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November 2019

ENVIRONMENTAL NOISE ASSESSMENT
POCKET HERBS & PRODUCE
TWEED SHIRE CONUCIL

TABLE OF CONTENTS

Client: Tweed Shire Council

Job No: N13772 R4

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1 INTRODUCTION

Tweed Shire Council has conducted noise monitoring at two rural residential land uses near the Pocket Herbs & Produce facility to measure noise emissions for a period of 6 months from mid-April till mid-October, 2019.

JTA Health, Safety & Noise Specialists (JTA) was engaged by Tweed Shire Council to perform analysis of noise data obtained during noise monitoring conducted from the 17th of April to the 14th of August 2019 and provide an environmental noise assessment. The purpose of the environmental noise assessment is to obtain representative noise levels associated with the Pocket Herbs & Produce facility and of the surrounding area. The assessment was commissioned by David McNicoll of Tweed Shire Council.

The two noise monitors were deployed at nearby rural residential land uses in close proximity to the north and east of the Pocket Herbs & Produce facility, which recorded noise levels and audio for the duration of the monitoring period.

To complete an environmental noise assessment of the Pocket Herbs & Produce facility, the analysis of the noise data obtained by the monitors was conducted in accordance with the requirements of the *NSW EPA Noise Policy for Industry, 2017,* with additional references to the Pocket Herbs & Produce relevant DA conditions (DA13/0712) and the Protection of the Environment Operations Act (POEO Act) 1997.

For each logger location JTA was engaged to perform analysis of two random weeks of noise data obtained throughout the entire monitoring period to conduct the environmental noise assessment.

The Environmental Noise Assessment included the following:

1. The measurement of Background Noise Levels (L_{90}) at noise sensitive locations during the day, evening and night time periods.

2. Calculation of the noise trigger levels for the relevant noise sensitive locations.

3. The measurement of noise levels (L_{Aeq}) and the calculation of Effective Noise Levels associated with the operation of the Pocket Herbs & Produce facility separated into the following categories:
    a. Trade Hours – Site noise emissions between 0700 and 1700, Monday to Sunday,
    b. Outside Trade Hours – Site noise emissions between 1700 and 0700, due to 24 hour plant operation.

4. Comparison of Effective Noise Levels with the Intrusiveness Noise Levels and the Amenity Noise Levels to determine benchmarks above which noise management measures are required to be considered in accordance with the requirements of the NSW EPA Noise Policy for Industry.

5. Preparation of a report detailing the conditions during the assessment, the results of the assessment and a comparison with the relevant noise trigger levels.

2 SITE DESCRIPTION

The area of assessment is located in Tweed Shire Council along Howards Road, Burringbar and will focus on the commercial operator of Pocket Herbs & Produce Pty Ltd (the Farm) and the surrounding rural residential land use. The site is currently zoned as Rural Landscape (RU2) with the zone extending for 1 to 2km in all directions. There are 2 Noise Sensitive Receivers (NSRs) in the immediate local area and are as follows:

- 75 Howards Road, located directly north and adjacent to the Farm
- 74 Howards Road, located east and separated by a 2 lane road.

The Farm consists of a few fixed structures primarily comprised of two greenhouses (GH1 & GH2), soil area and a location for packaging plants into trays. The Farm's approved hours of operation under development consent are from 0700 to 1700 Monday to Friday, however analysis of audio has shown that machinery and grounds work have been observed to finish at 1600 and does operate on Saturday.

With the exception of the small fans in Greenhouse 2, all site noise sources only operate during operational hours between 0700 and 1700. The small fans operate 24 hours per day.

Presented in Figure 2.1 below are the structures associated with Pocket Herbs & Produce and the surrounding NSR of assessment.

