

NOISE ASSESSMENT

**WATLINGTON QUARRY
PROPOSED OAK FIELD EXTENSION**

MICK GEORGE LTD

JANUARY 2022

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Status	Prepared By	Date
3.0	L Jephson BEng (Hons) MIOA	7/1/22

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1. Introduction

- 1.1. LF Acoustics Limited have been appointed by Mick George Ltd to carry out a noise assessment for a proposed extension to Watlington Quarry. The extension would be within Oak Field, which is the area to the south of the existing plant site area, bounded to the east by the A10 and Watlington Road to the south.
- 1.2. It is proposed to retain the existing processing plant, located within the plant site, to process the excavated material, with the extraction and restoration operations undertaken in an equivalent manner to the existing operations within the quarry, which will include the extraction of underlying clay to supply local flood defence works, lining of lagoons and capping of landfill sites.
- 1.3. Inert materials would be brought into the site, primarily on a backhaul basis, and used to restore the extension area back suitable for agricultural use. These operations would be subject to an Environmental Permit.
- 1.4. This report presents an assessment of the likely noise levels generated at surrounding noise sensitive receptors during the working of the Oak Field extension area. Section 2 provides a summary of the applicable standards and guidelines, with a summary of the relevant conditions within the present planning permission provided within Section 3. Section 4 provides information on the surrounding land uses and existing noise environment. Calculations and assessment of the noise generated by the working of the extension area, including noise from the processing plant are provided in Section 5, with recommendations for any mitigation or control measures provided in Section 6. Finally, Section 7 presents a summary of this report.
- 1.5. This report has been prepared by L Jephson BEng (Hons) in Electroacoustics, Member of the Institute of Acoustics and Director of LF Acoustics Ltd.

2. Applicable Standards and Guidance

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

2.1. National Planning Policy Framework

2.1.1. The principal planning guidance in England is contained within the National Planning Policy Framework [1]. At the heart of the NPPF is a presumption in favour of sustainable development, although environmental criteria should be set out to ensure that the permitted operations do not have unacceptable adverse impacts, with appropriate noise limits adopted to control noise.

2.1.2. The current minerals planning practice guidance (MPPG) attached to the NPPF relating to noise from mineral extraction and related processes, including aggregate recycling, restoration and the disposal of construction waste, was updated in March 2014 [2] and provides guidance and advises upon acceptable levels of noise from this type of operations.

2.1.3. For normal daytime works the guidance seeks to ensure that the operations do not result in significant adverse effects and advises for normal daytime operations that the following limits (in terms of $L_{Aeq, 1 \text{ hour}}$ freefield noise levels) should not be exceeded:

- 10 dB above the background (L_{A90}) noise level; subject to
- a maximum value of 55 dB $L_{Aeq, 1 \text{ hour}}$ (freefield).

2.1.4. Where background noise levels are low, the guidance accepts that it may be very difficult to achieve a limit based upon background + 10 dB(A) without imposing unreasonable burdens on the mineral operator. In such cases, the limit set should be as near that level as practicable during normal working hours and should not exceed 55 dB $L_{Aeq, 1 \text{ hour}}$ (freefield).

2.2. British Standard BS 4142

2.2.1. BS 4142 [2] is the British Standard for rating and assessing noise of a commercial or industrial nature. As advised within Section 1.3 of the Standard, it is not intended that the Standard be used for other sources of noise falling within the scopes of other Standards or Guidance, which in this case relates to the use of the MPPG, as this is specific to the quarrying and restoration operations.

2.2.2. BS 4142 is a comparative standard in which initial estimates of the potential impacts are assessed on the basis of a comparison of noise levels from the proposed development to the representative / typical background noise level from existing uses.

2.2.3. The background noise level is the L_{A90} noise level, usually measured in the absence of noise from the source being assessed, but may include other existing industrial or commercial sounds. The background noise levels should generally be obtained from a series of measurements each of not less than 15 minute duration and taken over a representative period.

2.2.4. The Rating Level of the noise being assessed is defined as its L_{Aeq} noise level (the 'specific noise level'), with the addition of appropriate corrections should the noise exhibit a marked impulsive and/or tonal component or should the noise be irregular enough in character to attract attention. The extent of the correction is dependent upon the degree of tonality or character in the noise and is determined either by professional judgement, where the plant is not operational at present, or by measurement.

- 2.2.5. Where the noise is tonal in nature, the standard imposes the following corrections when assessing the rating level:
- 2 dB for a tone which is just perceptible;
 - 4 dB where the tone is clearly perceptible; and
 - 6 dB where the tone is highly perceptible.
- 2.2.6. Where noise exhibits other sound characteristics, the Standard advises a correction of 3 dB should be applied.
- 2.2.7. During the daytime, the specified noise levels are determined over a reference time interval of 1 hour, with a 15 minute reference period adopted when assessing night-time noise.
- 2.2.8. If the Rating Level of the noise being assessed exceeds the background level by 10 dB or more BS 4142 advises that there is likely to be an indication of a significant adverse impact, depending upon context. A difference between background level and Rating Level of around 5 dB is likely to be an indication of an adverse impact, depending upon context. The lower the Rating Level is, relative to the background noise level, the less likely the specific source will have an adverse or significant adverse impact. Where the Rating Level does not exceed the background noise level is an indication of a low impact, depending upon context.
- 2.2.9. Where the initial assessment of impact, based upon and assessment of the external noise levels, needs to be modified due to the context, all pertinent factors should be taken into account, including:
- The absolute level of sound;
 - Where background sound levels and rating levels are low, absolute levels might be as, or more, relevant than the margin by which the rating level exceeds the background. This is especially true at night; and
 - The sensitivity of the receptor and whether the premises will already incorporate measures to ensure good internal and/or external acoustic conditions.

2.3. Environment Agency Guidelines

- 2.3.1. The importation of soils to infill and restore the quarry will require an Environmental Permit.
- 2.3.2. The Environment Agency (EA) have recently published guidance on the requirements for noise assessments for permit applications [3] and require an assessment of the noise levels associated with the proposed permitted operations.
- 2.3.3. The guidance requires the use of BS 4142 to quantify the level of environmental noise impact from industrial processes.
- 2.3.4. Whilst the guidance requires the use of BS 4142 to assess potential impacts, the EA assessment methodology differs from that within BS 4142 and following criteria to be considered:

Unacceptable level of audible or detectable noise

This level of noise means that significant pollution is being, or is likely to be, caused at a receptor (regardless of whether you are taking appropriate measures).

You must take further action or you may have to reduce or stop operations. The environment agencies will not issue a permit if you are likely to be operating at this level.

The closest corresponding BS 4142 descriptor is 'significant adverse impact' (following consideration of the context).

Audible or detectable noise

This level of noise means that noise pollution is being (or is likely to be) caused at a receptor.

Your duty is to use appropriate measures to prevent or, where that is not practicable, minimise noise. You are not in breach if you are using appropriate measures. But you will need to rigorously demonstrate that you are using appropriate measures.

The closest corresponding BS 4142 descriptor is 'adverse impact' (following consideration of the context).

No noise, or barely audible or detectable noise

This level of noise means that no action is needed beyond basic appropriate measures or BAT.

The closest corresponding BS 4142 descriptor is 'low impact or no impact' (following consideration of context).

Low impact does not mean there is no pollution. However, if you have correctly assessed it as low impact under BS 4142, the environment agencies may decide that taking action to minimise noise is a low priority. Note that BS 4142 is unlikely to be the appropriate methodology on its own to assess low frequency noise.

- 2.3.5. In undertaking the assessment and deriving the rating level of noise, the EA guidance specifies "where the sound is neither impulsive nor tonal, but you can readily distinguish it against the usual residual acoustic environment, the environment agencies will expect you to apply a minimum character correction of +3 decibels (dB) 'other'. This is unless you can robustly justify that you do not need such a correction."

3. Current Planning Conditions

- 3.1. The current planning permission covering operations within the existing quarry area is subject to a number of conditions.
- 3.2. The operation of the processing plant within the Plant Site area is controlled through permission ref. C/2/2018/2002, which sought a variation to the original planning permission to allow the processing plant to operate until 31 December 2023.
- 3.3. Condition 7 limits noise levels at surrounding properties. In relation to the properties potentially affected by the operations within Oak Field, the limits are as follows:
 - Dwellings in Tottenhill – 55 dB $L_{Aeq, 1 \text{ hour}}$;
 - Dwellings at Tottenhill Row, - 45 dB $L_{Aeq, 1 \text{ hour}}$; and
 - The Kennels – 45 dB $L_{Aeq, 1 \text{ hour}}$.
- 3.4. Condition 10 of the planning permission restricts the operational hours, as follows:
 - 07:00 – 17:00 Mondays to Fridays; and
 - 07:00 -13:00 on Saturdays.
- 3.5. Separate planning permissions cover the current extraction operations being carried out within the MIN76 area, which is on land to the west of the Plant Site area and south of Tottenhill Row. This planning permission (ref. C/2/2018/2001), specifies the following updated noise limits at properties likely to be affected by the operations within Oak Field:
 - Dwellings at Tottenhill Row (dwellings to the west), - 44 dB $L_{Aeq, 1 \text{ hour}}$; and
 - The Kennels – 46 dB $L_{Aeq, 1 \text{ hour}}$.

