

215 Macarthur Road, Spring Farm

Noise Impact Assessment

June 2022

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Approval and Authorisation

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1 EXECUTIVE SUMMARY

Broadcrest Pty. Ltd. were engaged by Group Development Services to carry out a noise impact assessment at 215 Macarthur Road, Spring Farm ('the site') within R1 General Residential zoning. The assessment will accompany plans to subdivide Lot 11 in DP 534539 into 51 Residential Lots.

A site inspection was carried out on the 17.09.2021 which involved a visual assessment of the site and the surrounding noise producing nodes. At the time of inspection, the site and surrounds consisted of:

- Residential streets and housing (dominant noise source)
- Spring Farm Quarry to the south, across MacArthur Road (non-audible during the site inspection).
- Spring Farm public School (not operational during the assessment)
- Camden Bypass ~400m west of the site (barely/faintly audible).

An acoustic logger was setup for unattended continuous noise level monitoring (a noise survey). The acoustic logger was installed on the 17/09/2021 with monitoring beginning at midnight. The logger was recovered on the 25/09/2021 at 14:30. The data was validated to ensure no extraneous noise sources biased the data (section 5.4).

Council subsequently requested further information regarding the noise level from Spring Farm Quarry and associated truck movements. Broadcrest has undertaken attended noise measurements of quarry truck movements at the nearest property boundary to the quarry entrance. A logger was set up for a long-term unattended noise survey of the quarry noise.

No other noise sources of concern were identified. It is our opinion that, given the recommendations in section 7 are followed, the development will meet the relevant acoustic requirements of the EPA Noise Policy for Industry, NSW State Environmental Planning Policy (Infrastructure) 2007, NSW Dept. of Planning (2008) Interim Guideline and Australian Standard AS3671.

2 INTRODUCTION

2.1 Foreword

A Noise Impact Assessment is a technical document which assesses noise producing nodes, determines their impact on nearby sensitive receivers and recommends control options. A noise assessment carefully considers the environmental, social and economic aspects of a project and its surrounds.

2.2 Background

Broadcrest Pty. Ltd. were engaged by Group Development Services to carry out a noise impact assessment at 215 Macarthur Road, Spring Farm ('the site'). The assessment will accompany plans to subdivide Lot 11 in DP 534539 into 51 Residential Lots.

A site inspection was carried out on the 17.09.2021 which involved a visual assessment of the site and the surrounding noise producing nodes. At the time of inspection, the site and surrounds consisted of:

- Residential streets and housing (dominant noise source)
- Spring Farm Quarry to the south, across MacArthur Road (non-audible during the site inspection).
- Spring Farm public School (not operational during the assessment)
- Camden Bypass ~400m west of the site (barely/faintly audible).

Council subsequently requested further information regarding the noise level from Spring Farm Quarry and associated truck movements. An option is to conduct noise modelling of the quarry to predict the noise levels at the development. To conduct an accurate noise model of the quarry, details of the operations and equipment would be required. This approach is typically only undertaken when a noise producing development is seeking approval.

For existing operations, best practice is to conduct noise monitoring of the quarry operations at the nearest property boundary to determine the true equivalent sound pressure level (LAeq).

Broadcrest has undertaken attended noise measurements of quarry truck movements at the nearest property boundary to the quarry entrance. A logger was set up for a long-term unattended noise survey of the quarry noise.



Figure 2.1: Site Location (blue) and surrounding noise sources

2.3 Objectives

The purpose of the Noise Impact Assessment is to assess the background noise levels and any potential impacts on the development. Requirements for the proposed development are determined from criteria present in Clause 102 of the NSW Government SEPP (Infrastructure) 2007, NSW DoP (2008) *Interim Guidelines*, as well as Australian Standards AS 3671 and AS 2107.

2.4 Scope of works

- Site assessment & installation of temporary noise logger in field
- Existing noise environment measurement & characterisation
- Noise level assessment
- Review & determination of relevant assessment criteria
- Review of relevant literature and material for noise management
- Mitigation measures (if required) & recommendations

3 DESCRIPTION

3.1 Site Description

The proposed development is located at 215 Macarthur Road, Spring Farm within R1 General Residential zoning. The site is bounded by Macarthur Road, Spring Farm Public School, Spring Farm Quarry and residential dwellings (figure 3.1).

