


**NOISE ASSESSMENT**

**IMPORTATION OF INERT MATERIALS  
TO IMPROVE BIODIVERSITY OF THE LAKES  
AT BISHOPS BOWL FISHERY**

**MICK GEORGE LTD**

**OCTOBER 2019**



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Status	Prepared By	Date
2.0	L Jephson BEng (Hons) MIOA	14/10/19

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

- 1.1. LF Acoustics Limited have been appointed by Mick George Ltd to carry out an assessment of the noise levels associated with the continuation of importation of inert material to improve the biodiversity and stabilisation of lakes at the Bishops Bowl Fishery.
- 1.2. Planning permission to undertake the works were granted by Warwickshire County Council in October 2018 (Warwickshire County Council Ref. SDC/18/CM019). Similar works have been undertaken in the Mitre Pool and the eastern side of Greenhill Lake for over two years (Warwickshire County Council Ref. SDC/14CM002). These works are nearing completion, and it is now proposed to undertake similar operations within the main area of Greenhill Lake, Belles Lake and Rush Glen Lake, to reduce the depth to improve the biodiversity of the lakes.
- 1.3. The working method will remain as per the existing operations, with a small number of deliveries made to the site daily and typically a single dozer or excavator operating on the site. No changes to the existing operating hours are proposed. The lakes would be worked progressively, commencing with Greenhill Lake and working generally in a westerly direction. The location of the lakes is indicated on Figure 1.
- 1.4. The proposed operations would be no closer to residential properties than those undertaken to date, with the main operational areas either effectively screened or over 300 metres from surrounding residential properties.
- 1.5. This report presents an assessment of the likely noise levels generated at surrounding noise sensitive receptors during the reprofiling of the three lakes. 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 infill and restoration operations 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.

## 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 the UK 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 planning practice guidance attached to the NPPF relating to noise was updated in March 2014 [2], which covers mineral extraction and related processes, including aggregate recycling, restoration and the disposal of construction waste, provides guidance and advises upon acceptable levels of noise from this type of operations. This is the most recent guidance when assessing noise from minerals and related 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. The Environment Agency have requested an assessment of the noise levels attributable to the importation of materials in relation to the infilling and restoration operations to be made against the requirements of BS 4142 [3].

2.2.2. BS 4142 is intended for the assessment of noise from commercial and industrial operations and is not intended to be applied to the assessment of noise from minerals operations, including aggregate recycling and restoration operations and construction and demolition, as advised in Section 1.3 of the Standard. It is clear from the Standard that the most appropriate guidance to adopt should be that contained within the PPG described above.

2.2.3. However, consideration to this Standard has been given within this report to address the requirements of the EA.

2.2.4. BS 4142 is a comparative standard in which the estimated noise levels from the proposed development are compared to the representative background noise level from existing uses.

2.2.5. BS 4142 relates the likelihood of complaint to the difference between the Rating Level of the noise being assessed and the background noise level.

2.2.6. 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.

- 2.2.7. 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. Given that the noise attributable to the operation of a sand and gravel quarry is principally associated with diesel engines, it has not been considered appropriate to apply any corrections when determining the Rating Levels of noise from the operation of the site.
- 2.2.8. During the daytime, the specified noise levels are determined over a reference time interval of 1 hour.
- 2.2.9. 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.

### 3. Current Planning Conditions

3.1. The current planning permission is subject to a number of conditions.

3.2. Condition 12 relates to the operational hours for the site, which would remain unchanged for the proposed operations. The operational hours are as follows:

- Between 07:00 – 18:00 hours Mondays to Fridays;
- Between 07:00 – 13:00 hours Saturdays;
- No working on Sundays and Bank Holidays.

Condition 17 relates to noise and specifies the following:

The level of noise from the site shall not exceed the following noise limits at residential properties at the specified locations. All measurements shall be made in accordance with the methodology of 5228-1:2009 and its subsequent amendments. Where access to the nearest sound sensitive property is not possible, measurements shall be undertaken at an appropriate location and corrected to establish the noise levels at the nearest sound sensitive property.

Location	Noise Limit LAeq, 1 hour
Greenhill Farm	51 dB
Walworth Farm	47 dB
Model Farm	47 dB
Residential Properties to east of B4451	53 dB

#### 4. Baseline Assessment

##### 4.1. Identification of Potentially Affected Noise-Sensitive Receptors

- 4.1.1. There are a small number of properties surrounding the fishery, which would have the potential to be affected by noise from the proposed operations.
- 4.1.2. Portland Lodge and dwellings within the Greenhill Farm complex are located to the north west of the proposed working areas. These dwellings are adjacent to the current operational areas within Mitre Pool and Greenhill Lake, and are approximately 270 metres from the permitted operations. The proposed operation would be further from the properties and located at least 300 metres from the proposed working areas.
- 4.1.3. Walworth Farm House to the south. This property is effectively screened from the site operations by the surrounding farm buildings, with the proposed operations no closer to the farm house than presently permitted. The farm is operational, with noise generating operations observed, including sand blasting, during a recent site visit.
- 4.1.4. Model Farm to the north west. This property is located within Harbury and is situated approximately 350 metres from the closest working area within Rush Glen Lake and over 800 metres from Greenhill Lake.
- 4.1.5. A new residential development is proposed on land to the east of the B4451. These properties would be over 300 metres from the main operational areas, although the closest properties could be approximately 100 metres from the main site access.
- 4.1.6. These locations are identified on Figure 2.

