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72 Lawn Road

London

Plant Noise Assessment Report

17 September 2024

Contents

SUMMARY

A new air source heat pump is proposed in the rear garden of 72 Lawn Road in London.

Camden Council has requirements for new items of external building services plant, which require a noise survey and plant noise assessment to be undertaken.

A background noise survey has therefore been undertaken to determine background noise levels at the nearest noise sensitive properties, against which the potential noise emissions can be compared.

The results of the assessment show that noise emissions associated with the proposed plant are not predicted to exceed the proposed noise limits at the nearest noise sensitive properties.

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1.0 Introduction

A new air source heat pump is proposed in the rear garden of 72 Lawn Road in London.

Camden Council has requirements for new items of external building services plant, which require a noise survey and plant noise assessment to be undertaken.

The following report presents the methodology and results of a noise survey, and an assessment of noise emissions associated with the proposed plant.

The report is technical in nature, and such, a summary of noise units and acoustic terminology are included in Appendix A for reference.

2.0 Description of Site and Proposals

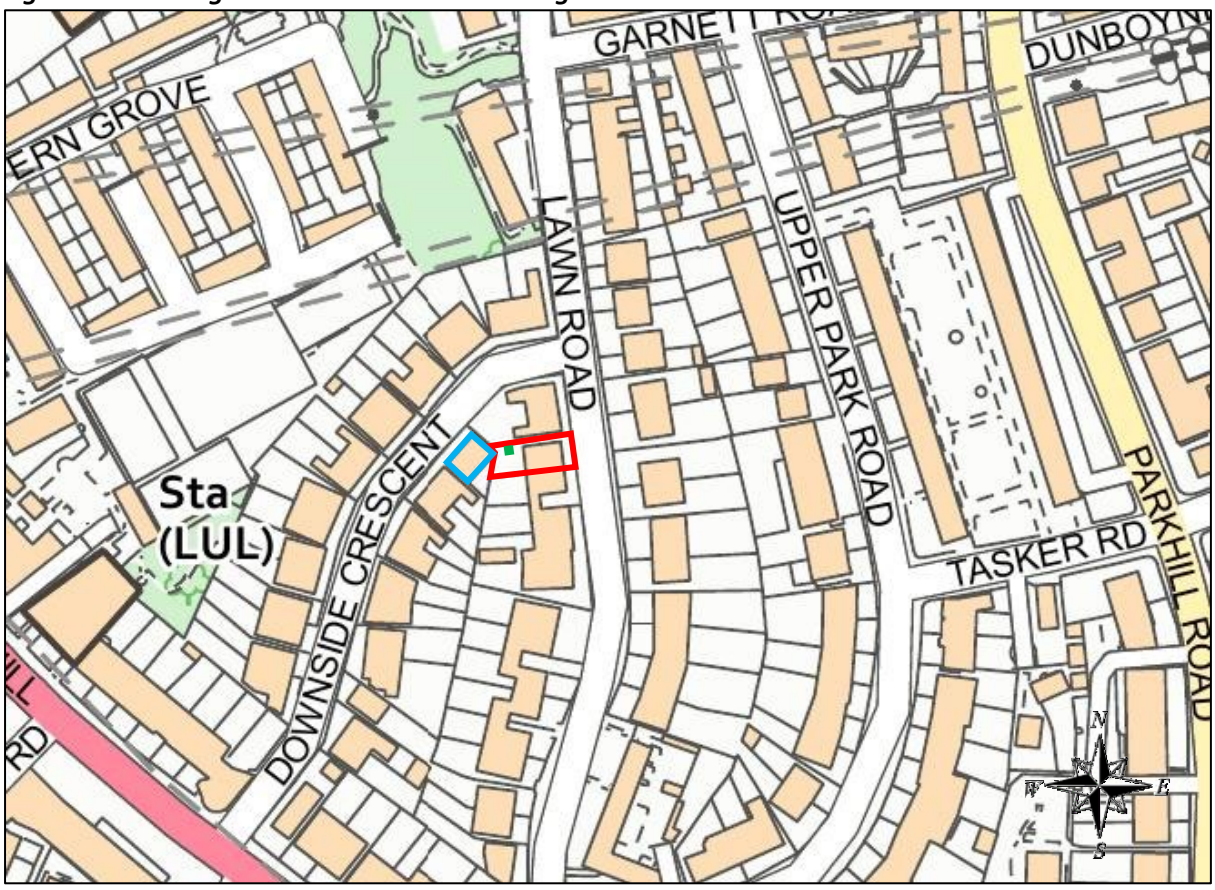
The site is located at 72 Lawn Road is occupied by a residential house and gardens in a predominantly residential area.

Residential properties are located to the north, south, east and west of the site.

An air source heat pump is proposed in the rear garden, to the west of the site, on the northern boundary. The nearestr noise sensitive property to the proposed air source heat pump is noted to be the residential property to the rear/west of the site at 24 Downside Crescent.

Figure 2.1 shows the approximate existing site extent in **red** in relation to the surrounding area, with proposed plant location indicated in **green** and the nearest noise sensitive property indicated in **blue**.