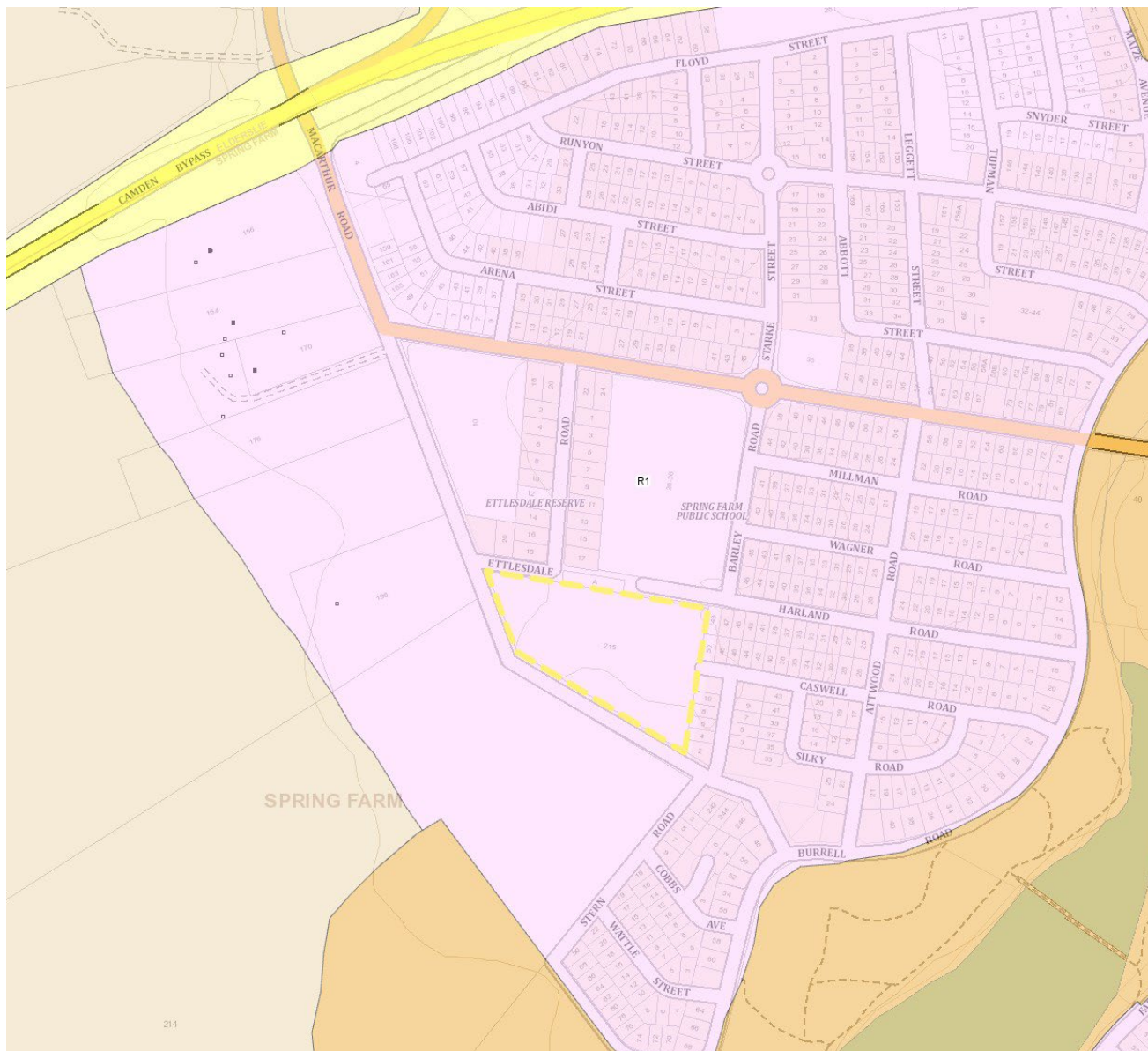


Figure 3.1: Surrounding zoning – NSW ePlanning Spatial Viewer

3.2 Site acoustic concerns

The following existing environmental noise sources were identified for assessment:

- Spring Farm Public School
- Spring Farm Quarry
- Camden Bypass
- General background noise levels

An acoustic logger was set up to record the background noise level on the site for seven days (see section 5.1).

3.3 Development description

The proposed development is to subdivide Lot 11 in DP 534539 into 51 Residential Lots.



Figure 3.2: Proposed subdivision – Extract of Appendix A

3.4 Traffic volume

No traffic volumes have been recorded by the RMS for Camden Bypass.

