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2-44 GRAINGER ROAD, WEST FOOTSCRAY

Acoustic Report

16 December 2022

Paintback Ltd C/- Davis Advisory

MD913-01F01 Acoustic Report (r6).docx

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Document details

Detail	Reference
Doc reference:	MD913-01F01 Acoustic Report (r6).docx
Prepared for:	Paintback Ltd C/- Davis Advisory
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Document control

Date	Revision history	Non-issued revision	Issued revision	Prepared	Instructed	Reviewed / Authorised
31.10.2022	Issued		0	M. Weston		N. Peters
04.11.2022	Minor amendments		1	M. Weston		N. Peters
22.11.2022	Further amendments		2	M. Weston		N. Peters
29.11.2022	Operational scenario changes		3	M. Weston		N. Peters
14.12.2022	Final		4	M. Weston		N. Peters
16.12.2022	Final issued		5	M. Weston		N. Peters
16.12.2022	Further amendments		6	M. Weston		N. Peters

File Path: M:\AssocMelbProjects\MD901-MD950\MD913 ar 2-44 Graingers Rd, West Footscray - Paint Recovery Facility\1 Docs\MD913-01F01 Acoustic Report (r6).docx

Executive summary

Renzo Tonin & Associates undertook an acoustic assessment of the proposed paint recovery plant to be located at 2-44 Grainger Road, West Footscray (the Subject Facility), to assess noise from commercial operations.

We have been briefed by Davis Advisory to consider Acoustics in relation to the proposed Paint Circular Economy HQ (PaCE HQ) project in West Footscray. The PaCE HQ project is described in Annexure D of the application, and our comments and findings are referrable to that project.

In conducting the acoustic assessment, Renzo Tonin & Associates has:

- Quantified relevant noise criteria: EPA 1826-P1
- Measured noise levels from operational activities and associated mechanical equipment at a similar industrial facilities
- Analysed the noise monitoring and measurements
- Constructed a three-dimensional noise model of the Subject Facility, to assess various noise impacts (described below)
- Assessed and compared predicted levels to noise limits.

The outcomes of the acoustic assessment are:

- Noise levels from the representative mechanical services were found to conform at all times with EPA 1826-P1 criteria.
- Noise levels from anticipated delivery activities were found to conform at all times with EPA 1826-P1 criteria.
- Noise levels from the warehouse/plant operations (i.e. other than deliveries) were found to conform at all times with EPA 1826-P1 criteria, with the specific requirement for a not less than 6dB noise reduction to the identified equipment.

  The 6dB reduction could be achieved via localised enclosures or wall/ceiling treatments to the warehouse. Such treatments are commonplace, and application is straight forward to design, during the design stage when more detailed information is available.

Based on the above, the PaCE HQ project is expected to conform with all nominated criteria, and on this basis, not unreasonably affect noise amenity in the area.

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1 Introduction

Renzo Tonin & Associates undertook an acoustic assessment of the proposed paint recovery plant to be located at 2-44 Grainger Road, West Footscray (the Subject Facility), to assess noise from commercial operations.

We have been briefed by DA to consider Acoustics in relation to the proposed PaCE HQ project in West Footscray. The PaCE HQ project is described in Annexure D of the application, and our comments and findings are referrable to that project.

The acoustic assessment has been based on drawings (detailed within this assessment) and information provided by the client.

The work documented in this report was carried out in accordance with the Renzo Tonin & Associates Quality Assurance System, which is based on Australian Standard / NZS ISO 9001. Appendix A contains a glossary of acoustic terms used in this report.

2 Site overview

The Subject Facility is proposing operate Monday to Saturday from 7am to 6pm. Figure 1 and Table 1 present an overview of the Subject Facility surrounding land uses.

Table 1: Existing land uses surrounding the Subject Facility

Subject Facility	2-44 Grainger Road, West Footscray • Industrial 1 Zone (IN1Z) & Industrial 3 Zone (1N3Z)
North of the Subject Facility	Rail corridor 18 Newman Drive, Footscray • General Residential Zone -Schedule 1 (GRZ1) • Residential building approximately 120 metres from the Subject Facility's existing northern boundary, across rail corridor
East of the Subject Facility	268 Geelong Road, West Footscray • Industrial 1 Zone (IN1Z) • Fenner Conveyors – Industrial equipment supplier
South of the Subject Facility	46 Grainger Road, West Footscray • Industrial 3 Zone (IN3Z) • Mixed commercial showrooms / warehouses **R2 - 2 Robbs Road, West Footscray** • General Residential Zone -Schedule 1 (GRZ1) • Residential building approximately 70 metres from the Subject Facility **R4 - 4 Robbs Road, West Footscray** • General Residential Zone -Schedule 1 (GRZ1) • Residential building approximately 80 metres from the Subject Facility **R5 - 5 Hansen Street, West Footscray** • General Residential Zone -Schedule 1 (GRZ1) • Residential building approximately 95 metres from the Subject Facility
West of the Subject Facility	11 Braid Street, West Footscray • Industrial 3 Zone (IN3Z) • Keables P/L – Fastener supplier **R1 - 1 Robbs Road, West Footscray** • Industrial 3 Zone (IN3Z) • Residential building approximately 35 metres from the Subject Facility **R3 - 3 Robbs Road, West Footscray** • General Residential Zone -Schedule 1 (GRZ1) • Residential building approximately 50 metres from the Subject Facility **R6 – 17 Braid Street, West Footscray** • General Residential Zone -Schedule 1 (GRZ1) • Residential building approximately 110 metres from the Subject Facility

Figure 1: Subject Site and Facility & surrounding unattended monitoring and attended measurement locations

3 Noise measurements

3.1 Unattended long-term noise monitoring

To quantify the existing noise levels in the area, Renzo Tonin & Associates conducted unattended noise monitoring as detailed below. We conducted door knocking, to seek permission to place the monitoring equipment for the duration, with both residents happy to provide access. The monitor locations (L1 & L2) are shown in Figure 1 and described in Table 2 below. Appendix B presents graphs of the unattended monitored noise levels at each location.

