



Decision Document

Environmental Protection Act 1986, Part V

Proponent: BHP Billiton Worsley Alumina Pty Ltd

Licence: L5960/1983/11

Registered office: Gastaldo Road
Allanson WA 6225

ACN: 008 905 155

Premises address: Boddington Bauxite Mine
Pinjarra-Williams Road
Marradong WA 6390
Being Marradong and Saddleback Mining Operation as depicted in
Schedule 1.

Issue date: Thursday, 25 September 2014

Commencement date: Wednesday, 1 October 2014

Expiry date: Monday, 30 September 2019

Decision

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

Decision Document prepared by: Jamie Piotrowski
Licensing Officer

Decision Document authorised by: Neville Welsh
Manager Licensing



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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.

Works approval and licence conditions

DER has three types of conditions that may be imposed on works approvals and licences. They are as follows;

Standard conditions (SC)

DER has standard conditions that are imposed on all works approvals and licences regardless of the activities undertaken on the Premises and the information provided in the application. These are included as the following conditions on works approvals and licences:

Works approval conditions: 1.1.1-1.1.4, 1.2.1, 1.2.2, 5.1.1 and 5.1.2.

Licence conditions: 1.1.1-1.1.4, 1.2.1-1.2.4, 5.1.1-5.1.4 and 5.2.1.

For such conditions, justification within the Decision Document is not provided.

Optional standard conditions (OSC)

In the interests of regulatory consistency DER has a set of optional standard conditions that can be imposed on works approvals and licences. DER will include optional standard conditions as necessary, and are likely to constitute the majority of conditions in any licence. The inclusion of any optional standard conditions is justified in Section 4 of this document.

Non standard conditions (NSC)

Where the proposed activities require conditions outside the standard conditions suite DER will impose one or more non-standard conditions. These include both premises and sector specific conditions, and are likely to occur within few licences. Where used, justification for the application of these conditions will be included in Section 4.



2 Administrative summary

Administrative details		
Application type	Works Approval <input type="checkbox"/> New Licence <input type="checkbox"/> Licence amendment <input checked="" type="checkbox"/> Works Approval amendment <input type="checkbox"/>	
Activities that cause the premises to become prescribed premises	Category number(s) 5: Processing or beneficiation of metallic or non-metallic ore.	Assessed design capacity 18,800,000 tonnes per annual period
Application verified	Date: 02/07/2014	
Application fee paid	Date: 10/07/2014	
Works Approval has been complied with	Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input checked="" type="checkbox"/>	
Compliance Certificate received	Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input checked="" type="checkbox"/>	
Commercial-in-confidence claim	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
Commercial-in-confidence claim outcome		
Is the proposal a Major Resource Project?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Was the proposal referred to the Environmental Protection Authority (EPA) under Part IV of the <i>Environmental Protection Act 1986</i> ?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Referral decision No: Managed under Part V <input type="checkbox"/> Assessed under Part IV <input type="checkbox"/>
Is the proposal subject to Ministerial Conditions?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Ministerial statement No: 719 EPA Report No: Bulletins 823, 1209
Does the proposal involve a discharge of waste into a designated area (as defined in section 57 of the <i>Environmental Protection Act 1986</i>)?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Department of Water consulted Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Is the Premises within an Environmental Protection Policy (EPP) Area Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> If Yes include details of which EPP(s) here.		
Is the Premises subject to any EPP requirements? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> 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 Worsley Alumina Pty Ltd manages the Boddington Bauxite Mine (BBM), consisting of the Marradong and Saddleback operations. The site is located 15 km from the Boddington township and is part of a greater mining lease of 22,000 ha, encompassing State forest and private lands. BMM commenced development in 1980 and as of 2012, covers 3,747 ha.

Bauxite ore is excavated from open cut mining operations following clearing and blasting operations. Ore is transported to centrally located crushers where it is crushed and sized for transport via conveyor to the Worsley Alumina Refinery (L4504/1981/16).

The main emissions from the operations at BBM are noise, dust and sediment runoff. Noise is monitored via the Noise Sentinel monitoring program which is used to manage mining operations to reduce noise levels. Dust is continuously monitored at monitoring stations located near the perimeter of the mining area and mitigated via dust suppression on roads, stockpiles and other fugitive dust sources. High volume dust generation areas such as the crushers and conveyors are enclosed and water-sprayed to reduce fugitive dust.

This licence amendment is proponent-initiated to amend section 2.6: fugitive emissions, as well as some errors in referencing Australian Standards. The fugitive emissions will be managed through the licensee's Dust Management Plan with regular monitoring and reporting to DER.



