (e.g. 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 weeds.

6.2.2 WTS Offset Requirements

MS 807 and CPS 4581 do not specify the need for an offset; therefore the Proponent considers that the clearing approved under MS 807 and CPS 4581 is exempt from the requirement to offset under a new contemporised Ministerial Statement.

However, consistent with other recent Ministerial Statements, Condition 9 of MS 946 requires an offset for clearing of vegetation in good to excellent condition.

Therefore, on approval of this Proposal, the Proponent proposes the rationalisation of Condition 9 (of MS 946) into a new condition which will reflect that the clearing of 750 ha (as approved under MS 807) and 150 ha (as approved under CPS 4581) are exempt from the requirements of an offset, and that the remainder of the 4,350 ha of clearing authorised for the Proposal (2,700 ha as approved via MS 946 and 750 ha of additional clearing requested via this Proposal) will be subject to an offset for the clearing of vegetation in good to excellent condition.

This approach is consistent with recent Ministerial Statements for Proposals, such as MS 1000 for the Brockman Syncline 4 Project.

The Environmental Offsets Reporting Table is included in Table 6-6.

Table 6-6: Significant Residual Impact of the Proposal

Existing environment/ Impact	Mitigation			Significant Residual Impact	Offset Calculation Methodology				
	Avoid and Minimise	Rehabilitation Type	Likely Rehab Success		Type	Risk	Likely offset success	Time Lag	Offset Quantification
750 ha of additional clearing of native vegetation mostly considered to be in Good to Excellent condition.	**Avoid**: The extensive biological surveys will ensure that any areas identified as significant can be avoided (such as P1 priority flora species). **Minimise:** Use of existing infrastructure, transport corridors and plant facilities will minimise clearing. **Rectify and Reduce:** 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 areas of successful rehabilitation within its Pilbara operations. What is the type of vegetation being rehabilitated? Assorted vegetation assemblages associated with plains, hills, drainage lines and gorge/gully habitat types. Time lag? Progressive rehabilitation where practicable. Credibility of the rehabilitation proposed (evidence of demonstrated success) See previous rehabilitation by the Proponent.	Extent: 750 ha Quality: Mostly in 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 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 for clearing of vegetation in Good to Excellent condition.

7 OTHER ENVIRONMENTAL FACTORS

As previously discussed the key environmental factors of this Proposal are considered to be: *Flora and Vegetation*; *Subterranean Fauna*; *Hydrological Processes; Inland Waters Environmental Quality* and *Rehabilitation and Decommissioning*.

The following factors, although not considered key, are relevant to this Proposal due to the proposed additional clearing of native vegetation:

- Terrestrial Fauna
- Visual Amenity
- Air Quality
- Heritage.

Table 7-1 outlines the consideration of these factors relevant to the Proposal.

The remaining environmental factors (Landforms and Terrestrial Environmental Quality) are also addressed in Table 7-1.