##### 4.2. Baseline Noise Monitoring

- 4.2.1. A noise monitoring exercise was carried out on 5 June 2018 to determine the existing noise environment at the surrounding properties identified above.
- 4.2.2. Whilst the site was open during the monitoring period, there was no plant operational and thus the conditions monitored were considered to be representative of the general noise environment in the area.
- 4.2.3. During the survey, weather conditions were good, fine and dry, with very light winds (<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 between 1.2 – 1.3 metres and freefield (i.e. at least 3.5 metres from any building facades).
- 4.2.5. A series of 15 minute measurements were obtained at each location during the survey period, over a period of at least 2 hours, which was considered sufficient to enable typical levels to be determined.
- 4.2.6. The noise monitoring locations are indicated on Figure 2.

##### *Greenhill Farm*

- 4.2.7. Noise monitoring at this location was taken along the western boundary of the farm complex, with the location chosen representative of the noise environment within the development.



4.2.8. Noise measurements were taken between 09:50- 12:05, with the results obtained provided in Table 4.1 below.

Start Period	Measured Noise Levels [dB]		
	L <sub>Aeq</sub>	L <sub>Amax,F</sub>	L <sub>A90</sub>
09:50	51.0	69.3	43.4
10:05	46.6	58.4	41.6
10:20	57.7	81.0	43.6
10:35	50.1	66.0	44.0
10:50	50.8	71.5	42.1
11:05	49.3	71.0	41.4
11:20	46.3	58.5	41.0
11:35	47.6	59.4	41.4
11:50	50.8	72.7	41.1

**Table 4.1 Results of Noise Monitoring at Greenhill Farm**

4.2.9. Noise levels monitored at this location were principally influenced by distant road traffic, birdsong and occasional trains passing on the railway line to the north east.

4.2.10. Based upon the noise measurements at this location, background noise levels are typically 41 dB L<sub>A90</sub>.

*Walworth Farm*

4.2.11. Noise levels at this location were obtained at the site boundary to the west of the farm house.

4.2.12. Noise levels at this location were generally influenced by leaves rustling in the gentle breeze, birdsong and distant road traffic. Sand blasting operations being carried out at the farm were observed during the monitoring exercise, with the operations clearly influencing the measured noise levels at times during the survey period.

4.2.13. The results of the monitoring carried out at this location are provided in Table 4.2.

Start Period	Measured Noise Levels [dB]		
	L <sub>Aeq</sub>	L <sub>Amax,F</sub>	L <sub>A90</sub>
09:30	56.8	78.7	47.2
09:45	55.4	74.1	39.0
10:00	55.0	67.2	47.3
10:15	44.9	68.5	41.3
10:30	51.8	72.7	42.5
10:45	52.4	67.2	42.7
11:00	56.6	68.4	43.0
11:15	51.3	69.6	39.0
11:30	56.2	71.3	38.9
11:45	53.9	70.2	37.8

Note \* - Period influenced by Sand Blasting

**Table 4.2 Results of Noise Monitoring at Walworth Farm**

4.2.14. Excluding the periods when the operations at the farm clearly influenced the measured noise levels at this location, the results would indicate typical background noise levels of 37 dB L<sub>A90</sub> at this location.

*Model Farm*

4.2.15. Noise levels at this location were obtained along the public footpath which runs to the south of the property, with the noise monitoring position set at an equivalent distance from the road as the property.

4.2.16. Noise levels at this location were observed to be influenced by a mix of sources. There were regular vehicle movements along the road, influencing ambient (L<sub>Aeq</sub>) and maximum noise levels, with background (L<sub>A90</sub>) noise levels principally influenced by a mix of distant road traffic, birdsong and leaves rustling on the trees within the surrounding area in the gentle breeze. It was also possible to hear the sand blasting operations being undertaken at times at Model Farm, although this operation had minimal influence on the measured noise levels.

4.2.17. The results of the monitoring carried out at this location are provided in Table 4.3 below.

Start Period	Measured Noise Levels [dB]		
	L <sub>Aeq</sub>	L <sub>Amax,F</sub>	L <sub>A90</sub>
10:00	48.2	66.9	38.9
10:15	46.2	61.6	37.7
10:30	48.2	75.4	37.0
10:45	48.2	63.7	37.7
11:00	45.4	61.4	36.4
11:15	46.4	63.4	35.6
11:30	49.4	67.7	38.4
11:45	45.5	61.3	37.1

**Table 4.3 Results of Noise Monitoring at Model Farm**

4.2.18. Based upon the results presented above, the typical background noise level at this location is 37 dB  $L_{A90}$ .

*New Residential Development to East of B4451*

4.2.19. No specific noise monitoring was carried out at this location, as the residential development was not constructed at the time of the baseline noise monitoring.

4.2.20. Noise monitoring had been carried out to support the planning application for the proposed development and it was considered appropriate to adopt the results obtained from that assessment, as they were representative of the noise levels at the proposed dwellings.