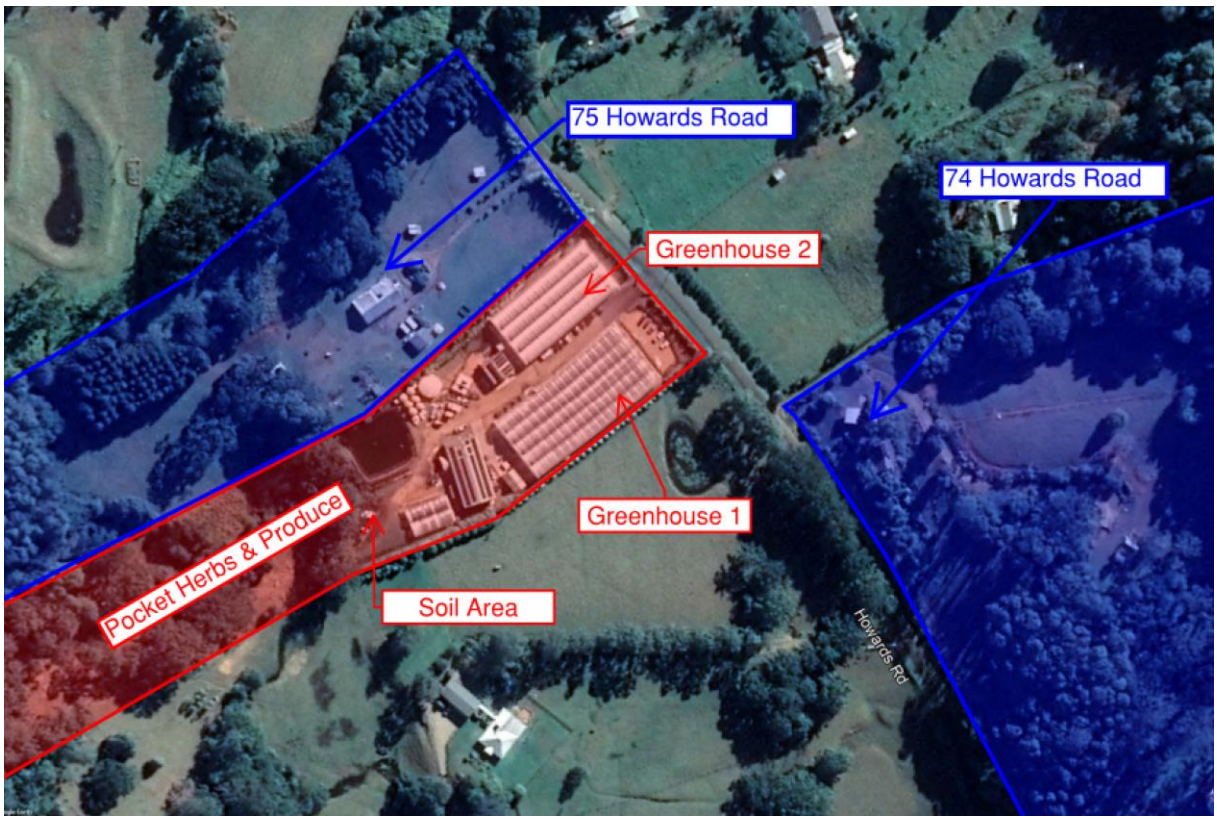

Figure 2.1 – Pocket Herbs & Produce & NSRs

3 ASSESSMENT CRITERIA

3.1 NSW Environmental Noise Policy – Noise Policy for Industry, 2017

The NSW Noise Policy for Industry, 2017 (the Policy) sets out its policies to ensure noise impacts associated with particular industrial developments are evaluated and managed in a consistent and transparent manner. It provides noise levels for assessing the potential impact of noise from industry and includes a frame for considering feasible and reasonable noise mitigation measures.

The Environmental Planning and Assessment Act 1979 (EP&A Act) and Protection of the Environment Operations Act 1997 (POEO Act) require that authorities examine and take into account matters affecting the environment when making decisions about development and activities.

The policy sets out a process for determining project noise trigger levels which are benchmark levels above which noise management measures are required to be considered. These noise trigger levels are an appropriate and achievable statutory noise limits for the industry in question and help form operational requirements for development consents and environment protection licences.

The noise trigger level provides a benchmark or objective for assessing a proposal or site. It is not intended for use as a mandatory requirement. The noise trigger level is a level that, if exceeded, would indicate a potential noise impact on the community, and so 'trigger' a management response. The noise trigger level, feasible and reasonable mitigation, and consideration of residual noise impacts are used together to assess noise impact and manage the noise from a proposal or site. It is the combination of these elements that is designed to ensure that acceptable noise outcomes are determined.

The noise trigger levels is the lower (the more stringent) value of the intrusiveness noise level, which represent the shorter-term intrusiveness due to changes in the noise environment, and amenity noise level, which represents maintaining the noise amenity of an area and is determined through a process of monitoring onsite conditions and reviewing recommended amenity noise levels based on studies of community annoyances in relation to industrial noise.

The noise levels in this policy differentiate between noise impacts during the day, evening and night. More stringent levels are applied for evening and night-time periods. It is widely accepted that noise is generally more disturbing in the evening and night as noise sensitive activates occur at those times.

Note that non-compliance with a project noise trigger level does not necessarily confirm offensive noise in relation to the EP&A Act and development consent conditions. The policy discusses that careful consideration of noise impacts and the feasible and reasonable mitigation measures available at existing sites is to be considered, noting that noise limits may not be the same as those for a greenfield site.

The project noise trigger level, feasible and reasonable mitigation, and consideration of the residual noise impacts are used together to assess noise impact and manage the noise from the site. It is the combination of these elements that is designed to ensure that acceptable noise outcomes are determined by decision makers.

3.1.1 Project Intrusiveness Noise Level

A projects' intrusiveness of an industrial noise source may generally be considered acceptable if the level of noise from the sources (represented by the L_{Aeq} descriptor), measured over a 15 minute period does not exceed the Background Noise Level (represented by the L_{90} descriptor) by more than 5 dB when beyond a minimum threshold. This intrusiveness noise level seeks to limit the degree of change a new noise source introduces to an existing environment.

The Background Noise Levels and Noise Level from a facility are measured at a point within a "Noise Sensitive Area", usually the nearest residence or a site of complaint. The noise level is adjusted where necessary for factors that increase the annoyance of the noise such as tone, intermittency, and impulsive components. The final level is the Effective Noise Level, and is compared with the Noise Limit to determine the potential impact. Note however that effective noise levels being higher than a project noise trigger level does not necessarily confirm offensive noise or non-compliance with development consent conditions.

Intrusiveness noise levels are not used directly as regulatory limits. They are used in combination with the amenity noise level to assess the potential impact of noise, assess reasonable and feasible mitigations options and subsequently determine achievable noise requirements.

The intrusiveness noise level is determine as follows:

Table 3.1 – Intrusiveness Noise Level

$L_{Aeq,\ 15min}$ = rating background noise level +5 Where: $L_{Aeq,\ 15min}$ represents the equivalent continuous (energy average) A-weighted sound pressure level of the source over 15 minutes. And Rating background noise level (RBL), represents the background level to be used for assessment purposes.

