Government of Western Australia
Department of Environment Regulation

Licence

Environmental Protection Act 1986, Part V

Licensee: BHP Billiton Iron Ore Pty Ltd

Licence: L7851/2002/6

Registered office: Level 1, City Square Brookfield Place
125 -137 St Georges Terrace
PERTH WA 6000

ACN: 008 700 981

Premises address: Mining Area C Project
Mining Tenement ML281SA
NEWMAN WA 6753
As depicted in Schedule 1

Issue date: Thursday, 13 November 2014

Commencement date: Monday, 17 November 2014

Expiry date: Tuesday, 16 November 2027

Prescribed premises category
Schedule 1 of the *Environmental Protection Regulations 1987*

Category number	Category description	Category production or design capacity	Approved Premises production or design capacity
5	Processing or beneficiation of metallic or non-metallic ore: premises on which – (a) Metallic or non-metallic ore is crushed, ground, milled or otherwise processed; (b) Tailings from metallic or non-metallic ore are reprocessed; or Tailings or residue from metallic or non-metallic ore are discharged into a containment cell or dam.	50,000 tonnes or more per year	65,000,000 tonnes per annual period
6	Mine dewatering: premises on which water is extracted and discharged into the environment to allow mining of ore.	50,000 tonnes or more per year	27,541,000 tonnes per annual period
54	Sewage facility: premises – (a) on which sewage is treated (excluding septic tanks); or (b) From which treated sewage is discharged onto land or into waters.	100 m^3 or more per day	480 m^3 per day
63	Class I inert landfill site: premises on which waste (as determined by reference to the waste type set out in the document entitled "Landfill Waste Classification and Waste Definitions 1996" published by the Chief Executive Officer and as amended from time to time) is accepted for burial.	500 tonnes or more per year	5,000 tonnes per annual period

73	Bulk storage of chemicals etc.: premises on which acids, alkalis or chemicals that – (a) contain at least one carbon to carbon bond; and (b) Are liquid at STP (standard temperature and pressure), are stored.	1 000 m^3 in aggregate	3 500 m^3 in aggregate
85B	Water desalinisation plant: premises at which salt is extracted from water if waste water is discharged onto land or into waters (other than marine waters)	0.50 gigalitres or more per year	0.9125 gigalitres per annual period
89	Putrescible landfill site: premises on which waste (as determined by reference to the waste type set out in the document entitled "Landfill Waste Classification and Waste Definitions 1996" published by the Chief Executive Officer, as amended from time to time) is accepted for burial.	More than 20 but less than 5 000 tonnes per year	3 000 tonnes per annual period

Conditions
This Licence is subject to the conditions set out in the attached pages.

Date signed: 29 September 2016
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Alana Kidd
Manager Licensing – Resource Industries
Officer delegated under section 20
of the *Environmental Protection Act 1986*

Contents

Introduction

This Introduction is not part of the Licence conditions.

DER's industry licensing role
The Department of Environment Regulation (DER) is a government department for the state of Western Australia in the portfolio of the Minister for Environment. DER's purpose is to advise on and implement strategies for a healthy environment for the benefit of all current and future Western Australians.

DER has responsibilities under Part V of the *Environmental Protection Act 1986* (the Act) for the licensing of prescribed premises. Through this process DER regulates to prevent, control and abate pollution and environmental harm to conserve and protect the environment. DER also monitors and audits compliance with works approvals and licence conditions, takes enforcement action as appropriate and develops and implements licensing and industry regulation policy.

Licence requirements
This Licence is issued under Part V of the Act. Conditions contained within the Licence relate to the prevention, reduction or control of emissions and discharges to the environment and to the monitoring and reporting of them.

Where other statutory instruments impose obligations on the Premises/Licensee the intention is not to replicate them in the licence conditions. You should therefore ensure that you are aware of all your statutory obligations under the Act and any other statutory instrument. Legislation can be accessed through the State Law Publisher website using the following link:
http://www.slp.wa.gov.au/legislation/statutes.nsf/default.html

For your Premises relevant statutory instruments include but are not limited to obligations under the:

- *Environmental Protection (Unauthorised Discharges) Regulations 2004* – these Regulations make it an offence to discharge certain materials such as contaminated stormwater into the environment other than in the circumstances set out in the Regulations.

- *Environmental Protection (Controlled Waste) Regulations 2004* - these Regulations place obligations on you if you produce, accept, transport or dispose of controlled waste.

- *Environmental Protection (Noise) Regulations 1997* – these Regulations require noise emissions from the Premises to comply with the assigned noise levels set out in the Regulations.

You must comply with your licence. Non-compliance with your licence is an offence and strict penalties exist for those who do not comply.

Licence holders are also reminded of the requirements of section 53 of the Act which places restrictions on making certain changes to prescribed premises unless the changes are in accordance with a works approval, licence, closure notice or environmental protection notice.

Licence fees
If you have a licence that is issued for more than one year, you are required to pay an annual licence fee prior to the anniversary date of issue of your licence. Non payment of annual licence fees will result in your licence ceasing to have effect meaning that it will no longer be valid and you will need to apply for a new licence for your Premises.

Ministerial conditions
If your Premises has been assessed under Part IV of the Act you may have had conditions imposed by the Minister for Environment. You are required to comply with any conditions imposed by the Minister.

Premises description and Licence summary
BHP Billiton Iron Ore Pty Ltd (BHPBIO) operates Mining Area C (MAC) to produce iron ore for export via Port Hedland. MAC is located in the Pilbara region of Western Australia, within mining tenement ML281SA. The nearest township is Newman, which is approximately 120 kilometres (km) south-west of MAC. Rio Tinto Iron Ore's Hope Downs operation, Weeli Wolli Springs and the Coondewanna Flats are located 10km east, 20km east and 20km south-west respectively of the MAC operation.

Conventional open cut mining methods are used at MAC to extract ore for processing through a two stage crushing and screening system to produce lump and fines products. Following blending into stockpiles, the ore is loaded onto trains and railed to Port Hedland for export.

MAC began dewatering operations in April 2010 to allow continued mining of the ore body, with all water abstracted being re-used on site for dust control. The MAC operation has now moved into a surplus mine water balance situation and BHPBIO are in the process of conducting a Managed Aquifer Recharge (MAR) trial to enable an assessment of the overall feasibility and long term sustainability of a MAR operation at MAC. This trial has been approved by the Office of the Environmental Protection Agency (OEPA), was approved under works approval W5079/2011/1 and is licensed under L7851/2002/6.

The objectives of the trial are to investigate the hydraulic properties of the receiving aquifer and intervening formations between the Paraburdoo Dolomite and the Marra Mamba ore body, at a local and regional scale. BHPBIO have completed Stage 1 of the MAR trial and are ready to commence stage 3 (stage 2 will no longer be completed). Over the course of the trial the total injection rate is not expected to exceed the current approved design capacity of 5.84GL/year.

This Licence is the result of an amendment sought by BHPBIO to:

- Approve the construction and operation of the Packsaddle Infiltration Ponds to dispose of up to 10.95 GL/year of mine dewater;
- Approve the construction and operation of the MAC Water Treatment Plant (WTP) and associated spray field required for disposal of reject water. The WTP will have a design capacity of 0.9125 GL/year;
- Increase the Category 6 premises production limit from 5.84 GL/year to 27.541 GL/year, to account for the discharge of surplus mine dewater to the proposed Packsaddle Infiltration Ponds and the existing Western and Central Sediment Basins;
- Include Category 85B on the Licence to allow for the operation of the proposed WTP; and
- Specify the Western and Central Sediment Basins as emission points to land and update monitoring requirements as required.

The licences and works approvals issued for the Premises since 19/08/2002 are:

Instrument log		
Instrument	**Issued**	**Description**
W3663/2002/1	19/08/2002	New works approval application for construction of prescribed premises
W3687/2002/1	10/12/2002	Works approval application to construct category 54 sewage facility and category 63 and 64 landfills
L7851/2002/1	05/05/2003	New licence application to allow ore processing operations to commence
L7851/2002/2	05/05/2004	Licence re-issue
L7851/2002/3	07/11/2004	Licence re-issue
W4105/2002/1	05/09/2005	Works approval application to increase capacity of category 5 ore processing infrastructure
W4162/2002/1	21/10/2005	Works approval application to construct category 54 sewage facility
L7851/2002/4	07/11/2006	Licence re-issue
L7851/2002/5	17/11/2009	Licence re-issue
W4665/2010/1	31/05/2010	Works approval application to construct category 89 putrescible landfill
W4939/2011/1	11/07/2011	Works approval application to increase capacity of category 5 ore processing infrastructure
W5079/2011/1	05/03/2012	Works approval application relating to Managed Aquifer Recharge trial
W5244/2012/1	10/09/2012	Works approval application – Category 5 additional crushing and screening plant (5mtpa).
L7851/2002/6	17/11/2014	Licence re-issue and amendment to REFIRE format
L7851/2002/6	22/01/2014	Minor amendment
L7851/2002/6	07/04/2016	Amendment and update to template version 2.9.
L7851/2002/6	29/09/2016	Amendment 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.

Severance

It is the intent of these Licence conditions that they shall operate so that, if a condition or a part of a condition is beyond the power of this Licence to impose, or is otherwise *ultra vires* or invalid, that condition or part of a condition shall be severed and the remainder of these conditions shall nevertheless be valid to the extent that they are within the power of this Licence to impose and are not otherwise *ultra vires* or invalid.

END OF INTRODUCTION

Licence conditions

1 General

1.1 Interpretation

1.1.1 In the Licence, definitions from the *Environmental Protection Act 1986* apply unless the contrary intention appears.

1.1.2 For the purposes of this Licence, unless the contrary intention appears:

'Act' means the *Environmental Protection Act 1986;*

'acceptance criteria' has the meaning defined in Landfill Definitions;

'annual period' means the inclusive period from 1 July until 30 June in the following year;

'AS/NZS 2031' means the Australian Standard AS/NZS 2031 *Selection of containers and preservation of water samples for microbiological analysis;*

'AS/NZS 5667.1' means the Australian Standard AS/NZS 5667.1 *Water Quality – Sampling – Guidance of the Design of sampling programs, sampling techniques and the preservation and handling of samples;*

'AS/NZS 5667.10' means the Australian Standard AS/NZS 5667.10 *Water Quality – Sampling – Guidance on sampling of waste waters;*

'AS/NZS 5667.11' means the Australian Standard AS/NZS 5667.11 *Water Quality – Sampling – Guidance on sampling of groundwaters;*

'AS/NZS 2031' means the Australian Standard AS/NZ 2031:2001 *Selection of containers and preservation of water samples for microbiological analysis;*

'averaging period' means the time over which a monitoring result is obtained;

'CEO' means Chief Executive Officer of the Department of Environment Regulation;

'CEO' for the purpose of correspondence means;
Chief Executive Officer
Department Division 3 Part V of the *Environmental Protection Act 1986*
Locked Bag 33 Cloisters Square
PERTH WA 6850
Email: info@der.wa.gov.au;

'Clean Fill' has the meaning defined in Landfill Definitions;

'Compliance Report' means a report in a format approved by the CEO as presented by the Licensee or as specified by the CEO from time to time and published on the Department's website;

'controlled waste' has the definition in *Environmental Protection (Controlled Waste) Regulations 2004*;

'Department' means the department established under section 53 of the Public Sector Management Act and designated as responsible for the administration of Division 3 Part V of the *Environmental Protection Act 1986*;

'freeboard' means the distance between the maximum water surface elevations and the top of retaining banks or structures at their lowest point;

'Inert Waste Type 1' has the meaning defined in Landfill Definitions;

'Inert Waste Type 2' has the meaning defined in Landfill Definitions;

'Landfill Definitions' means the document titled "Landfill Waste Classification and Waste Definitions 1996" published by the Chief Executive Officer of the Department of Environment as amended from time to time;

'Licence' means this Licence numbered L7851/2002/6 and issued under the Act;

'Licensee' means the person or organisation named as Licensee on page 1 of the Licence;

'mbgl' means metres below ground level;

'NATA' means the National Association of Testing Authorities, Australia;

'NATA accredited' means in relation to the analysis of a sample that the laboratory is NATA accredited for the specified analysis at the time of the analysis;

'normal operating conditions' means any operation of a particular process (including abatement equipment) excluding start-up, shut-down and upset conditions, in relation to stack sampling or monitoring;

'**NTU'** means nephelometric turbidity units;

'Putrescible' has the meaning defined in Landfill Waste Classification and Waste Definitions 1996 (As amended December 2009), published by the CEO and as amended from time to time;

'Premises' means the area defined in the Premises Map in Schedule 1 and listed as the Premises address on page 1 of the Licence;

'quarterly' means the 4 inclusive periods from 1 April to 30 June, 1 July to 30 September, 1 October to 31 December and in the following year, 1 January to 31 March;

'rehabilitation' means the completion of the engineering of a landfill cell and includes capping and/or final cover;

'Schedule 1' means Schedule 1 of this Licence unless otherwise stated;

'Schedule 2' means Schedule 2 of this Licence unless otherwise stated;

'Special Waste Type 1' has the meaning defined in Landfill Definitions;

'spot sample' means a discrete sample representative at the time and place at which the sample is taken;

'tipping area' means the area of the landfill in which waste other than cover material is being deposited;

'µS/cm' means microsiemens per centimetre; and

'Waste Code' means the Waste Code assigned to a type of controlled waste for purposes of waste tracking and reporting as specified in the Department of Environment Regulation "Controlled Waste Category List" (July 2014), as amended from time to time.

