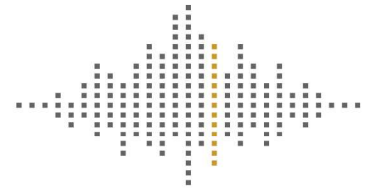


SHARPS REDMORE

ACOUSTIC CONSULTANTS ▪ Established 1990



Report 1

ES Volume 2 Appendix 9.1

Noise Technical Assessment

Northern Gateway JPA 1.1

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- C. Figures
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This report has been prepared with all reasonable skill, care and diligence commensurate with an acoustic consultancy practice under the terms and brief agreed with our client at that time. Sharps Redmore provides no duty or responsibility whatsoever to any third party who relies upon its content, recommendations or conclusions.

1.0 Introduction

1.1 Sharps Redmore has been appointed by Northern Gateway Development Vehicle LLP (NGDV) to undertake a noise assessment in relation to a predominantly commercial project referred to as Northern Gateway JPA 1.1.

1.2 This noise technical report is to be included as Appendix 9.1 of an Environmental Statement (ES) which has been produced to accompany an outline planning application (with all Matters Reserved) (the Application) for the Proposed Scheme which is described as:

'Application for outline planning permission (all matters reserved) for a national-scale employment development, comprising Storage & Distribution (Use Class B8) and Industrial (Use Classes B2, E(g)(ii) and E(g)(iii)) uses (including, but not limited to, Logistics, Manufacturing Processes and Data Centres), with supporting ancillary uses including Hotel (Use Class C1), Commercial, Business & Service (Uses Class E(a-g)), Education (Use Class F1(a)), Local Community (Use Class F2(a-c)) uses, Sui Generis uses (in accordance with the Uses Schedule), and associated demolition works, landscaping, drainage, ecological enhancements, highway works, cycleway and footpath linkages and other ancillary infrastructure.'

1.3 The Application is being prepared following the allocation of land (JPA 1.1) within the Greater Manchester's Places for Everyone (PfE) Joint Development Plan Document (March 2024). The Project for Assessment includes the entire JPA 1.1 allocation excluding for the South Heywood development¹ which is already consented and the land required for the Simister Island junction improvement works which is currently subject to a DCO application. The Proposed Scheme, for which planning consent is sought, is located within the Project for Assessment. A comprehensive development description is presented within Chapters 4 and 5 of the ES.

1.4 The Parameters Plans and EIA Assessment Plans that provide a visual representation of the Project for Assessment (represented by the Assessment Boundary) and the Proposed Scheme (Represented by the Application Boundary) are presented in Appendix A. Where there are inter-related descriptions and assessment of effects associated with the Project for Assessment and the Proposed Scheme, these are considered under the umbrella of the Project for Assessment. Where considered relevant, the assessment and mitigation measures relevant to the planning application for the Proposed Scheme, for which planning consent is sought, are presented in isolation.

1.5 The following report presents an assessment associated with the impact of noise from the operational phase of the Project for Assessment relating to the following elements:

- A) Noise from proposed commercial and industrial uses including internal access roads;
- B) Noise from proposed energy infrastructure; and
- C) Impact on proposed residential receptors.

1.6 Consultation has been undertaken with the Environmental Health Officers (EHO's) at Rochdale Borough Council (RBC) and Bury Council BC). As the Proposed Scheme is outline with all matters reserved, there is insufficient information available at this stage for a

¹ Rochdale Borough Council, Application Ref: 16/01399/HYBR

detailed assessment to be carried out. It has therefore been provisionally agreed with the EHO's at both Districts that a qualitative assessment associated with the likely operational elements associated with the Proposed Scheme and Project for Assessment is acceptable.

- 1.7 A separate noise technical report is provided with regard to the assessment of road traffic noise on the local highway network including facilitating infrastructure within the Potential Infrastructure Areas AAA-CCC (Presented in Appendix 9.2 of the ES).
- 1.8 The assessment of noise and vibration during the construction phase is presented in the Chapter 9 of the Environmental Statement.
- 1.9 The assessment methodology and criteria are presented in Section 2. Baseline noise surveys have been undertaken to establish existing noise levels at and around the Project for Assessment with the details of the surveys presented in Section 3. The key findings of the assessment are presented in Section 4 with Primary and Secondary mitigation measures recommended in Section 5. Conclusions are presented in Section 6. This report should be read in conjunction with Chapter 9 of the ES as well as introductory Chapters of this ES (Chapters 1 – 6).
- 1.10 A guide to the acoustic terminology used within this report is included in Appendix B.

2.0 Assessment Methodology and Criteria

2.1 The National Planning Policy Framework² (NPPF), December 2024, sets out the Government's planning policies for England and "these policies articulate the Government's vision of sustainable development." In respect of noise, Paragraph 198 of the NPPF states the following:

2.2 *"Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:*

- a) mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life^[72];*
- b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason; and*
- c) limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation".*

[72] See Explanatory Note to the Noise Policy Statement for England (Department for Environment, Food & Rural Affairs, 2010).

2.3 In addition, Paragraph 200 states:

2.4 *"Planning policies and decisions should ensure that new development can be integrated effectively with existing businesses and community facilities (such as places of worship, pubs, music venues and sports clubs). Existing businesses and facilities should not have unreasonable restrictions placed on them as a result of development permitted after they were established. Where the operation of an existing business or community facility could have a significant adverse effect on new development (including changes of use) in its vicinity, the applicant (or 'agent of change') should be required to provide suitable mitigation before the development has been completed".*

2.5 Guidance on the interpretation of the policy aims contained within the NPPF is contained within National Planning Policy Guidance³ (NPPG). The NPPG introduces the concept of a noise exposure hierarchy based on likely average response. The guidance contained in the NPPG is summarised in Table 2.1:

² National Planning Policy Framework, Ministry of Housing, Communities and Local Government, December 2024

³ Planning Practice Guidance: Noise, Ministry of Housing, Communities and Local Government, July 2019

Table 2.1: Noise Exposure Hierarchy

Response	Examples of Outcomes	Increasing Effect Level	Action
No Observed Effect Level			
Not present	No Effect	No Observed Effect	No specific measures required
No Observed Adverse Effect Level			
Present and not intrusive	Noise can be heard, but does not cause any change in behaviour, attitude or other physiological response. Can slightly affect the acoustic character of the area but not such that there is a change in the quality of life.	No Observed Adverse Effect	No specific measures required
Lowest Observed Adverse Effect Level (LOAEL)			
Present and intrusive	Noise can be heard and causes small changes in behaviour, attitude or other physiological response, e.g. turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is a small actual or perceived change in the quality of life.	Observed Adverse Effect	Mitigate and reduce to a minimum
Significant Observed Adverse Effect Level (SOAEL)			
Present and disruptive	The noise causes a material change in behaviour, attitude or other physiological response, e.g. avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.	Significant Observed Adverse Effect	Avoid
Present and very disruptive	Extensive and regular changes in behaviour, attitude or other physiological response and/or an inability to mitigate effect of noise leading to psychological stress, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory	Unacceptable Adverse Effect	Prevent

2.6 The NPPF and NPPG reinforce the March 2010 DEFRA publication, “Noise Policy Statement for England” (NPSE)⁴, which states three policy aims, as follows:

⁴ Noise Policy Statement for England, Department for Environment, Food and Rural Affairs, March 2010

- 2.7 *“Through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development:*
- a) avoid significant adverse impacts on health and quality of life;*
 - b) mitigate and minimise adverse impacts on health and quality of life; and*
 - c) where possible, contribute to the improvement of health and quality of life.”*
- 2.8 Together, the first two aims require that, within the context of Government policy on sustainable development, significant adverse impact should be avoided and that, where a noise level which falls between a level which represents the lowest observed adverse effect and a level which represents a significant observed adverse effect, then according to the explanatory notes in the statement:
- 2.9 *“... all reasonable steps should be taken to mitigate and minimise adverse effects on health and quality of life whilst also taking into consideration the guiding principles of sustainable development. This does not mean that such effects cannot occur.”*
- 2.10 Taking an overview of national policy aims and guidance it is clear that when considering the impact of noise that the fact can be heard and causes impact, is not reason to refuse an application as consideration should also be given to the significance of the impact and the mitigation measures available.
- 2.11 Neither national policy or guidance contains any technical advice on acceptable noise levels. However, documents such as the BS 8233:2014⁵ and BS 4142:2014+A1:2019⁶ support the current national policy guidance contained within the NPPF and Noise Policy Statement for England 2010.
- 2.12 With regard to tranquillity, it is not considered that there are any tranquil areas located within proximity to the Application Site which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason.

Local Policy

- 2.13 Relevant Local Planning Policy is as follows:

Greater Manchester’s Places for Everyone (PfE) Joint Development Plan Document (March 2024)

Policy Allocation JPA 1.1

- 2.14 *‘Development at this allocation will be required to ‘12. Provide an appropriate buffer between the development and the motorway/local road network where required to serve multiple functions including air quality, noise, visual mitigation and high quality landscaping;....’*
- 2.15 With regard to a buffer to the motorway / local road network, this is considered to be relevant to the noise impact on proposed residential development in Assessment Plot FF

⁵ BS 8233:2014 'Guidance on Sound Insulation & Noise Reduction for Buildings'

⁶ BS 4142:2014+A1:2019, Methods for rating and assessing industrial and commercial sound

rather than on proposed commercial / industrial noise sources in the remainder of the Project for Assessment.

Rochdale Borough Unitary Development Plan 2001 – 2016 (Adopted 2016)

Policy EM/2 Pollution

'If the emission of pollutants from a proposed development cannot readily be controlled by other environmental legislation, such development will not be permitted where it would be likely to result in an increase in air, water, noise, light or other pollution, which would be harmful to the environment, and to land uses and land users in the area.

Where permission is granted, it will be subject to appropriate conditions or obligations to ensure that air, water and noise pollution is kept to acceptable levels.

New housing or other environmentally sensitive development will not be permitted where existing pollution levels are unacceptable and cannot satisfactorily be reduced'.

Policy EM/3 Noise and New Development

'Development will not be permitted where:

a) It would lead to unacceptable levels of noise nuisance to nearby existing or future occupants of buildings, or users of open space; or

b) It involves a noise sensitive use (such as housing, a school or hospital) which would be sited in or close to an area that is, or is likely to become, subject to unacceptably high levels of noise generation. 186 Rochdale UDP 2006 Environmental Management

Where the effects of existing noise on proposed new development, or noise likely to be generated by new development, can be adequately controlled by design, landscaping and other measures, as enforced by planning conditions, the Council will grant planning permission, provided the development is acceptable in all other respects'.

Bury Unitary Development Plan (Adopted 1997)

EN 7/2 – Noise Pollution

'In seeking to limit noise pollution the Council will not permit:

- *development which could lead to an unacceptable noise nuisance to nearby occupiers and/or amenity users;*
- *development close to a permanent source of noise'.*

- 2.16 Local policy aims are consistent with those in the NPPF that when considering the impact of noise, the significance or acceptability of the impact must be considered.

Noise Generating Sources Associated with Project for Assessment

- 2.17 At this outline stage, specific development details associated with the Project for Assessment are not available. Therefore, a qualitative assessment of likely noise generating sources has been presented.

2.18 It is possible to apply objective standards to the assessment of noise and the effect produced by the introduction of a certain noise source may be determined by several methods, as follows:

- i) The effect may be determined by reference to guideline noise values, such as those contained in the World Health Organisation (WHO) “Guidelines for Community Noise”⁷.
- ii) Another method is described within BS 4142:2014+A1:2019 to determine the significance of sound impact from sources of industrial and/or commercial nature. The sources that the newly revised standard is intended to assess are sound from industrial and manufacturing processes, sound from fixed plant installations, sound from loading and unloading of goods at industrial and/or commercial premises and the sound from mobile plant and vehicles, such as forklift, train or ship movements.
- iii) Alternatively, the impact may be determined by considering the change in noise level that would result from the proposal, in an appropriate noise index for the characteristic of the noise in question. There are various criteria linking change in noise level to effect. This is the method that is suited to, for example, the assessment of noise from road traffic because it is capable of displaying impact to all properties adjacent to a road link irrespective of their distance from the road.

Guidelines for Community Noise

2.19 The WHO “Community Noise Guidelines” (CNG) values are appropriate to what are termed “critical health effects”. This means that the limits are at the lowest noise level that would result in any psychological or physiological effect. They are, as defined by NPSE, set at the Lowest Observed Adverse Effect Level (LOAEL), but do not define the level above which effects are significant (the SOAEL). Compliance with the LOAEL should, therefore, be seen as a robust aim.

2.20 In 2018 the WHO published the “Environmental Noise Guidelines for the European Region” (ENGER). The latest WHO Environmental Noise Guidelines (page 28) explain that “The current environmental noise guidelines for the European Region supersede the CNG from 1999. Nevertheless, the GDG (Guideline Development Group) recommends that all CNG indoor guideline values and any values not covered by the current guidelines (such as industrial noise and shopping areas) should remain valid”. Hence the CNG remain relevant to this assessment.

2.21 The WHO ENGER brings together the latest research on the effects of specific types of noise on health in relation to transportation noise sources (road, rail and aircraft noise exposure), wind turbines and leisure noise. Hence in direct relation to the specific proposal in terms of commercial and industrial noise considered within this assessment that this noise assessment considers, the new WHO ENGER are not of material consideration.

2.22 The relevant World Health Organisation (CNG) noise values are summarised in the following table:

⁷ World Health Organisation (1999), “Guidelines for Community Noise”

Table 2.2: WHO CNG values

Document	Level	Guidance
World Health Organisation “Guidelines for Community Noise 1999”	$L_{AeqT} = 55 \text{ dB}$	Serious annoyance, daytime and evening. (Continuous noise, outdoor living areas)
	$L_{AeqT} = 50 \text{ dB}$	Moderate annoyance, daytime and evening. (Continuous noise, outdoor living areas).
	$L_{AeqT} = 35 \text{ dB}$	Moderate annoyance, daytime and evening. (Continuous noise, dwellings, indoors)
	$L_{AeqT} = 45 \text{ dB}$	Sleep disturbance, windows open at night. (external level).
	$L_{AeqT} = 30 \text{ dB}$	Sleep disturbance, night-time (indoors)
	$L_{Amax} = 60 \text{ dB}$	Sleep disturbance, windows open at night. (Noise peaks outside bedrooms, external level).
	$L_{Amax} = 45 \text{ dB}$	Sleep disturbance at night (Noise peaks inside bedrooms, internal level)

Assessment using BS 4142:2014+A1:2019

2.23 As outlined, this British Standard enables the significance of sound impact to be determined in relation to industrial and commercial sources. The significance of sound impact is to be determined according to the following summary process:

- i) Determine the background sound levels, in terms of the index L_{A90} , at the receptor locations of interest.
- ii) Determine the specific sound level of the source being assessed, in terms of its L_{AeqT} level ($T = 1$ hour for day or 15 minutes for night), at the receptor location of interest.
- iii) Apply a rating level acoustic feature correction if the source sound has tonal, impulsive, intermittent, or other characteristics which attract attention.
- iv) Compare the rating sound level with the background sound level; the greater the difference between the two, the higher the likelihood of adverse impact.
- v) A difference (rating – background) of around +10 dB is an indication of significant adverse impact, depending on the context; a difference of +5 dB is an indication of an adverse impact, depending on the context. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending upon context.
- vi) BS 4142:2014+A1:2019 considers that the threshold of significant adverse impact is “a difference around +10 dB or more ... depending upon the context”. However the NPPF and NPPG state that where a noise level which falls between a level which represents the lowest observable adverse effect and a level which represents a significant observed adverse effect, then according to the explanatory notes in the statement “...all reasonable steps should be taken to mitigate and minimise adverse effects in health and quality of life while together taking into account the guiding principles of sustainable development. This does not mean that adverse effects cannot occur but that effort should be focused on minimising such effects”.

- 2.24 Depending on context, it is considered that the LOAEL would correspond to a rating level of between 0 to +5 dB(A) above the background noise level whilst the SOAEL would correspond to a rating level of + 10dB(A) above the background noise level.
- 2.25 BS 4142:2014+A1:2019 introduces the concept of 'context' to the process of identifying noise impact. Section 11 of BS 4142:2014 explains *"The significance of sound of an industrial and/or commercial nature depends upon both the margin by which the rating level of the specific sound source exceeds the background sound level and the context in which the sound occurs. An effective assessment cannot be conducted without an understanding of the reason(s) for the assessment and the context in which the sound occurs/will occur. When making assessments and arriving at decisions, therefore, it is essential to place the sound in context"*.
- 2.26 There are many context points to consider when undertaking an assessment of sound impact including:
- The absolute level of sound;
 - The character and level of the specific sound in the context of the existing noise climate; for example is the sound to occur in a location already characterised by similar activities as those proposed;
 - The sensitivity of the receptors;
 - The time and duration that the specific sound is to occur; and
 - The conclusions of assessments undertaken using alternative assessment methods, for example WHO guidelines noise values or change in noise level.
- 2.27 It is therefore entirely possible that whilst the numerical outcome of a BS 4142:2014+A1:2019 assessment is indicative of adverse or significant adverse impact, when the proposal is considered in context the significance of the impact is reduced to an acceptable level.

Changes in noise level

- 2.28 For the purpose of this assessment at this stage of the planning process, consideration has been given to the guidance provided within BS 4142 and the WHO absolute noise levels to consider on-site noise generating sources. During later planning stages, consideration could be given to the change in noise level where appropriately justified to supplement other assessments.
- 2.29 With respect to operational road traffic noise, consideration has been given in the accompanying technical report which is included in Appendix 9.2 of the ES.

General Activities (Internal Access Roads and Car Parks)

- 2.30 Further to noise associated with commercial and industrial activities that would fall within the scope of BS 4142, there are other general activities that would be associated with the Project for Assessment. Such noise generating sources are considered to include road traffic noise on internal access roads and car parks. Consideration with regard to such sources has been given with respect to the criteria presented in Table 2.2, which is considered to represent the LOAEL, along with the consideration of existing ambient noise levels.

- 2.31 The SOAEL is considered to be represented has been set at the level above which a closed window providing a sound reduction of 25dB would no longer be sufficient to result in an acceptable internal level. These values would be 25dB above the relevant guideline values from BS 8233 and WHO 1999. This night-time level coincides with the WHO 'Night Noise Guidelines for Europe' (2009) recommended an Interim Target of 55dB L_{night} outside dwellings at night.
- 2.32 The resulting LOAEL and SOAEL values are shown in Table 2.3.

Table 2.3: LOAEL and SOAEL values for noise from general activities (free-field values)

Time Period	LOAEL	SOAEL
Day (07:00-23:00)	50dB $L_{Aeq, 16h}$	60dB $L_{Aeq, 16h}$
Night (23:00-07:00)	45dB $L_{night, outside}$	55dB $L_{Aeq, 8h}$

- 2.33 Sudden noises at night, such as may occur within car parking areas, when car doors or boots are closed have the potential to result in sleep disturbance. It is not possible to accurately predict noise ingress to receptors from such sounds due to the varying construction specification of dwellings around the Project for Assessment. Regardless of façade construction, external noise ingress is typically dictated by the sound reduction provided by the windows, vents or other penetrations in the building envelope. Should these windows be partially open, such as for ventilation or cooling, then sound reduction would be inherently limited to approximately 15dB according to BS 8233. When applied to the internal threshold of 45dB L_{Amax} (from WHO 1999 guidelines), this results in an external value of 60dB L_{Amax} as the threshold considered to represent the LOAEL. Following the same approach identified above, the SOAEL is considered to be 70 dB L_{Amax} .

Existing Educational Receptors

- 2.34 With regard to consideration of potential effects at educational receptors, guidance is available within Building Bulletin 93: Acoustic design of schools: performance standards (February 2015) which sets out the minimum performance standards for acoustics of school buildings. Acoustics for Schools: a design guide (November 2015) provides supporting guidance and recommendations on the acoustic design of new and refurbished schools. Various criteria and reconditions are presented with the following considered as part of the potential noise impact of commercial and industrial noise sources of the Project for Assessment on educational premises:

- Upper limit for indoor ambient noise levels $L_{Aeq, 30mins}$ (assuming naturally ventilated), new build: 40 dB $L_{Aeq, 30mins}$; and

- 2.35 With regard noise criteria in external areas, the 'Acoustics for Schools: a design guide' provides good practice guidelines which include:

- Noise levels in unoccupied playing fields and other outdoor areas should not exceed 55 dB $L_{Aeq, 30mins}$.