Figure 2.1 Existing Site Extent and Surroundings



3.0 Camden Council Requirements

Camden Council's typical requirements relating to external plant noise emissions are as follows:

"A*n independent noise assessment including details of the external noise level emitting from plant/machinery/equipment and mitigation measures as appropriate shall be submitted to and approved in writing by the local planning authority. The design and installation of new items of fixed plant shall be such that when operating the cumulative noise level* L_{Aeq} *arising from the proposed plant, measured or predicted at 1m from the façade of the nearest noise sensitive premises, shall be a rating level of at least 10 dB(A) below the typical background noise level* L_{AF90} *(15 dBA where tonality of impulsivity is perceptible). The measurement and/or prediction of the noise should be carried out in accordance with the methodology contained within BS 4142: 2014.*"

A background noise survey and noise assessment has therefore been undertaken to address the above.

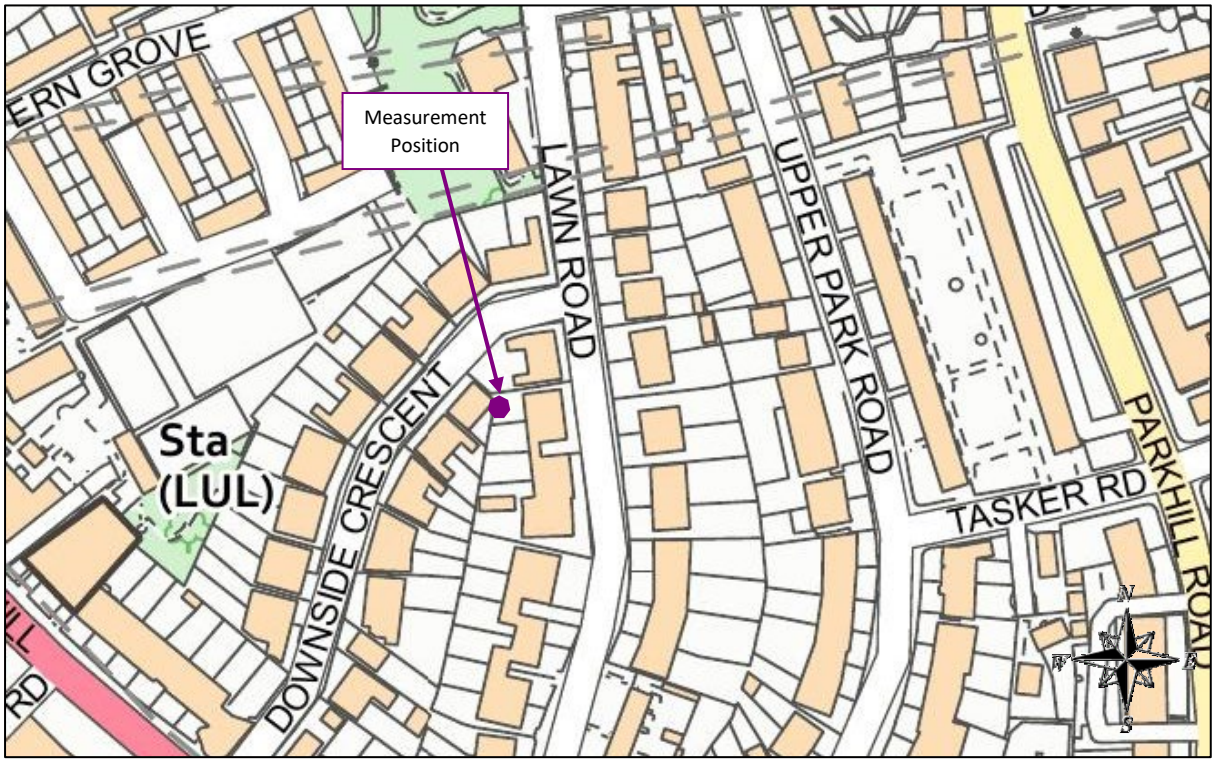
4.0 Noise Survey Methodology and Results

4.1 Methodology

An unmanned environmental noise survey was undertaken between Friday 6 September 2024 and Tuesday 10 September 2024. The noise survey period was selected to assess background noise levels during the period when the proposed plant could operate – daytime and night-time, weekday and weekend.

The measurement microphone was mounted on a tripod in the centre of the rear garden on the western side of the site in free-field, in the approximate location shown in **purple** on Figure 4.1.

Figure 4.1 Noise Measurement Positions in Relation to Site Extent and Surroundings



The measurement position was selected as being representative of background noise levels at the nearest noise sensitive property.

The equipment used for the noise survey is summarised in Table 4.1.

Table 4.1 Description of Equipment used for Noise Survey

Item	Make & Model	Serial Number
Type 1 automated logging sound level meter	01dB FUSION	10325
Type 1 ½" microphone	GRAS 40CD	292580
Calibrator	Cirrus CR515	95405

L_{Aeq} and L_{A90} sound pressure levels were measured throughout the noise survey over contiguous 1-second intervals.

