

**PERIODIC NOISE MONITORING
22 DECEMBER 2020**

**MITCHELL HILL QUARRY,
TWENTYPENCE ROAD, COTTENHAM**

MICK GEORGE LTD

DECEMBER 2020

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This report has been prepared using all reasonable skill and care within the resources and brief agreed with the client. LF Acoustics Ltd accept no responsibility for matters outside the terms of the brief or for use of this report, wholly or in part, by third parties.

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1. Introduction

LF Acoustics Limited have been appointed by Mick George Ltd to undertake a periodic noise monitoring exercise at Mitchell Hill Quarry, Twentypence Road, Cottenham.

Planning permission to operate the quarry has granted by Cambridgeshire County Council (Application ref. S/0088/18/CM), subject to Conditions.

This report presents the results of a noise monitoring exercise carried out on 22nd December 2020 to demonstrate compliance with the noise limits presented in Condition 12 of the planning permission and was carried out in accordance with the approved Noise Management and Mitigation Plan.

The noise monitoring and analysis was carried out by L Jephson BEng (Hons), MIOA, Director of LF Acoustics Ltd.

2. Current Planning Conditions and Site Noise Limits

A description of the noise units referred to within this report is provided in Appendix A.

2.1. Planning Conditions

The planning permission for the quarry was granted by Cambridgeshire County Council on 21 December 2018, subject to Conditions (Application ref. S/0088/18/CM).

Conditions 12 – 14 of the planning permission relate to noise, specifying site noise limits for normal and temporary operations and the requirement for noise mitigation and Management Plan to be submitted and agreed with the Minerals Planning Authority.

Condition 12 presents the noise limits relevant to the normal operations being carried out within the quarry and is reproduced below, for reference.

12. Noise Mitigation - Noise Limits at sensitive receptors

The cumulative noise from all sources on the proposed development shall not exceed the following threshold noise levels at the identified receptors. The threshold and background levels shall be determined in accordance with BS 4142:2014.

Name of Receptor	Background LA90,t	Daytime threshold dB Laeq 1hr free field	Temporary operations: soil and overburden stripping, bund formation & restoration* dB Laeq 1hr free field	Haul Road Traffic dB Laeq 1hr free field
The Farmhouse	38dB	48dB	70	
Gravel Diggers Farm	38dB	48dB	70	50
Elm Farm	38dB	48dB	70	
Chestnut Farm	38dB	48dB	70	50
The Lakes	40dB	50dB	70	
Mitchell Hill Farm	39dB	49dB	70	
TwentyPence Cottage	40dB	50dB	70	

*This limit allowed for only up to 8 weeks in any 12 month period

The approved Noise Management and Mitigation Plan was prepared by Sharps Redmore¹ to satisfy the requirements of Condition 13.

Section 7 of the plan defines the requirements for periodic noise monitoring, which have been adopted for the purposes of the current monitoring exercise.

¹ Sharps Redmore. Mitchell Hill Quarry. Noise Management and Mitigation Plan Pursuant to Condition 13 of Application re: S/0088/18/CM. 22 January 2019. Project No. 1717132.

3. Noise Monitoring

3.1. Monitoring Exercise

A noise monitoring exercise was carried out during Tuesday 22nd December 2020.

The quarry has been operational for several months, with extraction having been progressing within Phase 1.

The site was operating normally during the monitoring exercise, with the processing plant operating throughout the survey period.

The plant and vehicles were being serviced using a Doosan and CAT loading shovels, which were both operating periodically during the exercise.

No extraction was being undertaken at the time of the survey, as this is carried out on a campaign basis. Extraction had been previously undertaken to create the plant site area, with the material excavated and stockpiled, which is presently being processed. Excavation will commence again once the stockpiles are depleted. The excavator, which is understood to be generally used for this purpose, was operating within the north eastern corner of Phase 1 close to the processing plant, undertaking some general soil handling.

One HGV was observed to enter and leave the quarry during the monitoring period, along the main access road.

Weather conditions for the survey were fine and dry, with temperatures of between 8 - 9°C. Winds were either calm or a very light westerly (<0.5 m/s) throughout the exercise.

Measurements were made using a Rion NL-52 Class 1 Sound Level Meter, which was calibrated with a Rion NC-74 Class 1 Acoustic Calibrator before and after the exercise, with the instrument reading 94.0 dB on both occasions. The instruments had been previously laboratory calibrated in accordance with national / manufacturers guidelines. A summary of the calibration dates is provided below (full calibration certificates can be provided on request).

Instrument	Serial No.	Calibration Date	Laboratory / Certificate No.
Rion NL-52 Class 1 SLM	00610177	7/7/20	ACSL – 15804
Rion NC-74 Class 1 Acoustic Calibrator	35125830	6/7/20	ACSL – 15801

At each monitoring location, the microphone was set at a height of 1.2 metres above the ground and free-field, i.e. at least 3.5 metres from any building or other reflecting surface other than the ground.

The noise monitoring scheme requires a measurement of at least 15 minute duration to be carried out at each location. For the purposes of the current monitoring exercise, monitoring was carried out over a period of 1 hour at each location.

