



# ROBE

## ROBE environmental compliance Noise monitoring

July 2016



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# 1. Introduction

## 1.1 Purpose of this report

This document summarises the results of the Riverina Oils and BioEnergy Pty Ltd (ROBE) annual noise monitoring conducted on 7<sup>th</sup> July 2016, including an assessment of compliance with ROBE's NSW Environment Protection Licence (EPL #13097).

The ROBE integrated oilseed crushing, extraction and refining plant is located at the intersection of Trahairs Road and Byrnes Road in Bomen at Lot 12, DP 1130519, approximately 8 kilometres northeast of the city of Wagga Wagga, NSW.

## 1.2 Assumptions and Limitations

This report: has been prepared by GHD for ROBE and may only be used and relied on by ROBE for the purpose agreed between GHD and the ROBE as set out in section 1.1 of this report.

GHD otherwise disclaims responsibility to any person other than ROBE arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described in section 3 of this report. GHD disclaims liability arising from any of the assumptions being incorrect.

GHD has not independently verified all aspects of the plant engineering, operational or management aspects and procedures associated with the ROBE Bomen facility.

GHD has assumed when compiling this summary report that the ROBE facility was operating under 'normal' conditions during the noise monitoring period and accepts no responsibility for the results obtained during the monitoring period.

Site conditions may change after the date of this summary report. GHD does not accept responsibility arising from, or in connection with, any change to the site conditions. GHD has no obligation to update this report if the site conditions change.

## 2. Monitoring and Performance Requirements

### 2.1 Noise limits

The Department of Planning and Environment CoA 24 and Environment Protection License 13097 Clause L4.1 specify the following noise limits for the existing ROBE facility are as follows:

*Noise Limits (dB(A))*

Day	Evening	Night	Night	Location
L <sub>Aeq</sub> (15 minute)	L <sub>Aeq</sub> (15 minute)	L <sub>Aeq</sub> (15 minute)	L <sub>A1</sub> (1 minute) or L <sub>A</sub> max	
35	35	35	45	At any residence or other sensitive receiver

*Note: a) To determine compliance with the L<sub>Aeq</sub> (15 min) noise level limits in the above table, noise from the project is to be measured at the most affected point within the residential boundary, or at the most affected point within 30 metres of a dwelling where the dwelling (rural situations) is more than 30 metres from the boundary. To determine compliance with the L<sub>A1</sub> (1 minute) noise level limits in the above table, noise from the project is to be measured at 1 metre from the dwelling façade. Where it can be demonstrated that direct measurement of noise from the project is impractical, the EPA may accept alternative means of determining compliance (see Chapter 11 of the NSW Industrial Noise Policy).*

*The modification factors in Section 4 of the NSW Industrial Noise policy shall also be applied to the measured noise levels where applicable.*

*b) The noise emission limits identified in the above table apply under meteorological conditions of:*

- *Wind speeds of up to 3 m/s at 10 metres above ground level; and*
- *Temperature inversion conditions of up to 3°C/100m, and wind speeds of up to 2m/s at 10 metres above the ground level.*

*L4.2 For the purpose of the above condition:*

- *Day is defined as the period from 7 am to 6 pm Monday to Saturday and 8 am to 6 pm Sundays and Public Holidays;*
- *Evening is defined as the period from 6 pm to 10 pm; and*
- *Night is defined as the period from 10 pm to 7 am Monday to Saturday and 10 pm to 8 am and Public holidays.*

### 3. Methodology

The nearest residential receivers to the site have been identified in Table 1 and Figure 1.

Table 1 Surrounding sensitive receivers

Receiver	Easting	Northing	Distance to site boundary (km)
R1	537248	6121739	1.5
R2	537625	6121799	1.9
R3	538090	6121848	1.0
R4	537968	6122862	1.5
R5	537760	6123116	1.75
R6	538140	6123263	1.5
R7	538268	6123807	1.9
R8	540329	6119814	1.9
R9	540594	6119575	2.25



Figure 1 Site boundary and surrounding sensitive receivers

It is not practical to measure noise levels at the receiver locations due to the distance from the noise source and influence of the ambient noise environment in the area. Section 11.1.2 of the Industrial Noise Policy (EPA, 2000) states that where ambient noise levels are higher than the source noise level measurements may be taken closer to the source and then calculated back to the specified location.

Attended noise measurements were undertaken at the site boundary to determine the operational noise emissions from the site. The measurements were undertaken

- during the night-time period to minimise extraneous noise such as traffic on Byrnes Road.
- at three locations on the site boundary
- with the plant running under typical operational capacity
- using a Svantek SV977 Type 1 sound level meter (SN: 36871) and Svantek SV979 Type 1 sound level meter (SN: 27100)
- The measurements included the following parameters:
  - audio wave files to assist with excluding extraneous noise if required
  - 1/3 octave band noise levels to check for tonal modifying factor corrections
  - A-weighted fast and impulsive response times to check for impulsive modifying factor corrections
  - A-weighted and C-weighted noise levels to check for low frequency modifying factor corrections

The sound level meter was calibrated before and after the measurement period using a SVAN SV-30 acoustic calibrator (SN: 29030) and was found to be within the acceptable tolerance of  $\pm 0.5$  dB(A).

