Government of Western Australia
Department of Water and Environmental Regulation

Amendment Notice #1

Licence Number	L6942/1997/13
Licence Holder	BHP Billiton Iron Ore Pty Ltd
ACN	008 700 981
File Number:	DER2013/000329
Premises	Eastern Ridge Iron Ore Mine Mining Tenement ML244SA within coordinates MGA Zone 50: NEWMAN WA 6753 As depicted in Schedule 1, Maps and co-ordinates
Date of Amendment	09/05/2018

Amendment

The Chief Executive Officer (CEO) of the Department of Water and Environmental Regulation (DWER) has amended the above Licence in accordance with section 59 of the *Environmental Protection Act 1986* (EP Act) as set out in this Amendment Notice. This Amendment Notice constitutes written notice of the amendment in accordance with section 59B(9) of the EP Act.

Date signed: 9 May 2018

Alana Kidd
Manager, Licensing – Resource Industries
Regulatory Services - Environment

an officer delegated under section 20 of the *Environmental Protection Act 1986* (WA)

Definitions and interpretation

Definitions

In this Amendment Notice, the terms in Table 1 have the meanings defined.

Table 1: Definitions

Term	Definition
AACR	Annual Audit Compliance Report
ACN	Australian Company Number
AER	Annual Environment Report
Amendment Notice	refers to this document
AS3580.9.11	means the Australian Standard AS3580.9.11 Methods for sampling and analysis of ambient air- Determination of suspended particulate matter – PM10 beta attenuation monitors
AS3580.14-2014	means the Australian Standard AS 3580.14 Methods for sampling and analysis of ambient air – Meteorological monitoring for ambient air quality monitoring applications
ATS5621-2012	means Australian Technical Specification ATS5621-2013 Iron ores – rapid moisture determination
Average Monthly Availability	means the combined average percentage availability of equipment, calculated for each calendar month by dividing the time that the equipment is operating, by the time the equipment is required to be operating
Category/ Categories/ Cat.	categories of Prescribed Premises as set out in Schedule 1 of the EP Regulations
CEO	means Chief Executive Officer. CEO for the purposes of notification means: Director General Department Administering the *Environmental Protection Act 1986* Locked Bag 33 Cloisters Square PERTH WA 6850 info@dwer.wa.gov.au
CS Act	*Contaminated Sites Act 2003* (WA)
Day	24 hour period, from 24:00 hours to 24:00 hours (midnight).
Delegated Officer	an officer under section 20 of the EP Act
Department	means the department established under section 35 of the *Public*

	Sector Management Act 1994 and designated as responsible for the administration of Part V, Division 3 of the EP Act
Department Request	means a request for Books or other sources of information to be produced, made by an Inspector or the CEO to the Licence Holder in writing and sent to the Licence Holder's address for notifications, as described at the front of this Licence, in relation to: (a) compliance with the EP Act or this Licence; (b) the Books or other sources of information maintained in accordance with this Licence; or (c) the Books or other sources of information relating to Emissions from the Premises
Discharge	has the same meaning given to that term under the EP Act
DWER	Department of Water and Environmental Regulation
Emission	has the same meaning given to that term under the EP Act
Environmental Harm	has the same meaning given to that term under the EP Act
EPA	Environmental Protection Authority
EP Act	*Environmental Protection Act 1986* (WA)
EP Regulations	*Environmental Protection Regulations 1987* (WA)
Existing Licence	The Licence issued under Part V, Division 3 of the EP Act and in force prior to the commencement of and during this Review
GL/a	Gigalitres per annual period
ISO3087:2011	means International Standardization Organization ISO3087:2011 *Iron ores – Determination of the moisture content of a lot.*
km	kilometres
Licence Holder	BHP Billiton Iron Ore Pty Ltd
m^3	cubic metres
µS/cm	Micro siemens per centimetre
Minister	the Minister responsible for the EP Act and associated regulations
MS	Ministerial Statement
Mtpa	Million tonnes per annum
NEPM	National Environmental Protection Measure
Noise Regulations	*Environmental Protection (Noise) Regulations 1997* (WA)
Occupier	has the same meaning given to that term under the EP Act.

Ore Handling Activities	means activities occurring within the Premises which involve the movement and/or disturbance of Iron Ore, including, but not limited to, in-loading, crushing, stacking, reclaiming, rehandling, transferring (via conveyors) and out-loading of Iron Ore.
PM	Particulate Matter
PM_{10}	used to describe particulate matter that is smaller than 10 microns (µm) in diameter.
Prescribed Premises	has the same meaning given to that term under the EP Act.
Premises	refers to the premises to which this Decision Report applies, as specified at the front of this Decision Report
Reportable Event	means an exceedance to a criteria specified requiring certain actions to be undertaken by the Licence Holder, including but not limited, to reporting to the CEO
Risk Event	as described in *Guidance Statement: Risk Assessment*
RiWI Act	*Rights in Water and Irrigation Act 1914*
Sealed	means any seal including concrete paving, bitumen, or bitumen-based seal that is resistant to heavy vehicle traffic.
TEC	Threatened Ecological Community as listed under the *Biodiversity Conservation Act 2016*
TRH	Total recoverable hydrocarbons
UDR	*Environmental Protection (Unauthorised Discharges) Regulations 2004* (WA)
$\mu g/m^3$	micrograms per cubic metre
WHPZ	Well Head Protection Zone (within the Newman Water Reserve) *'…declared around wellheads in public drinking water source areas to protect the groundwater from immediate contamination threats in the nearby area.'* (DoW, 2014)

Amendment Notice

This amendment is made pursuant to section 59 of the *Environmental Protection Act 1986* (EP Act) to amend the Licence issued under the EP Act for a prescribed premises as set out below. This notice of amendment is given under section 59B(9) of the EP Act.

This notice is limited only to:

- Increase the surplus water disposal limit of Category 6 by 5.1 GL/a to a total of 19 GL/a;
- Addition of monitoring point D05 (OB25DMDEW005) to monitor the quality of overflow water from the D04-3 and D04-4 discharge point, recharge basins;
- Allow for the construction and operation of dewatering infrastructure from Orebody 24 through the Premise, to the existing recharge basin Discharge Point D04-4;
- Removal of Discharge Point D03 (OB25DMDEW003) and amendment of Premise boundary in the northeast to excise this discharge point;
- Increase the limit of Category 5 by 1,000,000 tonnes per annual period to 32,000,000 tonnes per annual period; and
- An increase to the boundary of L6942/1997/13 to the north and northwest to include 'Orebody 24' which comprises a new series of associated infrastructure and open pits within the Eastern Ridge Premises boundary being mined for extraction of iron ore.

The following guidance statements have informed the decision made on this amendment*:*

- *Guidance Statement: Regulatory Principles (July 2015)*
- *Guidance Statement: Setting Conditions (October 2015)*
- *Guidance Statement: Licence Duration (August 2016)*
- *Guidance Statement: Decision Making (February 2017)*
- *Guidance Statement: Risk Assessment (February 2017)*

Amendment description

Table 2 below outlines the proposed changes to the Licence categories

Table 2: Proposed throughput capacity changes

Category	Current design/ throughput capacity	Proposed design/ throughput capacity	Description of proposed amendment
5	31,000,000 tonnes per annual period	32,000,000 tonnes per annual period	Increase of 1,000,000 tonnes to 32,000,000 tonnes per annual period, in line with approved MS1037.
6	13.9 gigalitres per annual period	19 gigalitres of dewatering discharge per annual period	Increase of 5.1 gigalitres of dewatering discharge per annual period, in line with approved MS1037.
63	10,000 tonnes per annual period	No change	Nil
85	52 cubic metres per day	No change	Nil

Surplus mine water and pipeline installation

Mine dewatering that is not used in ore processing and dust suppression at Eastern Ridge (within L6942/1997/13) is currently approved for disposal via recharge ponds (basins for aquifer recharge) or discharge points for surface water flow to Ophthalmia Dam and Homestead Creek. The recharge ponds and Homestead Creek discharge point are located in an area that provides a direct connection to the alluvial aquifer (Fortescue River Basin) (i.e. recharge) (EPWRMP, 2017). Ophthalmia Dam is also an artificial aquifer recharge system. The Ophthalmia aquifer provides a potable water supply via the Ophthalmia Borefield to the town of Newman. All dewatering discharge locations (recharge ponds and direct discharge points) are located within the BHP Billiton managed Ophthalmia and Eastern Ridge borefields.

Dewatering volumes at Eastern Ridge are projected to increase significantly as below water table mining commences at Orebody 24.

To cater for the forecasted increase in excess water, the Licence Holder is requesting an increase in the surplus water disposal limit to Ophthalmia Dam and other licenced discharge locations by 5.1 GL/a to a total of 19 GL/a. To facilitate this, an additional ~9 km of dewatering pipeline is also required to be installed between Orebody 24 dewatering storage dam and the licenced discharge point D04-4.

The new main pipeline from OB24 will have air release valves, isolation valves, scour valves, control valves, pressure sustaining valves and non-return valves. There are (currently) level transmitters and switches present to control the flow of water into the discharge point. The pipeline will consist of 400DN (diameter) PVC pipework with some 315DN and 250DN in pit. The pipeline will be predominantly installed above ground but buried in selected areas within the OB24 pit and installed in polyethylene culverts (sleeves) for road crossings.

Flowmeters are currently installed at abstraction bores and at the existing licenced discharge points.

As discussed in ‘Other Approvals’ below, the Part IV approved limit for discharge of surplus dewater is 19 GL/a.

The Licence Holder has requested the licence allow for overflow from D04-4 and D04-3 (recharge ponds when at capacity) and to monitor this overflow, adding discharge monitoring location D05 (OB25DMDEW005 located at 791744.24E, 7417407.36N [in GDA 1994 MGA Zone 50]). No clearing, earthworks or modifications are required to allow for the overflow of water from the recharge ponds. The proposed monitoring point at D05 is within a previously constructed v-drain which travels for approximately 1.47km to a recharge basin located to the north of the Ophthalmia Dam wall. When overflow of DO4-4 and DO4-3 occurs, discharged water will travel via the v-drain, past D05 towards and into the recharge basin. Prior to reaching the (end-point) recharge basin, the discharged water may recharge into the aquifer via seepage below the v-drain, en-route to the dam.

D05 was previously on the operational licence, however the (previous) discharge point was located approximately 850m downstream towards Ophthalmia Dam from the current proposed D05 monitoring point.

The recharge ponds at D04-4 and D04-3 are located at the confluence of the Fortescue River and Homestead Creek on a low rise of outcropping calcrete (Figure 1). This provides a direct connection to the aquifer with no apparent limiting layers (BHP, 2015). A shallow and variable soil profile was removed during excavation to provide maximum exposure of clean calcrete for maximum recharge rates (BHP, 2015). Given this (historical) information, it is reasonable to anticipate some localised recharge of D04-4 and D04-3 overflow before it reaches the final recharge basin (near Ophthalmia Dam).

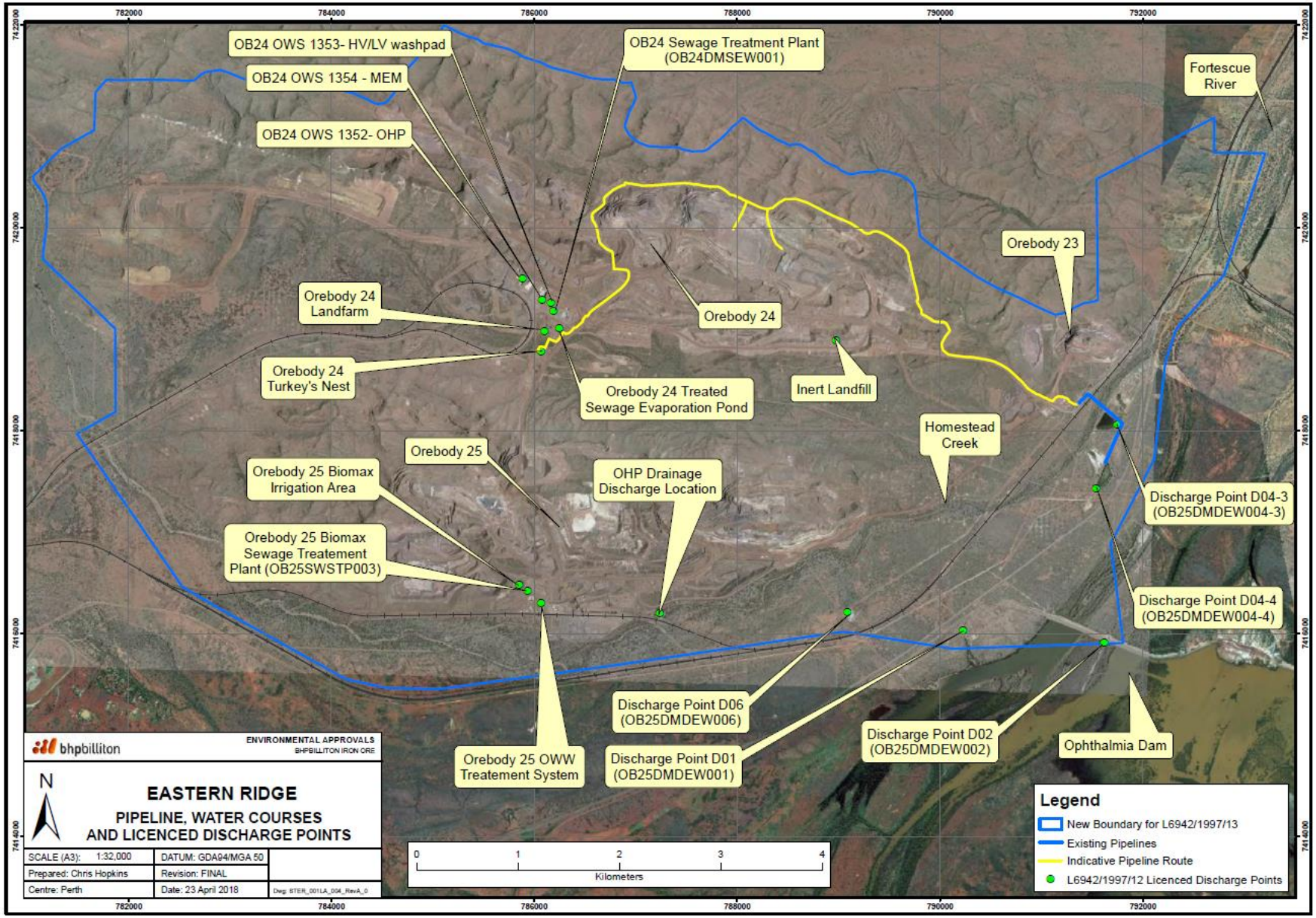


Figure 1 Pipeline and licenced discharge points in relation to existing (named) water courses and Ophthalmia Dam.

