Stopford
Energy & Environment

# Noise Assessment Report

for

## TMG Sports Vehicles Limited

## Project Number R6485

20th December 2017

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Issue A2
Document Number: R6485-IE-0001

ISOQAR REGISTERED
UKAS MANAGEMENT SYSTEMS 0026
Certificate Number 5021

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# Revision History

| Issue | Reviewed by (date) | Approved by (date) | Comments |
|---|---|---|---|
| A1 | M. Wilkinson (18/12/2017) | B. Herbert (18/12/2017) | |
| A2 | M. Wilkinson (20/12/2017) | B. Herbert (20/12/2017) | Updated to clarify supplementary information regarding the planning application |
| | | | |

## Executive Summary

Fitzgerald Planning and Design appointed Stopford Energy and Environment (SEE) to undertake a noise impact assessment at residential properties near TMG Sports Vehicles Ltd.

TMG Sports Vehicles Ltd modify vans and trucks to create horseboxes, and a noise impact assessment is required to support an application for Change of Use from class B1 to class B2.

SEE identified the nearest residential receptor to TMG Sports Vehicles Ltd that may be affected by noise from the site. A subjective assessment of the sources of noise in the area was undertaken and background noise levels were measured. An assessment in line with the requirements of BS 4142:2014 (Methods for rating and assessing industrial and commercial sound) was made to assess the impact of noise from the site at the proposed times of operation.

The assessment identified that the main sources of noise in the area are road vehicles and industry. TMG Sports Vehicles Ltd contribute to the noise in the area but are not the only source and there is little difference in the background noise level when the noisier activities, such as angle grinding, are carried out during normal hours of operation. The steps that TMG Sports Vehicles Ltd has taken to mitigate noise (the building of the new extension to house these noisier activities) have had a significant effect on reducing the noise levels from the site. It is noted that these activities may still cause a disturbance at quieter times of day when the background noise levels drop.

The noise survey indicates that the noisier elements of TMG Ltd's operations (e.g. angle grinding in the new extension building) will have very little impact on the background noise levels in the area during normal hours of operation.

The noise survey also showed that while noise levels at the nearest residential property meet the acceptable internal noise criteria when windows are closed, the noise level is above guideline values when windows are partially open. The results indicate that the noise levels in the area are exceeding the limit of the guidance given in BS 8233:2014 and WHO for external noise.

SEE recommends that all businesses in the area take steps to reduce their contribution to noise. This can be achieved by ensuing that doors are kept shut when industrial activities are taking place and, where possible, minimising the number of vehicle movements and vehicles left idling on site.

## Glossary of Terms

| | |
|---|---|
| dB (decibel) | The scale on which sound pressure is measured is the decibel scale, which is a logarithmic scale. It 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 $x10^{-5}$Pa). |
| dB(A) | A-weighted decibel.<br>The human ear is most sensitive to sounds of frequencies between 2 and 5 kHz and less sensitive at higher and lower frequencies. Sound level meters are fitted with an A weighting network which weights the electrical signal in a manner similar to a human ear. |
| $L_{Aeq,T}$ | The constant sound level, in dB(A), which contains the same quantity of sound energy, as the actual varying sound level over the same time period (T).<br>The time period to which the $L_{Aeq}$ refers is usually indicated by the symbol $L_{Aeq,T}$, e.g. a 2-minute sample would be written as $L_{Aeq,\ 2\ minutes}$. |
| $L_{A90}$ | The A-weighted sound pressure level exceeded for 90% of the time. |
| Free-field | Away from any reflective surfaces other than the ground within 1.5m of the microphone. |
| Fast | A time weighting used in the root mean square section of a sound level meter with a 125-millisecond time constant. |

# 1 Introduction

Fitzgerald Planning and Design appointed Stopford Energy and Environment (SEE) to undertake a noise impact assessment at residential properties near TMG Sports Vehicles Ltd.

The assessment is required to support an application for change of use from class B1 to class B2.