4.2.21. The monitoring carried out for that development indicated a typical daytime background noise level of 43 dB  $L_{A90}$ , which was agreed with local authority officers as being appropriate to use and upon which to base the assessment.

## 5. Calculations and Assessment

### 5.1. Proposed Operations

- 5.1.1. The operation within the site would remain as that which is presently being carried out within the eastern part of Greenhill Lake.
- 5.1.2. Generally, loads would be delivered to the working area by 8-wheeled lorries. The material would then be spread using a dozer (CAT D6 or equivalent). An excavator would also be used on site periodically, to finalise the banks etc. Given the low volumes of materials being delivered to site, the plant would not normally be operational throughout the day, with only the dozer or excavator normally operational at any one time.
- 5.1.3. As per the existing operations, it is anticipated that there would be an average of 24 loads per day delivered to the site during the normal operating hours of 07:00 – 18:00 hours, spread evenly throughout the day. On this basis, it is not anticipated that there would be normally more than 10 HGV movements per hour (5 in / 5 out).
- 5.1.4. The works would be undertaken in a general westerly direction, commencing within Greenhill Lake, where the water level has already been reduced for the present operations.
- 5.1.5. Material would be placed across the lake to the desired profile and once completed, the lake would be reflooded and a new temporary dam established to enable Belles Lake to be drained, with works continuing in this area.
- 5.1.6. Once Belles Lake had been reprofiled, the lake would be reflooded and Rush Glen Lane dewatered, with the final stage of reprofiling works carried out within this lake at the western extremity of the fishery site.

### 5.2. Source Term Information

- 5.2.1. As indicated previously, no plant was operational at the time of the noise survey and source term noise information for plant to be used on the site has therefore been obtained from measurements made adjacent to similar plant operating at similar facilities.
- 5.2.2. As indicated above, the plant requirements would be low, thus ensuring noise levels were minimised. To provide a realistic worst case assessment, it has been assumed that the dozer would be operational 100% of the time over the 1 hour assessment period. Whilst consideration has been given to the operation of an excavator, as indicated in Table 5.2 below, noise levels associated with the excavator would be lower and thus result in lower noise levels at the properties compared with the operation of the dozer.
- 5.2.3. Based on the above information, the noise source terms which have been assumed for this assessment are provided in Table 5.1.

Source	SWL	L <sub>Aeq</sub> at 10m	Number	% On-Time
Dozer	-	79.0	1	100
Excavator	-	75.7	1	100
HGV Movements	106.1	-	10 per hour	-

**Table 5.1 Source Term Noise Levels**

### 5.3. Criteria to be Adopted for the Assessment

- 5.3.1. Based upon the results of the baseline noise monitoring, the following freefield normal daytime working limits have therefore been adopted for this assessment, in accordance with the requirements of the planning guidance and as specified in Condition 17 of the planning permission:

Location	Typical Freefield Background Noise Level [dB L <sub>A90</sub> ]	Proposed Freefield Normal Working Limit [dB L <sub>Aeq, 1 hour</sub> ]
Greenhill Farm	41	51
Walworth Farm	37	47
Model Farm	37	47
New Dwellings to East of B4451	43	53

**Table 4.2 Proposed Normal Working Limits**

- 5.3.2. By adopting this approach, the noise levels attributable to the operation of the plant within the site would remain below a level of +10 dB(A) above the present background noise levels, specified in BS 4142 as representing a level where there is an indication of a significant adverse impact, depending upon context. The approach taken would ensure that the proposed operations would not result in any significant adverse noise impacts when assessed against either the planning condition limits or BS 4142.

### 5.4. Calculation Methodology

- 5.4.1. 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 [4]. Where barrier corrections have been calculated, the algorithm used within a Calculation of Road Traffic Noise [5] has been used.
- 5.4.2. Calculations have been made at positions representative of the likely closest operations to the properties.
- 5.4.3. The calculations associated with the site operations have assumed that the plant would be operational close to the final restoration level. The calculations are therefore a worst case at each position, as generally the plant would be working at a lower level and thus afforded additional noise attenuation by the sides of the lakes, particularly to the north where there is a large bank.
- 5.4.4. The details of the calculations are provided in Appendix B.

5.4.5. The assessment against BS 4142 requires consideration of the character of the noise to be accounted for when determining the Rating Level of noise. The main source of noise associated with the operation of the plant would be attributable to the vehicle engines, either on the HGVs delivering the material to the site or on the dozer. The character of the noise generated would be equivalent to that associated with vehicles passing along the surrounding roads or associated with farm machinery operating in the surrounding fields. The noise would therefore not be uncharacteristic for the area and thus no penalties are required to be applied when assessing the noise levels against BS 4142.

#### 5.5. Assessment of Noise Levels at Greenhill Farm

5.5.1. Noise levels at these properties are presently influenced by the existing operations within Greenhill Lake during the periods when the plant is operational on site.

5.5.2. Noise levels at these properties associated with the proposed operations would be at a maximum during the operations within Greenhill Lake, as this is the closest area to the properties.