Removal of Discharge Point D03

The Licence Holder has requested the removal of Discharge Point D03 (OB25DMDEW003) from the licence as this discharge point is no longer used by the Eastern Ridge mining operations for the purpose of mine dewatering discharge. The pipework will remain for the provision of water supply to the Newman Water Treatment Plant (not subject of this amendment).

Increase in Ore Processing

The Licence Holder is seeking to increase the Category 5 production limit by 1 Mtpa to a new limit of 32 Mtpa, which will be achieved purely through on-site efficiency measures with no construction of new infrastructure required. Geological studies have identified higher grade ore which will be available at a lower strip ratio and less overburden waste will be produced. The lower strip ratio means that while proposed ore production will increase, the total material handling volumes will decrease.

No alteration to current dust management and monitoring has been proposed by the Licence Holder in relation to the proposed increase in production capacity. The current standard dust management practices are discussed in the risk assessment below. These dust management controls are also outlined in the current Orebody 23 Environmental Management Plan (BHPBIO, 2008) and the Orebody 24/25 Upgrade Project Environmental Management Plan (BHPBIO, 2010).

Under the OB23 Environmental Management Plan the Licence Holder also committed to implementing a dust monitoring program to quantify the significance of dust emissions and to determine the ambient dust conditions.

A network of real-time monitoring stations surrounding Newman to monitor atmospheric PM_{10} concentrations has been established and is operational. The real-time monitoring stations provide (digital) data, obtained every 10 minutes which is transferred through to operations personnel. Within this network of real-time atmospheric PM_{10} monitoring stations, there are a series of mobile monitors that inform operational dust monitors. Two solar powered BAM1020 dust monitoring PM_{10} units are located at the Eastern Ridge operations.

The fixed ambient air monitors located within the Newman township (‘Newman 1’ and ‘Newman 3’) are utilised to determine particulate deposition and potential impacts on the town. The wind arcs utilised by BHP to indicate potential deposition of particulate that has originated from Eastern Ridge operations is provided below as Figures 2 and 3. Response actions where elevated airborne dust levels are detected at the fixed Newman 1 and Newman 3 monitors are discussed in the risk assessment below.

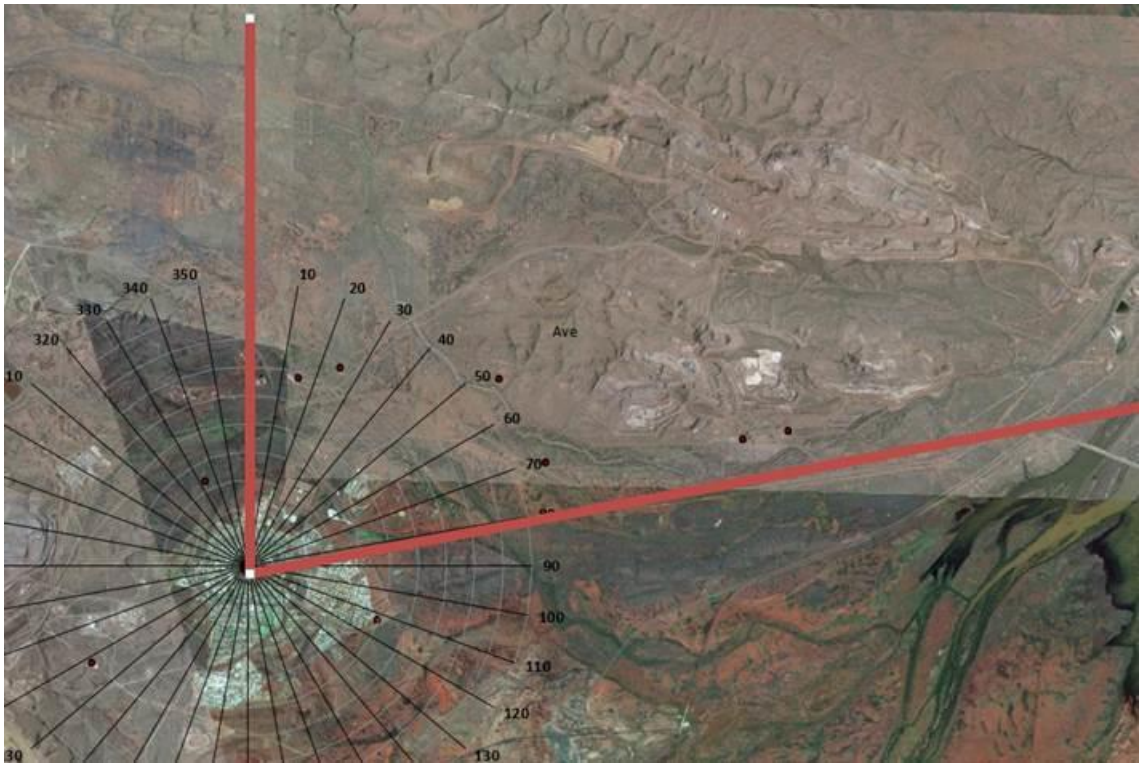


Figure 2 Town Centre (Newman 1) Wind Arc.

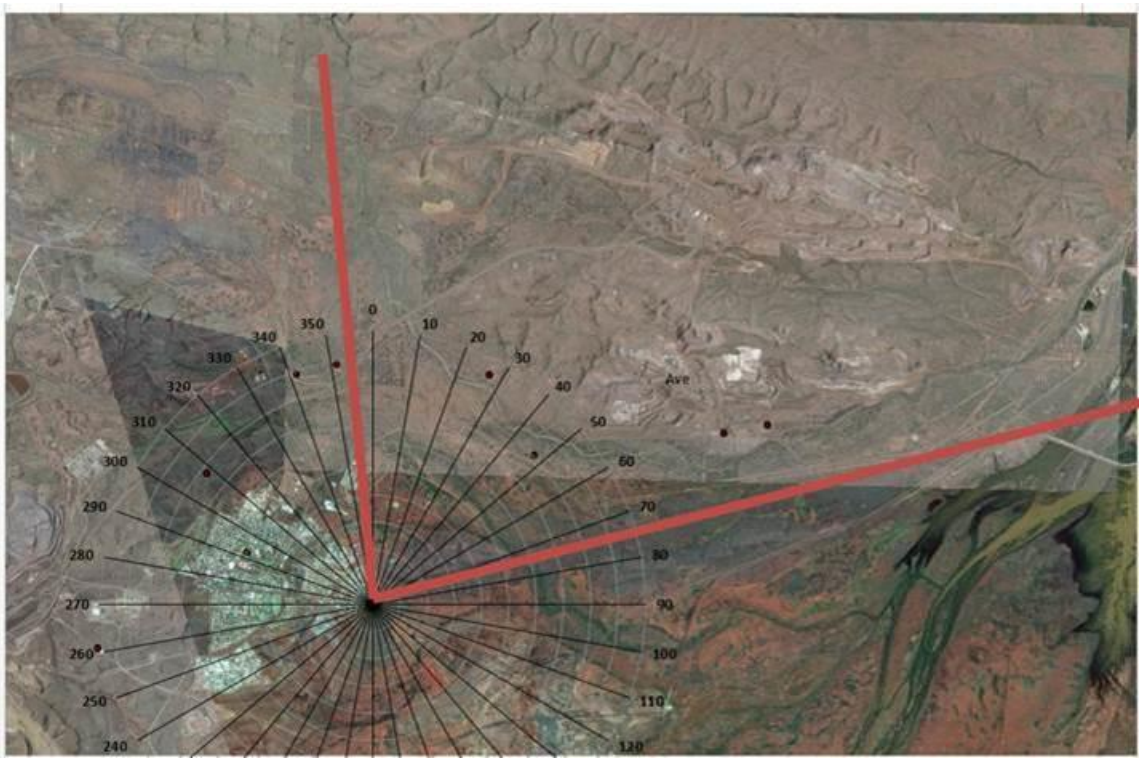


Figure 3 Newman East (Newman 3) Wind Arc.

The background monitoring site is currently located approximately 5 km north west of the OB24 operations. The Eastern Ridge OB32 monitoring unit is situated approximately 1.2 km south west of the OB25 operations and 2.8 km northwest of the Newman town site.

It is noted that air quality impact assessments conducted for the recent Part IV EP Act (Eastern Ridge) approval infers that increases above air quality targets and standards will

occur at sensitive receptors with an increased throughput at the Eastern Ridge mining hub (at a larger throughput, such as the proposed future increase of 45Mtpa). This will be subject to a separate assessment once received.

To demonstrate effectiveness of the existing dust management measures for a 1Mtpa increase and the expansion of the Premise boundary, conditions will be applied to this amendment to allow the Licence Holder to demonstrate the anticipated likelihood of '*no changes predicted to the number of days per year above air quality targets and standards, specifically in Newman, due to the increased level of mining activity and dust emissions'*.

Amendment and increase the Premises boundary of L6942/1997/13

The Licence Holder has requested amendment to the boundary in the northeast of the Premises to excise the tenure no longer required for discharge point D03.

In addition, an extension to the boundary of the Premise to the north and northwest has also been requested to include Orebody 24 which was not previously displayed in Schedule 1: Maps. The extension to the Premise layout is to the west and north, only. There are no additional prescribed activities approved within the extended boundary area.

The proposed alignment of the Premises boundary aligns with the MS 1037 development boundary in the west and northern sections only. The Premise boundary is outside the MS1037 development envelope boundary in the southwest, south, east and northeast.

The Premises boundary continues to include OB23 (northeast of the Premises). OB23 is not regulated by MS1037 but by MS478 as listed in Table 3, below.

Exclusion to this assessment

The Licence Holder has indicated that clearing of ~3 ha of vegetation for dewatering pipeline installation will be required. The clearing of this vegetation has not been included as part of this assessment as this has previously been assessed and approved under MS 1037, MS 478, (for dewatering infrastructure of Orebody 23) and CPS 6762/1. See Table 3 for more information.

Other approvals

Other approvals relevant to this amendment are outlined in Table 3.

Table 3: Relevant approvals

Legislation	Number	Approval
Part IV EP Act	Ministerial Statement 1037 (MS 1037) Published (and last updated) on 21 September 2016	MS 1037 comprises combined the Ministerial Statements for Orebody 24 (MS 834), Orebody 25 (MS 712) and Orebody 32 (MS 1018). MS 1037 also approves below water table mining at Orebody 24 and an increase in surplus water discharge to 19 gigalitres per annum (GL/a).
	Ministerial Statement 478 (MS 478) originally published on 8 June 1998, last updated via s45C on 4 December 2012	Newman Satellite Development – Mining of Orebody 23 below the Water table. (Note: this MS is outside but immediately adjacent to the north-eastern boundary of MS1037).
Granted under section 51E of the *Environmental Protection Act 1986*	CPS 6762/1, expires 30/11/2020	CPS 6762/1 - BHP Billiton Iron Ore Pty Ltd Area Applied to clear: 10 ha for the purpose of Construction and Maintenance of Fences, Maintenance of Infiltration Basins and Associated Activities shown within the crosshatched area on AML 70/244
Rights in Water and	GWL65219(9) within the Ophthalmia Borefield for	AML70/244 – Mt Whaleback Operation & Orebody 25, Crown Lease 3116/3684- Ophthalmia Dam &

Irrigation Act 1914	annual water entitlement of 10,000,000kL (equivalent to 10 GLa). Licence valid until 26 September 2022	Pastoral Lease 3114/992 Ethel Creek Station for the purposes of: Dust suppression Earthworks and construction Exploratory drilling General campsite purposes Mineral ore processing and other mining purposes Potable water supply purposes Water Supply for Public Scheme
	GWL182237(2) within the Eastern Ridge Borefield (specifically PB25 Pit 1, OB 25 Pit 3 and OB24) for annual water entitlement of 10,920,000kL (equivalent to 10.92 GLa). Licence valid until 2 May 2027	AML70/244 – - Section 13 – OB25(Pit 1) Operation, AML70/244 – - Section 13 – OB25(Pit 3) Operation, AML70/244 – OB24 for the purposes of: Dewatering for mining purposes Dust suppression Earthworks and construction Exploratory drilling General campsite purposes Mineral ore processing and other mining purposes Potable water supply purposes Water Supply for Public Scheme Water used for Industrial processing purposes
	GWL74556(10) within the Eastern Ridge and Mt Whaleback (mining) Operations (specifically OB23) areas for annual water entitlement of 14,600,000kL (equivalent to 14.6 GLa). Licence valid until 1 December 2024	AML70/244 – Mt Whaleback Operation and OB23/25 Operations, AML70/244 for the purposes of: Dewatering for mining purposes Dust suppression Earthworks and construction Mineral ore processing and other mining purposes Potable water supply purposes

Amendment history

Table 4 provides the amendment history for Part V (EP Act) approvals relevant to the Premises.

Table 4: relevant works approvals and amendments issued

Instrument	Issued	Amendment
L6942/1997/11	08/11/2007	Licence amendment to allow processing of iron ore mined from OB23 and OB25 at the OB25 processing facilities
L6942/1997/12	11/11/2010	Licence reissue
W4982/2011/1	15/09/2011	Works approval issued for Orebody 24/25 Upgrade Project. Ore Processing Facility (category 5) and Sewage Treatment Facilities (Category 85).
W5282/2012/1	6/12/2012	Works approval issued for Orebody 24/25. Addition of Sewage Treatment Facility (Category 85) designed to treat 30 m^3/day of effluent.
L6942/1997/12	14/11/2013	Licence amendment following competition of works approved through works approval W4982/2011/1.
L6942/1997/13	12/11/2015	Licence reissue and amendment, updated to licence template version 2.9.
L6942/1997/13	9/05/2018	Amendment Notice # 1 (this notice) Licence amendment to include: • Increasing the boundary of L6942/1997/13 (west and north) to

		include Orebody 24 and amendment of the northeastern section of the premise boundary; • Allowing for the construction and operation of dewatering infrastructure from Orebody 24 to the existing Eastern Ridge water network; • Increasing the surplus water disposal limit of Category 6 by 5.1 GL/a to a total of 19 GL/a; • Addition of monitoring point D05 (OB25DMDEW005) which receives overflow from the nearby licenced recharge basins; • Increasing the limit of Category 5 to from 31,000,000 tpa to 32,000,000tpa; and • Removal of Discharge Point D03 (OB25DMDEW003) as it is no longer required for operational purposes.

