Government of Western Australia
Department of Water and Environmental Regulation

Amendment Notice #3

Licence Number	L7851/2002/6
Licence Holder	BHP Billiton Iron Ore Pty Ltd
ACN	008 700 981
File Number:	DER2013/000925
Premises	Mining Area C Mining Tenement ML281SA and ML249SA NEWMAN WA 6753
Date of Amendment	**07/11/2019**

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.

Alana Kidd
Digitally signed by Alana Kidd
Date: 2019.11.07 09:49:34 +08'00'

ALANA KIDD

MANAGER, RESOURCE INDUSTRIES

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 Environmental Report
Amendment Notice	refers to this document
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 10 Joondalup DC WA 6919 info@dwer.wa.gov.au
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.
DWER	Department of Water and Environmental Regulation
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
Licence Holder Licensee	BHP Billiton Iron Ore Pty Ltd
MAC	Mining Area C
MAR	Managed Aquifer Recharge
m^3	cubic metres

Minister	the Minister responsible for the EP Act and associated regulations
MS	Ministerial Statement
MW	Mega watts
mtpa	million tonnes per annum
Noise Regulations	*Environmental Protection (Noise) Regulations 1997* (WA)
Occupier	has the same meaning given to that term under the EP Act.
PEC	Priority Ecological Community
PM_{10}	Particulate matter with an equivalent aerodynamic diameter of 10 micrometres (µm) or less
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.
Risk Event	as described in *Guidance Statement: Risk Assessment*
SWL	Standing Water Level
TSP	Total Suspended Particulates
UDR	*Environmental Protection (Unauthorised Discharges) Regulations 2004* (WA)

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 an amendment for Categories 5, 6, 12, 52, 63 and 73.

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: Land Use Planning (February 2017);*
- *Guidance Statement: Licence Duration (August 2016);*
- *Guidance Statement: Decision Making (June 2019);*
- *Guidance Statement: Risk Assessment (February 2017);* and
- *Guidance Statement: Environmental Siting (November 2016).*

Amendment description

An amendment application from the Licensee was received on 29 November 2018. The amendments applied for include:

Category 5 (these changes do not modify the 71 Mtpa throughput):

- Minor upgrades to the conveyors and stacker drives for the Ore Handling Plants (OHPs) (refer to Table 2; and
- Installation of a new 5 Mtpa relocatable crusher.

Table 2: Conveyor and Stacker Upgrades

Conveyor Upgrades	Stacker Upgrades
Conveyors MC301 and MC302: • Install new 450 kW drive units (motor & gearbox) and remove existing 250 kW drive; • Installation of HV switchgear / Substation works; • Install new radio remote control and associated power switching and remove Low Voltage Variable Voltage Variable Frequency; • Install new drive pulley (and new coupling); • Structural strengthening to supports TS30 and TS210; • Modifications to MC01 and MC30 surge bars, training plates and skirts; and • Head end chute impact plate adjustments. Conveyors MC303 and MC304: • Install new fluid couplings to provide start-up torque; • Training plate modification; and • New surge bars to tail end feed chutes. Conveyors MC08 and MC11: • Integration of power switching into existing radio remote control to manage loads on infrastructure; • Systematic idler change out; • New tripper head chutes; • Deflector plate installation; • New tripper jump pulley installation; and • Modifications to location of primary and secondary scrapers. Conveyors MC307 and MC308: • Integration of power switching into existing radio remote control; • Training plate modification and new surge bars to tail end feed chutes; • Replace upper section of tripper head chute; • Realign and replace impact plate; • Brake modification by adding additional clippers; • Structural and mechanical counterweight modifications.	The stacker upgrades will remove bottlenecks between the fixed (OHPs) and relocatable plant and include: • Replacing the stacker's boom mast; • Extending the stacker's conveyor skirting; • Upgrading the stacker's conveyor drive by: ➢ Replacing the fluid coupling with a flexible coupling; ➢ Installing an oil cooler; and ➢ Installing a speed encoder. • Upgrading the stacker's E-House by: ➢ Undertaking structural reinforcements; ➢ Installing a variable frequency drive; and ➢ Installing air conditioning. • Upgrading the stacker's Tripper Car Head Chute by: ➢ Replace the head chute and deflector plate; and ➢ Install a jump pulley and new transition idlers. • New safety programmable logic controller (AS4324.1 luff and limit protection).

Category 6:

- Remove the depth to groundwater restriction on the six Juna Downs Reinjection bores and place this restriction on six adjacent bores;
- Retain 34.931 GL/a maximum surplus water disposal, but increase the following:
  - Juna Downs MAR reinjection limit from **7.3 GL/a to 12.775 GL/a.** This is due to the current A Deposit scheme requiring to be turned off once below water table mining commences there. The surplus water is to instead be disposed of to Juna Downs;
  - Replace the Juna Downs MAR monitoring bore HCF0044M, as it is shallow and often dry, with HCF0023M, which is located 12 m south west;
  - Include two additional reinjection bores (HGSL0037P and HGSL0038P) and two associated monitoring bores (HGSL0019M and HGSL0025M) at Juna Downs. These bores will be managed under the existing licence limits and thresholds;
  - Remove A Deposit MAR monitoring bores; and
  - Add a new discharge point for the Western Sediment Basin.
- Allow the overtopping of the Packsaddle infiltration ponds to the natural drainage line as part of a three year trial. Water will overtop the western most point of each pond. The wetting front limit (green star) and the early warning point (pink star) are shown in Schedule 1. Their distances are shown in Table 3.

Table 3: Wetting Front Distances from the Packsaddle Infiltration Ponds Discharge

Point	Distance from the Coondewanna Flats PEC (km)	Distance from the Discharge Point (Northern Route) (km)	Distance from the Discharge Point (Southern Route) (km)	Marker / Monitoring Device to be Installed[1]
Wetting front limit	3.8	20.6	16.9	SCPH0010
Early warning point	7.2	17.2	13.5	SCPH0009

Note 1: Loggers are installed and running as of Jan 2019

Category 12:

- Increase the capacity of the single mobile stemming plant from 130,000 tonnes per annum to 400,000 tonnes per annum to create a 2 – 3 year stockpile of stemming material.

Category 52:

- Addition of Category 52 to enable operation of the existing 20 MW diesel Power Station beyond the current standby / emergency usage for the next 2 years. The existing feeder line is currently at capacity and resulting in voltage supply issues. BHP is upgrading the MAC power supply network substation and feeder line to resolve this issue. While this occurs the standby / emergency Power Station is to be utilised. Table 4 shows the expected emissions of the Power Station.

Table 4: Power Station expected emissions (BHP, August 2019)

Output	100%	75%	50%
Engine Output [MW]	2.132	1.599	1.066
Exhaust mass [kg/s]	3.3	3.0	2.1
Exhaust temp [°C]	507.0	459.0	432.0
NOx[g/kWh]	8.9	10.2	9.1
NOx [mg/m^3]	716.1	740.4	636.2
CO[g/kWh]	0.9	0.9	1.2
CO [mg/m^3]	74.0	63.9	84.6
$C0_2$[g/kWh]	669.0	682.0	674.0

$C0_2$ [mg/m3]	53831.4	49505.7	47124.2
HC [g/kWh]	0.4	0.6	0.7
HC [mg/m^3]	32.2	46.5	50.3
02[Vol.%]	10.4	11.9	12.4
Exhaust mass (m3/s) (Zero degrees)	2.6	2.3	1.6
Exhaust mass (m3/s) (Exhaust temp)	7.4	6.1	4.2

Category 63:

- Construction and operation of 3 new inert landfills for South Flank; and
- Increase the approved capacity from 14,000 tpa to 16,500 tpa to allow a once off disposal of waste rail ballast.

Category 73:

- Construction and operation of two 2 ML hydrocarbon storage facilities at South Flank that are to be located at Primary Crusher 1 and Primary Crusher 2; and
- Increase the capacity from 6,000 m^3 in aggregate to 10,000 m^3 in aggregate.

Table 5 outlines the proposed changes to the Licence.

Table 5: Proposed design or throughput capacity changes

Category	Current design or throughput capacity	Proposed design or throughput capacity	Description of proposed amendment
5	71,000,000 tpa	71,000,000 tpa (no change)	Undertake some minor changes to the drives of the conveyors and stackers associated with OHPs. Install a new 5 mtpa relocatable crusher.
6	34,931,000 tpa	34,931,000 tpa (no change)	Remove the depth to groundwater restriction on the six Juna Downs Reinjection bores and place the depth to groundwater restriction on six adjacent monitoring bores (within 30 m). Increase the capacity of the Juna Downs MAR reinjection scheme. This is due to the current A Deposit scheme requiring to be turned off once below water table mining commences there. The surplus water is to instead be disposed of to Juna Downs. Add a new Western Sediment Basin discharge point. Allow a discharge trial from the Packsaddle Infiltration ponds.
12	2,000,000 tpa	2,000,000 tpa (no change)	Increase the capacity of the single mobile stemming plant from 130 ktpa to 400 ktpa to enable additional stemming to be undertaken to create a two to three year stockpile of stemming material across the prescribed premises.
52	-	20 MW	Operation of the existing Power Station beyond the current standby / emergency usage
63	14,000 tpa	16,500 tpa	To allow a once off disposal of waste rail ballast
73	6,000 m^3 in aggregate	10,000 m^3 in aggregate	Addition of hydrocarbon storage facilities at South Flank

Groundwater monitoring bore GWB0039M has also been removed as the bore has become blocked and redrilling would be difficult as it's located within the Coondewanna Flats Priority Ecological Community (PEC). HCF0032M will be used instead.

Other approvals

The Licence Holder has provided the following information relating to other approvals as outlined in Table 6.

Table 6: Relevant approvals

Legislation	Number	Approval
Iron Ore (Mount Goldsworthy) Agreement Act 1964	ML281SA and ML249SA	Tenure (State Agreement)
	State Agreement Project Proposals	Detailed Proposals describing the proposed infrastructure and mining operations. There are no State Agreement proposals in preparation for MAC / South Flank at this time. All proposed activities are covered under existing approved State Agreement Proposals.
Environment Protection and Biodiversity Conservation Act 1999 (Cth)	*Strategic Environmental Assessment Approval Notice dated 19 June 2017*	Matters of National Significant: • Northern Quoll (*Dasyrurus hallucatus*); • Greater Bilby (*Macrotis lagotis*); • Pilbara Leaf-nosed Bat (*Rhinoicteris aurantia*); • Pilbara Olive Python (*Liasis olivaceus barroni);* and • Ghost Bat (*Macroderma gigas*).
Part IV of the EP Act (WA)	Ministerial Statement - MS1072 dated 20 February 2018	Approval to implement revised proposal to mine the Mining Area C Northern Flank and Southern Flank orebodies. Replaces former MS 491 which was for 'Multiple Iron Ore Mine Development, Mining Area C – Northern Flank, 100 km north-west of Newman (Note: '*Water usage and dewatering requirements'* was removed as a Part IV Key Characteristic in March 2014 as *'conservation values are managed under the Life of Mine Environmental Management Plan; dewatering and discharge can be managed under other legislation'*).' Central Pilbara Water Resource Management Plan Version 3.4 submitted to DWER Part IV of the EP Act for review on 1 March 2019 and endorsed 9 April 2019 (BHP Billiton, 2019).
Rights in Water and Irrigation Act 1914 (RIWI Act)	Groundwater Licence (GWL) 110044(10)	Mining Area C- Up to 15,330,000 kilolitres per annum (kL/a) from Pilbara, Hamersley Fractured Rock aquifer
	GWL178477(2)	Juna Downs Borefield allocation of 750,000kL/a from Wittenoom Aquifer
	GWL174613(1)	Mulla Mulla Camp Borefield 50,000kL/a from Pilbara, Hamersley Fractured Rock aquifer
	GWL166477(5)	Up to 1,500,000 kL/a from Pilbara, Hamersley Fractured Rock aquifer
	GWL166389(1)	Up to 1,500,000 kL/a from the Pilbara, Wittenoon – Wittenoom aquifer

Dangerous Goods Safety Act 2004	Dangerous Goods Licence DGS017237	Facilities added to the manifest as required.
Health Act 1914	Permit to operate apparatus for the treatment of sewage.	To operate WWTPs.

Central Pilbara Water Management Plan

The Licence Holder submitted the Central Pilbara Water Resource Management Plan (the Plan) on 1 March 2019 to EPA Services. The Plan was prepared to satisfy condition 6-1, 6-2, 6-3 and 6-4 of Ministerial Statement 1072 as below:

6-1 The proponent shall prepare and submit an Environmental Management Plan (the Plan), on the advice of the Department of Water and Environmental Regulation, and the Department of Biodiversity, Conservation and Attractions, that demonstrates how the proponent will achieve the following:

(1) no reduction in the extent of each of the following components of the Coolibah-Lignum Flats Priority Ecological Community occurrence on the Coondewanna Flats:
(a) Coolibah woodlands over lignum over swamp wandiree, or
(b) Coolibah and mulga woodland over lignum and tussock grasses on clay plains, attributable to the Revised Proposal.

(2) no reduction in the extent of the Weeli Wolli Spring occurrence of the Weeli Wolli Spring Priority Ecological Community attributable to the Revised Proposal.

(3) no reduction in the extent of the Ben's Oasis occurrence of the Weeli Wolli Spring Priority Ecological Community attributable to the Revised Proposal.

6-2 The Plan shall specify Outcome/s, Trigger Criteria, Threshold Criteria, Monitoring, Trigger Level Actions, Threshold Contingency Actions, and Reporting to demonstrate that the outcome in Condition 6-1(1) will be met.

6-3 The Plan shall specify Management Actions, Management Targets, Monitoring and Reporting to demonstrate that the objectives in Condition 6-1(2) and 6-1(3) will be met.

6-4 The Plan shall be prepared in accordance with the EPA's Instructions on how to prepare Environmental Protection Act 1986 Part IV Environmental Management Plans, or any guideline published by the EPA which amends or replaces this document from time to time.

EPA Services endorsed the Plan on 9 April 2019.

As this Licence amendment includes increases to the MAR reinjection limit at Juna Downs and potential for SWL to increase in the vicinity of the Coondewanna Flats and also mine dewatering discharge from the Packsaddle Infiltration Ponds that flow towards the Coondewanna Flats, the Plan had to be endorsed prior to the finalisation of this Licence amendment. The Plan discusses management measures to address the MAR reinjection and Packsaddle Infiltration Ponds mine dewatering discharge. Licence conditions are consistent with the Plan.

Amendment history

Table 7 provides the amendment history for L7851/2002/6.