During Phase 1, measurements are required to be carried out at two positions, representative of The Farmhouse / Elm Farm and Chestnut Farm / Gravel Diggers Farm to the south of the quarry and adjacent to the access road. The monitoring locations used for this exercise are indicated on Figure 1.

3.2. Results of Noise Monitoring at The Farmhouse / Elm Farm

These properties are located to the south / south east of the processing plant area. Bunding has been provided to effectively screen the property from the operational areas. As the maintenance works were being undertaken within the processing site area, it was considered appropriate to monitor at a position closest to The Farmhouse on this occasion, as indicated on Figure 1.

Noise levels monitored at this location were observed to be influenced by birdsong and traffic travelling along Twentypence Road throughout the monitoring period.

Noise levels associated with the operation of the quarry were observed to be very low. The operation of the processing plant was just audible throughout the exercise, with the loading shovels operating audible at times and whilst the buckets were being cleared. The operation of the quarry was observed not to be the main influence on the overall noise environment.

One HGV arrived and left the quarry during the monitoring period, arriving at 09:20 and leaving five minutes later. The vehicle was audible as it travelled along the access, principally associated with the body of the empty vehicle rattling.

The results of the noise measurements taken at this location and assessment against the noise limit are presented below.

Measurement Period	Measured Noise Levels [dB]			Site Noise Limit [dB L _{Aeq} , 1 hr]	Site Noise Limit Exceeded
	L _{Aeq}	L _{Amax,F}	L _{A90}		
08:50 – 09:05	42.3	54.6	37.8	48	No
09:05 – 09:20	42.6	54.0	38.0	48	No
09:20 – 09:35	43.8	60.1	39.6	48	No
09:35 – 09:50	42.9	61.9	37.3	48	No
L_{Aeq}, 1 hr	43.0	-	-	48	No

The results of the noise monitoring carried out at this location indicates the present noise levels attributable to the operation of the quarry are below the 48 dB L_{Aeq} noise limit and thus acceptable at the present time.

3.3. Results of Noise Monitoring at Chestnut Farm / Gravel Diggers Farm

These properties are located to the south east of the quarry and close to the quarry access. The measurements at this location were obtained approximately 20 metres north of the access and close to Chestnut Farm, as indicated on Figure 1.

Traffic on Twentypence Road and birdsong were observed to influence the measured noise levels during the monitoring period.

The operation of the processing plant was audible throughout the monitoring period, with the noise continuous in nature and influenced both the ambient (L_{Aeq}) and background (L_{A90}) noise levels.

The loading shovels were also audible at times, although noted to have minimal influence on the measured noise levels.

Measurement Period	Measured Noise Levels [dB]			Site Noise Limit [dB L _{Aeq} , 1 hr]	Site Noise Limit Exceeded
	L _{Aeq}	L _{Amax,F}	L _{A90}		
09:55 – 10:10	40.3	57.3	37.3	48	No
10:10 – 10:25	40.7	56.8	37.6	48	No
10:25 – 10:40	41.0	57.2	37.9	48	No
10:40 – 10:55	41.3	56.9	37.8	48	No
L_{Aeq}, 1 hr	40.8	-	-	48	No

The results of the noise monitoring carried out at this location indicates the present noise levels attributable to the operation of the quarry are substantially below the 48 dB L_{Aeq} noise limit and thus acceptable at the present time.