The noise monitoring locations on the property boundary are shown in Note 1: Site noise was constant therefore the LA90 of the monitoring period was used to exclude extraneous noise such as traffic movements on Byrnes Road. This is in accordance with Section 2.3 of the Industrial Noise policy (EPA, 2000).





Figure 2. Site monitoring locations

Table 2 details the noise monitoring results at three corner boundary locations (L1 to L3) for two 15-minute measurement (M1 and M2). Measurements were not undertaken at the north eastern boundary corner as access was not available and no sensitive receivers are located in that direction.

The weather conditions during the monitoring period consisted of the following:

- moderate cloud cover,
- no noticeable wind at ground level,
- temperature of between 11°C and 12°C (Wagga Wagga Airport weather station)
- humidity between 80% and 87% (Wagga Wagga Airport weather station)
- no rain, however very light rain started to fall towards the end of measurement M2.

Attended observations and data analysis indicated the following:

- Noise from the site was clearly audible at the site boundary and constant
- No impulsive noise sources were observed
- A review of the 1/3 octave data indicates no tonal characteristics
- A review of the measured data indicates no low frequency characteristics at location L1 or L2 however some moderate low frequency characteristics were recorded at location 3.

- Road traffic and extraneous events influenced the measurements and as such were excluded from the site contribution

Table 2 Site noise monitoring results, dB(A)

	Location 1 (L1)		Location 2 (L2)		Location 3 (L3)	
	M1	M2	M1	M2	M1	M2
L <sub>Aeq</sub> site contribution <sup>1</sup>	41.5	42.1	47.2	49.1	44.5	45.1
Low frequency check (LC <sub>eq</sub> – LA <sub>eq</sub> )	11.4	11.0	9.9	8.8	15.2	14.9
Measurement commenced	20:07	20:22	21:09	21:24	19:55	20:10
Measurement ceased	20:22	20:37	21:24	21:39	20:10	20:25

Note 1: Site noise was constant therefore the LA90 of the monitoring period was used to exclude extraneous noise such as traffic movements on Byrnes Road. This is in accordance with Section 2.3 of the Industrial Noise policy (EPA, 2000).



Figure 2 Noise monitoring locations

This noise measurement results on the property boundary have been used to calibrate the noise model which has been used to predict the noise emissions from the facility at the identified surrounding sensitive receivers (R1 to R9). Noise modelling was undertaken using CadnaA v4.4 which calculates environmental noise propagation according to *ISO 9613-2 Acoustics – Attenuation of sound during propagation outdoors*.

The following assumptions and calculation parameters were used in the noise model:

- the site and surrounding land was modelled assuming a ground absorption coefficient of 0.5 to conservatively represent a mix of soft soil and hard ground.
- atmospheric absorption was based on an average temperature of 10 °C and an average humidity of 70 per cent which accounts for typical worst case propagation
- the algorithm also takes into account the presence of a well-developed moderate ground based temperature inversion, such as commonly occurs on clear, calm nights or 'downwind' conditions which are favourable to sound propagation
- noise receivers were modelled at a height of 1.5 metres
- The noise source on the facility was modelled at a noise level and location that achieved a noise model calibration of within 0.5 dB(A). Validation of the noise model is shown in Table 3 which compares the predicted and measured ROBE property boundary noise levels. Note that the source level was set to ensure that the predicted noise levels were greater than the measured noise levels for conservatism.

**Table 3** Noise model validation

Monitoring location	Modelled, dB(A)	Measured, dB(A)	Difference
L1	42.2	41.8	+0.4
L2	48.4	48.3	+0.1
L3	44.8	44.8	+0.0

## 4. Results

Noise levels from the ROBE facility are shown in Table 4 and comply with the EPL 13097 Clause L4.1 noise limits.

Low frequency characteristics are not expected to be audible at the receiver location, however noise emissions would still be compliant with the noise limits if a 5 dBA penalty was applied for low frequency noise characteristics.

There are no significant LAmax or LA1 events therefore the LAmax / LA1 noise emissions from the site are compliant with the noise limits.

Table 4 Noise levels at surrounding sensitive receivers from existing operations, dB(A)

Receiver	Noise limit	noise level	Compliance with the noise limit
R1	35 LAeq(15min) 45 LAmax or LA(1min)	23	-12
R2		25	-11
R3		26	-9
R4		25	-10
R5		26	-9
R6		26	-9
R7		24	-11
R8		19	-16
R9		17	-18

## 5. Conclusion

Noise monitoring was undertaken in accordance with the Industrial Noise Policy (EPA, 2000). The results from the July annual monitoring indicate that noise levels are compliant with the noise limits specified in the ROBE's EPL (#13097).

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