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Proposed Industrial Rezoning
Horsley Drive
Horsley Park

ACOUSTIC REPORT




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Frasers Property
Attn: Michaela Leerdam

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1. Introduction

This report is in response to a request by the Frasers Property to assess environmental noise impacts associated with the proposed industrial rezoning of the lots located at 137-211 Chandos Road, 143-225 & 120-206 Redmayne Road, and 1617-1671 The Horsley Drive, Horsley Park. The environmental noise assessment was conducted in accordance with Fairfield City Council requirements and the NSW Noise Policy for Industry. To facilitate the assessment, unattended noise monitoring was conducted in the vicinity of nearby sensitive receivers to establish the criteria for onsite activities.

2. Site Description

2.1 Site Location

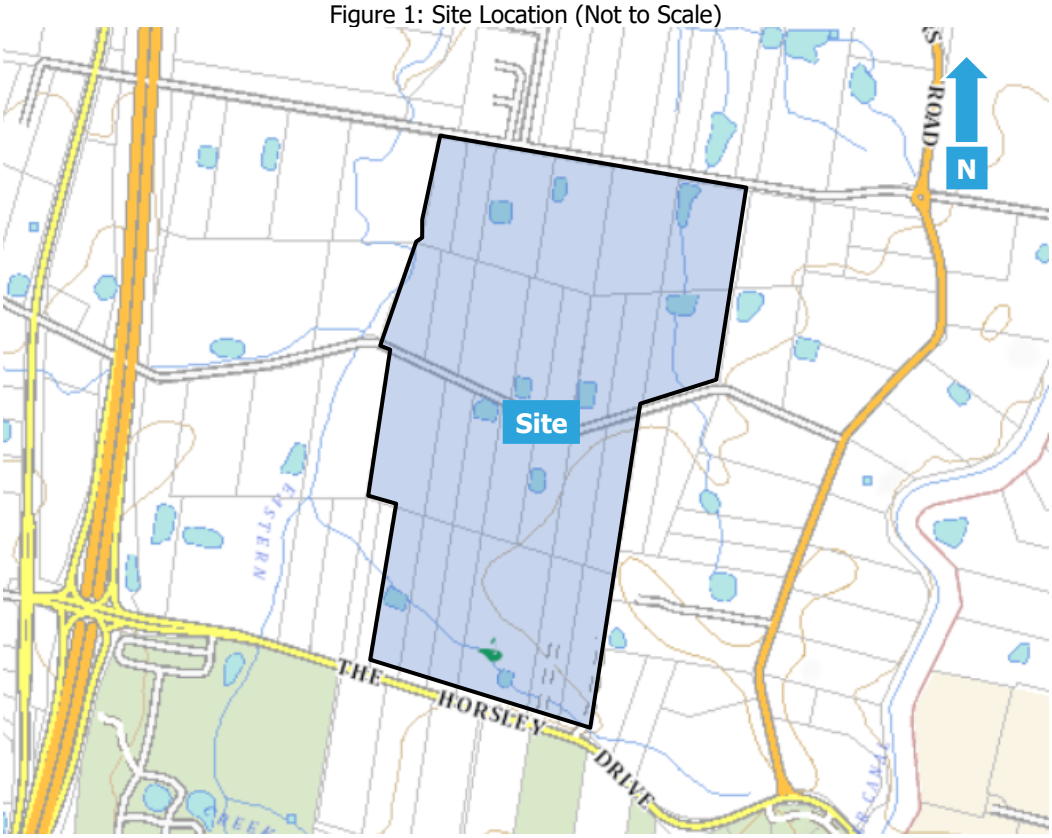
The site is described by the following:

137-211 Chandos Road, 143-225 & 120-206 Redmayne Road, 1617-1671 The Horsley Drive

Lots 58A, 58B, 61B, 74A, 74B, 79A, 79B & 53, 54, 56, 57, 63, 64, 77 on DP17288, DP13961, & Lots A, B on DP361393
Lots A, B on DP347034 & DP357890, 59A, 59B on DP362022, 1, 2 on DP505934
Lots 79A, 79B on DP347873, 1 on 849649, 81A-B on DP348110

Refer to Figure 1 for site location.

Figure 1: Site Location (Not to Scale)



A comprehensive site survey was conducted on the 11th February 2020 which identified the following:

- The site is located in RU2 – Rural as defined in the Fairfield Local Environmental Plan 2013
- The land surrounding the site is located in WSP – Western Sydney Parklands as defined in the State Environmental Planning policy (Western Sydney Parklands) 2009.
- Commercial premises and residential dwellings currently occupy the site and will be demolished to make way for the development.
- Chandos Road separates the site from single storey residential dwellings and industrial premises to the north.
- Single storey residential dwellings, commercial premises and the M7 Motorway are located west of the site.
- Single and two storey residential dwellings are located adjacent the eastern site boundary
- The Horsley Drive separates the site from single storey residential dwellings, commercial premises and parkland to the south of the site.
- The Eastern Gas Pipeline is located adjacent the site's western boundary.
- The Smithfield Lateral Gas Pipeline is located north of the site.

2.2 Proposal

The proposal seeks to rezone the lots highlighted in purple in Figure 2 from RU2 – Rural landscape to IN1 – General Industrial to facilitate the construction of an industrial estate subject to a different Development Application.

Figure 2: Site Layout

Note if the nominated lot layouts change, further assessment may be required to determine the viability of the development site for 24-hour operation.

2.3 Acoustic Environment

The surrounding area is primarily affected by road traffic from the Horsley Drive, the M7 Motorway and noise from existing nearby industrial activities.

3. Equipment

The following equipment was used to record noise levels:

- Rion NL42 Environmental Noise Monitors (SN# 00175548 and 00171587)
- Pulsar Model 105 Ltd Sound Calibrator (SN # 57417)

The Environmental Noise Monitor holds current NATA Laboratory Certification and was field calibrated before and after the monitoring period, with no significant drift from the reference signal recorded.

4. Receivers and Noise Monitoring Locations

4.1 Receiver Locations

The nearest sensitive receiver locations were identified as follows;

1. Residential dwellings are located on the northern side of Chandos Road at 126 – 166 Chandos Road.
2. Residential dwellings are located adjacent the eastern site boundary at 105 – 119 Chandos Road, 208-230 Redmayne Road and 53-127 Ferrers Road.
3. A single storey residential dwelling is located adjacent the western site boundary at 137-141 Redmayne Road.
4. The Horsley Drive separates the site from single and two storey residential dwellings to the south at 1601-1609 and 1634-1662 The Horsley Drive.

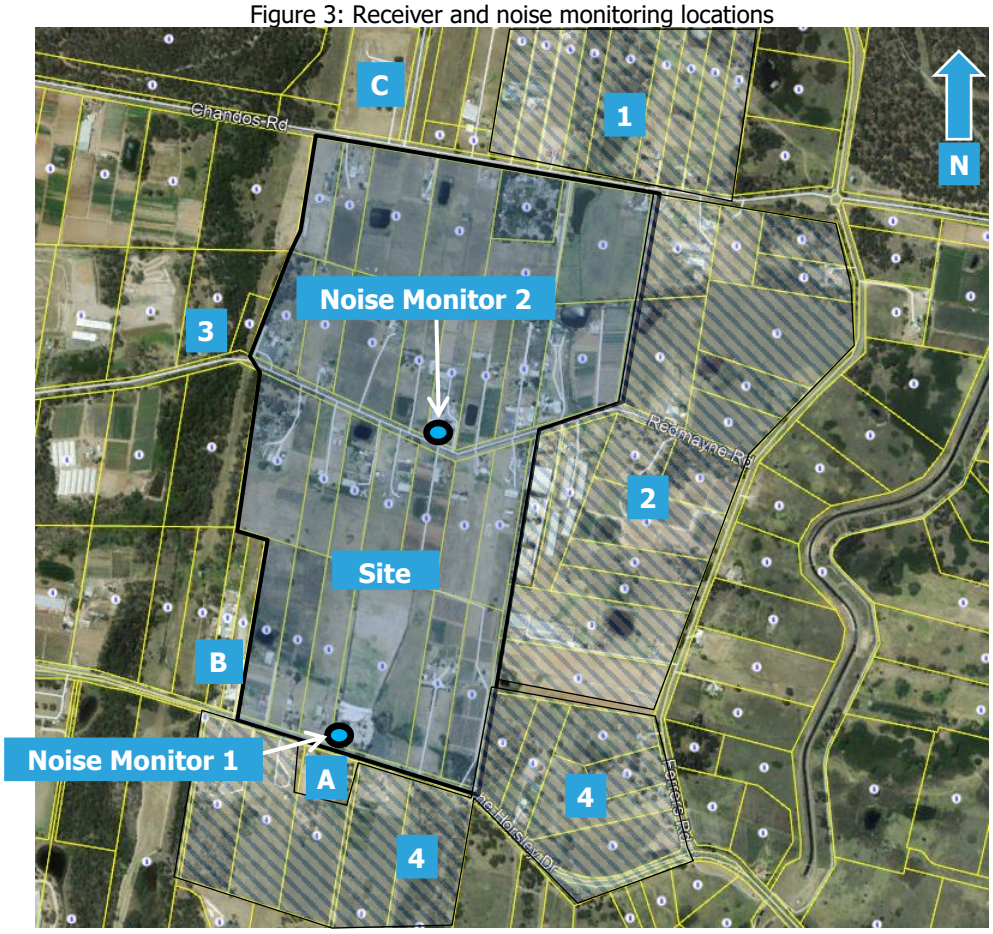
A. The Horsley Drive separates the site from commercial premises including a 24-hour service station to the south at 1642 The Horsley Drive.

B. Ur Ashur Club is located adjacent the western site boundary at 1677 The Horsley Drive and is open Sundays from 6pm to 12am.

C. The Eastern Gas Pipeline's Horsley Park Meter Station is located to the north of the site at 176-214 Chandos Road.

These locations were chosen as being representative of the nearest sensitive receivers to the proposed development. Refer to Figure 3 for these locations.

Figure 3: Receiver and noise monitoring locations



4.2 Unattended Noise Monitoring

Rion NL42 environmental noise monitors were placed at 1647 The Horsley Drive (noise monitor 1), and 195-201 Redmayne Road (noise monitor 2), Horsley Park to measure ambient noise levels. These locations were chosen as they were considered representative of the nearest residential receiver locations, with noise monitor 1 being representative of receiver 4, and noise monitor 2 being representative of receivers 1 to 3. The monitors were located in free field positions with the microphones approximately 1.4 metres above ground surface level. The noise monitors were set to record noise levels between the 11th and 18th February 2020.

Both environmental noise monitors were set to record noise levels in "A" weighting, Fast response using 15 minute statistical intervals. Ambient noise monitoring was conducted in accordance with Australian Standard AS1055:1997 *Acoustics – Description and measurement of environmental noise*. For the unattended noise monitoring locations refer to Figure 3.

Weather conditions were fine for the majority of the monitoring period, with some periods of intermittent wind and rain which had no effect on the measured data.

5. Existing background noise levels

The following tables present the measured existing ambient noise levels from the unattended noise survey. Any periods of inclement weather or extraneous noise are omitted from the measured data prior to determining the overall results.

5.1 Meteorological conditions

Meteorological observations during the unattended noise monitoring survey were obtained from the Bureau of Meteorology website (http://www.bom.gov.au/climate/data), shown in Table 1 below.

Table 1: Meteorological conditions – Horsley Park

Day	Date	Rainfall (mm)	Wind			
			9am		3pm	
			Speed (km/h)	Direction	Speed (km/h)	Direction
Tuesday	11/02/2020	0	4	WNW	Calm	
Wednesday	12/02/2020	0	9	SSE	19	ESE
Thursday	13/02/2020	6.4	6	SSE	20	ENE
Friday	14/02/2020	6.4	11	SSE	13	SE
Saturday	15/02/2020	0	2	NW	9	ESE
Sunday	16/02/2020	16.6	6	S	11	ESE
Monday	17/02/2020	0.6	Calm	-	6	N
Tuesday	18/02/2020	0	6	NNW	7	NNE

5.2 Background noise levels

The measured rating background noise levels (RBL) were determined in accordance with the NSW Noise Policy for Industry with levels for the different monitoring locations presented in Table 2.