Table 7-1: Other Environmental Factors

Terrestrial Fauna - *To maintain representation, diversity, viability and ecological function at the species, population and assemblage level*		
• Surveys have been conducted across the WTS region since 2005 (~35,000 ha) enabling a detailed and consistent understanding of the fauna and fauna habitats. • The two potential habitats of higher value to conservation significant fauna comprising 'gorge and gullies' and 'eucalypt woodlands on major watercourses' in the Proposal area was also included in the assessment of the original Proposals. Clearing of these two communities is not expected to result in significant local or regional impact to the fauna. These habitat types are well represented in the wider Hamersley subregion. • No caves have been located that would represent suitable roosts for the orange leaf-nosed bat or permanent roosts for the ghost bat. • Potential foraging habitat suitable for the Pilbara olive python occurs along major drainage lines within the WTS Development Envelope. • Invertebrate groups recorded are considered unlikely to harbour SRE taxa due to the extensive distributions of their preferred habitats across the Pilbara Bioregion (Biota 2014).		
Potential impact / Environmental Aspect • 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	**Mitigation to address residual impact** • Management measures as noted for Flora and Vegetation (Table 6-2) to minimise impacts to fauna habitat. • The proposed clearing will be constrained within the WTS Development Envelope. • Suitable habitat for all species of conservation significance exists outside the WTS Development Envelope and is well represented in the Pilbara bioregion; the proposed additional clearing is not considered to contribute to cumulative impacts on fauna habitat.	**Mechanism for ensuring mitigation** 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.
Heritage - *To ensure that historical and cultural associations are not adversely affected.*		
• The WTS Development Envelope is located within the traditional lands of the Eastern Guruma (B1 to S10) and Yinhawangka (S17) people. • No ethnographic sites have been identified to date. Archaeological sites identified include rock shelters, scar trees, artefact scatters, petroglyphs and gnamma holes. Some of the archaeological sites identified occur in areas that may be impacted by the Proposal.		

Potential impact / Environmental Aspect	Mitigation to address residual impact	Mechanism for ensuring mitigation
Some of the archaeological sites identified may be impacted from clearing for development of the mine and associated areas.	• Surveys will continue to be conducted prior to any ground disturbance, as per the Proponents protocols. • The Proposal design has minimised planned clearing to areas necessary for safe construction and operation. • The additional clearing of 750 ha will only occur within approval boundaries. • 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.	• Existing MSs 807 and 946, and new MS for Proposal - with specified clearing limit and a defined Development Envelope • Sites of heritage significance are managed under the *Aboriginal Heritage Act 1972.* 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 and disturbance limits via the Ministerial Statements.
Air Quality - *To maintain air quality for the protection of the environment and human health and amenity*.		
• Impacts to air quality due to dust, noise, vibration, and greenhouse gas (**GHG**) emissions were assessed as a minor environmental factor for Stage 2 and S10 BRK. • The current mine plan is to sustain tonnes for Tom Price mine and is limited by the capacity of the current infrastructure, so the development of the deposits are likely to be sequential and the amount of emissions being generated are not likely to be different to what has been reviewed and approved for the S10 BRK and Stage 2 deposits. • Due to the remote location of the mine there is unlikely to be any significant impact to health or amenity arising from dust associated from the Proposal		
Potential impact / Environmental Aspect	**Mitigation to address residual impact**	**Mechanism for ensuring mitigation**
This Proposal is not expected to result in a significant change to dust, noise, vibration, and GHG emissions from the current Tom Price/WTS operations.	• The Proposal design has minimised planned clearing to areas necessary for safe construction and operation. • The additional clearing of 750 of will only occur within approval boundaries. • Disturbed areas will be progressively rehabilitated to minimise total exposed area. • Dust control measures will continue to be implemented on haul roads, working surfaces and stockpiles as required. • Vehicle access has been, and will continue to be restricted to designated tracks and roads as far as practicable.	• Existing MSs 807 and 946, and a new MS for Proposal - with specified clearing limit, defined WTS Development Envelope and a Condition relating to Rehabilitation. • GHG are reported in accordance with the *National Greenhouse and Energy Reporting Act 2007* (Cwth). • Works Approval(s) granted under Part V of the EP Act for the construction of facilities and Operating Licences under Part V of the EP Act for the management of discharges and emissions. • Environmental Protection (Noise) Regulations 1997. 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 and disturbance limits via the Ministerial Statements.

Visual Amenity - *To maintain air quality for the protection of the environment and human health and amenity.*

- Impacts to visual amenity at the Stage 2 (including B1) and S10 operations were assessed as a minor environmental factor during both the original assessments.
- A portion of the S10 administration offices and some mining activities can be seen from the Nanutarra-Munjina road but these are minor and no complaints have been received from the visitors travelling on the road. Section 10 and the Marra Mamba to the north are the closest deposits to the Nanutarra-Munjina road and the deposits have a short mine life (<10 years).