1.1.3 Any reference to an Australian or other standard in the Licence means the relevant parts of the standard in force from time to time during the term of this Licence.

1.1.4 Any reference to a guideline or code of practice in the Licence means the version of that guideline or code of practice in force from time to time, and shall include any amendments or replacements to that guideline or code of practice made during the term of this Licence.

1.2 Premises operation

1.2.1 The Licensee shall record and investigate the exceedance of any descriptive or numerical limit in this section.

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	5 000 tonnes/year	None specified
Inert Waste Type 2		Tyres, rubber and plastic only
Putrescible Waste	3 000 tonnes/year	None specified
Clean Fill		None specified
Sewage	480 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.*

1.2.3 The Licensee shall ensure that where waste does not meet the waste acceptance criteria set out in condition 1.2.1 it is removed from the Premises, where that is not possible, stored in a segregated storage area or container and removed to an appropriately authorised facility as soon as practicable.

1.2.4 The Licensee shall ensure that wastes accepted onto the landfills, Rubber / Tyre Dump and sewage treatment plants are only subjected to the process(es) set out in Table 1.2.2 and in accordance with any process limits described in that Table.

Table 1.2.2: Waste processing

Waste type(s)	Process	Process limits [1,2]
All	Disposal of waste by landfilling	Shall only take place within the areas shown in Schedule 1. No waste shall be temporarily stored or landfilled within 35 metres from the boundary of the premises. The separation distance between the base of the landfill and the highest groundwater level shall not be less than 2m.
Clean Fill	Receipt, handling and disposal by landfilling	None specified
Inert Waste Type1		
Inert Waste Type 2 – Tyres[1]	Receipt, handling, storage prior to disposal	To be stored in piles of up to 100 units with a 6m separation distance between piles.

	by landfilling	Tyres/rubber shall only be landfilled in overburden storage areas located within the prescribed premises boundary shown in Schedule 1
Putrescible Waste	Receipt, handling, storage prior to disposal by landfilling	Shall only be placed in the Putrescible Landfill sites shown in Schedule 1.
Sewage	Biological, physical and chemical treatment	None specified
Sewage sludge	Drying and storage	None specified

Note 1: Requirements for landfilling tyres are set out in Part 6 of the *Environmental Protection Regulations1987.*
Note 2: Additional requirements for the acceptance and landfilling of controlled waste (including asbestos and tyres) are set out in the *Environmental Protection (Controlled Waste) Regulations 2004.*

1.2.5 The Licensee shall manage the landfilling activities to ensure:
(a) waste is levelled and compacted as soon as practicable after it is discharged;
(b) waste is placed and compacted to ensure all faces are stable and capable of retaining rehabilitation material; and
(c) rehabilitation of a cell or phase takes place within 6 months after disposal in that cell or phase has been completed.

1.2.6 The Licensee shall ensure that cover is applied and maintained on landfilled wastes in accordance with Table 1.2.3 and that sufficient stockpiles of cover are maintained on site at all times.

Table 1.2.3: Cover requirements [1]

Waste Type	Material	Depth	Timescales
Inert Waste type 1	N/A	N/A	No cover required
Inert Waste Type 2	Type 1 Inert waste, clean fill or soil	100mm	As soon as practicable following the achievement of final process limits (as defined in Table 1.2.2) in the area(s) in which tyres are deposited
Putrescible Waste		150mm	As soon as practicable and not later than weekly
		1 000mm	Within 3 months of achieving final waste contours

Note 1: Additional requirements for the covering of tyres are set out in Part 6 of the *Environmental Protection Regulations 1987*.

1.2.7 The Licensee shall prevent unauthorised access to the landfill(s).

1.2.8 The Licensee shall ensure that wind-blown waste is contained within the boundary of the Premises and that wind-blown waste is returned to the tipping area on at least a monthly basis.

1.2.9 The Licensee shall manage the wastewater treatment facilities, wastewater treatment evaporation ponds and irrigation areas such that:
(a) stormwater runoff resulting from site drainage shall be prevented from entering the wastewater treatment ponds or causing erosion of the outer pond embankments;
(b) overtopping of the ponds shall not occur, except as a result of a storm event of 10 years average recurrence interval and 72 hours duration;
(c) vegetation and debris (emergent or otherwise) is prevented from growing or accumulating in the pond wastewaters or on the inner pond embankments;
(d) no irrigation generated run-off, spray drift or discharge occurs beyond the boundary of the defined irrigation area(s).

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	65,000,000 tonnes of ore per annual period
6	Mine dewatering	27,541,000 tonnes per annum total, being: • 5,840,000 tonnes per annual period reinjected • 2,081,000 tonnes per annual period discharged to the Western Sediment Basin • 8,670,000 tonnes per annual period discharged to the Central Sediment Basin • 10,950,000 tonnes per annual period discharged to the Packsaddle Infiltration Ponds
73	Bulk storage of chemicals, etc	3,500 cubic metres in aggregate
85B	Water desalinisation plant	0.9125 gigalitres per annual period

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

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
Oily Water Separator Treated Wastewater Ponds	Treated wastewater from HV Washdown bays and Workshops oily water separators	• 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 • high water level alarm installed and maintained on each pond •

1.2.12 The Licensee shall construct the Packsaddle Infiltration Ponds 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 L7851/2002/6 – amendment*, Chris Hopkins, BHP Billiton Pty Ltd	All, including Attachments	19 May 2016, 08:17
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

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
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; • 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

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.

1.2.15 The Licensee shall operate the Mining Area C Water Treatment Plant in accordance with the conditions of this Licence, following submission of the commissioning report required under condition 4.2.3.

2 Emissions

2.1 General

2.1.1 The Licensee shall record and investigate the exceedance of any descriptive or numerical limit specified in any part of section 2 of this Licence.

2.2 Point source emissions to groundwater

2.2.1 The Licensee shall ensure that where waste is emitted to groundwater from the emission points in Table 2.2.1 and identified on the map of emission points in Schedule 1 it is done so in accordance with the conditions of this Licence.

Table 2.2.1: Emission points to groundwater

Emission point reference and location on Map of emission points	Description	Source including abatement
HGA0001P HGA0002P HGA0040P HGA0041P	Direct injection below ground	Water from dewatering associated with the Managed Aquifer Recharge Trial

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

2.2.3 The Licensee shall take the specified management action in the case of an event in Table 2.2.3.

Table 2.2.3: Management actions

Emission point reference	Event/ action reference	Event	Management action
HGA0001P HGA0002P HGA0040P HGA0041P	EA1	Any time the monitoring data indicates an exceedance of the limit specified in condition 2.2.2	The Licensee shall cease direct injection at the emission point listed in Table 2.2.1 where the limit exceedance occurred

2.3 Emissions to land

2.3.1 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 Discharge of treated	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 ponds during extreme rainfall events	Treated wastewater from HV Washdown bays and Workshops oily water separators
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

2.3.2 The Licensee shall not cause or allow emissions to land greater than the limits listed in Table 2.3.2.

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

3 Monitoring

3.1 General monitoring

3.1.1 The Licensee shall ensure that:
(a) all water samples are collected and preserved in accordance with AS/NZS 5667.1;
(b) all wastewater sampling is conducted in accordance with AS/NZS 5667.10;
(c) all groundwater sampling is conducted in accordance with AS/NZS 5667.11;
(d) all microbiological samples are collected and preserved in accordance with AS/NZS 2031; and
(e) all laboratory samples are submitted to and tested by a laboratory with current NATA accreditation for the parameters being measured unless indicated otherwise in the relevant table.

3.1.2 The Licensee shall ensure that:
(a) monthly monitoring is undertaken at least 15 days apart; and
(b) quarterly monitoring is undertaken at least 45 days apart.

3.1.3 The Licensee shall ensure that all monitoring equipment used on the Premises to comply with the conditions of this Licence is calibrated in accordance with the manufacturer's specifications.

3.1.4 The Licensee shall, where the requirements for calibration cannot be practicably met, or a discrepancy exists in the interpretation of the requirements, bring these issues to the attention of the CEO accompanied with a report comprising details of any modifications to the methods.

3.2 Monitoring of point source emissions to groundwater

3.2.1 The Licensee shall undertake the monitoring in Table 3.2.1 according to the specifications in that table.

Table 3.2.1: Monitoring of point source emissions to groundwater

Emission point reference[1]	Parameter	Units	Averaging period	Frequency
HGA0001P HGA0002P HGA0040P HGA0041P	Cumulative Volume	m^3/day	Spot Sample	Monthly
	Electrical Conductivity[2]	µS/cm		
	pH[2]	pH Units		
	Groundwater level	mbgl		
	Aluminium	mg/L	Spot sample	Quarterly
	Arsenic			
	Barium			
	Boron			
	Calcium Carbonate			
	Cadmium			
	Calcium			
	Chloride			
	Chromium			
	Copper			
	Fluoride			
	Iron			
	Lead			
	Magnesium			
	Manganese			
	Mercury			

	Molybdenum			
	Nickel			
	Nitrate			
	Potassium			
	Selenium			
	Sodium			
	Sulfate			
	Total Dissolved Solids			
	Zinc			

Note 1: pH, electrical conductivity and hydrochemistry samples are only required to be taken from one emission point during each quarterly monitoring event and only emission points that are active in the monitoring period are required to be sampled.
Note 2: In-field non-NATA accredited analysis permitted.

3.3 Monitoring of emissions to land

3.3.1 The Licensee shall undertake the monitoring in Table 3.3.1 according to the specifications in that table.

Table 3.3.1: Monitoring of emissions to land

Emission point reference	Monitoring point location	Parameter	Units	Averaging Period	Frequency
L1 – L3	Flow meter to irrigation area or evaporation / infiltration pond	Volumetric flow rate (cumulative)	m^3/day	Monthly	Continuous
	Final storage tank - prior to discharge to emission points	pH[1]	pH units	Spot sample	Quarterly
		5-Day Biochemical Oxygen Demand	mg/L		
		Total Suspended Solids			
		Total Nitrogen			
		Total Phosphorus			
		E.coli	cfu/100mL		
L4	Discharge overflow point from evaporation pond	Total Recoverable Hydrocarbons	mg/L	Spot sample	Quarterly while discharging
L5 and L6	L5/L6 sample point				Quarterly
L7	Flow meter to irrigation area	Volumetric flow rate (cumulative)	m^3/day	Quarterly	Continuous
	Final storage tank – prior to discharge emission point	Total Dissolved Solids	mg/L	Spot sample	Quarterly
L8 to L12	At the trunk line prior to the infiltration/sediment basin	Volumetric flow rate (cumulative)	m^3/day	Quarterly	Continuous
		pH[1]		Spot sample	Quarterly
		Electrical Conductivity[1]	µS/cm		
		Aluminium	mg/L		
		Arsenic	mg/L		

		Barium	mg/L		
		Boron	mg/L		
		Calcium Carbonate	mg/L		
		Cadmium	mg/L		
		Calcium	mg/L		
		Chloride	mg/L		
		Chromium	mg/L		
		Copper	mg/L		
		Fluoride	mg/L		
		Iron	mg/L		
		Lead	mg/L		
		Magnesium	mg/L		
		Manganese	mg/L		
		Mercury	mg/L		
		Molybdenum	mg/L		
		Nickel	mg/L		
		Nitrate	mg/L		
		Potassium	mg/L		
		Selenium	mg/L		
		Sodium	mg/L		
		Sulfate	mg/L		
		Total Dissolved Solids	mg/L		
		Zinc	mg/L		

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

3.4 Monitoring of inputs and outputs

3.4.1 The Licensee shall undertake the monitoring in Table 3.4.1 according to the specifications in that table.

Table 3.4.1: Monitoring of inputs and outputs

Input/output	Parameter	Units	Averaging period	Frequency
Waste Inputs	Inert Waste Type 1 Inert Waste Type 2 Putrescible Waste Clean Fill	tonnes	N/A	Annual records of total waste arriving at each waste management facility depicted in Schedule 1

3.5 Ambient environmental quality monitoring

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 (Mine dewater reinjection)	Total Dissolved Solids	≤750mg/L	Spot Sample	Quarterly
HPSA1633 (Packsaddle Infiltration Ponds)	Standing water level	≤ 8 metres below ground level	Spot sample	Monthly

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
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.