5.5.3. Noise levels during the working in this lake are anticipated to be up to 45 dB  $L_{Aeq, 1 \text{ hour}}$ , during the latter stages as the infilling is reaching the final levels. Noise levels at the commencement of operations, whilst the plant is working at a lower level would be lower, as additional screening would be afforded from the northern face of the former quarry. Noise levels attributable to the operations during this period would be up to 4 dB(A) above the typical background noise levels at this location. On this basis, an assessment against the requirements of BS 4142 would indicate a low potential for an adverse noise impact at these properties.

5.5.4. Noise levels would reduce during the working within Belles Lake and Rush Glen Lake, as the plant would be operating further from the properties. Noise levels during the working in these areas are not anticipated to exceed 40 dB  $L_{Aeq, 1 \text{ hour}}$ . Noise levels would remain below the background noise levels during operations within these areas and an assessment against the requirements of BS 4142 would indicate a low impact.

5.5.5. Noise levels from the operation of the site at these properties would remain low throughout the duration of the works on site and are not anticipated to exceed the normal working limit of 51 dB  $L_{Aeq, 1 \text{ hour}}$  at these properties. The operation of the site would therefore not result in any significant noise effects upon the residents of these properties and with noise levels remaining below a level of 5 dB(A) above the typical background noise levels, an assessment against the requirements of BS 4142 would indicate a low potential for adverse noise impacts.

#### 5.6. Assessment of Noise Levels at Walworth Farm

5.6.1. As with the present site operations, this property would be effectively screened from the working areas by the existing farm buildings within Walworth Farm, which fully screen the property from the lakes.

5.6.2. Noise levels attributable to the proposed operations would be at a maximum during operations within Greenhill Lake, which is closest to the property. Noise levels during this period have been calculated to be 39 dB  $L_{Aeq, 1 \text{ hour}}$  attributable to the vehicle movements and operation of the dozer. Noise levels would be a maximum of 2 dB(A) above the background noise levels at this property, and an assessment against BS 4142 would indicate a low potential for an adverse impact during works in this area.

- 5.6.3. Noise levels would reduce as the works progress into Belles Lake and latterly into Rush Glen Lake, with worst case noise levels of 35 dB  $L_{Aeq, 1 \text{ hour}}$  and 31 dB  $L_{Aeq, 1 \text{ hour}}$  calculated. Noise levels during the operations within these areas are not anticipated to exceed the prevailing background noise levels, thus ensuring that the operations resulted in a low impact.
- 5.6.4. Noise levels from the operation of the site at this property would remain low throughout the duration of the works on site and are not anticipated to exceed the normal working limit of 47 dB  $L_{Aeq, 1 \text{ hour}}$ . The operation of the site would therefore not result in any adverse noise impacts at this location.
- 5.7. Assessment of Noise Levels at Model Farm
- 5.7.1. This property is located to the west of the fishery and is at an elevated ground level compared with the level of the lakes, with a line of sight onto Rush Glen Lake.
- 5.7.2. The property is some distance from the initial operational areas within Greenhill Lake, which would be screened by the existing land formation. Noise levels during the working within this area are anticipated to be of the order of 33 dB  $L_{Aeq, 1 \text{ hour}}$  and very low compared to noise from other surrounding noise sources. Noise levels during works in this area would remain considerably below the prevailing background noise levels and thus seek to ensure there were no adverse noise impacts.
- 5.7.3. As works progress into Belles Lake and latterly Rush Glen Lake, noise levels would gradually increase, with worst case noise levels of 36 dB  $L_{Aeq, 1 \text{ hour}}$  and 42 dB  $L_{Aeq, 1 \text{ hour}}$  calculated.
- 5.7.4. Noise levels during the operations within Rush Glen Lake, which are closest to the property would be a maximum of 5 dB(A) above the background noise levels at this location. Assessing the noise levels during this period against the requirements of BS 4142 would indicate, at worst, the potential for an adverse impact, depending upon the context. Given that the overall noise levels attributable to the operation of the site would remain very low, any potential adverse impacts would be low.
- 5.7.5. The operational noise levels would remain very low for daytime operations and would remain substantially below the normal working limit of 47 dB  $L_{Aeq, 1 \text{ hour}}$  at this location. The operation of the site would therefore not result in any significant noise effects upon the residents of this property.
- 5.8. Assessment of Noise Levels at Proposed Residential Development to East of B4451
- 5.8.1. Planning permission has been granted for a new residential development on land to the east of the B4451. The closest dwellings within this development are likely to be constructed approximately 100 metres from the site entrance and approximately 300 metres from the operational areas.
- 5.8.2. Noise levels attributable to the operation of the site would be at a maximum during the operations within Greenhill Lake, with noise levels of up to 47 dB  $L_{Aeq, 1 \text{ hour}}$  predicted. Noise levels would be up to 4 dB(A) above the background noise levels during this period, although would not exceed the noise limit of 53 dB  $L_{Aeq, 1 \text{ hour}}$ . Assessing the noise levels against the requirements of BS 4142 during this period would indicate the potential for a low impact.

