

**Report VA3059.200110.NIA**

**Homeground, Claypits Road, Eastington,  
Gloucestershire**

**Noise Impact Assessment**

**15 January 2020**

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## Attachments

VA3059/SP1	Indicative Site Plan
VA3059/TH1-TH8	Environmental Noise Time Histories – First Survey
VA3059/TH1-TH12	Environmental Noise Time Histories – Second Survey
VA3059/NM1-3	Site Noise Maps

## 1. Introduction

A scoping study is being undertaken to determine the feasibility of the development of a residential scheme on the currently open field at Homeground, Claypits Road, Eastington, Gloucestershire.

Venta Acoustics has been commissioned by Eastington Community Land Trust to undertake a survey of existing noise levels across the site, leading to an assessment of the current environmental noise impact and provide recommendations of acoustic mitigation where required.

An environmental noise survey has been undertaken to determine the noise levels incident on the site. These levels are then used to undertake an assessment of the likely impact in accordance with the National Planning Policy Framework with reference to relevant standards, guidance and the planning requirements of Local Authority.

Outline mitigation measures are considered and an appraisal of the requirements of external building fabric elements are provided where appropriate.

## 2. Guidance and Legislation

### 2.1 ProPG: Planning & Noise (2017)

ProPG (Professional Practice Guidance: Planning and Noise) 2017 has been jointly developed by the Institute of Acoustics (IOA), the Association of Noise Consultants (ANC) and the Chartered Institute of Environmental Health (CIEH) to guide Local Planning Authorities (LPA's) and Practitioners in assessing the suitability for residential development on sites predominantly exposed to airborne transport noise.

The guidance advocates a proportionate and risk based 2-stage assessment approach.

**Stage 1** is an initial noise risk assessment of the site, based on measurements or predictions, in the absence of mitigation or consideration of the proposed layout. A risk category is assigned to the site as follows:

Risk Category	Indicative Daytime Noise Levels $L_{Aeq,16hr}$	Indicative Night Time Noise Levels $L_{Aeq,8hr}$	Pre-Planning Application Advice
Negligible Risk	< 50 dB	< 40 dB	Indication that the development site is likely to be acceptable from a noise perspective and application need not normally be delayed on noise grounds.
Low Risk	50 - 60 dB	40 - 50 dB	Indication that the development site is likely to be acceptable provided a good acoustic design process is followed and is confirmed in a detailed Acoustic Design Statement confirming how noise will be mitigated
Medium Risk	60 - 70 dB	50 - 60 dB	
High Risk	> 70dB	> 60dB	Indication that the development site may be refused on noise grounds unless a good acoustic design process and detailed Acoustic Design statement can demonstrate the significant noise risk can be mitigated.

#### Notes

- Indicative noise levels should be assessed without inclusion of the acoustic effect of any scheme specific noise mitigation measures.
- Indicative noise levels are the combined free-field noise level from all sources of transport noise and may also include industrial/commercial noise where this is present but is “not dominant”.
- $L_{Aeq,16hr}$  is for daytime 0700 – 2300,  $L_{Aeq,8hr}$  is for night-time 2300 – 0700.
- An indication that there may be more than 10 noise events at night (2300 – 0700) with  $L_{Amax,F} > 60$  dB means the site should not be regarded as negligible risk.

The table suggests hard boundaries between risk categories based on values. The intent is a more considered and progressive increase in risk level as noise levels increase.

**Table 2.1 – ProPG Stage 1 Site Noise Risk Assessment**

**Stage 2** is a detailed assessment of the proposals with consideration of four key elements:

- Element 1 – demonstrating a “Good Acoustic Design Process”
- Element 2 – observing internal “Noise Level Guidelines”
- Element 3 – undertaking an “External Amenity Area Noise Assessment”
- Element 4 – consideration of “Other Relevant Issues”

## 2.2 The National Planning Policy Framework (2019)

The revised *National Planning Policy Framework* (NPPF), adopted in 2019, sets out the Government’s planning policies for England, superseding all previous planning policy statements and guidance.

In respect of noise, the NPPF states that the planning system should contribute to and enhance the natural and local environment by preventing both new and existing developments from contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable levels of noise pollution.

Hence, Paragraph 180 states that *planning policies and decisions should also ensure 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*
- 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*

In regards to the term adverse impact, reference is made to the Noise Policy for England:

## 2.3 Noise Policy Statement for England (2010)

The Noise Policy Statement for England (NPSE) sets out the long term vision of Government noise policy: to promote good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development.

This vision is supported by the following aims:

- *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 terms “significant adverse” and “adverse” are related to the following concepts:

- No Observed Effect Level (NOEL) - the level below which no effect on health and quality of life can be detected.
- Lowest Observed Adverse Effect Level (LOAEL) - the level above which adverse effects on health and quality of life can be detected.
- Significant Observed Adverse Effect Level (SOAEL) - the level above which significant adverse effects on health and quality of life occur.

The guidance acknowledges 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, but will be different for different noise sources, receptors and times.

In order to enable assessment of impacts in line with these requirements, reference should be made to other currently available guidance.

## 2.4 WHO Guidelines for Community Noise (1999)

The guidance in this document details suitable noise levels for various activities within residential and commercial buildings.

The relevant sections of this document are shown in Table 2.2.

Criterion	Environment	Design range $L_{Aeq,T}$ dB
Maintain speech intelligibility and avoid moderate annoyance, daytime and evening	Living Room	35 dB
Prevent sleep disturbance, night time	Bedrooms	30 dB

Table 2.2 – Excerpt from WHO

[dB ref. 20μPa]

This guidance also states:

*For a good sleep, it is believed that indoor sound pressure levels should not exceed approximately 45dB  $L_{Amax}$  more than 10-15 times a night (Vallet & Vernet 1991).*

For outdoor living areas, it is stated that:

*To protect the majority of people from being seriously annoyed during the daytime, the outdoor sound level from steady, continuous noise should not exceed 55dB  $L_{Aeq}$  on balconies, terraces and in outdoor living areas. To protect the majority of people from being moderately annoyed during the daytime, the outdoor sound level should not exceed 50dB  $L_{Aeq}$ . Where it is practical and feasible, the lower outdoor sound level should be considered the maximum desirable sound level for new development.*

For sleep disturbance, i.e. in bedrooms at night, the NOEL can, therefore, be taken as anything below 30dB(A), whilst the onset of the LOAEL occurs at 30dB(A) and above. The SOAEL cannot be inferred from this information.

During daytime periods, for avoidance of annoyance, the NOEL relates to anything up to 50dB(A) (typically applied to external areas, such as gardens), whilst the onset of the LOAEL occurs at 50dB(A) and above.

## 2.5 BS8233:2014

BS8233 *Guidance on sound insulation and noise reduction for buildings* provides guidance as to desirable internal ambient noise levels for different areas within residential buildings.

The relevant section of the standard is shown below in Table 2.3.

Activity	Location	07:00 to 23:00	23:00 to 07:00
Resting	Living Room	35 dB $L_{Aeq, 16 \text{ hour}}$	-
Dining	Dining Room	40 dB $L_{Aeq, 16 \text{ hour}}$	-
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq, 16 \text{ hour}}$	30 dB $L_{Aeq, 8 \text{ hour}}$

Table 2.3 – Excerpt from BS8233:2014 - Indoor ambient noise levels for dwellings

[dB ref. 20μPa]

For external areas the standard states the following:

*For traditional external areas that are used for amenity space, such as gardens and patios, it is desirable that the external noise level does not exceed 50 dB  $L_{Aeq,T}$ , with an upper guideline value of 55 dB  $L_{Aeq,T}$  which would be acceptable in noisier environments.*

*However, it is also recognized that these guideline values are not achievable in all circumstances where development might 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 the 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.*

## 2.6 BS4142:2014

British Standard BS4142:2014 *Methods for rating and assessing industrial and commercial sound* describes a method for rating and assessing sound of an industrial and/or commercial nature, which includes sound from fixed installations comprising mechanical and/or electrical plant and equipment;

The assessment methodology considers the Specific Sound Level, as measured or calculated at a potential noise sensitive receptor, due to the source under investigation. A correction factor is added to this level to account for the acoustic character of the sound as follows:

**Tonality** – A correction of up to 6dB depending on the prominence of tones;

**Impulsivity** - A correction of up to 9dB depending on the prominence of impulsivity;

**Other sound characteristics** - A 3dB correction may be applied where a distinctive acoustic character is present that is neither tonal nor impulsive;

**Intermittency** - A 3dB correction may be applied where the specific sound has identifiable on/off conditions.

An estimate of the impact of the source is obtained by subtracting the typical background noise level from the corrected Specific Sound Level.

- Typically, the greater this difference, the greater the magnitude of the impact.
- A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.
- A difference of around +5 dB could be an indication of an adverse impact, depending on the context.
- The lower the rating level is relative to the measured background sound level, the less likely it is that there will be an adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound having a low impact, depending on the context.

## 3. Site Description

As illustrated on the attached site plan VA3059/SP1, the site is an open field on the western side of Eastington and is bounded by the M5, within a cutting, to the west, Claypits Road to the north and the Eastington Community Centre, Owen Harris Memorial Ground, playgrounds and a skatepark to the south.

To the north, on the opposite side of Claypits Road, is Smith's Plant and Machinery Hire, a listed building and several existing residential dwellings.

Identified noise sources potentially affecting the site include:

- Road traffic noise;
- Commercial activities at Smith's (vehicle maintenance etc);
- HGV movements associated with Smith's;
- Noise from the skate park;
- Noise from the use of the community centre (hired for parties etc).

## 4. Environmental Noise Survey

### 4.1 Survey Procedure & Equipment

In order to establish the existing noise levels across the site, a noise survey was carried out between Thursday 12<sup>th</sup> and Tuesday 17<sup>th</sup> December 2019 at the three locations shown in site plan VA3059/SP1.

Due to inclement weather recorded during this survey, a second survey was undertaken between Friday 3<sup>rd</sup> and Monday 6<sup>th</sup> January 2020 for validation purposes. During this period, the weather was generally dry with light windows. The repeated survey indicated that the weather had not significantly altered the readings during the first survey.

Continuous 5-minute samples of the  $L_{Aeq}$ ,  $L_{Amax}$ ,  $L_{A10}$  and  $L_{A90}$  sound pressure levels were undertaken at each of the measurement locations.

Measurements were made generally in accordance with ISO 1996 2:2017 *Acoustics - Description, measurement and assessment of environmental noise – Part 2: Determination of sound pressure levels*.

The following equipment was used in the course of the survey:

Manufacturer	Model Type	Serial No	Calibration	
			Certificate No.	Date
NTi Class 1 Integrating SLM	XL2	A2A-11586-E0	UCRT18/1582	7/6/18
NTi Class 1 Integrating SLM	XL2	A2A-12202-E0	UCRT19/1017	4/1/19
NTi Class 1 Integrating SLM	XL2	A2A-15993-E0	FL-19-122	14/3/19
Larson Davis calibrator	CAL200	13049	UCRT19/1501	18/4/19

**Table 4.1 – Equipment used for the survey**

The calibration of the sound level meters was verified before and after use with no significant calibration drift observed.



## 4.2 Results

The measured sound levels are shown as time-history plots on the attached charts.

The site is primarily affected by traffic on the M5 with a small contribution from traffic on Claypits Road.

The average noise levels for the Daytime and Night-time periods, as measured at the automated monitoring position were:

Monitoring Period	Typical $L_{Aeq,T}$ First Survey / Second Survey		
	West	North	South East*
07:00 – 23:00 hours	74 dB / 74 dB	71 dB / 70 dB	60 dB
23:00 – 07:00 hours	69 dB / 66 dB	63 dB / 62 dB	52 dB

**Table 4.2 – Typical ambient noise levels at measurement locations**

[dB ref. 20μPa]

\* The southwest monitor did not provide reliable data during the first survey. The data from the second survey is reported.

The typical night time  $L_{Amax}$  events, generated by vehicle passbys on the M5, were recorded to be in the order of 78dB  $L_{Amax,fast}$ .

At the north monitor location, typical night time  $L_{Amax}$  levels were measured to be around  $L_{Amax,fast}$  80dB.

The typical daytime background noise levels measured were around  $L_{A90}$  58dB on the north boundary of the site and  $L_{A90}$  62dB to the west, with the south-west boundary measuring  $L_{A90}$  52dB.

## 5. Initial Site Noise Assessment

### 5.1 Traffic Noise

Topographical data for the site has been used to generate a 3D model of the study area in specialist noise mapping software. The source noise levels of the roads were input and calibrated to the noise levels measured on site. The model uses several different calculation protocols to derive accurate noise analysis predictions. Noise propagation and barrier attenuation are calculated in accordance with ISO 9613-1:1993 *Acoustics - Attenuation of sound during propagation outdoors - Part 1: Calculation of the absorption of sound by the atmosphere* and ISO 9613-2:1996 *Acoustics - Attenuation of sound during propagation outdoors - Part 2: General method of calculation*.

The noise contour map of the undeveloped site is attached in the figures VA3059/NM1 for daytime levels ( $L_{Aeq,16hr}$ ) and VA3059/NM2 for night time levels ( $L_{Aeq,8hr}$ )

Referring to the noise hierarchy proposed in the ProPG guidance (Table 2.1 above), it is seen that the majority of the sight would fall under the 'Medium Risk' category with narrow regions along the west and north boundaries being at 'High Risk' and the south-east portion falling within the low-to-medium risk range. The above is based on traffic noise alone with no consideration of mitigations.

The noise risk areas are indicated on attached figure VA3059/NM3.

BS8233 and WHO guidance recommend that external noise levels during the day should be below  $L_{Aeq,16hr}$  55dB, and ideally below  $L_{Aeq,16hr}$  50dB to provide good external amenity. These levels are exceeded across the site.

To mitigate traffic noise, a combination of a screening bund, optimised site layout and building orientation and appropriate external building fabric specifications will be considered.

## 5.2 Commercial Noise

Smith's Plant Hire has a large, open depot to the north of the site.

During site visits noise associated with pumping fuel as well as maintenance (grinding metal) was observed. These sounds are expected to occur during the working day only and would not be likely in the evenings or over weekends.

Movements of HGVs, including tonal reversing alarms, were also noted. It is understood that equipment can leave the yard in the early morning.

These sounds were clearly audible on the northern boundary of the site, becoming quieter across the site and less audible to the west due to increased road traffic noise.