Location and receptors

Table 5 below lists the relevant sensitive land uses in the vicinity of the Prescribed Premises which may be receptors relevant to the proposed amendment.

Table 5: Receptors and distance from activity boundary

Residential and sensitive premises	Distance from Prescribed Premises
Newman township	2.3 km south-southwest of the premises boundary
Newman Gymkhana and Polocrosse Club – Agistment area	1.06 km south-southwest of the premises boundary
Parnpajinya Aboriginal Community	1.90 km southwest of the premises boundary

Table 6 below lists the relevant environmental receptors in the vicinity of the Prescribed Premises which may be receptors relevant to the proposed amendment.

Table 6: Environmental receptors and distance from activity boundary

Environmental receptors	Distance from Prescribed Premises
Homestead Creek (as well as adjacent floodplains and major tributaries)	Within the Premises boundary, the creek runs east – west along the south section of the premises boundary. Surface water (when flowing) travels west to east towards Ethel Gorge. Homestead Creek recharges the superficial aquifer below, from which water is drawn to supply the township of Newman.
Ophthalmia Dam	A portion of this is within the southeast corner of the Premises boundary, the northern section of the Dam receives dewatering discharge
Section of the Fortescue River (supporting the Ethel Gorge Aquifer Stygobiont TEC)	A portion of this is within the Premises boundary, however does not permanently flow and remains dry for the majority of the year. Only flows during flood events.
Ethel Gorge Aquifer Stygobiont TEC Listed as “EN B) ii)” Category of Threat criteria. This means the TEC is (DEC, 2013): *EN) An ecological community that has been adequately surveyed and found to have been subject to a major contraction in area and/or was originally of limited distribution and is in danger of significant modification throughout its range or severe modification or destruction over most of its range in the near future.* *B) Current distribution is limited, and* *ii) there are few occurrences, each of which is small and/or isolated and all or most occurrences are very vulnerable to known threatening processes.*	This TEC is located in the groundwater aquifer below the eastern section of the Premises and below licenced discharge points (recharge basins) D04-4 and D04-3. Recharge to the alluvial aquifer system supporting the TEC occurs mostly from incidental rainfall and infiltration from surface water flows in Homestead Creek
Newman Water Reserve (Proclaimed)	This reserve has Priority 1 status and overlies most of the Premises, with the exception of some areas in eth north of the premises boundary. The current Licence Holder dewatering discharge points are located within a 1km radius of the following well head protection zones (bores) (DoW, 2014) H10, H8, E11, E12, E15, K29, K30, K31. A 500 m radius WHPZs for the production bores within the P1 area is applicable in the Newman Water Reserve.

Risk assessment

Tables 7 and 8 below describe the Risk Events associated with the amendment consistent with the *Guidance Statement: Risk Assessments*. Both tables identify whether the emissions present a material risk to public health or the environment, requiring regulatory controls.

Table 7: Risk assessment for proposed amendments during construction and commissioning

Risk Event						Consequence rating	Likelihood rating	Risk	Reasoning
Source/Activities		**Potential emissions**	**Potential receptors**	**Potential pathway**	**Potential adverse impacts**				
Category 6 Mine dewatering and water discharge to the environment	Construction, mobilization, positioning of dewatering pipeline infrastructure and pipeline commissioning. Includes re-installation of dewatering overflow monitoring point at D05.	**Dust**: associated with earthworks and vehicle movement	Residences within the Newman township Parnpajinya Aboriginal Community Newman Gymkhana and Polocrosse Club – Agistment area	Air: Transport through air then transfer through respiratory system	Human health impacts – respiratory illness	N/A	N/A	N/A	There is at least a 5km buffer between the pipeline construction areas within the Premises boundary and the nearest residential or sensitive receptor. This is considered sufficient to prevent noise and dust impacts from occurring. All environmental receptors are located close to the proposed dewatering infrastructure route, with some of the pipeline being laid on the ground surface over the (subsurface) Ethel Gorge Aquifer Stygobiont TEC. Despite this proximity, as no major excavations are required for infrastructure placement; no risk of impact to identified environmental receptors is considered to occur by this activity. The Delegated Officer also notes that construction activities, and associated noise and dust emissions, will be of relatively short duration.
			Terrestrial vegetation near construction area	Air: Transport through air then disposition	Smothering and the potential to be deposited on vegetation which may prevent photosynthesis and plant respiration	N/A	N/A	N/A	
		Noise: associated with earthworks and vehicle movement	Sensitive receptors (horse agistment area)	Air or other physical medium: Vibration of particles	Human health and amenity impacts	N/A	N/A	N/A	

Risk Event						Consequence rating	Likelihood rating	Risk	Reasoning
Source/Activities		Potential emissions	Potential receptors	Potential pathway	Potential adverse impacts				
		Mine dewater of neutral pH with EC readings being between 650 and 660 µS/cm. Nitrate (as N) at 1.4 mg/L (Feb 2017) and 0.5 mg/L (May 2017) (OB24 (named HEA0313P) production bore in BHP 2017 Annual Aquifer Review).	Terrestrial vegetation near construction area	Pipeline failure during commission resulting in direct discharge to land	Vegetation loss	Slight: Given the good quality and low salinity of the groundwater being abstracted from OB24 and the lack of vegetation near the proposed pipeline route, the onsite and amenity impacts are anticipated to be minimal.	Unlikely	Low	There are no significant flora species within 1km of the proposed new pipeline route and vegetation where required, will be removed from around the pipeline route utilizing grant by existing approvals. This will limit the vegetation that may be present or impacted by a pipeline leak or rupture during pipeline commissioning. In addition, is anticipated that the Licence Holder controls and real-time management during commissioning will limit the un-planned discharge (ie: leak) of significant quantities of water. As such, the risk to the environment is considered to be **low**.
		Sediment: increased sedimentation generated by installation of pipelines in or crossing drainage lines	Surface drainage lines	Land	Blocking or diverting natural stream flows reducing natural water flow to vegetation/ downstream Smothering of vegetation from sediment	Minor	Unlikely	Low	The Licence Holder has committed to installing the pipeline to ensure that the natural surface flow will be maintained. There are no major drainage channels crossing the pipeline route and the crossing points are anticipated to generate minor disruption to localized soil profiles at these locations. Taking the Licence Holder commitments into consideration, the risk is considered to be **low**.

Risk Event						Consequence rating	Likelihood rating	Risk	Reasoning
Source/Activities		Potential emissions	Potential receptors	Potential pathway	Potential adverse impacts				
					buildup				

Table 8: Risk assessment for proposed amendments during operation

Risk Event						Consequence rating	Likelihood rating	Risk	Reasoning
Source/Activities		Potential emissions	Potential receptors	Potential pathway	Potential adverse impacts				
Cat 5 Processing or beneficiation of metallic or non-metallic ore	Operation of processing infrastructure and movement of additional ore product	**Dust**: associated with additional ore handling	Newman Gymkhana and Polocrosse Club – Agistment area, Parnpajinya Aboriginal Community and Newman township	Air: Transport through air then disposition	Health and amenity impacts	Moderate	Possible	Medium	The Licence Holder has advised that the proposed increase in production to 32 000 tonnes per annual period (increase of 1 000,000 tonnes per annual period) will be achievable via a decrease in ore/waste strip ratio. This decreased ore strip ratio will be associated with accessing more high grade ore meaning that overall there will potentially be less material handling at the Eastern Ridge Mining Operation. Operations currently conducted at Eastern Ridge have the following standard controls adopted for management of dust: • dampening haul roads, unsealed roads and

Risk Event						Consequence rating	Likelihood rating	Risk	Reasoning
Source/Activities		Potential emissions	Potential receptors	Potential pathway	Potential adverse impacts				
	Operation of processing infrastructure and movement of additional ore product Cont..								construction areas with water trucks; • dust extraction via collectors; • transfer points enclosed and fitted with water sprays (Note: All chutes/transfer stations are enclosed. CV108/CV104, CV104/CV04, CV05/RC01 transfer chutes are enclosed and fitted with water sprays. The main intent of these water sprays is to add water to ore for overall dust suppression rather than to manage emissions from the transfer station); • land disturbance and exposed soil restricted to a practicable minimum; • sprinklers / water sprays on the processing circuit (e.g. primary crusher bins, ore stockpiles); • ore (moisture) conditioning; • dust suppression equipment is maintained in efficient operating condition in accordance with relevant regulations; • vehicle speeds on haul roads is restricted to minimise dust; • where practicable, blasting is timed to coincide with favourable wind and weather conditions; • routine maintenance and housekeeping practices are

Risk Event						Consequence rating	Likelihood rating	Risk	Reasoning
Source/Activities		Potential emissions	Potential receptors	Potential pathway	Potential adverse impacts				
									implemented to ensure waste materials do not accumulate and lead to the generation of unacceptable airborne dust; • informing all employees and contractors of the importance of minimising ambient dust levels; • a Near Infrared (NIR) Moisture Analyser is used to monitor the moisture content of material on the conveyor system (Note: conveyor location (CV108) and reclaimer locations RC01 and RC03 are fitted with NIRs. These are strategically placed around the plant to ensure that we are getting the moisture on ore content right before we stockpile). In the event that moisture content is outside the accepted ore moisture range, the water supply is adjusted to ensure adequate dust suppression; • rehabilitation of disturbed areas; and • a dust monitoring program. With respect to the dust monitoring program, where airborne dust levels have: • Exceeded the licence conditions; and/or • Been assessed (through exposure assessment

Risk Event						Consequence rating	Likelihood rating	Risk	Reasoning
Source/Activities		Potential emissions	Potential receptors	Potential pathway	Potential adverse impacts				
									program or individual risk assessment) to be above the specified limits; or • Present a risk to the health and safety of any person at iron ore operations and/or the local community; BHP has advised the following response actions, should be carried out on site: • Exceedances are to be managed in accordance with iron ore event management procedures including investigation, external reporting and/or escalation protocols as required. • For each exceedance, ensure inspection of plant equipment, operating method and operating area is undertaken to identify the cause of the reported increased airborne dust level. • Apply adaptive management to reduce the amount of airborne dust being generated, response actions that include: - operations modified in/with consideration of wind direction. - Additional dust control equipment assigned to relevant specific work areas. - Preventative

Risk Event						Consequence rating	Likelihood rating	Risk	Reasoning
Source/Activities		Potential emissions	Potential receptors	Potential pathway	Potential adverse impacts				
									maintenance scheduled to enable dust suppression systems to operate to required availability. - Mandatory utilisation of personal protective equipment (PPE). It is noted that several of the dust monitoring program response actions are the same as the standard controls as outlined by the Licence Holder in the Application supporting document. These have been replicated here to ensure that these actions as advised by the Licence Holder are captured in their entirety. <u>*Consequence:*</u> The dust management controls listed above are the standard controls as outlined in the current management plans for Eastern Ridge. However, self-reporting for other Instruments held by the Licence Holder (eg: L4503/1975/14) has indicated that under normal management of operations with wind conditions at slow speeds, and a wind orientation of approximately

Risk Event						Consequence rating	Likelihood rating	Risk	Reasoning
Source/Activities		Potential emissions	Potential receptors	Potential pathway	Potential adverse impacts				
									66 to 92 degrees that licence target levels of PM_{10} 24 hour average 70µg/m^3 (licence target) were exceeded at the Newman 1 Town Centre monitoring location and caused by activity at Eastern Ridge mine. This has indicated that at current operating conditions, off-site impacts are possible. Consequently, the offsite impacts on a wider scale are determined to be minimal but detectable. The Specific Consequence Criteria for public health are at risk of not being met and the risk is determined to be **moderate**. *Likelihood:* This risk is considered to occur at some time. The likelihood consequence has been determined as **possible**. *Overall Risk Rating:* Comparison of the consequence and likelihood ratings described above with the Risk Rating Matrix (Guidance Statement, Risk Assessments 2017) determines the overall rating of risk of health and amenity impacts to be **medium**.

Risk Event						Consequence rating	Likelihood rating	Risk	Reasoning
Source/Activities		**Potential emissions**	**Potential receptors**	**Potential pathway**	**Potential adverse impacts**				
Category 6 Mine dewatering and water discharge to the environment	Increase the surplus water disposal limit of Category 6 by 5.1 GL/a to a total of 19 GL/a	**Mine dewater:** surface discharge from pipeline leaks or ruptures across the premise	Land within the Premise boundary Vegetation	Seepage of discharged dewater through soil profiles Pooled water within the soil profile	Flooding of vegetation	Slight	Unlikely	Low	Water quality from the OB24 (named HEA0313P) production bore (to be used for dewatering and operations) was reviewed (BHP 2017 Annual Aquifer Review). This was the only data provided for bores within the OB24 area and abstraction from this bore commenced in October 2016. The data demonstrated a near-neutral pH with EC readings being between 650 and 660 µS/cm. Nitrate was significantly lower (as N in mg/L: 1.4mg/L [Feb 2017] and 0.5 mg/L [May 2017] compared to the site-specific trigger levels [Golder Associates, 2013]) of >17.3 mg/L. There are no significant flora species within 1km of the proposed new pipeline route and vegetation where required, will have been removed from around the pipeline route during construction. This will limit the vegetation that may be present or impacted by a pipeline leak or rupture. <u>*Consequence:*</u> Given the good quality and low salinity of the groundwater being abstracted from OB24 and

Risk Event						Consequence rating	Likelihood rating	Risk	Reasoning
Source/Activities		Potential emissions	Potential receptors	Potential pathway	Potential adverse impacts				
									the lack of vegetation near the proposed pipeline route, the onsite and amenity impacts are anticipated to be minimal. Therefore the consequence is **slight**. *Likelihood:* This risk is considered to not occur in most circumstances. The likelihood consequence has been determined as **unlikely**. *Overall Risk Rating:* Comparison of the consequence and likelihood ratings described above with the Risk Rating Matrix (Guidance Statement, Risk Assessments 2017) determines the overall rating of risk of health and amenity impacts to be **low**.
	Increase the surplus water disposal limit of Category 6 by 5.1 GL/a to a total of 19 GL/a Cont..	**Mine dewater discharge:** - Elevated seepage	Vegetation Fortescue River Major channels and floodplain	Seepage discharge of dewater through soil and geological profiles	Adverse alteration of groundwater levels (localised mounding or excessive ground water drawdown) Longer exposure/ inundation of	N/A	N/A	N/A	The risk of this emission has been assessed and is managed under Condition 6 of MS 1037 and a Condition Environmental Management Plan as required by Condition 5 of MS 1037. As such, further assessment and conditioning of this potential risk of changes to groundwater levels is not required.