- 5.8.3. Noise levels would reduce as the works progress into Belles Lake and Rush Glen Lake, which are further from the proposed dwellings, with noise levels during these periods principally influenced by the vehicles travelling along the site access. Noise levels during the operations within these two areas are anticipated to be of the order of 44 dB  $L_{Aeq, 1 \text{ hour}}$ , 9dB(A) below the planning condition noise limit and a maximum of 1 dB(A) above the background noise levels at this location. Noise levels would thus fully meet the requirements of the planning condition and assessing the noise levels against the requirements of BS 4142 would indicate a low impact and thus acceptable.



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

- 6.1. The assessment within Section 5 indicates that noise levels associated with the re-profiling operations within the three lakes at Bishops Bowl Fishery would not result in any adverse noise effects upon on the occupants of surrounding properties.
- 6.2. 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.
- 6.3. Vehicles travelling along the temporary haul routes between the lakes have potential to cause disturbance even at low noise levels. To ensure potential disturbance is minimised, the routes would 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.
- 6.4. 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.
- 6.5. Given the fact that the calculated noise levels were substantially below the appropriate normal working limits and a level which would result in adverse noise impacts, it is not considered that regular noise monitoring would be required to demonstrate compliance. Monitoring has therefore only been proposed following receipt of any justified complaints.
- 6.6. 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).
- 6.7. 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 site noise limits specified within Section 5.3, 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.
- 6.8. 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.

## 7. Summary

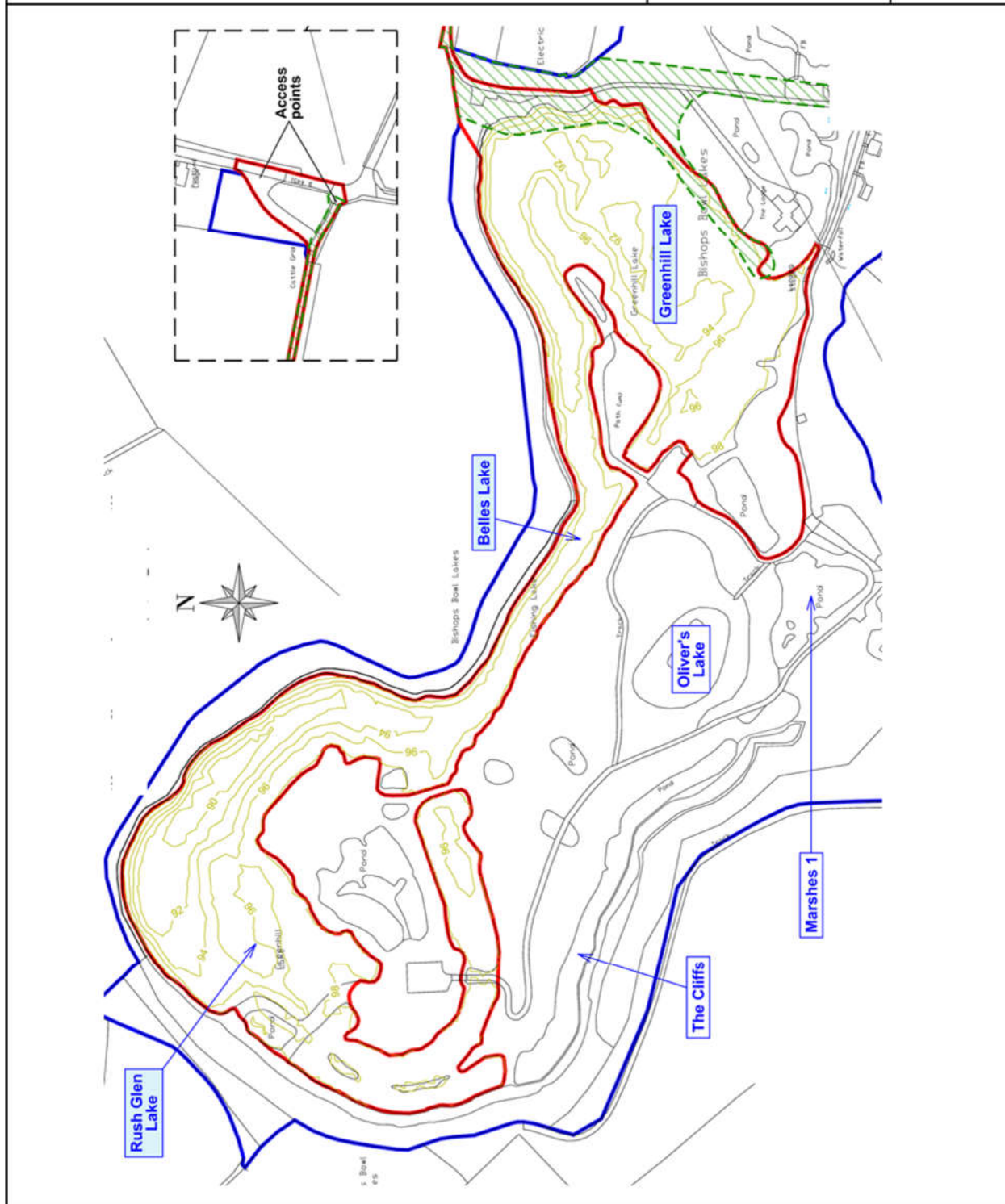
- 7.1. LF Acoustics Limited were appointed by Mick George Ltd to carry out a noise assessment to support a planning application for the continuation of importation of inert material to improve the biodiversity and stabilisation of lakes at the Bishops Bowl Fishery.
- 7.2. Planning permission to undertake the works were granted by Warwickshire County Council in October 2018 (Warwickshire County Council Ref. SDC/18/CM019). Similar works have been undertaken in the Mitre Pool and the eastern side of Greenhill Lake for over two years (Warwickshire County Council Ref. SDC/14CM002). These works are nearing completion, and it is now proposed to undertake similar operations within the main area of Greenhill Lake, Belles Lake and Rush Glen Lake, to reduce the depth to improve the biodiversity of the lakes.
- 7.3. The working method within the three lakes would remain as per the existing operations, with a small number of deliveries made to the site daily and typically a single dozer or excavator operating on the site. No changes to the existing operating hours are proposed. The lakes would be worked progressively, commencing with Greenhill Lake and working generally in a westerly direction.
- 7.4. Noise monitoring has been carried out to establish the current background noise levels at surrounding properties, during a period when the plant on site was not operational. The noise levels have been used to derive appropriate site noise limits in accordance with the requirements of the PPG and upon which an appropriate planning condition has been imposed.
- 7.5. Calculations of the likely worst case noise levels have been prepared and assessed against the proposed limits. The assessment concluded that the operational noise levels at the surrounding properties would remain low and remain substantially below the proposed limits.
- 7.6. Noise associated with the operation of the site would therefore not result in any adverse noise effects when assessed against the requirements of BS 4142 and would thus fully comply with the requirements of Condition 17 of the planning permission and the NPPF.

