



<b>Licence number</b>	L5960/1983/11
<b>Licence holder</b>	South32 Worsley Alumina Pty Ltd
<b>ACN</b>	008 905 155
<b>Registered business address</b>	Gastaldo Road, Allanson WA 6225
<b>DWER file number</b>	2011/005367
<b>Duration</b>	25/09/2014 to 30/09/2035
<b>Date of amendment</b>	03/03/2023
<b>Premises details</b>	Boddington Bauxite Mine Pinjarra-Williams Road, Marradong WA 6390 Legal description - Being Marradong and Saddleback Mining Operation as depicted in Schedule 1.

<b>Prescribed premises category description (Schedule 1, <i>Environmental Protection Regulations 1987</i>)</b>	<b>Assessed production / design capacity</b>
Category 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  (c) tailings or residue from metallic or non-metallic ore are discharged into a containment cell or dam.	18,800,000 tonnes per annual period

This licence is granted to the licence holder, subject to the attached conditions, on 03 March 2023, by:

A/Manager, Resource Industries  
Regulatory Services  
an officer delegated under section 20 of the *Environmental Protection Act 1986* (WA)

## Licence history

The licences and works approvals issued for the Premises since 1997 are shown in Table 1 below:

Date	Reference number	Summary of changes
1/10/2000	L5960/1983/3	Licence granted.
1/10/2001	L5960/1983/4	Licence re-issue
1/10/2002	L5960/1983/5	Licence re-issue
1/10/2003	L5960/1983/6	Licence re-issue
1/10/2004	L5960/1983/7	Licence re-issue
1/10/2005	L5960/1983/8	Licence re-issue
1/10/2008	L5960/1983/9	Licence re-issue
1/10/2011	L5960/1983/10	Licence re-issue
9/02/2012	L5960/1983/10	Licence amendment to amend premises boundary and amend reference to Oil Water Separation Unit
25/09/2014	L5960/1983/11	Licence re-issue, licence amendment following Licensee amendment application and REFIRE conversion
11/06/2015	L5960/1983/11	Licence amendment to change dust conditions
30/11/2017	L5960/1983/11	Amendment Notice to change the legal entity of the Licence Holders.
3/04/2019	L5960/1983/11	Amendment Notice to change premises maps
22/02/2021	L5960/1983/11	Licence amendment to change ambient dust monitoring conditions and consolidate amendment notices.
03/03/2023	L5960/1983/11	Licence amendment to change location of ambient dust monitor AQ4.

## Interpretation

In this licence:

- (a) the words 'including', 'includes' and 'include' in conditions mean "including but not limited to", and similar, as appropriate;
- (b) where any word or phrase is given a defined meaning, any other part of speech or other grammatical form of that word or phrase has a corresponding meaning;
- (c) where tables are used in a condition, each row in a table constitutes a separate condition;
- (d) any reference to an Australian or other standard, guideline, or code of practice in this licence:
  - (i) if dated, refers to that particular version; and
  - (ii) if not dated, refers to the latest version and therefore may be subject to change over time;
- (e) unless specified otherwise, any reference to a section of an Act refers to that section of the EP Act; and
- (f) unless specified otherwise, all definitions are in accordance with the EP Act.

**NOTE:** This licence requires specific conditions to be met but does not provide any implied authorisation for other emissions, discharges, or activities not specified in this licence.

## Licence conditions

The licence holder must ensure that the following conditions are complied with:

### Infrastructure and equipment

1. The licence holder must ensure that the site infrastructure and equipment listed in Table 1 and located at the corresponding infrastructure location is maintained and operated in accordance with the corresponding operational requirement set out in Table 1.

**Table 1: Infrastructure and equipment requirements**

Site infrastructure and equipment	Material	Operational requirements
Karafil Dam	Treated wastewater and groundwater	Maintain integrity of HDPE liner with a permeability of $<10^{-9}$ m/s or equivalent. Minimum vertical freeboard of 300mm
Marradong maintenance facilities' evaporation pond	Treated wastewater and runoff	Maintain integrity of HDPE liner with a permeability of $<10^{-9}$ m/s or equivalent. Minimum vertical freeboard of 300mm

### Emissions and discharges

2. The licence holder must ensure that where waste is emitted to air from the emission points in Table 2 and identified on the map of emission points in Figure 2 of Schedule 1 it is done so in accordance with the conditions of this Licence.

**Table 2: Emission points**

Emission Point		Source, including any abatement
A1	Marradong Primary Crusher	Second stage of Marradong Primary Crusher via bag filters
A2	Marradong Secondary Crusher	Marradong Secondary Crusher via bag filters
A3	Saddleback Primary Crusher	Saddleback Primary Crusher via bag house in front of the discharge conveyor
A4	Saddleback Secondary Crusher	Saddleback Secondary Crusher via bag house in front of the discharge conveyor

3. The licence holder must use all reasonable and practical measures to prevent, and where that is not practicable, to minimise dust emissions from the Premises.