## 1.1 The site

### 1.1.1 Site Address

TMG Sports Vehicles Ltd
Units 16-21 Mitton Rd Industrial Estate. Mitton Road, Whalley, BB7 9JY

### 1.1.2 Surrounding Area

The area is mixed residential and commercial, and the industrial estate is accessed via Mitton Road (B6246).

The closest residential property to TMG Sports Vehicles Ltd has been identified as:
1 The Cottages, Mitton Road, Whalley, BB7 9JY

The front of the TMG Sports Vehicles Ltd building to the boundary of 1 The Cottages is approximately 16 m. (From the side elevation of the cottage to the building line is 21 m)

The site has previously been designated for industrial use but has only recently been developed. The site is now a purpose built industrial estate providing a total of 21 units with a variety of light industrial and commercial use. Planning approval has recently been granted (Reference 3/2017/0714) on land to the south of this site for Phase 2 and 3 of Mitton Road Business Park. The site will provide 6,840 square metres of new employment floor space comprising B1c, B2 and B8. A new access point will be created as part of the development and the existing access which serves TMG Ltd and other existing businesses will be closed off, reducing vehicle movements and associated vehicle noise.

### 1.1.3 Operations

TMG Sports Vehicles Ltd modify vans and trucks to create horseboxes. The site consists of 6 units on a recently developed industrial estate accessed off Mitton Road, Whalley. TMG Sports Vehicles Ltd is the largest of the businesses on the site and closest to the nearest residential property.

A planning application was approved for an extension to the north of the existing building, creating an additional 75sqm of workshop floor space. This extension has now been built and it is proposed that the noisier elements of work will be done inside this building.

The noisier elements of the process are:

- An angle grinder
- A guillotine to cut glass
- Industrial cutters to remove window frames

The business estimates that, in total, these elements take an average of 2 hours out of the whole process when creating one horsebox. The company produces approximately 250 boxes per year.

# 2 Assessment methodology and criteria

## 2.1 National Planning Policy Framework

The National Planning Policy Framework (NPPF) provides guidance on planning on noise. Paragraph 123 of the document states:

"Planning policies and decisions should aim to

- avoid noise from giving rise to significant adverse impacts on health and quality of life as a result of new development;
- mitigate and reduce to a minimum other adverse impacts on health and quality of life arising from noise from new development, including through the use of conditions;
- recognise that development will often create some noise and existing businesses wanting to develop in continuance of their business should not have unreasonable restrictions put on them because of changes in nearby land uses since they were established; and
- identify and protect areas of tranquillity which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason."

No further guidance is provided as to what level of noise would have "significant adverse impact on health and quality of life". SEE propose that this can be achieved by:

- Meeting the internal and external noise levels outlined in BS 8233 (Guidance on sound insulation and noise reduction for buildings) and the recommendations contained within the World Health Organisations guidelines.
- Assessing or predicting the noise impact from any new developments using the methods and criteria detailed in BS 4142: 2014.

## 2.2 BS 4142:2014 Methods for rating and assessing industrial and commercial sound

The potential of a noise to cause annoyance to people is related to its level above the pre-existing background noise level and the context in which the sound occurs. Typically, the greater the difference

between the industrial/commercial sound and the background sound level the greater the magnitude of the impact.

BS 4142: 2014 describes methods for rating and assessing sound of an industrial or commercial nature which includes:

• Sound from industrial and manufacturing processes;

• Sound from fixed installations with mechanical and electrical plant and equipment;

• Sound from the loading and unloading of goods and materials at industrial and/or commercial premises; and

• Sound from mobile plant and vehicles that form an intrinsic part of the sound emanating from the premises or processes (e.g. forklift trucks, train, or ship movements on an industrial or commercial site).

Outdoor sound levels are used to assess the likely effect of the specific sound under investigation on people who may be inside or outside residential properties. The standard can be used for investigating complaints, assessing the impact of sound from proposed, new, modified, or additional sources of commercial/industrial sources and assessing the impact of sound at proposed new residential premises. The determination of noise nuisance is beyond the scope of the standard.

The procedure detailed in the standard compares the measured or predicted noise level, "the specific noise level", from the source with the background sound level at the residential dwelling. The measured background level at the receptor should be reliable and should not necessarily be the lowest measured background sound level, but rather quantify what is "typical" for that area.

