

Amendment Report

Application for Licence Amendment

Part V Division 3 of the Environmental Protection Act 1986

Licence Number	L5960/1983/11
Licence Holder	South32 Worsley Alumina Pty Ltd
ACN	008 905 155
File Number	2011/005367
Premises	Boddington Bauxite Mine Pinjarra-Williams Road, Marradong WA 6390
	Legal description – Being Marradong and Saddleback Mining Operation as depicted in Schedule 1. As defined by the Premises maps attached to the Revised Licence.
Date of Report	22 February 2021
Proposed Decision	Revised licence granted

A/MANAGER WASTE INDUSTRIES REGULATORY SERVICES

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

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1. Decision summary

Licence L5960/1983/11 is held by South32 Worsley Alumina Pty Ltd (Licence Holder) for the Boddington Bauxite Mine (the Premises), located southwest of the Boddington town site.

This Amendment Report documents the assessment of potential risks to the environment and public health from proposed changes to the emissions and discharges during the operation of the Premises. As a result of this assessment, Revised Licence L5960/1983/11 has been granted.

The Revised Licence issued as a result of this amendment consolidates and supersedes the existing Licence previously granted in relation to the Premises. The Revised Licence has been granted in a new format with existing conditions being transferred, but not reassessed, to the new format.

2. Scope of assessment

2.1 Regulatory framework

In completing the assessment documented in this Amendment Report, the department has considered and given due regard to its Regulatory Framework and relevant policy documents which are available at https://dwer.wa.gov.au/regulatory-documents.

2.2 Amendment summary

On 24 April 2020, the Licence Holder submitted an application to the department to amend Licence L5960/1983/11 under section 59 and 59B of the *Environmental Protection Act 1986* (EP Act). The Licence Holder is proposing to amend the locations of the ambient air quality monitors within the premises to improve compliance with AS/NZS 3580.1.1. This proposal follows a review conducted by the Licence Holder that identified that monitoring locations AQ1, AQ2 and AQ5 are slightly impacted by vegetation growth adjacent to the monitors. The proposal includes moving the monitors to more suitable, but similarly located position.

No other changes to the throughput or Licence categories are proposed by the Licence Holder in the application.

2.3 Part IV of the EP Act

The amendment application was referred to EPA Services for comment on 29 July 2020, seeking advice as to whether the proposed amendment to dust monitoring locations related to the Part IV proposal currently with the EPA for assessment.

EPA Services provided advice that the application to amend the dust monitoring locations is considered to be related to the mining operations approved under the current licence, and as such, a determination on the amendment application is therefore not considered to be constrained by section 41 of the EP Act.

2.4 Consolidation of Licence

As part of this amendment package, the department has consolidated the Licence by incorporating changes made under the Amendment Notices as summarized in Table 1.

Instrument	Issued	Summary of approval
L5960/1983/11	25 September 2014	Licence granted

Table 1: Licences consolidated in this amendment

Instrument	Issued	Summary of approval					
L5960/1983/11	30 November 2017	Amendment Notice 1 to enable a change to a legal entity.					
L5960/1983/11	3 April 2019	Amendment Notice 2 to enable a change premises maps.					

The obligations of the Licence Holder have not changed in consolidating the Licence. The department has not undertaken any additional risk assessment of the Premises related to previous Amendment Notices.

In consolidating the Licence, the CEO has:

- updated the format and appearance of the Licence;
- deleted the redundant AACR form set out in schedule 1 of the previous Licence and advise the Licensee to obtain the form from the department's website; and
- revised Licence condition's numbers, and removed any redundant conditions and realigned condition numbers for numerical consistency.

The full consolidation of Licence conditions as they relate to this Revised Licence are detailed in Section 5.1. Previously issued Amendment Notices will remain on the department's website for future reference and will act as a record of the department's decision making.

2.5 Review of existing monitoring data

As part of a routine review of premises activities and monitoring data, DWER conducted an investigation into the outcomes of recent compliance inspections, data reported through annual reporting requirements (Annual Environment Report (AER)), as well as complaints received to the department regarding premises activities.

