

## INTRODUCTION

10.1 This chapter considers the noise implications of the proposed continuation of mineral extraction and restoration through the importation of wastes at Wingmoor Farm Integrated Waste Management Facility (IWWMF). This chapter of the ES has been prepared by the Walker Beak Mason Partnership, which has been abbreviated to WBM in subsequent paragraphs. In order to appreciate some of the terms, Appendix 10.1 describes the noise units that are referred to in this chapter.

10.2 To consider the environmental noise implications of the proposed development it is necessary to:

- obtain data about the existing and baseline noise climate;
- propose noise limits appropriate to the location and the times of the day during which the various parts of the facility would operate;
- model the proposals by way of site noise calculations; and
- test the ability of the site plant associated with the IWWMF to conform with the proposed noise limits; before making mitigation recommendations aimed at achieving the noise limits.

10.3 Various documents such as MPS 2 Annex 2 Noise, PPG 24, BS 5228, BS 4142, CRTN for traffic noise and others will be relevant to aspects of the proposals. Discussions have been held with the relevant environmental health department to inform the baseline data collection and regard has been had to relevant local government guidance or other documents referred to by the local authorities that may affect the noise assessment.

10.4 Baseline noise measurements have been obtained near to dwellings by way of sample attended measurements so as to describe the noise climate over the main working periods, which will remain unchanged for mineral extraction and landfill activities as Monday to Friday 07:00 to 18:00 and Saturday 07:00 to 13:00. Operations within the Materials Recovery Facility (MRF) will be 06.30 until 21:00 Monday to Friday. Night time baseline data has also been obtained to allow for continually running plant, such as landfill gas flares / gas engines, to be assessed during this night time period. Longer term unattended noise monitoring for weekdays and a weekend has been completed, making use of suitable weather conditions, to gather additional data.

10.5 The baseline noise data has been used to suggest noise limits at dwellings, taking into account relevant guidance and the currently permitted operations.

10.6 Noise measurements near to operating plant and equipment on site have allowed the noise levels generated at source to be determined. Where plant is not currently operating or cannot be measured on site, typical or representative plant data have been used.

10.7 Calculated site noise levels for the existing and proposed site operations have been made and used to test whether or not the noise levels arising from the development will meet the suggested site noise limits. As part of this process it has been necessary to identify the requirements for mitigation where the suggested site noise limits are exceeded. Mitigation measures have been included in the scheme where the evidence suggests they would be of value.

10.8 The assessment takes into account the potential noise impacts of changes to site traffic flows, based on traffic data set out in the transport assessment. Consideration of road traffic noise on the wider road network has been considered by way of calculation. Noise measurements adjacent to roads other than Stoke Orchard Road were not made.

10.9 Ground-borne vibration from machinery on mineral and landfill sites is rarely perceptible outside the boundary of these sites. No other operations are proposed, such as piling, which could generate ground-borne vibration that would be perceptible at the nearest dwellings. Therefore no detailed assessment for ground-borne vibration has been undertaken.

10.10 Limitations for the noise assessment undertaken are primarily concerned with the lack of plant noise data for some operations that are permitted for the site but were not operating during the period when baseline measurements and plant noise data were obtained, during September and October 2008. The main plant items not in use were:

- the sand and gravel processing plant, and
- the materials recovery facility (under construction).

10.11 The noise output for the sand and gravel processing plant has been based on measurements for many similar plants obtained by WBM. The noise output for the materials recovery facility (MRF) is based on measurements made by others at another site operated by Grundon Waste Management Limited, at Beenham near

Reading in Berkshire. The measurements were contained in a noise assessment submitted as part of the planning application for the MRF permitted in 2006 (Ref: T/05/4037/1317/Ful). This basis for the noise output was selected as the facility at Beenham has the same function as the MRF at the Wingmoor Farm site.

10.12 Assumptions about plant noise data have been made, as summarised above, and will be detailed in the relevant section of this chapter.

## STUDY AREA

10.13 The baseline noise measurements have been made for dwellings in each direction, generally those within about 300 metres of the site boundary. For the most part these are isolated dwellings but the study area includes dwellings in the nearest part of Bishop's Cleeve, at the junction of Stoke Orchard Road and Stoke Road. The selected locations are detailed in the Receiving Environment section of this chapter and shown on Figure 10.1.

10.14 The baseline noise measurements describe the existing noise climate and are used for consideration of noise arising from activity within the site boundary as outlined in Chapter 3 of this ES. The study area for road traffic noise is on Stoke Orchard Road to the east of the site and at two locations on the A435 in the vicinity of dwellings in Bishops Cleeve. Haydon has not been considered separately for road traffic noise since this dwelling is situated adjacent to Stoke Orchard Road between the two site entrances and will be subject to less passing site traffic than dwellings further east that will be subject to all the traffic to and from the site.