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	Groundwater level	mbgl	Daily
	Visual assessment of surrounding vegetation (GWB0025M, HGA0003P, GAOB07RM, HGA0066M)	-	Vegetation monitoring will continue for two weeks after water levels have receded to below target level
	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: o Tree moisture; o Foliage cover; o New growth; and o Flowering status.		

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

4 Information

4.1 Records

4.1.1 All information and records required by the Licence shall:
(a) be legible;
(b) if amended, be amended in such a way that the original and subsequent amendments remain legible or are capable of retrieval;
(c) except for records listed in 4.1.1(d) be retained for at least 6 years from the date the records were made or until the expiry of the Licence or any subsequent licence; and
(d) for those following records, be retained until the expiry of the Licence and any subsequent licence:
(i) off-site environmental effects; or
(ii) matters which affect the condition of the land or waters.

4.1.2 The Licensee must submit a Compliance Report indicating the extent to which the Licensee has complied with the conditions in this Licence for the Annual Period.

4.1.3 The Licensee shall implement a complaints management system that as a minimum records the number and details of complaints received concerning the environmental impact of the activities undertaken at the Premises and any action taken in response to the complaint.

4.2 Reporting

4.2.1 The Licensee shall submit to the CEO an Annual Environmental Report by the 1 October each year. The report shall contain the information listed in Table 4.2.1 in the format or form specified in that table.

Table 4.2.1: Annual Environmental Report		
Condition or table (if relevant)	**Parameter**	**Format or form[1]**
-	Summary of any failure or malfunction of any pollution control equipment and any environmental incidents that have occurred during the annual period and any action taken	None specified
-	Summary of design capacity and throughputs for each prescribed activity on the premises	None specified

Tables 3.5.2	Groundwater level exceedances	None specified
Tables 1.2.1, 1.2.4, 2.2.2, 2.3.2, 3.5.1	Limit exceedances	None specified
3.2.1	Cumulative volume, standing water level, pH, electrical conductivity, physicochemical parameters as listed in Table 3.2.1 and a comparison of results against established trigger values. Details of investigations conducted, including outcomes, environmental impacts and remedial actions, in relation to trigger exceedances and a discussion of any trends identified	None specified
3.3.1	L1-L3 – Monitoring results and comparison against the National Water Quality Management Strategy *Australian Guidelines for Sewerage Systems – Effluent Management* (Agriculture and Resource Management Council of Australia and New Zealand, Australian and New Zealand Environment and Conservation Council, 1997)	None specified
	L4-L7 – Monitoring results	
	L8-L12 – Monitoring results and comparison of results against established trigger values and previous monitoring results. Details of investigations conducted, including outcomes, environmental impacts and remedial actions, in relation to trigger exceedances and a discussion of any trends identified.	
3.4.1	Inputs and outputs of waste on the premises	None specified
3.5.2	Ambient groundwater monitoring results and a comparison of results against established trigger values. Details of investigations conducted, including outcomes, environmental impacts and remedial actions, in relation to trigger exceedances and a discussion of any trends identified	None specified
4.1.2	Compliance	None specified
4.1.3	Complaints summary	None specified

Note 1: Forms are in Schedule 2

4.2.2 The Licensee shall ensure that the Annual Environmental Report also contains an assessment of the information contained within the report against previous monitoring results and Licence limits and/or triggers.

4.2.3 The Licensee shall submit the information in Table 4.2.2 to the CEO according to the specifications in that table.

Table 4.2.2: 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	Not applicable	Within one month of the completion of	The report shall include: (a) a summary of monitoring results;

	Water Treatment Plant		commissioning	(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.
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

4.3 Notification

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

Table 4.3.1: 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	Four weeks prior to the commencement of commissioning.	None specified

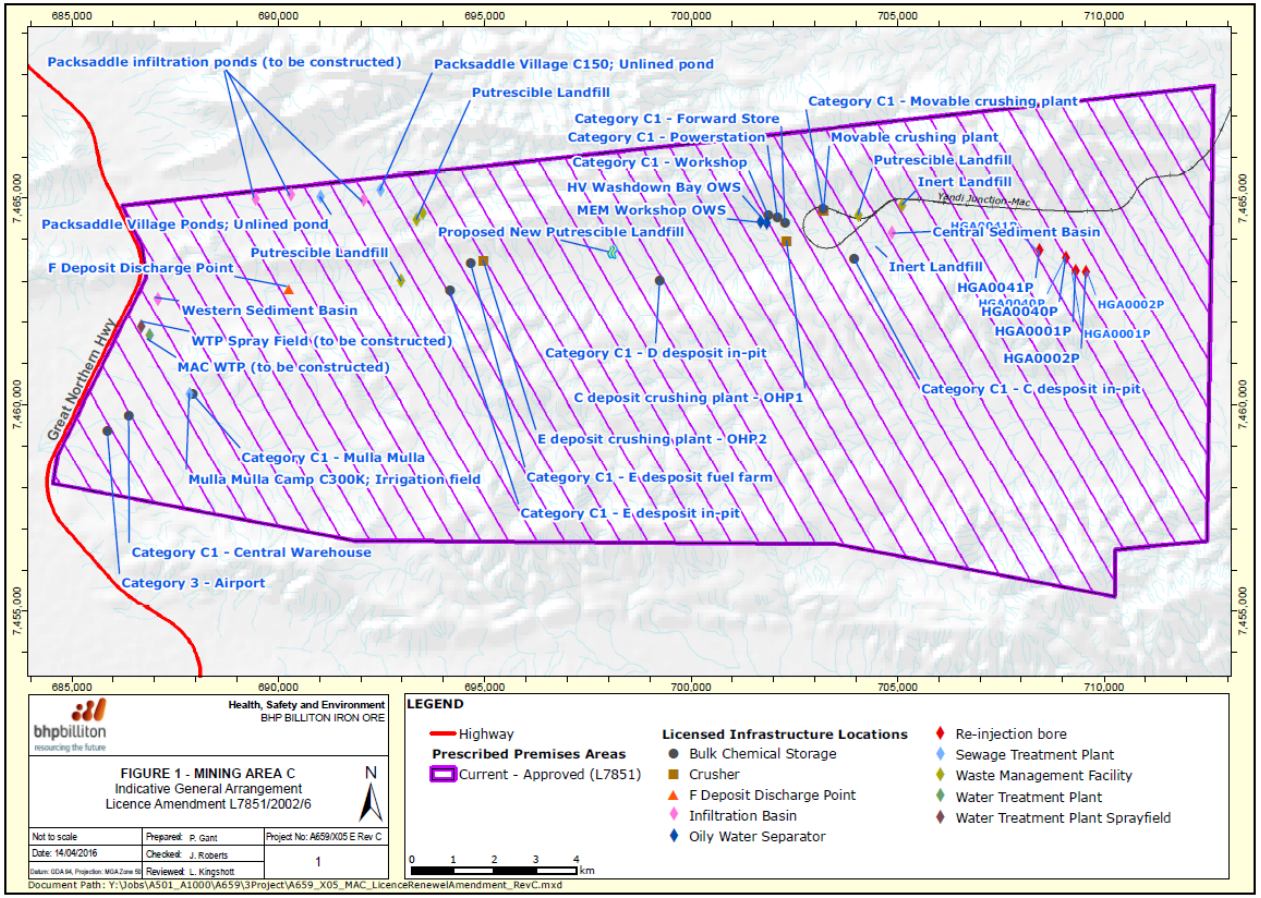
	be managed; (f) start up and shut down procedures; and (g) reporting proposals including accidents, malfunctions and reporting against the commissioning plan. Commissioning shall be carried out in accordance with the commissioning plan.		
1.2.12 1.2.13 1.2.14	The Licensee shall submit a compliance document to the CEO, following construction of each of the Packsaddle Infiltration Ponds and Mining Area C Water Treatment Plant and prior to commissioning of the same. The compliance document shall: a) certify that the works were constructed in accordance with the documents *Mining Area C L7851/2002/6 – Licence Amendment Supporting Documentation* (BHP Billiton, April 2016); 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
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

Schedule 1: Maps

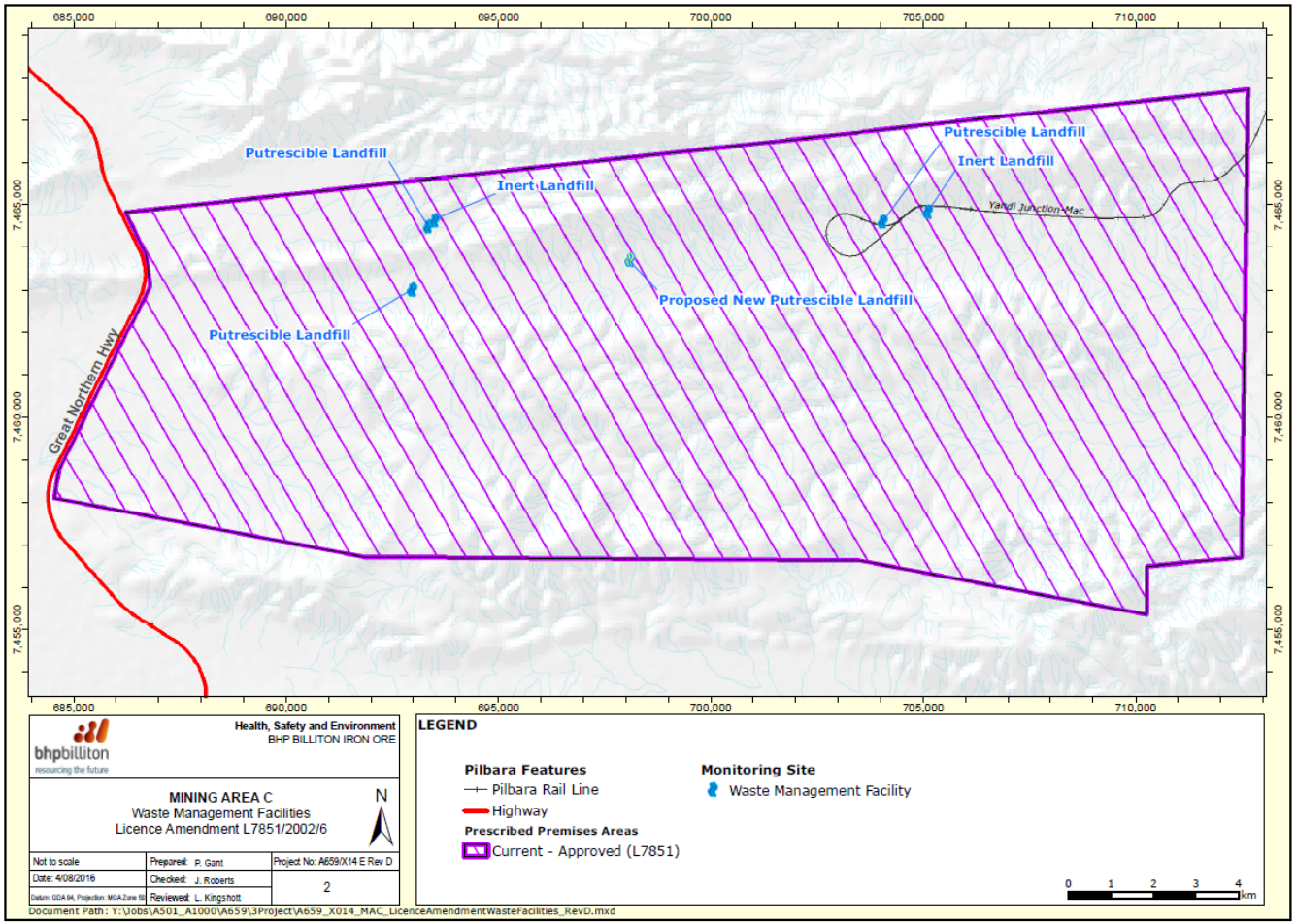
Premises map

The Premises is shown in the map below. The purple line depicts the Premises boundary.