As part of the investigation, DWER requested available data from the Licence Holder concerning any quantitative analysis of dust composition conducted on dust samples obtained during ambient dust monitoring undertaken on the premises. The Licence Holder indicated that no dust composition sampling had been undertaken on any previous PM₁₀ samples, as the equipment being used (TEOM) is not filter based and therefore not suitable for the collection of bulk dust for analytical purposes.

In lieu of the dust composition sampling, the Licence Holder provided analytical results from previous sampling of ore geochemistry. This geochemistry data provides relevant data for the ore body and waste rock in general and provides an indication of the composition of the ore associated with the mining undertaken on the premises. It is DWERs view that the ore geochemistry data cannot be interpreted to be directly comparable to the composition of dust generated or emitted from the premises. Dust particles are likely to be comprised of a number of dust sources, and in various portions. Dust sources are related to both prescribed and non-prescribed activities occurring on the premises.

3. Emission sources, pathways and receptors

3.1 Emission sources

The key emission related to the amendment is dust. Fugitive dust within the Premises boundary is generated from 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. Dust is continuously monitored at monitoring stations located near the perimeter of the mining area.

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The Licence Holder is proposing to move dust monitoring location AQ1 from south of the Boddington Town site to south southwest of the town site and to temporarily remove monitor AQ5 as it is located in close proximity to AQ1. At its new location, the Licence Holder has advised that AQ1 will provide comparable data for ongoing trend analysis to be undertaken.

3.2 Pathways

As dust is the key emission related to the amendment, the prevailing wind directions and rainfall are considered. Predominantly east south-easterly and west to southwesterly winds. Long term data from Bureau of Meteorology shows an average of 525.8 mm rain, mainly occurring between May and September.

3.3 Receptors

The nearest sensitive receptors to the is located approximately 1,600 m to the southeast and 2,500 m to the west of the Marradong Primary Crusher with the closest sensitive receptors to the Marradong secondary crusher, Saddleback Primary Crusher and the Saddleback Secondary Crusher being approximately 3,400 m to the west and 3,200 m to the northeast. The nearest sensitive receptors to the conveyors that transfer ore between the crushers are located approximately 750 m and 1,000 m to the west. As dust is considered to be the key emission source for the proposed amendment, the sampling parameters and location of monitoring points will been assessed to ensure that they are appropriate for the surrounding sensitive receptors.

3.4 Controls

Although dust emissions from premises operations include regulated emissions and emissions that are generally regulated by other regulatory authorities (including Department of Mines Industry Regulation and Safety and the Environmental Protection Authority), historical versions of the licence have had regard to dust controls relating to emissions from various sources. Table 2 below details the applicants control measures implemented across the entire mining operation used to assist in mitigating dust emissions, where necessary.

Source	Pathway	Controls
Mine planning	N/A	South 32 Worsley incorporates dust minimisation into its mine planning and development procedures by minimising the time between clearing and rehabilitation. The mine planning process also makes an assessment of sensitive premises and public utilities that may be susceptible to dust emissions.
Drilling and blasting	Air/windborne pathway	Dust generated from drilling is minimised by wetting when required. Any dust emissions are localised to the immediate drilling area.
		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 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.

Table 2: Proposed applicant co

Source	Pathway	Controls
Mine operation and haulage	Air/windborne pathway	Ensuring active haulage routes are wetted by dedicated water tankers during periods when dust lift off is likely. This wetting is typically reduced during periods of rainfall and low evaporation.
		Utilising dust suppressants other than water, in order to minimise dust creation in high risk areas (e.g. by binding the road surface together to minimise dust creation and lift- off).
Stockpiles and open areas	Air/windborne pathway	In addition to maintaining wetted surfaces within active mining areas, these surfaces are wetted using water trucks during periods where unfavourable weather conditions could pose a high dust emission risk.
		Worsley proactively rehabilitates all areas disturbed by mining operations as soon as practicable following mining.
Processing and crushing	Air/windborne pathway	Mined bauxite is transported to primary and secondary crushing facilities and, following crushing, is stockpiled over a hopper which feeds the overland conveyor (for transport to the refinery). Water sprays are fitted at the crushing stations and the reclaim stockpile to wet the ore and reduce dust. The Marradong two-stage primary crusher is located in an excavated pit approximately 27 m deep to help minimise dust emissions with dust collectors located at transfer points.