Table 7: Licence amendments

Instrument	Issued	Amendment
L7851/2002/6	17/11/2014	Licence reissue and amendment to new format template
L7851/2002/6	22/01/2014	Minor amendment
L7851/2002/6	7/04/2016	Licence amendment to update to template version 2.9
L7851/2002/6	29/09/2016	Licence amendment initiated by Licensee to increase Category 6 production capacity, approve construction of the Packsaddle Infiltration Ponds and MAC WTP, include Category 85B and include the Western and Central Sediment Basins as emission points to land
L7851/2002/6	5/10/2017	Amendment Notice 1 Licence amendment initiated by Licensee to increase Category 6 and Category 63 production capacity, approve construction of the Juna Downs MAR Scheme, approve construction and operation of a new WWTP spray field for the Mulla Mulla Camp and include associated monitoring conditions, include the light vehicle washdown bay as emission point to land along with associated monitoring conditions and expand the premises boundary
L7851/2002/6	16/10/2018	Amendment Notice 2 Licence amendment initiated by Licensee to update to the Premises legal description to include new (approved) tenure, expand the approved L7851/2002/6 boundary, install a second screening plant to increase the capacity of the existing relocatable (ore) crushers, increase to Category 5 processing rate of 6Mtpa, amend reinjection bore nomenclature and amend associated figures, add four new dewatering discharge locations, add a new Premises Category (12) to allow for the operation of two 1 million tonne capacity mobile crushing screening units, increase Category 54 throughput from 480 m^3/day to 1,110 m^3/day (increase of +630 m^3/day) in line with the Mulla Mulla Village WWTP throughput, incorporate construction requirements for the Mulla Mulla Village WWTP (W6092/2017/1) into L7851/2002/6, add new effluent emission (reference) points for the two spray field locations associated with the Mulla Mulla Village WWTP, increase Category 63 inert waste disposal volume by 5,000tpa to account for an increase in inert waste resulting from the construction of the Southern Flank mining hub, increase Category 73 fuel storage volume by 2,500m^3 to allow for the installation of an additional 15 fuel bullets within the revised Premise boundary, increase Category 89 putrescible waste volume by 2,000tpa to account for an increase in putrescible waste resulting from the expansion of Mulla Mulla Village, approve the construction and operation of a new putrescible landfill, assess the increased discharge of mine dewater to the western sediment basin and increased the maximum discharge volume accordingly.
L7851/2002/6	7/11/2019	Licence amendment initiated by the Licence Holder for the following: Category 5 minor upgrades to the conveyors and stacker drives for the Ore Handling Plants and installation of a new 5 Mtpa relocatable crusher. Category 6 remove the depth to groundwater restriction on the six Juna Downs Reinjection bores and place this restriction on six adjacent bores; Retain 34.931 GL/a maximum surplus water disposal, but increase the Juna Downs MAR reinjection limit from 7.3 GL/a to 12.775 GL/a, replace the Juna Downs MAR monitoring bore HCF0044M, as it is shallow and often dry, with HCF0023M, which is located 12 m south west, include two additional reinjection bores (HGSL0037P and HGSL0038P) and two associated monitoring bores (HGSL0019M and HGSL0025M) at Juna Downs (these bores will be managed under the existing licence limits and thresholds), remove A Deposit MAR monitoring bores, add a new discharge point for the Western Sediment Basin and allow the overtopping of the Packsaddle infiltration ponds to the natural drainage line as part of a three year trial. Cateogry 12 increase the capacity of the single mobile stemming plant from 130 ktpa to 400 ktpa to create a 2 – 3 year stockpile of stemming material.

		Category 52 addition of Category 52 to enable operation of the existing 20 MW Power Station beyond the current standby / emergency usage. Category 63 construction and operation of 3 new inert landfills for South Flank and increase the approved capacity from 14,000 tpa to 16,500 tpa to allow a once off disposal of waste rail ballast. Category 73 construction and operation of two 2 ML hydrocarbon storage facilities at South Flank that are to be located at Primary Crusher 1 and Primary Crusher 2 and increase the capacity from 6,000 m^3 in aggregate to 10,000 m^3 in aggregate. Groundwater monitoring bore GWB0039M removed as the bore has become blocked and redrilling would be difficult as it's located within the Coondewanna Flats Priority Ecological Community (PEC). HCF0032M will be used instated.

Location and receptors

The Premises boundary of MAC (including the Southern Flank area) is located approximately 100 kilometres (km) north-west of the town of Newman in the Pilbara region of Western Australia.

Table 8 and Table 9 list the relevant sensitive land uses and specified ecosystems/environmental receptors in the vicinity of the Prescribed Premises which may be receptors relevant to the proposed amendment. This is in accordance with DWER's Guidance Statement: *Environmental Siting*.

Table 8: Receptors and distance from activity boundary

Sensitive Land Uses	**Approximate distance from the prescribed premises boundary**	**Approximate distance from the nearest Category 5, Category 6, Category 12, Category 52, Category 63, Category 73 activities**
Great Northern Highway	100 m	5.5. km
Rio Tinto Iron Ore's Hope Downs One Mining Operation and village	1.5 km	6.5 km
Juna Downs Pastoral Station Homestead	28 km	42 km
Marillana Pastoral Station	44 km	53 km
Town of Newman	100km	85 km

Table 9: Specified ecosystems

Specified ecosystems	**Distance from the proposed Premises boundary**	**Approximate distance from the nearest Category 5, Category 6, Category 12, Category 52, Category 63, Category 73 activities**
PEC - Priority 3: Coondewanna Flats ((Coondewanna Flats and Wanna Munna Flats)* - Priority 3(i))	200 m	200 m
PEC - Priority 1: Weeli Wolli Spring Community	PEC - Priority 1: Weeli Wolli Spring Community	PEC - Priority 1: Weeli Wolli Spring Community
PEC – Priority 1: West Angelas Cracking-Clays	PEC – Priority 1: West Angelas Cracking-Clays	PEC – Priority 1: West Angelas Cracking-Clays

Threatened flora	No species listed under the EPBC Act or the *Wildlife Conservation Act 1950* are within the prescribed premises. Twelve flora species listed as priority flora by the Department of Biodiversity, Conservation and Attractions occur within the premises boundary: • *Acacia bromilowiana* (Priority 4) • *Aristida jerichoensis supsp. spinulifera* (Priority 3). • *Aristida lazaridis* (Priority 2). • *Eremophila magnifica subsp. magnifica* (Priority 4). • *Goodenia nuda*: Priority 4. • *Grevillea saxicola* (Priority 3). • *Nicotiana umbratica* (Priority 3). • *Rhagodia sp. Hamersley* (M. Trudgen 17794) (Priority 3). • *Rostellularia adscendens var. latifolia* (Priority 3). • *Sida sp. Barlee Range* (S. van Leeuwen 1642) (Priority 3). • *Themeda sp. Hamersley Station* (M.E. Trudgen 11431): Priority 3. • *Triodia sp. Mt Ella* (M.E. Trudgen 12739) (Priority 3).
Threatened fauna	The development envelope contains large areas of suitable habitat for four species listed as vulnerable or endangered under both the *Wildlife Conservation Act 1950* and the EPBC Act. These species are the *Dasyurus hallucatus* (Northern quoll), the *Liasis olivaceus barroni* (Pilbara olive python), the *Rhinonicterus aurantia* (Pilbara leafnosed bat), and the *Macroderma gigas* (Ghost Bat). The following significant fauna species have also been identified within the proposed prescribed premises boundary: • *Anilios ganei*, (Pilbara Flat-headed Blind-snake): DPaW Priority 1; • *Apus pacificus* (Fork-tailed Swift):EPBC Act Migratory, WC Act Schedule 5; • *Falco hypoleucos* (Grey Falcon): Schedule 3; • *Falco peregrinus* (Peregrine Falcon): WC Act Schedule 7; • *Merops ornatus* (Rainbow Bee-eater): EPBC Act Migratory, WC Act Schedule 5; • *Pseudomys chapmani* (Western Pebble-mound Mouse): DPaW Priority 4; and • *Underwoodisaurus seorsus* (Pilbara Barking Gecko): DPaW Priority 2. Nine major fauna habitats occur within the proposed prescribed premises. In addition to the major fauna habitats, significant habitat features, such as caves and waterholes have been recorded.
Parks and Wildlife (now Department of Biodiversity, Conservation and Attractions) tenure	The Juna Downs MAR scheme is located on Unallocated Crown Land (excluded from the Juna Downs Pastoral Lease in July 2015) and proposed to be added to the conservation reserve system, due to the occurrence of the Coondewanna Flats (Priority 3(i)) and Lake Robinson (Priority 1) Priority Ecological Communities (PEC) (Parks and Wildlife, 2017).
Other values	
The majority of vegetation within the premises is considered to be good or better condition. Vegetation in areas of higher relief with restricted access to stock ranged from Excellent to Pristine. Vegetation on drainage lines and flood plains and areas where exploration activities have occurred or impacted by stock declines to very good to good.	

Risk assessment

Table 10 and Table 11 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 10: Risk assessment for proposed amendments during construction

Source/Activities		Risk Event: Potential emissions	Potential receptors	Potential pathway	Potential adverse impacts	Consequence rating	Likelihood rating	Risk	Reasoning
Category 5 *Processing or beneficiation of metallic or non-metallic ore* ***Category 12*** *Screening, etc. of material*	Minor upgrades to the conveyors and stacker drives for the Ore Handling Plants Positioning of additional new 5 Mtpa relocatable crusher. Positioning of additional new 400,000 tonnes mobile crushing and screening (stemming) plant.	***Dust****: Associated with positioning activities*	*Hope Downs Ore Mining Operation and village 6.5 km from premises*	*Air/wind dispersion*	*Health and amenity impacts*	*Slight*	*Unlikely*	*Low*	The nearest potential receptor is Hope Downs Village (mining camp), located approximately 6.5 km from the Category 5 and 12 prescribed activities. Minor upgrades to the conveyors and stacker drives for the Ore Handling Plants are not expected to result in any additional dust emissions. The Licence Holder has committed to the watering of roads and cleared areas during site preparation works for the installation of the crushers, to minimize dust. Dust equipment will be maintained in efficient operating condition, routine maintenance and housekeeping will be undertaken to avoid accumulation of waste materials that could lead to dust generation and employees and contractors will continue to be inducted regarding importance of minimizing dust levels. It is considered that the separation distance between the source and closest receptor is sufficient and adequate controls will be implemented to minimize dust emissions during construction.
		Noise: *Associated with positioning activities*	*Hope Downs Ore Mining Operation and village 6.5 km from premises*	*Air/wind dispersion*	*Amenity impacts*	*Slight*	*Rare*	*Low*	It is considered that the separation distance between the source and closest receptor is sufficient, the risk of noise impacts is low.
Category 63 Class I inert landfill site	Construction of 3 new inert landfills for South Flank	***Dust:*** *Associated with excavation for the landfill trenches*	*Hope Downs Ore Mining Operation and village 6.5 km from premises*	*Air/wind dispersion*	*Health and amenity impacts*	*Slight*	*Unlikely*	*Low*	The Delegated Officer considers that the separation distance between the source and potential receptor is sufficient and adequate controls will be implemented to minimize dust emissions during construction.
		Noise: *Associated with excavation for the landfill trenches*	*Hope Downs Ore Mining Operation and village 6.5 km from premises*	*Air/wind dispersion*	*Amenity impacts*	*Slight*	*Rare*	*Low*	The Delegated Officer considers that the separation distance between the source and potential receptor is sufficient, the risk of noise impacts is low.
Category 73 Bulk storage of chemicals, etc.	Installation of two 2 ML hydrocarbon storage facilities at South Flank	***Dust:*** *Associated with positioning of the storage tanks*	*Hope Downs Ore Mining Operation and village 6.5 km from premises*	*Air/wind dispersion*	*Health and amenity impacts*	*Slight*	*Unlikely*	*Low*	The Delegated Officer considers that the separation distance between the source and potential receptor is sufficient and adequate controls will be implemented to minimize dust emissions during construction.
		Noise: *Associated with positioning of the storage tanks*	*Hope Downs Ore Mining Operation and village 6.5 km from premises*	*Air/wind dispersion*	*Amenity impacts*	*Slight*	*Rare*	*Low*	The Delegated Officer considers that the separation distance between the source and potential receptor is sufficient, the risk of noise impacts is low.

Table 11: 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**				
Category 5 *Processing or beneficiation of metallic or non-metallic ore* ***Category 12*** *Screening, etc. or material*	Operation of additional new 5 Mtpa relocatable crusher Operation of additional new 400,000 tonnes mobile crushing and screening (stemming) plant	***Dust:*** predominantly particulates PM_{10} and TSP associated with additional ore handling	Hope Downs Ore Mining Operation and village 6.5 km away Great Northern Highway road users	Air/wind dispersion	Health and amenity impacts and visibility impacts to the Great Northern Highway road users	Minor	Unlikely	Medium	Refer to Section 1.1.1.
		Noise: Operation of additional infrastructure	Hope Downs Ore Mining Operation and village 6.5 km away Great Northern Highway road users	Air/wind dispersion	Health and amenity impacts	Slight	Unlikely	Low	The Delegated Officer considers that the separation distance between the source and potential receptor is sufficient to prevent noise impacts occurring. The Licence Holder will install silenced crushing equipment and power packs, where possible and maintain exhaust silencers on stationary and mobile equipment. Monitoring of noise at the major noise sources throughout the relocatable crushing and screening plant will be undertaken to avoid the occurrence of noise induced hearing loss. Once operations commence, potential high level noise areas will be identified and where necessary fitted with polyester screen mats. If further measures are required rubber liners and curtains will also be fitted. The separation distance, in addition to the proposed controls are deemed sufficient to manage the risk from noise. <u>Consequence:</u> Given the distance to the nearest sensitive receptor, there will be minimal impacts to amenity. The consequence has been determined as **slight**. <u>Likelihood:</u> The risk event will probably not occur in most circumstances. The likelihood of the risk event has been determined as **unlikely**. <u>Overall risk rating:</u> 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**.
		Stormwater: Operation of the plants may result in additional sediment and hydrocarbon contamination in plant areas	Native vegetation Soils Infiltration to groundwater	Direct discharges Infiltration	Impacts to vegetation health from deposition of sediment or hydrocarbon contamination	Minor	Unlikely	Low	The Category 5 relocatable crusher and the Category 12 mobile crushing and screening (stemming) plant are to be located within the already disturbed areas, where some stormwater diversions are already in place. Licence Holder controls on both the Category 5 relocatable crusher and the Category 12 mobile crushing and screening (stemming) plant include: • Stormwater infrastructure (earthen bunds) constructed as required to prevent stormwater ingress into the mobile crushing and screening (stemming) plants operational areas; and • Located at least 50 metres from drainage lines. <u>Consequence:</u> Given that onsite impacts would be low level and offsite impacts minimal, there will be minimal impacts to sensitive receptors. The consequence has been determined as **minor**. <u>Likelihood:</u> The risk will probably not occur in most circumstances. The likelihood of the consequence has been determined as **unlikely**. <u>Overall risk rating:</u> Comparison of the consequence and likelihood ratings described above with the Risk Rating Matrix (*Guidance Statement, Risk Assessments 2017*) determines the overall rating of impacts to vegetation health from deposition of sediment or hydrocarbon contamination to be **low**.