4 NOISE CRITERIA

The following documents and policies have been reviewed for guidance and to achieve compliance during the assessment:

- NSW SEPP (Infrastructure) 2007. (1)
- NSW DoP, 2008. *Development Near Rail Corridors and Busy Roads – Interim Guideline*
- AS 3671-1989 'Acoustics - Road Traffic Noise Intrusion - Building Siting and Construction' (2)
- AS 2107 – 2016 'Acoustic – Recommended Design Sound Levels and Reverberation Times for Building Interiors' (3)
- NSW EPA Noise Policy for Industry 2017

4.1 NSW State Environmental Planning Policy (Infrastructure) 2007

The criteria relevant to this assessment is the State Environmental Planning Policy (Infrastructure) 2007, *Subdivision 2 - Development in or adjacent to road corridors and road reservations*, specifically Clause 102 (1), *Impact of road noise or vibration on non-road development*. The SEPP (Infrastructure) 2007 states the following:

1. This clause applies to development for any of the following purposes that is on land in or adjacent to the road corridor for a freeway, a tollway or a transitway or any other road with an annual average daily traffic volume of more than 20,000 vehicles (based on the traffic volume data published on the website of RMS) and that the consent authority considers is likely to be adversely affected by road noise or vibration:
 - a) a building for residential use,
 - b) a place of public worship,
 - c) a hospital,
 - d) an educational establishment or child care centre.
2. Before determining a development application for development to which this clause applies, the consent authority must take into consideration any guidelines that are issued by the Director-General for the purposes of this clause and published in the Gazette.
3. If the development is for the purposes of a building for residential use, the consent authority must not grant consent to the development unless it is satisfied that appropriate measures will be taken to ensure that the following LAeq levels are not exceeded:
 - a) in any **bedroom** in the building — **35 dBA** at any time between 10 pm and 7 am,
 - b) **anywhere else** in the building (other than a garage, kitchen, bathroom or hallway) — **40 dBA** at any time.
4. In this clause, freeway, tollway and transitway have the same meanings as they have in the Roads Act 1993.

4.2 NSW Dept. of Planning (2008) Interim Guideline

The assessment criteria of the NSW Department of Planning *Development near Rail Corridors and Busy Roads – Interim Guideline* (herein NSW DOP) is outlined within Table 3.1 of Section 3.6.1 *Airborne Noise*, Part C: Noise and Vibration. Residential building noise criteria are derived from the NSW Infrastructure SEPP 2007, with non-residential criteria based upon the NSW EPA (1999) ECRTN guideline (now superseded by the NSW DECCW (2011) RNP).

Table 4.2 – Table 3.1: Noise criteria of DoP (2008)

Residential Buildings		
Type of occupancy	Noise Level (dBA)	Applicable time period
Sleeping areas (bedroom)	35	Night – 10pm to 7am
Other habitable rooms (excl. garages, kitchens, bathrooms, & hallways)	40	At any Time
Non-Residential Buildings		
Type of occupancy		Recommended Max Level (dBA)
Educational Institutions including child care centres		40
Places of Worship		40
Hospitals	Wards	35
	Other noise sensitive areas	45

Note: Air borne noise is calculated as $L_{eq}(9h)(night)$ and $L_{eq}(15h)(day)$. Ground borne noise is calculated as L_{max} (slow) for 95% of rail pass-by events.

4.3 Australian Standards AS 3671-1989 and AS 2107-2016

The criteria applicable to this assessment, as presented in Australian Standards, include AS 3671-1989 'Acoustics - Road traffic noise intrusion - building siting and construction' (2) which references guideline limits in AS 2107. Australian Standard AS 2107 – 2016 'Acoustic – Recommended Design Sound Levels and Reverberation Times for Building Interiors' (3) provides recommended design sound levels for different areas of occupancy in buildings. This includes recommended internal design sound levels from continuous road traffic noise for houses and apartments near major roads as shown in Table 4.2 below.

Table 4.3 – Recommended Design Sound Level for Residential Buildings (AS 2107:2016)

Type of Occupancy / Activity	Design Sound Level ($L_{Aeq,t}$) Range
Houses and apartments in inner city areas or entertainment districts or near major roads	
Apartment common areas (e.g. foyer, lift lobby)	45 to 50
Living areas	35 to 45
Sleeping areas (night time)	35 to 40
Work Areas	35 to 45

4.4 NSW EPA Noise Policy for Industry

The NSW Noise Policy for Industry (NPI) states that a noise source should not be intrusive and the amenity of nearby land should be preserved. The NPI recommends that the amenity criteria noise levels should be assessed at the most affected point on or within the property boundary. The noise level adopted should be the lesser of the amenity noise level or the LA10 + 5dBA (intrusiveness).