Table 2: Noise monitoring locations

ID	Location	Details
L1	1 Robbs Road- Representative of the most affected residential receiver (at 2 Robbs Road) – approximately 70m SSW from the front fence to rear fence of Subject Facility	• Monitoring period: Thursday 6th October to Thursday 13th October 2022 • The microphone was set up 1.5 metres above ground level in the front yard, 3.5m in front of the bedroom window • Generally low wind and limited precipitation for the duration of the monitoring • The noise environment was dominated by traffic noise on Geelong Road
L2	4 Hansen Street (background measurement location) - 140m SW of the rear fence of Subject Facility with dwellings between.	• Monitoring period: Thursday 6th October to Thursday 13th October 2022 • The microphone was set up 1.5 metres above ground level, set up such that topography blocked line of sight to the Subject Facility & other noise generating industry within the surrounding area • Generally low wind and limited precipitation for the duration of the monitoring • The noise environment was dominated by local wildlife and distant traffic on Geelong Road

Notes:
1. The monitors were set to record broadband and spectral noise descriptors, and audio for noise source verification
2. Weather data per Bureau of Meteorology's Laverton RAAF weather station.

Table 3 presents background noise levels relevant for derivation of noise limits.

Table 3: Period average background noise levels

ID	Location	Representative period background noise level, L_{90} dB(A)		
		Day	Evening	Night
L1	1 Robbs Road, West Footscray	49	47	44
L2	4 Hansen Street, West Footscray	44	42	40

Period Definitions:
Day: Monday to Saturday 7am - 6pm
Evening: Monday to Saturday 6pm - 10pm; Sundays 7am - 10pm
Night: All days 10pm - 7am

Notes: NTI XL2 Class 1 noise monitors were used for the campaign. The calibration of the device was checked in the field immediately before and after the measurement using a Brüel & Kjær Type 4231 calibrator; no drift in calibration was observed. The noise monitors conform with IEC 61672-1:2013 and IEC 61260-1:2014; the sound calibrator conforms with IEC 60942:2017, and; all carry manufacturers certification or NATA certification detailing Standard conformance testing within the last two years and one year respectively

3.2 Offsite attended short-term noise measurements

To assist with identifying the existing noise sources in the area, Renzo Tonin & Associates conducted attended noise measurements on Thursday 6th October 2022 between 10:30am and 12:00pm. The measurement locations (A1 & A2) are shown in Figure 1 and described in Table 4 below.

These measurements have been conducted to provide a greater understanding of the surrounding environment and the potential impacts on the nearby residents to the Subject Facility.

In this way, these measurements have confirmed that the noise levels recorded at the unattended monitoring location (L1) are not impacted by noise sources (i.e. industrial facilities within the area).

Table 4: Offsite noise measurement locations

ID	Location	Measurement Details[1]
A1	Corner of Grainger & Geelong Road	• Conducted on Thursday 6th October to Thursday 13th October 2022 between 10:30am & 12pm • Measured noise level of 69 L_{eq} dB(A) and 59 L_{90} dB(A) • The microphone was set up 1.5 metres above ground level • The noise environment was dominated by local traffic and nearby industrial noise
A2	Front of 17 Braid St, West Footscray	• Conducted on Thursday 6th October to Thursday 13th October 2022 between 10:30am & 12pm • Measured noise level of 59 L_{eq} dB(A) and 55 L_{90} dB(A)The microphone was set up 1.5 metres above ground level • The noise environment was dominated by local traffic noise on Geelong Road

Notes:
1. Measurements were set to record broadband and spectral noise descriptors, and audio for noise source verification
2. NTi XL2 sound level analysers were used for the measurement campaigns. The XL2 is a Class 1 instrument having accuracy suitable for field and laboratory use. The calibration of the device was checked in the field immediately before and after the measurement using a Brüel & Kjær Type 4231 calibrator; no drift in calibration was observed. The noise monitors conform with IEC 61672-1:2013 and IEC 61260-1:2014; the sound calibrator conforms with IEC 60942:2017, and; all carry manufacturers certification or NATA certification detailing Standard conformance testing within the last two years and one year respectively.

4 Noise sources

The following noise source levels have been provided to Renzo Tonin & Associates and have been referred to in this assessment. Any noise sources that have not been provided have been sourced from our noise data library and are considered suitable to use for the purpose of this acoustic assessment.

Table 5: Specific internal warehouse equipment/activity noise levels

Item	Equipment/activity	Sound power level $L_{W,eq}$ dB(A)
1	Bin Conveyor	75 dB(A) at 1m
2	Solvent Runi Screw Compactor	55 dB(A) at 1m
3	Inclined Auger	75 dB(A) at 1m
4	Inclined Auger	75 dB(A) at 1m
5	Runi Screw Compactor	55 dB(A) at 1m
6	Inclined Conveyor	75 dB(A) at 1m
7	Force Quad Shaft Shredder	76 dB(A) at 1m
8	Dewatering Screen	90 dB(A) at 1m
9	Dewatering Screen	90 dB(A) at 1m
10	Inclined Conveyor	75 dB(A) at 1m
11	Overband Magnet Separator	50 dB(A) at 1m
12	Bi Directional Conveyor	75 dB(A) at 1m
13	Inclined conveyor	75 dB(A) at 1m
14	Float Sink tank	75 dB(A) at 1m
15	Dewatering Auger	80 dB(A) at 1m
16	Granulator	85 dB(A) at 1m
17	Friction Washer	94 dB(A) at 1m[1]
18	Horizontal Auger	75 dB(A) at 1m
19	Mechanical Dryer	94 dB(A) at 1m[1]
20	Blower	94 dB(A) at 1m[1]
21	Pre cleaner and Magnetic Separator	90 dB(A) at 1m
22	Blower	94 dB(A) at 1m[1]
23	Double Bagging Station	75 dB(A) at 1m
24	Control Panel	Nil
25	Remote Panel	Nil

Note 1. The client has committed to attenuation measures to provide not less than 6dB noise reduction to the identified equipment. The 6dB reduction could be achieved via localised enclosures or wall/ceiling treatments to the warehouse. Such treatments are commonplace, and application is straight forward to design, during the design stage when more detailed information is available.