### 2.2.1 Determination of specific sound level

The standard requires that measurements are made of the following:

- Background Level at the residential property, $L_{A90,T}$.
- Ambient Sound Level - sound level from all sources including the source under investigation, $L_{Aeq,T}$

- Residual Sound Level - the level of the ambient sound i.e. when the specific source is supressed, $L_{Aeq,T}$

The specific noise level Ls can be calculated by subtracting (logarithmically) the residual sound level Lr from the ambient sound level La

$Ls = 10 \log (10^{La/10} - 10^{Lr/10})$

### 2.2.2 Correction for distance

To calculate the noise level at the residential property, corrections need to be applied to the measured noise level to take into the account the effects of distance from the source.

To allow for the distance attenuation from the monitoring location to the residential dwelling concerned, the following formula is used for point sources:

$L_2 = L_1 - (20 \times \log (D_2/D_1))$

Where

$L_2$ is the noise level at the dwelling (or garden)

$L_1$ is the measured noise levels at the measurement position

$D_2$ is the distance from the source to the façade of the dwelling or centre of the garden (m)

$D_1$ is the distance from the source to the measurement position (m)

### 2.2.3 Correction for acoustic features

The procedure detailed in the standard allows "penalties" to be attributed to the specific sound level depending upon the "acoustic features" of the sound level under investigation. The sound is corrected to take account of any features present in the sound by adding the appropriate correction to the specific level:

- Tonality (whine, hiss screech, hum) - up to + 6dB
- Impulsivity (bangs, clinks, clatters) - up to +9dB

- Other noticeable characteristics - up to +3dB
- Intermittency - up to +3dB

### 2.2.4 Comparison of specific sound level to background sound level

Once the specific sound level at the residential property has been determined, and penalties added for any acoustic feature, the "rating level" is then obtained.

If the rating level noise is +10 dB or more above the background level this indicates a likely significant impact, depending on context. A difference of around +5dB indicates an adverse impact, depending on context, and where the rating level does not exceed the background level, this indicates a low impact depending on context.

## 2.3 World Health Organisations (WHO) Guidelines for Community Noise

The World Health Organisations 'Guidelines for Community Noise' provides advice concerning noise criteria applicable to sleep disturbance. As TMG Sports Vehicles Ltd hours of operation are daytime working, and these criteria fall outside the scope of this assessment.

However, the guidelines also offer advice with regards to external noise:

"*To protect the majority of people from being seriously annoyed during the daytime, the sound pressure level on balconies, terraces and outdoor living areas should not exceed 55 dB $L_{Aeq}$ for a steady, continuous noise. To protect the majority of people from being moderately annoyed during the daytime, the outdoor sound pressure level should not exceed 50 dB $L_{Aeq}$*".

## 2.4 British Standard BS 8233:2014 Guidance on Sound Insulation and Noise Reduction

BS 8233:2014 provides guidance and recommendations for the control of noise in and around buildings. The standard suggests suitable internal noise levels for different buildings and rooms, including dwellings, based on the guidelines suggested by the WHO. The criteria are summarised in Table 1.

BS 8233:2014 also provides guidance for external noise:

"*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*".

**Table 1: Assessment Criteria**

| Environment | 07:00 to 23:00 |
|---|---|
| Living Room | 35 dB $L_{Aeq,\ 16\ hour}$ |
| Dining Room | 40 dB $L_{Aeq,\ 16\ hour}$ |
| Bedroom (Internal) | 35 dB $L_{Aeq,\ 16\ hour}$ |
| Outdoor Living area (gardens) | 50 dB $L_{Aeq,\ 16\ hour}$ |

### 2.4.1 Correction for double glazing

BS 8233:2014 suggests that standard double-glazing units will attenuate noise levels from road traffic by 30 dB and so this has been used to calculate internal noise levels when windows are closed.

BS 8233:2014 also provides guidance for partially open windows, that may be required for ventilation, and suggests that a value of 15 dB should be used for noise reduction.