Following the guidance in BS4142: 2014 *Methods for rating and assessing industrial and commercial sound*, the likely impact of the yard is assessed.

The following source noise levels will be used in the assessment:

Noise Source	Measurement Distance	Measured $L_{Aeq}$
Pumping	30m	65dB
Angle Grinder	Library data	80dB @ 10m
Lorry manoeuvring	Library data	73dB @ 8m

**Table 5.1 – Measured and library data noise sources used for assessment**

The following character corrections are associated with the operations at Smith's, estimated using the subjective method.

Noise Source	Subjective Description	Allocated Corrections
Pumping	Low frequency character to sound	Other Characteristics: +3dB
Angle Grinder	Expected to be slightly perceptible above background and intermittent and impulsive in use.	Tonality: 0dB Impulsivity: +3dB Intermittency: +3dB
Lorry Manoeuvring	Intermittent movements, diesel engine broadband, reversing alarm is tonal.	Tonality: +2dB Impulsivity: 0dB Intermittency: +3dB

**Table 5.2 – Acoustic character corrections**

The commercial noise assessment follows:

Noise Source	Specific Sound Level	Distance Correction (to 50m)	On time per hour (Correction)	Character penalties	Rating Level	Difference from Background (L <sub>A90</sub> 58dB)	Outcome
Pumping	65 dB	-4 dB	60 mins (-0)	3 dB	64 dB	+6dB	Adverse Impact
Angle Grinder	80 dB	-14 dB	30 mins (-3)	6 dB	69 dB	+11dB	Significant Adverse Impact
Lorry Manoeuvring	73 dB	-16 dB	10 mins (-8)	5 dB	54 dB	-4dB	Low Impact

**Table 5.3 - Specific and Rating Sound Levels for Smith's**

Noise from maintenance activities at Smith's is expected to represent between a moderate and significant adverse impact at the most affected dwellings. Noise from HGV movements are considered to be a low impact.

It is not clear how frequently maintenance activities take place. Review of the measured data and audio recordings do not indicate commercial noise being regularly prominent against the general traffic noise levels. However, this does not necessarily indicate that the noise is not present and audible.

On two of the site visits there was no significant noise from Smith's observed. On one visit the pump was observed to be generating sound which was audible but not considered overly intrusive. On the final visit the sound of grinding was clearly heard but not considered to increase the overall local noise levels.

Given the size of the yard, it is reasonable to expect that maintenance operations may occur regularly and would indicate a significant risk.

It is expected that vehicle movements will be the most common noise source.

To mitigate against the commercial noise, noise sensitive rooms should be positioned to face away from Smith's. Specification of glazing to control general traffic noise is expected to also control the noise from the early morning HGV movements.

## 5.3 Community Centre

During the site visits and surveys, no noise associated with the community centre was noted except for occasions car movements down the drive along the south boundary of the site.

Most community activities (meetings, play groups, etc) are not expected to represent a significant noise impact against the noise from traffic on the M5.

It is not known if the centre is made available for parties in the evenings or events which would include music or the sale of alcohol. If music or night time events were to take place, there would be a risk of a noise impact on the proposed dwellings along the southern boundary.

## 5.4 Skate Park

During the site visits and surveys there were no people making use of the skate park, possible due to the cold and wet weather.

Skate parks have the potential to significantly impact nearby residents due to the irregular but frequent and loud impulsive sound of boards hitting against the concrete ramps and rails as well as shouting and possible music. This is a significant risk if the skate park is busy during fine weather.

Based on previous experience of skate parks, noise levels of around  $L_{Amax}$  70dB can be expected at the nearest proposed dwellings. This is significant and would be indicative that annoyance would be highly likely to occur<sup>1</sup>.

Solid fences along the boundaries of gardens may reduce the noise slightly, but a moderate risk of annoyance would remain.

## 6. Mitigation

### 6.1 Acoustic Screening

#### 6.1.1 West Boundary

Calculations have indicated that it is not likely to be feasible to adequately control road traffic noise with a screen alone (a requirement of a 10m high bund is indicated by the calculations).

However, to reduce noise, it is recommended that a barrier be constructed along the west boundary at the location shown in the attached site plan.

This may be formed of a combination of bund with a timber fence above with a combined height of 4m above the site ground level. The fence should be imperforate with a closed board structure and have a surface weight of at least 18kg/m<sup>2</sup>.

This would be expected to reduce noise level on the western side of the site by approximately 10dB (as measured at 1.6m above ground level).

#### 6.1.2 North and South Boundary

To reduce noise to the gardens of dwellings on the north and south boundary, it is recommended that 2m high closed board fences are applied to the gardens that have a perimeter on the north or south boundary of the site.

The fence should be imperforate with a closed board structure and have a surface weight of at least 12kg/m<sup>2</sup>.

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<sup>1</sup> This assessment is based loosely on the Clay Target Shooting guidance which recommends that frequent impulsive type of noises (shots) above 65dB is highly likely to result in annoyance. Reducing the level to below 55 dB is considered to result in annoyance being less likely to occur.

## 6.2 Site Layout

The use of boundary fences and screens alone are not expected to be sufficient to achieve recommended noise levels in gardens.

It is recommended that the buildings are positioned so as to screen the gardens from the noise sources to the north, south and west.

In its most fundamental form, this would have terrace rows of houses following the three boundaries, with the gardens central to the site and the houses facing inwards and roads, parking being around the outside of the buildings (following the site boundary).

## 6.3 Building Orientation

It is recommended that the houses are designed and orientated to have noise sensitive rooms (living rooms and bedrooms) facing away from the road and commercial noise sources. Kitchens and bathrooms should be prioritised for the sides of the buildings that are exposed to the identified noise sources.

## 6.4 Sound Reduction Performances of Building Elements

BS8233 suggests a loss of 15dB can be expected through a partially open window. Based on the measured noise levels across the site, appropriate internal noise levels will not be achieved with open windows and the external building fabric will be relied upon to control internal levels.

The required sound reduction performance of the building fabric elements will be calculated and specified in detail as the site layout is developed but the following provides indicative values for early guidance.

It is assumed that the buildings will be of traditional construction with blockwork walls and tiled roofs.

Windows are expected to required a sound reduction performance of  $R_w$  35dB from the frame and glazing combinations. This is expected to be provided by proprietary double glazing in a standard depth profile.

## 6.5 Ventilation

In order to maintain appropriate internal noise levels, the windows will need to be able to be kept closed. Allowance should therefore be made for alternative means of background ventilation. The ventilation strategy should fully consider the required air transfer rates and summer cooling without relying on windows being opened. From previous experience, this is likely to require a mechanical ventilation system.

This does not preclude the opening of windows for personal preference or purge ventilation.

## 7. Conclusion

A baseline noise survey has been undertaken by Venta Acoustics to establish the prevailing noise climate in the locality of Homeground, Claypits Road, Eastington, Gloucestershire.

These levels have been used to undertake an initial study of the expected noise impact on the residential development proposed for the site.

Noise from the M5, Claypits Road, Smith's, the community centre and the skate park have been considered.

Road traffic noise and noise from maintenance operations at Smith's are considered to represent a high risk / significant noise impact on the most exposed sides of the site.

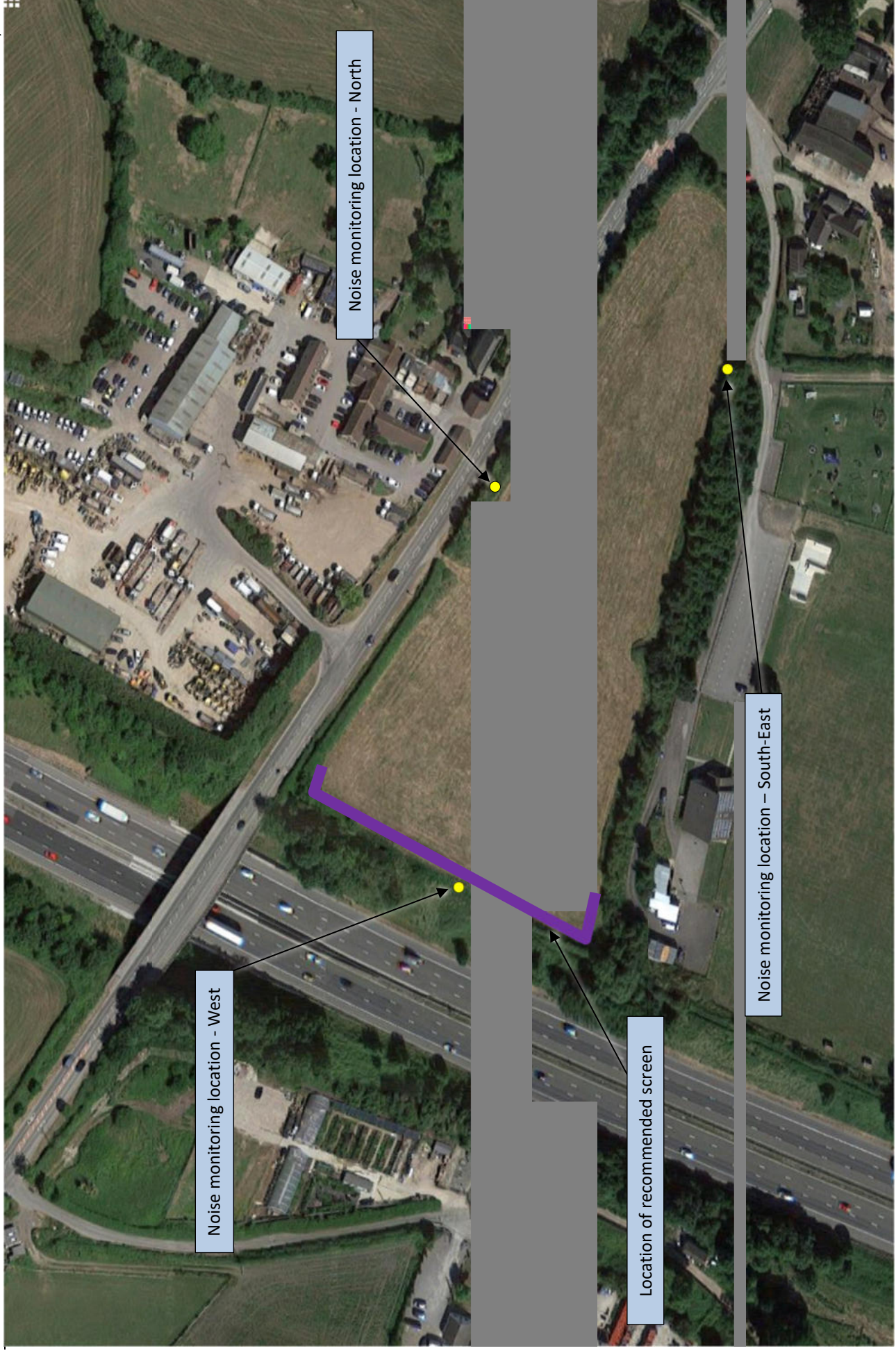
Noise from the community centre is not expected to be of concern with the exception of possible music / night time events.

Noise from the skate park is likely to be a moderate to high risk during summer months, depending on the utilisation of the facility.

Mitigation options have been discussed for development during the detailed design. This includes a bund and screening fence to the west façade, fencing around exposed gardens and appropriate layout and orientation of the new buildings.

**Steven Liddell MIOA**







VA3059/NM1

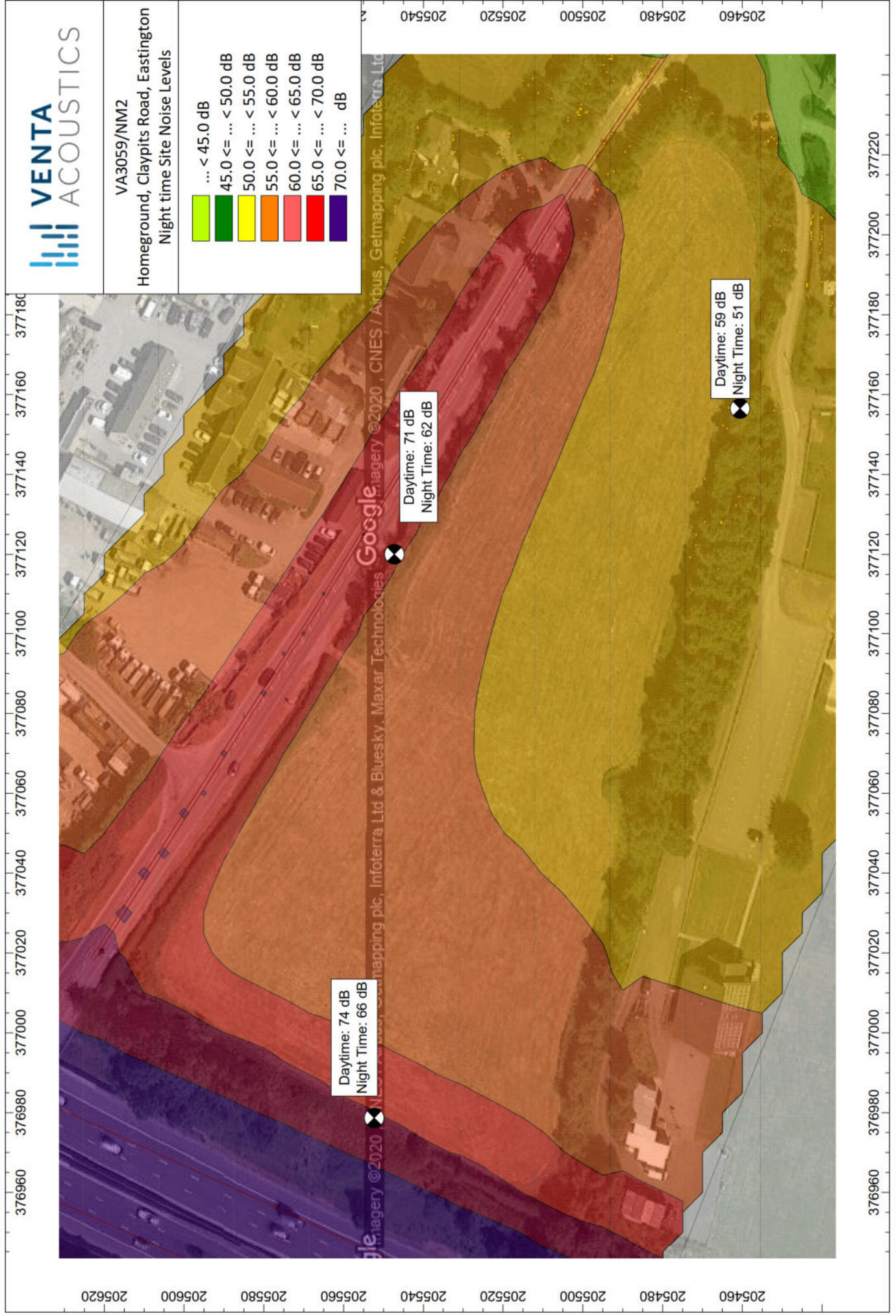
Homeground, Claypits Road, Eastington  
Daytime Site Noise Levels



