2. General Description of Proposal

2.1 Proposal Description

BHP Billiton Iron Ore is seeking to develop and operate Eastern Ridge mining operations under a single Ministerial Statement, as determined through the assessment of the Proposal.

The Proposal includes the following:

- exploration, mining and associated activities undertaken within the Development Envelope;
- a production rate of up to 45 Mtpa;
- mining above the water table at Orebody 32, and below the water table at Orebody 25, Orebody 24 and Orebody 25 West;
- dewatering of the below water table deposits and the discharge of surplus water volumes to Ophthalmia Dam and associated dewatering infrastructure;
- overburden backfilled in-pit or construction of ex-pit overburden storage areas;
- ore processed and transported using existing ore handling plants, moveable crushers and existing rail infrastructure; and
- construction and maintenance of ancillary infrastructure, conveyors, roads, service corridors and other associated activities to support exploration, mining, progressive rehabilitation and closure activities.

2.2 Proposal Tenure

The Proposal is located within Mineral Lease 244SA and subject to the *Iron Ore (Mount Newman) Agreement Act 1964* (Newman Agreement Act) (Figure 2). There are a number of underlying leases including:

- Special Leases N088235, I154279 and K858923 held by Mount Newman Joint Venture (pursuant to the Newman Agreement Act); and
- Pastoral Lease N049724 held by BHP Billiton Minerals Pty Ltd and Pilbara Pastoral Company Pty Limited.

The western boundary of the Development Envelope encroaches on the Great Northern Highway Road Reserve (Lot 176 and Lot 201 on DP 219293) (Figure 2). No mining will occur on the Road Reserve and consent will be obtained from Main Roads Western Australia if any activities are required within this location.

2.3 Other Approvals

2.3.1 Part V Approvals

BHP Billiton Iron Ore currently holds a Licence to Operate for Orebody 24 and Orebody 25 (L6942/1997/13). BHP Billiton Iron Ore will consult with the Department of Environment Regulation (DER) regarding the amendment of the Licence and the requirement for Works Approvals, post a decision on the Proposal.

There are a number of Native Vegetation Clearing Permits (NVCPs) within or partially overlapping the Development Envelope. These areas are excluded from the Ministerial Statement clearing allocations and a summary of all clearing under NVCPs is reported in the Annual Environmental Report (AER).

2.3.2 Rights in Water and Irrigation Act 1914

The Proposal will require mine dewatering for Orebody 24, Orebody 25 and Orebody 25 West ahead of mining below the water table to facilitate dry mining conditions. Groundwater abstraction will continue to be managed by the Department of Water (DoW) via Groundwater Licence No. 158381(6) and No. 160437(5) under the *Rights in Water and Irrigation Act 1914*. BHP Billiton Iron Ore will consult with the DoW regarding the amendment of these licences.

2.3.3 Native Title

The Proposal falls within the boundary of the Nyiyaparli Native Title Claim (WC05/6). BHP Billiton Iron Ore signed a comprehensive agreement with the Nyiyaparli in 2012. Archaeological and ethnographical surveys have been conducted to identify heritage sites in order to avoid where practicable through design, planning and engineering solutions. Where disturbance cannot be avoided, BHP Billiton Iron Ore will obtain approval under Section 18 of the *Aboriginal Heritage Act 1972*.

3. Stakeholder Consultation

BHP Billiton Iron Ore's commitment to community engagement is articulated in the company's Code of Business Conduct, whereby:

> *Our aim is to be the company of choice, valued and respected by the communities in which we operate. We do this by engaging regularly, openly and honestly with people affected by our operations, and by taking their views and concerns into account in our decision-making.*

To support this commitment, BHP Billiton Iron Ore has comprehensive company standards and dedicated resources to ensure our activities are underpinned by continuous community engagement and feedback.

BHP Billiton Iron Ore has identified stakeholders with diverse interests in the Proposal. Based on an analysis of the Proposal location, affected land users and potential impacts and risks, BHP Billiton Iron Ore has commenced consultation with the stakeholders as outlined in Table 4.

Table 4: Details of Stakeholder Consultation

Stakeholder	Date	Topic/Issue Raised	Proponent Response/Outcome
Office of the Environmental Protection Authority (OEPA)	10 March 2015	Presentation of the preliminary Eastern Ridge mining operations proposed scope and the proposed preliminary key factors and environmental impact assessments.	The OEPA advised that regional scale management plans need to meet the guidelines for environmental management plans and that site specific information is within these plans for Eastern Ridge mining operations. The OEPA also advised that the proponent will need to ensure that the API-A template contains the supporting information for Ministerial Statement amalgamation as an Appendix. The OEPA advised early consultation with government agencies about proposed changes to conditions through the revised Proposal process is required.
	2 July 2015	Presentation of the Eastern Ridge Revised Proposal scope and the supporting impact assessments undertaken for relevant environmental factors. Preliminary results were discussed.	The OEPA advised that there are other recent examples of revised proposals where other proponents have undertaken a Ministerial Statement amalgamation and the proponent needs to provide similar information as is shown in these recent project examples.
	5 November 2015	Detailed outcomes of the environmental impact assessments were discussed, in particular the: • discussions held with the Department of Parks and Wildlife (DPaW); • approach to management plans; and • key factors for the Proposal, including approach to *Eremophila magnifica* subsp. *velutina* and the Pilbara Olive Python. The discussion also included proposed revised conditions that will be superseded, replaced or deemed no longer relevant for the Proposal. Management measures and the draft structure of the management plans were also discussed.	The OEPA provided advice that they are continuing to work on implementing the approach for outcome-based conditions and the new management plan guidelines in contemporary Ministerial Statements. The OEPA advised to undertake early consultation with government agencies prior to formal referral, particularly in regards to the Pilbara Olive Python and *Eremophila magnifica* subsp. *velutina*, and the proposed changes to conditions.
	1 December 2015	BHP Billiton Iron Ore provided a 'draft for comment' version of the referral documentation to the OEPA as part of the pre-referral review process. On 14 December 2015, the OEPA provided minor comments via email regarding text edits and a request to include additional information on acid and metalliferous drainage (AMD) within Table 12.	The Referral Document has been updated accordingly to address the OEPA's review comments.

Stakeholder	Date	Topic/Issue Raised	Proponent Response/Outcome
Department of Mines and Petroleum (DMP)	3 December 2014	Discussion of progress to date on achievements and challenges in the development of Ecological Completion Criteria and alignment on new target date for defining agreed draft criteria, possibly 2020.	BHP Billiton Iron Ore committed to reporting progress in the BHP Billiton Iron Ore Annual Environmental Review document on an annual basis.
	5 January 2015	Written correspondence that outlined BHP Billiton Iron Ore's intent to develop a new consolidated Mine Closure Plan for the Eastern Ridge Mine Hub (including Orebody 32) during 2015.	This approach was discussed further with the DMP during the meeting of 29 January 2015.
	29 January 2015	This meeting provided the DMP with a general update on closure planning across the business, including Eastern Ridge. BHP Billiton Iron Ore noted that the current Decommissioning and Rehabilitation Plan applicable to Orebody 24 and Orebody 25 is scheduled to be updated in 2015, however, a new consolidated Mine Closure Plan for the wider Eastern Ridge Mine Hub (including the Orebody 32 deposit) was the preferred way forward for managing closure.	The DMP was supportive of BHP Billiton Iron Ore's approach towards creating a new consolidated Mine Closure Plan for Eastern Ridge to supersede the current plan.
	27 August 2015	Noted upcoming submissions and request for two week turn around on Closure Plan review. No position stated either way on ability to meet this timeline. Also noted that Orebody 32 East will be included in the Eastern Ridge Mine Closure Plan. The DMP assessing officer was not available for this presentation and another briefing session prior to submission was suggested by the DMP.	BHP Billiton Iron Ore scheduled a follow up session with the DMP assessing officer late October 2015 to present the Mine Closure Plan which supports the Proposal.
	21 October 2015	Detailed presentation of the Proposal scope and BHP Billiton Iron Ore's approach to closure of this hub. A number of closure scenarios were discussed, including backfill, partial backfill and no backfill scenarios. Final landform designs, AMD risk assessments and the key consideration of terrestrial environmental quality were presented to the DMP.	The DMP advised that formal response would be provided following receipt and review of the document. General comments provided to make sure details of final landform designs for those elements close to closure were included. The DMP requested the Mine Closure Plan information on the amount of topsoil available, topsoil stockpiles and information on rebound groundwater levels.
	4 December 2015	BHP Billiton Iron Ore provided a 'draft for comment' version of the referral documentation to the DMP as part of the pre-referral review process.	The Mine Closure Plan has been updated accordingly to address the DMP's review comments.