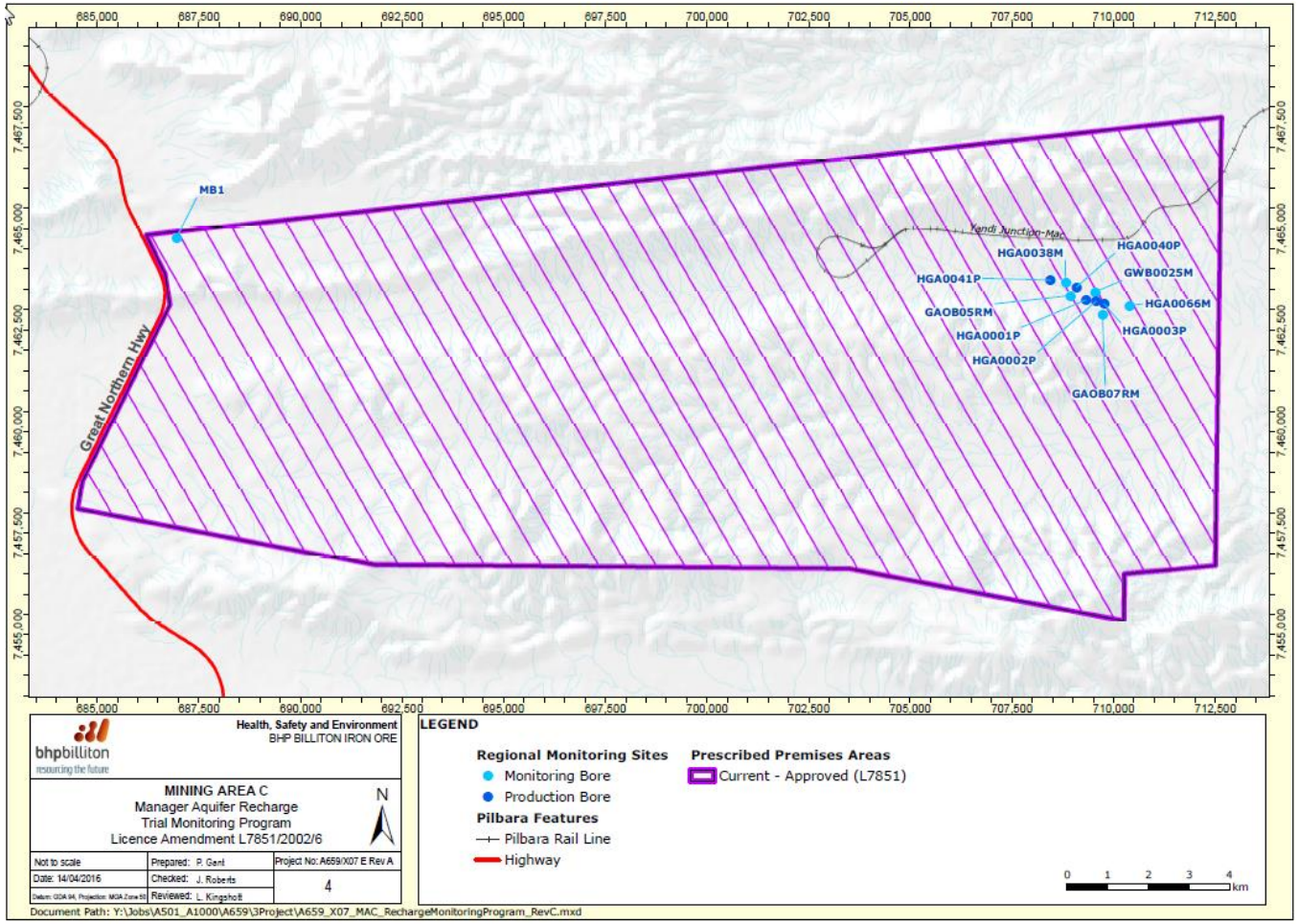
Map of emission points and monitoring locations

The locations of the emission points (waste processing locations) defined in Table 1.2.2 are shown below.

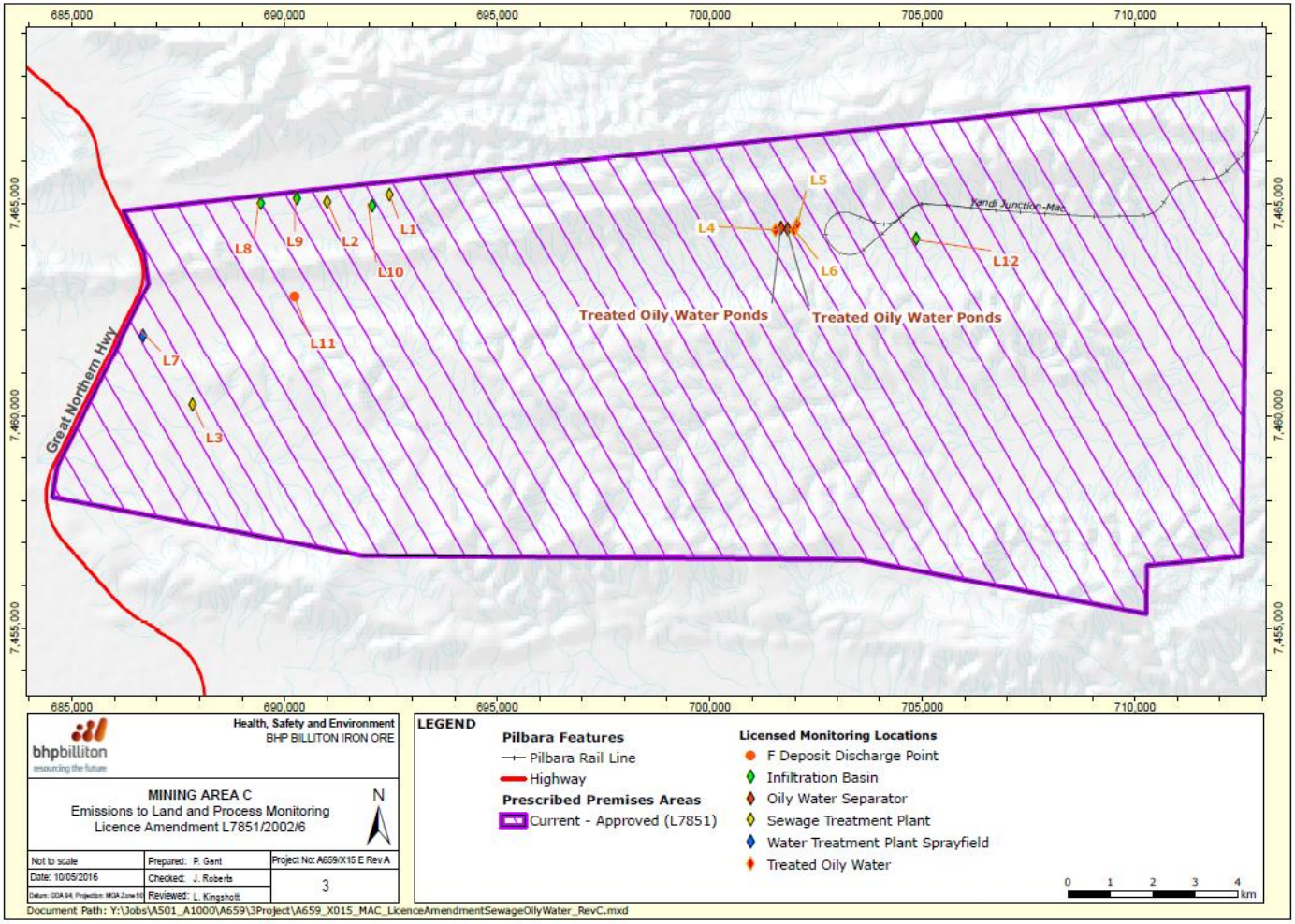


Map of emission points and monitoring locations

The locations of the emission points defined in Table 2.2.1 and the monitoring points defined in Tables 3.2.1, 3.5.1, 3.5.2, and 3.5.3 are shown below.



The locations of the containment infrastructure defined in Table 1.2.5, emission points defined in Table 2.3.1 and the monitoring points defined in Table 3.3.1 are shown below.



Schedule 2: Reporting & notification forms

These forms are provided for the proponent to report monitoring and other data required by the Licence. They can be requested in an electronic format.

Licence: L7851/2002/6 Licensee: BHP Billiton Iron Ore Pty Ltd
Form: N1 Date of breach:

Notification of detection of the breach of a limit

These pages outline the information that the operator must provide.
Units of measurement used in information supplied under Part A and B requirements shall be appropriate to the circumstances of the emission. Where appropriate, a comparison should be made of actual emissions and authorised emission limits.

Part A

Licence Number	
Name of operator	
Location of Premises	
Time and date of the detection	

Notification requirements for the breach of a limit	
Emission point reference/ source	
Parameter(s)	
Limit	
Measured value	
Date and time of monitoring	
Measures taken, or intended to be taken, to stop the emission	

Part B

Any more accurate information on the matters for notification under Part A.	
Measures taken, or intended to be taken, to prevent a recurrence of the incident.	
Measures taken, or intended to be taken, to rectify, limit or prevent any pollution of the environment which has been or may be caused by the emission.	
The dates of any previous N1 notifications for the Premises in the preceding 24 months.	

Name	
Post	
Signature on behalf of BHP Billiton Iron Ore Pty Ltd	
Date	

Government of Western Australia
Department of Environment Regulation

Decision Document

Environmental Protection Act 1986, Part V

Proponent: BHP Billiton Iron Ore Pty Ltd

Licence: L7851/2002/6

Registered office:	Level 1, City Square Brookfield Place 125 -137 St Georges Terrace PERTH WA 6000
ACN:	008 700 981
Premises address:	Mining Area C Project Mining Tenement ML281SA NEWMAN WA 6753
Issue date:	Thursday, 13 November 2014
Commencement date:	Monday, 17 November 2014
Expiry date:	Tuesday, 16 November 2027

Decision

Based on the assessment detailed in this document the Department of Environment Regulation (DER), has decided to issue an amended Licence. DER considers that in reaching this decision, it has taken into account all relevant considerations and that the Licence and its conditions will ensure that an appropriate level of environmental protection is provided.

Decision Document prepared by:	Haley Brunel Licensing Officer
Decision Document authorised by:	Alana Kidd Manager Licensing (Resource Industries)

Contents

1 Purpose of this Document

This decision document explains how DER has assessed and determined the application and provides a record of DER's decision-making process and how relevant factors have been taken into account. Stakeholders should note that this document is limited to DER's assessment and decision making under Part V of the *Environmental Protection Act 1986.* Other approvals may be required for the proposal, and it is the proponent's responsibility to ensure they have all relevant approvals for their Premises.

2 Administrative summary

Administrative details		
Application type	Works Approval ☐ New Licence ☐ Licence amendment ☒ Works Approval amendment ☐	
Activities that cause the premises to become prescribed premises	**Category number(s)**	**Assessed design capacity**
	5	65,000,000 tonnes per annum
	6	27,541,000 tonnes per annum
	54	480 cubic metres per day
	63	5,000 tonnes per annum
	73	3,500 cubic metres in aggregate
	85B	0.9125 gigalitres per annum
	89	3,000 tonnes per annum
Application verified Application fee paid	Date: N/A Date: N/A	
Works Approval has been complied with Compliance Certificate received	Yes☐ No☐ N/A☒ Yes☐ No☐ N/A☒	
Commercial-in-confidence claim	Yes☐ No☒	
Commercial-in-confidence claim outcome	N/A	

Is the proposal a Major Resource Project?	Yes☒ No☐	
Was the proposal referred to the Environmental Protection Authority (EPA) under Part IV of the *Environmental Protection Act 1986*?	Yes☒ No☐	Referral decision No: 1108 Managed under Part V ☐ Assessed under Part IV ☒
Is the proposal subject to Ministerial Conditions?	Yes☒ No☐	Ministerial statement No: 491 EPA Report No: 913
Does the proposal involve a discharge of waste into a designated area (as defined in section 57 of the *Environmental Protection Act 1986*)?	Yes☒ No☐ Department of Water consulted Yes ☒ No ☐	
Is the Premises within an Environmental Protection Policy (EPP) Area Yes☐ No☒ If Yes include details of which EPP(s) here.		
Is the Premises subject to any EPP requirements? Yes☐ No☒ If Yes, include details here, eg Site is subject to SO_2 requirements of Kwinana EPP.		