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	OSC or NSC	Justification (including risk description & decision methodology where relevant)	Reference documents
General conditions	L1.2.5	OSC	Abnormal Operation DER's assessment and decision making are detailed in Appendix A.	Application supporting documentation General provisions of the <i>Environmental Protection Act 1986</i> . <i>Environmental Protection (Unauthorised Discharges) Regulations 2004</i> Proponent Commitment 1 of Ministerial Statement No.719 BWAPL Water Resource Management Plan – Mining (updated June 2014)
Premises operation	L1.3.1	OSC	Normal Operation DER's assessment and decision making are detailed in Appendix A.	<i>Environmental Protection (Unauthorised Discharges) Regulations 2004</i> Proponent Commitment 1 of Ministerial Statement No.719 BWAPL Water Resource Management Plan – Mining (updated June 2014)
Emissions	L2.1.1	OSC	Descriptive limits will be set through condition L2.6.1 and Table	N/A



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general			3.8.1 of the licence and therefore OSC regarding recording and investigation of exceedances of limits or targets has been included.	
Point source emissions to air including monitoring	L2.2.1, Table 2.2.1 and L3.2	OSC	<p>Normal Operation</p> <p><u>Emission Description</u></p> <p><i>Emission:</i> Particulates from two bag filters are located on the upstream and downstream points of the second stage of the Marradong Primary Crusher's discharge chute to the Overland Conveyor to Saddleback.</p> <p><i>Impact:</i> Particulates emitted to air have the potential to impact on human health, through ingestion of small particles and also to impact on vegetation, through deposition on leaves impeding photosynthesis and thus plant growth. Point source baghouse emissions are expected in normal operation to constitute a small contribution to ambient air quality in comparison to fugitive dust sources.</p> <p><i>Controls:</i> Bag filters dust collection on transfer point from Marradong Primary Crusher to Overland Conveyor. Primary and secondary crushers are inspected according to BWAPL procedures, as documented to the BWAPL Dust Management Plan – Bauxite Mining and Transport (June 2014).</p> <p><u>Risk Assessment</u></p> <p><i>Consequence:</i> Insignificant</p> <p><i>Likelihood:</i> Possible</p> <p><i>Risk Rating:</i> Low</p> <p><u>Regulatory Controls</u></p> <p>Vegetation impacts are currently monitored and assessed through the Ministerial Statement No.719. An ambient dust monitoring program is in place and results will be reported as part of the Annual Environmental Report as per L5.2.1.</p>	<p>Application supporting documentation</p> <p>Proponent Commitment 2 of Ministerial Statement No. 719</p> <p>BWAPL Dust Management Plan – Bauxite Mining and Transport (updated June 2014)</p>



DECISION TABLE

Works Approval / Licence section	Condition number W = Works Approval L = Licence	OSC or NSC	Justification (including risk description & decision methodology where relevant)	Reference documents
			<p>Point source emissions to air locations are identified in licence condition 2.2.1 and Table 2.2.1.</p> <p><u>Residual Risk</u> <i>Consequence:</i> Insignificant <i>Likelihood:</i> Possible <i>Residual Risk Rating:</i> Low</p>	
Point source emissions to surface water including monitoring	L2.3	N/A	<p>Normal Operation No significant point source emissions to surface water are expected as a result of operations prescribed by the Licence. No specific conditions relating to point source emissions to surface water or the monitoring of these emissions are required to be added to the licence.</p>	<p>Application supporting documentation</p> <p>Water Quality Protection Guidelines for Mining and Mineral Processing – Minesite stormwater (WQPG No. 6)</p> <p>Proponent Commitment 1 of Ministerial Statement No. 719 BWAPL Water Resource Management Plan – Mining (updated June 2014)</p>
Point source emissions to groundwater including monitoring	L2.4	N/A	<p>Normal Operation No significant point source emissions to groundwater are expected as a result of operations prescribed by the Licence. All containment ponds for oily wastewater from Saddleback Oil Water Separator and Marradong Triple Interceptor are lined to prevent seepage. Refer also to Appendix A for DER's risk assessment of seepage or discharge from lined containment ponds.</p> <p>Potential emissions to groundwater from hydrocarbon contaminated wastewater at Saddleback are monitored under this Licence under ambient environmental monitoring condition L3.8.1.</p>	<p><i>Environmental Protection (Unauthorised Discharges) Regulations 2004</i></p> <p>Proponent Commitment 1 of Ministerial Statement No. 719</p> <p>BWAPL Water Resource Management Plan – Mining (updated June 2014)</p>