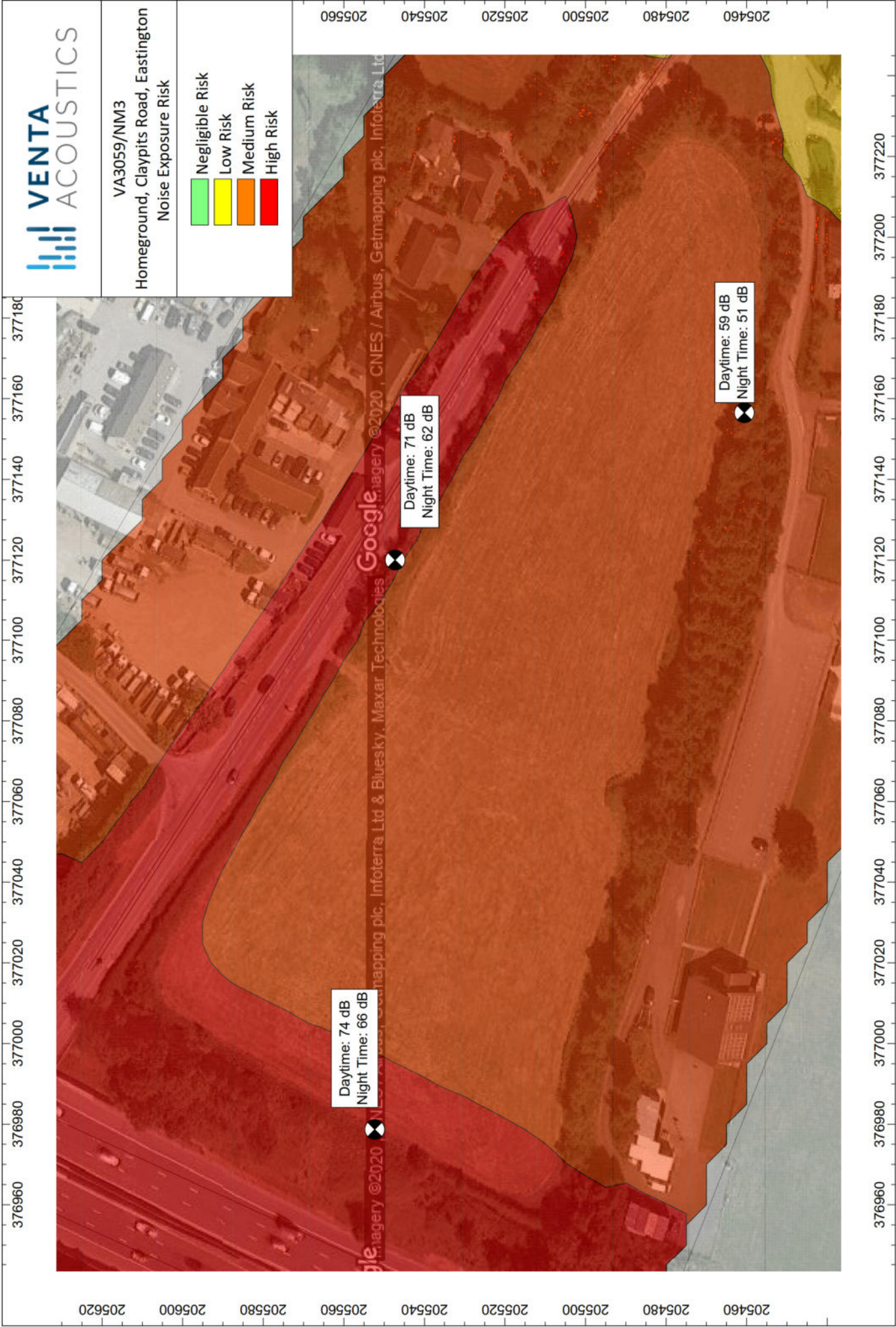


VA3059/NM2

Homeground, Claypits Road, Eastington  
Night time Site Noise Levels

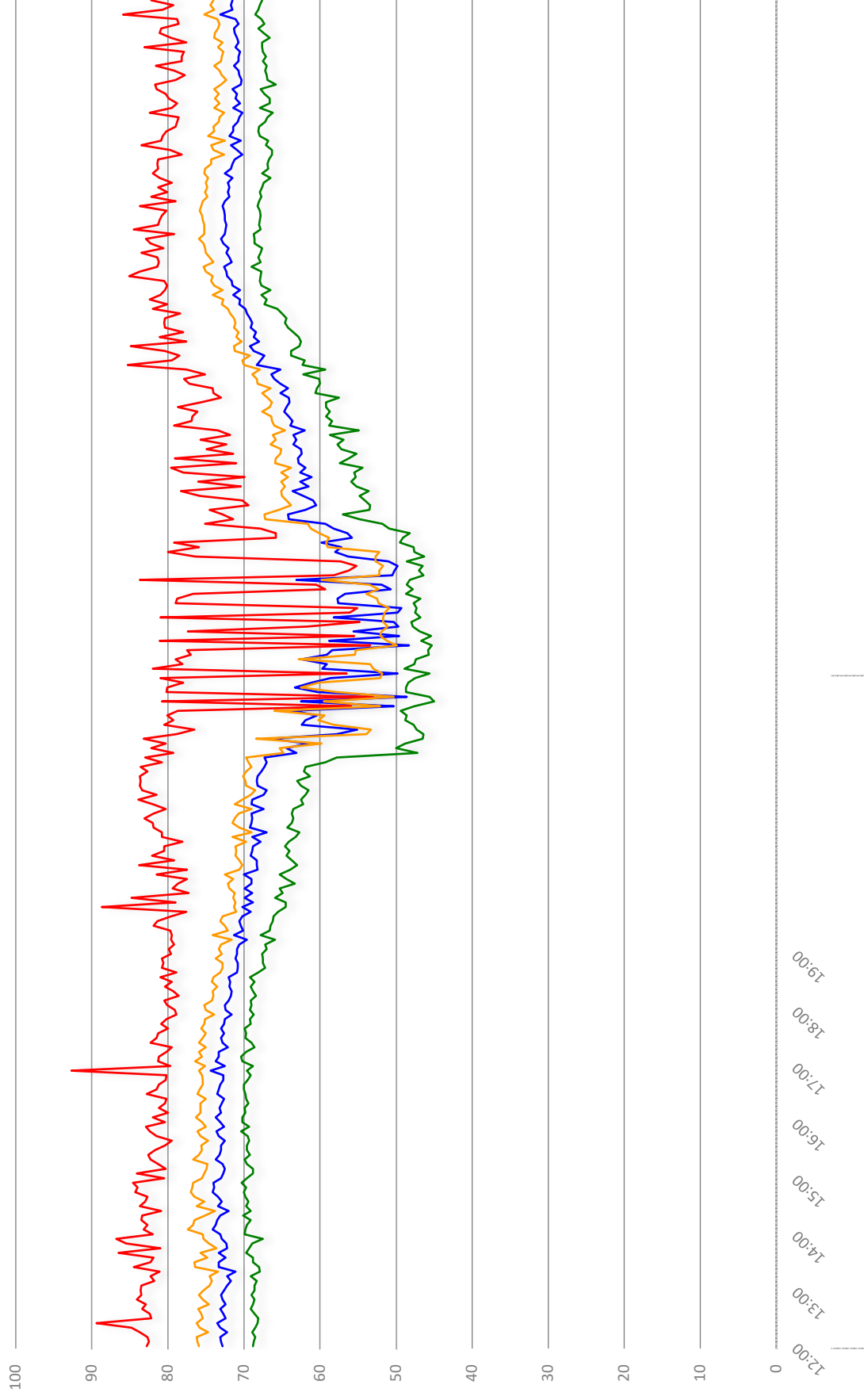


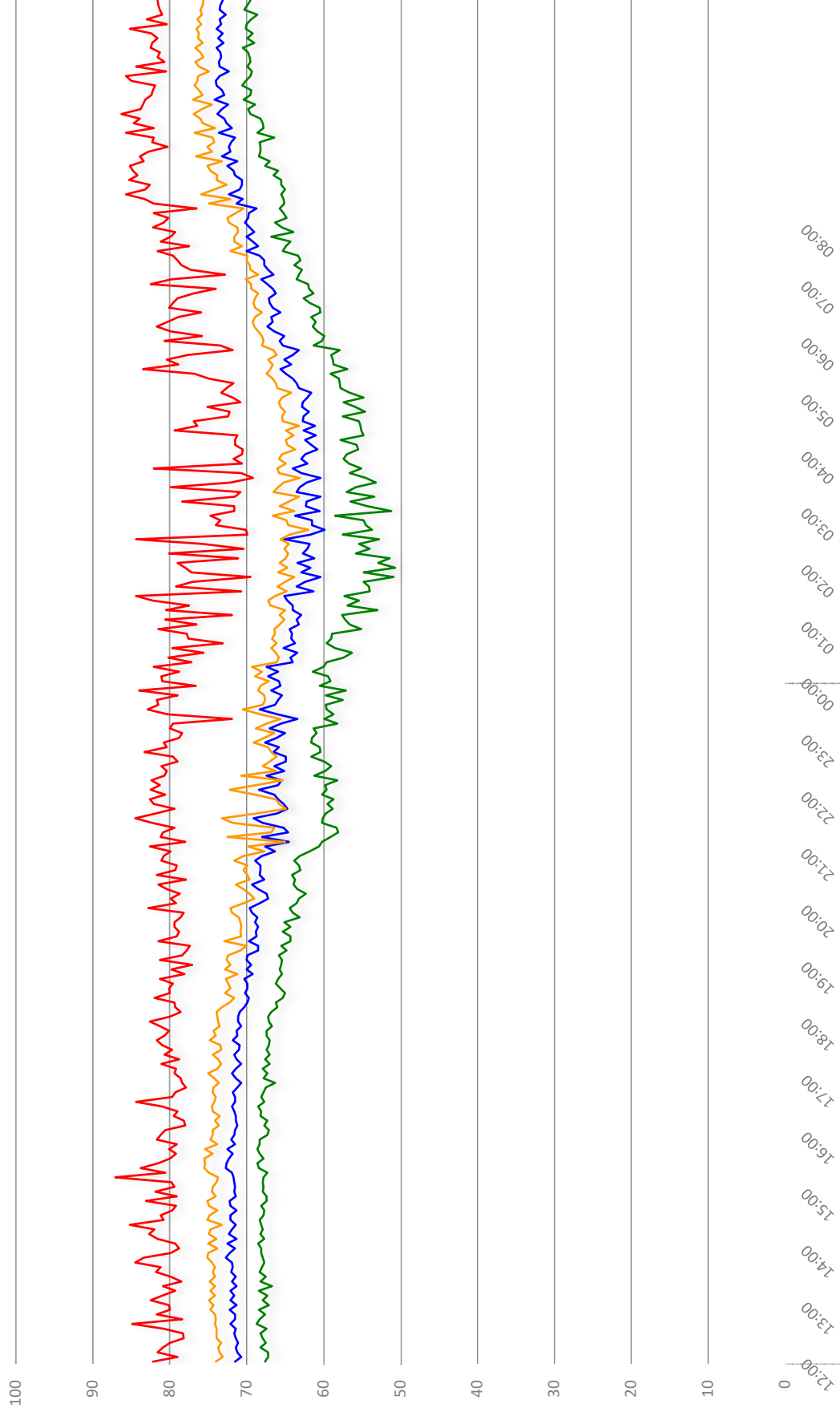


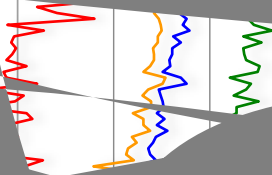
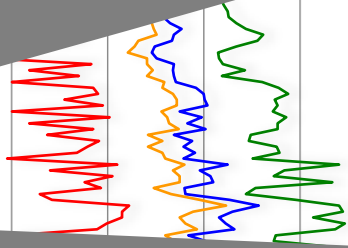
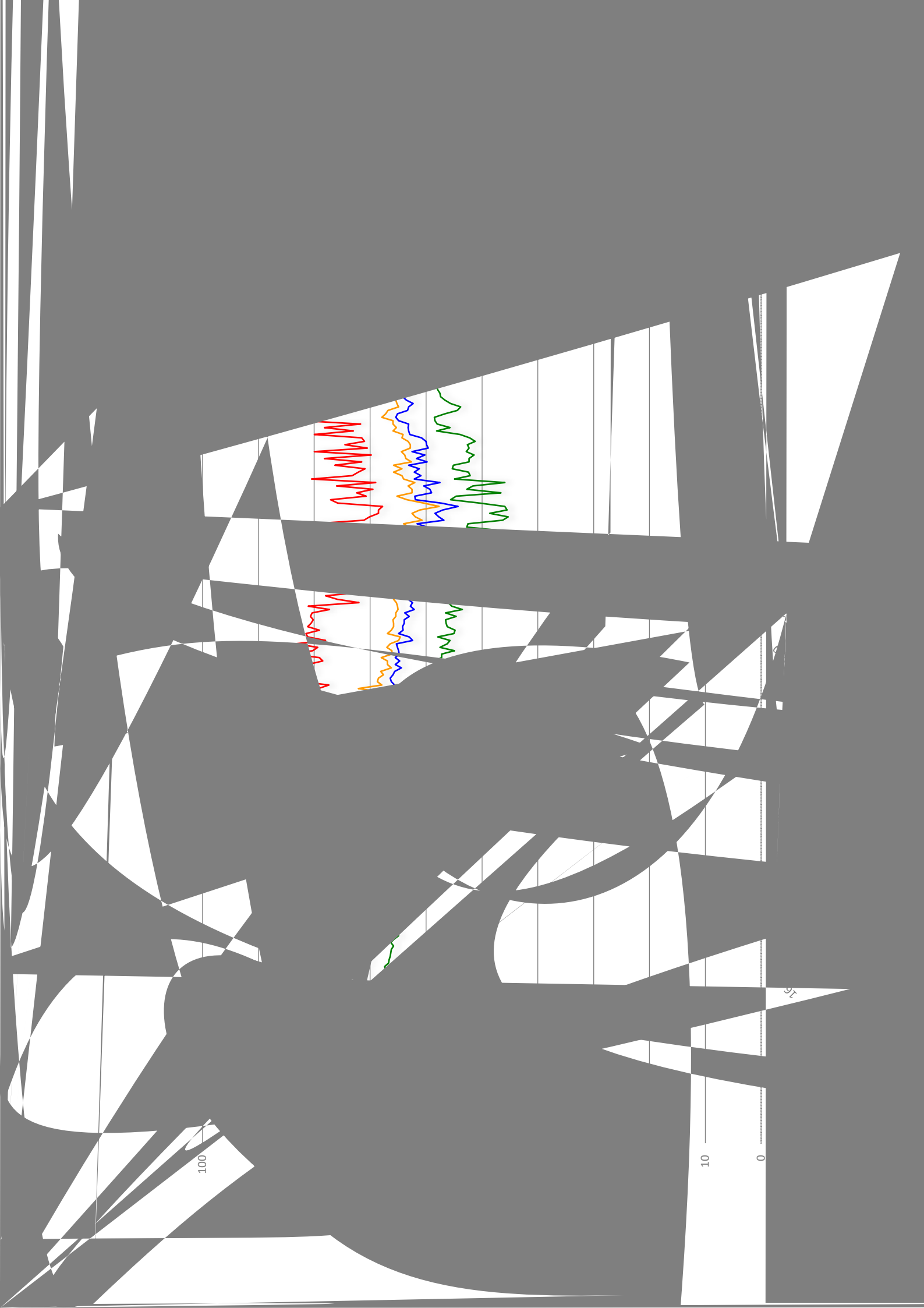


