

Be First

Welbeck Wharf, River Road, Barking

Noise Impact Assessment 16 November 2020 Fix



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Contents

1	Introduction	1
2	Guidance and Standards	2
2.1	Local Authority Acoustic Requirements – London Borough of Barking and Dagenham.....	2
2.2	National Planning Policy Framework, 2019	2
2.3	Noise Policy Statement for England, 2010	3
2.4	National Planning Practice Guidance, England	4
2.5	New London Plan.....	6
2.6	British Standard 4142:2014+A1:2019	6
3	Site Description	8
4	Baseline Sound Conditions	10
4.1	Noise Monitoring Methodology	10
4.2	Survey Results	12
5	Noise Impact Assessment – Static Plant	13
6	Noise Impact Assessment – Operational Noise (B2 Industrial Activity)	14
6.1	Site Based B1/B2 Vehicular Movements	14
6.2	B2 Activity Noise Break-Out.....	14
7	Conclusion	17

Appendix A - Glossary of Acoustic Terminology

Appendix B - Sound Survey Results

1 Introduction

It is understood that planning permission is being sought for the change of use of the existing B8 commercial storage and distribution facility at Welbeck Wharf, River Road, Barking, to accommodate light industrial, B2 (general industrial) and B8 (storage and distribution).

Accordingly, MLM Consulting Engineers Ltd has been commissioned by Be First to undertake an assessment of the potential impact of sound from the proposed change of use of the Welbeck Wharf site from B8 to flexible light industrial B2 and B8 uses.

Accordingly, this report presents the results of a sound monitoring exercise, carried out at the proposed site to determine the existing sound climate at the nearest noise-sensitive receptors to the proposed development, as a basis for the subsequent assessment.

The report also presents an assessment of the potential impacts in line with BS 4142 guidance and provides an assessment of the likely audibility of noise from the proposed B2 uses within the warehouses. Accordingly, where the assessment identifies an exceedance of either the BS 4142-led criteria or the proposed inaudibility criteria, outline advice is provided relating to noise mitigation needed to appropriately limit off-site impacts.

Noise emission limits have also been provided for the total sound emission of all the fixed plant and machinery associated with the change of use on the site, in line with LPA requirements. Provided that the sound levels from all fixed plant and machinery do not exceed the stated noise criteria, whether through the application of noise control techniques or otherwise, the impact of noise from such sources is predicted to have no more than a low impact on existing sensitive receptors.

This report contains references of a technical nature, a glossary of acoustic terminology has therefore been provided in Appendix A to assist in any interpretation.

Full tabulated and charted measurement results are presented in Appendix B.

2 Guidance and Standards

2.1 Local Authority Acoustic Requirements – London Borough of Barking and Dagenham

Based on previous experience on projects within the LBBDD, we understand that the likely planning requirements applied to this development are as set out below.

Noise from Commercial Use

The combined rating level of the noise from any plant installed pursuant to this permission (other than plant which is only to be operated in emergency circumstances) shall not exceed the existing background noise level outside the window to any noise-sensitive room. Any assessment of compliance with this condition shall be made according to the methodology and procedures presented in BS4142:2014.

Any machinery and equipment installed pursuant to this permission shall be designed and installed to ensure that structure borne (re-radiated) noise emissions shall not exceed 35 L_{Aeq} dB (5 min) when measured in any habitable room in adjoining residential premises.

2.2 National Planning Policy Framework, 2019

The revised National Planning Policy Framework (NPPF) published on July 2018 and updated on 19 February 2019 sets out the Government's planning policies for England and how these are expected to be applied. It provides a framework within which locally prepared plans for housing and other development can be produced.

Planning law requires that applications for planning permission be determined in accordance with the development plan, unless material considerations indicate otherwise. The National Planning Policy Framework must be considered in preparing the development plan and is a material consideration in planning decisions.

The document states that the purpose of the planning system is to contribute to the achievement of sustainable development. At a very high level, the objective of sustainable development can be summarised as meeting the needs of the present without compromising the ability of future generations to meet their own needs.

NPPF goes on to suggest that achieving sustainable development means that the planning system has three overarching and interdependent objectives: an economic objective, a social objective and an environmental objective.

Planning policies and decisions should play an active role in guiding development towards sustainable solutions, but in doing so should take local circumstances into account, to reflect the character, needs and opportunities of each area.

At the heart of the Framework is a presumption in favour of sustainable development, which for decision-taking it means:

- Approving development proposals that accord with an up-to-date development plan without delay; or
- Where there are no relevant development plan policies, or the policies which are most important for determining the application are out-of-date, granting permission unless:
 - i. The application of policies in this Framework that protect areas or assets of importance provides a clear reason for refusing the development proposed; or
 - ii. Any adverse impacts of doing so would significantly and demonstrably outweigh the benefits, when assessed against the policies in this Framework taken as a whole.

Under Section 11; Making effective use of land, the following is stated:

Planning policies and decisions should promote an effective use of land in meeting the need for homes and other uses, while safeguarding and improving the environment and ensuring safe and healthy living conditions.

Regarding noise pollution, the document states the following:

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:

- Mitigate and reduce to a minimum potential adverse impact resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life;
- Identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason;
- The revised NPPF introduces the concept of 'agent of change' and states:
 - 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.

As stated above, this document makes reference to mitigating and reducing to a minimum, potential adverse impacts resulting from noise from new development, but does not set absolute criteria.

2.3 Noise Policy Statement for England, 2010

The underlying principles and aims of existing noise policy documents, legislation and guidance are clarified in the Noise Policy Statement for England (NPSE). The NPSE sets out the 'Long Term Vision' of Government noise policy as follows: *"Promote good health and good quality of life through the effective management of noise within the context of Government policy on sustainable development"*.

The NPSE outlines the following three aims for the effective management and control of environmental, neighbour and neighbourhood noise:

- *"Avoid significant adverse impacts on health and quality of life;*
- *Mitigate and minimise adverse impacts on health and quality of life; and*
- *Where possible, contribute to the improvement of health and quality of life"*.

The guidance defines three established concepts from toxicology that are currently being applied to noise impacts, for example, by the World Health Organisation (WHO):

- "NOEL (No observed Effect Level) – This is the level below which no effect can be detected. In simple terms, below this level, there is no detectable effect on health and quality of life due to the noise";
- "LOAEL (Lowest Observed Adverse Effect Level) – This is the level above which adverse effects on health and quality of life can be detected"; and
- "SOAEL (Significant Observed Adverse Effect Level) – This is the level above which significant adverse effects on health and quality of life occur".

The guidance also states that it is not possible to have a single objective noise-based measure that defines SOAEL that is applicable to all sources of noise in all situations and that not having specific SOAEL values in the NPSE provides the necessary policy flexibility until further evidence and suitable guidance is available.

2.4 National Planning Practice Guidance, England

Further guidance in relation to the National Planning Policy Framework and the Noise Policy Statement for England has been published in the National Planning Practice Guidance in England: Noise (NPPG-Noise), which summarises the noise exposure hierarchy, based on the likely average response.

The National Planning Practice Guidance (NPPG) has been revised and updated to be easily accessible and available online.

The Noise Guidance advises on how planning can manage potential noise impacts in new development. It sets out when noise is relevant to planning and outlines the following Observed Effect Levels to determine the noise impact:

- Significant observed adverse effect level: This is the level of noise exposure above which significant adverse effects on health and quality of life occur;
- Lowest observed adverse effect level: this is the level of noise exposure above which adverse effects on health and quality of life can be detected;
- No observed effect level: this is the level of noise exposure below which no effect at all on health or quality of life can be detected.

The document recognises the subjective relationship between noise levels and the impact on those affected and advises on factors which may influence on whether noise could be a concern.

The significance criteria from NPPG-Noise is reproduced in Table B1 below.

Table 1: Significance Criteria from NPPG In England: Noise			
Perception	Examples of Outcomes	Increasing Effect Level	Action
Not noticeable	No Effect	No Observed Effect	No specific measures required
Noticeable and not intrusive	Noise can be heard but does not cause any change in behaviour or attitude. Can slightly affect the acoustic character of the area but not such that there is a perceived change in the quality of life.	No Observed Adverse Effect	No specific measures required
Lowest Observed Adverse Effect Level (LOAEL)			
Noticeable and intrusive	Noise can be heard and causes small changes in behaviour and/or attitude, 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 perceived change in the quality of life.	Observed Adverse Effect	Mitigate and reduce to a minimum
Significant Observed Adverse Effect Level (SOAEL)			
Noticeable and disruptive	The noise causes a material change in behaviour and/or attitude, 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
Noticeable and very disruptive	Extensive and regular changes in behaviour and/or an inability to mitigate effect of noise leading to psychological stress or physiological effects, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory	Unacceptable Adverse Effect	Prevent

2.5 New London Plan

A draft new London Plan was published by the Mayor for consultation in December 2017. The current 2016 plan is still the adopted Development plan, but the draft new London plan is a material consideration in planning decisions.