# 3 Procedure

The following approach was used to determine the impact of noise from TMG Sports Vehicles Ltd:

- The background noise levels at the nearest residential property were measured $L_{A90,\ 10min}$. It was noted that there were several sources of intermittent noise on and around the site (including traffic movements to all units and tree felling on Mitton Road), so several background readings were made, each for 10-minute periods, so that the contribution of the various sources could be put into context.

- Readings were also taken at the nearest residential property ($L_{Aeq,\ 10min}$) and these were compared to the guidance for internal and external noise in BS 8233:2014 and WHO.

- A noise assessment for the noisiest activities at the TMG Sports Vehicles Ltd site was undertaken in accordance with BS 4142:2014.

- Noise readings were recorded for the noisiest activities whilst the door to the extension building was shut and again whilst it was open so that the impact on the reduction of noise of the new extension could be determined.

# 4 Noise Survey

## 4.1 Date and Time

The survey was carried out on 12th December 2017 between 10:00 and 14:00. SEE was advised that the noise levels at this time were typical for the hours of operation of the site.

## 4.2 Personnel

Monitoring was undertaken by staff holding a Certificate of Competence in Environmental Noise Measurement.

## 4.3 Weather

The weather was dry and overcast with a south-west wind of less than 5 m/s. The ambient temperature was 2°C.

## 4.4 Location

Background noise levels were taken at the boundary of the nearest residential property, 1 The Cottages Mitton Road, Whalley, BB7 9JY.

The monitor was then moved, and readings were taken whilst angle grinding was undertaken in the new extension building. The façade of the new extension is 32 m from the boundary of 1 The Cottages. The monitor was set up at 5 m from the façade of the new extension building. The microphone was located at a height of 1.2 m in free-field conditions.

## 4.5 Noise Measurement Equipment

The equipment used in the noise survey is detailed in Table 2 and complies with the requirements of BS 4142:2014 (BS EN 61672 Class 1 for monitoring equipment in free field applications. BS EN 60942 Class 1 for sound calibrators). Calibration certificates are available on request. The microphone was fitted with a wind shield during the survey.

**Table 2: Noise Measuring Equipment.**

| Equipment | Manufacturer and Type | Serial No. | Calibration date |
|---|---|---|---|
| Sound Level Meter | Nor 140 | 1402924 | 3rd August 2017 |
| Pre-amplifier | Nor 1209 | 12071 | 2nd August 2017 |
| Microphone | Nor 1225 | 8525 | 18th July 2017 |
| Calibrator | Nor 1251 | 17266 | 16th May 2017 |

## 4.6 Calibration check

On-site calibration was done before and after the monitoring survey and levels agreed with the calibrator. No significant drift occurred

Calibration check start: 114.2 dB(A)

Calibration check finish: 114.2 dB(A)

# 5 Results

## 5.1 Subjective assessment at closest residential property

The industrial estate is accessed via Mitton Road (B6246) and traffic on this road was constant and audible throughout the assessment. There were numerous vehicle movements on the industrial estate; some of which were attributed to TMG Sports Vehicles Ltd whilst others were to and from the various other units on the site. There were several vehicles left idling which contributed to the noise levels in the area.

In terms of industrial noise there were several sources other than TMG Sports Vehicles Ltd including chain saws from tree felling on Mitton Road. (SEE was advised that the tree felling activity is a new source of noise and will only be present for a short period of time. However there have previously been construction activities on/near the site and further activities are planned on a nearby site in the future. SEE therefore considers the noise levels recorded to be typical).

It is proposed that the noisier activities will be undertaken in the new extension with the door shut, so the assessment of the angle grinder was made under these conditions. Whilst noise recordings were being taken, SEE noted that the noise from the angle grinder could not be heard outside the closest residential property. SEE were advised that previously these activities were performed on the rear yard. An assessment of these conditions was made for comparison and SEE could then hear the noise at the nearest residential property.