Proposed Noise Sensitive Residential Receptors

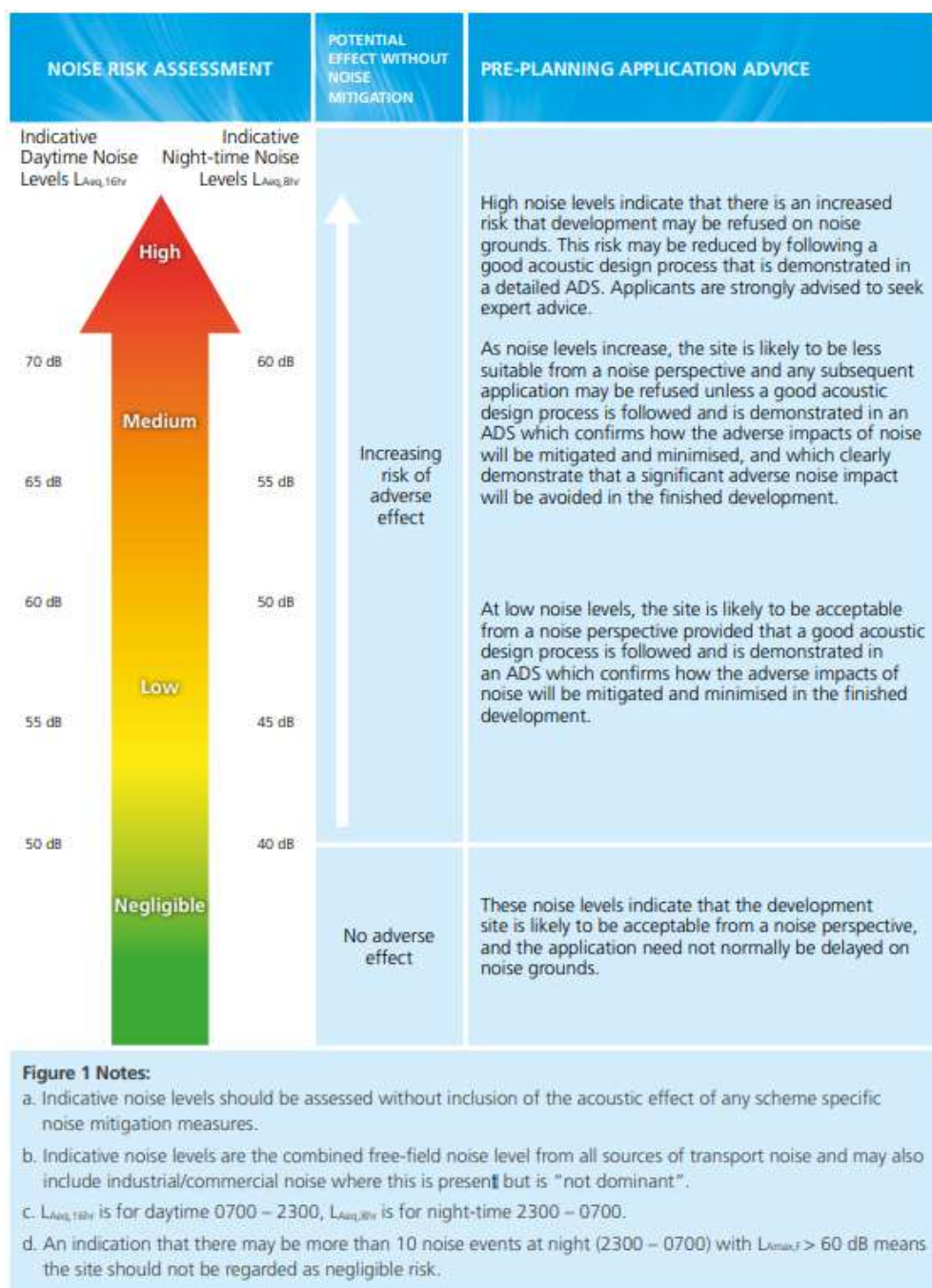
- 2.36 Assessment Area FF, is located in the western side of the Project for Assessment and is allocated for proposed residential use. This development parcel is outside of the planning application boundary and not under control of the applicant. On this basis a qualitative

assessment has been undertaken. Reference is given to industry standard guidance that would be typically considered for a proposed residential development.

Professional Practice Guidance on Planning and Noise for new residential development (ProPG)

- 2.37 Professional Practice Guidance on Planning and Noise for new residential development (ProPG) was published in May 2017 by the Chartered Institute of Environmental Health (CIEH), the Association of Noise Consultants (ANC) and the Institute of Acoustics (IOA). The guidance has been published to provide practitioners with guidance on the management of noise within the planning system in England.
- 2.38 The guidance is specifically for ‘new residential development’ that would be exposed predominantly to noise from existing transport sources and reflects the Government’s overarching Noise Policy Statement for England (NPSE), the National Planning Policy Framework (NPPF), and Planning Practice Guidance (including PPG-Noise), as well as other authoritative sources of guidance.
- 2.39 The guidance provides advice for Local Planning Authorities (LPAs) and developers, and their respective professional advisers which complements Government planning and noise policy and guidance. There are two stages of the overall approach outlined in the ProPG:
- Stage 1 – an initial noise risk assessment of the proposed development site; and
 - Stage 2 – a systematic consideration of 4 key elements which is underpinned by an Acoustic Design Statement.
- 2.40 With regard to Stage 1, the ProPG provides guidance for producing an initial site risk assessment, pre-mitigation, with regards to noise based on the prevailing daytime and night time noise levels across the site, from which the site (or areas thereof) can be allocated a Noise Risk as shown overleaf in Figure 2.1. This shows the various Noise Risks Categories (NRC) together with their corresponding sound levels as referred to in the ProPG. It should be noted that the categories are not distinct which allows context to be included within the assessment with the purpose of the Stage 1 assessment to determine the likely acoustic challenges on the site.

Figure 2.1 ProPG Stage 1, Noise Risk Assessment



2.41 At Stage 2, which is not required to be progressed if the Stage 1 assessment determines a negligible risk, there are 4 elements which should be undertaken in parallel. These are:

- Good Acoustic Design Process,
- Internal Noise Level Guidelines ,
- External Amenity Area Noise Assessment, and

■ Assessment of Other Relevant Issues.

- 2.42 There is then the requirement to present an ADS to provide sufficient evidence that the ProPG Stage 1 and Stage 2 Elements 1 to 4 have been followed.
- 2.43 The assessment of the residential development within the Project for Assessment is outside of the control of the applicant. Assessment Area FF is allocated for residential development in the Greater Manchester PfE⁸ and therefore the principle of residential use on this site has already been established. Therefore, the Stage 1 assessment, would be used as an initial stage to inform the design of the residential development including noise surveys. Assessments that would inform the design of the residential development would be undertaken as part of separate studies and planning applications. However, a proportionate qualitative assessment has been undertaken with reference to the guidance provided within the ProPg considered qualitatively.
- 2.44 Note: The advice contained within ProPG is based on the policy objectives contained within the NPPF and the objective noise guidelines within BS 8233:2014. However the ProPG does not constitute an official government code of practice.
- 2.45 The ProPg guidance is primarily relevant to the assessment of transportation noise sources. Therefore, when considering the potential impact at proposed residential receptors of proposed employment uses within the Project for Assessment, consideration may also be required with regard to the guidance provided within BS 4142.

BS 8233:2014

- 2.46 The current nationally accepted guideline internal noise levels for dwellings are given in BS 8233⁹. BS 8233 provides the following internal noise standards:

Table 2.4: BS 8233:2014 Internal Noise Level Criteria

BS 8233:2014 Table 4 – Indoor ambient noise levels for dwellings			
Activity	Location	0700 to 2300	2300 to 0700
Resting	Living room	35 dB $L_{Aeq,16hour}$	-
Dining	Dining room/area	40 dB $L_{Aeq,16hour}$	-
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq,16hour}$	30 dB $L_{Aeq,8hour}$

- 2.47 For outdoor private external amenity areas, BS 8233:2014 recommends that *“it is desirable that the external noise level does not exceed 50 dB $L_{Aeq,T}$, with an upper guideline value of 55 dB $L_{Aeq,T}$ in noisier environments”*. However, the document recognises that that these guideline values are not achievable in all circumstances and in higher noise areas, a compromise might be warranted. In such circumstances, development should be designed to achieve the lowest practicable levels in these external amenity spaces.
- 2.48 Further to the criteria stated in Table 2.4, there is no longer a L_{Amax} standard for bedrooms in BS 8233. However, footnote 4 to BS 8233 Table 4 states that:

“Regular individual noise events (for example, scheduled aircraft or passing trains) can cause sleep disturbance. A guideline value may be set in terms of

⁸ Greater Manchester’s Places for Everyone (PfE) Joint Development Plan Document (March 2024)

⁹ BS 8233:2014 'Guidance on Sound Insulation & Noise Reduction for Buildings'

SEL or $L_{Amax,F}$ depending on the character and number of events per night.
Sporadic noise events could require separate values.”

- 2.49 In this case, it is proposed that the previous BS 8233 criterion (also referenced in World Health Organisation Guidelines for Community Noise) is relevant. This is 45 dB L_{Amax} inside bedrooms should not normally be exceeded more than 10 to 15 times per night.
- 2.50 Other guidance including reference to the ProPg is presented where considered relevant within the ‘residential development’ section of this report.

3.0 Baseline Conditions

Description of the Assessment Boundary and Noise Sensitive Receptors

- 3.1 The Assessment Boundary is formed largely of a number of agricultural parcels with Pike Fold Golf Club located in the south western part of the Assessment Boundary. The strategic highway network, the M62 and M66 form large part of the boundaries to the south and west respectively. Moss Hall Road traverses through a central area of the Assessment Boundary and provides access to the existing Birch Industrial Estate which is located centrally (adjacent to the Assessment and Application Boundaries). Further industrial premises are located within the wider area including the Heywood Distribution Park to the north and north east.
- 3.2 Generally, there are a limited number of noise sensitive residential receptors within and around the Assessment Boundary. A denser proportion of residential dwellings are located beyond the M62 and M66 to the south and west as well as to the east beyond Queen Elizabeth II Way. A noise receptor location plan is presented in Figure 9.1 which shows the location of individual and groups of identified receptors sensitive to noise sources. For residential premises on the opposite side of the M62 and M66 to the Assessment Boundary, it is unlikely that effects which are Significant would occur due to noise attributable to the intervening motorways. However, for completeness these have also been included on the noise receptor location plan. The receptor locations presented in Figure 9.1 represent both isolated and clusters of residential receptors as well as future residential receptors within the approved South Heywood development to the east of the Assessment Boundary.
- 3.3 As outlined in Chapter 4: High Level Development Specification, some existing buildings within the Assessment Boundary are proposed to be demolished. These receptors are presented separately in Figure 9.1 and are retained for consideration in the event these could be present during different phases of the Project for Assessment.
- 3.4 For the purpose of this ES, receptors have been identified which are considered to be key receptors which would generally act as control points and form a basis of the assessment at this outline planning stage. The location of these sensitive receptors are presented in Figure 9.1 in Appendix C and described in Table 3.1. The sensitive receptors (identified by the notation 'R') represent individual and groups of receptors.

Table 3.1: Receptor Locations

Receptor Reference	Description
R1	Stock Nook
R2	New Gap Farm (Off Manchester Road)
R3	Cluster of Houses around Stock Nook (Off Doctor Fold Lane)
R4	Properties on Doctor Fold Lane (By access to Lower Whittle Farmhouse)
R5	Lower Whittle Farmhouse
R6	Cluster of Properties at Whittle Fold off Whittle Fold Lane
R7	Cluster of Properties off Moss Hall Road (opposite access to Pilsworth Fisheries)
R8	Pilsworth Fisheries
R9	Pilsworth Cottages off Castle Road
R10	Castle House off Castle Road
R11	Beck House off Griffe Lane (Including cluster of dwellings to the south)
R12	Egypt Farm off Egypt Lane
R13	Sandfield Farm (Beyond the M62)

Receptor Reference	Description
R14	Dwellings on the edge of the settlement of Simister (Beyond the M62)
R15	Dwellings on the edge of Whitefield (Beyond M66)
R16	Proposed Residential development Within Project for Assessment (Assessment Plot FF)
R17	Proposed Residential Development within South Heywood Development
R18	Unsworth Academy Playing Fields
R19	Proposed School South Heywood

- 3.5 The receptors identified above are primarily residential receptors.
- 3.6 In addition, Pilsworth Fisheries is located adjacent to Application Boundary to the north has been identified (R8). A planning application¹⁰ for the erection of a café / shop at the Fisheries has been approved but is not yet constructed.
- 3.7 With regard to educational receptors, a school is proposed to be located within the approved South Heywood development¹¹ to the north east of Assessment Boundary. The school is proposed to be located to the north / north east from the Assessment Boundary with a parcel allocated for sports pitches located in the intervening area. A development is proposed for a new (relocated replacement) school building and games areas associated with Unsworth Academy. The existing and proposed school buildings at Unsworth Academy are located beyond the M66 to the east. The existing and proposed sports pitches are located to the east of the motorway adjacent to part of the Assessment Boundary.
- 3.8 Further sensitive receptors include residential premises located adjacent to the local road network in the wider study area. Additional receptors include: a hotel (Rc1) adjacent to the Assessment Boundary along Pilsworth Road to the west of J3 of the M66. The assessment of operational road traffic noise along the existing and proposed road network is presented as a separate technical report in Appendix 9.2 within the ES.

Baseline Noise Survey

- 3.9 An environmental noise survey has been undertaken by Sharps Redmore between 29th August and 4th September 2024. Measurements were collected at eight predominantly unattended measurement locations with attended measurements obtained at three locations. Whilst the noise survey included measurements undertaken during the school holiday period it is considered that the survey periods would be representative of what would be considered typical and suitable for the assessment of noise. This is on the basis of road traffic noise being the principal noise source and proximity to the motorway network as well as industrial estates. The measurements have been supplemented at an additional predominantly unattended noise monitoring location between 23rd to 24th October 2024.
- 3.10 A noise monitoring location plan is presented as Figure 9.2 with the locations described below. LT1 to LT9 are the longer term unattended measurement locations whilst ST1 to ST3 represent shorter term attended locations. At LT2 and LT9, the measurement periods were reduced due to concerns regarding the security of the monitoring equipment. Where applicable cross reference to measurements obtained at other locations has been used to

¹⁰ Rochdale Borough Council, Application Ref: 16/01399/HYBR

¹¹ Bury Council, Application Ref: 70697

supplement the analysis of this data. LT8 was originally proposed to be a short term attended location as indicated within the Scoping Study, however, following agreement with the landowner, measurements were collected over an approximately 24 hour period.

- LT1 – Located on field boundary to the rear of New Gap Farm;
- LT2 – Located on field boundary to the north west of the residential property at Stock Nook;
- LT3 – Located within yard of residential property at Whittle Fold;
- LT4 – Located on field boundary to the west of Moss Hall / east of properties off Moss Hall Lane;
- LT5 – Located on the garden boundary of Unsworth Moss Bungalow;
- LT6 – Located adjacent to cluster of dwellings at the bottom of Griffie Lane / to the south of Brick House Farm;
- LT7 – Located within the front garden of the residential property at Thurston Fold Farm;
- LT8 – Located on field boundary of Lower Whittle Farmhouse;
- LT9 – Located on field boundary to the south of the lake at Pilsworth Fisheries;
- S1 – Adjacent to Moss Hall Road, opposite the driveway of Broomhill Farm;
- S2 – Located adjacent on the access track to Pilsworth Fisheries, approximately 10m from Moss Hall Road; and
- S3 – Located on Castle Road a short distance to the south east of Pilsworth Cottages.

- 3.11 The type 1/class 1 sound level meters were calibrated before and after the survey with no significant drift recorded (<0.5 dB). Measurements were obtained in freefield conditions at a height of approximately 1.5m above local ground level. Calibration certificates are available on request.
- 3.12 A Davis Vantage Vue weather station installation was set up a short distance to the east of the noise monitoring equipment located at LT3 with weather conditions monitored over continuous 30 minute durations over the course of the survey. Average wind speeds were measured to be low, typically 0 -2 m/s with maximum wind gusts generally less than 5 m/s over the entire duration of the survey apart from a small number of isolated occasions. When the wind was of a magnitude that was measurable, wind direction varied including periods when the wind was blowing towards the Assessment Boundary from the motorways and blowing towards the motorways. Infrequent periods of scattered showers occurred primarily on 1st and 2nd September for individual periods of up to 1 hour. A summary of the measured wind speeds, direction and rainfall periods is presented in Appendix D with the raw survey data is available upon request. Weather conditions were suitable for the measurement of sound levels.
- 3.13 The dominant source of noise was observed to be road traffic noise from the M62 and M66 with localised traffic dominant closer to other roads within the area surrounding the Site including along Moss Hall Road and Pilsworth Road. At positions further into the Site

and further away from local roads, noise was primarily influenced by the distant road traffic. Whilst no prominent noise was observed during the site visit from existing premises within Birch Industrial Estate, it is expected that there would be localised industrial and commercial noise present. Industrial and commercial noise sources were observed to be present to the north east of the Assessment Boundary beyond Pilsworth Road and Hareshill Road.

- 3.14 A summary of the measured noise levels is presented in Table 3.3. Time history graphs are presented in Appendix D. The raw data collected at long term (LT) locations are available on request. For the LT1 to LT9 positions, the presented $L_{Aeq,T}$ is the logarithmic average, the $L_{A10,T}$ arithmetic average and the $L_{A90,T}$ the modal level of each continuous 15 minute measurement over the stated survey period.

Table 3.3: Summary of Measured Noise Levels

Time / Date	Location	Period	Duration	$L_{Aeq,T}$ (dB)	$L_{A10,T}$ (dB)	$L_{A90,T}$ (dB)
12:30 – 11:00 (29/08/24 - 04/09/24)	LT1	Daytime	95 Hours	55	55	56
23:00 – 07:00 (29/08/24 - 04/09/24)		Night-time	48 Hours	52	52	47
19:00 – 12:45 (29/08/24 - 30/08/24)	LT2	Daytime	10 Hours	47	46	43
23:00 – 07:00 (29/08/24 - 30/08/24)		Night-time	8 Hours	46	47	44
13:45 – 23:00 (29/08/24 - 02/09/24)	LT3	Daytime	73 Hours	56	55	51
23:00 – 06:00 (29/08/24 - 03/09/24)		Night-time	39 Hours	52	52	47
13:45 – 23:00 (29/08/24 - 02/09/24)	LT4	Daytime	73 Hours	48	48	44
23:00 – 04:30 (29/08/24 - 03/09/24)		Night-time	38 hours	44	45	40
17:45 – 10:15 (29/08/24 - 04/09/24)	LT5	Daytime	89 Hours	55	55	51
23:00 – 07:00 (29/08/24 - 04/09/24)		Night-time	48 Hours	52	52	46
16:00 – 12:30 (29/08/24 - 04/09/24)	LT6	Daytime	93 Hours	54	53	45
23:00 – 07:00 (29/08/24 - 04/09/24)		Night-time	48 Hours	49	48	40
15:45 – 12:00 (29/08/24 - 04/09/24)	LT7	Daytime	92 Hours	51	50	46
23:00 – 07:00 (29/08/24 - 04/09/24)		Night-time	48 Hours	47	46	42
10:30 – 12:15 (29/08/24 - 30/08/24)	LT8	Daytime	18 Hours	63	63	62
23:00 – 07:00 (29/08/24 - 30/08/24)		Night-time	8 Hours	60	61	51
15:45 – 10:15 (23/10/24 - 24/10/24)	LT9	Daytime	11 Hours	51	52	48
23:00 – 07:00 (23/10/24 - 24/10/24)		Night-time	8 Hours	47	47	41
29/08/24 14:18	S1	Daytime	15 mins	59	63	44
29/08/24 21:33		Daytime (Evening)	15 mins	55	60	43

Time / Date	Location	Period	Duration	L _{Aeq,T} (dB)	L _{A10,T} (dB)	L _{A90,T} (dB)
30/08/24 00:23		Night-time	15 mins	53	50	41
29/08/24 11:57	S2	Daytime (Evening)	15 mins	64	69	46
29/08/24 21:07		Daytime (Evening)	15 mins	59	57	47
29/08/24 23:59		Night-time	15 mins	57	54	48
29/08/24 11:04		Daytime	15 mins	57	56	53
29/08/24 11:19	S3	Daytime	15 mins	58	61	52
29/08/24 22:12		Daytime (Evening)	15 mins	49	50	47
29/08/24 22:27		Daytime (Evening)	15 mins	52	55	47
29/08/24 23:02		Night-time	15 mins	54	56	49
29/08/24 23:18		Night-time	15 mins	53	56	49

- 3.15 A review of the measured noise level data has been undertaken to determine the reference background noise level for each monitoring location. As noted previously, the wind direction varied during the survey period which is considered to have influenced the measured noise levels to varying degrees. During periods when the wind direction was towards the motorway typically lower noise levels were measured across the Assessment Boundary as would be expected. When wind speeds were measured to be very low or not detectable, there is less of a correlation. A wind rose¹² is presented in Appendix D which shows the predominant wind direction being a south / south westerly direction. This suggests that typically that wind direction would be from the motorway network towards the Assessment Boundary.
- 3.16 A statistical analysis of the measured daytime and night-time noise levels is presented in Appendix D and typical background noise levels have been established using the guidance provided within BS 4142. As indicated above, due to varying weather conditions, typical background noise levels were shown to vary. This is not unusual for locations at reasonable distances from the strategic road network where wind direction would be expected to have an influence on measured noise levels. At closer distances, wind direction would have a negligible or lesser influence on noise propagation, however, at larger distances this could have a more noticeable effect. Table 3.4 presents typical background levels measured during the survey for each location. The higher presented levels are based on the modal measured background noise levels across the survey period at all LT locations. The lower presented levels are based on professional judgement to align with periods when noise from the motorways was considered likely to be suppressed due to meteorological conditions. This is with the exception of LT6 where the measured modal background noise level across the survey period was at the lower end of the range of measured levels.
- 3.17 Due to the shorter measurement periods at L2 and L8, the stated typical background noise levels during has been established through additional review and cross reference to measurements obtained at LT1, LT3 and LT5 where a more substantial measurement period was obtained. For instance, data collected at LT2 has been compared with the data collected at LT4 which is set back further into the Site from the motorway network.