Table 6: Typical equipment/activity noise levels

Description	Sound power level $L_{W,eq}$ dB(A)
Ventilation duct (operating continuously)	78 dB(A) at 1m
Outdoor air conditioner cassette (5 units assumed)	65 dB(A) at 1 metre
Forklift movement (continuous)	64 dB(A) at 5m
Small-scale exhaust fan (e.g. toilet, 5 units assumed)	57 dB(A) at 0.5 metres

5 Criteria

5.1 EPA 1826-P1 commercial noise legislation

Within the Melbourne metropolitan region, noise from commercial plant and activities affecting residential properties is governed by the Victorian Part 1 of EPA Publication 1826 *'Noise Limit and Assessment Protocol for the Control of Noise from Commercial, Industrial and Trade Premises and Entertainment Venues'* (1826-P1), legislated by way of the Environment Protection Act 2017 (VIC); to protect beneficial domestic uses, in particular sleep during the night period.

EPA 1826-P1 noise limits are calculated from zoning and background noise levels measured within an area, in absence of intrusive commercial noise sources. Table 7 presents the applicable noise limits which have been calculated in accordance with the EPA 1826-P1.

Table 7: EPA 1826-P1 noise limits

Period	Zoning level, L_{eq} dB(A)	Background L_{90} dB(A)	Background classification	EPA 1826-P1 limit L_{eq} dB(A)
1 Robbs Road, West Footscray				
Day	*55*	*49*	*High Background*	**55**
Evening	*49*	*47*	*High Background*	**50**
Night	*44*	*44*	*High Background*	**47**
4 Hansen Street, West Footscray				
Day	*52*	*44*	*Neutral*	**52**
Evening	*46*	*42*	*Neutral*	**56**
Night	*41*	*40*	*High Background*	**43**

Period Definitions:
Day: Monday to Saturday 7am - 6pm;
Evening: Monday to Saturday 6pm - 10pm; Sundays 7am - 10pm
Night: All days 10pm - 7am

Notes: Background noise levels from L1 have been used for sensitive receivers that are directly affected by traffic noise from Geelong Road, while background noise levels from L2 have been used for all sensitive receivers that are shielded from traffic noise from Geelong Road. These background noise levels were used to determine noise limits for each identified sensitive receiver location

EPA 1826-P1 noise limits are calculated from zoning and background noise levels measured within an area, in absence of intrusive commercial noise sources.

In addition, where applicable, the effective noise level is determined, for noise from commercial, industrial and trade premises, as a 30-min equivalent sound pressure level $L_{Aeq,30min}$ adjusted, where relevant for:

a. duration (A_{dur})
b. Noise character
   i. tonality (A_{tone})
   ii. impulse (A_{imp})
   iii. intermittency (A_{int})

   Measurement position
   i. reflection (A_{refl})
   ii. indoor (A_{ind})

The effective noise level is calculated using the following equation:

$$\mathbf{ENL = L_{Aeq} + (A_{dur}) + (A_{tone}) + (A_{imp}) + (A_{int}) + (A_{refl}) + (A_{ind})}$$

6 Noise assessment

6.1 Noise propagation model

A Cadna-A three-dimensional noise model, implementing ISO 9613 noise propagation algorithms was built to calculate noise propagation from the Subject Facility to the nearest residential dwellings. The following propagation effects were included in the predictive model:

- Mitigation of noise with distance, including geometrical spreading and air absorption
- Reflections from buildings and environment
- Barrier effects due to obstructions between noise sources and residential receivers
- Ground absorption effects
- Local topographical changes

6.2 Commercial noise assessment

6.2.1 Operational modelling scenarios and assumptions

Renzo Tonin & Associates have provided two scenarios, including a limited operations '4 Day' scenario, and a full capacity operations 'Busy Day' scenario.

To ensure a typical worst case noise scenario, in accordance with EPA Pub 1826, the assessment assumes 30-minute operational scenario, with noise source locations provided in Figure 2 below.

Scenario A (4 Day)

- 1 x truck delivery (semitrailer arrives, idles whilst unloading, leaves) (continuously over 30-minute period)
- 1 x forklift use (moving between warehouses) (continuously over 30-minute period)
- Warehouse/Plant operations at limited capacity (only Item 1to Item 9 from Table 5 operating) (continuously over 30-minute period)
- All mechanical equipment (i.e. Vents, AC's, exhaust) operating at full capacity (continuously over 30-minute period)

Scenario B (Busy Day)

- 1 x truck delivery (semitrailer arrives, idles whilst unloading, leaves) (continuously over 30-minute period)
- 1 x forklift use (moving between warehouses) (continuously over 30-minute period)
- Warehouse/Plant operations at full capacity (all Items from Table 5 operating) (continuously over 30-minute period)
- All mechanical equipment (i.e. Vents, AC's, exhaust) operating at full capacity (continuously over 30-minute period)

Further to the above, the following assumptions have been made with respect the various operational activities:

- roller doors on the northern and eastern façade of the warehouse remain fully open
- Roller doors on the western and southern façade of the warehouse remain closed at all times
- All warehouse windows are closed
- Existing building construction material expected performance:

Metal clad roofing	Minimum 0.55mm BMT	R_w 17
Roller doors	Steel roller door with sealed gaps to prevent air flow	R_w 15
Reinforced glass windows	10mm wire reinforced glass	R_w 20

Noise levels for sources referred to in this assessment are detailed in Section 4. Renzo Tonin & Associates understands that specific items of equipment, identified in Table 5, have a sound power level that, if not attenuated by not less that 6dB for each item of equipment, may result in predicted noise levels at sensitive receivers that are non-compliant with the EPA 1826-P1 criteria. The specific items of equipment are friction washer, mechanical dryer, and two blowers. The 6dB reduction could be achieved via localised enclosures or wall/ceiling treatments to the warehouse. Such treatments are commonplace, and application is straight forward to design, during the design stage when more detailed information is available.