## METHODOLOGY

10.15 The baseline noise conditions were determined by a series of noise surveys in the vicinity of the site. Attended sample noise surveys were carried out for daytime and night-time periods during which the noise sources responsible for the existing noise climate were noted. Approaches were made to residents of dwellings in order to install sound level meters in secure locations for longer term, unattended noise monitoring. Details of the meters used and calibration are set out in Appendix 10.2. The details of the noise surveys are summarised in this chapter and are set out in Appendices 10.3 and 10.4.

10.16 Noise from the site, when IWWMF activities are taking place, is calculated for this assessment using

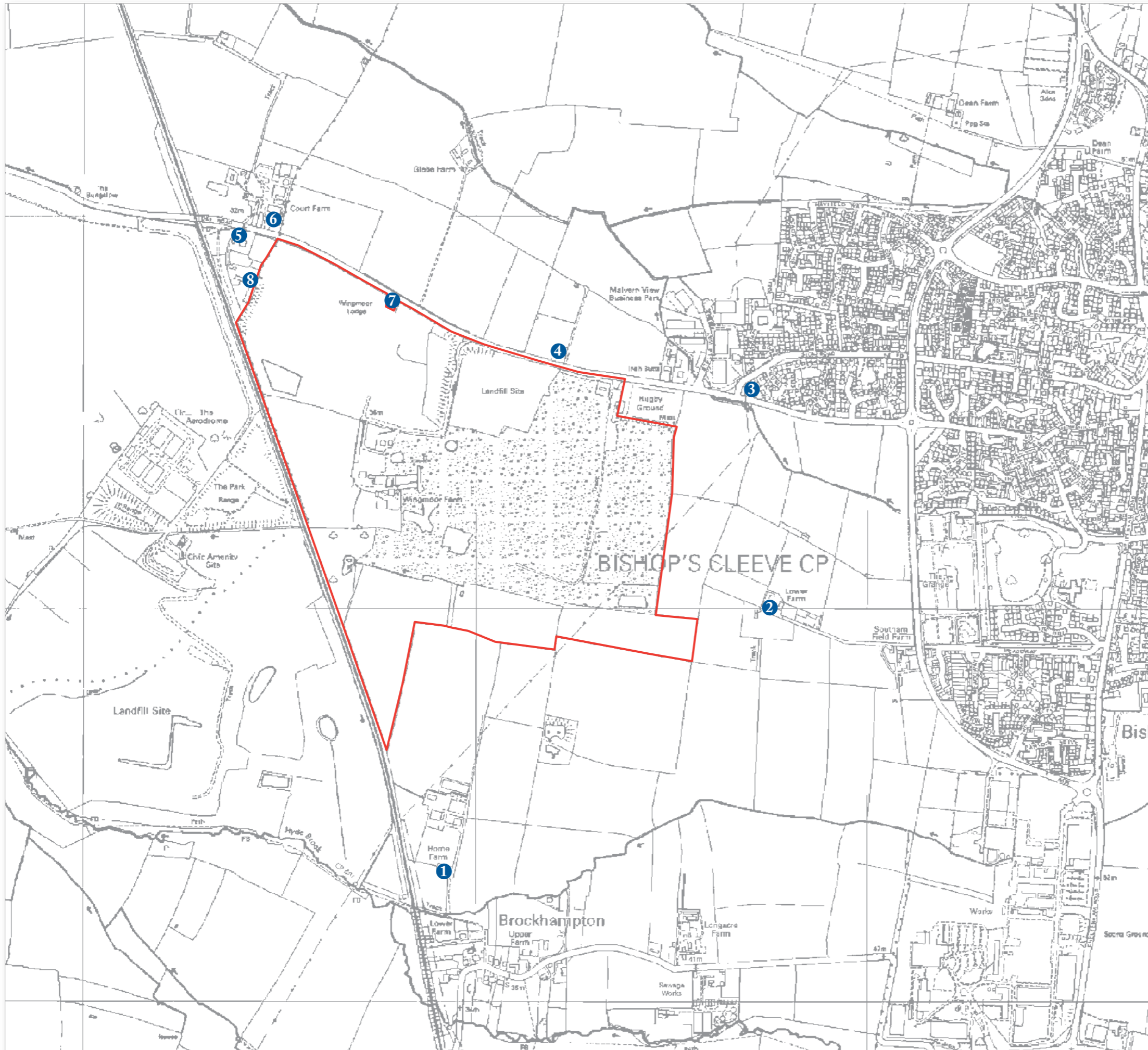


Figure 10.1 : Noise Monitoring Locations

- ① Home Farm
- ② Lower Farm
- ③ Stoke Road
- ④ Haydon
- ⑤ Pussy Willows
- ⑥ Court Farm
- ⑦ Wingmoor Lodge
- ⑧ Log Cabin



