BHP Billiton Iron Ore

Pilbara Public Environmental Review Strategic Proposal

March 2016

Document Control

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DISCLAIMER

This Public Environmental Review Strategic Proposal (PERSP) has been prepared for submission to the Western Australian Environmental Protection Authority for the purpose of the Minister for Environment making a determination regarding whether to approve BHP Billiton Iron Ore's Proposal under the Western Australian *Environmental Protection Act 1986*. This PERSP has been developed for this purpose only, and no one other than the Environmental Protection Authority or the Minister should rely on the information contained in this PERSP to make any decision.

In preparing this PERSP, BHP Billiton Iron Ore has relied on information provided by specialist consultants, government agencies and other third parties available during preparation.

The PERSP has been prepared for information purposes only; and, to the full extent permitted by law, BHP Billiton Iron Ore, in respect of all persons other than the Environmental Protection Authority or the Minister, makes no representation and gives no warranty or undertaking, expressed or implied, in respect of the information contained in the PERSP and does not accept responsibility and is not liable for any loss or liability whatsoever arising as a result of any person acting or refraining from acting on any information contained in the PERSP.

NOTE ON CURRENCY

Where possible, the contents of this PERSP are up to date as at **16 March 2016**

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Invitation to make a submission

The Environmental Protection Authority (EPA) invites people to make a submission on this proposal. The environmental impact assessment process is designed to be transparent and accountable and includes specific points for public involvement, including opportunities for public review of environmental review documents. In releasing this document for public comment, the EPA advises that no decisions have been made to allow this proposal to be implemented.

BHP Billiton Iron Ore Pty Ltd (BHP Billiton Iron Ore) is seeking environmental approval to progressively develop iron ore mines and supporting infrastructure within and around its existing Pilbara operations over the long term. In accordance with the *Environmental Protection Act 1986*, a Public Environmental Review Strategic Proposal (PERSP) document has been prepared that describes this proposal and its likely effects on the environment. The PERSP document is available for a public review period of **12** weeks from **21 March 2016,** closing on **13 June 2016**.

Comments from government agencies and the public will assist the EPA to prepare an assessment report in which it will make recommendations to government.

Where to get copies of this document

Printed and CD copies of this document may be obtained from Project Manager – Strategic Assessment, Main Reception, 125 St Georges Terrace, Perth, Western Australia, 08 6224 4444.

The PERSP may also be accessed through the proponent's website at www.bhpbilliton.com.

Why write a submission?

A submission is a way to provide information, express your opinion and put forward your suggested course of action – including any alternative approaches. It is useful if you indicate any suggestions you have to improve the proposal.

All submissions received by the EPA will be acknowledged, with electronic submissions being acknowledged electronically. The proponent will be required to provide adequate responses to points raised in submissions. In preparing its assessment report for the Minister for Environment, the EPA will consider the information in submissions, the proponent's responses and other relevant information. Submissions will be treated as public documents unless provided and received in confidence, subject to the requirements of the Freedom of Information Act 1992, and may be quoted in full or in part in the EPA's report.

Why not join a group?

If you prefer not to write your own comments, it may be worthwhile joining a group or groups interested in making a submission on similar issues. Joint submissions may help to reduce the workload for an individual or group, as well as increase the pool of ideas and information. If you form a small group (up to 10 people), please indicate all the names of the participants. If your group is larger, please indicate how many people your submission represents.

Developing a submission

You may agree or disagree with or comment on the general issues or specific elements discussed in the PER document. It helps if you give reasons for your conclusions, supported by relevant data. You may make an important contribution by suggesting ways to make the proposal more environmentally acceptable.

When making comments on specific elements in the PER document:

- clearly state your point of view;
- indicate the source of your information or argument if this is applicable; and
- suggest recommendations, safeguards or alternatives.

Points to keep in mind

By keeping the following points in mind, you will make it easier for your submission to be analysed:

- attempt to list points so that issues raised are clear. A summary of your submission is helpful;
- refer each point to the appropriate section, chapter or recommendation in the PER document;
- if you discuss different sections of the PER document, keep them distinct and separate, so there is no confusion as to which section you are considering; and
- attach any factual information you may wish to provide and give details of the source. Make sure your information is accurate.

Remember to include:

- your name;
- address;
- date; and
- whether you want your submission to be confidential.

The closing date for submissions is: **13 June 2016.**

The EPA prefers submissions to be made at: https://consultation.epa.wa.gov.au.

Alternatively submissions can be:

- posted to: Chairman, Environmental Protection Authority, Locked Bag 10, East Perth, Western Australia 6892; or
- delivered to the Environmental Protection Authority, Level 8, The Atrium, 168 St Georges Terrace, Perth.

If you have any questions on how to make a submission, please ring the Office of the Environmental Protection Authority on (08) 6145 0800.

Document Abbreviations

ABBREVIATION	MEANING
AER	annual environmental report
AHD	Australian height datum
ALA	Atlas of Living Australia.
AMD	acid and metalliferous drainage
ANC	acid neutralising capacity
ANZMEC	Australian and New Zealand Minerals and Energy Council
ARMCANZ	Agriculture and Resource Management Council of Australia and New Zealand
BoM	Bureau of Meteorology
CALM	Department of Conservation and Land Management
CEO	chief executive officer
CIA	cumulative impact assessment
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DAA	Department of Aboriginal Affairs
DER	Department of Environment Regulation
DITR	Department of Industry Tourism and Resources (now the Department of Industry and Science)
DME	Department of Minerals and Energy (now the Department of Mines and Petroleum)
DMP	Department of Mines and Petroleum
DotE	Department of the Environment (Commonwealth)
DoW	Department of Water
DPaW	Department of Parks and Wildlife
DSEWPaC	Department of Sustainability, Environment, Water, Populations and Communities (now DotE)

ABBREVIATION	MEANING
ECA	ecohydrological change assessment
EHU	ecohydrological unit
EIA	environmental impact assessment
EP Act	*Environmental Protection Act 1986* (WA)
EPA	Environmental Protection Authority
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Cth)
EPP	environmental protection policy
ESA	environmentally sensitive area
ESD	Environmental Scoping Document (BHP Billiton Iron Ore 2013)
g	gram
GHG	greenhouse gas
GIS	geographic information system
GWL	groundwater well licence
ha	hectare
halophytic	Of or pertaining to a plant adapted to living in a saline environment.
IBRA	Interim Biogeographic Regionalisation for Australia
INAP	International Network for Acid Prevention
IUCN	International Union for Conservation of Nature
kg	kilogram
km	kilometre
LGM	last glacial maximum
LVRA	landscape and visual risk assessment

ABBREVIATION	MEANING
m	metre
MAR	managed aquifer recharge
MCA	Minerals Council of Australia
MNES	matters of national significance
Mt	million tonnes
Mtpa	million tonnes per annum
NAF	non-acid forming
NAPP	net acid production potential
NEPC	National Environment Protection Council
NEPM	National Environment Protection Measure
NPI	National Pollutant Inventory
OEPA	Office of the Environmental Protection Authority
PAF	potentially acid forming
PEAHR	Project Environment and Aboriginal Heritage Review
PEC	priority ecological community
PERSP	Public Environmental Review Strategic Proposal (this document)
RMA	Regional Management Approach
SEA	strategic environmental assessment
SRE	short-range endemic
TEC	threatened ecological community
TSP	total suspended particulates
UCL	Unallocated Crown land.