Due to the nature of the noise survey, i.e. unmanned, we are unable to comment on the weather conditions throughout the entire noise survey period. However, at the beginning and end of the survey period, there was a clear sky, low wind speeds and generally sunny conditions. Weather conditions are not expected to have had any effect on measured noise levels and are considered appropriate for undertaking environmental noise measurements.

The noise monitoring equipment was calibrated before and after the noise survey period. No significant change was found. Laboratory equipment calibration certificates can be provided upon request.

4.2 Noise Survey Results & Observations

Appendix B presents time history graphs showing the measured $L_{Aeq,}$ and L_{A90} sound pressure levels measured throughout the noise survey (shown as 15-minute periods) at each position.

At the measurement position, the daytime noise climate was noted to be dominated by distant road traffic and typical anonymous suburban noise.

Table 4.2 presents the typical measured background noise levels for daytime and night-time periods, when the plant is proposed to be operational.

Table 4.2 Typical Measured Background Noise Levels

Daytime Background Noise Level $L_{A90\ (1\ hour)}$ (dB)	Night-time Background Noise Level $L_{A90\ (15\ min)}$ (dB)
34	30

We would consider the levels measured to be reasonable, taking into account the location of the measurement position and the dominant noise sources.

5.0 Plant Noise Assessment

5.1 Nearest Noise Sensitive Properties

The nearest noise sensitive property is considered to be the residential property to the rear/west of the site at 24 Downside Crescent (at a distance of approximately 5m from the proposed plant), as indicated on Figure 2.1 above.

5.2 Plant Noise Limits

The measured background noise levels are considered to be very low, therefore we propose to limit plant noise emissions to 30 dB, based on the following:

- External noise levels less than 30 dB are generally considered to be very low, for example, the previous version of BS 4142 (1997-2013) stated that "*background noise levels below about 30 dB and rating levels below about 35 dB are considered to be very low*".
- During daytime periods, a 30 dB limit would be 4 dB less than the typical background noise level.
- This is based on the typical background noise level – background noise levels were measured to be in excess of 30 dB for all of the daytime periods during the noise survey and for 73% of the night-time periods.
- A plant noise level of 30 dB outside an open window of the nearest noise sensitive property would result in an internal level of 15-20 dB, which is comfortably less than the 'desirable' limit of 30 dB taken from BS 8233: 2014 for bedrooms at night. The internal noise level would be even lower with windows closed.

Based on the above, the noise limits for plant noise emissions when measured 1m from the façade of the nearest noise sensitive property are as presented in Table 5.1.

Table 5.1 Plant Noise Limits

Daytime (07:00 – 23:00 hours) Noise Limit $L_{Ar,Tr}$ (dB)	Night-time (23:00 – 07:00 hours) Noise Limit $L_{Ar,Tr}$ (dB)
30	30

5.3 Proposed Plant

An air source heat pump is proposed in the rear garden to the west of the site in the approximate location indicated on Figure 2.1. The proposed unit is a Stiebel Eltron WPL 25 ACS, for which the manufacturer states a sound power level of 55 dB L_{wA}.

The air source heat pump is to be located within a louvre enclosure which is expected to reduce noise emissions by approximately 3 dB L_{pA}.

The plant will not operate intermittently and is not expected to be tonal or impulsive in nature.

5.4 Assessment and Conclusion

We have undertaken calculations to predict noise emissions associated with the proposed plant at the nearest noise sensitive property.

As previously noted, noise from the units is not expected to be tonal, intermittent or impulsive, therefore no feature corrections have been applied in the calculations.

The plant noise calculation results at the nearest noise sensitive properties are presented in Table 5.2 below.

Table 5.2 Plant Noise Calculations

Element	Level (dB)	
	Daytime	Night-time
Sound Power Level Level L_{wA}	55	55
Enclosure Attenuation	-3	-3
Distance Attenuation	-22	-22
Plant Noise Level at Noise Sensitive Property	**30**	**30**
Noise Limit	**30**	**30**

The results show that noise emissions associated with the proposed plant are not predicted to exceed the proposed noise limits at the nearest noise sensitive properties.

Appendix A – Acoustic Terminology

Parameter	Description
Decibel (dB)	A logarithmic scale representing the sound pressure or power level relative to the threshold of hearing ($20x10^{-6}$ Pascals).
Sound Pressure Level (L_p)	The sound pressure level is the sound pressure fluctuation caused by vibrating objects relative to the threshold of hearing.
A-weighting (L_A or dBA)	The sound level in dB with a filter applied to increase certain frequencies and decrease others to correspond with the average human response to sound.
L_{Amax}	The A-weighted maximum noise level measured during the measurement period.
$L_{Aeq,T}$	The A-weighted equivalent continuous noise level over the time period T (typically T= 16 hours for daytime periods, T = 8 hours for night-time periods). This is the sound level that is equivalent to the average energy of noise recorded over a given period.
$L_{A90\ (15\ min)}$	The noise level exceeded for 90% of the time (also referred to as the background noise level), measured over a 15-minute period

Appendix B – Noise Survey Results