ACOUSTIC CONSULTANTS LTD

Noise Impact Assessment

Proposed Pump Track
Boomcraft Road, Pewsey

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Client:

Velosolutions

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The report has been prepared in good faith, with all reasonable skill and care, based on information provided or available at the time of its preparation and within the scope of work agreement with the Client. We disclaim any responsibility to the Client and others in respect of any matters outside the scope of the above. The report is provided for the sole use of the named Client and is confidential to them and their professional advisors. No responsibility is accepted to other parties.

The report limits itself to addressing solely on the noise, acoustic, and vibration aspects as included in this report. We provide advice only in relation to noise, vibration and acoustics. It is recommended that appropriate expert advice is sought on all the ramifications (e.g. CDM, structural, condensation, fire, legal, etc.) associated with any proposals in this report or as advised and concerning the appointment. It should be noted that noise predictions are based on the current information as we understand it and, on the performances noted in this report. Any modification to these parameters can alter the predicted level. All predictions are in any event subject to a degree of tolerance of normally plus or minus three decibels. If this tolerance is not acceptable, then it would be necessary to consider further measures.

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1. Introduction

Velosolutions appointed Acoustic Consultants Limited to undertake an environmental noise assessment for the proposed Pump track at Boomcraft Road, Pewsey. The assessment considered the impact of environmental noise on the nearby residential properties.

The assessment includes the measurement of noise from an existing pump track located in Stockwood and uses the data collected to model the noise emitting from the proposed site.

The author of this report is a Technician Member of the Institute of Acoustics and is considered suitably qualified to undertake this noise impact assessment.

2. The Site

The site is an existing field situated on Boomcroft Road, Pewsey. The field currently houses Boomcroft Road Play Park which is a relatively small children's playground.

The site is bordered by the Pewsey to Bedwyn trainline to the south, to the east is an existing playground, beyond which are a number of residential properties. To the south is Boomcroft Road, beyond which are a number of residential properties while to the west there is a small section of woodland.

The proposals are for the instalment of a pump track towards the western section of the field. We are unaware of any formal restrictions to the operating hours of the proposed track, however we do not believe there are any plans to introduce significant artificial lighting so the use is generally restricted to the hours of daylight.

The following plan shows the location of the site and surrounding area.

Figure 1: Site location



3. Planning and Noise

3.1. National Planning Policy Framework

The National Planning Policy Framework (NPPF) was published in March 2012 and revised in July 2021. Section 15 entitled 'Conserving and enhancing the natural environment' addresses noise as a requirement of planning. Paragraph 174 states:

"174. 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…"

Paragraph 185 states:

"185. 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;

b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason; and

c) limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation."

The document does not prescribe any assessment methodology or criteria to assess the adverse effect of noise.

3.2. Noise Policy Statement for England

The NPPF refers to the Noise Policy Statement for England (NPSE). This was published in March 2010 and aims to provide clarity regarding current policies and practices to enable noise management decisions to be made within the wider context, at the most appropriate level, in a cost-effective manner and in a timely fashion and applies to all forms of noise including environmental noise, neighbour noise and neighbourhood noise.

The NPSE sets out the long-term vision of Government noise policy. This long-term vision is supported by three noise policy aims as follows:

"Through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development:

- *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 NPSE introduces the concept of "Significant adverse" and "Adverse" impacts of noise which relate to the noise policy aims. These are applied as follows:

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.

SOAEL – Significant Observed Adverse Effect Level

This is the level above which significant adverse effects on health and quality of life occur. With regard to where there is potential for noise impact it states the following in relation to the second noise policy aim:

"The second aim of the NPSE refers to the situation where the impact lies somewhere between LOAEL and SOAEL. It requires that all reasonable steps should be taken to mitigate and minimise adverse effects on health and quality of life while also taking into account the guiding principles of sustainable development (paragraph 1.8). This does not mean that such adverse effects cannot occur."

The NPSE does not provide any assessment criteria for the noted effect levels and each case must be considered on its merits. The NPSE does, however, emphasise that in dealing with noise Local Planning Authorities are required to take a balanced approach in considering the benefits of development as against any adverse effects which arise. Paragraph 2.18 of the NPSE is particularly relevant in this respect and states:

"There is a need to integrate consideration of the economic and social benefits of the activity or policy under examination with proper consideration of the adverse environmental effects, including the impact of noise on health and quality of life. This should avoid noise being treated in isolation in any particular situation, i.e. not focusing solely on the noise impact without taking into account other related factors."