ABBREVIATION	MEANING
WC Act	*Wildlife Conservation Act 1950*
WRF	Weather Research and Forecasting

Document Definitions

TERM	DEFINITION
asset	A specific component of the biophysical environment that supports one or more environmental or social values. Examples include the Karijini National Park and Fortescue Marsh.
BHP Billiton Iron Ore Strategic Proposal	The BHP Billiton Iron Ore Strategic Proposal encompasses the Company's planned development for mining and support infrastructure for the Pilbara within the geographic extent of the Project Definition Boundary.
bioregion	A biogeographic region as defined in the Interim Biogeographic Regionalisation for Australia (DSEWPaC 2012a).
brownfield	A brownfield exploration or mining area is an area where mineral deposits have previously been discovered and mining may already be occurring in the local area.
Derived Proposal	A Derived Proposal is a future proposal that was identified in the Strategic Proposal, that has been referred to and considered by the EPA, and that is then declared to be a Derived Proposal.
Ecohydrology Study Area	This boundary represents the spatial extent of the BHP Billiton Iron Ore Ecohydrological Study Area; this was based on the area likely to be influenced by hydrological change because of the Strategic Proposal.
future operation	Future operations within the context of the Strategic Proposal include greenfield and brownfield mines and expansions, together with supporting infrastructure including (but not limited to) rail lines, accommodation villages and roads.
greenfield	Greenfield exploration seeks to discover mineral deposits in new areas, away from the local area of producing mines.
landscape	A spatially heterogeneous area, scaled relative to the process of interest. Within landscapes, it is usually possible to define a series of different ecosystems, landforms, habitats and natural or man-made features.
local	Pertaining to a discrete area and its immediate vicinity (as opposed to the whole area within the Project Definition Boundary or the whole bioregion).
local scale	At the scale of a local activity – e.g. the zone of impact of a particular activity. Used to differentiate between regional-scale impacts (i.e. impacts at the scale of the bioregion or on the entire distribution of a species) and impacts at the scale of a future mine.
mining operation	A site of mining activities on BHP Billiton Iron Ore tenure. The mining operation may contain one or more processing hubs within it, depending on the mining strategy.

TERM	DEFINITION
mitigation hierarchy	The order in which measures to reduce the risk of impact are to be applied, namely avoid, minimise, rehabilitate and (where appropriate) offset.
Project Definition Boundary	The geographical extent of the Strategic Proposal for the purposes of Commonwealth and state environmental impact assessment.
Office of the EPA	The Office of the EPA supports the EPA in conducting environmental impact assessments and developing policies to protect the environment.
Public Environmental Review Strategic Proposal	The document that outlines the potential impacts of the Strategic Proposal on factors and the management strategies to address these potential impacts. It is assessed by the EPA in considering whether the Strategic Proposal is environmentally acceptable.
region	Pertaining to a vast area (e.g. an entire IBRA bioregion as opposed to a specific locality).
regional scale	At the scale of the region. Used to differentiate between local-scale impacts (i.e. at the scale of a future mine) and impacts at a broader scale.
run-of-mine	The unprocessed ore that results from blasting. The run-of-mine will often require crushing and may require further processing (e.g. beneficiation) prior to being suitable for transport to port.
Strategic Proposal	BHP Billiton Iron Ore's proposal for future mining operations within the Project Definition Boundary.
study area	This is the spatial boundary for a technical study and varies depending on the factor being considered. The study areas are a subset of the Project Definition Boundary.
typical mining operation	An indicative scenario for the purposes of impact assessment. The typical mining operation includes features and activities that enable mining (e.g. pits and stockpiles and supporting process and non-process infrastructure).
value	Any particular benefit or use of the environment that is important for a healthy ecosystem or for public benefit. Values are not quantifiable and cannot be directly monitored, measured or assessed.

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EXECUTIVE SUMMARY

Background and purpose of the Strategic Proposal

BHP Billiton is among the world's largest producers of major commodities, including coal, copper, iron ore, nickel and uranium, and has substantial interests in oil and gas. BHP Billiton Iron Ore, one of BHP Billiton's businesses, has been developing mines and infrastructure in the Pilbara region since the 1960s, and proposes to continue to do so over the long term.

Having devised a long-term development plan, BHP Billiton Iron Ore is now able to consider a more regional approach to environmental management across all of its current and future operations. Rather than focusing on project-by-project issues, a regional approach draws emphasis to key environmental values and features in the landscape and enables consideration of cumulative impacts and management. A regional approach also aligns with current direction from regulators towards outcome-based conditions and objectives.

The key elements of any environmental impact assessment are evaluating the existing environment, detailing the nature of the proposal, evaluating the environmental impacts, outlining management responses and quantifying the residual impact. While an assessment of a strategic proposal (this document) follows a similar process, it is fundamentally different from typical individual project environmental impact assessments in that it has a broader, regional focus and considers regional management approaches rather than site-specific mitigation measures. Individual future proposals (Derived Proposals) that are part of the overall strategic proposal will provide a greater level of project-specific information and will verify and validate predicted impacts and management approaches at a local scale.

The key steps in the Strategic Proposal assessment process are shown in Figure ES1.

BHP Billiton Iron Ore is committed to engaging its host communities and interested key stakeholders on potential future plans. BHP Billiton Iron Ore has a long history of engaging through community and industry consultative groups in the Pilbara and through other mechanisms. The strategic proposal approach supports this by involving communities early in the environmental approval process. Pilbara residents in particular will have more information and be able to provide more informed comment during the consultation process. Obtaining a strategic proposal provides greater certainty for the Pilbara community and allows other stakeholders to conduct more informed long-term planning for their own organisations and operations in the region.

To initiate the strategic environmental assessment process, BHP Billiton Iron Ore lodged a Strategic Proposal Referral Document with the Environmental Protection Authority (EPA) on 6 July 2012 under s. 38 of the *Environmental Protection Act 1986*. Following public comment, the EPA announced on 25 July 2012 the decision to proceed with the assessment and set the level of assessment at Public Environmental Review Strategic Proposal (PERSP). This document and its supporting studies form that PERSP document.

BHP Billiton Iron Ore prepared an Environmental Scoping Document (ESD), which was submitted to and then approved by the EPA on 28 November 2013. The ESD sets the scope of the PERSP, including the proposed studies to support the overall assessment process.