Stakeholder	Date	Topic/Issue Raised	Proponent Response/Outcome
		On 31 December 2015, the DMP provided review comments focused on key aspects that are considered most relevant to the agency, primarily rehabilitation and closure.	
Department of Water (DoW)	7-9 July 2015	BHP Billiton Iron Ore coordinated a site visit to a number of its Pilbara operations. Discussions during the site visit included: • the proposed Eastern Pilbara Water Resource Management Plan; • operation and management of Ophthalmia Dam; and • general discussions regarding future plans for potable water management across the region.	The DoW was supportive of BHP Billiton Iron Ore's approach towards water management.
	16 November 2015	BHP Billiton Iron Ore presented the Eastern Ridge Revised Proposal scope and the approach to groundwater and surface water technical studies and the Eastern Pilbara Water Resource Management Plan.	The DoW requested for technical assessments to be made available in the consultation process. Queries raised included regional drawdown, pit backfill strategies, salinisation of pit lakes, potentially acid forming (PAF) risk and the risk of releasing metals to the catchment, categorisation of waste types, and the geological understanding of the area. BHP Billiton Iron Ore committed to providing this technical information to the DoW through the formal consultation for this Referral Document.
	4 December 2015	BHP Billiton Iron Ore provided a 'draft for comment' version of the referral documentation to the DoW as part of the pre-referral review process. On 24 December 2015, the DoW provided comments via email regarding hydrological processes, groundwater quality modelling, subterranean fauna (stygofauna) and mine closure.	The Referral Document has been updated accordingly to address the DoW's review comments.
Department of Parks and Wildlife (DPaW)	15 July 2015	BHP Billiton Iron Ore discussed the results of the flora and vegetation environmental impact assessment that was in progress. DPaW advised the referral needs to provide information on the local and regional occurrence of *Eremophila magnifica* subsp. *velutina*. Amalgamation discussion was held where BHP Billiton Iron Ore proposed that conditions are removed and replaced with information in management plans; it was noted that BHP	BHP Billiton Iron Ore has held further conversations with DPaW about the approach to management plans and conditions for the amalgamation. Follow up discussions will be undertaken with the DPaW regarding the management approach to the *Eremophila magnifica* subsp*. velutina* species and population.

Stakeholder	Date	Topic/Issue Raised	Proponent Response/Outcome
		Billiton Iron Ore have allowed additional time in assessment time for negotiation of conditions and also that we plan to map which parts of the management plan replace certain conditions. DPaW noted that they are keen for discussions on the condition mapping to occur sooner rather than later and that a "mapping" summary would be highly beneficial.	
	15 August 2015	Eastern Ridge operations were discussed as part of a broader discussion about water management and BHP Billiton Iron Ore's knowledge of the existing environment through extensive historical hydrological data.	No concerns.
	17 September 2015	A site visit to Eastern Ridge was undertaken to discuss the results of impact assessments, including flora and vegetation, fauna, troglofauna, preliminary results for stygofauna and hydrological processes.	No concerns.
	28 October 2015	Outcomes of the environmental impact assessments were presented. Discussions were held on potential impacts and management actions to minimise impacts to *Eremophila magnifica subsp. velutina,* terrestrial fauna and subterranean fauna. The discussion also included the proposed revised conditions that will be superseded, replaced or deemed no longer relevant for the Proposal and mapping these to existing conditions. Management measures and the draft structure of the management plans were also discussed.	DPaW requested to review the Referral Document and relevant management plans. DPaW requested that these plans specifically refer to management of priority flora, Pilbara Olive Python and Ethel Gorge Aquifer Stygobiont Community and habitat. DPaW support outcome-based, non-prescriptive conditions in line with the risks and potential impacts of the Proposal.
	1 December 2015	BHP Billiton Iron Ore provided a 'draft for comment' version of the referral documentation to DPaW as part of the pre-referral review process. On 10 December 2015, DPaW provided comments via email regarding matters relevant to the Department's *Wildlife Conservation Act 1950* related responsibilities. DPaW advised that adequate information on conservation significant flora, vegetation and fauna values for this proposal has been provided. DPaW provided advice regarding the Priority 3 population of *Eremophila magnifica* subsp. *velutina*. If the impacts on this species are avoided/minimised and a viable portion of the local *Eremophila magnifica* subsp.	BHP Billiton Iron Ore is considering DPaW's recommendation that impacts on *Eremophila magnifica* subsp. *velutina* individuals are avoided/minimised wherever possible and that a viable portion of the local *Eremophila magnifica* subsp. *velutina* population is retained. Ground-truthing of the 2012 flora survey results was undertaken on 7 January 2016 to ascertain actual numbers and locations of *Eremophila magnifica* subsp. *velutina* in targeted areas where no disturbance is proposed. Large populations were located in the targeted areas. Species records in the targeted areas are therefore likely to be avoided during the implementation of this Proposal (Table 7 and

Stakeholder	Date	Topic/Issue Raised	Proponent Response/Outcome
		velutina population is retained, DPaW considers the implementation of the Proposal and the likely impacts on conservation significant flora, vegetation and fauna values as manageable. DPaW was supportive of the commitment to include *Eremophila magnifica* subsp. *velutina* in rehabilitation efforts.	Figure 5).
Department of State Development	19 December 2014	Submission of a notice to the Premier under the State Agreement for Orebody 25 West.	No response required.
Newman Community Consultative Group	25 November 2015	Presentation of the Eastern Ridge proposed scope and the key findings of the noise and air quality impact assessments undertaken to support the environmental approval process.	No concerns.
Nyiyaparli Traditional Owners	12 October 2015	Presentation of the Eastern Ridge proposed scope and approval process. Discussed the amalgamation of three prior approvals into a single amalgamated approval. Dust will be managed due to the close proximity to Newman.	Nyiyaparli Traditional Owners noted that dust is coming off trains. Some questions were asked about salt, and BHP Billiton Iron Ore responded that salt was not considered an issue but will be subject to ongoing monitoring and management, where required. BHP Billiton Iron Ore committed to send the Nyiyaparli Traditional Owners the Referral Document.
	17 November 2015	Presentation of the Eastern Ridge Mine Closure Plan as a case study of the application of the Regional approach to closure and rehabilitation (as outlined within the Strategic Environment Assessment)	Nyiyaparli Traditional Owners showed a strong interest in rehabilitation including; water, plant species used in rehabilitation and environmental land management (particularly post closure). Opportunities to view the site and be involved in rehabilitation activities would be welcomed. BHP Billiton Iron Ore committed to send Nyiyparli Traditional Owners the Mine Closure Plan and continue discussions regarding rehabilitation.

4. Environmental Studies and Survey Effort

Table 5 details the studies, investigations and surveys undertaken to date, the study area covered, the guidelines referred to and any limitations of the study.