Source. Walker Beak Mason

Scale. 1:10 000

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BS5228-1: 2009 “Code of practice for noise and vibration control on construction and open sites – Part 1: Noise” which on 1 January 2009 came into effect and supersedes BS 5228-1 1997 and other parts which are withdrawn. The calculation methods, for any plant which is stationary or quasi-stationary, are those set out in BS5228-1: 2009 Annex F (informative), and are the “Method for activity LAeq” and the “Method for plant sound power level” described in sections F.2.2 and F.2.3 respectively. The calculation methods take account of the separation distances between each specified noise source and each specified receiver location, and the reduction in noise level due to distance is calculated assuming hemispherical propagation, as incorporated within the BS5228-1:2009 calculation methods.

10.17 The calculation method of dB LAeq, T noise level for the contribution of vehicles on the site access roads and internal haul routes is that set out in BS5228-1: 2009 Annex F, and is the “Method for mobile plant using a regular well-defined route (e.g. haul roads)” described in section F.2.5. Vehicle flows on the IWWMF site access roads and internal haul routes have been calculated assuming rates consistent with the waste inputs and removal of materials from the IWWMF site.

10.18 Ground absorption due to any soft ground between the noise sources and receivers has been calculated using the technique set out in BS5228-1: 2009 Annex F, which takes into account the height of noise sources and receivers above the ground. The method of assessing barrier attenuation, where existing landforms or proposed screening would exist, is that attributed to Maekawa as used also in BS5228-1: 2009 and various other Government published documents.

10.19 The effects of ground absorption are not used in the calculations if barrier attenuation has been assessed and offers a higher attenuation. The landform considered for potential barrier attenuation is the existing restored landform between the continuing operations and two isolated dwellings adjacent to Stoke Orchard Road and to a lesser extent for dwellings near the railway line and at the western edge of Stoke Orchard. Perimeter bunding has been considered for waste disposal activities in the north western corner of the site in the vicinity of dwellings adjacent to Stoke Orchard Road and near to the railway line.

10.20 The calculation techniques outlined above have been expanded from one octave band calculations so that one-third octave band data can be used in the calculations to yield the overall one-third octave band noise spectra for site noise at dwellings for consideration. The calculated

site noise levels without mitigation measures are presented in Appendix 10.6. The calculated site noise levels with mitigation measures are presented in Appendix 10.7. The calculated site noise levels for temporary works are presented in Appendix 10.8. Summary site noise calculation sheets for the selected receiver locations are included in Appendix 10.9. More details relating to the site noise calculations are included in Appendix 10.12.

10.21 The importation of waste to the IWWMF by road and the removal of the material from the site give rise to heavy goods vehicle (HGV) traffic on the existing road network, with associated potential road traffic noise impacts. Ground borne vibration from HGVs on highways is sometimes cited as a potential environmental impact but in practice it is only perceptible within a few metres of a very bad pothole and imperceptible on roads complying with relevant design standards. Airborne noise from HGV exhausts can sometimes be perceived as vibration by causing loose windows to rattle and in rare cases for suspended floors to vibrate. These effects are perceptible up to about 25 metres from the road.

10.22 Research by the Transport Research Laboratory has found that people’s reaction to vibration arising from HGV movements is very similar to their reaction to HGV noise but is less marked. In other words, people would complain more about the effect of vehicle noise than about any associated vibration. As such, it is usual to disregard vehicle induced vibration and concentrate on vehicle noise. Provided any noise increase is acceptable, the corresponding change in vibration would also be acceptable.

10.23 Guidance from the Government on highway design advises that changes in noise level of less than 1 dB(A) are not significant. In some circumstances, changes of up to 3 dB(A) can also be insignificant when the change is gradual.

10.24 The noise limits against which the site noise levels are assessed are based on the guidance in MPS 2 Annex 2 Noise. Where the noise limits for routine operations during the daytime are met, the impact is regarded as low.

10.25 Mitigation measures which should be adopted in order to yield acceptable noise levels for daytime and night-time operations, where the evidence suggests they would be of value, are recommended in this chapter.

## CONSULTATION

10.26 The Environmental Health Officer (EHO) at Tewkesbury Borough Council was consulted on 15 September 2008. WBM involvement was outlined and the noise monitoring locations proposed along with the approach to gathering baseline noise data.

