

ALLIED PINNACLE NOISE MONITORING

External Noise Survey 2021

Prepared for:

Allied Pinnacle Pty Ltd
55 Belmore Street,
Tamworth NSW 2340

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SLR 

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BASIS OF REPORT

This report has been prepared by SLR Consulting Australia Pty Ltd (SLR) with all reasonable skill, care and diligence, and taking account of the timescale and resources allocated to it by agreement with Allied Pinnacle Pty Ltd (the Client). Information reported herein is based on the interpretation of data collected, which has been accepted in good faith as being accurate and valid.

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DOCUMENT CONTROL

Reference	Date	Prepared	Checked	Authorised
630.30237-R01-v1.0	17 September 2021	Kieran Murphy	Martin Davenport	Martin Davenport

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1 Introduction

Allied Pinnacle Pty Ltd has commissioned SLR Consulting Australia Pty Ltd (SLR) to conduct operational noise monitoring for the Allied Pinnacle Mill located at 55 Belmore Street Tamworth, New South Wales (NSW) in accordance with Allied Pinnacle's Environment Protection Licence 2127 (EPL 2127).

The objectives of the noise monitoring programme for this operating period were as follows:

- Conduct operator attended noise surveys at 3 locations (as listed in **Section 3.3**) surrounding the grain mill during the day, evening and night-time periods.
- Quantify all sources of noise within each of the attended noise surveys, including their measured and/or estimated contribution and maximum level of individual noise sources.
- Assess the noise emissions of Allied Pinnacle and determine compliance with respect to the limits in the relevant approvals.

The following report uses specialist acoustic terminology. An explanation of common terms is provided in **Appendix A**.

2 Performance Assessment and Discussion

The following provides a summary of the attended noise measurements undertaken at each monitoring location. Further details are provided for each location in **Section 5** of this report.

Table 1 Performance Assessment – Operations

Location	Date	Allied Pinnacle Contribution dBA			Noise Criteria	Measurement Periods	Standard Weather ¹			Compliant
		LAeq 15 min Day	LAeq 15 min Evening	LAeq 15 min Night			Day	Evening	Night	
68 Belmore Street	07/09/2021	58	54	58	Day – LAeq(15minute) 70 dBA Evening – LAeq(15minute) 60dBA Night – LAeq(15minute) 55 dBA	Day - 1.5 hrs Evening - 0.5 hrs Night – 1hrs	N	N	N	N
	08/09/2021	57	53	53			N	Y	Y	Y
	09/09/2021	60	52	50			Y	N	Y	Y
42 William Street	07/09/2021	59	54	53	Day – LAeq(15minute) 70 dBA Evening – LAeq(15minute) 60 dBA Night – LAeq(15minute) 55 dBA		N	N	N	Y
	08/09/2021	61	52	53			N	N	N	Y
	09/09/2021	59	53	51			N	N	N	Y
7 Hercules Place	07/09/2021	54	N/A	N/A	Day – LAeq(15minute) 60dBA		N	N/A	N/A	Y
	08/09/2021	51	N/A	N/A			Y	N/A	N/A	Y
	09/09/2021	51	N/A	N/A			Y	N/A	N/A	Y

I/A = Inaudible, N/M = Not Measurable, N/A = Not Applicable

Note 1: Noise levels presented are the highest measured noise level under standard weather conditions over the monitoring period.

Compliance with the EPL 2172 noise criteria was achieved at all locations during all time periods with the exception of the night-time period at the 68 Belmore Street monitoring location where an exceedance of up to 3dB was recorded. The exceedance was primarily due to a truck accessing and being loaded onsite.

3 Noise Criteria

3.1 Environmental Protection Licence 2127

Noise monitoring surrounding the Allied Pinnacle Grain Mill in Tamworth was conducted in accordance with EPL 2127. The site specific EPL noise limits are summarised in “L2 Noise limits” of EPL 2127 and are reproduced in **Table 2** below.

Table 2 EPL Noise Criteria

Location	Day	Evening	Night
	LAeq(15minute)	LAeq(15minute)	LAeq(15minute)
68 Belmore Street	70	60	55
42 William Street	70	60	55
7 Hercules Street	60	-	-

3.2 Non-compliances & Exemptions

In accordance with Section 11.1.3 of the NSW Industrial Noise Policy (INP) a development is deemed to be in non-compliance with a noise consent or licence condition if the monitored noise level is more than 2 dB above the statutory noise limit specified in the consent or licence. This may occur for two reasons:

- The noise from the Allied Pinnacle is excessive, in which case Allied Pinnacle will be not complying with its consent or licence condition.
- The noise was increased by extreme, non-standard weather effects—in which case the Allied Pinnacle is not considered to be in noncompliance with its consent or licence condition.

In this latter case, further monitoring at a later date is required to determine compliance under “normal” meteorological conditions.