# Noise Monitoring Time Histories

## 1<sup>st</sup> Survey







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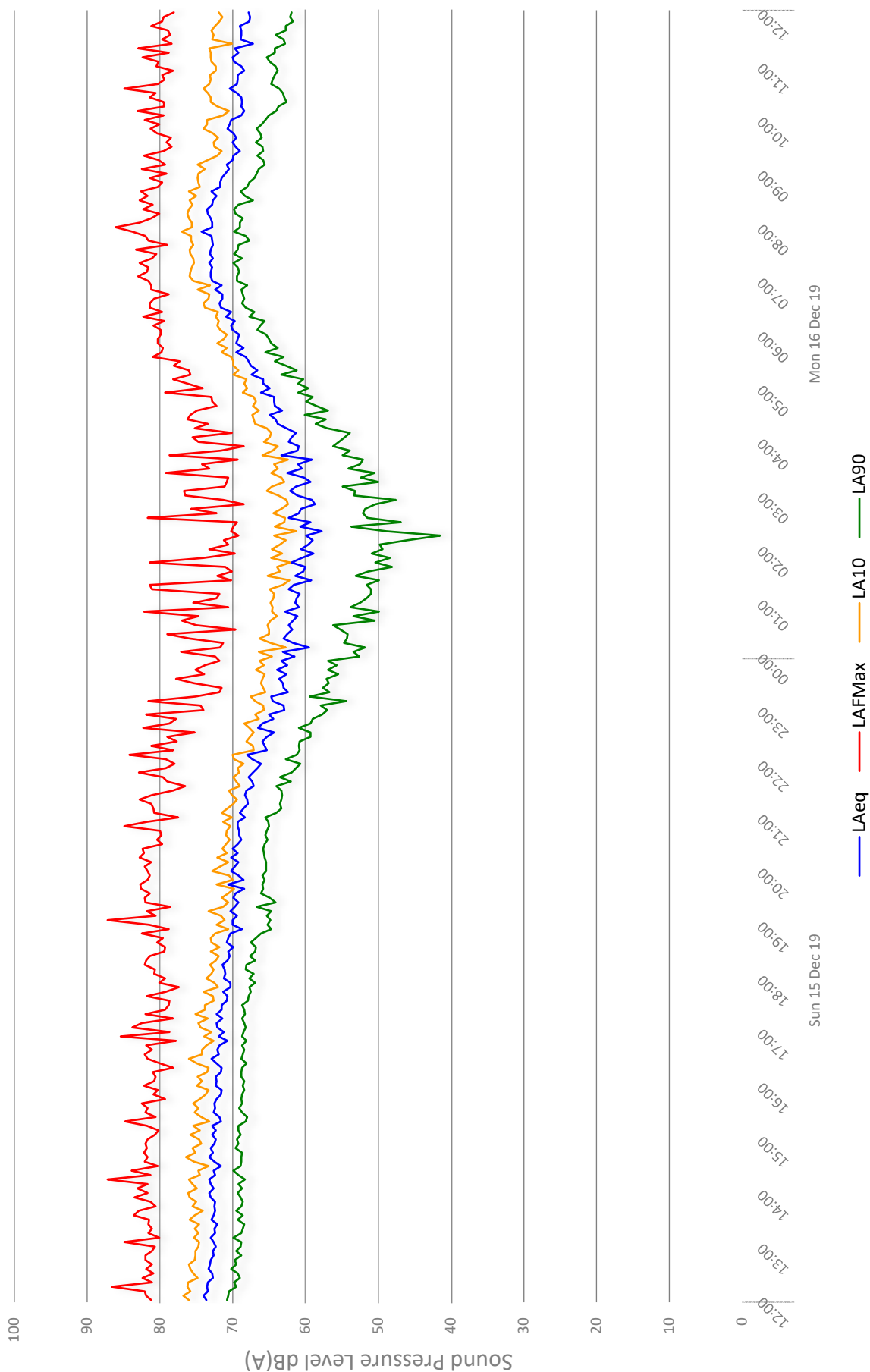
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Environmental Noise Time History: 4

North

Figure VA3059/TH4



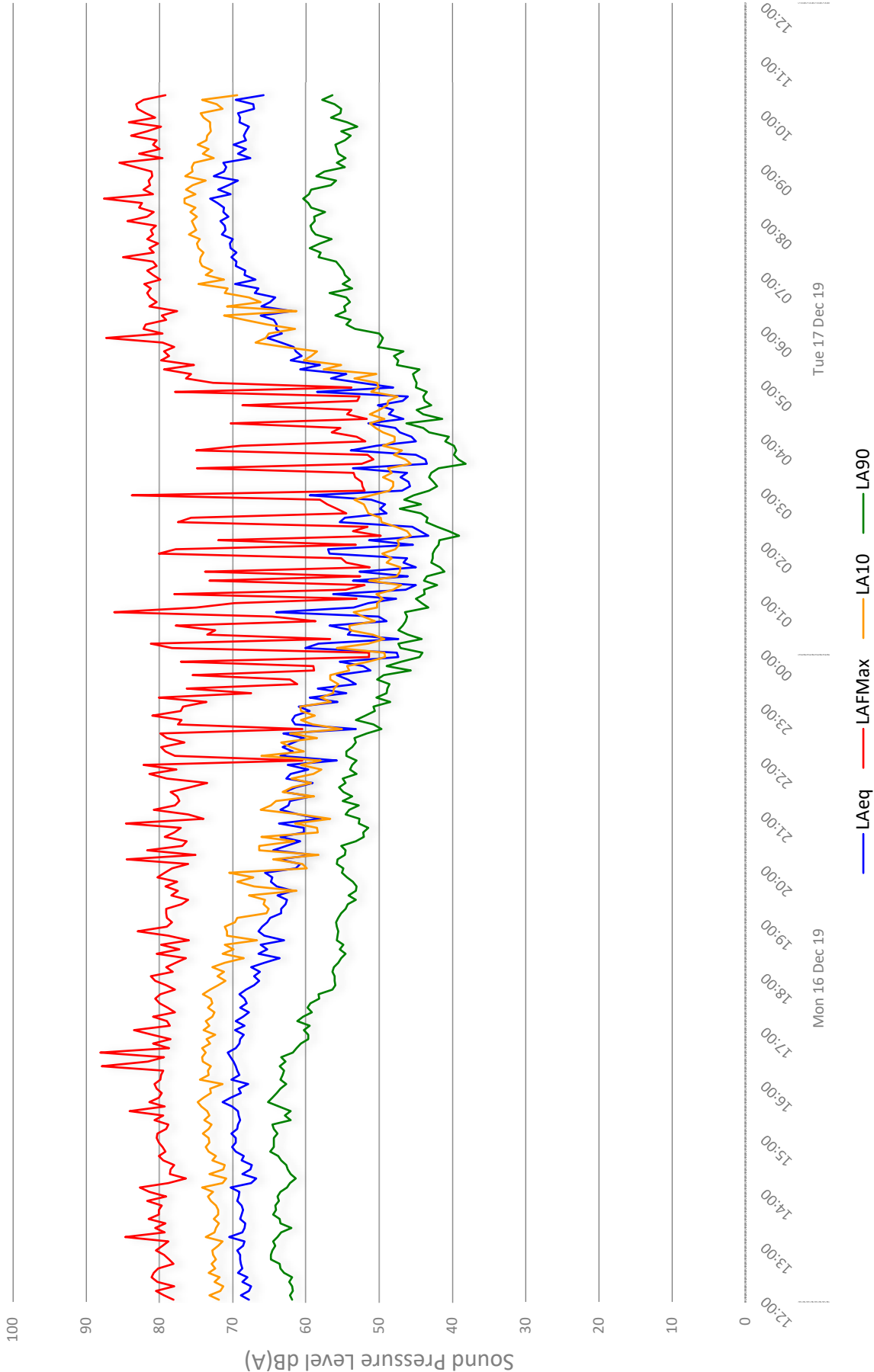
Homeground, Claypits Road, Eastington, Gloucestershire



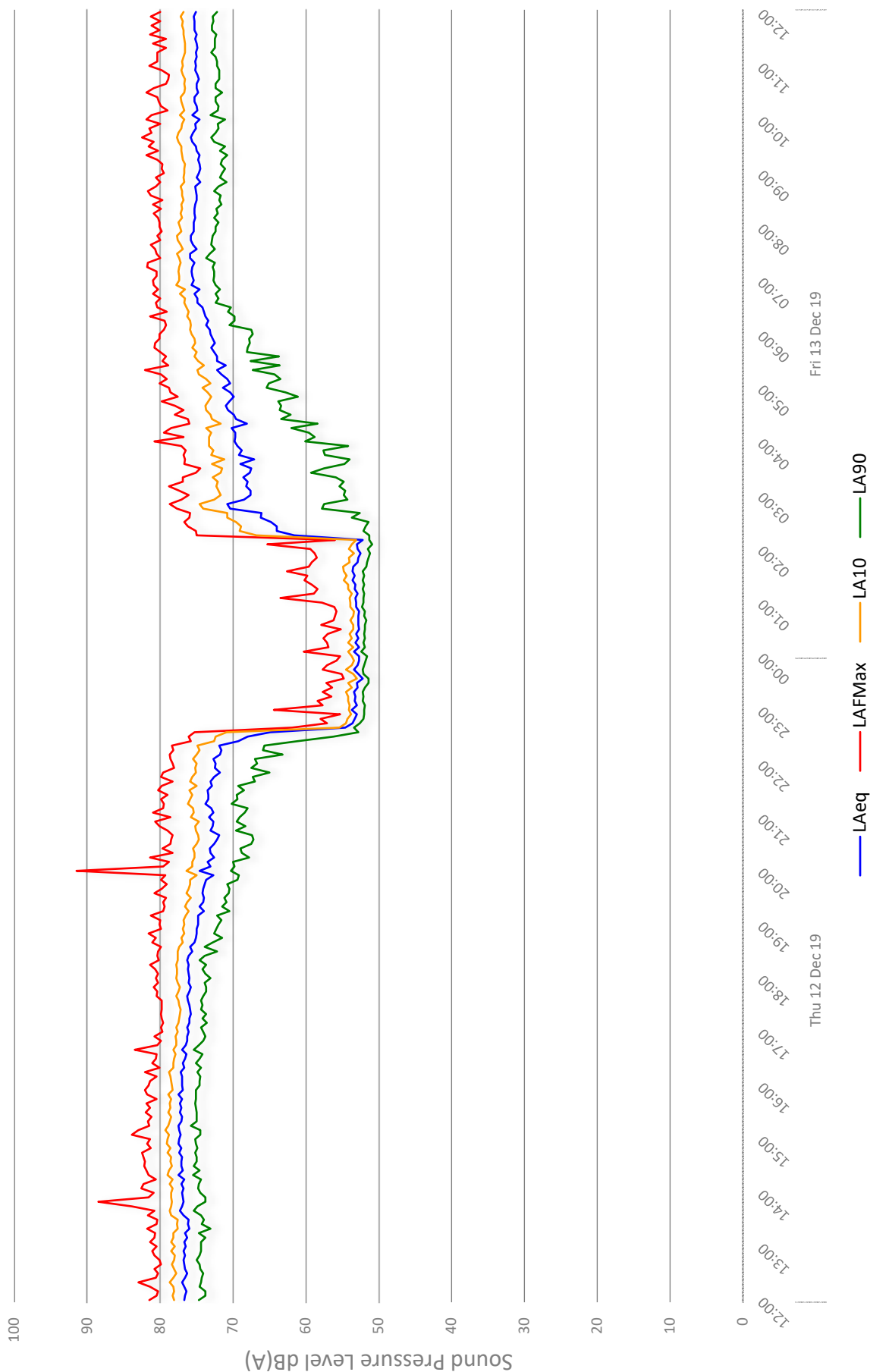
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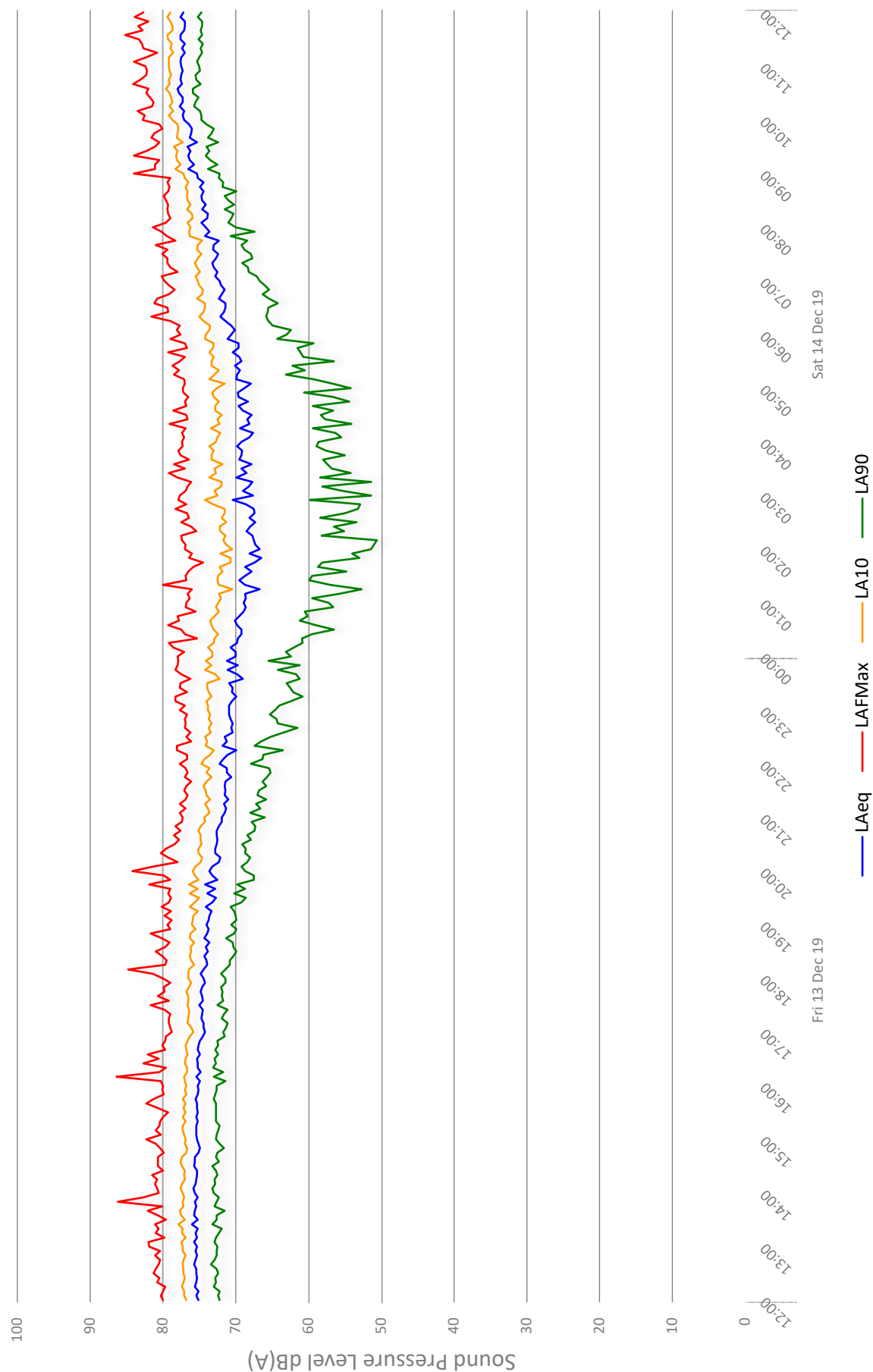
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Figure VA3059/TH5