¹² Sourced from Redmore Environmental who are undertaking the Air Quality Assessment; Manchester Airport 2023

Table 3.4 Representative Background Noise Levels

Location	Typical Background Noise Level: Across Survey Period $L_{A90,T}$ (dB)	
	Daytime	Night-time
LT1	45 / 49	43 / 47
LT2	38 / 43	38 / 44
LT3	46 / 51	42 / 47
LT4	43 / 44	39 / 40
LT5	46 / 51	42 / 46
LT6	45	40
LT7	42 / 46	33 / 42
LT8	54 / 58	51 / 56

- 3.18 As can be seen in Table 3.4, typically, there is around a 5 dB difference between the typical background noise levels over the survey period and the 'lowest' period' when atypical meteorological conditions occurred.
- 3.19 Table 3.5 presents reference background noise levels which correspond to the identified receptor locations along with a description of the approach in establishing these values. The over-arching approach includes generally consideration of the 'lower' typical background noise levels presented in Table 3.4 rather than the model values across the entire survey period to provide a robust assessment. The approach includes professional judgement with respect to receptors where representative values have been adopted.
- 3.20 A proportionate noise survey has been undertaken at this outline stage. For some identified receptors, some of which are located within the Assessment Boundary but outside of Application Boundary, these are located adjacent to or on the opposite side of the M62 and M66, baseline noise surveys have not been undertaken. With the exception of R12, which is located a short distance to the south of the M62, the receptor locations are located at a substantial distance from the Application Boundary. Therefore, for the purpose of the assessment at this stage, reference background noise levels at receptors R12 to R15 are represented by the noise level data obtained at LT8.

Table 3.5: Reference Background Noise Levels at Identified Residential Receptor Locations

Receptor Reference	Description	Reference Typical Existing Background Noise Level (dB $L_{A90,T}$)		Representative Monitoring Location / Description of approach
		Daytime	Night-time	
R1	Stock Nook	43*	38	LT2
R2	New Gap Farm (Off Manchester Road)	45	43	LT1
R3	Cluster of Houses around Stock Nook (Off Doctor Fold Lane)	45	43	LT1
R4	Properties on Doctor Fold Lane (By access to R5)	45	43	LT1
R5	Lower Whittle Farmhouse	54	51	LT8
R6	Cluster of Properties at Whittle Fold off Whittle Fold Lane	46	42	LT3

Receptor Reference	Description	Reference Typical Existing Background Noise Level (dB L _{A90,T})		Representative Monitoring Location / Description of approach
		Daytime	Night-time	
R7	Cluster of Properties off Moss Hall Road (opposite access to Pilsworth Fisheries)	43	39	LT4
R9	Pilsworth Cottages off Castle Road	47	42	Cross Reference to LT6, LT7 and S3 Daytime ST3; Night-time LT7 'Higher' LA90**
R10	Castle House off Castle Road	47	42	Cross Reference to LT6, LT7 and S3 Daytime ST3; Night-time LT7 'Higher' LA90**
R11	Beck House off Griffe Lane (Including cluster of dwellings to the south)	45	40	LT6
R12	Egypt Farm off Egypt Lane	54	51	LT8***
R13	Sandfield Farm (Beyond the M62)	54	51	LT8***
R14	Dwellings on the edge of the settlement of Simister (Beyond the M62)	54	51	LT8***
R15	Dwellings on the edge of Whitefield (Beyond M66)	47	42	Equivalent to R9 and R10

*The criteria corresponds to the modal daytime level which also corresponds to the 'lower' daytime typical background noise level at LT4.

**Receptor Locations are located closer to the M66 than LT6 and LT7. Also, existing farm buildings at LT7 provided screening to the monitoring position from the north to the motorway. Therefore, the criteria corresponds to; Daytime – the evening measured noise levels at ST3 which is comparable to the modal measured L_{A90} at LT7; Night-time – the modal L_{A90} value across the survey period.

*** As a proportionate approach at this stage, LT8 is considered to be representative given the proximity and exposure to the receptors from motorway traffic noise

4.0 Key Findings

4.1 The following section provides an assessment associated with the following:

- A) Noise from proposed commercial and industrial uses including internal access roads;
- B) Noise from proposed energy infrastructure; and
- C) Impact of noise on proposed residential receptors.

4.2 Following the assessment approach set out in the Scoping Study, a qualitative assessment of these sources has been undertaken.

4.3 A separate noise technical report is provided with regard to the assessment of road traffic noise on the local highway network including facilitating infrastructure (Appendix 9.2 of the ES). This includes the assessment of receptors which are located within proximity to Moss Hall Road which traverses through a broadly central area of the Project for Assessment. The assessment of noise and vibration during the construction phase is presented in the Chapter 9 of the Environmental Statement.

4.4 Outline mitigation measures are presented in Section 5.

A) Noise from proposed commercial and industrial uses including road traffic noise along internal access roads

4.5 The EIA Assessment Plan (Including Parameters Plan) which forms the basis of the Project for Assessment parameters submitted to accompany the ES is presented in Appendix A. This includes the presentation of Assessment and Application Plots designated for the Project for Assessment and Proposed Scheme. The extent of the Assessment Plots in the EIA Assessment Plans has been used to determine the likely location of employment uses and identification of sensitive receptor locations as presented in Section 3.

4.6 As the Project for Assessment is outline in nature, there are no fixed details of buildings or exact locations of noise generating sources. The design of buildings and other features is a matter to be considered in detail at the reserved matters stage for each plot or phase of development. Also the exact nature of the activities associated with the Project for Assessment that would occur during the operational phase would not be known until the operators are confirmed.

4.7 The location of internal access roads is also a matter to be considered in detail at reserved matters stage.

4.8 The requirement for mitigation and associated design details such as the location of acoustic barriers or the positioning of service yards would also be established at Reserved Matters stage.

Sources of Commercial and Industrial Noise (E.g. deliveries / servicing, noise breakout from buildings and fixed plant)

4.9 On the basis of the outline nature of the Project for Assessment, noise criteria at identified receptor locations has been defined to control noise associated with on-site industrial / commercial activities including deliveries / servicing, noise breakout from buildings and fixed plant. This also includes HGV movement within service yards, however, noise from vehicle movements within car parks and along internal access roads within the Assessment

Boundary is considered separately. Whilst not forming part of the planning application, allowances have also been made for the Project for Assessment (i.e. Assessment Areas outside of the Application Boundary). This presents a method which enables effects of the Proposed Scheme and Project for Assessment to be considered in combination.

4.10 In determining the noise criteria, consideration has been given to the following:

- The representative existing measured background noise level for each receptor has been established from a review of the ST data and a statistical analysis of the LT noise survey data. The background noise level values presented in Table 3.4 have been used as a source of reference. The approach taken has regard to the guidance provided within BS 4142 relating to the comparison of reference background noise levels with rating levels associated with sources of commercial and industrial noise.
- The criteria is based on industrial or commercial noise sources occurring within the future plot boundaries of proposed employment premises.
- The use of rating levels, as defined within BS 4142. This allows the incorporation of a correction depending on whether the noise source has a tonal, impulsive or other distinctive character that could be perceptible at the receptor and to what extent.
- The criteria is based on a rating level of +5dB above the 'lower' typical reference background noise levels presented in Table 3.4. BS 4142 indicates that adverse impacts are likely to occur where rating levels are +5dB above typical background noise levels. By taking a conservative approach and using the 'lower' typical background noise levels as a reference, it is considered that this represents the LOAEL. Based on typical background noise levels taken over the full survey period, the difference and associated impact would be reduced. As such it is considered that a robust approach has been taken.
- Consideration has been given to deriving separate criteria for the Application Plots (Proposed Scheme) and, for information only, other Assessment Plots (AA, BB, CC, DD, EE). Professional judgement has been used where likely noise levels could be influenced by noise from both the Proposed Scheme and Project for Assessment. For such receptors (R1, R4, R5, R9 to R11 and R13) a -3dB correction has been applied to the stated criteria. This results in the combined rating level being +5 dB above the background noise level. No criteria has been stated for some receptors where closer receptors would represent a control point (i.e. impacts would be controlled by assessing against the closer receptor). For R7, it is considered reasonable that no correction is applied to the criteria for either the Proposed Scheme and other Assessment Plots within the Project for Assessment. This is on the basis of the receptor locations being surrounded by the Proposed Scheme and are closer to Moss Hall Road than measurement position LT4 which forms a basis of the criteria.
- It is also considered appropriate to provide separate indicative targets for proposed building services plant. It is considered that a suitable target level for rating levels for proposed building services plant being equal to the reference background noise level which equates to a low impact when assessed against BS 4142 methodology.

- For likely future residential receptors (R16 and R17), there is a degree of overlap, ambiguity and scope for interpretation between BS 4142 and BS 8233, which is the current standard guidance available with regard to the control and design of noise associated with a proposed residential development. A reasonable approach would be to assess permissible noise levels against BS 8233 criteria with the incorporation of a penalty or correction that would be equivalent to a rating level (If the BS 8233 criteria was predicted to be exceeded then mitigation would be expected to be incorporated within the design of proposed dwellings). For building services plant, a criteria of a rating level equal to the background noise level established at representative existing receptor locations has been adopted. [Note: See Paragraph 2.51 regarding an expected upcoming update to BS 8233].
- For non-residential receptors, the guidance provided within BS 4142 would not be considered to be applicable. A description of the assessment criteria associated with recreational receptors at Pilsworth Fisheries and identified educational receptors is provided separately below.
- At Reserved Matters Stage, or separate planning applications associated with Assessment Areas outside of the Application Boundary further contextual points could be appropriate and relevant with further discussion in this regard presented in the following assessment.

- 4.11 Table 4.1 presents outline noise criteria associated with industrial or commercial noise sources associated with the Proposed Scheme that could be considered cumulatively associated with development within future Application Plot boundaries. In addition, outline noise criteria has also been presented in Table 4.2 for Assessment Plots which are located within the Assessment Boundary (i.e. Project for Assessment) but outside of the Application Boundary (i.e. Proposed Scheme). As stated, these noise criteria are provided for information only as the assessment of these plots would be undertaken as part of separate planning applications. Where 'N/A' is stated, it is considered that other receptor locations act as control points or the receptor is not considered sensitive to the Proposed Scheme and Project for Assessment by virtue of distance and / or proximity to the motorway network.
- 4.12 It is considered that this approach sets a basis for a Framework for the both Proposed Scheme in isolation and, for information only, other Assessment Plots within the Project for Assessment. It is, however, considered appropriate that there should be allowance during Reserved Matters or other applications for the opportunity to deviate from the criteria, if appropriately justified. This is pertinent, as BS 4142 clearly states that a numerical analysis only forms an initial outcome of the assessment of impacts. There is also the requirement to consider context which could be relevant on a plot by plot / development by development basis such as the type of activities, hours of operation and existing ambient noise environment (for instance L_{Aeq} and L_{Amax} noise levels) which would not be feasible to quantify at an outline stage. Further consideration to this and how this could be secured by planning condition is presented in Section 5.
- 4.13 The criteria stated for proposed residential receptors is 50 dB $L_{Aeq,1hour}$ during the daytime and 45 dB $L_{Aeq,1hour}$ during the night-time period. The criteria is stated as a rating level. Alternatively, at future Reserved Matter or other planning application stage, noise surveys may indicate that baseline noise levels are higher and an alternative approach could be

permissible. Additionally, there may be noise mitigation included within the design of the residential receptors which could be a pertinent contextual consideration allowable under BS 4142 guidance.

Table 4.1: Outline Noise Criteria (Noise Breakout and Activities within Service Yards, e.g. deliveries)

Receptor Location	Proposed Scheme (PS) Noise Criteria*: Rating Level (dB L _{A,Tr})		PfA (Other Assessment Plots) Noise Criteria* **: Rating Level (dB L _{A,Tr})		PS & PfA Noise Level Criteria* **: dB L _{Amax}
	Daytime	Night-time	Daytime	Night-time	Night-time
R1	45	40	45	40	60
R2	N/A	N/A	50	48	60
R3	N/A	N/A	50	48	60
R4	47	45	47	45	60
R5	56	53	56	53	60
R6	51	47	N/A	N/A	60
R7	48	44	48	44	60
R9	49	44	49	44	60
R10	49	44	49	44	60
R11	47	42	47	42	60
R12	N/A	N/A	56	53	60
R13	56	53	56	53	60
R14	N/A	N/A	56	53	60
R15	N/A	N/A	56	53	60
R16	N/A	N/A	50	45	60
R17	N/A	N/A	50	45	60

*Freefield at a position representative of the façade

** Project for Assessment (PfA), presented for information only

- 4.14 Further to the above, it is also considered appropriate to provide separate indicative targets for proposed building services plant. It is considered that a suitable target level for proposed building services plant would be equal to the reference background noise level. This target level represents a level where a low impact is predicted. During the later design stages, it may be justifiable that the targets stated from plant noise should be higher.

Table 4.2: Outline Noise Criteria for Building Services Plant (Cumulative for all Units)

Receptor Location	Proposed Scheme (PS) Noise Criteria*: Rating Level (dB L _{A,Tr})		Project for Assessment (Other Assessment Plots) Noise Criteria* **: Rating Level (dB L _{A,Tr})	
	Daytime	Night-time	Daytime	Night-time
R1	40	35	40	35
R2	N/A	N/A	45	43
R3	N/A	N/A	45	43
R4	42	40	42	40
R5	51	48	51	48
R6	46	42	N/A	N/A
R7	43	39	43	39

Receptor Location	Proposed Scheme (PS) Noise Criteria*: Rating Level (dB L _{A,Tr})		Project for Assessment (Other Assessment Plots) Noise Criteria* **: Rating Level (dB L _{A,Tr})	
	Daytime	Night-time	Daytime	Night-time
R9	44	39	44	39
R10	44	39	44	39
R11	42	37	42	37
R12	N/A	N/A	N/A	N/A
R13	51	48	51	48
R14	N/A	N/A	51	48
R15	N/A	N/A	51	48
R16	N/A	N/A	42	37
R17	N/A	N/A	45	43

*Freefield at a position representative of the façade

** Project for Assessment (PfA), presented for information only

- 4.15 In addition to the receptors presented in Tables 4.1 and 4.2, there could be receptors within the Project for Assessment which, whilst being identified as being removed, could be present during earlier phases of the Project for Assessment and require assessment.
- 4.16 Additionally, the criteria presented in Table 4.1 and 4.2 is relevant to residential receptors. With regard to non-residential receptors, the following criteria is proposed.
- 4.17 Table 4.3 presents criteria in relation to Pilsworth Fisheries. This receptor is of lower sensitivity than residential receptors and therefore a criteria of up to 55 dB L_{Aeq,1hour} would be considered reasonable. This corresponds to the WHO guideline daytime criteria for private external amenity areas of 55 dB L_{Aeq,16hours} although with a more stringent 1 hour assessment period. A criteria of 51 dB L_{Aeq,1hour} has been recommended for general commercial / industrial noise sources and 51 dB L_{Aeq,1hour} from building services plant. These levels are equivalent to the measured ambient noise level at LT9 of 51 dB L_{Aeq,T} and below 55 dB L_{Aeq,1hour}.

Table 4.3: Proposed Scheme: Outline Noise Criteria Pilsworth Fisheries (R8)

Source	Proposed Scheme(PS) Noise Criteria: Specific Level (dB L _{A,Tr})	PfA (Other Assessment Plots) Noise Criteria*: Rating Level (dB L _{A,Tr})
Commercial / Industrial	51	N/A
Building Services Plant	51	N/A

* Project for Assessment (PfA), presented for information only

- 4.18 With regard to educational receptors, the existing and proposed school playing fields at Unsworth Academy (R18) are located within closer proximity to the M66. Typical measured noise levels at LT6 are around 56 dB L_{Aeq,15mins} during the normal school daytime period. Correcting for the closer distance of the fields to the M66, a corresponding noise level of around 60 dB L_{Aeq,15mins} is predicted in the eastern part of the school fields. Therefore, existing ambient noise levels are high at this receptor and already above the guideline good practice criteria of 55 dB L_{Aeq,30mins} stated within the 'Acoustics for Schools: a design guide'. On this basis, this receptor is not considered further.

- 4.19 For the proposed school within the South Heywood development (R19), a noise criteria of 50 dB $L_{Aeq,30mins,freefield}$ has been presented as a suggested value which may inform future assessments. This is comparable to the criteria for proposed residential receptors within the South Heywood development and provides headroom with regard to the guideline criteria with respect to good practice criteria of 55 dB $L_{Aeq,30mins}$ stated within the 'Acoustics for Schools: a design guide'. This would also align with the criteria associated with internal teaching spaces assuming a natural ventilation strategy.

Table 4.4: Outline Noise Criteria Proposed South Heywood School (R18)

Receptor Location	Proposed Scheme Noise Criteria*: Specific Level (dB $L_{A,Tr}$)	Project for Assessment (Assessment Plot BB) Noise Criteria* **: Rating Level (dB $L_{A,Tr}$)
Commercial / Industrial	N/A	50
Plant	N/A	50

* freefield, outdoor teaching spaces / representative of the proposed façade, whichever is closer

** Project for Assessment (PfA), presented for information only

- 4.20 It is considered that by designing the Proposed Scheme and Project for Assessment to correspond to the outline criteria noise could be controlled so that adverse effects would be minimised and significant effects avoided.
- 4.21 Primary and secondary mitigation measures for the Proposed Scheme are presented in Section 5. As stated previously, the criteria is considered to be outline to allow the opportunity to deviate from the criteria during Reserved Matters applications, including the consideration of context, if suitably justified. The requirement to undertake an assessment in accordance with BS 4142 at Reserved Matters Stage can be secured by planning condition.
- 4.22 Mitigation measures are also presented for the Project for Assessment for information only.

New Motorway Services Area and Waste Facilities

- 4.23 With regard to a new motorway services, whilst specific details are unknown, by virtue of the likely location within proximity to the M62, it is considered that noise from plant and deliveries are unlikely to result in significant adverse impacts. It is considered that noise from the motorway services could be considered in isolation under its own merits as part of future Reserved Matters applications or, for the Project for Assessment, as separate planning applications.
- 4.24 The Project for Assessment will include appropriate facilities for the storage, handling and collection of waste types identified in Chapters 4 and 5 of the ES. The location of the waste sites is currently unknown and, provisionally, noise from such facilities could fall under the criteria stated in Tables 4.1 to 4.4. However, it should be noted that the sources of noise would be specific to the actual operations which is unlikely to be known until an operator is present (such as location, type of activities, hours of operation) which could be of relevance to such sources. Often the principal source of noise from such facilities is attributable to processing activities.

- 4.25 Therefore, if suitably justified within the context of the guidance provided within BS 4142, such facilities could be assessed on their own merits. Secondary mitigation, if required, is presented within Section 5.
- 4.26 The assessment undertaken is considered relevant to both the Project for Assessment and the Proposed Scheme.

General Activities Vehicle Movements On The Internal Access Roads and Car Parking)

- 4.27 The assessment of transportation noise associated with the proposed primary internal access road could be assessed against existing ambient noise levels and absolute noise level criteria (see Table 2.3: WHO Guideline criteria) relevant to this type of noise sources. It is not possible to undertake a detailed assessment at this stage as the alignment and proposed ground levels of the internal road network within the Project for Assessment is subject to detailed design.
- 4.28 However, cross referencing the criteria presented within Table 2.3, it is considered that through appropriate consideration within the design, significant adverse effects could be avoided and, as far as reasonably practicable, adverse effects minimised. Additional context could be provided with a comparison of the change in noise level when compared to existing ambient noise levels which could be appropriate where existing noise levels are above the presented absolute thresholds. It is considered that this would be applicable to both residential receptors and Pilsworth Fisheries.
- 4.29 With regard to noise associated with car parking events, typically assessments would be undertaken separately. As with noise on internal access roads, this could be considered within the context of the WHO absolute noise level criteria stated in Table 2.3 or and / comparison with existing ambient noise levels. Unless car parks were located within close proximity to residential premises, it is considered likely that the WHO absolute noise level criteria presented in Table 2.2 would be met without the requirement for mitigation. However, Secondary Mitigation is presented in Section 5 and, with appropriate consideration within the design, significant adverse impacts are not predicted.
- 4.30 The assessment undertaken is considered relevant to both the Project for Assessment and the Proposed Scheme.

B) Noise from Proposed Energy Infrastructure (Providing power to the Project for Assessment)

- 4.31 The development specifications for the Project for Assessment and the Proposed Scheme detailed within ES Chapters 4 and 5 respectively, indicates that the Project for Assessment will be all-electric, (although there may be certain processes that require gas or oil). The source of electricity will likely be from a mix of sources, predominantly provided by on-site solar energy utilising the expansive roof areas of B2/B8 development. There is potential for the Project for Assessment to generate renewable energy through roof mounted wind power as well as potential for micro-hydrogen.
- 4.32 The exact details are unknown and therefore it is only possible at this stage to outline a Framework for assessment at later stages. Typically noise sources that would be akin to plant equipment would be assessed in accordance with BS 4142 and would fall under the umbrella for the outline noise criteria outlined in Tables 4.1 and 4.2 along with the

associated caveats. However, depending on the specific noise sources, other guidance may be required to be considered.