The planning need is outside the scope of noise and acoustics and will need to be addressed by others.

3.3. National Planning Practice Guidance, Noise (NPPG)

The National Planning Practice Guidance (NPPG) on noise referred to here is based on the current version (July 2019) as provided on the Planning Guidance Website.

It states that "Noise needs to be considered when new developments may create additional noise and when new developments would be sensitive to the prevailing acoustic environment."

It provides generic guidance on how to determine the noise impact and what factors could be a concern. It includes the option types to mitigate any adverse effects of noise stating that there are four broad types of mitigation. These are engineering, layout, using planning conditions or obligations and noise insulation.

Paragraph 5 of the NPPG provides a table identifying the effect level and examples of effect relating to the impact effect levels provided in the NPSE. The table is duplicated below:

Table 1: NPPG Noise – Perception of Effect Levels

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	
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	
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

The table does not provide any objective assessment which equates to the noted effect levels.

4. Assessment Methodology

4.1. British Standard 8233:2014

This standard, entitled 'Guidance on sound insulation and noise reduction for buildings', provides advice on noise as it affects buildings of all types, giving consideration to various common sources of noise.

This is considered relevant when assessing noise from existing anonymous noise sources (road traffic) as it effects the proposed residential properties.

It outlines design guidance in general terms and provides criteria for the indoor ambient noise levels (IANLs) for different types of room. These are stated in terms of the 'equivalent continuous sound pressure level' over the reference time period, the $L_{Aeq,\ T}$. The IANLs specified by British Standard 8233 that are relevant to this development are as follows.

Table 2: IANL criteria of British Standard 8233:2014

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

Section 7.7.2 Note 4 of the British Standard states *"Regular individual noise events (for example, scheduled aircraft or passing trains) can cause sleep disturbance. A guideline value may be set in terms of SEL or $L_{Amax,F}$ depending on the character and number of events per night. Sporadic noise events could require separate values".*

British Standard 8233:2014 provides no definitive criteria for maximum noise levels from individual events ($L_{Amax,F}$). Section 3.4 of the WHO Guidance states *"For a good sleep, it is believed that indoor sound pressure levels should not exceed approximately 45 L_{Amax} more than 10-15 times per night (Vallet & Verbey 1991)".*

4.2. World Health Organisation 'Guidelines for Community Noise'

The World Health Organisation 'Guidelines for Community Noise' published in 1999 gives the following description of community noise.

"Community noise (also called environmental noise, residential noise or domestic noise) is defined as noise emitted from all sources except noise at the industrial workplace. Main sources of community noise include road, rail and air traffic, industries, construction and public work, and the neighbourhood. Typical neighbourhood noise comes from premises and installations related to the catering trade (restaurant, cafeterias, discotheques, etc.); from live or recorded music; sport

events including motor sports; playgrounds; car parks; and domestic animals such as barking dogs."

This includes "sport events" and, as such, the use of a Pump Track.

For noise levels internally and externally to dwellings it states:

"In Dwellings. The effect of noise in dwellings, typically, are sleep disturbance, annoyance and speech interference. For bedrooms the critical effect is sleep disturbance. Indoor guideline values for bedrooms are 30 LAeq for continuous noise and 45 LAmax for single sound events. Lower noise levels may be disturbing depending on the nature of the noise source. At night-time, outside sound levels about 1 metre from façades of living spaces should not exceed 45 dB LAeq, so that people may sleep with bedrooms open. This value was obtained by assuming the noise reduction from outside to inside with the window open is 15 dB. To enable casual conversation indoors during daytime, the sound level of interfering noise should not exceed 35 dB LAeq. The maximum sound pressure level should be measured with the sound pressure meter set at "fast"."

Based on the same methodology used to determine the night time noise level (with a 15 dB(A) for an open window) outside a residential property, the daytime noise level about 1 metre from façades of living spaces should not exceed 50 dB LAeq.

Table 4.1 of the document provides guidelines for community noise in specific environments, suggesting noise levels at which adverse health and annoyance effects are likely. The relevant noise criteria are as follows:

Table 3: WHO Noise Criteria

Specific Environment	**Critical Health Effect**	**$L_{eq(T)}$ dB(A)**
Outdoor living area	Serious annoyance, daytime and evening	55
	Moderate annoyance, daytime and evening	50
Dwelling indoors	Speech intelligibility & moderate annoyance, daytime & evening	35

According to the WHO guidance, moderate annoyance is caused by noise levels exceeding 50 $L_{Aeq(T)}$ dB externally and 35 $L_{Aeq(T)}$ dB internally. With relation to the adverse effect level, we would consider this the threshold of the Lowest Observed Adverse Effect Level.