## References

1. Ministry of Housing, Communities and Local Government. National Planning Policy Framework. February 2019.
2. Department for 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. British Standards Institute. Code of Practice for Noise and Vibration Control on Construction and Open Sites. Part 1:Noise. BS 5228-1+A1. 2014.
5. Calculation of Road Traffic Noise (CRTN). Department of Transport. 1988.

## Figures

**Figure 1:**  
Location of Lakes Within  
Fishery



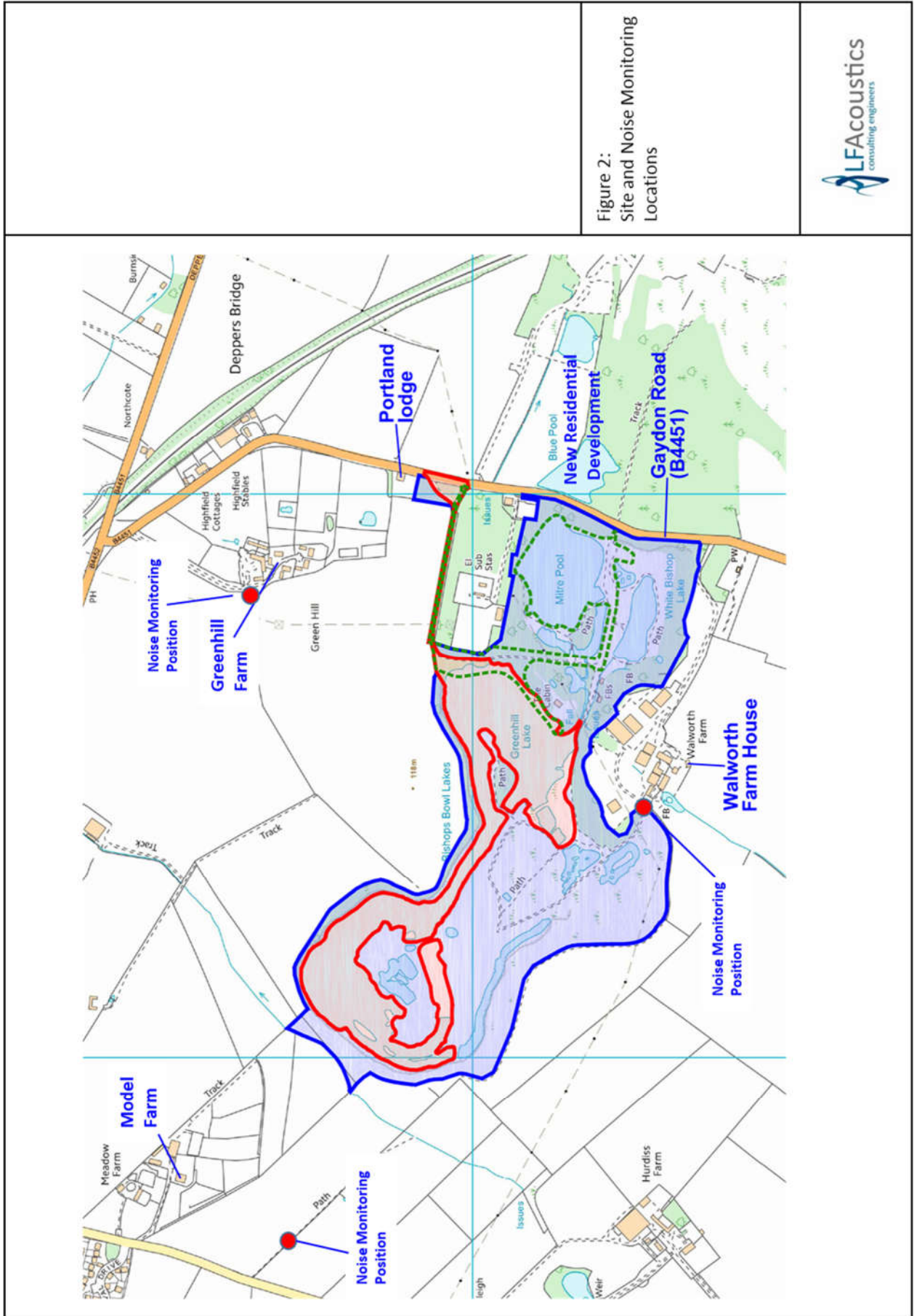


Figure 2:  
Site and Noise Monitoring  
Locations



## 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**  
**Calculation Details**



**Bishops Bowl Fishery  
Calculated Noise Levels from Reprofitting Operations**

14-Oct-2019

Receptor: Properties at Greenhill Farm  
Height 118 m  
Grid Ref: 438898 X 259281 Y

Uses BS5228

**Predicted Freefield Noise Levels**

	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]	Total LAEq [dB]
				X	Y					Hard	Soft				
<b>Greenhill Lake</b>															
Dozer	79.0 LAeq	1	100	438676	259060	100	310	103	50	-29.8	-35.3	-5.0	-35.3	43.7	
HGV Movements (Main Access)	41.5 LAeq	10	-	438850	259060	104	225			-27.1	-31.8	0.0	-31.8	36.7	
HGV Movements (Lake)	35.1 LAeq	10	-	438665	259019	100	350	103	50	-30.9	-36.6	-5.0	-36.6	24.4	44.5
<b>Belles Lake</b>															
Dozer	79.0 LAeq	1	100	438356	259019	100	600	103	50	-35.6	-42.5	-7.3	-42.9	36.1	
HGV Movements (Main Access)	41.5 LAeq	10	-	438850	259060	104	225			-27.1	-31.8	0.0	-31.8	36.7	
HGV Movements (Lake)	35.6 LAeq	10	-	438665	259019	100	350	103	50	-30.9	-36.6	-5.0	-36.6	24.9	39.6
<b>Rush Glen Lake</b>															
Dozer	79.0 LAeq	1	100	438309	259167	100	600	103	50	-35.6	-42.5	-7.3	-42.9	36.1	