- 4.33 It is assumed that four primary substations will be required. Potential sources of noise would be expected to include the associated transformers and air handling fans. On modern substations, it is assumed that noise from the cooling fans would be the dominant noise source with noise from the transformers controlled as source. Noise from the cooling fans would fall under the umbrella for the outline noise criteria outlined in Tables 4.1 and 4.2 along with the associated caveats. However, with regard to transformer noise, particular consideration may be necessary to consider low frequency noise (100 Hz).
- 4.34 For roof mounted wind power, the highest noise levels would be expected to occur during conditions when wind speeds are in excess of the BS 4142 guidelines for the measurement of noise levels to establish a baseline (e.g. up to 5 m/s). Therefore the use of a methodology based on BS 4142 is likely to be unsuitable. The installation of standalone wind turbines on domestic properties, subject to limitations and conditions, may fall within permitted development rights, however, this does not extend to non-domestic premises. ETSU_R-97¹³ and a Good Practice Guide published by the Institute of Acoustics (IOA)¹⁴ forms the current wind turbine noise assessment guidance in the UK.
- 4.35 The type of roof mounted roof mounted wind power units and locations are currently unknown, therefore, it is not considered appropriate at this stage to set outline criteria. Given the large separation distances from areas within the Project for Assessment from receptors, it is considered that noise from energy infrastructure could be suitably accommodated within the Assessment Boundary.
- 4.36 The assessment undertaken is considered relevant to both the Project for Assessment and the Proposed Scheme. For the Proposed Scheme, the requirement to undertake a noise assessment at Reserved Matters Stage can be secured by planning condition.

A) & B) Summary

- 4.37 Noise surveys at positions representative of identified noise sensitive receptors have been undertaken. The surveys undertaken are considered proportionate at this outline planning stage.
- 4.38 At Reserved Matters or other planning application stages, further surveys could be undertaken if it would be considered of merit to add further contextual points that would be more appropriate to consider at a later design stage. Further surveys may also be required if receptors which are proposed to be removed could still be present during earlier phases of the Project for Assessment.
- 4.39 The results of the noise survey have been used to identify noise criteria at sensitive receptor locations. Noise data was collected over a number of days at a large number of locations within the Project for Assessment and a conservative approach has been taken with regard to establishing noise limits which minimises uncertainty of the measurement. Given the scale and outline nature of the Proposed Scheme, outline criteria has been presented which forms the basis of a Framework that the Proposed Scheme will be

¹³ Working Group on Noise from Wind Turbines, 1996. The assessment & rating of noise from wind farms: Final report. ETSU-R-97. Department of Trade and Industry.

¹⁴ IOA, 2013. A good practice guide to the application of ETSU-R-97 for the assessment and rating of wind turbine noise. Institute of Acoustics. [Supplementary Notes Published in 2014]]

designed to. It is not considered that the criteria is a fixed limit as, the BS 4142 assessment methodology provides emphasis on incorporating context in determining the final impact outcome, which would not be commensurate at this stage. As part of noise assessments undertaken at future Reserved Matters stage, a deviation from the criteria stated could be appropriate, if suitably justified.

- 4.40 Separate planning applications would be undertaken for the Project for Assessment. The assessment undertaken is also considered relevant to the Project Assessment but is presented for information only.
- 4.41 There are numerous measures which could inter-relate and feed into the design of the Proposed Scheme and Project for Assessment to control noise. With suitable consideration at later design stages, significant adverse noise effects at identified sensitive receptors are not predicted and with the incorporation of Secondary Mitigation where required, adverse effects would be minimised.
- 4.42 It is therefore recommended that the suggested criteria discussed above are used as a framework design of the Proposed Scheme and, for information only, the Project for Assessment for the proposed uses. Prior to each phase of the development a detailed assessment should be carried out, which could include an updated noise survey at noise sensitive receptors where considered relevant, full assessment of the potential impacts based on the approach discussed above and identification of mitigation measures to control any potential noise impact. For the Proposed Scheme, this could be enforced by a suitably worded planning condition.

C) Proposed Residential Receptors (Project for Assessment)

- 4.43 Assessment Plot FF, which forms part of the JPA 1.1 site allocation, is proposed for residential development of up to 200 homes. This Plot is partially bounded to the west by the M66 and existing school playing fields. Assessment Plots DD and EE with associated future employment uses proposed are located to the east and south respectively. Retained residential dwelling are present in the western and southern parts of Plot FF.
- 4.44 With regard to the impact of noise from existing noise sources and proposed end uses on future receptors, assessments that would inform the design of the Plot for residential development would be undertaken as part of separate studies and planning applications. As such, a high level qualitative assessment has been undertaken and, as Secondary mitigation, the method for subsequent analysis and design advice to inform the proposed residential development is presented.
- 4.45 The principle noise source that is expected that would require consideration is road traffic noise from the M66. There may be the potential to also consider noise from the existing / proposed Unsworth Academy sports pitches along with potential noise from plant in the northern corner of Plot FF where there is understood to be a gas governor compound. Whilst at this time of site walkovers, no noise was audible from the compound, there may be occasions when the plant is operational and may require consideration.
- 4.46 Assessments would be undertaken at as separate planning applications delivered by 3rd parties which would be expected to include a noise survey. There are various design measures that would inter-relate and the guidance provided within the ProPg provides a basis for such assessment including guidance with regard to a good acoustic design process.

- 4.47 Primary and Secondary mitigation measures that could feed into the scheme design are presented in Section 5 for information only. The outcome of the assessments would be to design proposed dwellings to meet the BS 8233 internal noise level criteria stated in Table 2.4. With regard to noise in private external amenity areas (e.g. gardens), BS 8233 recognises that a guidelines value of 55 dB $L_{Aeq,16hours}$ is *“not achievable in all circumstances where development may be desirable. In higher noise areas, such as city centres or urban areas adjoining the strategic transport network, a compromise between elevated noise levels and other factors, such as convenience of living in these locations or making efficient use of land resources to ensure development needs can be met, might be warranted. In such a situation, development should be designed to achieve the lowest practicable levels in these external amenity spaces, but should not be prohibited”*.
- 4.48 With regard to the relationship between proposed residents in Plot FF and proposed employment uses in Plots EE and DD, outline design criteria for proposed employment use has been stated in Tables 4.1 and 4.2. The hierarchy of environmental control measures, require that pollutants, including noise should ideally be controlled at source, then by preventing transmission of noise to receptors and finally reducing impact at source. Controlling noise from the proposed employment uses is therefore considered to be the principle design approach. However, Secondary mitigation has been suggested to provide further controls within a future residential scheme to follow the principles of good acoustic design.
- 4.49 With suitable consideration at later design stages, significant adverse noise effects at identified sensitive receptors could be avoided and, with the incorporation of Secondary Mitigation where required, adverse effects minimised.

5.0 Primary and Secondary Mitigation Summary

5.1 Primary Mitigation measures have been incorporated into the EIA Assessment Plans and Parameters Plans which include:

- A suitable stand-off distance is dependent on numerous variables including the positioning of the noise source, the size of the units (e.g. if there is a large service yard and number of units. Therefore, at this stage a short landscape buffer has been incorporated within the parameters plan around existing residential premises.
- Similarly, there are a number of inter-relating design measures which would feed into a suitable stand-off between existing and proposed noise sources and proposed dwellings. Therefore, at this stage a 50m buffer has been included in the parameters plan as a reasonable minimum stand-off to the M66. A comparable stand-off to that provided around existing residential premises has been provided between proposed employment and proposed residential zones.

Proposed Scheme

5.2 Secondary mitigation relating to the Proposed Scheme is as follows:

Employment Use: On-site Industrial / Commercial Noise Generating Sources

5.3 At this outline stage, there are no fixed details of buildings or exact locations of noise generating sources. The design of buildings and other features is a matter to be considered in outline or detail during future planning applications.

5.4 With respect to the Proposed Scheme, typical mitigation or noise control measures for the proposed employment uses, could include:

- Design of the Proposed Scheme to comply with the noise criteria stated in Table 4.1 (Sources of Commercial and Industrial Noise) and Table 4.2 (fixed building services plant). Where a deviation from the criteria is proposed this should be suitably justified within the context of the guidance provided within BS 4142. An example of a deviation from the criteria would be for plant such as reserve power generators which would only operate in an emergency or scheduled short duration testing.
- Stand-off from receptors in addition to Primary Mitigation.
- Locating less 'noisy' development within closer proximity to noise sensitive receptors, for instance E(g) use.
- Orientating service yards on the rear side of buildings away from residents (i.e. the building provides the barrier) typically provides the highest degree of attenuation. Screening by buildings would also be expected to be of benefit to internal access roads and access routes to yards.
- Provision of acoustic grade barriers between noise sources and receptors. The principle relating to barriers is to provide direct line of sight screening between a source and receptor (including upper storey habitable rooms). Typically, a greater degree of attenuation would be expected if a barrier was closer to either the source or receiver rather than somewhere in the middle. Where specified, barriers should be in the form of walls or close-boarded fences which are of solid construction, with no air gaps, and a minimum mass of 10 kg/m².

- Restricting hours for trading and / or deliveries.
 - Control of building services plant equipment.
 - Depending on the proposed uses, noise breakout from buildings may need to be considered. Measures to control noise breakout could include measures such as the sound insulation performance of the building fabric.
- 5.5 It should be noted that the noise criteria relates to noise emissions from corresponding sources for the whole of the Proposed Scheme. Therefore, noise from individual plots would need to take into account the cumulative effect. This could be demonstrated where noise from each unit or plot being designed to 10 dB below the noise criteria. It is not considered that this should be used as a design recommendation as this could lead to over design and overly restrictive controls. However, this provides a guide for a potential option for a proportionate assessment of individual units or plots in isolation in the future.
- 5.6 The requirement to consider noise associated with the proposed employment uses can be secured by way of a planning condition.

Energy Infrastructure

- 5.7 Typically noise sources that would be akin to plant equipment would be assessed in accordance with BS 4142 and would fall under the umbrella for the outline noise criteria outlined in Tables 4.1 and 4.2 along with the associated caveats. With regard to transformers, consideration may be necessary to consider low frequency noise (100 Hz).
- 5.8 With regard to roof mounted wind power, the type of roof mounted wind power units and locations are currently unknown, therefore, it is not considered appropriate at this stage to set outline criteria. Given the large separation distances from areas within the Proposed Scheme from receptors, it would be reasonable to assume that options for renewable energy could be accommodated within the Proposed Scheme, however, careful consideration is likely to be required at closer proximity to identified receptors.
- 5.9 As part of assessments to inform the detailed design associated with proposed energy infrastructure, the following mitigation measures provide recommendations which could be considered, where relevant, in the design of plots within the Proposed Scheme. As noted these measures could be suitable in isolation or as a suite of measures depending on specific circumstances:
- Design of the Proposed Scheme to comply with the noise criteria stated in Table 4.2 (fixed building services plant) in Appendix 9.1. Where a deviation from the criteria is proposed this should be suitably justified within the context of the guidance provided within BS 4142. This only relates to sources that fall within the scope of BS 4142;
 - Stand-off distance to receptors;
 - Provision of acoustic grade barriers between noise sources and receptors;
 - Control of plant equipment at source; and
 - Depending on the proposed uses, noise breakout from buildings may need to be considered. Measures to control noise breakout could include measures such as the sound insulation performance of the building fabric.

General Activities (Internal Access Roads and Car Parking)

- 5.10 At this outline stage, there are no fixed details of buildings or exact locations of internal access roads or car parks. The design of buildings and other features is a matter to be considered in outline or detail during future planning applications.
- 5.11 Typical mitigation or noise control measures could include:
- The noise criteria in Table 2.3 could be used to inform the design of internal access roads and car parks. An aim should be for noise attributable to internal roads to not exceed 50 dB $L_{Aeq,16hours}$ during the daytime and 45 dB $L_{Aeq,8hours}$ during the night-time which represent the LOAEL. Where this is not practicable, an upper criteria should be to not exceed 60 dB $L_{Aeq,16hours}$ during the daytime and 55 dB $L_{Aeq,8hours}$ during the night-time which represents the SOAEL. Additional context could be provided with a comparison of the change in noise level when compared to existing ambient noise levels which could be appropriate where existing noise levels are above the presented absolute thresholds.
 - For car parking, to represent sudden noises, an aim would be to meet a criteria of 60 dB L_{Amax} . Where this is not practicable, the aim should be to not exceed 70 dB L_{max} during the night-time which represents the SOAEL.
 - Stand-off from receptors in addition to Primary Mitigation.
 - Inclusion of screening from barriers such as earth bunds, acoustic grade fences and / or proposed buildings.

Project for Assessment

- 5.12 It is considered that the principles outlined above would also be relevant to other Assessment Plots within the Project for Assessment with the measures presented for information only. In addition, the consideration of proposed residential receptors in Assessment Area FF is presented as follows.

Proposed Residential Receptors (Project for Assessment Only)

- 5.13 Assessments would be undertaken as separate planning applications delivered by 3rd parties which would be expected to include a noise survey. There are various design measures that would inter-relate and the guidance provided within the ProPg provides a basis for such assessment including guidance with regard to a good acoustic design process.
- 5.14 The following guidance is presented for information only.

Good Acoustic Design Process

- 5.15 The design of buildings and other features is a matter to be considered in detail at the Reserved Matters stage for each plot or phase of development. Good acoustic design principles could include:
- Providing a greater stand-off from the M66 as far as practicable within the context of other design and masterplanning requirements as well as inter-relationship with other acoustic mitigation measures.

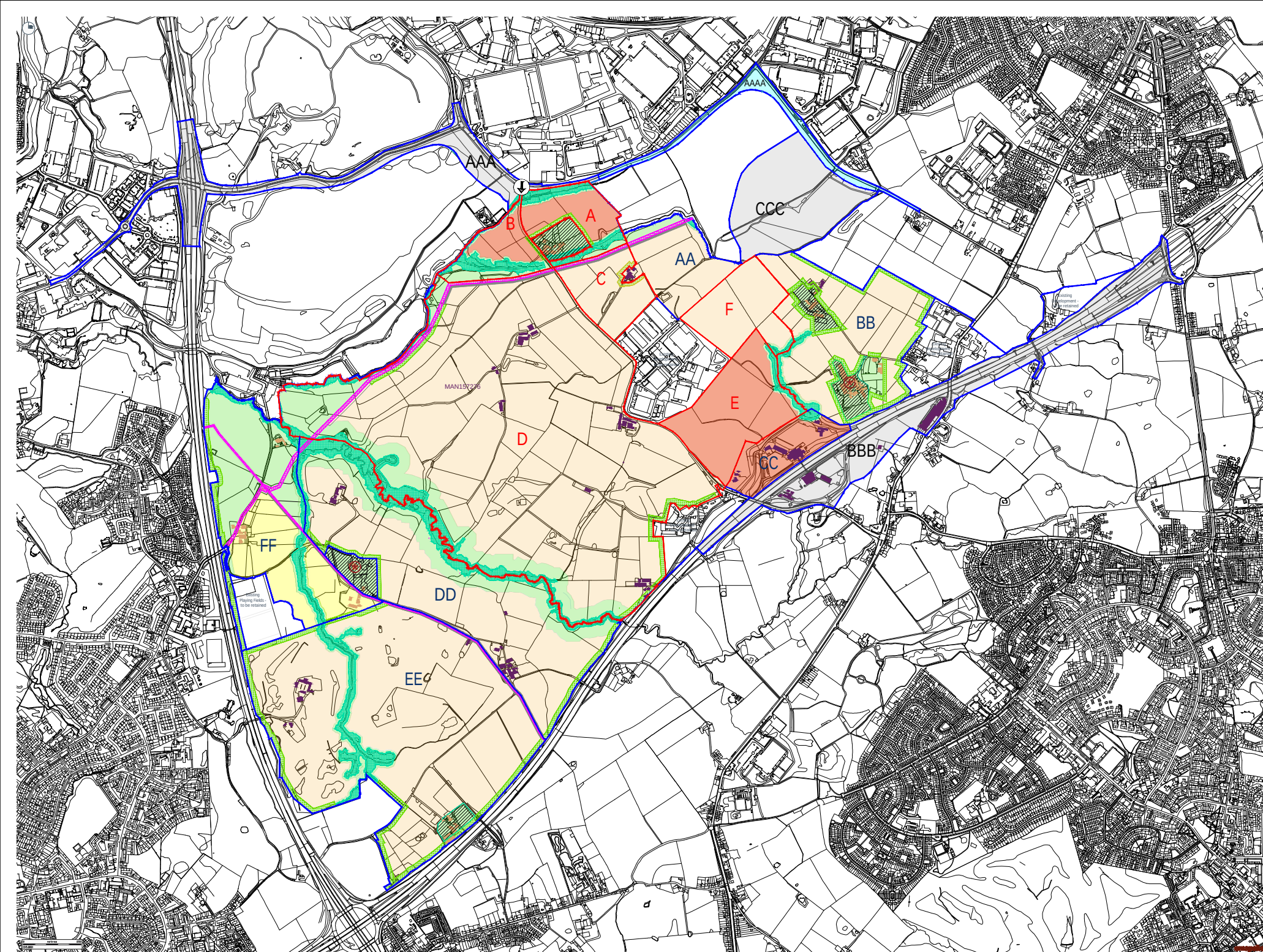
- Provision of acoustic garden barriers between noise sources and receptors. This could include localised barriers around garden boundaries.
 - Using the layout of the scheme to reduce noise propagation across the Plots e.g. the 1st tier of buildings provide screening to dwellings / residents further into the relevant Plots. A potential option could include could be the provision of apartments in the noisiest areas of Plot FF. In such cases, the provision of balconies should be considered including, if balconies are proposed in locations of higher noise levels, access to quieter amenity space.
 - Using the design of the dwellings to reduce impact on noise sensitive rooms, such as bedrooms, This may include having single aspect dwellings with bedrooms facing away from noise sources.
 - As is typical with such developments, a suitable scheme of sound insulation would be established during later design stages.
 - With regard to the impact from future commercial or industrial uses at proposed residential premises, mitigation measures could be a combination of acoustic design at the dwellings and at the employment development.
- 5.16 With regard to a suitable scheme of sound insulation, the means to achieve this would be typically through a suitable scheme of sound insulation to the window unit, which typically includes the glazing, frame and ventilators. With the adoption of suitable mitigation which is typical for such developments, proposed dwellings could be designed to meet the relevant BS 8233 / WHO noise criteria of 35 dB $L_{Aeq,16hours}$ in living rooms and 30 dB $L_{Aeq,8hours}$ / 45 dB (for typical) L_{Amax} in bedrooms.
- 5.17 With regard to noise levels within garden, With regard to noise levels within garden, there is no defined upper noise limit. However, where external noise levels in gardens or on balconies exceed 55 dB all reasonable steps should be taken to reduce noise levels. It is clear from the advice in BS 8233 and ProPG that external noise levels should not be reason to refuse planning permission, however there is no guidance on what would be considered a maximum permitted level above which noise may become unacceptable. Depending on context, a design criteria of 60 dB $L_{Aeq16hr}$ could be considered to be reasonable upper target level to inform the future design as long as it is demonstrated that a good acoustic design process has been followed including incorporating reasonable measures to achieve the lowest practicable levels in these external amenity spaces. However, this upper target level should not be considered a fixed limit or in isolation and any impacts may be off-set, for instance, if residents have access to a relatively quiet, protected, external publicly accessible amenity space.
- 5.18 It is anticipated that ventilation provision for the scheme would be designed in accordance with the relevant parts of Approved Document F of the Building Regulations. Ventilation provision can be achieved in several ways, including the use of acoustic trickle vents (which need to have an overall sound reduction equal to or greater than the glazing), other passive ventilation systems (e.g. through-wall ventilator) or a mechanical ventilation system. The acoustic requirements of Approved Document O of the Building Regulations will also need to be considered.
- 5.19 With the incorporation of suitable design measures, it is considered that significant adverse noise effects could be avoided.

6.0 Conclusion

- 6.1 Sharps Redmore has been appointed by Northern Gateway Development Vehicle LLP (NGDV) to undertake a noise assessment in relation to a predominantly commercial project referred to as Northern Gateway JPA 1.1. This technical report is to be included within 9.1 of the ES and should be read in conjunction with Chapter 9 of the ES as well as introductory Chapters of this ES (Chapters 1 – 6). Effects associated during the construction phase have been assessed within Chapter 9 of the ES whilst a separate noise technical report is provided with regard to the assessment of road traffic noise on the local highway network including facilitating infrastructure within the Potential Infrastructure Areas AAA-CCC (Presented in Appendix 9.2 of the ES). This report presents an assessment associated with the impact of noise from the operational phase of the Project for Assessment relating to the following elements:
- A) Noise from proposed commercial and industrial uses including internal access roads;
 - B) Noise from proposed energy infrastructure (Providing power to the Project for Assessment); and
 - C) Impact on proposed residential receptors.
- 6.2 Baseline noise surveys have been undertaken and road traffic noise is the dominant noise source at and around the Project for Assessment including the Proposed Scheme. At this outline stage, there are no fixed details of buildings or exact locations of noise generating sources. The design of buildings and other features is a matter to be considered in outline or detail during future planning applications.
- 6.3 Therefore, with regard to proposed industrial and commercial uses, outline noise criteria has been established with regard to likely on-site noise generating sources such as noise breakout from buildings, activities such as deliveries occurring in service yards, building services plant. The criteria has been derived within the context of existing background noise levels at positions representative of nearby sensitive receptors. Consideration of other noise sources such as energy infrastructure and internal access roads has been provided.
- 6.4 With the incorporation of suitable design measures which would be established at Reserved Matters stage, it is considered that significant effects associated with the Proposed Scheme including proposed industrial and commercial uses, energy infrastructure and new internal access roads could be avoided and adverse effects minimised. It is considered that the principles outlined above would also be relevant to other Assessment Plots within the Project for Assessment with the measures presented for information only. The requirement to control noise associated with the Proposed Scheme could be secured by a suitably worded planning condition.
- 6.5 With regard to proposed residential development, the relevant Assessment Plot does not form part of the Proposed Scheme. Assessments that would inform the design of the Plot for residential development would be undertaken as part of separate studies and planning applications. As such, a high level qualitative assessment has been undertaken and, as Secondary mitigation, the method for subsequent analysis and design advice to inform the proposed residential development is presented. With the incorporation of suitable design measures, it is considered that significant adverse noise effects could be avoided.