Risk Event						Consequence rating	Likelihood rating	Risk	Reasoning
Source/Activities		Potential emissions	Potential receptors	Potential pathway	Potential adverse impacts				
					rooting zone to water may cause vegetation health decline or death				
	Increase the surplus water disposal limit of Category 6 by 5.1 GL/a to a total of 19 GL/a Cont..	**Mine dewater discharge:** Contaminated or elevated metals/metalloids as compared to background groundwater /surface water / and or elevated TDS dewater	Alluvial aquifer below and adjacent to the recharge ponds: The aquifer system below the recharge ponds is located in an area that provides a direct connection to the alluvial aquifer (Fortescue River Basin). Water infiltrating these ponds recharges the upper alluvial aquifers. Ophthalmia Dam and associated recharge system: The Dam is an artificial aquifer recharge system. Seepage from Ophthalmia Dam filters to the upper and lower aquifers in the area as there is no confining layer beneath the dam,	Seepage from recharge ponds (calcrete layer) / Ophthalmia Dam through soil and geological profiles/ aquifer systems	Increase in nutrients, salinity and metals causing adverse impacts to the health and survival of the stygofauna TEC Impacts to upper and lower aquifers beneath Ophthalmia Dam	Major	Possible	High	The Ethel Gorge TEC has a strong groundwater hydrological dependency provided by shallow saturated pore spaces in which stygofauna live. During the EPA assessment of the Eastern Ridge Iron Ore (Part IV EP Act) Revised Proposal, the discharge of up to 19GL/a of dewater was assessed (EPA Report 1571). This is reflected in the key characteristics table of MS 1037. Management of potential impacts to the TEC has been conditioned by the EPA under Condition 8 of MS1037, being the *Eastern Pilbara Water Resource Management Plan* (EPWRMP) (as the 'Condition Environmental Management Plan' required by the MS). The EPWRMP also covers management of the key environmental factors of subterranean fauna and inland waters environmental quality and in the management of these aspects, inadvertently addresses management

Risk Event						Consequence rating	Likelihood rating	Risk	Reasoning
Source/Activities		Potential emissions	Potential receptors	Potential pathway	Potential adverse impacts				
	Increase the surplus water disposal limit of Category 6 by 5.1 GL/a to a total of 19 GL/a Cont..		allowing hydraulic connection between aquifers. Biological diversity and ecological integrity of the subterranean fauna (Ethel Gorge Aquifer Stygobiont – Endangered TEC. This stygofauna habitat is present in the zone of the fluctuating water table and permanent shallow groundwater system (upper alluvial aquifer)						requirement for the maintenance of some of hydrological processes in the area for (water levels and TDS only) and impacts to the upper and lower aquifers beneath Ophthalmia Dam. Metals and other parameters (such as nutrients) that may impact water quality are not addressed in this plan and as such, are to be managed under Part V of the EP Act. Water abstracted for (Newman) town water supply is abstracted from the upper areas of the lower alluvial Ophthalmia Dam borefield aquifer, just below coarse gravel facies and calcrete. This area receives some diffuse water recharge from the wider catchment but more significantly from Ophthalmia Dam seepage. Groundwater abstracted from these aquifers (by production bores) is reticulated into three pipelines: E-Line, H-Line and K-Line. The K-Line is used to supply process water to the Mount Whaleback operation from Eastern Ridge mine dewatering and a small volume to Newman Airport. The E-Line delivers raw potable water to the Newman

Risk Event						Consequence rating	Likelihood rating	Risk	Reasoning
Source/Activities		Potential emissions	Potential receptors	Potential pathway	Potential adverse impacts				
	Increase the surplus water disposal limit of Category 6 by 5.1 GL/a to a total of 19 GL/a Cont..								Water Treatment Plant and the H-Line delivers process water to (Licence Holder owned) Yarnima Power Station (BHP AAR, 2017). The dewatering recharge areas and Ophthalmia Dam form part of the Newman Water Reserve, which was proclaimed in 1983 under the *Country Areas Water Supply Act 1947 (WA)* for public drinking water source protection. By-laws created under this Act enable the Department of Water (now DWER) to control potentially polluting activities, to regulate land use, inspect premises and take the necessary steps to prevent or clean up pollution. In addition there are existing RiWI Act approvals (GWL65219(9)) providing for the management of the surface water and groundwater movement within this Priority 1 (Newman Water) Reserve. Noting that existing management measures are in place for the management of water (levels and TDS) being received into the aquifers below and adjacent to the Prescribed Premises under Part IV of the EP Act via the EPWRMP, the

Risk Event						Consequence rating	Likelihood rating	Risk	Reasoning
Source/Activities		Potential emissions	Potential receptors	Potential pathway	Potential adverse impacts				
	Increase the surplus water disposal limit of Category 6 by 5.1 GL/a to a total of 19 GL/a Cont..								Delegated Officer deems that further assessment and conditioning of the impact of metals and other parameters that may impact water quality, is required. *Consequence:* Given the offsite impacts at a local scale have the potential to be mid-to high level and there could be an impact to an area of high conservation value (such as the TEC), the consequence is determined to be **major**. *Likelihood:* This risk is considered that it may occur at some time. The likelihood consequence has been determined as **possible**. *Overall Risk Rating:* Comparison of the consequence and likelihood ratings described above with the Risk Rating Matrix (Guidance Statement, Risk Assessments 2017) determines the overall rating of risk of impacts to be **high**.
		Mine dewater discharge: discharge of contaminated or elevated metals/metalloid -s above	Groundwater system feeding Fortescue River and Homestead Creek The Ophthalmia	Infiltration via calcrete basins to groundwater	Alteration of groundwater quality in the Newman water supply area and underlying water quality in	Major	Possible	Medium	Water abstracted for (Newman) town water supply is abstracted from the upper areas of the lower alluvial Ophthalmia Dam borefield aquifer, just below coarse gravel facies and calcrete.

Risk Event						Consequence rating	Likelihood rating	Risk	Reasoning
Source/Activities		Potential emissions	Potential receptors	Potential pathway	Potential adverse impacts				
	Increase the surplus water disposal limit of Category 6 by 5.1 GL/a to a total of 19 GL/a Cont..	background groundwater quality/ and or elevated TDS water	aquifer which provides a potable water supply via the Ophthalmia Borefield to Newman.		Fortescue River downstream				This area receives some diffuse water recharge from the wider catchment but more significantly from Ophthalmia Dam seepage. Groundwater abstracted from these aquifers (by production bores) is reticulated into three pipelines: E-Line, H-Line and K-Line. The K-Line is used to supply process water to the Mount Whaleback operation from Eastern Ridge mine dewatering and a small volume to Newman Airport. The E-Line delivers raw potable water to the Newman Water Treatment Plant and the H-Line delivers process water to (Licence Holder owned) Yarnima Power Station (BHP AAR, 2017). The dewatering recharge areas and Ophthalmia Dam form part of the Newman Water Reserve, which was proclaimed in 1983 under the *Country Areas Water Supply Act 1947 (WA)* for public drinking water source protection. By-laws created under this Act enable the Department of Water (now DWER) to control potentially polluting activities, to regulate land use, inspect premises and take the necessary steps

Risk Event						Consequence rating	Likelihood rating	Risk	Reasoning
Source/Activities		Potential emissions	Potential receptors	Potential pathway	Potential adverse impacts				
	Increase the surplus water disposal limit of Category 6 by 5.1 GL/a to a total of 19 GL/a Cont..								to prevent or clean up pollution. In addition there are existing RiWI Act approvals (GWL65219(9) providing for the management of the surface water and groundwater movement within this Priority 1 (Newman Water) Reserve. The Licence Holder is to manage the production borefields within the P1 area in accordance with the *'Newman Water Reserve drinking water source protection plan – Newman town water supply'.* Noting that existing management measures are in place for the management of water (levels and TDS) being received into the P1 reserve and also under Part IV of the EP Act via the EPWRMP, the Delegated Officer deems that further assessment and conditioning of the impact of metals and other parameters that may impact water quality, is required. <u>*Consequence:*</u> Given the offsite impacts at a local scale have the potential to be mid-to high level and there could be an impact to the groundwater system, the consequence is determined

Risk Event						Consequence rating	Likelihood rating	Risk	Reasoning
Source/Activities		Potential emissions	Potential receptors	Potential pathway	Potential adverse impacts				
									to be **major**. *Likelihood:* This risk is considered that it may occur at some time. The likelihood consequence has been determined as **possible**. *Overall Risk Rating:* Comparison of the consequence and likelihood ratings described above with the Risk Rating Matrix (Guidance Statement, Risk Assessments 2017) determines the overall rating of risk of impacts to be **high**.
	Increase the surplus water disposal limit of Category 6 by 5.1 GL/a to a total of 19 GL/a Cont..	**Surface water quality:** changes as a result of potential changes to surface water flow	Minor drainage lines intersected by pipework.	Surface drainage	Change to surface flow route Increased sedimentation	Slight	Rare	Low	There are no major drainage channels crossing the new pipeline route. The Licence Holder has committed to operating the pipeline to ensure that the natural surface flow will be maintained and sedimentation, minimised. *Consequence:* The onsite and amenity impacts are anticipated to be minimal. Therefore the consequence is **slight**. *Likelihood:* This risk is considered to only occur in exceptional circumstances. The likelihood consequence has been

Risk Event						Consequence rating	Likelihood rating	Risk	Reasoning
Source/Activities		**Potential emissions**	**Potential receptors**	**Potential pathway**	**Potential adverse impacts**				
									determined as **rare**. *Overall Risk Rating:* Comparison of the consequence and likelihood ratings described above with the Risk Rating Matrix (Guidance Statement, Risk Assessments 2017) determines the overall rating of risk of health and amenity impacts to be **low**.
Category 6 Mine dewatering and water discharge to the environment Cont..	Overflow of mixed dewatering water from recharge basins at D04-4 and D03-4	**Mine dewater discharge**	Land and nearby vegetation	Surface flow	Localised flooding leading to vegetation health decline	N/A	N/A	N/A	The overflow from both recharge basins will be 'trained' into pre-constructed v-drains such that localized flooding is not expected during operations-related overflow events. If the engineered drains were to overtop, this would only be anticipated during significant rainfall events whereby it is likely that the nearby area will also be naturally inundated. As such, the risk to the land and nearby vegetation by the training of overflow to the engineered drain is not considered to be a risk to the environment and no further assessment conducted.

Risk Event						Consequence rating	Likelihood rating	Risk	Reasoning
Source/Activities		**Potential emissions**	**Potential receptors**	**Potential pathway**	**Potential adverse impacts**				
	Overflow of mixed dewatering water from recharge basins at D04-4 and D03-4	**Mine dewater discharge:** quality changes impacting the alluvial aquifer below the channel from D05 leading to Ophthalmia Dam	The alluvial aquifer recharge system below the recharge/ overflow area	Surface flow into groundwater	Increase to aquifer recharge (volume) in this area of the premises.	N/A	N/A	N/A	The recharge into the aquifer from recharge basin overtopping events is considered to be negligible. In addition, the overflow from both recharge basins will be 'trained' into pre-constructed v-drains such that localized flooding is not expected during operations-related overflow events. If the engineered drains were to overtop, this would only be anticipated during significant rainfall events whereby it is likely that the nearby area will also be naturally inundated. The Eastern Pilbara Water Resource Management Plan (EPWRMP) for the Eastern Ridge Mine Hub covers management of the key environmental factor of inland water environmental quality (as identified in the Part IV EP Act assessment for MS1037) and in the management of this aspect, inadvertently addresses management requirement for the maintenance of hydrological processes in the area and the additional water volume entering the alluvial aquifer from infiltration basin overflow. As such, further assessment

Risk Event						Consequence rating	Likelihood rating	Risk	Reasoning
Source/Activities		Potential emissions	Potential receptors	Potential pathway	Potential adverse impacts				
									this potential risk is not required.
		Mine dewater discharge: quality changes impacting the alluvial aquifer below the channel from D05 leading to Ophthalmia Dam	The alluvial aquifer recharge system below the recharge/ overflow area	Surface flow into groundwater	Increased nutrients from dewatering discharge entering the aquifer	Minor	Unlikely	Medium	The recharge and deposition of increased nutrients into the aquifer from basin overtopping events is considered to be low in risk due to the anticipated (low) frequency of overtopping events occurring. In addition, the overflow from both recharge basins will be 'trained' into pre-constructed v-drains such that localized

Risk Event						Consequence rating	Likelihood rating	Risk	Reasoning
Source/Activities		Potential emissions	Potential receptors	Potential pathway	Potential adverse impacts				
									flooding is not expected during operations-related overflow events. If the engineered drains were to overtop, this would only be anticipated during significant rainfall events whereby it is likely that the nearby area will also be naturally inundated. The Licence Holder has committed to the addition of monitoring point D05 (OB25DMDEW005) receiving licenced overflow from the recharge basins to determine the quality of any overflow reaching the v-drain and potentially recharging the aquifer. *Consequence:* The onsite impacts are anticipated to be low level. Therefore the consequence is **minor**. *Likelihood:* This risk is considered to probably not occur in most circumstances. The likelihood consequence has been determined as **unlikely**. *Overall Risk Rating:* Comparison of the consequence and likelihood ratings described above with the Risk Rating Matrix

Risk Event						Consequence rating	Likelihood rating	Risk	Reasoning
Source/Activities		**Potential emissions**	**Potential receptors**	**Potential pathway**	**Potential adverse impacts**				
									(Guidance Statement, Risk Assessments 2017) determines the overall rating of risk of environmental impacts to be **medium**.
-	An increase to the boundary of L6942/1997/13 to the north and northwest to include Orebody 24	**Dust**: associated with ore handling, blasting and vehicle movement around site	Vegetation and identified sensitive receptors, including the Newman township	Air: Transport through air then disposition	Smothering and the potential to be deposited on vegetation which may prevent photosynthesis and plant respiration	Slight	Possible	Low	The increase to the Premises boundary to incorporate the orebody 24 (OB24) (mining area) is anticipated to have minimal impact on the identified sensitive and environmental receptors as the activities occurring within the north and northwest of the Premises (within the Premises extension area) are further away than current activities. This increase in distance across the Premises will provide a buffer from the sensitive receptors. The physical increase to the boundary is not anticipated to generate a greater risk of hydrocarbon contamination, sedimentation or dust impact on the identified sensitive and environmental receptors as these receptors are located to the south and east of the existing Premises boundary. No receptors have been identified to the west of the proposed Premises boundary. In addition, (regarding dust
		Sediment: Increased transfer of sediment towards Homestead Creek	Vegetation	Overland surface water flow from new (exposed) unsealed roads and cleared areas	Reduction in creek line vegetation health, smothering of vegetation which may prevent photosynthe-sis and plant respiration	Slight	Unlikely	Low	
		Hydrocarbons: Increased transfer of hydrocarbons within and towards Homestead Creek	Vegetation and ecosystems within Homestead Creek and smaller tributaries	Overland surface water flow from new (exposed) unsealed roads and operational areas with machinery using hydrocarbon	Waterway pollution and reduction in creek line vegetation health	Slight	Unlikely	Low	