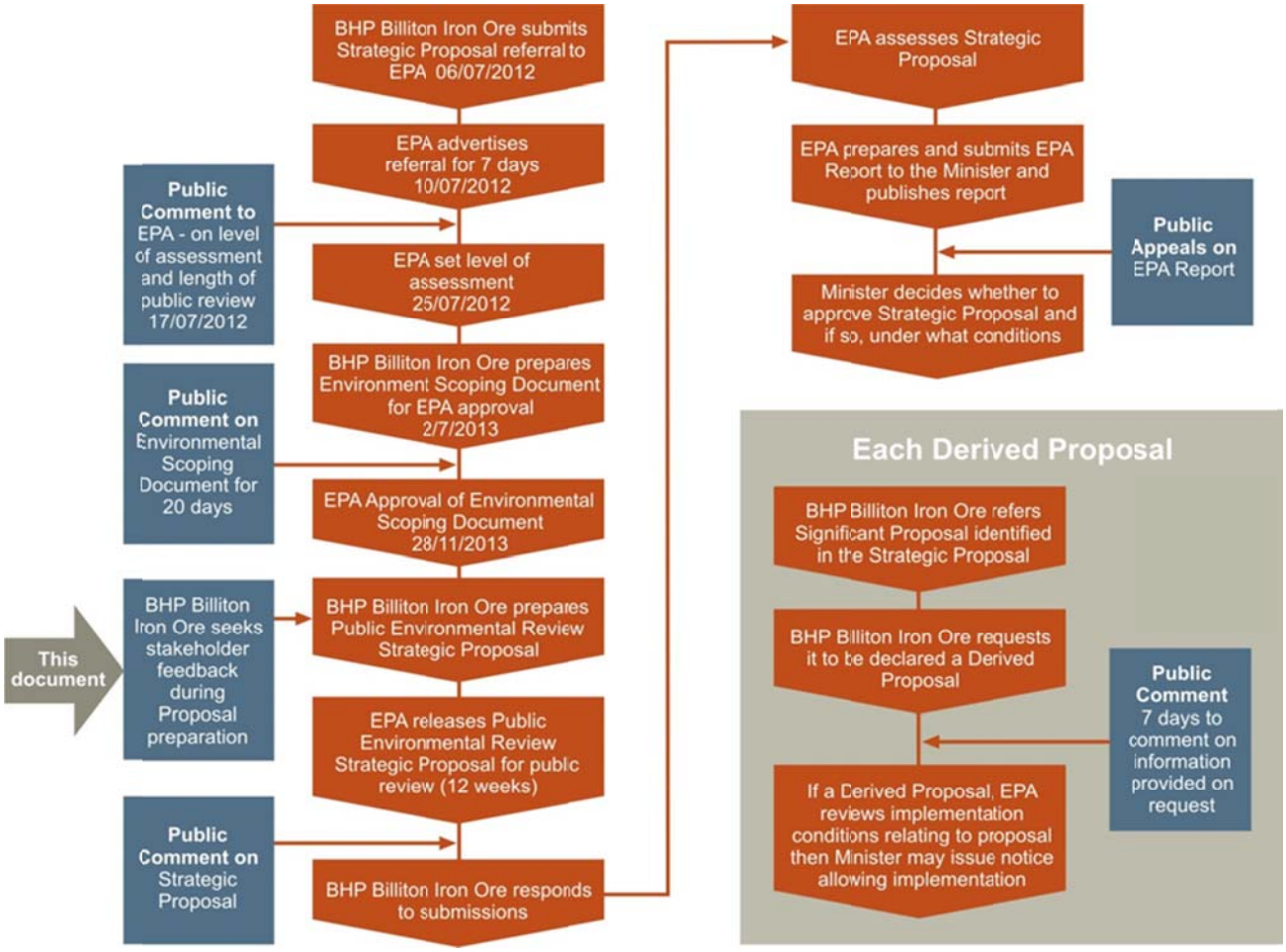


Figure ES1: EPA flowchart for the Strategic Proposal assessment process

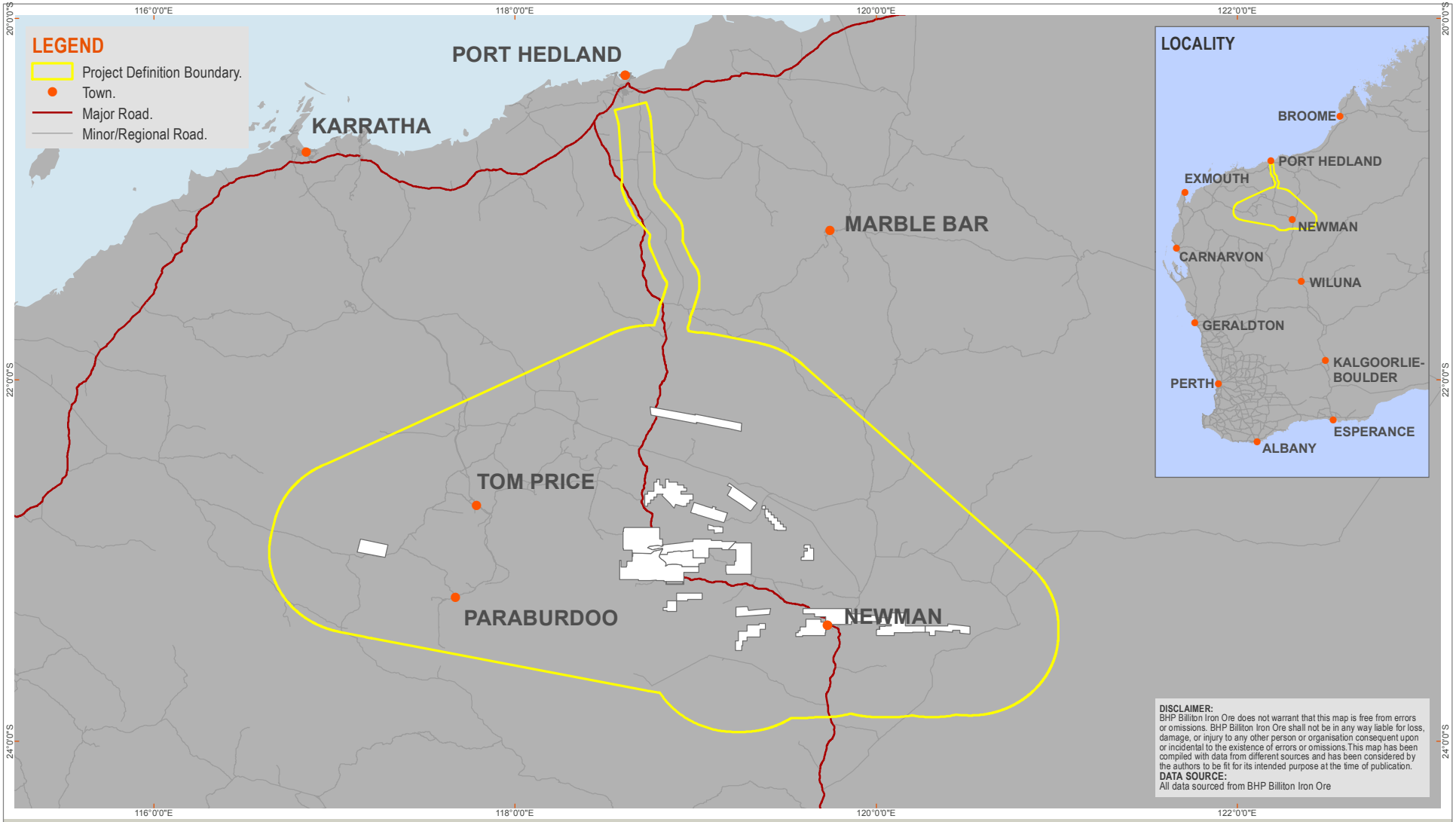
To provide confidence to the Minister, regulators and all stakeholders, BHP Billiton Iron Ore has undertaken a thorough and robust assessment of the proposal using the best available information. This PERSP addresses the following EPA environmental factors for the relevant EPA themes, in accordance with the ESD:

- **Land** – Flora and Vegetation, Landforms, Subterranean Fauna, Terrestrial Environmental Quality and Terrestrial Fauna;
- **Water** – Hydrological Processes and Inland Waters Environmental Quality;
- **Air** - Air Quality and Atmospheric Gases;
- **People** – Amenity, Heritage and Human Health; and
- **Integrating Factors** – Rehabilitation and Decommissioning and Offsets.

The key steps in delivering an environmental impact assessment of a strategic proposal are discussed below and are shown in Figure ES2.

Understand the area in which we operate

BHP Billiton Iron Ore has defined a Project Definition Boundary for the Strategic Proposal (Figure ES3) that identifies the area within which activities covered by the scope of the Strategic Proposal will be undertaken. The total area of the Project Definition Boundary is 7,650,074 ha.



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Environmental Approvals

Figure ES3 Project Definition Boundary and BHP Billiton Iron Ore Strategic Proposal Tenure

Sources of current knowledge of the area within the Project Definition Boundary and data relevant to the Strategic Proposal include BHP Billiton Iron Ore's data; other Pilbara proponents' publicly available survey data; and data generated by scientists, researchers and regulators within the region. Over the last decade, BHP Billiton Iron Ore has completed over 350 individually commissioned biological studies within the Project Definition Boundary. Knowledge and data will continue to be accumulated and used to inform adaptive management for future operations so that improvements can be made and changing environmental conditions can be considered and accounted for.

Figure ES2: Overview of the PERSP Approach

Identify significant features and those protected by legislation

In considering regional information, it is evident that there are aspects that need to be examined more closely as part of the environmental impact assessment. For example, some environmental features (assets) within the Project Definition Boundary, such as springs, wetlands and gorges, are recognised as threatened and priority ecological communities. Similarly, there are key listed flora and fauna species that are considered to be conservation-significant, and there are areas that have important landscape or recreational values.

Based on consultation and previous studies, BHP Billiton Iron Ore has recognised these significant environmental features and species and has tailored a regional management approach to focus on the most important environmental values.

What are the current and future threats to the environment?

The PERSP has brought together contemporary information to identify the key threatening processes from both mining and non-mining activities on the biophysical environment within and surrounding the Project Definition Boundary. This task has been informed by a number of recent publications and workshops, as well as by technical peer reviewers. Key threats include climate change; altered fire regimes; invasive species; land clearing; increased grazing pressure from pastoral activities; and mining impacts, such as groundwater drawdown.

Crucial to the assessment is an understanding of both current and future mining activities. While the specifics of all future operations are not available at this time, BHP Billiton Iron Ore has prepared conceptual development scenarios to enable an assessment of the significance of impacts and to identify the focus for future management. Similarly, all reasonably foreseeable mining operations (those that are operational, approved or in the approvals process) from other companies have also been documented.

The Strategic Proposal includes all new mine developments involving resources in which BHP Billiton Iron Ore currently has or may acquire an interest in and the development of existing operations, all within the Project Definition Boundary.

The Strategic Proposal groups these proposed future developments around a series of nominal mining operations to facilitate the efficient processing and transportation of ore, although the location of mining operations may change in the future.