Minimum assumed RBLs apply in this policy. These results in minimum intrusiveness noise levels as follows:

Table 3.2 – Minimum Assumed RBLs and Project Intrusiveness Noise Levels.

Time of day	Minimum Assumed Rating Background Noise Level dB(A)	Minimum Project Intrusiveness Noise Level $L_{Aeq,\ 15min}$ dB(A)
Day	35	40
Evening	30	35
Night	30	35

The time of day is defined as follows:

- Day – the period from 7am to 6 pm Monday to Saturday or 8am to 6pm on Sundays and public holidays
- Evening – the period from 6pm to 10pm
- Night – the remaining times

3.1.2 Amenity Noise Levels and Project Amenity Noise Levels

To limit continuing increasing in noise level from applications of the intrusiveness level alone, the ambient noise level within an area from all industrial noise sources combined should remain below the recommended amenity noise levels specified in Table 3.3 where feasible and reasonable.

The recommended amenity noise levels represent the objective for total industrial noise at a receiver location, whereas the project amenity noise level represents the objective for noise from a single industrial development at a receiver location.

To ensure that industrial noise levels (existing plus new) remain within the recommended amenity noise levels for an area, a project amenity noise level applies for each new source of industrial noise as follows:

Project amenity noise levels for industrial developments = recommended amenity noise level (Table 3.2) minus 5 dB(A). For the local area in question, the only industry premises in the vicinity of rural residential land uses is the Pocket Herbs & Produce facility.

Table 3.3 Amenity noise levels

Receiver	Noise amenity area	Time of day	L_{Aeq}, dB(A)
Residential	Rural	Day	50
		Evening	45
		Night	40

The time of day is defined as follows:

- Day – the period from 7am to 6 pm Monday to Saturday or 8am to 6pm on Sundays and public holidays
- Evening – the period from 6pm to 10pm
- Night – the remaining times

Table 3.4 provides guidance on assigning residential receiver noise categories; however it is to be noted when selecting the appropriate category of site-specific circumstances and consultation with the relevant planning/licensing authority may be required in some circumstances. Note, only the relevant receiver category is shown below.

Table 3.4 Determining which of the Residential Receiver Categories Applies.

Receiver category	Typical planning zoning – standard instrument	Typical existing background noise level	Description
Rural residential	RU1 – primary production RU2 – rural landscape RU4 – primary production small lots R5 – large lot residential E4 – environmental living	Daytime RBL <40 dB(A) Evening RBL <35 dB(A) Night RBL <30 dB(A)	Rural – an area with an acoustical environment that is dominated by natural sounds, having little or no road traffic noise and generally characterised by low background noise levels. Settlement patterns would be typically sparse. Note: Where background noise levels are higher than those presented in column 3 due to existing industry or intensive agricultural activities, the selection of a higher noise amenity area should be considered.

3.1.3 Determining the Significance of Noise Impacts

A residual noise impact may exist where the best-achievable noise level from a development, when assessed at a sensitive receiver location, remains above the project noise trigger levels.

Residual noise impacts are identified after all source and pathway feasible and reasonable noise mitigation measures have been considered. The significance of the residual impact may need to be considered as part of an authority's determination/approval process. The project noise trigger level is the lowest value of the project intrusiveness or project amenity noise level.

Determining the significance of any residual noise impact is an essential component of the noise assessment process, to ensure that effective and appropriate mitigation measures are taken in each case.

There is no 'one-size-fits-all' approach to determine the impact from an existing industry. The following governing principles should be applied when determining the project noise trigger levels and/or assessment requirements for existing industry:

- The project noise trigger levels should not be applied as mandatory noise limits. The project noise trigger level is the level used to assess noise impact and drive the process of assessing all feasible and reasonable control measures.

- Where an existing industry has been in operation for more than 10 years and existing site operations exceed the project amenity noise level, the project amenity noise level may be adopted as the project noise trigger level to assess existing, and existing plus proposed site operations, as relevant.

- Where a development proposal involves a discrete process, and premises-wide mitigation has or is to be considered outside of the development proposal, a project noise trigger level for noise from new/modified components (not the whole site) of the operation may be set at 10 dB(A) or more below existing site noise levels or requirements. This approach means that the increase in noise from the whole site is minimised and provides scope for existing components to achieve noise reductions over time.

Note that for sites with limited mitigation measures available, the achievable noise limits can be above the project noise trigger levels. In some instances noise will be required to be managed as an integral part of site upgrades. The development of formal operating practices to reduce noise generation do not always need to be linked to site upgrades and, where feasible, these operating practices should be applied at the earliest opportunity. Where this process occurs as a part of the EPA's regulatory activity, the measures required to achieve the noise limits are usually set out in a pollution reduction program attached to the environment protection licence.

3.2 DA Conditions

The following DA conditions (DA13/0712) for the Pocket Herbs & Produce facility with regard to noise emission are applicable:

18. All proposed works are to be carried out in accordance with the conditions of development consent, approved management plans, approved construction certificate, drawings and specifications.

19. Construction and/or demolition site work including the entering and leaving of vehicles is limited to the following hours, unless otherwise permitted by Council:

- Monday to Saturday from 7.00am to 6.00pm
- No work to be carried out on Sundays or Public Holidays
- The proponent is responsible to instruct and control subcontractors regarding hours of work.

43. The use to be conducted so as not to cause disruption to the amenity of the locality, particularly by way of the emission of noise, dust and odours or the like.