Table 2: Measured L90 noise levels

Day	Date	Noise Monitor 1 (Receiver 4)			Noise Monitor 2 (Receivers 1 to 3)		
		Background L90 dB(A)			Background L90 dB(A)		
		Day	Evening	Night	Day	Evening	Night
Tuesday	11/02/2020	x	49.5	38.8	x	36.5	39.5
Wednesday	12/02/2020	59.5	49.4	40.1	39.3	39.6	39.0
Thursday	13/02/2020	60.8	51.1	41.7	38.8	38.5	40.9
Friday	14/02/2020	60.2	50.6	41.4	40.8	41.3	41.7
Saturday	15/02/2020	51.5	48.5	39.8*	36.8	38.9	39.6*
Sunday	16/02/2020	49.4	47.1	40.0	34.7	38.6	38.2
Monday	17/02/2020	59.5	47.5	40.9	35.8	36.1	39.7
RBL		60	49	41	38	39	40

*Note the night period on Saturday 15th February was affected by heavy rainfall and has been omitted from the measured data.

5.3 Ambient Noise levels – The Horsley Drive (Monitor 1)

Due to the proximity of receiver 4 to the Horsley Drive, the amenity criteria was derived from $L_{Aeq, period}$ minus 15 dBA in accordance with the Noise Policy for Industry 2017's provisions for receivers in areas of high traffic noise.

Table 3: Measured Leq noise levels

Day	Date	Noise Monitor 1 (Receiver 4)		
		Background Leq dB(A)		
		Day	Evening	Night
Tuesday	11/02/2020	x	65.7	64.9
Wednesday	12/02/2020	69.4	66.2	66.0
Thursday	13/02/2020	70.2	66.6	65.5
Friday	14/02/2020	69.1	66.3	62.7
Saturday	15/02/2020	65.3	64.8	58.7
Sunday	16/02/2020	68.1	62.8	65.7
Monday	17/02/2020	69.2	65.5	65.4
LAeq,T		69	66	65

6. Noise Criteria

The relevant noise criteria have been determined in consultation with Fairfield City Council requirements and the NSW Noise Policy for Industry 2017.

6.1 Fairfield City Council

The site is located within Fairfield City Council local government area. Therefore reference was made to the Fairfield Development Control Plan 2013 which states the following;

> *"9.10.6 Noise and Vibration*
> *a) Noise and/or vibration generating activities are to be located within buildings or orientated away from residential properties or other sensitive land uses such as child care centres or places of public worship.*
> *b) An Acoustic Engineers Report may be required to be prepared as part of a development application where Council considers that the proposed development has the potential to produce an adverse noise and/or vibration impact."*

6.2 Secretary's Environmental Assessment Requirements (SEARs)

The Secretary's Environmental Assessment Requirements (SEARs) outline the requirements for the construction and operational use of the proposed development. Section 4.11 of SEARs 2015 states the following;

> *"Noise and Vibration – Amenity*
> *1. The Proponent must assess construction and operational noise vibration guidelines. The assessment must include consideration of impacts to sensitive receivers including small businesses, and include consideration of sleep disturbance and, as relevant, the characteristics of noise and vibration (for example, low frequency noise).*
> *2. The Proponent must demonstrate that blast impacts are capable of complying with the current guidelines, if blasting is required.'*

As a specific criterion is not specified, further reference was made to *Assessing Vibration: A Technical Guide 2006,* the *NSW Noise Policy for Noise, NSW Road Noise Policy* and the *NSW Interim Construction Guideline.*

6.3 Assessing Vibration: A Technical Guideline 2006

6.3.1 Types of vibration

There are three types of vibration as classified in the guide;

- Continuous - vibration continues uninterrupted for a defined period (usually throughout daytime and/or night-time). This type of vibration is assessed on the basis of weighted RMS (root mean squared) acceleration values.
- Impulsive - rapid build up to a peak followed by a damped decay that may or may not involve several cycles. The duration is short, typically less than 2 seconds. Impulsive vibration (no more than three occurrences in an assessment period) is assessed on the basis of acceleration values.

- Intermittent - interrupted periods of continuous (e.g. a drill) or repeated periods of impulsive vibration (e.g. a pile driver), or continuous vibration that varies significantly in magnitude. Assessed on the basis of vibration dose values.

6.3.2 Acceptable values for continuous and impulsive vibration (1-80Hz)

The relevant criteria for continuous and impulsive vibration are as follows;

Table 4: Preferred weighted RMS vibration acceleration values

Type	Location	Assessment period	Preferred values m/s^2		Maximum values m/s^2	
			z-axis	x- and y-axes	z-axis	x- and y-axes
Continuous vibration	Critical areas	Day or night time	0.005	0.0036	0.01	0.0072
	Residences	Day time	0.01	0.0071	0.02	0.014
		Night time	0.007	0.005	0.014	0.01
	Offices, schools, educational institutions and places of worship	Day or night time	0.02	0.014	0.04	0.028
	Workshops	Day or night time	0.04	0.029	0.08	0.058
Impulsive vibration	Critical areas	Day or night time	0.005	0.0036	0.01	0.0072
	Residences	Day time	0.3	0.21	0.6	0.42
		Night time	0.1	0.071	0.2	0.14
	Offices, schools, educational institutions and places of worship	Day or night time	0.64	0.46	1.28	0.92
	Workshops	Day or night time	0.64	0.46	1.28	0.92

6.3.3 Acceptable values for intermittent vibration

Intermittent vibration is assessed using the vibration dose value (VDV) root-mean-quad method. VDV accumulates the vibration energy received over the daytime and night-time periods. The vibration dose methodology is as per standard BS 6472–1992.

6.4 Noise Policy for Industry

Assessment of noise in accordance with NSW EPA Noise Policy for Industry (2017) has two main components: intrusiveness and amenity criteria. These are compared to each other (after conversion of amenity noise level to LAeq,15min equivalent level) to determine the overall project noise trigger level.

6.4.1 Intrusiveness noise level

The intrusiveness noise level is based on the $L_{Aeq\ (15\ min)}$ associated with commercial activity being less than or equal to the measured L_{A90} Rating Background Level + 5dB as per section 2.3 of the policy. A modifying factor should also be added where appropriate to allow for tonality, impulsiveness, and intermittency or low frequency effects.

6.4.2 Amenity noise level

The amenity noise level is determined in accordance with Section 2.4 of the policy based on the

land use and relevant noise criteria specified in Tables 2.2 and 2.3.

The Noise Policy for Industry sets out acceptable noise levels for various locations. Determination of which residential receiver category applies is described in Table 2.3 of the policy.

Table 7: Receiver category (Table 2.3 of the Noise Policy for Industry)

Receiver category	**Typical planning zoning – standard instrument**	**Typical existing background noise levels**	**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.
Suburban residential	RU5 – village RU6 – transition R2 – low density residential R3 – medium density residential E2 – environmental conservation E3 – environmental management	Daytime RBL<45 dB(A) Evening RBL<40 dB(A) Night RBL <35dB(A)	**Suburban** – an area that has local traffic with characteristically intermittent traffic flows or with some limited commerce or industry. This area often has the following characteristic: evening ambient noise levels defined by the natural environment and human activity.
Urban residential	R1 – general residential R4 – high density residential B1 – neighbourhood centre (boarding houses and shop-top housing) B2 – local centre (boarding houses) B4 – mixed use	Daytime RBL> 45 dB(A) Evening RBL> 40 dB(A) Night RBL >35 dB(A)	**Urban** – an area with an acoustical environment that: • is dominated by 'urban hum' or industrial source noise, where urban hum means the aggregate sound of many unidentifiable, mostly traffic and/or industrial related sound sources • has through-traffic with characteristically heavy and continuous traffic flows during peak periods • is near commercial districts or industrial districts • has any combination of the above.

To determine the appropriate receiver category, the following observations were made:

- Residential receivers 1, 2, and 4 are zoned WSP (Western Sydney Parklands). These residences will be assessed against the rural criteria.
- Residential receiver 3 is zoned RU2 – Rural landscape and will be assessed against the rural criteria.
- Residential receiver 4 is zoned RU2 – Rural landscape and is affected by high levels of traffic noise during all time periods.
- Receivers A and B will be assessed against the commercial criteria.
- Receiver C will be assessed against the industrial criteria.

- The measured RBL values presented in Section 5.2 corresponds with the typical existing background noise levels of the rural category for receivers 1 to 3.
- Receiver 4 was found to be affected by high levels of traffic noise during all time periods.

Therefore, the nearest residential receivers would be assessed against the rural criteria.

6.4.3 Amenity noise levels in areas of high traffic

Areas affected by a certain level of traffic noise may be high enough to make noise from an industrial source effectively inaudible. In such cases the project amenity noise level may be derived from the $L_{Aeq,\ period}$ minus 15 dBA on the condition all of the following apply:

- Traffic noise is identified as the dominant noise source at the site
- The existing traffic noise level is 10 dB or more above the recommended amenity noise level for the area
- It is highly unlikely traffic noise levels will decrease in the future.

Applicability is to be determined for each assessment period.

6.4.4 Modifying factors

The Noise Policy for Industry includes correction factors such as tonal noise, low-frequency noise, intermittent noise and duration. Where two or more modifying factors are present, the maximum adjustment to a noise source level is 10dBA (excluding duration correction).

6.5 Project noise trigger level

To determine the project trigger noise level, the amenity noise level must first be standardised to an equivalent LAeq 15min in order to compare to the intrusiveness noise level. This is done in accordance with Sections 2.2 and 2.4 of the policy as follows;

$$L_{Aeq,15min} = L_{Aeq,\ period} + 3dB$$

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. Project amenity noise level for industrial developments = recommended amenity noise level minus 5dB(A).

Therefore, based on the measured data presented in Section 5.2, the project specific noise limits are determined.

6.5.1 Sleep disturbance noise level

Sleep disturbance is based on the maximum noise level of events from premises during the night-time period. The Noise Policy for Industry defines sleep disturbance as a noise from a premise at a residential location that exceeds:

- LAeq,15min 40 dB(A) or the prevailing RBL plus 5 dB, whichever is the greater, and/or
- LAFmax 52 dB(A) or the prevailing RBL plus 15 dB, whichever is the greater,

6.5.2 Intrusiveness noise criteria

The intrusiveness noise levels are as follows;

Table 5: Intrusiveness noise levels

Time period	Receivers 1 to 3	Receiver 4	Receivers A, B & C
	Criteria $L_{eq\ (15min)}$ dB(A)	Criteria $L_{eq\ (15min)}$ dB(A)	Criteria $L_{eq\ (15min)}$ dB(A)
Day (7am-6pm Mon-Sat; 8am-6pm Sun)	43	65	N/A
Evening (6pm-10pm)	44	54	N/A
Night (10pm-7am Sun-Fri, 10pm-8am Sat)	45	46	N/A

*N/A: Intrusive noise criteria only applies to residential receivers.

6.5.3 Amenity criteria

Based on Section 2.4 of the policy, the amenity noise levels are as follows;

Table 6: Amenity noise levels

Time period	Receivers 1 to 3	Receiver 4*	Receivers A and B	Receiver C
	Criteria $L_{eq(15min)}$ dB(A)	Criteria $L_{eq(15min)}$ dB(A)	Criteria $L_{eq(15min)}$ dB(A)	Criteria $L_{eq(15min)}$ dB(A)
Day	48	57	65	70
Evening	43	54	65	70
Night	38	53	65	70

*Note Receiver 4 was found to be affected by high levels of traffic noise during all time periods, therefore the the LAeq, period minus 15 dBA (+3dB Project noise trigger) correction was applied in accordance with Section 2.4.1 of the Noise Policy for Industry (2017).