## Monitoring

### General monitoring

4. The licence holder must 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 surface water sampling is conducted in accordance with AS/NZS 5667.4 or AS/NZS 5667.6 as relevant;

- (d) all groundwater sampling is conducted in accordance with AS/NZS 5667.11;
  - (e) all ambient air monitoring data collected must be validated in accordance with AS/NZS 3580.19
  - (f) all laboratory samples are submitted to and tested by a laboratory with current NATA accreditation for the parameters being measured.
  - (g) monthly monitoring is undertaken at least 15 days apart; and
  - (h) six monthly monitoring is undertaken at least 5 months apart.
5. The licence holder must record production or throughput data and any other process parameters relevant to any non-continuous or CEMS monitoring undertaken.
  6. The licence holder must 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.
  7. The licence holder must, 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.

### Inputs and outputs

8. The licence holder must undertake the monitoring in Table 3 according to the specifications in that table.

**Table 3: Monitoring of inputs and outputs**

Output	Location	Parameter	Units	Averaging period	Frequency
Treated hydrocarbon contaminated wastewater	Karafil Dam	pH	-	Spot sample	Monthly
		Total dissolved solids	mg/L		
		Total recoverable hydrocarbons			
		Total Chromium			
		Copper			
		Zinc			
	Post Oil/Water Separation Unit	pH	-	Spot sample (if available)	Monthly
		Total dissolved solids	mg/L		
		Total recoverable hydrocarbons			
		Total Chromium			
		Copper			
		Zinc			

### Ambient air quality monitoring

9. The licence holder must undertake the monitoring in Table 4 according to the specifications in that table. The licence holder shall record and investigate results that do not meet any target specified.

**Table 4: Ambient air quality monitoring**

Monitoring Point reference and location	Parameter	Target	Averaging Period	Frequency	Siting	Method
AQ1 - Must be located in the approximate location of AQ1 as shown in Figure 3	PM <sub>10</sub>	50 µg/m <sup>3</sup>	24 hours	Continuous	AS/NZS 3580.1.1	AS/NZS 3580.9.8 or e-samplers when required <sup>1</sup>
AQ2 - Must be located in the approximate location of AQ2 as shown in Figure 3	PM <sub>10</sub>	50 µg/m <sup>3</sup>	24 hours	Continuous	AS/NZS 3580.1.1	AS/NZS 3580.9.8 or e-samplers
AQ3 - Must be located in the approximate location of AQ3 as shown in Figure 3	PM <sub>10</sub>	50 µg/m <sup>3</sup>	24 hours	Continuous	AS/NZS 3580.1.1	AS/NZS 3580.9.8 or e-samplers
AQ4 – Must be located in the approximate location of AQ4 as shown in Figure 3	PM <sub>10</sub>	50µg/m <sup>3</sup>	24 hours	Continuous	AS/NZS 3580.1.1	AS/NZS 3580.9.8 or AS/NZS 3580.9.11 or e-samplers when required <sup>1</sup>
Weather Station - Must be located in the approximate location of WS1 as shown in Figure 3	Wind direction: Degrees from true North (°)	N/A	Hourly	Continuous	AS/NZS 3580.1.1	AS/NZS 3580.14
	Wind speed: Meters/second (m/s)					
	Air temperature: Degrees Celsius (°C)					
	Air pressure: Hectopascals (hPa)					
	Humidity: Percent (%)					
	Precipitation: Millimetres (mm)					

Note: All units are referenced to STP

Note 1: When required during short-term periods of maintenance of the AS/NZS 3580.9.8 or AS/NZS 3580.9.11 compliant monitor only

### Groundwater quality monitoring

10. The licence holder must undertake the monitoring in Table 5 according to the specifications in that table.

**Table 5: Ambient groundwater quality monitoring**

Monitoring Point reference and location	Parameter	Averaging Period	Units	Frequency
HMB01/03 HMB02/03	Total recoverable hydrocarbons	Spot sample	mg/L	Six monthly

### Noise quality monitoring

11. The licence holder must undertake the monitoring in Table 6 according to the specifications in that table. The licence holder shall record and investigate results that do not meet any target specified. Where an air blast has not been detected, a 'below detection limit' shall be recorded.

**Table 6: Ambient noise quality monitoring**

Monitoring Point reference and location	Parameter	Units	Frequency
NQ1 - NQ63 (as indicated within Schedule 1, Figure 4)	Air-blast over-pressure	dB(lin)	Each blast event

### Records and reporting

12. The licence holder must record the following information in relation to complaints received by the licence holder (whether received directly from a complainant or forwarded to them by the Department or another party) about any alleged emissions from the premises:
- the name and contact details of the complainant, (if provided);
  - the time and date of the complaint;
  - the complete details of the complaint and any other concerns or other issues raised; and
  - the complete details and dates of any action taken by the licence holder to investigate or respond to any complaint.
13. The licence holder must:
- undertake an audit of their compliance with the conditions of this licence during the preceding annual period; and
  - prepare and submit to the CEO by no later than 90 days after the end of that annual period an Annual Audit Compliance Report in the approved form.
14. The licence holder must maintain accurate and auditable books including the following records, information, reports, and data required by this licence:
- the calculation of fees payable in respect of this licence;
  - any maintenance of infrastructure that is performed in the course of complying with the conditions of this licence;

- (c) monitoring programmes undertaken in accordance with conditions 5 - 11 of this licence; and
  - (d) complaints received under condition 12 of this licence.
- 15.** The books specified under condition 14 must:
- (a) be legible;
  - (b) if amended, be amended in such a way that the original version(s) and any subsequent amendments remain legible and are capable of retrieval;
  - (c) except for records listed in condition 15(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
  - (d) records corresponding to off-site environmental effects and matters which affect the condition of the land or waters must be retained until the expiry of the Licence and any subsequent licence; and
  - (e) be available to be produced to an inspector or the CEO as required.
- 16.** The licence holder must submit to the CEO by no later than 90 days after the end of each annual period, an Annual Environmental Report for that annual period for the conditions listed in Table 8, and which provides information in accordance with the corresponding requirement set out in Table 8.