10.27 It was agreed that existing residential property should be considered in the noise assessment. The Regional Spatial Strategy (RSS) and the potential for new dwellings in the vicinity of Bishop’s Cleeve were also discussed. The RSS allocation to the north of Bishop’s Cleeve is not anticipated to be any closer than existing residential properties. The allocation to the north of Cheltenham is also anticipated not to be any closer than the residential properties on the northern side of Swindon Village.

10.28 The baseline noise measurements and assessment followed the discussion with the EHO and consider existing dwellings but not potential future dwellings that might be constructed in the area around Bishop’s Cleeve since they will be further from the site than existing dwellings which are considered in this assessment.

## IMPLICATIONS OF POLICY AND GUIDANCE

10.29 Paragraphs 5.137 to 5.139 in the Gloucestershire Waste Local Plan 2002 to 2012 set out guidance on Noise and Vibration. Paragraph 5.137 states that the “night-time nominal limit should be 42 dB LAeq,1h, (free field)” with night-time normally defined as 19:00 to 07:00. Paragraph 5.138 states “A difference of around 5 dB is of marginal significance but when it approaches 10 dB or higher above background noise then complaints are likely.” For this assessment, suggested noise limits are based on ‘background plus 5 dB(A)’ for night-time and ‘background plus 10 dB(A)’ for daytime” operations. Paragraph 5.139 states “The aim should be to ensure that complaints are unlikely from the proposed facility” which could be taken to imply more stringent limits. For the continuation of mineral extraction and restoration it is considered that the suggested noise limits in this chapter are appropriate.

10.30 Chapter 9 of Gloucestershire Minerals Local Plan 1997 to 2006 is headed Development Control Criteria and section 9.2 is headed Control of Environmental Impacts of Mineral Development. Paragraph 9.2.2 relates to noise and Policy No. DC 1 for the mitigation of environmental impacts. Paragraph 7 (ii) in Appendix J “Supporting information for proposed mineral

development applications” of the Gloucestershire Minerals Local Plan mentions noise as one of three Environmental Effects. The paragraph starts “Mineral development can give rise to considerable noise which will need to be assessed and mitigated”. The paragraph ends “PPG 24 “Planning and Noise” and MPG 11 “The Control of Noise at Surface Mineral Workings” provides advice on this matter.” MPG 11 (1993) and the replacement document MPS 2 (2005), which is the up to date guidance from the Government on noise, are mentioned later in this section.

10.31 Policy EVT 3 of the Tewkesbury Borough Local Plan to 2011, dated March 2006, deals with the subject of noise pollution. The policy wording is given along with a reasoned justification which states “Excessive noise levels can affect the quality of life and, ultimately, people’s health. The minimum acceptable daytime standard set by the World Health Organisation during daytime (taken by the Borough Council to be 0700 to 2200) is LAeq (60 minutes) 50dB and at night time, LAeq (5 minutes) 35 dB.” For the continuation of mineral extraction and restoration it is considered that the suggested noise limits in this chapter are appropriate, some of which are up to 55 dB LAeq,1 hour,free field at dwellings for the daytime period.

10.32 The World Health Organisation (WHO) published Guidelines for Community Noise in 1999. It is stated in the Executive Summary of the WHO document, under the headings “Guideline values” and “Specific environments” that “To protect the majority of people from being seriously annoyed during the daytime, the outdoor sound level from steady continuous noise should not exceed 55 dB LAeq on balconies, terraces, and in outdoor living areas. To protect the majority of people from being moderately annoyed during the daytime, the outdoor sound level should not exceed 50dB LAeq. Where it is practical and feasible, the lower outdoor sound level should be considered the maximum desirable sound level for new development.”

10.33 In the same section of the WHO document it is stated that “At night-time, outside sound levels about 1 metre from facades of living spaces should not exceed 45 dB LAeq, so that people may sleep with bedroom windows open.” A façade level of 45 dB LAeq, T would normally equate to a free field noise level of 42 dB LAeq, T outside a dwelling, for a façade facing towards a particular noise source.

10.34 Table 1 “Guideline values for community noise in specific environments” in the same section of the WHO document states a value of 60 dB LAmax, fast (dB) outside bedrooms, on the same line in the table as the value of 45 dB LAeq, T expressed over a time base of 8 hours for night-time. These values of 45 dB LAeq, 8 hours and 60 dB LAmax, fast outside bedrooms are said in the text of the document to

correspond to values of 30 dB  $L_{Aeq,8\text{ hours}}$  and 45 dB  $L_{Amax,fast}$  inside bedrooms at night.