6.5.4 Project specific noise criteria

The project noise trigger level is the lower (that is, the most stringent) value of the intrusiveness and amenity noise levels. Therefore the project noise trigger levels are as follows:

Table 7: Project criteria

Time period	Receivers 1 to 3	Receiver 4	Receivers A and B	Receiver C
	Criteria $L_{eq(15min)}$ dB(A)	Criteria $L_{eq(15min)}$ dB(A)	Criteria $L_{eq(15min)}$ dB(A)	Criteria $L_{eq(15min)}$ dB(A)
Day	43	57	65	70
Evening	43	54	65	70
Night	38	46	65	70

6.5.5 Sleep disturbance

The sleep disturbance noise levels are as follows;

Table 8: Sleep disturbance criteria

Time period	Receivers 1 to 3		Receiver 4	
	Criteria $L_{eq(15min)}$ dBA	Criteria L_{AFmax} dBA	Criteria $L_{eq(15min)}$ dBA	Criteria L_{AFmax} dBA
Night	45	55	46	56

6.6 NSW Road Noise Policy 2008

The NSW Road Noise Policy outlines the criteria for any increase in the total traffic noise level at the location due to a proposed project or traffic generating development. Therefore the following criteria applies:

Table 9: Relative increase criteria for residential land uses

Road Category	Type of project/development	Total traffic noise level increase – dB(A)	
		Day (7am to 10pm)	Night (10pm to 7am)
Freeway/arterial/sub-arterial roads and transitways	New road corridor/redevelopment of existing road/land use development with the potential to generate additional traffic on existing road	Existing traffic $L_{Aeq(15hr)}$ + 12dB (external)	Existing traffic $L_{Aeq(9hr)}$ + 12dB (external)

7. Environmental Assessment

7.1 Onsite activities

Noise associated with the development was assessed based on previous measurements of similar activities. The calculations assume that the nominated activities are located at a representative distance within the development site to each receiver location. Any relevant shielding or building transmission loss is taken into account for these activities. Separation distances were based on layout plans provided by Frasers Property (ref: MP – HP – FS – 701, dated 31/05/2019).

Noise levels were calculated for activities at each warehouse in proximity to the receiver and assumed a worst-case scenario. In the tables in Section 7 activities are the sum of measured noise levels for sounds generated by typical operations. Truck activities consists of $LA_{eq,\ 15\ min}$ noise levels from a truck passby, air brakes, door closures, tonal reverse alarms and idling truck engines. Car park consists of $LA_{eq,\ 15\ min}$ noise levels from a car passby, car door closures, and car engine ignition. Forklift activities consists of $LA_{eq,\ 15\ min}$ noise levels from a forklift moving, reversing with a tonal alarm, and loading and unloading pallets. A maximum of 2 trucks, 18 cars and 2 forklifts was assumed for each warehouse, with the closest warehouses considered for each receiver.

7.2 Project specific criteria

The noise source levels at the receiver locations are shown in Table 10 and Table 11. LAeq results are not shown where the calculated total is less than 0dBA.

Table 10: Project specific noise levels – Receivers 1 to 4

Receivers										
Receiver	1. 126-166 Chandos Road 2. 105-119 Chandos Road, 208-220 Redmayne Road 3. 137-141 Redmayne Road 4. 1634-1662 The Horsley Drive Description	Source Leq@1m dB(A)	Correction dB(A)*	Corrected Leq@1m dB(A)	LAeq adj,T ext. dB(A) Day	LAeq adj,T ext. dB(A) Eve	LAeq adj,T ext. dB(A) Night	LAeq 15 min Compliance Day	Eve	Night
	Criteria							43	43	38
	Car Park Warehouse 01	69		69	5	5	5	Yes	Yes	Yes
1	Car Park Warehouse 02	69		69	8	8	8	Yes	Yes	Yes
	Car Park Warehouse 03A	69		69	9	9	9	Yes	Yes	Yes
	Car Park Warehouse 03B	69		69	7	7	7	Yes	Yes	Yes
	Truck Activities Warehouse 01	87		87	27	27	27	Yes	Yes	Yes
	Truck Activities Warehouse 02	87		87	30	30	30	Yes	Yes	Yes
	Truck Activities Warehouse 03A	87		87	27	27	27	Yes	Yes	Yes
	Truck Activities Warehouse 03B	87		87	26	26	26	Yes	Yes	Yes
	Forklift activities Warehouse 01	89	5	94	29	29	29	Yes	Yes	Yes
	Forklift activities Warehouse 02	89	5	94	31	31	31	Yes	Yes	Yes
	Forklift activities Warehouse 03A	89	5	94	31	31	31	Yes	Yes	Yes
	Forklift activities Warehouse 03B	89	5	94	30	30	30	Yes	Yes	Yes
	Total				38	38	38	**Yes**	**Yes**	**Yes**
	Criteria							43	43	38
	Car Park Warehouse 03B	69		69	8	8	8	Yes	Yes	Yes
2	Car Park Warehouse 07	69		69	12	12	12	Yes	Yes	Yes
	Car Park Warehouse 06B	69		69	11	11	11	Yes	Yes	Yes
	Car Park Warehouse 05	69		69	3	3	3	Yes	Yes	Yes
	Truck Activities Warehouse 03B	87		87	28	28	28	Yes	Yes	Yes
	Truck Activities Warehouse 07	87		87	32	32	32	Yes	Yes	Yes
	Truck Activities Warehouse 06B	87		87	16	16	16	Yes	Yes	Yes
	Truck Activities Warehouse 05	87		87	15	15	15	Yes	Yes	Yes
	Forklift activities Warehouse 03B	89	5	94	29	29	29	Yes	Yes	Yes
	Forklift activities Warehouse 07	89	5	94	35	35	35	Yes	Yes	Yes
	Forklift activities Warehouse 06B	89	5	94	21	21	21	Yes	Yes	Yes
	Forklift activities Warehouse 05	89	5	94	14	14	14	Yes	Yes	Yes
	Total				38	38	38	**Yes**	**Yes**	**Yes**
	Criteria							43	43	38
	Car Park Activities Warehouse 01	69		69				Yes	Yes	Yes
3	Car Park Activities Warehouse 04	69		69	10	10	10	Yes	Yes	Yes
	Car Park Activities Warehouse 03	69		69	22	22	22	Yes	Yes	Yes
	Car Park Activities Warehouse 05B	69		69	5	5	5	Yes	Yes	Yes
	Truck Activities Warehouse 01	87		87	9	9	9	Yes	Yes	Yes
	Truck Activities Warehouse 04	87		87	31	31	31	Yes	Yes	Yes
	Truck Activities Warehouse 03	87		87	25	25	25	Yes	Yes	Yes
	Truck Activities Warehouse 05B	87		87	32	32	32	Yes	Yes	Yes
	Forklift activties Warehouse 01	89	5	94	12	12	12	Yes	Yes	Yes
	Forklift activties Warehouse 04	89	5	94	32	32	32	Yes	Yes	Yes
	Forklift activties Warehouse 03	89	5	94	24	24	24	Yes	Yes	Yes
	Forklift activties Warehouse 05B	89	5	94	31	31	31	Yes	Yes	Yes
	Total				38	38	38	**Yes**	**Yes**	**Yes**
	Criteria							57	54	46
	Car Park Warehouse 01	69		69	22	22	22	Yes	Yes	Yes
4	Car Park Warehouse 02	69		69	21	21	21	Yes	Yes	Yes
	Car Park Warehouse 08	69		69	23	23	23	Yes	Yes	Yes
	Car Park Warehouse 09	69		69	23	23	23	Yes	Yes	Yes
	Truck Activities Warehouse 01	87		87	38	38	38	Yes	Yes	Yes
	Truck Activities Warehouse 02	87		87	31	31	31	Yes	Yes	Yes
	Truck Activities Warehouse 08	87		87	38	38	38	Yes	Yes	Yes
	Truck Activities Warehouse 09	87		87	32	32	32	Yes	Yes	Yes
	Forklift activities Warehouse 01	89	5	94	40	40	40	Yes	Yes	Yes
	Forklift activities Warehouse 02	89	5	94	36	36	36	Yes	Yes	Yes
	Forklift activities Warehouse 08	89	5	94	40	40	40	Yes	Yes	Yes
	Forklift activities Warehouse 09	89	5	94	29	29	29	Yes	Yes	Yes
	Total				46	46	46	**Yes**	**Yes**	**Yes**

Table 11: Project specific noise levels – Receivers A to C

Receiver	Receivers A. 1642 The Horsley Drive B. 1677-1681 The Horsley Drive C. 204-214 Chandos Road Description	Source Leq@1m dB(A)	Correction dB(A)*	Corrected Leq@1m dB(A)	LAeq adj,T ext. dB(A) Day	LAeq adj,T ext. dB(A) Eve	LAeq adj,T ext. dB(A) Night	LAeq 15 min Compliance Day	Eve	Night
	Criteria							65	65	65
	Car Park Warehouse 01	69		69	26	26	26	Yes	Yes	Yes
A	Car Park Warehouse 08	69		69	18	18	18	Yes	Yes	Yes
	Car Park Warehouse 09	69		69	19	19	19	Yes	Yes	Yes
	Car Park Warehouse 02	69		69	17	17	17	Yes	Yes	Yes
	Truck Activities Warehouse 01	87		87	41	41	41	Yes	Yes	Yes
	Truck Activities Warehouse 08	87		87	43	43	43	Yes	Yes	Yes
	Truck Activities Warehouse 09	87		87	37	37	37	Yes	Yes	Yes
	Truck Activities Warehouse 02	87		87	35	35	35	Yes	Yes	Yes
	Truck Activities Warehouse 06	87		87	37	37	37	Yes	Yes	Yes
	Car Park Warehouse 06	69		69	17	17	17	Yes	Yes	Yes
	Forklift activities Warehouse 01	89	5	94	46	46	46	Yes	Yes	Yes
	Forklift activities Warehouse 08	89	5	94	47	47	47	Yes	Yes	Yes
	Forklift activities Warehouse 09	89	5	94	41	41	41	Yes	Yes	Yes
	Forklift activities Warehouse 02	89	5	94	41	41	41	Yes	Yes	Yes
	Forklift activities Warehouse 06	89	5	94	41	41	41	Yes	Yes	Yes
	Total				52	52	52	**Yes**	**Yes**	**Yes**
	Criteria							65	65	65
	Car Park Warehouse 01	69		69	34	34	34	Yes	Yes	Yes
B	Car Park Warehouse 08	69		69	14	14	14	Yes	Yes	Yes
	Car Park Warehouse 09	69		69	17	17	17	Yes	Yes	Yes
	Car Park Warehouse 02	69		69	24	24	24	Yes	Yes	Yes
	Truck Activities Warehouse 01	87		87	44	44	44	Yes	Yes	Yes
	Truck Activities Warehouse 08	87		87	41	41	41	Yes	Yes	Yes
	Truck Activities Warehouse 09	87		87	34	34	34	Yes	Yes	Yes
	Truck Activities Warehouse 02	87		87	48	48	48	Yes	Yes	Yes
	Truck Activities Warehouse 06	87		87	38	38	38	Yes	Yes	Yes
	Car Park Warehouse 06	69		69	22	22	22	Yes	Yes	Yes
	Forklift activities Warehouse 01	89	5	94	49	49	49	Yes	Yes	Yes
	Forklift activities Warehouse 08	89	5	94	46	46	46	Yes	Yes	Yes
	Forklift activities Warehouse 09	89	5	94	39	39	39	Yes	Yes	Yes
	Forklift activities Warehouse 02	89	5	94	53	53	53	Yes	Yes	Yes
	Forklift activities Warehouse 06	89	5	94	43	43	43	Yes	Yes	Yes
	Total				57	57	57	**Yes**	**Yes**	**Yes**
	Criteria							70	70	70
	Car Park Warehouse 01	69		69	6	6	6	Yes	Yes	Yes
C	Car Park Warehouse 02	69		69	5	5	5	Yes	Yes	Yes
	Car Park Warehouse 03A	69		69	5	5	5	Yes	Yes	Yes
	Car Park Warehouse 03B	69		69	3	3	3	Yes	Yes	Yes
	Truck Activities Warehouse 01	87		87	29	29	29	Yes	Yes	Yes
	Truck Activities Warehouse 02	87		87	27	27	27	Yes	Yes	Yes
	Truck Activities Warehouse 03A	87		87	26	26	26	Yes	Yes	Yes
	Truck Activities Warehouse 03B	87		87	23	23	23	Yes	Yes	Yes
	Truck Activities Warehouse 05A	87		87	35	35	35	Yes	Yes	Yes
	Car Park Warehouse 05A	69		69	17	17	17	Yes	Yes	Yes
	Forklift activities Warehouse 01	89	5	94	31	31	31	Yes	Yes	Yes
	Forklift activities Warehouse 02	89	5	94	29	29	29	Yes	Yes	Yes
	Forklift activities Warehouse 03A	89	5	94	28	28	28	Yes	Yes	Yes
	Forklift activities Warehouse 03B	89	5	94	28	28	28	Yes	Yes	Yes
	Forklift activities Warehouse 05A	89	5	94	40	40	40	Yes	Yes	Yes
	Total				43	43	43	**Yes**	**Yes**	**Yes**