Potential impact / Environmental Aspect	Mitigation to address residual impact	Mechanism for ensuring mitigation
The additional clearing is not expected to result in a visual impact that is significantly different from that of the existing operations.	• The Proposal design has minimised planned clearing to areas necessary for safe construction and operation. • The additional clearing of 750 ha will only occur within approval boundaries. • Disturbed areas will be progressively rehabilitated to come as close as possible to local landscape values and surrounding environment. • Continuing to locate infrastructure in or near previously disturbed areas where possible.	The Proposal can be managed to meet the EPA's objective for this factor through the existing MSs 807 and MS 946, and the new MS for this Proposal – with specified clearing limit, defined WTS Development Envelope and the WTS Mine Closure Plan (Appendix 14).

Landforms - *To maintain the variety, integrity, ecological functions and environmental values of landforms.*

Potential impact / Environmental Aspect	Mitigation to address residual impact	Mechanism for ensuring mitigation
• Alteration of existing landforms (from creation of pits and external waste dumps and stockpiles) 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.	• Implementation of sediment and erosion control measures. • Manage closure and rehabilitation plans as listed in the factor 'Rehabilitation and Decommissioning' in Table 6-5.	The Proposal can be managed to meet the EPA's objective for this factor through implementation of the WTS Mine Closure Plan (Appendix 14).

Terrestrial Environmental Quality - *To maintain the quality of lands and soils so that the environment values, both ecological and social, are protected.*

Potential impact / Environmental Aspect	Mitigation to address residual impact	Mechanism for ensuring mitigation

• Disturbance of rock and soils.
• Lack of / inappropriate management of:
  • General domestic waste;
  • Industrial wastes; and
  • Hazardous wastes
	• Manage waste and potential for hydrocarbon or chemical spills as listed in the factors 'Hydrological Processes and Inland Waters Environmental Quality' in Table 6-4.	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 (in particular Part V of the EP Act).

that leads to pollution or fauna injuries. • Soils contamination from hydrocarbon or chemical spills.		

8 PRINCIPLES OF ENVIRONMENTAL PROTECTION AND EIA

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 ESD are incorporated into the EP Act and the EPA's Position Statement No. 7 - Principles of Environmental Protection (EPA 2004c). These principles have been considered for the Proposal and are summarised below in Table 8-1.

Table 8-1: Principles of Environmental Protection

Principle	Consideration Given in the 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.	During the Proposal planning and design phase, the Proponent undertook comprehensive baseline studies, investigations and modelling of aspects of the Proposal that may affect the surrounding environment. Where significant environmental impacts were identified, measures have been, and will continue to be, incorporated into Proposal design and management to avoid or minimise predicted impacts where practical.
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 Proponents 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 Proponents HSEQ Management System has well established rehabilitation procedures for restoring disturbed environments.

Principle	Consideration Given in the 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 Proposal planning phase, and will continue to be considered during the operational and closure phases of the Proposal. Proposal planning, 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 Proponents 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 should be taken to minimise the generation of waste and its discharge into the environment through the existing approvals and Proponents site management procedures.

The environmental principles of the EPA (EAG 8 2015) have been considered for the Proposal and are summarised below in Table 8-2.

Table 8-2: 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 manages and operates numerous iron ore mines in the Pilbara and best practice requires that Rio Tinto ensures that proposed environmental impact is prevented, or minimised, as far as practicable.
Continuous Improvement The implementation of environmental practices should aim for continuous improvement in environmental performance.	The Proponent operates under an HSEQ Management System which sets out a framework of adaptive management based on the Deming Cycle (Plan-Do-Check-Act).

9 RATIONALISATION OF STATEMENTS

This Proposal provides an opportunity to rationalise the WTS Project description, implementation conditions and commitments from two Ministerial Statements into one new modernised Ministerial Statement, pursuant to section 46 of the EP Act.