APPENDIX A

EIA ASSESSMENT PLAN AND PROPOSED SCHEME PARAMETER PLAN



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- KEY**

 - Boundaries
 - Application Location
 - Application Plot
 - Assessment Boundary
 - Assessment Plot
 - Potential Highways Improvement Works
 - Potable Water Infrastructure

Developable Areas and Uses

 - Developable Area 1
This area includes Class C and F and Assessment Plots AA, BB, DD and EE) This area includes land uses classes: IB, BB, CC, E (E) (G), H (H), FDZL, and CC (in accordance with the Schedule)
 - Developable Area 2
Application Plots A, B and F and Assessment Plot CC This area includes land use classes: IB, BB, CC, E (E), EG-C (F), EG-D (F), EG-E (F) and GG-S (in accordance with the Schedule)
 - Developable Area 3
Limited to land uses Class CC

Developable Areas

 - (not applicable; access, culture, heritage and landscape)

Peripheral Landscaping Buffer

 - Temporary Peripheral Landscaping Buffer

Landscaping Mitigation Area

 - Building Footprint Offset
 - Weathering Habitat Corridor
 - Wetland crossings only
 - Built Environment Assessments (Access only)
 - Heritage Setting Offset

Other

 - Grade 1 Limited Listing
 - Existing Building (To be demolished)
 - Existing Building (To be retained)
 - Location of Primary Access



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CLIENT
Northern Gateway Development Vehicle

PROJECT Northern Gateway	
DRAWING EIA Assessment Plan 1: Uses	
PROJECT NUMBER NORM3018	
DRAWING NUMBER Fig. 4.1	CHECKED BY TJ & NW
REVISION F	STATUS Final
DATE February 2005	SCALE 1:5,000 @ A0





Developable Area 2
(Application Plots A, B and E)
This may include land use classes:
B2, B8, C1, E(a-b), E(c)(i-iii), E(d-f), E(g)
F1(a), F2(a-c) and Sui Generis Uses
(in accordance with the Uses Schedule)

Maximum Quantum of Development
Employment Uses: Up to 600,000 sqm.
(Ind. B2, B8 and E(g)(i-iii))
Other Uses: Up to 5,000 sqm.
(Ind. C1, E(a-b), E(c)(i-iii), E(d-f), F1(a), E(g)(i-iii), F2(a-c) and Sui Generis Uses)

Non-Developable Areas

-  Wetland Habitat Corridor (Bridge crossings only)
-  Build Over Easements (Access only)

CLIENT
Northern Gateway Development Vehicle

DRAWING

PROJECT NUMBER	
NORM3018	
DRAWING NUMBER	CHECKED BY
Fig. 5.1	TJ & NW
REVISION	STATUS
E	Final

DATE April 2025 SCALE 1:2,500 @ A0

Curley

APPENDIX B

ACOUSTIC TERMINOLOGY

Acoustic Terminology

- A1 Noise, which is sometimes defined as unwanted sound, is measured in units of decibels, dB. The range of audible sounds is from 0 dB to 140 dB. Two equal sources of sound, if added together will result in an increase in level of 3 dB, i.e. 50 dB + 50 dB = 53 dB. Increases in continuous sound are perceived in the following manner:
- 1 dB increase - barely perceptible
 - 3 dB increase - just noticeable
 - 10 dB increase - perceived as twice as loud
- A2 Frequency (or pitch) of sound is measured in units of Hertz. 1 Hertz (Hz) = 1 cycle/second. The range of frequencies audible to the human ear is around 20Hz to 18000Hz (or 18kHz). The capability of a person to hear higher frequencies will reduce with age. The ear is more sensitive to medium frequency than high or low frequencies.
- A3 To take account of the varying sensitivity of people to different frequencies a weighting scale has been universally adopted called "A-weighting". The measuring equipment has the ability automatically to weight (or filter) a sound to this A scale so that the sound level it measures best correlates to the subjective response of a person. The unit of measurement thus becomes dBA (decibel, A-weighted).
- A4 The second important characteristic of sound is amplitude or level. Two units are used to express level, a) sound power level - L_w and b) sound pressure level - L_p . Sound power level is an inherent property of a source whilst sound pressure level is dependent on surroundings/distance/directivity, etc. The sound level that is measured on a meter is the sound pressure level, L_p .
- A5 External sound levels are rarely steady but rise or fall in response to the activity in the area - cars, voices, planes, birdsong, etc. A person's subjective response to different noises has been found to vary dependent on the type and temporal distribution of a particular type of noise. A set of statistical indices have been developed for the subjective response to these different noise sources.
- A6 The main noise indices in use in the UK are:
- L_{A90} : The sound level (in dBA) exceeded for 90% of the time. This level gives an indication of the sound level during the quieter periods of time in any given sample. It is used to describe the "background sound level" of an area.
 - L_{Aeq} : The equivalent continuous sound level in dBA. This unit may be described as "the notional steady noise level that would provide, over a period, the same energy as the intermittent noise". In other words, the energy average level. This unit is now used to measure a wide variety of different types of noise of an industrial or commercial nature, as well as aircraft and trains.
 - L_{A10} : The sound level (in dBA) exceeded for 10% of the time. This level gives an indication of the sound level during the noisier periods of time in any given sample. It has been used over many years to measure and assess road traffic noise.

L_{AMAX} The maximum level of sound measured in any given period. This unit is used to measure and assess transient noises, i.e. gun shots, individual vehicles, etc.

- A7 The sound energy of a transient event may be described by a term SEL - Sound Exposure Level. This is the L_{Aeq} level normalised to one second. That is the constant level in dBA which lasting for one second has the same amount of acoustic energy as a given A weighted noise event lasting for a period of time. The use of this unit allows the prediction of the L_{Aeq} level over any period and for any number of events using the equation;

$$L_{AeqT} = SEL + 10 \log n - 10 \log T \text{ dB.}$$

Where

n = Number of events in time period T.

T = Total sample period in seconds.

- A8 In the open, known as free field, sound attenuates at a rate of 6 dB per each doubling of distance. This is known as geometric spreading or sometimes referred to as the Inverse Square Law. As noise is measured on a Logarithmic scale, this attenuation in distance = 20 Log (ratio of distances), e.g. for a noise level of 60 dB at ten metres, the corresponding level at 160 metres is:

$$60 - 20 \log \frac{160}{10} = 60 - 24 = 36 \text{ dB.}$$

- A9 Lowest Observed Adverse Effect Level (LOAEL): This is the level above which adverse effects on health and quality of life can be detected.
- A10 Significant Observed Adverse Effect Level (SOAEL): This is the level above which significant adverse effects on health and quality of life occur.

APPENDIX C

FIGURES

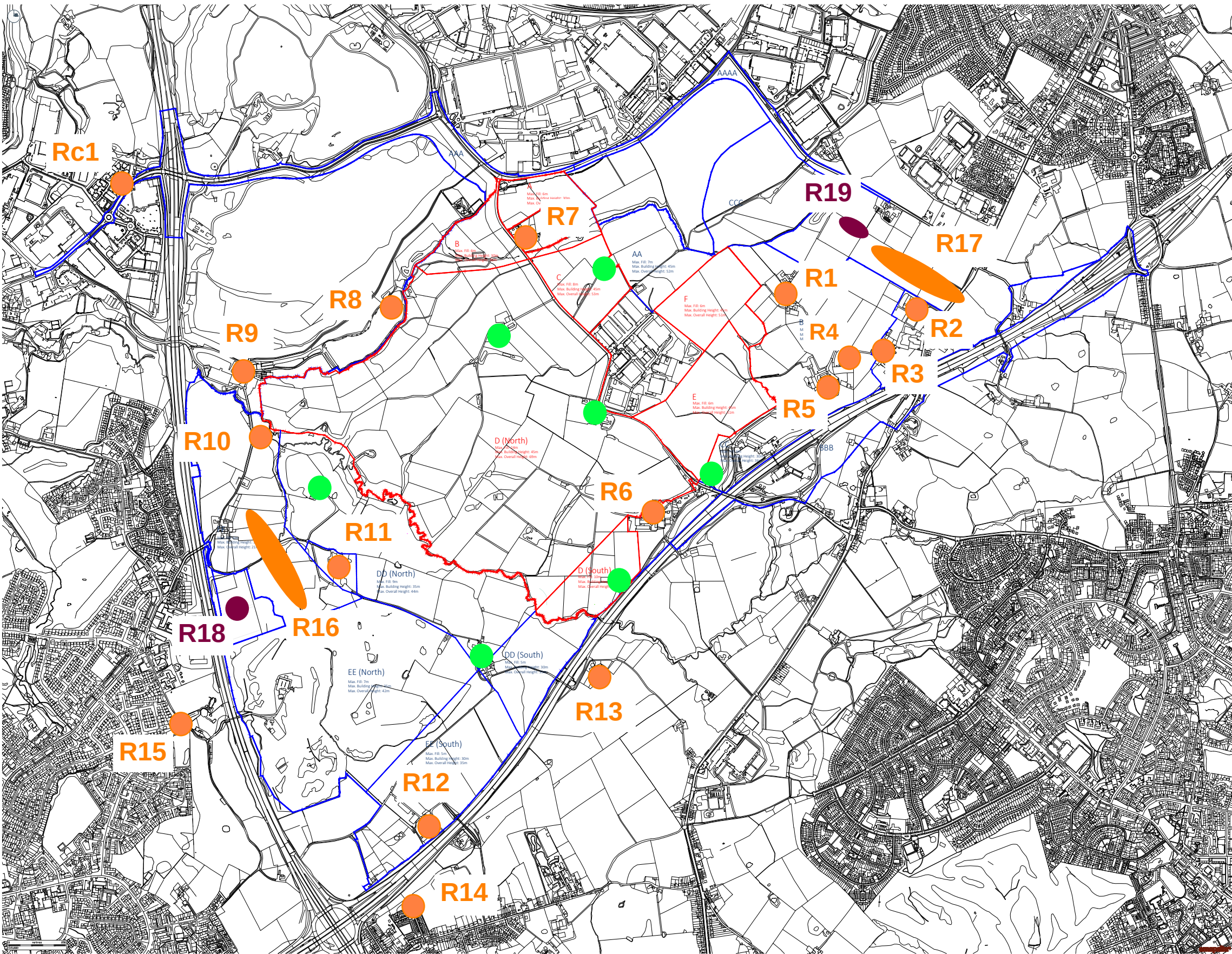
PROJECT:	Northern Gateway JPA 1.1
CLIENTS:	Northern Gateway Development Vehicle LLP
FIGURE NUMBER:	9.1
FIGURE TITLE:	Noise Sensitive Receptor Plan
DATE:	March 2025

Key

- Noise Sensitive Receptor
- Noise Sensitive Receptor (Depending on Phasing)
- Proposed / Committed Residential Receptors
- Educational Facility Receptors

Note:
Locations are representative of individual and groups of sensitive receptors

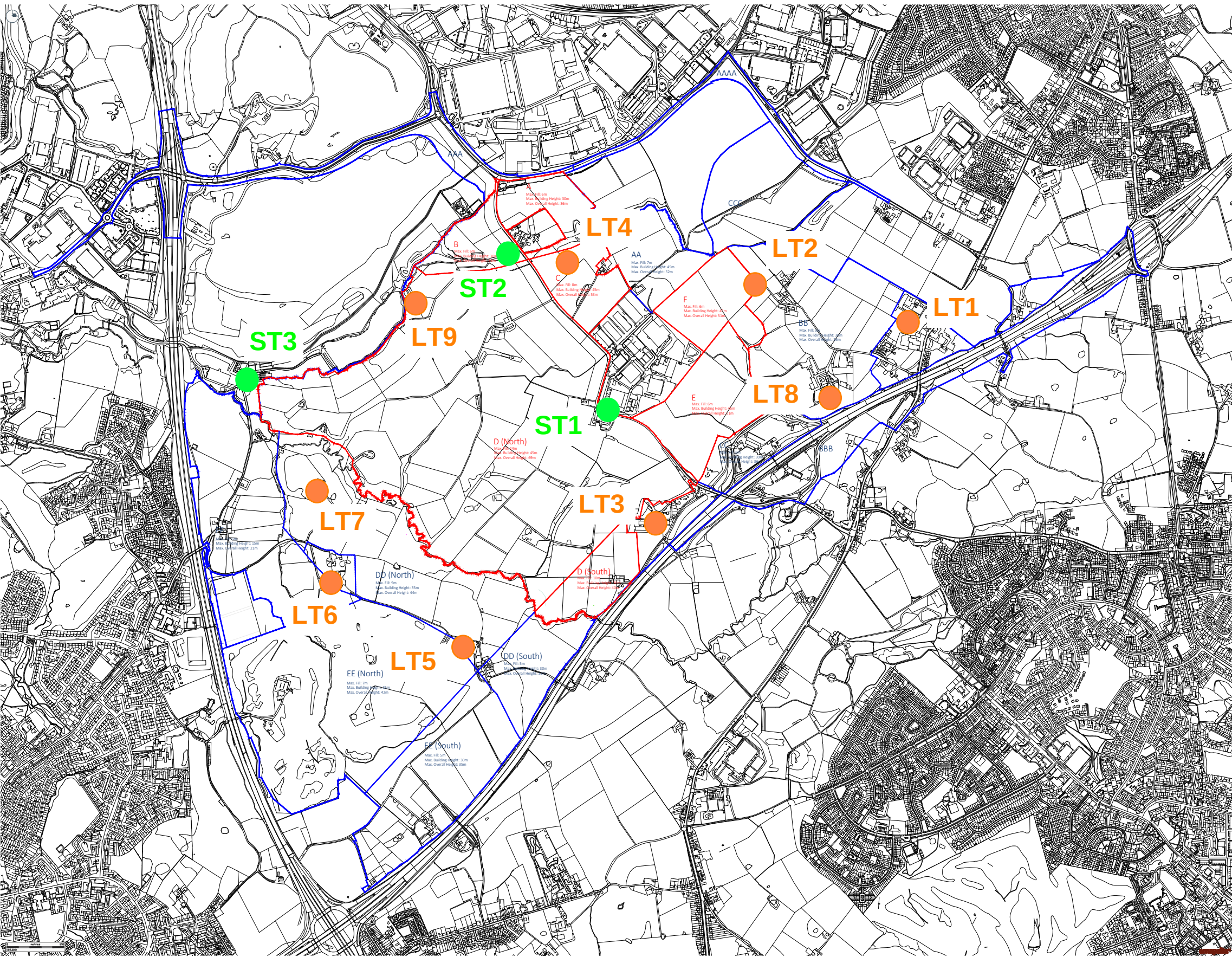
Scale: Not to Scale



PROJECT:	Northern Gateway JPA 1.1
CLIENTS:	Northern Gateway Development Vehicle LLP
FIGURE NUMBER:	9.2
FIGURE TITLE:	Noise Monitoring Location Plan
DATE:	April 2025