4. Existing Site Conditions

4.1. Identification of Potentially Affected Noise-Sensitive Receptors

- 4.1.1. There are a small number of properties surrounding the extension area, which would have the potential to be affected by noise from the proposed operations within the extension area. These locations are identified on Figure 1.
- 4.1.2. Dwellings within Tottenhill to the south east of the extension area and to the east of the A10. The properties identified include the former Public House and Old Mill House. These are the closest properties to the proposed extension area, approximately 50 metres from the closest site boundary.
- 4.1.3. The Kennels, located to the south west of the extension area. This property is approximately 430 metres from the closest site boundary.
- 4.1.4. Dwellings to the north west, within Tottenhill Row. These dwellings are located closest to the Plant Site area, with the proposed extension area to the south west. The closest properties are approximately 420 metres from the closest boundary of the extension area. These properties would be screened from the proposed extension area by the bunding which runs along the quarry boundary, with the processing plant also generally further screened by stockpiles.

4.2. Noise Monitoring

- 4.2.1. A noise monitoring exercise was carried out on Wednesday 24 July 2019 adjacent to the three properties identified above to determine the existing noise environment attributable to the present site operations.
- 4.2.2. The processing plant was operational throughout the monitoring period, with extraction being undertaken within the northern part of the MIN76 area to the north of The Kennels.
- 4.2.3. During the survey, weather conditions were good, fine and dry, with light winds (averaging <1 m/s).
- 4.2.4. The measurements were obtained using three Rion NL-52 Class 1 Sound Level Meters, which were calibrated before and after the exercise using a Rion NC-74 Class 1 Acoustic Calibrator, with no drift recorded. At each position, the microphone was positioned at a height of 1.2 metres and freefield (i.e. at least 3.5 metres from any building facades).
- 4.2.5. Measurements were obtained over a period of 3 hours at each location during the survey period, which was considered sufficient to enable typical levels to be determined.
- 4.2.6. A midweek monitoring period was selected, as the traffic using the A10 to the east of the quarry is influenced by holiday traffic travelling to the Norfolk Coast. During the mid week period, holiday traffic would have been lighter and thus provide likely worst case conditions, when compared to other days in the week, including Saturdays, when traffic is likely to be heavier.
- 4.2.7. The noise monitoring locations are indicated on Figure 1.

Tottenham

- 4.2.8. The noise measurements at this location were taken within the site boundary. The monitoring equipment was set approximately 30 metres from the kerb of the A10 at an equivalent distance to the road as The Old Mill House.
- 4.2.9. Noise levels at this location were principally influenced by traffic travelling along the A10.
- 4.2.10. The operation of the processing plant was not audible at this location during the survey period and thus the noise levels monitored were representative of typical conditions.
- 4.2.11. The results of the noise monitoring carried out at this location are provided in Appendix B.
- 4.2.12. The results indicate typical ambient noise levels of 65 dB $L_{Aeq, T}$, with typical background noise levels of 48 dB L_{A90} recorded, both attributable to the road traffic travelling along the A10.

The Kennels

- 4.2.13. The noise monitoring equipment was located along the northern boundary of the property, set back approximately 20 metres from the lane.
- 4.2.14. The monitoring location was beyond the bunding which has been constructed to screen the extraction operations within the MIN76 area to the north, with the plant operating within this area not generally audible during the monitoring period, with the operation of the plant having minimal influence on the measured noise levels. The background noise levels monitored were therefore considered representative of conditions whilst the quarry would not be operational.
- 4.2.15. The noise levels monitored at this location were observed to be influenced by a mix of local and more distant road traffic and birdsong. There were also military aircraft flying overhead at times during the survey period and whilst audible, the movements had no influence on the measured background noise levels.
- 4.2.16. The results, presented in Appendix B, indicate typical ambient noise levels of 55 dB $L_{Aeq, T}$, with typical background noise levels of 36 dB L_{A90} . The background noise levels monitored are consistent with previous background monitoring carried out at this location.

Dwellings in Tottenham Row

- 4.2.17. The noise monitoring at this location was carried out on the land adjacent to the easternmost properties within the hamlet, which are closest to the proposed extension area.
- 4.2.18. Noise levels monitored at this location were observed to be principally influenced by a mix of local road traffic and distant road traffic from vehicles travelling along the A10 to the east. The military aircraft flying overhead at times were clearly audible, although the movements had no influence on the measured background noise levels.
- 4.2.19. The operation of the extraction plant operating within the MIN76 area and the operation of the main processing plant were not audible at this location during the survey period. Thus the measured levels were representative of periods when the quarry would not be operational and provided appropriate background levels upon which to base the assessment.
- 4.2.20. The results, presented in Appendix B, indicate typical ambient noise levels of 57 dB $L_{Aeq, T}$, with typical background noise levels of 38 dB L_{A90} .

5. Calculations and Assessment

5.1. Proposed Operations

- 5.1.1. The location and proposed phasing of the working of the Oak Field Extension is indicated on Figure 2.
- 5.1.2. It is proposed to work the extension within five main phases, working generally from north to south, with a sixth phase located in the area of the proposed storage mounds directly to the east of Phase 1.
- 5.1.3. The extraction operations would be equivalent to those presently being carried out within the quarry, although clay would additionally be excavated from the base of the workings to supply local flood defence works, lining of lagoons and capping of landfill sites. The soils would be initially stripped and stored in bunding and with regards Phases 4 and 5, the bunding, constructed to a height of 3 metres, would be located along the eastern and southern boundaries to screen the operational area from the A10 and the properties in Tottenhill.
- 5.1.4. Excavation would be carried out using a single tracked excavator, which would load the excavated material onto ADTs which would transport the material back to the existing plant site.
- 5.1.5. The material would be processed using the existing processing plant, located within the Plant Site area, where a single loading shovel also operates to service the plant and load vehicles.
- 5.1.6. In addition to the operation of the main processing plant, a crusher is used within the processing area periodically for the recycling of brick/concrete hardcore. A mobile crusher would be brought to the site as and when to crush the material, typically four times a year and would be operational on site for a two-week period each time.
- 5.1.7. Restoration of the extension area would be carried out progressively utilising materials stored on site and imported inert materials, delivered to site using back hauls. The material would be spread periodically utilising a dozer. It is only these operations which would require a permit.
- 5.1.8. No changes in the operational hours of the quarry proposed, nor any changes to the existing vehicle movements, which are typically of the order of 40 movements per day.

5.2. Source Term Information

- 5.2.1. Source term noise levels adopted for the present assessment have been obtained adjacent to the plant which is presently operating within the quarry and considered representative of the plant likely to operate within the extension area.
- 5.2.2. The noise source terms which have been assumed for this assessment are provided in Table 5.1.

Source	SWL [dB]	L _{Aeq} [dB]	Number	% On-Time
Plant Site Area				
Wash Plant and Primary Screen	-	77.4 @ 10 metres	1	100
Final Screen	-	77.8 @ 10 metres	1	100
Feed Hopper Motor	-	70.5 @ 10 metres	1	100
Water Pump	-	77.7 @ 10 metres	1	100
Loading Shovel	-	72.0 @ 10 metres	2	100
HGV Movements	106	-	10 / hour	-
Mobile Crusher (Periodic Use)	-	79.1 @ 10 metres	1	100
Excavation				
Excavator	-	73.4 @ 10 metres	1	100
Dump Truck Movements	110	-	20 per hour	-
Soils Stripping / Bund Formation				
Excavator	-	73.4 @ 10 metres	1	100
Dump Truck Movements	110	-	20 per hour	-
Restoration				
Dozer	-	79.0 @ 10 metres	1	50
HGV Movements	106	-	6 per hour	-

Table 5.1 Source Term Noise Levels

5.3. Calculation Methodology

- 5.3.1. The calculations of the noise levels from the proposed operations at the closest properties have been made using the methodology contained within BS 5228-1 [5]. Where barrier corrections have been calculated, the algorithm used within a Calculation of Road Traffic Noise [6] has been used.
- 5.3.2. Calculations have been made at positions representative of the likely closest operations to the properties.
- 5.3.3. The calculations associated with the site operations have assumed that the extraction plant would be operational at a level approximately 2 metres below the existing ground level, to account for the soils stripped, with the dozer working close to the existing surface.
- 5.3.4. In addition, no account has been taken of any additional screening which may be provided, particularly in relation to the stockpiles generally located to the west of the processing plant, which provides additional screening to the properties within Tottenham Row.
- 5.3.5. Calculations have been made upon the normal operation of the quarry, i.e. extraction and processing and during the periods when the crusher would be operational.
- 5.3.6. The details of the calculations are provided in Appendix C.