Table 5: Environmental Studies and Surveys

Factor	Consultant	Survey/Report Name	Study Area, Type and Timing	Study Standard/Guidance and Limitations
Flora and Vegetation	Onshore Environmental Consultants (2015) (Appendix C)	*Eastern Ridge Flora and Vegetation Environmental Impact Assessment*	This report was completed in 2015 and assessed the additional items of scope for the Proposal and incorporated survey knowledge for the entire Development Envelope. This environmental impact assessment compiles the results of previous flora and vegetation surveys that have been completed within, or partly within, the Development Envelope between 1995 and 2013 (Onshore Environmental Consultants 2012, 2013; ENV Australia 2006, 2009, 2012; Onshore Environmental Consultants and Biologic Environmental Survey 2009; GHD 2008; Ecologia Environment 1995, 2004a, 2004b, 2005; Biota Environmental Sciences 2001; BHP Billiton Iron Ore 2000).	EPA Guidance Statement No. 51. Terrestrial Flora and Vegetation Surveys for Environmental Impact in Western Australia (EPA 2004a). EPA Guidance Statement No. 2. Environmental Protection of Native Vegetation in Western Australia: Clearing of native vegetation with particular reference to agricultural areas (EPA 2000). EPA Position Statement No. 3 Terrestrial Biological Surveys as an Element of Environmental Protection (EPA 2002).
	AQ2 (2015)	*Assessment of water sources used by riparian vegetation in Upper Homestead Creek (Memorandum to BHP Billiton)*	This memorandum was completed in 2015 and assessed water sources used by the riparian vegetation in Upper Homestead Creek area. This assessment used vegetation information collected from three baseline surveys covering portions of Homestead Creek	No standards or guidance documents referred to in this memorandum.
	Astron Environmental Services (2015a)	*Homestead Creek Riparian Vegetation Monitoring Program Annual Report*	This report documents the annual results from the riparian vegetation monitoring completed for Homestead Creek. This monitoring is a requirement under Ministerial Statements 478 and 712. Monitoring undertaken from June 2014 to April 2015. Historical monitoring results were also incorporated into this annual report.	No standards or guidance documents referred to in this memorandum.
Subterranean Fauna	Bennelongia Environmental Consultants (2015a) (Appendix D)	Eastern Ridge Revised Proposal: Stygofauna Assessment	This report was completed in 2015 and assessed the impacts to stygofauna from the additional items of scope for the Revised Proposal and incorporated survey knowledge for the entire Development Envelope and surrounding area (including Ethel Gorge).	Environmental Assessment Guideline No. 12 Consideration of subterranean fauna in environmental impact assessment in Western Australia (EPA 2013). EPA Guidance Statement No. 54a. Sampling Methods and Survey Considerations for

Factor	Consultant	Survey/Report Name	Study Area, Type and Timing	Study Standard/Guidance and Limitations
			This environmental impact assessment compiles the results of subterranean fauna sampling completed within, or partly within, the Development Envelope between 2007 and 2015. Results from ongoing subterranean fauna monitoring undertaken at Ethel Gorge and its immediate vicinity were also included.	Subterranean Fauna in Western Australia (EPA 2007).
	Bennelongia Environmental Consultants (2015b)	Eastern Ridge Revised Proposal: Troglofauna Assessment	This report was completed in 2015 and assessed the impacts to troglofauna from the additional items of scope for the Revised Proposal and incorporated survey knowledge for the entire Development Envelope and surrounding area. This environmental impact assessment compiles the results of subterranean fauna sampling completed within, or partly within the Development Envelope between 2007 and 2015.	Guidance documents as above.
	MWH (2015)	*Orebody 23/24/25 and Jimblebar Stygofauna Monitoring 2015*	The study area covered Orebody 23, 24, 25 and Jimblebar. This survey is ongoing monitoring for stygofauna in and around the Ethel Gorge Aquifer Stygobiont Community. The most recent monitoring round and accompanying report was completed in 2015, with sampling being undertaken since 2005.	EPA Guidance Statement No. 54a. Sampling Methods and Survey Considerations for Subterranean Fauna in Western Australia (EPA 2007).
	Bennelongia, Ecowise and Subterranean Ecology (data only)	*Regional Subterranean Sampling Program*	The Regional Subterranean Fauna Sampling Program has been undertaken since 2007 across BHP Billiton Iron Ore tenure (including the Development Envelope and surrounds). This sampling program involved surveying for stygofauna and troglofauna.	Guidance documents as above.
	Biota Environmental Sciences (2008)	*BHP Billiton Regional Subterranean Fauna Study (Stygofauna) 2005-2007 Final Report*	The Regional Subterranean Fauna Study was a two-year regional-scale subterranean fauna study across BHP Billiton Iron Ore operations in the Pilbara. This sampling program surveyed for stygofauna between 2005 and 2007.	EPA Guidance Statement No. 54 Consideration of subterranean fauna in groundwater and caves during Environmental Impact Assessment in Western Australia (EPA 2003).

Factor	Consultant	Survey/Report Name	Study Area, Type and Timing	Study Standard/Guidance and Limitations
Terrestrial Fauna	Astron Environmental Services (2015b) (Appendix E)	*Eastern Ridge Revised Proposal Vertebrate Fauna Environmental Impact Assessment*	This report was completed in 2015 and assessed the impacts to terrestrial vertebrate fauna from the additional items of scope for the Revised Proposal and incorporated survey knowledge for the Development Envelope. This environmental impact assessment compiles the results of previous vertebrate fauna surveys that have been completed within, or partly within, the Development Envelope between 1995 and 2013 (Biologic Environmental Survey 2013, 2014a, 2014b; Eco Logical Australia 2012; ENV Australia 2006, 2011; Onshore Environmental Consultants and Biologic Environmental Survey 2009; Outback Ecology 2009; GHD 2008; Ecologia Environment 1995, 1996, 2004a, 2004b; Biota Environmental Sciences 2001).	EPA Guidance Statement No. 56, Terrestrial Fauna Surveys for Environmental Impact Assessment in Western Australia (EPA 2004c). EPA Position Statement No. 3, Terrestrial Biological Surveys as an Element of Biodiversity Protection (EPA 2002).
	Biologic Environmental Survey (2015a)	*Eastern Ridge Revised Proposal Terrestrial Short-range Endemic Invertebrate Fauna Environmental Impact Assessment*	This report was completed in 2015 and assessed the impacts to terrestrial short-range endemic invertebrate fauna species from the additional items of scope for the Revised Proposal and incorporated survey knowledge for the Development Envelope. This environmental impact assessment compiles the results of previous short-range endemic invertebrate fauna surveys that have been completed within, or partly within, the Development Envelope between 2008 and 2014 (Biologic Environmental Survey 2014b, 2015b; Outback Ecology 2008; ENV Australia 2008)	EPA Guidance Statement No. 20 Sampling of Short Range Endemic Invertebrate Fauna for Environmental Impact Assessment in Western Australia (EPA 2009). EPA Guidance No. 56, Terrestrial Fauna Surveys for Environmental Impact Assessment in Western Australia (EPA 2004c). EPA Position Statement No. 3, Terrestrial Biological Surveys as an Element of Biodiversity Protection (EPA 2002).
Hydrological Processes / Inland Waters Environmental Quality	BHP Billiton Iron Ore (2015a) (Appendix F)	*Eastern Ridge Revised Proposal Hydrological Change Assessment*	This study was completed in 2015 and it consolidated the outcomes of two field hydrogeological investigations and two modelling studies: • Orebody 24 Financial Year (FY) 14 Hydrogeological Investigation Report (BHP Billiton Iron Ore 2014a); • Orebody 25 West FY14 Hydrogeological Investigations Report (BHP Billiton Iron Ore	The main uncertainties associated with the studies are: • Lack of any long term transient calibration data in the Orebody 24 and Orebody 25 West area commensurate with long term mine dewatering; • Assumptions inherent in the mine plan (i.e. rate, sequence, timing and depth of

Factor	Consultant	Survey/Report Name	Study Area, Type and Timing	Study Standard/Guidance and Limitations
			2014b); • Ethel Gorge Modelling Report (RPS 2015b); and • Memorandum - Ethel Gorge Assessment of the Impact of Orebody 31 Dewatering Discharge into Ophthalmia Dam – Groundwater and Salt Balance Modelling (RPS 2014).	pushbacks); and Assumptions in closure settings (particularly backfill properties and evaporation rates). Guidelines are listed below.
	RPS (2015)	*Eastern Ridge Mining Operations Amalgamation: Surface Water Environmental Impact Assessment*	This study was an environmental impact assessment review of potential impacts to surface water from the Proposal and was completed in 2015.	Operational Policy No.1.02 Policy on water conservation/efficiency plans (DoW 2009). Pilbara Regional Water Plan 2010-2030 (DoW 2010). Operational Policy No. 5.08 Use of Operating Strategies in the water licensing process (DoW 2011). Western Australia Water in Mining Guideline (DoW 2013a). Pilbara Groundwater Allocation Plan (DoW 2013b). Pilbara Regional Water Supply Strategy: a long-term outlook of water demand and supply (DoW 2013c). Use of Mine Dewatering Surplus (DoW 2013d). Newman Water Reserve Drinking Water Source Protection Plan (DoW 2014). Australian Drinking Water Guidelines Paper 6 National Water Quality Management Strategy (NHMRC, NRMMC 2011). Guidelines for Preparing Mine Closure Plans (DMP and EPA 2015). EAG No. 8 for Environmental principles, factors, and objectives (EPA 2015).