DECISION TABLE

Works Approval / Licence section	Condition number W = Works Approval L = Licence	OSC or NSC	Justification (including risk description & decision methodology where relevant)	Reference documents
			No specified conditions relating to point source emissions to groundwater or the monitoring of these emissions are required to be added to the licence.	
Emissions to land including monitoring	L2.5	N/A	Normal Operation There are no impacts from emissions to land expected during mining operations. No specified conditions relating to emissions to land are included in the Licence.	Application supporting documentation
Fugitive emissions	L2.6.1	OSC	Normal Operation DER's assessment and decision making are detailed in Appendix B.	Proponent Commitment 2 of Ministerial Statement No. 719 Boddington Bauxite Mine Dust Management Plan for Marradong Operations (Environmental Alliance, June 2011) BWAPL Dust Management Plan – Bauxite Mining and Transport (updated May 2015)
Odour	L – no conditions	N/A	Normal Operation There are no odour impacts expected during mining operations. No specified conditions relating to odour are included in the Licence.	Application and supporting documentation General provisions of the <i>Environmental Protection Act 1986</i> .
Noise	L 3.8.1 and 3.8.2	OSC	Noise management and noise monitoring are managed according to Ministerial Statement No.719. 75 complaints for mining noise were registered in the 2013 Annual Environmental Report, of which 75 were related to operations at the Marradong mining operation. 18 complaints resulted in operation modifications to reduce noise impact on neighbours.	<i>Environmental Protection (Noise) Regulations 1997</i> Proponent Commitment 3 of Ministerial Statement No. 719 BWAPL Noise and Vibration Management Plan - Mining



DECISION TABLE

Works Approval / Licence section	Condition number W = Works Approval L = Licence	OSC or NSC	Justification (including risk description & decision methodology where relevant)	Reference documents
			Potential emissions to ambient noise quality from blasting operations are monitored under this Licence under ambient environmental monitoring conditions L3.8.1 and 3.8.2. One complaint was registered in the 2013 Annual Environmental Report in relation to blast overpressure.	
Monitoring general	L3.1.1 to 3.1.5	OSC	General monitoring conditions are included in the Licence to ensure environmental monitoring specified in conditions L3.6.1 and L3.8.1 of the Licence is carried out in accordance with the relevant standards at appropriate intervals.	Application and supporting information Australian Standard AS/NZS 5667.1 – <i>Water Quality – Sampling – Guidance on the Design of sampling programs, sampling techniques and the preservation and handling of samples</i>
Monitoring of inputs and outputs	L3.6.1	NSC	Previous licence condition W3(a) (in part) converted to REFIRE template. Wastewater from Karafil Dam is applied to haul roads as a dust suppressant, whereas wastewater from the Marradong maintenance facilities' evaporation pond is not. Refer also to justification for L1.3.1.	General provisions of the <i>Environmental Protection Act 1986</i> .
Process monitoring	L – no conditions	N/A	No specified conditions relating to process monitoring are included in the Licence.	N/A
Ambient quality monitoring	L3.8.1 L3.8.2	OSC OSC	OSC L3.8.1 has been included in the Licence to ensure: <ul style="list-style-type: none"> Trends in groundwater quality are monitored and investigated accordingly (Table 3.8.1). Seepage impacts are risk assessed in Appendix A. PM₁₀ is monitored. Fugitive dust emissions are risk assessed in Appendix B. Airblast over pressure for each blast event is undertaken . OSC L3.8.1 has been included in the Licence to ensure ambient air monitoring is undertaken as per Australian Standards.	'Australian Standard AS/NZS 5667.11 <i>Water Quality – Sampling – Guidance on sampling of groundwaters</i> <i>Environmental Protection (Noise) Regulations 1997</i> <i>Noise Management Plan – Mining and Blasting Version 2.0</i> 'Australian Standard AS 3580.1.1 <i>Methods for sampling</i>



DECISION TABLE				
Works Approval / Licence section	Condition number W = Works Approval L = Licence	OSC or NSC	Justification (including risk description & decision methodology where relevant)	Reference documents
				<i>and analysis of ambient air – Guide to siting air monitoring equipment'</i>
Meteorological monitoring	L – no conditions	N/A	No specified conditions relating to meteorological monitoring are included in the licence.	N/A
Improvements	L – no conditions	N/A	No specified conditions relating to improvements are included in the licence.	N/A
Information	L5.2.2	OSC	OSC L5.2.2 has been included to ensure appropriate supporting information is reported to DER as part of the Annual Environmental Report.	General provisions of the <i>Environmental Protection Act 1986</i> .
	L5.3.1	OSC	OSC L5.3.1 details the notification requirements for the Licensee to DER according to the terms of this Licence.	
Licence Duration	N/A	N/A	Standard licence duration of five (5) years.	N/A