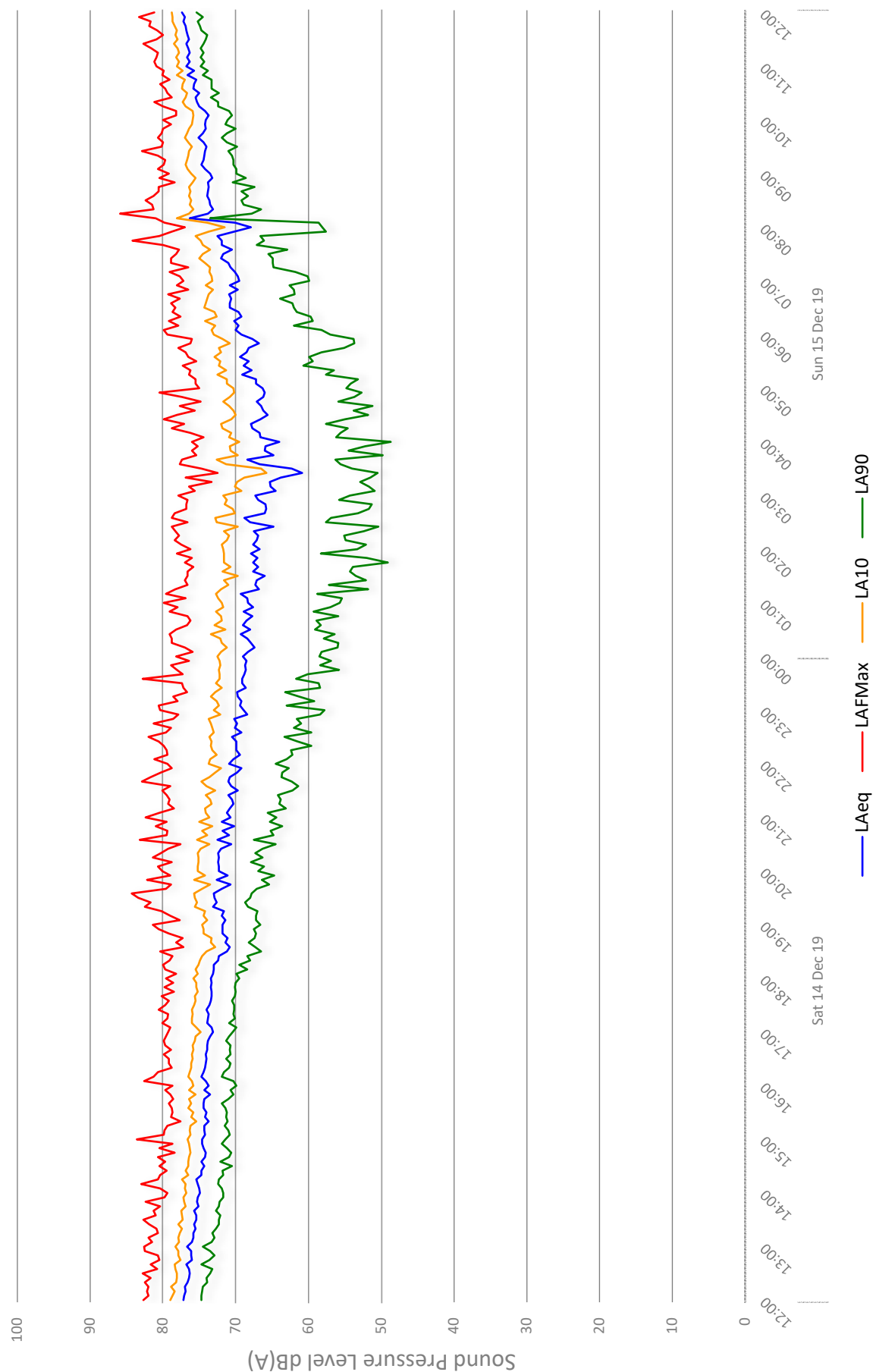


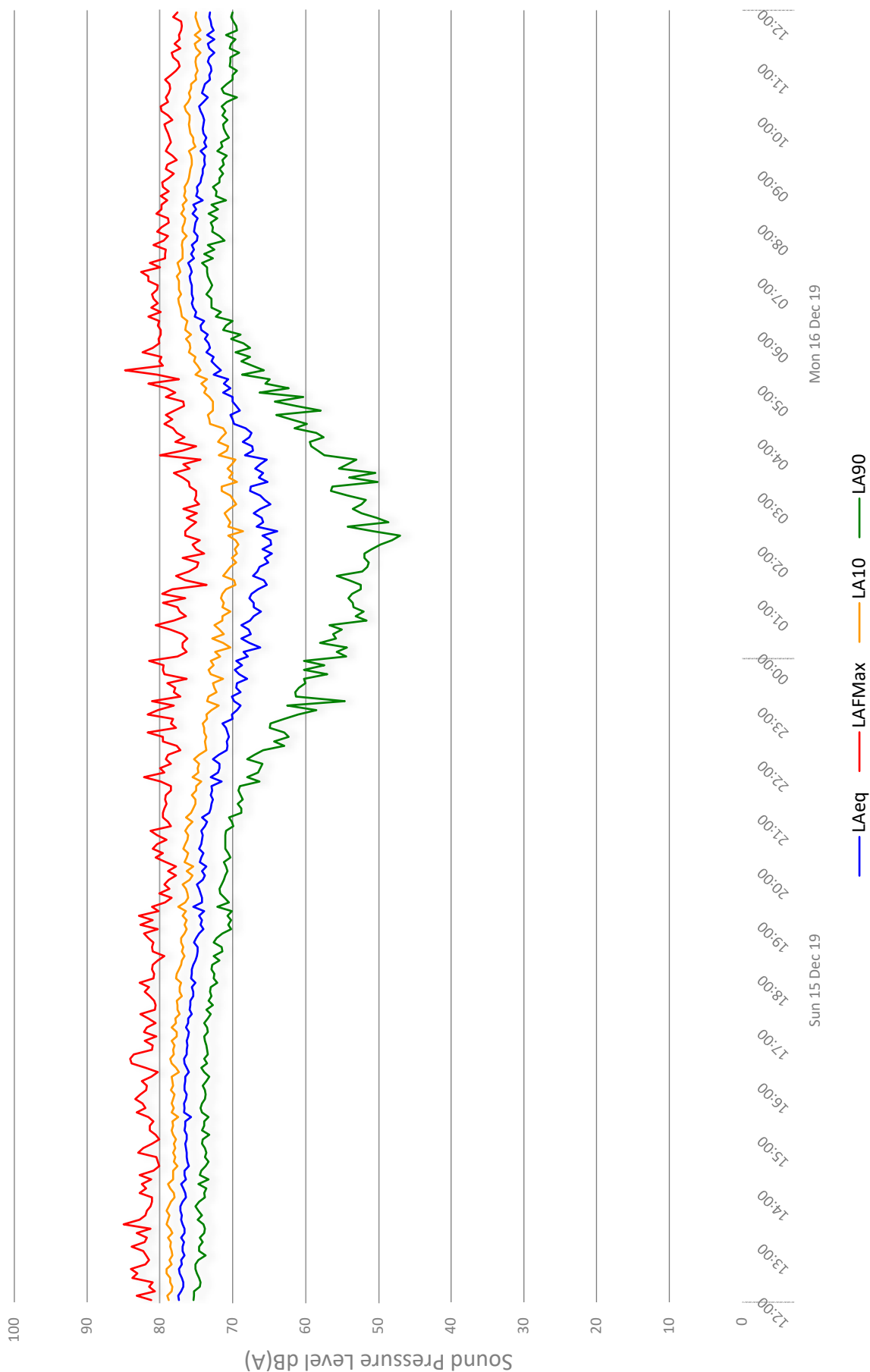


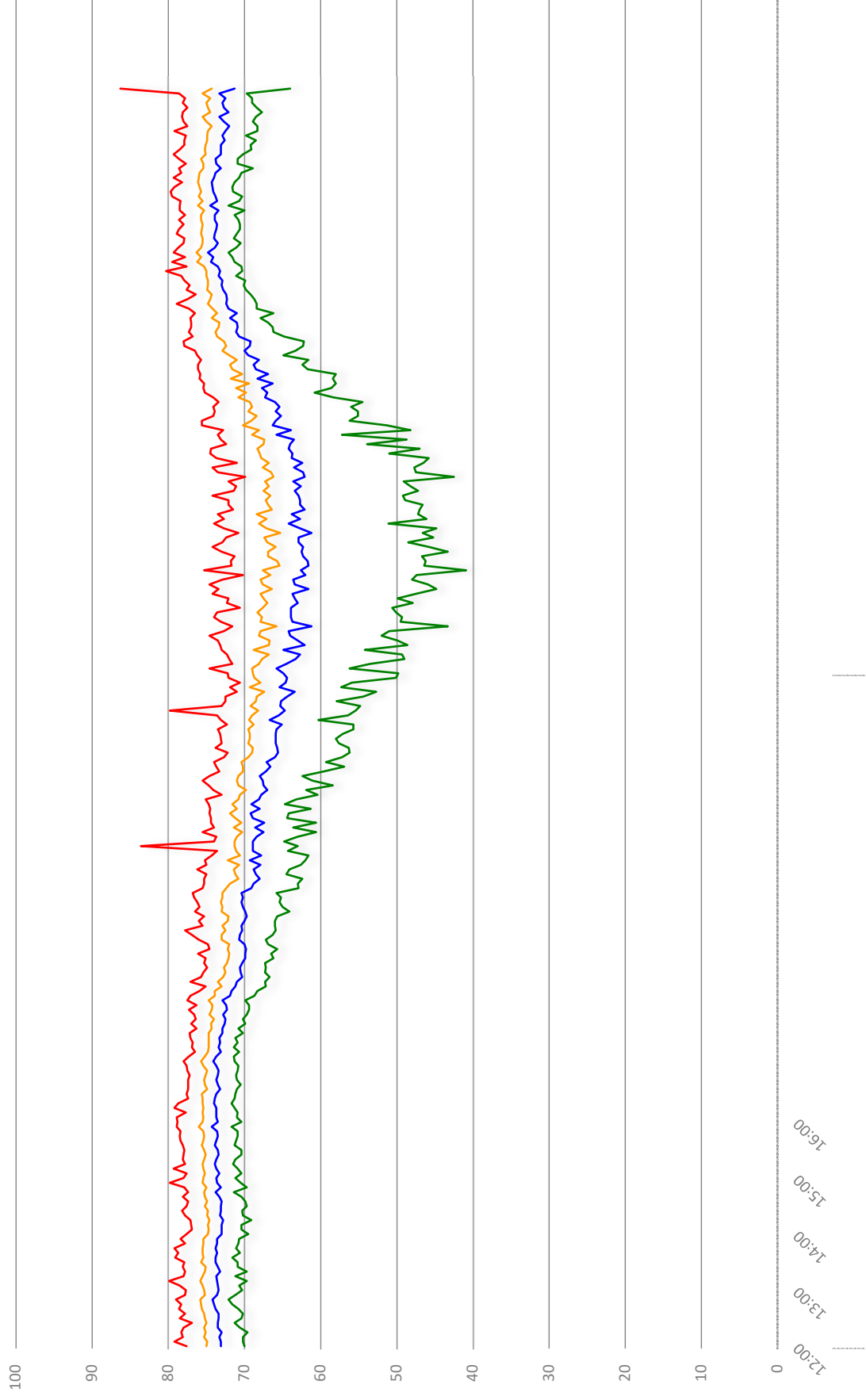
Environmental Noise Time History: 8

West

Figure VA3059/TH8

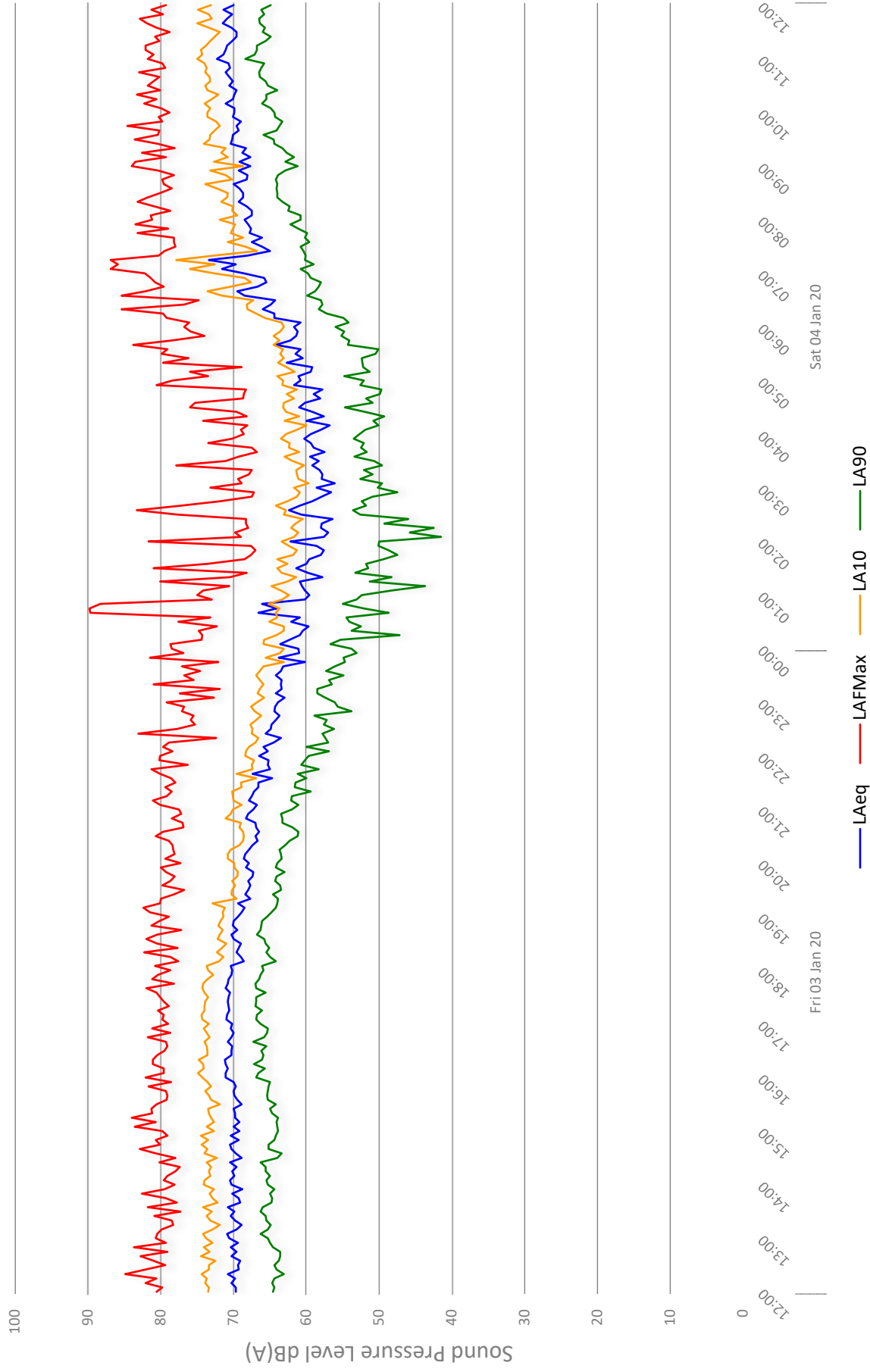




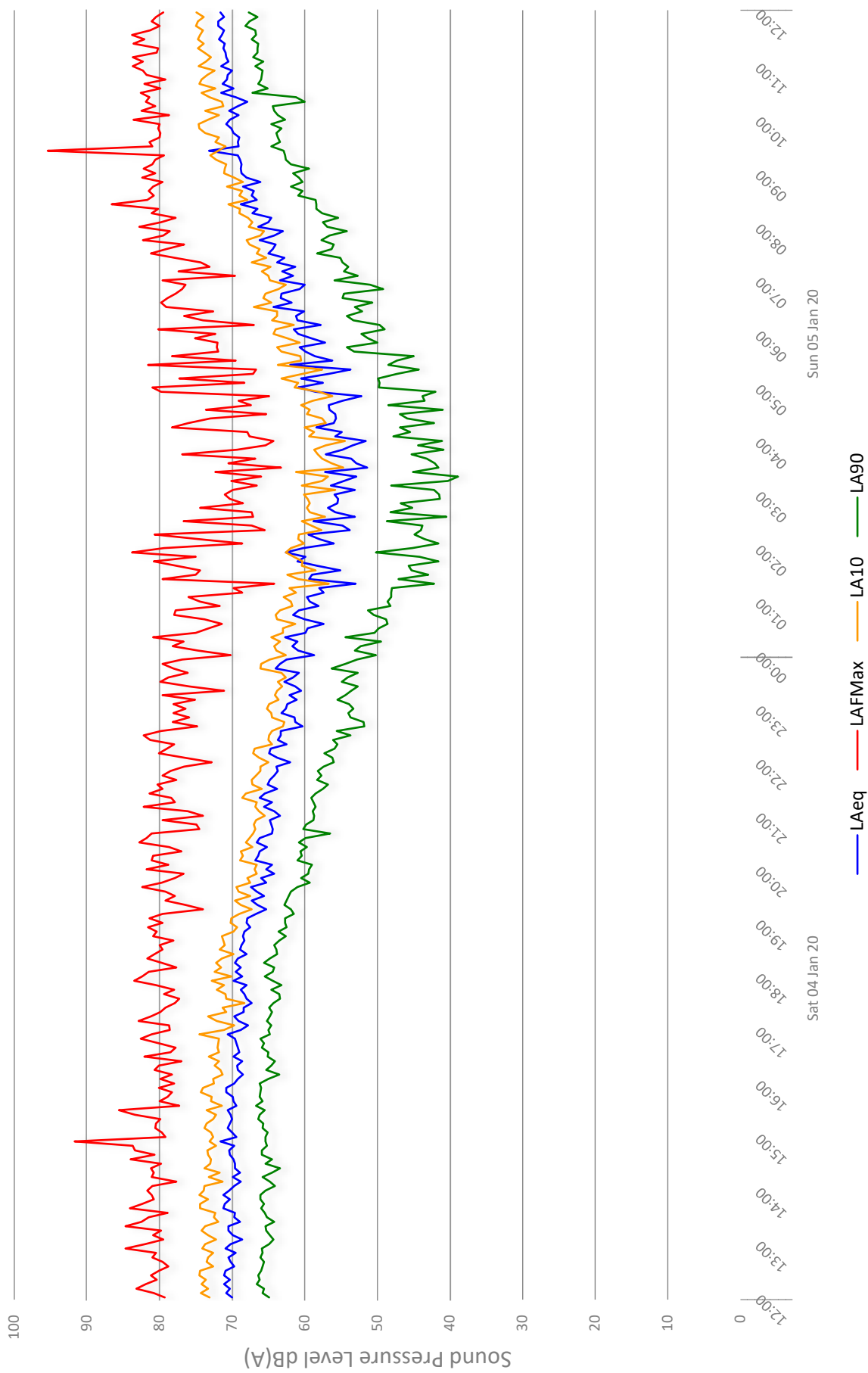