The INP states in Section 9.2 that *“it is not practicable to meet the noise limit under all inversion events; hence exceedances under extreme temperature inversions are not considered to be a non-compliance with consent or licence conditions.”*

Non-standard weather effects include:

- Wind speeds greater than 3 m/s at 10m above ground level; or
- Stability category F temperature inversion conditions and wind speeds greater than 2 metres/second at 10 metres above ground level; or
- Stability category G temperature inversion conditions

As stated in L2.4 of EPL 2127:

- i) *Data recorded by the Tamworth Airport Bureau of Meteorology Weather Station must be used to determine meteorological conditions and temperature inversion conditions; and*
- ii) *Temperature inversion conditions (stability category) are to be determined by the sigma-theta method referred to in Part E4 of Appendix E to the NSW Industrial Noise Policy 2000."*

Tamworth Airport records wind speed and direction at 10m above ground level. All weather data reported in **Table 5** to **Table 13** have been recorded at the Tamworth Airport weather station.

3.3 Attended Monitoring

Attended Noise monitoring is to be undertaken on a 3 yearly basis at residential areas. The attended monitoring will take place at the following locations shown in the EPL 2127 'Noise Limits table':

3.3.1 EPL Monitoring Locations

- 68 Belmore Street
- 42 William Street
- 7 Hercules Street

The following details the requirements of the monitoring:

3.3.2 EPL Monitoring Requirements

- At each one of the locations within the EPL 2127 'Noise Limits table' and;
- Occur once every three years;
- Occur during each day, evening and night period as defined by condition L2.2 for a minimum of:
 - i) 1.5 hours during the day;
 - ii) 30 minutes during the evening; and
 - iii) 1 hour during the night.
- Occur for three consecutive operating days.

4 Operational Noise Monitoring Methodology

4.1 General Requirements

All acoustic instrumentation employed throughout the monitoring programme has been designed to comply with the requirements of AS IEC 61672.1 – 2004 *Electroacoustics—Sound level meters – Specifications*, AS IEC 61672.2-2004, AS IEC 61672.3-2004 and carried current NATA or manufacturer calibration certificates. Instrument calibration was checked before and after each measurement survey, with the variation in calibrated levels not exceeding ± 0.5 dBA. Calibration certificates for all instruments employed during the monitoring campaign are presented in **Appendix B**.

4.2 Methodology – Operator Attended Noise Monitoring

Operator attended noise measurements were conducted during the day, evening and night-time periods for a minimum of 1.5 hours during the day; 30 minutes during the evening and 1 hour during the night at the three EPL nominated noise monitoring locations, with the exception of 7 Hercules Street where monitoring was only conducted during the day0time period. The three EPL nominated EPL locations are provided in **Table 3** and shown in **Figure 1**. During the operator attended noise measurements, the character and relative contribution of ambient noise sources and mill contributions were determined.

Table 3 Noise Monitoring Locations

Monitoring Location	Receiver Type	Monitoring Location - MGA Zone 56	
		Easting (m)	Northing (m)
68 Belmore Street	Residence	301264	6558193
42 William Street	Residence	301238	6558341
7 Hercules Street	Child Care Centre	301101	6558205

The objective of the operator attended noise monitoring was to measure the $L_{Aeq(15\text{minute})}$ noise level contribution from the Allied Pinnacle Mill at the nominated monitoring locations in order to determine the noise contribution of operational activities associated with Allied Pinnacle Mill over each 15 minute measurement period. In addition, the operator quantifies and characterises the overall levels of ambient noise in the area (i.e. L_{Amax} , LA_1 , LA_{10} , LA_{90} , and L_{Aeq}) over the 15 minute measurement interval.

Operator attended noise measurements were conducted using one-third octave integrating Brüel & Kjær Type 2250 sound level meter (s/n 3003389).

Figure 1 Attended Noise Monitoring Locations



Table 4 presents a summary of which days the monitoring was conducted, in accordance with condition M4 of EPL 2127.

Table 4 Days of the Week EPL Monitoring was Conducted

Period	Day of the Week (Excluding Weekends and Public Holidays)				
	Monday	Tuesday	Wednesday	Thursday	Friday
Day		07/09/2021	08/09/2021	09/09/2021	
Evening		07/09/2021	08/09/2021	09/09/2021	
Night ¹		07/09/2021	08/09/2021	09/09/2021	

Note 1: Taken to mean the night-time period from 10:00 pm on the stated day to 7:00 am the following day.

5 Results and Discussion

5.1 Results of Operator Attended Monitoring

Results of the operator attended noise surveys at 68 Belmore Street, 42 William Street and 7 Hercules Street are provided in **Table 5** to **Table 13**.

Ambient noise levels presented include all noise sources such as transport (roads, rail and aircraft), fauna (insects, frogs, birds and bats), the natural environment (wind in trees), domestic noises, other industrial operations as well as Allied Pinnacle noise emissions.

The tables also provide the following information:

- Date and start time, operator and equipment details.
- Monitoring location.
- Wind velocity (m/s) and temperature (°C) at the Tamworth Airport weather station, as detailed in **Section 3.2**.
- Typical maximum (L_{Amax}) and contributed L_{Aeq(15minute)} noise levels.