Risk Event						Consequence rating	Likelihood rating	Risk	Reasoning
Source/Activities		Potential emissions	Potential receptors	Potential pathway	Potential adverse impacts				
	An increase the boundary of L6942/1997/13 to the north and northwest to include Orebody 24 cont…			-s					impacts) the change in Premises boundary (extension) is not in the alignment of identified wind directions that have indicated a potential increase in PM_{10} at the Newman 1 Town Centre monitor (resulting from Eastern Ridge mining operations). Therefore, the risk to receptors from this boundary extension (to the north and west) is considered to be low. With respect to the impact on vegetation from the extension of the boundary, there is no discernible impact on the vegetation as the dust and any sedimentation (build up) generated from operations will continue commensurate with the level and location of operational activity. The increase of the boundary allows for an increased footprint for deposition of dust emissions as well as an increased dust management footprint for operations to cover. The current localised dust management measures as discussed in the first row of Table 8 (operational dust, above) are considered be adequate for the reduction of dust impacts on vegetation in the areas to be included

Risk Event						Consequence rating	Likelihood rating	Risk	Reasoning
Source/Activities		Potential emissions	Potential receptors	Potential pathway	Potential adverse impacts				
	An increase the boundary of L6942/1997/13 to the north and northwest to include Orebody 24 cont…								within the Premises boundary extension. *Consequence:* Taking the Licence Holder – proposed management measures into consideration, the impacts to vegetation are anticipated to be minimal. Therefore the consequence is **slight**. *Likelihood:* This risk is considered to probably not occur in most circumstances. The likelihood consequence has been determined as **unlikely**. *Overall Risk Rating:* Comparison of the consequence and likelihood ratings described above with the Risk Rating Matrix (Guidance Statement, Risk Assessments 2017) determines the overall rating of risk of health impacts on vegetation within the Premises boundary extension area to be **low**.

Decision

The risks to groundwater from the physical activity of dewatering the groundwater resource has previously been assessed under Part IV of the EP Act and under the RiWI Act. The risk of alteration of the groundwater system via abstraction and physical infiltration (recharge) on the TEC has also been assessed under Part IV, conditioned via MS 1037 and is to be managed as outlined in the EPWRMP for the Eastern Ridge Mine Hub and hence is not assessed here.

With respect to discharge water quality, the parameters within the surface water emission monitoring locations have been updated to reflect the parameters that are recorded (BHP AAR, 2017) at the pit production bores and also those required for monitoring and reporting under Schedule 4, Part 3, Table 2 (4) of the EP Regulations. This will enable better quality data for long-term comparison of source-water and quality of water that is emitted to the environment. In addition, improvement conditions have been added to allow for the clarification of specific groundwater monitoring locations and site specific trigger values (SSTV's) in relation to improvement of water quality information and identification source-receptor (water quality) changes that may occur.

Conditions have been applied to monitor and report on ambient air quality in relation to the operations of the Eastern Ridge Hub. These conditions have been added to assist in adequately implement the existing dust monitoring programme, to quantify the significance of dust emissions and to determine the ambient dust conditions that may impact the Newman township.

To facilitate this, the existing network of real-time monitoring stations relevant to the Eastern Ridge Hub will be added to this amendment for quantification and comparative information purposes. The inclusion of the licenced requirement for air quality monitoring at Eastern Ridge will also assist in determining the extent of mines related dust event activity both for Eastern Ridge Hub and the Mount Whaleback and OB 29, 30 and 35 (under L4503/1975/14 Condition 3.6.1).

Licence Holder controls for construction of the works are conditioned on the Licence to ensure that potential environmental impacts are monitored and subsequently managed. Conditions relating to operational emissions have been updated to include new water and dust monitoring requirements.

Licence Holder's comments

The Licence Holder was provided with the draft Amendment Notice on 20 April 2018. Comments received from the Licence Holder have been considered by the Delegated Officer as shown in Appendix 2.

Amendment

1. Prescribed premises category, Schedule 1 of the *Environmental Protection Regulations 1987* is amended by the deletion of the text shown in strikethrough and the insertion of the bold text shown in underline below:

Category number	Category description	Category production or design capacity	Approved Premises production or design capacity
5	Processing or beneficiation of metallic or non-metallic ore	50,000 tonnes or more per year	**32** ~~31~~,000,000 tonnes of ore per annual period
6	Mine dewatering	50,000 tonnes or more per year	**19**~~13.9~~ gigalitres per annual period
63	Class 1 inert landfill site	500 tonnes or more per year	10,000 tonnes per annual period
85	Sewage facility	More than 20 but less than 100 cubic metres per day	52 cubic metres per day

2. Condition 1.3.8, Table 1.3.5 is amended by the deletion of the text shown in strikethrough and the insertion of the bold text shown in underline below:

Table 1.3.5 Production or design capacity limits		
Category [1]	**Category description**[1]	**Premises production or design capacity limit**
5	Processing or beneficiation of metallic or non-metallic ore	**32** ~~31~~,000,000 tonnes of ore per annual period
6	Mine dewatering	**19**~~13.9~~ gigalitres per annual period

Note 1: *Environmental Protection Regulations 1987*, Schedule 1.

3. New condition 1.3.9 has been added to the licence by the inclusion of bold text shown in underline below:

The Licence Holder must install and undertake the Works for the infrastructure and equipment:
(a) specified in Column 1;
(b) to the requirements specified in Column 2; and
(c) at the location specified in Column 3
of Table 1.3.6.

4. New condition 1.3.10 has been added to the licence by the inclusion of bold text shown in underline below:
The Licence Holder must not depart from the requirements specified in Column 2 of Table 1.3.6 except:
(a) where such departure does not increase risks to public health, public amenity or the environment; and
(b) all other Conditions in this Licence are still satisfied.

5. New condition 1.3.11 has been added to the licence by the inclusion of bold text shown in underline below:
Subject to Condition 1.3.12, within seven days of the completion of the Works specified in Column 1 of Table 1.3.6, the Licence Holder must provide to the CEO a report confirming each item of infrastructure or component of infrastructure specified in Column 1 of Table 1.3.6 below has been constructed and commissioned with no material defects and to the requirements specified in Column 2.

6. New condition 1.3.12 and Table 1.3.6 has been added to the licence by the inclusion of bold text shown in underline below:

Where a departure from the requirements specified in Column 2 of Table 1.3.6 occurs and is of a type allowed by Condition 2, the Licence Holder must provide to the CEO a description of, and explanation for, the departure along with the report required by Condition 1.3.11.

Table 1.3.6 Works specifications		
Column 1	**Column 2**	**Column 3**
Infrastructure / Equipment	**Requirements (design and construction)**	**Site plan reference**
Water conveyance pipelines from OB24	**Approximately 9.0 kilometres of 400DN (diameter) pipework with some 315DN and 250DN in pit. The pipeline is to be predominantly installed above ground but buried in selected areas within the pit and installed in Polyethylene culverts (sleeves) for road crossings.** **Tie-in of pipelines to existing dewatering discharge pipelines.**	**Schedule 1, Map 1 (labelled 'Indicative Pipeline Route')**

7. Condition 2.2.1, Table 2.2.1 is amended by the deletion of the text shown in strikethrough and the insertion of the bold text shown in underline below:

Table 2.2.1: Emission points to surface water			
Emission point reference	**Emission point reference on Map of emission points**	**Description**	**Source including abatement**
D01	OB25DMDEW001	~~Discharge of excess mine dewatering water to infiltration basins at confluence of the Fortescue River and Homestead Creek, Oph~~**h**~~thalmia Dam and Fortescue River~~ **Direct discharge to Ophthalmia Dam over existing rip-rap disposal area**	Water abstracted from ~~Orebody 23 and 25~~ **Eastern Ridge mining area** to facilitate mining below the water table
D02	OB25DMDEW002		
~~**D03**~~	~~**OB25DMDEW003**~~	~~-~~	~~-~~
D04-3	OB25DMDEW004-3	**Recharge ponds (basins) that receive discharged excess mine dewatering water.** **The basins are located in an area that provides a direct connection to the alluvial aquifer (Fortescue River Basin).**	**Water abstracted from Eastern Ridge mining area to facilitate mining below the water table**
D04-4	OB25DMDEW004-4		

D05	**OB25DMDEW005**	**Monitoring point for contingency discharge of overflow (via v-drains) from the infiltration basins (DO4-4 and DO4-3). Sampling to occur before water travels down the v drain towards a recharge basin at the base of the Ophthalmia Dam wall.**	**To be used when the recharge ponds (basins) overtop so the water travels down the existing v drain to a recharge basin and not to Homestead Creek.**
D06	OB25DMDEW006	Contingency discharge point to Homestead Creek	Discharge of water during wet weather events and equipment malfunctions **from the OB25 TPS tank overflow via a pipeline**

8. Condition 3.2.1, Table 3.2.1 is amended by the deletion of the text shown in strikethrough and the insertion of the bold text shown in underline below.

Table 3.2.1: Monitoring of point source emissions to surface water				
Emission point reference	**Monitoring point location**	**Parameter**	**Units**	**Frequency**
D01 D02 ~~D03~~ D04-3 D04-4	Flow meters to discharge point	Volumetric flow rate (cumulative)	L/s and m^3/day	Continuous
		Electrical conductivity	(µS/cm)	Quarterly when discharging
		pH[1]	-	
		Total Dissolved Solids **Total Hardness as $CaCO_3$** Total Suspended Solids Total Recoverable Hydrocarbons **(TRH)** Aluminium (Al) Arsenic (As)	mg/L	
D05	**Monitoring point located downstream from DO4-4 and DO4-3 overflow points**	**Barium (Ba)** **Boron (B)** Calcium (Ca) Cadmium (Cd) Chlorine (Cl) Carbonate (CO_3) Chemical Oxygen Demand (COD) Chromium (Cr) Copper (Cu) **Flouride (F^-)** Iron (Fe) Bicarbonate (HCO_3) Mercury (Hg) Potassium (K) Magnesium (Mg) Manganese (Mn) **Mercury (Hg)** **Molybdenum (Mo)** Sodium (Na) Nickel (Ni) Nitrate (NO_3) Lead (Pb) **Selenium (Se)** **Silica (SiO_2)** Sulfate (SO_4) Total Nitrogen (TN) Total Phosphorus (TP) **Vanadium (V)** Zinc (Zn)		**Weekly when overflow from D04-4 and DO4-3 occurs**
D06	Flow meter to discharge point	Volumetric flow rate (cumulative)	L/s and m^3/day	Continuous when discharging
	Discharge point	Electrical conductivity	(µS/cm)	Weekly when discharging
		pH[1]	-	
		Total Dissolved Solids	mg/L	
		Total Suspended Soilds	mg/L	
		Total Recoverable Hydrocarbons	mg/L	

9. Condition 3.6, is added and includes new condition 3.6.1 and Table 3.6.1 shown by the insertion of the bold text shown in underline below.

Table 3.6.1: Monitoring of ambient air quality							
Monitoring point reference and location	**Parameter**	**Target**	**Units[1]**	**Averaging period**	**Average wind direction (degrees)**	**Frequency**	**Method**
Newman 1 ('Town Centre')(WBAQRT010) **Newman 3 ('Newman East')(WBAQRT006) McLennan Drive**	**Particulates as PM_{10}**	**<70**	**µg/m³**	**24 hours**	**355 to 90**	**Continuous**	**AS 3580.9.11**

Note 1: All units are referenced to STP dry.

10. IR1 compliance with respect to Orebody 25 WWTP was met on 23 December 2015. As such, this section of the condition has been deleted. Condition 4.1.1, Table 4.1.1 is amended as shown by the deletion of text shown in strikethrough and insertion of the bold text shown in underline below.

Table 4.1.1: Improvement program		
Improvement reference	**Improvement**	**Date of completion**
IR1	~~The Licensee shall, with respect to the Orebody 25 WWTP, either:~~ ~~1. Submit to the CEO an improvement plan that includes the following:~~ ~~a) monitoring data from the WWTP obtained during the commissioning period, including an assessment against the manufacturer's specifications;~~ ~~b) an assessment of potential environmental impacts associated with the discharge of treated wastewater from the WWTP, including remedial actions and implementation timeframes; and~~ ~~c) specific details of measures to be implemented, including timeframes, to improve the quality of treated wastewater to meet the manufacturer's specifications; or~~ ~~2. Submit to the CEO a report which clearly demonstrates that the discharge of treated wastewater from the Orebody 25 WWTP will not result in any ongoing environmental impacts and includes the following:~~ ~~a) Details of the investigations conducted, including monitoring results, to determine that no environmental impacts have occurred;~~ ~~b) Details of ongoing monitoring to determine that no impacts are occurring from the continued discharge of treated wastewater; and~~ c) ~~Reporting requirements.~~	~~17 January 2016~~

IR1	**The Licence Holder shall undertake a gap analysis between Golders 2013 and 2015 (Site Specific Trigger Values reports) to determine which are the appropriate SSTV's for indicating a potential environmental problem and so 'trigger' further investigation by the Licence Holder.**	**Three months from the approval of this amendment**
IR2	**The Licence Holder shall undertake an investigation, including revision of current aquifer and emissions data and provide a report detailing the most appropriate water quality SSTV's for the aquifers and borefield in and surrounding the Premises. The report is to include assessment of all monitoring parameters as listed in Table 3.2.1 of this Licence and provide sufficient justification on how the Licence Holder has determined the appropriate water quality SSTV's for indicating a potential environmental problem and so 'trigger' further investigation by the Licence Holder.**	**Provision of the report 12 months from the approval of this amendment**