45. All externally mechanical plant or equipment are to be located so that any noise impact due to their operation which may be or is likely to be experienced by any neighbouring remises is minimised. Notwithstanding this requirement all mechanical plant and or equipment is to be acoustically treated or shielded where considered necessary to the satisfaction of the General Manager or his delegate such that the operation of any mechanical plant and or equipment does not result in the emission of offensive or intrusive noise.

46. Hours of operation of the business are restricted to the following hours:

- 7:00am to 5:00pm Monday to Sunday.
- All deliveries and pickups relating to the business are to occur within the approved hours

48. Upon receipt of a noise complaint that Council deems to be reasonable, the operator/owner is to submit to Council a Noise Impact Study (NIS) carried out by a suitably qualified and practicing acoustic consultant. The NIS is to be submitted to the satisfaction of the General Manager or his delegate. It is to include recommendations for noise attenuation. The operator/owner is to implement the recommendations of the NIS within a timeframe specified by Council's authorised officer.

49. Any vehicles that remain on site for periods in excess of two (2) minutes are required to switch off their engines.

3.3 Protection of the Environment Operations Act (POEO Act)

The POEO Act states the following with regard to what *offensive noise* means:

a) that, by reason of its level, nature, character or quality, or the time at which it is made, or any other circumstances:
   i. is harmful to (or is likely to be harmful to) a person who is outside the premises from which it is emitted, or
   ii. interferes unreasonably with (or is likely to interfere unreasonably with) the comfort or repose of a person who is outside the premises from which it is emitted, or

b) that is of a level, nature, character or quality prescribed by the regulations or that is made at a time, or in other circumstances, prescribed by the regulations.

4 METHODOLOGY

Tweed Shire Council deployed two Svantek 977 Type 1 Environmental Noise Loggers adjacent to the boundary of rural residential land uses near the Pocket Herbs & Produce facility on the properties of 74 and 75 Howards Road. The commercial operators and residential tenants were also required to keep a diary of the daily operations of Pocket Herbs & Produce from mid-April to mid-October 2019.

The noise monitor's recorded data and diary notes between the 17st of April to the 14st of August 2019 were provided to JTA for analysis. Two weeks from the monitored period were selected for assessment against the NSW EPA Noise for Industry noise criteria. The two weeks selected by JTA were based on the best window of metrological conditions in the region in accordance with the methods and procedures of *NSW EPA Noise Policy for Industry.* Operating equipment and machinery or any other factors were not considered during the selection process.

The two selected weeks are as follows:

- Week 1 – 25th of April to the 1st of May
- Week 2 – 30th of July to the 4th of August

The weather conditions during the assessed weeks were in line with the requirements for the *NSW EPA Noise Policy for Industry*, with no rain and light winds during measurement periods, with a mixture of clear and cloudy conditions.

Deployment locations of the Environmental Noise Loggers are presented in Figure 4.1 below.

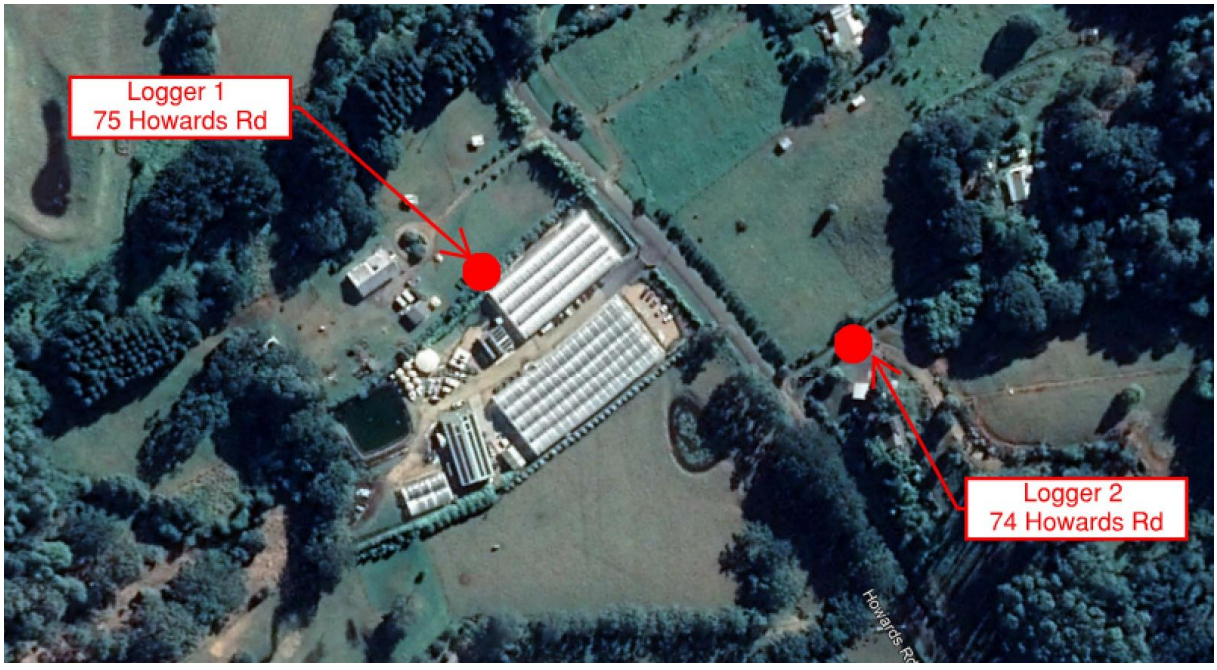

Figure 4.1 – Logger locations

4.1 Background Noise

Noise logging of background noise levels was performed using the two Svantek 977 Type 1 Environmental Noise Logger deployed by Tweed Shire Council. The loggers were positioned outdoors approximately 1.2m above ground level more than 4 metres from any acoustically reflective surfaces.