Policy D13 Noise of the plan is relevant to this assessment. The policy is outlined below.

Policy D13 Noise

This policy states that:

'In order to reduce, manage and mitigate noise to improve health and quality of life, residential and other non-aviation development proposals should manage noise by:

- 1) *avoiding significant adverse noise impacts on health and quality of life*
- 2) *reflecting the Agent of Change principle as set out in Policy D12*
- 3) *mitigating and minimising the existing and potential adverse impacts of noise on, from, within, as a result of, or in the vicinity of new development without placing unreasonable restrictions on existing noise-generating uses.*
- 4) *improving and enhancing the acoustic environment and promoting appropriate soundscapes (including Quiet Areas and spaces of relative tranquillity)*
- 5) *separating new noise-sensitive development from major noise sources (such as road, rail, air transport and some types of industrial use) through the use of distance, screening layout orientation uses and materials – in preference to sole reliance on sound insulation*
- 6) *where it is not possible to achieve separation of noise-sensitive development and noise sources without undue impact on other sustainable development objectives, then any potential adverse effects should be controlled and mitigated through applying good acoustic design principles*
- 7) *promoting new technologies and improved practices to reduce noise at source and on the transmission path from source to receiver'*

2.6 British Standard 4142:2014+A1:2019

BS 4142 sets out a method to assess the likely effect of sound from factories, industrial premises or fixed installations and sources of an industrial nature in commercial premises, on people who might be inside or outside a dwelling or premises used for residential purposes in the vicinity.

The procedure contained in BS 4142 for assessing the effect of sound is to compare the measured or predicted sound level from the source in question, the $L_{Aeq,T}$ 'specific sound level', with the $L_{A90,T}$ background sound level at the assessment location.

Where the sound contains a tonality, impulsivity, intermittency and other sound characteristics, then a correction depending on the grade of the aforementioned characteristics of the sound is added to the specific sound level to obtain the $L_{A,r,Tr}$ 'rating sound level'. A correction to include consideration of a level of uncertainty in sound measurements, data and calculations can also be applied when necessary.

BS 4142 states: "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 estimation of the impact of the specific sound can be obtained by the difference of the rating sound level and the background sound level and considering the following:

Table 2: Classification of Industrial/Commercial Noise Impacts	
Difference Between Rating Sound Level and Background Sound Level (dB)	Impact Category (depending on the context)
+ 10 dB or more	Significant adverse impact
+ 5 dB	Adverse impact
Equal or less than	Low impact

For the daytime, the assessment is typically carried out over a reference time period of one hour, but at night-time it is carried out over a 15-minute period. The periods associated with day or night, for the purposes of the Standard, are 07.00 to 23.00 and 23.00 to 07.00, respectively.

Interpreting the guidance given in BS4142:2014, with consideration of the guidance given in the NPSE and NPPG Noise, an estimation of the impact of the rating sound is summarised in the following text:

- A rating sound level that is +10 dB above the background sound level is likely to be an indication of a Significant Observed Adverse Effect Level;
- A rating sound level that is +5 dB above the background sound level is likely to be an indication of a Lowest Observed Adverse Effect Level;
- The lower the rating sound level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating sound level does not exceed the background sound level, this is an indication of the specific sound source having a low impact and would therefore be classified as a No Observed Adverse Effect Level.

As the proposed operation for the industrial or commercial units within the development is likely to be 24 hours a day, both daytime and night-time periods have been considered.

3 Site Description

It is understood that under these proposals, the existing B8 commercial storage and distribution facility at Welbeck Wharf, River Road, Barking is to be used to also accommodate flexible light industrial, Class B2 (general industrial) and Class B8 (storage and distribution) uses. At this stage, the specific uses and locations of each activity are unknown; however, it is understood that the existing buildings at the site are to be retained, with no further building proposed.

The application site is located adjacent to the busy River Road (to the east) and is bound by existing commercial enterprises to the south and east. The northern extent of the site lies approximately 130m south of the A13 dual carriageway and the western boundary of the site is shared with the Mayes Brook canal, beyond which are located the rear of residential properties located along Westminster Gardens. The site is approximately 3km from the runway of London City Airport.

As a result of its setting, the site is affected by relatively high levels of environmental noise, primarily resulting from mixed road traffic movements along the adjacent River Road, but also the nearby A13 dual carriageway and from ongoing commercial activities in the area. The currently permitted B8 site uses also contribute to the noise climate at the site and at nearby noise-sensitive receptors. These activities include HGV movements, forklift truck movements, passenger car movements and general warehousing activities.

The nearest and worst-affected noise-sensitive receptors (NSR) have been identified as the rear gardens/windows of the residential properties to the west of the site, along Westminster Gardens.

The site location and nearest noise-sensitive receptors are identified in Figure 1.

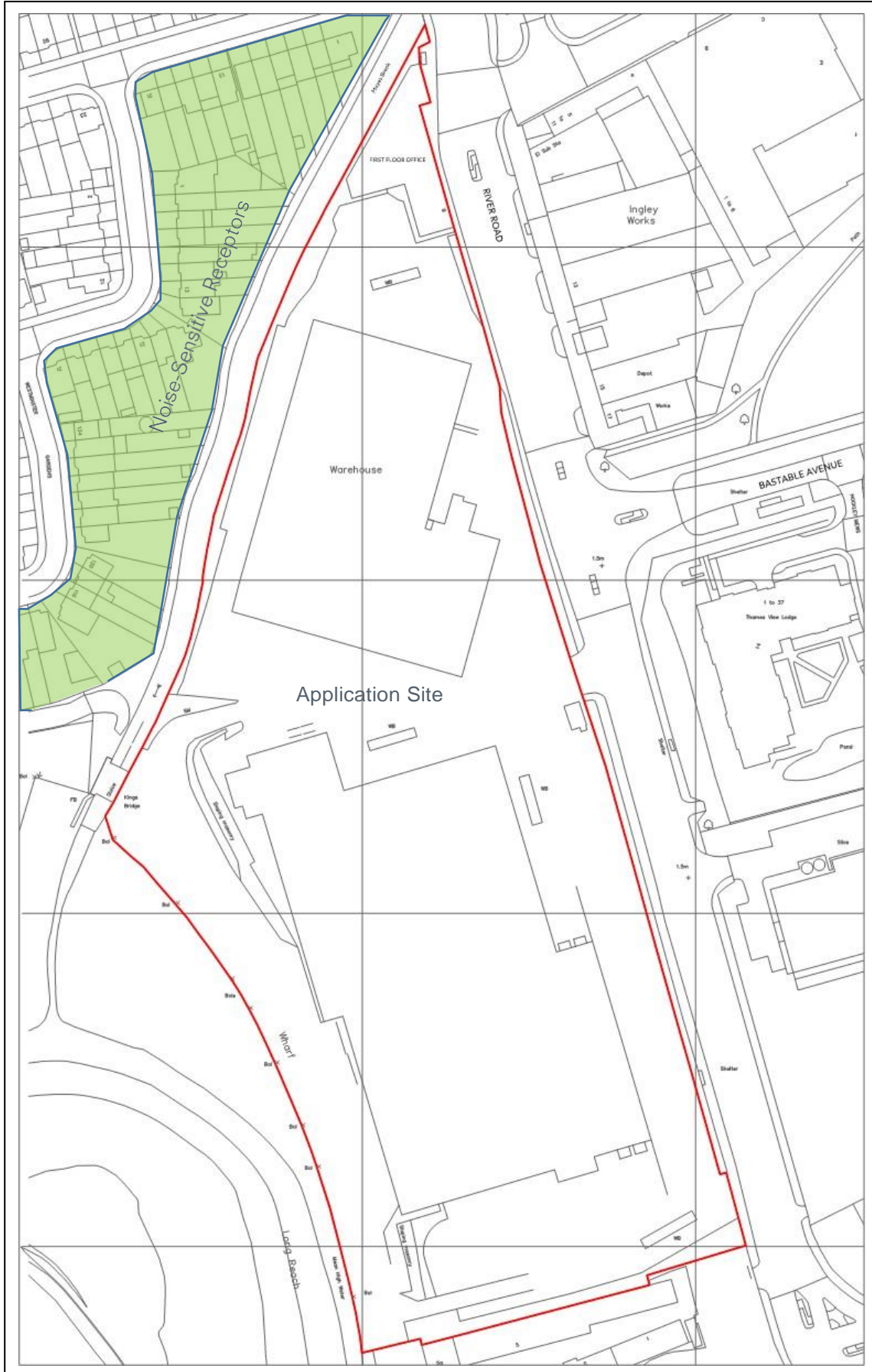


Figure 1: Site Layout

4 Baseline Sound Conditions

The prevailing sound conditions in the area have been determined by an environmental noise survey. Measurements were conducted between Thursday 1 and Friday 2 October 2020.