3 Executive summary of proposal and assessment

BHP Billiton Iron Ore Pty Ltd (BHPBIO) operates Mining Area C (MAC) to produce iron ore for export via Port Hedland. MAC is located in the Pilbara region of Western Australia, within mining tenement ML281SA. The nearest township is Newman, which is approximately 120 kilometres (km) south-west of MAC. Rio Tinto Iron Ore's Hope Downs operation, Weeli Wolli Springs and the Coondewanna Flats are located 10km east, 20km east and 20km south-west respectively of the MAC operation.

Conventional open cut mining methods are used at MAC to extract ore for processing through a two stage crushing and screening system to produce lump and fines products. Following blending into stockpiles, the ore is loaded onto trains and railed to Port Hedland for export.

BHPBIO has applied to amend the MAC operating licence L7851/2002/6. Under this amendment, BHPBIO is seeking approval to construct and operate three infiltration ponds to dispose of excess mine dewater; and increase the rate of mine dewater discharge from 5.8 gigaltires per annum to 27.54 gigalitres per annum. BHPBIO is also seeking approval for the construction and operation of a Water Treatment Plant (WTP) to produce potable water for the site's accommodation villages. Reject water from the WTP will be disposed of to a 7.4 hectare (ha) irrigation area.

At the time of this amendment, existing sedimentation basins used as a disposal option for excess mine dewater are also being included in the Licence as specified emission points to land.

During this amendment, DER has assessed the emissions and discharges associated with construction and operation of the Packsaddle Infiltration Ponds and Water Treatment Plant; and the operation of the existing sediment ponds. The inclusion of new conditions and changes to existing conditions have been justified in Section 4.

4 Decision table

All applications are assessed in line with the *Environmental Protection Act 1986*, the *Environmental Protection Regulations 1987* and DER's Operational Procedure on Assessing Emissions and Discharges from Prescribed Premises. Where other references have been used in making the decision they are detailed in the decision document.

DECISION TABLE			
Works Approval / Licence section	**Condition number W = Works Approval L= Licence**	**Justification (including risk description & decision methodology where relevant)**	**Reference documents**
General conditions	Definitions Conditions 1.1.5, 1.1.6 and 1.1.7 (removed)	In accordance with recent administrative changes implemented within the Department, the definition of CEO has been updated; and definitions for 'Compliance Report' and 'Department' included in the Licence to reflect changes to the reporting requirements for annual compliance reports. Guidance Statement *Setting conditions* (DER, October 2015) states that conditions imposed on Licences must be valid, enforceable and/or risk based. Noting the requirements of this Guidance Statement, conditions 1.1.5, 1.1.6 and 1.1.7 have been removed from the Licence, explained further below. Previous condition 1.1.5 specified: *"Nothing in the Licence shall be taken to authorise any emission that is not mentioned in the Licence, where the emission amounts to:* *(a) pollution;* *(b) unreasonable emission;* *(c) discharge of waste in circumstances likely to cause pollution; or* *(d) being contrary to any written law."* This condition is not valid, enforceable or risk based as it is an explanatory statement that attempts to provide clarification of the operation of the Licence; and has therefore been removed from the Licence. Previous condition 1.1.6 specified:	General provisions of the *Environmental Protection Act 1986* Guidance Statement *Setting Conditions* (DER, October 2015)

DECISION TABLE			
Works Approval / Licence section	**Condition number W = Works Approval L= Licence**	**Justification (including risk description & decision methodology where relevant)**	**Reference documents**
		"The Licensee shall operate and maintain all pollution control and monitoring equipment to the manufacturer's specifications or any relevant and effective internal management system." This condition is not enforceable as it is not clear or certain in that the pollution control equipment and monitoring equipment required to be operated and maintained is not specified. The requirements to achieve compliance are not clear. Previous condition 1.1.7 specified: *"The Licensee shall immediately recover, or remove and dispose of spills of environmentally hazardous materials outside an engineered containment system."* This condition is not valid as it inconsistently regulates activities below prescribed category thresholds. DER has assessed the risk associated with spills of environmentally hazardous materials to determine if specific regulatory controls are required on the Licence. <u>Emission description</u> *Emission:* Spills of environmentally hazardous materials, including hydrocarbons, detergents and glues/paints, outside of engineered containment systems. *Impact:* Soil contamination, impacts to groundwater and surface water quality, ecosystem disruption, depending on nature and volume of material released to the environment. *Controls:* Operational personnel at MAC are trained in spill management and spill kits are located at various points around the premises. These	

DECISION TABLE			
Works Approval / Licence section	**Condition number W = Works Approval L= Licence**	**Justification (including risk description & decision methodology where relevant)**	**Reference documents**
		management measures were observed and confirmed during the DER compliance inspection undertaken on 7 May 2015. Prior to the commencement of mining, groundwater at MAC was approximately 75 metres below ground level. Creek systems in the project area are ephemeral, flowing after rainfall events. Groundwater at this depth and ephemeral creek systems are unlikely to be impacted by spills of environmentally hazardous materials outside of containment areas, if attended to quickly, in accordance with site procedures. It is also the responsibility of the Licensee to ensure compliance with other legislative requirements, including Australian Standard 1940-2004 – The storage and handling of flammable and combustible liquids, which specifies that clean up action needs to be initiated immediately following a leak or spill. Risk Assessment *Consequence:* Minor *Likelihood:* Rare *Risk rating:* Low Regulatory Controls: The risk associated with spills outside of engineered containment systems is low, therefore no further regulatory controls are being applied to the Licence at this time. The general provisions of the *Environmental Protection Act 1986* with respect to the causing of pollution and environmental harm apply, as does subsidiary legislation including the *Environmental Protection (Unauthorised Discharges) Regulations 2004*. The site will also be subject to DER compliance inspections, during which	

DECISION TABLE			
Works Approval / Licence section	**Condition number W = Works Approval L= Licence**	**Justification (including risk description & decision methodology where relevant)**	**Reference documents**
		procedures and measures to manage spills and leaks will be inspected. Residual Risk: *Consequence:* Minor *Likelihood:* Rare *Risk rating:* Low	
Premises operation	L1.2.2	The Licensee has indicated that the existing putrescible landfill is nearly at capacity and is seeking to include a new putrescible landfill location on the Licence. There is to be no increase to the design capacity of 3,000 tonnes of waste per annual period, and the relevant waste acceptance specifications and process limits on the Licence will remain unchanged. The land system, soil type and aquifer for the existing and proposed landfill locations are the same. However, depth to groundwater is approximately 80 metres at the new location, as opposed to 100 m at the existing landfill site. The depth to groundwater at the new location is still sufficient and impacts from leachate accessing groundwater are unlikely. The risk profile for the new landfill is unchanged; therefore no further regulatory controls are required to be applied to the Licence. The maps in Schedule 1 have been updated to show the location of the new putrescible landfill.	Application supporting documentation *Landfill Waste Classification and Waste Definitions 1996* Guidance Statement *Licensing and works approval process* (DER, September 2015) *Environmental Protection (Unauthorised Discharges) Regulations 2004* General provisions of the *Environmental Protection Act 1986*
	L1.2.4	The waste acceptance specifications in Table 1.2.1 have been updated to allow the outflow from the Biomax WWTPs to be measured. Inflow to the Packsaddle WWTP pond system will continue to be measured to determine effluent inputs to this facility.	
	L1.2.12 and L1.2.13	The tyre disposal requirements specified in Table 1.2.2 have been amended to remove duplication with Part 6 of the *Environmental Protection Regulations 1987*.	

DECISION TABLE			
Works Approval / Licence section	**Condition number W = Works Approval L= Licence**	**Justification (including risk description & decision methodology where relevant)**	**Reference documents**
		Construction and Operation - Packsaddle Infiltration Ponds and Mining Area C WTP DER's assessment and decision making with respect to the construction and operation of the Packsaddle Infiltration Ponds; and the Mining Area C WTP and irrigation area is detailed in Appendix A. Condition 1.2.12 and 1.2.13 has been included in the Licence and requires the construction of the Packsaddle Infiltration Ponds and Mining Area C Water Treatment Plant in accordance with the supporting documentation submitted with the Licence amendment application. Condition 1.2.14 and 1.2.15 allows the operation of these facilities in accordance with the conditions of the Licence following submission of compliance documentation for construction of the works.	
Emissions to land including monitoring	L2.3.1 and L3.3.1	**Operation – Packsaddle Infiltration Ponds** The Licensee is proposing to operate three infiltration ponds to dispose of excess mine dewater through Managed Aquifer Recharge. DER's assessment and decision making with respect to this emission is detailed in Appendix A (Premises operation). **Operation – Western and Central Sediment Basins** The Licensee currently disposes of excess mine dewater to the Western and Central Sediment Basins, which are being included on the Licence as emission points to land. DER's assessment and decision making with respect to the operation of these infiltration basins is detailed in Appendix B.	General provisions of the *Environmental Protection Act 1986* *Environmental Protection (Unauthorised Discharges) Regulations 2004* Guidance Statement *Licensing and works approval process* (DER, September 2015)
Fugitive emissions	N/A	**Construction and operation** Emission Description	General provisions of the *Environmental Protection*

DECISION TABLE			
Works Approval / Licence section	**Condition number W = Works Approval L= Licence**	**Justification (including risk description & decision methodology where relevant)**	**Reference documents**
		Emission: Fugitive dust and noise emissions from site preparation works, including earthworks and vehicle movement, for the Packsaddle Infiltration Ponds and Mining Area C WTP and irrigation area. There is not expected to be any significant dust or noise emissions during operation of these facilities. *Impact:* Dust emissions can be harmful to human health and the environment. Elevated total suspended particulates can impact ambient environmental quality resulting in amenity impacts and can smother vegetation. Particulate matter that is less than 10 (PM_{10}) or 2.5 ($PM_{2.5}$) micrometres in diameter can be drawn deep into the lungs causing human health impacts. Noise emissions can be a nuisance to nearby residents. *Controls:* The closest receptor to the Mining Area C WTP construction site is the Mulla Mulla Camp, located approximately 1.5 km to the south east. The closest receptor to the Packsaddle Infiltration Ponds construction site is Packsaddle camp, located approximately 1 km east of the closest infiltration basin. During construction there is expected to be a minor increase in dust and noise. Due to the distance of the construction sites to the nearest on-site sensitive receptors and temporary nature of construction works, impacts will be negligible. <u>Risk Assessment</u> *Consequence:* Insignificant *Likelihood:* Possible *Risk Rating:* Low <u>Regulatory Controls:</u> The general provisions of the *Environmental Protection Act 1986* apply. Noise	*Act 1986* *Environmental Protection (Noise) Regulations 1997* Mining Area C Environmental Management Plan (Revision 5, September 2012)

DECISION TABLE			
Works Approval / Licence section	**Condition number W = Works Approval L= Licence**	**Justification (including risk description & decision methodology where relevant)**	**Reference documents**
		emissions are subject to the provisions of the *Environmental Protection (Noise) Regulations 1997.* The Mining Area C Life of Mine Environmental Management Plan (EMP), required under Ministerial Statement (MS) 491, includes provisions relating to the management of dust. Specifically the watering of haul roads, construction areas and unsealed roads, minimising land disturbance where practicable, maintenance of dust suppression equipment and control systems, and informing employees of the importance of minimising ambient dust levels. No further regulatory controls are required to be applied to the Licence as the risk associated with fugitive noise and dust emissions from construction activities and the operation of the facilities has been assessed as low. <u>Residual Risk</u> *Consequence:* Insignificant *Likelihood:* Possible *Risk Rating:* Low	
Ambient quality monitoring	L3.5.1 to L3.5.3	Conditions 3.5.1, 3.5.2 and 3.5.3 have been updated to include monitoring requirements to determine impacts to groundwater and vegetation as a result of the operation of the Packsaddle Infiltration Ponds, which is discussed further in Appendix A.	Application supporting documentation.
Information	L4.2.1 and L4.3.1	Condition 4.2.1 has been updated to include reporting requirements for the monitoring results associated with the discharge of mine dewater to the Packsaddle Infiltration Ponds and Western and Central Sedimentation Basins. The notification requirements specified in condition 4.3.1 have been updated to require the submission of compliance documentation following completion of construction of the Packsaddle Infiltration Ponds and Mining Area C WTP. A	