5.1.1 Operator Attended Noise Survey Results – 68 Belmore Street

Results of the operator attended noise surveys at 68 Belmore Street are provided in **Table 5**, **Table 6** and **Table 7**. Monitoring location at 68 Belmore Street represents residential receptors located to the south of the site.

Table 5 Operator Attended EPL Noise Survey – 68 Belmore Street, Tamworth (Day 1)

Period Date/Start Time Weather SLM Details	Criteria	Measurement Number	Primary Noise Descriptor						Allied Pinnacle Contribution, (dB)	Description of Noise Emissions and Typical Maximum Noise Levels (dBA)
			L _{Amax} (dB)	L _{A1} (dB)	L _{A10} (dB)	L _{A90} (dB)	L _{Aeq} (dB)	L _{Amin} (dB)		
Day 1 7-09-2021 4:08 PM 5 - 6 m/s W 21-24 °C	70 dBA LA _{eq} (15minute)	1	81	67	58	45	56	42	I/A	Site Related Noise Events: Mechanical Plant 42-52 Other Noise Events: Traffic 67-85 Wind 62-70
		2	80	67	58	46	56	44	I/A	
		3	73	67	58	46	55	44	I/A	
		4	85	69	59	52	58	50	52	
		5	76	69	59	51	58	50	51	
		6	74	63	56	51	54	50	51	
Evening 1 07-09-2021 7:03 PM 1 – 3 m/s W 10 °C	60 dBA LA _{eq} (15minute)	1	64	56	54	52	53	50	52	Site Related Noise Events: Mechanical Plant 50-52

Period Date/Start Time Weather SLM Details	Criteria	Measurement Number	Primary Noise Descriptor						Allied Pinnacle Contribution, (dB)	Description of Noise Emissions and Typical Maximum Noise Levels (dBA)
			L _{Amax} (dB)	L _{A1} (dB)	L _{A10} (dB)	L _{A90} (dB)	L _{Aeq} (dB)	L _{Amin} (dB)		
		2	68	61	54	52	54	50	52	Other Noise Events: Traffic 58-68
Night 1 08-09-2021 5:55 AM 2 – 3 m/s SE 1 °C	55 dBA L _{Aeq} (15minute)	1	63	58	57	48	53	46	48	Site Related Noise Events: Mechanical Plant & Truck loading in loading dock 46-58 Other Noise Events: Traffic 64-72 Birds 58- 62
		2	69	64	59	57	58	55	58	
		3	70	64	60	56	58	54	58	
		4	72	67	60	57	59	55	59	

Table 6 Operator Attended EPL Noise Survey – 68 Belmore Street, Tamworth (Day 2)

Period Date/Start Time Weather SLM Details	Criteria	Measurement Number	Primary Noise Descriptor						Allied Pinnacle Contribution, (dB)	Description of Noise Emissions and Typical Maximum Noise Levels (dBA)
			LAmx (dB)	LA1 (dB)	LA10 (dB)	LA90 (dB)	LAeq (dB)	LAmn (dB)		
Day 2 08-09-2021 9:03 AM 1 - 3 m/s E – SE 12-16 °C 3003389	70 dBA LAeq (15minute)	1	80	66	59	48	57	44	I/A	Site Related Noise Events: Mechanical Plant 45-48 Other Noise Events: Traffic 67-80 Dry cleaner 58-61
		2	67	63	55	47	53	44	47	
		3	70	64	57	48	54	45	48	
		4	71	65	57	48	55	45	48	
		5	79	69	59	48	57	46	48	
		6	71	64	58	49	55	46	49	
Evening 2 08-09-2021 6:35 PM 2 m/s W 13 °C	60 dBA LAeq (15minute)	1	75	65	56	51	55	49	51	Site Related Noise Events: Mechanical Plant 49-51

Period Date/Start Time Weather SLM Details	Criteria	Measurement Number	Primary Noise Descriptor						Allied Pinnacle Contribution, (dB)	Description of Noise Emissions and Typical Maximum Noise Levels (dBA)
			L _{Amax} (dB)	L _{A1} (dB)	L _{A10} (dB)	L _{A90} (dB)	L _{Aeq} (dB)	L _{Amin} (dB)		
		2	69	62	55	51	54	50	51	Other Noise Events: Traffic 62-69 Car Door Slam 75
Night 2 09-09-2021 5:59 AM 2 – 4 m/s SE 4 °C	55 dBA L _{Aeq} (15minute)	1	67	57	54	51	53	49	51	Site Related Noise Events: Mechanical Plant 50-52 Other Noise Events: Traffic 68-75 Birds 55-60
		2	69	63	56	52	55	50	52	
		3	72	66	57	52	55	50	52	
		4	75	67	60	52	57	50	52	

Table 7 Operator Attended EPL Noise Survey – 68 Belmore Street, Tamworth (Day 3)