The delegated officer notes that while these controls relate to both the wider premise operations and prescribed activities, the controls implemented are likely to influence the nature of emissions that are regulated by the licence. DWER recognise that monitoring controls included prescribed on the licence are designed to monitor emissions from and non-prescribed activities and as such data obtained from the two emission sources cannot currently be separated for the purposes of interpretation in the risk assessment.

3.5 Risk assessment

Risk ratings have been assessed in accordance with the *Guidance Statement: Risk Assessments* (DER 2017) for each identified emission source and takes into account potential source-pathway and receptor linkages. Where linkages are incomplete they have not been considered further in the risk assessment.

Where the applicant has proposed mitigation measures/controls (as detailed in Table 2), these have been considered where relevant, when determining the final risk rating. Where the Delegated Officer considers the applicant's proposed controls to be critical to maintaining an acceptable level of risk, these will be incorporated into the Licence as regulatory controls.

Additional regulatory controls may be imposed where the applicant's controls are not deemed sufficient. Where this is the case the need for additional controls will be documented and justified in Table 3.

The conditions in the issued Licence, as outlined in Table 3 have been determined in accordance with *Guidance Statement: Setting Conditions* (DER 2015).

Table 3: Risk assessment table

Risk Event					Risk rating ¹	Applicant	Conditions ²	
Source/Activities	Potential emission	Potential pathways and impact	Receptors	Applicant controls	C = consequence L = likelihood	sufficient?	of Licence	Justification for additional regulatory controls
 Dust generated by: crushing and materials handling transfer of ore into crushers, reclaim stockpile; and loading of crushed material onto the overland conveyors 	Dust	Air/windborne pathway causing impacts to health and amenity	Refer to Section 3.43	Refer to Section 3.4	C = Moderate L = Possible Medium Risk	Ν	Condition 9 Condition 10 Condition 18	The proposal to change the locations of the ambient air quality monitors is not considered to significantly impact the ongoing monitoring of potential dust impacts from premises operations, including those from the prescribed activities. The Delegated Officer notes that the proposed changes are required to improve siting location issues and will likely improve the quality of data obtained. The review conducted by the department determined that ambient dust monitoring data obtained from the adjusted locations will continue to provide valid and relevant data to monitor qualitative dust emissions from premises operations. The Delegated Officer also notes that the existing licence does not include the monitoring of relevant meteorological data. Continuous meteorological monitoring data is required to support the ambient air monitoring data analysis, to facilitate and assist in the identification of dust sources and to understand those meteorological conditions that are likely to result in increased dust impacts to receptors. The Delegated Officer has therefore included the requirement to monitor for meteorological conditions within the ambient monitoring network. The Delegated Officer also notes that the review of dust emission monitoring data, as presented in section 2.5, found that a gap exists in the currently monitored air emissions from the prescribed activities. Specifically, the current monitoring undertaken does not include any quantitative measure of dust composition. Given this data gap, identified in the review of monitoring data, a lack of baseline dust composition data, and the information obtained from ore geochemistry sampling, the Delegated Officer considers there is currently insufficient data available to comprehensively characterise