DECISION TABLE			
Works Approval / Licence section	**Condition number W = Works Approval L= Licence**	**Justification (including risk description & decision methodology where relevant)**	**Reference documents**
		commissioning plan for the Mining Area C WTP is also required under condition 4.3.1. The requirement to submit a commissioning report following the completion of commissioning has been included in the non-annual reporting requirements of the Licence, specified under condition 4.2.2	
Licence duration	N/A	The existing expiry date aligns with the expiry of Mining Tenement ML281SA.	Guidance Statement, Licence duration (DER, November 2014)

5 Advertisement and consultation table

Date	Event	Comments received/Notes	How comments were taken into consideration
9 May 2016	Application referred to Department of Water and Department of Parks and Wildlife	**Department of Parks and Wildlife** provided comments regarding potential impacts to Mulga Woodlands, the proposed groundwater and vegetation monitoring program and Priority flora identified in the indicative infiltration zone.	Comments noted.
20 June 2016	Proponent sent a copy of draft instrument (prior to 21 day consultation period)	**LICENCE** **Licence expiry date** Request that the expiry date remain unchanged, as it currently aligns with the expiry of Mining Tenement ML281SA. **Condition 1.2.12 and Table 1.2.6** - remove reference to Works Approval application form to avoid confusion and correction to condition referenced in note. **Condition 3.5.1 and 3.5.2 –** Correct the limits referenced in Table 3.5.1 and 3.5.2. **DECISION DOCUMENT** • Comment regarding dust and that it is not a key factory for Mining Area C and therefore it is managed	Change implemented. In accordance with recent administrative changes implemented within the department, the reference to Applications form has been removed from the Licence and replaced with specific construction requirements for the infrastructure subject to approval under the amendment. Updated in line with comments. Comment noted

Date	Event	Comments received/Notes	How comments were taken into consideration
		under Part V via existing standard operating procedures.	
21 July 2016	21 day consultation period correspondence sent to Licensee, including draft amended Licence highlighting changes and draft decision document	**LICENCE** **Licence expiry date** Request to retain existing expiry date in order to align with the expiry of Mining Tenement ML281SA (ie. 4 August 2028).	Change implemented.
		Table 1.2.1 – amend waste acceptance specifications for the WWTP's which discharge treated effluent to irrigation areas to require recording of outflow volume as opposed to inflow volume.	Change implemented. Volume of treated wastewater from Biomax systems is to be recorded at the outflow to the irrigation areas, and inflow for the Packsaddle WWTP which is a pond treatment system.
		Table 1.2.6 – amend the construction requirement table to remove specific infrastructure specifications. This will allow for minor modifications without the requirement to apply for a separate Licence amendment.	Change not implemented, however condition has been updated to allow for design variations provided they are: - minor in nature and do not materially change or affect the infrastructure; or - where change 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 the Licence.
		Table 3.2.1 and Table 3.3.1 – change 'chlorine' to 'chloride'.	Change implemented.
		Table 3.3.1 – as opposed to having a flow meter at each infiltration pond, allow flow to be measured from one meter at the trunk line prior to discharge to the infiltration/sediment basins. With respect to	Change implemented to allow flow to be measured from one meter at the trunk line prior to discharge to the infiltration/sediment basins.

Date	Event	Comments received/Notes	How comments were taken into consideration
		the proposed Packsaddle Infiltration Ponds, the Licensee has indicated that the 'high level alarm' system implemented on each pond will ensure water is distributed appropriately. **Table 3.5.1 –** monitoring bore MB1 has been constructed. Replace reference to MB1 with bore reference HPSA1633.	Change implemented.

6 Risk Assessment

Note: This matrix is taken from the DER Corporate Policy Statement No. 07 - Operational Risk Management

Table 1: Emissions Risk Matrix

Likelihood	Consequence				
	Insignificant	Minor	Moderate	Major	Severe
Almost Certain	Moderate	High	High	Extreme	Extreme
Likely	Moderate	Moderate	High	High	Extreme
Possible	Low	Moderate	Moderate	High	Extreme
Unlikely	Low	Moderate	Moderate	Moderate	High
Rare	Low	Low	Moderate	Moderate	High

Appendix A – Premises Operation

Packsaddle Infiltration Ponds – Construction and Operation

Dewatering volumes at Mining Area C are projected to increase significantly over the FY2017-2021 period, with peak volumes estimated to reach up to 32 megalitres per day (ML/day) in FY2017 and more than 70 ML/day in FY2021. Site water demand over the same period is projected to remain relatively constant, at around 10 to 14 ML/day, which will result in estimated surplus water volumes of 22 ML/day in FY2017, increasing to 60 ML/day in FY2021.

In response to the increasing surplus mine dewater volumes, BHPBIO is proposing to develop and operate a number of distinct surplus water disposal options at Mining Area C to provide operational flexibility and enable the transition away from surplus water injection at A Deposit to allow below water table mining at that location.

The first surplus water disposal option proposed for development is a Managed Aquifer Recharge (MAR) scheme, comprising a series of three infiltration ponds (Packsaddle Infiltration Ponds) each with the capacity to dispose of up to 10ML/day of surplus mine dewater with a total scheme capacity of 30 ML/day. This is based on:

- Nominal pond dimensions of 80 metres (m) wide by 500 m long by 0.5 m deep; and
- Long term, conservative, infiltration rate of 250 millimetres per day (mm/day).

Each infiltration basin will comprise four individual basins, with three basins in use at any one time and the fourth acting as standby to enable maintenance (removal of algal/weed growth and sediment). The ponds will be fenced to restrict livestock access. Figure 1 depicts the indicative location of the infiltration ponds relative to the existing Mining Area C operations.

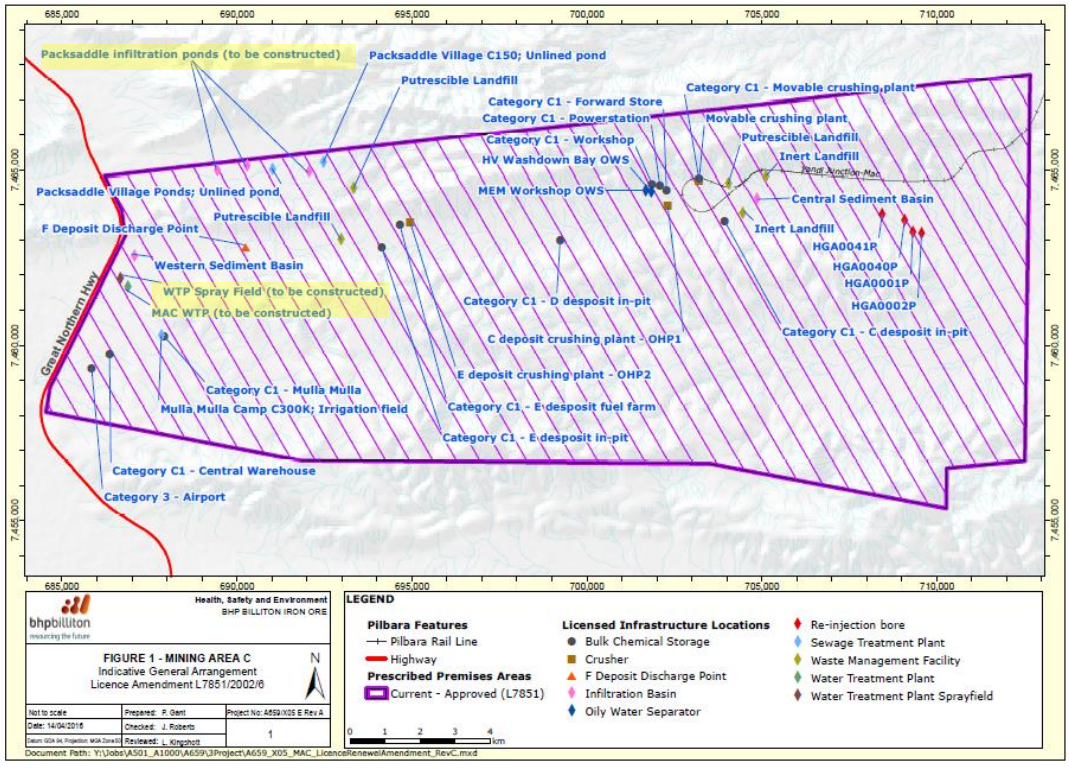


Figure 1. Location of proposed Packsaddle Infiltration Ponds and Mining Area C WTP and irrigation area (highlighted yellow)

The ponds will be located within the Hamersley Range – Fractured Rock aquifer unit. The geological sequence beneath the infiltration ponds comprises 20 to 50 m of tertiary detrital and alluvial material, derived from erosion of the Brockman Iron Formation (BIF) ridges on either side of the valley, which is underlain by mineralised, weathered and fractured BIF and Shale of the BIF.

Groundwater elevations within the valley are relatively constant. Depth to groundwater is approximately 96 m in the area of the proposed infiltration ponds and 75 m beneath the Mulga woodland to the west. The groundwater table is situated within the fractured bedrock aquifer and the tertiary detritals are unsaturated.

No Threatened Flora species listed under the *Environment Protection and Biodiversity Conservation Act 1999* or the *Wildlife Conservation Act 1950* have been identified within the indicative infiltration zone.

Two species listed as Priority flora by the Department of Parks and Wildlife have been recorded within the indicative infiltration zone.

The project will require up to 12 hectares (ha) of native vegetation to be cleared for the infiltration ponds and will involve some disturbance of vegetation along the approximately 7 km long pipeline route. All clearing will be undertaken in accordance with MS 491. The Licensee has indicated that clearing will be minimised and cleared areas that are no longer required will be revegetated.

Normal operation

Emission Description

Emission: Discharge of up to 30 ML/day of mine dewater from the Mining Area C Marra Mamba deposits into the three Packsaddle Infiltration Ponds. Water discharged will seep into the subsurface through the relatively thick unsaturated zone and continue to saturate it before it reaches the groundwater table.

Impact: Infiltration of mine dewater causing a rise in the groundwater level (mounding) beneath the Packsaddle Valley, potentially impacting on Mulga woodland located at the western end of the valley, should levels rise to less than 5 metres below ground level (mbgl) as soils become waterlogged.

Preliminary infiltration trials have been conducted in the indicative infiltration ponds zone and have proven the alluvial and detrital material to be highly permeable, exceeding 500 mm/day. Figure 2 depicts the location of the infiltration ponds and extent of the Mulga woodland potentially impacted by groundwater mounding.