Factor	Consultant	Survey/Report Name	Study Area, Type and Timing	Study Standard/Guidance and Limitations
Landforms	360 Environmental Consultants (2015)	*Eastern Ridge Revised Proposal Landscape and Visual Impact Assessment*	This study was completed in 2015. It included data captured from pre-determined vantage points in the vicinity of the Proposal area. It also utilised modelling to assess the impact on viewsheds and landscape character types in the Eastern Pilbara region.	Visual Landscape Planning in Western Australia: a Manual for Evaluation, Assessment, Siting and Design (DPI 2007). Guidelines for Landscape and Visual Impact Assessment 3rd Edition (Landscape Institute and Institute of Environmental Management and Assessment 2013).
Terrestrial Environmental Quality	SRK (2015a to 2015g) Numerous reports included as Appendices to the Eastern Ridge Mine Closure Plan (Appendix G)	*AMD waste characterisation and risk assessments for the Eastern Ridge deposits* (included within the Proposal)	The AMD studies were completed in 2014 and 2015. The studies reviewed the potential AMD risks for Orebody 23/25, Orebody 24 below the water table mining, Orebody 25 West below the water table mining and Orebody 32 above the water table mining. Specific geochemical scoping calculations have been undertaken to evaluate groundwater chemistry associated with Orebody 25 (Pit 3) and Orebody 23 pit voids as both pit lakes and backfilled pits, noting the controls required for backfilling pits with respect to backfill material geochemistry. Calculations examined the evolution of pit water chemistry over a period of 100 years following mine closure. Base case values for key parameters (e.g. oxidation rate, leachable content of backfill and evaporation rate) were used along with sensitivity analysis to evaluate the effect of key input parameters on the outcomes (see Mine Closure Plan section *7.8.3.2 Groundwater; water quality – mine voids approaching closure*). This assessment incorporated information supplied by BHP Billiton Iron Ore including: geochemical characterisation of geological materials, geological and mine planning data, and findings of surface water, groundwater and ecological studies.	Department of Industry, Tourism and Resources [DITR] (2007) Leading Practice Sustainable Development Program for the Mining Industry - Managing Acid and Metalliferous Drainage. International Network for Acid Prevention (2012*)* Global Acid Rock Drainage Guide (GARD Guide). Australian and New Zealand Environment Conservation Council and Agriculture and Resource Management Council of Australia and New Zealand (2000), Australian Water Guidelines for Fresh and Marine Waters and its updates.

Factor	Consultant	Survey/Report Name	Study Area, Type and Timing	Study Standard/Guidance and Limitations
	Landloch (2013, 2015a, 2015b)	*Erosion characteristics and design of stable landforms for Eastern Ridge*	These studies were undertaken between 2013-2015. The assessment of waste rock from across the Eastern Ridge operations to assess suitability in constructing closure landforms.	Department of Mines and Petroleum and Environmental Protection Authority, Guidelines for Preparing Mine Closure Plans May 2015 (DMP and EPA 2015).
Air Quality and Atmospheric Gases	Jacobs (2015)	*Eastern Ridge Revised Proposal Air Quality Environmental Impact Assessment*	This study was completed in 2015 and identified any potential air quality issues and assessed any potential air quality impacts to local sensitive receptors, including the township of Newman, from Eastern Ridge revised proposal. The study assessed these aspects for current Eastern Ridge operations, proposed Eastern Ridge operations and proposed operations plus other existing operations (cumulatively for the Eastern Pilbara BHP Billiton Iron Ore operations).	National Environment Protection (Ambient Air Quality) Measures (National Environmental Protection Council 2003). Emission Estimation Technique Manual for Mining (National Pollutant Inventory 2012). Compilation of Air Pollutant Emission Factors, AP-42 (U.S. Environmental Protection Agency 1985).
	BHP Billiton Iron Ore (2015c)	*Greenhouse Gas Assessment*	Review of mine plan data and updated greenhouse gas assessment for the Eastern Ridge Revised Proposal.	*National Greenhouse and Energy Reporting Act 2007.* National Greenhouse Accounts (NGA) Factors (Commonwealth Department of Climate Change and Energy Efficiency 2010).
Amenity	360 Environmental Consultants (2015)	*Eastern Ridge Revised Proposal Landscape and Visual Impact Assessment*	This study was completed in 2015. It included data captured from pre-determined vantage points in the vicinity of the Proposal area. It also utilised modelling to assess the impact on viewsheds and landscape character types in the Eastern Pilbara region.	Visual Landscape Planning in Western Australia: a Manual for Evaluation, Assessment, Siting and Design (DPI 2007). Guidelines for Landscape and Visual Impact Assessment 3rd Edition (Landscape Institute and Institute of Environmental Management and Assessment 2013).
Heritage	Various	*A number of archaeological and ethnographical surveys have been carried out.*	Archaeological and ethnographical surveys have been undertaken within the Development Envelope.	Guidance Statement No. 41 Assessment of Aboriginal Heritage (EPA 2004d).
Human Health	SVT Engineering Consultants (2015)	*Eastern Ridge Environmental Noise Assessment*	This study was completed in 2015. This study utilised noise modelling to assess the potential impact of the Proposal by determination	Environmental Assessment Guideline No. 13 for consideration of environmental impacts from noise (EPA 2014a).

Factor	Consultant	Survey/Report Name	Study Area, Type and Timing	Study Standard/Guidance and Limitations
			of potential noise levels at selected sensitive receptors within the regional area.	Environmental Protection (Noise) Regulations 1997 (EPA 2014b).
Rehabilitation and Decommissioning	BHP Billiton Iron Ore (2015b) (Appendix G)	*Eastern Ridge Mine Closure Plan*	This Mine Closure Plan was prepared in 2015. The Mine Closure Plan presents the closure strategies for the existing Orebody 24, Orebody 25, Orebody 32 and Orebody 23, and the new proposed mining at Orebody 25 West consolidated into a single hub based Mine Closure Plan. Supporting technical studies for key risk areas were undertaken to inform the risk assessment and closure management strategy for each deposit.	Department of Mines and Petroleum and Environmental Protection Authority, Guidelines for Preparing Mine Closure Plans May 2015 (DMP and EPA 2015).

5. Assessment of Preliminary Key Environmental Factors

5.1 Assessment of Preliminary Key Environmental Factors

Key environmental factors were identified for the Proposal during the assessment process undertaken for Ministerial Statements 712, 834 and 1018. BHP Billiton Iron Ore has completed environmental impact studies to quantify the potential environmental impacts and determine the significance of the environmental factors identified for Eastern Ridge against the EPA Significance Framework (EPA 2015a). The environmental factors outlined within the existing Ministerial Statements were reviewed following the completion of the studies and impact assessments for the Proposal. The potential key environmental factors, as defined in EAG No. 8 (EPA 2015b) were determined and include the key environmental factors as detailed in Table 6. Other factors which were considered in relation to this assessment but are not considered key factors are discussed in Section 6.