Period Date/Start Time Weather SLM Details	Criteria	Measurement Number	Primary Noise Descriptor						Allied Pinnacle Contribution, (dB)	Description
			LAm _{ax} (dB)	LA ₁ (dB)	LA ₁₀ (dB)	LA ₉₀ (dB)	LA _{eq} (dB)	LA _{min} (dB)		
Day 3 08-09-2021 9:04 AM Calm - 2 m/s N 13-18 °C	70 dBA LA _{eq} (15minute)	1	74	67	58	47	55	44	I/A	Site Related Noise Events: Mechanical Plant 43-47 Other Noise Events: Traffic 67-85 Car Alarm 69 Dry Cleaners 65
		2	73	68	58	47	56	45	47	
		3	77	68	60	46	57	43	I/A	
		4	85	71	59	46	58	43	I/A	
		5	80	69	59	47	58	43	I/A	
		6	89	70	62	47	60	43	I/A	
Evening 3 07-09-2021	60 dBA LA _{eq} (15minute)	1	75	67	55	52	52	51	52	Site Related Noise Events: Mechanical Plant 51-52

Period Date/Start Time Weather SLM Details	Criteria	Measurement Number	Primary Noise Descriptor						Allied Pinnacle Contribution, (dB)	Description
			LAmx (dB)	LA1 (dB)	LA10 (dB)	LA90 (dB)	LAeq (dB)	LAmn (dB)		
6:53 PM 2 – 3 m/s NNW 14 °C		2	74	65	56	52	52	50	52	Other Noise Events: Traffic 68-74
Night 3 10-09-2021 5:53 AM 1 – 3 m/s SE 4 °C	55 dBA LAeq (15minute)	1	67	63	54	49	53	46	49	Site Related Noise Events: Mechanical Plant 46-52 Other Noise Events: Traffic 68-74 Birds 62-68
		2	69	62	55	50	53	48	50	
		3	80	67	55	50	55	49	50	
		4	74	68	57	52	56	50	52	

5.1.2 Operator Attended Noise Survey Results – 42 William Street

Results of the operator attended noise surveys at 42 William Street are provided in **Table 8**, **Table 9** and **Table 10**. Monitoring location at 42 William Street represents residential receptors located to the east of the.

Table 8 Operator Attended EPL Noise Survey – 42 William Street, Tamworth (Day 1)

Period Date/Start Time Weather SLM Details	Criteria	Measurement Number	Primary Noise Descriptor						Allied Pinnacle Contribution, (dB)	Description
			L _{Amax} (dB)	L _{A1} (dB)	L _{A10} (dB)	L _{A90} (dB)	L _{Aeq} (dB)	L _{Amin} (dB)		
Day 1 7-09-2021 2:10 PM 3 - 6 m/s W 19-20 °C	70 dBA L _{Aeq} (15minute)	1	75	69	61	49	58	48	49	Site Related Noise Events: Mechanical Plant 49-51 Other Noise Events: Traffic 67-83 Wind 63-72 Birds 65- 71
		2	74	68	62	50	58	47	50	
		3	82	67	61	50	57	47	50	
		4	74	67	61	50	57	47	50	
		5	83	71	63	49	59	47	I/A	
		6	73	67	62	51	58	49	51	
Evening 1 07-09-2021 6:280 PM	60 dBA L _{Aeq} (15minute)	1	68	62	54	53	54	51	53	Site Related Noise Events: Mechanical Plant 50-53

Period Date/Start Time Weather SLM Details	Criteria	Measurement Number	Primary Noise Descriptor						Allied Pinnacle Contribution, (dB)	Description
			L _{Amax} (dB)	L _{A1} (dB)	L _{A10} (dB)	L _{A90} (dB)	L _{Aeq} (dB)	L _{Amin} (dB)		
3 m/s W 13 °C		2	66	58	54	53	54	52	53	Other Noise Events: Traffic 58-68 Birds 63-66
Night 1 08-09-2021 4:49 AM 2 – 4 m/s SE 1 °C	55 dBA L _{Aeq} (15minute_	1	69	65	55	52	55	50	52	Site Related Noise Events: Mechanical Plant 50-52
		2	71	66	53	51	55	50	51	
		3	70	61	53	51	53	50	51	Other Noise Events: Traffic 64-71 Birds 62-70
		4	68	63	54	51	53	50	51	

Table 9 Operator Attended EPL Noise Survey – 42 William Street, Tamworth (Day 2)

Period Date/Start Time Weather SLM Details	Criteria	Measurement Number	Primary Noise Descriptor						Allied Pinnacle Contribution, (dB)	Description
			L _{Amax} (dB)	L _{A1} (dB)	L _{A10} (dB)	L _{A90} (dB)	L _{Aeq} (dB)	L _{Amin} (dB)		
Day 2 08-09-2021 7:23 AM 1 - 3 m/s E – SE 12-16 °C	70 dBA Laeq (15minute)	1	71	67	59	51	57	50	51	Site Related Noise Events: Mechanical Plant 49-52 Other Noise Events: Traffic 66-78 Birds 68-72
		2	71	66	59	51	56	49	51	
		3	72	68	62	51	58	49	51	
		4	76	70	63	52	59	49	52	
		5	78	71	65	51	61	49	51	
		6	75	67	61	51	57	49	51	
Evening 2 08-09-2021 6:01 PM 2 m/s W 13 °C	60 dBA Laeq (15minute)	1	74	67	55	51	56	50	51	Site Related Noise Events: Mechanical Plant 50-51 Other Noise Events: Traffic 67-72 Dog barking 65-67
		2	72	67	58	51	56	50	51	