5.4. Assessment Criteria

- 5.4.1. Noise limits associated with the normal daytime operation of the quarry, whilst working the extension area, have been defined on the basis of the requirements of the MPPG and current planning permission, i.e. to ensure that noise levels do not exceed a level of more than 10 dB(A) above the prevailing background noise levels.
- 5.4.2. On this basis, the following limits have been defined:
- Dwellings in Tottenhill – 55 dB $L_{Aeq, 1 hr}$;
 - The Kennels – 46 dB $L_{Aeq, 1 hr}$;
 - Dwellings in Tottenhill Row – 48 dB $L_{Aeq, 1 hr}$.
- 5.4.3. These limits would also seek to ensure that the operations do not result in unacceptable levels of noise when assessed against the EA guidelines.
- 5.4.4. For temporary operations, such as soil stripping (not subject to the permit requirements), carried out for a period of 8 weeks per annum, a limit of 70 dB $L_{Aeq, 1 hr}$ would apply, in accordance with the requirements of the PPG.
- 5.4.5. Noise levels at other times, would be limited to a level of 42 dB $L_{Aeq, 1 hr}$ at noise sensitive receptors, in accordance with the requirements of the MPPG.

5.5. Assessment of Noise Levels at Dwellings in Tottenhill

- 5.5.1. Noise levels at these properties are presently influenced by road traffic travelling along the A10, with the existing site and processing operations not audible. The calculations indicate noise levels attributable to the processing plant of the order of 39 dB $L_{Aeq, 1 hr}$, 9dB(A) below the typical background noise level at this location. During periods when the crusher was operational within the processing area, noise levels attributable to operations within this area would increase to 40 dB $L_{Aeq, 1 hr}$, still remaining substantially below the background noise levels.
- 5.5.2. Noise levels at the commencement of extraction operations within Phase 1 would remain low, with overall noise levels attributable to the extraction and processing operations of the order of 41 - 42 dB $L_{Aeq, 1 hr}$.
- 5.5.3. Infilling and restoration would commence as Phase 1 is worked out, with soils being brought onto site periodically by HGV and spread periodically using a dozer. These operations would be subject to an environmental permit.
- 5.5.4. Noise levels would gradually increase whilst working Phases 2 and 3, with overall noise levels, taking account of extraction, processing and infilling, remaining below 45 dB $L_{Aeq, 1 hr}$ and 10 dB(A) below the proposed limit at this location. To provide a worst case assessment against the EA guidance, the overall site noise levels have been considered, noting that the noise levels associated with the permitted operations would be of the order of 7 dB(A) lower. Assuming a level of 45 dB $L_{Aeq, 1 hr}$ and applying the 3 dB 'other' character correction, would result in a rating level of 48 dB $L_{Aeq, 1 hr}$, equivalent to the prevailing background noise levels and thus resulting in barely audible noise levels, when assessed against the guidance, and remaining acceptable.
- 5.5.5. Prior to operations commencing in Phase 4, the soils would be stripped and a bund formed along the eastern site boundary, to screen the closest operations from the A10. Noise levels during this period are anticipated to increase to 48 dB $L_{Aeq, 1 hr}$. This activity would be temporary in nature and would not exceed the temporary working criteria.

- 5.5.6. Operations within Phase 4, including the progressive infilling and restoration operations within Phase 3 and recycling operations would be up to 47 dB $L_{Aeq, 1 hr}$, whilst the plant was operating close to the surface and within the eastern part of the phase, again resulting in noise levels 8 dB(A) below the normal working limit. With regards to an assessment against the EA guidance, the equivalent rating level of 50 dB $L_{Aeq, 1 hr}$ would be 2 dB(A) above the prevailing background noise levels, thus resulting in barely audible noise levels, when assessed against the guidance, and remaining acceptable.
- 5.5.7. Noise levels would be at a maximum during the temporary works to strip the soils from Phase 5 and construct the remaining section of the eastern boundary and southern boundary, which would screen the operations from the dwellings. Noise levels of 53 dB $L_{Aeq, 1 hr}$ are predicted during these operations, thus remaining marginally below the normal working limit and substantially below the temporary working limit.
- 5.5.8. Once, constructed, noise levels during the working of Phase 5 are anticipated to remain below 48 dB $L_{Aeq, 1 hr}$ and 7 dB(A) below the normal working limit. With regards to an assessment against the EA guidance, the equivalent rating level of 51 dB $L_{Aeq, 1 hr}$ would be 3 dB(A) above the prevailing background noise levels, thus resulting in barely audible noise levels, when assessed against the guidance, and remaining acceptable.
- 5.5.9. Noise levels would decrease during the working of phase 6 and restoration of Phase 5, with noise levels of up to 44 dB $L_{Aeq, 1 hr}$ predicted, thus remaining below the normal working limit. The rating level of noise would also remain below the background noise levels, thus ensuring adverse impacts were minimised.
- 5.5.10. A summary of the likely worst case noise levels at these properties is provided in Table 5.2.

Phase	Overall Noise Level General / During Recycling [dB $L_{Aeq, 1 hr}$]	Planning Condition Limit	Exceeds Planning Condition Limit?	EA Assessment (Rating Level – Background of 48 dB L_{A90})	EA Assessment
Phase 1 Extraction	41 / 42	55	No	N/A	N/A
Phase 2 Extraction / Phase 1 Restoration	43 / 43	55	No	-2 / -2	Barely Audible
Phase 3 Extraction / Phase 2 Restoration	44 / 44	55	No	-1 / -1	Barely Audible
Phase 4 Soil Strip / Creation of Bund	48	70	No	N/A	N/A
Phase 4 Extraction / Phase 3 Restoration	46 / 47	55	No	+1 / +2	Barely Audible
Phase 5 Soil Strip / Creation of Bund	53	70	No	N/A	N/A
Phase 5 Extraction / Phase 4 Restoration	47 / 47	55	No	+2 / +2	Barely Audible
Phase 6 Extraction / Phase 5 Restoration	44 / 44	55	No	-1 / -1	Barely Audible
Phase 6 Restoration	35	55	No	-10	Not Audible

Table 5.2 Summary Assessment of Noise Levels at Tottenham

5.5.11. Noise levels from the operation of the extension at this property would remain below the normal working limit of 55 dB $L_{Aeq, 1 hr}$ and would therefore not result in any significant noise effects upon the residents of these properties. Furthermore, an assessment of the overall site noise levels against the requirements of the EA guidelines would indicate acceptable levels of noise to minimise any potential adverse impacts.

5.6. Assessment of Noise Levels at The Kennels

5.6.1. This property is located to the west, some distance from the proposed extension area, which is beyond previously worked areas of the quarry.

5.6.2. Noise levels during operations within Phases 1 and 2, located to the north east of the property would remain low, with noise levels of 37 – 41 dB $L_{Aeq, 1 hr}$ calculated, while the plant is operating close to the surface. Noise levels during the working of these phases would remain below the normal working limit of 46 dB $L_{Aeq, 1 hr}$.

5.6.3. Noise levels during the working of these phases would therefore not exceed a rating level of 44 dB $L_{Aeq, 1hr}$, which, when assessed against the EA guidelines, would have the potential to result in audible or detectible levels of noise. The quarry would continue to adopt measures to minimise noise levels, as described in the noise management plan. Furthermore, to put the noise levels into context, the noise levels associated with the working of these phases would remain below that which was previously experienced whilst working the area of the quarry closer to the property. The noise levels associated with the permitted operations remain at a level which would result in barely detectible levels of noise, remaining below a rating level of 5 dB(A) above the prevailing background noise levels.

5.6.4. Noise levels would increase marginally, during operations within Phase 3, which would be the closest to the dwelling. Noise levels during operations within this Phase are anticipated to be up to 42 dB $L_{Aeq, 1 hr}$, thus remaining below the normal working limit of 46 dB $L_{Aeq, 1hr}$. Noise levels associated with the overall site operations during the working of this phase would therefore not exceed a rating level of 45 dB $L_{Aeq, 1hr}$, which, when assessed against the EA guidelines, would have the potential to result in audible or detectible levels of noise. Again, as with the working of the previous phases, noise levels associated with the permitted operations would be considerably lower and would not be anticipated to exceed the background noise levels by more than 5 dB(A).

5.6.5. Noise levels would reduce marginally during the working of Phases 4 and 5 within the southern part of the extension, with noise levels of up to 41 dB $L_{Aeq, 1 hr}$ predicted during periods of general working, increasing marginally to 42 dB $L_{Aeq, 1 hr}$ during periods when the crusher was operating recycling material. Noise levels when assessed against the EA guidance would result in the potential for detectible levels of noise, which would be minimised through appropriate site controls.

5.6.6. Noise levels would reduce marginally during the working of Phase 6, with noise levels of up to 40 dB $L_{Aeq, 1 hr}$ predicted. No adverse impacts have been identified during these operations.