Therefore, where noise levels from the proposed development do not exceed 50 $L_{Aeq(T)}$ dB externally and 35 $L_{Aeq(T)}$ dB internally, the effect is below the Lowest Observed Adverse Effect Level and will have no adverse effect. The noise level of the Pump Track may be noticeable but not intrusive and is considered acceptable in planning terms.

The equivalent noise level is determined over a specific time period. The World Health Organisation guidelines for residential development are typically equivalent noise levels calculated over a 16-hour daytime period.

In our opinion, a 16-hour assessment period may not truly reflect the noise impact as it takes into account times of use and non-use. We would propose an alternative, more stringent but appropriate assessment time period of one hour of continuous use which will allow us to assess the worst-case operation of the pump track.

The WHO criteria were reviewed in a report by the National Physical Laboratory (reference CMAM16) which states:

"Exceedance of the WHO guideline values does not necessarily imply significant noise impact and indeed, it may be that significant impacts do not occur until much higher levels of noise exposure are reached."

Therefore, it is not necessarily the case that where these levels are exceeded the noise will adversely affect nearby residential properties.

4.3. British Standard 8233:2014 Guidance on sound insulation and noise reduction for buildings

British Standard 8233:2014 entitled 'Guidance on sound insulation and noise reduction for buildings' came into effect on 28th February 2014 and supersedes British Standard 8233:1999.

Table 4 of the British Standard provides internal ambient noise levels for dwellings from noise sources 'without a specific character' and are based on existing guidelines issued by the World Health Organisation in 1999. The British Standard provides no definition of noise 'without a specific character'.

No reference of guidance on sporting uses is given in the British Standard, unlike the WHO Guidelines. As such, we propose that the definition of community noise is applicable to the proposed noise limits. The British Standard 8233:2014 provides the same guidance levels as the World Health Organisation document.

5. Site Noise Monitoring

An attended site noise survey was undertaken on the 5th June 2023 to determine noise levels from the existing pump track, located in Stockwood.

The monitoring was arranged with the client and a local competent bike rider used the track for the purposes of the measurements.

5.1. Monitoring Equipment

Sound Pressure Levels were measured using Class 1 sound level meters with a half-inch condenser microphone, using the 'fast' setting. The equipment is checked regularly using a Quality System meeting the requirements of British Standard EN ISO/IEC 17025:2017 "General requirements for the competence of testing and calibration laboratories"; in accordance with British Standard EN 10012:2003 "Measurement management systems. Requirements for measurement processes and measuring equipment"; and traceable to the National Standards. This equipment was checked and calibrated as noted below and the certificates are available for inspection.

Table 4: Equipment and Calibration Status

Equipment Description / Manufacturer / Type	Serial Number	Date of Calibration	Calibration Certification Number
SLM, NTI, XL2	A2A-13561-E0	17/11/2021	39498
Pre-Amp, NTI, MA220	7606	17/11/2021	39498
Microphone, NTI, MC230A	A17955	17/11/2021	39497
Calibrator, Larson Davis, CAL200	15064	08/12/2022	42729

The measurement equipment was checked before and after use with the noted calibrators and no significant drift was detected.

5.2. Weather Conditions

During the measurement, the weather was dry with an air temperature of 15 degrees centigrade. Wind speeds during the noise monitoring exercise were no more than 4 metres per second, with a predominantly north-easterly direction.

5.3. Monitoring Procedure

The microphone was in a free-field position, approximately 1.5 metres above ground on a tripod. The sound level meter was moved to a different position for each section of the track so that there was a clear line of site for the full run of the trick on the obstacle. The duration of each measured activity was approximately 2-3 seconds and encompassed the movement of a rider along the adjacent area of the track.

The following figure shows the location of each measurement location and gives a reference number for the tabulated measurement results.