As the commercial operator is in close proximity to the loggers, and machinery and equipment were operating throughout the majority of the day time period, Ambient and Background noise levels were determined during periods where no activities or operations from the Farm were audible or present according to diary records.

Both Ambient and Background noise levels do not include any audible contribution from the industry in questions. The Ambient noise level is the typical noise level of the area inclusive of all noise sources (other than the industry in question) inclusive of traffic, wildlife, breeze in trees, etc. The Background noise levels is the underlying noise level excluding transient events and is representative of the noise levels during the lulls in Ambient noise. The Background noise level can be thought of as the arithmetic average of the quietest 10% of noise levels measured over a period. Whereas the Ambient noise level is the logarithmic average of all noise measured over a period.

Ambient and Background noise levels were taken over the two weeks of assessment and the background level averaged to determine the intrusiveness noise level. All measurements were a minimum of 15 minutes in duration.

The Background noise level is used to set a low value, representative of the quietest times during the measurement period, which then has adjustments applied to it (plus 5 dB) to set a benchmark for comparing industry noise levels against.

The Ambient noise level is used to describe the existing noise levels in the area. It can be used to determine the character of the area by comparing the value against the background noise level to determine how much transient events dominate the noise environment. It is also used when assessing construction type activities with the expectation that construction type activities during the day time period being generally more tolerated by the community than other noise sources.

4.2 Site Operational Noise

Site operational noise levels were also conducted using the two Svantek 977 Environmental Noise Loggers and continuous monitoring was performed from the 17th of April to the 14th of August 2019. Noise measurements were reviewed after the monitoring period at the logger location and the effective noise levels were calculated at the noise sensitive receptors defined by Figure 2.1 in accordance with the methods and procedures of the NSW EPA Noise Policy for Industry.

The weather conditions during the assessed durations were in line with the requirements of the NSW EPA Noise Policy for Industry, with no rain and light winds during measurement periods, with a mixture of clear and cloudy conditions.

5 RESULTS

5.1 Background Noise

Background measurements were obtained at 15 minute internals from the noise monitors deployed at the boundaries of 74 and 75 Howard Roads.

Table 5.1 below details the background and ambient noise levels recorded during the day-time noise assessment period, for dates where suitably valid data was obtained. Note, data affected by adverse weather conditions area not presented in this table.

Table 5.1 – Background Noise Levels

Date & Time	Logger 1 75 Howards Road		Logger 2 74 Howards Road	
	Background Noise Levels L_{90} dB(A)	Ambient Noise Levels L_{eq} dB(A)	Background Noise Levels L_{90} dB(A)	Ambient Noise Levels L_{eq} dB(A)
Week 1				
25th April 10:36 – 10:51	36	39	36	42
26th April 11:51-12:06	37	44	36	42
29th April 16:21-16:36	34	42	39	45
30th April 15:36 – 15:51	36	44	37	44
1st May 07:51 – 08:06	37	43	37	47
Week 2				
30th July 11:33 – 11:48	36	39	35	42
31st July 16:04 – 16:19	35	43	37	49
1st August 17:19 – 17:34	34	51	34	46
2nd August 08:08 – 08:23	37	46	35	46
3rd August 15:49 – 16:05	33	51	34	42
4th August 10:03 – 10:18	37	46	37	48
Median	**36**	**44**	**36**	**45**

As can be seen by comparing Ambient and Background noise levels against each other, the noise environment is highly transient with higher noise levels followed by lulls of quiet noise levels.

5.2 Site Noises

Throughout the duration of monitoring of the local area, the measurements collected of the operational noise sources identified that the Pocket Herbs & Produce facility was audible for the majority of their trading hours between 0800 to 1600.

Site main noise sources were identified from the noise monitoring loggers from the 17th of April to the 14th of August 2019. The main noise sources include the 14L mister, excavator, blower, pumps,

pressure washers and forklifts. The 14L misters, blowers, pumps, pressure washers and forklifts are primarily located at Greenhouse 1 & 2, and the excavator being located at the soil area.

Extraneous noises were also observed during the assessment which included wildlife (birds, insects and livestock), local road traffic and aircraft flying overhead.

All noise sources were audible at some point during the assessment, however the operational noises from the forklifts, blowers, fan and pumps were often inaudible with noise levels dominated by extraneous noise. It was also observed that the mister has a tonal component at 630Hz of greater than 5dB compared to the surrounding one third octaves and therefore attracts a tonal adjustment of +5 dB in accordance with the NSW EPA Noise Policy of Industry.

Due to the noise monitors being located closer to the Farm noise sources than the residential dwellings, approximate sound power levels of each equipment was determined based on the monitor location to where the noise source was observed, based on diary entries recorded by equipment operators. The distance of the noise source was approximated to a centralised position within the facility and the approximate sound power level was than calculated from that location based on measured sound pressure levels at the monitor location. From the resulting sound power levels of the equipment, the sound pressure level was predicted to the noise sensitive receptor dwellings. The NSW EPA Noise Policy for industry requires assessment locations to generally be located outdoors in front of the façade of a habitable room.