Figure 2: Layout and sound source locations

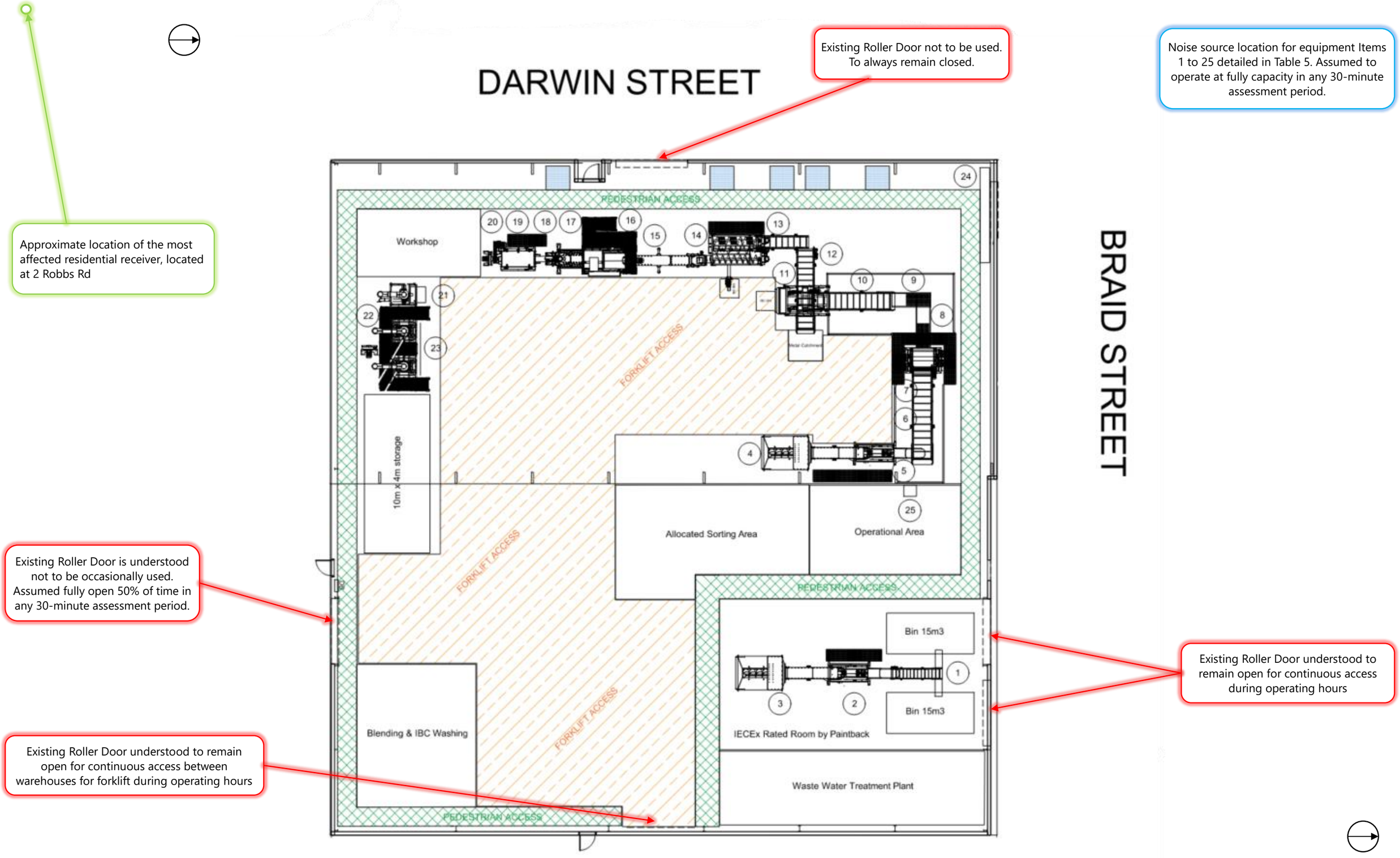


Table 8: Commercial noise assessment

Receiver ID, dwelling location and noise source(s)/activities[1,2]	Predicted Effective noise level (ENL) at dwelling, L_{eq} dB(A), Day		Complies with EPA 1826-P1? Day
R1 – 1 Robbs Road, West Footscray	**Scenario A (4 Day)**	**Scenario B (Busy Day)**	**55**
Warehouse/Plant	50	55[3]	✓ / ✓
Truck deliveries & carpark activities	44	44	✓ / ✓
All mechanical services	28	28	✓ / ✓
Cumulative noise level	**51**	**55**	✓ / ✓
R2 – 2 Robbs Road, West Footscray	**Scenario A (4 Day)**	**Scenario B (Busy Day)**	**55**
Warehouse/Plant	48	53[3]	✓ / ✓
Truck deliveries & carpark activities	43	43	✓ / ✓
All mechanical services	27	27	✓ / ✓
Cumulative noise level	**49**	**54**	✓ / ✓
R3 – 3 Robbs Road, West Footscray	**Scenario A (4 Day)**	**Scenario B (Busy Day)**	**55**
Warehouse/Plant	45	51[3]	✓ / ✓
Truck deliveries & carpark activities	38	38	✓ / ✓
All mechanical services	28	28	✓ / ✓
Cumulative noise level	**46**	**51**	✓ / ✓
R4 – 4 Robbs Road, West Footscray	**Scenario A (4 Day)**	**Scenario B (Busy Day)**	**55**
Warehouse/Plant	45	51[3]	✓ / ✓
Truck deliveries & carpark activities	42	42	✓ / ✓
All mechanical services	27	27	✓ / ✓
Cumulative noise level	**47**	**51**	✓ / ✓
R5 – 5 Hansen Street, West Footscray	**Scenario A (4 Day)**	**Scenario B (Busy Day)**	**55**
Warehouse/Plant	40	44[3]	✓ / ✓
Truck deliveries & carpark activities	37	37	✓ / ✓
All mechanical services	29	29	✓ / ✓
Cumulative noise level	**42**	**45**	✓ / ✓
R6 – 17 Braid St, West Footscray	**Scenario A (4 Day)**	**Scenario B (Busy Day)**	**55**
Warehouse/Plant	35	40[3]	✓ / ✓
Truck deliveries & carpark activities	37	37	✓ / ✓
All mechanical services	34	34	✓ / ✓
Cumulative noise level	**40**	**42**	✓ / ✓

Note:
1. Noise levels at other dwellings are lower than the noise levels presented above, as a result of greater distance from the Subject Development
2. Noise sources and activities per Section 6.2.1
3. Prediction includes 6dB reduction to identified items of equipment detailed in Table 5, and summarised below.

As shown, the proposed operations are predicted to comply with EPA 1826-P1 noise limits. The assessment assumes that all noise sources are operating simultaneously, which is conservative. As such, actual noise levels are expected to be lower than presented. Additionally the assessment assumes that

the following items of equipment have been attenuated by not less than 6dB for each item of equipment:

- Friction Washer
- Mechanical Dryer
- Blower
- Blower

Further to the assessment, Renzo Tonin & Associates understands that the client has committed to attenuation measures to provide not less than 6dB noise reduction to the identified equipment.