Figure 2: Harpenden Skate Park Obstacles



Table 5: Measured Noise Levels

Reference	Description	Distance	$L_{Aeq,T}$ (dB)	$L_{AF,Max}$ (dB)
1	180 Berm	2	60	63
2	Center	2	55	61
3	90 Berm	1	58	65
3	90 Berm	1	59	65
4	Roller Double	1	56	60
4	Roller Double	1	56	60
2	3 laps general use	-	56	68
2	Residual noise climate	-	39	44

It is clear from the above measured levels that there is no need to correct for the residual noise climate as it was significantly below the specific levels associated with the use of the track.

6. Noise Modelling

Using the data acquired from the existing pump track at Stockwood we have modelled the proposed track. To ensure the reliability and applicability of the measured data collected at the existing track, a calibration model of the current track was made - each measurement was adjusted to align with the pass-by level derived from the maximum sound level (LAFmax) recorded during each run. Two models have been created to predict the noise levels produced from the track.

The first model considers a single rider utilizing the pump track continuously for an hour. This is deemed representative of the typical usage during an hour, considering that while there might be multiple riders, there will also be intervals where no riders are present, thus not contributing to the noise generated.

The other model demonstrates the absolute worst-case use of the track, with 10 riders using the pump track. This model presumes that each section of the track that we have modelled is in use at any given time and thus producing noise, and that 1200 laps of the track are being completed every hour.

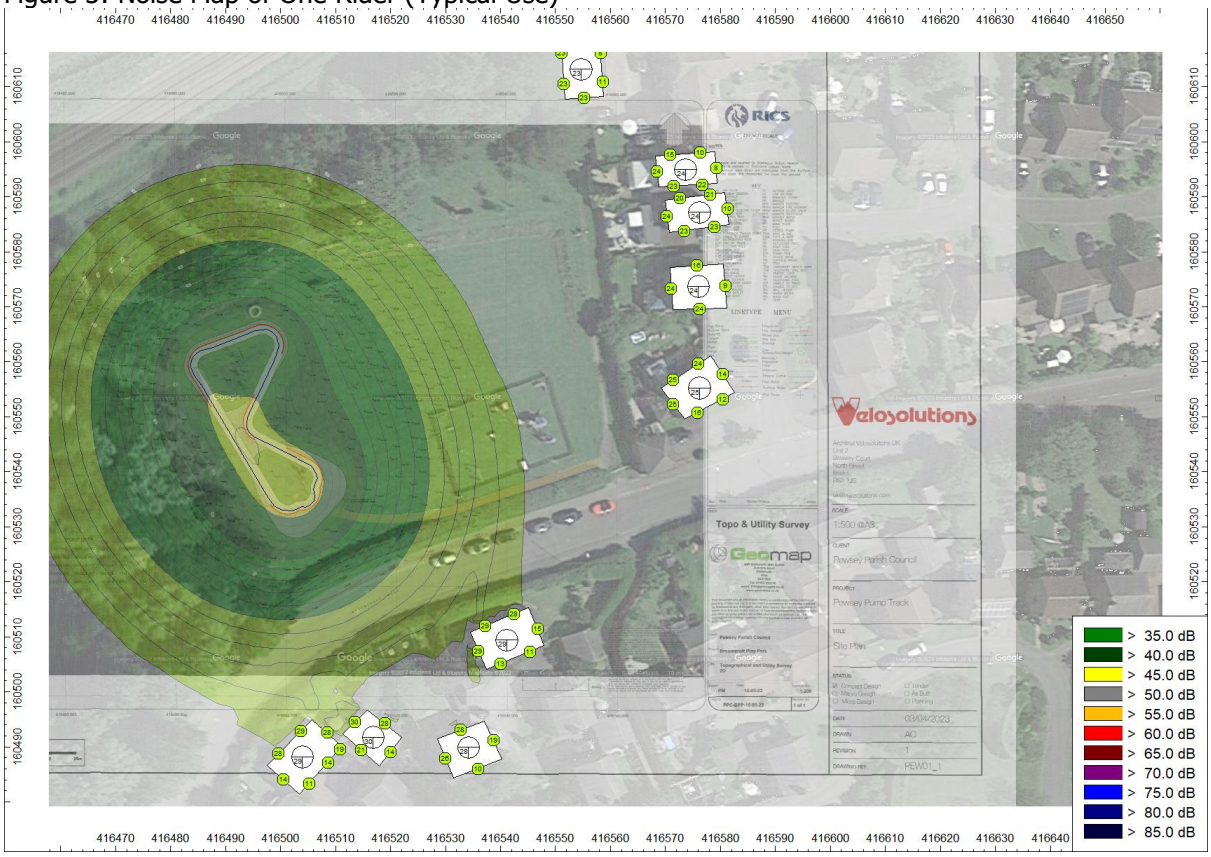
6.1. **Modelling Parameters**

The proposed track has been modelled in the noise modelling software Cadna:A by DataKustik. The modelling software calculates sound levels based on the inputted sound emission values, source and receiver locations and primarily distance, barrier and ground attenuation. Calculations are undertaken using the General method od Calculation from UISO 9613. The parameters within the Cadna:A model are as follows:

- The existing dwellings are based on Google Earth observations.
- The order of reflections is 3, and all buildings are reflective.
- The ground across the site and surrounding area is considered hard and reflective (this is worst-case as a majority of the site is grass which would provide some level of absorption).
- The predictions are based on the above calibration method utilising the pass-by levels.
- The predictions are based on each full length of the track taking approximately 30-seconds for a full lap, with the uses as above equating to 120 laps an hour for one rider and 1200 laps an hour for 10 simultaneous riders.
- The predicted noise maps are at 4.5m high.
- Building evaluation levels are the maximum per façade.
- The predicted building evaluation levels are free-field.

The modelling results can be seen below:

Figure 3: Noise Map of One Rider (Typical Use)



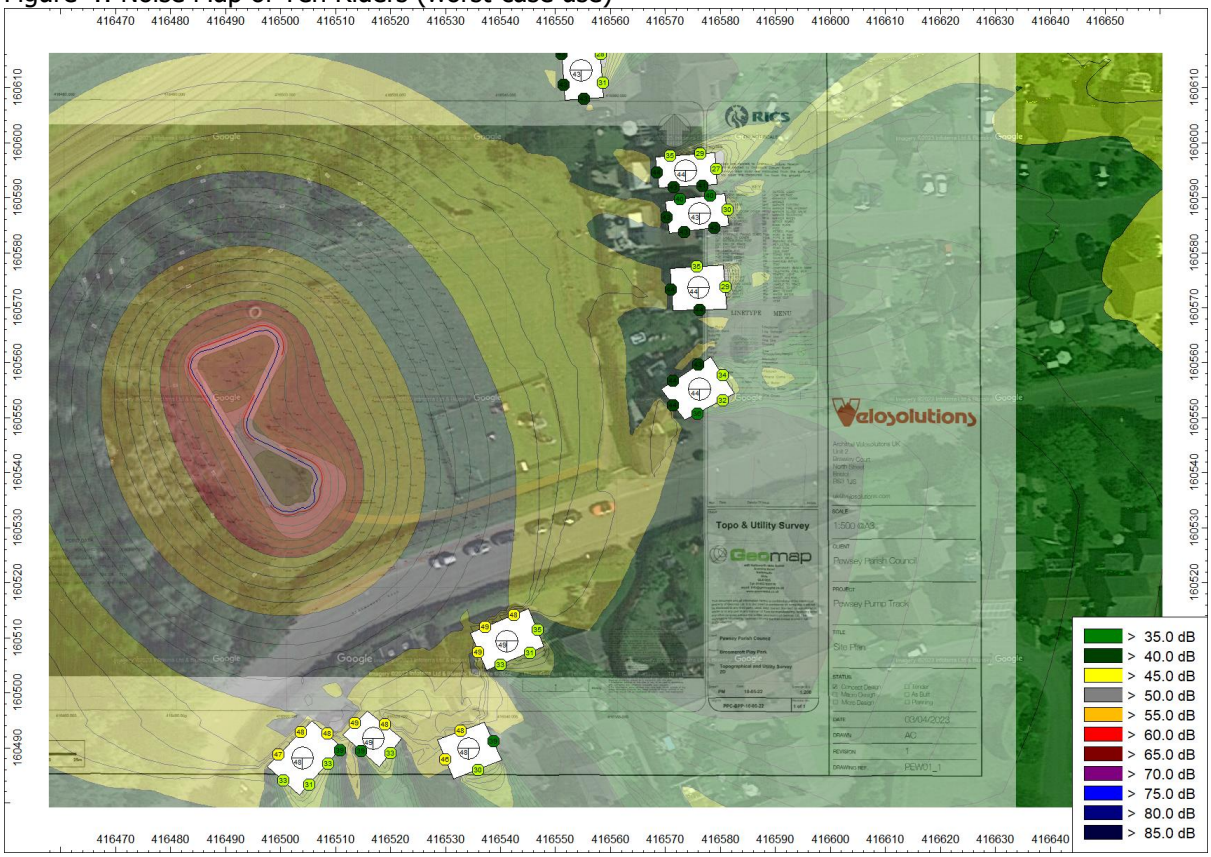
The highest predicted noise level from the proposed Pump Track, is 30 dB $L_{Aeq\ (1\ hour)}$ at the façade of the residential houses to the South and 25 dB $L_{Aeq\ (1\ hour)}$ at the façade of the residential houses to the East.