5.3 Operational Noise

During the assessment the small irrigation pumps and fans associated with Greenhouse 2 were not audible during the night time period at NSR locations. During the operational hours period Greenhouse 2 fixed plant noise sources were below the project trigger level.

5.3.1 Intrusiveness Noise Level

Noise intrusive criteria are calculated from the measured background noise level plus 5 dB(A). The median L_{90} background levels presented in Table 5.1 for both noise sensitive receptors was 36 dB(A).

The intrusiveness noise Level for the day time assessment period is as follows:

$L_{Aeq,\ 15min}$ = rating background noise level + 5dB

$L_{Aeq,\ 15min}$ = <u>41 dB</u>

The intrusiveness noise is then compared with the effective noise level at the noise sensitive receptor to determine any potential impact. See Appendix I for effective noise levels compared to the criteria.

As the Intrusiveness Noise Level is lower than the Amenity Noise Level, it will become the project trigger level.

It is to be reiterated that the Intrusiveness Noise Levels are not used directly as regulatory noise limits, but are used in combination with the Amenity Noise Levels to assess potential impacts of noise, reasonable and feasible mitigation options and subsequently determine achievable noise requirements.

Table 5.2 on the following page compares the effective noise levels with the intrusiveness noise limits during the day time period.

Table 5.2 – Intrusiveness Noise Level Comparison

Receiver	Period	Number of Exceedances of the Trigger Level
Week 1		
74 Howard Road	24th April – 1st May	10
75 Howard Road		8
Week 2		
74 Howard Road	29th July – 4th August	9
75 Howard Road		8

5.3.2 Amenity Noise Levels

The Amenity Noise Level criteria in accordance with NSW EPA Noise Policy for industry, for a rural property in a Rural Landscape (RU2) with a typical background level of greater than 40 dB during the day time period is 50 dB(A).

The loudest effective noise levels from the operations and activity at Pocket Herbs & Produce over the two weeks of assessment is presented in Table 5.3 below.

Table 5.3 – Effective Noise Level at NSR Locations

Receiver	Equipment	Measured Operation Noise Level dB(A) (Logger)	Modifying Factors & Meteorology Adjustments (dB)	Effective Noise Level dB(A)
75 Howard Road	14L Mister	57	Distance adjustment[2] = -7 Tonal = +5[1]	**55**
	Excavator	56	Distance adjustment[2] = -0	**56**
	Blower	48	Distance adjustment[2] = -7	**41**
	Forklift	41	Distance adjustment[2] = -4	**37**
74 Howard Road	14L Mister	55	Distance adjustment[2] = -1 Tonal = +5dB[1]	**59**
	Excavator	54	Distance adjustment[2] = -0	**54**
	Blower	47	Distance adjustment[2] = -1	**46**
	Forklift	54	Distance adjustment[2] = -1	**53**

1 – The mister is tonal at 630Hz of greater than 5dB of the surrounding octaves and therefore attracts a tonal adjustment of +5 dB in accordance with the NSW EPA Noise Policy of Industry.
2 – Distance adjustment were calculated based on the location of the noise source to the NSR, and the sound power level calculated from the logger to the noise source.

Table 5.4 below compares the sites' effective noise levels with the Amenity Noise Level criteria.

Table 5.4 – Amenity Criteria Compliance

Receiver	Equipment	Measured Operation Noise Level dB(A)	Amenity Noise Level Criteria dB(A)	Criteria Achieved
75 Howard Road	14L Mister	55	50	No
	Excavator	56		No
	Blower	41		Yes
	Forklift	37		Yes
74 Howard Road	14L Mister	59	50	No
	Excavator	54		No
	Blower	46		Yes
	Forklift	53		No

No other site noise sources other than those detailed in Table 5.3 exceeded the Amenity Noise Level.

Based on the results of the assessment and the amount of time noise sources produced noise levels above the Amenity Noise Level during operational hours; the percentage of time the Pocket Herbs & Produce facility exceeded the Amenity Noise Level criteria is presented in Table 5.5.

Note, the assessment did not capture all audible events as some events were either too low in magnitude or extraneous noise sources were too high to isolate the facility noises for inclusion into the assessment results.

Table 5.5 – Percentage of Time Amenity Noise Level Criteria Exceeded

Receiver	Period	Percentage of Time Criteria Exceeded during Operational Hours
Week 1		
74 Howard Road	24th April – 1st May	4.3%
75 Howard Road		0.8%
Week 2		
74 Howard Road	29th July – 4th August	3.5%
75 Howard Road		1.3%

6 DISCUSSION

6.1 Meteorological Conditions

Weather conditions throughout the monitoring were varied with periods of favourable conditions and periods with high winds and/or rain. Of the 15 days assessed, 13 days were determined as suitable for obtaining valid data i.e. winds below 17km/h and rain below 2mm. Weather data for the assessment period has been obtained from the Bureau of Meteorology Murwillumbah weather station which is the closest weather station to Burringbar.

Presented in Table 6.1 below are the weather data during the assessed weeks.