4.5 Adopted noise criteria

When ensuring the amenity of occupants for a new sub-division, consideration should be given to both the internal noise levels and external noise levels. The most applicable guidance documents have been used for each scenario.

4.7.1 Internal Noise Levels

Site-specific internal road traffic noise criteria ($L_{eq, period}$) is shown in table 4.7.1 in line with the SEPP (Infrastructure) 2007, NSW DoP and Australian Standard AS 2107.

Table 4.7.1: Internal allowable noise criteria

Time of day	Bedroom / sensitive receiver	Other habitable room
Day (7:00 – 2200)	40	40
Night (22:00 – 07:00)	35	40

4.6.2 External Noise Levels

Noise criteria for allowable external noise levels are based on the EPA NPI amenity values for a suburban area (table 5.3.1).

Day: 55.dBA
Evening: 45 dBA
Night: 40 dBA

5 SITE NOISE SURVEYS

5.1 Methodology

Acoustic loggers were setup for attended and unattended continuous noise level monitoring (a noise survey). The loggers were located at a secure point within the site (see figure 5.1). The loggers were offset from any reflective structures, hard surfaces and bias noise producing sources. The microphone was maintained within a foam windshield on collapsible post 1.2m off the ground.

The first acoustic logger was installed on the 17/09/2021 with monitoring beginning at midnight. The logger was recovered on the 25/09/2021 at 14:30.

The second logger was installed on the 21/01/2022 at 12:00 with logging beginning at 12:15. The logger was recovered on the 27/01/2022 at 13:00.

Attended logging of the trucks was conducted on the 21/01/2022 from 11:15 to 12:00, with details of all vehicle movements recorded.

The data was validated to ensure no extraneous noise sources biased the data (section 5.5).



Figure 5.1: Representative Logger locations

5.2 Equipment

All equipment was checked and calibrated immediately before and after use at 94dB and 114dB (± 0.3 dB) using a 1000hz signal.

For the first noise survey, a Norsonic Noise Logger (Serial number 2020050601) acoustic logger was employed for the assessment.

For the second noise survey and attended noise survey, a Rion NL-42EX logger (serial number 510451) was employed for monitoring of the quarry noise levels.

Both devices were set using 'A' frequency weighting and 'fast' time weighting. The loggers utilised conform with the following standards:

- IEC 61672-1:2003 Class 2
- ANSI S1.4-1983 Type 2
- ANSI S1.25-1992 Type 2
- ANSI S1.43-1997 Type 2

The results of the surveys have been assessed based on the EPA NPI guideline. A summary of the calculated levels and criteria selected are provided in sections 5.3 and 5.4 below.

5.3 Site noise survey one results – logger 1

Table 5.3.1: Residential site noise levels and noise limits dB(A)

Time of day	LA_{EQ_1}	RBL ²	Intrusiveness (RBL + 5db)	Amenity LA_{EQ_3}	Project Specific Levels ⁴
Day (7:00 – 18:00)	52.0	38.7	43.7	55.0	43.7
Evening (18:00 – 22:00)	47.9	32.3	37.3	45.0	37.3
Night (22:00-7:00)	47.8	30.8	35.8	40.0	35.8

See table 5.3.2 notes

5.4 Site noise survey two results – logger 2

Table 5.3.2: Residential site noise levels and noise limits dB(A)

Time of day	LA_{EQ_1}	RBL ²	Intrusiveness (RBL + 5db)	Amenity LA_{EQ_3}	Project Specific Levels ⁴
Day (7:00 – 18:00)	52.5	34.4	39.4	55.0	40.0
Evening (18:00 – 22:00)	49.3	33.6	38.6	45.0	38.6
Night (22:00-7:00)	41.9	29.3	34.3	40.0	35.0

- 1) LA_{eq} has been calculated using log-averages in accordance Table A2 of the NPI (1)
- 2) The Rating Background Level (RBL) has been calculating in accordance with section B1.3 of the NPI
- 3) Amenity values taken from Table 2.2 of the NPI for residential dwellings in a suburban environment.
- 4) Project specific levels equal the lesser of the Intrusiveness, Amenity and minimum values in table 2.1 of the NPI

5.5 Extraneous noise

Section A1 of the NSW EPA Noise Policy for Industry states:

“For the assessment of modifications to existing premises, the noise from the existing premises should be excluded from background noise measurements. The exception is where the premises has been operating for a significant period of time and is considered a normal part of the acoustic environment; it may be included in the background noise assessment under the following circumstances:

- the development must have been operating for a period in excess of 10 years in the assessment period/s being considered and is considered a normal part of the acoustic environment; and,*
- the development must be operating in accordance with noise limits and requirements imposed in a consent or licence and/or be applying best practice”. (4)*

Extraneous noise is any breach to the above clause. Typically, these are noises resulting from activities that are not typical of the area such as construction, additional noise sources during holiday periods, sporting events or weather conditions.