5.6.7. A summary of the likely worst case noise levels at this property is provided below.

Phase	Overall Noise Level General / During Recycling [dB L _{Aeq, 1 hr}]	Planning Condition Limit	Exceeds Planning Condition Limit?	EA Assessment (Rating Level – Background of 36 dB L _{A90})	EA Assessment
Phase 1 Extraction	38 / 39	46	No	+5 / +6	Audible or Detectible Noise
Phase 2 Extraction / Phase 1 Restoration	40 / 41	46	No	+7 / +8	Audible or Detectible Noise
Phase 3 Extraction / Phase 2 Restoration	42 / 42	46	No	+9 / +9	Audible or Detectible Noise
Phase 4 Extraction / Phase 3 Restoration	41 / 42	46	No	+8 / +9	Audible or Detectible Noise
Phase 5 Extraction / Phase 4 Restoration	40 / 41	46	No	+7 / +8	Audible or Detectible Noise
Phase 6 Extraction / Phase 5 Restoration	39 / 40	46	No	+6 / +7	Audible or Detectible Noise
Phase 6 Restoration	33	46	No	0	Barely Audible

Table 5.3 Summary Assessment of Noise Levels at The Kennels

- 5.6.8. Noise levels from the operation of the site at this property would remain low throughout the duration of the works and are not anticipated to exceed the normal working limit of 46 dB L_{Aeq, 1 hr}. The operations within the extension area would therefore not result in any significant noise effects at this property.
- 5.6.9. Whilst the assessment of the overall noise levels attributable to the quarry operations against the EA guidance indicates the potential for audible levels of noise at the property, appropriate measures and controls would continue to be implemented to minimise noise from the operations. Furthermore, noise levels attributable to the permitted landfilling operations would remain below a level which would generally be considered barely audible and considerably below those associated with presently permitted operations.
- 5.7. Assessment of Noise Levels at Dwellings in Tottenhill Row
- 5.7.1. As indicated previously, the properties within Tottenhill Row are located to the north west of the quarry, with the processing plant area screened by bunding which runs alongside Watlington Road. Present noise levels associated with the operation of the quarry at these properties were observed to be very low.

- 5.7.2. Noise levels during the working of the extension area would be at a maximum during operations within Phases 1 and 2, which are closest to the dwellings. Noise levels during these Phases are anticipated to be of the order of 43 - 44 dB $L_{Aeq, 1 hr}$, whilst plant operates close to the surface and would be lower as the excavation deepens. Noise levels attributable to the operations within the extension and within the processing plant area are not anticipated to exceed the normal working limit of 48 dB $L_{Aeq, 1 hr}$. Noise levels associated with the overall site operations during the working of this phase would therefore not exceed a rating level of 47 dB $L_{Aeq, 1hr}$, which, when assessed against the EA guidelines, would have the potential to result in audible or detectable levels of noise. Noise levels associated with the landfill operations would be considerably lower and would not be anticipated to exceed the background noise levels by more than 5 dB(A).
- 5.7.3. Noise levels would gradually reduce as work progresses into Phases 3 – 5, which are further from the properties. Noise levels during operations within these phases would be principally attributable to the operation of the processing plant and anticipated to be between 42 – 44 dB $L_{Aeq, 1 hr}$, thus remaining within acceptable limits. Noise levels associated with the overall site operations during the working of these phases would therefore not exceed a rating level of 47 dB $L_{Aeq, 1hr}$, which, when assessed against the EA guidelines, would have the potential to result in audible or detectable levels of noise. Noise levels associated with the landfill operations would be considerably lower and would not be anticipated to exceed the background noise levels by more than 5 dB(A).
- 5.7.4. During operations within Phase 6, noise levels are anticipated to increase marginally, with levels of between 37 – 44 dB $L_{Aeq, 1 hr}$ predicted, thus remaining below the normal working limit. Again, when assessed against the EA guidelines, noise levels attributable to the overall site operations, including extraction, processing and landfill / restoration operations would result in detectable levels of noise. Noise levels specifically associated with the permitted operations would be considerably lower and unlikely to exceed a rating level of more than 5 dB(A) above the prevailing background noise levels.
- 5.7.5. A summary of the likely worst case noise levels at these properties is provided in Table 5.4.

Phase	Overall Noise Level General / During Recycling [dB L _{Aeq, 1 hr}]	Planning Condition Limit	Exceeds Planning Condition Limit?	EA Assessment (Rating Level – Background of 38 dB L _{A90})	EA Assessment
Phase 1 Extraction	43 / 44	48	No	+8 / +9	Audible or Detectible Noise
Phase 2 Extraction / Phase 1 Restoration	43 / 44	48	No	+8 / +9	Audible or Detectible Noise
Phase 3 Extraction / Phase 2 Restoration	42 / 44	48	No	+7 / +9	Audible or Detectible Noise
Phase 4 Extraction / Phase 3 Restoration	42 / 43	48	No	+7 / +8	Audible or Detectible Noise
Phase 5 Extraction / Phase 4 Restoration	42 / 43	48	No	+7 / +8	Audible or Detectible Noise
Phase 6 Extraction / Phase 5 Restoration	39 / 44	48	No	+4 / +9	Audible or Detectible Noise
Phase 6 Restoration	37	48	No	+2	Barely Audible

Table 5.4 Summary of Noise Levels at Tottenham Row

- 5.7.6. Noise levels from the operation of the extension area, taking account of overall site operations, at the properties within Tottenham Row would remain low and are not anticipated to exceed the normal working limit of 48 dB L_{Aeq, 1 hr}. The working of the extension area would therefore not result in any significant noise effects at this location.
- 5.7.7. Whilst the assessment of the overall noise levels attributable to the quarry operations against the EA guidance indicates the potential for audible levels of noise at the property, appropriate measures and controls would continue to be implemented to minimise noise from the operations. Furthermore, noise levels attributable to the permitted landfilling operations would remain below a level which would generally be considered barely audible and considerably below those associated with presently permitted operations.

6. Requirement for Noise Monitoring, Additional Mitigation and Control Measures

- 6.1. The assessment within Section 5 indicates that noise levels associated with the operation of the Oak Field extension area would remain low at surrounding properties and below the normal working noise limits.
- 6.2. The assessment against the EA guidance indicates that the operations would result in audible levels of noise at the neighbouring residential properties. Measures to control and mitigate noise levels would continue to be maintained whilst working the extension area, to ensure that Best Available Techniques have been implemented to minimise noise.
- 6.3. To ensure noise levels associated with the operation of the site were minimised appropriate on-site controls would continue to be adopted, which include:
 - Ensuring all plant is kept well maintained;
 - Ensuring silencers on plant are effective;
 - Turning off plant when not in use; and
 - Using alternative non tonal reversing signals on mobile plant.
- 6.4. Vehicles travelling along the access routes have potential to cause disturbance even at low noise levels. To ensure potential disturbance is minimised, the routes would continue to be inspected at regular intervals to ensure that the surface remains in good condition. Where defects are identified, these should be rectified immediately. This action seeks to ensure that empty vehicles travelling on the access and passing over the defect do not give rise to body slap, which is potentially disturbing. Furthermore, the speed limit on the access road should be well enforced, this measure also seeks to minimise the likelihood of body slap from empty vehicles.
- 6.5. The current planning guidance advises that noise monitoring should be carried out periodically to ensure that noise levels associated with site operations remain within acceptable limits.
- 6.6. Given the fact that the calculated noise levels were below the appropriate normal working limits, it is not considered that regular noise monitoring would be required to demonstrate compliance during the working of the extension area. Monitoring has therefore only been proposed following receipt of any justified complaints.
- 6.7. Should a complaint be received, an initial assessment would be undertaken by site personnel, within a period of 48 hours of the complaint being received. The purpose of the initial assessment would be to identify any particular activities giving rise to the complaint, with the aim of addressing the issue.
- 6.8. Where the noise at the property is identified to be associated with the operation of the quarry and no particular source identified, a noise measurement exercise would be carried out by a competent person within a period of 2 weeks of the complaint.
- 6.9. For any measurements made, a meter conforming to at least Class 2 standards should be used, which should be calibrated before and after the exercise. The meter should be positioned at a height of 1.2 metres above the ground and at a free-field location (i.e. at least 3.5 metres from a building facade or other reflecting surface other than the ground).

- 6.10. At least one 15 minute measurement should be obtained at each monitoring location, during a period when the site is fully operational (a 15 minute period is usually considered to be representative of the hourly period upon which the limits are based). Notes should be taken identifying the main sources of noise during the monitoring period. Should the results of the monitoring indicate an exceedance of the 45 dB $L_{Aeq, 1 \text{ hour}}$ site noise limits, with the site operations not clearly audible, a second measurement should be obtained whilst the site is stood (e.g. during a break period) to enable a comparison to be made.
- 6.11. If the results indicate that the limits are being exceeded attributable to site operations, further operational controls or mitigation measures, should be considered and implemented, where appropriate.
- 6.12. Further details of the proposed mitigation and control measures are provided in the Noise Management Plan.