The predicted noise level is below the proposed criterion of 50 dB $L_{Aeq\ (1\ hour)}$ derived from WHO 1999 as being the threshold for the onset of moderate community annoyance.

The World Health Organisation provides a sound reduction through an open window of 15 dB(A) which results in a predicted internal equivalent noise level of 15 dB $L_{Aeq\ (1\ hour)}$ at the worst case location.

The predicted noise level in all of the gardens is below the proposed criterion of 50 dB $L_{Aeq\ (1\ hour)}$.

Figure 4: Noise Map of Ten Riders (worst-case use)



The highest predicted noise level from the proposed Pump Track operating at a worst-case level, is 49 dB $L_{Aeq\ (1\ hour)}$ at the façade of the residential houses to the South and 44 dB $L_{Aeq\ (1\ hour)}$ at the façade of the residential houses to the East.

The predicted noise level is below the proposed criterion of 50 dB $L_{Aeq\ (1\ hour)}$ derived from WHO 1999 as being the threshold for the onset of moderate community annoyance.

The World Health Organisation provides a sound reduction through an open window of 15 dB(A) which results in a predicted internal equivalent noise level of 34 dB $L_{Aeq\ (1\ hour)}$ at the worst-case location.

The predicted noise level in all the gardens is below the proposed criterion of 50 dB $L_{Aeq\ (1\ hour)}$.

7. Summary and Conclusions

Velosolutions appointed Acoustic Consultants Limited to undertake an environmental noise assessment for the proposed pump track at Stockwood.

The site is an existing field situated on Boomcroft Road, Pewsey. The field currently houses Boomcroft Road Play Park which is a relatively small children's playground.

The Pewsey to Bedwyn trainline marks the southern border of the site, and to the east, there is an existing playground, followed by several residential properties. Boomcroft Road is situated to the south, accompanied by additional residential properties, while to the west, there is a small patch of woodland.

The plans involve setting up a pump track in the western part of the field. As of now, we have no knowledge of any official limitations on the track's operating hours. However, it is important to note that there are no intentions to introduce extensive artificial lighting, which means that the track's usage will generally be limited to daylight hours.

An attended site noise survey was undertaken on the 5th June 2023 to determine noise levels from the use of an existing pump track located in Pewsey. This data has been calibrated to ensure accurate modelling of the newly proposed site.

The modelling shows a wort-case predicted noise level from the Pump Track of 49 dB $L_{Aeq\ (1\ hour)}$ at the façade of the worst-case residential receiver, while typical use of the track is predicted to emit levels of 30 dB $L_{Aeq\ (1\ hour)}$ at the façade of the worst-case residential receiver.

The World Health Organisation provides a sound reduction through an open window of 15 dB(A) which results in a predicted internal equivalent noise level of 34 dB $L_{Aeq\ (1\ hour)}$) and 15 dB $L_{Aeq\ (1\ hour)}$) for the worst-case and typical levels, respectively.

Based on the results of the above, noise from the pump track may be noticeable but not intrusive as defined by the 'No Observed Adverse Effect' level of the NPPG. This falls below the 'lowest observed adverse effect level' of the NPPG: Noise and, therefore, complies with the aims of the Noise Policy Statement for England (NPSE) requirements.

8. Appendix 1 – Glossary of Acoustic Terminology

A-weighted sound pressure pA – value of overall sound pressure, measured in pascals (Pa), after the electrical signal derived from a microphone has been passed through an A-weighting network.

A-weighted sound pressure level, L_{pA} - quantity of A-weighted sound pressure given by the following formula in decibels (dBA)

$L_{pA} = 10 \log_{10} (p_A/p_0)^2$

where:

p_A is the A-weighted sound pressure in pascals (Pa);
p_0 is the reference sound pressure (20 µPa)

Background sound level, $L_{A90,T}$– A-weighted sound pressure level that is exceeded by the residual sound assessment location for 90% of a given time interval, T, measured using weighting F and quoted to the nearest whole number of decibels

Break-in - noise transmission into a structure from outside.

