



Bicester Heritage,  
Experience and  
Demonstration Track

Environmental Noise Impact  
Assessment for Bicester  
Motion Ltd

Date 13 April 2023

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# Document control sheet

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Prepared by	Ian Arthurs BSc (Hons), MSc, MIOA, Associate	
Checked by	Chris Beale BSc (Hons), Director Hydrock SPLtrack	
Approved by	Chris Beale BSc (Hons), Director Hydrock SPLtrack	

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## 1. Introduction

SPLtrack Environmental (SPLtrack), a Hydrock Consultants Ltd (Hydrock) company, referred to hereinafter as Hydrock SPLtrack, have been appointed by Bicester Motion Ltd (BML) to undertake an environmental noise impact assessment to support the planning application to regularise the use of the experience and demonstration track at Bicester Heritage (BH), Oxon, OX27 8AL.

This report was prepared by Ian Arthurs, an Associate Acoustic Engineer at Hydrock. Ian holds a Master's degree (MSc) in Applied Acoustics and Noise Control Engineering, a BSc (hons) degree in Engineering, and is a full corporate Member of the Institute of Acoustics (MIOA). Ian has over 15 years of experience of work in the field of environmental noise assessments.

This report was checked by Chris Beale BSc (hons), Director of Hydrock SPLtrack. Chris has a wealth of experience providing automotive noise management and has been involved in the noise management of Bicester Heritage for several years. SPLtrack developed the 'drive-by' noise trapping system, which is in use at most UK circuits and has become the automotive noise measurement standard.

Hydrock Acoustics is a member of the Association of Noise Consultants (ANC) (the trade association for acoustic, noise and vibration consultancy practices in the UK). Our Acoustic consultancy staff are corporate members of the Institute of Acoustics (IOA).

This report is technical in nature; therefore, a glossary of acoustic terminology is provided in **Appendix A** to assist in understanding this report.

## 2. Existing site and proposal

Founded in 2013, the BH venue is operated by BML to offering indoor and outdoor venue hire, and a vehicle experience and demonstration test tack.

### 2.1. Existing use

The experience and demonstration track currently provides:

- » Approx. 1km track available to run in two configurations – loop, or figure of eight;
- » Operates with 1 car at any one time, unless by prior arrangement;
- » Overtaking is permitted on the track straight;
- » Operating times 9am – 5pm excepting electric vehicles with;
- » Daylight hours in winter months have reduced operating times;
- » Typical users of the experience and demonstration track is provided in **Table 1**.

Table 1: Typical existing users of the experience and demonstration track

Use	Occurrence (Annual)	Vehicle Type	Typical Number of Attendees
<b>Bicester Heritage Users</b>	200	Road legal and classic vehicles	Up to 5
<b>Experience</b>	10	Road legal vehicles	100+ per event
<b>Community &amp; Leisure</b>	30	Bicycles	21-50
<b>Vehicle Exercising</b>	60	Road legal vehicles, some race vehicles (silencers required)	60
<b>Events</b>	25		100+
<b>Promotional (film, photos)</b>	20	Road legal vehicles	20

Noise limits applicable and monitored to include:

- » No engines may run prior to 08:30 or after 18:00;
- » 100 dB drive-by; and
- » No tyre squeal is permitted.

#### 2.1.1. Noise Management

BML are committed to responsibly managing noise in the community and have a Noise Management Plan<sup>1</sup> (NMP) in place. The NMP includes the use of the experience and demonstration track, and

<sup>1</sup> SPLtrack Environmental. Bicester Heritage (Figure 8) Test Experience Noise Management Plan. April 2021

provides a protocol for event management, noise monitoring and mitigation, track operations, complaint procedures, enforcement procedures, noise limits and operational hours.

## 2.2. Proposal

This noise impact assessment looks to support the planning application to regularise the use of the BH experience and demonstration track to include:

Table 2: Proposed use for experience and demonstration track

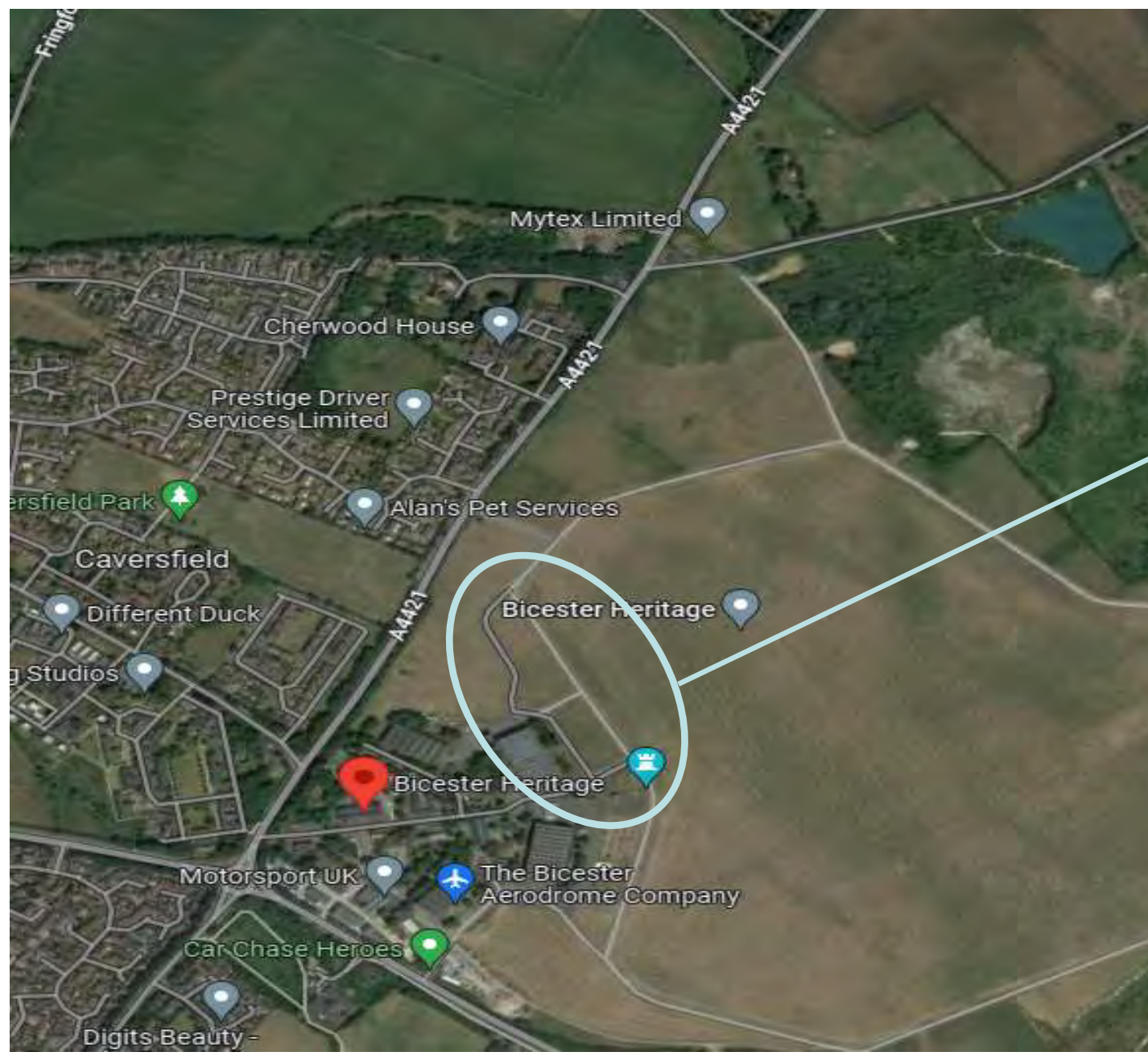
Category	Use
<b>A</b>	Days on which the ambient noise level at the residential monitors is increased by no more than 6 dBL <sub>Aeq,1hr</sub> due to circuit activity
<b>B</b>	Days on which the ambient noise level at the residential monitors is increased by no more than 12 dBL <sub>Aeq,1hr</sub> due to circuit activity
<b>C</b>	Days on where the ambient noise level at the residential monitors is increased by more than 12 dB L <sub>Aeq,1hr</sub> due to circuit activity, but is limited to no more than 90 minutes in any one day

**\*Electric vehicles (EVs) to operate at any time**

An overview of the Bicester Heritage site, and experience and demonstration track is provided in **Figure 1**.

All other activities associated with the wider BH operations and experience track fall outside the scope of this assessment.