Period Date/Start Time Weather SLM Details	Criteria	Measurement Number	Primary Noise Descriptor						Allied Pinnacle Contribution, (dB)	Description
			L _{Amax} (dB)	L _{A1} (dB)	L _{A10} (dB)	L _{A90} (dB)	L _{Aeq} (dB)	L _{Amin} (dB)		
Night 2 09-09-2021 4:54:00 AM 2 – 4 m/s SE 4 °C 3003389	55 dBA Laeq (15minute)	1	67	57	54	51	53	49	51	Site Related Noise Events: Mechanical Plant 49-52 Other Noise Events: Traffic 67-75
		2	69	63	56	52	55	50	52	
		3	72	66	57	52	55	50	52	
		4	75	67	60	52	57	50	52	

Table 10 Operator Attended EPL Noise Survey – 42 William Street, Tamworth (Day 3)

Period Date/Start Time Weather SLM Details	Criteria	Measurement Number	Primary Noise Descriptor						Allied Pinnacle Contribution, (dB)	Description
			L _{Amax} (dB)	L _{A1} (dB)	L _{A10} (dB)	L _{A90} (dB)	L _{Aeq} (dB)	L _{Amin} (dB)		
Day 3 09-09-2021 7:04 AM 1 - 2 m/s E – SE 5 - 10 °C	70 dBA L _{Aeq} (15minute)	1	74	67	58	47	55	44	I/A	Site Related Noise Events: Mechanical Plant 43-47 Other Noise Events: Traffic 67-85 Wind 70-80 Birds 62-70
		2	73	68	58	47	56	45	47	
		3	77	68	60	46	57	43	I/A	
		4	85	71	59	46	58	43	I/A	
		5	80	69	59	47	58	43	I/A	
		6	89	70	62	47	60	43	I/A	
Evening 3 09-09-2021 6:10 PM 3 m/s NNW 16 - 17 °C	60 dBA L _{Aeq} (15minute)	1	71	66	56	51	55	50	51	Site Related Noise Events: Mechanical Plant 50-51 Other Noise Events: Traffic 66-73
		2	73	68	56	51	56	51	51	

Period Date/Start Time Weather SLM Details	Criteria	Measurement Number	Primary Noise Descriptor					Allied Pinnacle Contribution, (dB)	Description	
			L _{Amax} (dB)	L _{A1} (dB)	L _{A10} (dB)	L _{A90} (dB)	L _{Aeq} (dB)			L _{Amin} (dB)
Night 3 10-09-2021 4:48 AM 3 m/s S – SE 3 - 4 °C	55 dBA L _{Aeq} (15minute)	1	71	62	52	49	52	48	49	Site Related Noise Events: Mechanical Plant 47-49 Other Noise Events: Traffic 62-73
		2	68	64	52	48	52	47	48	
		3	70	58	50	49	51	48	49	
		4	73	66	54	49	54	48	49	

5.1.3 Operator Attended Noise Survey Results – 7 Hercules Street

Results of the operator attended noise surveys at 7 Hercules Street are provided in **Table 11**, **Table 12** and **Table 13**. Monitoring location at 7 Hercules Street represents a child care centre receptor located to the east of the site.

Table 11 Operator Attended EPL Noise Survey – 7 Hercules Street, Tamworth (Day 1)

Period Date/Start Time Weather SLM Details	Criteria	Measurement Number	Primary Noise Descriptor						Allied Pinnacle Contribution, (dB)	Description
			L _{Amax} (dB)	L _{A1} (dB)	L _{A10} (dB)	L _{A90} (dB)	L _{Aeq} (dB)	L _{Amin} (dB)		
Day 1 08-09-2021 12:53 PM 1 - 3 m/s E – SE 12-16 °C	60 dBA L _{Aeq} (15minute)	1	80	71	60	48	59	46	48	Site Related Noise Events: Mechanical Plant -45-50 Other Noise Events: Traffic 64-85 Wind 70-80 Birds 62-70 Construction 61- 68
		2	80	64	55	48	55	46	48	
		3	79	74	63	48	61	46	48	
		4	85	73	58	48	62	45	48	
		5	82	73	65	49	62	46	49	
		6	85	75	68	50	64	47	50	

Table 12 Operator Attended EPL Noise Survey – 7 Hercules Street, Tamworth (Day 2)

Period Date/Start Time Weather SLM Details	Criteria	Measurement Number	Primary Noise Descriptor						Allied Pinnacle Contribution, (dB)	Description
			LAm _{ax} (dB)	LA ₁ (dB)	LA ₁₀ (dB)	LA ₉₀ (dB)	LA _{eq} (dB)	LA _{min} (dB)		
Day 2 8-09-2021 11:02 AM 2 m/s W 16-18 °C	60 dBA LA _{eq} (15minute)	1	71	63	54	45	52	43	45	Site Related Noise Events: Mechanical Plant 43-49 Other Noise Events: Traffic 63-85 Construction 55-62
		2	77	68	56	47	56	44	47	
		3	76	68	56	49	56	46	49	
		4	82	69	53	47	58	44	47	
		5	85	72	57	46	60	44	46	
		6	80	66	57	48	57	45	48	