Meteorological events must be considered during the assessment. Monitoring data acquired during the following events should be excluded from assessment:

- Where the average wind speed is over 5m/s (for a period of 15-minutes)
- During any rainfall

Climate data from the Bureau of Meteorology (BOM) was monitored during the assessment period to identify potential adverse conditions. The most suitable weather station for monitoring was taken as Camden Airport weather station. Wind exceedances are plotted on the noise result graphs (see appendix C).

6 NOISE IMPACT ASSESSMENT

6.1 Spring Farm Public School

Spring farm public school is located 25m north of the proposed subdivision. Typical school opening hours are daytime only, from 07:30 till 05:00pm.

6.1.1 Classrooms and students

The school has been designed to form a U shape with the buildings to contain the noise within a central courtyard. Noise from the classrooms and students' movement will be attenuated by the buildings, providing at least a 30dBA reduction. No further assessment of the classroom or court yard is deemed necessary.

6.1.2 Parking and traffic

For car movements, the critical case of the school carpark and kiss and drop has been assessed.

- The school carpark is located ~120m from the nearest proposed lot (#49).
- The kiss and drop zone is located ~65m from the nearest proposed lot (#49)

Free field noise calculations were used to predict the noise impact from a car driving into and out of the drop-off zone. An SWL of 85.0dBA (30 seconds) be used for a car parking and car door closing (1). This was converted to an SPL of 77.0dB using a Q factor of 2.

Based on a distance of 65m, the noise level is calculated to be 40.7dBA at the critical boundary of lot 49. This is 3.0dBA under the day time criteria and therefor acceptable.

6.1.2 Outdoor play area

The proposed subdivision is shielded from the outdoor play area by the school buildings, providing 30dBA of attenuation in addition to free-field noise fall off. No further assessment of the outdoor play area is deemed necessary.

6.2 Spring farm quarry

The active area of spring farm quarry is located approximately 50m south of the subdivision critical boundary. The quarry is recessed into the landscape from operations. The quarry is responsible for complying with the relevant state legislation and requirements regarding noise production.

Council have requested an assessment of the noise level from Spring Farm Quarry and associated truck movements. Broadcast has undertaken attended noise measurements of quarry truck movements at the nearest property boundary to the quarry entrance (see figure 5.1). In addition to the attended logging, long term unattended noise measurements of the quarry operations were taken at the closest property boundary to the quarry activities.

6.2.1 Truck Movements

The truck movements from the quarry have the potential to impact the amenity of the principle private open space (PPOS) and living areas. The project specific values for the PPOS and living areas 55dBA and 40dBA respectively.

The loudest truck movement was from a double bogie leaving the site (peak 80.6dBA, table 6.1). The duration of the peak was ~5 seconds, with the total event (above the LAeq) being approximately 30 seconds.

The equivalent LAeq, 15 minutes for the event has been calculated as 65.8dBA. Table C1 in the EPA Noise Policy for Industry suggests a 5dBA adjustment for intermittent noises during the night time period only. As the quarry is restricted to day time hours this adjustment has not been applied.

Free field noise modelling has been used to calculate the minimum distance requirement from the road to attenuate the noise level (see section 6.2.2 and 6.2.3).

6.2.2 Principle Private Open Space

To attenuate the noise in the PPOS, a setback of 17.4m from the quarry exit is required to achieve an ambient LAeq of 55.0dBA. This will be achieved in the rear yard of all lots. No further attenuation is required.

6.2.3 Living area

To attenuate the noise in the living area, either:

- a distance of 98m is required to achieve an ambient LAeq of 40.0dBA
- Lots 1, 2, 6, 7, 8 and future Lot 101 require building construction suitable for attenuating 25.8dBA equivalent attenuation. Example components suitable for meeting the attenuation goals are provided in table 7.1.
- Shielded lots (i.e, all except Lots 1, 2, 6, 7, 8 and future Lot 101) do not require further attenuation

The results of the attended truck noise movements have been graphed in figure 6.1 with the observations summarised in table 6.1.