11. Condition 5.2.1, Table 5.2.1 is amended as shown by the insertion of the bold text shown in underline below.

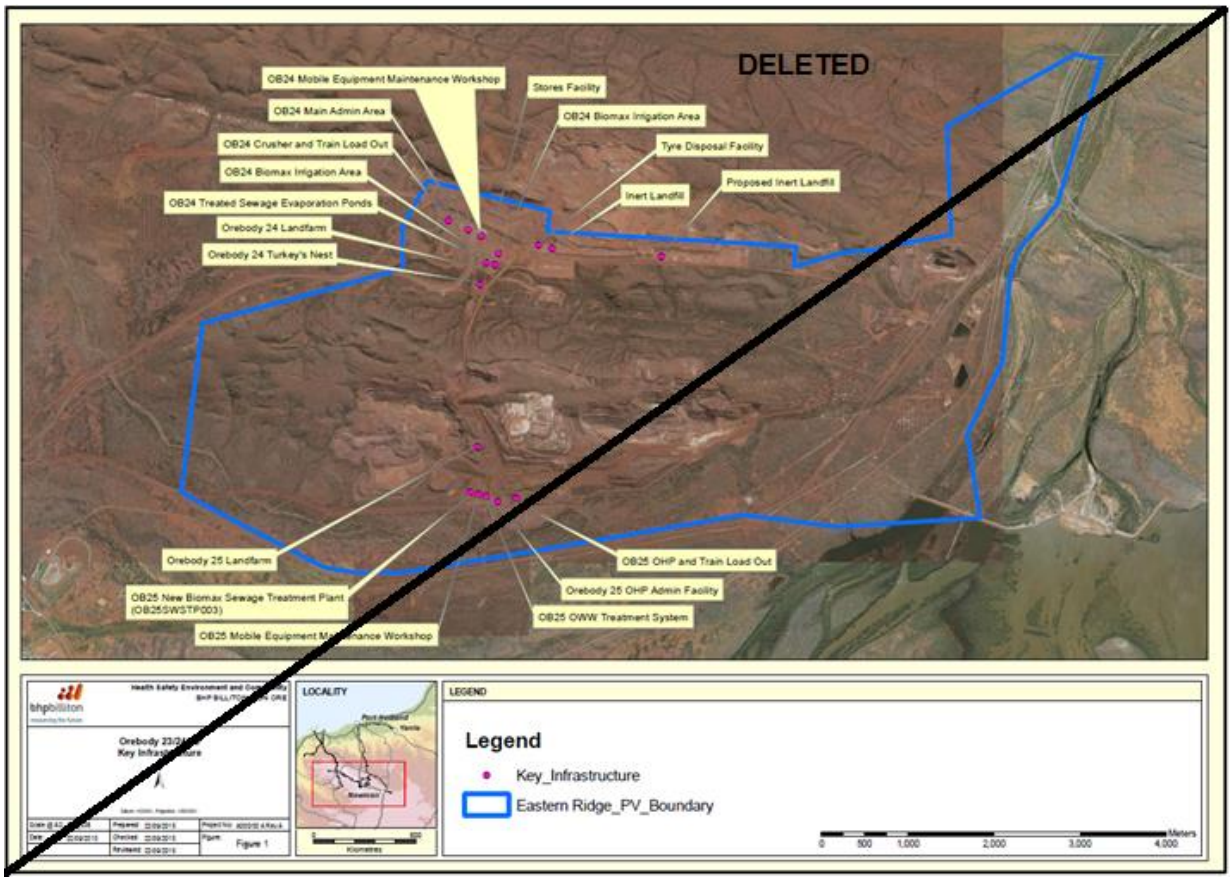
Table 5.2.1: Annual Environmental Report		
Condition or table (if relevant	**Parameter**	**Format or form**
-	Summary of any failure or malfunction of any pollution control equipment and any environmental incidents that have occurred during the annual period and any action taken	None specified
Table 1.3.1	Waste acceptance	None specified
Table 1.3.5	Production or design capacity data and limit exceedances	None specified
Table 3.2.1	Cumulative volume of dewatering water discharged	None specified
Table 3.2.1 (D01,**D02, D04-3,** D04-4, **DO5**)	Surface water emission monitoring results and a comparison of results against the water quality information from the relevant abstraction bores and emission trigger values specified in the document "Site specific trigger values – Eastern Ridge" (Golder Associates, 25 September 2013). Details of investigations conducted, including outcomes, environmental impacts and remedial actions, in relation to trigger exceedances.	None specified
Table 3.2.1 (D06)	Contingency discharge from D06: • **Emission parameter** ~~M~~**m**onitoring results; • Date and duration of the discharge; and • Reason for discharge	None specified
Table 3.3.1	Emissions to land monitoring results (WWTP) and comparison of results against the manufacturers specifications	None specified
Table 3.5.1	Process monitoring results	None specified
Table 3.6.1	**PM_{10} Monitoring results comprising:** • **Total number of elevated 24 hour average PM_{10} readings per monitor** • **Graphical results compared to licence target level (per quarter)** • **Summary of Newman air quality**	• **Tabular** • **Graphical** • **Tabular**

	monitoring for the financial year reporting period, including identification of potential cause of dust event and management measures undertaken on site during exceedance period	
5.1.3	Compliance	Annual Audit Compliance Report (AACR)
5.1.4	Complaints summary	None specified

12. Schedule 1: Maps title has been updated to read: **Schedule 1, Maps and coordinates**.

13. Schedule 1, Maps and coordinates, Map 1 is amended by the deletion of the following figure and replaced with an updated Premises Map.
Amendments to the map comprise:
    - The amended Premises boundary;
    - New location of the (previously approved) inert landfill;
    - New dewatering discharge pipeline route from orebody 24 to an existing dewatering discharge pipeline (that leads to DO4-4);
    - OB24 Biomax Irrigation Area, removed: This facility no longer exists and has been decommissioned (previously approved).
    - Orebody 24 Landfarm: This point has been added back onto the map.
    - Orebody 25 Landfarm, removed: This facility has been decommissioned and all contaminated soil was moved to the Orebody 24 Landfarm.
    - Orebody 24 OWW Treatment System: This point was removed as it is the treatment location, not the discharge point. The treated water goes to the Orebody 24 Turkey's Nest which is shown on the map and is Monitoring Reference Point P1 (Condition 3.5.1, Table 3.5.1).

    Addition to the Schedule includes the coordinates of the revised Premises boundary.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OB24 Main Admin Area
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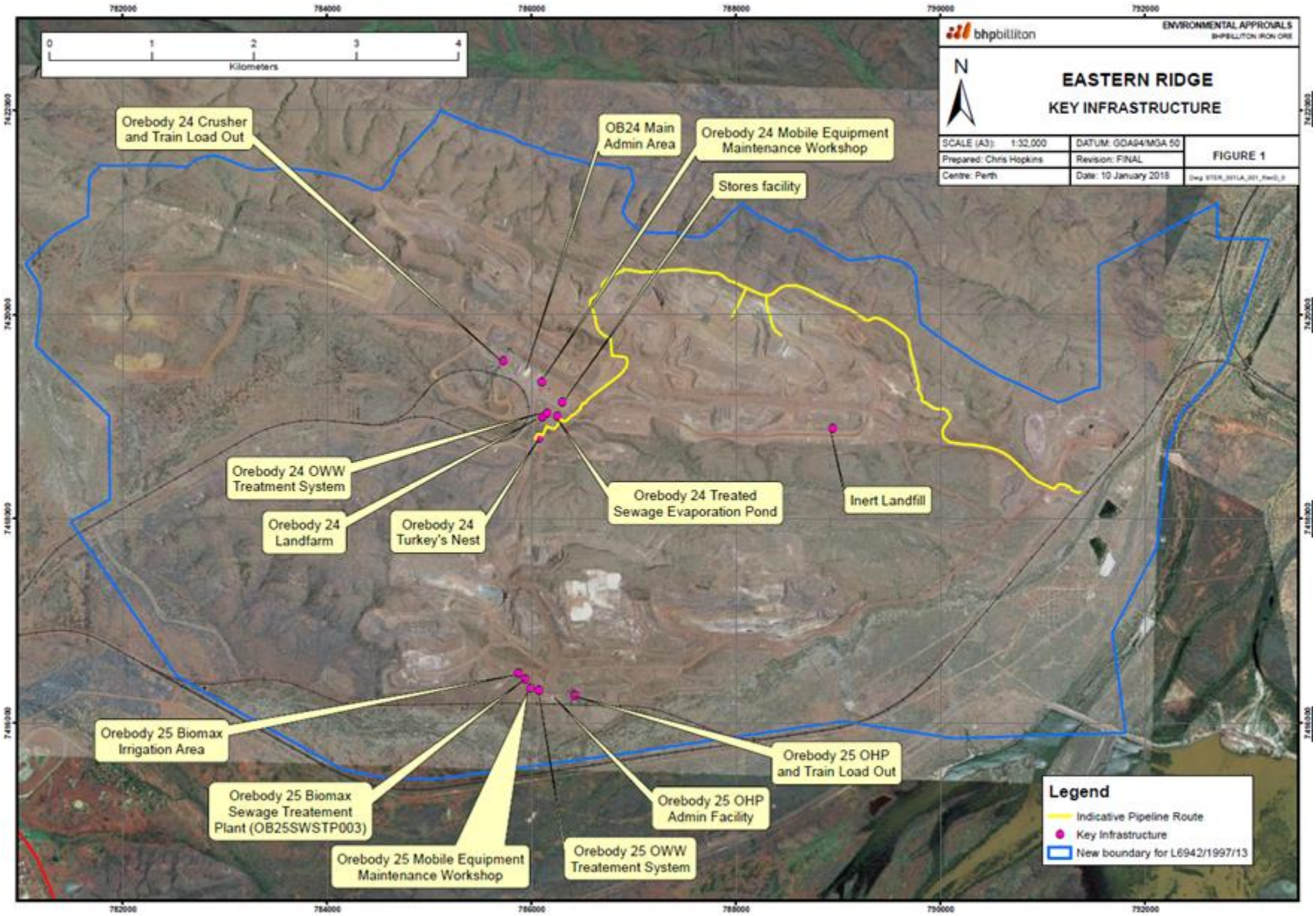
OB24 Crusher and Train Load Out
Tyre Disposal Facility
OB24 Biomax Irrigation Area
Proposed Inert Landfill
Inert Landfill
OB24 Treated Sewage Evaporation Ponds
Orebody 24 Landfarm
Orebody 24 Turkey's Nest
Orebody 25 Landfarm
OB25 OHP and Train Load Out
Orebody 25 OHP Admin Facility
OB25 New Biomax Sewage Treatment Plant
(OB25SWSTP003)
OB25 OWW Treatment System
OB25 Mobile Equipment Maintenance Workshop
bhpbilliton
LOCALITY
LEGEND
Legend
Key_Infrastructure
Eastern Ridge_PV_Boundary
Meters
0
500
1,000
2,000
3,000
4,000
Figure 1


bhpbilliton
ENVIRONMENTAL APPROVALS
BHPBILLITON IRON ORE
N
EASTERN RIDGE
KEY INFRASTRUCTURE
SCALE (A3): 1:32,000
DATUM: GDA94/MGA 50
Prepared: Chris Hopkins
Revision: FINAL
Centre: Perth
Date: 10 January 2018
FIGURE 1
0 1 2 3 4
Kilometers
Orebody 24 Crusher and Train Load Out
OB24 Main Admin Area
Orebody 24 Mobile Equipment Maintenance Workshop
Stores facility
Orebody 24 OWW Treatment System
Orebody 24 Landfarm
Orebody 24 Turkey's Nest
Orebody 24 Treated Sewage Evaporation Pond
Inert Landfill
Orebody 25 Biomax Irrigation Area
Orebody 25 Biomax Sewage Treatement Plant (OB25SWSTP003)
Orebody 25 Mobile Equipment Maintenance Workshop
Orebody 25 OWW Treatement System
Orebody 25 OHP Admin Facility
Orebody 25 OHP and Train Load Out
Legend
Indicative Pipeline Route
Key Infrastructure
New boundary for L6942/1997/13

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Updated Premises boundary coordinates