The 6dB reduction could be achieved via localised enclosures or wall/ceiling treatments to the warehouse. Such treatments are commonplace, and application is straight forward to design, during the design stage when more detailed information is available.

7 Conclusion

Renzo Tonin & Associates undertook an acoustic assessment of the proposed paint recovery plant to be located at 2-44 Grainger Road, West Footscray, to assess noise from commercial operations.

We have been briefed by Davis Advisory to consider Acoustics in relation to the proposed Paint Circular Economy HQ (PaCE HQ) project in West Footscray. The PaCE HQ project is described in Annexure D of the application, and our comments and findings are referrable to that project.

In conducting the acoustic assessment, Renzo Tonin & Associates has:

- Quantified relevant noise criteria: EPA 1826-P1
- Measured noise levels from operational activities and associated mechanical equipment at a similar industrial facilities
- Analysed the noise monitoring and measurements
- Constructed a three-dimensional noise model of the Subject Facility, to assess various noise impacts (described below)
- Assessed and compared predicted levels to noise limits.

The outcomes of the acoustic assessment are:

- Noise levels from the representative mechanical services were found to conform at all times with EPA 1826-P1 criteria.
- Noise levels from anticipated delivery activities were found to conform at all times with EPA 1826-P1 criteria.
- Noise levels from the warehouse/plant operations (i.e. other than deliveries) were found to conform at all times with EPA 1826-P1 criteria, with the specific requirement for a not less than 6dB noise reduction to the identified equipment.

  The 6dB reduction could be achieved via localised enclosures or wall/ceiling treatments to the warehouse. Such treatments are commonplace, and application is straight forward to design, during the design stage when more detailed information is available.

Based on the above, the Subject Facility is expected to conform with all nominated criteria, and on this basis, not unreasonably affect noise amenity in the area.

APPENDIX A Glossary of terminology

The following is a brief description of the technical terms used to describe noise to assist in understanding the technical issues presented.

Air-borne noise	Noise which is fundamentally transmitted by way of the air and can be attenuated by the use of barriers and walls placed physically between the noise source and receiver.		
Ambient noise	The all-encompassing noise associated within a given environment at a given time, usually composed of sound from all sources near and far.		
Assessment period	The time period in which an assessment is made. e.g. Day 7am-10pm & Night 10pm-7am.		
Assessment Point	A location at which a noise or vibration measurement is taken or estimated.		
Attenuation	The reduction in the level of sound or vibration.		
A-weighting	A filter applied to the sound recording made by a microphone to approximate the response of the human ear.		
Background noise	Background noise is the term used to describe the underlying level of noise present in the ambient noise, measured in the absence of the noise under investigation. It is described as the average of the minimum noise levels measured on a sound level meter and is measured statistically as the A-weighted noise level exceeded for ninety percent of a sample period. This is represented as the L_{A90} noise level if measured as an overall level or an L_{90} noise level when measured in octave or third-octave bands.		
Barrier (Noise)	A natural or constructed physical barrier which impedes the propagation of sound and includes fences, walls, earth mounds or berms and buildings.		
Berm	Earth or overburden mound.		
Buffer	An area of land between a source and a noise-sensitive receiver and may be an open space or a noise-tolerant land use.		
Bund	A bund is an embankment or wall of brick, stone, concrete or other impervious material, which may form part or all of the perimeter of a compound.		
Decibel [dB]	The units that sound is measured in. The following are examples of the decibel readings of common sounds in our environment:		
	threshold of hearing	0 dB	The faintest sound we can hear, defined as 20 micro Pascal
		10 dB	Human breathing
	almost silent	20 dB	
		30 dB	Quiet bedroom or in a quiet national park location
	generally quiet	40 dB	Library
		50 dB	Typical office space or ambience in the city at night
	moderately loud	60 dB	CBD mall at lunch time
		70 dB	The sound of a car passing on the street
	loud	80 dB	Loud music played at home
		90 dB	The sound of a truck passing on the street
	very loud	100 dB	Indoor rock band concert
		110 dB	Operating a chainsaw or jackhammer
	extremely loud	120 dB	Jet plane take-off at 100m away
	threshold of pain	130 dB	
		140 dB	Military jet take-off at 25m away

dB(A)	A-weighted decibel. The A- weighting noise filter simulates the response of the human ear at relatively low levels, where the ear is not as effective in hearing low frequency sounds as it is in hearing high frequency sounds. That is, low frequency sounds of the same dB level are not heard as loud as high frequency sounds. The sound level meter replicates the human response of the ear by using an electronic filter which is called the "A" filter. A sound level measured with this filter is denoted as dB(A). Practically all noise is measured using the A filter.
dB(C)	C-weighted decibels. The C-weighting noise filter simulates the response of the human ear at relatively high levels, where the human ear is nearly equally effective at hearing from mid-low frequency (63Hz) to mid-high frequency (4kHz), but is less effective outside these frequencies. The dB(C) level is not widely used but has some applications.
Diffraction	The distortion of sound waves caused when passing tangentially around solid objects.
EPA	Environment Protection Authority
Flanking	Flanking is the transfer of sound through paths around a building element rather than through the building element material directly. For example, sound travelling through a gap underneath a door or a gap at the top of a wall.
Fluctuating Noise	Noise that varies continuously to an appreciable extent over the period of observation.
Free-field	An environment in which there are no acoustic reflective surfaces. Free field noise measurements are carried out outdoors at least 3.5m from any acoustic reflecting structures other than the ground.
Frequency	Frequency is synonymous to pitch. Sounds have a pitch which is peculiar to the nature of the sound generator. For example, the sound of a tiny bell has a high pitch and the sound of a bass drum has a low pitch. Frequency or pitch can be measured on a scale in units of Hertz or Hz.
Heavy Vehicle	A truck, transporter or other vehicle with a gross weight above a specified level (for example: over 8 tonnes).
Impulsive noise	Having a high peak of short duration or a sequence of such peaks. A sequence of impulses in rapid succession is termed repetitive impulsive noise.
Intermittent noise	The level suddenly drops to that of the background noise several times during the period of observation. The time during which the noise remains at levels different from that of the ambient is one second or more.
L_1	The sound pressure level that is exceeded for 1% of the time for which the given sound is measured.
L_{10}	The sound pressure level that is exceeded for 10% of the time for which the given sound is measured.
L_{90}	The level of noise exceeded for 90% of the time. The bottom 10% of the sample is the L_{90} noise level expressed in units of dB(A).
L_{Aeq} or L_{eq}	The "equivalent noise level" is the summation of noise events and integrated over a selected period of time, which would produce the same energy as a fluctuating sound level. When A-weighted, this is written as the L_{Aeq}.
L_{max}	The maximum sound pressure level measured over a given period. When A-weighted, this is usually written as the $L_{Amax.}$
L_{min}	The minimum sound pressure level measured over a given period. When A-weighted, this is usually written as the $L_{Amin.}$
Loudness	A rise of 10 dB in sound level corresponds approximately to a doubling of subjective loudness. That is, a sound of 85 dB is twice as loud as a sound of 75 dB which is twice as loud as a sound of 65 dB and so on. That is, the sound of 85 dB is four times or 400% the loudness of a sound of 65 dB.
Noise	Unwanted sound
Reflection	Sound wave reflected from a solid object obscuring its path.
SEL	Sound Exposure Level (SEL) is the constant sound level which, if maintained for a period of 1 second would have the same acoustic energy as the measured noise event. SEL noise measurements are useful as they can be converted to obtain L_{eq} sound levels over any period of time and can be used for predicting noise at various locations.