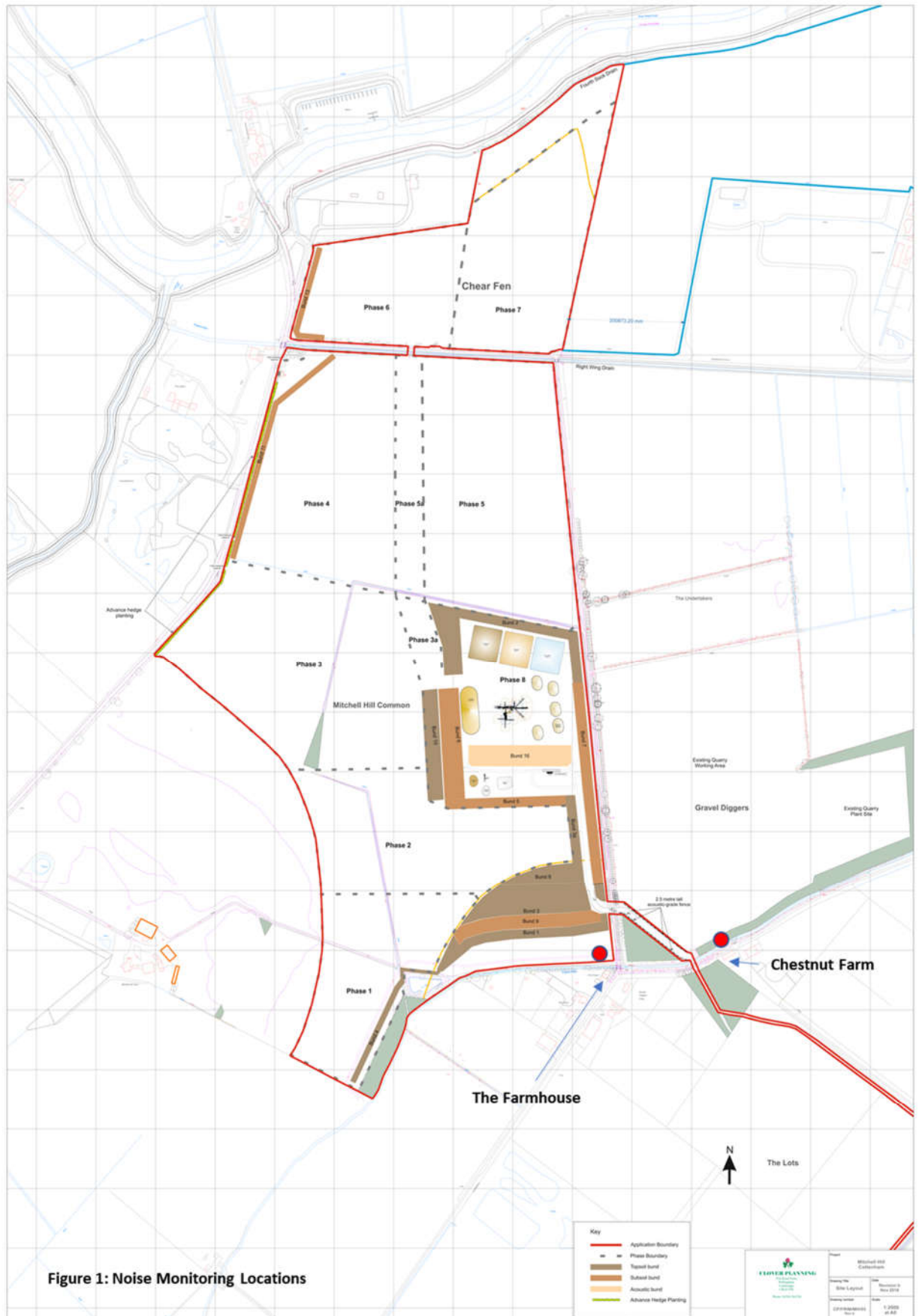
4. Summary

A periodic noise monitoring exercise was carried out at properties surrounding Mitchell Hill Quarry on Tuesday 22nd December 2020.

The quarry was operating normally during the monitoring period, with the processing plant, two loading shovels and an excavator working. No extraction was being undertaken at the time of the survey, as this is carried out on a campaign basis, with stockpiles of previously excavated material presently being processed.

Noise measurements were obtained at the two specified monitoring positions within the Noise Mitigation and Management Plan, whilst the site was fully operational.

The measured noise levels have been compared to the normal working noise limits for site operations specified within the planning permission. The measurements and assessment indicate that the present site operations are generating noise levels within the site noise limits and are therefore acceptable.



Appendix A

Noise Units

Decibels (dB)

Noise can be considered as 'unwanted sound'. Sound in air can be considered as the propagation of energy through the air in the form of oscillatory changes in pressure. The size of the pressure changes in acoustic waves is quantified on a logarithmic decibel (dB) scale firstly because the range of audible sound pressures is very great, and secondly because the loudness function of the human auditory system is approximately logarithmic.

The dynamic range of the auditory system is generally taken to be 0 dB to 140 dB. Generally, the addition of noise from two sources producing the same sound pressure level will lead to an increase in sound pressure level of 3 dB. A 3 dB noise change is generally considered to be just noticeable, a 5 dB change is generally considered to be clearly discernible and a 10 dB change is generally accepted as leading to the subjective impression of a doubling or halving of loudness.

A-Weighting

The bandwidth of the frequency response of the ear is usually taken to be from about 18 Hz to 18,000 Hz. The auditory system is not equally sensitive throughout this frequency range. This is taken into account when making acoustic measurements by the use of A-weighting, a filter circuit that has a frequency response similar to the human auditory system. All the measurement results referred to in this report are A-weighted.

Units Used to Describe Time-Varying Noise Sources (L_{Aeq} , L_{Amax} and L_{A90})

Instantaneous A-weighted sound pressure level is not generally considered as an adequate indicator of subjective response to noise because levels of noise usually vary with time.

For many types of noise the Equivalent Continuous A-Weighted Sound Pressure Level ($L_{Aeq,T}$) is used as the basis of determining community response. The $L_{Aeq,T}$ is defined as the A-weighted sound pressure level of the steady sound which contains the same acoustic energy as the noise being assessed over a specific time period, T.

The L_{Amax} is the maximum value that the A-weighted sound pressure level reaches during a measurement period. $L_{Amax F}$, or Fast, is averaged over 0.125 of a second and $L_{Amax S}$, or Slow, is averaged over 1 second. All L_{Amax} values referred to in this report are Fast.

The L_{A90} is the noise level exceeded for 90% of the measurement period. It is generally used to quantify the background noise level, the underlying level of noise that is present even during the quieter parts of measurement period.