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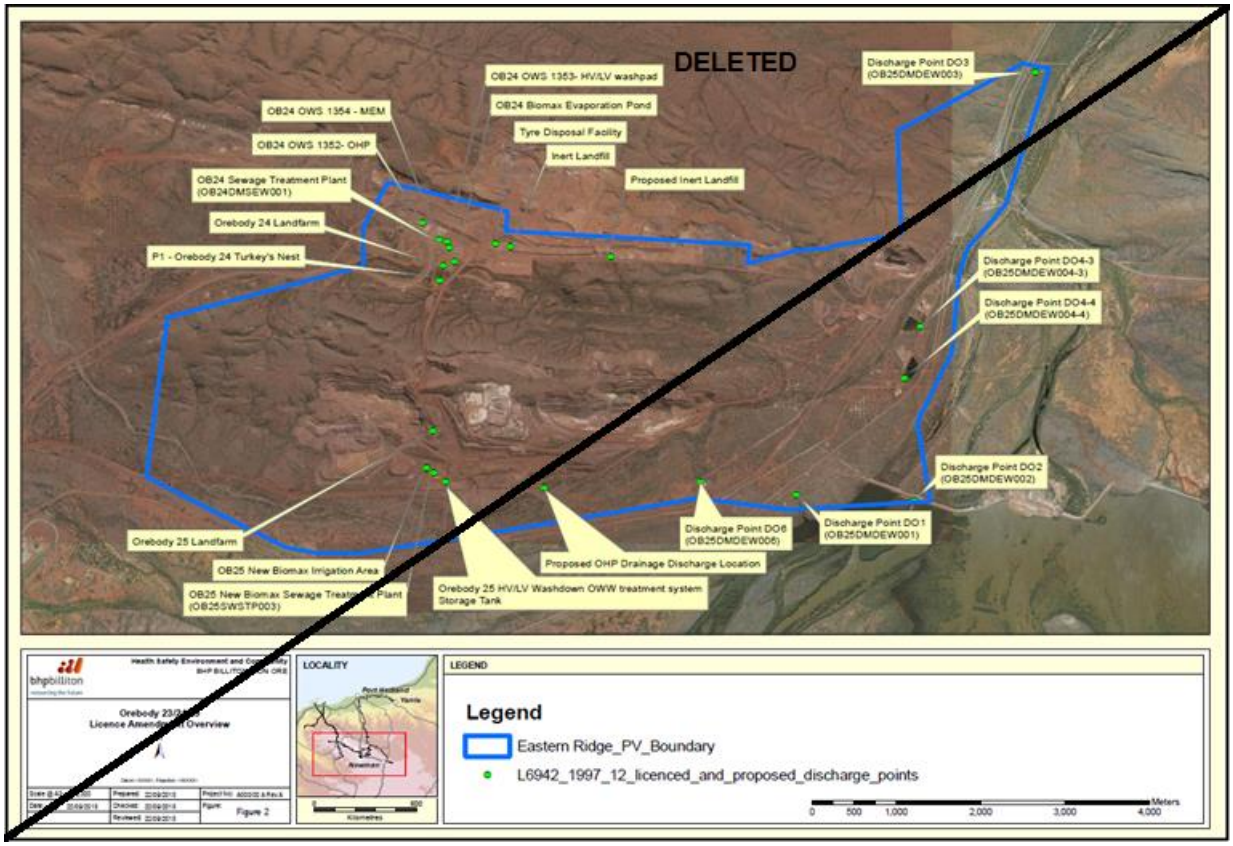
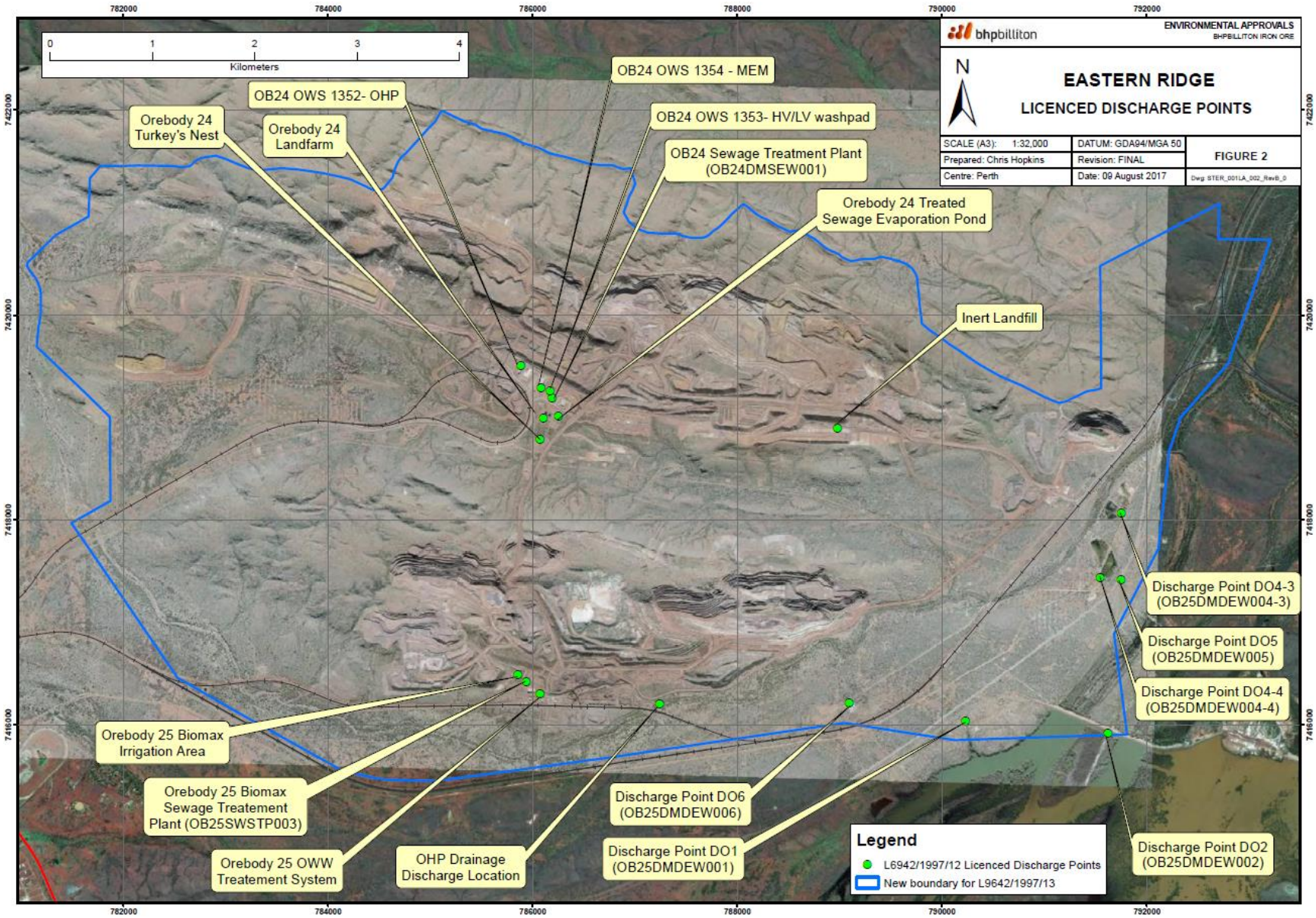
E784668.3042, N7421461.3; E784677.4265, N7421481.19; E784682.8503, N7421491.792;
E784688.6108, N7421502.193; E784693.274, N7421509.873; E784702.0172, N7421522.575;
E784710.6219, N7421533.36; E784718.5896, N7421542.23; E784726.1863, N7421549.88;
E784738.9599, N7421561.352; E784749.3434, N7421569.575; E784757.5753, N7421575.555;
E784994.4482, N7421836.09; E785044.4546, N7421884.509; E785109.0719, N7421995.711;
E785137.5851, N7421981.352; E785246.3245, N7421927.599; E785335.0871, N7421887.219;
E785439.9886, N7421856.853; E785452.3041, N7421850.961; E785480.9204, N7421827.171;
E785495.7733, N7421820.242; E785510.7402, N7421814.821; E785533.8509, N7421810.015;
E785642.8588, N7421785.687; E785684.7657, N7421775.82; E785729.264, N7421764.447;
E785812.3689, N7421730.949; E785835.1322, N7421717.026; E785868.2036, N7421694.069;
E785908.3079, N7421675.36; E785988.8223, N7421650.737; E786048.0862, N7421634.489;
E786091.6952, N7421616.801; E786135.9448, N7421592.072; E786194.1668, N7421570.627;
E786325.0563, N7421541.318; E786479.8101, N7421497.088

14. Schedule 1, Maps and coordinates, Map 2 is amended by the deletion of the following figure and replaced with an updated Premises Map.
Amendments to the map comprise:

- The amended Premises boundary;
- New location of the (previously approved) inert landfill;
- Addition of D05 Monitoring point (labelled D05 Discharge Point OB25DMDEW005);
- Removal of Discharge point D03; and
- Removal of Orebody 25 Landfarm.




bhpbilliton
ENVIRONMENTAL APPROVALS
BHPBILLITON IRON ORE
EASTERN RIDGE
LICENCED DISCHARGE POINTS
SCALE (A3): 1:32,000
DATUM: GDA94/MGA 50
Prepared: Chris Hopkins
Revision: FINAL
Centre: Perth
Date: 09 August 2017
FIGURE 2
Kilometers
OB24 OWS 1354 - MEM
OB24 OWS 1352- OHP
OB24 OWS 1353- HV/LV washpad
Orebody 24 Turkey's Nest
Orebody 24 Landfarm
OB24 Sewage Treatment Plant (OB24DMSEW001)
Orebody 24 Treated Sewage Evaporation Pond
Inert Landfill
Discharge Point DO4-3 (OB25DMDEW004-3)
Discharge Point DO5 (OB25DMDEW005)
Discharge Point DO4-4 (OB25DMDEW004-4)
Orebody 25 Biomax Irrigation Area
Orebody 25 Biomax Sewage Treatement Plant (OB25SWSTP003)
Orebody 25 OWW Treatement System
OHP Drainage Discharge Location
Discharge Point DO6 (OB25DMDEW006)
Discharge Point DO1 (OB25DMDEW001)
Discharge Point DO2 (OB25DMDEW002)
Legend
L6942/1997/12 Licenced Discharge Points
New boundary for L9642/1997/13

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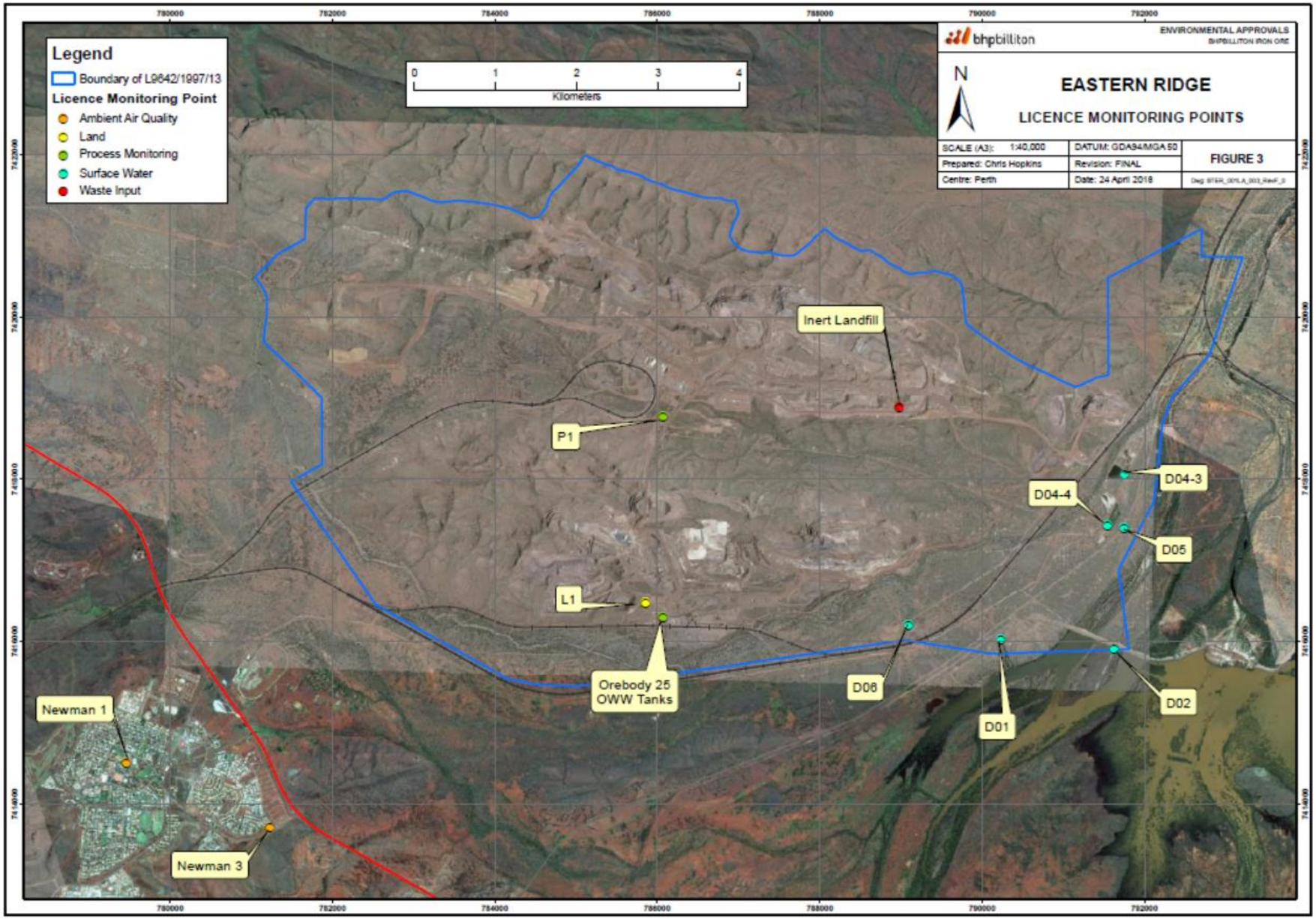
15. Schedule 1, Maps and coordinates, Map 3 – Licence monitoring points is a new map for the licence.
The map comprises:
- Air quality monitor locations: Newman 1 (‘Town Centre’)(WBAQRT010) and Newman 3 (‘Newman East’)(WBAQRT006) McLennan Drive monitors;
- Land discharge monitoring location (treated effluent);
- Process monitoring (treated waste water from oil water separators);
- Surface water monitoring (emissions to surface water);
- Waste input monitoring location (inert landfill); and
- The amended Premises boundary.


Legend
Boundary of L9642/1997/13
Licence Monitoring Point
Ambient Air Quality
Land
Process Monitoring
Surface Water
Waste Input
0 1 2 3 4
Kilometers
N
bhpbilliton
ENVIRONMENTAL APPROVALS
EASTERN RIDGE
LICENCE MONITORING POINTS
SCALE (A3): 1:40,000
DATUM: GDA94/MGA 50
Prepared: Chris Hopkins
Revision: FINAL
Centre: Perth
Date: 24 April 2018
FIGURE 3
Inert Landfill
P1
D04-3
D04-4
D05
L1
Orebody 25
OWW Tanks
D06
D01
D02
Newman 1
Newman 3

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Appendix 1: Key documents

	Document title	In text ref	Availability
1	BHP Billiton Iron Ore – Waiver of Consultation Period for amendment. 2 May 2018	-	DWER record A1666364
2	Bennelongia Environmental Consultants – Eastern Ridge Revised Proposal: Stygofauna Assessment prepared for BHP Billiton Iron Ore, November 2015. Final Report	Bennelongia, 2015	https://consultation.epa.wa.gov.au/seven-day-comment-on-referrals/eastern-ridge-revised-proposal/supporting_documents/CMS15064%20%20Referral%20%20Appendix%20D.pdf
3	BHP Billiton Iron Ore Response: Re: APPLICANT NOTIFICATION - L6942/1997/13 - NOTICE OF PROPOSED AMENDMENT TO LICENCE – BHP Responses and provision of updated figures. 26 April 2018	(See Summary of Licence Holder Comments section)	DWER record A1663419
4	BHP Billiton Iron Ore Annual Aquifer Review 2017 (Eastern Ridge and Ophthalmia Borefields)	BHP AAR, 2017	Available from the Licence Holder DWER records A1609263 and A1609241.
5	BHP Billiton Iron Ore Pty Ltd Annual Environmental Report. July 2016 – June 2017	BHP AER, 2017	Available from the Licence Holder DWER records A1541895
6	BHP Billiton Iron Ore Orebody 24/25 Upgrade Project Environmental Management Plan Revision 4 January 2010	BHPBIO, 2010	DWER record A5705147
7	BHP Billiton Iron Ore Orebody 23 Environmental Management Plan (November, 2008)	-	Available from the Licence Holder
8	BHP Billiton Iron Ore Orebody 24/25 Mining Operations Environmental Management Plan	-	Available from the Licence Holder
9	BHP Iron Ore (Controlled Document) Eastern Pilbara Water Resource Management Plan, Version 4.0 Version 3.0 endorsed DG of DWER / OEPA 5/8/16. Resubmitted 24/7/17.	EPWRMP, 2017	Available from the Licence Holder and DWER record A1506533
10	DEFINITIONS, CATEGORIES AND CRITERIA FOR THREATENED AND PRIORITY ECOLOGICAL COMMUNITIES, Department of Environment and Conservation January 2013	DEC, 2013	https://www.dpaw.wa.gov.au/images/plants-animals/threatened-species/definitions_categories_and_criteria_for_threatened_and_priority_ecological_communities.pdf