Project Title	Bicester Heritage - Experience and Demonstration Track
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Drawing Title	Site Location
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By	IA
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Status	A1

Rev	Description	Date	By
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Drawing No.	Figure 1
Issue	01

### 3. Assessment Methodology

#### 3.1. Policy and guidance

The methodology used for this noise impact assessment is based on the most relevant and up to date policy and guidance documents, including:

- » National Planning Policy Framework, 2021 (NPPF);
- » Noise Policy Statement for England, 2010 (NPSE);
- » Planning Practice Guidance – Noise, 2014 (PPG);
- » British Standard 7445-1:2003 - Description and measurement of environmental noise. Guide to quantities and procedures (BS 7445).

A review of the relevant planning policy and acoustics guidance is found throughout this document and in **Appendix D**.

#### 3.2. Motor leisure venue noise

The relationship between automotive activity facilities in the United Kingdom and environmental noise in the adjacent community has not always been positive, however relatively recent developments in noise management technology and a sea change in the understanding of operators and participants has achieved much. Many motor venues now have very positive relationships with their neighbours.

Most important has been the realisation that motor vehicle noise can only be measured dynamically. For this reason, all circuits now use a 'drive-by' noise trapping system that can measure each vehicle accurately at its point of highest noise output. The system in use at most UK circuits was designed and developed by SPLtrack and has become a standard for accuracy.

The number of vehicles on circuit simultaneously does affect overall noise from the venue, however the change in noise level associated with numbers of vehicles is not intuitive. For example, doubling the number of vehicles increases receptor levels by only 3dB which represents a 'just perceptible' increase in noise. Clearly, lower noise output from all participating vehicles results in lower environmental impact, however a single non-compliant vehicle has a disproportionate environmental impact both in the sound level at receptors and disturbance due to the audible prominence of that vehicle. Drive-by noise regulation ensures that such vehicles can be removed from the circuit immediately and provides the basis for confidence in calculation and planning.

Daily management of circuit time, including the length of circuit sessions and the periods of intermission between them is important. For this reason, an appropriate sample period should be used to evaluate noise in the environment. This ensures that there will be sufficient detailed reporting to prevent short periods of high noise being lost in longer measurement periods.

Most venues operate a calendar that provides a tiered operational calendar which identifies the number of days in the year on which certain classes of vehicle may operate. This strategy ensures that a balance between public amenity and the moderate noise impact from, for example, historic vehicle activities can be managed.

The single most significant cause of conflict between residents and motoring facilities is lack of communication. Experience at other venues has been that the vast majority of residents are supportive, providing that they are consulted and properly informed.

There is no British Standard that can be applied directly to the assessment of motor leisure venue noise, however the impact of new developments is assessed under the National Planning Policy Framework 2019 (the NPPF).



The impact of the 'agent of change' with respect to the benefits that arise from a given development is one of balance and amenity.

Planning consent for motoring facilities will most often contain conditions and it is the responsibility of the operator to provide evidence of compliance. The conditions most often appear under the following headings:

- » The days in the year on which activities are permitted;
- » The time of day during which activity is permitted;
- » Maximum permitted specific noise levels at defined receptors; and
- » Specific level thresholds may be varied on a number of days in order to accommodate specific events.

It is usually a combination of these factors that form the basis of a regulatory method.

### 3.2.1. *Subjective assessment of noise impact*

Noise from daytime activity from motoring leisure venues is usually assessed in terms of subjective impact at community receptors, the typical thresholds, are described below. These thresholds are not encapsulated in guidance or standard, however they are drawn from 15 year of accumulated data and complaint reports at all of the major UK motor sport circuits.

- » Up to 3dB increase in noise level - **no impact**

It must be remembered that a 3dB increase in measured noise at a receptor would mean that specific noise from the venue is at the same level as ambient noise, the two summing to produce an overall 3dB increase.

- » Between 3dB and 6dB increase in noise level - **low impact**

At this threshold venue noise would be audible outdoors and would be assessed as a small increase in noise over time when compared with days on which the venue was not operating. Specific venue noise would not be audible indoors with windows open.

- » Between 6dB and 9dB increase in noise level - **moderate impact**

Noise at a receptor would be assessed as clearly audible outdoors and would be just audible indoors with windows open but inaudible indoors with windows closed.

- » Between 9dB and 12dB increase in noise level - **high impact**

Noise at a receptor would become clearly audible with windows open and may be detectable with windows closed.

- » Above 12dB increase in noise level - **very high impact**

Noise at a receptor would become audible with windows closed. Further increase in noise level would become intrusive and would normally be unacceptable to residents under any circumstances. The exception would be a major community event where there would be public interest.

## 4. Noise survey and measurements

### 4.1. Baseline noise survey

SPLtrack undertook a baseline noise survey between Friday 22d March, and Monday 1st April 2019.

Measurements were obtained at two locations, Fulmar Court, and Blencowe Close to establish the existing prevailing noise environment and measure the diurnal variation in noise levels over weekday, and weekend periods. Monitoring locations were discussed, and prior agreed with the Environmental Protection Officer of Cherwell District and South Northamptonshire Council and are considered to be representative of the prevailing noise environment across the site.

A copy of the full baseline noise survey, including monitoring locations, equipment, and weather conditions is provided in **Appendix B**.

#### 4.1.1. Summary of baseline noise survey results

A summary of the 2019 baseline noise survey results is provided in Table 1. and presented graphically in a Time-history form on **Appendix A**.

The presented overall levels are the logarithmic average for  $L_{Aeq}$ , typical  $L_{A90}$  values and maximum measured  $L_{Amax,F}$  values.

Table 3: Summary of baseline noise survey results

Monitoring location	Time period	Measured noise levels		
		$L_{Aeq,T}$ dB	$L_{A90,T}$ dB	$L_{Amax}$ dB
Fulmar Court	06:00 to 18:00	48.5	42.0	79.6
Blencowe Close	06:00 to 18:00	48.7	41.5	76.5

#### 4.1.2. Review of historical noise monitoring results

The results of historical drive-by noise monitoring results and presented in **Appendix C** for the following events:

- » 6th September 2021 - Car chase heroes
- » 10th August 2022 - Everyman racing
- » 25th October 2022 - Car chase heroes
- » 14th February - Car chase heroes.

The results of the drive-by noise monitoring indicate that noise-levels remain below the 100 dB  $L_{Amax,F}$  limit.

## 5. Noise Impact Assessment

### 5.1. Noise sensitive receptors

Noise sensitive receptors (Rx) considered for this noise assessment are detailed in **Table 4** and are presented on **Figures 2 – 4**. Receptors have been selected following a review of the proposed development plans, and prior Bicester Heritage site experience. Baseline noise levels presented in **Table 3** have been assigned to the noise sensitive receptors presented in **Table 4**.

Table 4: identified noise sensitive receptors

Receptor ID	Receptor address	Receptor type
R1	Harmon Close	Residential
R2	Stratton Audley	Residential
R3	Bicester Road	Commercial
R4	Curtiss Close	Residential
R5	Turnpike Road	Residential

### 5.2. Operation hours

The experience and demonstration track operates 09:00 – 17:00hrs, with 30 minutes respite. No engines may run prior to 08:30, or after 18:00hrs. No restriction on EVs.

### 5.3. Noise modelling

Noise predictions have been carried out using the ADA modelling software which uses calculation methodology found in BS 4142:2014, and for certain types of noise, information and principles contained within BS 5228. ADA uses sound directivity and drive-by data for a wide range of motor vehicles that has been accumulated over nine years of monitoring at all types of motor vehicle facilities. It also incorporates calculations for building, embankment, and barrier structures in following the principles of ISO 9613-2. ADA factors the effects of meteorological conditions and their impacts upon noise propagation and uses OS mapping to create a 3D study area of the site.

The following assumptions were adopted and implemented into the ADA model:

- » Mapping of the Site and the surrounding area was calibrated into the noise model based on information provided by the design team and known Ordnance Survey grid reference points;
- » As the site terrain between the noise sources and the proposed development is flat, the Digital Terrain Model (DTM) has been created to reflect flat ground conditions;
- » Existing buildings were incorporated within the acoustic model, to allow prediction of screening effects across the Site;
- » No specific mitigation has been included within the acoustic model; and
- » Noise propagation is predicted following the principles contained within ISO 9613-2:1996 'Acoustics – Attenuation of sound during propagation outdoors – Part 2: General Method of calculation' (ISO9613).

## 5.4. Noise sources

To assess the noise emissions associated with the use of the experience and demonstration track at Bicester Heritage, the following venue noise sources have been considered.