- Key
- (LT) Long-term unattended location
- (ST) Short-term attended location

Scale: Not to Scale

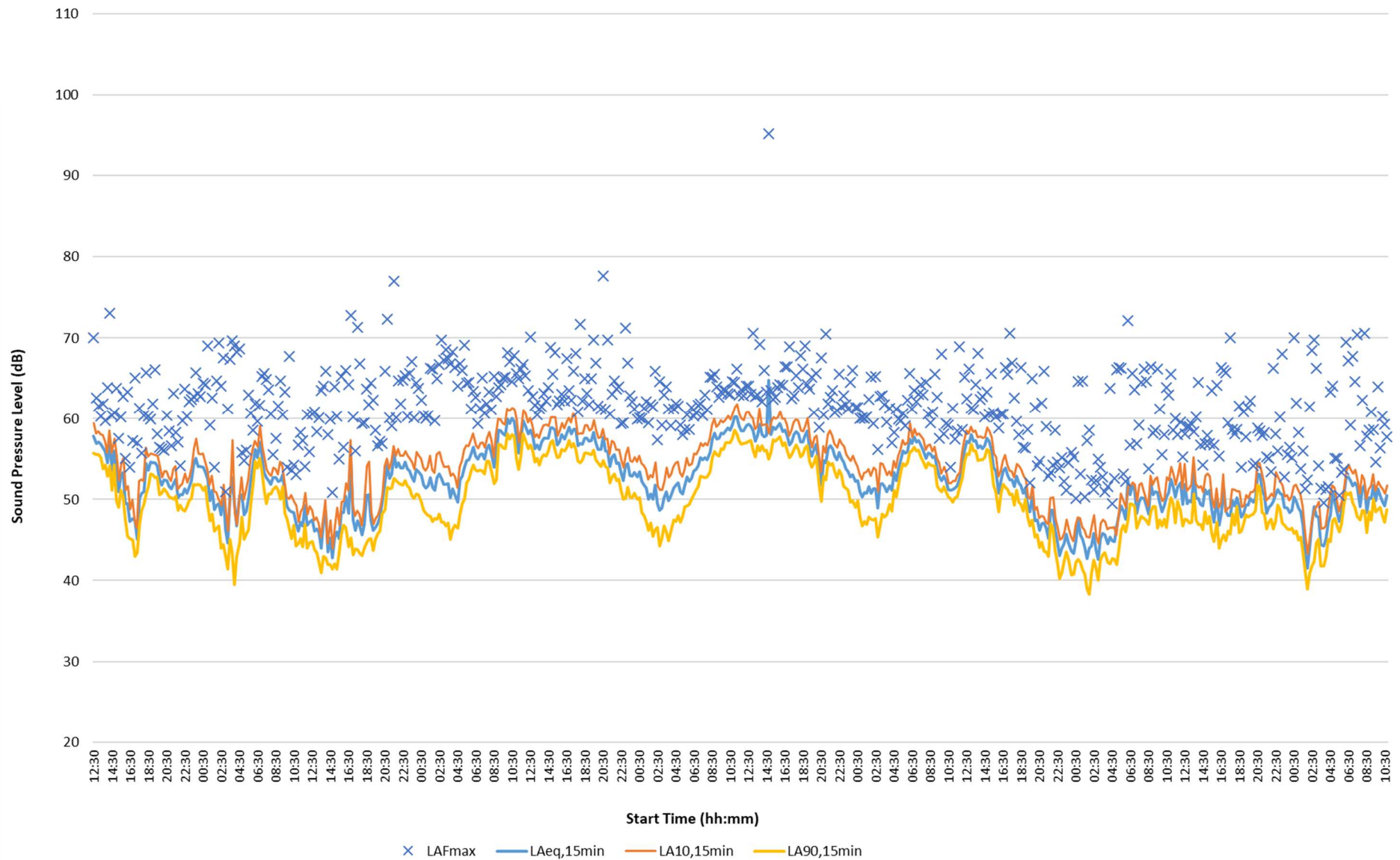


APPENDIX D

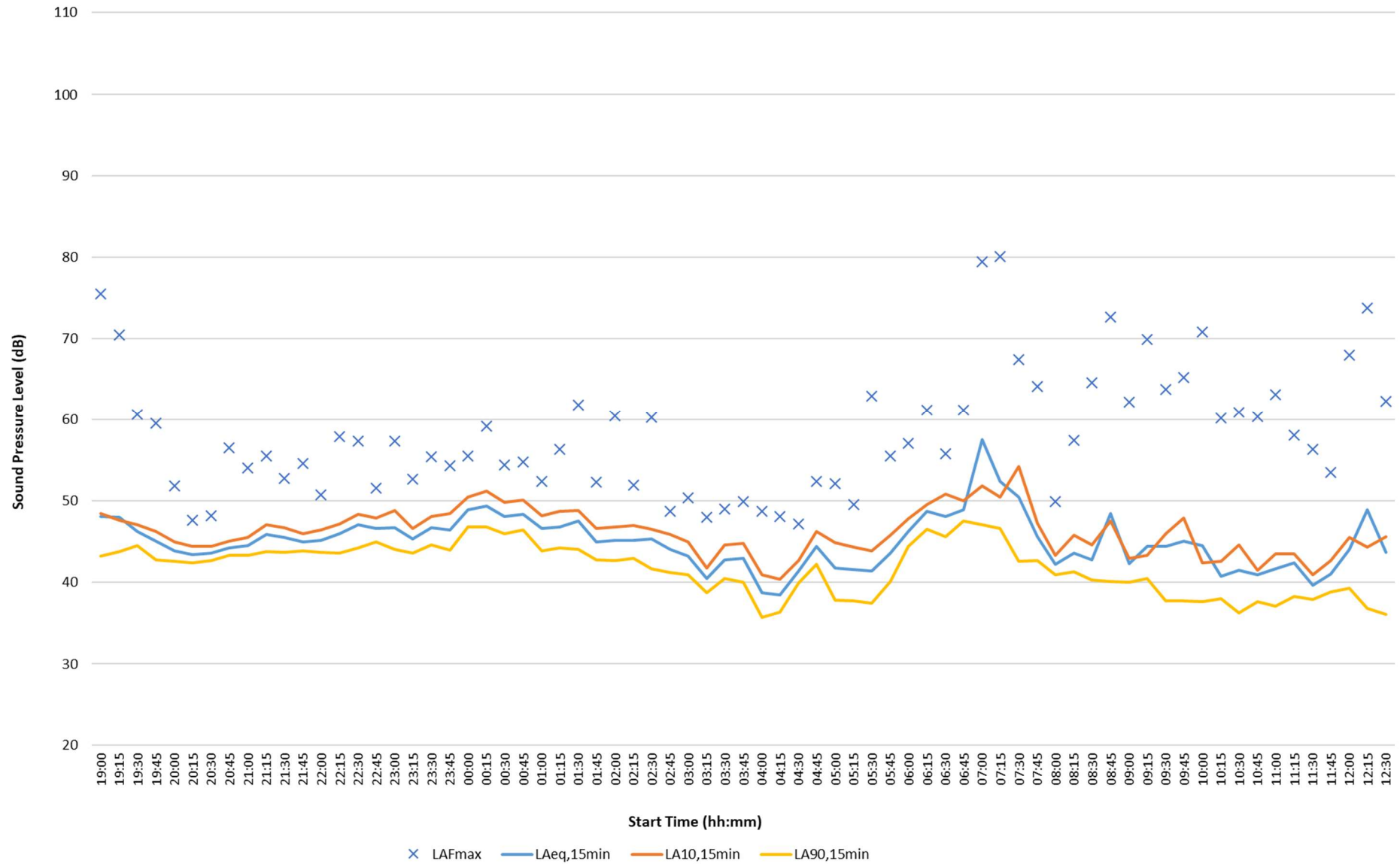
NOISE SURVEY DATA

**(INCLUDING NOISE SURVEY TIME HISTORY GRAPHS, BACKGROUND NOISE LEVEL GRAPHS
and WEATHER DATA SUMMARY)**

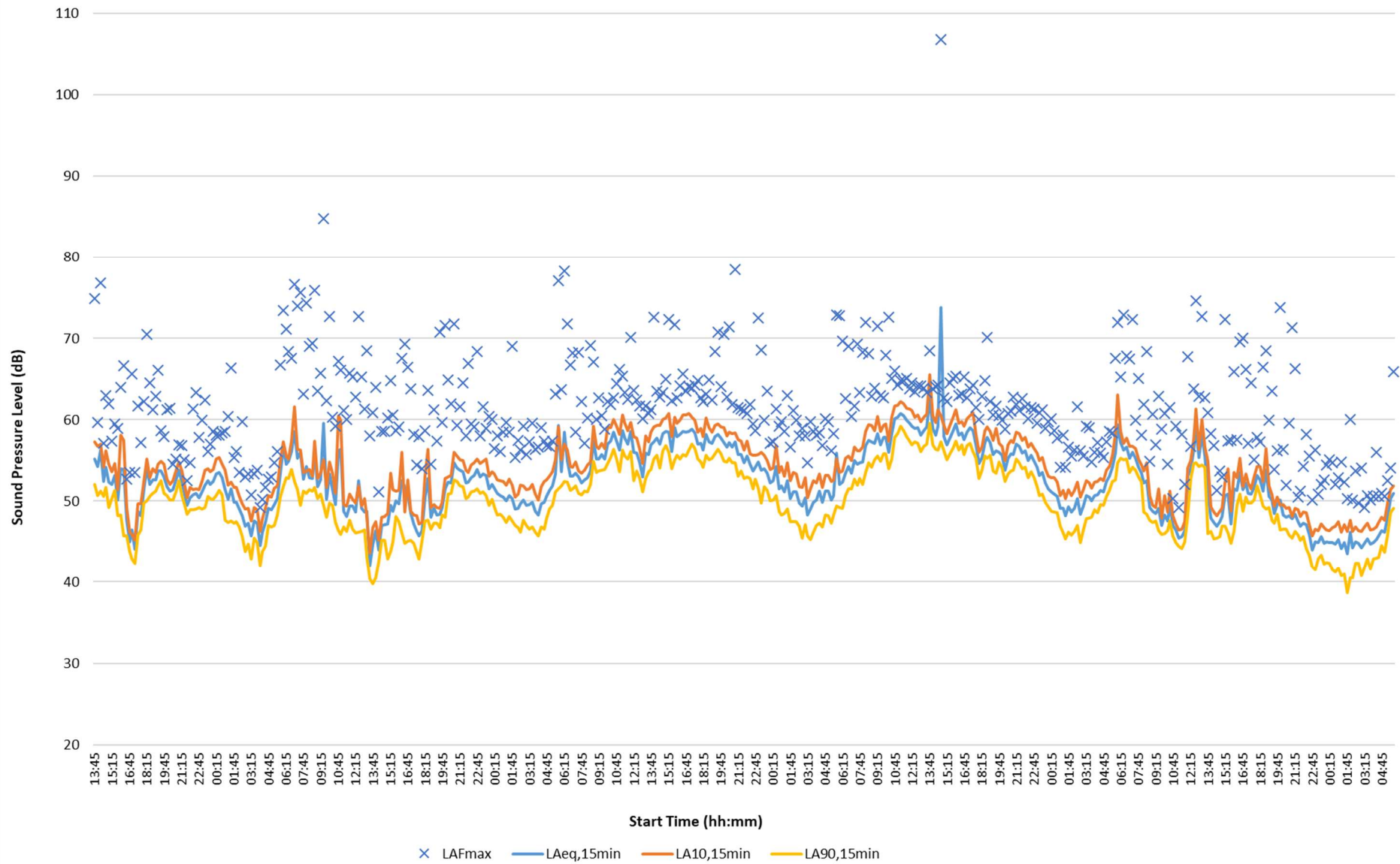
Northern Gateway LT1 (29/08/24 to 04/09/24)



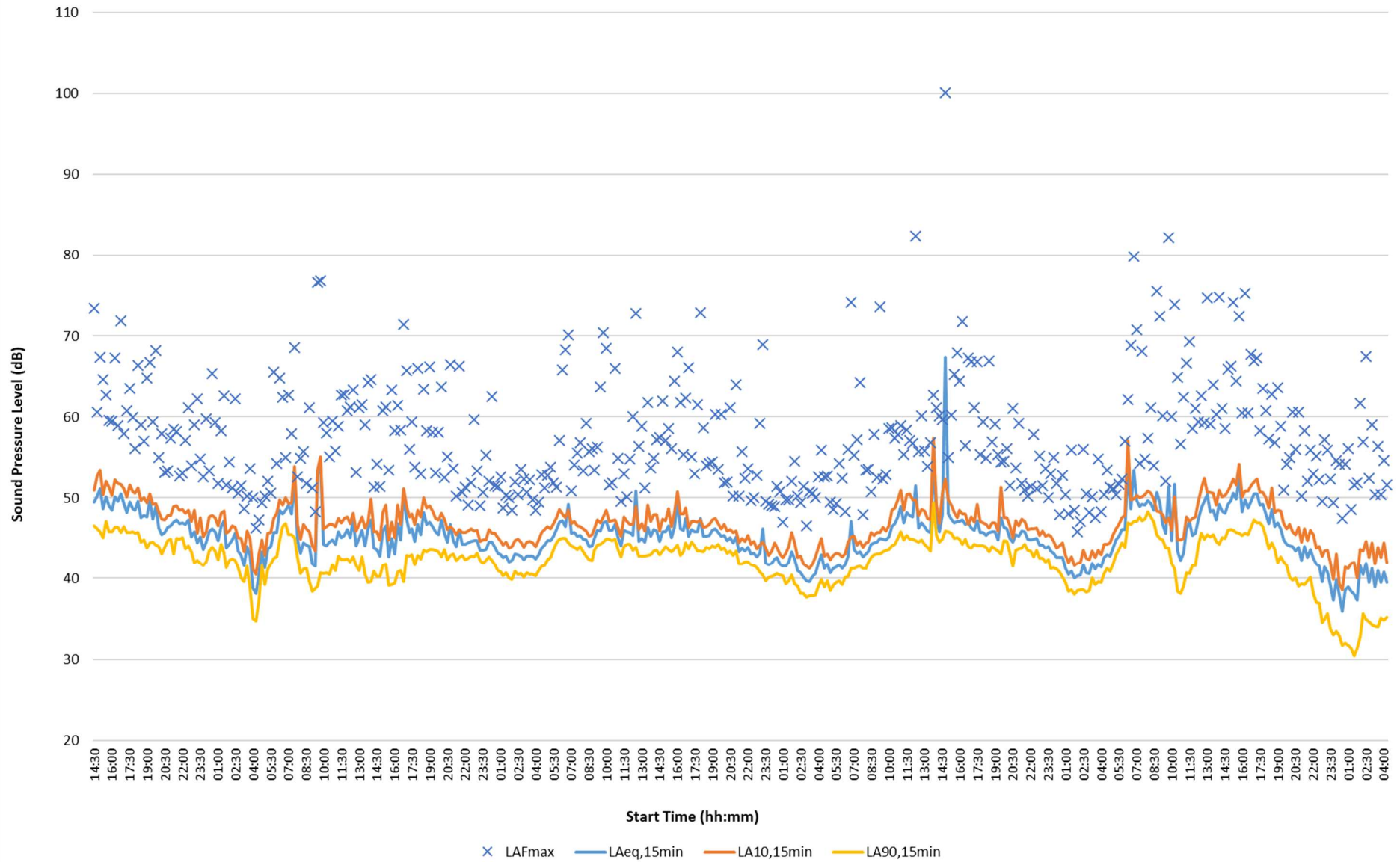
Northern Gateway LT2 (29/08/25 to 30/08/25)



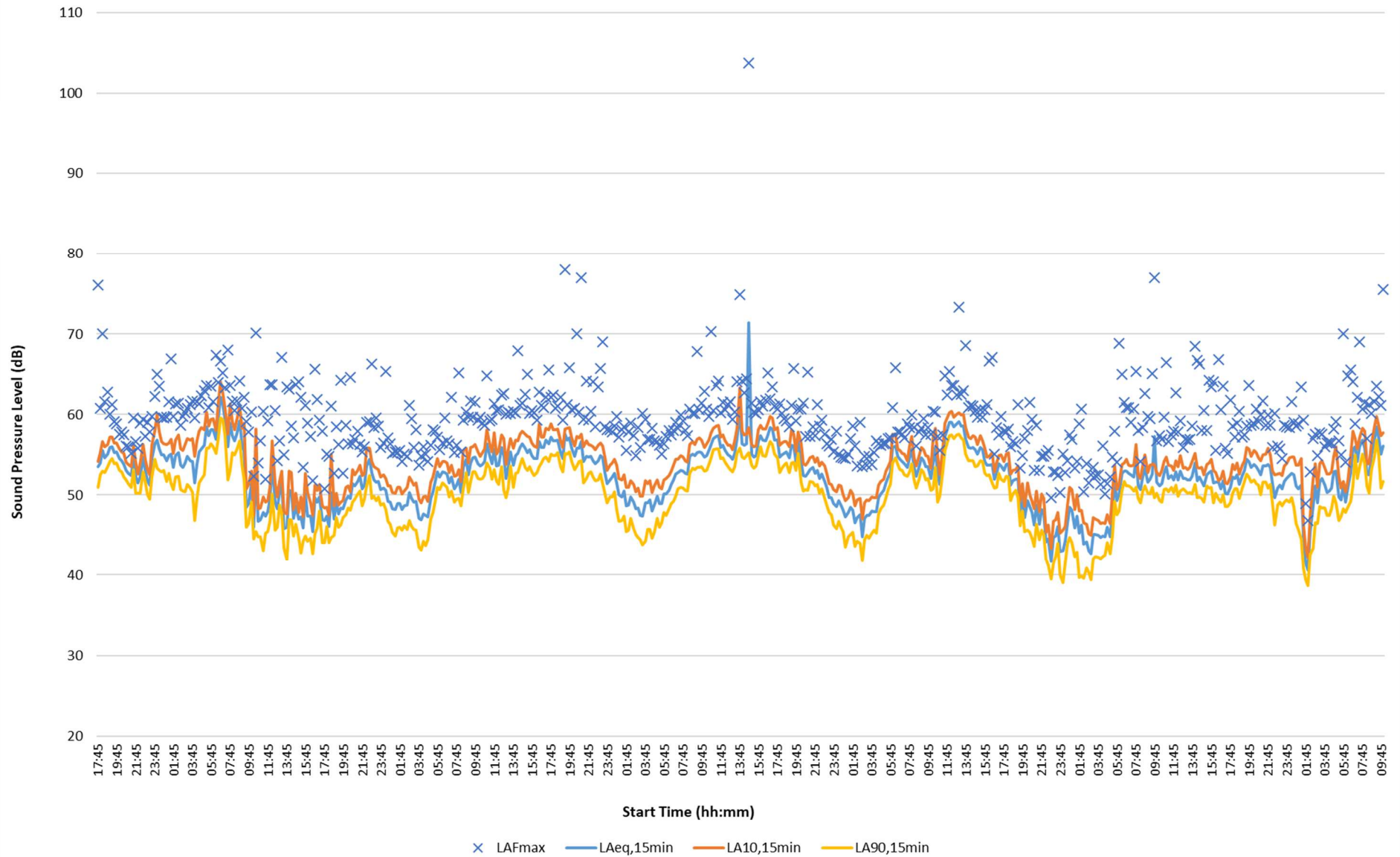
Northern Gateway LT3 (29/08/24 to 03/09/24)



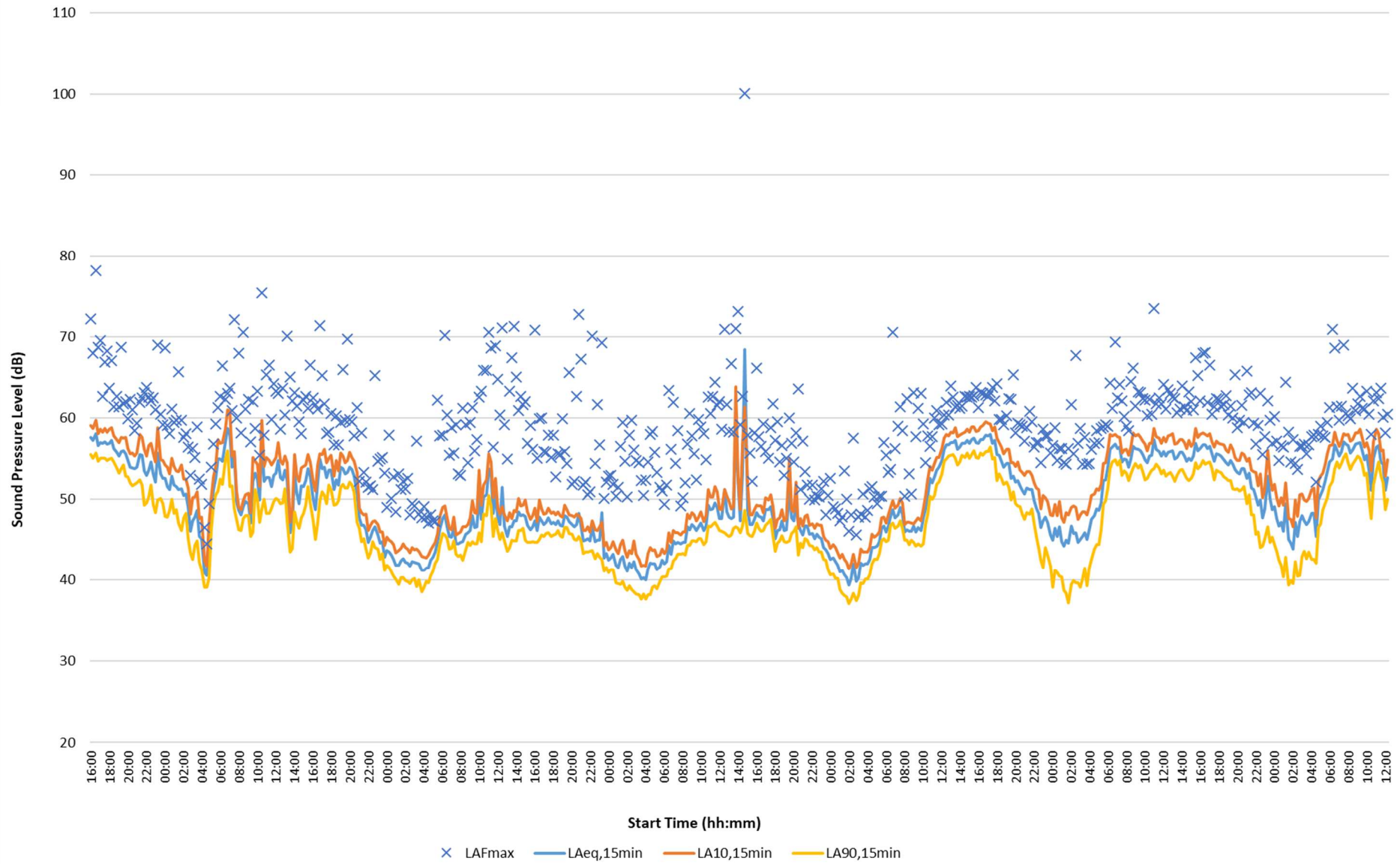
Northern Gateway LT4 (29/08/24 to 03/09/24)



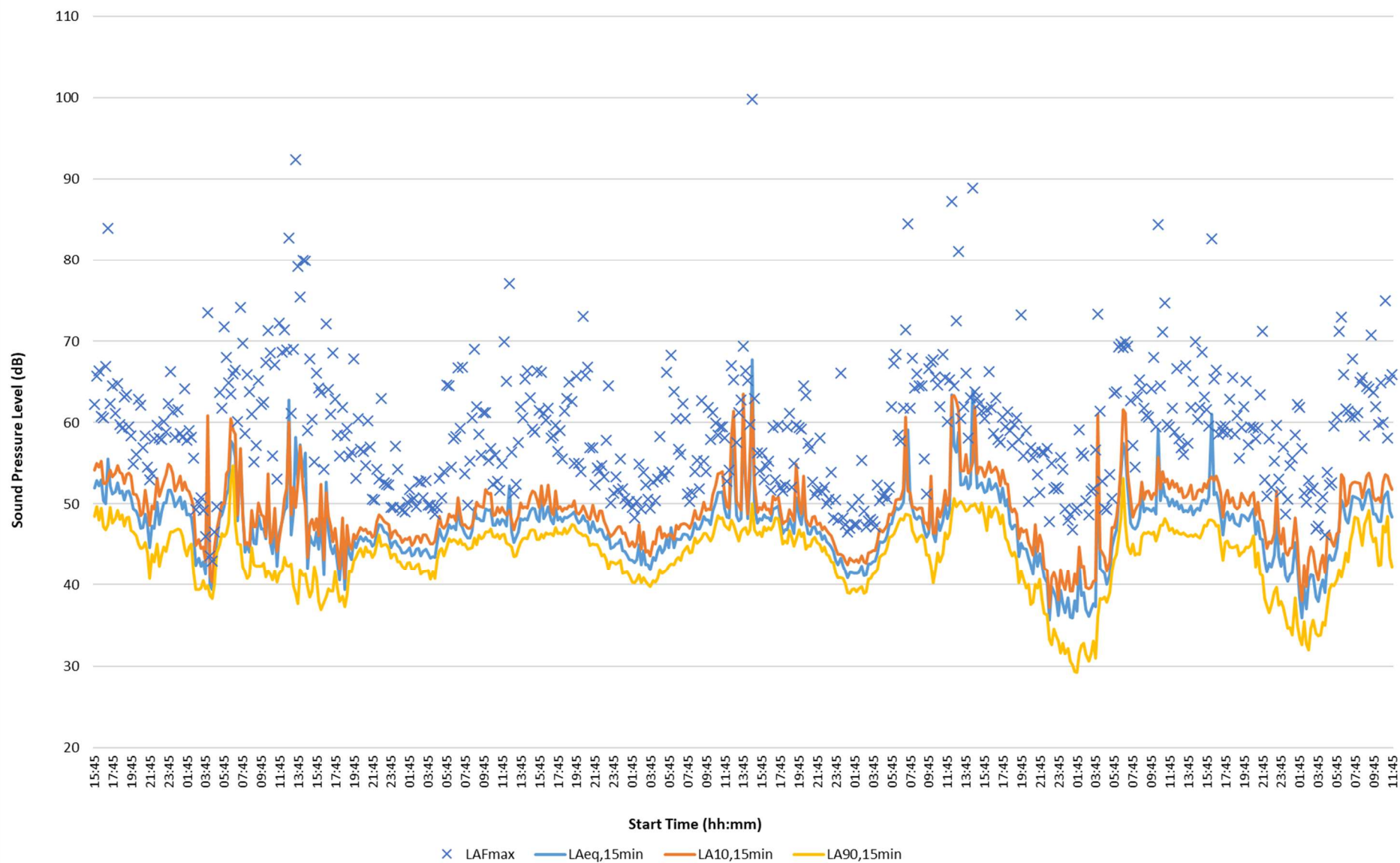
Northern Gateway LT5 (29/08/24 to 04/09/24)