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				potential consequences associated with dust emissions from the ore processing activities on the premises.
				The Delegated Officer therefore considers it necessary that a sampling and analysis plan is developed that specifically considers dust composition from the crushing of ore and associated activities, relevant to the identified sensitive receptors. Advice from the department's air quality branch notes that a one in six day, 3 month sampling regime is considered to be sufficient to establish a baseline dataset, and can be used to inform future dust emission risk assessments. It is noted that the applicant may propose an alternative approach to monitoring, but this must be justified on a risk basis.
				The Delegated Officer considers that analysis of the dust composition is an important consideration in the assessment of potential impacts related dust and particulate emissions. The Delegated Officer also considers that the sampling and analysis plan provides the appropriate mechanism for the Licence Holder to develop a site specific dust composition monitoring programme. DWER's findings for both the premise operations and prescribed activities will be compiled and communicated to relevant regulatory authorities for further consideration.
				Conditions have been included within the amended licence that require the Licence Holder to develop and implement a sampling and analysis plan to better inform the risk assessment associated with dust emissions from the premises.

Note 1: Consequence ratings, likelihood ratings and risk descriptions are detailed in the Guidance Statement: Risk Assessments (DER 2017).

Note 2: Proposed applicant controls are depicted by standard text. **Bold and underline text** depicts additional regulatory controls imposed by department.

4. Consultation

Table 4 provides a summary of the consultation undertaken by the department.

Table 4: Consultation

Consultation method	Comments received	Department response
Licence Holder was provided with draft amendment on 22/12/2020	Need to provide flexibility to allow the use of e-samplers where required due to access to mains power and during periods of maintenance.	Change made to Table 5 to allow the use of e-samplers where required.
	Location of the weather station is yet to be confirmed. South32 will send a location m ap upon determination of the weather station site.	Updates to Table 5 and Figure 3 upon receipt of the weather station siting map.
	Confirmation of timing for compliance with Condition 10.	Condition 10 updated to reflect the proposed timeframes.

5. Conclusion

Based on the assessment in this Amendment Report, the Delegated Officer has determined that a Revised Licence will be granted, subject to conditions commensurate with the determined controls and necessary for administration and reporting requirements.

5.1 Summary of amendments

Table 5 provides a summary of the proposed amendments and will act as record of implemented changes. All proposed changes have been incorporated into the Revised Licence as part of the amendment process.

Condition no.	Proposed amendments
Condition 9 Table 5	Addition to include meteorological monitoring. Inclusion of new dust monitoring locations. Inclusion of dust composition monitoring requirements.
Condition 10	Development of a dust composition sampling and analysis plan. Dust composition monitoring.
Condition 18	Dust composition reporting.

Table 6 provides a summary of the proposed amendments and will act as record of implemented changes. All proposed changes have been incorporated into the Revised Licence as part of the amendment process.

Existing condition	Condition summary	Revised Licence condition	Conversion notes
1.1.1 1.1.2	Interpretation and definitions	Definitions in Table 10	Redundant condition. Revised to current licensing format.
1.1.3 1.1.4	Australian or other standard	Definitions in Table 10	Redundant condition. Revised to current licensing format.
1.2.1	Emissions	Condition 1 and Table 2	Redundant condition. Revised to current licensing format.
1.2.2	Pollution control and monitoring equipment	N/A	Redundant condition. Adequately covered by alternative existing conditions. Deleted from Licence.
1.2.3	Storage of environmentally hazardous materials	N/A	Redundant condition. Adequately regulated by the Dangerous Goods Safety Act 2004. Deleted from Licence.
1.2.4	Recovery and removal of spills	N/A	Redundant condition. Adequately covered by EP (Unauthorised Discharges) Regulations 2004. Deleted from Licence.
1.2.5	Prevention of contamination and containment of contaminated stormwater	N/A	Redundant condition. Adequately covered by alternative existing conditions and proposed new conditions. Deleted from Licence.
1.3.1 Table 1.3.1	Containment infrastructure	Condition 1 Table 2	Revised to current licensing format.
2.1.1	Record and investigate exceedances of limits or targets	N/A	Redundant condition. Deleted from Licence.
2.2.1 Table 2.2.1	Emissions	Condition 2 and Condition 3	New numbering and update to wording format.
2.3	Emissions to surface water	N/A	Redundant condition. Adequately covered by s.49 of the EP Act 1986. Deleted from Licence.