**Table 8: Annual Environmental Report**

Condition	Requirement
5	Summary of any relevant process, production or operational data.
8	Monitoring of inputs and outputs. The sampling method used and sampling date and time must also be reported.
9	Summary of ambient air monitoring results and a statement of method conformance outlined in section 3.2 of AS 3589.19.2020 noting any non-conformances with the standard
10	Summary of ambient groundwater monitoring results. The sampling method used and sampling date and time must also be reported.
11	Summary of ambient noise quality monitoring results.
12	Complaints summary.
13	Compliance with the conditions of this licence.
N/A	an assessment of the information contained within the report against previous monitoring results and Licence limits and/or targets.
N/A	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.

## Notification

### General monitoring

- 17.** The licence holder must ensure that the parameters listed in Table 9 are notified to the CEO in accordance with the notification requirements as set out in Table 9.



**Table 9: Notifications**

Condition	Parameter	Notification requirement <sup>1</sup>
7	Calibration report	As soon as practicable
9	Exceedances of PM <sub>10</sub> targets	As soon as practicable, if the investigation determines that the target exceedance is due to the activities on the premises.
11	Air-blast over-pressure exceedance according to the <i>Environmental Protection (Noise) Regulations 1997</i>	Within 7 days of the recording, submit a report to the CEO outlining the reasons for the exceedance and, where applicable, corrective action to be taken to ensure that future blasts do not cause exceedances.
N/A	Any failure or malfunction of any pollution control equipment or any incident, which has caused, is causing or may cause pollution	Submit N1 Form as attached in Schedule 2. Part A: As soon as practicable but no later than 5pm of the next usual working day. Part B: As soon as practicable

Note 1: Notification requirements in the Licence shall not negate the requirement to comply with Section 72 of the EP Act.

- 18.** The licence holder must ensure that the investigation of any target PM<sub>10</sub> exceedances listed in Condition 9, and reported as per Condition 17 must include, but is not limited to:
- (a) meteorological details: temperature, wind speed and wind direction, humidity at the time of the exceedance;
  - (b) any site operational activities that may have contributed to the exceedance;
  - (c) any detail on the ore body mined at the time of exceedance;
  - (d) any dust suppression activities utilised at the time of exceedance (or failures of dust suppression equipment);
  - (e) any complaints received that may have been caused or associated with the exceedance;
  - (f) the root cause analysis for the exceedance; and
  - (g) a description of remedial measures taken or planned to be taken, including those taken to prevent recurrence of the exceedances.

## Specified Actions

- 19.** The licence holder shall complete;
- (a) the action reference specified in Column 1,
  - (b) for the specific actions specified in Column 2, and
  - (c) by the date of completion in Column 3,
- of Table 7.

**Table 7: Specified Actions**

Action	Specified Action	Date of Completion
1	<p>The licence holder must replace the ambient air monitor located at the AQ4 location depicted in Figure 3 with an ambient air monitor that's method complies with either:</p> <p>(a) AS/NZS 3580.9.11 <i>Methods for sampling and analysis of ambient air Determination of suspended particulate matter - PM 10 beta attenuation monitors</i> or;</p> <p>(b) AS/NZS 3580.9.7 <i>Methods for sampling and analysis of ambient air Determination of suspended particulate matter - PM10 continuous direct mass method using a tapered element oscillating microbalance analyser.</i></p>	31 <sup>st</sup> November 2023

- 20.** The licence holder must within 30 calendar days of an item equipment required by condition 19 being installed:
- (a) undertake an audit of their compliance with the requirements of condition 19; and
  - (b) prepare and submit to the CEO a Compliance Report on that compliance.
- 21.** The Compliance Report required by condition 20, must include as a minimum the following:
- (a) certification by an air quality professional that the infrastructure, as specified in condition 19, has been constructed in accordance with the relevant requirements specified in condition 19;
  - (b) as constructed plans or photographic evidence of the infrastructure specified in condition 19; and
  - (c) be signed by a person authorised to represent the works approval holder and contains the printed name and position of that person.

## Definitions

In this licence, the terms in Table 10 have the meanings defined.