Based on current knowledge, the Strategic Proposal includes the following key components:

- new mining operations at:
  - Caramulla;
  - Coondiner;
  - Gurinbiddy;
  - Jinidi;
  - Marillana;
  - Mindy;
  - Ministers North;
  - Mudlark;
  - Munjina/Upper Marillana;
  - Ophthalmia/Prairie Down;
  - Rocklea;
  - Roy Hill; and
  - Tandanya
- future expansions to existing mining operations at:
  - Jimblebar;
  - Mining Area C;
  - Newman; and
  - Yandi.
- associated infrastructure, including, but not limited to, power lines, pipelines, accommodation camps, access roads, conveyors and airports;
- rail spurs (connecting the new mining operations to existing rail infrastructure);
- rail loops (within each mining operation to enable ore loading); and
- potential expanded rail capacity of the Newman to Port Hedland rail line.

The PERSP considers the direct, indirect and cumulative impacts to environmental factors as a result of the above activities.

The Strategic Proposal does not include:

- developments within any existing national park, including Karijini National Park;
- activities at Port Hedland or north of rail-chainage 26 km;
- developments within the scope of existing approved BHP Billiton Iron Ore operations and infrastructure;
- development of the proposed South Flank mine; or
- future developments within BHP Billiton Iron Ore's existing operations along the Goldsworthy rail line from Goldsworthy to and including Yarrie.

The PERSP also considers other mining company operations including:

- Rio Tinto's (including joint ventures with Hamersley Iron, Hamersley HMS and Robe River Mining Co.) Brockman Syncline 4, Hope Downs 1, Hope Downs 4, Koodaideri, Marandoo, West Angelas, Western Turner Syncline, Western Turner Syncline Stage 2, Yandicoogina (Junction SE, Junction SW and Oxbow, Pocket and Billiard South);
- Fortescue Metal Group's Cloudbreak, Christmas Creek, Mindy Mindy and Nyidinghu;

- Atlas Iron's Davidson's Creek;
- Australian Premium Iron Management's Hardey;
- Iron Ore Holdings' Iron Valley;
- Brockman Resources' Marillana; and
- Hancock Prospecting's Roy Hill Stage 1 and Roy Hill Stage 2.

Outline a regional management approach

Given the regional focus of the assessment, BHP Billiton Iron Ore has developed a regional management approach that links regional objectives and outcomes (for key assets and species) to consistent and coordinated regional management. The approach has been structured to align with the EPA's factor objectives and to provide a framework that cascades these regional objectives to specific management outcomes that can be addressed for each future Derived Proposal. Key elements of the approach include:

- developing regional management objectives that align with EPA's objectives;
- identifying relevant mitigation options;
- embedding an adaptive management approach; and
- providing a framework for the development of measureable management outcomes and performance criteria (e.g. targets, triggers or thresholds) for key assets and species at the Derived Proposal stage.

Assess cumulative impacts

The typical iron ore mining–related activities proposed as the scope of the Strategic Proposal were examined for impact to the environmental factors under each of the following conceptual development scenarios:

- Existing Development;
- 30% Conceptual Development; and
- Full Conceptual Development.

Each scenario included both BHP Billiton Iron Ore and non-BHP Billiton mining operations. Additionally, this PERSP also considers the impacts that are directly attributable to BHP Billiton Iron Ore activities and thus helps to inform the adaptive management approach.

Having consolidated information on the existing environment, identified key environmental features (assets) and species, and defined the Strategic Proposal and other threatening processes, BHP Billiton Iron Ore has undertaken a number of factor-based regional cumulative impact assessments (CIAs). Using a spatial geographic information system (GIS) analysis, relevant direct and indirect impacts have been considered where sufficient knowledge was available to support a quantitative assessment. The assessments covered:

- biodiversity;
- water (surface and groundwater);
- air quality;
- noise; and
- landscape and visual amenity.

The purposes of the cumulative impact assessments were to understand potential impacts on key environmental factors arising from the Strategic Proposal and to quantify the significance of the impact where possible. The cumulative impact assessments has identified areas in which an increased BHP Billiton Iron Ore management focus is required to ensure that potential impacts can be mitigated to an acceptable level.

The Strategic Proposal regional management approach provides a process for managing potential environmental impacts. This is underpinned by adaptive management, which provides a structured, iterative process of decision-making with the capacity to validate predicted impacts and to develop appropriate responses to emerging issues through monitoring and adapting to environmental, economic and social changes. An integral component of adaptive management is the application of the mitigation hierarchy (avoid, minimise, rehabilitate and offset).

This approach provides clear guidance for management plans, which will be developed and implemented (when relevant) at the Derived Proposal stage, to manage predicted impacts to key environmental factors as mining operations are progressively developed.

A series of case studies have also been presented that demonstrates that the approach and management controls considered in this PERSP are currently being implemented successfully across BHP Billiton Iron Ore projects within the Pilbara and shows the Company's commitment to improving environmental performance and managing environmental outcomes.

Table ES1 includes the EPA and BHP Billiton Iron Ore objectives for each factor, a summary of the cumulative impact assessment results and the regional management approach. The relationship between sensitivity to impact, the level of uncertainty and the magnitude of the impact for each factor is assessed. Those factors with higher sensitivity and uncertainty will require a greater level of management and potentially require validation at the Derived Proposal stage. Factors with lower impacts and sensitivity, such as Air Quality and Atmospheric Gases and Amenity (including noise and visual amenity), are typically managed using standard management practices during construction and operational phases of a project. This is consistent with BHP Billiton Iron Ore's operational experience in the Pilbara and existing approval requirements.

Given BHP Billiton Iron Ore's history and knowledge of operating iron ore mines and infrastructure in the Pilbara, as well as the Company's proven track record in environmental stewardship, the findings of the impact assessment studies in this PERSP and the regional management approach presented, it is considered that implementation of the Strategic Proposal will meet the EPA's objectives.

Commit to an assurance framework for future proposals

While it is the intent of the PERSP to provide confidence that BHP Billiton Iron Ore's operations can be undertaken to meet the EPA's objectives, the Company recognises that, given the potential time span of the Strategic Proposal, changes to the environment, regulation and guidance will inevitably occur and that stakeholders will require assurance that BHP Billiton Iron Ore will continue to implement best environmental practice. In addition, stakeholders want confidence that the Company will deliver on the commitments made in the PERSP and that the appropriate checks and balances will be in place and will be transparent over the life of the Strategic Proposal.

To this end, BHP Billiton Iron Ore has committed to an assurance framework for each Derived Proposal assessed under the Strategic Proposal. Key elements of the framework are:

- a proposed verification and validation process to meet EPA's requirements to declare a Derived Proposal;
- consultation with decision-making authorities on the development of regional management plans. Any plans will need to be approved by the chief executive officer (CEO) of the Office of the EPA;
- inclusion in these plans of measurable management outcomes and performance criteria (e.g. targets, indicators or thresholds), which will be publicly reported; and
- early and ongoing stakeholder engagement.

Table ES1: Strategic Proposal impact assessment summary table

IMPACT RATING LEGEND
Potential inherent impact (without mitigation):

- Impacts not discernible at a regional scale. The factor is well understood (high knowledge level) and there is a high level of certainty that acceptable outcomes will be achieved. Low impact to key assets and significant species.
- Potential impact at a regional scale; negligible to low impact to key assets and significant species. Further studies will be used to validate predicted impacts.
- Potential impacts at a regional scale and moderate to high impacts to key assets or significant species. Requires further studies or validation to address uncertainty.

Potential residual impact (with mitigation):

- Impacts considered to meet EPA's factor objective through business as usual (BAU) management standard. High level of certainty that acceptable outcome will be achieved.
- Impacts considered to meet EPA's factor objective through targeted management in addition to BAU management. Moderate to high level of certainty acceptable outcome will be achieved
- Impacts considered unlikely to meet EPA's factor objective.