7. Summary

- 7.1. LF Acoustics Limited were appointed by Mick George Ltd to carry out a noise assessment for a proposed extension to Watlington Quarry. The extension would be within Oak Field, which is the area to the south of the existing plant site area, bounded to the east by the A10 and Watlington Road to the south.
- 7.2. It is proposed to retain the existing processing plant, located within the plant site, to process the excavated material, with the extraction and restoration operations. undertaken in an equivalent manner to the existing operations within the quarry, which will include the extraction of underlying clay to supply local flood defence works, lining of lagoons and capping of landfill sites. Inert materials would be brought into the site, primarily on a backhaul basis, and used to restore the extension area back suitable for agricultural use.
- 7.3. The working method for the proposed extension will differ to existing operations, as the Oak Field extension is closer to the processing plant. Rather than use a conveyor, it is proposed to load the excavated material directly onto ADTs, which will be used to transport the material to the processing area.
- 7.4. Calculations of the likely worst case noise levels during the working of the extension area have been prepared and assessed against appropriate noise limits based upon the requirements of the current PPG attached to the NPPF.
- 7.5. The assessment concluded that the operational noise levels at the surrounding properties would remain low and below the proposed noise limits.
- 7.6. Noise associated with the operation of the extension area would therefore not result in any adverse noise effects and would thus fully comply with the requirements of the NPPF.
- 7.7. An assessment of the operational noise levels has also been made against the EA guidelines, as the landfill operations would be subject to a permit. The assessment concluded that the noise levels associated with the overall site operations, including permitted and non-permitted operations, would result in the potential for audible levels of noise at surrounding properties, noting that the noise levels attributable to the permitted operations would be considerably lower. Appropriate mitigation and control measures would continue to be implemented on site to ensure noise levels associated with the operation are minimised.

References

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2. Ministry of Housing, Communities and Local Government. Planning Practice Guidance. Assessing Environmental Impacts from Minerals Extraction. 6 March 2014.
3. British Standards Institute. Methods for Rating and Assessing Industrial and Commercial Sound. BS 4142:2014 +A1:2019.
4. Environment Agency. Noise and Vibration Management: Environmental Permits. Published 23 July 2021.
5. British Standards Institute. Code of Practice for Noise and Vibration Control on Construction and Open Sites. Part 1:Noise. BS 5228-1+A1. 2014.
6. Calculation of Road Traffic Noise (CRTN). Department of Transport. 1988.

Figures

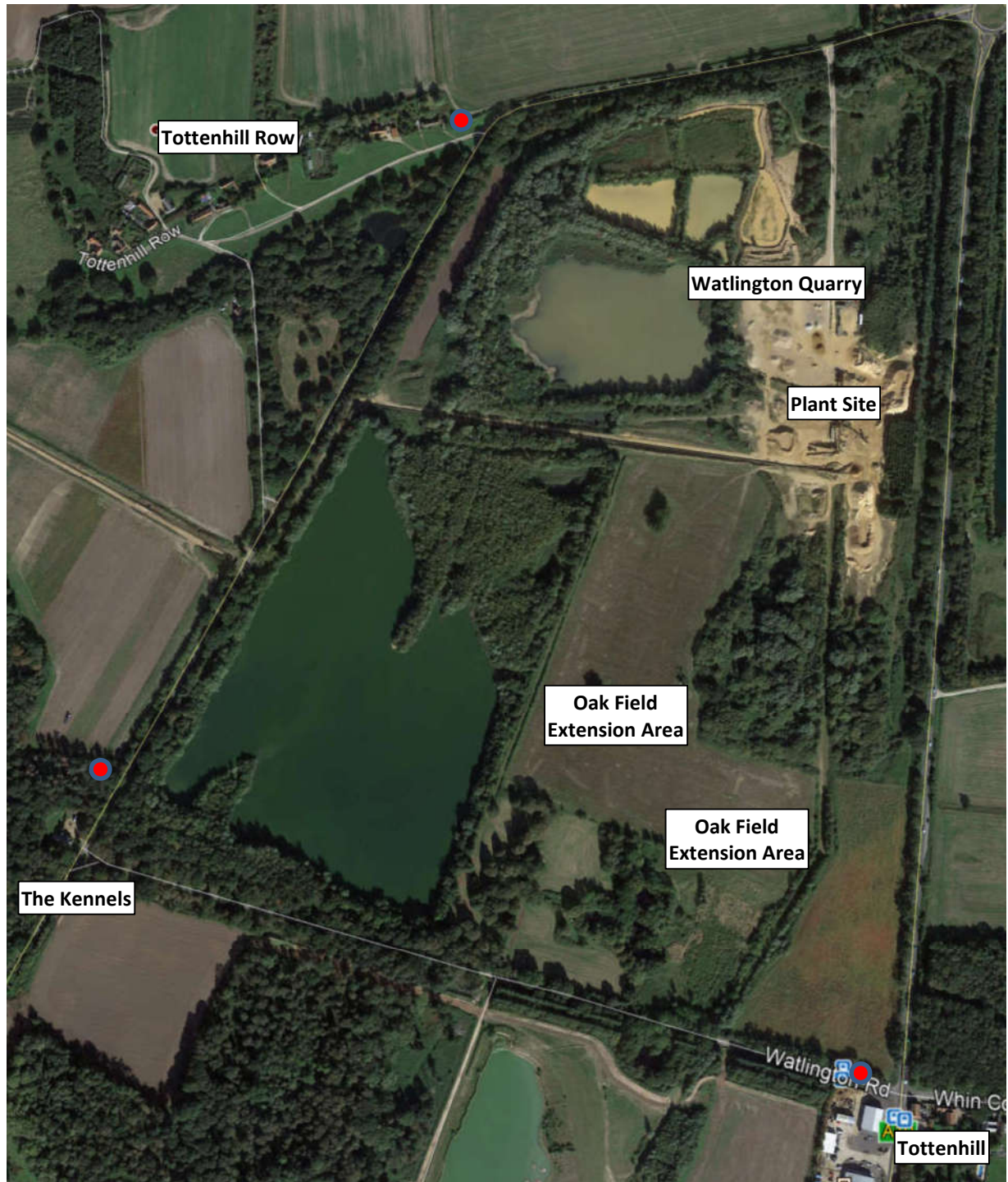
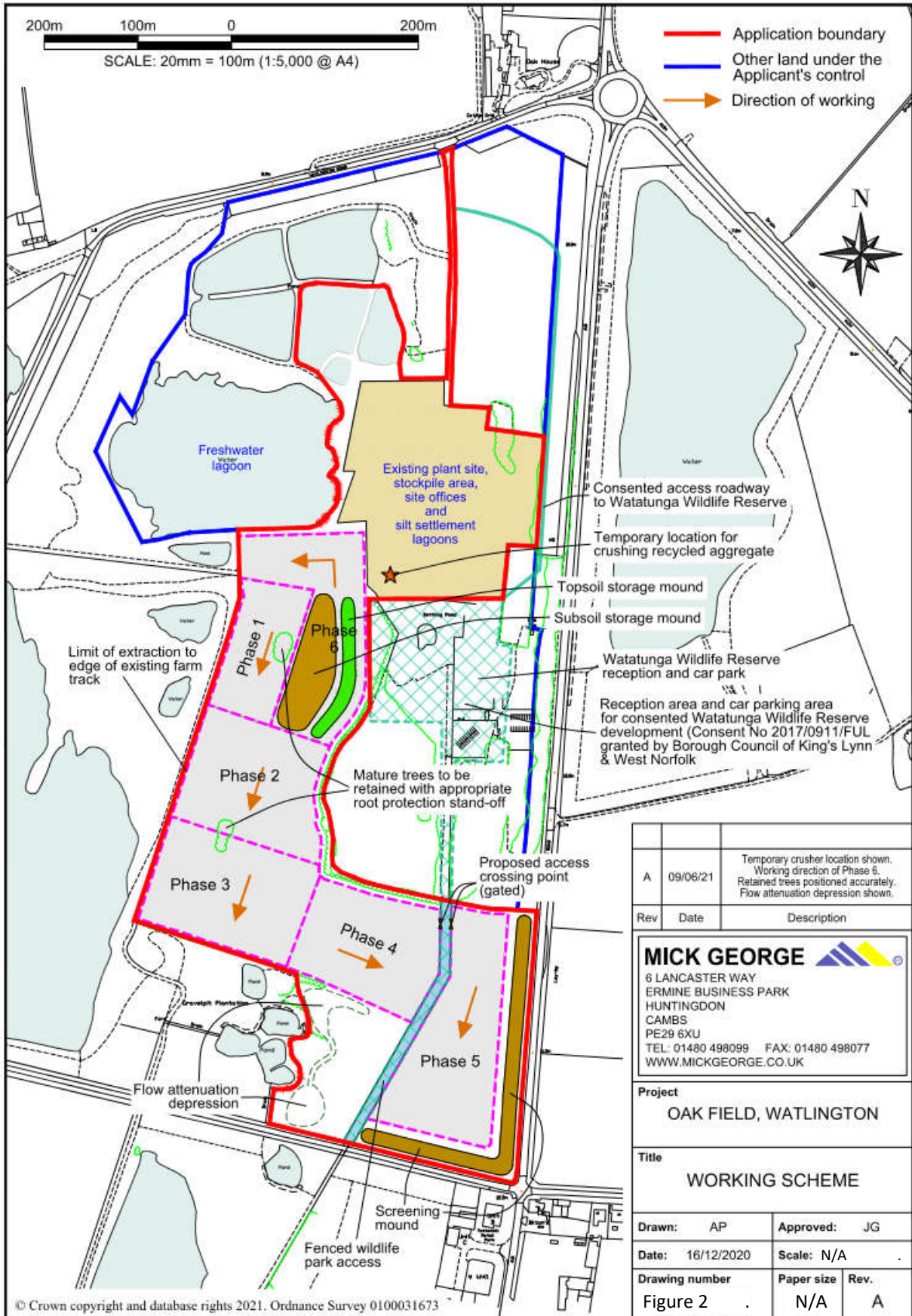


Figure 1: Noise Monitoring Locations



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} , L_{A10} , 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.