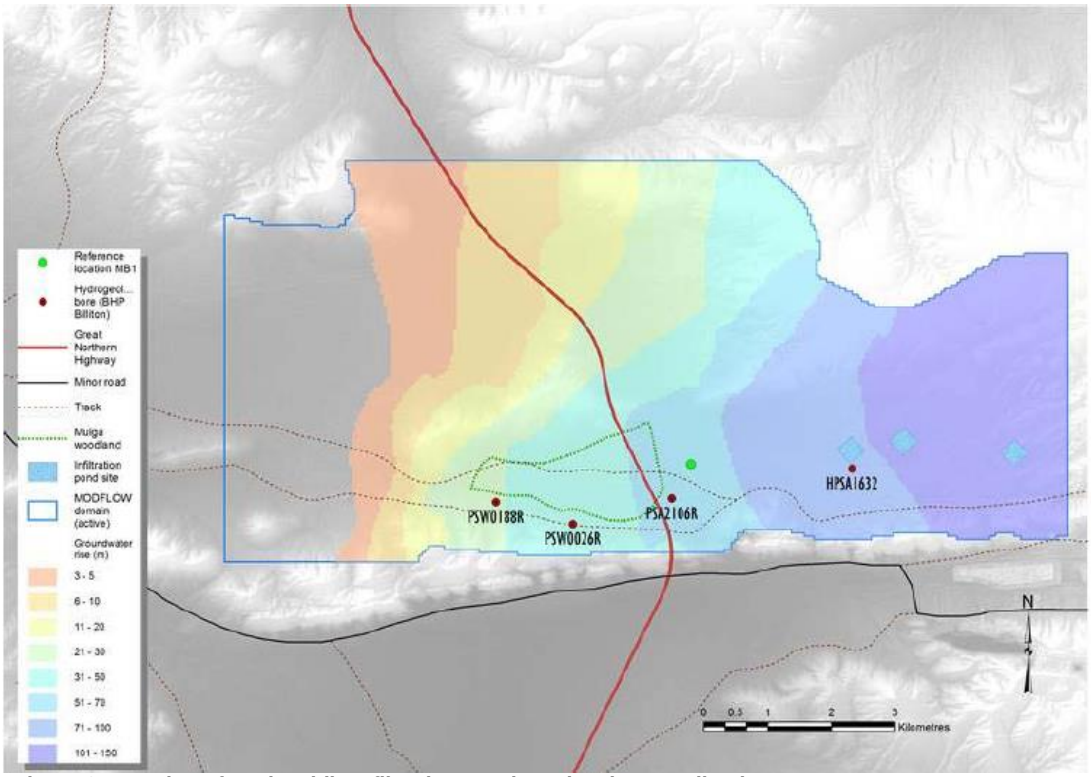


Figure 2. Location of Packsaddle Infiltration Ponds and Mulga woodland

To assist in quantifying the likely response of groundwater levels within Packsaddle Valley, and hence the likelihood of impacts to the Mulga woodland, a simple 3D numerical groundwater model was used. The model was run for a period of ten years with an initial infiltration rate of 30 ML/day (nominally 10 ML/day at each of the indicative pond locations). As the hydraulic properties of the alluvium/detrital deposits are uncertain, two scenarios were run with the hydraulic conductivity and storage settings for these deposits at the low (Case A) and high (Case B) end of what is expected (Figure 3).

Modelled Aquifer Unit	Modelled Aquifer Properties					
	Kh (m/d)		Kv (m/d)		Sy	
	Case A	Case B	Case A	Case B	Case A	Case B
Alluvium / Detritals	2.5	25	0.25	2.5	5%	10%
Weathered Bedrock	1.0		0.1		1%	
Unweathered Bedrock	0.01		0.01		0.1%	

Figure 3. Hydrogeological units of the Aquifer Model

Key findings from the modelling, presented in the MAC Discharge Disposal Study (MWH, 23 May 2016) are:

- Operation of the infiltration ponds leads to an increase in groundwater levels directly beneath them which propagates westwards;
- At monitoring bore , groundwater levels start to rise in response to operation of the ponds after less than a year, and continue rising throughout the modelled period;
- Wide-scale development of the groundwater mound occurs in about two years and by ten years most of the valley detritals will experience some mounding;

- The modelled low case indicates that groundwater levels rise to a maximum of 16 mbgl, which would not be expected to impact the Mulga woodland;
- The modelled high case indicates that groundwater levels rise to within 5 m of surface after approximately 7 years and almost to the surface at the Mulga woodland after 10 years. This shows the potential for the Mulga woodland to be impacted if large volumes of water are discharged to the infiltration ponds over an extended period.

The MAC Discharge Disposal Study report indicates that an infiltration rate of 30 ML/day is feasible, although this may reduce over time as the detritals underlying the ponds become fully saturated.

Deterioration of groundwater quality and potential impacts to ecosystems receiving groundwater in the area may also occur as a result of the infiltration of mine dewater.

Controls:
A large network of monitoring bores has been installed within Packsaddle Valley and along the adjacent Packsaddle Range (within the P1W and P1E deposits). These bores will be monitored throughout the operation of the infiltration ponds to determine how the valley aquifer system responds to the influx of water. The frequency of data collection will be greatest during the initial years of operation of the ponds, and will reduce as the response of the aquifer system to infiltration is understood. This data collected will be reviewed on an ongoing basis and any trends which show a likely impact on the environment or future mining activities will trigger mitigating action, most likely involving a reduction of water discharge to the ponds before an impact occurs. A water level trigger and limit will be implemented for HPSA1633, as described further below.

Groundwater levels
The groundwater modelling undertaken indicated that groundwater levels at HPSA1633 responded gradually to the cessation of operation of the ponds in both modelled cases. The Licensee has indicated that potential impacts to the Mulga woodland could be effectively managed by monitoring groundwater levels between the ponds and the Mulga woodland, and adjusting the rate of water discharge to the ponds as required.

In order to prevent impacts to the Mulga woodland, the Licensee has indicated that groundwater levels will be monitored on a monthly basis at monitoring bore HPSA1633. Changes in groundwater levels at HPSA1633 will trigger management actions to prevent impacts to the Mulga woodland.

In the event that groundwater levels at HPSA1633 reach the trigger level of 13 mbgl (corresponds to 10 mbgl at the Mulga woodland), the volume of water discharged to the infiltration ponds will need to be reduced to prevent further increases in groundwater levels at HPSA1633 and the Licensee will notify DER of the trigger exceedance. In the event that the groundwater level limit of 8 mbgl is exceeded at HPSA1633 (corresponds to 5 mbgl at the Mulga woodland), discharge will cease until such a time as groundwater levels recede past 13 mbgl at HPSA1633. The Licensee has indicated that during such events surplus water will be disposed of via one or more of the existing surplus water management options, being the Western and Central Sedimentation Basins and the A deposit MAR. The Licensee is also investigating two new MAR schemes at Juna Downs and Camp Hill which will be subject to separate approval. It is currently anticipated that the Juna Downs MAR borefield will commence operation during FY18 and Camp Hill will follow in FY2020.

Ground water quality
Groundwater quality is generally fresh. A groundwater sample taken from the centre of the Packsaddle Valley returned a concentration of 434 mg/L of total dissolved solids (TDS). This is comparable to samples taken from the Mining Area C dewatering borefield which range from 254 mg/L to 408 mg/L TDS, as reported in the Mining Area C FY2015 Annual Aquifer Review.

As the quality of surplus water from mine dewatering is very similar to the quality of groundwater within Packsaddle Valley, impacts to the quality of the groundwater resource are not expected as a result of this discharge.

If monitoring data show that changes to the groundwater table are greater than predicted by the model, the Licensee has indicated that the groundwater model may be re-calibrated an additional scenarios run to predict the capacity of the surplus management scheme and refine the assessment of potential environmental impacts.

Risk Assessment
Consequence: Moderate
Likelihood: Unlikely
Risk Rating: Moderate

Regulatory Controls:
The Packsaddle Infiltration Ponds have been specified as emission points to land under condition 2.3.1 of the Licence. Under condition 3.3.1 the Licensee is required to monitor the volume and quality of water discharged to the infiltration ponds. Monitoring results will be reported to DER annually for assessment.

In order to prevent impacts to the Mulga woodland as a result of groundwater mounding caused by operation of the infiltration ponds, groundwater levels at HPSA1633 will be monitored on a monthly basis and a limit for groundwater level has been specified under Conditions 3.5.1.

Under condition 4.3.1 the Licensee will be required to notify DER in the event of a limit exceedance.

In March 2014, MS491 was amended to remove the water usage and dewatering requirements from the Key Characteristics Table; which now states, *"dewatering and discharge can be managed under other legislation"*. The Licensee has advised and it is noted that the drawdown extent at MAC is being realised at an earlier date than initially planned, however does not represent a material change in the groundwater drawdown footprint and the associated impacts presented in the EMP required under MS 491.

The disposal of surplus mine dewater forms a part of the adaptive management approach adopted under MS 491, acknowledging that:

- dewatering rate is dependent upon the rate of below water table mining, the mining sequence and the deposit being mined at any one time; and
- the indicative mine schedule could change and as a result the maximum dewatering rates and period of dewatering may vary accordingly.

Residual Risk
Consequence: Moderate
Likelihood: Rare
Risk Rating: Low

Emergency situations
Emission: Overtopping of infiltration ponds, discharging mine dewater to land.

Impact: Infiltration of potentially sediment laden water to land, impacting on vegetation. Infiltration of water, impacting groundwater quality and levels in the receiving aquifer.

Controls: The Licensee manages the infiltration ponds such that overtopping does not occur, except during high rainfall events. Upstream watercourses will be directed around the ponds; therefore the

only rainfall entering the ponds will be that which is incident on the ponds or the surrounding bunds. Spillways have not been incorporated into the design.

The lowest pond in each infiltration basin will be equipped with a 'high water level' alarm, which will trigger operational personnel to attend the ponds and resolve the issue. There is significant redundant capacity designed into the ponds, primarily to enable maintenance activities without affecting scheme capacity, and this will further reduce the likelihood of the ponds overtopping.

In the event that ponds overflow, excess mine dewater will be directed to one or more of the existing surplus water management options, being the Western and Central Sedimentation Basins and the A deposit MAR. Inundation of vegetation near the ponds would be short term in nature and occur only while the ponds are overtopping. Such an event would be managed so that the duration of the overtopping event does not result in inundation that results in a loss of vegetation.

The quality of groundwater within the source and receiving aquifer are the same, therefore groundwater quality is unlikely to be affected as a result of overtopping of the ponds.

An operational freeboard of 300mm will be maintained. Initially inspections will be undertaken daily to confirm performance of the ponds. Currently, it is anticipated that inspections will be reduced to weekly on a long-term basis.

Risk Assessment
Consequence: Insignificant
Likelihood: Unlikely
Risk Rating: Low

Regulatory Controls:
The risk associated with the overflow of mine dewater from the ponds has been assessed as low. No regulatory controls are required to be applied to the Licence. Section 49 of the *Environmental Protection Act 1986* applies and discharges may also be subject to the *Environmental Protection (Unauthorised Discharges) Regulations 2004*.

Residual Risk
Consequence: Insignificant
Likelihood: Unlikely
Risk Rating: Low

Mining Area C WTP – Construction, Commissioning and Operation
BHPBIO is proposing to construct a new nano-filtration WTP at Mining Area C to supply potable water to the Packsaddle and Mulla Mulla Camps. The project will be undertaken in two stages:

- Stage 1: Construction of a 0.584 gigalitre per annum (GL/a) (average of 1.6 MG/day) WTP; and
- Stage 2: Expansion of the Stage 1 facility to a 0.9125 GL/a (average of 2.5 ML/day WTP.

The WTP will operate by using a high pressure nano-filtration pump which pushes the pre-treated feedwater through a dual train nano-filtration membrane system, with 87% passing through as permeate (potable water) and 13% rejected as brine. The proposed locations of the WTP and irrigation area are shown in Figure 1 (above). The general layout of the WTP and irrigation areas are depicted in Figures 4 and 5, below.