The intent of this rationalisation is as follows:

- To reflect the proposed changes to the WTS Project that have been assessed and approved.
- To facilitate integrated management under a single set of conditions.
- To reflect contemporary presentation.

9.1 MODERNISATION OF PROJECT CHARACTERISTICS

The Proponent is seeking approval for a new project description within Schedule 1 of a consolidated Statement (the **Statement**) for the WTS Project.

The following proposed changes are requested:

- The description of the WTS Project is updated in line with the changes proposed in this document.
- The description of the WTS Project is updated in line with more recent and contemporary presentation.
- The description of the WTS Project to reflect consolidation of the two WTS related Ministerial Statements (MS 807 and MS 946).
- The Statement will supersede MS 807 and MS 946.

The proposed administrative changes and consolidation of the Key Characteristics of the WTS Project are summarised in Table 2-2. The contemporised Project Description and Key Characteristics for the WTS Project are provided in Appendix 16.

9.2 RATIONALISATION OF MINISTERIAL CONDITIONS AND COMMITMENTS

The Proponent has undertaken a review of the current conditions of MSs 807 and 946. This Section is for the purpose of rationalising the implementation conditions for the new Statement of the WTS Project.

The intent of the rationalisation of conditions of is as follows:

- Conditions relating to compliance auditing should be updated to reflect contemporary presentation and to align the Proposal reporting with reporting required under other Ministerial Statements for the Proponent's Pilbara iron ore operations.
- Removal of redundant conditions where this can be justified.
- Development of outcomes-based conditions where requirements have been developed and approved by the CEO of the OEPA. These conditions should be consolidated into outcomes based conditions, consistent with EPA guidance (Environmental Assessment Guideline, Towards Outcome-based Conditions, and EAG 11 2013). The updated conditions should address key environmental factors, consistent with the EP Act, EPA guidance (Environmental Assessment Guideline for Environmental Factors and Objectives, EAG 8 2015a) and the EPA Significance Framework (Environmental Assessment Guideline, Application of a Significance Framework in the EIA Process, EAG 9 2015b).

- Removal of conditions that are managed under other processes and as such, do not require regulation under Part IV the EP Act. This will also avoid unnecessary duplication with other regulatory agencies.

The rationale for updating the conditions in each of the existing Ministerial Statements is described in Appendix 17. Compliance status for each auditable element has been reviewed based on actions completed to date as 'Compliant - Complete'; 'Compliant - Ongoing'; 'Not yet required'; or 'Non-compliant'.

The proposed new conditions for the Proposal cover the following aspects:

1. Proposal Implementation
2. Contact Details
3. Compliance Reporting
4. Public Availability of Data
5. Riparian Vegetation
6. Rehabilitation and Closure
7. Residual Impacts and Risk Management Measures

These proposed conditions are closely aligned to the existing conditions for MS 946 and are not different from the intent of MS 807 and MS 946. The proposed conditions will maintain the overall level of protection of environmental values, and the required standard of management of key environmental factors. They present a contemporary and outcome based approach to managing and protection the key environmental factors relevant to the Proposal.

The Proponent proposes that these conditions be adopted for the Proposal's Statement which, if approved, will supersede MS 807 and MS 946. The proposed new Statement for the Proposal is presented in Appendix 16.

10 CONCLUSION

The Proponent considers that the Proposal will not result in detrimental environmental effects, in addition to or different from the effects of the initial Proposal as assessed, approved, and implemented under MS 807 and MS 946.

The Statement that reflects the proposed changes to Schedule 1 of the WTS Project and changes to implementation conditions is included as Appendix 16 for consideration.

10.1 APPLICATION OF THE SIGNIFICANCE FRAMEWORK

Figure 10-1 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.