***Category 6** Mine dewatering*	Modifications to the Juna Downs reinjection bores by removing the depth to groundwater restrictions. Increasing the MAR reinjection limit, replacing a MAR monitoring bore, including additional reinjection and monitoring bores and including a new discharge point for the Western Sediment Basin.	***Reinjection of surplus water:*** Mine dewatering water	Vegetation, particularly the Coondewanna Flats PEC	Reinjection to groundwater	Mounding Degradation of receiving aquifer	N/A	N/A	N/A	*The following modifications do not result in the potential for any additional environmental impacts:* <u>Juna Downs Limit</u> The SWL limit on the 6 Juna Downs reinjection bores is to be removed and placed on 6 new monitoring bores. This is because currently, in order to take the SWL readings, reinjection activities have to cease. By moving the limits to 6 new monitoring bores that are within 30m of these bores, reinjection activities can continue while the readings are taken. This modification allows depth to groundwater to be monitored more effectively and does not modify the overall risk assessment. This modification does not result in the potential for additional environmental impacts.
						N/A	N/A	N/A	<u>Replace shallow bore</u> New MAR groundwater monitoring bore HCF0023M is located 12m south west of the shallow monitoring bore HCF0044M. Replacing this bore is beneficial as it is too shallow and samples cannot always be obtained so monitoring is unreliable. This modification does not result in the potential for additional environmental impacts.
						N/A	N/A	N/A	<u>Add new discharge point</u> Existing discharge point L11 for the Western Sediment Basin is scheduled to be covered by an overburden storage area within the next 12 months so a new discharge point (L20) is required approximately 700m west of L11. The sensitive receptors remain unchanged by this modification. This modification does not result in the potential for additional environmental impacts.
						Moderate	Possible	Medium	<u>Increase MAR Limit</u> The MAR reinjection limit is to be increased from 7.3 GL/a to 12.775 GL/a at Juna Downs. This is due to the current A Deposit scheme requiring to be turned off once below water table mining commences there. The surplus water is to instead be disposed of to Juna Downs. Groundwater modelling has been conducted based on the reinjection of 12.775 GL/a for a period of 18 years. The key findings are that a rise of 11 – 15 m in groundwater levels at Coondewanna Flats after 18 years of reinjection to the Juna Downs borefield and continued dewatering at MAC are expected. This brings the groundwater level to within 9 – 14 mbgl. The updated modelling predicts an increase in the rate and magnitude of water table rise beneath Coondewanna Flats as a result of the increased water reinjection rate. Modelling of the impact to vegetation concluded the following: • Reinjection is predicted to progressively increase groundwater levels underlying stands of *Eucalyptus victrix* at the Coondewanna Flats; • The lower portion of *Eucalyptus victrix* trees root systems could become exposed to groundwater for a period of time resulting in increased growth rates; • The majority of *Eucalyptus victrix* root systems will remain unaffected, however, some trees may reconfigure their root systems to exploit the groundwater resource; • At the conclusion of the project groundwater levels will progressively decline; • Trees that came in contact with the groundwater resource may be negatively impacted, however, trees will gradually readjust; and • *Acacia aptaneura* trees and understory species will not be affected. Licence Holder management measures (Central Pilbara Water Resource Management Plan) and existing Licence conditions include: • Groundwater level monitoring; • Groundwater quality sampling; • Groundwater quality and level early warning triggers, action triggers and thresholds, along with contingency actions (cease discharge with visual and photographic vegetation monitoring); and • Biodegradable chemicals used for bore cleaning and flushing. <u>Consequence:</u> Given that onsite impacts would be mid-level and offsite impacts minimal, there will be potential impacts to sensitive receptors. The consequence has been determined as **moderate**. <u>Likelihood:</u> The risk event could potentially occur at some time. The likelihood of the risk event 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 impacts to vegetation from reinjection to be **medium**. The Licence contains conditions to detect issues in groundwater levels and vegetation monitoring to be conducted if groundwater levels are exceeded.
			Subterranean fauna	Reinjection to groundwater	Mounding Degradation of receiving aquifer Impacts to subterranean fauna habitat from increased groundwater levels or modification in groundwater quality of the aquifer	Slight	Possible	Low	Increase MAR Limit The MAR reinjection limit is to be increased from 7.3 GL/a to 12.775 GL/a at Juna Downs. This is due to the current A Deposit scheme requiring to be turned off once below water table mining commences there. The surplus water is to instead be disposed of to Juna Downs. No restricted troglofauna species and one restricted stygofauna species have been found within the modelled mounding zone. It is unlikely that increased reinjection will impact on subterranean fauna as the surplus water to be reinjected is similar in quality to the receiving aquifer and monitoring has not shown any change in groundwater quality at the receiving aquifer. Licence Holder management measures (Central Pilbara Water Resource Management Plan) and Licence conditions include: • Groundwater level monitoring; • Groundwater quality sampling; • Groundwater quality and level trigger and thresholds, along with contingency actions; and • Biodegradable chemicals used for bore cleaning and flushing. Ministerial Statement 1072 also requires reporting/review. Consequence: Given that onsite impacts would be minimal, the consequence has been determined as **slight**. Likelihood: The risk event could potentially occur at some time. The likelihood of the risk event 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 impacts to vegetation from reinjection to be **low**.
	Overtopping of the Packsaddle Infiltration Pond into nearby drainage lines	***Surface discharge:*** Mine dewatering water	Vegetation and soil fauna, particularly the Coondewanna Flats PEC	Direct discharges to land	Inundation of vegetation Vegetation dependent on water discharge that impacts vegetation when discharge of water ceases	Moderate	Possible	Medium	The Packsaddle Infiltration ponds have not performed as anticipated. Overtopping of the ponds is planned as a 3 year trial to understand the behavior of water in the drainage lines downstream of the Packsaddle Infiltration Ponds and investigate the response of vegetation along the discharge pathways. The drainage lines from the Packsaddle Infiltration Ponds flow to the west, beneath the Great Northern Highway via existing culverts. The dewatering discharge water is expected to spread across the plain in a westerly direction and into a single drainage line that feeds Lake Robinson within the Coondewanna Flats PEC. It should be noted that the water to be discharged is of good fresh quality, generally meets the ANZECC/ARMCANZ 95% level of species protection trigger values for freshwater and is currently monitored under the Licence. Management measures in place by the Licence Holder (Central Pilbara Water Resource Management Plan) include: • 2 crest gauges fitted with telemetry are to be installed along the drainage lines northwest of Coondewanna Flats. The first will act as an early warning trigger to show when discharge water is moving towards Coondewanna Flats, but is 7 km from the PEC. When water is detected, the discharge is to be ceased or moved to an alternate drainage line. The second is to be located 3.75 km upstream of the PEC boundary to confirm that water hasn't reached the Coondewanna PEC. • Monitoring will be carried out using a combination of field and remotely gathered multispectral data to allow an evaluation of plant stress along the discharge flow path. Control points for vegetation condition will be identified once the trial has started to identify points outside the wetting footprint. If vegetation monitoring indicates negative impacts then discharge is to be changed to an alternative drainage line and discharge cycles are to be modified to maximize drying periods. An Improvement Condition has been implemented for the Licence Holder to provide a Vegetation Monitoring Programme.

									Consequence: Onsite impacts to vegetation from the mine dewatering water discharge have the potential to be mid-level with offsite impacts at a low level if discharges were to reach the PEC. The consequence has been determined as **moderate**. Likelihood: The risk event could potentially occur at some time. The likelihood of the risk event 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**.
Category 52 *Electric power generation*	Increase in operations of the existing 20 MW Power Station beyond the current standby / emergency usage for the next 2 years	***Air:*** Emissions of NOx, SOx, CO, VOcs, PM_{10}, $PM_{2.5}$ via stacks from diesel combustion	Packsaddle Camp is 10 km from the Power Station Mulla Mulla Camp is 14 km from the Power Station Hope Downs Ore Mining Operation and village 16 km from the Power Station	Air/wind dispersion	Health and amenity impacts	Slight	Unlikely	Low	The standby / emergency Power Station consists of ten MWM TCD 2020 V16 G4 Limited-time running power (LTP) diesel fueled reciprocating engines each coupled to 2600kVA AVK alternators. The original construction of the Power Station did not require a works approval as it was for standby / emergency power only. The Delegated Officer considers that the separation distance between the source and potential receptor is sufficient to prevent air emissions impacts occurring. Once the new MAC to Newman transmission line is completed (estimated 2 years) the Power Station will return to an emergency / standby facility. Table 4 shows the expected emissions from the Power Station. When compared to the *NSW Protection of the Environment Operations (Clean Air) Regulation 2010*, the Power Station meets the requirements for NOx of a Power Station in Groups 1 – 4 with NOx less than 2,500mg/m^3. However, this is for electricity generation in excess of 30MW and this Power Station is 20MW. Energy-efficient equipment is selected and designed as part of standard selection process. Consequence: Onsite impacts to sensitive receptors from air emissions have the potential to be minor and localised. The consequence has been determined as **slight**. Likelihood: The risk event is unlikely to occur due to the distance to the nearest sensitive receptors. The likelihood of the risk event 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**.
		Noise: Associated with running the turbines	Packsaddle Camp is 10 km from the Power Station Mulla Mulla Camp is 14 km from the Power Sta tion Hope Downs Ore Mining Operation and village 16 km from the Power Station	Air/wind dispersion	Health and amenity impacts	Slight	Unlikely	Low	The Delegated Officer considers that the separation distance between the source and potential receptor is sufficient to prevent noise impacts occurring. Consequence: Onsite impacts to sensitive receptors from noise emissions have the potential to be minor and localised. The consequence has been determined as **slight**. Likelihood: The risk event is unlikely to occur due to the distance to the nearest sensitive receptors. The likelihood of the risk event 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**.
		Hydrocarbons: Leaks/spills of diesel	Vegetation and soil fauna	Direct discharges to land	Contamination of soil and surface water drainage with hydrocarbons	Slight	Unlikely	Low	The Licence Holder is required to store hydrocarbons in accordance with *Australian Standard 1940-2017 The storage and handling of flammable and combustible liquids*. The Licence Holder is responsible for ensuring compliance with the abovementioned standard, which includes provisions for ensuring spills are attended to immediately. The provisions of the *Environmental Protection (Unauthorised Discharges) Regulations 2004* also apply. Consequence: Onsite impacts to soils from the hydrocarbon storage areas have the potential to be minor

									and localised. The consequence has been determined as **slight**. Likelihood: The risk event is unlikely to occur due to the facilities construction controls and in line with the Australian Standards. The likelihood of the risk event 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 stormwater and hydrocarbon leaks/spills to be **low**.
Category 63 *Class I inert landfill site*	Operation of 3 new inert landfills for South Flank The proposed new south flank inert landfill facilities are required for the disposal of inert waste generated during the construction of the Southern Flank mining hub. Increase in the approved capacity from 14,000 tpa to 16,500 tpa to allow a once off disposal of waste rail ballast	***Dust:*** Associated with vehicle movements and waste deposition	Hope Downs Ore Mining Operation and village 6.5 km	Air/wind dispersion	Health and amenity impacts	Slight	Rare	Low	The Delegated Officer considers that the separation distance between the source and potential receptor is sufficient to prevent dust impacts occurring. Intermittent use of the landfill reduces the likelihood of dust emissions impacting receptor. Consequence: Onsite impacts to sensitive receptors from dust have the potential to be minor and localised. The consequence has been determined as **slight**. Likelihood: The risk event is unlikely to occur due to the distance to the nearest sensitive receptors. The likelihood of the risk event has been 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**.
		Windblown waste: Additional waste potentially leaving the landfill site via wind transportation	Terrestrial environment, including fauna habitat	Direct discharges to land	Visual amenity, impacts to flora and fauna	Slight	Unlikely	Low	Existing licence conditions requiring wind-blown waste to be contained within the boundary of the premises, and for wind-blown waste to be returned to the tipping area on at least a monthly basis, waste acceptance criteria and volumes, waste leveling, compaction and rehabilitation. Final trench design and orientation has yet to be confirmed, however, the tipping area of the site will not be greater than 30 m in length and 2 m above ground level in height. Windrows will be built around the facilities to prevent stormwater from entering. Fencing is not proposed, however, an earthen bund will be constructed around the landfills and as the waste is construction waste (not easily windblown plastics), it is not expected that windblown waste will be an issue. Consequence: Onsite impacts to from windblown wastes have the potential to be minor and localised. The consequence has been determined as **slight**. Likelihood: The risk event is unlikely to occur due to the control measures in place. The likelihood of the risk event 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 windblown waste to be **low**.
		Fauna attraction: Attraction of fauna to the landfills due to the waste disposal	Detrimental impacts to fauna from ingestion of waste	Ingestion	Health impacts	Slight	Rare	Low	Fencing is not proposed for the landfills. The landfills are inert and are thus it is not likely that fauna will be attracted to them. Consequence: Onsite impacts to from fauna attraction have the potential to be minor and localised. The consequence has been determined as **slight**. Likelihood: The risk event is no likely to occur as there is no putrescible waste to attract fauna. The likelihood of the risk event has been 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 windblown waste to be **low**.
		Leaching: Associated with rainfall percolation	Soils and groundwater	Infiltration	Impacts to groundwater beneficial use	Slight	Rare	Low	Depth to groundwater at the 3 new inert landfills for South Flank ranges from 60 m on the western most landfill to 99 m at the north eastern landfill. Consequence:

		through additional waste in trenches							Onsite impacts to groundwater infiltration have the potential to be minor and localised. The consequence has been determined as **slight**. Likelihood: The risk event is unlikely to occur due to the depth to groundwater. The likelihood of the risk event has been 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 leaching to be **low**.
Category 73 *Bulk storage of chemicals, etc*	Operation of two 2 ML hydrocarbon storage facilities at South Flank that are to be located at Primary Crusher 1 and Primary Crusher 2. Increase the capacity from 6,000 m^3 in aggregate to 10,000 m^3 in aggregate.	***Stormwater:*** Operation of the facilities may result in additional sediment and contamination in plant areas	Soils	Direct discharges to land	Contamination of soil and surface water drainage with hydrocarbons	Slight	Rare	Low	The facilities are constructed and operated with appropriate bunding and diversions. Consequence: Onsite impacts to soils from sediment and contamination have the potential to be minor and localised. The consequence has been determined as **slight**. Likelihood: The risk event is unlikely to occur due to the facilities construction controls with appropriate bunding and diversions. The likelihood of the risk event has been 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 stormwater to be **low**
		Hydrocarbons: Leaks/spills	Soils	Direct discharges to land	Contamination of soil and surface water drainage with hydrocarbons	Slight	Unlikely	Low	Key features: • 10 x 200kL transportable self bunded diesel tanks; • unloading manifold with 5 unloading points on a bunded slab to receive fuel from road tankers; • separate refueling dispensing system for light vehicles and heavy vehicles; • Fast filling dispensing system for Haulmax service vehicles; • Modular diesel fuel pumps; • Duty and standby arrangement for unloading fuel and a series of pumps with a standby pump for refuelling; • Filter/coalescer for fuel dispensing system with bypass (primary and secondary) filtration unit; • Interconnecting tank piping and valve systems; • Tank level monitoring and measuring systems; • Fuel management system AdaptFMS; • Safety systems with overfill protection; • Aprons and slabs to contain accidental spillage; • Grated drainage trenches; • Drive-in collection sump; • Hose reel for general hose down; • Fire protection system; and • Oily water separator. The Licence Holder is required to store hydrocarbons in accordance with *Australian Standard 1940-2014 The storage and handling of flammable and combustible liquids.* The Licence Holder is responsible for ensuring compliance with the abovementioned standard, which includes provisions for ensuring spills are attended to immediately. The provisions of the *Environmental Protection (Unauthorised Discharges) Regulations 2004* also apply. Consequence: Onsite impacts to soils from the hydrocarbon storage areas have the potential to be minor and localised. The consequence has been determined as **slight**. Likelihood: The risk event is unlikely to occur due to the facilities construction controls and in line with the Australian Standards. The likelihood of the risk event 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 hydrocarbon leaks/spills to be **low**

The risk rating is determined for risk events in accordance with the risk rating matrix set out in Table 12 below.