HGV Movements (Main Access)	41.5 LAeq	10	-	438850	259060	104	225			-27.1	-31.8	0.0	-31.8	36.7	
HGV Movements (Lake)	37.4 LAeq	10	-	438665	259019	100	350	103	50	-30.9	-36.6	-5.0	-36.6	26.7	39.7

**Moving Point Sources**

Ref SWL	No. Veh per hour	Speed [km/h]	Dist to Centre of Haul Road	AOV	LAEq [dB]
106.1	10	25	225	70	41.5
106.1	10	25	350	25	35.1
106.1	10	25	500	40	35.6
106.1	10	25	500	60	37.4

Note: Mitigation Provided by Existing Quarry Face to North

**Bishops Bowl Fishery  
Calculated Noise Levels from Reprofiling Operations**

14-Oct-2019

Receptor: Walworth Farm  
Height 109 m  
Grid Ref: 438529 X 258661 Y

Uses BS5228

**Predicted Freefield Noise Levels**

	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]	Total LAeq [dB]
				X	Y					Hard	Soft				
<b>Greenhill Lake</b>															
Dozer	79.0 LAeq	1	100	438541	258844	100	180	114	150	-25.1	-29.4	-14.8	-39.9	39.1	
HGV Movements (Main Access)	34.0 LAeq	10	-	438726	259069	104	450	114	420	-33.1	-39.3	-13.2	-46.2	14.6	
HGV Movements (Lake)	36.6 LAeq	10	-	438645	258941	100	300	114	270	-29.5	-34.9	-13.9	-43.5	17.3	39.1
<b>Belles Lake</b>															
Dozer	79.0 LAeq	1	100	438396	258964	100	330	114	300	-30.4	-36.0	-13.8	-44.2	34.8	
HGV Movements (Main Access)	34.0 LAeq	10	-	438726	259069	104	450	114	420	-33.1	-39.3	-13.2	-46.2	14.6	
HGV Movements (Lake)	39.6 LAeq	10	-	438645	258941	100	300	114	270	-29.5	-34.9	-13.9	-43.5	20.3	35.0
<b>Rush Glen Lake</b>															
Dozer	79.0 LAeq	1	100	438227	259179	100	600	114	570	-35.6	-42.5	-13.3	-48.8	30.2	
HGV Movements (Main Access)	34.0 LAeq	10	-	438726	259069	104	450	114	420	-33.1	-39.3	-13.2	-46.2	14.6	
HGV Movements (Lake)	40.5 LAeq	10	-	438645	258941	100	300	114	270	-29.5	-34.9	-13.9	-43.5	21.2	30.8