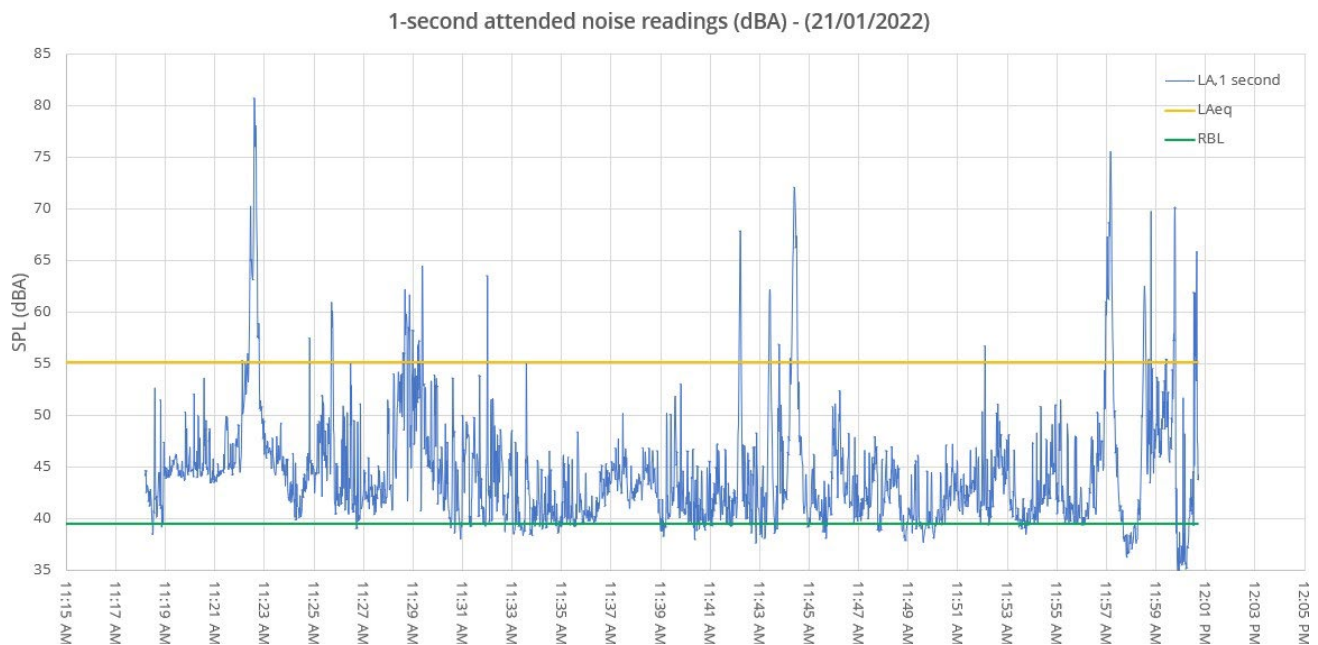


Figure 6.1: Attended noise results

Table 6.1: Recorded traffic movement and peak sound power level (dBA)

Time	Peak SPL (dBA)	Description
11:22	80.6	Double Bogie leaving site
11:42	67.8	Car Passing (resident)
11:44	61.9	Dump Truck retuning
11:57	75.6	Dump Truck leaving
11:58	69.8	Car Passing (resident)
11:59	70.1	Car Passing (resident)
12:00	65.5	Dump truck returning

6.2.2 Quarry Operations

In order to identify noise impacts from the quarry, a noise logger was set up on the nearest property boundary. The raw data from the noise logging was analysed to determine the statistical levels over the monitoring period. The results are provided in section 5.4.

The results show high consistency of the RBL and LA_{eq} for the day time period. The data does not provide a quantifiable impact which can be associated with the quarry).

No further assessment is required.

6.3 Camden Bypass

During the site inspection road noise was primarily identified from movement on the surrounding residential streets. Camden valley way was faintly heard in the background.

No existing traffic volume data exists from the RMS for Camden Bypass. It is typical for large arterial roads to have between 20,000 and 30,000 vehicles / day during peak usage. The *NSW Department of Planning: Development near Rail Corridors and Busy Roads - Interim Guideline* does not provide a screen test for developments greater than 300m from the house. Based on 25,000 vehicles at 300m, no noise treatment is required.

6.4 Background Noise Levels

A review of the data from the first survey reveals noise levels typical of a residential area. The results are consistent across all days, with the background noise levels tied to traffic on the surrounding roads. Data on the Sunday supports this, with an increase in the background noise levels later in the morning (7am rather than 5:30am), consistent with a lack of trade traffic. Peak noise levels (LA_{max}) are consistent across the period, with no distinct peaks at specific times, which is often attributed to commercial operations.