Table 12: Risk rating matrix

Likelihood	Consequence				
	Slight	Minor	Moderate	Major	Severe
Almost certain	Medium	High	High	Extreme	Extreme
Likely	Medium	Medium	High	High	Extreme
Possible	Low	Medium	Medium	High	Extreme
Unlikely	Low	Medium	Medium	Medium	High
Rare	Low	Low	Medium	Medium	High

Risk Assessment – Dust emissions

The overall Category 5 ore production capacity is not increasing from 71 Mtpa.

The Category 12 capacity is to increase from 130 ktpa to 400 ktpa so dust emissions from the premises may increase.

1.1.1 Description of dust emissions

The main dust emission sources are associated with mining activities and mining support infrastructure. The relative contribution of each emission source to the overall impact of dust from site is variable and influenced by:

- the separation distance between the source and the sensitive receptor;
- the ore moisture content (i.e. how similar it is to the Dust Extinction Moisture (DEM), that is the moisture content at when fines material is considered to emit no dust;
- the amount of material or surface area exposed;
- the effectiveness of dust mitigation measures applied to that source; and
- meteorological conditions –the key influencing factors are the wind speed, wind direction, rainfall and the degree of wind isolation variability at the time. (BHP, June 2019)

1.1.2 Identification and general characterisation of emission

Dust particles as particulate matter smaller than 10 microns (µm) in diameter (PM_{10}) and Total Suspended Particles (TSP).

1.1.3 Description of potential adverse impact from the emission

Health and amenity impacts and visibility impacts to the Great Northern Highway road users.

1.1.4 Criteria for assessment

The Delegated Officer notes the Department's Guidance Statement, Risk Assessments stipulates that in identifying potential receptors, the Department will exclude employees, visitors, or contractors of the Licence Holder, as protection of these parties often involves different exposure risks and prevention strategies, and is provided for under other State legislation. The Delegated Officer has identified Hope Downs Village and the Great Northern Highway road users as sensitive receptors most at risk of being impacted by operational dust emissions from the ore processing (Category 5) and crushing and screening (Category 12).

On 13 July 2018 Works Approval W6142/2018/1 for the Mining Area C – South Flank project was approved by DWER. Construction of South Flank will increase the Category 5 production

capacity at MAC to 150 Mtpa. As part of the application for Southern Flank and increase to 150 Mtpa, BHP Billiton commissioned Pacific Environment Limited (PEL) to conduct air quality modelling to determine potential impacts to Hope Downs village and users of the Great Northern Highway from dust at the increased rate of production.

The study included the assessment of dust particles as particulate matter smaller than 10 microns (µm) in diameter (PM_{10}) and Total Suspended Particles (TSP). The modelling was conducted for a number of scenarios to assess the ground-level impact of the emissions from existing MAC operations and South Flank. The modelled scenarios utilized the year of mining with the highest movement of tonnes of ore and waste in the closest proximity to the sensitive receptors, as a worst case scenario.

The model predicted (PEL, 2016) that a 15 km section of the Great Northern Highway is at high risk of reduced visibility (visibility up to 1 km) for up to 12% of the time. Vehicle closing speeds are 220 km per hour.

With respect to Hope Downs village, the model predicted a highest PM_{10} (24-hour) concentration at Hope Downs village of 77 $\mu g/m^3$, with two exceedances over 50 $\mu g/m^3$ for the year.

The standard and goal for particles as PM_{10} as outlined in Schedule 1 of the National Environment Protection (Ambient Air Quality) Measure (NEPM) is 50 $\mu g/m_3$ averaged over 1 day, with no exceedances.

The Delegated Officer notes that NEPM provides a national framework for all Australian jurisdictions to monitor and publicly report on common ambient air pollutants.

The NEPM guidance publications including the Explanatory Statement clearly outline the application of the NEPM and identify that the imposition of NEPM ambient air quality standards as boundary or compliance limits is not consistent with the aims and intent of the NEPM. The NEPM sets national air quality standards and goals for six common ambient air pollutants, including PM_{10}. They are based on health evidence of the impacts of air pollutants available at the time the standards are set; and are designed to provide protection to people from the pollutants' adverse human health effects. The standards are also designed to be realistically achievable in the different Australian jurisdictions with a focus on large urban areas, where the majority of Australia's population resides.

The NEPM aims to guide policy formulation that allows for the adequate protection of human health and wellbeing. It does not compel or direct pollution control measures, or set penalties for non-compliance. (Department of Environment and Energy, 2018).

DWER supports the implementation of the NEPM in Western Australia by maintaining an air quality monitoring network and providing air quality data and reporting. Where appropriate, DWER uses NEPM goals to assess risks to public health and set emission limits.

The NEPM requires participating jurisdictions to undertake nationally consistent monitoring and reporting activities that support the formulation of air quality management policies. NEPM monitoring protocols provide guidance to jurisdictions on monitoring population exposure to air pollution.

NEPM standards are health based. The standards in the NEPM are not intended to be applied as an environmental standard by jurisdictional environmental regulators without consideration of regulatory impacts. Section 7 of the *National Environment Protection Council Act 1994* allow jurisdictions to implement the NEPM by such laws and other arrangements as are necessary. The implementation of the NEPM does not preclude jurisdictions from adopting tighter or complementary standards or goals for their own policy or regulatory purposes. In doing this, jurisdictions may utilise a risk-based approach in determining environmental standards appropriate for their own circumstances or conditions, along with improvement strategies for regulated and non-regulated sources and exposure reduction strategies.

The NEPM provides for DWER; the responsibility to manage, and where appropriate to regulate, air quality to achieve protection of human health. It does not obligate DWER to ensure that PM_{10} emissions do not at any time or in any location, exceed the criteria intended to protect population health.

NEPM implementation guidance is understood and implemented by experts in air quality management within DWER. This guidance provides for regulation of individual premises in order to meet the measure in populated areas but specifically states that the measure is not suitable for use as a boundary or compliance limit in regard to those individual premises.

The Delegated Officer notes that the dust modelling for South Flank has predicted an exceedance of the NEPM for PM_{10}. It is acknowledged however, that the dust modelling for South Flank was undertaken for a significantly higher production rate (150 Mtpa) than what is being assessed via this Licence amendment (no increase).

1.1.5 Licence Holder controls

This assessment has reviewed the controls set out in Table 13 below.

Table 13: Licence Holder's proposed controls for dust emissions

Site infrastructure	Description	Operation details
Operation of additional new 5 Mtpa relocatable crusher	• *Fitted dust sprays and dust covers at the head drum and discharge point of the main conveyor and at the feed point.*	• *Dust equipment will be maintained in efficient operating condition;* • *Routine maintenance and housekeeping will be undertaken to avoid accumulation of waste materials that could lead to dust generation; and* • *Employees and contractors will be inducted regarding importance of minimizing dust levels.*
Operation of additional new 400,000 tonnes mobile crushing and screening (stemming) plant	• *Fitted dust sprays and dust covers at the head drum and discharge point of the main conveyor and at the feed point*	• *Dust equipment will be maintained in efficient operating condition;* • *Routine maintenance and housekeeping will be undertaken to avoid accumulation of waste materials that could lead to dust generation; and* • *Employees and contractors will be inducted regarding importance of minimizing dust levels.*

1.1.6 Key findings

The Delegated Officer has reviewed the information regarding dust emissions and has found:

1. *The separation distances of the Category 5 and 12 activities from the sensitive receptors are sufficient.*
2. *The proposed controls are deemed sufficient to manage the risk from dust.*

1.1.7 Consequence

If dust emissions occurs, then the Delegated Officer has determined that the impact of dust emissions will be low level onsite and minimal offsite impacts with public health criteria likely to be met. Therefore, the Delegated Officer considers the consequence of dust emissions to be **minor**.

1.1.8 Likelihood of Risk Event

The Delegated Officer considers that the addition of the 5 Mtpa relocatable crusher and operation of the additional new 400,000 tonnes mobile crushing and screening (stemming) plant approved under this Licence amendment, is unlikely to result in a significant increase in dust experienced at Hope Downs Village, or result in a reduction of visibility for the users of the Great Northern Highway. The Delegated Officer has determined that the likelihood of dust emissions risk event occurring probably will not occur in most circumstances. Therefore, the Delegated Officer considers the likelihood of the risk event to be **unlikely**.

1.1.1 Overall rating of dust emissions

The Delegated Officer has compared the consequence and likelihood ratings described above with the risk rating matrix (Table 12) and determined that the overall rating for the risk of dust emissions is **medium**.

Decision

The Delegated Officer has determined to allow the amendments below:

Condition 1.2.2, Table 1.2.1 has been amended to increase the quantity limit of the landfill from 14,000 tonnes up to 16,500 tonnes/year.

Condition 1.2.10, Table 1.2.4 has been amended for category 6 to increase the mine dewater from 7,300,000 tonnes/year up to 12,775,000 reinjected to Juna Downs, include category 52 limit of 20 MWe, and increase the capacity of category 73 from 3,500 cubic metres in aggregate to 10,000 cubic metres in aggregate.

Condition 1.2.11, Table 1.2.5 has been amended to remove the freeboard requirements so that the Packsaddle Infiltration ponds can overflow. Overtopping three year trial to expire 31 December 2022.

Condition 1.2.12, Table 1.2.6 has been amended to include the supporting documentation for this amendment.

Condition 1.2.13, Table 1.2.7 has been amended to remove the Packsaddle Infiltration Ponds, Stage 1 of the Water Treatment Plant, Mulla Mulla Camp WWTP and 6 Mtpa relocated crusher as compliance documents have been received for this infrastructure. Inclusions are the Packsaddle Infiltration Ponds overtopping, Western Sediment Basin discharge point, increase the capacity of the stemming plant, 5 Mtpa relocatable crusher, hydrocarbon storage, inert landfills and Ore Handling Plants upgrades. Juna Downs reinjection bores (HGSL0037P and HGSL0038P) and two associated monitoring bores (HGSL0019M and HGSL0025M) included.

Condition 1.2.14 is removed as the Packsaddle Infiltration Ponds compliance documents has been received and the ponds are operational.

Condition 1.2.22 is removed as the commissioning period for the Mulla Mulla Camp WWTP is completed and it is now operating under this Licence.

Condition 1.2.23, Table 1.2.23 has been removed as commissioning of the Mulla Mulla Camp is completed and it is now operating under this Licence.

Condition 2.2.2, Table 2.2.2 has been amended to replace the Juna Down reinjection bores depth restriction to six adjacent monitoring bores. A Deposit MAR monitoring bores HGA0001P,

HGA0002P, HGA0040P and HGA0041P have been removed as they have been decommissioned. Monitoring bores HGSL0019M and HGSL0025M at Juna Downs included.

Condition 2.3.1, Table 2.3.1 has been amended to include a new discharge point L20 for the Western Sediment Basin.

Condition 2.3.2, Table 2.3.2 has been amended to add in a limit for the wetting front limit documented in the Premises map titled Packsaddle Infiltration Ponds Trial Wetting Front and Limits in Schedule 1.

Condition 3.5.1, Table 3.5.1 has been amended to insert groundwater monitoring bore HCF0023M in place of HCF0044M as it is very shallow and often dry. A Deposit MAR monitoring bores GAOB07RM, GWB0025M, HGA0003P and HGA0066M have been removed as they have been decommissioned.

Condition 3.5.2, Table 3.5.2 has been amended to insert groundwater monitoring bore HCF0023M in place of HCF0044M as it is very shallow and often dry. A Deposit MAR monitoring bores GAOB07RM, GAOB05RM, GWB0025M, HGA0003P, HGA0038M and HGA0066M have been removed as they have been decommissioned.

Condition 3.5.3, Table 3.5.3 has been amended to insert groundwater monitoring bore HCF0023M in place of HCF0044M as it is very shallow and often dry. A Deposit MAR monitoring bores GAOB07RM, GWB0025M, HGA0003P and HGA0066M have been removed as they have been decommissioned.

Condition 4.1.1, Table 4.1.1 has been included as an Improvement condition to submit a Vegetation Monitoring Programme for the Packsaddle Infiltration Ponds overflow to drainage lines.

Please note the conditions below will change to Section 5 in the consolidated Licence.

Condition 4.2.3, Table 4.2.2 has been updated to remove the commissioning report for the Mulla Mulla Camp WWTP as this has been received.

Condition 4.3.1, Table 4.3.1 has been updated to include compliance requirements for the modifications.

The Premises Maps have been updated and new discharge point L20 included.

Licence Holder's comments

The Licence Holder was provided with the draft Amendment Notice on 22 October 2019. Comments received from the Licence Holder have been considered by the Delegated Officer as shown in Appendix 2.

Amendment

1. Condition 1.2.2, Table 1.2.1 of the Licence is amended by the deletion of the text shown in strikethrough below and the insertion of the bold text shown in underline below:

1.2.2 The Licensee shall only accept waste onto the inert landfill, putrescible landfills, Rubber/Tyre Dump and sewage treatment plants, shown on the maps in Schedule 1, if:

(a) it is of a type listed in Table 1.2.1;
(b) the quantity accepted is below any quantity limit listed in Table 1.2.1; and
(c) it meets any specification listed in Table 1.2.1.

Table 1.2.1: Waste acceptance		
Waste type	**Quantity limit**	**Specification** [1]
Inert Waste Type 1	~~14,000~~ **16,500** tonnes/year	None specified
Inert Waste Type 2		Tyres, rubber and plastic only
Putrescible Waste	5,000 tonnes/year	None specified
Clean Fill		None specified
Sewage	1,110 m^3/day	Accepted through sewer inflow(s) only. Packsaddle WWTP Pond System, flow recorded as inflow All Biomax WWTPs, flow recorded at outflow

Note 1: Additional requirements for the acceptance of controlled waste (including asbestos and tyres) are set out in the *Environmental Protection (Controlled Waste) Regulations 2004.*

2. Condition 1.2.10, Table 1.2.4 of the Licence is amended by the deletion of the text shown in strikethrough below and the insertion of the bold text shown in underline below:

1.2.10 The Licensee shall ensure the limits specified in Table 1.2.4 are not exceeded.

Table 1.2.4 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	71,000,000 tonnes of ore per annual period
6	Mine dewatering	34,931,000 tonnes per Annual Perio**d**~~s~~ total, being: • ~~5,840,000 tonnes per Annual Period reinjection – Deposit A~~ • 10,950,000 tonnes per Annual Period (discharged to the Western Sediment Basin) • 8,760,000 tonnes per Annual Period (discharged to the Central Sediment Basin) • 10,950,000 tonnes per Annual Period (discharged to the Packsaddle Infiltration Ponds) • ~~7,300,000~~ **12,775,000** tonnes per Annual Period (reinjection – Juna Downs)
12	Screening, etc. of material	2,000,000 tonnes per Annual Period
52	**Electric power generation**	**20 MW**
73	Bulk storage of chemicals, etc	~~3,500~~ **10,000** cubic metres in aggregate
85B	Water desalinisation plant	0.9125 gigalitres per Annual Period

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

3. Condition 1.2.11, Table 1.2.5 of the Licence is amended by the deletion of the text shown in strikethrough below and the insertion of the bold text shown in underline below:

1.2.11 The Licensee shall ensure that waste material is only stored and/or treated within vessels or compounds listed in Table 1.2.5 and identified in Schedule 1 in accordance with the requirements specified within Table 1.2.5.