Regional Biodiversity Values

EPA Objectives and BHP Billiton Iron Ore Objectives *for Regional Biodiversity are stated in each of the Factor sections and summarised in Section 8.1.1.1.*

Potential Impacts	Management Approach
The Full Conceptual Development Scenario footprint does not overlap with Karijini National Park or Mungaroona Range Nature Reserve. Some indirect impact to Karijini could occur from dewatering activities and visual amenity; these are discussed in respective sections. There is potential for direct impact to the Juna Downs pastoral lease exclusion area. The footprint overlaps the Ethel Gorge Aquifer Stygobiont Community TEC is by approximately 10% (4% when only pits are considered, which is more relevant to this TEC). The footprint overlaps 0.06% of the Vegetation of Sand Dunes of the Hamersley Range/Fortescue Valley PEC; and 2.24% of the Coolibah-lignum Flats PEC Subtype 1: Coolibah and mulga woodland over lignum and tussock grasses on clay plains (Coondewanna and Wannamunna flats). In addition, the footprint overlaps buffer areas for the Fortescue Marsh (Marsh Land System) PEC, Weeli Wolli Spring Community PEC; and Four Plant Assemblages of the Wona Land System PEC. Regional biodiversity modelling indicates that parts of BHP Billiton Iron Ore's tenure contain areas of predicted high biodiversity significance. These areas align with the above PECs and TECs and also other areas some as high mountain tops and drainage lines.	BHP Billiton Iron Ore considers that current ranking frameworks for the significance of environmental assets and communities, in this case conservation estate, and TECs, provide the most appropriate ranking inputs to prioritise mitigation. Applying the tiered system described in Section 6.2, to prioritise and rank our management objective in relation to conservation estate, and TECs places these within the highest tier (Tier 1). PECs may largely be placed in Tier 2, with the opportunity to opportunistically review their ranking on a case-by-case basis. For Tier 1 assets, BHP Billiton Iron Ore will define the mitigation measures, to be applied from the Land and Biodiversity Management Toolkit within management plans. The Derived Proposal process allows the consideration of environmental change in the future, including changes to boundaries of the existing conservation estate, PECs and TECs and the gazettal of new conservation estate.

Acceptability of Impact

BHP Billiton Iron ore considers that potential impact within the Juna Down pastoral lease exclusion area will be managed to an acceptable level given the stakeholder engagement activities that BHP Billiton Iron Ore has committed to for any future Derived Proposal referral. BHP Billiton Iron Ore recognises that both direct and indirect impacts to TECs and PECs will require effective management to ensure that objectives for Tier 1 and Tier 2 assets are met. For example, management of the groundwater regime at Ethel Gorge will maintain stygofauna habitat and is one of the principle considerations in BHP Billiton Iron Ores regional water management planning for the Eastern Pilbara. BHP Billiton Iron Ore considers that, given its operational experience in managing impacts to surface water and groundwater in the Pilbara, impacts to these environmental assets managed to an acceptable level.	**Potential Inherent Impact Rating:**  **Potential Residual Impact Rating** *(after mitigation)*: 

EPA Environmental Factor - Flora and Vegetation

EPA Objective – to maintain representation, diversity, viability and ecological function at the species, population and community level.

BHP Billiton Iron Ore Objective – BHP Billiton Iron Ore shall mitigate risks to flora and vegetation from its activities to an acceptable level.

Potential Impacts	Management Approach
Beard vegetation associations, 18 (low woodland; mulga (*Acacia aneura*)) and 216 (low woodland; mulga (with spinifex on rises)), may be impacted by BHP Billiton Iron Ore from the Full Conceptual Development Scenario footprint by 5.2% and 17.4% of their pre-European extent in Western Australia respectively. The consolidated mapping on BHP Billiton Iron Ore tenure has highlighted that some mapped vegetation associations have a small (i.e., less than 20 ha) mapped extent across BHP Billiton Iron Ore tenure, or occur largely within the Full Conceptual Development Scenario footprint. The majority of mapped vegetation within the Full Conceptual Development Scenario footprint is mapped as Good to Excellent condition. Vegetation condition is one of the aspects that is considered in closure, rehabilitation and offsets planning. These aspects are described in their respective sections. Cumulative impacts to the vast majority of flora species of conservation significance are not considered to be significant; however, impacts to known records of *Synostemon hamersleyensis*, are considered to have potential to be significantly impacted from the Strategic Proposal without mitigation.	The Land and Biodiversity Management toolkit will be implemented in accordance with BHP Billiton Iron Ore's regional management approach and standard business management practices. Examples include: • *Avoidance* or *minimisation through informed design* by avoiding or minimising clearing habitat for conservation significant species, by undertaking *baseline* and *targeted surveys* and where practicable altering mine plans to avoid significant habitats. • Implement *regional state offset initiative* or *project-specific offset initiatives* where required to achieve the flora and vegetation objective, and undertake *offset monitoring* to ensure effectiveness. • Draft and implement *management plans* for key assets and significant species. • Establish *performance criteria* to maintain significant flora and vegetation or areas with ecological value. Refer to the Water Management Toolkit and Rehabilitation and Decommissioning Toolkit for further management measures.

Acceptability of Impact

The cumulative impact to the above Beard vegetation associations will result in a reduction of these associations, so that 94.2% and 81.5%, respectively, of the pre-European extent remains. Both of these vegetation associations occur outside of the Pilbara bioregion and are common and widespread in the Pilbara region.

None of the consolidated vegetation associations mapped on BHP Billiton Iron Ore tenure are located within formally recognised PECs or TECs. Given BHP Billiton Iron Ore's commitment to manage impacts to these areas in line with the key regional asset management, BHP Billiton Iron Ore considers that impacts to conservation-significant vegetation associations will be managed to an acceptable level.

Synostemon hamersleyensis has potential to be significantly impacted by the Strategic Proposal. This species has only recently been described (2015), and knowledge on the species occurrence and ecology is still evolving. Given that 50% of known records of *Synostemon hamersleyensis* may be impacted under the Full Conceptual Development Scenario, BHP Billiton Iron Ore recognises that this species will require considered management to meet the objectives for flora and vegetation. BHP Billiton Iron Ore will validate that the objectives for flora and vegetation can be met as part of any future Derived Proposal referral at a local and regional scale using updated baseline data and detailed mine planning and design. Given this validation process, BHP Billiton Iron Ore considers that impacts to this species will be managed to an acceptable level.

Potential Inherent Impact Rating: 

Potential Residual Impac Rating ***(after mitigation)*****:** 

EPA Environmental Factor – Terrestrial Fauna

EPA Objective – to maintain representation, diversity, viability and ecological function at the species, population and assemblage level.

BHP Billiton Iron Ore Objective – BHP Billiton Iron Ore shall mitigate risks to terrestrial fauna from its activities to an acceptable level.

Potential Impacts	Management Approach
There is no regional dataset for vertebrate fauna habitat in the Pilbara, so landform and land system mapping has been used to assess the potential regional impact to vertebrate fauna habitats. The highest impact is to the Wannamunna Land System, with a predicted impact of 10.41%. The hardpan plains that comprise most (56%) of this land system are unlikely to support any breeding populations of conservation-significant species; although the mulga woodlands, which are not constrained to the Wannamunna Land System, do support a number of species (in particular birds and reptiles) that are largely restricted to this habitat type. Consolidated fauna habitat mapping within BHP Billiton Iron Ore tenure (including miscellaneous licences) provides detailed information on fauna habitats, and identifies those habitats that are at higher risk under implementation of the 30% or Full Conceptual Development Scenario, and therefore would be the focus of further investigation or management at the Derived Proposal stage. Those habitats identified to have the highest proportional impact under the Full Conceptual Development Scenarios were Drainage Area (30.5%), Gorge/Gully (30.4%), Minor Drainage Line (29.5%), Crest/Slope (28.4%), Mulga (27.9%) and Hardpan (26.5%). These habitats are found extensively outside BHP Billiton Iron Ore tenure. Five species of conservation significance were identified from the 2015 data to have more than 10% of their known records occurring within the Full Conceptual Development Scenario footprints. These were the Pilbara olive python (14.05%), ghost bat (22.29%), Pilbara flat-headed blind-snake (29.55%), Pilbara barking gecko (29.41%), and western pebble-mound mouse (33.72%). Suitable SRE fauna habitat within Full Conceptual Development Scenario footprint, was identified as medium and high risk areas. From this, potential priorities for future management were derived.	The Land and Biodiversity Management toolkit will be implemented in accordance with BHP Billiton Iron Ore's regional management approach and standard business management practices. Examples include: • *Avoidance or minimisation through informed design* by avoiding or minimising clearing of habitat for conservation-significant species through undertaking baseline surveys and, where practicable, altering mine plans to avoid significant habitats. • Undertake *ecological asset monitoring* where appropriate. • Draft and implement *management plans* for key assets and significant species. • Establish *performance criteria* to maintain terrestrial fauna habitat values. • *Progressive rehabilitation* of altered landforms, where possible, in line with the Rehabilitation and Decommissioning Management toolkit using provenance species and creating fauna habitat where possible. • Undertake appropriate *putrescible waste management* to avoid attracting and maintaining populations of introduced species. • Undertake *employee awareness programs*, e.g. inductions, toolbox meetings highlighting fauna issues. • Implement the *fire response procedure* to ensure that the Strategic Proposal does not increase fire risk. Refer to the Water Management Toolkit, Air Management Toolkit and Rehabilitation and Decommissioning Toolkit for further management measures.