Table 5: Identified noise sources

Category	Measured drive by noise level , dB $L_{Amax}$
A + B restricted	100
C unrestricted	108+








## 5.5. Noise assessment

A summary of identified venue activities and relative noise impacts are presented in **Table 6.** with the output of the noise modelling presented in **Figures 2 to 4.**

Table 6: Summary of noise impacts

Category		A	B	C
Use		Restricted, 3 vehicles on track, unlimited days per year	Restricted, 5 vehicles on track, 50 days per year	Unrestricted, 12 days per year, but activity is no more than 90 minutes
Drive-by-level dB $L_{Amax,F}$		100	100	108
Receptor ID	Ambient, dB $L_{Aeq,T}$	Predicted dB $L_{Aeq,T}$		
R1	65	64	70	76
R2	45	32	33	33
R3	45	41	41	40
R4	64	56	56	55
R5	59	62	64	65

Key:

	Less than 3 dB above ambient	Very low impact
	Between 3 dB and 6 dB above ambient	Low impact
	Between 6 dB and 9 dB above ambient	Moderate impact
	Between 9 dB and 12 dB above ambient	High impact
	Greater than 12 dB above ambient	Very high impact

Current Project: Bicester 3 cars 100dBALF  
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Roads ON  
 Buildings (9) ON  
 Forests/Woodland (2) ON

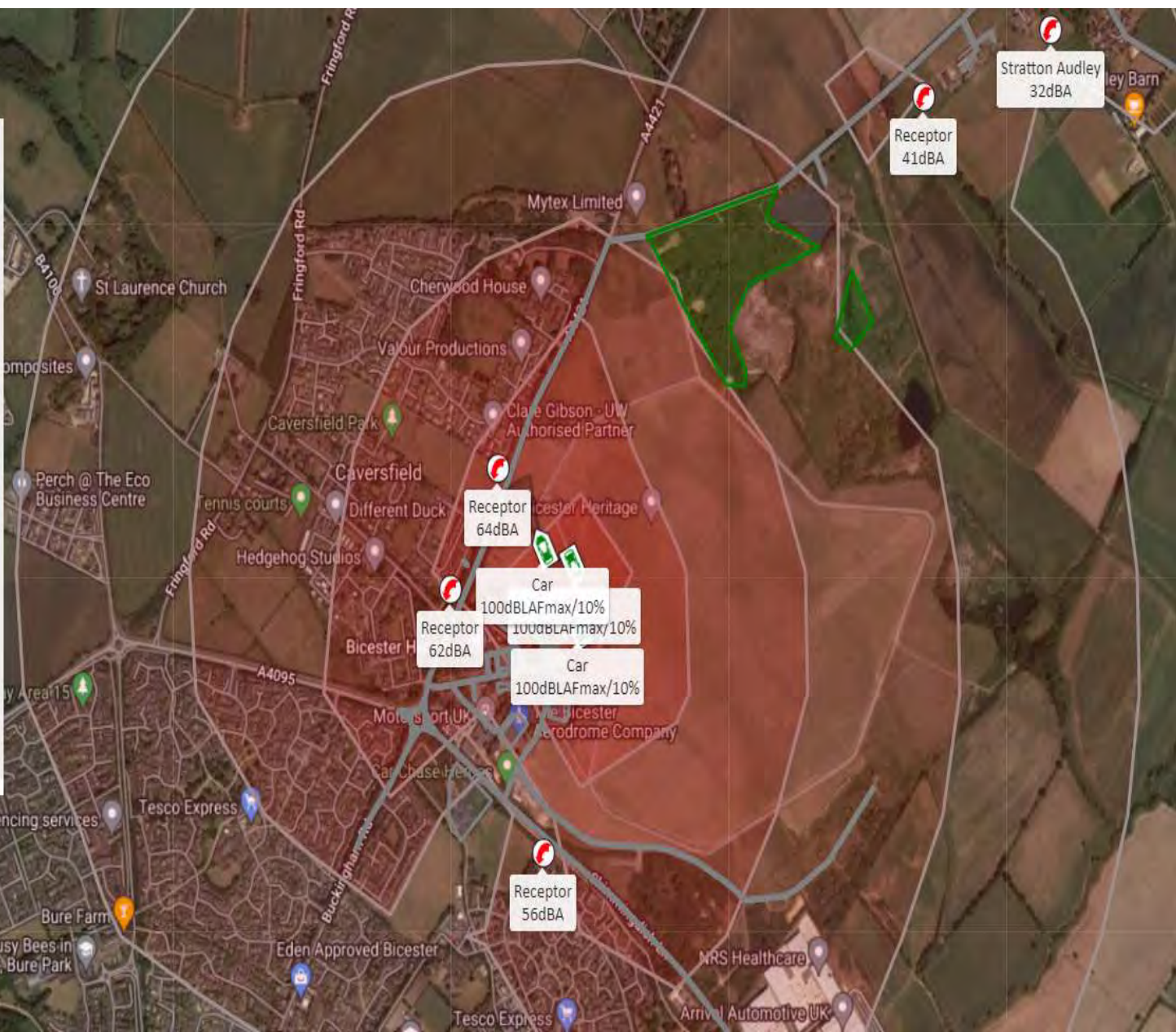
Sources (3)

Source	SPL (A)	Ton.	Imp.	Int.	Duty Cycle	dBLwA	Distance
Car	100.0	0	0	0	10%	137.0	20.0m
Car	100.0	0	0	0	10%	137.0	20.0m
Car	100.0	0	0	0	10%	137.0	20.0m

Receptors (5)

Receptor	Cumulative dBLAeq(t)	Rating dBLAeq(t)	Residual dBLA90(t)	Variation	B54142 Impact
Receptor [E]	64	63	60	4.0	Low impact
Stratton Audley [E]	32	23	32	0.0	Low impact
Receptor [E]	41	28	40	1.0	Low impact
Receptor [E]	56	42	55	1.0	Low impact
Receptor [E]	62	60	59	3.0	Low impact

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Project Title  
 Bicester Heritage - Experience and Demonstration Track

Drawing Title  
 Noise Model Output - Category A

Job Number  
 28453

Date  
 6.04.2023

Scale  
 NTS

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 A1

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Drawing No.  
 Figure 2

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Current Project: Bicester drive-by  
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Roads ON  
Buildings (9) ON  
Forests/Woodland (2) ON

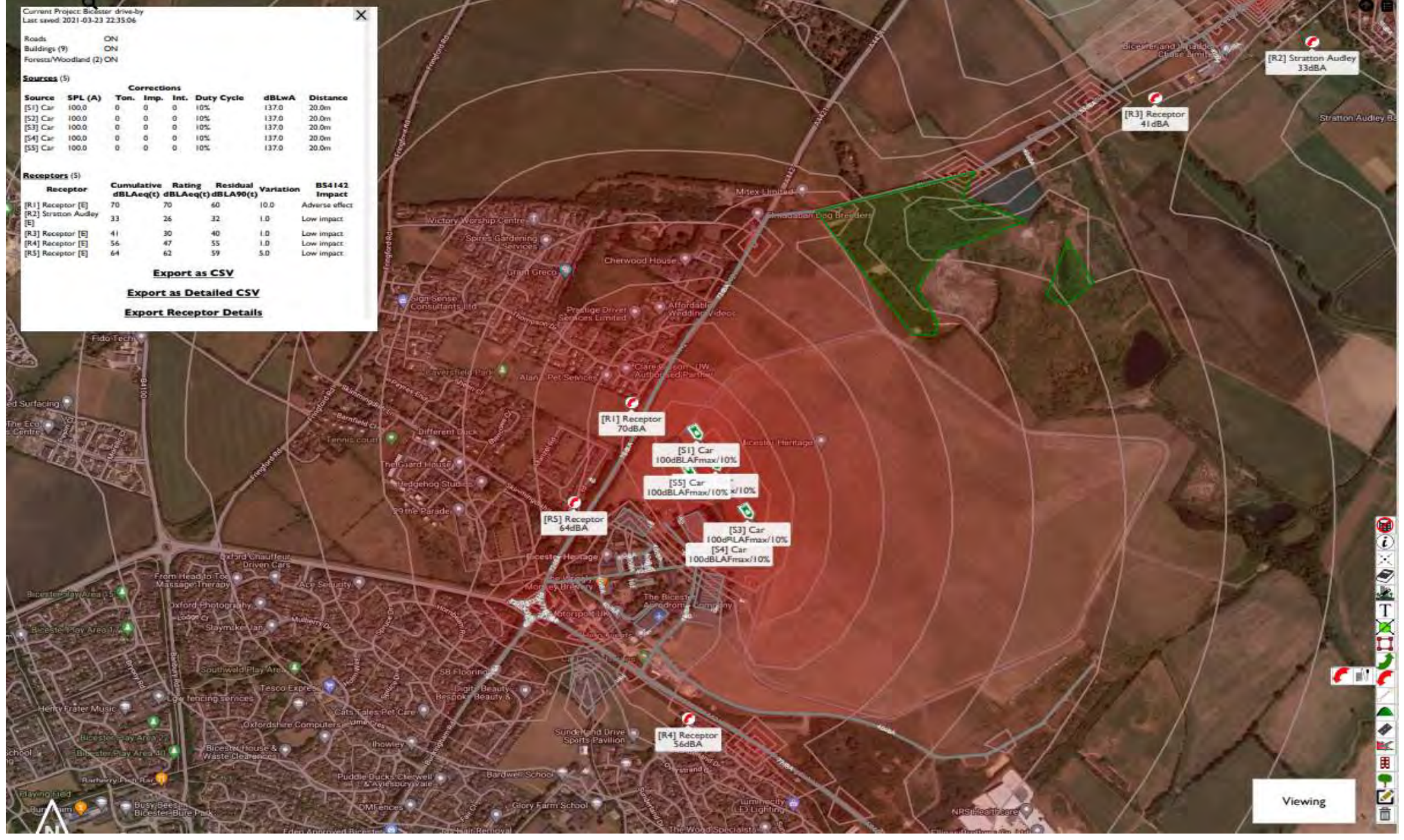
Sources (5)