Appendix B
Noise Monitoring Results

Oak Field, Watlington Quarry

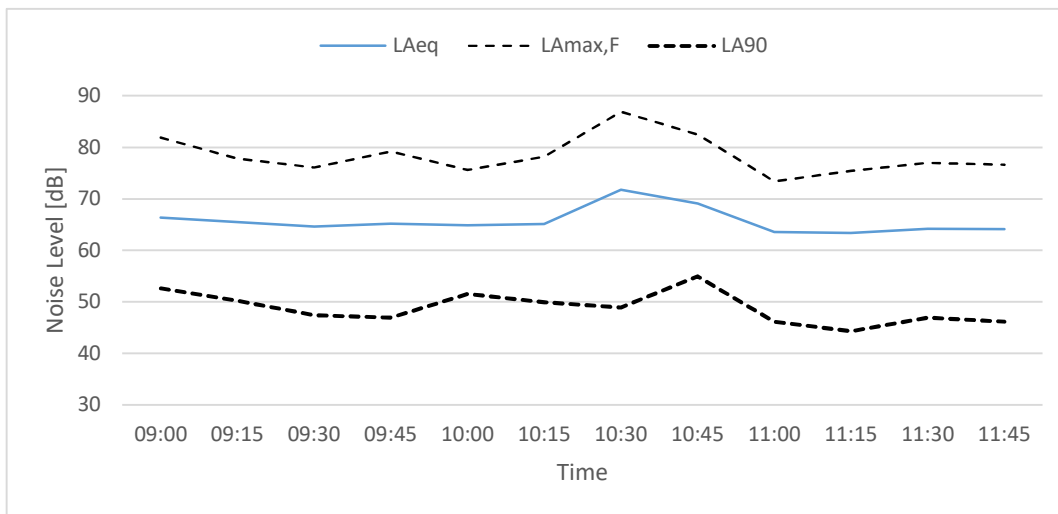
Results of Noise Measurements Carried Out On 24 July 2019

Equipment Used: Rion NL-52 Class 1 Sound Level Meter (Serial No. 00231655)

Location: 1 - Tottenhill (In Field Opposite Dwellings, 30m from A10)

All Levels; Fast, Freefield, Mic Height 1.2 metres.

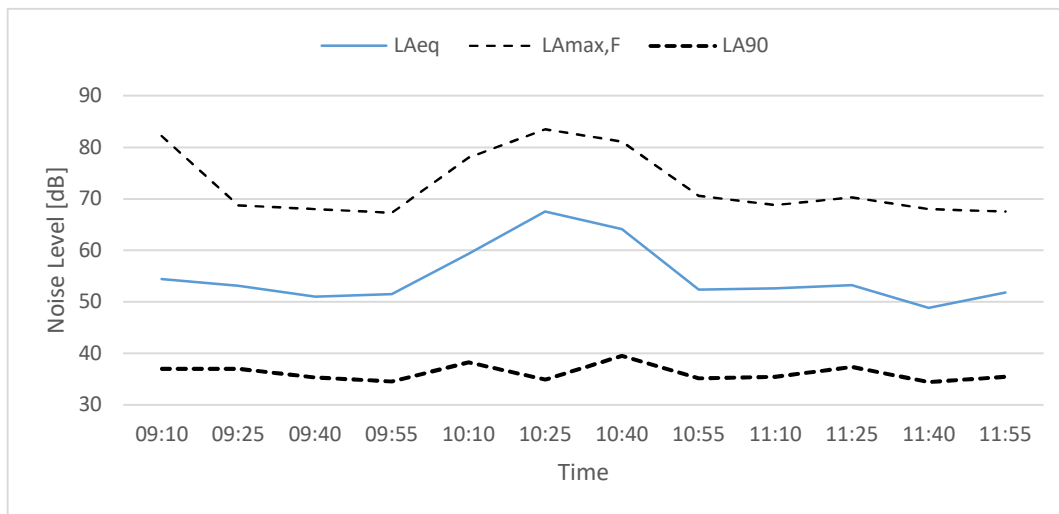
Start Period	Measured Noise Levels [dB]		
	L _{Aeq}	L _{Amax}	L _{A90}
09:00	66.3	81.9	52.6
09:15	65.5	77.8	50.2
09:30	64.6	76.1	47.4
09:45	65.2	79.2	46.9
10:00	64.8	75.6	51.5
10:15	65.1	78.2	49.9
10:30	71.8	86.9	48.9
10:45	69.1	82.5	54.9
11:00	63.6	73.4	46.1
11:15	63.4	75.4	44.3
11:30	64.2	77.0	46.9
11:45	64.1	76.6	46.1



Oak Field, Watlington Quarry
Results of Noise Measurements Carried Out On 24 July 2019

Equipment Used: Rion NL-52 Class 1 Sound Level Meter (Serial No. 00231657)
 Location: 2 - The Kennels (On Boundary to North)
 All Levels; Fast, Freefield, Mic Height 1.2 metres.

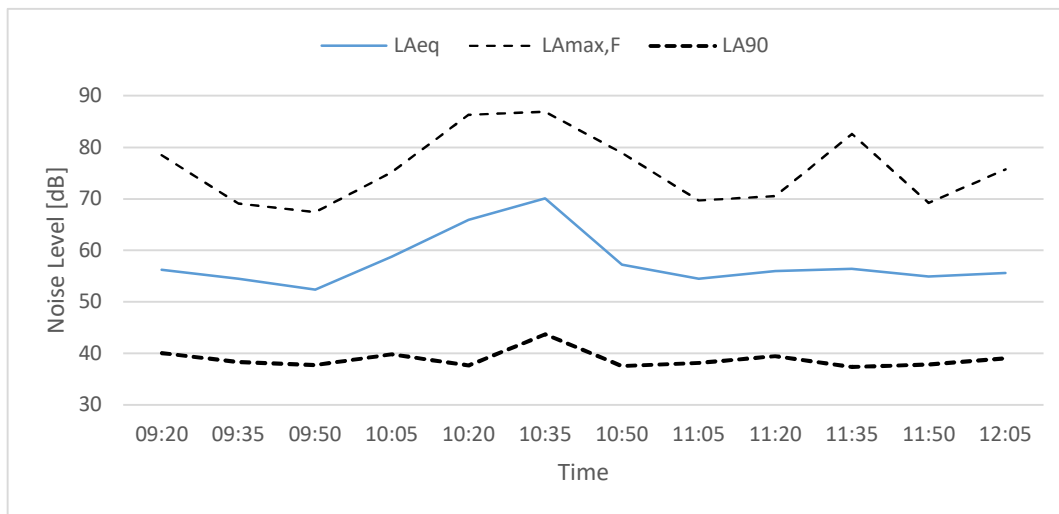
Start Period	Measured Noise Levels [dB]		
	L _{Aeq}	L _{Amax}	L _{A90}
09:10	54.4	82.2	37.0
09:25	53.1	68.7	37.0
09:40	51.0	68.0	35.3
09:55	51.5	67.3	34.5
10:10	59.3	78.0	38.2
10:25	67.5	83.5	34.9
10:40	64.1	81.1	39.5
10:55	52.4	70.6	35.1
11:10	52.6	68.8	35.4
11:25	53.2	70.3	37.3
11:40	48.8	68.0	34.4
11:55	51.8	67.5	35.4



Oak Field, Watlington Quarry
Results of Noise Measurements Carried Out On 24 July 2019

Equipment Used: Rion NL-52 Class 1 Sound Level Meter (Serial No. 00610177)
 Location: 3 - Tottenhill Row (To East of Properties)
 All Levels; Fast, Freefield, Mic Height 1.2 metres.