Sound absorption	The ability of a material to absorb sound energy by conversion to thermal energy.
Sound level meter	An instrument consisting of a microphone, amplifier and indicating device, having a declared performance and designed to measure sound pressure levels.
Sound power level	Ten times the logarithm to the base 10 of the ratio of the sound power of the source to the reference sound power of 1 pico watt.
Sound pressure level	The level of noise, usually expressed in decibels, as measured by a standard sound level meter with a microphone referenced to 20 mico Pascal.
Tonal Noise	Sound containing a prominent frequency and characterised by a definite pitch.

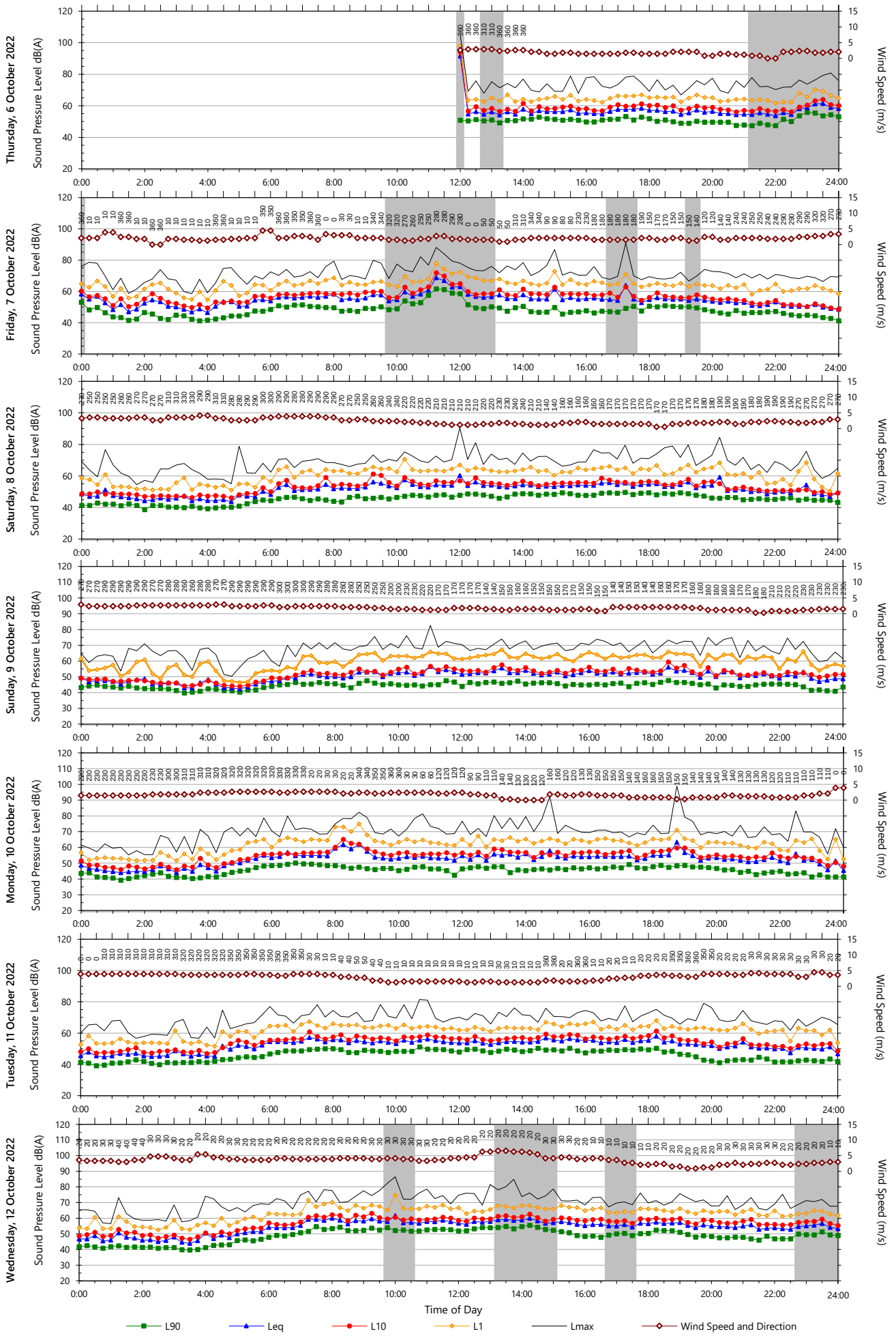
APPENDIX B Noise monitoring

B.1 L1 – 1 Robbs Road Resident's front yard

Greyed out periods in noise monitoring charts correspond to times of precipitation or excessive wind, referenced from Bureau of Meteorology Laverton RAAF Weather Station.