# Noise Monitoring Time Histories

## 2<sup>nd</sup> Survey



North



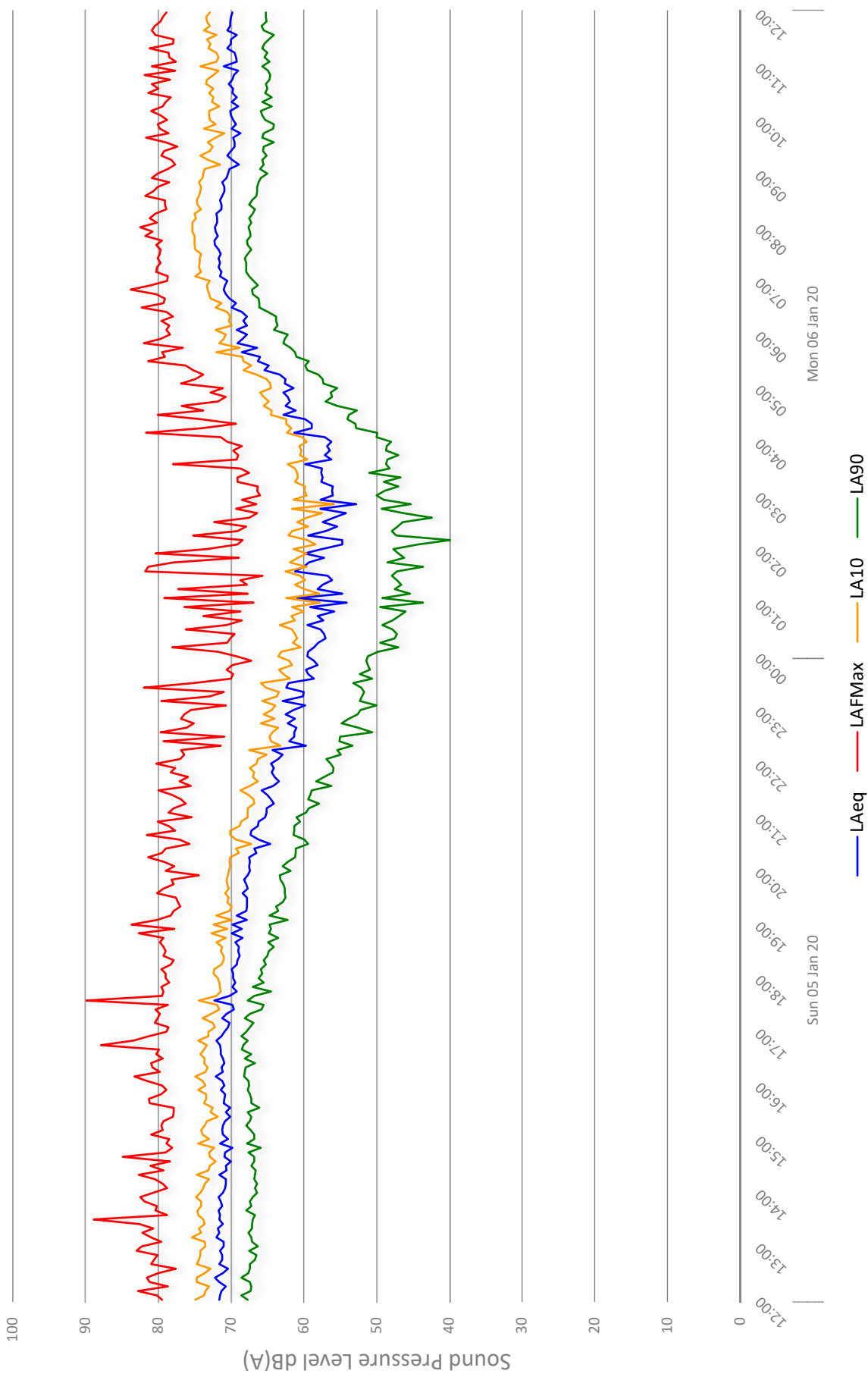


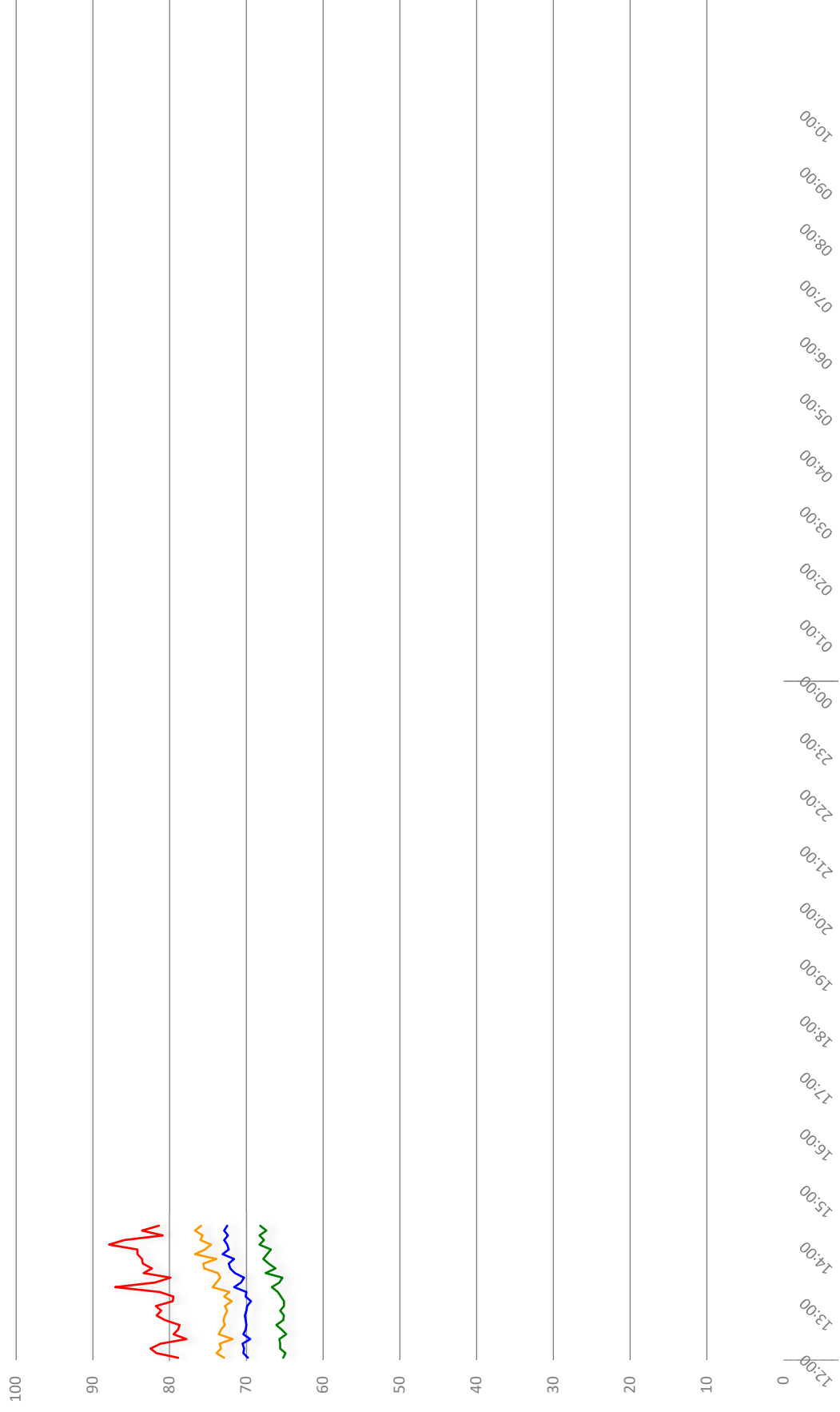


Environmental Noise Time History: 13

North

Figure VA3059/TH13





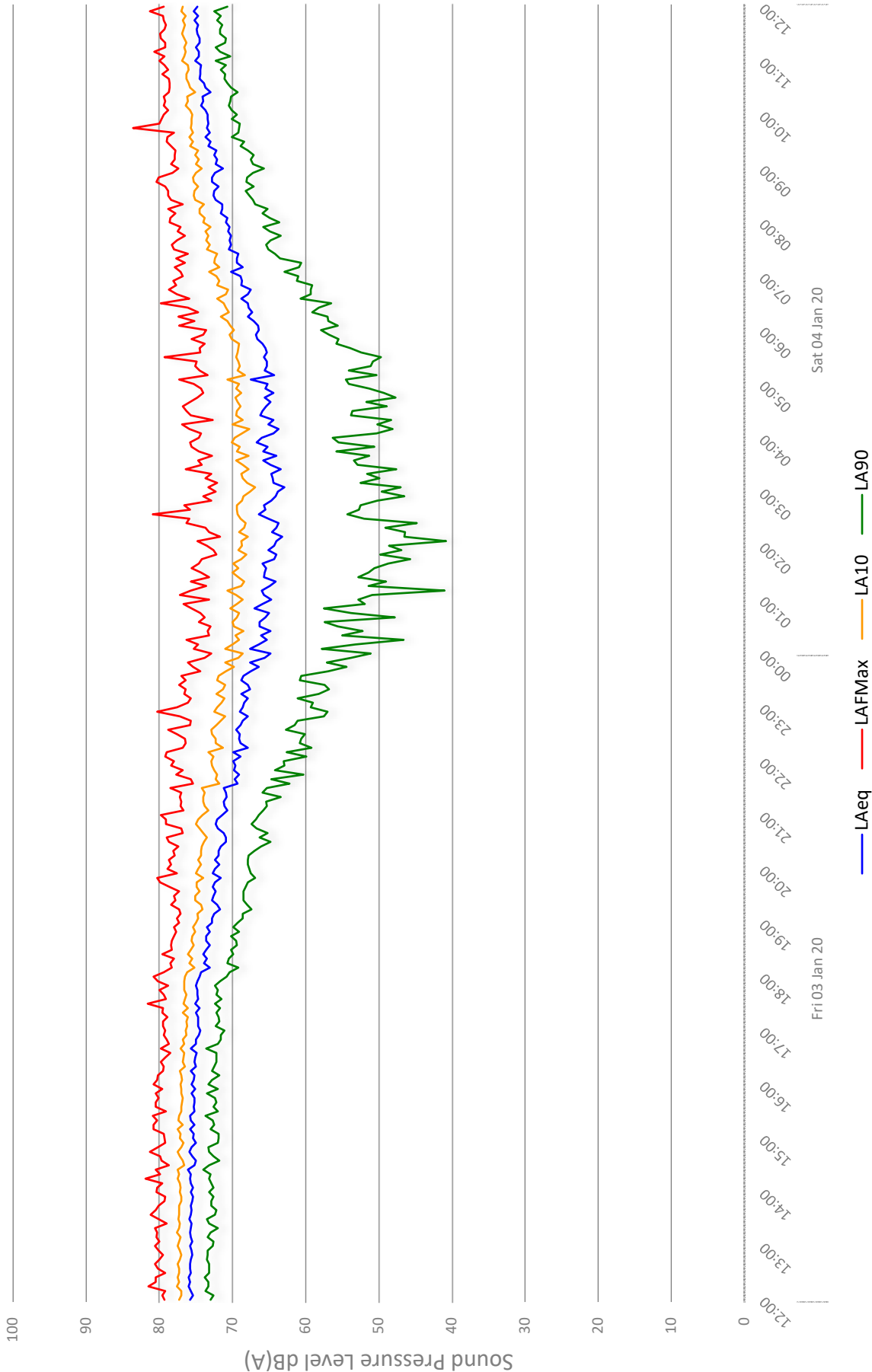
Homeground, Claypits Road, Eastington, Gloucestershire