**Moving Point Sources**

Ref SWL	No. Veh per hour	Speed [km/h]	Dist to Centre of Haul Road	AOV	LAEq [dB]
106.1	10	25	450	25	34.0
106.1	10	25	300	30	36.6
106.1	10	25	300	60	39.6
106.1	10	25	300	75	40.5

Note: Mitigation Provided by Farm Buildings at Walworth Farm

**Bishops Bowl Fishery**  
**Calculated Noise Levels from Reprofitting Operations**

14-Oct-2019

Receptor: Model Farm  
 Height 120 m  
 Grid Ref: 437785 X 259522 Y  
 Uses BS5228

**Predicted Freefield Noise Levels**

	Ref Level @10m	No.	% On Time	Grid Reference X	Grid Reference Y	Source Ht	Dist S-R	Barrier Ht	Dist S-B	Distance Attenuation			Total LAeq [dB]
										Hard	Soft	Max Attenuation	
<b>Greenhill Lake</b>													
Dozer	79.0 LAeq	1	100	438424	258976	100	840	103	50	-38.5	-46.1	-7.7	32.8
HGV Movements (Main Access)	26.6 LAeq	10	-	438698	259040	104	1000	103	50	-40.0	-48.0	-2.2	16.4
HGV Movements (Lake)	28.8 LAeq	10	-	438507	258986	100	900	103	50	-39.1	-46.9	-7.8	13.2
<b>Belles Lake</b>													
Dozer	79.0 LAeq	1	100	438258	259079	100	650			-36.3	-43.3	0.0	35.7
HGV Movements (Main Access)	26.6 LAeq	10	-	438698	259040	104	1000			-40.0	-48.0	0.0	18.6
HGV Movements (Lake)	31.1 LAeq	10	-	438292	259043	100	700			-36.9	-44.1	0.0	23.9
<b>Rush Glen Lake</b>													
Dozer	79.0 LAeq	1	100	438060	259268	100	375			-31.5	-37.4	0.0	41.6
HGV Movements (Main Access)	26.6 LAeq	10	-	438698	259040	104	1000			-40.0	-48.0	0.0	18.6
HGV Movements (Lake)	34.8 LAeq	10	-	438130	259234	100	450			-33.1	-39.3	0.0	28.5

**Moving Point Sources**

Ref SWL	No. Veh per hour	Speed [km/h]	Dist to Centre of Haul Road	AOV	LAeq [dB]
106.1	10	25	1000	10	26.6
106.1	10	25	900	15	28.8
106.1	10	25	700	20	31.1
106.1	10	25	450	30	34.8

**Bishops Bowl Fishery  
Calculated Noise Levels from Reprofitting Operations**

14-Oct-2019

Receptor: New Residential Development to East of B4451  
Height 98 m  
Grid Ref: 439031 X 258972 Y

Uses BS5228

**Predicted Freefield Noise Levels**

	Ref Level @10m	No.	% On Time	Grid Reference X Y	Source Ht	Dist S-R	Barrier Ht	Dist S-B	Distance Attenuation Hard Soft	Barrier Attenuation	Max Attenuation	L <sub>Aeq</sub> [dB]	Total L <sub>Aeq</sub> [dB]
<b>Greenhill Lake</b>													
Dozer	79.0	L <sub>Aeq</sub>	1	100	438715 258964	100	315	315	-30.0 -35.5	0.0	-35.5	43.5	46.5
HGV Movements (Main Access)	46.1	L <sub>Aeq</sub>	10	-	439024 259073	104	100	100	-20.0 -23.0	0.0	-23.0	43.1	46.5
HGV Movements (Lake)	36.4	L <sub>Aeq</sub>	10	-	438715 258964	100	315	315	-30.0 -35.5	0.0	-35.5	30.9	46.5
<b>Belles Lake</b>													
Dozer	79.0	L <sub>Aeq</sub>	1	100	438449 258970	100	580	580	-35.3 -42.1	0.0	-42.1	36.9	44.1
HGV Movements (Main Access)	46.1	L <sub>Aeq</sub>	10	-	439024 259073	104	100	100	-20.0 -23.0	0.0	-23.0	43.1	44.1
HGV Movements (Lake)	31.6	L <sub>Aeq</sub>	10	-	438715 258964	100	315	315	-30.0 -35.5	0.0	-35.5	26.1	44.1
<b>Rush Glen Lake</b>													
Dozer	79.0	L <sub>Aeq</sub>	1	100	438265 259058	100	770	770	-37.7 -45.2	0.0	-45.2	33.8	43.6
HGV Movements (Main Access)	46.1	L <sub>Aeq</sub>	10	-	439024 259073	104	100	100	-20.0 -23.0	0.0	-23.0	43.1	43.6
HGV Movements (Lake)	24.6	L <sub>Aeq</sub>	10	-	438715 258964	100	3158	3158	-50.0 -60.5	0.0	-60.5	14.1	43.6

**Moving Point Sources**

Ref SWL	No. Veh per hour	Speed [km/h]	Dist to Centre of Haul Road	AOV	L <sub>Aeq</sub> [dB]
106.1	10	25	100	90	46.1
106.1	10	25	315	30	36.4
106.1	10	25	315	10	31.6
106.1	10	25	3158	20	24.6