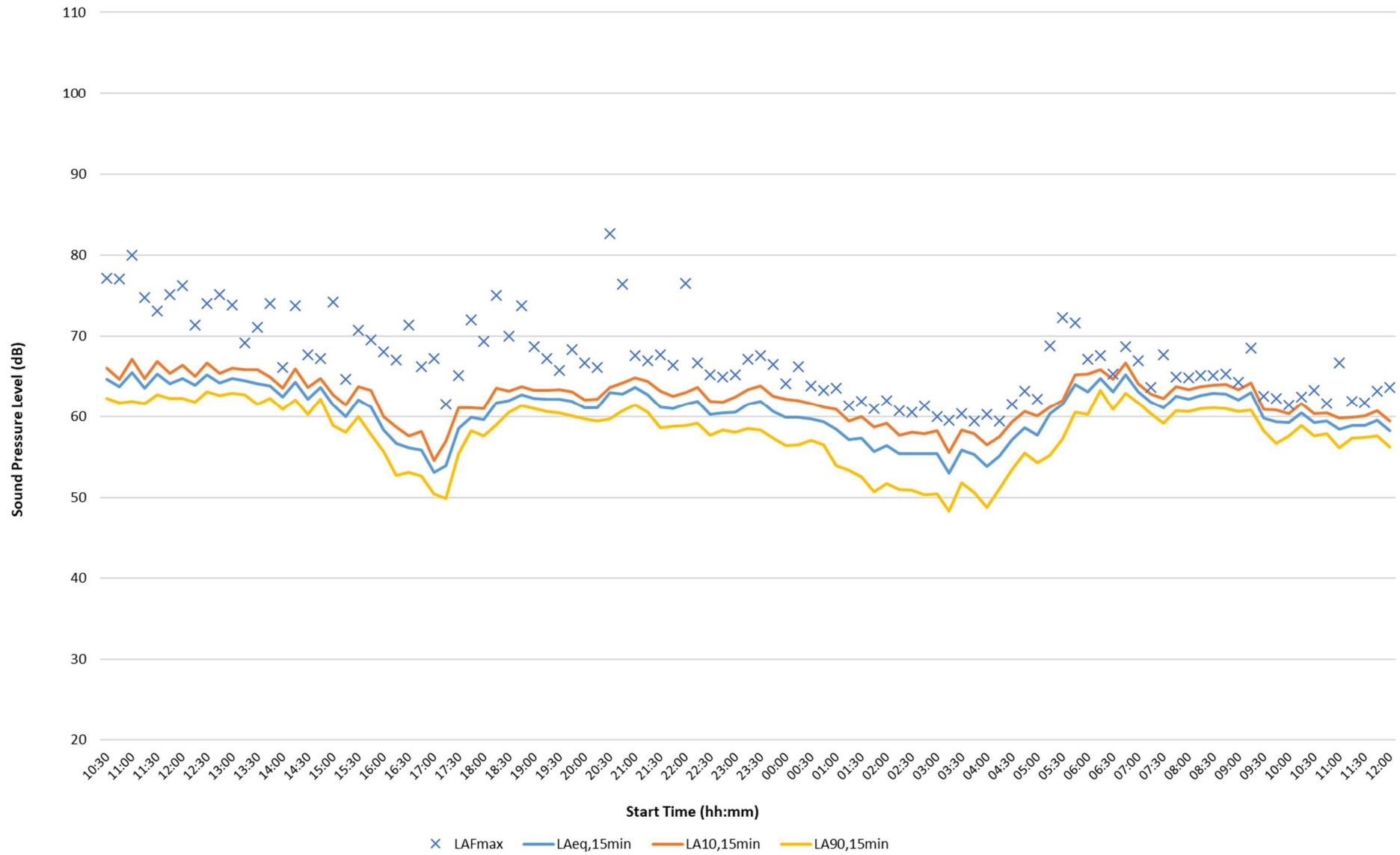
Northern Gateway LT6 (29/08/24 to 04/09/24)



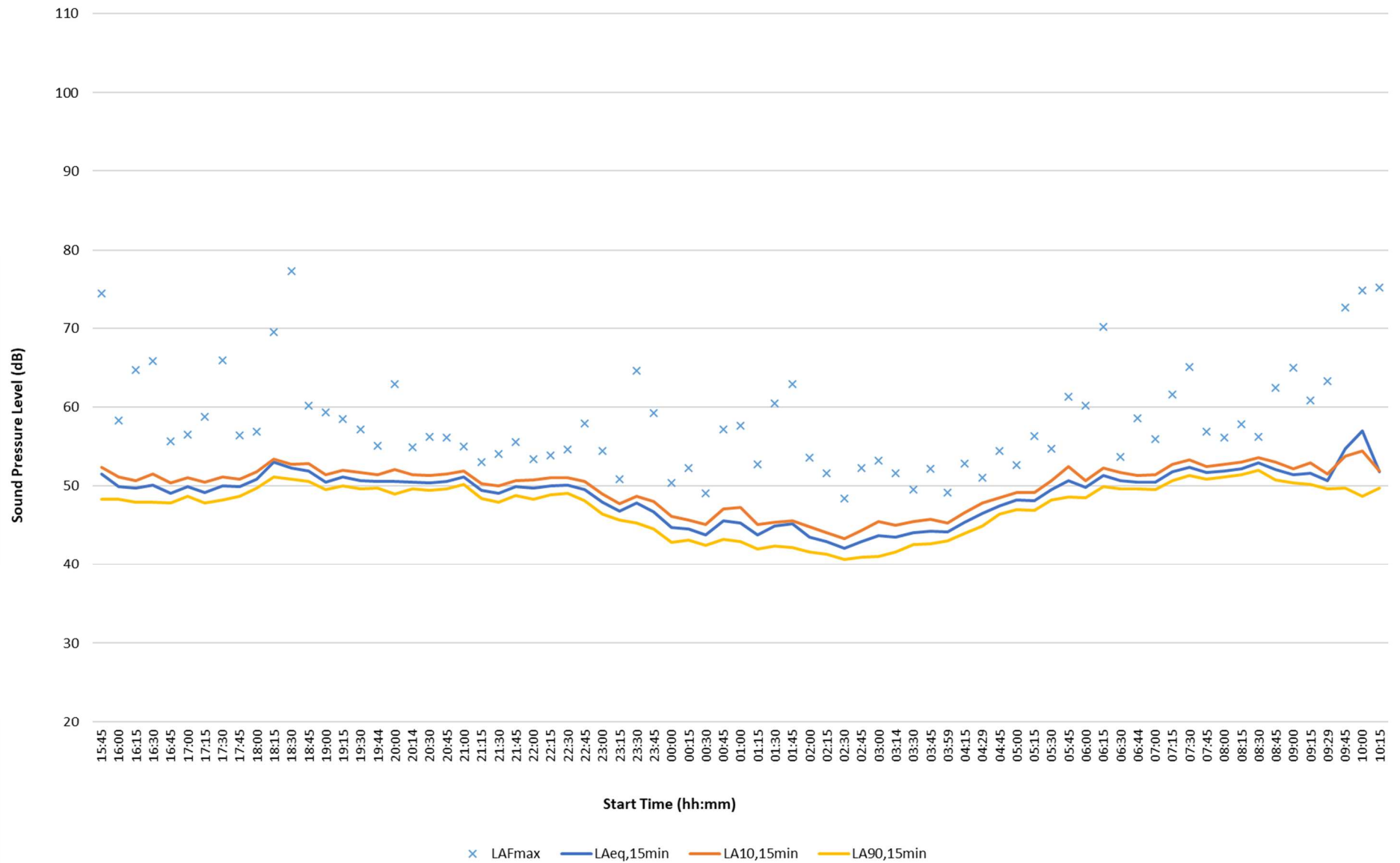
Northern Gateway LT7 (29/08/24 to 04/09/24)



Northern Gateway LT8 (29/08/24 to 30/08/24)

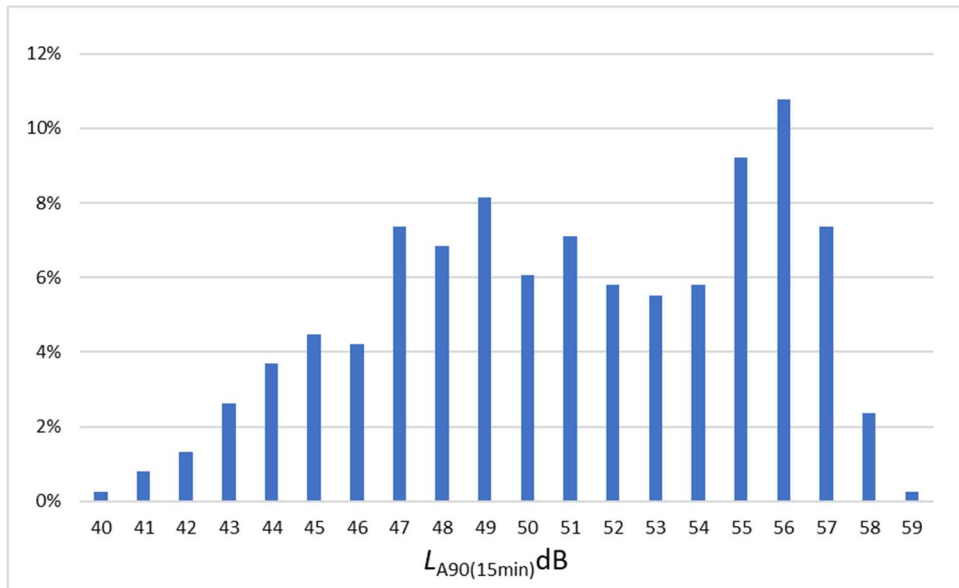


Northern Gateway LT9 (23/10/24 to 24/10/24)