Compliance is predicted for all onsite activities at the receiver locations during the proposed operating hours on the condition the recommendations detailed in Section 9 are implemented.

7.3 Sleep disturbance criteria

The noise source levels and predicted levels of noise at the receiver locations are shown in Table 12.

Table 12: Sleep Disturbance noise levels – Receivers 1 to 4

Receiver	Description	Source @1m dB(A)	Correction dB(A)*	Corrected dB(A)	Laeq adj, T ext. dB (A) Night	LAmax adj,T ext.. dB(A)	Complies Leq 15 min dB(A)	Complies Lmax dB(A)
	Receivers 1. 126-166 Chandos Road 2. 105-119 Chandos Road, 208-220 Redmayne Road 3. 137-141 Redmayne Road 4. 1634-1662 The Horsley Drive							
	Criteria						45	55
	Car Park Warehouse 01	69		69	18	6	Yes	Yes
1	Car Park Warehouse 02	69		69	18	11	Yes	Yes
	Car Park Warehouse 03A	69		69	13	19	Yes	Yes
	Car Park Warehouse 03B	69		69	24	11	Yes	Yes
	Truck Activities Warehouse 01	87		87	6.5	29	Yes	Yes
	Truck Activities Warehouse 02	87		87	17	29	Yes	Yes
	Truck Activities Warehouse 03A	87		87	32	33	Yes	Yes
	Truck Activities Warehouse 03B	87		87	32	30	Yes	Yes
	Forklift activities Warehouse 01	89	5	94	7.5	34	Yes	Yes
	Forklift activities Warehouse 02	89	5	94	18	35	Yes	Yes
	Forklift activities Warehouse 03A	89	5	94	18	36	Yes	Yes
	Forklift activities Warehouse 03B	89	5	94	13	36	Yes	Yes
	Criteria						45	55
	Car Park Warehouse 03B	69		69	18	9	Yes	Yes
2	Car Park Warehouse 07	69		69	18	11	Yes	Yes
	Car Park Warehouse 06B	69		69	13	11	Yes	Yes
	Car Park Warehouse 05	69		69	24	3	Yes	Yes
	Truck Activities Warehouse 03B	87		87	6.5	29	Yes	Yes
	Truck Activities Warehouse 07	87		87	17	36	Yes	Yes
	Truck Activities Warehouse 06B	87		87	32	29	Yes	Yes
	Truck Activities Warehouse 05	87		87	32	27	Yes	Yes
	Forklift activities Warehouse 03B	89	5	94	24	33	Yes	Yes
	Forklift activities Warehouse 07	89	5	94	16	38	Yes	Yes
	Forklift activities Warehouse 06B	89	5	94	7.5	35	Yes	Yes
	Forklift activities Warehouse 05	89	5	94	18	29	Yes	Yes
	Criteria						45	55
	Car Park Activities Warehouse 01	69		69	18	-10	Yes	Yes
3	Car Park Activities Warehouse 04	69		69	18	10	Yes	Yes
	Car Park Activities Warehouse 03	69		69	13	22	Yes	Yes
	Car Park Activities Warehouse 05B	69		69	24	5	Yes	Yes
	Truck Activities Warehouse 01	87		87	6.5	9	Yes	Yes
	Truck Activities Warehouse 04	87		87	17	32	Yes	Yes
	Truck Activities Warehouse 03	87		87	32	26	Yes	Yes
	Truck Activities Warehouse 05B	87		87	32	33	Yes	Yes
	Forklift activties Warehouse 01	89	5	94	7.5	15	Yes	Yes
	Forklift activties Warehouse 04	89	5	94	18	36	Yes	Yes
	Forklift activties Warehouse 03	89	5	94	18	28	Yes	Yes
	Forklift activties Warehouse 05B	89	5	94	13	34	Yes	Yes
	Criteria						45	55
	Car Park Warehouse 01	69		69	18	17	Yes	Yes
4	Car Park Warehouse 02	69		69	18	15	Yes	Yes
	Car Park Warehouse 08	69		69	13	17	Yes	Yes
	Car Park Warehouse 09	69		69	24	17	Yes	Yes
	Truck Activities Warehouse 01	87		87	6.5	32	Yes	Yes
	Truck Activities Warehouse 02	87		87	17	26	Yes	Yes
	Truck Activities Warehouse 08	87		87	32	32	Yes	Yes
	Truck Activities Warehouse 09	87		87	32	26	Yes	Yes
	Forklift activities Warehouse 01	89	5	94	24	37	Yes	Yes
	Forklift activities Warehouse 02	89	5	94	16	33	Yes	Yes
	Forklift activities Warehouse 08	89	5	94	7.5	36	Yes	Yes
	Forklift activities Warehouse 09	89	5	94	18	31	Yes	Yes

Compliance is predicted for all onsite activities at the receiver locations during the proposed operating hours on the condition the recommendations detailed in Section 9 are implemented.

8. Road Traffic Noise

A traffic assessment by Ason Group (ref: project number 1219 r01v1, dated 24/02/2020) predicted the increase in traffic generated by the development to be 1438 trips per day. 660 trips per day are predicted for the Horsley Drive, 444 for Redmayne Road and 334 for Chandos Road. Assuming that peak hour accounts for 10% of daily traffic volume, the current Annual Average Daily Traffic (AADT) for the area is estimated at 23860 for the Horsley Drive, 1760 for Redmayne Road and 9190 for Chandos Road.

Therefore, based on the available information, the predicted increase in daily $LAeq_{(15hr)}$ for residential receivers is predicted to be 1dB for receivers on Redmayne Road, and less than 1dB for receivers on the Horsley Drive and Chandos Road. This complies with the criterion of +12dB(A) as outlined in Section 6.6.

9. Recommendations

9.1 Operational Noise

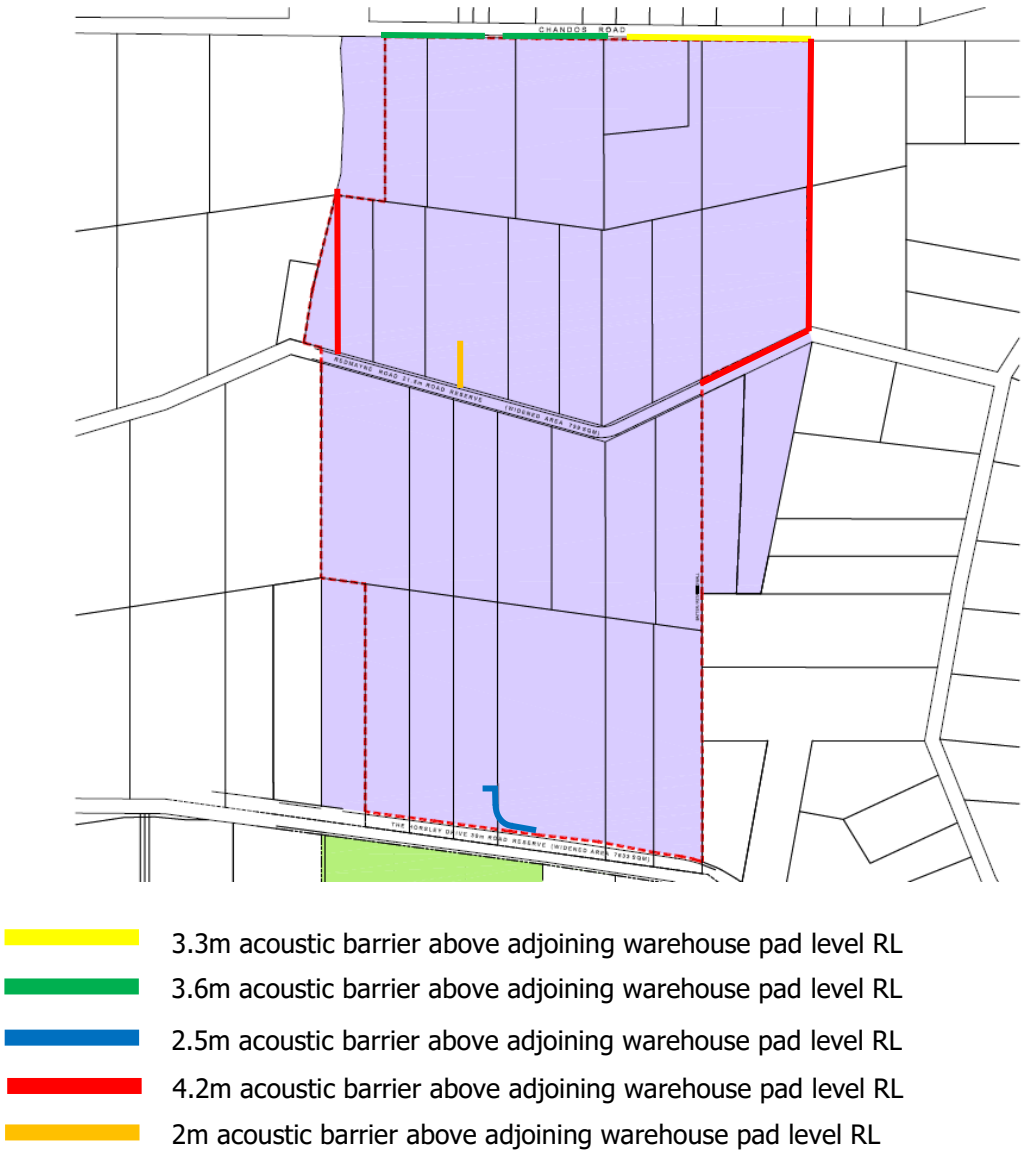
The review indicates that 24 hour operation of the site is predicted to comply with the assessment criteria on the condition that the following recommendations are implemented. In addition, on the condition the following recommendations are implemented, the site is not predicted to cause the emission of "Offensive Noise" as defined in the Protection of the Environment (Operations) Act 1997 or "intrusive noise" as defined in the NSW EPA Noise Policy for Industry (2017).

9.1.1 Barriers

To allow for unlimited site use, we recommend constructing acoustic barriers comprised of the following:

- Acoustic barriers shall be constructed to the height and extent shown in Figure 4. The acoustic barriers should be constructed using either masonry, 9mm fibre cement sheet, Hebel, or other materials with a minimum surface density of 9kg/m^2 and shall be free of gaps and holes.