**Table 10: Definitions**

Term	Definition
ACN	Australian Company Number
Air Quality Professional	Means a person who: a) Holds a Bachelor of Science qualification, or an Air Quality Science-related tertiary level qualification; and b) Has a minimum of at least 3 years experience working in the field of air quality monitoring and assessment; or is otherwise approved by the CEO to act in this capacity.
Annual Audit Compliance Report (AACR)	means a report submitted in a format approved by the CEO (relevant guidelines and templates may be available on the Department's website).
annual period	a 12 month period commencing from 1 July until 30 June of the immediately following year.
approved form	the AACR Form template approved by the CEO for use and available via DWER's external website
AS/NZS 3580.1.1	means the Australian Standard AS/NZS 3580.1.1 <i>Methods for sampling and analysis of ambient air— Guide to siting air monitoring equipment.</i>
AS/NZS 3580.9.8	means the Australian Standard AS/NZS 3580.9.7 <i>Methods for sampling and analysis of ambient air Determination of suspended particulate matter - PM10 continuous direct mass method using a tapered element oscillating microbalance analyser</i>
AS/NZS 3580.9.11	Means the Australian Standard AS/NZS 3580.9.11 <i>Methods for sampling and analysis of ambient air Determination of suspended particulate matter - PM 10 beta attenuation monitors</i>
AS/NZS 3580.14	means the Australian Standard AS/NZS 3580.14 <i>Methods for sampling and analysis of ambient air Meteorological monitoring for ambient air quality monitoring applications</i>
AS/NZS 3580.19	means the Australian Standard AS/NZS 3580.14 <i>Methods for sampling and analysis of ambient air Method 19: Ambient air quality data validation and reporting</i>
AS/NZS 5667.1	means the Australian Standard AS/NZS 5667.1 <i>Water Quality — Sampling — Guidance of the Design of sampling programs, sampling techniques and the preservation and handling of samples.</i>
AS/NZS 5667.4	means the Australian Standard AS/NZS 5667.4 <i>Water Quality— Sampling — Guidance on sampling from lakes, natural and man-made.</i>

Term	Definition
AS/NZS 5667.6	means the Australian Standard AS/NZS 5667.6 <i>Water Quality—Sampling— Guidance on sampling of rivers and streams</i> .
AS/NZS 5667.10	means the Australian Standard AS/NZS 5667.10 <i>Water Quality—Sampling— Guidance on sampling of waste waters</i> .
AS/NZS 5667.11	means the Australian Standard AS/NZS 5667.11 <i>Water Quality—Sampling— Guidance on sampling of groundwaters</i> .
averaging period	means the time over which a limit or target is measured, or a monitoring result is obtained.
books	has the same meaning given to that term under the EP Act.
CEO	means Chief Executive Officer of the Department. “submit to / notify the CEO” (or similar), means either: Director General Department administering the <i>Environmental Protection Act 1986</i> Locked Bag 10 Joondalup DC WA 6919 or: <a href="mailto:info@dwer.wa.gov.au">info@dwer.wa.gov.au</a>
controlled waste	has the definition in <i>Environmental Protection (Controlled Waste) Regulations 2004</i> .
dangerous goods	has the meaning defined in the <i>Dangerous Goods Safety (Storage and Handling of Non-explosives) Regulations 2007</i> .
department	means the department established under section 35 of the <i>Public Sector Management Act 1994</i> (WA) and designated as responsible for the administration of the EP Act, which includes Part V Division 3.
discharge	has the same meaning given to that term under the EP Act.
emission	has the same meaning given to that term under the EP Act.
environmentally hazardous material	means material (either solid or liquid raw materials, materials in the process of manufacture, manufactured products, products used in the manufacturing process, by-products and waste) which if discharged into the environment from or within the premises may cause pollution or environmental harm. Note: environmentally hazardous materials include dangerous goods where they are stored in quantities below placard quantities. The storage of dangerous goods above placard quantities is regulated by the Department of Mines and Petroleum.
EP Act	<i>Environmental Protection Act 1986</i> (WA)
EP Regulations	<i>Environmental Protection Regulations 1987</i> (WA)
freeboard	means the distance between the maximum water surface elevations and the top of retaining banks or structures at their lowest point.

Term	Definition
fugitive emissions	means all emissions not arising from point sources identified in Condition 2.
licence	refers to this document, which evidences the grant of a licence by the CEO under section 57 of the EP Act, subject to the specified conditions contained within.
licence holder	refers to the occupier of the premises, being the person specified on the front of the licence as the person to whom this licence has been granted.
monthly period	means a one-month period commencing from the first day of a month until the last day of the month.
NATA	means the National Association of Testing Authorities, Australia.
NATA accreditation	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.
Oil Water Separation Unit	means equipment designed to separate hydrocarbons from water.
PM <sub>10</sub>	means particles with an equivalent aerodynamic diameter of less than 10µm
premises	refers to the premises to which this licence applies, as specified at the front of this licence and as shown on the premises map (Figure 1) in Schedule 1 to this licence.
prescribed premises	has the same meaning given to that term under the EP Act.
six monthly	means the 2 inclusive periods from 1 April to 30 September and 1 October to 31 March in the following year.
spot sample	means a discrete sample representative at the time and plan at which the sample is taken.
STP	standard temperature and pressure (0°C and 1 atmosphere of pressure)
waste	has the same meaning given to that term under the EP Act.