## 5.2 Measured noise levels at closest residential property

**Table 3: Measured noise levels at closest residential property**

| Time | $L_{A90,\ 10min}$ (dB) | $L_{Aeq,\ 10\ min}$ (dB) | Noise sources |
|---|---|---|---|
| 10:10 - 10:20 | 50.2 | 54.0 | Road traffic on Mitton road (B6246).<br>Vehicles entering and leaving site.<br>Idling vehicle for 2 minutes next to monitor.<br>Sirens/beeping in distance.<br>General activities at TMG Vehicles Ltd ceased (no extractor or angle grinding).<br>Chain saws from tree felling on Mitton Road (constant for last 3 minutes of recording). |
| 10:25 - 10:35 | 48.3 | 53.7 | Road traffic on Mitton road (B6246).<br>Vehicles entering and leaving site.<br>Site vehicle reversing next to monitor.<br>General activities at TMG Vehicles Ltd (no extractor or angle grinding).<br>Chain saws from tree felling on Mitton Road (constant for first 5 minutes of recording). |
| 10:40 - 10:50 | 48.7 | 53.0 | Road traffic on Mitton road (B6246).<br>Vehicles entering and leaving site.<br>Site vehicle reversing next to monitor.<br>General activities at TMG Vehicles Ltd (no extractor or angle grinding).<br>Chain saws from tree felling on Mitton Road (constant for first 2 minutes of recording). |
| 10:50 - 11:00 | 49.8 | 57.6 | Road traffic on Mitton road (B6246).<br>Vehicles entering and leaving site.<br>Idling vehicle left next to monitor.<br>General activities at TMG Vehicles Ltd (no extractor or angle grinding).<br>No chain saws. |

| Time | $L_{A90,\ 10min}$ (dB) | $L_{Aeq,\ 10\ min}$ (dB) | Noise sources |
|---|---|---|---|
| 11:00 - 11:10 | 50.5 | 54.3 | Road traffic on Mitton road (B6246).<br>Vehicles entering and leaving site.<br>General activities at TMG Vehicles Ltd no extractor or angle grinding).<br>No chain saws. |
| 11:15 - 11:25 | 50.3 | 54.5 | Road traffic on Mitton road (B6246).<br>Vehicles entering and leaving site.<br>General activities at TMG Vehicles Ltd (no extractor or angle grinding).<br>Chain saws from tree felling on Mitton Road (Intermittent from 11:20).<br>Car alarm from 11:21- 11:23.<br>Trolley movement on site. |
| 12:20 - 12:30 | 48.5 | 53.0 | Road traffic on Mitton road (B6246).<br>Vehicles entering and leaving site.<br>Sirens/beeping in distance.<br>General activities at TMG Vehicles Ltd (no extractor or angle grinding).<br>No chainsaws. |
| 12:30 - 12:40 | 50.1 | 56.8 | Road traffic on Mitton road (B6246).<br>Vehicles entering and leaving site including bin wagon.<br>Sirens/beeping in distance.<br>General activities at TMG Vehicles Ltd (no extractor or angle grinding).<br>No chainsaws. |

## 5.3 Noise levels of angle grinding

**Table 4: Measured noise levels of angle grinding**

| Time | Test Conditions | $L_{Aeq,\ 5\ min}$ (dB) |
|---|---|---|
| 11:30 - 11:35 | Extension door closed<br>Angle grinder off | 50.1 |
| 11:35 - 11:40 | Extension door closed<br>Angle grinder on | 55.9 |
| 11:40 - 11:45 | Extension door open<br>Angle grinder on | 73.1 |

## 5.4 Calculations

### 5.4.1 Determination of specific sound level of angle grinding

The specific sound level of the angle grinder with the door closed has been calculated as SEE has been advised that this is how the activity will be carried out and is considered "normal operation".

$Ls = 10 \log (10^{La/10} - 10^{Lr/10})$

$Ls = 10 \log (10^{55.9/10} - 10^{50.1/10}) = 54.57$ dB(A)

### 5.4.2 Correction for distance

Measurements were made at approximately 5 m from the new extension.