Figure 4: Barrier recommendations



9.1.2 Onsite Mechanical Plant

No information regarding mechanical services was available at the time of the assessment. Any new mechanical plant shall be designed to comply with the criteria nominated in Section 7 of this report.

Based on the ambient noise levels measured at the nearest sensitive receiver (refer to Section 5) and separation distances, mechanical plants located on the plant deck of each warehouse will require a combined sound power level that does not exceed 74dB(A) for each warehouse. The nominated levels will ensure that plant noise is 10 below background levels at all receiver locations (inaudible). The number of mechanical plant units is predicted to exceed 1, therefore as a guide, Table 13 nominates specific noise levels dependent on the number of units.

Table 13: Mechanical plant maximum sound power level

Number of mechanical plant	Maximum Sound Power Level dB(A)
1	74
2	71
3	69
4	68
8	65

Acoustic Works recommends that once mechanical plant selection is finalised, an assessment by qualified acoustic consultant be conducted prior to installation to determine any requirements for acoustic treatments.

9.1.3 Sleep Disturbance

On the condition the applicable noise criteria outlined in Section 6.5.4 is implemented, then compliance is predicted with the Sleep Disturbance criteria.

9.1.4 NSW Road Noise Policy – Traffic Generation

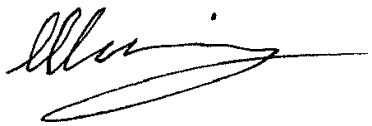
Per Ason Group's report (ref: project number 1219 r01v1, dated 24/02/2020) the traffic generation from the proposed development is predicted to be approximately 1,438 vehicles per day. Based on the existing traffic volumes, this increase in traffic volume is not predicted to exceed the criteria nominated in Section 6.6.

10. Conclusion

A noise assessment was conducted for the proposed industrial rezoning in Horsley Park. On the condition the recommendations detailed in Section 9 are implemented, general compliance is predicted with Fairfield City Council conditions and the NSW Noise Policy for Industry requirements.

If you should have any queries please do not hesitate to contact us.

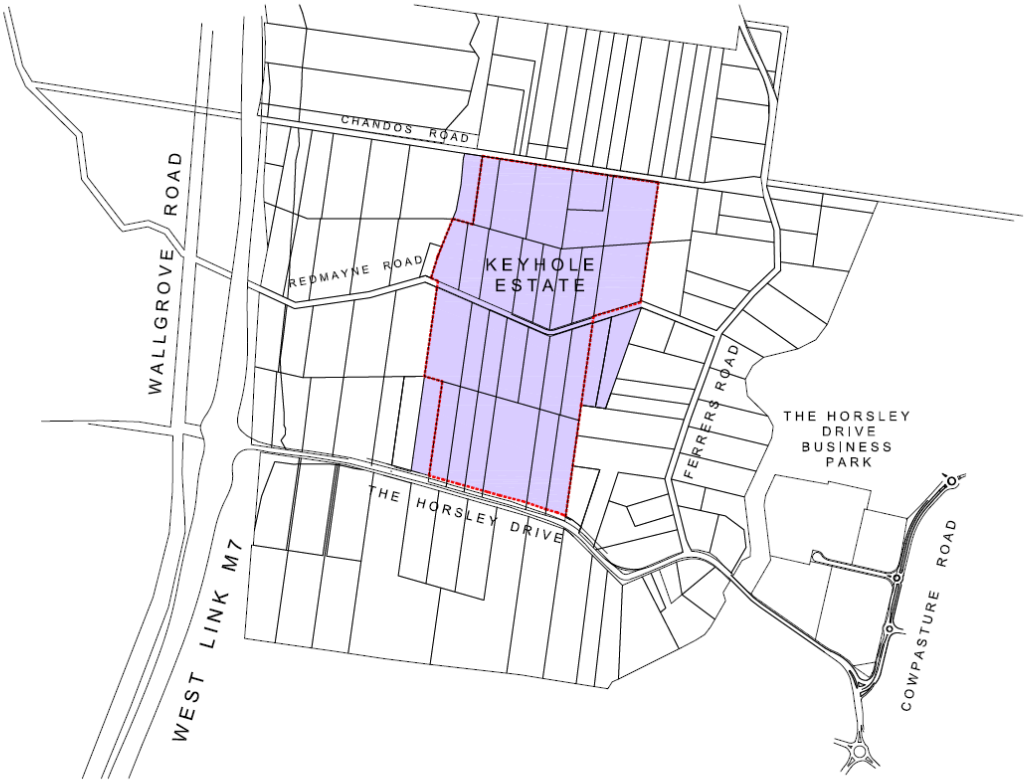
Report Prepared By



Michael Gunning M.ArchSci
Acoustic Consultant
acousticworks)))

11. Appendices

11.1 Development Plans



FRASERS PROPERTY

SYDNEY
LEVEL3
1C Homebush Bay Drive
Rhodes
NSW 1670
TEL: 02 9767 2000 FAX: 02 9767 2933

KEYHOLE ESTATE
LOCATION PLAN

SITE PLAN

© FRASERS PROPERTY AUSTRALIA P/L

SCALE
SCALE 1:5000 @ A1
JOB
MP • WSP • FS • 402
DATE
11.02.21
REV
A

FRASERS PROPERTY

SYDNEY
LEVEL3
1C Homebush Bay Drive
Rhodes
NSW 1670
TEL: 02 9767 2000 FAX: 02 9767 2933

KEY HOLE SITE
HORSLEY DRIVE, HORSLEY PARK

MASTER PLAN

© FRASERS PROPERTY AUSTRALIA P/L

SCALE
SCALE 1:1500 @ A1
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MP - HP - FS - 701
DATE
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REV
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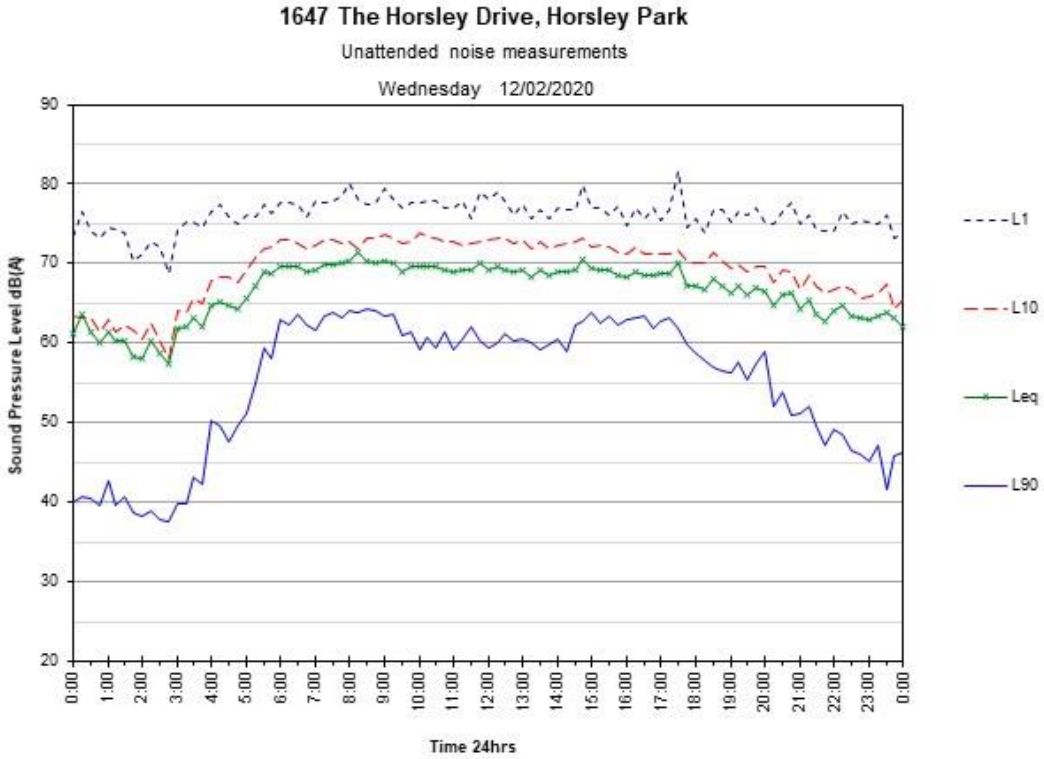
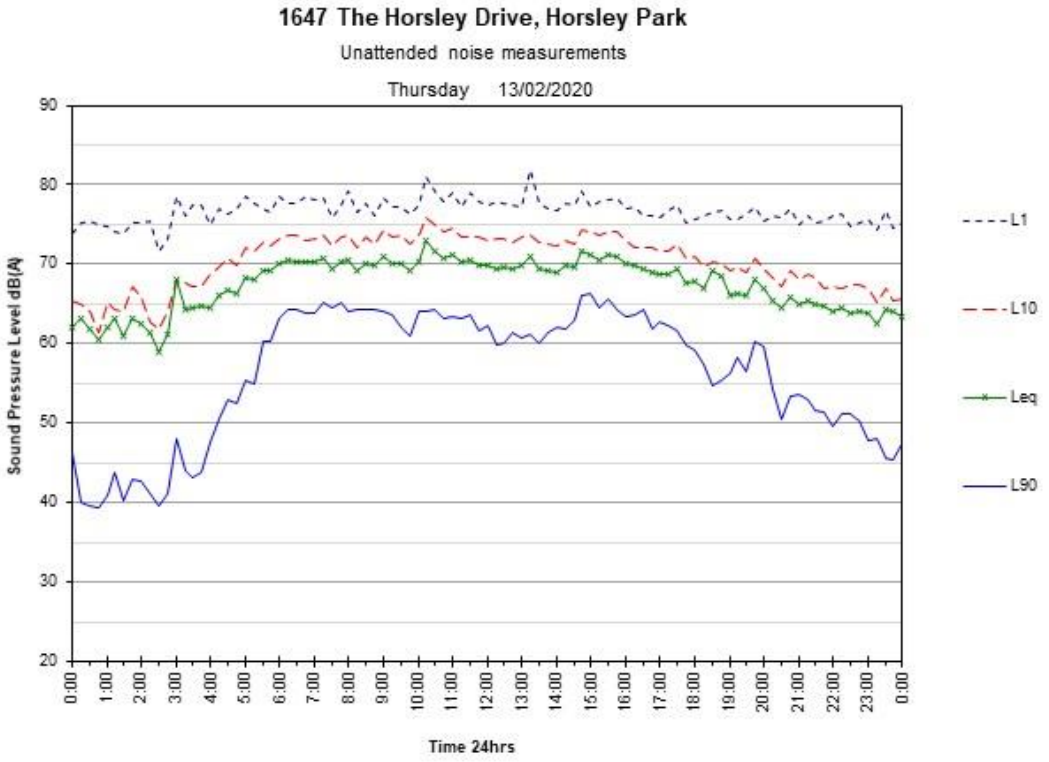
11.2 Noise Monitoring Charts