Acceptability of Impact

BHP Billiton Iron Ore recognises that without effective mitigation, there are potential significant impacts to some terrestrial fauna habitat types and known species locations.
BHP Billiton Iron Ore considers that impacts to fauna habitat can be managed to an acceptable level through normal business management practices or though targeted management measures identified in the Land and Biodiversity Management Toolkit. Validation of habitat extent and presence of conservation significant species as part of Derived Proposal referrals will demonstrate that BHP Billiton Iron Ore can meet the objectives for fauna, and also for areas of habitat that are key assets or support conservation –significant species.

Potential Inherent Impact Rating:	
Potential Residual Impact Rating *(after mitigation)***:**	

EPA Environmental Factor –Subterranean Fauna

EPA Objective – to maintain representation, diversity, viability and ecological function at the species, population and assemblage level.

BHP Billiton Iron Ore Objective – BHP Billiton Iron Ore shall mitigate risks to terrestrial fauna from its activities to an acceptable level.

Potential Impacts	Management Approach
Stygofauna: Stygofauna habitat was considered to be of high prospectivity if depth to groundwater was less than 40 m. Strategic Proposal tenure in which both high prospectivity habitats and medium to high groundwater change potential occur are predicted to be Tandanya, Mudlark, Jinidi, Newman, Jimblebar, Carramulla, Coondiner, Mindy and Marillana. 60% of stygofauna species in the Pilbara have locally restricted distributions (known from single sub basins, such as the middle Fortescue), and Halse et al. (2014) suggested the median range of such species is less than 700 km^2. Thus, it is likely that about 30% of stygofauna species have ranges that are small enough to be threatened by impacts approaching 30 km in linear extent if the species' distribution and impacts coincide. In most situations, the factors controlling species' distributions and impacts will be different so that relatively few species distributions are likely to be completely encompassed by impacted areas. **Troglofauna:** Areas of likely troglofauna occurrence were determined using an investigative method based on topography. All areas with a slope greater than 11.6° were considered to contain valley flanks, mesas or other features likely to support troglofauna. The mapping highlights the Hamersley Range as being likely to contain the richest troglofauna communities in the Pilbara, which existing information suggests is correct. Almost all BHP Billiton Iron Ore tenure proposed as future mining hubs overlaps with areas that are predicted to be of high prospectivity for troglofauna. The exceptions are Jimblebar, Caramulla, Ophthalmia/Prairie Downs and Roy Hill.	The Land and Biodiversity Management toolkit will be implemented in accordance with BHP Billiton Iron Ore's regional management approach and standard business management practices. Examples include: • *Avoidance through informed design* by minimising clearing to the smallest area possible and placing waste in-pit where practicable. • *Avoidance* or *minimisation through informed design* by avoiding or minimising removal of habitat for subterranean fauna, by undertaking *baseline surveys* and where practicable altering mine plans to avoid significant habitats. • Avoid unauthorised clearing (or excavation) through implementation of the *spatial on-site disturbance compliance tool* (i.e., PEAHR procedure). • Undertake appropriate *groundwater management* to avoid significant impacts to areas with high subterranean fauna value. • Undertake *ecological asset monitoring* where appropriate for areas with high subterranean fauna values.

Acceptability of Impact

BHP Billiton Iron Ore recognises that the Strategic Proposal has potential to impact subterranean habitat of high prospectivity through mining and groundwater drawdown. BHP Billiton Iron Ore considers that impacts to fauna habitat can be managed to an acceptable level through normal business management practices or though targeted management measures identified in the Land and Biodiversity Management Toolkit. Validation of habitat extent and requirements of subterranean fauna as part of Derived Proposal referrals will demonstrate that BHP Billiton Iron Ore can meet the objectives for subterranean fauna once detailed mine design and planning is determined.	**Potential Inherent Impact Rating:**  **Potential Residual Impact Rating** *(after mitigation)*: 

EPA Environmental Factor – Terrestrial Environmental Quality and Landforms

EPA Objectives:

- **Terrestrial Environmental Quality** – to maintain the quality of land and soils so that the environmental values, both ecological and social, are protected.
- **Landforms** – to maintain the variety, integrity, ecological functions and environmental values of landforms.

BHP Billiton Iron Ore Objectives:

- **Terrestrial Environmental Quality** – BHP Billiton Iron Ore shall mitigate risks to terrestrial environmental quality from its activities to an acceptable level.
- **Landforms** – BHP Billiton Iron Ore shall mitigate risks to landforms from its activities to an acceptable level.

Potential Impacts	Management Approach
The Project Definition Boundary consists of a range of common landforms generally classified as hills and ranges and other elevated areas or plains. Impacts to landforms and landscapes at the regional level were considered to be low: • Between 0% and 1.34% reduction in the area of landscape units. All retain more than 96% of their pre-European extents. • Between 0.080% and 0.771% reduction in the area of landform types. All retain more than 98% of their pre-European extents. • Between 0% and 8.05% reduction in the area of land systems. All retain more than 90% of their pre-European extents. Impacts to terrestrial environmental quality were identified as potentially stemming from AMD and erosion. The study identified potential risk areas and showed that the risks are still relatively low compared to other regions and the rest of the state. Successful AMD and erosion management have been a substantial part of the management of existing operations in the region. As management is site-specific, tailored to unique site geomorphologies and geochemistries, detailed management of potential AMD and erosion risk will be addressed prior to any mining operation commencing after being informed by site-specific baseline assessments.	Key mitigation tools for landforms and terrestrial environmental quality are presented in Rehabilitation and Decommissioning.

Acceptability of Impact

BHP Billiton Iron Ore considers potential impacts to landform extent to be acceptable, given that the extent of landscape units, landform types and land systems will remain high relative to their pre-European extents.

BHP Billiton Iron Ore considers that impacts to terrestrial environmental quality can be managed to an acceptable level through normal business management practices or though targeted management measures identified in Rehabilitation and Decommissioning toolkit. Validation as part of Derived Proposal referrals will demonstrate that BHP Billiton Iron Ore can meet the objectives for landforms and terrestrial environmental quality once detailed mine design and planning is determined.

Potential Inherent Impact Rating: 

Potential Residual Impact Rating *(after mitigation)*: 

EPA Environmental Factor – Hydrological Processes and Inland Waters Environmental Quality

EPA Objectives:

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

BHP Billiton Iron Ore Objectives:

- **Hydrological Processes** – BHP Billiton Iron Ore shall mitigate risks to hydrological processes from its activities to an acceptable level.
- **Inland Waters Environmental Quality** – BHP Billiton Iron Ore shall mitigate risks to inland waters environmental quality from its activities to an acceptable level.

Potential Impacts	Management Approach
There is potential for groundwater drawdown and reduction in surface water availability for BHP Billiton Iron Ore's Full Conceptual Development Scenario without mitigation in place. Without mitigation, key areas of surface water change for the Full Conceptual Development Scenario include the northern flank of the Fortescue River Valley, lower Weeli Wolli Creek, catchment areas surrounding Coondewanna Flats, and drainages that contribute flows to Ethel Gorge. Without mitigation, the areas of potential change in EHUs related to groundwater drawdown are most apparent in the central Pilbara, Fortescue Marsh, and Marillana Creek regions and Weeli Wolli Creek. Change potential for key environmental assets is summarised below: • Coondewanna Flats, Ethel Gorge, Fortescue Marsh and Weeli Wolli Spring have moderate to high level potential impacts without mitigation in place. • Freshwater Claypans of the Fortescue Marsh and Karijini National Park have no to low or moderate change potential without mitigation in place.	The Water Management toolkit will be implemented in accordance with BHP Billiton Iron Ore's regional management approach and standard business management practices. Examples include: • Undertake *controlled dewatering* to ensure that groundwater drawdown is minimised as far as practicable while meeting operational needs. • Undertake *ecological asset monitoring* where appropriate for ecological receptors in line key assets and significant species management as above. • Undertake *managed aquifer recharge* or *controlled surface water discharge* where appropriate to mitigate groundwater drawdown. • Undertake groundwater monitoring where appropriate to detect changes in groundwater quality to trigger an effective management response. • *Avoidance* or *minimisation through informed design* by avoiding or minimising clearing of significant flora and vegetation.