Table 13 Operator Attended EPL Noise Survey – 7 Hercules Street, Tamworth (Day 3)

Period Date/Start Time Weather SLM Details	Criteria	Measurement Number	Primary Noise Descriptor						Allied Pinnacle Contribution, (dB)	Description
			L _{Amax} (dB)	L _{A1} (dB)	L _{A10} (dB)	L _{A90} (dB)	L _{Aeq} (dB)	L _{Amin} (dB)		
Day 3 09-09-2021 7:04 AM 1 - 2 m/s E – SE 5 - 10 °C	60 dBA L _{Aeq} (15minute)	1	74	64	52	45	52	43	45	Site Related Noise Events: Mechanical Plant 43-48 Other Noise Events: Traffic 62-83 Construction 62-72
		2	76	66	56	45	55	43	45	
		3	72	62	53	48	52	44	48	
		4	69	62	54	47	52	45	47	
		5	83	72	58	48	60	46	48	
		6	78	68	58	48	56	45	48	

5.2 Modifying Factors

No corrections for modifying factors for low frequency noise or tonal noise are required to be applied to the measurement results as per the Noise Policy for Industry.

6 Conclusion

SLR was engaged by Allied Pinnacle Pty Ltd to conduct attended noise monitoring for the Allied Pinnacle Mill Tamworth in accordance with the Allied Pinnacle Mill Tamworth Environment Protection Licence 2127.

Operator attended noise monitoring was conducted at the three EPL 2172 nominated locations in order to determine the noise performance of the Allied Pinnacle. Compliance with the EPL 2172 noise criteria was achieved at all locations during all time periods with the exception of the night-time period at the 68 Belmore Street monitoring location where an exceedance of up to 3dB was recorded. The exceedance was primarily due to a truck accessing and being loaded onsite.

APPENDIX A

Acoustic Terminology

Sound Level or Noise Level

The terms “sound” and “noise” are almost interchangeable, except that in common usage “noise” is often used to refer to unwanted sound.

Sound (or noise) consists of minute fluctuations in atmospheric pressure capable of evoking the sense of hearing. The human ear responds to changes in sound pressure over a very wide range. The loudest sound pressure to which the human ear responds is ten million times greater than the softest. The decibel (abbreviated as dB) scale reduces this ratio to a more manageable size by the use of logarithms.

The symbols SPL, L or LP are commonly used to represent Sound Pressure Level. The symbol LA represents A-weighted Sound Pressure Level. The standard reference unit for Sound Pressure Levels expressed in decibels is 2×10^{-5} Pa.

2 “A” Weighted Sound Pressure Level

The overall level of a sound is usually expressed in terms of dBA, which is measured using a sound level meter with an “A-weighting” filter. This is an electronic filter having a frequency response corresponding approximately to that of human hearing.

People’s hearing is most sensitive to sounds at mid frequencies (500 Hz to 4000 Hz), and less sensitive at lower and higher frequencies. Thus, the level of a sound in dBA is a good measure of the loudness of that sound. Different sources having the same dBA level generally sound about equally loud.

A change of 1 dBA or 2 dBA in the level of a sound is difficult for most people to detect, whilst a 3 dBA to 5 dBA change corresponds to a small but noticeable change in loudness. A 10 dBA change corresponds to an approximate doubling or halving in loudness. The table below lists examples of typical noise levels.

Sound Pressure Level (dBA)	Typical Source	Subjective Evaluation
130	Threshold of pain	Intolerable
120	Heavy rock concert	Extremely noisy
110	Grinding on steel	
100	Loud car horn at 3 m	Very noisy
90	Construction site with pneumatic hammering	
80	Kerbside of busy street	Loud
70	Loud radio or television	
60	Department store	Moderate to quiet
50	General Office	
40	Inside private office	Quiet to very quiet
30	Inside bedroom	
20	Recording studio	Almost silent

Other weightings (eg B, C and D) are less commonly used than A-weighting. Sound Levels measured without any weighting are referred to as “linear”, and the units are expressed as dB(lin) or dB.

3 Sound Power Level

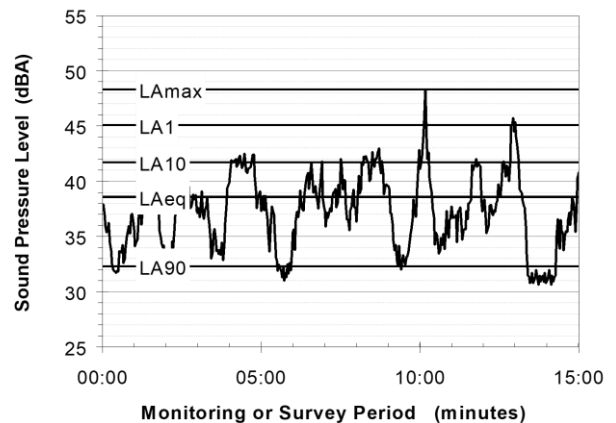
The Sound Power of a source is the rate at which it emits acoustic energy. As with Sound Pressure Levels, Sound Power Levels are expressed in decibel units (dB or dBA), but may be identified by the symbols SWL or LW, or by the reference unit 10^{-12} W.