11.2.1 1647 The Horsley Drive




1647 The Horsley Drive, Horsley Park
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Sound Pressure Level dB(A)
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80
70
60
50
40
30
20
0:00
1:00
2:00
3:00
4:00
5:00
6:00
7:00
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13:00
14:00
15:00
16:00
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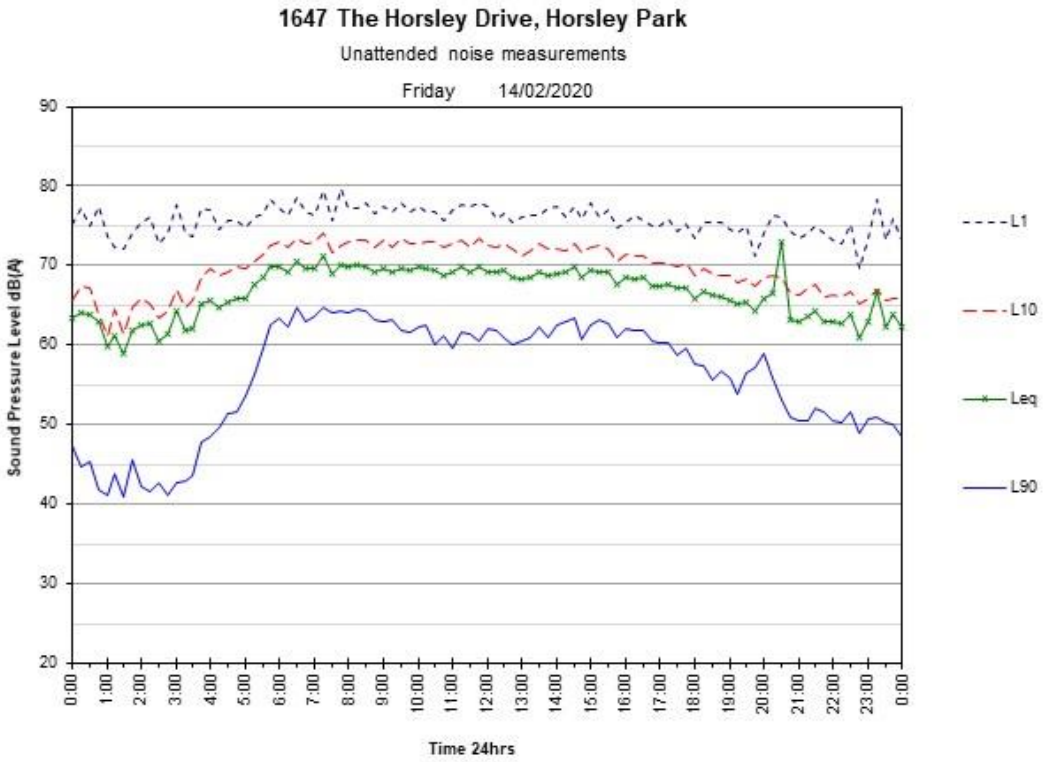
0:00
Time 24hrs
L1
L10
Leq
L90


1647 The Horsley Drive, Horsley Park
Unattended noise measurements
Friday 14/02/2020
Sound Pressure Level dB(A)
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70
60
50
40
30
20
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1:00
2:00
3:00
4:00
5:00
6:00
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15:00
16:00
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22:00
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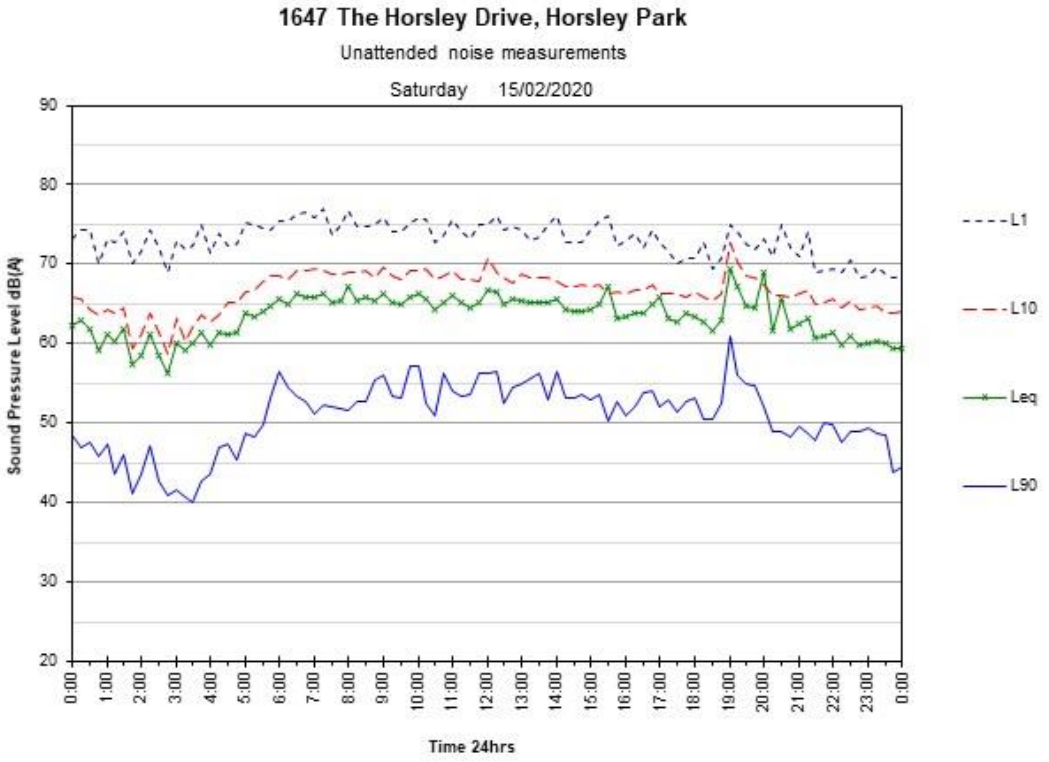
0:00
Time 24hrs
L1
L10
Leq
L90


1647 The Horsley Drive, Horsley Park
Unattended noise measurements
Saturday 15/02/2020
Sound Pressure Level dB(A)
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50
40
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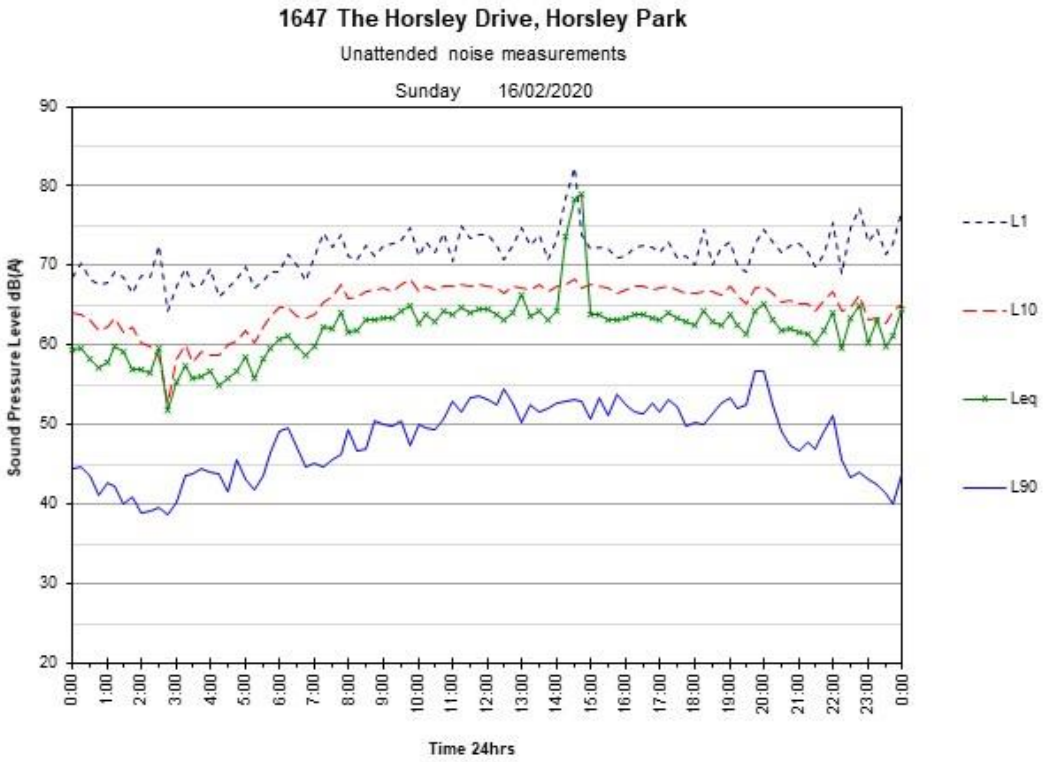
Time 24hrs
L1
L10
Leq
L90