4.1 Noise Monitoring Methodology

All noise measurements were undertaken by a consultant certified as competent in environmental noise monitoring, and, in accordance with the principles of BS 7445.

All acoustic measurement equipment used during the noise survey conformed to Type 1 Specification of British Standard 61672. A full inventory of this equipment is shown in Table 3 below:

Item	Make & Model	Serial Number
1 - Sound Level Meter	01dB Fusion	11051
1 - Preamplifier	01dB PRE-22N°	1507083
1 - Microphone	GRAS 40CE	226358
2 - Sound Level Meter	01dB Fusion	11052
2 - Preamplifier	01dB PRE-22N°	1507093
2 - Microphone	GRAS 40CE	217662
3 - Sound Level Meter	Rion NL-52	01054199
3 - Preamplifier	Rion NH-25	54272
3 - Microphone	Rion UC-59	08655
Calibrator	Rion NC-74	34662223

The noise measurement equipment used during the survey was calibrated at the start and end of the measurement period. The calibrator used had been calibrated by an accredited calibration laboratory within the twelve months preceding the measurements. No significant drift in calibration was found to have occurred the sound level meter.

During most of the survey period, it was noted that the weather conditions were generally suitable for the sound measurement exercise, it being dry with light winds. However, periods of rainfall were noted to have occurred at times.

The microphones were fitted with protective windshields for the measurements, which are described in greater detail below and identified in Figure 2.

Measurement Position 1 (MP1) – At a point approximately 2.5m above local ground level at the north-eastern boundary of the site, approximately 4m from the nearside carriageway edge of River Road. Noise levels at this position were dominated by mixed road traffic using the adjacent River Road. However, during lulls in localised traffic, the nearby A13 dual carriageway was noted to be audible, as well as ongoing site activities within the application site and within the wider area. Site activities were noted to include vehicle and personnel movements. The noise levels at this position are considered representative of the existing noise levels at the location of the nearest commercial receptors to the east of the site, as well as representing a typical worst-case façade incident noise level for the existing buildings to the northern extent of the site.

Measurement Position 2 (MP2) – At a point approximately 2.2m above local ground level at the western boundary of the site, approximately 10m from the rear boundary fences of the residential dwellings located on Westminster Gardens, which back onto the development site. Noise levels at this position were relatively low and affected by mixed road traffic using the adjacent River Road and the wider road network and ongoing commercial activities within the application site. Site activities audible at this location were noted to include forklift truck movements, personnel movements and activities within the existing warehouses. The noise levels at this position are considered representative of the existing noise levels at the location of the nearest noise-sensitive residential receptor, to the west of the site.

Measurement Position 3 (MP3) – At a point approximately 2.5m above local ground level at the south-eastern boundary of the site, approximately 6m from the nearside carriageway edge of River Road. Noise levels at this position were dominated by mixed road traffic using the adjacent River Road. However, during lulls in localised traffic, the nearby A13 dual carriageway was noted to be audible, as well as ongoing site activities within the application site and within the wider area. Site activities were noted to include vehicle and personnel movements. The noise levels at this position are considered representative of the existing noise levels at the location of the nearest commercial receptors to the south of the site, as well as representing a typical worst-case façade incident noise level for the existing buildings to the southern extent of the site.



Figure 2: Noise Monitoring Locations

4.2 Survey Results

The measured daytime and night-time average noise levels (L_{Aeq}), typical background noise levels (L_{A90}) and typical maximum noise levels (L_{Amax}) at measurement positions 1, 2 and 3 are detailed in Table 4 below:

Table 4: Measured Daytime and Night-time L_{Aeq} , L_{A90} and L_{Amax} Noise Levels						
Measurement Position	Daytime (07:00 – 23:00)			Night-time (23:00 – 07:00)		
	Average $L_{Aeq,16hr}$	Typical $L_{A90,15mins}$	L_{Amax}	Average $L_{Aeq,8hr}$	Typical $L_{A90,15mins}$	L_{Amax}
MP1	69	60 – 65	92	66	48 – 49	86
MP2	53	48	74	48	40	61
MP3	69	59	89	66	47	82

In order to take into account both the “typical” L_{AFmax} values as well as the contribution of individual events for each long term measurement position, which may exceed the “typical” L_{AFmax} values, we carried out a statistical analysis of the measured L_{AFmax} (23:00 – 07:00) over the measurement period. For the purpose of this exercise, we have calculated the 90th percentile of the L_{AFmax} noise levels measured at each measurement position (the 90th percentile of the L_{max} of all measured data is the L_{max} noise level that will not be exceeded for 90% of the time).

Please note that in accordance with the requirements of BS4142:2014+A1, the typical L_{A90} noise levels presented above have been derived following a detailed statistical analysis of the measured noise levels over the relevant daytime and night-time periods. The lowest L_{A90} is not typical and, therefore, should not be the basis of an assessment in accordance with BS4142:2014+A1. The results of the statistical analysis are detailed in Appendix B.

The measured L_{Aeq} , L_{Amax} and L_{A90} noise levels are presented as time histories in Appendix B.

5 Noise Impact Assessment – Static Plant

New proposed industrial and commercial office uses can often incorporate plant and processes that have the potential to generate noise.

Any new external plant to be installed by the future tenants will be subject to a separate planning application and the assessment criteria detailed below should be used as a guide.

Any future external items of static plant and machinery associated with the application will need to be designed to give a cumulative sound rating level ($L_{A,r,Tr}$) of no greater than the current prevailing typical background sound level ($L_{A90,T}$) at any time, at the location of the nearest noise-sensitive receptors.

The noise criteria set out in Table 5 are proposed. These are based on the typical daytime and night-time background sound levels measured at MP2 and MP3.

Location of Nearest Sensitive Receptor	Target Rating Sound Criteria, $L_{A,r,Tr}$ (dB)	
	Daytime (07:00-23:00)	Night-time (23:00-07:00)
Westminster Close Residential Receptors	48	40
River Road Commercial Receptors	59	47

The above limits will apply to the total noise emission levels from all static plant and processes corresponding to the new light industrial and B2 uses on site. Individual plant items may need to be designed to a lower limit such that the overall total achieves the stated criteria above. All plant associated with the existing and to-be-retained B8 uses is considered as approved by the LPA and therefore, is considered as part of the prevailing sound climate and should be subject to no further mitigation requirements.

Compliance with the above limiting noise levels would result in a positive indication that complaints are unlikely and that plant and machinery noise will give rise to a low impact in accordance with BS 4142.

BS 4142 advises that when the noise contains a tonality, impulsivity, intermittency and other sound characteristics, then a correction depending on the grade of the aforementioned characteristics of the sound is added to the specific noise level to obtain the $L_{A,r,Tr}$ 'rating noise level'. At this stage there is no information available to permit the evaluation of the need to apply such corrections, and no allowance has been made in the stated limits. At detailed assessment stage, due consideration will need to be given and any necessary rating corrections applied.

6 Noise Impact Assessment – Operational Noise (B2 Industrial Activity)

The proposed B2 industrial uses can be expected to incorporate plant and processes that have the potential to generate noise. The following section provides an outline assessment of the likely operational noise associated with the proposed development.

6.1 Site Based light industrial/B2 Vehicular Movements

Under the proposed B2 use class, it is anticipated that delivery vehicles (HGVs) will be a source of external operational noise.

At this stage, information relating to the specific B2 uses is not known and precise information relating to the permitted B8 uses are not available.

However, given that the B2 uses are to replace parts of the permitted B8 use on the site, in this instance it is considered that the proposals are highly likely to result in a net reduction of heavy vehicular activity to and from and within the site.

As such, it is anticipated that the proposed change of use would result in a net benefit, effectively reducing the levels of vehicular noise currently experienced at the location of the adjacent noise-sensitive receptors.

6.2 B2 Activity Noise Break-Out

In order to assess the potential impact of activity noise break-out from the proposed B2 warehouse units, an outline assessment has been undertaken, as discussed below.

Locations

For the purposes of this assessment it is assumed that the proposed B2 uses will be limited to the existing warehouses on the site.

Maximum Internal Activity Noise Levels

Based on BS5839-8:1998 guidance we have assumed a maximum Indoor Reverberant Level of 80 dBA L_{Prev} for each of the proposed B2 warehouse units. It is important to note that BS5839-8:1998 recommends that noise levels (L_{pA}) for noisy warehouses are usually between 63 to 80 dBA. For the purposes of this assessment, this is considered a reasonable maximum operational level for the proposed use class.