Table 6.1 – Meteorological Conditions

Date	Wind		Rain (mm)
	9am Data	3pm Data	
Week 1			
24th April	7	19	0
25th April	Calm	-	0
26th April	Calm	11	0
27th April	15	-	0
28th April	15	-	0
29th April	4	13	0
30th April	4	4	0
1St May	4	7	1.4
Week 2			
29th July	2	11	0
30th July	4	6	-
31st July	15	Calm	0
1st August	15	19	0
2nd August	4	2	0.8
3rd August	4	-	0.7
4th August	Calm	-	0

Meteorological conditions were characteristic of the area for the particular time of the year. No meteorological adjustments have been applied. Temperature inversions can artificially increase noise levels at NSRs greater than 200m from sites when there is a significant temperature gradient between 0m and 100m above ground level. The temperature gradient and distance between the site and NSRs effectively refracts (bends) sound back down on to NSRs rather than travelling off into the atmosphere. Initial screening of meteorological conditions was undertaken to determine if temperature inversions are likely to artificially increase noise levels at NSRs for greater than 30% of the days during the winter months as per the NSW EPA Noise Policy for Industry. Screening results indicates no allowance for temperature inversion is required due to the operational time of the farm, resulting in stabilised temperatures between ground and air when the site is operational during the day time period.

6.2 Operational Noise

The noise environment at the assessed NSRs located at 74 and 75 Howards Rd, Burringbar was influenced by activities and operations from Pocket Herbs & Produce. The primary noise source which exceeded the Intrusiveness Noise Level and Amenity Noise Level were the 14L mister, forklift and excavator. Other equipment was also audible during the assessed periods, however was found to generally be less than the Intrusiveness and/or Amenity Noise Levels or were dominated by extraneous noises.

It was observed that the 14L mister, forklift and excavator operate intermittently throughout the day with some occurrence of the excavator operation occurring for longer durations.

Fixed plant noise sources associated with the Greenhouse 2 component of the Pocket Herbs & Produce facility was found to be inaudible over extraneous noise sources during the night time period. Random samples were selected from various nights of the assessed two separate weeks, with no facility noise sources audible. During the day time period no Greenhouse 2 fixed plant noise sources exceeded the trigger noise level.

6.3 Impact at Adjacent Rural Residential Land Uses

When determining the noise impact of the Pocket Herbs & Produce facility at the adjacent rural residential land uses, many separate factors are required to be considered. The measured levels above the Intrusiveness and Amenity Noise Level criteria, the amount of times or percentage of time the criteria is exceeded, the existing noise environment and the feasible and reasonable mitigation measures available to reduce noise emissions.

Measured noise levels associated with the Pocket Herbs & Produce facility can exceed the Intrusiveness and Amenity Noise Levels on occasion. The exceedances only occur during the operational hours of the facility between 0700 and 1700 on weekdays.

The portion of time the facility exceeds the Amenity Noise Levels at the adjacent rural residential land uses ranges between 1% to 4% over a week during operational hours. The number of events that exceed the Intrusiveness Noise Level ranges between 8 to 10 times per week.

Measured noise levels associated with the forklift are only marginally above the Amenity Noise Levels, with effective noise levels 3 dB above the criterion under worst-case conditions. The mister and excavator can exceed the Amenity Noise Levels under worst-case conditions by up to 9 dB and 6 dB respectively.

The existing background noise level is very low during the day time period and is considered consistent with highly rural typical background noise levels. Ambient noise levels are considered typical of highly rural areas with wildlife and local traffic dominating the noise environment. When the mister, excavator and forklift were not operated, noise levels at NSRs were dominated by extraneous noise sources for the majority of the time.

In rural areas it is not uncommon for agricultural activities associated with typical farm mobile plant or appliances to produce high noise levels at neighbouring dwellings. With the exception of the mister and occasionally the excavator, Pocket Herbs & Produce noise emissions are in line with what would be expected for rural living.

However, agricultural activities tend to be seasonal or their noise sources operating on large land areas where noise sources are only generating high noise levels for limited amounts of time of the year at nearby dwellings. This generally provides the nearby dwellings respite from high noise levels, therefore reducing the noise impact.

The Pocket Herbs & Produce facility operates throughout the week and although noise sources that produce high noise levels are intermittent in nature, there is no respite from facility noise levels for significant periods of time as there is for agricultural activities associated with typical farming. So while there are similarities between the Pocket Herbs & Produce facility noise emissions and typical agricultural activities associated with farming, the two are not directly comparable.

It is understood that the Pocket Herbs & Produce facility has invested in significant upgrades to the site to reduce noise emissions, replacing high noise equipment with lower noise alternatives. There is limited options available to reduce noise emissions from typical forklift of excavator activities effectively. Quieter exhaust options could be explored but they can have a limited effectiveness at reducing equipment noise output if not selected or designed appropriately. Additionally the main

noise source from these equipment items is often the handling of material or engine breakout noise. If implemented engineering options to reduce noise emissions are exhausted and it is not feasible to replace the equipment with a quitter alternative, constructing a noise wall along the boundary of the site may be the only other option available.

The mister produces significantly higher noise levels at the adjacent rural residential land uses compared to other site noise sources. Replacing the current mister with an electric battery powered unit should be investigated. Alternatively, if feasible, consideration should be given to investigating if the mister can be substituted with a fixed plant equivalent with the pump housed in an acoustic enclosure to minimise noise emissions.

If feasible and reasonable noise mitigation measures are not available to be implemented, other strategies should be implemented to achieve acceptable noise outcomes. These could include agreed management controls such as scheduled operational times of certain equipment items.

7 CONCLUSION

The results of the environmental noise assessment determined that Pocket Herbs & Produce activities can currently exceed the Intrusiveness and Amenity noise levels on occasion at NSRs at adjacent rural residential land uses during the day time period, 0700-1800.