Source	SPL (A)	Corrections	Ton.	Imp.	Int.	Duty Cycle	dBLwA	Distance
[S1] Car	100.0		0	0	0	10%	137.0	20.0m
[S2] Car	100.0		0	0	0	10%	137.0	20.0m
[S3] Car	100.0		0	0	0	10%	137.0	20.0m
[S4] Car	100.0		0	0	0	10%	137.0	20.0m
[S5] Car	100.0		0	0	0	10%	137.0	20.0m

Receptors (5)

Receptor	Cumulative dBLAeq(t)	Rating dBLAeq(t)	Residual dBLA90(t)	Variation	BS4142 Impact
[R1] Receptor [E]	70	70	60	10.0	Adverse effect
[R2] Stratton Audley [E]	33	26	32	1.0	Low impact
[R3] Receptor [E]	41	30	40	1.0	Low impact
[R4] Receptor [E]	56	47	55	1.0	Low impact
[R5] Receptor [E]	64	62	59	5.0	Low impact

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	Project Title	Drawing Title	Job Number	By	Rev	Description	Date	By	Drawing No.
	Bicester Heritage - Experience and Demonstration Track	Noise Model Output – Category B	28453	IA	-		-	-	Figure 3
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			Scale NTS	Status A1	-		-	-	Issue 01



Current Project: Bicester drive-by  
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Roads ON  
Buildings (9) ON  
Forests/Woodland (2) ON

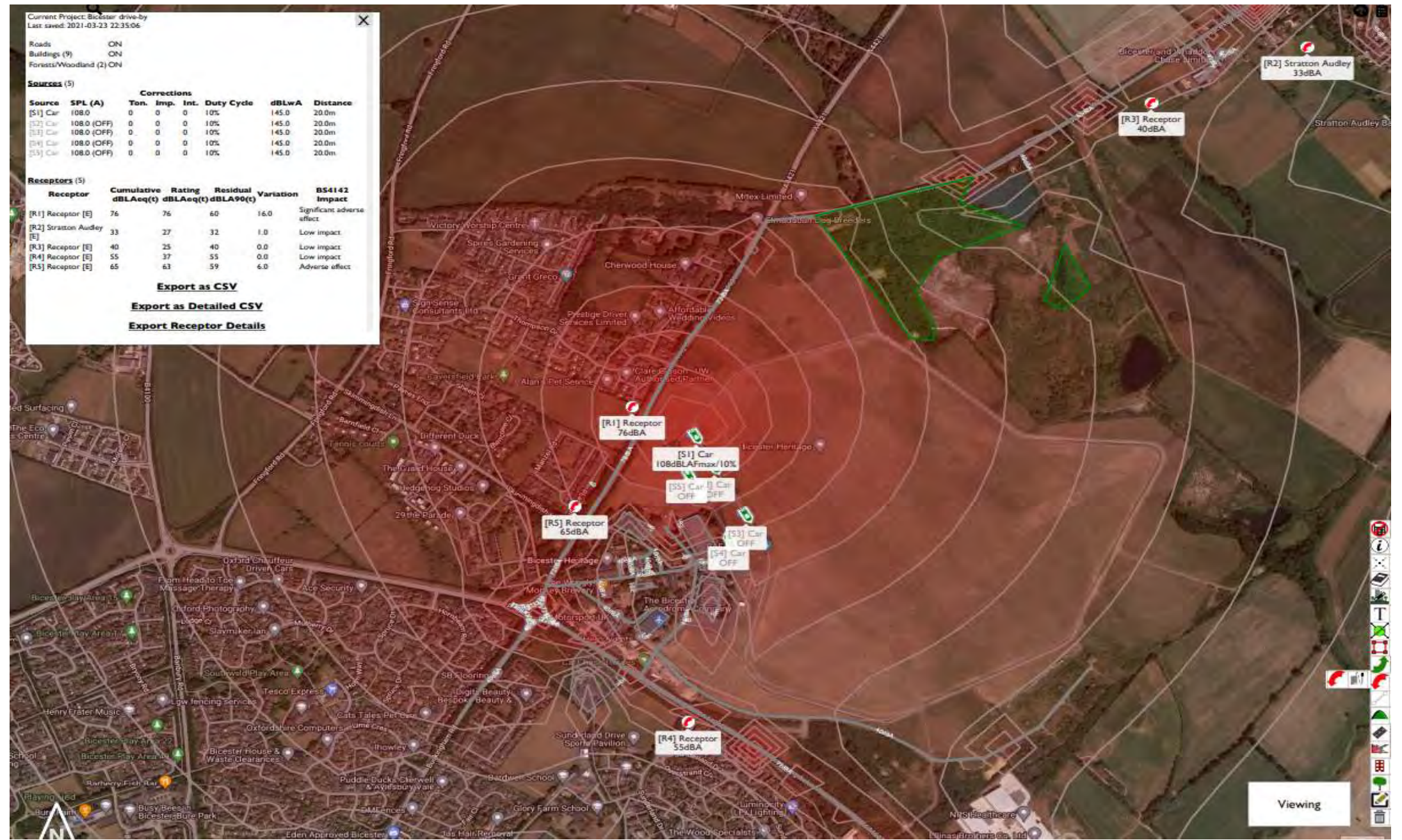
Sources (5)

Source	SPL (A)	Corrections	Ton.	Imp.	Int.	Duty Cycle	dBLwA	Distance
[S1] Car	108.0	0	0	0	0	10%	145.0	20.0m
[S2] Car	108.0 (OFF)	0	0	0	0	10%	145.0	20.0m
[S3] Car	108.0 (OFF)	0	0	0	0	10%	145.0	20.0m
[S4] Car	108.0 (OFF)	0	0	0	0	10%	145.0	20.0m
[S5] Car	108.0 (OFF)	0	0	0	0	10%	145.0	20.0m

Receptors (5)

Receptor	Cumulative dBLAeq(t)	Rating	Residual dBLA90(t)	Variation	BS4142 Impact
[R1] Receptor [E]	76	76	60	16.0	Significant adverse effect
[R2] Stratton Audley [E]	33	27	32	1.0	Low impact
[R3] Receptor [E]	40	25	40	0.0	Low impact
[R4] Receptor [E]	55	37	55	0.0	Low impact
[R5] Receptor [E]	65	63	59	6.0	Adverse effect

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Project Title  
**Bicester Heritage - Experience and Demonstration Track**

Drawing Title  
**Noise Model Output – Category C**

Job Number  
**28453**

Date  
**6.04.2023**

Scale  
**NTS**

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**IA**

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**CB**

Status  
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**Figure 4**

Issue  
**01**



### *Categories A & B - Restricted use*

Noise modelling indicates low impact under the category A & B – restricted use scenarios considered.

Operational compliance will be determined by boundary monitoring.

### *Category C - Unrestricted use*

Noise modelling indicates that the residential area to the west of the site is most likely to be impacted by the Category unrestricted activities at the experience and demonstration track, however, it should be noted by restricting the amount of time to go minutes within a day, the equivalent noise exposure over 7-hour operating day will be low.

All other receptor's locations indicate very low impact under the unrestricted scenario considered.

Operational compliance will be determined by boundary monitoring.

## 6. Noise mitigation

In the case of category C - unrestricted days, the summary of results shown in **Table 6** indicates there is a risk of noise impact at receptors located to the west. Mitigation of the potential impact could be achieved by:

- » by restricting the amount of time in each hour or day during which noisy activity is permitted (e.g. by restricting the number of laps per hour that a noisy vehicle could operate).