11	DER, July 2015. *Guidance Statement: Regulatory principles.* Department of Environment Regulation, Perth.	DER 2015a	accessed at www.dwer.wa.gov.au
12	DER, October 2015. *Guidance Statement: Setting conditions.* Department of Environment Regulation, Perth.	DER 2015b	
13	DER, November 2016. *Guidance Statement: Environmental Siting* (November 2016). Department of Environment Regulation, Perth.	DER 2016a	
14	DER, February 2017. Guidance Statement: Risk Assessments. Department of Environment Regulation, Perth.	DER 2017	
15	DER, November 2016. *Guidance Statement: Decision Making*. Department of Environment Regulation, Perth.	DER 2017b	
16	Department of Water Newman Water Reserve Drinking Water source protection review Newman town water supply. Report WRP 146 June 2014	DoW, 2014	https://www.water.wa.gov.au/__data/assets/pdf_file/0006/4758/107500.pdf
17	Eastern Ridge Revised Proposal Air Quality Environmental Impact Assessment. Unpublished Report for BHP Billiton Iron Ore.	Jacobs, 2015	Available from the Licence Holder
18	Halse S.A., Scanlon, M.D., Cocking, J.S., Barron, H.J., Richardson, J.B and Eberhard, S.M. (2014) Pilbara stygofauna: deep groundwater of an arid landscape contains globally signification radiation of biodiversity. *Records of the Western Australian Museum Supplement.* ***78****, 443-483*.	Halse,*et al,* 2014	Available from the Western Australian Museum
19	L6942 BHPBIO – Orebody 23 24 and 25 Further information for licence amendment	BHP, 2015	DWER record A895832
20	Licence L6942/1997/13 – Eastern Ridge Iron Ore Mine	L6942/1997/13	accessed at www.dwer.wa.gov.au
21	List of Threatened Ecological Communities (TECs) endorsed by the Western Australian Minister for Environment Species & Communities Branch (Correct as at 6 October 2016)	-	https://www.dpaw.wa.gov.au/images/plants-animals/threatened-species/threatened_ecological_communities_endorsed_by_the_minister_october_2016.pdf
22	Ministerial Statement 478	MS 478	accessed at www.dwer.wa.gov.au
23	Ministerial Statement 1037	MS 1037	accessed at www.dwer.wa.gov.au
24	Newman Water Reserve drinking water source protection plan (2009, WRP no.97). Prepared by Department of Water. Reviewed in 2014.	DoW, 2014	accessed at https://www.water.wa.gov.au/__data/assets/pdf_file/0012/5151/107903.pdf

25	Site-Specific Trigger Values – Eastern Ridge. Technical Memorandum prepared for BHP Billiton Iron Ore Pty Ltd by Golders Associates dates 25 September 2013. Project No: 137646047-003-M Rev0.	Golders Associates, 2013	Available from the Licence Holder
26	Summary of 2013 Site-specific Trigger value. Report for Eastern Ridge (Orebody 23 and 24) Project No. 1415963-003-M-Rev). Golder Associates, Perth, Western Australia	Golders Associates, 2014	Available from the Licence Holder
27	Update of Site-Specific Trigger Values – for Orebody 23 and Orebody 25 (Eastern Ridge). Technical Memorandum prepared for BHP Billiton Iron Ore Pty Ltd by Golders Associates dates 15 September 2015. Project No: 1415963-010-M Rev0.	Golders Associates, 2015	Available from the Licence Holder
28	Vegetation Clearing Permit CPS6762/1	CPS 6762/1	accessed at www.dwer.wa.gov.au

Appendix 2: Summary of Licence Holder comments

The Licence Holder was provided with the draft Amendment Notice on 20 April 2018 for review and comment. The Licence Holder responded on 26 April 2018, waiving the remaining comment period on 2 May 2018. The following comments were received on the draft Amendment Notice.

Condition / Comment on Amendment Supporting Information	Summary of Licence Holder comment	DWER response
Amendment Description, 'Increased Ore Processing' section.	The dust monitoring program is reactive. The justification for reactive management response actions by BHP have been provided as follows: Where airborne dust levels have: - Exceeded the licence conditions; and/or - Been assessed (through exposure assessment program or individual risk assessment) to be above the specified limits; or - Present a risk to the health and safety of any person at iron ore operations and/or the local community The following actions should be carried out: - Exceedances are to be managed in accordance with iron ore event management procedures including investigation, external reporting and/or escalation protocols as required. - For each exceedance, ensure inspection of plant equipment, operating method and operating area is undertaken to identify the cause of the reported increased airborne dust level. - Apply adaptive management to reduce the amount of airborne dust being generated, response actions that include: • operations modified in consideration of wind direction.	This information has been incorporated into the Risk Assessment (Table 8) - 'Reasoning column' for the standard and reactive management of airborne dust levels. There is no change to the conditions regarding the monitoring of ambient air quality as a result of the provision of this information.

Condition / Comment on Amendment Supporting Information	Summary of Licence Holder comment	DWER response
	• Additional dust control equipment assigned to relevant specific work areas. • Preventative maintenance scheduled to enable dust suppression systems to operate to required availability. • Mandatory utilisation of personal protective equipment (PPE).	
Amendment Description, 'Increased Ore Processing' section cont…	The Licence Holder provided pictorial evidence of the current wind arcs monitored at the Newman 1 and Newman 3 monitors.	The wind arcs were included in the Amendment description section (Increase in Ore Processing, Figures 2 and 3). Following review, the monitoring of ambient air quality (Average wind direction (degrees)) condition (condition 3.6.1 and Table 3.6.1) updated to reflect this wind arc information.
	The Licence Holder provided a copy of the '*Eastern Ridge Revised Proposal – Air Quality Environmental Impact Assessment [Final Rev 0]*' dated 30 October 2015 produced by Jacobs Group (Australia) Pty Ltd and a summary indicating that winds in the Newman region were generally favourable for transporting emissions from the Eastern Ridge mining areas away from town. The model also predicted that at 45 mtpa (an ~50% increase in production rate) it is predicted that the number of days above Mt Whaleback's 70 µg/m^3 target will increase from 10 days per year to 12 days per year at Newman Town Centre. The Licence Holder requested that it should be noted that the results are likely to be conservative, due to the modelled maximum mining rates and an increase	This information has been noted with no further update to this document.

Condition / Comment on Amendment Supporting Information	Summary of Licence Holder comment	DWER response
	to 32 mtpa (an ~3% increase in production rate) would be unlikely to result in any change to the number of days above the 70 µg/m^3 target, particularly as there will be less vehicle movements due to improved stripping ratios within the mining pit areas.	
Table 8: Operational risk assessment, Category 5 Eastern Ridge controls adopted for management of dust.	All chutes/transfer stations are enclosed. CV108/CV104, CV104/CV04, CV05/RC01 transfer chutes are enclosed and fitted with water sprays. The main intent of these water sprays is to add water to ore for overall dust suppression rather than to manage emissions from the transfer station	Provision of information noted and included in the risk assessment.
Functioning flow meter to measure volumetric flow rate (cumulative) from the pit	The Licence Holder queried the inclusion of the requirement for a functioning flow meter (In Table 1.3.6) to measure the volumetric flow rate (cumulative) from the pit for the following reasons: • The Licence Holder considers it duplication with the *Rights in Water and Irrigation Act, 1914* (RIWI Act) requirements under its existing 5C (abstraction) licence. • Water emissions released from the licenced discharge points are required to be monitored in accordance with Environmental Licence L6942/1997/13.	The Delegated Officer has considered the Licence Holder request to remove the requirement to have a functioning flow meter on Condition 1.3.12, Table 1.3.6 for the 'Water conveyance pipelines from OB24, Requirements (Design and Construction)'. This request is considered reasonable as the cumulative flow is already being measured as required by RIWI Act and the volumes released to the environment are required to be measured in accordance with Condition 3.2.1 of this licence.
Condition 4.1.1, Table 4.1.1	The Licence Holder requested that proposed conditions IR1a and IR1b are removed to avoid duplication with other legislation. The Licence Holder noted that the Annual and Triennial Aquifer Reviews (AAR/TAR) (required under the RiWI Act) would have water quality monitoring parameters updated to include those added in this	The Delegated Officer has reviewed this request and considers the proposed removal of the specific bore information acceptable as the purpose of identifying the monitoring and production bores was to enable monitoring and comparison of results to determine water quality changes and impacts that may be occurring.

Condition / Comment on Amendment Supporting Information	Summary of Licence Holder comment	DWER response
	licence amendment.	Information will be available in the AAR/TAR (RiWI Act) and AER as required in Table 5.2.1.
Condition 4.1.1, Table 4.1.1 cont..	The Licence Holder commented that will provide monitoring details of surface water discharges and a comparison back to the water quality abstracted [information from the AAR/TAR] and the associated trigger levels in the Part V EP Act Annual Environmental Report (AER) to determine that no water quality impacts are occurring. Based on this the Licence Holder requested that the date for IR1c be the 01 October 2018 (date of the AER submission).	The Delegated Officer has reviewed this request and considers the proposed methodology for the review and reporting of water quality data to report on potential water quality impacts as reasonable. The request for a reporting date change to coincide with the AER submission is also considered reasonable. The Delegated Officer notes that should water quality parameters indicate that a decline in quality may be occurring, this will be reviewed in line with results provided from IR2 and an increase in frequency of sampling and reporting may be instigated by DWER. In response to this commitment, this monitoring and data comparison will be updated within Table 5.2.1 - Annual Environmental Reporting requirements of this Licence.
	The Licence Holder requested that IR2(1)a and IR2(1)b be separated into two separate improvement references. Eg: IR2(1)a to become IR2 and IR2(1)b to become IR3.	The Delegated Officer has reviewed this request and considers the request reasonable. Table 4.1.1 has been amended to reflect this.
	The Licence Holder has committed to undertaking a gap analysis between Golders 2013 and 2015 to determine which are the most appropriate SSTV's. The Licence Holder has also confirmed that the outcome of this analysis will be provided to DWER within 3 months of the licence amendment issue and	The Delegated Officer has reviewed this commitment and Table 4.1.1 has been amended to reflect this. It is understood that there is currently some variance between the two Golders reports and that both sets of SSTV's (from the respective reports) are reported against by the

Condition / Comment on Amendment Supporting Information	Summary of Licence Holder comment	DWER response
	the confirmed SSTV's will be used in the FY18 AER reporting.	Licence Holder in varying annual reporting documents. With respect to the confirmation of the SSTV report and the subsequent use of the report outcomes for reporting in the 2018 AER, the requirement to report on this comparison in the AER will require a licence amendment.
Condition 4.1.1, Table 4.1.1 cont..	The Licence Holder has advised that the development of the most appropriate SSTV's is an iterative process and that they will undertake a thorough investigation into the most appropriate SSTV's. The Licence Holder expects this will take a period of 12 months. In the interim, the Licence Holder has advised that they wish to use SSTV's determined from IR2 until new values are set. Following the investigation the Licence Holder proposes to use, where appropriate, the updated SSTV's determined from IR2. The revised SSTV's will then be incorporated into the EPWRMP (in the next revision of the plan following agreement of the SSTV's with the DWER).	The Delegated Officer has considered the proposal for further detailed investigation into the SSTV relevant for the Eastern Ridge aquifers and borefields, and the water management program for iron operations in the region. The request for extension of timing has also been noted and Table 4.1.1 has been amended to reflect this. It is noted that the Licence Holder should continue to report against the Golders, 2013 SSTV's in their AER until such time that the licence is amended to reflect any agreed and updated SSTV results. It is noted that the Licence Holder intends to update the EPWRMP following submission and DWER approval of any revised SSTV's.
Assessment of risk	The Licence Holder has queried the determination of risk to the (Ethel Gorge Aquifer Stygobiont) TEC from metals and other parameters. "*The risk assessment associated with this aspect (Table 8 of the Decision Report) does not reflect the actual risk to the TEC from metals and other parameters (excluding water level and TDS, which is regulated under Part IV).*	The Delegated Officer notes the comment provided in relation to historical impact on the TEC. Limited information was provided as part of the application with respect to water quality (metals and other parameters) of the receiving TEC environment. Information was reviewed from the recent Annual Environmental Report and Annual Aquifer Review and the referral information

Condition / Comment on Amendment Supporting Information	Summary of Licence Holder comment	DWER response
	The decision report (Table 8) rates this risk as High (Major, Possible). Given that the water chemistry (metals and other parameters) of the TEC is of a worse quality than the water abstracted from Eastern Ridge it is unclear how DWER have arrived at the risk rating. Given that surplus water is added to the TEC to maintain water levels the addition of higher quality water will reduced the concentration of metals within the aquifer. Based on this the actual risk rating of the impacts of metals and other parameters on the TEC should be Low (Slight, Unlikely). *This is supported by the fact that the TEC has not shown any detrimental impact associated with metals and other parameter during the period (more than 10 years) where BHP have been managing the TEC."*	provided to inform the Part IV EP Act assessment for the Eastern Ridge revised proposal to inform this assessment. It is noted that the Bennelongia report on stygofauna (Bennelongia, 2015) only summarised impacts on the stygofauna of the TEC in relation to increases in salinity (TDS) and changes in groundwater level/drawdown and not other water quality parameters or impacts from metals. As such, the risk assessment (for this amendment) on metals and other parameters impacting the TEC was based on the additional volume (and therefore increased quantity of metals and other parameters such as nitrates) and potential for changes in quality of the dewatered emission (ie: water being removed from a reduced oxygen state below ground to an oxygenated state aboveground having the potential to mobilise metals and alter their chemical absorption state). The consequence of 'major' was derived from the risk that there could be a '*short –term impact to an area of high conservation value or special significance*'. The likelihood was derived from the possibility that abstracted water quality from the dewatered pit areas could change over time with regards to quality. It is understood that apart from salinity, that the physicochemical tolerance of stygofauna to different groundwater parameters, especially in the Pilbara, is poorly defined (see Halse, *et al,* 2014). In addition it was considered that the Licence Holder was unlikely (under the current licence) to

Condition / Comment on Amendment Supporting Information	Summary of Licence Holder comment	DWER response
		conduct any immediate intervention or modification of water quality prior to discharge at the licenced discharge locations, should the quality show signs of decline. The likelihood was therefore assessed as being ‘possible’.