Sound Insulation Performance of Existing Buildings

We understand that the existing warehouse structures on site are formed of cavity masonry up to first floor level, with lightweight insulated panels up to roof level. The roof is also understood to be formed of lightweight insulated panels. Several large roller-shutter doors are also included in the eastern facades of the warehouses.

At this stage, we have assumed that the existing warehouses provide a minimum composite sound reduction performance of the order of 35 dB R_w , which is considered suitably robust for the purposes of this outline assessment.

Noise Modelling

In order to predict the impact of B2 industrial noise on the surrounding noise-sensitive receptors, a detailed noise model has been created.

The predictions have been carried out using the noise-modelling suite Cadna/A, in accordance with the ISO 9613 prediction methodology, such that the propagation of B2 noise from the warehouses can be assessed at the identified receptors. This assessment methodology allows consideration of the effects of the acoustic screening provided by the as-built structures of the development and, in addition to the B2 warehouse source noise levels (i.e. 80 dBA L_{Prev}) used in the predictions, the model considers the effects of the topographical conditions throughout the area, ground absorption, atmospheric absorption, acoustic reflections and acoustic screening, as well as allowing the sound insulation performance of the buildings to be considered. It also applies a light downwind propagation correction to represent a worst-case.

The output from the acoustic modelling exercise has identified that the specific sound level resulting from the proposed B2 commercial activity at the worst-affected residential receptor is predicted to be 36 dBA at 1m from the worst-affected residential window.

Assessment

The predicted specific noise emission level of 41 dBA at 1m from the worst-affected residential window has been used to undertake a BS 4142-led assessment of the likely impacts, as detailed in Table 6 below.

Receptor	Assessment Period	Predicted Specific Sound Level, dB $L_{Aeq,T}$	Background sound Level, dB $L_{A90,T}$	Excess of specific over background sound level, dB	BS 4142 Significance of Impact
Rear of Westminster Way Dwellings	Daytime	36	48	-12	Low impact
	Night-time		40	-4	Low impact

As may be seen with reference to Table 7, in BS 4142 terms the proposed B2 business uses within the existing warehouses on site would be expected to lead to no more than a low impact at the worst-affected noise-sensitive residential receptor. This is a positive indication that complaints relating to the proposed operation are unlikely.

Further to this, an additional assessment has been undertaken to determine the likely internal noise level within the worst-affected dwelling resulting from the operation of the proposed B2 uses. The assessment has assumed that partially opened windows are used as the form of background ventilation within the residential receptors and, on this basis, it has been assumed that the internal ambient noise level within the residential receptors are 10 – 15 dB lower than the predicted façade incident noise levels.

In order to ensure the general inaudibility of sound sources, we would typically recommend that any mitigation is specified to ensure that noise break-in to the sensitive receptors is limited to a level of 10 dB below the otherwise prevailing internal ambient noise level. On the assumption that the residential receptors have been designed to achieve the internal ambient noise levels recommended in BS 8233:2014 (i.e. 35 dB internally during the daytime period and 30 dB internally during the night-time period), it is assumed that where noise emissions from the proposed B2 uses are less than 25 dB $L_{Aeq,T}$ during the daytime and less than 20 dB $L_{Aeq,T}$ during the night-time period, general inaudibility would be achieved.

On this basis, an outline assessment of the likely audibility of the B2 commercial operations has been undertaken. The results of this assessment are detailed in Table 7.

Receptor	Assessment Period	Predicted Façade Incident	Open Window Loss	Resultant Internal	Target IANL, dB	Inaudibility Criteria, $L_{Aeq,T}$, dB
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Table 7: Assessment of B2 Commercial Noise Audibility within Noise-Sensitive Receptors

		Specific Sound Level, dB L _{Aeq,T}		Ambient Noise Level, L _{Aeq,T} dB		
Rear of Westminster Way Dwellings	Daytime	33	10 - 15	18 – 23	35	≤ 25
	Night-time				30	≤ 20

As may be seen with reference to Table 8, the proposed B2 business uses within the existing warehouses could be expected to be generally inaudible within the worst-affected residential receptor during the daytime period. This is a positive indication that complaints relating to the proposed operation are unlikely during the daytime.

During the night-time period, the assessment has shown that activities may be faintly audible. However, given the low levels of exceedance predicted, it is considered that complaints would be unlikely.

Notwithstanding the above, whilst it is considered unlikely to be required, should the proposed B2 activities be required for 24-hours a day, then it may be necessary to uprate the facades of the warehouses to minimise noise break out. Alternatively, reducing noise emissions at source would be considered a more feasible solution. To that end, night-time operations would need to be limited to a level of 77 dBA L_{Prev} within the warehouses in order to ensure general inaudibility 24 hours a day.

7 Conclusion

MLM Consulting Engineers Ltd has been commissioned by Be First to undertake an assessment of the potential impact of sound from the proposed change of use of the Welbeck Wharf site from B8 to light industrial, B2 and B8 uses.

Accordingly, this report presents the results of a sound monitoring exercise, carried out at the proposed site to determine the existing sound climate at the nearest noise-sensitive receptors to the proposed development, as a basis for the subsequent assessment.

The report also presents an assessment of the potential impacts in line with BS 4142 guidance and provides an assessment of the likely audibility of noise from the proposed B2 uses within the warehouses. Accordingly, where the assessment identifies an exceedance of either the BS 4142-led criteria or the proposed inaudibility criteria, outline advice is provided relating to noise mitigation needed to appropriately limit off-site impacts.

Noise emission limits have also been provided for the total sound emission of all the fixed plant and machinery associated with the change of use on the site, in line with LPA requirements. Provided that the sound levels from all fixed plant and machinery do not exceed the stated noise criteria, whether through the application of noise control techniques or otherwise, the impact of noise from such sources is predicted to have no more than a low impact on existing sensitive receptors.

Subject to the recommendations of this report and the application of appropriate Conditions, it is considered that planning permission for the proposed change of use should not be refused on noise grounds.

Appendix A - Glossary of Acoustic Terminology

Wording	Description
Sound Pressure	Sound, or sound pressure, is a fluctuation in air pressure over the static ambient pressure.
Sound Pressure Level (Sound Level)	The sound level is the sound pressure relative to a standard reference pressure of $20\mu\text{Pa}$ (20×10^{-6} Pascal's) on a decibel scale.
Decibel (dB)	A scale for comparing the ratios of two quantities, including sound pressure and sound power. The difference in level between two sounds s_1 and s_2 is given by $20 \log_{10}(s_1 / s_2)$. The decibel can also be used to measure absolute quantities by specifying a reference value that fixes one point on the scale. For sound pressure, the reference value is $20\mu\text{Pa}$.
A-weighting, dB(A)	The unit of sound level, weighted according to the A-scale, which takes into account the increased sensitivity of the human ear at some frequencies.
Noise Level Indices	Noise levels usually fluctuate over time, so it is often necessary to consider an average or statistical noise level. This can be done in several ways, so a number of different noise indices have been defined, according to how the averaging or statistics are carried out.
$L_{eq,T}$	A noise level index called the equivalent continuous noise level over the time period T. This is the level of a notional steady sound that would contain the same amount of sound energy as the actual, possibly fluctuating, sound that was recorded.
$L_{max,T}$	A noise level index defined as the maximum noise level during the period T. L_{max} is sometimes used for the assessment of occasional loud noises, which may have little effect on the overall L_{eq} noise level but will still affect the noise environment. Unless described otherwise, it is measured using the 'fast' sound level meter response.
$L_{90,T}$	A noise level index. The noise level exceeded for 90% of the time over the period T. L_{90} can be considered to be the "average minimum" noise level and is often used to describe the background noise.
$L_{10,T}$	A noise level index. The noise level exceeded for 10% of the time over the period T. L_{10} can be considered to be the "average maximum" noise level. Generally used to describe road traffic noise.
Free-Field	Far from the presence of sound reflecting objects (except the ground), usually taken to mean at least 3.5m
Facade	At a distance of 1m in front of a large sound reflecting object such as a building façade.
Fast Time Weighting	An averaging time used in sound level meters. Defined in BS 5969.