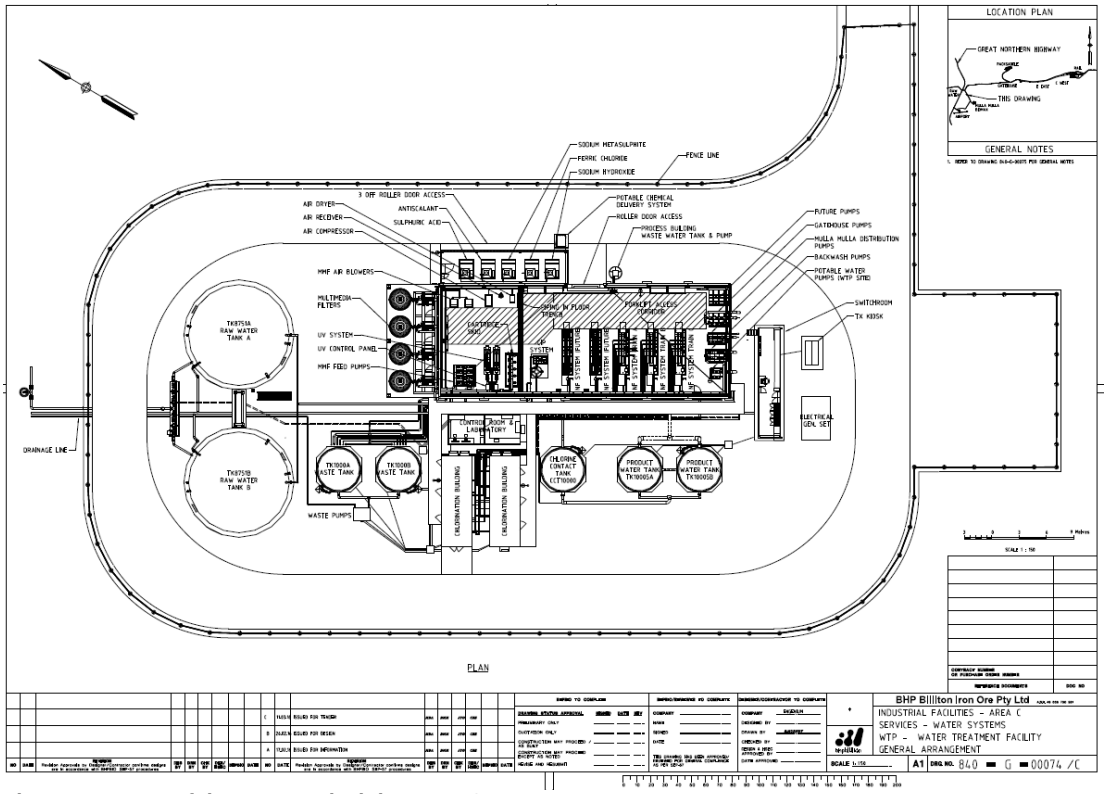


Figure 4. Layout of the proposed Mining Area C WTP

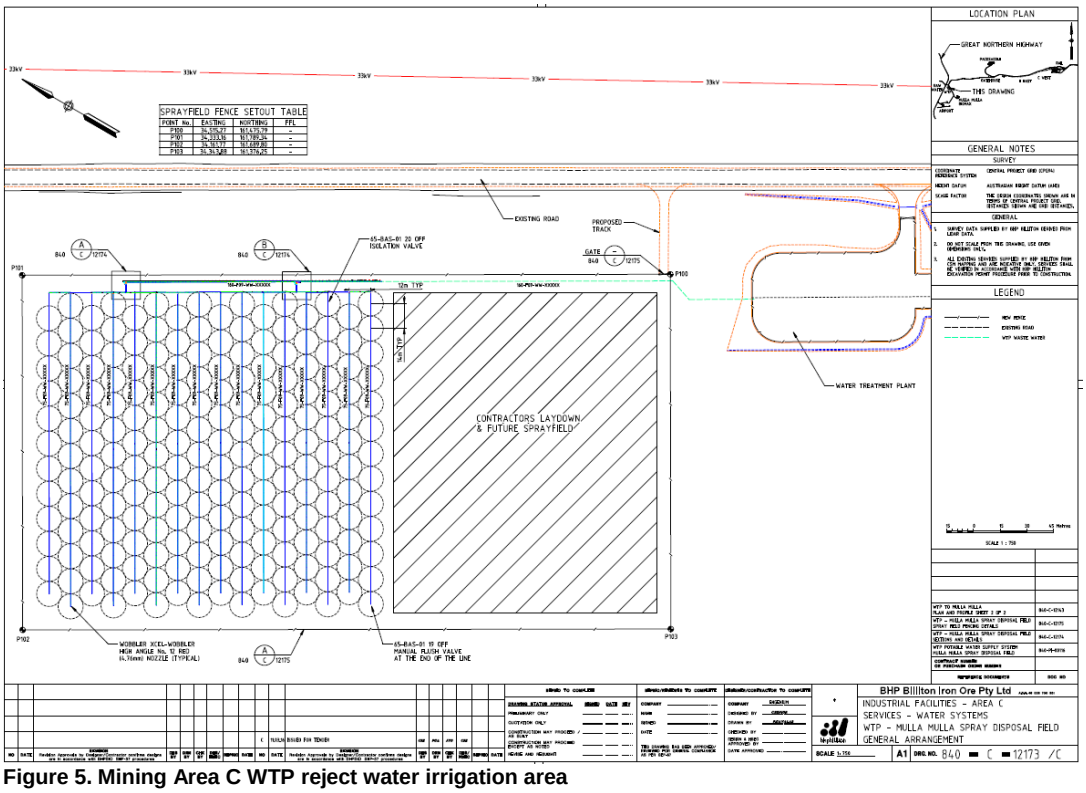


Figure 5. Mining Area C WTP reject water irrigation area

Permeate is mixed with some of the filtered feed water to achieve reject water with a targeted average TDS of 1,500 mg/L, which will be disposed of at an adjacent 7.4 ha spray field. Following completion of Stage 2 the WTP will produce up to 228.5 ML/a (626 kL/day) of reject water.

The project will require the clearing of approximately 1 ha of native vegetation for the WTP and will involve some disturbance of vegetation within the 7.4 ha spray field. All clearing will be undertaken in accordance with the approved Native Vegetation Clearing Permit (NVCP) CPS 4337/1.

Commissioning and Normal operation

Emission Description

Emission: Discharge of up to 626 kL/day of reject water, with a TDS concentration of approximately 1,500 mg/L, to a 7.4 ha spray field.

Impact: Impacts to native vegetation as a result of irrigation of reject water, impacts to groundwater quality and levels due to infiltration of reject water, impacts to surface water quality resulting from runoff of water from the irrigation area.

Controls:

The Licensee will monitor the volume and quality of the reject water and has proposed a limit of 1,800 mg/L TDS.

In the event that the TDS of the reject water exceeds 1,500 mg/L but is less than the 1,800 mg/L limit, the following actions will be undertaken:

- TDS will be measured daily for one week to determine if there is an increasing trend;
- If the TDS continues to exceed 1,500 mg/L but does not show an increasing trend monitoring will continue on a weekly basis for one month; and
- If the TDS continues to exceed 1,500 mg/L but still does not show an increasing trend monitoring will return to a quarterly basis.

In the event that the TDS of the reject water exceeds 1,500 mg/L, is less than the 1,800 mg/L limit, but shows an increasing trend the following actions will be undertaken:

- The reject water will be monitored on a weekly basis;
- An investigation into potential causes of the high TDS will be undertaken; and
- The appropriate actions identified in the investigation will be implemented.

In the event that the TDS of the reject water exceeds the limit of 1,800 mg/L the following actions will be undertaken:

- Reject water will be blended (with either raw or treated water) to ensure that water discharged to the spray field has a TDS below 1,800 mg/L; and
- An investigation into the cause of the exceedance will be undertaken and appropriate actions taken to correct the problem.

The Licensee has undertaken a similar project at the Mooka Camp, which operates under Part V of the EP Act Licence L8679/2012/1. A TDS discharge limit of 1,876 mg/L was specified under the Mooka Camp operating Licence and vegetation monitoring was conducted six monthly to identify if there has been any degradation in vegetation quality as a result of the TDS in discharge water. The Licensee has reviewed the past 2.5 years of monitoring data and determined that there has been no detrimental effect on the vegetation of the Mooka Camp spray field.

The proposed discharge from the proposed Mining Area C WTP is unlikely to impact on the vegetation of the spray field as:

- There has been no adverse impact on vegetation as a result of the TDS of the irrigated water at the Mooka spray field (licence limit of 1,876 mg/L);

- The proposed Mining Area C spray field has the same floristic community (Triodia Open Hummock Grassland) as the existing Mooka spray field;
- The proposed Mining Area C spray field has the same soil type as the existing Mooka spray field; and
- The target TDS of the reject water from the Mining Area C will be an average of 1,500 mg/L TDS, with a limit of 1,800 mg/L which is less than that of the Mooka irrigation field.

There are no surface water features in or adjacent to the proposed WTP and sprayfield. The nearest drainage line lies more than one kilometre to the south of the proposed irrigation field. Depth to groundwater is 80 m and is used mainly for mining and mine dewatering from the iron ore mines.

Mean daily evaporation recorded at the closest meteorological site (Wittenoom located 90 km away) is 8.6 mm/day, which equates to 3.1 m per year. Negligible impacts to groundwater and surface water are expected, due to the distance between the sprayfield and these receptors, and the regions high evaporation rates.

It is also noted that no Threatened Flora species listed under the *Environment Protection and Biodiversity Conservation Act 1999*, the *Wildlife Conservation Act 1950* or species listed as Priority flora by the Department of Parks and Wildlife have been identified within the area.

The Licensee has indicated that a Commissioning Plan for the WTP is currently being developed, however it is unlikely to be finalised until after construction has commenced. The final commissioning plan will detail the monitoring frequency and limits of the discharges associated with the WTP and the contingencies to be undertaken should the water quality be unacceptable for irrigation.

Risk Assessment
Consequence: Minor
Likelihood: Unlikely
Risk Rating: Moderate

Regulatory Controls:
Condition 2.3.1 specifies the discharge of reject water to the sprayfield as a Licensed emission point. A limit for TDS concentration in water discharged to the irrigation is specified under condition 2.3.2. In the event that the limit is exceeded, discharge will need to cease and DER notified. Monitoring requirements for volume discharged and water quality are specified under condition 3.3.1.

The requirement to submit a commissioning plan to DER has been included under condition 4.3.1.

Residual Risk
Consequence: Minor
Likelihood: Rare
Risk Rating: Low

Appendix B – Emissions to land including monitoring

Normal operation
Emission: Discharge of 2.08 gigalitres per year (GL/year) of excess mine dewater to the Western Sediment Basin and 8.67 GL/year of excess mine dewater to the Central Sediment Basin. Water is directed to the sedimentation basins either through the existing stormwater management drainage system or through water pipelines.

Impact: Infiltration of water through the soil profile, impacting on groundwater quality and levels in the receiving aquifer, potential impacts to ecosystems receiving groundwater in the area.

Depth to groundwater is approximately 80 m at the Western Sediment Basin and 106 m at the Central Sediment Basin.

Controls: The quality of groundwater within the source and receiving aquifers are the same, therefore impacts to groundwater quality are not expected to occur as a result of the infiltration of mine dewater.

Infiltration rates are low due to clay-rich detritals, groundwater levels are deep and the basement aquifer (dolomite) is highly permeable and will conduct water away. Groundwater mounding impacting on vegetation in the disturbed mining areas is unlikely.

Groundwater levels are monitored regularly throughout MAC and towards the Coodewanna Flats to the west, and so any changes in groundwater levels which could affect vegetation would be identified. However, no specific groundwater monitoring at these basins is undertaken or planned by the Licensee.

Discharge water will also be lost to evaporation.

Risk Assessment
Consequence: Minor
Likelihood: Possible
Risk Rating: Moderate

Regulatory Controls:
Condition 2.3.1 has been amended to include the Western and Central Sediment Basins as specified emission points to land. Under Condition 3.3.1 the Licensee will be required to monitor the volume of surplus mine dewater discharged to the basins and undertake quarterly monitoring to analyse water quality. The Licensee will be required to report the monitoring results annually to DER for review, including a comparison against previous monitoring results to identify any trends.

Residual Risk
Consequence: Minor
Likelihood: Possible
Risk Rating: Moderate

Emergency situations
Emission: Overtopping of sediment basins, discharging mine dewater to land.

Impact: Infiltration of potentially sediment laden water to land, impacting on vegetation. Infiltration of water, impacting groundwater quality and levels in the receiving aquifer.

Controls: The Licensee manages the sediment basins such that overtopping does not occur, except during high rainfall events. In the event that the basins overtop the vegetation downstream is unlikely

to be impacted as the overtopping events are likely to be short term and the vegetation occurs on a floodplain which is used to periodic inundation.

The quality of groundwater within the source and receiving aquifer are the same, therefore groundwater quality is unlikely to be effected as a result of overtopping of the ponds.

An operational freeboard of 300 mm is maintained on the Western Sediment Basin and the spillway has been designed to accommodation flows over a 100 year Annual Recurrence Interval (ARI).

The Central Sediment Basin lies along a highly disturbed unnamed non-perennial drainage line which flows easterly from the centre of MAC before leaving the side at the Eastern boundary of MAC. Prior to leaving MAC this unnamed non-perennial drainage line passes through the Eastern Sediment Basin to ensure that no sediment is discharged from the site. The Eastern Sediment Basin has been constructed to capture sediment flowing to the east from the mining operation, and has been constructed with a spillway which accommodates flows over the 5 year ARI.

Risk Assessment
Consequence: Insignificant
Likelihood: Unlikely
Risk Rating: Low

Regulatory Controls:
The risk associated with the overflow of mine dewater from the basins has been assessed as low. No regulatory controls are required to be applied to the Licence. Section 49 of the *Environmental Protection Act 1986* applies and discharges may also be subject to the *Environmental Protection (Unauthorised Discharges) Regulations 2004*.

Residual Risk
Consequence: Insignificant
Likelihood: Unlikely
Risk Rating: Low