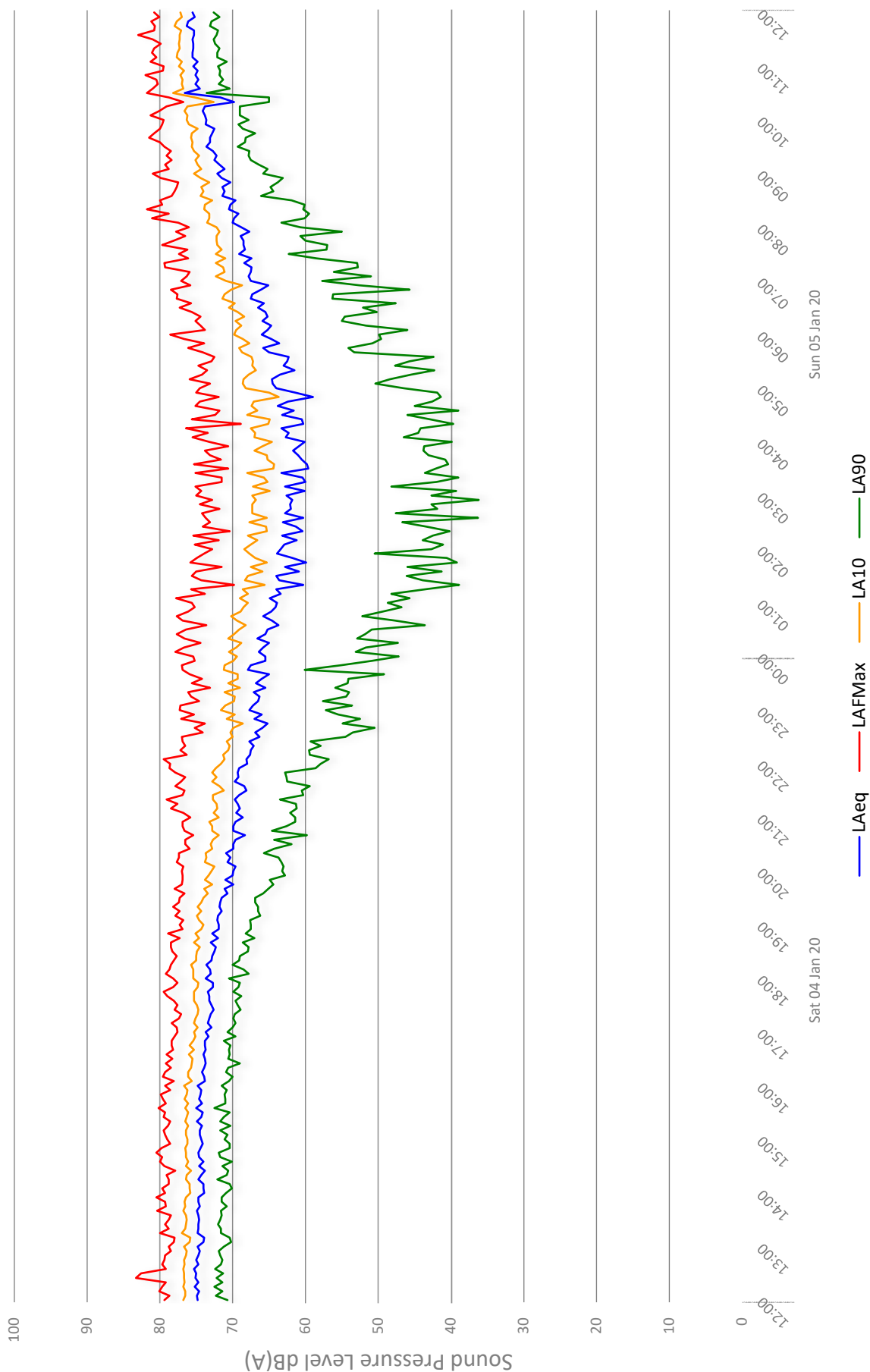


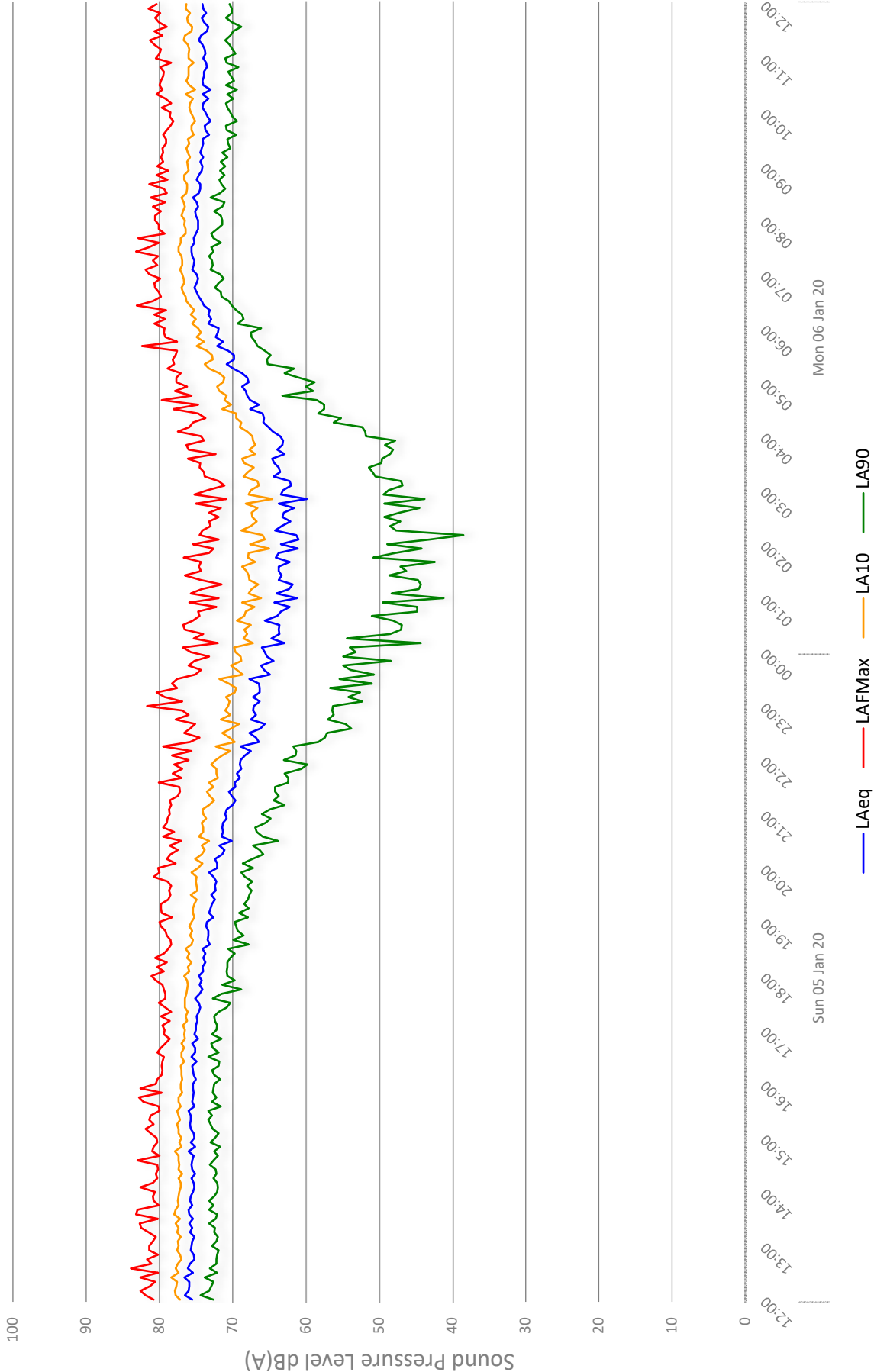
Environmental Noise Time History: 15

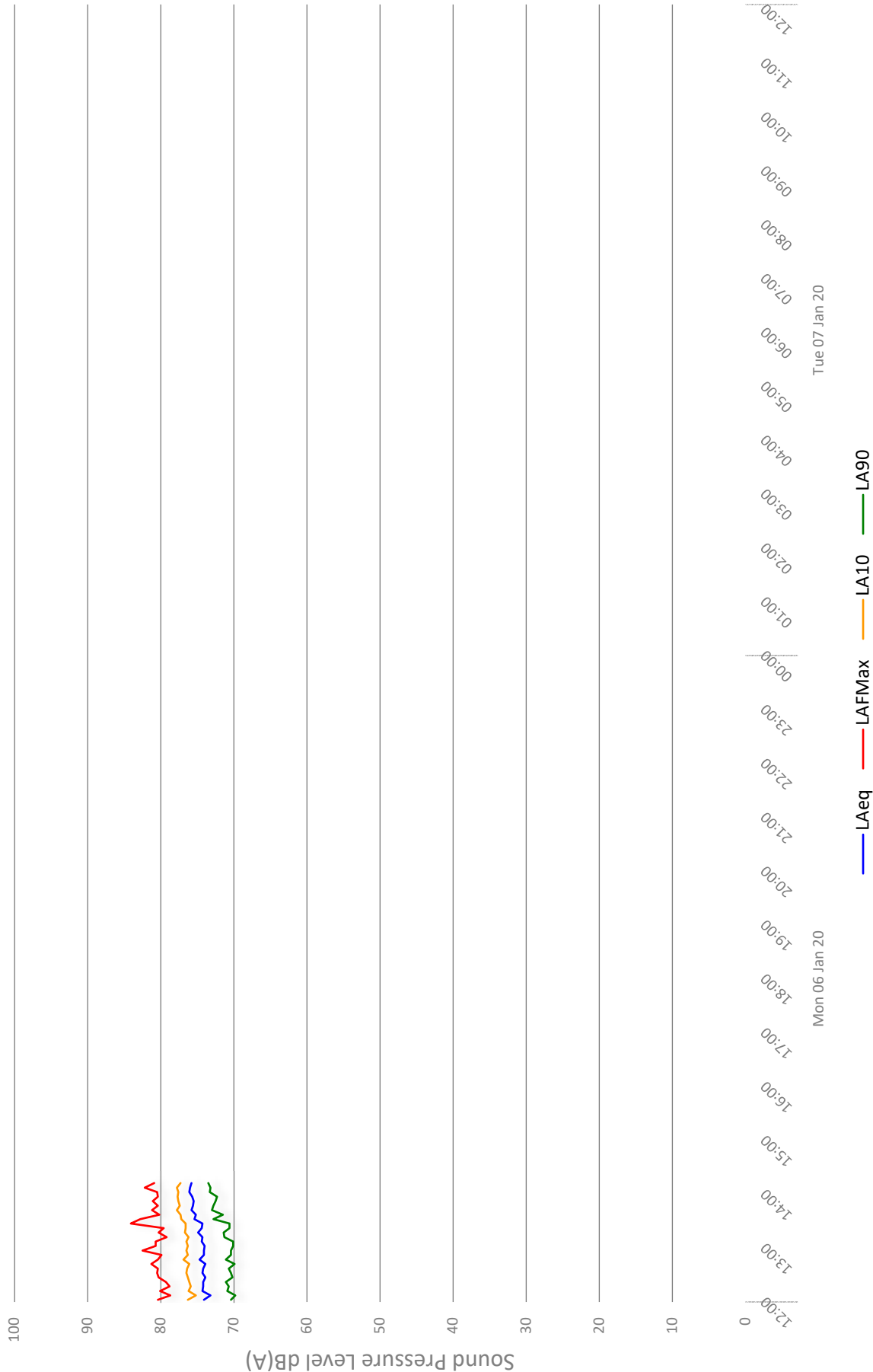
West

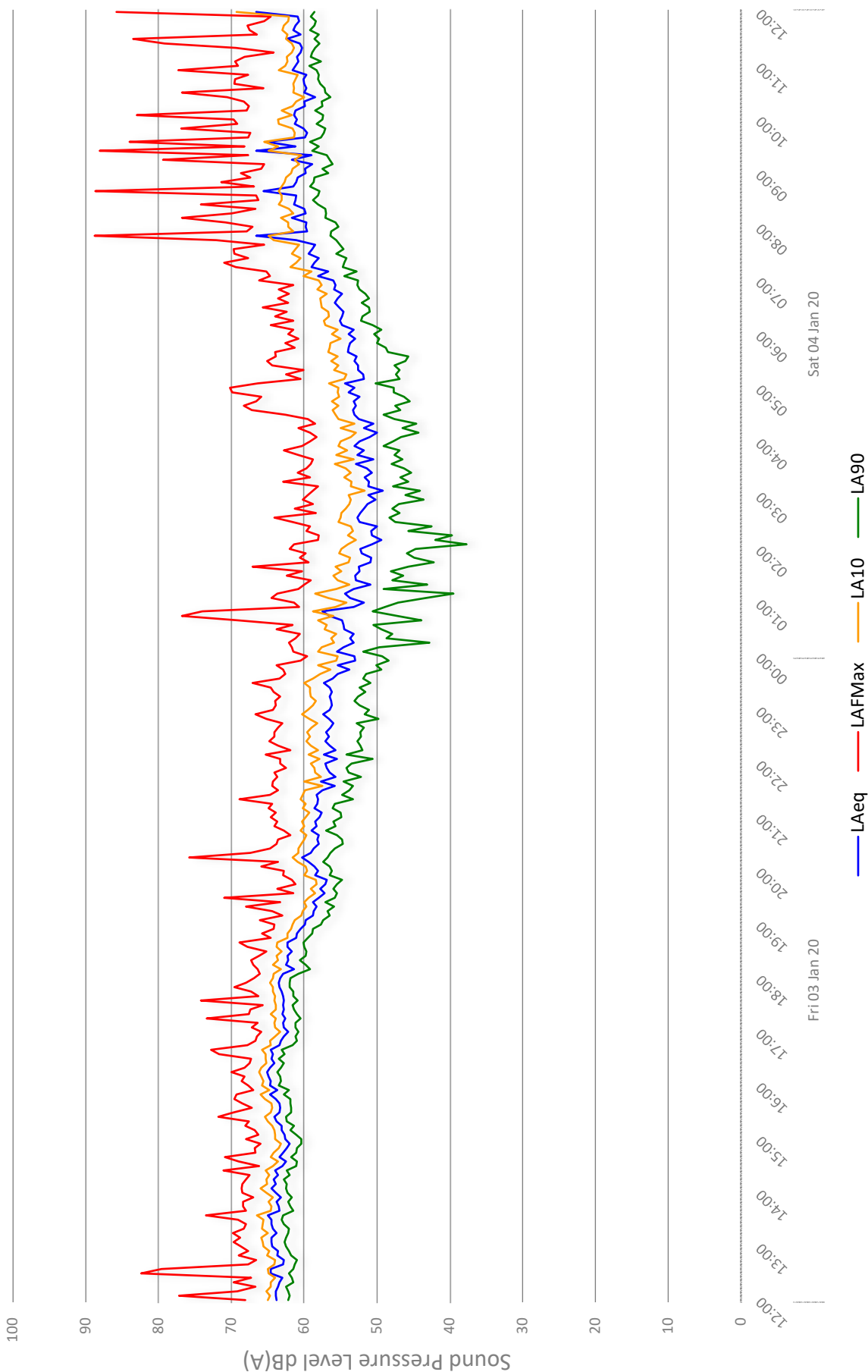
Figure VA3059/TH15











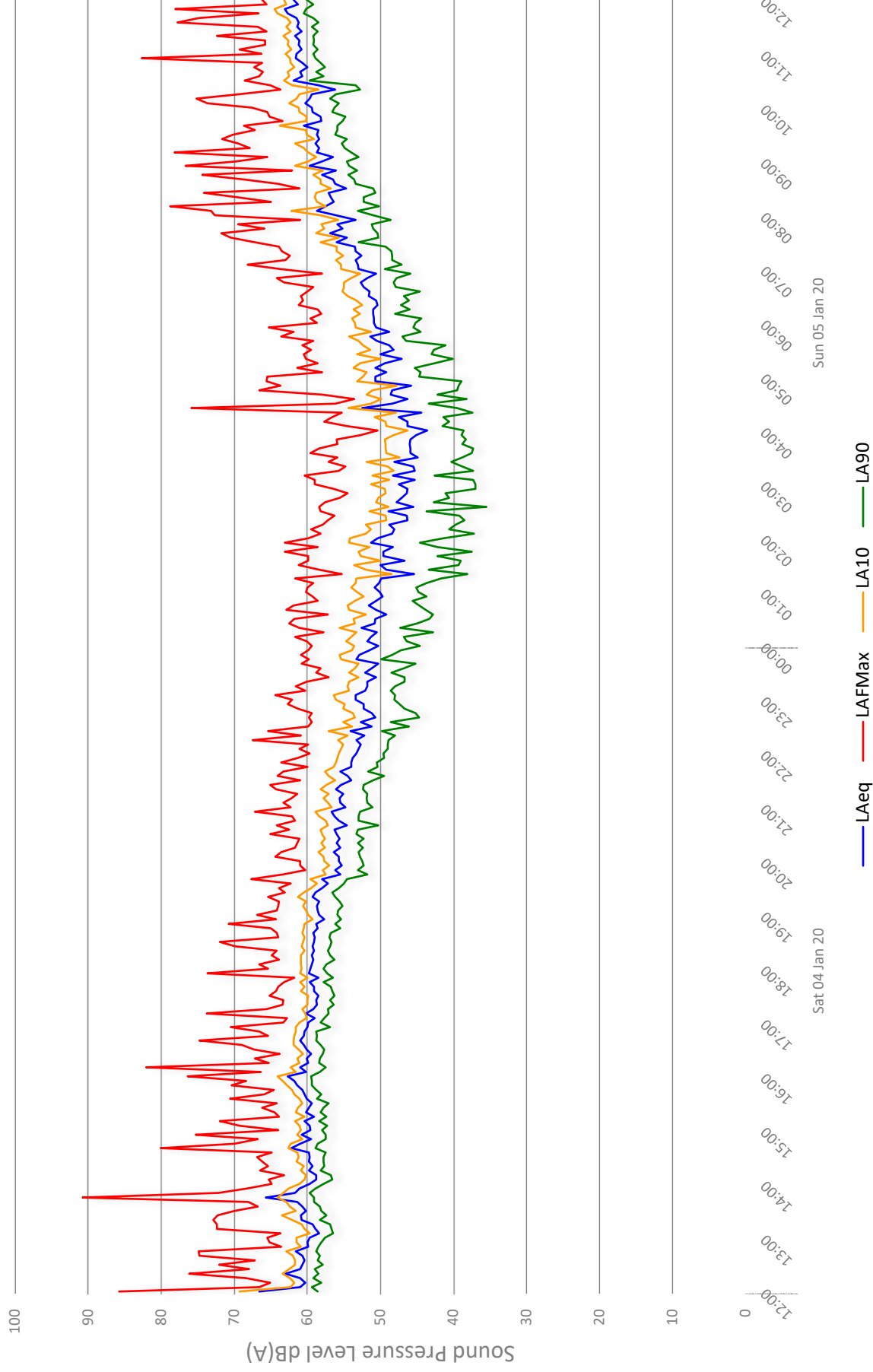