Appendix B - Sound Survey Results

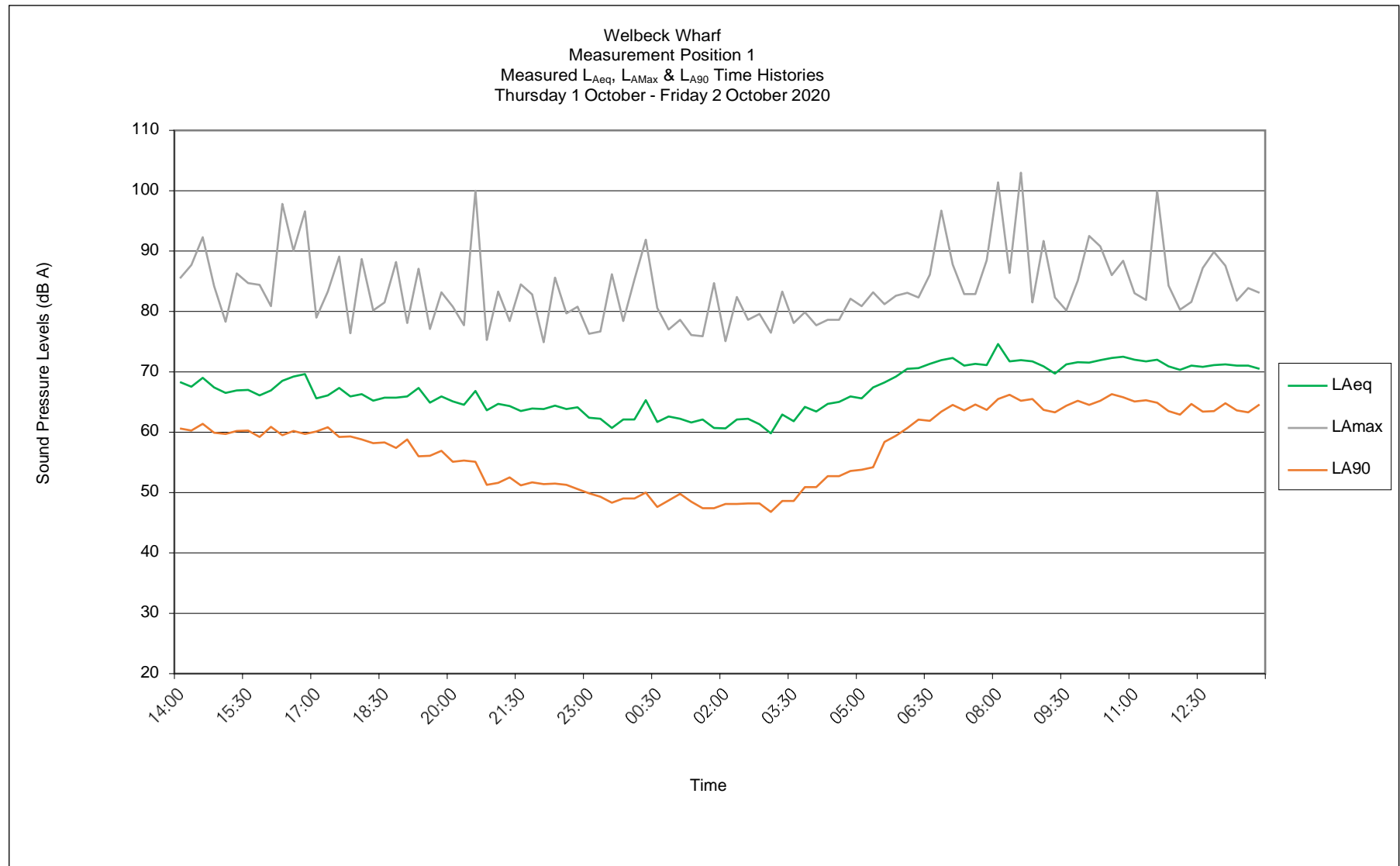


Figure B1: Measurement Position 1 – Time History Graph

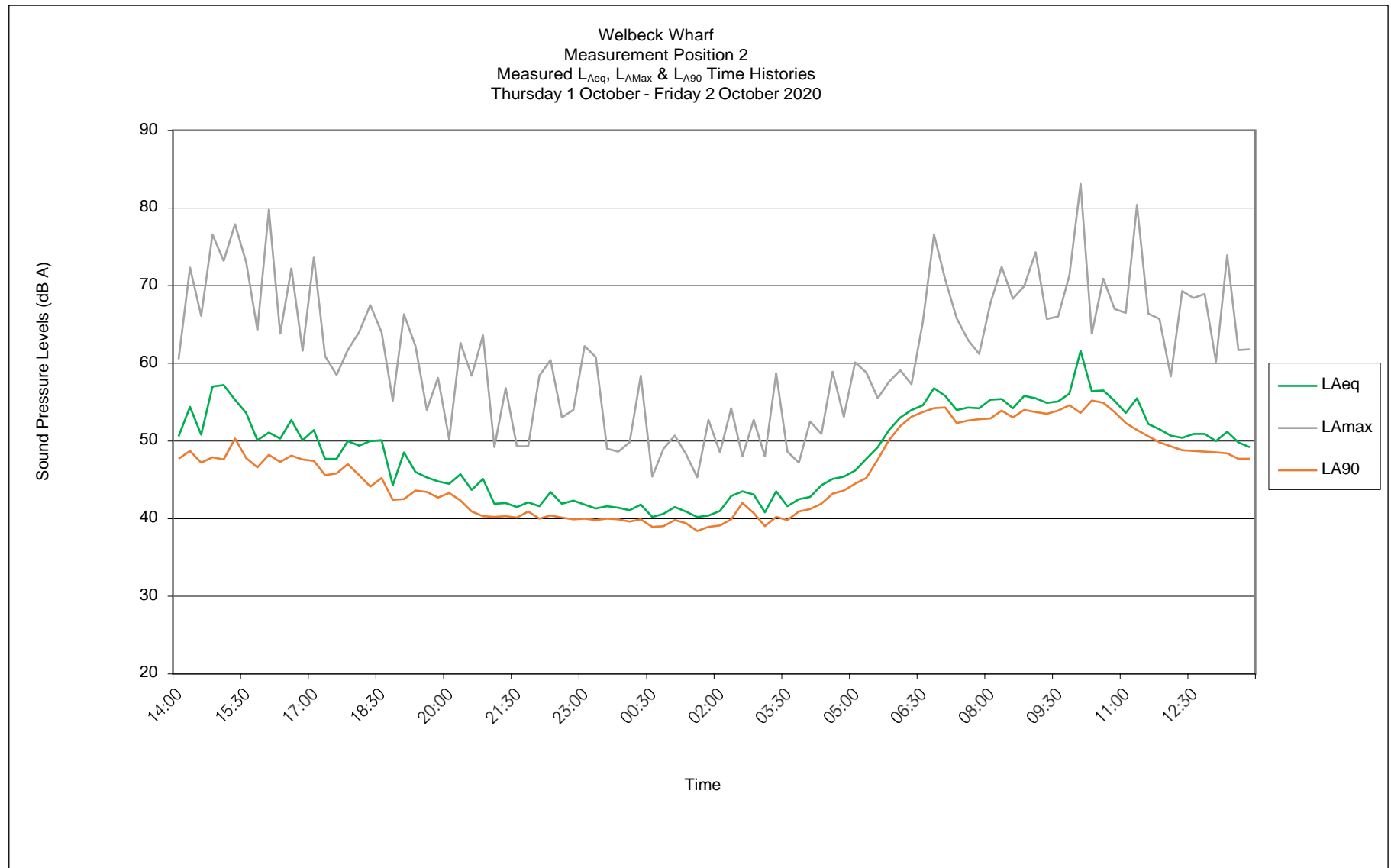


Figure B2: Measurement Position 2 – Time History Graph

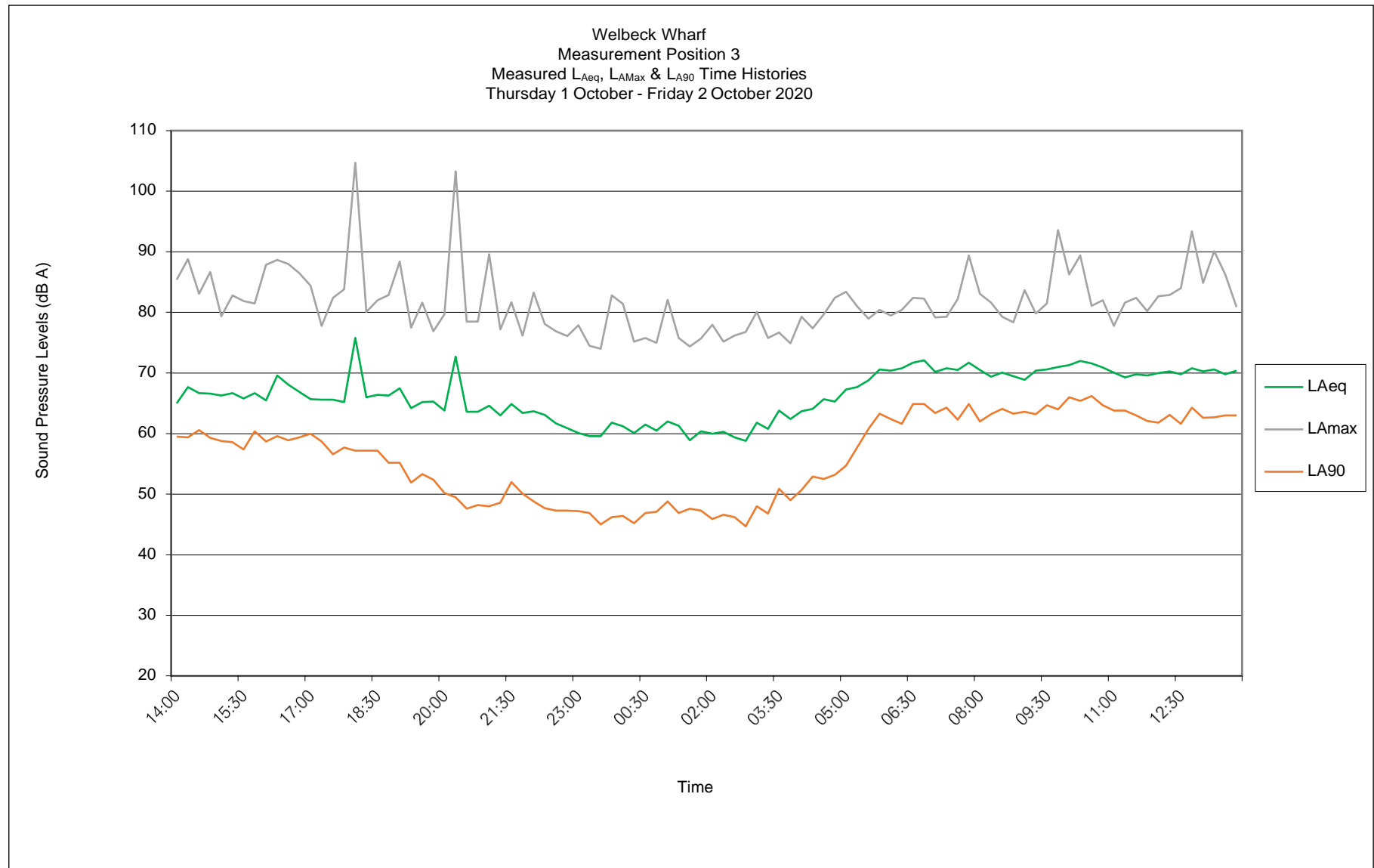