5 Advertisement and consultation table

Date	Event	Comments received/Notes	How comments were taken into consideration
28/07/2014	Application advertised in <i>The West Australian</i>	No comments received	
08/09/2014	Proponent sent a copy of draft instrument	Comments received 11/9/2014 Corrections to technical specifications and minor administrative matters such as reporting periods. Request to change references to dust management plans required by Ministerial Statement to manage fugitive dust emissions, and change requirements to report summary ambient environmental quality monitoring data and exceedances.	Corrections made as appropriate. Dust management plans not referenced in licence conditions. Requirements to monitor and report fugitive dust unchanged; requirements are appropriate and commensurate to risk
18/05/2015	Proponent sent a copy of draft instrument	No comments received	



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

General conditions

Emission Risk Assessment

Abnormal Operation

Emission Description

Emission: Stormwater contaminated with sediment (including ore and overburden) and hydrocarbons discharged to environment such that it impacts on local surface water quality.

Impact: Contamination of surrounding vegetation and local surface water quality. BBM experiences seasonal rainfall during winter. The Premises are sited predominately in state forest, with a small amount of cleared agricultural land. The current mining operations occur adjacent to drinking water quality catchments and are surrounded by many small watercourses. Potential impacts to the quality of surface water may arise from sediment and hydrocarbon contaminated stormwater discharges; in particular increased turbidity and salinity from the addition of sediment.

Controls: The Licensee proposes to direct stormwater from potential hydrocarbon spill affected areas to lined containment ponds with sufficient freeboard to prevent overflow during extreme weather events (1 in 10 year rainfall event) (Karafil Dam at Saddleback; lined evaporation pond at Marradong). The Licensee has a spill management procedure in place.

The Licensee has committed to designing all site drainage systems to retain stormwater except during a 1 in 10 year rainfall event where provision for discharge is made after allowing for the entrained silt load to be settled out. Drainage infrastructure is inspected and maintained annually during summer. In the 2013 Annual Environmental Report, BWAPL recorded 1 incident of uncontrolled stormwater discharge after a sump failure.

Risk Assessment

Consequence: Minor

Likelihood: Unlikely

Risk Rating: Moderate

Regulatory Controls

SC L1.2.3 and L1.2.4 replace previous licence conditions W1(a) - (d).

OSC L1.2.5 has been included in the licence. This replaces previous licence condition W2.

NSC L1.3.1 has been added to the licence to ensure the Licensee maintains sufficient freeboard on containment ponds to prevent overflows during extreme weather conditions. This replaces previous licence condition S1 (ii) –(v).

Residual Risk

Consequence: Minor

Likelihood: Unlikely

Risk Rating: Moderate



Normal Operation

Emission Description

Emission: Contamination to land and groundwater by uncontrolled discharges of hydrocarbons. Pathways may include seepage from poorly maintained containment ponds or overtopping from ponds.

Impact: Contamination of surrounding land and surface water drainage systems. Short term potential impacts on surface water quality from the discharge of hydrocarbons. Short to medium term potential impact to groundwater from seepage due to liner failure,

Controls: The Licensee proposes to direct stormwater from potential hydrocarbon spill affected areas to lined containment ponds with sufficient freeboard to prevent overflow during extreme weather events (1 in 10 year rainfall event) (Karafil Dam at Saddleback; lined evaporation pond at Marradong). Storage and treatment of hydrocarbons contaminated wastewater is limited to containment infrastructure listed in Table 1.3.1. All containment infrastructure will be maintained to standards listed in Table 1.3.1. The Licensee has a spill management procedure in place. Two groundwater monitoring bores (HMB01/03 and HMB02/03), situated near the Saddleback oil water separator/workshop area, are monitored for total recoverable hydrocarbons every six months. No groundwater bores in the Marradong area are monitored for total recoverable hydrocarbons.

Risk Assessment

Consequence: Minor

Likelihood: Unlikely

Risk Rating: Moderate

Regulatory Controls

NSC 1.3.1 has been added to the licence to ensure that containment infrastructure of environmentally hazardous materials is adequately operated and maintained. These conditions replace previous licence condition S1 (ii) to (iv).