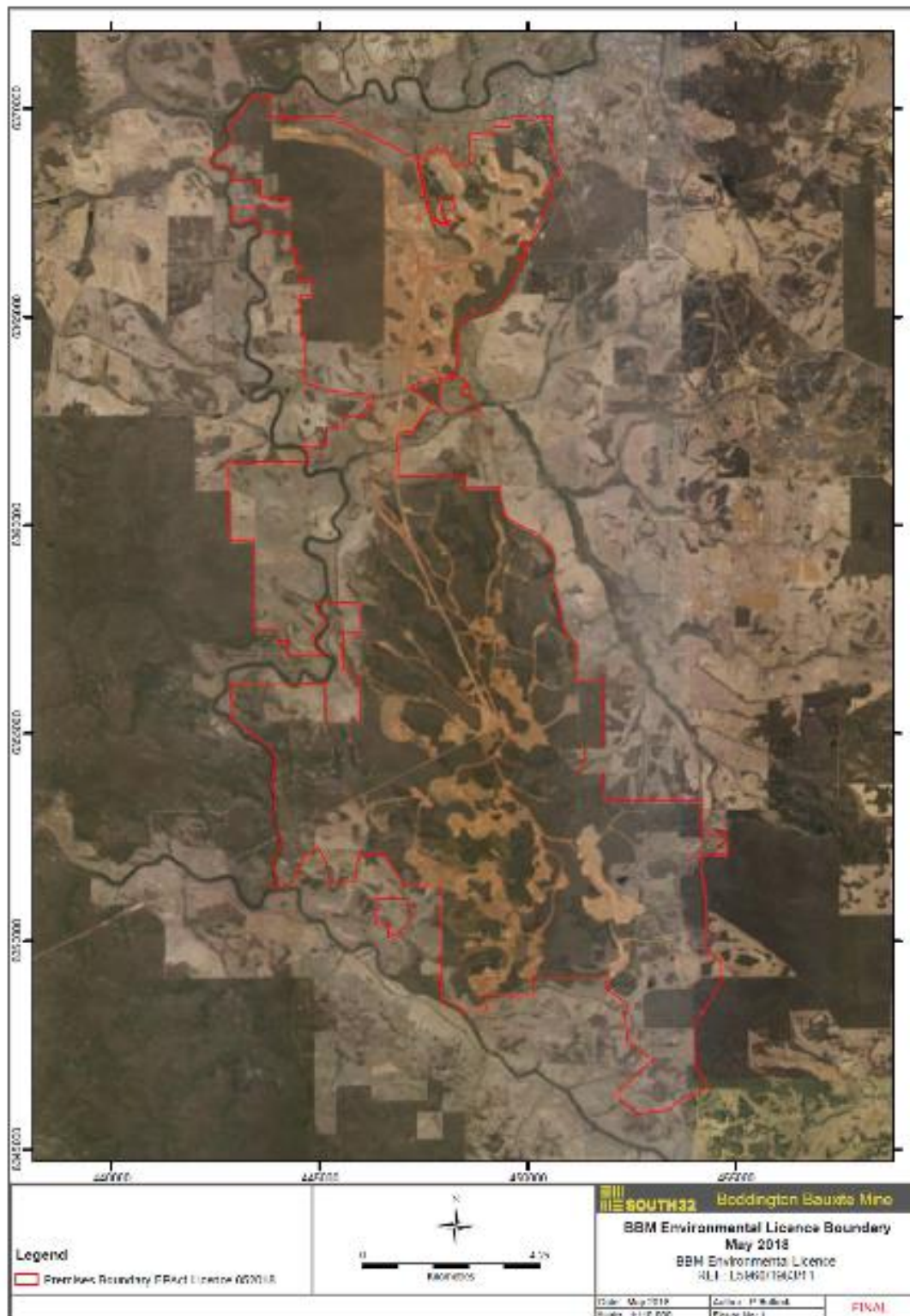
---

**END OF CONDITIONS**

# Schedule 1: Maps

## Premises map

The boundary of the prescribed premises is shown in the map below (Figure 1).



**Figure 1: Map of the boundary of the prescribed premises**

L5960/1983/11

IR-T06 Licence template (v7.0) (February 2020)