Acceptability of Impact

BHP Billiton Iron Ore recognises that the Strategic Proposal has potential to impact certain parts of the landscape through impacts to surface water as described above if appropriate mitigation is not implemented. The modelled outputs highlight the mitigation considerations for EHUs. BHP Billiton Iron Ore considers that impacts to groundwater can be managed to an acceptable level through normal business management practices or though targeted management measures identified in the Water Management Toolkit. BHP Billiton Iron Ore has a proven track record of implementing water management measures to manage impacts to an acceptable level.	**Potential Inherent Impact Rating:**  **Potential Residual Impact Rating** *(after mitigation)*: 

EPA Environmental Factor – Heritage

EPA Objective – to ensure that historical and cultural associations are not adversely affected.

BHP Billiton Iron Ore Objective – BHP Billiton Iron Ore shall mitigate risks to heritage from its activities to an acceptable level.

Potential Impacts	Management Approach
Aboriginal heritage is managed and protected in compliance with the Aboriginal Heritage Act. Large-scale archaeological and ethnographic surveys have been undertaken to identify places of cultural significance. These surveys are undertaken with the relevant Native Title groups of the area. Approximately 55% of the Full Conceptual Development Scenario area has been archaeologically surveyed with all identified heritage sites (archaeological and ethnographic) managed by BHP Billiton Iron Ore's Heritage and GIS teams. The potential to disturb European heritage places is considered low.	The Heritage Management toolkit will be implemented in accordance with BHP Billiton Iron Ore's standard business management practices. Examples include: • *Avoidance through informed design* by avoiding known sites and engaging with Native Title claimants to determine heritage values. • *Avoidance* or *minimisation through informed design* by demarcation of known sites of significance. • *Avoidance* through unauthorised clearing, access or activities through implementation of the *spatial on-site disturbance compliance tool* (i.e., PEAHR procedure). • *Minimise* potential impact through consultation and via the development and application of a Cultural Materials Management Plan. • *Minimise* potential impact by monitoring cultural heritage sites • *Minimise* impact via the establishment of Native Title Agreements

Acceptability of Impact

BHP Billiton Iron Ore will continue to engage with Native Title Groups through targeted consultation and via administration of heritage Agreements, and therefore any potential impacts to heritage values are considered to meet the EPA's factor objective through business as usual management standards, with a high level of certainty that acceptable outcomes will be achieved.	**Potential Inherent Impact Rating:**  **Potential Residual Impact Rating** *(after mitigation)*: 

EPA Environmental Factor – Amenity (visual and noise)

EPA Objective – to ensure that impacts to amenity are reduced as low as reasonably practicable.

BHP Billiton Iron Ore Objective – BHP Billiton Iron Ore shall mitigate risks to amenity from its activities to an acceptable level.

Potential Impacts	Management Approach
The visual and noise assessments demonstrate that impacts at the regional scale are predicted to be low, both from BHP Billiton Iron Ore 30% and Full Conceptual Development Scenarios and cumulatively. Impacts to visual amenity are likely to be restricted to several areas: • Newman, surrounding settlements and Ophthalmia Dam; • Weeli Wolli Creek system; • Great Northern Highway; and • Mount Meharry (Karijini National Park). Cumulative noise modelling identified two sensitive receptors where noise criteria were exceeded: Mount Meharry and Weeli Wolli Creek. The predicted exceedances were based on cumulative impacts from third-party developments, business-as-usual management and conservative assumptions. It is considered that noise can be managed to an acceptable level by application of additional mitigation, where relevant.	Implement the Amenity Management toolkit in accordance with BHP Billiton Iron Ore's regional management approach and standard business management. Examples include: • Avoidance through informed design by minimising clearing to the smallest area possible. • Avoidance or minimisation through informed design by locating mining and mining-related activities away from sensitive receptor locations. • Minimise visual impact via visual screening methods, which may include screening structures, vegetation or engineering controls. • Rehabilitate cleared areas, progressively where possible.

Acceptability of Impact

Amenity (visual amenity and noise) was not considered a key environmental factor when the EPA provided its determination on the ESD; however, in recognition of potential societal impacts from its mining operations, BHP Billiton Iron Ore has assessed and discussed this factor in the PERSP. BHP Billiton Iron Ore has applied the significance framework detailed in Environmental Guideline 9 (EPA 2015b) during the assessment of these environmental factors and has found that the residual impact to visual amenity and noise amenity is anticipated to meet the EPA's factor objective with a high level of certainty that acceptable outcomes will be achieved.	**Potential Inherent Impact Rating:**  **Potential Residual Impact Rating** *(after mitigation)*: 

EPA Environmental Factor – Air Quality and Atmospheric Gases

EPA Objective – to maintain air quality for the protection of the environment and human health and amenity, and to minimise the emission of greenhouse and other atmospheric gases through the application of best practice.

BHP Billiton Iron Ore Objective – BHP Billiton Iron Ore shall mitigate risks to air quality and atmospheric gases from its activities to an acceptable level.

Potential Impacts	Management Approach
Given the nature of the environmental context and the relatively remote nature of the proposed operations, the strategic assessment focused on particulate (or dust) emissions to air and on greenhouse gases. For the Full Conceptual Development Scenario, with Leading Controls at BHP Billiton Iron Ore operations and Standard Controls at third-party operations, predicted PM_{10} concentrations are above the Air NEPM standard at eight sensitive receptors with Leading Controls in place; with Marillana Homestead and Wirrilimarra community area being the only two sensitive receptors to be permanently occupied. Marillana Homestead was identified as the only permanently occupied sensitive receptor not to meet the Kwinana EPP TSP limit with Leading Controls at BHP Billiton Iron Ore operations. It should be noted that the Full Conceptual Development Scenario is conservative in that it assumes all sites are operating concurrently and at full production. As such, the modelled outcomes will overestimate likely impacts. It is also noted that the predicted exceedances of the PM_{10} standard and TSP criteria at Marillana Homestead and Wirrilimarra community area appear to be strongly influenced by third-party operations, which are outside of BHP Billiton Iron Ore's control. BHP Billiton Iron Ore's cumulative contribution to these sensitive receptors is low, when Leading Controls are applied. Predicted GHG contributions at an Australian and Western Australian level are 0.8% and 6.2% respectively.	The Air Emissions Management toolkit will be implemented in accordance with BHP Billiton Iron Ore's regional management approach and standard business management practices for construction and operational phases. Examples include: • *Avoidance through informed design* by minimising clearing to the smallest area possible. • *Avoidance or minimisation through informed design* by locating dust-generating activities away from sensitive receptor locations. • *Minimise dust generation* by ore and waste moisture management. • *Minimise dust generation* by reducing the exposed ore surface area or by implementing dust control measures such as barriers. • *Rehabilitate* cleared areas, *progressively* where possible, thus minimising surface area with potential for exposure as dust. • *Monitor* ambient air dust levels and report and manage as required. The management of particulate emissions is an important operational focus, with emissions managed using standard business management practices for construction and operational phases. The Air Quality Assessment (Appendix 9) demonstrates the improvement possible with management intervention.

Acceptability of Impact

At a regional level, the model shows the Strategic Proposal, with mitigation, can maintain air quality for the protection of human health and amenity.

This assessment has demonstrated the improvement possible with mitigation of dust impacts on the broader Newman area. Furthermore, the Strategic Proposal assessment has considered controls in the broad sense; and it is reasonable to assume that, as a regional management approach is applied to Derived Proposals, there will be greater opportunity to implement tailored actions to manage emissions effectively.

The assessment completed for the Strategic Proposal shows that, with the implementation of management measures, the EPA objective for Air Quality and Atmospheric Gases can be met. BHP Billiton Iron Ore will implement a combination of targeted management and controls, in addition to business-as-usual management, as required to manage Air Quality and Atmospheric Gases to an acceptable level.

Potential Inherent Impact Rating:

Potential Residual Impact Rating *(after mitigation)***:**

EPA Environmental Factor – Rehabilitation and Decommissioning

EPA Objectives – To ensure that premises are decommissioned and rehabilitated in an ecologically sustainable manner.