Table 6: Consolidation of Licence conditions in this amendment

Existing condition	Condition summary	Revised Licence condition	Conversion notes
2.4	Emissions to groundwater	N/A	Redundant condition. Adequately covered by s.49 of the EP Act 1986. Deleted from Licence.
2.5	Emissions to land	N/A	Redundant condition. Adequately covered by s.49 of the EP Act 1986. Deleted from Licence.
2.6.1	Fugitive emissions	Condition 3	New numbering
2.7	Odour emissions	N/A	Redundant condition. Adequately covered by s.49 of the EP Act 1986. Deleted from Licence.
2.8	Noise emissions	N/A	Redundant condition. Adequately covered by s.49 of the EP Act 1986. Deleted from Licence.
3.1.1 3.1.2 3.1.3 3.1.4 3.1.5	General monitoring	Condition 4 – Condition 7	New numbering
3.2 3.3 3.4	Monitoring of point sources	N/A	Redundant condition. Deleted from Licence.
3.6.1 Table 3.6.1	Monitoring of inputs and outputs	Condition 8 Table 4	New numbering and update to wording format
3.7	Process monitoring	N/A	Redundant condition. Deleted from Licence.
3.8.1 Table 3.8.1	Air quality monitoring	Condition 9 Table 5	New numbering and update to wording format. Additional sampling and analysis included
3.8.2	Air quality monitoring siting	Condition 9 Table 5	Moved to air quality monitoring table.
Table 3.8.2	Groundwater monitoring	Condition 11 Table 6	New numbering and update to wording format.

Existing condition	Condition summary	Revised Licence condition	Conversion notes
Table 3.8.3	Noise monitoring	Condition 12 Table 7	New numbering and update to wording format.
3.9	Meteorological monitoring	Condition 9 Table 5	Addition to include meteorological monitoring.
4	Improvements	N/A	Redundant condition. Deleted from Licence.
5.1.1	Records	Condition 15 and Condition 16	New numbering and update to wording format
5.1.2	Licence awareness	N/A	Redundant condition. Deleted from Licence.
5.1.3	Annual Audit Compliance Report	Condition 14	New numbering and update to wording format
5.1.4	Complaints management	Condition 13	New numbering and update to wording format
5.2.1 Table 5.2.1	Annual Environmental Report	Condition 17 Table 8	New numbering
5.3.1	Notification requirements	Condition 19 Table 9	New numbering
Schedule 1: Maps	Premises map	Schedule 1: Maps	New naming convention, no change to maps
Schedule 2 Reporting & notifications	Annual Audit Compliance Report	N/A	Redundant attachment. Deleted from Licence Forms accessed at www.dwer.wa.gov.au
Schedule 2 Reporting & notifications	Form WR1	N/A	Redundant attachment. Deleted from Licence
Schedule 2 Reporting & notifications	Form ET1	Condition 20	New numbering and update to wording format
Schedule 2 Reporting & notifications	Form N1 Notification	Schedule 2: Forms	New numbering and update to wording format

Appendix 1: Key documents

Document title	In text ref	Availability	
L5960/1983/11	L5960/1983/11	Accessed at www.dwer.wa.gov.au	
Licence amendment application and supporting documentation	N/A	DWER records (A1887848)	
Change to Air Monitoring Locations - Post Validation	N/A	DWER records (A1901037)	
DER, July 2015. Guidance Statement: Regulatory principles. Department of Environment Regulation, Perth.	DER 2015a		
DER, October 2015. Guidance Statement: Setting conditions. Department of Environment Regulation, Perth.	DER 2015b		
DER, November 2016. Guidance Statement: Environmental Siting. Department of Environment Regulation, Perth.	DER 2016	Accessed at www.dwer.wa.gov.au	
DER, February 2017. Guidance Statement: Risk Assessments. Department of Environment Regulation, Perth.	DER 2017		
DWER, June 2019. Guidance Statement: Decision Making. Department of Water and Environmental Regulation, Perth.	DER 2019		