Table 6: Preliminary Environmental Factors

EPA Factor	Proposal Aspect	Potential Impact
Flora and Vegetation	Mine pit excavation. Ex-pit overburden storage areas. Non-process infrastructure, including access tracks.	Clearing of native vegetation in 'Good' or above condition. Clearing of the Priority 3 flora species, *Eremophila magnifica* subsp. *velutina*. Potential impacts to riparian tree species (*Eucalyptus camaldulensis* subsp. *refulgens* and *E. victrix*) located within sections of Homestead Creek. Spread/introduction of weeds.
Subterranean Fauna (Stygofauna)	Groundwater drawdown through mine dewatering. Quality of surplus water discharge.	Potential reduction of quality or quantity of habitat for stygofauna at Ethel Gorge Aquifer Stygobiont Community.
Terrestrial Fauna (Vertebrate Fauna)	Mine pit excavation. Ex-pit overburden storage areas. Non-process infrastructure, including access tracks.	Clearing of Pilbara Olive Python individuals and suitable habitat (semi-permanent waterholes).
Hydrological Processes	Groundwater drawdown through mine dewatering. Quality of surplus water discharge.	Change in local and regional groundwater levels and quality.
Offsets (integrating factor)	Mine pit excavation. Ex-pit overburden storage areas. Non-process infrastructure, including access tracks.	Clearing of native vegetation in 'Good' or above condition.
Rehabilitation and Decommissioning (integrating factor)	Alteration of the landform through the creation of pits, overburden storage areas and overland infrastructure.	Pit voids with the potential to become pit lakes post-closure. Landform stability and visual impacts. Potential AMD impacts on groundwater, surface water and soil quality.

For each key environmental factor, the following information is provided (Tables 7 to 12):

- context, including a concise description of the relevant environmental values;
- environmental aspects and the potential impacts resulting from the proposed development;
- a description of ongoing mitigation for each significant impact;
- the regulation process required to make sure adequate mitigation occurs; and
- a statement of the outcome and justification to demonstrate that the EPA's objective would be achieved.

BHP Billiton Iron Ore has considered the mitigation hierarchy in the *Western Australian Environmental Offsets Guidelines* (Western Australian Government 2014) and the EPA's bulletin *Environmental Protection Bulletin No.1 Environmental Offsets* (EPA 2014c) which describes how the EPA will consider offsets through the environmental impact assessment process. The mitigation hierarchy steps include:

- avoid;
- minimise;
- rehabilitate; and
- offset.

BHP Billiton Iron Ore considers that the potential impacts on the key factors can be adequately managed through the implementation of regional management plans. The management plans that are applicable to the implementation of the Proposal include:

- Eastern Ridge Mine Closure Plan (Appendix G);
- Condition Environmental Management Plan (Appendix H); and
- Eastern Pilbara Water Resource Management Plan (Appendix I).

5.2 Application of the Significance Framework

BHP Billiton Iron Ore has applied the significance framework detailed in EAG No. 9 *Application of a significance framework in the environmental impact assessment process* (EPA 2015a) during the assessment of the Proposal. The significance framework has been applied to manage the residual impacts following the consideration of the mitigation hierarchy and proposed management actions. Figure 4 provides a conceptual illustration intended to provide the EPA with confidence that the objective for each preliminary key environmental factor will be met.