Table 1.2.5: Containment Infrastructure

Storage vessel or compound	Material	Requirements
Packsaddle evaporation/infiltration ponds (L1 and L2)	250 m^3/day of effluent from the Packsaddle Village Closed pond system (L1) 80 m^3/day of effluent from the Packsaddle Biomax (L2)	• minimum vertical freeboard of 300 mm except during a 72 hour duration, ten year annual recurrence interval storm event
Treated Oily Water Ponds	Treated wastewater from heavy vehicle washdown bays, workshop oily water separators and untreated water from the light vehicle wash down bay	• 1.5 mm HDPE lined evaporation pond to achieve a permeability of $<10^{-9}$ m/s
Western Sediment Basin	Mine dewater	• minimum vertical freeboard of 300 mm except during a 72 hour duration, ten year annual recurrence interval storm event
Packsaddle Infiltration Ponds (L8-L10)	Mine dewater	• ~~minimum vertical freeboard of 300 mm except during a 72 hour duration, ten year annual recurrence interval storm event~~ • **overtopping three year trial to expire 31 December 2022** • ~~high water level alarm installed and maintained on each pond~~

4. Condition 1.2.12, Table 1.2.6 of the Licence is amended by the insertion of the bold text shown in underline below:

1.2.12 The Licensee shall construct **and implement** the ~~Packsaddle Infiltration Ponds~~ **Category 5, 6, 12, 52, 63 and 73 modifications** and Mining Area C Water Treatment Plant in accordance with the documentation detailed in Table 1.2.6.

Table 1.2.6: Construction requirements

Document	Parts	Date of document
Mining Area C L7851/2002/6 – Licence Amendment Supporting Documentation	All, including drawings and appendices	April 2016
Email correspondence, *RE: Mining Area C Project – Licence*	All, including Attachments	19 May 2016, 08:17

L7851/2002/6 – amendment, Chris Hopkins, BHP Billiton Pty Ltd		
Email correspondence, *RE: Mining Area C Project – Licence L7851/2002/6 – amendment*, Chris Hopkins, BHP Billiton Pty Ltd	All, including Attachments	24 May 2016, 13:45
Application to amend L7851 MAC Environmental Licence	**All, including Attachments**	**29 November 2018 08:44**
FW: Application to amend L7851 MAC Environmental Licence	**All, including Attachments**	**27 February 2019 07:35**
RE: L7851 MAC additional information	**All, including Attachments**	**15 July 2019 08:27**
RE: MAC Licence Amendment	**All, including Attachments**	**17 September 2019 12:48**
RE: APPLICANT NOTIFICATION - L7851/2002/6 - NOTICE OF PROPOSED AMENDMENT TO LICENCE	**All, including Attachments**	**01 November 2019 07:22**

5. Condition 1.2.13, Table 1.2.7 of the Licence is amended by the deletion of the text shown in strikethrough below and the insertion of the bold text shown in underline below:

1.2.13 The Licensee must not depart from the specifications in Column 1 and 2 for the infrastructure in each row of Table 1.2.7 except:

a) where such departure is minor in nature and does not materially change or affect the infrastructure; or

b) where such departure improves the functionality of the infrastructure and does not increase risks to public health, public amenity or the environment; and is in accordance with all other conditions of this Licence.

Table 1.2.7: Infrastructure to be constructed

Infrastructure	**Specifications (design and construction)**
Packsaddle Infiltration Ponds	
~~1) Pond construction~~	• ~~Three infiltration ponds, 80 metres wide, 500 metres long, 0.5 metres in depth, each pond comprising of four basins~~ • ~~High level alarms installed on each pond~~ • ~~Stock proof fencing erected around perimeter of each pond~~
~~2) Water conveyance~~	~~Polyethylene pipeline approximately 7 kilometres in length from the E Deposit Turkey's Nest to convey excess mine dewater to the infiltration ponds, using diesel pumps~~
~~3) Groundwater monitoring~~	~~Installation of groundwater monitoring bore MB1~~
1) **Overtopping point**	• **Mine dewater to overtop the western most point of each pond from the Packsaddle Infiltration ponds, discharging into two drainage lines (northern and southern), that flow to the west and beneath the Great Northern Highway via existing culverts.**
Mining Area C Water Treatment Plant	
1) Water treatment plant	• Installation of a nano-filtration water treatment plant, in two stages: • ~~Stage1: Construction of a 0.584 gigalitre per annum water treatment plant; and~~ ➢ Stage 2: Expansion of the Stage 1 facility to a 0.9125 gigalitre per annum water treatment plant. • Water treatment plant to comprise of: ➢ Two raw water tanks, Tank A and Tank B; ➢ Two Waste tanks, TK1000A and TK10000B; ➢ Two chlorination buildings;

	➢ Five nano-filtration trains; ➢ Multimedia filters; ➢ Building to contain sulphuric acid, antiscalant, sodium metasulphate, ferric chloride and sodium hydroxide; ➢ One chlorine contact tank, CCT100000; ➢ Two product water tanks, TK10005A and TK10005B; and ➢ Control room and laboratory.
2) Irrigation area	• Construction of a 7.4 hectare irrigation area, comprising of Wobbler xcel 4.76 millimetres sprays. • Stock proof fencing erected around perimeter of irrigation area
Juna Downs MAR Scheme	
1) Reinjection bores	• Construction of injection bores with flow meters installed; HGSL0005, HGSL0006, HGSL0014 and HGSL0015 as per location on Attachment 1 of Amendment Notice 1; • Construction of two additional bores named HGSL0016 and HGSL0017 (including flowmeters) located within the green area demarcated 'Indicative Area for New Bore' as per Attachment 1 of Amendment Notice 1; and • **Construction of reinjection bores with flow meters installed (HGSL0037P and HGSL0038P) and two associated monitoring bores (HGSL0019M and HGSL0025M) as per Schedule 1, Figure 4**
2) Water conveyance	• Approximately 22 km of polyethylene pipe.
~~***Mulla Mulla Camp WWTP sprayfield***~~	
	~~Spray irrigation heads: 24 sprinklers at ~34m spacing~~
	~~Perimeter fencing for an area of 3.047ha~~
	~~110dia HDPE, PE100 PN12.5 pipework, protected and buried in a trench with sand bedding with a depth of cover of 900mm in areas subject to vehicular traffic and 750mm in areas not subject to vehicular traffic.~~
~~***New screening plant to expand the 6 million tonne per annum relocatable crusher***~~	
	~~Installation of one additional Metso TS5.2 screen at the 6 million tonnes per annum crusher to increase its capacity to 12 million tonnes per annum, with the following dust control infrastructure to be installed and maintained:~~ ~~• Dust hoods on bins;~~ ~~• Sprays on all transfer points and conveyors; and~~ ~~• Sprinkler system on plant infrastructure.~~
Sediment Basins	
1) Central Sediment Basin New discharge points	• Construction of two new discharge points (L16 & L17) for the Central Sediment Basin.
2) Western Sediment Basin New discharge points	• Construction of two new discharge points (L15 & L19) for the Western Sediment Basin; ~~and~~ • **Construction of new discharge point (L20) for the Western Sediment Basin approximately 700m west of the current L11 discharge point; and** • **Design minimises the risk of scouring and erosion by the use of rip rap and diffuser pipes**
Landfills	
1) Putrescible landfill	• Construction of four (4) landfill trenches measuring 200 metres in length, 25 metres in width and 2.5 metres in depth; • Windrows constructed along the southern and eastern boundary of the landfill facility to direct stormwater away from the trenches; and • Perimeter fencing erected and maintained around active landfill trenches.
2) **3 x inert landfills**	• **Constructed at South Flank Primary Crusher 1 (1.4km east of the crusher), Primary Crusher 2 (2.2km north west of the crusher) and rail loop (5km east of the rail loop);** • **Increase the capacity of category 63 from 14,000 tpa to 16,500 tpa to allow a once off disposal of waste rail ballast;** • **the tipping area of the site will not be greater than 30 m in length and**

	2 m above ground level in height; and • **Windrows will be built around the facilities to prevent stormwater from entering.**
Crushing and Screening Plants	
1) Two mobile crushing and screening plants for South Flank construction	• Construction, mobilization and installation of two, one million tonne per annum capacity mobile crushing and screening plants; • Fitted with spray nozzles to minimize dust emissions at the head drum, discharge point of the main conveyor and at the feed point; • Stormwater infrastructure (earthen bunds) constructed as required to prevent stormwater ingress into the mobile crushing and screening plants operational areas; and • Located at least 50 metres from drainage lines.
2) One mobile crushing and screening plant for stemming material production	• Construction, mobilization and installation of one mobile crushing and screening plant with a maximum annual throughput of ~~130,000~~ **400,000** tonnes; • Fitted with dust sprays and dust covers at the head drum and discharge point of the main conveyor and at the feed point; • Stormwater infrastructure (earthen bunds) constructed as required to prevent stormwater ingress into the mobile crushing and screening plants operational areas; and • Located at least 50 metres from drainage lines.
3) One **5mtpa relocatable crusher for processing of ore**	• **Construction, mobilization and installation of one relocatable crusher on previously disturbed area with compacted hardstand, with a maximum annual throughput of 5,000,000 tonnes;** • **Fitted with functioning dust sprays and dust covers at the head drum and discharge point of the main conveyor and at the feed point;** • **Stormwater infrastructure (earthen bunds) constructed to prevent stormwater ingress into the mobile crushing and screening (stemming) plant operational areas; and** • **Located at least 50 metres from drainage lines.**
4) 2 x 2ML hydrocarbon storage facilities at Primary Crusher 1 and Primary Crusher 2	• **10 x 200 kL horizontal transportable self bunded diesel storage tanks;** • **Constructed to meet the *Australian Standards AS 1940-2017 The storage and handling of flammable and combustible liquids*; and** • **Constructed at South Flank Primary Crusher 1 and Primary Crusher 2.**
5) Ore Handling Plants	• **Minor upgrades to the conveyors and stacker drives.** **Conveyors MC301 and MC302:** • **Install new 450 kW drive units (motor & gearbox) and remove existing 250 kW drive;** • **Installation of HV switchgear / Substation works;** • **Install new radio remote control and associated power switching and remove Low Voltage Variable Voltage Variable Frequency;** • **Install new drive pulley (and new coupling);** • **Structural strengthening to supports TS30 and TS210;** • **Modifications to MC01 and MC30 surge bars, training plates and skirts; and** • **Head end chute impact plate adjustments.** **Conveyors MC303 and MC304:** • **Install new fluid couplings to provide start-up torque;** • **Training plate modification; and** • **New surge bars to tail end feed chutes.** **Conveyors MC08 and MC11:** • **Integration of power switching into existing radio remote control to**

	manage loads on infrastructure; • **Systematic idler change out;** • **New tripper head chutes;** • **Deflector plate installation;** • **New tripper jump pulley installation; and** • **Modifications to location of primary and secondary scrapers.** **Conveyors MC307 and MC308:** • **Integration of power switching into existing radio remote control;** • **Training plate modification and new surge bars to tail end feed chutes;** • **Replace upper section of tripper head chute;** • **Realign and replace impact plate;** • **Brake modification by adding additional clippers;** • **Structural and mechanical counterweight modifications.** **The stacker upgrades will remove bottlenecks between the fixed (OHPs) and relocatable plant and include:** • **Replacing the stacker's boom mast;** • **Extending the stacker's conveyor skirting;** • **Upgrading the stacker's conveyor drive by:** ➢ **Replacing the fluid coupling with a flexible coupling;** ➢ **Installing an oil cooler; and** ➢ **Installing a speed encoder.** • **Upgrading the stacker's E-House by:** ➢ **Undertaking structural reinforcements;** ➢ **Installing a variable frequency drive; and** ➢ **Installing air conditioning.** • **Upgrading the stacker's Tripper Car Head Chute by:** ➢ **Replace the head chute and deflector plate; and** ➢ **Install a jump pulley and new transition idlers.** • **New safety programmable logic controller (AS4324.1 luff and limit protection).**

6. Condition 1.2.14, of the Licence is removed as shown in strikethrough below:

~~1.2.14 The Licensee shall operate the Packsaddle Infiltration Ponds in accordance with the conditions of this Licence, following submission of the compliance document required under condition 4.3.1.~~

7. Condition 1.2.22 of the Licence is removed as shown in strikethrough below:

~~1.2.22 The Licensee shall commission the Mulla Mulla Camp WWTP for a period of three months but not exceed a period of 12 months.~~

8. Condition 1.2.23, Table 1.2.23 of the Licence is removed as shown in strikethrough below:

~~1.2.23 The Licensee must undertake process monitoring during Commissioning of the Mulla Mulla Camp WWTP to the following requirements of Table 1.2.8:~~

~~(a) at the locations specified in Column 1;~~
~~(b) for the parameters specified in Column 2;~~
~~(c) at the frequency specified in Column 4;~~
~~(d) meet the limits specified in Column 5; and~~
~~(e) using the methods specified in Column 7.~~

~~Table 1.2.8~~**23**						
~~**Column 1**~~	~~**Column 2**~~	~~**Column 3**~~	~~**Column 4**~~	~~**Column 5**~~	~~**Column 6**~~	~~**Column 7**~~
~~Emission~~	~~Parameter~~	~~Units~~	~~Frequency~~	~~Limit~~	~~Averaging~~	~~Method~~

~~point reference~~					~~period~~	
~~Irrigation areas L13 and L14~~	~~Volume~~	~~kL/day~~	~~Continuous~~	~~<630~~	~~Cumulative daily~~	~~Mag-flow meter~~
~~Final effluent tank sampling tap prior to discharge to irrigation areas L13 and L14~~	~~Biochemical Oxygen Demand~~	~~mg/L~~	~~Weekly~~	~~<20~~	~~Spot sample~~	~~AS/NZS 5667:10~~
	~~Total Suspended Solids~~	~~mg/L~~	~~Weekly~~	~~<30~~		
	~~Total Thermo-tolerant Coliforms~~	~~Cfu/100mL~~	~~Weekly~~	~~<10~~		
	~~Total Nitrogen~~	~~mg/L~~	~~Weekly~~	~~<15~~		
	~~Total Phosphorus~~	~~mg/L~~	~~Weekly~~	~~<8~~		
	~~pH*~~	~~pH units~~	~~Weekly~~	~~>6.5 and <8.5~~		

~~*insitu sampling and recording permitted~~

9. Condition 1.2.2 is included in the Licence to operate the infrastructure as per the Licence conditions.

1.2.16 The Licensee shall operate the Packsaddle Infiltration Ponds overtopping points, Juna Downs MAR modifications, Western Sediment Basin discharge point, 5 Mtpa relocatable crusher, hydrocarbon storage facilities, inert landfills, Ore Handling Plants upgrades and Power Station in accordance with the conditions of this Licence, following submission of the compliance document required under Condition 5.3.1.