Start Period	Measured Noise Levels [dB]		
	L _{Aeq}	L _{Amax}	L _{A90}
09:20	56.2	78.5	40.0
09:35	54.5	69.1	38.3
09:50	52.4	67.4	37.7
10:05	58.8	75.2	39.8
10:20	65.9	86.3	37.6
10:35	70.1	86.9	43.7
10:50	57.2	78.9	37.5
11:05	54.5	69.7	38.1
11:20	56.0	70.5	39.4
11:35	56.4	82.6	37.3
11:50	54.9	69.2	37.8
12:05	55.6	75.7	39.0



Appendix C
Calculation Details

**Mick George Ltd
Oak Field, Watlington
Calculated Noise Levels from Site Operations**

07-Jan-2022

Receptor: Dwellings in Totterhill
Usage: Residential
Grid Ref: 563705 X 311073 Y

Uses BS5228

Predicted Freefield Noise Levels

Moving Point Sources	Ref SWL	No. Veh per hour	Speed [mph]	Dist to Centre of Haul Road	AOV	LAeq [dB]	Distance Attenuation			Max Attenuation	LAeq [dB]	Activity LAeq [dB]	Overall LAeq With Processing [dB]	With Processing and Periodic Crushing [dB]
							Hard	Soft	Barrier					
Processing Plant Area														
Wash Plant & Primary Screen	77.4	1	100	563532	311771	13	702	15	100	36.9	44.2	44.2	33.2	2110.709
Crusher	77.4	1	100	563532	311771	13	702	15	100	36.9	44.2	44.2	33.2	2110.709
Crusher	77.4	1	100	563532	311771	13	702	15	100	36.9	44.2	44.2	33.2	2110.709
Fined Hopper Motor	70.5	1	100	563530	311737	11	668	15	70	-36.5	-43.6	-43.6	24.9	310.4311
Water Pump	77.7	1	100	563538	311770	11	700	15	100	-36.9	44.1	-8.3	32.5	1769.733
Loading Shovel	72.0	2	100	563538	311770	11	700	15	100	-36.9	44.1	-8.3	32.5	1769.733
HGV Movements on Quarry Access	31.0	1	100	563538	311770	11	700	15	100	-36.9	44.1	0.0	38.7	957.1892
Periodic Use of Crusher	79.1	1	100	563539	311740	12	683	15	100	-38.7	-43.9	-44.1	35.0	238.4373
<i>Note: Existing Screening Around Plant Site Area</i>														
Phase 1 Extraction														
Excavator	73.4	1	100	563422	311595	11	584	0	0	-42.3	42.3	0.0	31.1	1276.037
ADT Movements	40.5	20	-	563422	311602	11	600	0	0	-42.5	42.5	0.0	33.6	2295.671
Phase 2 Extraction / Phase 1 Restoration														
Excavator (Phase 2 Extraction)	73.4	1	100	563472	311450	10	443	0	0	-39.2	39.2	0.0	34.2	2650.614
ADT Movements (Extraction)	42.5	20	-	563453	311511	11	500	0	0	-40.5	40.5	0.0	36.0	3885.6
Dozer (Phase 1 Restoration)	79.0	1	50	563422	311595	11	584	0	0	-42.3	42.3	0.0	33.6	2316.505
HGV Movements (Restoration)	29.5	6	-	563422	311602	11	600	0	0	-42.5	42.5	0.0	22.6	182.3605
Phase 3 Extraction / Phase 2 Restoration														
Excavator	73.4	1	100	563440	311329	11	375	0	0	-37.4	37.4	0.0	36.0	4011.997
ADT Movements (Extraction)	44.3	20	-	563480	311463	11	460	0	0	-39.3	39.3	0.0	38.0	6356.923
Dozer (Restoration)	79.0	1	50	563472	311450	11	443	0	0	-39.2	39.2	0.0	36.8	4812.359
HGV Movements (Restoration)	33.3	6	-	563453	311505	11	500	0	0	-40.5	40.5	0.0	28.8	479.1132
Phase 4 Soil Strip and Formation of Eastern Bund - Temporary Operation														
Excavator	73.4	1	100	563585	311264	11	226	0	0	-27.1	31.8	0.0	41.6	14331.21
ADT Movements	50.2	20	-	563565	311215	11	150	0	0	-27.4	27.4	0.0	46.3	42796.24
Dump Truck Movements	50.2	20	-	563565	311215	11	150	0	0	-27.4	27.4	0.0	46.3	42796.24
Phase 4 Extraction / Phase 3 Restoration														
Excavator (Extraction)	73.4	1	100	563585	311264	11	226	0	0	-27.1	31.8	0.0	41.6	14331.21
ADT Movements (Extraction)	46.2	20	-	563520	311370	11	350	0	0	-30.9	36.6	0.0	40.5	11886.15
Dozer (Restoration)	79.0	1	50	563472	311450	11	443	0	0	-39.2	39.2	0.0	36.8	4812.359
HGV Movements (Restoration)	35.2	6	-	563480	311404	11	400	0	0	-38.1	38.1	0.0	29.2	829.489
Phase 5 Soil Strip and Formation of Eastern / Southern Bund - Temporary Operation														
Excavator	73.4	1	100	563650	311156	11	100	0	0	-23.0	23.0	0.0	50.4	110157.1
ADT Movements	52.5	20	-	563650	311156	11	100	0	0	-23.0	23.0	0.0	49.5	89207.73
Dump Truck Movements	52.5	20	-	563650	311156	11	100	0	0	-23.0	23.0	0.0	49.5	89207.73
Phase 5 Extraction / Phase 4 Restoration														
Excavator (Extraction)	73.4	1	100	563650	311156	14	100	18	50	-20.0	-23.0	-8.9	44.5	28105.04
ADT Movements (Extraction)	46.8	20	-	563550	311330	11	300	18	250	-29.5	-34.9	-6.9	34.5	2825.285
Dozer (Restoration)	79.0	1	50	563585	311264	11	226	18	160	-27.1	-31.8	-8.1	35.1	40.9
HGV Movements (Restoration)	37.9	6	-	563550	311330	11	300	18	240	-29.5	-34.9	-7.1	25.4	345.5193
Phase 6 Extraction / Phase 5 Restoration														
Excavator (Extraction)	73.4	1	100	563490	311568	14	540	0	0	-41.3	41.3	0.0	32.1	1620.458
ADT Movements (Extraction)	0.0	20	-	563505	311670	11	630	0	0	-43.0	43.0	0.0	-7.0	0.199733
Dozer (Restoration)	79.0	1	50	563585	311175	14	150	19	50	-23.5	-27.4	-10.8	34.3	41.7
HGV Movements (Restoration)	38.5	6	-	563603	311245	11	200	18	150	-26.0	-30.5	-7.9	26.0	402.5183
Phase 6 Restoration														
Dozer	79.0	1	50	563490	311568	11	540	0	0	-41.3	41.3	0.0	34.7	2041.347
HGV Movements	29.3	6	-	563505	311670	11	630	0	0	-43.0	43.0	0.0	22.3	170.0007



**Mick George Ltd
Oak Field, Watlington
Calculated Noise Levels from Site Operations**

07-Jan-2022

Uses BS5228

Receptor: The Kennels
ID: 16 562852 X 311306 Y
Grid Ref:

Predicted Freefield Noise Levels

Moving Point Sources	Ref SWL	No. Veh per hour	Speed [km/h]	Dist to Centre of Haul Road	AOV	LAeq [dB]	Distance Attenuation		Barrier Attenuation	Max Attenuation	LAeq [dB]	Activity LAeq [dB]	Overall LAeq With Processing [dB]	With Processing and Periodic Crushing [dB]
							Hard	Soft						
Processing Plant Area														
Excavator	73.4	1	100	563622	311771	13	908	-39.2	-47.0	0.0	-47.0	30.4		
ADT Movements	35.7	20	-	563370	311608	11	600	-35.6	-42.4	0.0	-42.4	28.8	38.1	39.3
Phase 1 Extraction														
Excavator (Extraction)	73.4	1	100	563321	311480	10	500	-34.0	-40.5	0.0	-40.5	32.9		
ADT Movements (Extraction)	39.5	20	-	563321	311480	11	600	-35.6	-42.4	0.0	-42.4	33.5	40.3	41.1
Dozer (Restoration)	79.0	1	50	563370	311608	11	600	-35.6	-42.4	0.0	-42.4	19.8		
HGV Movements (Restoration)	26.3	6	-	563370	311608	11	600	-35.6	-42.4	0.0	-42.4	38.0		
Phase 2 Extraction / Phase 2 Restoration														
Excavator (Extraction)	73.4	1	100	563287	311375	11	440	-32.9	-39.1	0.0	-39.1	34.3		
ADT Movements (Extraction)	41.6	20	-	563287	311375	11	440	-32.9	-39.1	0.0	-39.1	36.6	41.6	42.2
Dozer (Restoration)	79.0	1	50	563321	311480	11	500	-34.0	-40.5	0.0	-40.5	35.8		
HGV Movements (Restoration)	30.3	6	-	563321	311480	11	500	-34.0	-40.5	0.0	-40.5	40.0		
Phase 3 Extraction / Phase 3 Restoration														
Excavator (Extraction)	73.4	1	100	563452	311302	11	600	-35.6	-42.5	0.0	-42.5	30.9		
ADT Movements (Extraction)	40.5	20	-	563452	311302	11	600	-35.6	-42.5	0.0	-42.5	33.6	41.2	41.9
Dozer (Restoration)	79.0	1	50	563287	311375	11	440	-32.9	-39.1	0.0	-39.1	36.9		
HGV Movements (Restoration)	32.8	6	-	563287	311375	11	440	-32.9	-39.1	0.0	-39.1	26.4		
Phase 4 Extraction / Phase 4 Restoration														
Excavator (Extraction)	73.4	1	100	563538	311166	14	700	-36.9	-44.1	0.0	-44.1	28.3		
ADT Movements (Extraction)	39.8	20	-	563538	311166	11	700	-36.9	-44.1	0.0	-44.1	32.6	38.8	40.7
Dozer (Restoration)	79.0	1	50	563452	311302	11	600	-35.6	-42.5	0.0	-42.5	24.3		
HGV Movements (Restoration)	31.2	6	-	563452	311302	11	600	-35.6	-42.5	0.0	-42.5	37.1		
Phase 5 Extraction / Phase 5 Restoration														
Excavator (Extraction)	73.4	1	100	563422	311575	14	630	-36.0	-43.0	0.0	-43.0	30.4		
ADT Movements (Extraction)	35.5	20	-	563422	311575	11	630	-38.0	-43.0	0.0	-43.0	28.5	39.0	40.0
Dozer (Restoration)	79.0	1	50	563538	311166	11	700	-36.9	-44.1	0.0	-44.1	23.8		
HGV Movements (Restoration)	31.0	6	-	563538	311166	11	700	-36.9	-44.1	0.0	-44.1	35.5		
Phase 6 Restoration														
Dozer	79.0	1	50	563422	311575	11	630	-36.0	-43.0	0.0	-43.0	35.0		
HGV Movements	26.3	6	-	563422	311575	11	630	-36.0	-43.0	0.0	-43.0	19.3		
Moving Point Sources														
HGV Movements on Quarry Access	106	10	25		913	20	239							
HGV Movements (Phase 1 Restoration)	106	6	25		600	10	265							
HGV Movements (Phase 2 Restoration)	106	6	25		500	20	303							
HGV Movements (Phase 3 Restoration)	106	6	25		600	30	312							
HGV Movements (Phase 4 Restoration)	106	6	25		630	30	31							
HGV Movements (Phase 5 Restoration)	106	6	25		630	10	26.3							
HGV Movements (Phase 6 Restoration)	106	6	25		630	10	26.3							
ADT Movements (Phase 1)	110	20	25		600	10	35.7							
ADT Movements (Phase 2)	110	20	25		440	30	41.8							
ADT Movements (Phase 3)	110	20	25		440	30	41.8							
ADT Movements (Phase 4)	110	20	25		600	30	40.5							
ADT Movements (Phase 5)	110	20	25		700	30	38.8							
ADT Movements (Phase 6)	110	20	25		630	10	35.5							

**Mick George Ltd
Oak Field, Watlington
Calculated Noise Levels from Site Operations**

07-Jan-2022

Receptor:
Height: 11 m
Grid Ref: 563181 X 312096 Y

Uttens BS5228

Totterhill Row
563181 X 312096 Y

Predicted Freefield Noise Levels

Processing Plant Area	Ref Level @10m	No.	%	On Time	Grid Reference			Source HT	Dist S-R	Barrier-Ht	Dist S-B	Distance Attenuation		Barrier Attenuation	Max Attenuation	LAeq [dB]	Overall LAeq With Processing [dB]	With Processing and Periodic Crushing [dB]
					X	Y	Hand					Soit						
Phase 1 Extraction																		
Excavator	73.4	1	100	-	563408	311719	11	440	13	365.0659	-32.9	-39.1	-7.6	-40.5	32.9	42.8	43.9	
ADT Movements	42.5	20	-	-	563542	311750	11	500					0.0	-40.5	36.0			
Phase 2 Extraction / Phase 1 Restoration																		
Excavator (Extraction)	73.4	1	100	-	563362	311598	10	530	13	454.8726	-34.5	-41.1	-7.6	-42.3	31.1			
ADT Movements (Extraction)	43.9	20	-	-	563425	311718	11	450	13	374.9111	-33.1	-39.3	-7.6	-40.7	30.0	33.6		
Dozer (Restoration)	79.0	1	50	-	563408	311719	11	440	13	365.0659	-32.9	-39.1	-7.6	-40.5	35.5	42.8	43.9	
HGV Movements (Restoration)	32.6	6	-	-	563408	311719	11	440	13	365.0659	-32.9	-39.1	-7.6	-40.5	18.7	35.6		
Phase 3 Extraction / Phase 2 Restoration																		
Excavator (Extraction)	73.4	1	100	-	563320	311461	11	650	13	575.0354	-36.3	-43.3	-7.6	-43.8	29.6			
ADT Movements (Extraction)	43.9	20	-	-	563425	311718	11	450	13	374.9111	-33.1	-39.3	-7.6	-40.7	30.0	32.8		
Dozer (Restoration)	79.0	1	50	-	563362	311598	11	530	13	454.8726	-34.5	-41.1	-7.6	-42.1	33.9	42.4	43.6	
HGV Movements (Restoration)	33.7	6	-	-	563425	311718	11	450	13	374.9111	-33.1	-39.3	-7.6	-40.7	19.8	34.1		
Phase 4 Extraction / Phase 3 Restoration																		
Excavator (Extraction)	73.4	1	100	-	563493	311392	11	770	13	695.039	-37.7	-45.2	-7.5	-45.3	28.1			
ADT Movements (Extraction)	43.5	20	-	-	563442	311670	11	500	13	424.9968	-34.0	-40.5	-7.6	-41.6	29.4	31.8		
Dozer (Restoration)	79.0	1	50	-	563320	311461	11	650	13	575.0354	-36.3	-43.3	-7.6	-43.8	32.2	42.1	43.4	
HGV Movements (Restoration)	34.7	6	-	-	563425	311718	11	450	13	374.9111	-33.1	-39.3	-7.6	-40.7	20.8	32.5		
Phase 5 Extraction / Phase 4 Restoration																		
Excavator (Extraction)	73.4	1	100	-	563829	311385	14	840	13	765.3719	-39.5	-46.1	-7.2	-46.1	27.3			
ADT Movements (Extraction)	43.5	20	-	-	563442	311670	11	500	13	424.9968	-34.0	-40.5	-7.6	-41.6	29.4	31.5		
Dozer (Restoration)	79.0	1	50	-	563493	311392	11	770	13	695.039	-37.7	-45.2	-7.5	-45.3	30.7	42.0	43.3	
HGV Movements (Restoration)	34.3	6	-	-	563442	311670	11	500	13	424.9968	-34.0	-40.5	-7.6	-41.6	20.2	31.1		
Phase 6 Extraction / Phase 5 Restoration																		
Excavator (Extraction)	73.4	1	100	-	563401	311780	14	385	13	375	-31.7	-37.6	-10.6	-42.3	31.1			
ADT Movements (Extraction)	43.6	20	-	-	563401	311780	11	385	13	375	-31.7	-37.6	0.0	-37.6	37.7	38.5		
Dozer (Restoration)	79.0	1	50	-	563829	311385	11	840	13	765.3719	-39.5	-46.1	-7.5	-46.1	29.9	44.3	44.3	
HGV Movements (Restoration)	35.4	6	-	-	563442	311670	11	500	13	424.9968	-34.0	-40.5	-7.6	-41.6	21.3	30.4		
Phase 6 Restoration																		
Dozer	79.0	1	50	-	563401	311780	11	385	13	375	-31.7	-37.6	0.0	-37.6	38.4	44.3		
HGV Movements	33.2	6	-	-	563401	311780	11	385	13	375	-31.7	-37.6	0.0	-37.6	27.3	38.7		
Moving Point Sources																		
Ref SWL																		
HGV Movements on Quarry Access	106																	
HGV Movements (Phase 1 Restoration)	106	10	25															
HGV Movements (Phase 2 Restoration)	106	6	25															
HGV Movements (Phase 3 Restoration)	106	6	25															
HGV Movements (Phase 4 Restoration)	106	6	25															
HGV Movements (Phase 5 Restoration)	106	6	25															
HGV Movements (Phase 6 Restoration)	106	6	25															
ADT Movements (Phase 1)	110	20	25															
ADT Movements (Phase 2)	110	20	25															
ADT Movements (Phase 3)	110	20	25															
ADT Movements (Phase 4)	110	20	25															
ADT Movements (Phase 5)	110	20	25															
ADT Movements (Phase 6)	110	20	25															