The relationship between Sound Power and Sound Pressure may be likened to an electric radiator, which is characterised by a power rating, but has an effect on the surrounding environment that can be measured in terms of a different parameter, temperature.

4 Statistical Noise Levels

Sounds that vary in level over time, such as road traffic noise and most community noise, are commonly described in terms of the statistical exceedance levels LAN, where LAN is the A-weighted sound pressure level exceeded for N% of a given measurement period. For example, the LA1 is the noise level exceeded for 1% of the time, LA10 the noise exceeded for 10% of the time, and so on.

The following figure presents a hypothetical 15 minute noise survey, illustrating various common statistical indices of interest.



Of particular relevance, are:

- LA1 The noise level exceeded for 1% of the 15 minute interval.
- LA10 The noise level exceeded for 10% of the 15 minute interval. This is commonly referred to as the average maximum noise level.
- LA90 The noise level exceeded for 90% of the sample period. This noise level is described as the average minimum background sound level (in the absence of the source under consideration), or simply the background level.
- LAeq The A-weighted equivalent noise level (basically the average noise level). It is defined as the steady sound level that contains the same amount of acoustical energy as the corresponding time-varying sound.

When dealing with numerous days of statistical noise data, it is sometimes necessary to define the typical noise levels at a given monitoring location for a particular time of day. A standardised method is available for determining these representative levels.

This method produces a level representing the “repeatable minimum” LA90 noise level over the daytime and night-time measurement periods, as required by the EPA. In addition the method produces mean or “average” levels representative of the other descriptors (LAeq, LA10, etc).

5 Tonality

Tonal noise contains one or more prominent tones (ie distinct frequency components), and is normally regarded as more offensive than “broad band” noise. 7. Impulsiveness

6 Impulsiveness

An impulsive noise is characterised by one or more short sharp peaks in the time domain, such as occurs during hammering.

7 Frequency Analysis

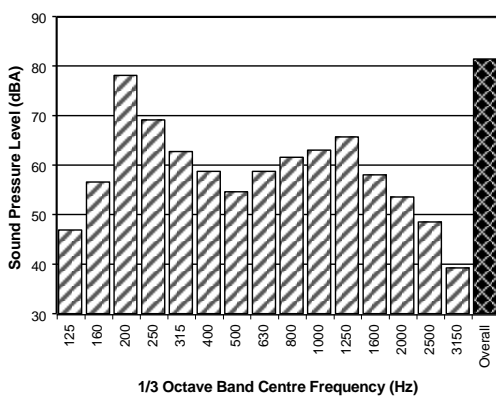
Frequency analysis is the process used to examine the tones (or frequency components) which make up the overall noise or vibration signal. This analysis was traditionally carried out using analogue electronic filters, but is now normally carried out using Fast Fourier Transform (FFT) analysers.

The units for frequency are Hertz (Hz), which represent the number of cycles per second.

Frequency analysis can be in:

- Octave bands (where the centre frequency and width of each band is double the previous band)
- 1/3 octave bands (3 bands in each octave band)
- Narrow band (where the spectrum is divided into 400 or more bands of equal width)

The following figure shows a 1/3 octave band frequency analysis where the noise is dominated by the 200 Hz band. Note that the indicated level of each individual band is less than the overall level, which is the logarithmic sum of the bands.



8 Vibration

Vibration may be defined as cyclic or transient motion. This motion can be measured in terms of its displacement, velocity or acceleration. Most assessments of human response to vibration or the risk of damage to buildings use measurements of vibration velocity. These may be expressed in terms of “peak” velocity or “rms” velocity.

The former is the maximum instantaneous velocity, without any averaging, and is sometimes referred to as “peak particle velocity”, or PPV. The latter incorporates “root mean squared” averaging over some defined time period.

Vibration measurements may be carried out in a single axis or alternatively as triaxial measurements. Where triaxial measurements are used, the axes are commonly designated vertical, longitudinal (aligned toward the source) and transverse.

The common units for velocity are millimetres per second (mm/s). As with noise, decibel units can also be used, in which case the reference level should always be stated. A vibration level V , expressed in mm/s can be converted to decibels by the formula $20 \log (V/V_0)$, where V_0 is the reference level (10^{-9} m/s). Care is required in this regard, as other reference levels may be used by some organizations.

9 Human Perception of Vibration

People are able to “feel” vibration at levels lower than those required to cause even superficial damage to the most susceptible classes of building (even though they may not be disturbed by the motion). An individual’s perception of motion or response to vibration depends very strongly on previous experience and expectations, and on other connotations associated with the perceived source of the vibration. For example, the vibration that a person responds to as “normal” in a car, bus or train is considerably higher than what is perceived as “normal” in a shop, office or dwelling.