# Emission points map

The locations of the emission points defined in Condition 2 are shown below

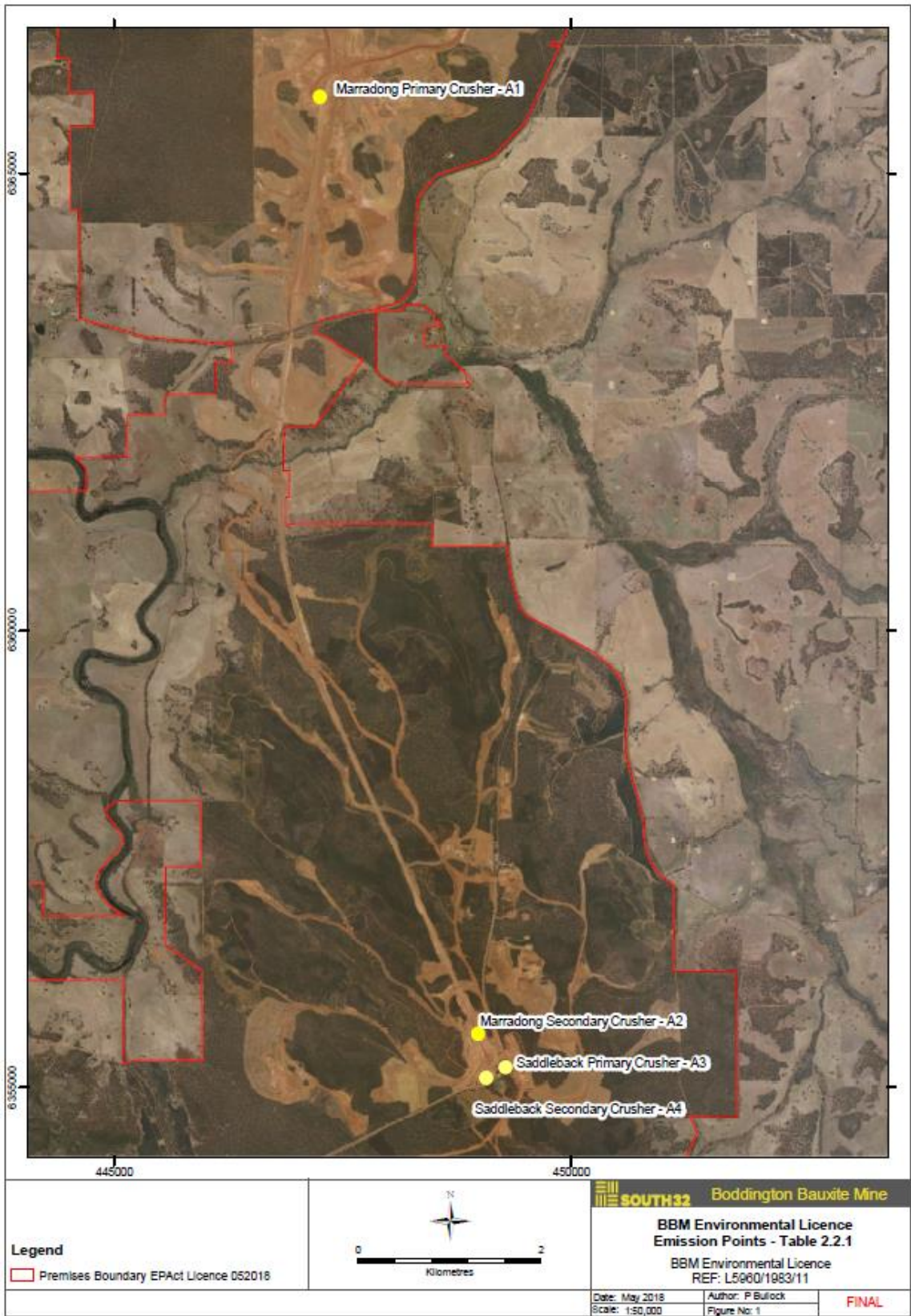


Figure 2: Map of the emission points

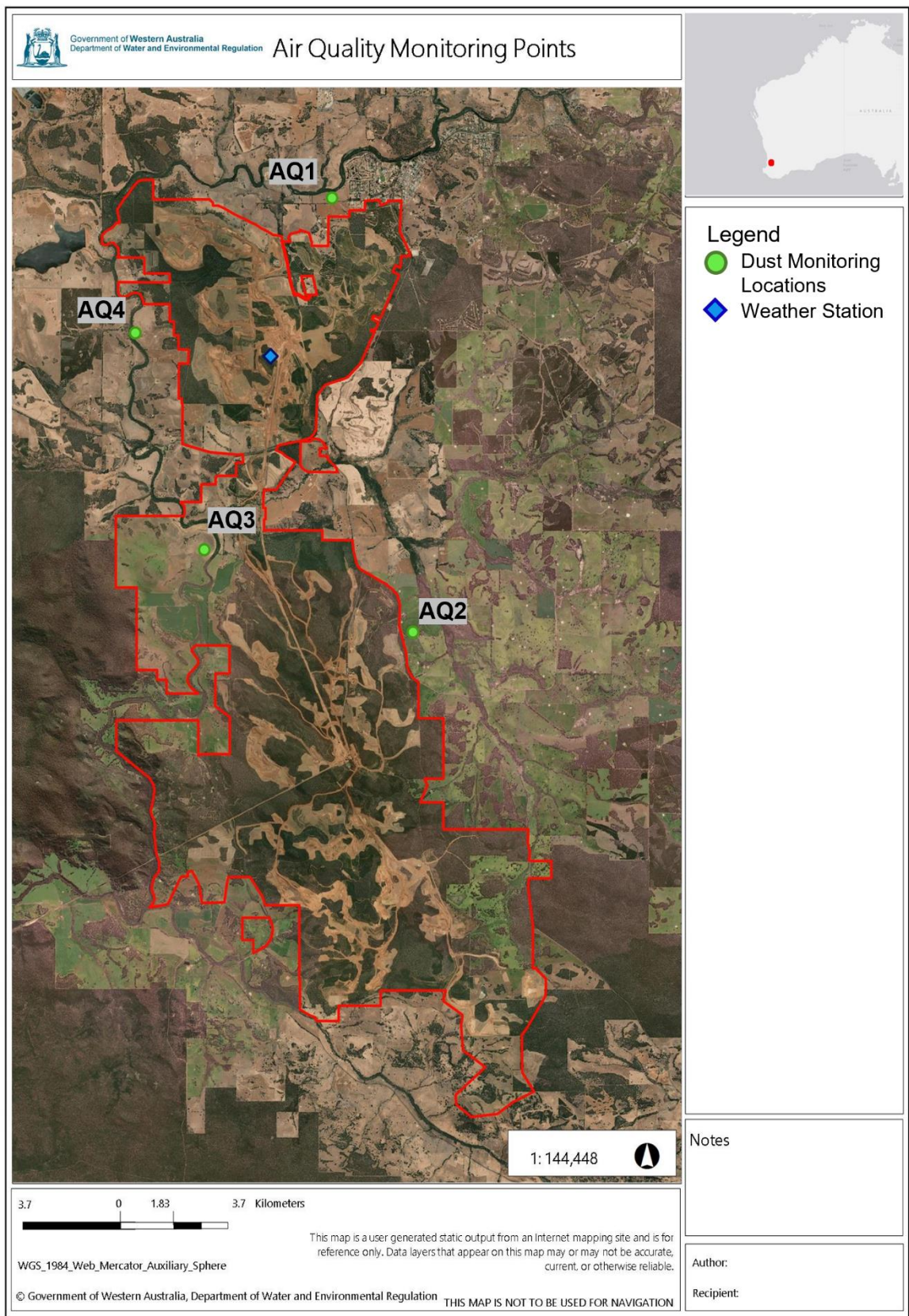
L5960/1983/11

IR-T06 Licence template (v7.0) (February 2020)



## Monitoring location maps

The locations of the monitoring points referenced in Condition 9 are shown below.



**Figure 3: Map of ambient air quality monitoring points**

L5960/1983/11

IR-T06 Licence template (v7.0) (February 2020)



The locations of the monitoring points referenced in Condition 11 are shown below.