Unattended Monitoring Results

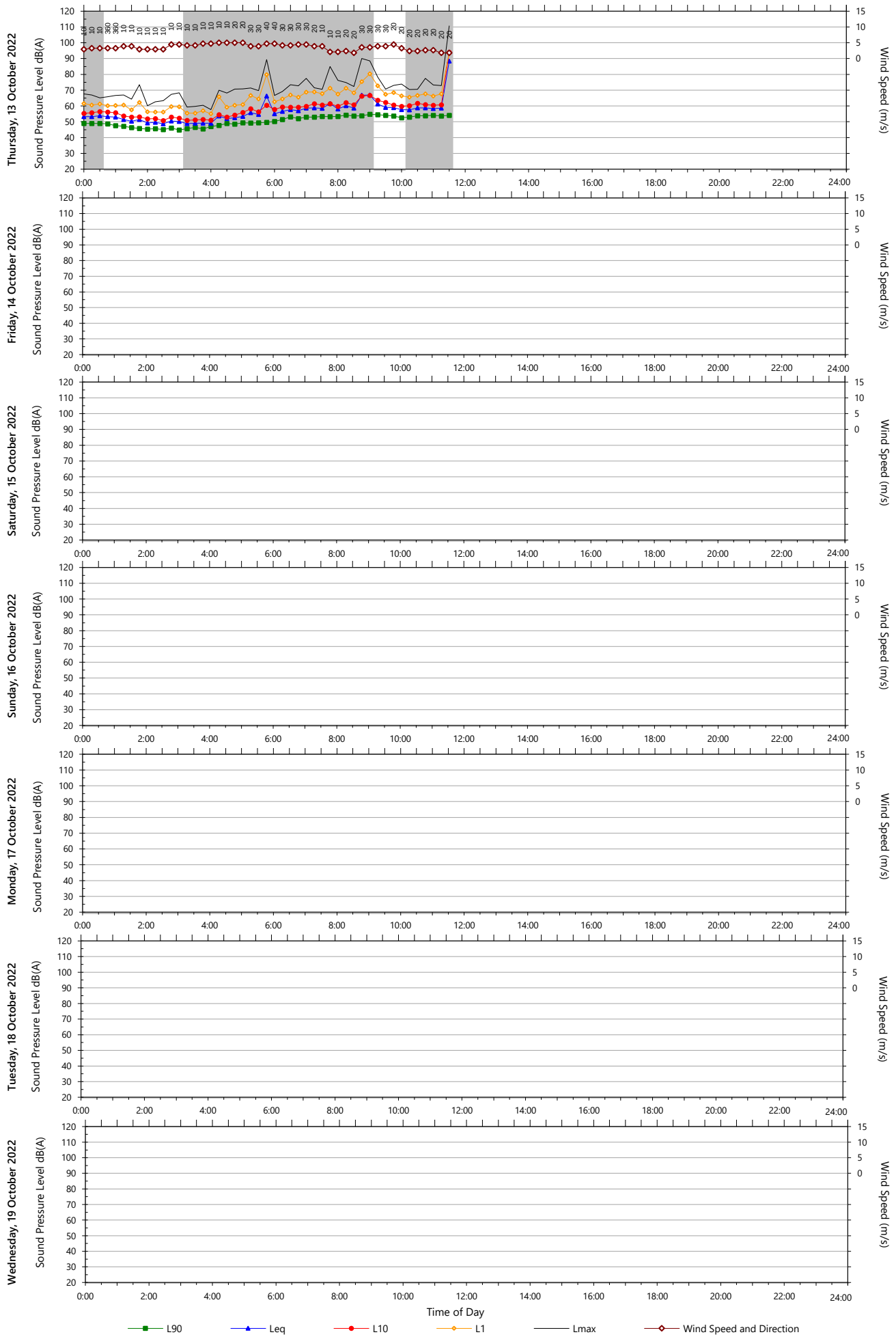
Location: 1 Robbs Road, West Footscray (front yard, free field)



Data File: 2022-10-06_SLM_001_123_Rpt_Report.txt

Template: QTE-26 Logger Graphs Program (r38)

Unattended Monitoring Results **Location: 1 Robbs Road, West Footscray (front yard, free field)**



Data File: 2022-10-06_SLM_001_123_Rpt_Report.txt

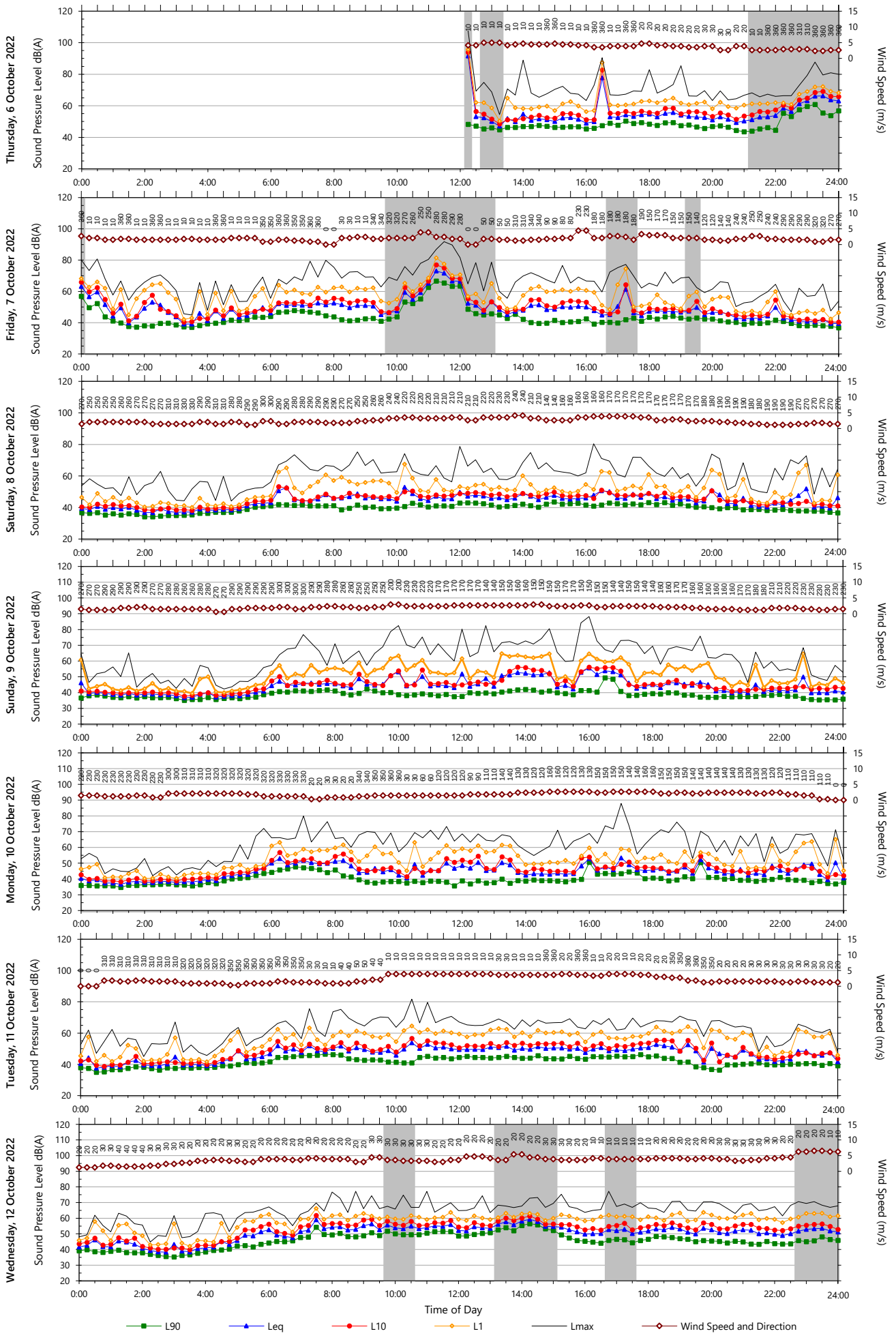
Template: QTE-26 Logger Graphs Program (r38)