1647 The Horsley Drive, Horsley Park
Unattended noise measurements
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70
60
50
40
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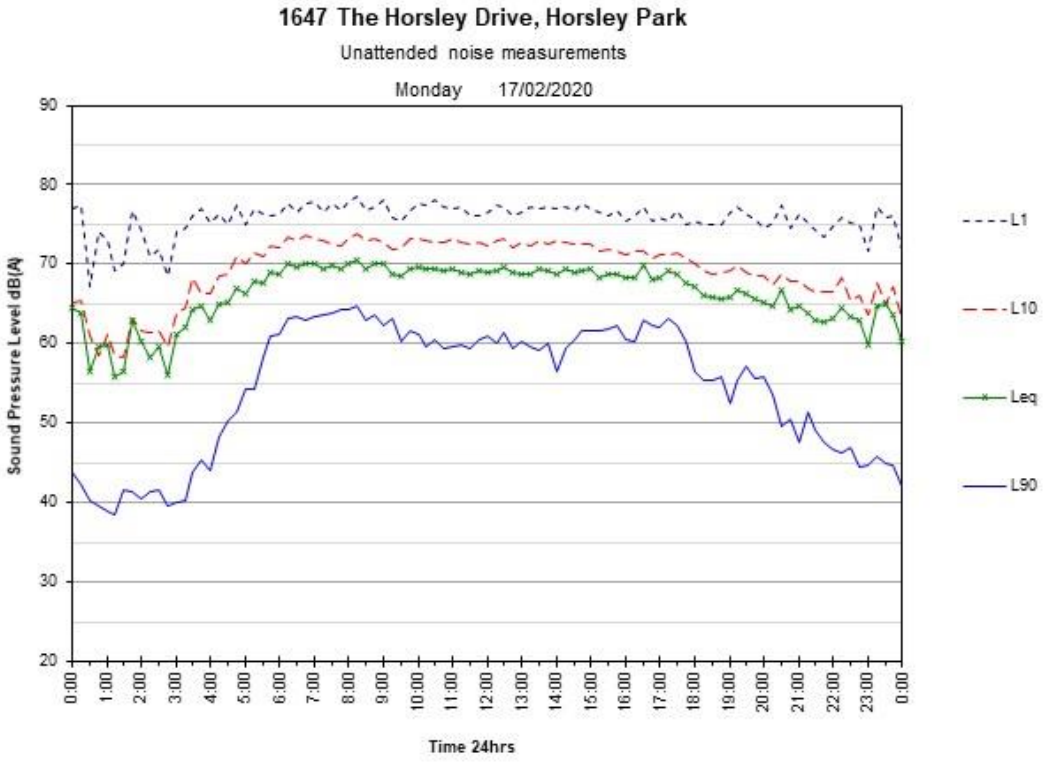
Leq
L90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Unattended noise measurements
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Time 24hrs
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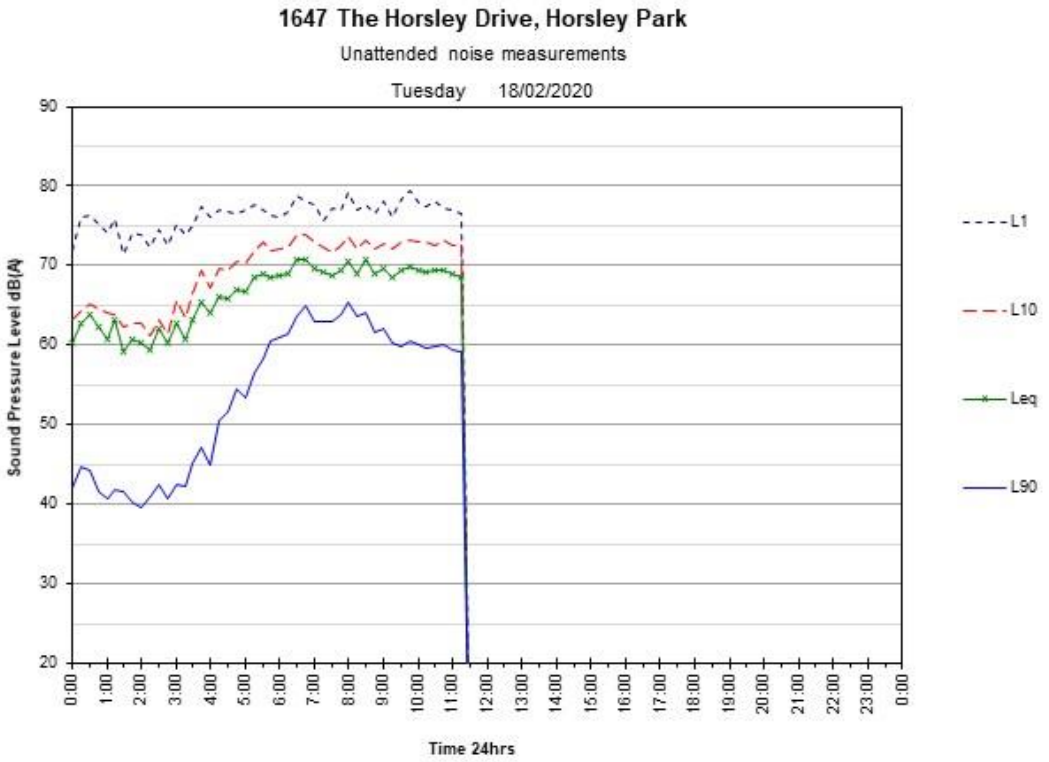
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Unattended noise measurements
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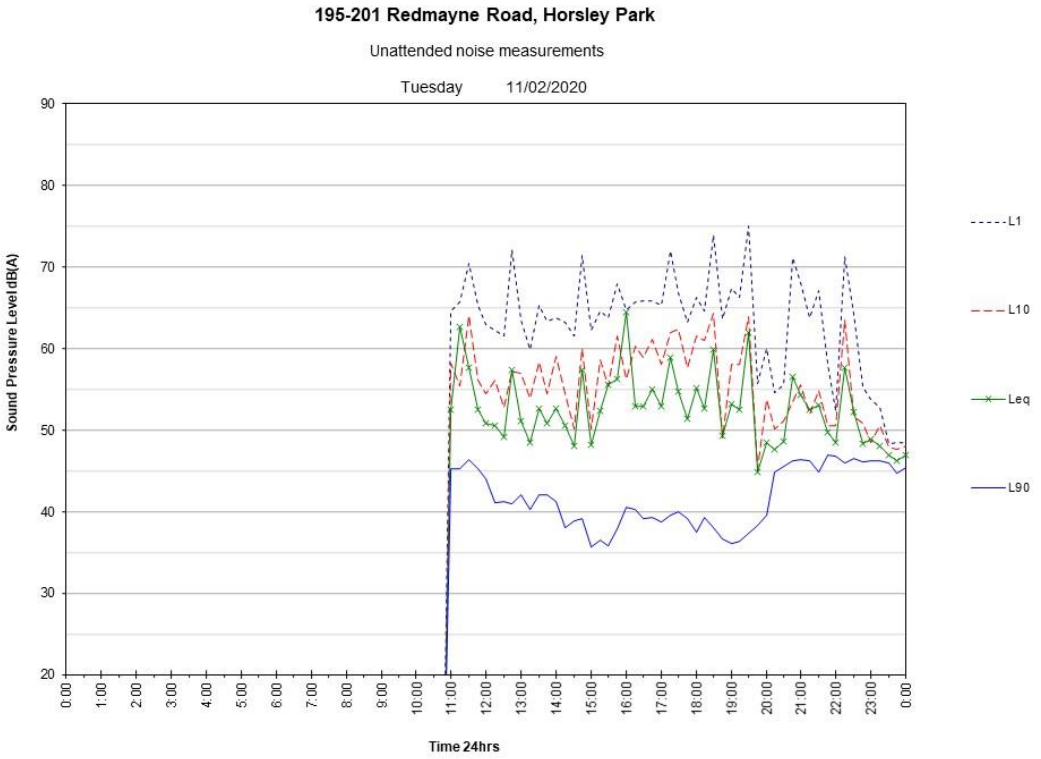
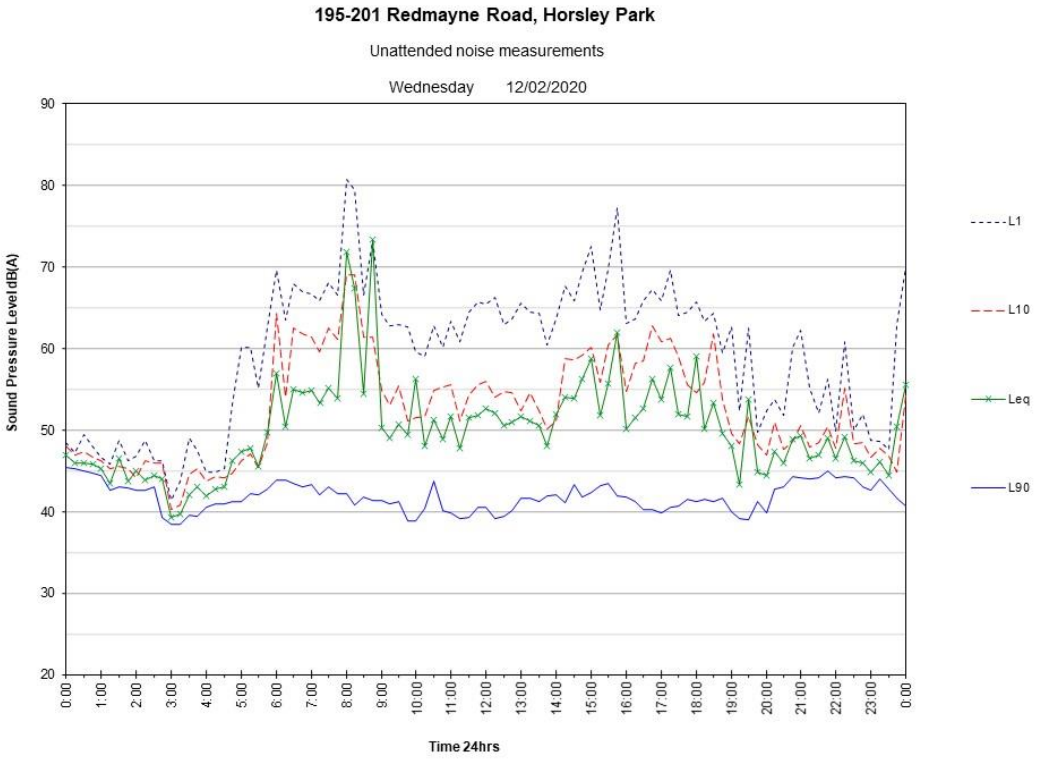
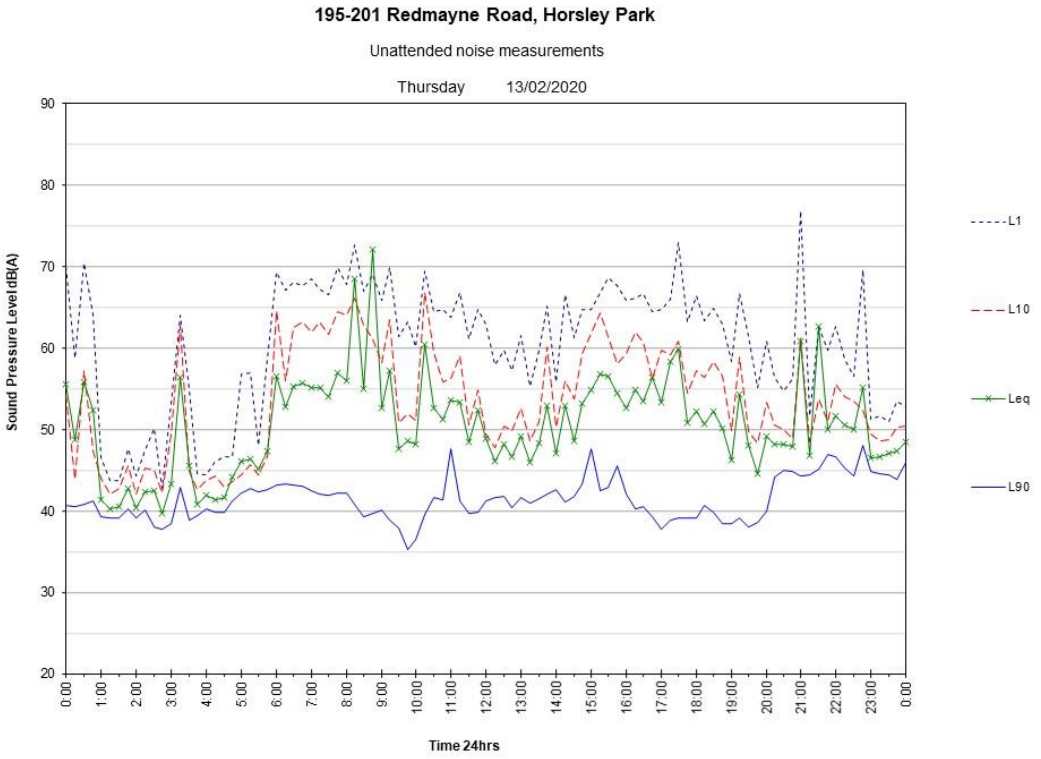
0:00
Time 24hrs
L1
L10
Leq
L90

11.2.2 195-201 Redmayne Road



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2:00
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4:00
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Time 24hrs
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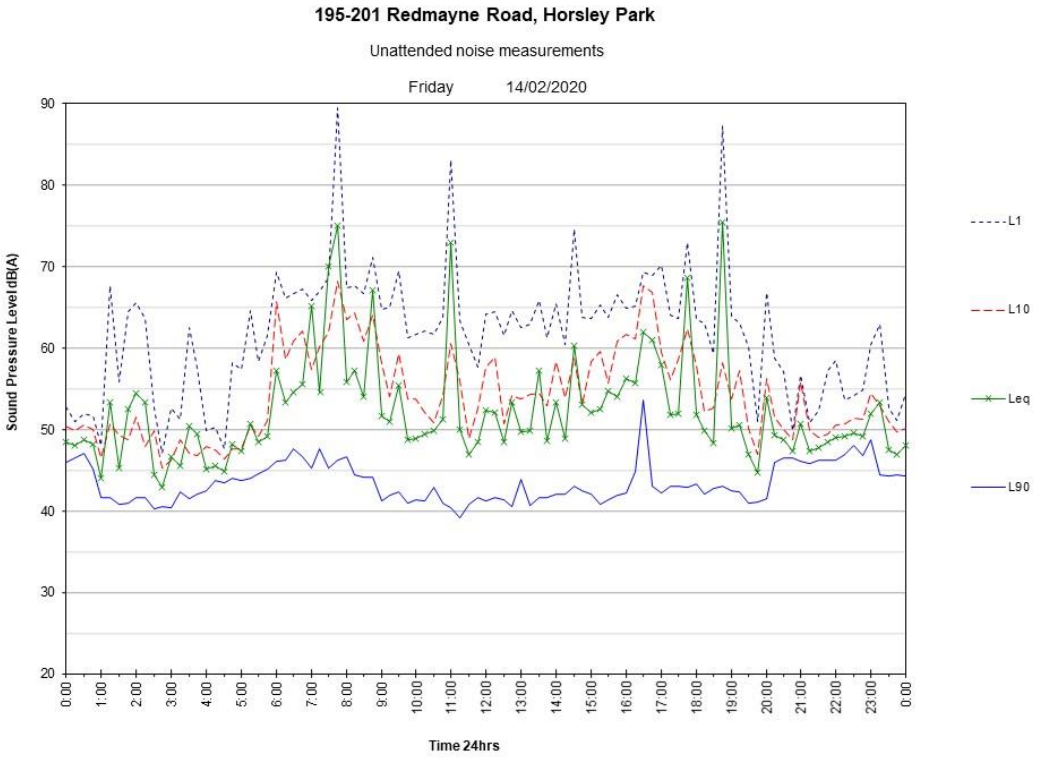
Leq
L90