Homeground, Claypits Road, Eastington, Gloucestershire



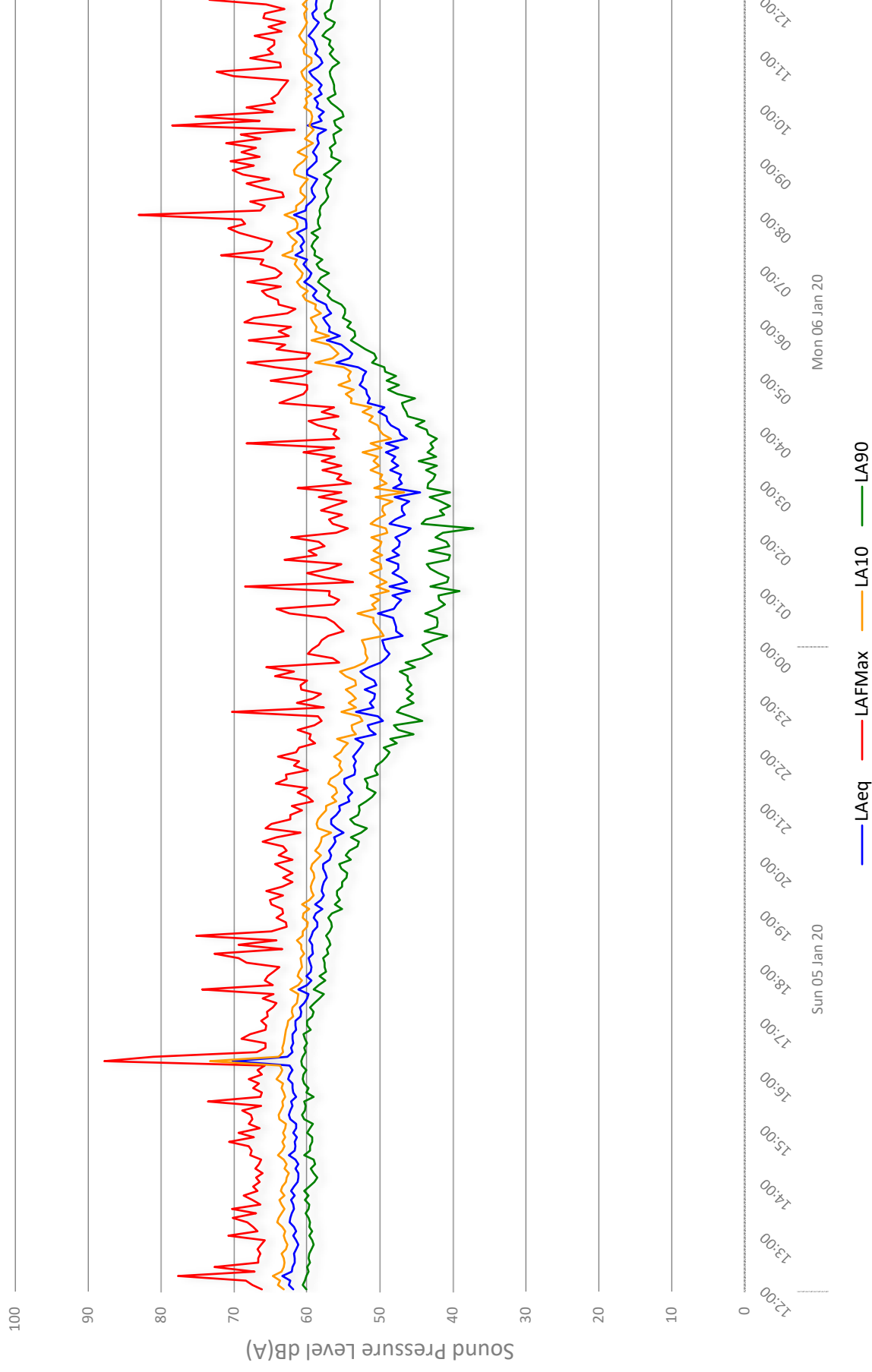
Environmental Noise Time History: 20

South-East

Figure VA3059/TH20







Environmental Noise Time History: 22

South-East

Figure VA3059/TH22