10 Over-pressure

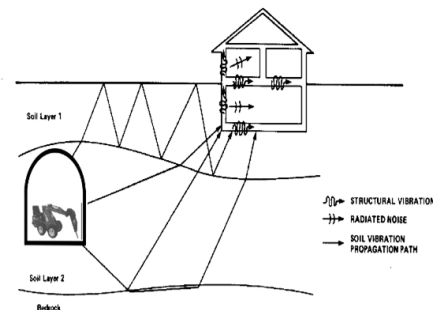
The term “over-pressure” is used to describe the air pressure pulse emitted during blasting or similar events. The peak level of an event is normally measured using a microphone in the same manner as linear noise (ie unweighted), at frequencies both in and below the audible range.

Ground-borne Noise, Structure-borne Noise and Regenerated Noise

Noise that propagates through a structure as vibration and is radiated by vibrating wall and floor surfaces is termed “structure-borne noise”, “ground-borne noise” or “regenerated noise”. This noise originates as vibration and propagates between the source and receiver through the ground and/or building structural elements, rather than through the air.

Typical sources of ground-borne or structure-borne noise include tunnelling works, underground railways, excavation plant (eg rockbreakers), and building services plant (eg fans, compressors and generators).

The following figure presents the various paths by which vibration and ground-borne noise may be transmitted between a source and receiver for construction activities occurring within a tunnel.



The term “regenerated noise” is also used in other instances where energy is converted to noise away from the primary source. One example would be a fan blowing air through a discharge grill. The fan is the energy source and primary noise source. Additional noise may be created by the aerodynamic effect of the discharge grill in the airstream. This secondary noise is referred to as regenerated noise

APPENDIX B

Calibration Certificates

CERTIFICATE OF CALIBRATION

CERTIFICATE NO.: SLM 27565 & FILT 5973

Equipment Description: Sound & Vibration Analyser

Manufacturer: B&K

Model No: 2250 **Serial No:** 3003389

Microphone Type: 4950 **Serial No:** 2913816

Preamplifier Type: ZC 0032 **Serial No:** 20519

Filter Type: 1/3 Octave **Serial No:** 3003389

Comments: All tests passed for class 1.
(See over for details)

Owner: SLR Consulting Australia Pty Ltd
120 High Street
North Sydney, NSW 2060

Ambient Pressure: 988 hPa \pm 1.5 hPa

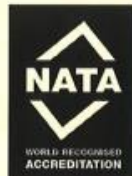
Temperature: 24 °C \pm 2° C **Relative Humidity:** 34% \pm 5%

Date of Calibration: 20/08/2020 **Issue Date:** 21/08/2020

Acu-Vib Test Procedure: AVP10 (SLM) & AVP06 (Filters)

CHECKED BY: *LRB* **AUTHORISED SIGNATURE:** *Hein Soe*

Accredited for compliance with ISO/IEC 17025 - Calibration
The results of the tests, calibration and/or measurements included in this document are traceable to Australian/national standards.



Accredited Lab. No. 9262
Acoustic and Vibration
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AVCERT10 Rev. 1.3 15.05.18

CERTIFICATE NO.: SLM 27565 & FILT 5973

The performance characteristics listed below were tested. The tests are based on the relevant clauses of IEC 61672-3:2013

Tests Performed:	<i>Clause</i>	<i>Result</i>
<i>Absolute Calibration</i>	10	Pass
<i>Acoustical Frequency Weighting</i>	12	Pass
<i>Self Generated Noise</i>	11.1	Observed
<i>Electrical Noise</i>	11.2	Observed
<i>Long Term Stability</i>	15	Pass
<i>Electrical Frequency Weightings</i>	13	Pass
<i>Frequency and Time Weightings</i>	14	Pass
<i>Reference Level Linearity</i>	16	Pass
<i>Range Level Linearity</i>	17	NA
<i>Toneburst</i>	18	Pass
<i>Peak C Sound Level</i>	19	Pass
<i>Overload Indicator</i>	20	Pass
<i>High Level Stability</i>	21	Pass

Statement of Compliance: The sound level meter submitted for testing has successfully completed the class 1 periodic tests of IEC 61672-3:2013, for the environmental conditions under which the tests were performed. As public evidence was available, from an independent organization responsible for approving the results of pattern evaluation tests performed in accordance with IEC 61672-2:2013, to demonstrate that the model of sound level meter fully conformed to the requirements in IEC 61672-1:2013, the sound level meter submitted for testing conforms to the class 1 requirements of IEC61672-1:2013.

This Sound Level Meter included an Octave Filter Set. Tests were based on IEC 1260: 1995 and AS/NZS 4476 - 1997 and were conducted to test the following performance characteristics:

1. Relative attenuation clause 5.3

A full technical report is available if required.

Date of Calibration: 20/08/2020 **Issue Date:** 21/08/2020

Accredited for compliance with ISO/IEC 17025 - Calibration
The results of the tests, calibration and/or measurements included in this document are traceable to Australian/national standards.

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