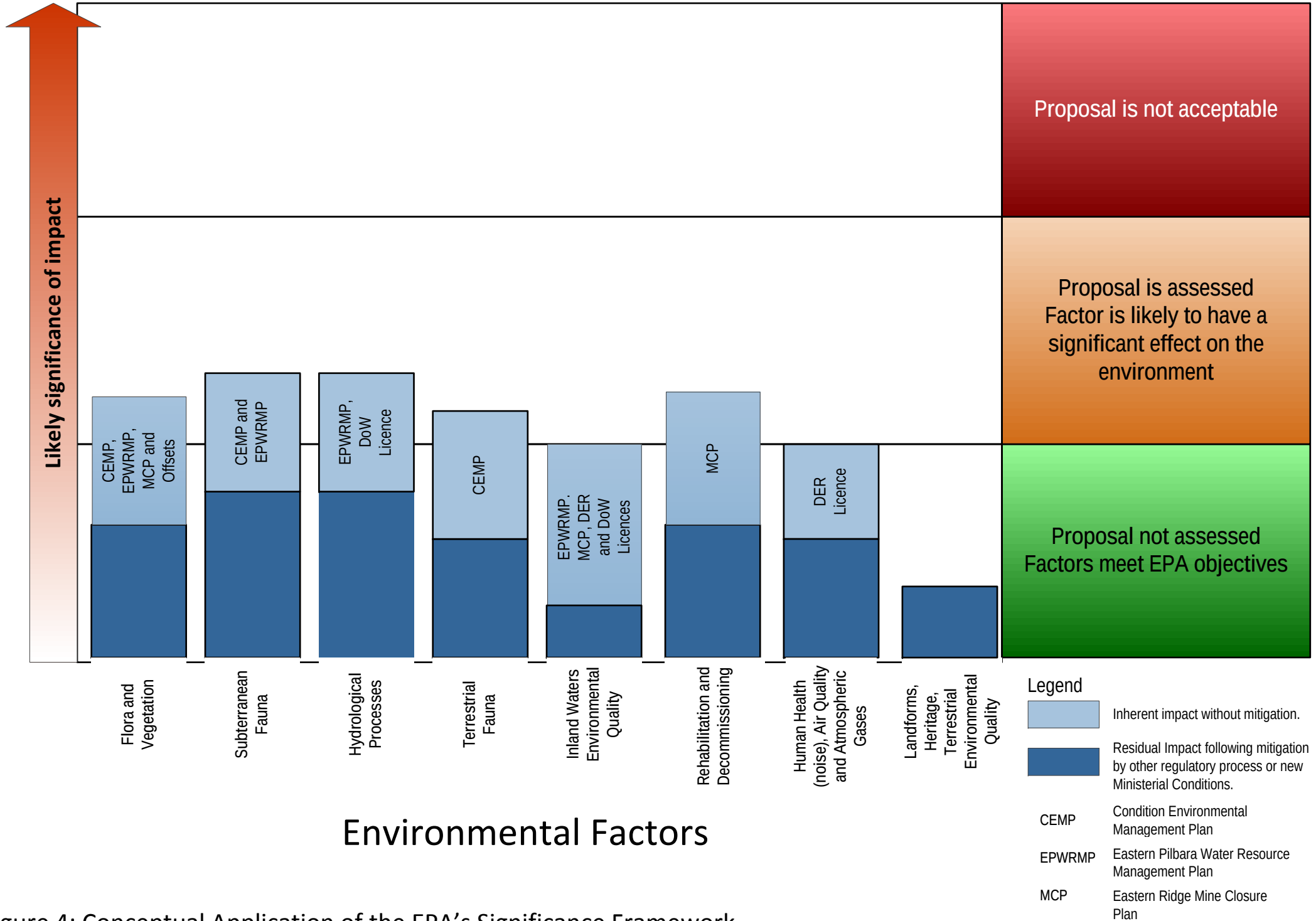


Figure 4: Conceptual Application of the EPA's Significance Framework

Table 7: Assessment of Key Environmental Factors – Flora and Vegetation

Inherent impact and aspects that may cause a significant impact	Mitigation actions to address residual impacts	Proposed regulatory mechanisms for ensuring mitigation	Outcome to demonstrate the Proposal meets EPA objective
Vegetation and Flora – *To maintain representation, diversity, viability and ecological function at the species, population and community level.*			
• No Threatened Flora species pursuant to subsection (2) of Section 23F of the *Wildlife Conservation Act 1950* (WC Act) or listed under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) have been recorded from the Development Envelope. • Four Priority flora species as listed by the DPaW have been recorded from within the Development Envelope (Figure 5): o *Isotropis parviflora* (Priority 2); o *Eremophila magnifica* subsp. *velutina* (Priority 3); o *Calotis latiuscula* (Priority 3); and o *Goodenia nuda* (Priority 4). • Due to a large number of *Eremophila magnifica* subsp. *velutina* records within the Development Envelope, impact to this species is considered high at a local scale; however, given the relatively large known distribution within the Pilbara region, the regional impact is determined to be low (Onshore Environmental Consultants 2015). Large populations of this species were located in areas where no ground disturbance is proposed (Figure 5) and are therefore likely to be avoided during the implementation of this Proposal. • Impacts to the three other Priority flora species are considered negligible. • Sections of Homestead Creek supporting the facultative phreatophyte species *Eucalyptus camaldulensis* subsp. *refulgens* and *E. victrix*, have been identified as species with the potential to be at risk from groundwater drawdown (Onshore Environmental Consultants 2015). The risk from cumulative groundwater drawdown to vegetation supporting the species *E. camaldulensis* subsp. *refulgens* and *E. victrix* is determined to be low (Onshore Environmental Consultants 2015). • Twenty-two introduced flora species (weeds) have been recorded from within the Development Envelope. None of the introduced flora species are listed as a Declared Pest under the *Biosecurity and Agriculture Management Act 2007* (BAM Act). • Twelve vegetation associations have been mapped from within the Development Envelope. None of these vegetation associations are affiliated with Federal and State listed Threatened Ecological Communities (TECs), or State listed Priority Ecological Communities (PECs). • The vegetation condition within the Development Envelope was rated as 'Pristine' through to 'Completely Degraded' (Onshore Environmental Consultants 2015) (Figure 6). • Two vegetation associations have been identified as potentially at risk from surface water flow alterations or reduction, due to the occurrence of Mulga species along minor and major drainage lines. Both vegetation associations occur within small areas of the Development Envelope and are well represented regionally, therefore potential impacts are considered to be low (Onshore Environmental Consultants 2015).			
Clearing of native vegetation in 'Good' condition or above.	*Avoid* – Use of existing infrastructure and facilities to reduce the clearing required. *Minimise* – PEAHR must be in place prior to land disturbance to minimise impacts to native vegetation through unauthorised clearing. *Minimise* – Reduce the clearing required for overburden storage areas through disposal of waste rock within mine pits where practicable. *Offset* – Provision of an environmental offset for unavoidable clearing of native vegetation in 'Good' condition or above.	A Ministerial Condition is suggested in Appendix J to implement the Condition Environmental Management Plan (Appendix H) to meet the objectives for the factor of Flora and Vegetation. This plan contains legal obligations for the ongoing mitigation and management of the Proposal. BHP Billiton Iron Ore is also committing to financial offsets to address residual impact for clearing of each hectare of native vegetation in 'Good' condition or above (refer to Offsets Factor, Table 11).	Flora and vegetation will be managed by the Ministerial Statement and the implementation of the Condition Environmental Management Plan. BHP Billiton Iron Ore considers it will meet the EPA objective for this factor within the Proposal area.
Clearing of *Eremophila magnifica* subsp. *velutina.*	*Avoid* – Known locations of *Eremophila magnifica* subsp. *velutina* located in areas where no ground disturbance is proposed will be avoided where practicable (i.e. outside of indicative pit and OSA boundaries; Figure 5). *Minimise* – PEAHR must be in place prior to land disturbance to minimise impacts through unauthorised clearing. *Rehabilitation* – Progressive rehabilitation will be implemented which will include the use of *Eremophila magnifica* subsp. *velutina* material.	A Ministerial Condition is suggested in Appendix J to implement the Eastern Ridge Mine Closure Plan (Appendix G) and the Condition Environmental Management Plan (Appendix H) to meet the objectives for the factor of Flora and Vegetation. These plans contain legal obligations for the ongoing mitigation and management of the Proposal.	
Groundwater drawdown.	*Minimise* – Monitoring of *Eucalyptus camaldulensis* subsp. *refulgens* and *E. victrix* within the Creek Monitoring Zone (section of Homestead Creek) will be undertaken periodically during activities that have the potential to cause an impact (i.e. active dewatering).	A Ministerial Condition is suggested in Appendix J to implement the Condition Environmental Management Plan (Appendix H) and the Eastern Pilbara Water Resource Management Plan (Appendix I) to meet the objectives for the factor of Flora and Vegetation. These plans contain legal obligations for the ongoing mitigation and management of the Proposal.	
Introduction or spread of weeds.	*Avoid* – Weed hygiene inspections of ground-engaging equipment prior to arriving at site. *Minimise* – Undertake periodic weed surveys, including species identification and mapping. *Minimise* – Implement weed management controls as required for areas adjacent to native vegetation.	A Ministerial Condition is suggested in Appendix J to implement the Condition Environmental Management Plan (Appendix H) to meet the objectives for the factor of Flora and Vegetation. This plan contains legal obligations for the ongoing mitigation and management of the Proposal.	

Table 8: Assessment of Key Environmental Factors – Subterranean Fauna (Stygofauna)

Inherent impact and aspects that may cause a significant impact	Mitigation actions to address residual impacts	Proposed regulatory mechanisms for ensuring mitigation	Outcome to demonstrate the Proposal meets EPA objective
Subterranean Fauna – *To maintain representation, diversity, viability and ecological function at the species, population and assemblage level.*			
• A total of 49 stygofauna species have been collected from the Groundwater Assessment Area (i.e. the area where the cumulative modelled drawdown is greater than or equal to 2 m over and above the natural climatic fluctuations). Five species have ranges that may result in the species being impacted from the modelled groundwater drawdown (Figure 7). These species include: o Enchytraeidae sp. OB3; o Phreodrilidae sp. WAM indet. 1; o *Pilbaracandona* 'OST002'; o *Bathynella* sp. B12; and o Bathynellidae sp. WAM indet. 1. • The five species in the Groundwater Assessment Area occur within the alluvium along the tributaries associated with the Upper Fortescue River. The considerable extent and habitat connectivity of the alluvial aquifers of the Tertiary Detrital valley-fill successions in these tributaries is expected to allow dispersal of stygofauna species between the Groundwater Assessment Area and surrounding aquifers. This extension of habitat is demonstrated by the occurrence of related species throughout the area therefore it is considered likely that the respective range for these species extends beyond the Groundwater Assessment Area (Bennelongia Environmental Consultants 2015a). • Ethel Gorge Aquifer Stygobiont Community is listed as an Endangered TEC endorsed by the Minister for Environment. It is located adjacent to the Development Envelope, and has the potential to be impacted from groundwater drawdown and from changes in water quality through discharge of surplus water into Ophthalmia Dam. Groundwater modelling predicts that there will be a minimal change in water levels and to the extent of drawdown when compared with areas previously approved (BHP Billiton Iron Ore 2015a, Bennelongia Environmental Consultants 2015a). • Monitoring of the Ethel Gorge Aquifer Stygobiont Community has been ongoing since 2005. The diversity of core endemic species recorded in the 2015 program is consistent with previous programs and indicates that there is not a decline in the stygobiont community at Ethel Gorge (MWH 2015). Based on these results and the minimal proposed change in water levels and spatial extent, the predicted additional drawdown at Ethel Gorge Aquifer Stygobiont Community resulting from the Proposal is unlikely to pose additional threat to stygofauna species (Bennelongia Environmental Consultants 2015a).			
Groundwater drawdown at Ethel Gorge Aquifer Stygobiont Community.	*Minimise* – Monitoring of groundwater levels within the Ethel Gorge Primary Habitat Monitoring Zone during operations (i.e. active dewatering) will be undertaken.	A Ministerial Condition is suggested in Appendix J to implement the Condition Environmental Management Plan (Appendix H) and the Eastern Pilbara Water Resource Management Plan (Appendix I) to meet the objectives for the factor of Subterranean Fauna. These plans contain legal obligations for the ongoing mitigation and management of the Proposal.	Subterranean fauna will be managed by the Ministerial Statement and the implementation of the Condition Environmental Management Plan and the Eastern Pilbara Water Resource Management Plan. BHP Billiton Iron Ore considers it will meet the EPA objective for this factor within the Proposal area.
Changes in water quality at Ethel Gorge Aquifer Stygobiont Community through disposal of surplus water.	*Minimise* – Monitoring of groundwater quality within the Ethel Gorge Primary Habitat Monitoring Zone during operations (i.e. active dewatering) will be undertaken.		