The second survey is reasonably consistent with the first, with a greater variance of the peak noise levels. This is likely due to the closer proximity to the road, but further proximity from other consistent noise sources such as the school and activity to the north of the development.

No noise characteristics of concern were identified within the noise data.

7 RECOMMENDATIONS

7.1 Building components

Lots 1, 2, 6, 7, 8 and future Lot 101 require building construction suitable for attenuating 25.8dBA equivalent attenuation. Table 7.1 provides example components which meet these requirements, however any component suitably acoustically rated may be used.

Table 7.1: Minimum building component requirements

Component	dB	Description
External Walls	>25.8	External facade with 10mm standard plasterboard internally
Roof	>25.8	Metal sheet roof / tiles, 10mm plasterboard ceiling fixed to ceiling joists
Entry Door	>25.8	Hung door, 30mm solid core, full weather seal
Floor	-	Concrete slab floor on ground
Glazing	26.0	4mm glazing with full weather seals

8 CONCLUSION

Broadcrest Pty. Ltd. were engaged by Group Development Services to carry out a noise impact assessment at 215 Macarthur Road, Spring Farm ('the site'). The assessment will accompany plans to subdivide Lot 11 in DP 534539 into 51 Residential Lots.

A site inspection was carried out on the 17.09.2021 which involved a visual assessment of the site and the surrounding noise producing nodes. At the time of inspection, the site and surrounds consisted of:

- Residential streets and housing (dominant noise source)
- Spring Farm Quarry to the south, across MacArthur Road (non-audible during the site inspection).
- Spring Farm public School (not operational during the assessment)
- Camden Bypass ~400m west of the site (barely/faintly audible).

Council subsequently requested further information regarding the noise level from Spring Farm Quarry and associated truck movements. Broadcrest has undertaken attended noise measurements of quarry truck movements at the nearest property boundary to the quarry entrance. A logger was set up for a long-term unattended noise survey of the quarry noise.

The noise assessment identified an isolated noise impact from trucks entering and exiting the quarry. Acoustic ratings for building components has been provided in section 7.2 Lots 1, 2, 6, 7, 8 and future Lot 101 to overcome these noise exceedances.

No other noise sources of concern were identified. It is our opinion that, given the recommendations in section 7 are followed, the development will meet the relevant acoustic requirements of the EPA Noise Policy for Industry, NSW State Environmental Planning Policy (Infrastructure) 2007, NSW Dept. of Planning (2008) Interim Guideline and Australian Standard AS3671.

9 REFERENCES

1. **NSW Government.** *State Environmental Planning Policy (Infrastructure)*. 2007.
2. **Standards Australia/Standards New Zealand.** *AS/NZS 3671:1989 Acoustics - Road traffic noise intrusion - Building siting and construction*. s.l. : SAI Global, 1989.
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9. **Standards Australia/Standards New Zealand.** *AS/NZS 2702:1984 Acoustics - Methods for the measurement of road traffic noise*. s.l. : SAI Global, 1984.
10. **NSW Department of Planning.** *Development near rail corridors and busy roads - interim guideline*. 2008.
11. **Road and Traffic Authority.** *Environmental Noise Management Manual - V1*. 2001.

A-weighted sound pressure

Noise levels that have been weighted to approximate the characteristics of normal human hearing. The human ear is not equally sensitive to sound at different frequencies. People are more sensitive to sound in the range of 1 to 4 kHz (1000 – 4000 vibrations per second) and less sensitive to lower and higher frequency sound. During noise measurement an electronic 'A-weighting' frequency filter is applied to the measured sound level dB(A) to account for these sensitivities. Other frequency weightings (B, C and D) are less commonly used. Sound measured without a filter is denoted as linear weighted dB(linear).

Airborne noise

Noise propagated between the source and receiver primarily through air.

Ambient noise/Sound

The total noise in a given situation, inclusive of all noise source contributions in the near and far field.

Background noise:

The underlying level of noise present in the ambient noise, excluding the noise source under investigation, when extraneous noise is removed.

Compliance

The process of checking that source noise levels meet with the noise limits in a statutory context.

Cumulative noise level

The total level of noise from all sources.

Decibel, dB:

Unit of acoustic measurement. Measurements of power, pressure and intensity. Expressed in dB relative to standard reference levels. It is weighted to approximate the sensitivity of human hearing to sound frequency. It is measured using a microphone and a sound level meter, and varies with distance from the source and the environment.