Decibel (dB) – The decibel is the unit used to quantify sound pressure levels. The human ear has an approximately logarithmic response to acoustic pressure over a very large dynamic range (typically 20 micro-Pascals to 100 Pascals). Therefore, a logarithmic scale is used to describe sound pressure levels and also sound intensity and power levels. The logarithms are taken to base 10. Hence an increase of 10 dB in sound pressure level is equivalent to an increase by a factor of 10 in the sound pressure level (measured in Pascals). Subjectively, this increase would correspond to a doubling of the perceived loudness of sound.

Equivalent continuous A-weighted sound pressure level, $L_{Aeq,T}$ – value of the A-weighted sound pressure level in decibels of continuous steady sound that, within a specified time interval, T = t2 – t1, has the same mean-squared sound pressure as a sound that varies with time, and is given by the following equation:

$$L_{AeqT} = 10\lg_{10}\left\{(1/T)\int_{t_1}^{t_2}[p_A(t)^2/p_0^2]dt\right\} \quad (1)$$

where:

p_0 is the reference sound pressure (20 µPa); and
$p_A(t)$ is the instantaneous A-weighted sound pressure (Pa) at time t

NOTE The equivalent continuous A-weighted sound pressure level is quoted to the nearest whole number of decibels.

Facade level – sound pressure level 1 m in front of the façade. Facade level measurements of L_{pA} are typically 1 dB to 3 dB higher than corresponding free-field measurements because of the reflection from the facade.

Free-field level – sound pressure level away from reflecting surfaces. Measurements made 1.2 m to 1.5 m above the ground and at least 3.5 m away from other reflecting surfaces are usually regarded as free-field. To minimize the effect of reflections the measuring position has to be at least 3.5 m to the side of the reflecting surface (i.e. not 3.5 m from the reflecting surface in the direction of the source).

Octave and Third Octave Bands – The human ear is sensitive to sound over a range of frequencies between approximately 20 Hz to 20 kHz and is generally more sensitive to medium and high frequencies than to low frequencies within the range. There are many methods of describing the frequency content of a noise. The most common methods split the frequency range into defined bands, in which the mid-frequency is used as the band descriptor and in the case of octave bands is double that of the band lower. For example, two adjacent octave bands are 250 Hz and 500 Hz. Third octave bands provide a fine resolution by dividing each octave band into three bands. For example, third octave bands would be 160 Hz, 250 Hz, 315 Hz for the same 250 Hz octave band.

Sound pressure level – Sound pressure level is stated on many of the charts. It is the amplitude of the acoustic pressure fluctuations in a sound wave, fundamentally measured in Pascals (Pa), typically from 20 micro-Pascals to 100 Pascals, but commonly simplified onto the decibel scale.

Sound reduction index, R – laboratory measure of the sound insulating properties of a material or building element in a stated frequency band.

Specific sound level, $L_s = L_{Aeq,Tr}$ – equivalent continuous A-weighted sound pressure level produced by the specific sound source at the assessment location over a given reference time interval, T_r.

Structure-borne noise – audible noise caused by the vibration of elements of a structure, the source of which is within a building or structure with common elements.

Rating level, $L_{Ar,Tr}$ – Specific sound level plus any adjustment for the characteristic features of the sound.

Reverberation Time, T – The reverberation time is defined as the time taken for a noise level in an enclosed space to decay by 60 dB from a steady level once the noise source has stopped. It is measured in seconds. Often a 60 dB decay cannot be measured so the reverberation time is measured over a lesser range and corrected back to the time for a 60 dB drop assuming a constant decay rate. Common parameters are T20 (time taken for a 20 dB decay multiplied by three) and T30 (time taken for a 30 dB decay multiplied by two).

Vibration Dose Value, VDV – measure of the total vibration experienced over a specified period of time.

Estimated Vibration Dose Value, eVDV – estimation of the total vibration experienced over a specified period of time. This is usually based on the number of events and shortened measurement data.

Weighted sound reduction index, R_w – Single-number quantity which characterizes the airborne sound insulating properties of a material or building element over a range of frequencies. The weighted sound reduction index is used to characterize the insulation of a material or product that has been measured in a laboratory (see BS EN ISO 717-1).



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