Table 9: Assessment of Key Environmental Factors – Terrestrial Fauna (Vertebrate Fauna)

Inherent impact and aspects that may cause a significant impact	Mitigation actions to address residual impacts	Proponent's proposed mechanism for ensuring mitigation	Outcome to demonstrate the Proposal meets EPA objective
Terrestrial Fauna – *To maintain representation, diversity, viability and ecological function at the species, population and assemblage level.*			
• Five conservation significant fauna species have been recorded from within the Development Envelope (Figure 8): o Pilbara Olive Python (*Liasis olivaceus barroni*) (EPBC Act Vulnerable; WC Act Schedule 3); o Peregrine Falcon (*Falco peregrinus*) (WC Act Schedule 7); o Rainbow Bee-eater (*Merops ornatus*) (EPBC Act Migratory; WC Act Schedule 5); o Ghost Bat (*Macroderma gigas*) (WC Act Schedule 3, DPaW Priority 4); and o Western Pebble-mound Mouse (*Pseudomys chapmani*) (DPaW Priority 4). • The Pilbara Olive Python was recorded from six locations within the Development Envelope, including a number of semi-permanent waterholes (preferred Pilbara Olive Python habitat). Proposed disturbance is likely to result in impacts to this species at a local level. This Pilbara Olive Python population may be considered an 'important population' as defined by Department of Environment (Astron Environmental Services 2015b). • The Peregrine Falcon, Rainbow Bee-eater, Ghost Bat and Western Pebble-mound Mouse are all known from previously approved areas within the Development Envelope and potential impacts are considered negligible (Astron Environmental Services 2015b). • Eight vertebrate fauna habitats were mapped within the Development Envelope, all of which are considered to be common, widely represented and typical of the Pilbara region; and therefore, do not have high ecosystem functional value. It is considered that the impact of clearing associated with the Proposal is unlikely to be significant (Astron Environmental Services 2015b).			
Clearing and alterations of fauna habitats.	*Avoid* – The Development Envelope has been modified to avoid some of the known locations of the Pilbara Olive Python habitat (specifically semi-permanent waterholes) to minimise direct impacts to this species where practicable (Figure 8). *Avoid* – Use of existing infrastructure and facilities to reduce the clearing required. *Minimise* – PEAHR must be in place prior to land disturbance to minimise impacts to fauna habitat through unauthorised clearing. *Minimise* – Reduce the clearing required for overburden storage areas through disposal of waste rock within mine pits where practicable.	A Ministerial Condition is suggested in Appendix J to implement the Condition Environmental Management Plan (Appendix H) to meet the objectives for the factor of Terrestrial Fauna. This plan contains legal obligations for the ongoing mitigation and management of the Proposal.	Terrestrial fauna will be managed by the Ministerial Statement and the implementation of the Condition Environmental Management Plan. BHP Billiton Iron Ore considers it will meet the EPA objective for this factor within the Proposal area.
Direct mortality of Pilbara Olive Python individuals.	*Avoid* – The Development Envelope has been modified to avoid some of the known locations of the Pilbara Olive Python habitat (specifically semi-permanent waterholes) to minimise direct impacts to this species where practicable (Figure 8).		

Table 10: Assessment of Key Environmental Factors – Hydrological Processes

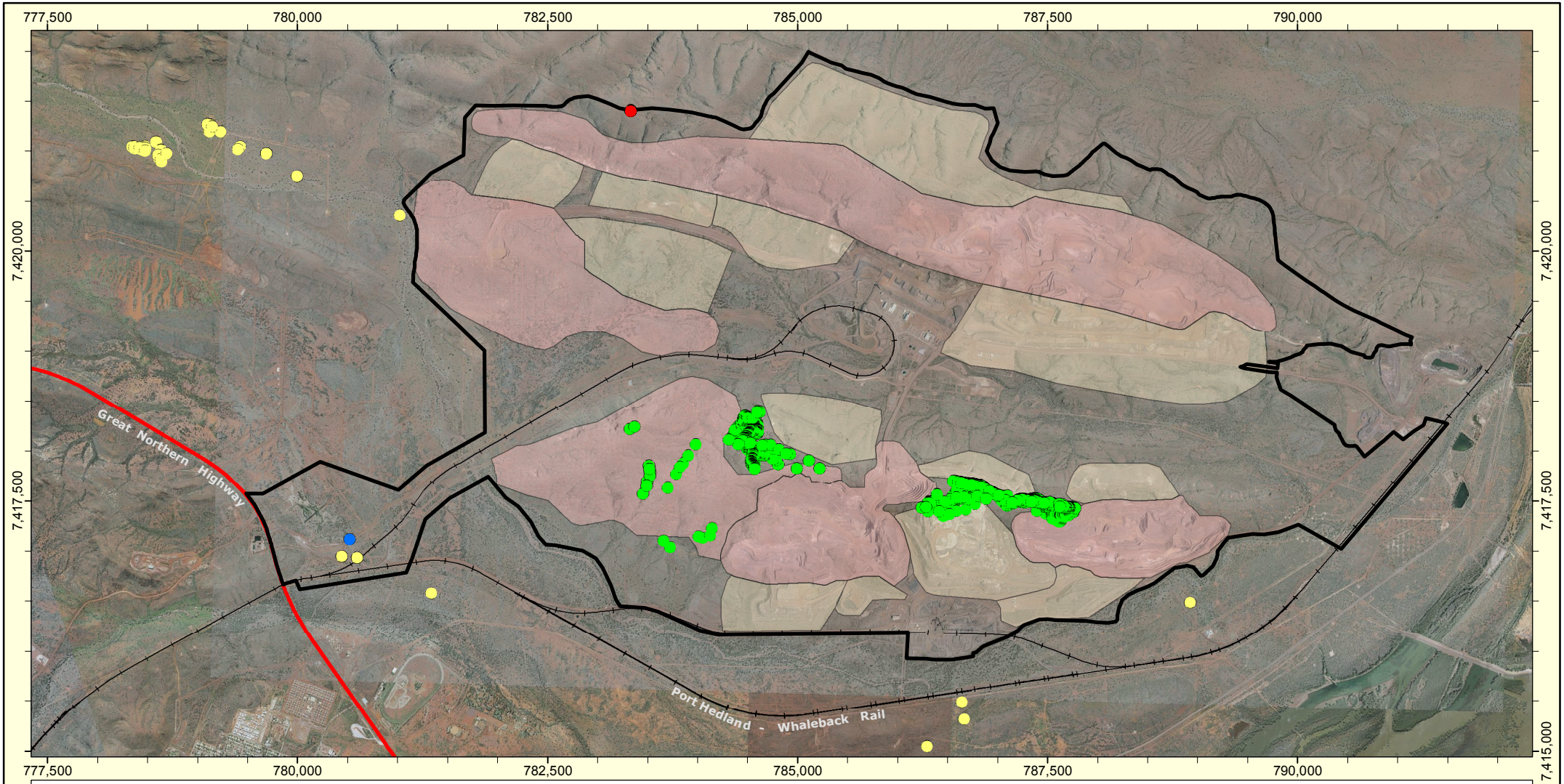
Inherent impact and aspects that may cause a significant impact	Mitigation actions to address residual impacts	Proposed regulatory mechanisms for ensuring mitigation	Outcome to demonstrate the Proposal meets EPA objective
Hydrological Processes – *To maintain the hydrological regimes of groundwater and surface water so that existing and potential uses, including ecosystem maintenance, are protected.*			
• The Proposal is located within a Public Drinking Water Source Area (Newman Water Reserve) and is adjacent to the Homestead and Ophthalmia borefields which are the potable water supply for the town of Newman, operated by BHP Billiton Iron Ore. These borefields are managed in accordance with a DoW approved Drinking Water Source Protection Plan and the Australian Drinking Water Guidelines (NHMRC, NRMMC 2011). In addition, BHP Billiton is constructing a new water treatment plant in Newman to mitigate any residual risks and deliver water within the Australian Drinking Water Guidelines. • Water balance modelling indicates that the dewatering volume is likely to be greater than the operational water demand and surplus water will be produced. The estimated dewatering volume is up to 24 GL/a with surplus water of up to 19 GL/a. • The change in local and regional groundwater levels resulting from dewatering is: o expected to be localised to the mining area; o likely to be dominated by the abstraction from the Homestead Borefield during the operational periods, in the upper Homestead Creek catchment; and o likely to represent less than 5% of the total drawdown contribution beneath Homestead Borefield and an additional abstraction of 20% for the Proposal. • The cumulative effects of changes resulting from the existing and proposed operations on groundwater levels in Ethel Gorge habitat is consistent with the original impact assessment for Eastern Ridge and remain within natural variance during operational periods owing to the Ophthalmia Dam recharge system maintaining water levels within the Ethel Gorge aquifer. This is supported by the groundwater modelling undertaken for Eastern Ridge, informed by historical monitoring data, which shows drawdown of local and regional groundwater within the Ethel Gorge aquifer is likely to be limited due to direct infiltration through Ophthalmia Dam, adjoining infiltration ponds and natural infiltration at Homestead Creek and Shovelanna Creek. • The discharge of surplus water into Ophthalmia Dam is not expected to have an unacceptable impact on the receiving environment. The management of surplus water is outlined in the Eastern Pilbara Water Resource Management Plan. • The modelling shows there is the potential to modify the hydrological conditions to unacceptable levels during operations and closure in the Ethel Gorge aquifer, potentially impacting the Ethel Gorge Aquifer Stygobiont Community. The management of water levels in Ethel Gorge aquifer is outlined in the Eastern Pilbara Water Resource Management Plan. • Dewater is proposed to be used as an operational water supply. Surplus water management options include: o re-used onsite in mining operations; o transferred to other nearby operations for use onsite; and o discharged via Ophthalmia Dam or the associated infiltration basins and recharge ponds. Note: Potential impacts to salinity resulting from surplus water management is addressed under the Inland Waters Environmental Quality factor in Table 13 and potential impacts to salinity resulting from post-closure pit voids is addressed under the Rehabilitation and Decommissioning factor in Table 12		
Groundwater drawdown.	*Minimise* – Monitoring of groundwater levels during operations (i.e. active dewatering) will be undertaken in accordance with the Eastern Pilbara Water Resource Management Plan (2015).	A Ministerial Condition is suggested in Appendix J to implement the Eastern Pilbara Water Resource Management Plan (Appendix I) to meet the objectives for the factor of Hydrological Processes. This plan contains legal obligations for the ongoing mitigation and management of the Proposal. Operate in accordance with DoW groundwater licences for the Eastern Ridge mining operations. Operate in accordance with DER licences for the disposal of surplus water to Ophthalmia Dam from the Eastern Ridge mining operations.	The Proponent therefore considers that the Proposal can meet the EPA's Objective for hydrological processes through the implementation of the Eastern Pilbara Water Resource Management Plan.
Changes in water quality through disposal of surplus water to Ophthalmia Dam.	*Minimise* – Monitoring of groundwater quality during operations (i.e. active dewatering) will be undertaken in accordance with the Eastern Pilbara Water Resource Management Plan (2015).		