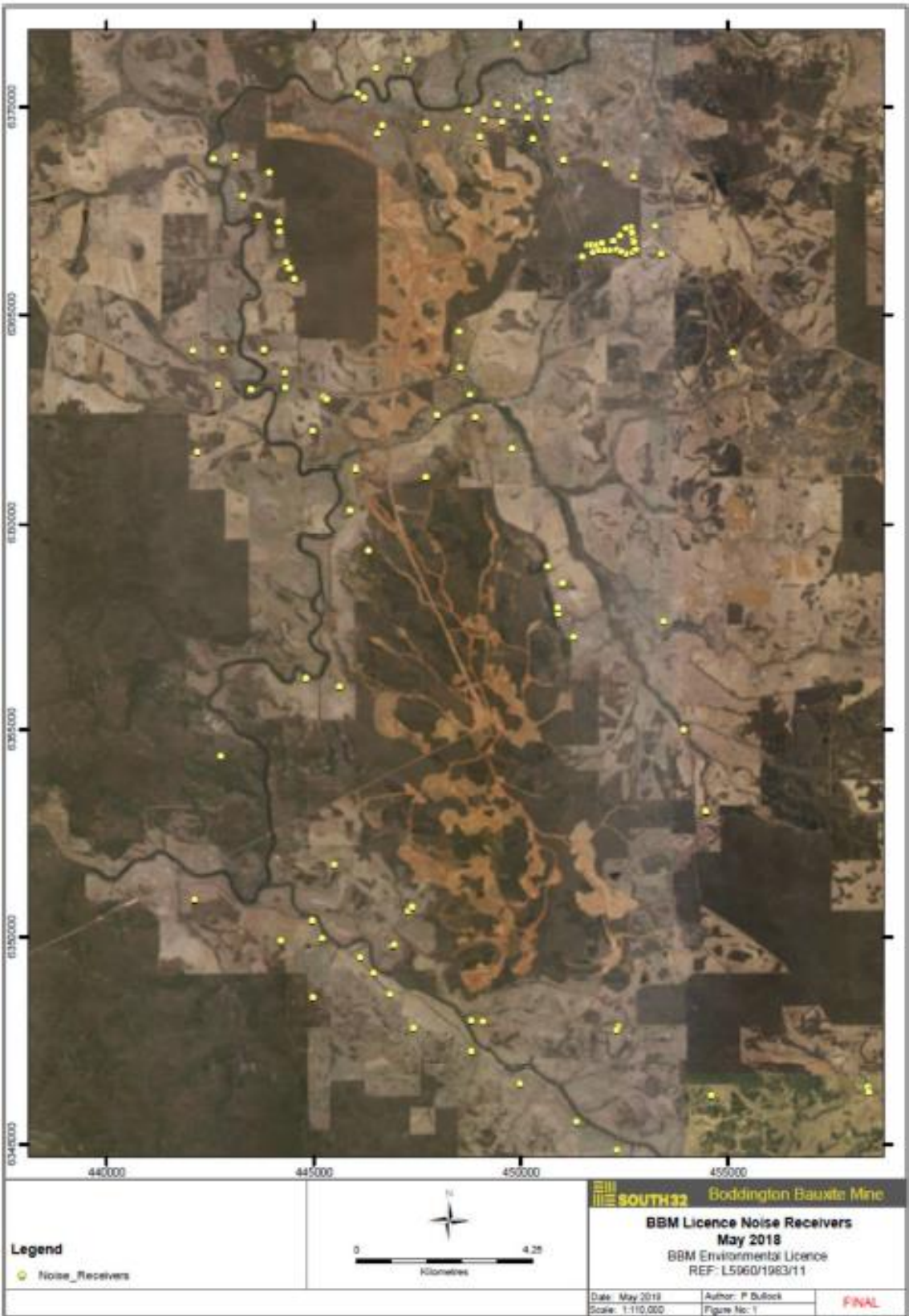


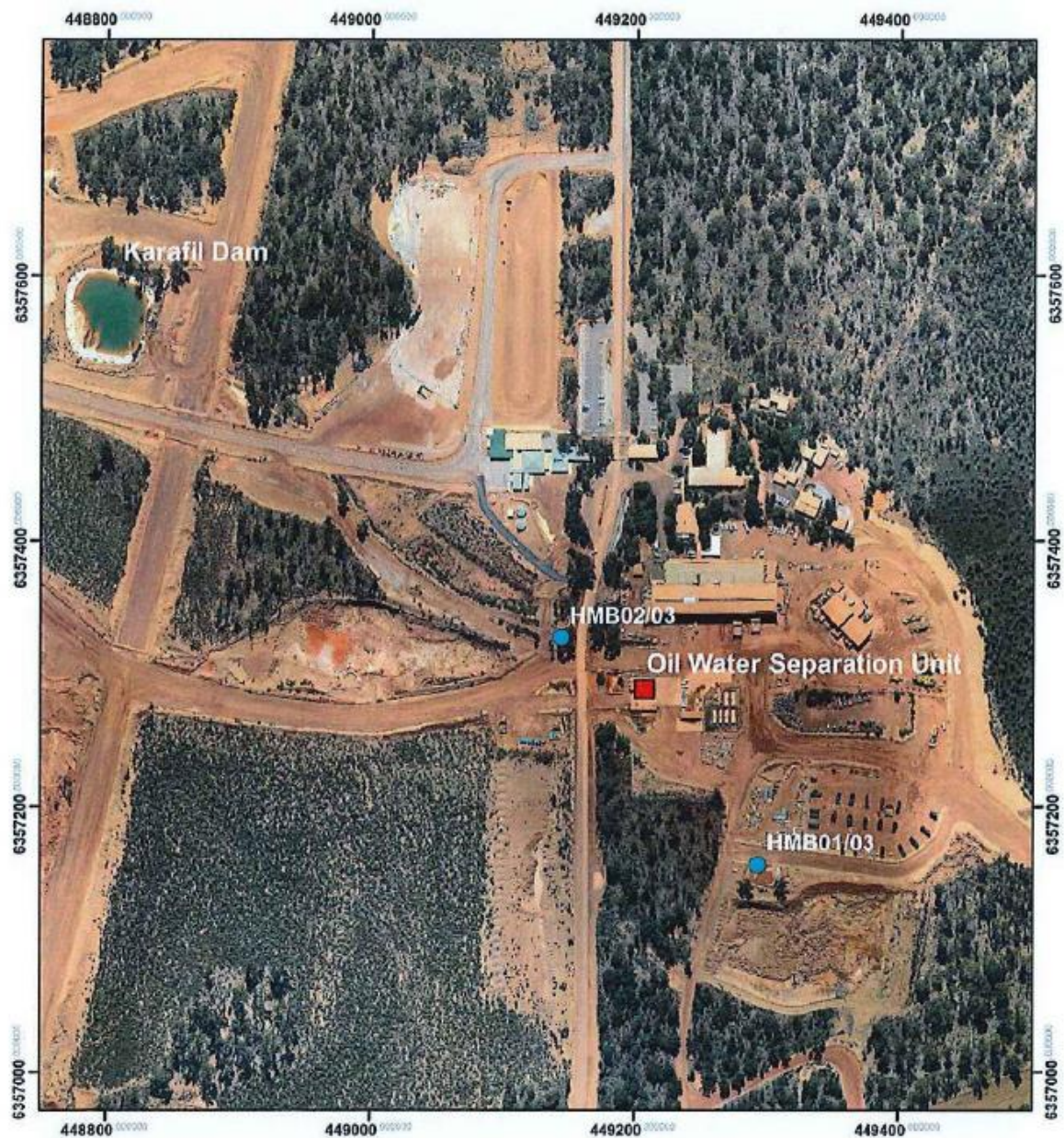
Figure 4: Map of ambient noise quality monitoring points

[L5960/1983/11](#)

IR-T06 Licence template (v7.0) (February 2020)



The locations of the monitoring points referenced in Condition 8 and 10 are shown below.



**Figure 5: Map of input/output monitoring points and ambient groundwater monitoring points**

## Schedule 2: Forms

Licence: L5960/1983/11  
Form: N1

Licence Holder: South32 Worsley Alumina Pty Ltd  
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	

Notification requirements for any failure or malfunction of any pollution control equipment or any incident which has caused, is causing or may cause pollution	
Date and time of event	
Reference or description of the location of the event	
Description of where any release into the environment took place	
Substances potentially released	

L5960/1983/11

Best estimate of the quantity or rate of release of substances	
Measures taken , or intended to be taken, to stop any emission	
Description of the failure or accident	

## 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 licence holder	
Date	