10. Condition 2.2.2, Table 2.2.2 of the Licence is amended by the deletion of the text shown in strikethrough below and the insertion of the bold text shown in underline below:

2.2.2 The Licensee shall not cause or allow point source emissions to exceed the limits listed in Table 2.2.2.

Table 2.2.2: Point source emission limits to groundwater

Emission point reference	Parameter	Limit (including units)	Averaging period
~~HGA0001P~~ ~~HGA0002P~~ ~~HGA0040P~~ ~~HGA0041P~~	Depth to groundwater	~~Not less than 10m below ground surface~~	Spot sample
~~HGSL0005~~ ~~HGSL0006~~ ~~HGSL0014~~ ~~HGSL0015~~ ~~HGSL0031~~ ~~HGSL0032~~ **HCL0008M** **HGSL0002M** **HGSL0010M** **HGSL0012M** **HGSL0022M** **HGSL0028M** **HGSL0019M** **HGSL0025M**		Not less than 7m below ground surface	

11. Condition 2.3.1, Table 2.3.1 of the Licence is amended by the insertion of the bold text shown in underline below:

2.1.1 The Licensee shall ensure that where waste is emitted to land from the emission points in Table 2.3.1 and identified on the map of emission points in Schedule 1 it is done so in accordance with the conditions of this Licence.

Table 2.3.1: Emissions to land		
Emission point reference	**Description**	**Source including abatement**
L1	Discharge of treated wastewater from Packsaddle Village C150K WWTP to designated unlined evaporation/infiltration pond	Treated wastewater from Packsaddle Village C150K WWTP
L2	Discharge of treated wastewater from Packsaddle Village WWTP to unlined evaporation/infiltration pond	Treated wastewater from Packsaddle Village WWTP ponds
L3	Discharge of treated wastewater from Mulla Mulla Camp C300K WWTP to designated irrigation area	Treated wastewater pipeline from Mulla Mulla Camp C300K WWTP
L4	Discharge of treated wastewater from overflow of evaporation	Treated wastewater from heavy vehicle washdown bays, workshop oily water separators and untreated wastewater from the light vehicle washdown bay
L5		
L6	Discharge of treated wastewater to undertake scheduled maintenance of ponds	
L7	Discharge of reject water from the Mining Area C Water Treatment Plant to designated irrigation area	Reject water from the Mining Area C Water Treatment Plant
L8	Discharge of excess mine dewater to the Packsaddle Infiltration ponds	Mine dewater
L9		
L10		
L11	Discharge of excess mine dewater to the Western Sediment Basin	Mine dewater
L12	Discharge of excess mine dewater to the Central Sediment Basin	Mine dewater
L13	Discharge of treated wastewater from the Mulla Mulla Camp WWTP to designated irrigation area	Treated wastewater ~~pipeline~~ from Mulla Mulla Camp WWTP
L14		
L15	Discharge of excess mine dewater to the Western Sediment Basin	Mine dewater
L16	Discharge of excess mine dewater to the Central Sediment Basin	Mine dewater
L17		
L18		
L19	Discharge of excess mine dewater to the Western Sediment Basin	Mine dewater
L20	**Discharge of excess mine dewater to the Western Sediment Basin**	**Mine dewater**

12. Condition 2.3.2, Table 2.3.2 of the Licence is amended by the insertion of the bold text shown in underline below:

Table 2.3.2: Emission limits to land			
Emission point reference	**Parameter**	**Limit (including units)**	**Averaging period**
L4, L5 and L6	Total Recoverable Hydrocarbons	15mg/L	Spot sample
L7	Total Dissolved Solids	1,800 mg/L	Spot sample
L8, L9 and L10	**Distance**	**Wetting Front Limit Marker SCPH0010:** **Distance from Coondewanna Flats PEC 3.8km** **Distance from the Discharge Point (Northern Route) 20.6km** **Distance from the Discharge Point (Southern Route) 16.9km**	**Visual inspection**

13. Condition 3.5.1, Table 3.5.1 of the Licence is amended by the deletion of the text shown in strikethrough below and the insertion of the bold text shown in underline below:

3.5.1 The Licensee shall not cause or allow exceedance of the ambient groundwater limits listed in Table 3.5.1.

Table 3.5.1: Ambient groundwater limits				
Monitoring point reference & location	**Parameter**	**Limit**	**Averaging period**	**Frequency**
~~GAOB07RM~~ ~~GWB0025M~~ ~~HGA0003P~~ ~~HGA0066M~~ ~~GWB0039M~~ **HCF0023M** HCF0032M ~~HCF0044M~~ HCF0045M	Total Dissolved Solids	≤750mg/L	Spot Sample	Quarterly
HPSA1633 (Packsaddle Infiltration Ponds)	Standing water level	≤ 8 mbgl	Spot sample	Monthly
~~GWB0039M~~ **HCF0023M** HCF0032M ~~HCF0044M~~ HCF0045M	Depth to groundwater	≤ 7mbgl		

14. Condition 3.5.2, Table 3.5.2 of the Licence is amended by the deletion of the text shown in strikethrough below and the insertion of the bold text shown in underline below:

3.5.2 The Licensee shall undertake the monitoring in Table 3.5.2 according to the specifications in that Table.

Table 3.5.2: Monitoring of ambient groundwater quality					
Monitoring point reference	**Parameter**	**Trigger**	**Units**	**Averaging period**	**Frequency**
~~GAOB05RM~~ ~~HGA0038M~~	~~Groundwater Level~~	~~≤ 12~~	~~mbgl~~	~~Spot Sample~~	~~Monthly~~
~~GAOB07RM~~ ~~GWB0025M~~ ~~HGA0003P~~ ~~HGA0066M~~	Depth to Groundwater Level	~~≤ 12~~	mbgl	Spot Sample	Monthly
~~GWB0039M~~ **HCF0023M** HCF0032M ~~HCF0044M~~ HCF0045M		**≤** 15			
HPSA1633		≤ 13			
GAOB07RM ~~GWB0025M~~ HGA0003P HGA0066M HPSA1633	Electrical Conductivity[1]	-	µS/cm	Spot Sample	Quarterly
	pH[1]	-	pH Units		
	Aluminium	-	mg/L	Spot sample	Quarterly
	Arsenic	-			
	Barium	-			
	Boron	-			
	Calcium Carbonate	-			
	Cadmium	-			
	Calcium	-			
	Chlorine	-			
	Chromium	-			
	Copper	-			
	Fluoride	-			
	Iron	-			
	Lead	-			
	Magnesium	-			
	Manganese	-			
	Mercury	-			
	Molybdenum	-			
	Nickel	-			
	Nitrate	-			
	Potassium	-			
	Selenium	-			
	Sodium	-			
	Sulfate	-			
	Total Dissolved Solids	-			
	Zinc	-			

Note 1: In-field non-NATA accredited analysis permitted.

15. Condition 3.5.3, Table 3.5.3 of the Licence is amended by the deletion of the text shown in strikethrough below and the insertion of the bold text shown in underline below:

3.5.3 The Licensee shall implement ambient environmental quality monitoring detailed in Table 3.5.3 if the depth to groundwater level specified in Table 3.5.2 in the relevant monitoring bores specified in Table 3.5.2 is exceeded.

Table 3.5.3: Monitoring following groundwater level exceedance			
Emission point reference	**Parameter**	**Units**	**Frequency**
~~GWB0025M~~ ~~HGA0003P~~ ~~GAOB07RM~~ ~~HGA0066M~~ ~~GWB0039M~~ **HCF0023M** HCF0032M ~~HCF0044M~~ HCF0045M	Groundwater level	mbgl	Daily
GWB0025M HGA0003P GAOB07RM HGA0066M	Visual assessment of surrounding vegetation (GWB0025M, HGA0003P, GAOB07RM, HGA0066M) Vegetation monitoring in the vicinity of the event comprising 5 to 10 trees of a variety of species to be photographed and an assessment of each consisting of: ○ Tree moisture; ○ Foliage cover; ○ New growth; and ○ Flowering status.	-	Vegetation monitoring will continue for two weeks after water levels have receded to below target level
~~GWB0039M~~ **HCF0023M** HCF0032M ~~HCF0044M~~ HCF0045M	Measurement of Leaf Water Potential at monitoring sites 12, 15 and 20 (in addition to ongoing Crown Condition Score and Diameter at Breast Height) to determine the response of tree water use to elevated groundwater levels	-	Six monthly

Note 1: In-field non-NATA accredited analysis permitted.

16. Insertion of Improvement Condition 4.1.1, Table 4.1.1 as shown by the insertion of the bold text shown in underline below:

4.1.1 The Licensee shall complete the improvements in Table 4.1.1 by the date of completion in Table 4.1.1.

Table 4.1.1: Improvement program		
Improvement reference	**Improvement**	**Date of completion**
IR1	**The Licensee shall submit to the CEO a Vegetation Monitoring Programme for the Packsaddle Infiltration Ponds overflow to drainage lines with timeframes outlined that:** **(a) identifies vegetation monitoring points along the wetting front;** **(b) identifies control points for vegetation outside the wetting footprint;** **(c) provides details of the field and remotely gathered multispectral data that will be gathered to allow for evaluation of plant stress along the discharge flow path;** **(d) provides details on how flow will be monitored to determine if discharge reaches the early**	**06 December 2019**

	warning point or the wetting front limit, including specific locations of crest gauges; and **(e) specifies what actions will be taken if the early warning point or the wetting front limit are reached.**	

Please note the conditions below will change to Section 5 in the consolidated Licence.

17. Condition 4.2.3, Table 4.2.2 of the Licence is amended by the deletion of the text shown in strikethrough below:

5.2.3 The Licensee shall submit the information in Table ~~4.2.2~~ **5.2.2** to the CEO according to the specifications in that table.

Table ~~4.2.2~~ 5.2.2: Non-annual reporting requirements

Condition or table (if relevant)	Parameter	Reporting period	Reporting date (after end of the reporting period)	Format or form
-	Copies of original monitoring reports submitted to the Licensee by third parties	Not Applicable	Within 14 days of the CEOs request	As received by the Licensee from third parties
1.2.12	Commissioning report for the Mining Area C Water Treatment Plant	Not applicable	Within one month of the completion of commissioning	The report shall include: (a) a summary of monitoring results; (b) a list of any original monitoring reports submitted to the Licensee from third parties for the commissioning period; (c) a summary of the environmental performance of the Mining Area C Water Treatment Plant as installed, against the design specification set out in the application; and (d) where they have not been met, measures proposed to meet the design specification and/or Licence conditions, together with timescales for implementing the proposed measures.
~~1.2.21~~	~~Commissioning report for the Mulla Mulla Camp WWTP~~	~~Not applicable~~	~~Within one month of the completion of commissioning~~	~~The report shall include:~~ ~~(a) a summary of monitoring results recorded under Condition 7;~~ ~~(b) a list of any original monitoring reports submitted to the Works Approval Holder from third parties for the Commissioning Period;~~

				~~(c) a summary of the environmental performance of the WWTP as installed, against the design specification set out in Table 1.2.7;~~ ~~(d) a review of performance against the Works Approval Conditions; and~~ ~~where they have not been meet, proposed measures to meet the design specification and/or Works Approval Conditions, together with timescales for implementing the proposed measures.~~
3.5.3	Monitoring results following groundwater level exceedance, including a discussion of results, environmental impacts and remedial actions	Not Applicable	Within one month of the completion of the vegetation monitoring specified in Table 3.5.3	None specified

18. Condition 4.3.1, Table 4.3.1 of the Licence is amended by the deletion of the text shown in strikethrough below and the insertion of the bold text shown in underline below:

4.3.1 The Licensee shall ensure that the parameters listed in Table ~~4.3.1~~ **5.3.1** are notified to the CEO in accordance with the notification requirements of the table.

Table ~~4.3.1~~ 5.3.1: Notification requirements

Condition or table (if relevant)	Parameter	Notification requirement[1]	Format or form[2]
~~1.2.12~~	~~The Licensee shall, prior to commencing commissioning of the Mining Area C Water Treatment Plant, submit a commissioning plan to the CEO. The commissioning plan shall include details relating to:~~ ~~(a) the commissioning stages and expected timescales for commissioning;~~ ~~(b) expected emissions and discharges during commissioning and the environmental implications of the emissions;~~ ~~(c) how emissions and discharges will be managed during commissioning;~~ ~~(d) the monitoring that will be undertaken during the commissioning period;~~ ~~(e) how accidents or malfunctions will be managed;~~ ~~(f) start up and shut down procedures; and~~ ~~(g) reporting proposals including accidents, malfunctions and reporting against the commissioning plan.~~	~~Four weeks prior to the commencement of commissioning.~~	~~None specified~~