Table 11: Assessment of Key Environmental Factors – Offsets

Inherent impact and aspects that may cause a significant impact	Mitigation actions to address residual impacts	Proposed regulatory mechanisms for ensuring mitigation	Outcome to demonstrate the Proposal meets EPA objective
Offsets – *To counterbalance any significant residual environmental impacts or uncertainty through the application of offsets*			
• The Proposal is seeking an additional 1,560 ha (in addition to the 2,260 ha already approved) clearing of native vegetation in 'Good' condition or above (Figure 6).			
Clearing of vegetation in 'Good' condition or above.	*Avoid* – Use of existing infrastructure and facilities to reduce the clearing required. *Minimise* – PEAHR must be in place prior to land disturbance to minimise impacts to native vegetation through unauthorised clearing. *Minimise* – Reduce the clearing required for overburden storage areas through disposal of waste rock within mine pits where practicable. *Offset* – Provision of an environmental offset for unavoidable clearing of native vegetation in 'Good' condition or above.	A Ministerial Condition is suggested in Appendix J to implement the Condition Environmental Management Plan (Appendix H) to meet the objectives for the factor of Offsets. This plan contains legal obligations for the ongoing mitigation and management of the Proposal. BHP Billiton Iron Ore is also committing to financial offsets to address residual impact for clearing of each hectare of native vegetation in 'Good' condition or above. A completed Offsets Form and supporting documentation is included as Appendix K.	Offsets will be managed by the Ministerial Statement and the implementation of the Condition Environmental Management Plan. BHP Billiton Iron Ore proposes to counterbalance any significant residual environmental impacts or uncertainty through the application of offsets. BHP Billiton Iron Ore considers it will meet the EPA objective for this factor within the Proposal area.

Table 12: Assessment of Key Environmental Factors – Rehabilitation and Decommissioning

Inherent impact and aspects that may cause a significant impact	Mitigation actions to address residual impacts	Proposed regulatory mechanisms for ensuring mitigation	Outcome to demonstrate the Proposal meets EPA objective
Rehabilitation and Decommissioning – *To ensure that premises are decommissioned and rehabilitated in an ecologically sustainable manner.*			
• Approximately 3,820 ha of ground disturbance will require progressive rehabilitation. • Acid and Metalliferous Drainage (AMD) and impacts on groundwater, surface water and soil quality in the immediate area of the pit void and waste rock are unlikely to have an impact on the regional groundwater quality. • The visual impact assessment concluded the Proposal would have low impact on the local and regional setting. • Waste associated with the Marra Mamba deposits is considered highly erodible. Brockman wastes are significantly less susceptible to surface erosion.			
Clearing of native vegetation.	*Minimise* – PEAHR must be in place prior to land disturbance to minimise unauthorised clearing. *Rehabilitation* – Progressive rehabilitation will be implemented.	A Ministerial Condition is suggested in Appendix J to implement the Eastern Ridge Mine Closure Plan (Appendix G) to meet the objectives for the factor of Rehabilitation and Decommissioning. This plan contains legal obligations for the ongoing mitigation and management of the Proposal.	Closure of the Proposal will be managed subject to approval and implementation of the Eastern Ridge Mine Closure Plan. BHP Billiton Iron Ore considers it will meet the EPA objective for this factor within the Proposal area.
Pit voids with the potential to become pit lakes post-closure.	*Minimise* – Backfill pit voids with inert waste material, where practicable and required to reduce residual risk, as described in the Eastern Ridge Mine Closure Plan. *Minimise* – Implement the Eastern Ridge Mine Closure Plan to minimise legacy issues associated with pit voids following cessation of active mining.		
Landform stability and visual impacts.	*Minimise* – Reduce the requirement for ex-pit overburden storage areas through disposal of waste rock in-pit where practicable, as described in the Eastern Ridge Mine Closure Plan. *Minimise* – Implement the closure strategies outlined in the Eastern Ridge Mine Closure Plan to minimise post-closure risks associated with pit voids and associated mine infrastructure.		
Potential AMD impacts on groundwater, surface water and soil quality.	*Minimise* – If required, segregate PAF overburden in accordance with leading practice to minimise AMD generation and its potential to impact groundwater, surface water and soil quality. *Minimise* – Backfill depleted mine pits with inert waste material, where practicable and required to reduce residual risk, as described in the Eastern Ridge Mine Closure Plan. *Minimise* – Implement the Eastern Ridge Mine Closure Plan to minimise legacy issues associated with pit voids following cessation of active mining.		



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Health, Safety and Environment
BHP BILLITON IRON ORE

EASTERN RIDGE
Conservation Significant Flora Species

Scale @ A4: 1:55,000	Prepared: P. Gant	Project No: A766/05
Date: 12/01/2016	Checked: E. Drain	Figure: 5
	Revision: Final	

LEGEND

- Proposed Eastern Ridge Development Envelope
- Indicative Pits
- Indicative Overburden Storage Areas

Flora Species

- Calotis latiuscula (Priority 3)
- Eremophila magnifica subsp. velutina (Priority 3)
- Goodenia nuda (Priority 4)
- Isotropis parviflora (Priority 2)

N

0 2 4
Kilometres

Document Path: Y:\Jobs\A501_A1000\A766\3Project\A766_005_ConservationSigFlora_STER_002EIA_007_RevA.mxd