195-201 Redmayne Road, Horsley Park
Unattended noise measurements
Friday 14/02/2020
Sound Pressure Level dB(A)
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2:00
3:00
4:00
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Time 24hrs
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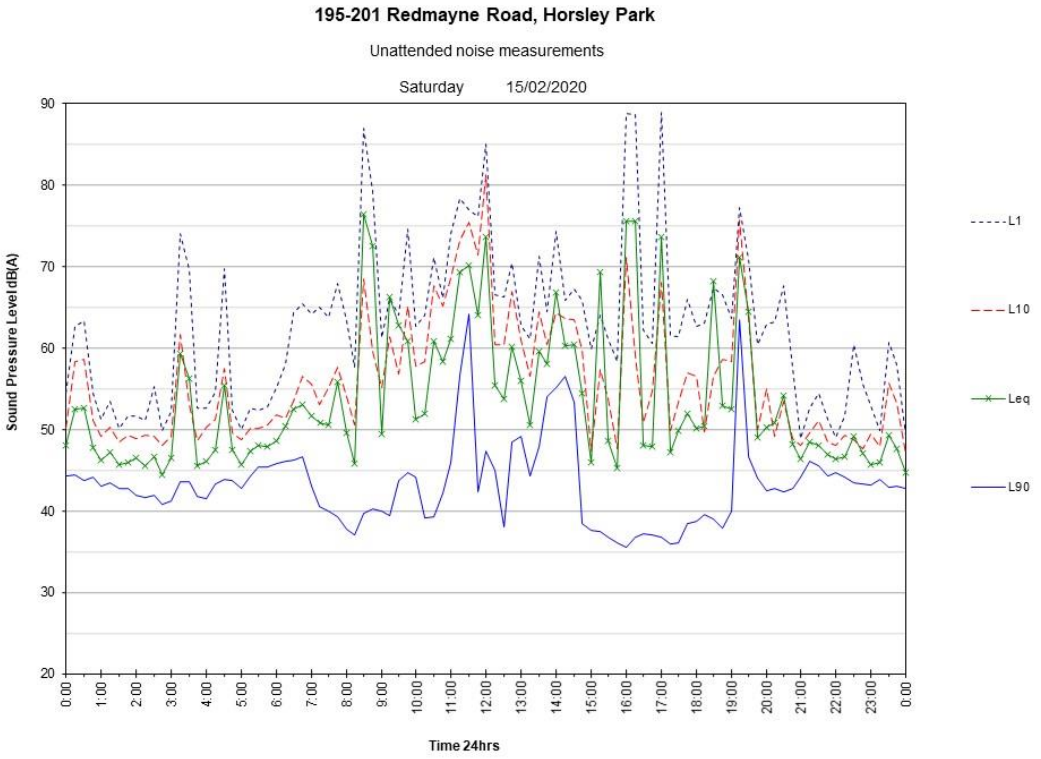
Leq
L90


195-201 Redmayne Road, Horsley Park
Unattended noise measurements
Saturday 15/02/2020
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80
70
60
50
40
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1:00
2:00
3:00
4:00
5:00
6:00
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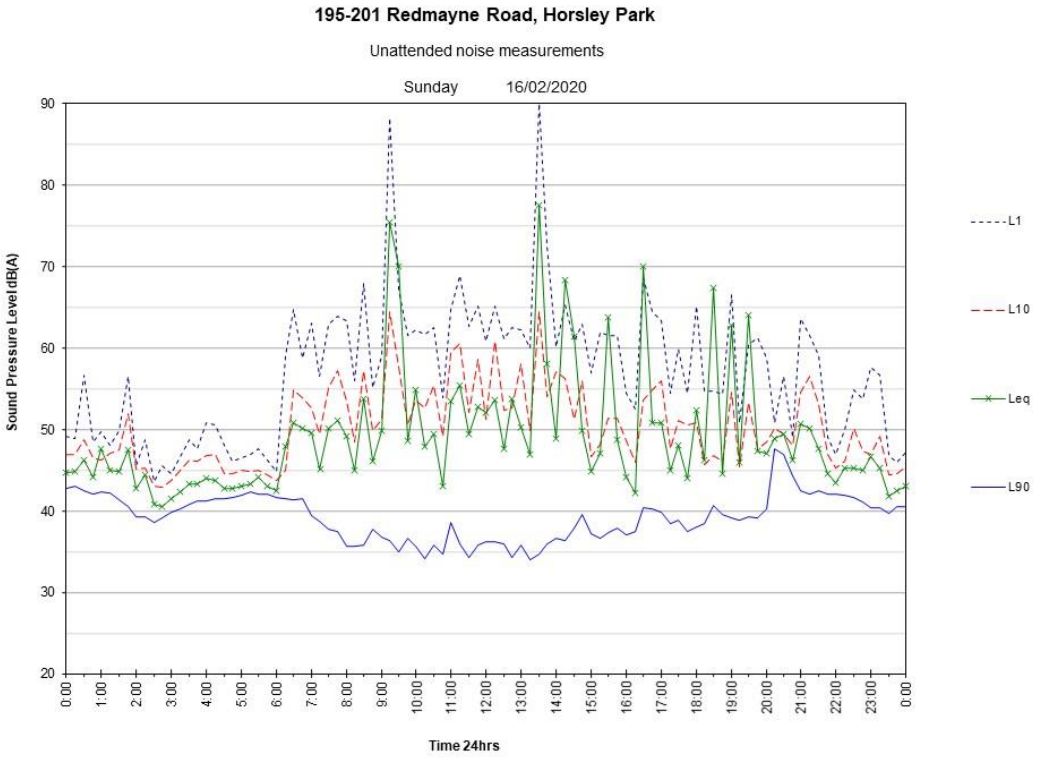
195-201 Redmayne Road, Horsley Park
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Sunday 16/02/2020
Sound Pressure Level dB(A)
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Time 24hrs
L1
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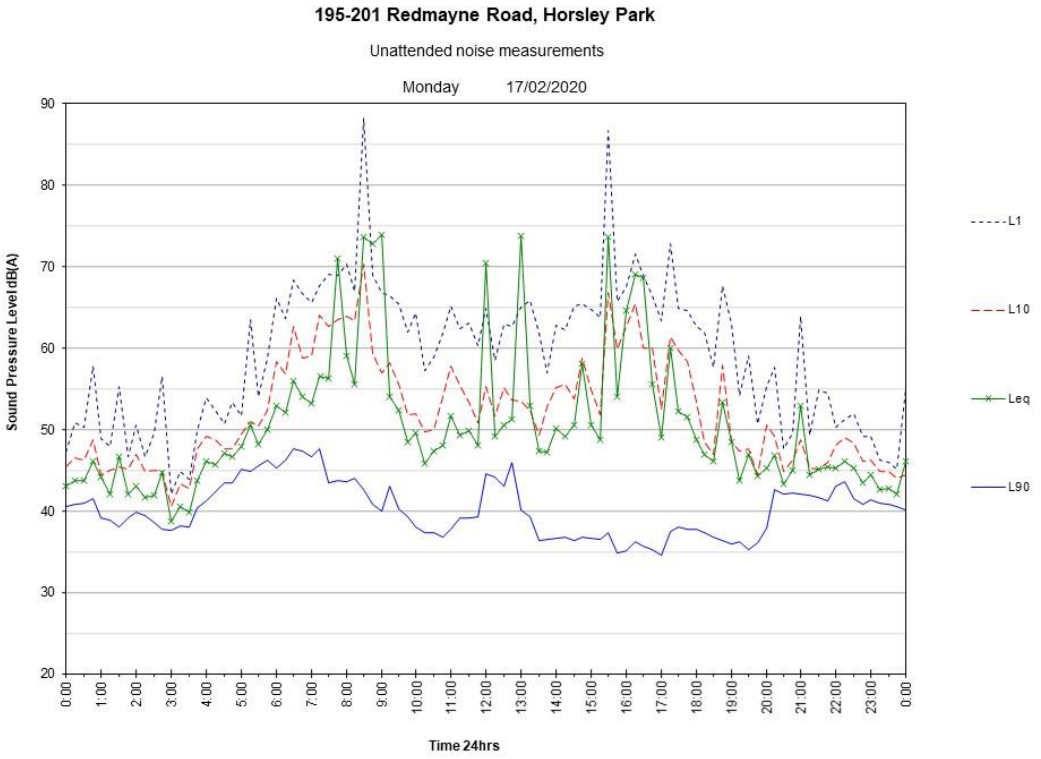
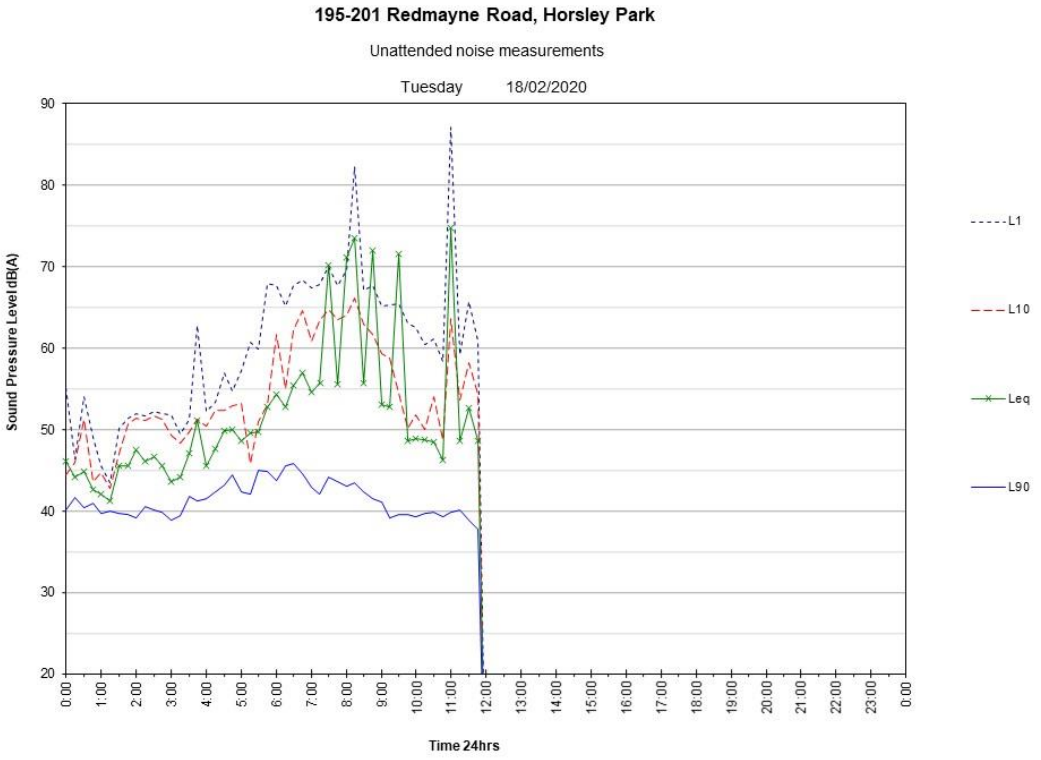
Leq
L90


195-201 Redmayne Road, Horsley Park
Unattended noise measurements
Monday 17/02/2020
Sound Pressure Level dB(A)
Time 24hrs
L1
L10
Leq
L90


195-201 Redmayne Road, Horsley Park
Unattended noise measurements
Tuesday 18/02/2020
Sound Pressure Level dB(A)
Time 24hrs
L1
L10
Leq
L90