Residual Risk

Consequence: Minor

Likelihood: Rare

Risk Rating: Low



Appendix B

Fugitive Emission Conditions

Emission Risk Assessment

Normal Operation

Emission Description

Emission: Fugitive dust particulate emissions in excess of ambient air quality limits and guidelines at monitoring sites outside the Prescribed Premises boundary.

Fugitive dust within the Premises boundary is generated from the following activities:

- Crushing and materials handling transfer of ore into crushers, reclaim stockpile and loading of crushed material onto the overland conveyor to Saddleback or the Worsley Alumina Refinery.
- Drilling and blasting
- Earthworks and loading and hauling of overburden and ore
- Dust generated by wind and occasional traffic over areas disturbed by mining

The Premises has a two stage Primary Crusher at the Marradong mining area, with a connecting overland conveyor to the Saddleback mining area, Saddleback has a Primary and Secondary Crushers, with feed to a 20 000t live stockpile and ore reclaim system, from which ore is transferred to the Overland Bauxite Conveyor (OBC) to the Worsley Alumina Refinery. Only the transfer point and part of the OBC included in the Premises' boundary is covered by the Licence,

There is also a contribution to ambient dust load from forest burning unrelated to operations conducted according to the Licence.

Impact: Particulates, especially those sized less than 10 microns in diameter (PM₁₀), have the potential to adversely affect human health. Nearest neighbours are located 100 m from the Premises boundary to the east of the Saddleback mining operations.

Vegetation can be impacted by dust deposition on leaves, impeding photosynthesis and thus plant growth. Dust can also cause an abrasion impact to leaves and stunt plant growth. Vegetation and human health are both experienced in the short term as acute impacts, or as a chronic impact over time. Seasonal rainfall ameliorates the impact of dust on vegetation.

A consultant review of FY2012 dust monitoring data identified one exceedance of the NEPM level. One complaint relating to dust was recorded in the 2013 Annual Environmental Report period.

Controls: The Marradong Primary Crusher is located in an excavated pit to mitigate dust and noise emissions. The first stage of the Marradong Primary Crusher has water sprays on the dump hopper and on the discharge conveyor. Bag filter dust collectors are installed on transfer point from the second stage of the Marradong Primary Crusher to the Overland Conveyor to the Marradong Secondary Crusher.

The Saddleback Primary and Secondary Crushers are located in near-fully enclosed buildings. Both are fitted with dust extraction systems in front of the discharge conveyor and water sprays at the discharge conveyor. Water sprays and cannons are installed on the 20 000t Live Stockpile. Operational procedures ensure dust is minimised in that the size of the stockpile is managed and no dozer operations take place. All dust collectors are a bag type with a rated air volume flow of



approximately 5,000 m³/hr each and designed to meet the AEC/NHMRC limit for solid particle emissions of 250 mg/m³ (AEC/NHMRC 1985).

Overland conveyors have the following controls:

- Completely covered for the Marradong Overland Conveyor and mostly covered for the Overland Bauxite Conveyor (refer to section 5.4 of the Dust Management Plan Bauxite Mining and Transport); and
- Dust containment systems such as covers and watering points strategically placed on the conveyor belts and at transfer points.

Haul roads are regularly water sprayed in accordance with internal procedures.

Section 5.1 of the *Dust Management Plan Bauxite Mining and Transport* has been updated to provide the following text:

Blasting activities are carefully controlled according to climatic conditions. Blasts are delayed or avoided when conditions (primarily wind direction and speed) are likely to impact on the amenity (both noise and dust) of nearby sensitive receptors. Mining pits located on premises boundaries must be carefully managed to minimise dust emissions as far as reasonably practicable. Where dust emissions cannot be prevented from crossing the premises boundary, controls must be in place to ensure that impacts on nearby sensitive receptors and roadways are minimised. Control measures available include:

- *Relocation Agreements; and/or*
- *Temporary road closures or traffic control points.*

Risk Assessment

Consequence: Minor

Likelihood: Possible

Risk Rating: Moderate

Regulatory Controls

OSC L2.6.1 has been added to the Licence to ensure that existing management and controls are maintained. These conditions replace previous licence conditions A1(a), A1(b) and A2.

The licence has been amended to remove previous condition 2.6.2 prohibiting dust from crossing the premises boundary as BBM are unable to comply on a few occasions when blasting close to the boundary. DER considers that the dust management plans will be adequate to ensure that dust is minimal and any impacts are acceptable.

Trends in performance can be assessed through conditions L5.2.1 and L5.2.2.

Residual Risk

Consequence: Moderate

Likelihood: Possible

Risk Rating: Moderate