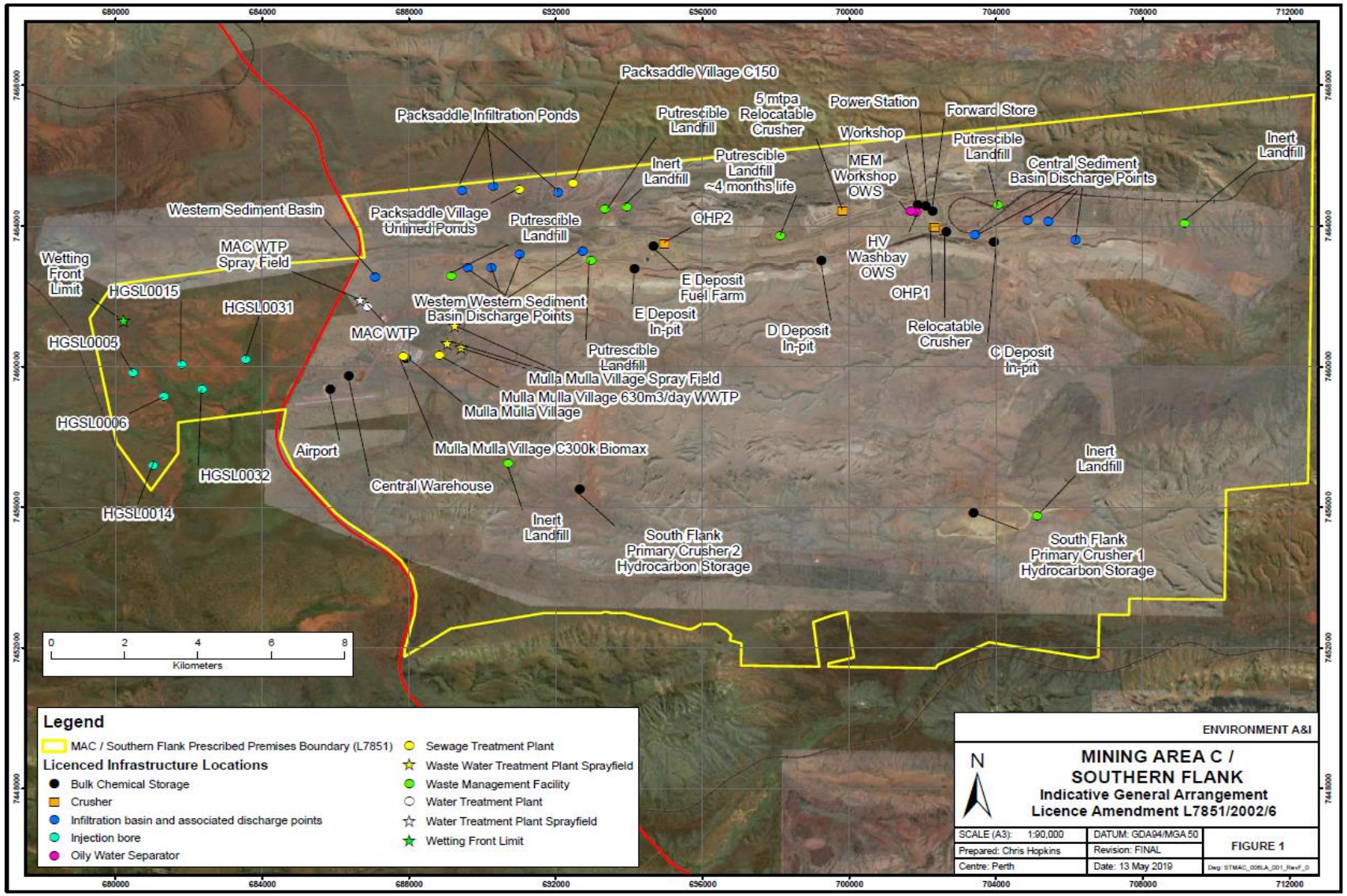
	~~Commissioning shall be carried out in accordance with the commissioning plan.~~		
1.2.12	**The Licensee shall submit a compliance document to the CEO, following construction of each of the Packsaddle Infiltration Ponds overtopping points, Juna Downs MAR modifications, Western Sediment Basin discharge point, 5 Mtpa relocatable crusher, hydrocarbon storage facilities, inert landfills and Ore Handling Plants upgrades.** **The Licensee must ensure compliance documentation:** a) **is certified by a suitably qualified professional engineer or builder stating that each item of infrastructure specified in Table 1.2.7 has been constructed in accordance with the conditions of the Licence with no material defects; and** b) **be signed by a person authorised to represent the Licensee and contain the printed name and position of that person within the company.**	**Within 7 days of the completion of construction**	**None specified**
1.2.12 1.2.13 1.2.14 1.2.16 **1.2.17** **1.2.18** **1.2.19** **1.2.20**	The Licensee shall submit a compliance document to the CEO, following construction of each of the ~~Packsaddle Infiltration Ponds,~~ Mining Area C Water Treatment Plant and the Juna Downs MAR scheme, ~~additional screening plant for the relocatable crusher~~, two new Central Sediment Basin discharge points, two new Western Sediment Basin discharge points, new putrescible landfill and three mobile crushing and screening plants, and prior to commissioning of the same. The Licensee must ensure compliance documentation: a) is certified by a suitably qualified professional engineer or builder stating that each item of infrastructure specified in Table 1.2.7 has been constructed in accordance with the conditions of the Licence with no material defects; and b) be signed by a person authorised to represent the Licensee and contain the printed name and position of that person within the company	Within 7 days of the completion of construction	None specified
1.2.12 1.2.13 1.2.16	The Licensee shall submit to the CEO, as part of the compliance document for the 2 new Juna Downs MAR scheme bores HGSL0016 and HGSL0017: a) written GPS locations of the 2 bores confirming the bores are within the area specified in Attachment 1.	Within 7 days of the completion of construction	None specified
1.2.13	If condition 1.2.13 applies, then the Licensee must provide the CEO with a list of departures which are certified as complying with condition 1.2.12	Within 7 days of the completion of construction	None specified

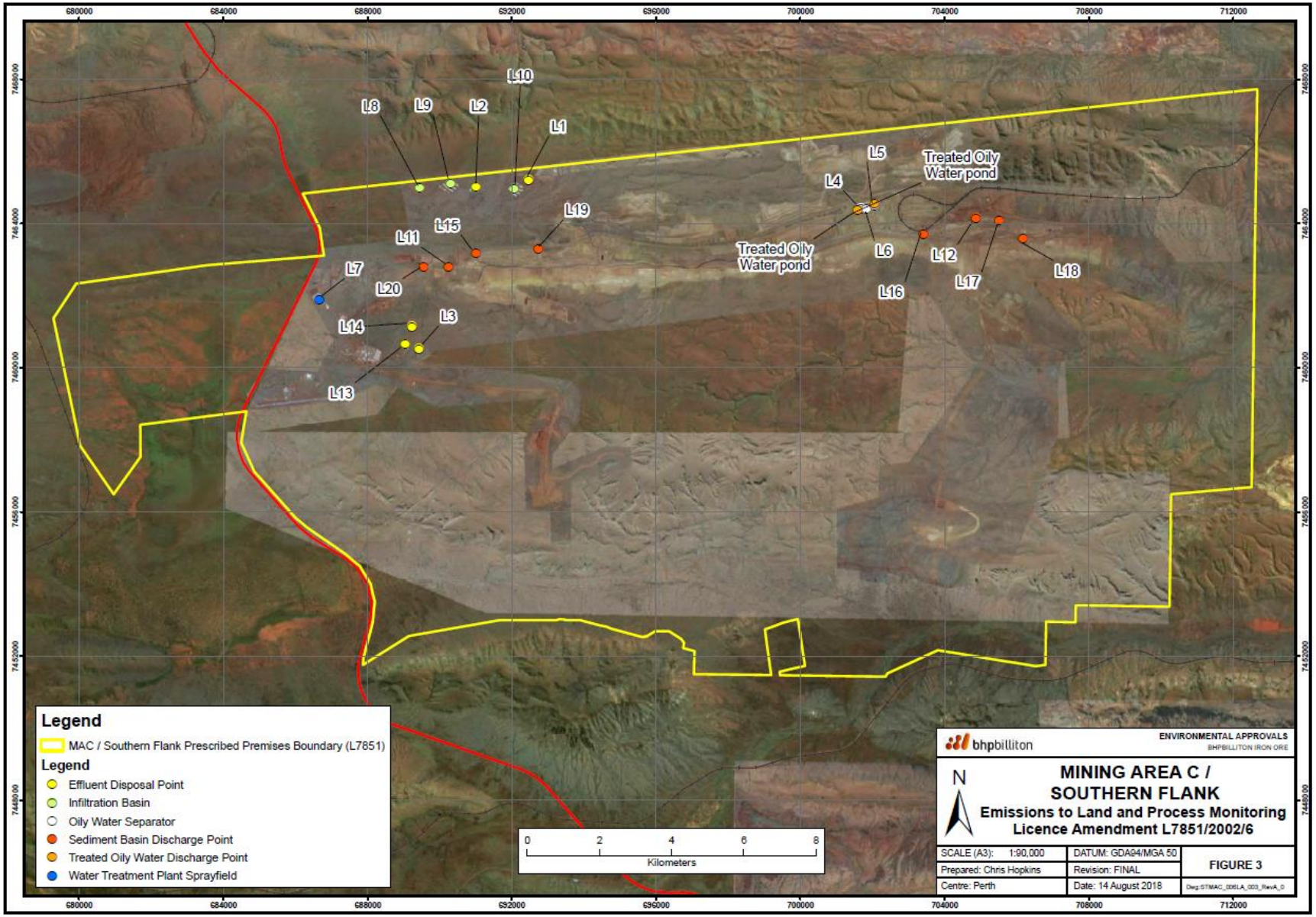
Tables 1.2.1, 1.2.4, 2.2.2, 2.3.2, 3.5.1	Breach of any limit specified in the Licence	Part A: As soon as practicable but no later than 5pm of the next usual working day. Part B: As soon as practicable	N1
3.5.2	Depth to groundwater level exceedance		
3.1.4	Calibration report	As soon as practicable.	None specified

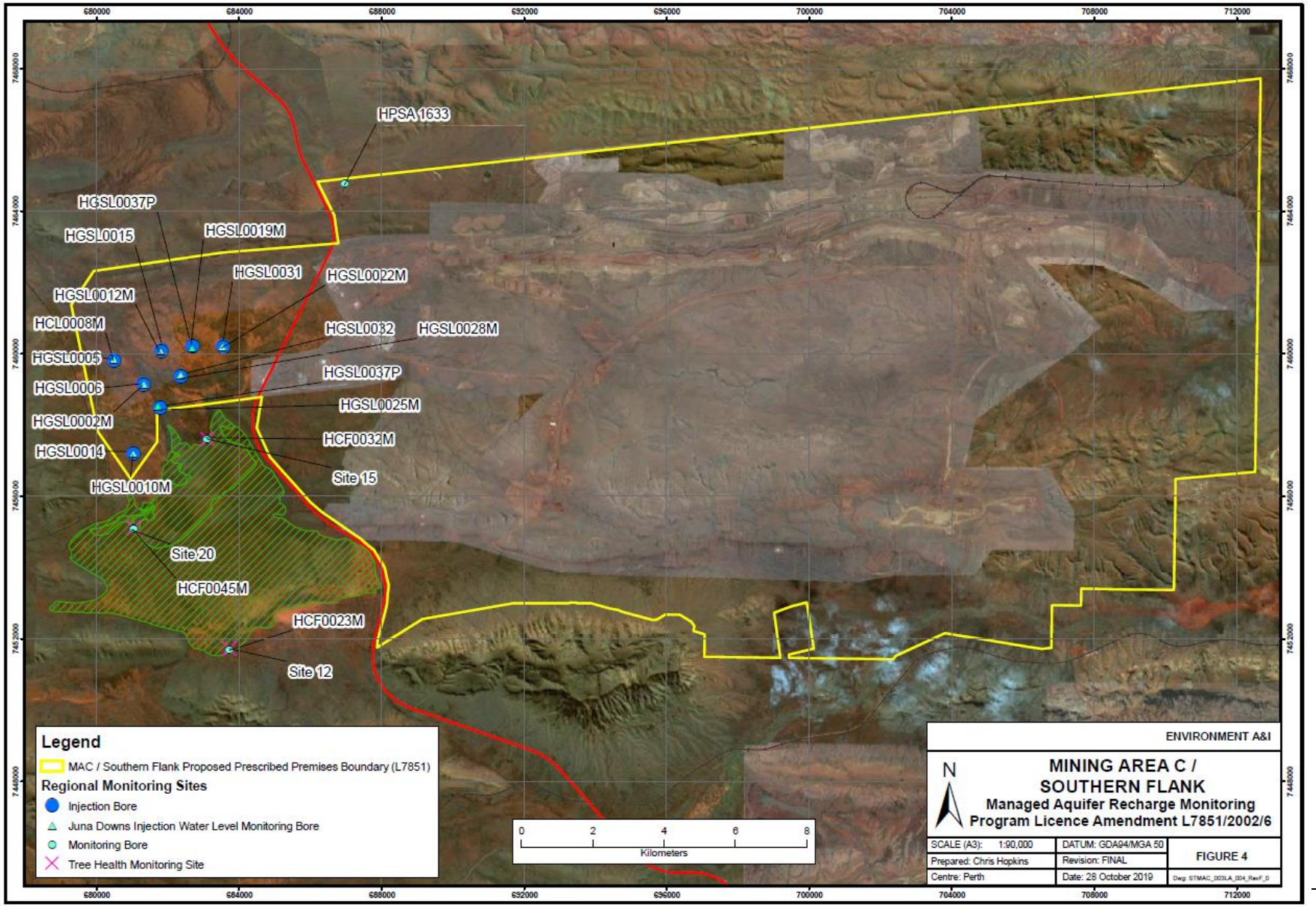
Note 1: Notification requirements in the Licence shall not negate the requirement to comply with s72 of the Act
Note 2: Forms are in Schedule 2

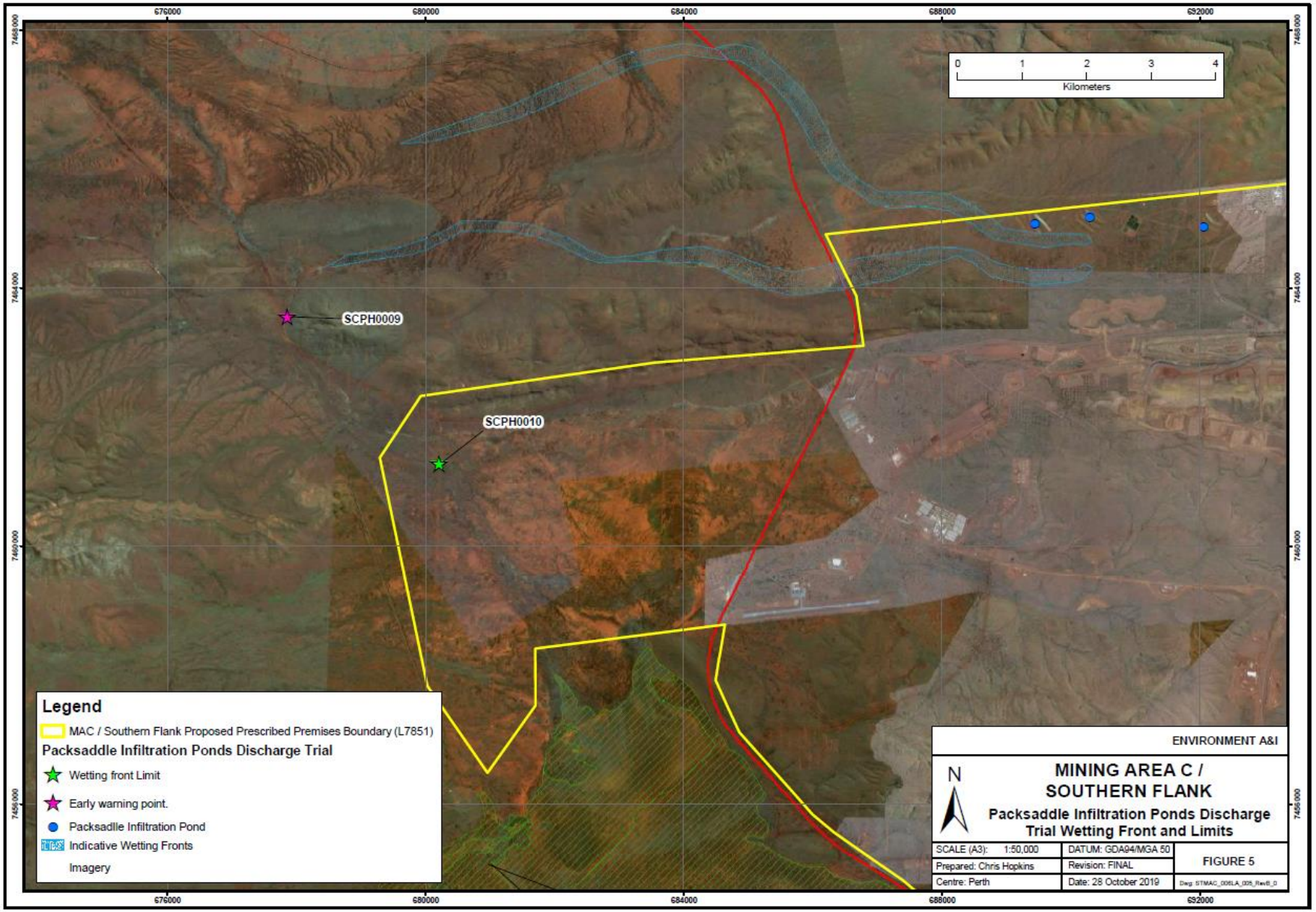
19. The Premises maps in Schedule 1 are updated to the following maps:

Premises map
Prescribed premises boundary, emission points to land and monitoring locations
Maps showing prescribed premises boundary, indicative general arrangement, Category 12 indicative operating locations, waste disposal locations defined in Table 1.2.2, location of containment infrastructure defined in Table 1.2.5, emission points defined in Tables 2.2.1 (emissions to groundwater), 2.3.1 (emissions to land) and the monitoring points defined in Tables 2.3.1 (groundwater monitoring), 3.3.1 (monitoring of emissions to land) 3.5.1 (ambient groundwater limits), 3.5.2 (ambient groundwater quality) and 3.5.3 (following groundwater level exceedance) are shown in the maps below.