LA_{EQ,T}:

Equivalent continuous A-weighted sound pressure level. The value of the A-weighted sound pressure level of a continuous steady sound that, within a measurement time interval T, has the same A-weighted sound energy as the actual time-varying sound.

Noise limits

Enforceable noise levels that appear in conditions on consents and licences. The noise limits are based on achievable noise levels, which the proponent has predicted can be met during the environmental assessment. Exceedance of the noise limits can result in the requirement for either the development of noise management plans or legal action.

Percentile Level - L90, L10, etc:

A statistical measurement giving the sound pressure level which is exceeded for the given percentile of an observation period, e.g. L90 is the level which is exceeded for 90% of a measurement period. L90 is commonly referred to as the "background" sound level.

Rating Background Level – RBL:

Method for determining the existing background noise level which involves calculating the 10th percentile from the LA90 measurements for each day, evening and night time period. This value gives the Assessment Background Noise Level (ABL). Rating Background Level is the median of the overall ABL.

Receptor

The noise-sensitive land use at which noise from a development can be heard.

Sleep disturbance

Awakenings and disturbance of sleep stages.

Sound Power Level, (SWL) dB

10 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 power level cannot be directly measured using a microphone. Sound power level does not change with distance. The sound power level of a machine may vary depending on the actual operating load.

Sound Pressure Level (SPL) dB(A)

The level of noise, usually expressed as SPL in dB(A), as measured by a standard sound level meter with a pressure microphone. The sound pressure level in dB(A) gives a close indication of the subjective loudness of the noise.

Statistical noise levels

See percentile Level

Threshold

The lowest sound pressure level that produces a detectable response (in an instrument/person).

Tonality

Tonal noise contains one or more prominent tones (and characterised by a distinct frequency components) and is considered more annoying. A 2 to 5 dBA penalty is typically applied to noise sources with tonal characteristics.

Appendix A – Plan drawing

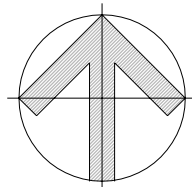


 BROADCAST MAPPING AND GLOBAL INFORMATION s e- com.au contact@broadcast.com.au 1300 554 945 Broadcast Consulting Pty Ltd ABN: 622 508 187	Client GROUP DEVELOPMENT SERVICES	Project 1354-AC-03 - Acoustic Assessment	Drawing: 1354-AC-03 - Appendix A1 - Site and Logger location	Scale 1:2,500	
	Location 215 Macarthur Road, Spring Farm	LGA Camden City Council	Base map NSW Spatial Data Services	Page	



 BROADCREST MAPPING AND GLOBAL INFORMATION g_E_r11t15C0m.au contact@broadcrest.com.au , 1300 554 945 Broadcrest Consulting Pty Ltd ABN: 622 508 187	Client GROUP DEVELOPMENT SERVICES	Project 1354-AC-03 - Acoustic Assessment	Drawing: 1354-AC-03 - Appendix A2 - Site and Noise Sources of Concern	Scale 1:3,500	
	Location 215 Macarthur Road, Spring Farm	LGA Camden City Council	Base map NSW Spatial Data Services	Page	

Appendix B: Client plans



LEGEND

- EXTENT OF WORKS
- (A) EASEMENT FOR INTERLOT DRAINAGE 1.5m WIDE
- (B) PADMOUNT SUBSTATION EASEMENT 2.75m x 5.5m
- (C) RESTRICTION ON THE USE OF LAND IN RELATION TO THE FIRE RATING OF BUILDINGS MEASURED 3.0m FROM SUBSTATION EASEMENT
- (D) RESTRICTION ON THE USE OF LAND IN RELATION TO THE SWIMMING POOLS MEASURED 5.0m FROM SUBSTATION EASEMENT

FOR DA APPROVAL
NOT TO BE USED FOR CONSTRUCTION PURPOSES

Rev.	Date	Revision Description	Drawn	Design	Appd.
C	08.09.2022	AMENDED TO MATCH REVISED STORMWATER DESIGN	DT	-	-
B	30.03.2022	RFI AMENDMENT	AM	-	-
A	18.01.2022	ISSUED FOR DA APPROVAL	AM	-	-



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Datum AHD	Coordinates MGA	Scale	Size A1

Drawn DT	Date 08.09.2022
Drafting Checked -	Date -
Design -	Date -
Design Checked -	Date -
Approved -	Date -

Client JMT CIVIL	Revision C
Project 215 MACARTHUR ROAD SPRING FARM	
Title SUBDIVISION PLAN STAGE 1	
Drawing Number P00468-SUBDIV-002	

Appendix C - Noise logger result graph