BHP Billiton Iron Ore Objectives – BHP Billiton Iron Ore shall manage its activities for the creation of safe, stable, non-polluting and sustainable landscapes so as to reduce risks to an acceptable level.

Potential Impacts	Management Approach
Without mitigation, the impacts associated with the Strategic Proposal will affect BHP Billiton Iron Ore's ability to meet its objective for Rehabilitation and Decommissioning. Rehabilitation of OSAs, associated infrastructure and rail is anticipated to reach a Good vegetation condition or better over time. The Rehabilitation and Decommissioning Management toolkit will be applied to minimise the footprint, where practicable, and to adopt the most effective rehabilitation method available for the infrastructure type at the time. For the purpose of the assessment, mine voids are considered unlikely to achieve a better vegetation condition than Degraded; therefore, BHP Billiton's residual impact, once rehabilitation and decommissioning are complete, is conceptually 50,316 ha. With adaptive management and advances in knowledge, mine void rehabilitation success may improve in the future. BHP Billiton Iron Ore will quantify the footprint area subject to residual impact at the time of any Derived Proposal submission.	• Plan for appropriate *OSA location and design*. • Develop appropriate *completion criteria* for landforms. • Conduct *climate change sensitivity assessment* where appropriate to ensure that final landforms are designed to withstand climate change. • Minimise impacts from clearing by *growth media management* to enable rehabilitation success. • Minimise presence of mine voids and pit lakes upon closure through mine planning, closure planning and *informed design*. • Minimise of impacts to water by *surface water drainage control* and through *pit lake management*. • *Minimise disturbance footprint through informed design.* • Undertake *progressive rehabilitation* where possible, and *rehabilitation monitoring* to determine rehabilitation success. • Undertake *geochemical waste characterisation* to inform final landform design. • Minimisation of impacts to soils and water through *AMD risk assessment*, and *PAF and unstable material avoidance* and/or *management*. Refer to the Land and Biodiversity Management Toolkit and the Water Management Toolkit for further management measures.

Acceptability of Impact

Effective rehabilitation of vegetation, to at least Good or better quality condition, is considered to be achieved for at least 50% of the Full Conceptual Development Scenario footprint within 15 years of cessation of activities. Given the Company's historical performance with rehabilitation and decommissioning, application of the management processes, a regional approach to management and preparation of mine closure plans, it is concluded that potential impacts are considered to meet EPA's factor objective through targeted management in addition to business-as-usual management. There is a moderate to high level of certainty that an acceptable outcome will be achieved.	**Potential Inherent Impact Rating:**  **Potential Residual Impact Rating** *(after mitigation)***:** 

EPA Environmental Factor – Offsets
EPA Objectives – to counterbalance any significant residual environmental impacts or uncertainty through the application of offsets ***BHP Billiton Iron Ore Objectives*** – BHP Billiton Iron Ore shall counterbalance any significant residual environmental impacts or uncertainty through the application of offsets
Management Approach
The Strategic Proposal enables consideration of environmental offsets as part of a long-term regional approach and provides a unique opportunity for BHP Billiton Iron Ore to deliver offsets that have strategic outcomes, are coordinated and are developed to address regional- or landscape-scale residual impacts and threatening processes. Where significant residual environmental impacts are identified for a Derived Proposal, BHP Billiton Iron Ore will provide either a regional offset at the Strategic Proposal level or a project-specific environmental offset. Based on the area of potential direct impact, approximately 98,500 ha of disturbance will potentially occur due to by the BHP Billiton Iron Ore's Full Conceptual Development Scenario. Based on current rehabilitation practices and assumptions associated with vegetation rehabilitation ability (for example, no rehabilitation of pit areas), the residual impact of the Full Development Scenario is 50,316 ha. The success of rehabilitation as a mitigation measure will be determined by a number of factors. For the purpose of estimating the quantum of residual impact, it has been assumed that rehabilitation will have achieved successful mitigation if vegetation of Good or better quality is establish that it is consistent with the final land use as defined in the mine closure plan. BHP Billiton Iron Ore believes that this level of success can be achieved on areas disturbed for OSAs, rail, and associated infrastructure (but not pits). On this basis, the potential scale of the residual impact from development of the BHP Billiton Iron Ore Full Conceptual Development Scenario is approximately 50,316 ha. This figure and the scale of each future proposal offset will be validated and set at the Derived Proposal stage. The acceptance of rehabilitation as a mitigation measure will require ongoing verification of rehabilitation success.

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DOCUMENT STRUCTURE

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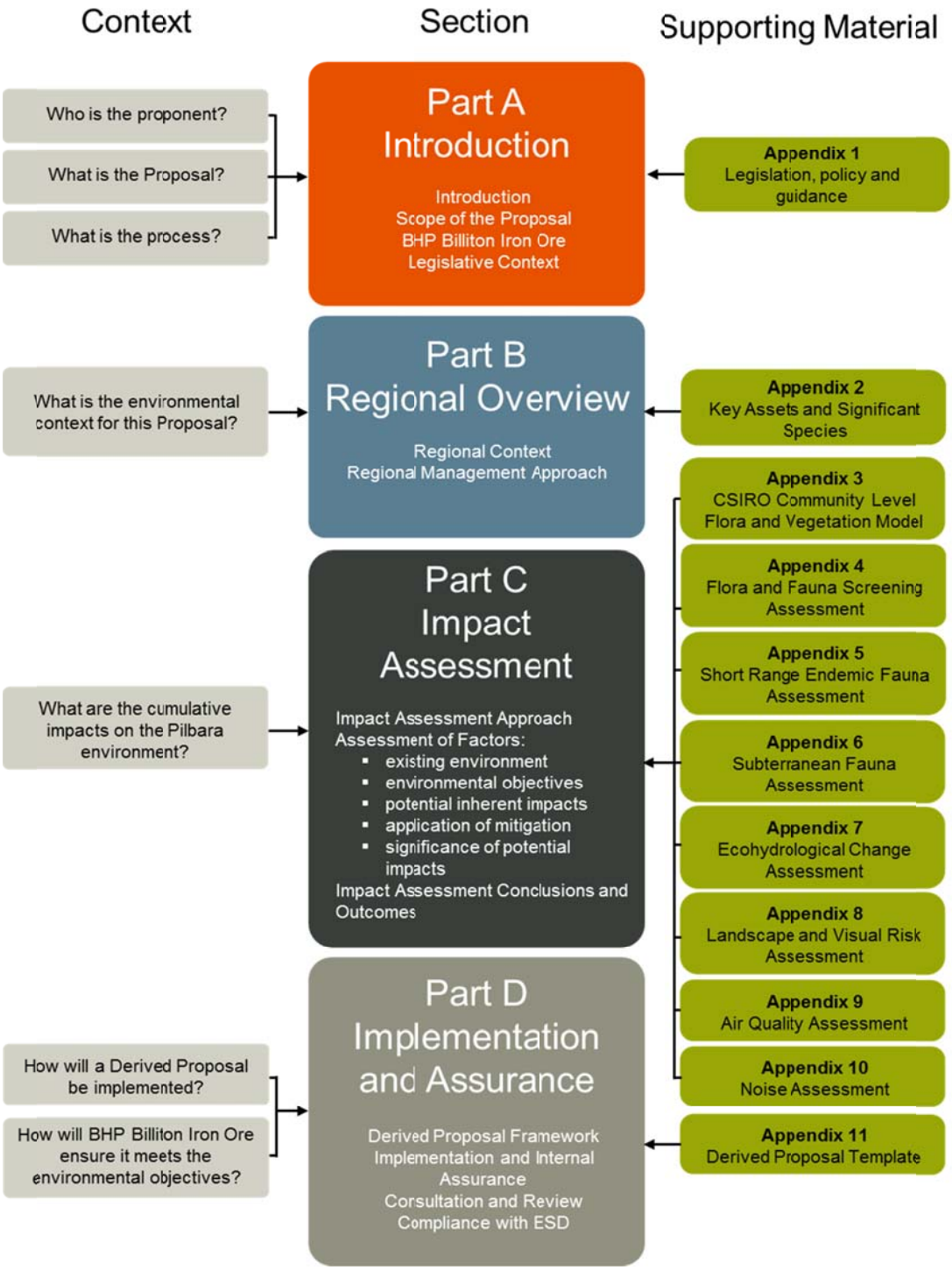

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