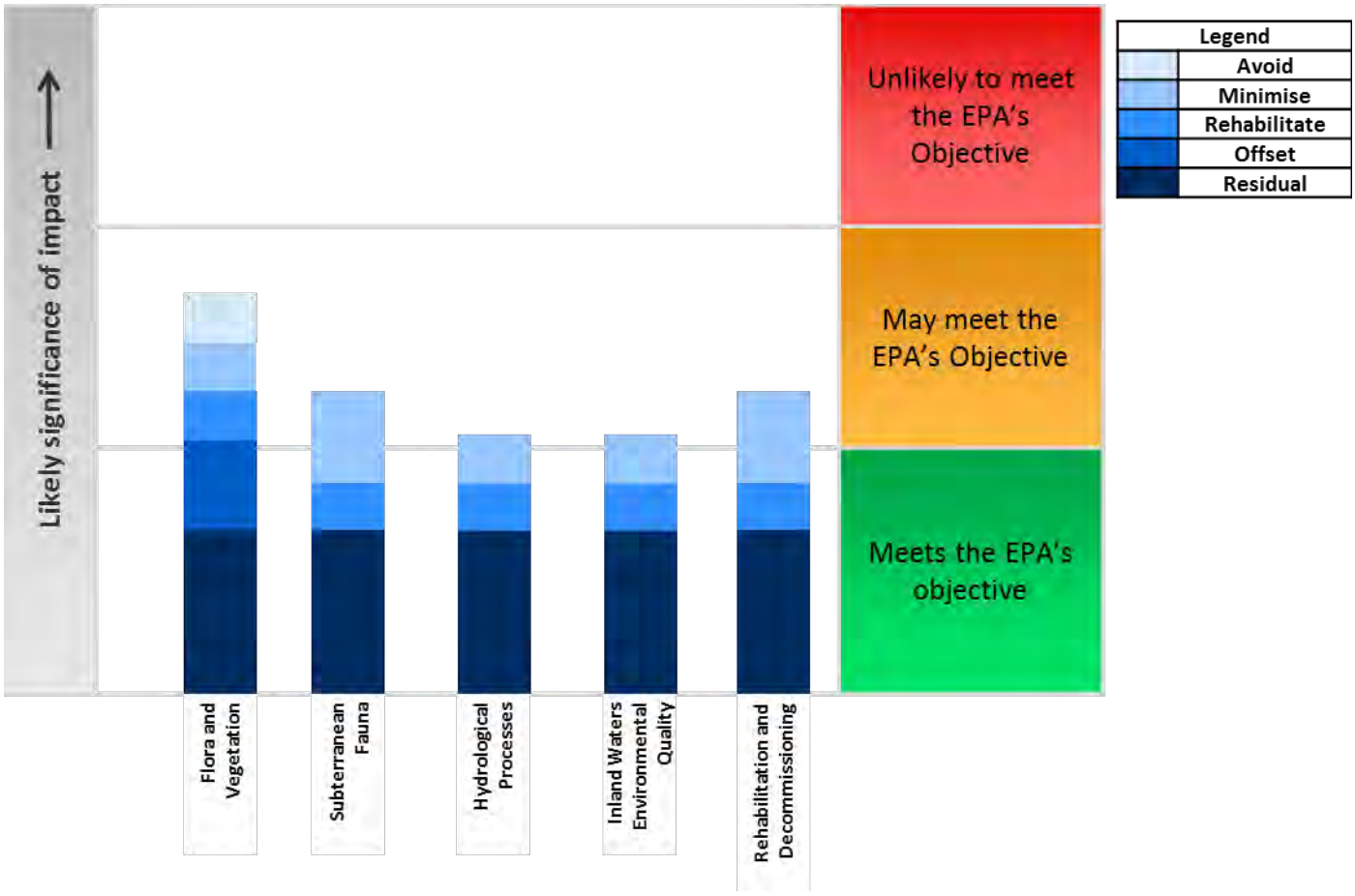

Figure 10-1: Conceptual Application of the EPA's Significance Framework

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