Figure B3: Measurement Position 3 – Time History Graph

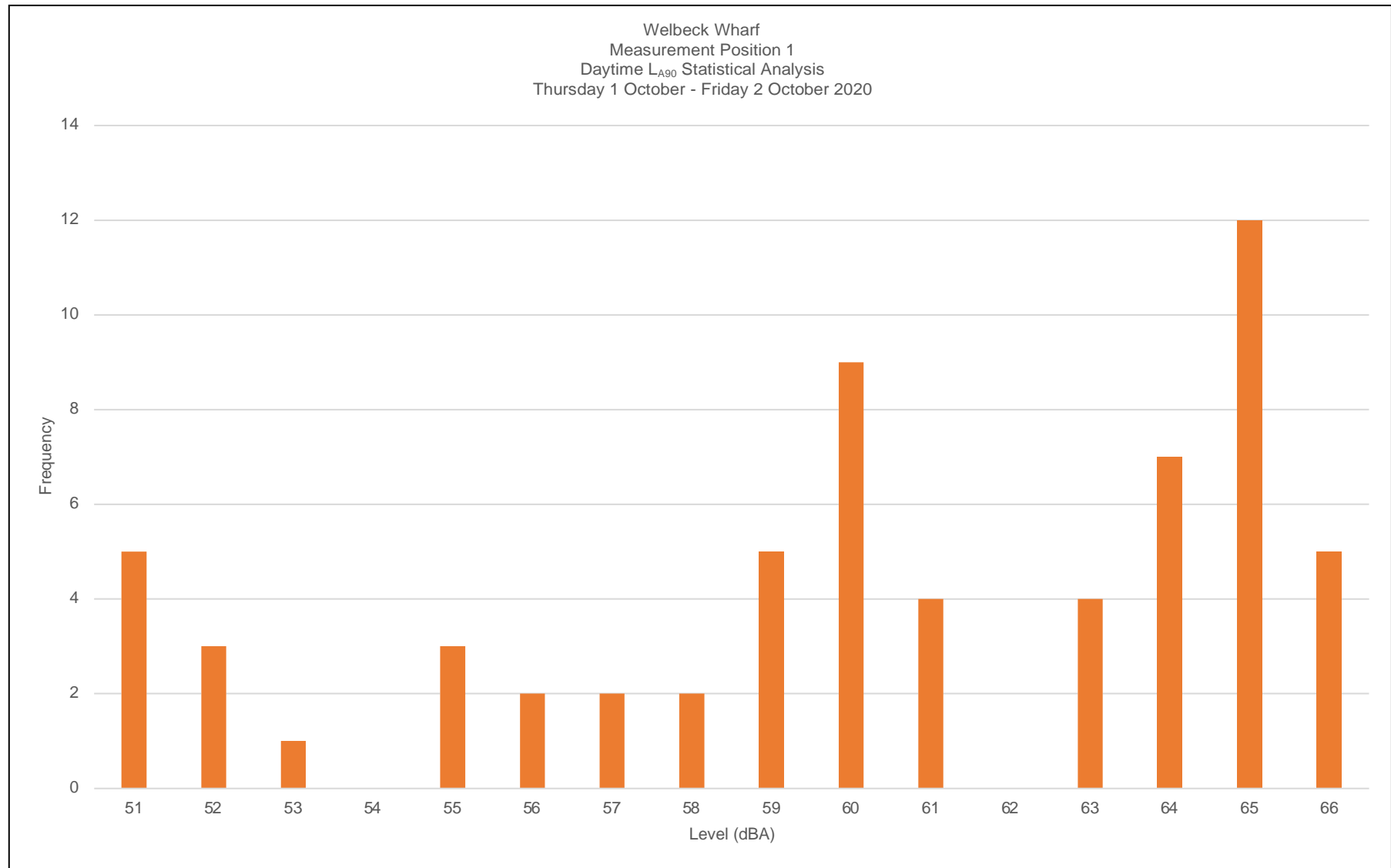


Figure B4: Measurement Position 1 – Daytime L_{A90} Statistical Analysis

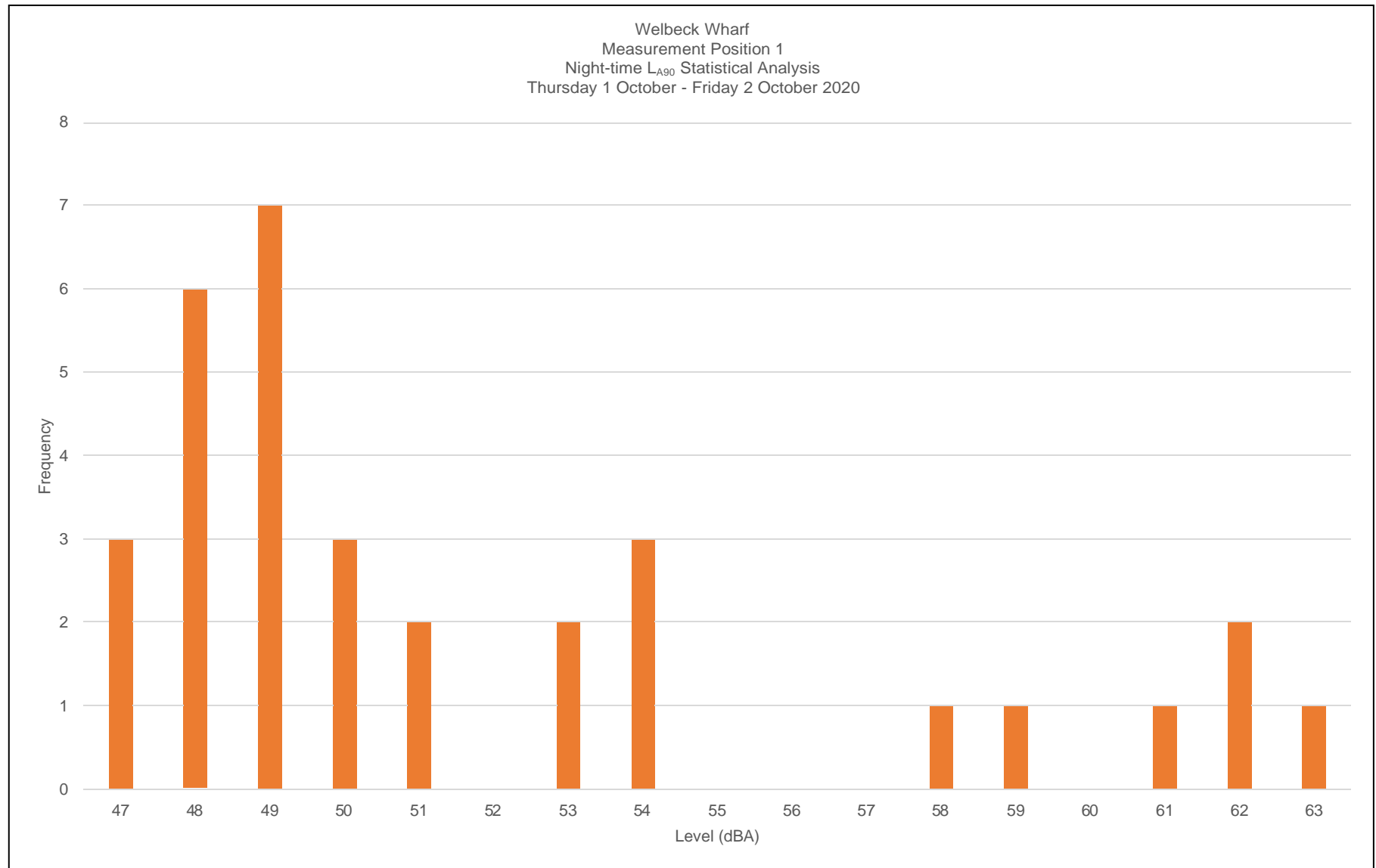


Figure B5: Measurement Position 1 – Night-time L_{A90} Statistical Analysis