B.2 L2 – 4 Hansen Street Resident's rear yard

Greyed out periods in noise monitoring charts correspond to times of precipitation or excessive wind, referenced from Bureau of Meteorology Laverton RAAF Weather Station.

Unattended Monitoring Results

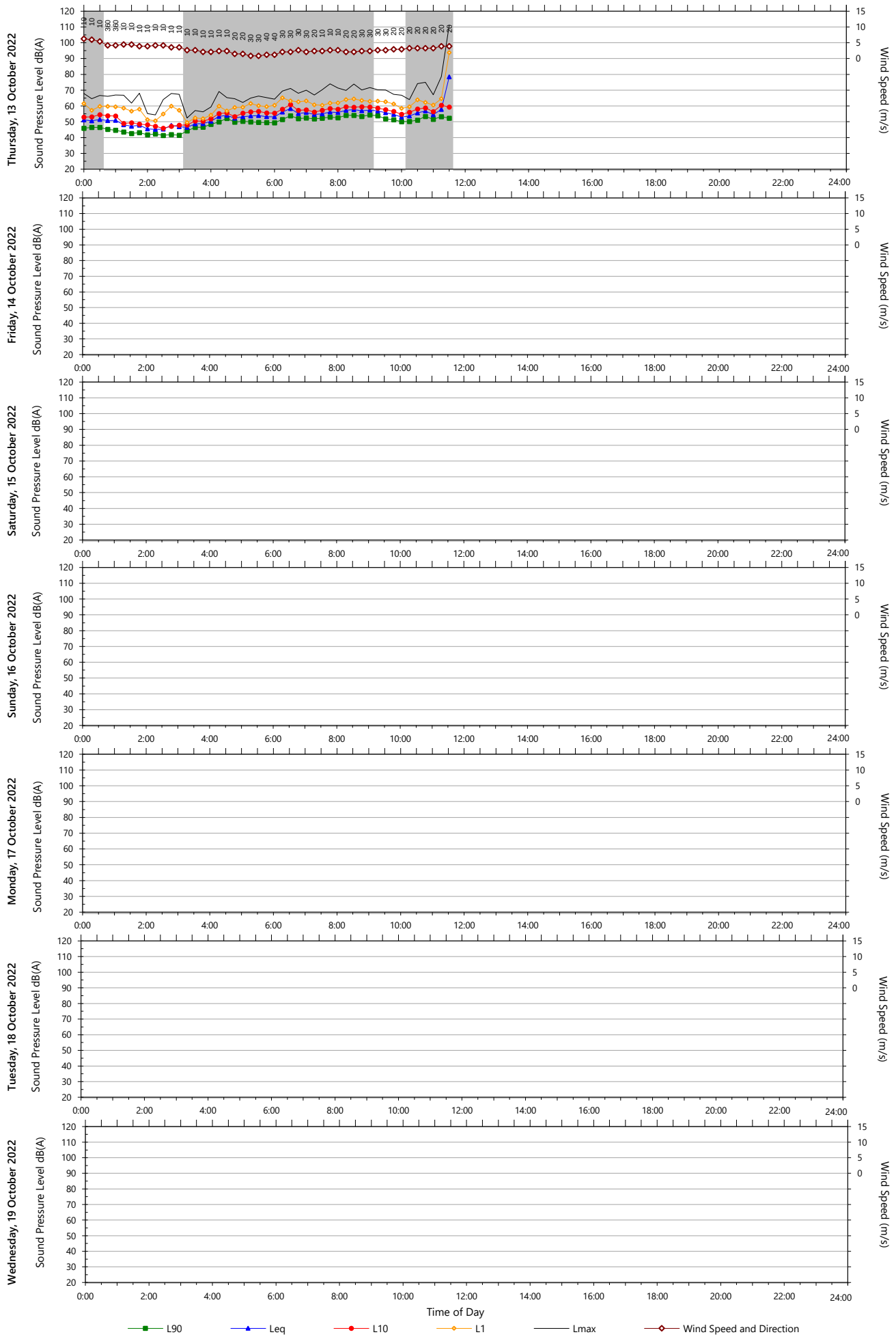
Location: 4 Hansen Street, West Footscray (rear yard, free field)



Data File: 2022-10-06_SLM_001_123_Rpt_Report.txt

Template: QTE-26 Logger Graphs Program (r38)

Unattended Monitoring Results **Location: 4 Hansen Street, West Footscray (rear yard, free field)**



Data File: 2022-10-06_SLM_001_123_Rpt_Report.txt

Template: QTE-26 Logger Graphs Program (r38)