680000
684000
688000
692000
696000
700000
704000
708000
712000
7468000
7464000
7460000
7456000
7452000
7448000
Packsaddle Village C150
Packsaddle Infiltration Ponds
Putrescible Landfill
5 mtpa Relocatable Crusher
Power Station
Forward Store
Workshop
Putrescible Landfill
Inert Landfill
Inert Landfill
Putrescible Landfill ~4 months life
MEM Workshop OWS
Central Sediment Basin Discharge Points
Western Sediment Basin
Packsaddle Village Unlined Ponds
Putrescible Landfill
OHP2
MAC WTP Spray Field
HV Washbay OWS
Wetting Front Limit
HGSL0015
E Deposit Fuel Farm
OHP1
HGSL0031
Western Western Sediment Basin Discharge Points
E Deposit In-pit
D Deposit In-pit
Relocatable Crusher
HGSL0005
MAC WTP
Putrescible Landfill
C Deposit In-pit
Mulla Mulla Village Spray Field
Mulla Mulla Village 630m3/day WWTP
Mulla Mulla Village
HGSL0006
Airport
Mulla Mulla Village C300k Biomax
Inert Landfill
HGSL0032
Central Warehouse
HGSL0014
Inert Landfill
South Flank Primary Crusher 2 Hydrocarbon Storage
South Flank Primary Crusher 1 Hydrocarbon Storage
0 2 4 6 8
Kilometers
Legend
MAC / Southern Flank Prescribed Premises Boundary (L7851)
Licenced Infrastructure Locations
Bulk Chemical Storage
Crusher
Infiltration basin and associated discharge points
Injection bore
Oily Water Separator
Sewage Treatment Plant
Waste Water Treatment Plant Sprayfield
Waste Management Facility
Water Treatment Plant
Water Treatment Plant Sprayfield
Wetting Front Limit
ENVIRONMENT A&I
N
MINING AREA C / SOUTHERN FLANK
Indicative General Arrangement
Licence Amendment L7851/2002/6
SCALE (A3): 1:90,000
DATUM: GDA94/MGA 50
Prepared: Chris Hopkins
Revision: FINAL
Centre: Perth
Date: 13 May 2019
FIGURE 1


680000
684000
688000
692000
696000
700000
704000
708000
712000
7468000
7464000
7460000
7456000
7452000
7448000
L10
L8
L9
L2
L1
L5
Treated Oily Water pond
L4
L19
L15
L11
L7
L20
L14
L3
L13
Treated Oily Water pond
L6
L12
L16
L17
L18
Legend
MAC / Southern Flank Prescribed Premises Boundary (L7851)
Legend
Effluent Disposal Point
Infiltration Basin
Oily Water Separator
Sediment Basin Discharge Point
Treated Oily Water Discharge Point
Water Treatment Plant Sprayfield
0
2
4
6
8
Kilometers
bhpbilliton
ENVIRONMENTAL APPROVALS
BHPBILLITON IRON ORE
N
MINING AREA C / SOUTHERN FLANK
Emissions to Land and Process Monitoring
Licence Amendment L7851/2002/6
SCALE (A3): 1:90,000
DATUM: GDA94/MGA 50
Prepared: Chris Hopkins
Revision: FINAL
Centre: Perth
Date: 14 August 2018
FIGURE 3


HPSA 1633
HGSL0037P
HGSL0015
HGSL0019M
HGSL0031
HGSL0022M
HGSL0012M
HCL0008M
HGSL0032
HGSL0028M
HGSL0005
HGSL0037P
HGSL0006
HGSL0025M
HGSL0002M
HCF0032M
HGSL0014
Site 15
HGSL0010M
Site 20
HCF0045M
HCF0023M
Site 12
Legend
MAC / Southern Flank Proposed Prescribed Premises Boundary (L7851)
Regional Monitoring Sites
Injection Bore
Juna Downs Injection Water Level Monitoring Bore
Monitoring Bore
Tree Health Monitoring Site
0 2 4 6 8
Kilometers
ENVIRONMENT A&I
N
MINING AREA C / SOUTHERN FLANK
Managed Aquifer Recharge Monitoring
Program Licence Amendment L7851/2002/6
SCALE (A3): 1:90,000
DATUM: GDA94/MGA 50
Prepared: Chris Hopkins
Revision: FINAL
Centre: Perth
Date: 28 October 2019
FIGURE 4


676000
680000
684000
688000
692000
7468000
7464000
7460000
7456000
0 1 2 3 4
Kilometers
SCPH0009
SCPH0010
Legend
MAC / Southern Flank Proposed Prescribed Premises Boundary (L7851)
Packsaddle Infiltration Ponds Discharge Trial
Wetting front Limit
Early warning point.
Packsadlle Infiltration Pond
Indicative Wetting Fronts
Imagery
ENVIRONMENT A&I
N
MINING AREA C / SOUTHERN FLANK
Packsaddle Infiltration Ponds Discharge Trial Wetting Front and Limits
SCALE (A3): 1:50,000
DATUM: GDA94/MGA 50
Prepared: Chris Hopkins
Revision: FINAL
Centre: Perth
Date: 28 October 2019
FIGURE 5

Appendix 1: Key documents

	Document title	In text ref	Availability
1	Licence L7851/2002/6 – Mining Area C	L7851/2002/6	accessed at www.dwer.wa.gov.au
2	Ministerial Statement 1072	MS 1072	accessed at www.epa.wa.gov.au/
3	DER, July 2015. *Guidance Statement: Regulatory principles.* Department of Environment Regulation, Perth.	N/A	accessed at www.dwer.wa.gov.au
4	DER, October 2015. *Guidance Statement: Setting conditions.* Department of Environment Regulation, Perth.	N/A	
5	DER, August 2016. *Guidance Statement: Licence duration.* Department of Environment Regulation, Perth.	N/A	
6	DER, November 2016. *Guidance Statement: Risk Assessments*. Department of Environment Regulation, Perth.	N/A	
7	DER, November 2016. *Guidance Statement: Decision Making*. Department of Environment Regulation, Perth.	N/A	
8	Email titled "Application to amend L7851 MAC Environmental Licence" dated 29/11/2018 8:44AM and authored by BHP Billiton Iron Ore Pty ltd	N/A	DWER records (A1743662)
9	Email titled "FW: Application to amend L7851 MAC Environmental Licence" dated 27/02/2019 7:34am and authored by BHP Billiton Iron Ore Pty Ltd	N/A	DWER records (A1771740)
10	Email titled "Central Pilbara Water Resource Management Plan Endorsed" dated 11/04/2019 9:44AM and authored by BHP Billiton Iron Ore Pty Ltd	BHP Billiton, 2019	DWER records (A1784086)
11	Email titled "FW: W6092/2017/1 - Mulla Mulla Village Wastewater Treatment Plant - Commissioning Report" dated 13/03/2019 2:26am and authored by BHP Billiton Iron Ore Pty Ltd	N/A	DWER records (A1792905)
12	Email titled "RE: L7851 - Compliance Report for Packsaddle Infiltration Ponds" dated 20/05/2019 5:11pm and authored by BHP Billiton Iron Ore Pty Ltd	N/A	DWER records (A1792901)
13	Email titled "Mining Area C - South Flank RESUBMISSION of the Dust Monitoring and Management Plan" dated 28/06/2019 11:01am and	BHP, June 2019	DWER records (A1805182)

	authored by BHP Billiton iron Ore Pty Ltd		
14	Email titled “RE: L7851 MAC additional information” dated 15/07/2019 8:27am and authored by BHP Billiton Iron Ore Pty Ltd	BHP, July 2019	DWER records (A1808663)
15	Email titled “L7851/2002/6 - Mobile screening plant - Compliance Report” dated 24/07/2019 1:31pm and authored by BHP Billiton Iron Ore Pty Ltd	N/A	DWER records (A1808668)
16	Email titled “RE: MAC Licence Amendment” dated 29/08/2019 12:49pm and authored by BHP Billiton Iron Ore Pty Ltd	BHP, August 2019	DWER records (A1822947)
17	Email titled” RE: MAC Licence Amendment” dated 17/09/2019 12:48pm and authored by BHP Billiton Iron Ore Pty Ltd	N/A	DWER records (A1824186)
18	Email titled “RE: APPLICANT NOTIFICATION - L7851/2002/6 - NOTICE OF PROPOSED AMENDMENT TO LICENCE” dated 1/11/2019 7:22am and authored by BHP Billiton Iron Ore Pty Ltd	N/A	DWER records (A1837465)

Appendix 2: Summary of Licence Holder comments

The Licence Holder was provided with the draft Amendment Notice on 22 October 2019 for review and comment. The Licence Holder responded on 01 November 2019. The following comments were received on the draft Amendment Notice.

Section	Summary of Licence Holder comment	DWER response
AMENDMENT DESCRIPTION Page 4, dot point 1	Could the reference to Ore Handling Plant 1 (OHP1) be updated to Ore Handling Plants (OHPs) as there are some interactions between the infrastructure and this would remove any possible confusion (as per Amendment 18 Table 5.3.1).	Updated as requested.
AMENDMENT HISTORY Table 7 last row	Could all references to Ore Handling Plant 1 (OHP1) be updated to Ore Handling Plants (OHPs) as there are some interactions between the infrastructure and this would remove any possible confusion (as per Amendment 18 Table 5.3.1).	Updated as requested.
RISK ASSESSMENT	Could all references to Ore Handling Plant 1 (OHP1) be updated to Ore Handling Plants (OHPs) as there are some interactions between the infrastructure and this would remove any possible confusion (as per Amendment 18 Table 5.3.1).	Updated as requested.
Table 5, Category 12	Lists the Category 12 limit 2,000 tpa. This should be 2,000 ktpa (as per current approval and Amendment 2 Table 1.2.10).	Updated as requested.
AMENDMENT Amendment 2, Table 1.2.4	Category 6: Remove the first dot point "5,840,000 tonnes per Annual Period reinjection – Deposit A" as A deposit has been decommissioned. Category 73. Replace ~~3,500~~ with ~~6,000~~ which is the currently approved value to be amended.	Category 6 dot point removed as requested. Category 73 not changed as the Supporting Documents request 10,000 cubic metres in aggregate
Amendment 3, Table 1.2.5	Packsaddle Infiltration Ponds (L8-L10) removed the high level alarm requirement as the ponds will now be designed to overtop.	Updated as requested.

Section	Summary of Licence Holder comment	DWER response
Amendment 5, Table 1.2.7	Juna Downs MAR Scheme: • Remove the 3 new dot points as no construction is associated with the listed activities (although BHP will replace the 20 ML/day pump with a new 35 ML/day pump – see Section 5.4.1 of the Supporting Document): ○ the monitoring bores are already existing; and ○ no new infrastructure is required to increase the reinjection rates. • Unless this will delay the licence approval the following be added to Table 1.2.47: ○ Construction and operation of two new reinjection bores (HGSL0037P and HGSL0038P) and the associated monitoring bores (HGSL0019M and HGSL0025M). 2x2ML Hydrocarbon Tanks: Can the reference to AS 1940:2004 be updated to AS 1940:2017. Ore Handling Plant 1. Could all references to Ore Handling Plant 1 (OHP1) this be updated to Ore Handling Plants (OHPs) as there are some interactions between the infrastructure and this would remove any possible confusion (as per Amendment 18 Table 5.3.1).	Juna Downs dot points not removed as requested as the infrastructure is already in place. Australian Standards updated as requested. OHPs referenced as requested. Juna Downs bores added as requested.
Amendment 10, Table 2.2.2	Remove A Deposit MAR bores HGA0001P, HGA0002P, HGA0040P and HGA0041P as they have been decommissioned (the scheme was decommissioned on 30 April 2019, as per email submitted to DWER on the 13 May 2019). As above, unless this will delay the licence add the	A Deposit MAR bores removed as requested. Juna Downs bores added as requested.

Section	Summary of Licence Holder comment	DWER response
	following bores after HGSL0028M: HGSL0019M and HGSL0025M (associated with the proposed two new injection bores for Juna Downs)	
Amendment 12, Table 2.3.2	The Emission points L11, L19 and L29 (Western Sediment Basin) need to be removed and replaced with Emission points L8, L9 and L10 (Packsaddle Infiltration ponds)	Updated as requested.
Amendment 13, Table 3.5.1	Remove A Deposit MAR monitoring bores GAOB07RM, GWB0025M, HGA0003P and HGA0066M as they have been decommissioned.	Updated as requested.
Amendment 14, Table 3.5.2	Remove A Deposit MAR monitoring bores GAOB07RM, GAOB05RM, GWB0025M, HGA0003P, HGA0038M and HGA0066M as they have been decommissioned.	Updated as requested.
Amendment 15, Table 3.5.3	Remove A Deposit MAR monitoring bores GAOB07RM, GWB0025M, HGA0003P and HGA0066M as they have been decommissioned.	Updated as requested.
Amendment 18, Table 5.3.1	Remove the reference to Juna Downs as no further construction activities are required, although BHP will replace the 20 ML/day pump with a new 35 ML/day pump (see Section 5.4.1 of the Supporting Document).	Not removed as additional Juna Downs bores have been included in Table 1.2.7.
Figure 4	Either: 1. If additional Juna Downs Bores are not to be added, replace the current Figure 4 with the correct Figure 4 which has A Deposit removed (STMAC_006LA_004_RevE_0 – no A Deposit). This figure has been attached and was provided to DWER on 17 September 2019; or 2. If additional Juna Downs Bores are not to be added, replace the current Figure 4 with the updated Figure 4 which has A Deposit removed (STMAC_006LA_004_RevF_0 – Juna Downs additional bores) and the additional Juna Downs	Updated with Figure 4 as requested.

Section	Summary of Licence Holder comment	DWER response
	injection and monitoring bores.	
Figure 5	Replace with an updated Figure 5 which labels both SCPH0009 (Wetting Front Early Warning Point) and SCPH0010 (Wetting Front Limit). Updated figure is attached.	Updated as requested.