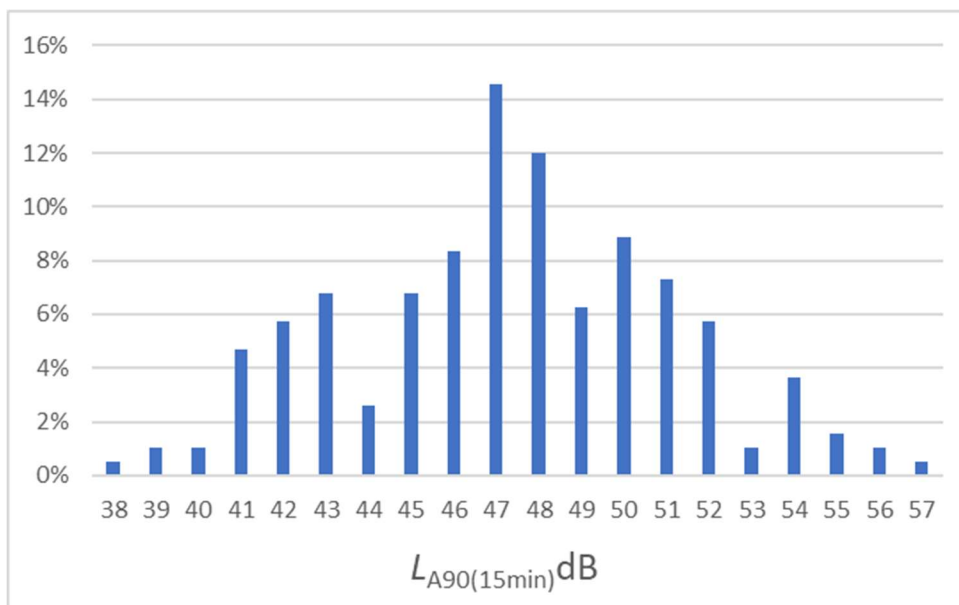


Measured Background Noise Level Graphs

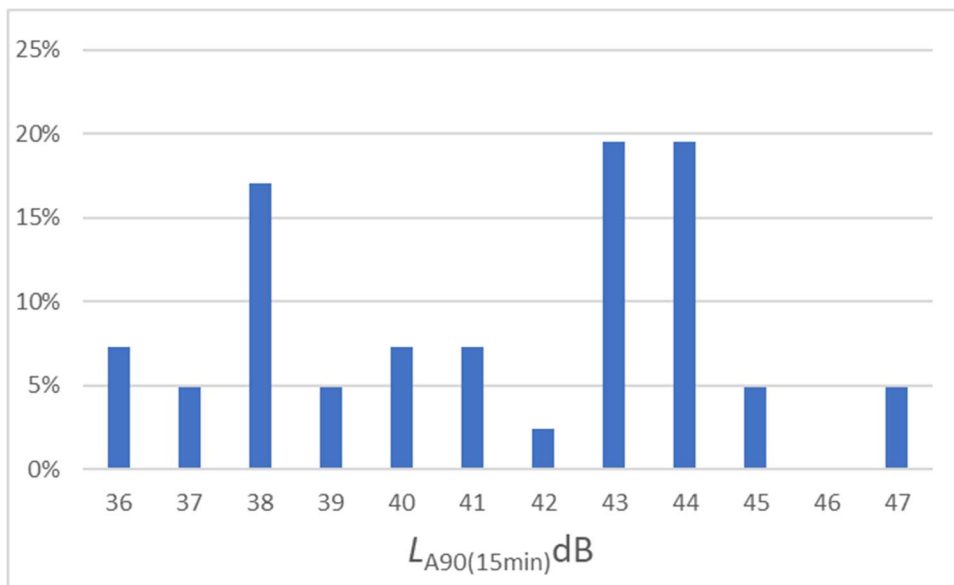
LT1: Daytime



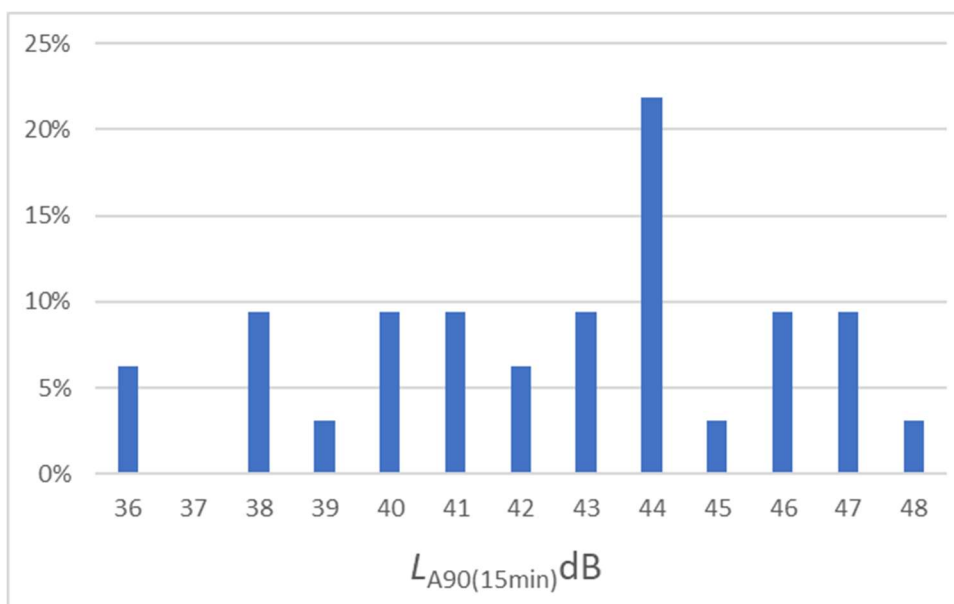
LT1: Night-time



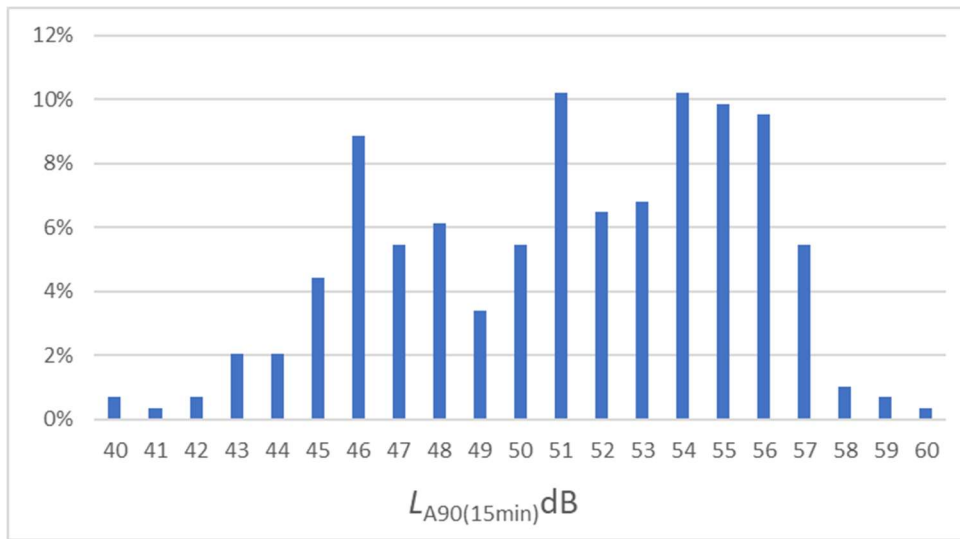
LT2: Daytime



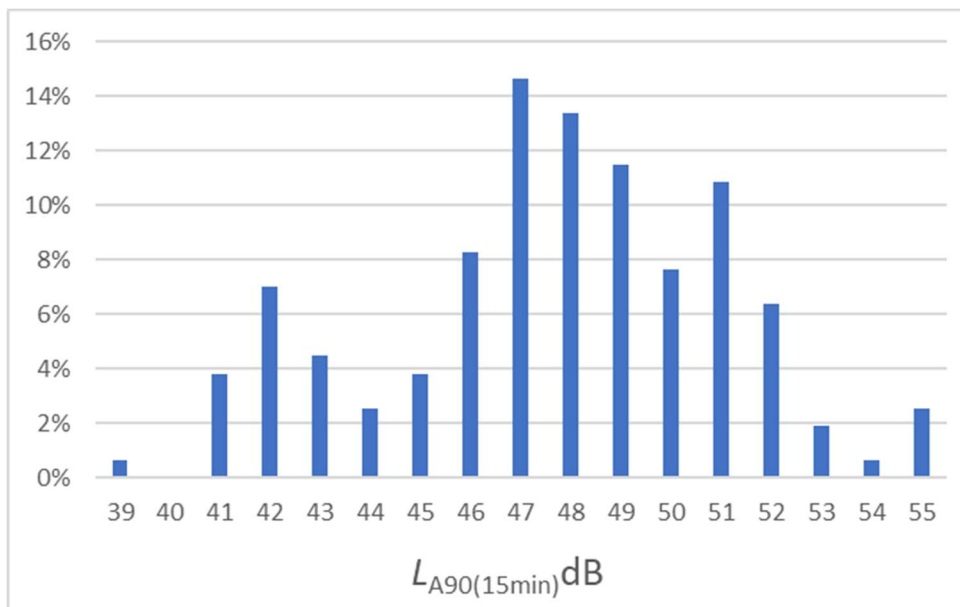
LT2: Night-time



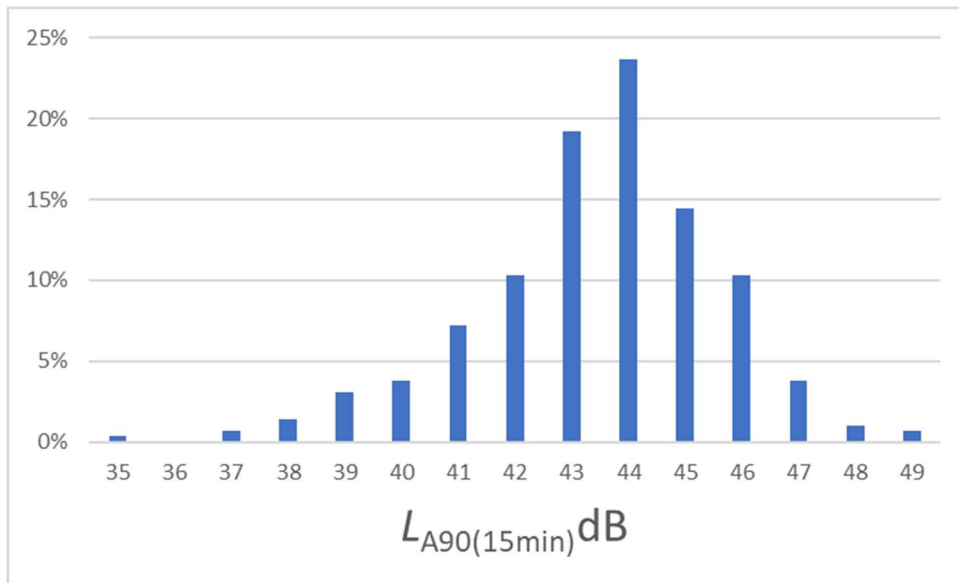
LT3: Daytime



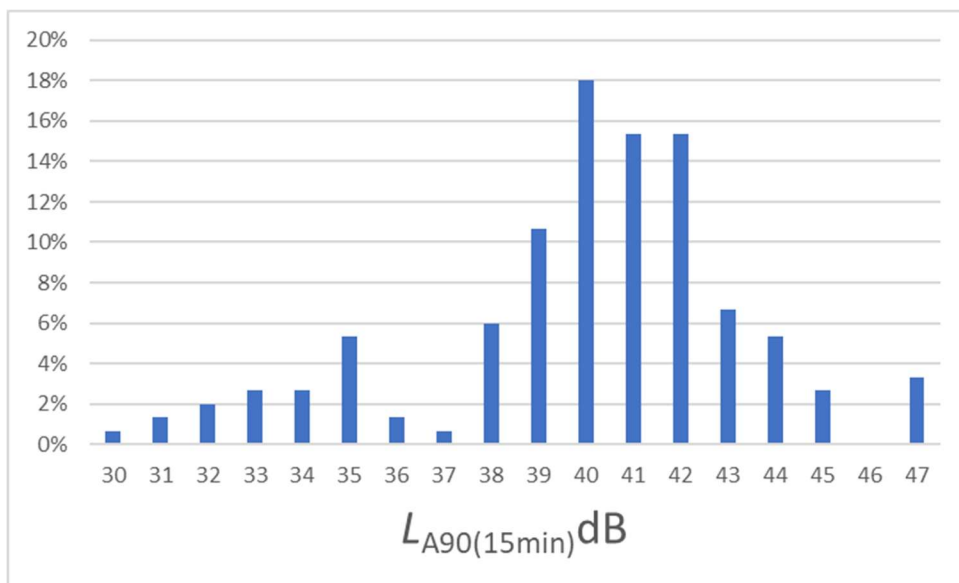
LT3: Night-time



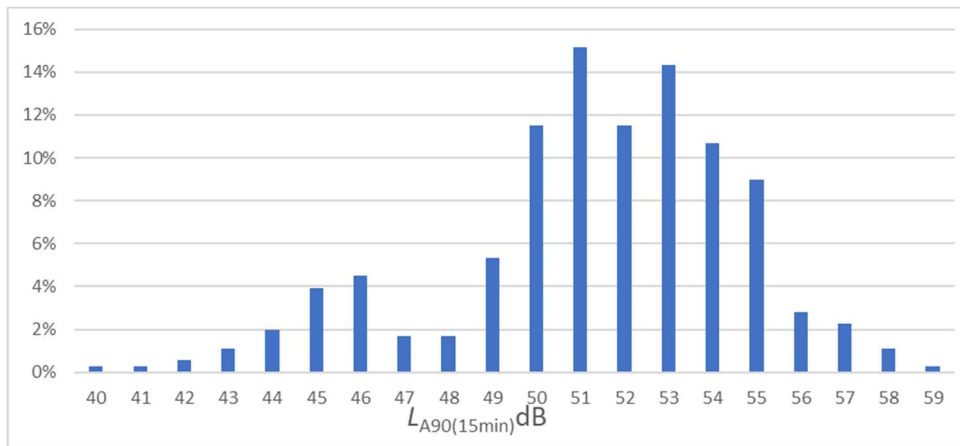
LT4: Daytime



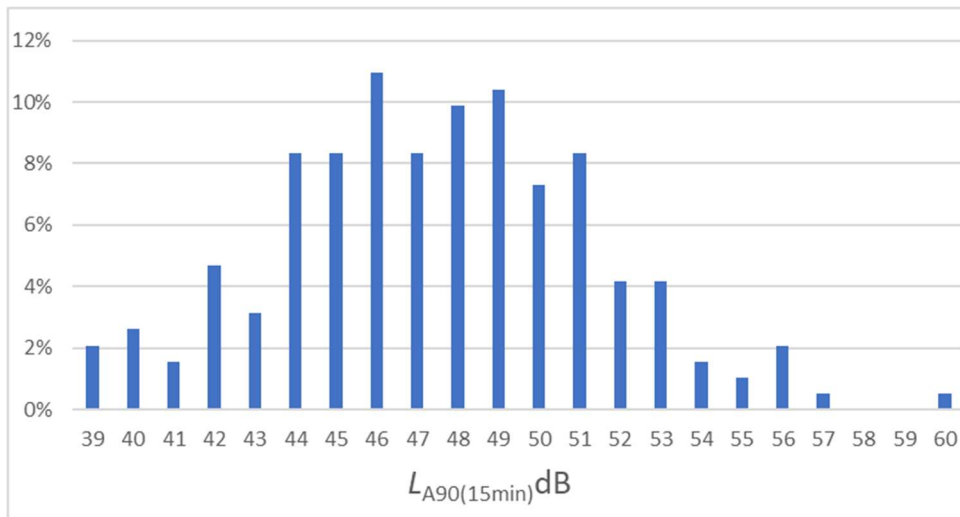
LT4: Night-time



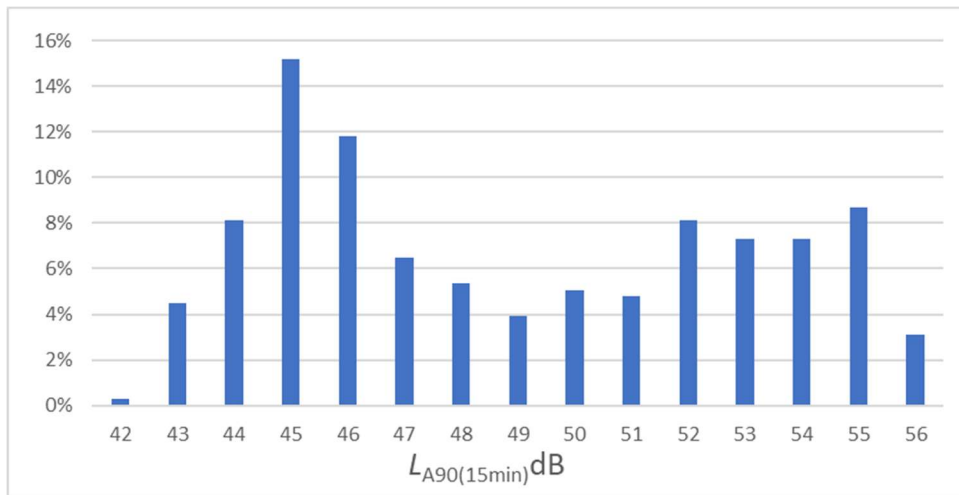
LT5: Daytime



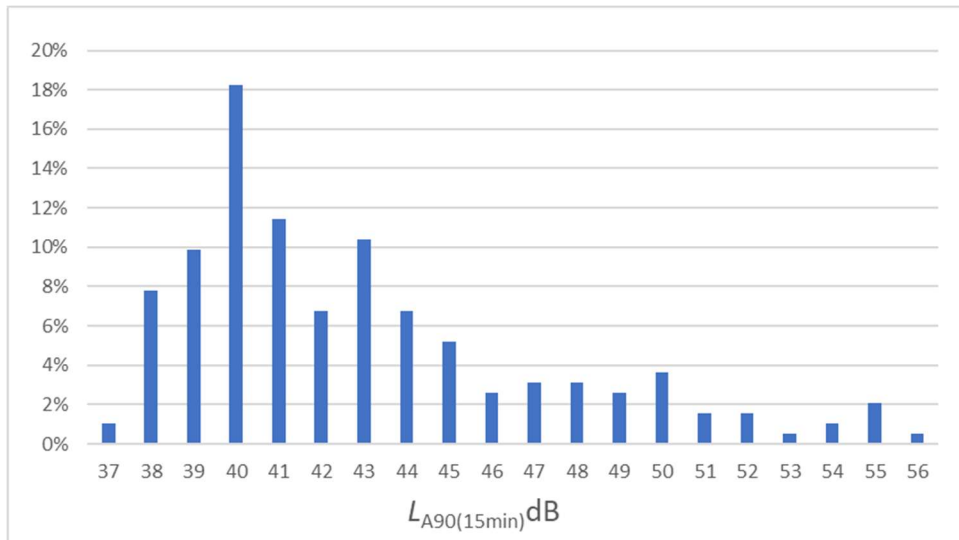
LT5: Night-time



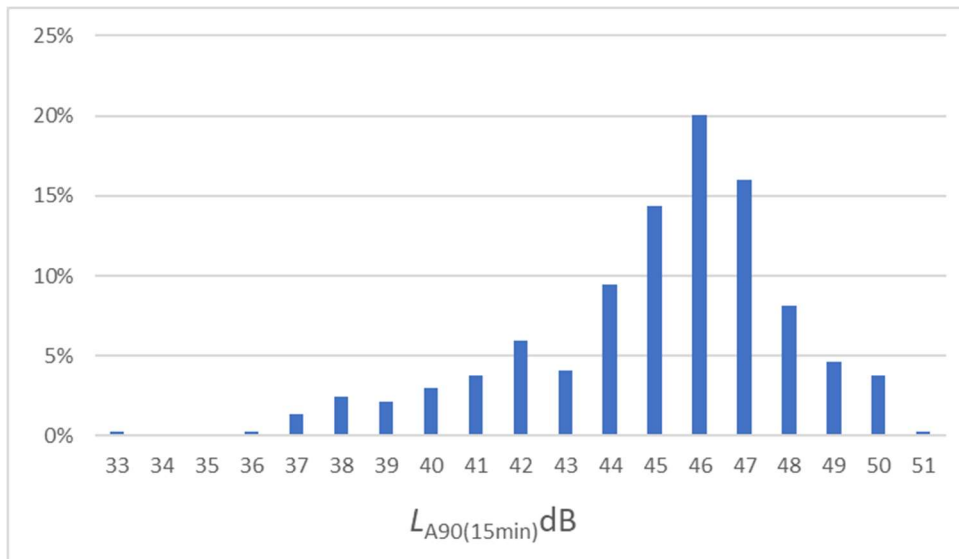
LT6: Daytime



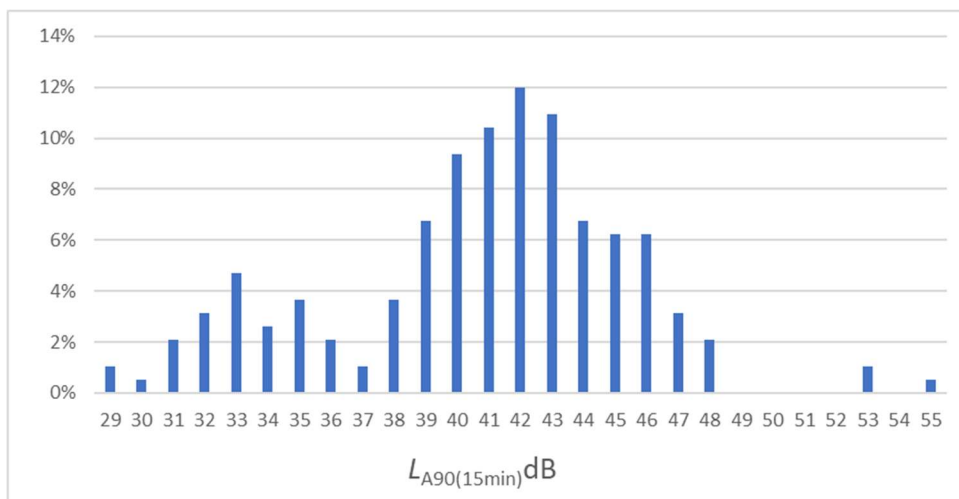
LT6: Night-time



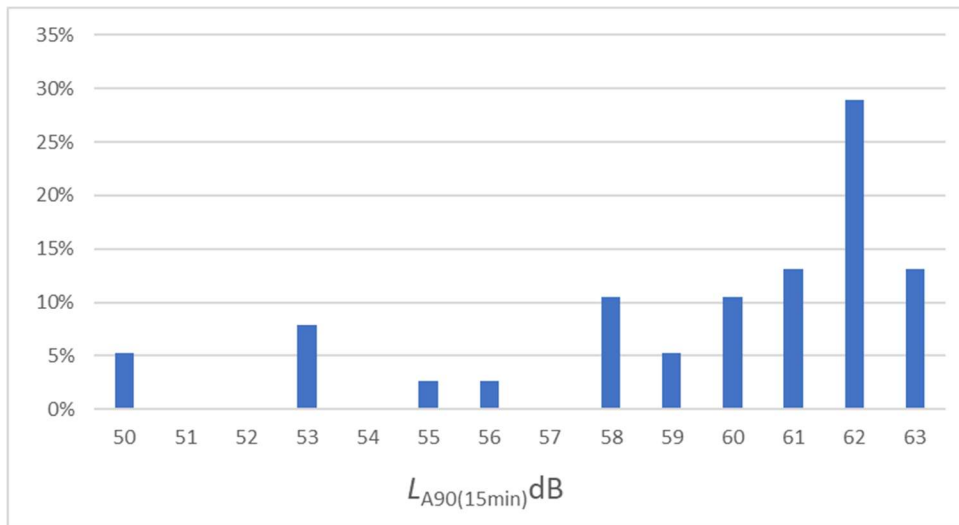
LT7: Daytime



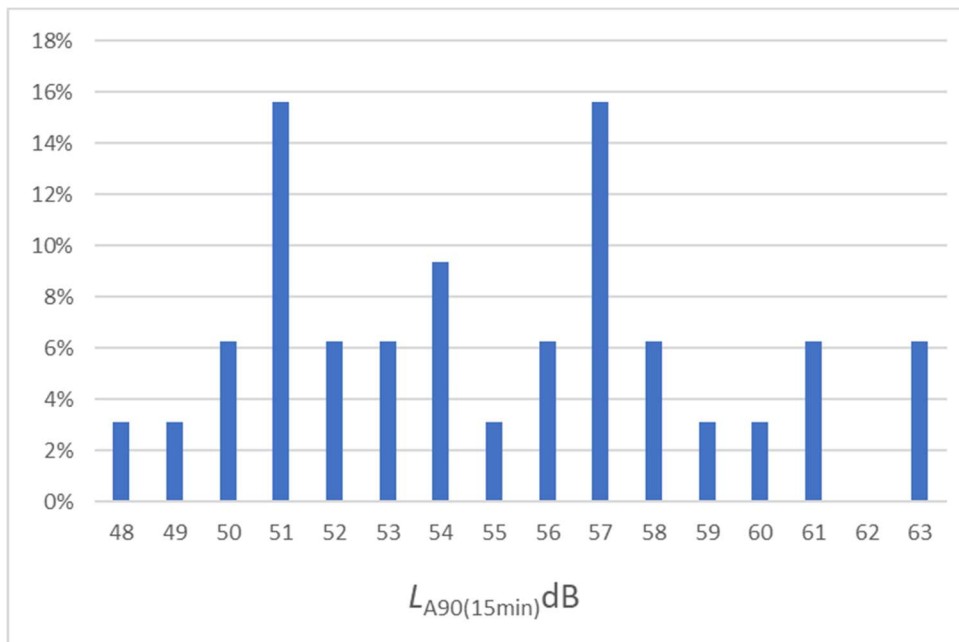
LT7 Night-time



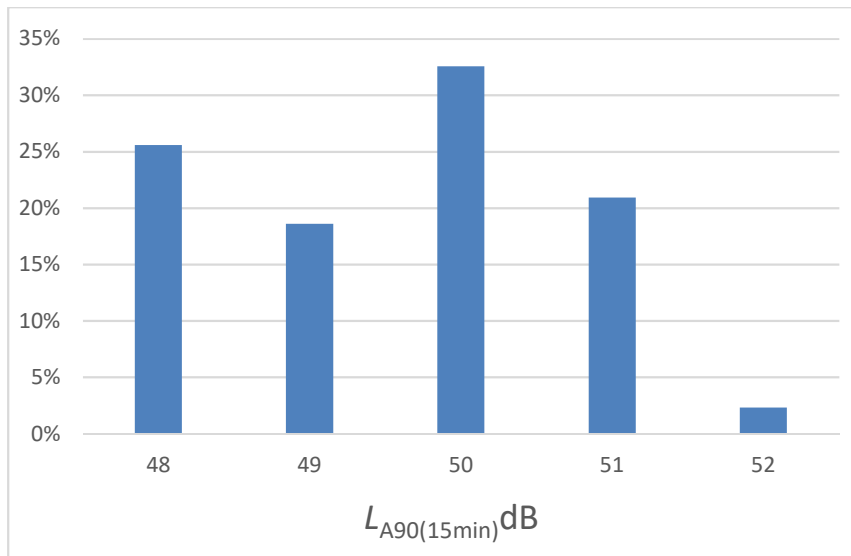
LT8: Daytime



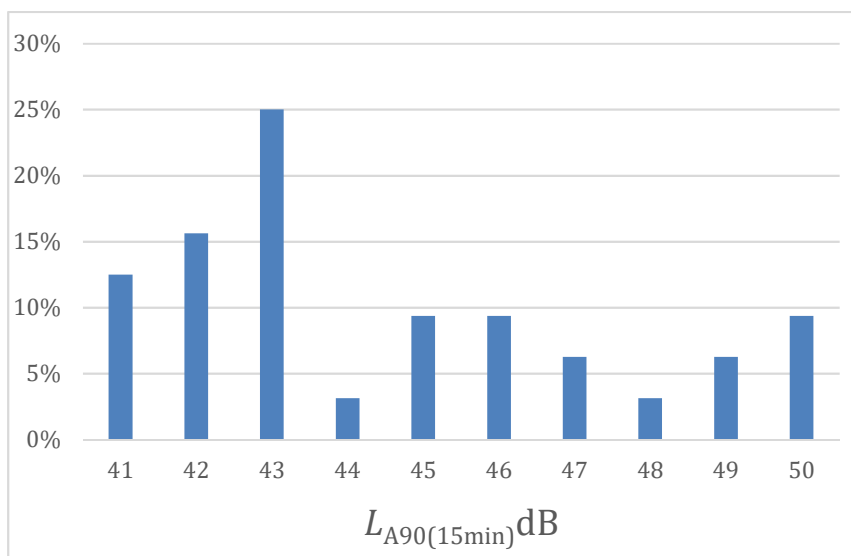
LT8: Night-time



LT9: Daytime



LT9: Night-time



Measured Weather Data (28/08/24 to 04/09/24)

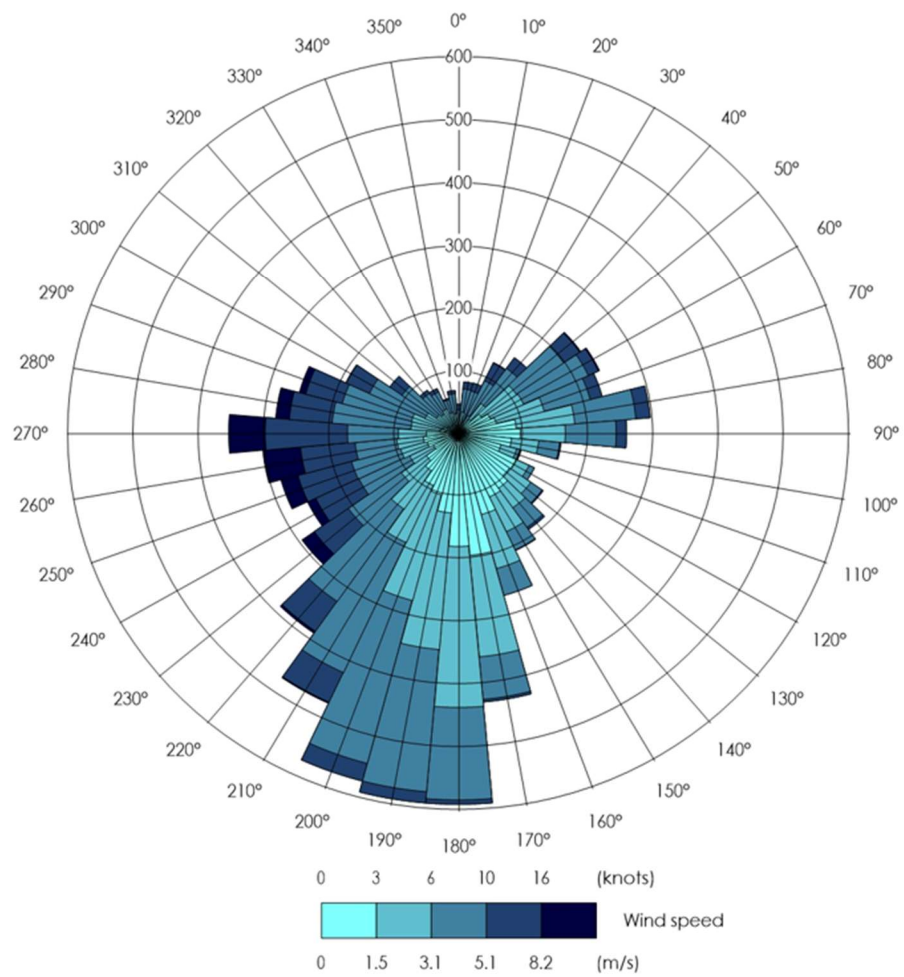
Date	Time	Average Wind Speed (m/s)*	Average Wind Direction	Max Wind Speed (m/s)*	Rainfall**
29/08/2024	13:00-19:00	0 to 0.4	NE	5.8	0
	19:00-23:00	0	NE	0.9	0
	23:00-07:00	0	SE	0.9	0
30/08/2024	07:00-13:00	0 to 0.4	SW	2.7	0
	13:00-19:00	0	SW	2.7	0
	19:00-23:00	0 to 0.4	N	1.8	0
	23:00-07:00	0 to 0.4	NW	2.7	0
31/08/2024	07:00-13:00	0 to 0.9	ENE	4.9	0
	13:00-19:00	0.9 to 1.3	ENE	5.8	0
	19:00-23:00	0.9	ENE	5.4	0
	23:00-07:00	0.4 to 1.3	ENE	5.4	0
01/09/2024	07:00-13:00	0.9 to 1.8	ENE	6.3	0
	13:00-19:00	0 to 1.3	ENE	4.9	3No.
	19:00-23:00	0 to 0.9	ENE	3.6	2No.
	23:00-07:00	0 to 0.4	NNW	3.1	1No.
02/09/2024	07:00-13:00	0 to 0.4	NNW	1.3	2No.
	13:00-19:00	0 to 0.9	SW	1.3	2No.
	19:00-23:00	0	E	0.4	0
	23:00-07:00	0	ESE	0.9	0
03/09/2024	07:00-13:00	0 to 0.4	SW to NE	2.7	0
	13:00-19:00	0 to 0.4	SW to ENE	3.6	0
	19:00-23:00	0	ENE	0.9	0
	23:00-07:00	0	SW	1.3	2No.
04/09/2024	07:00-13:00	0 to 0.4	SW	3.6	0
	13:00-19:00	0	SW	1.8	0

*Average wind speed over 30 minute measurement periods - range presented. Max Wind speeds – max gust recorded over time period

**Denotes number of periods (30 minute continuous measurement periods over the extent of the noise survey) when rainfall was recorded.

Windrose

2023 Manchester Airport Meteorological Data



Sourced from Redmore Environmental (ES Figure 10.5)