7.1.1 Compliance with the POEO Act

Based on the combination of the factors discussed in Section 6.3, the likelihood of Pocket Herbs & Produce emitting offensive noise levels without the mister, is low. When taking into consideration the mister, the likelihood of Pocket Herbs & Produce emitting offensive noise levels is low to moderate.

Further action is recommended to determine if feasible and reasonable noise mitigation measures are available to be implemented to reduce site noise emissions from the mister. Further action should be considered for the excavator and, if required, for other site noise sources as well as management controls to achieve acceptable noise outcomes.

7.1.2 Compliance with DA Conditions

Based on the results of the assessment the relevant DA conditions associated with the operation of the facility were found to be generally compliant. Some conditions are outside the scope of this assessment or not applicable such as DA conditions 18 and 19.

DA condition 43. States the following:

43. The use to be conducted so as not to cause disruption to the amenity of the locality, particularly by way of the emission of noise, dust and odours or the like.

Compliance with DA condition 43. can be differed to the outcomes of Section 7.1.1 above and Section 6.3.

8 30 Years Of Independent Tailor-Made Advice

JTA is one of Australia's leading independent workplace consultancies. For 30 years we've helped businesses manage their occupational health, safety and noise requirements. We pride ourselves on our ability to understand a client's needs and provide tailor-made advice. Our team of specialist consultants offer pragmatic recommendations based on innovative scientific solutions and legislative compliance. Creating healthy, safe and productive workplaces is what we do every day.

APPENDIX I – NOISE EVENTS

Equipment	Location	Sound Pressure Level at Logger 1 dB(A)	Sound Pressure Level at Logger 2 dB(A)	Adjustments dB	Effective Noise Level at 75 Howards Rd dB(A)	Effective Noise Level at 74 Howards Rd dB(A)
24th of April						
14L Mister	GH1	46	55	Tonal: +5 Logger 1 Distance adjustment: -4 Logger 2 Distance adjustment: -1	47	59
Forklift	GH1	41	50	Logger 1 Distance adjustment: -4 Logger 2 Distance adjustment: -1	37	49
Forklift	GH1	-	54	Logger 2 Distance adjustment: -1	-	53
14L Mister	GH2	52	44	Tonal: +5 Logger 1 Distance adjustment: -7 Logger 2 Distance adjustment: -1	50	48
Excavator	Toilet	55	-	Logger 1 Distance adjustment: -3.5	52	-
Blower	GH2	48	-	Logger 1 Distance adjustment: -7	41	-
26th of April						
Excavator	Soil	56	-	Logger 1 Distance adjustment: -0	56	-
Excavator	Soil	-	54	Logger 2 Distance adjustment: -0	-	54
27th of April						
14L Mister	GH2	49	54	Tonal: +5 Logger 1 Distance adjustment: -7 Logger 2 Distance adjustment: -1	47	58
28th of April						
Blower	GH1	43	47	Logger 1 Distance adjustment: -4 Logger 2 Distance adjustment: -1	39	46
29th of April						
Excavator	Toilet	-	53	Logger 1 Distance adjustment: -3.5	49	-
Excavator	Toilet	-	54	Logger 1 Distance adjustment: -3.5	51	-
Excavator	Toilet	-	53	Logger 1 Distance adjustment: -3.5	49	-
30th April						
Excavator	Toilet	55	-	Logger 1 Distance adjustment: -3.5	51	-
14L Mister	GH2	56	-	Tonal: +5 Logger 1 Distance adjustment: -7	54	-

Equipment	Location	Sound Pressure Level at Logger 1 dB(A)	Sound Pressure Level at Logger 2 dB(A)	Adjustments dB	Effective Noise Level at 75 Howards Rd dB(A)	Effective Noise Level at 74 Howards Rd dB(A)
				Logger 2 Distance adjustment: -1		
14L Mister	GH1	49	52	Tonal: +5 Logger 1 Distance adjustment: -4 Logger 2 Distance adjustment: -1	50	56
30th of July						
Blower	GH1	-	42	Logger 2 Distance adjustment: -1	-	41
Truck	All over	-	50	Logger 2 Distance adjustment: -1	-	49
31th of July						
14L Mister	GH2	54	49	Tonal: +5 Logger 1 Distance adjustment: -7 Logger 2 Distance adjustment: -1	52	52
Excavator	Soil	48	47	Logger 1 Distance adjustment: -0	48	47
14L Mister	GH1/HOA	51	53	Tonal: +5	52	57
1st of August						
Excavator	Soil	50	-	Logger 1 Distance adjustment: -0	50	-
Fan	GH2	45	-	Logger 1 Distance adjustment: -7	38	-
Forklift	Bin	41	-	Logger 1 Distance adjustment: -7 Logger 2 Distance adjustment: -1	34	-
Forklift	GH1	-	43	Logger 2 Distance adjustment: -1	-	42
Blower	GH2	48	44	Logger 1 Distance adjustment: -7 Logger 2 Distance adjustment: -1	41	42
2nd of August						
Pump	GH2	48	-	Logger 1 Distance adjustment: -7	41	-
Pump	GH2	48	-	Logger 1 Distance adjustment: -7	41	-
Pump	GH2	47	-	Logger 1 Distance adjustment: -7	40	-
3rd of August						
14L Mister	GH1	49	51	Tonal: +5 Logger 1 Distance adjustment: -4 Logger 2 Distance adjustment: -1	45	55
14L Mister	GH2	57	49	Tonal: +5 Logger 1 Distance adjustment: -7 Logger 2 Distance adjustment: -1	50	53