Noise metering equipment to be installed along the BM land ownership boundary and will include a 'look forward' calculation that can show at what time noise limits will be reached based upon accumulated data, making enforcement a manageable and accurate process.

Details of agreed mitigation and logging procedures will be set out in a separate Noise Management Plan specific for the experience and demonstration track.

The Noise Management Plan is a live document subject to regular review, including noise control conditions.

### 6.1. Day of permitted use and associated noise control

The number of days per year when specific activity will be permitted on the circuit(s) is<sup>[1]</sup> as follows:

Category	Condition	Days
<b>A</b>	Days on which the ambient noise level at the residential monitors is increased by no more than 6 dBL <sub>Aeq,1hr</sub> due to circuit activity	Unlimited
<b>B</b>	Days on which the ambient noise level at the residential monitors is increased by no more than 12 dBL <sub>Aeq,1hr</sub> due to circuit activity	50
<b>C</b>	Days on where the ambient noise level at the residential monitors is increased by 12dB L <sub>Aeq,1hr</sub> due to circuit activity, but activity is no more than 90 minutes in a day	12

Notes [1] Subject to agreement with Cherwell District Council [2] Participating vehicles' means any vehicle using the circuit for commercial or sporting purposes [2] EVs to operate at any time.

## 7. Summary and Conclusions

Hydrock SPLtrack have been appointed by Bicester Motion Ltd to undertake an environmental noise impact assessment to support the planning application to regularise the use of the experience and demonstration track at Bicester Heritage, Oxon. to include:

- » Category A – Days on which the ambient noise level at the residential monitors is increased by no more than 6  $\text{dB}_{L_{Aeq,1hr}}$  due to circuit activity;
- » Category B – Days on which the ambient noise level at the residential monitors is increased by no more than 12  $\text{dB}_{L_{Aeq,1hr}}$  due to circuit activity; and
- » Category C – Days on where the ambient noise level at the residential monitors is increased by more than 12  $\text{dB}_{L_{Aeq,1hr}}$  due to circuit activity, but is limited to no more than 90 minutes in any one day.

Noise predictions have been carried out using the ADA modelling software which uses sound directivity and drive-by data for a variety of motor vehicles.

Noise modelling indicates that the residential area to the west of the site is most likely to be impacted by the unrestricted activities at the experience and demonstration track. All other receptor locations indicate very low impact under the unrestricted scenario considered.

A noise metering system with a 'look forward' function will be installed along the BM land ownership boundary, making the enforcement a manageable and accurate process.

A complete description of agreed mitigation and logging procedures will be set out in a Noise Management Plan for the experience and demonstration track.

Days on where the ambient noise level at the residential monitors is increased by 12 $\text{dB}_{L_{Aeq,1hr}}$  due to circuit activity, should be restricted to 12 days per year, and no more than 90 minutes in a day.

# Appendix A Glossary

Term	Description
<b>dB (decibel)</b>	The scale on which sound pressure level is expressed. Sound pressure level is defined as 20 times the logarithm of the ratio between the root-mean-square pressure of the sound field and a reference pressure ( $2 \times 10^{-5} \text{Pa}$ ).
<b>dB(A)</b>	A-weighted decibel. This is a measure of the overall level of sound across the audible spectrum with a frequency weighting (i.e. 'A' - weighting) to compensate for the varying sensitivity of the human ear to sound at different frequencies.
<b><math>L_{Aeq,T}</math></b>	$L_{Aeq}$ is defined as the notional steady sound level which, over a stated period of time (T), would contain the same amount of acoustical energy as the A - weighted fluctuating sound measured over that period.
<b><math>L_{Amax}</math></b>	$L_{Amax}$ is the maximum A - weighted sound pressure level recorded over the period stated. $L_{Amax}$ is sometimes used in assessing environmental noise where occasional loud noises occur, 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.
<b><math>L_{10}</math></b>	If a non-steady noise is to be described, it is necessary to know both its level and the degree of fluctuation. The $L_n$ indices are used for this purpose, and the term refers to the level exceeded for n% of the time. Hence the $L_{10}$ is the level exceeded for 10% of the time. $LA_{10}$ is the index generally adopted to assess traffic noise.
<b><math>L_{90}</math></b>	If a non-steady noise is to be described, it is necessary to know both its level and the degree of fluctuation. The $L_n$ indices are used for this purpose, and the term refers to the level exceeded for n% of the time. Hence the $L_{90}$ is the level exceeded for 90% of the time.
<b>Free-field Level</b>	A sound field determined at a point away from reflective surfaces other than the ground with no significant contributions due to sound from other reflective surfaces. Generally as measured outside and at least 3m from buildings.



# Appendix B Baseline Noise Survey

## Appendix 1 - Baseline survey

1. This survey has been conducted to evaluate ambient and background noise levels in populated area close to the Bicester Heritage site.

### 2. Monitoring

2.1. Monitoring receptor locations were discussed and agreed with Neil Whitton, Environmental Protection Officer of Cherwell District and South Northamptonshire Council prior to installation. The actual monitoring receptor positions used were very close to agreed locations but were necessarily adjusted to ensure the security of monitoring equipment and were subject to the agreement of residents.

2.2. Meters used were NTi XL2 type approved and UKAS laboratory calibrated to BS-EN61672-3 Class 1. Certificates for both meters are appended to this report.

2.3. Meters were field calibrated prior to and immediately after the measurement sessions. In both cases the variation was less than 0.1dB.

2.4. The measurements were conducted continuously from the 22nd March 2019 to the 1st April 2019

2.5. The receptor locations were as follows:

2.5.1. Blencowe Close to the west of the site

2.5.2. Fulmar Court to the south of the site

2.6. The photographs below illustrate the equipment in position at Fulmar Court.



### 3. Modelling

3.1. Prior to the survey a noise model was created in the SPLtrack SPæL system. The model factored noise from roads surrounding the site and the survey receptors.

3.2. The result of the modelling exercise is shown in the appendix.

#### 4. Monitoring results

4.1. The following table illustrates the data from each of the monitoring receptor locations:

Fulmar Court									
Session	00-06			06-18			18-24		
Date	LA eq	L90	LAF max	LA eq	L90	LAF max	LA eq	L90	LAF max
Fri, 22 Mar 2019	47.2	39.4	67.2	49.8	44.3	80.8	46.3	41.1	70.1
Sat, 23 Mar 2019	44.6	34.2	72.4	48.8	41.5	73.3	45.4	38.8	65.8
Sun, 24 Mar 2019	45.8	33.5	67.0	46.6	39.4	71	44.4	37.9	75.1
Mon, 25 Mar 2019	47.0	33.7	68.8	49.7	43.6	78.6	45.9	39.3	71.7
Tue, 26 Mar 2019	46.9	36.8	68.4	47.9	42.4	72.2	44.4	37.2	68.4
Wed, 27 Mar 2019	45.4	34.9	63.6	48.5	41.8	80.2	46.5	41.1	68.0
Thu, 28 Mar 2019	46.3	35.6	64.1	47.6	39.9	86.2	48.2	44.0	70.9
Fri, 29 Mar 2019	48.1	42.5	70.6	48.2	43.0	76.5	48.7	42.3	70.0
Sat, 30 Mar 2019	46.8	40.5	67.6	46.7	39.8	70.1	44.1	38.1	64.9
Sun, 31 Mar 2019	41.2	29.3	64.0	49.6	43.2	78.6	45.2	37.3	69.7
Mon, 1 Apr 2019	43.0	29.4	63.4	48.9	43.4	80.7			
Equivalent	46.0	35.4	68.0	48.5	42.0	79.6	45.8	36.1	70.0
Blencowe Close									
Session	00-06			06-18			18-24		
Date	LA eq	L90	LAF max	LA eq	L90	LAF max	LA eq	L90	LAF max
Wed, 27 Mar 2019	46.1	35.1	69.6	47.2	40.2	47.2	45.4	38.5	69.1
Thu, 28 Mar 2019	48.8	34.3	75.5	48.1	38.8	76.3	46.3	42.2	66.9
Fri, 29 Mar 2019	47.8	42.8	69.6	49.3	45.6	75.4	49.7	42.3	69.6
Sat, 30 Mar 2019	46.5	38.2	68.7	47.0	40.2	70.1	43.8	36.9	69.7
Sun, 31 Mar 2019	37.3	29.1	61.9	47.9	42.4	77.4	45.9	38.7	76.9

Fulmar Court									
Session	00-06			06-18			18-24		
Date	LA <sub>eq</sub>	L90	LAF <sub>max</sub>	LA <sub>eq</sub>	L90	LAF <sub>max</sub>	LA <sub>eq</sub>	L90	LAF <sub>max</sub>
Mon, 1 Apr 2019	35.4	29.1	57.5	47.9	41.7	75.4			
Equivalent	46.5	34.8	70.6	48.7	41.5	76.5	46.6	33.1	71.8

4.2. Each day has been separated into sessions as follows:

4.2.1. 00:00 Midnight to 06:00

4.2.2. 06:00 to 18:00

4.2.3. 18:00 to Midnight

4.3. The following metrics have been recorded:

4.3.1.  $dB LA_{eq}$

4.3.2.  $dB LAF_{max}$

4.3.3.  $dB LA_{90}$

4.4. The equivalent level for each session on each day has been calculated. For  $LA_{eq}$  and  $LAF_{max}$  results the equivalent summation is logarithmic whilst for the  $L_{90}$  the summary is statistical.