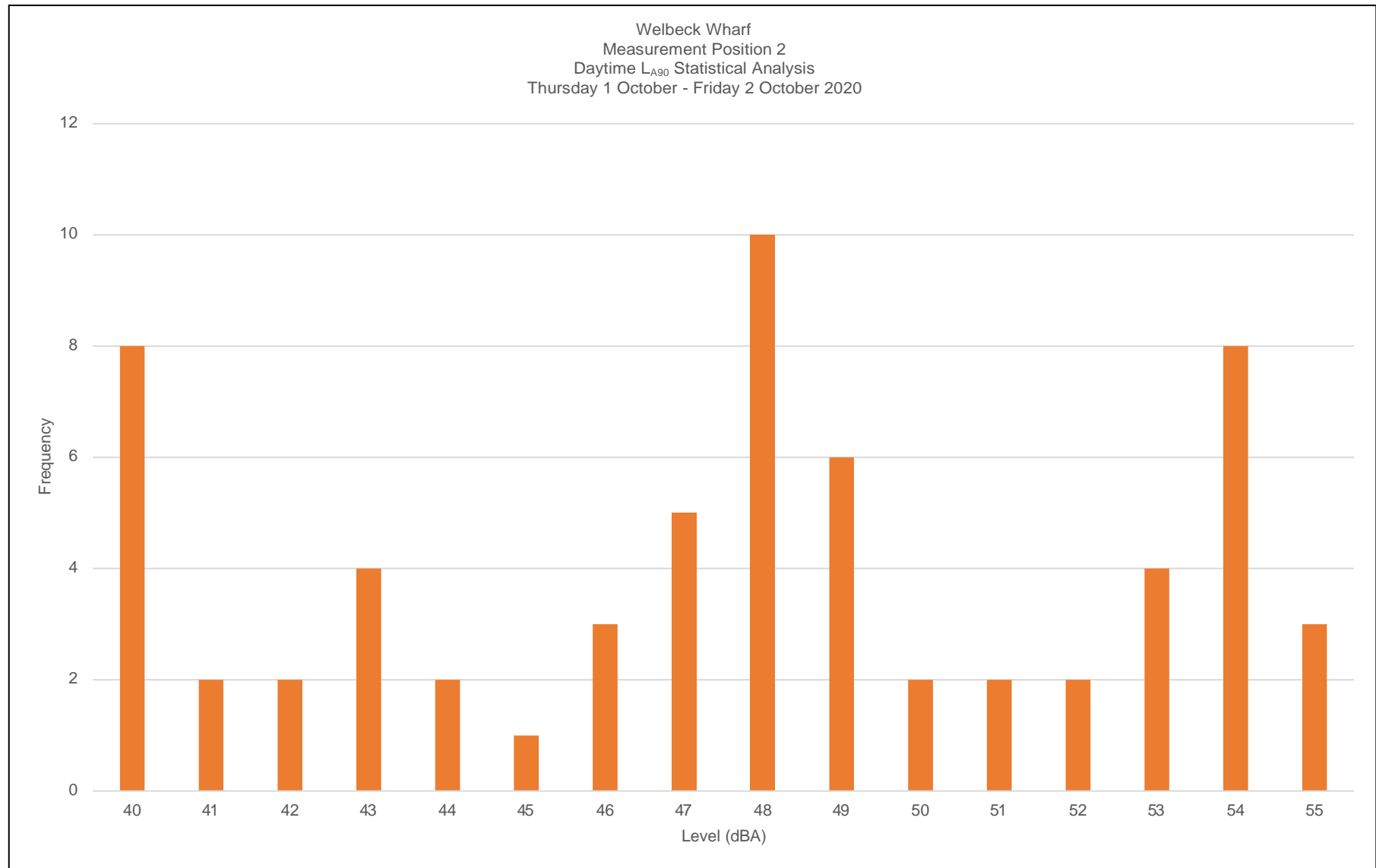


Figure B6: Measurement Position 2 – Daytime L_{A90} Statistical Analysis

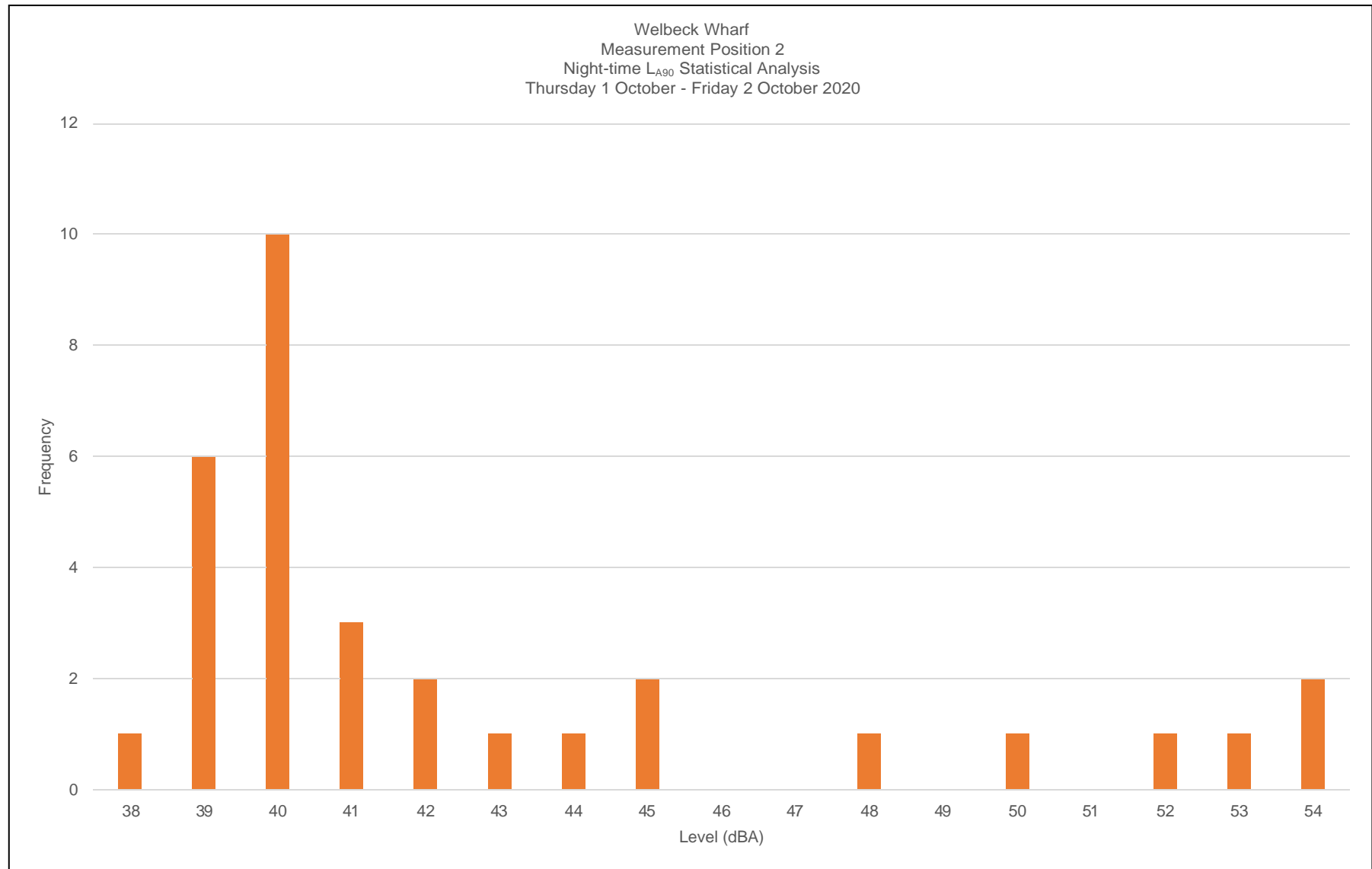


Figure B7: Measurement Position 2 – Night-time L_{A90} Statistical Analysis