The distance from the building line of the new extension to the boundary of Cottage 1 is 32 m

Measured noise level corrected for distance assuming hemispherical radiation from a point source

$$L_2 = L_1 - 20\log\left(\frac{r_2}{r_1}\right)$$

$$L_2 = 54.57 - 20\log\left(\frac{32}{5}\right) = 38.4dB(A)$$

### 5.4.3 Correction for acoustic features

The angle grinder had a high frequency tonal noise. Thus, a penalty of 6 dB is added

$L_2$ = 38.4 + 6 = 44.4 dB(A)

### 5.4.4 Calculation of background noise with angle grinder in operation

To determine the worst-case impact of using the angle grinder, the lowest recorded background noise has been used for this calculation,

Recorded background level: 48.3 dB(A)

Rating level of angle grinder: 44.4 dB(A)

Predicted background level:

$L = 10 \log (10^{48.3/10} + 10^{44.4/10}) = 49.8$ dB(A)

### 5.4.5 Correction for double glazing

To determine the predicted noise levels inside the nearest residential property, the highest recorded sound level has been used to determine the worst case.

$L_{Aeq,\ 10\ min}$ (dB) = 57.6

With windows closed, internal noise level: 57.6 - 30 = 27.6 dB(A)

With windows partially open, internal noise level: 57.6 - 15 = 42.6 dB(A)

# 6 Conclusions

Fitzgerald Planning and Design appointed SEE to undertake a noise impact assessment at residential properties near TMG Sports Vehicles Ltd to support an application for change of use from class B1 to class B2.

SEE identified the nearest residential receptor to TMG Sports Vehicles Ltd that may be affected by commercial and industrial noise from the site. A subjective assessment of the sources of noise in the area was undertaken and background noise levels were measured. An assessment in line with the requirements of BS 4142:2014 was made to assess the impact of noise from the site at the proposed times of operation.

The assessment identified that that the main sources of noise in the area were road vehicles and industry. There was constant background traffic noise from Mitton road (B6246), that was audible throughout the assessment, and there were numerous vehicle movements on Mitton Road industrial estate. Several vehicles (from TMG Sports Vehicles Ltd and other businesses on the site) were left idling for hours

periods during the assessment and this significantly contributed to the noise levels in the area. (SEE accepts that it was a particularly cold day, so drivers may have been trying to defrost vehicles and this practice may not be typical).

There were several sources of industrial noise, including TMG Sports Vehicles Ltd, other units, and chain saws from tree felling on Mitton Road. (SEE was advised that the tree felling activity is a new source of noise and will only be present for a short period of time. However there has previously been construction activities on/near the site and further activities are planned on a nearby site in the future. SEE therefore considers the noise levels recorded to be typical).

The results of the BS 4142 assessment show that the operation of the of the angle grinder in the new extension building will have very little impact on the background noise levels in the area during normal hours of operation. This was confirmed by the observations of SEE's staff who were unable to hear the noise outside the nearest residential property whilst the angle grinder was in operation. However, the sound may be audible when the background levels are lower.

During the assessment, SEE's staff were advised that activities had previously been carried out on the rear yard but are now carried out in a new extension. The recorded noise level when activities are

carried out in the yard are considerably louder, and the introduction of the new extension has significantly reduced the recorded noise levels by over 17 dB(A). An assessment was also made of the angle grinding operations when the doors to the new extension building were left open. This demonstrated that keeping the building doors shut considerably reduced noise levels at 1 The Cottage.

*General Comment*: The results show that the noise levels in the area are exceeding the limit of the guidance given in BS 8233:2014 and by the WHO for external noise. The result of the noise survey suggests that standard thermal double glazing will be sufficient in reducing the external noise level to an acceptable internal level. However, if the windows are partially open the internal noise levels exceed the criteria described in BS 8233:2014 and the WHO guidelines. SEE recommends that all businesses in the area take steps to reduce their contribution to noise. This can be achieved by ensuing that doors are kept shut when industrial activities are taking place and, where possible, minimising the number of vehicle movements and vehicles left idling on site.

## References

1. National Planning Policy Framework, Department for Communities and Local Government, March 2012.
2. World Health Organisations (WHO) Guidelines for Community Noise, 1999.
3. BS 8233:2014 Guidance on sound insulation and noise reduction for buildings.
4. BS 4142: 2014 Methods for rating and assessing industrial and commercial sound.

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