4.5. A graphical analysis of the monitoring results is shown in the appendix.

4.6. Weather conditions throughout the monitoring sessions have been summarised in the graphic analysis.

## 5. Executive Summary

5.1. Recorded noise levels were consistent from day to day and session to session indicating that the results can be considered typical of those that would prevail during proposed circuit operations.

5.2. Weather conditions were suitable throughout the survey. Wind conditions remained within traceable limits (max 7m/s) whilst daily temperatures varied between 8.7°C and 16.5°C.

5.3. Ambient noise levels during the 06:00 - 18:00 sessions at both locations were very similar recording an equivalent value of 48.1 and 48.7  $dB LA_{eq(session)}$  respectively. Background noise levels were also very similar recording 42.0 and

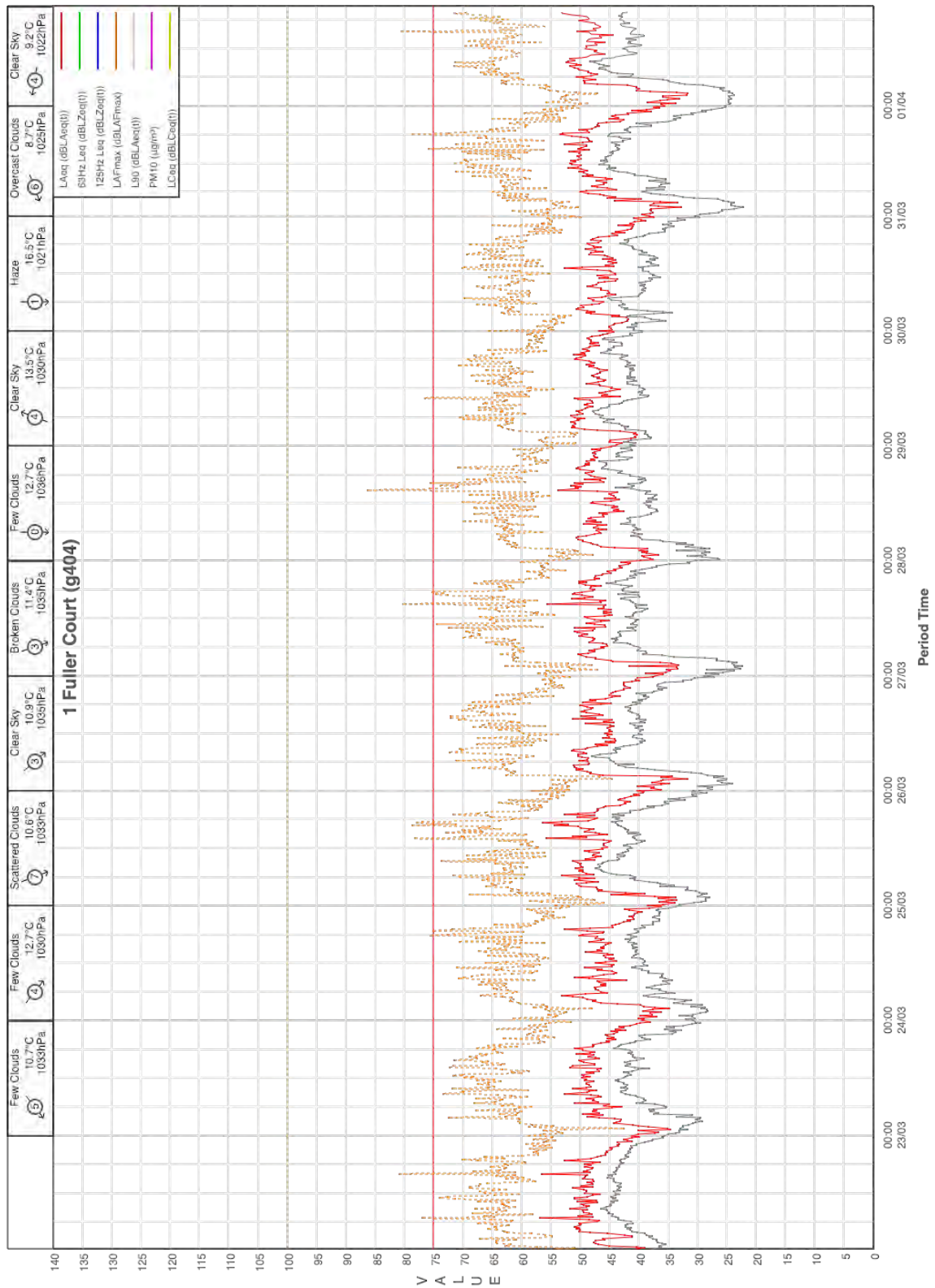
41.5 dBLA<sub>90(session)</sub> respectively. LAF<sub>max(session)</sub> levels were 79.6 and 76.5dB respectively.

5.4. With slight adjustments the model can be used to extrapolate the levels at other locations around the site with expectations of reasonable accuracy.

5.5. SPLtrack has well established data and directive models for sports and racing cars gained over several years monitoring at all of the major UK motor sport circuits. These can be applied to the overall model to create views for various track configurations, noise mitigation options and drive-by noise control levels.