Appendix 2: Application validation summary

SECTION 1: APPLICATION SUMMARY (as updated from validation checklist)								
Application type								
Amendment to Licence		\boxtimes	Current Licence number:	Lt	_5960/1983/11			
			Relevant works approval number:			N/A		
Date application received			24/04/2020		i			
Applicant and Premises details								
Applicant name/s (full legal name/s)			South32 Worsley Alumina Pty Ltd					
Premises name			Boddington Bauxite Mine					
Premises location			Being Marradong and Saddleback Mining Operation					
Local Government Authority			Shire of Boddington)				
Application documents								
HPCM file reference number:			2011/005367					
Key application documents (additional application form):	to		Supplementary information document					
Scope of application/assessment								
Summary of proposed activities or changes to existing operations.			proposed amendment to dust monitoring locations					
Category number/s (activities that cause the premises to become prescribed premises)								
Prescribed premises categories					T			
Prescribed premises category and description	ry and Assessed capacity		I production or design		Proposed changes to the production or design capacity			
Category 5			0 tonnes per annual		No changes proposed			
Processing or beneficiation of metallic or non-metallic ore: premises on which —	period							
(a) Metallic or non-metallic ore is crushed, ground, milled or otherwise processed;	hed, ground, milled or							
(b) Tailings from metallic or non- metallic ore are reprocessed; or								
(c) Tailings or residue from metallic or non-metallic ore are discharged into a containment cell or dam.								
Legislative context and other approvals								
Has the applicant referred, or do they intend to refer, their proposal to the E under Part IV of the EP Act as a significant proposal?	the EPA		□ No ⊠		Managed under Part V \boxtimes Assessed under Part IV \square			

Does the applicant hold any existing Part IV Ministerial Statements relevant to the application?	Yes 🛛 No 🗆	Ministerial statement No: 719 EPA Report No:
Has the proposal been referred and/or assessed under the EPBC Act?	Yes □ No ⊠	Reference No:
Has the applicant demonstrated occupancy (proof of occupier status)?	Yes 🛛 No 🗆	Mining lease / tenement ⊠
Has the applicant obtained all relevant planning approvals?	Yes 🛛 No 🗆 N/A 🗆	N/A
Has the applicant applied for, or have an existing EP Act clearing permit in relation to this proposal?	Yes □ No ⊠	No clearing is proposed.
Has the applicant applied for, or have an existing CAWS Act clearing Licence in relation to this proposal?	Yes □ No ⊠	No clearing is proposed.
Has the applicant applied for, or have an existing RIWI Act Licence or permit in relation to this proposal?	Yes □ No ⊠	Licence / permit not required.
Does the proposal involve a discharge of waste into a designated area (as defined in section 57 of the EP Act)?	Yes 🗆 No 🖂	Name: N/A
Is the Premises situated in a Public Drinking Water Source Area (PDWSA)?	Yes □ No ⊠	Name: N/A Priority: N/A
Is the Premises subject to any other Acts or subsidiary regulations (e.g. <i>Dangerous</i> <i>Goods Safety Act 2004, Environmental</i> <i>Protection (Controlled Waste) Regulations</i> <i>2004, State Agreement Act xxxx</i>)	Yes 🛛 No 🗆	Alumina Refinery (Worsley) Agreement Act 1973 Dangerous Goods Safety Act 2004
Is the Premises within an Environmental Protection Policy (EPP) Area?	Yes 🗆 No 🖂	N/A
Is the Premises subject to any EPP requirements?	Yes 🗆 No 🖂	N/A
Is the Premises a known or suspected contaminated site under the <i>Contaminated Sites Act 2003</i> ?	Yes ⊠ No □	Classification: There are two areas within the prescribed premises boundary that as classified as possibly contaminated - investigation required Date of classification: January 2007
		Date of classification. Janualy 2007