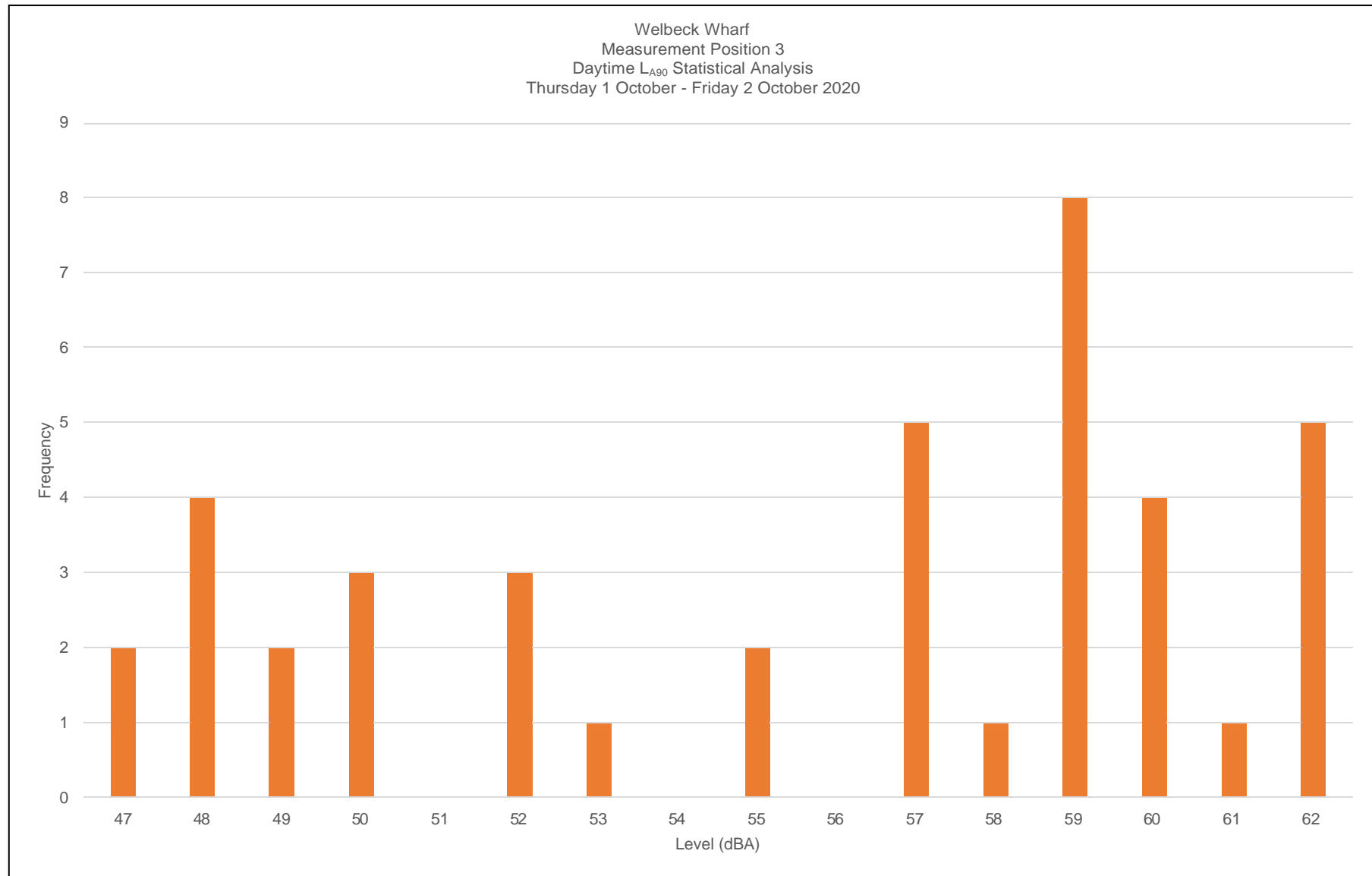


Figure B8: Measurement Position 3 – Daytime L_{A90} Statistical Analysis

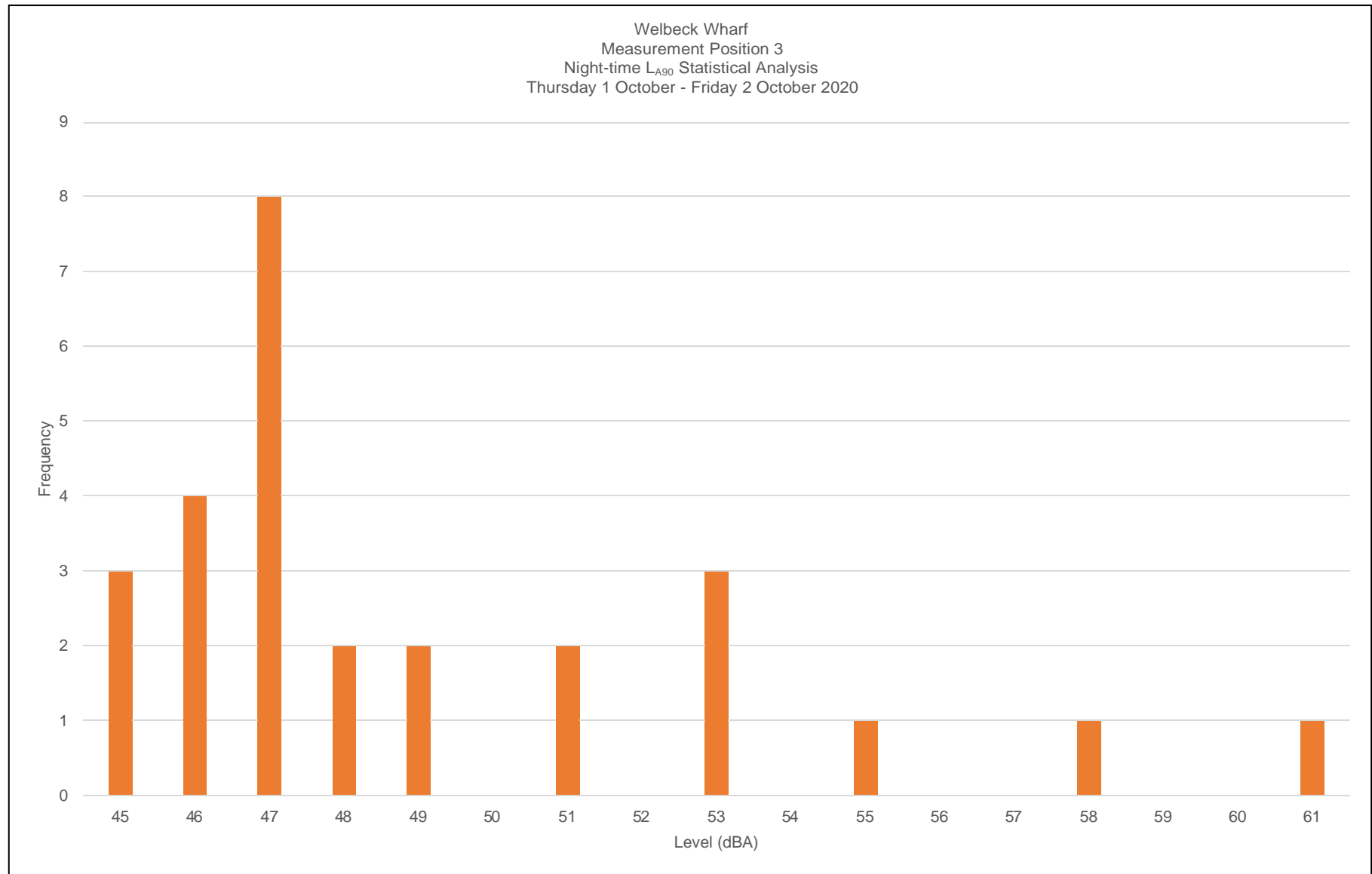


Figure B9: Measurement Position 3 – Night-time L_{A90} Statistical Analysis



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