Chris Beale BSc

Tuesday, 16 April 2019






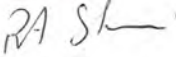
Fulmar Court



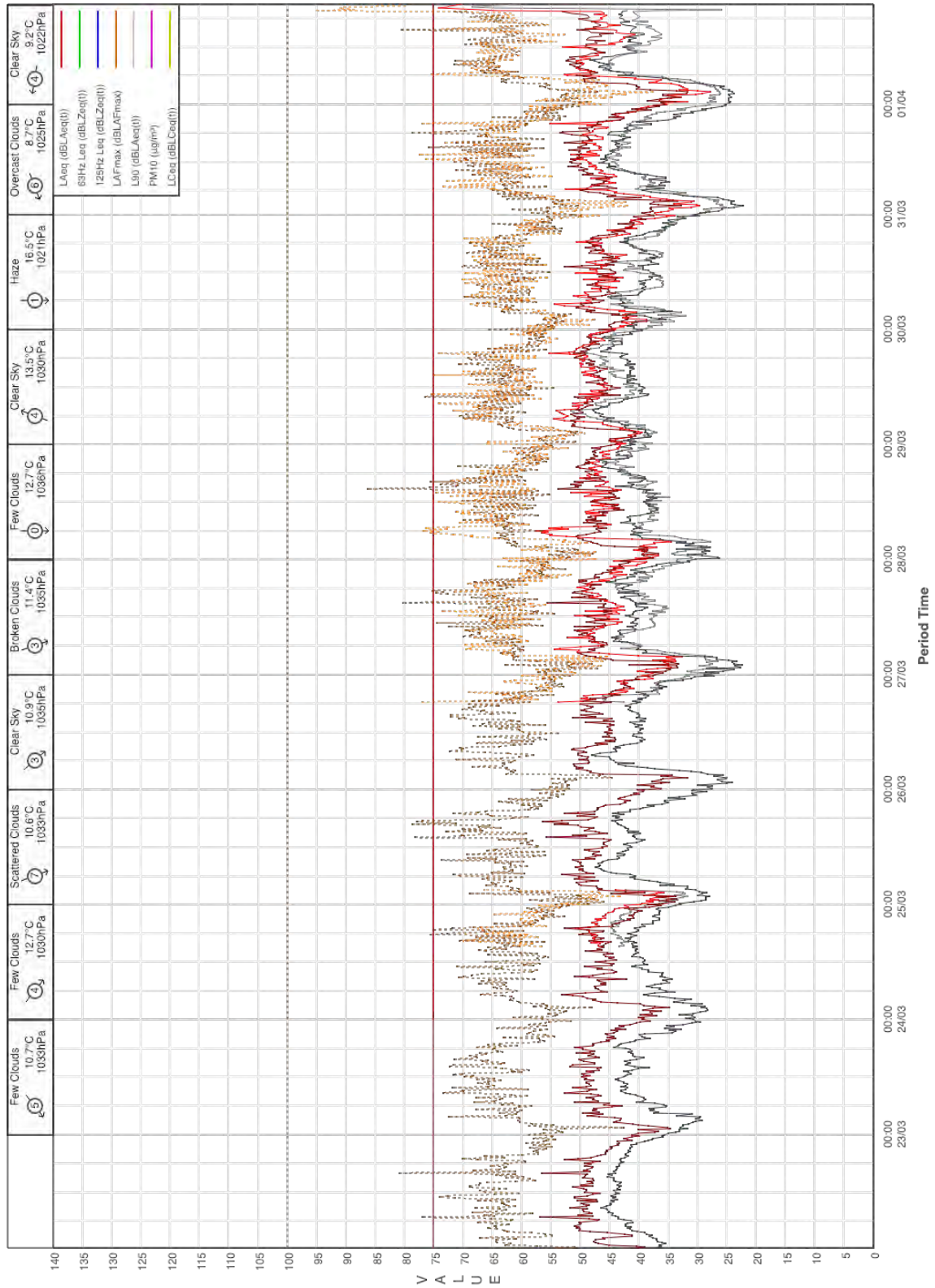
Baseline survey locations








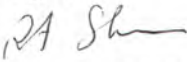
	<p><b>MTS Calibration Ltd,</b> The Grange Business Centre, Belasis Avenue, Billingham TS23 1LG, England Telephone: 01624 876 410</p>		 0607																			
<b>CERTIFICATE OF CALIBRATION</b>		Page 1 of 12																				
Issued by: <b>MTS Calibration Ltd</b>		Approved Signatory:  Tony Sherris																				
Date of Issue: 04 March 2019	Certificate Number: 32833U																					
<b>Sound Level Meter</b>																						
<b>Sound Level Meter Periodic Tests to EN 61672-3: 2013 Class 1</b>																						
<p><i>Client:</i> SPLtrack Ltd The Coach House Mallory Park Circuit Leicestershire LE9 7QE</p>	<p><i>Instrument Make:</i> NTI Audio <i>Instrument Model:</i> XL2 TA <i>Serial Number:</i> A2A-12690-EO</p>																					
	<p><i>Associated Equipment</i></p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;"><i>Associated Equipment</i></th> <th style="text-align: left;"><i>Make</i></th> <th style="text-align: left;"><i>Model</i></th> <th style="text-align: left;"><i>Serial number</i></th> </tr> </thead> <tbody> <tr> <td><i>Preamplifier</i></td> <td>NTI Audio</td> <td>MA220</td> <td>7280</td> </tr> <tr> <td><i>Microphone</i></td> <td>NTI Audio</td> <td>MC230</td> <td>A14951</td> </tr> <tr> <td><i>Calibrator</i></td> <td>Larson Davis</td> <td>CAL200</td> <td>9175</td> </tr> <tr> <td><i>Calibrator supplied by</i></td> <td colspan="3">MTS for this calibration</td> </tr> </tbody> </table>	<i>Associated Equipment</i>	<i>Make</i>	<i>Model</i>	<i>Serial number</i>	<i>Preamplifier</i>	NTI Audio	MA220	7280	<i>Microphone</i>	NTI Audio	MC230	A14951	<i>Calibrator</i>	Larson Davis	CAL200	9175	<i>Calibrator supplied by</i>	MTS for this calibration			
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<b>Test results summary, detailed results are shown on subsequent pages.</b>																						
Periodic tests were performed in accordance with procedures from IEC 61672-3:2013 Class 1																						
<b>Tests performed</b>	<b>Section</b>	<b>Results of test</b>	<b>Page</b>	<b>Comments</b>																		
Calibration Certificate	22		1																			
Additional information			2																			
Indication with Calibrator Supplied	10	No Limit	3																			
Self-Generated Noise	11	No Limit	3																			
Frequency and Time-weightings at 1kHz	14	Complies	3																			
Long term stability	15	Complies	3																			
High stability	21	Complies	3																			
Acoustic Tests	12	Complies	4																			
Frequency Weighting A	13	Complies	5																			
Frequency Weighting C	13	Complies	6																			
Frequency Weighting Z	13	Complies	7																			
Level Linearity	16	Complies	8																			
Level Linearity Range Control	17	Complies	9																			
Tone-burst Response	18	Complies	10																			
Peak C sound level	19	Complies	11																			
Overload indication	20	Complies	12																			
<p>The instrument was within the above specification as received - no modifications were made</p> <p>The sound level meter submitted for testing has successfully completed the periodic tests of IEC 61672-3: 2013 for the environmental conditions under which the tests were performed. As evidence was publicly available, from an independent testing organisation responsible for approving the results of pattern evaluation tests performed in accordance with IEC 61672-2: 2013, to demonstrate that the model of sound level meter fully conformed to the Class 1 specifications in IEC 61672-1: 2013, the sound level meter submitted for testing conforms to the Class 1 specifications of IEC 61672-1: 2013</p>																						
<b>Additional tests performed</b>		<b>Reference</b>																				
Microphone full frequency response		32835U		See additional UKAS certificate																		
A Wtg with Outdoor Microphone		32833M		See additional certificate																		
<p>This certificate is issued in accordance with the laboratory accreditation requirements of the United Kingdom Accreditation Service. It provides traceability of measurement to the SI system of units and/or to units of measurement realised at the National Physical Laboratory or other recognised national metrology institutes. This certificate may not be reproduced other than in full, except with the prior written approval of the issuing laboratory.</p>																						

Baseline data graphs



Blencowe Close

Calibration certificates

	<p><b>MTS Calibration Ltd,</b> The Grange Business Centre, Belasis Avenue, Billingham TS23 1LG, England Telephone: 01624 876 410</p>			
<b>CERTIFICATE OF CALIBRATION</b>		Page 1 of 12		
Issued by: <b>MTS Calibration Ltd</b>		Approved Signatory:  Tony Sherris		
Date of Issue: 04 March 2019	Certificate Number: 32836U			
<b>Sound Level Meter</b>				
<b>Sound Level Meter Periodic Tests to EN 61672-3: 2013 Class 1</b>				
<b>Client:</b> SPLtrack Ltd The Coach House Mallory Park Circuit Leicestershire LE9 7QE	<b>Instrument Make:</b> NTI Audio <b>Instrument Model:</b> XL2 TA <b>Serial Number:</b> A2A-13691-EO			
<b>Associated Equipment</b>	<b>Make</b>	<b>Model</b>	<b>Serial number</b>	
<i>Preamplifier</i>	NTI Audio	MA220	6696	
<i>Microphone</i>	NTI Audio	MC230	1015	
<i>Calibrator</i>	Larson Davis	CAL200	9175	
<i>Calibrator supplied by</i>	MTS for this calibration			
<b>Test results summary, detailed results are shown on subsequent pages.</b>				
Periodic tests were performed in accordance with procedures from IEC 61672-3:2013 Class 1				
<b>Tests performed</b>	<b>Section</b>	<b>Results of test</b>	<b>Page</b>	<b>Comments</b>
Calibration Certificate	22		1	
Additional information			2	
Indication with Calibrator Supplied	10	No Limit	3	
Self-Generated Noise	11	No Limit	3	
Frequency and Time-weightings at 1kHz	14	Complies	3	
Long term stability	15	Complies	3	
High stability	21	Complies	3	
Acoustic Tests	12	Complies	4	
Frequency Weighting A	13	Complies	5	
Frequency Weighting C	13	Complies	6	
Frequency Weighting Z	13	Complies	7	
Level Linearity	16	Complies	8	
Level Linearity Range Control	17	Complies	9	
Tone-burst Response	18	Complies	10	
Peak C sound level	19	Complies	11	
Overload indication	20	Complies	12	
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<b>Additional tests performed</b>		<b>Reference</b>		
Microphone full frequency response		32838U	See additional UKAS certificate	
A Wtg with Outdoor Microphone		32836M	See additional certificate	
This certificate is issued in accordance with the laboratory accreditation requirements of the United Kingdom Accreditation Service. It provides traceability of measurement to the SI system of units and/or to units of measurement realised at the National Physical Laboratory or other recognised national metrology institutes. This certificate may not be reproduced other than in full, except with the prior written approval of the issuing laboratory.				

# Appendix C Drive-by Noise Monitoring Results



Figure C1: Drive-by Noise Data, Car Chase Heroes, 2023-02-14

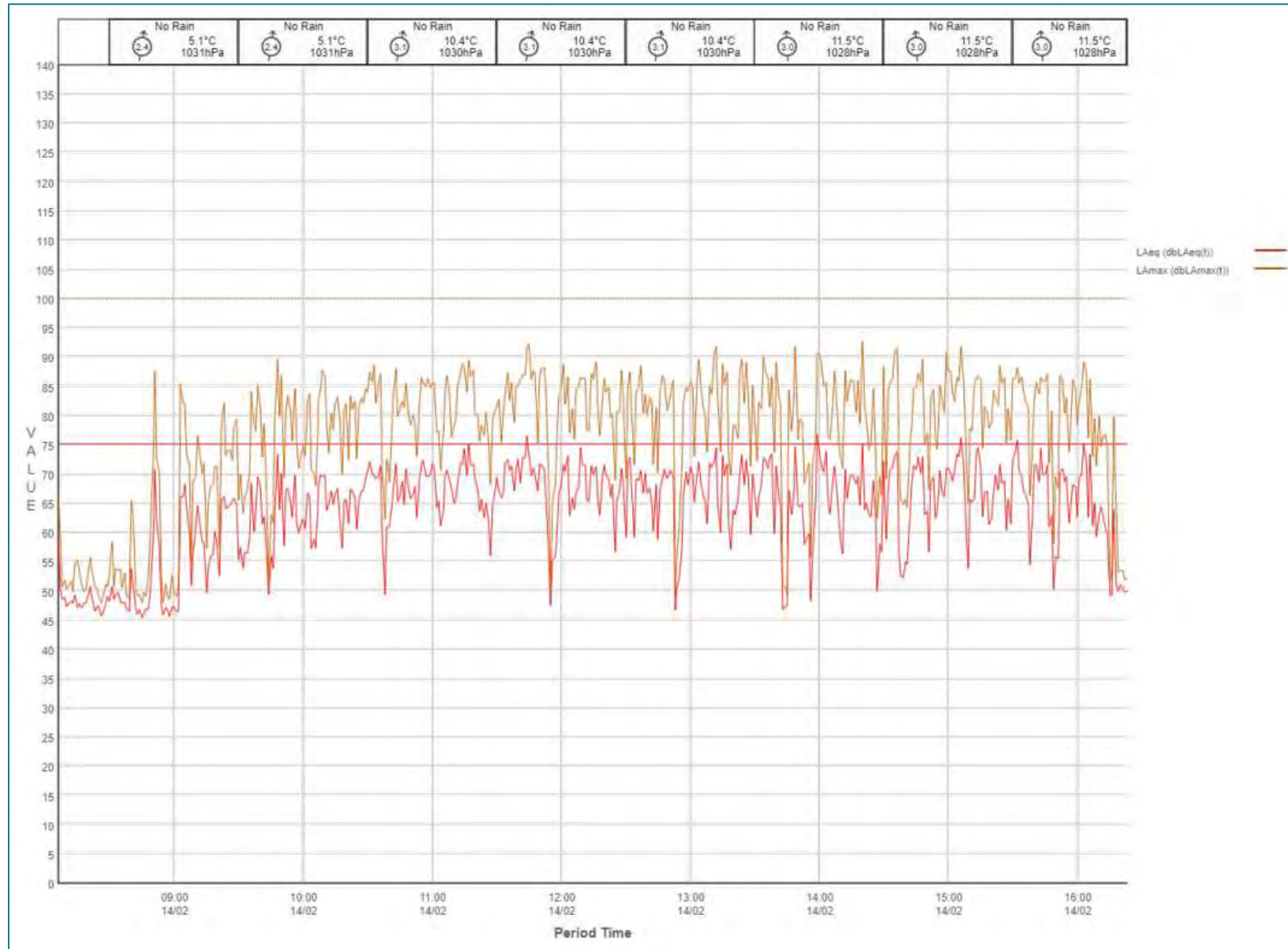
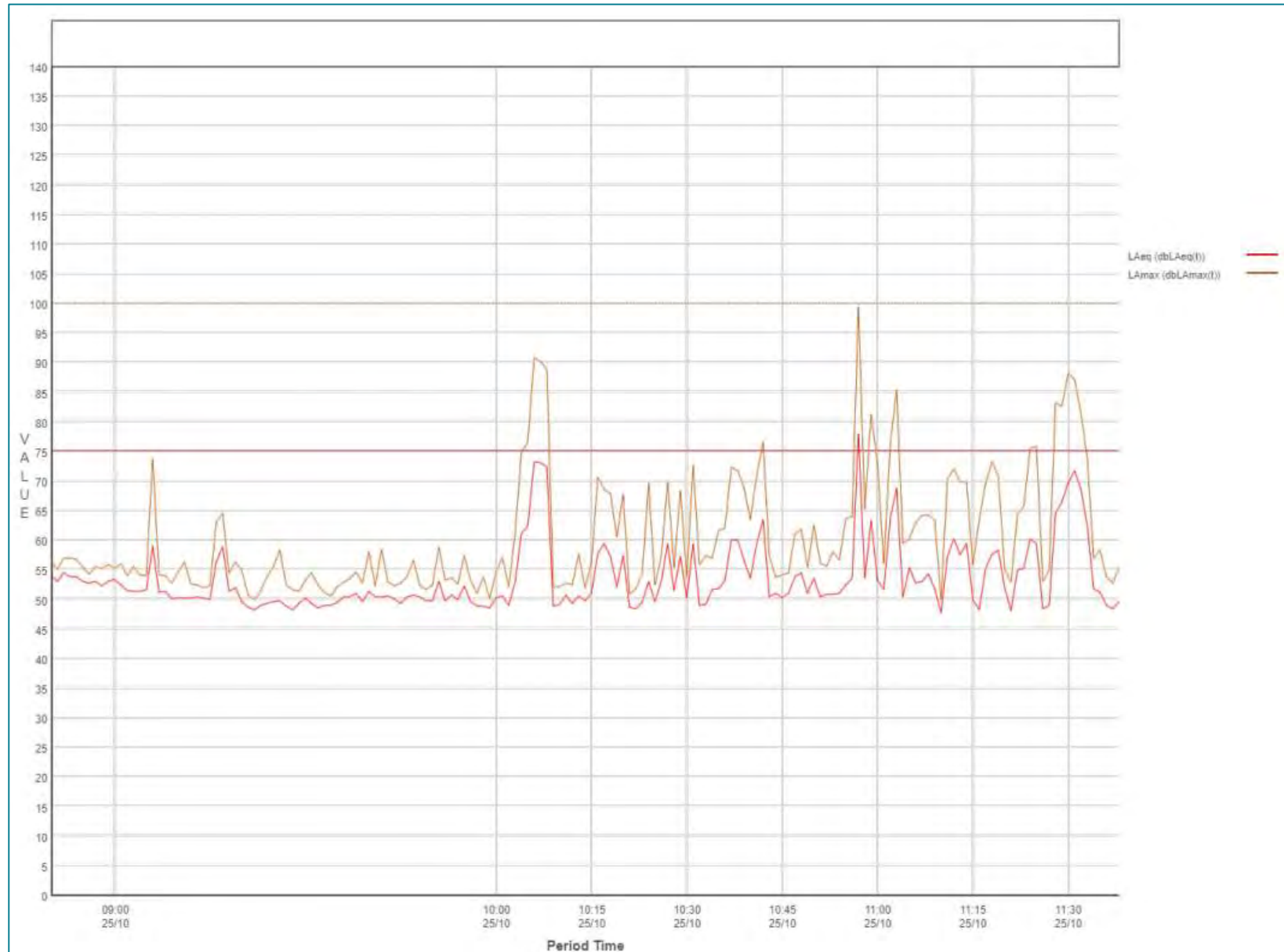




Figure C2: Drive-by Noise Data, Everyman Racing, 2022-08-01



Figure C3: Drive-by Noise Data, Car Chase Heroes, 2022-10-25



# Appendix D Policy and Guidance

## National Planning Policy Framework (NPPF)

Published in February 2019, this document sets out the Government's planning policies for England and supersedes the previous version of the NPPF published in 2012. It makes the following reference to noise in the section entitled Conserving and enhancing the natural environment:

*"170. Planning policies and decisions should contribute to and enhance the natural and local environment by:*

*[...]*

*e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans."*

It also makes the following references to noise in the Section entitled Ground conditions and pollution:

*"180. 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<sup>60</sup>;*

*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.*

*<sup>60</sup> See Explanatory Note to the Noise Policy Statement for England (Department for Environment, Food & Rural Affairs, 2010)."*

And

*"182. 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."*

## Noise Policy Statement for England (NPSE)

Published in March 2010, the Noise Policy Statement for England (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 identifies three observed effect levels, names "No Observed Effect Level" (NOEL), "Lowest Observed Adverse Effect Level" (LOAEL) and "Significant Observed Adverse Effect Level" (SOAEL).

The NPSE contains little detail on assessment methodologies and specific parameters at which the varying observed effect levels would occur in the context of a residential development.