10.35 The primary guidance on the planning aspects of noise is set out in Planning Policy Guidance Note 24 Planning and Noise (PPG 24) issued by the Department of the Environment in September 1994. PPG 24 outlines the considerations to be taken into account in determining planning applications both for noise-sensitive developments and for those activities that will generate noise.

10.36 PPG 24 has attempted to remove some of the confusion about time periods which have existed in acoustics for various noise sources and has recommended a consistent time period of 07:00 to 23:00 as defining daytime and 23:00 to 07:00 as defining night time. At present, some other documents have not been revised to take account of this move towards consistency but PPG 24 offers conversion factors enabling approved methods of calculation to be converted from other time periods into the 'standard' time periods.

10.37 For noise from industrial and commercial developments, it is stated in PPG 24, Annex 3, paragraph 19 that: *"The likelihood of complaints concerning noise from an industrial development can be assessed, where the Standard is appropriate, using guidance in BS 4142: 1990"*. British Standard (BS) 4142: 1997 *"Method for rating industrial noise affecting mixed residential and industrial areas"* came into effect on 15th September 1997. It superseded BS 4142: 1990, which was withdrawn. BS 4142: 1997 describes a method of determining the level of a noise of an industrial nature, together with procedures for assessing whether the noise in question is likely to give rise to complaints from persons living in the vicinity.

10.38 The standard compares the level difference between existing background noise and the noise from an industrial development. The BS 4142 standard states that: *"The greater this difference the greater the likelihood of complaints. A difference of around +10 dB or more indicates that complaints are likely. A difference of around +5 dB is of marginal significance. If the rating level is more than 10 dB below the measured background noise level then this is a positive indication that complaints are unlikely."* Where necessary, an appropriate allowance for any impulsive or tonal characteristics present in the industrial noise source is also taken into account. Using the guidance in BS 4142: 1997, a penalty of + 5 dB(A) would be added to the calculated site noise levels to arrive at a rating level for site noise if the noise contains a distinguishable, discrete, continuous note (whine, hiss, screech, hum etc); the noise contains distinct impulses (bangs, clicks, clatters, or thumps); the noise is irregular enough to attract attention.

10.39 Where possible, the background noise level is measured at the assessment location. Where this is not possible, for example if access is restricted, measurements are made at a location taken to be equivalent in terms of the prevailing noise climate. Measurements are made at a time when the proposed specific noise source will be operating. The rating level of the noise source under investigation is determined by the measurement or calculation of the specific noise level, along with an adjustment for the characteristic of the noise if necessary. It is stated in the Scope of BS 4142 that *"The method is not suitable for assessing the noise measured inside buildings or when the background and rating noise levels are both very low."* A note states *"For the purposes of this standard, background noise levels below about 30 dB and rating levels below about 35 dB are considered to be very low."*

10.40 It is stated in PPG 24, Annex 3, paragraph 19 that *"In addition, general guidance on acceptable noise levels within buildings can be found in BS8233: 1987, and guidance on the control of noise from surface mineral workings can be found in MPG 11."* Following extensive consultation and research, the Department of the Environment prepared guidelines on noise from mineral workings for Mineral Planning Authorities (MPAs) and Minerals Operators. This advice is contained in Minerals Planning Guidance Note 11 (MPG 11), *"The Control of Noise at Surface Mineral Workings"* dated April 1993.

10.41 Current advice from the Government is set out in Minerals Policy Statement 2 (MPS 2) - Controlling and Mitigating the Environmental Effects of Minerals Extraction in England, issued by the Office of the Deputy Prime Minister, specifically Annex 2: Noise, which in March 2005 replaced MPG 11. Paragraph 2.4 of MPS 2 Annex 2: Noise starts *"Annex 2 states the planning considerations the Government expects to be applied to noise emissions from surface mineral operations."* Paragraphs 2.18 to 2.21 inclusive of MPS 2 Annex 2: Noise are reproduced below.

10.42 *"2.18 Where appropriate, planning conditions should be used to ensure that mineral operations are carried out in such a way that noise emissions are minimised at the source and thereby controlled to acceptable levels. The layout and plant location, the sequencing of operations and the hours of working can have significant effect on the level of noise emissions and their impact on sensitive receptors. Enclosure of a noisy plant and the use of acoustic screening and baffle mounds can reduce noise emissions as well as having other benefits. It may be appropriate to incorporate a buffer zone around the operations. This is of particular significance in controlling the encroachment of other development towards an existing mineral working. Where certain species may be*

*significantly affected by noise (e.g. breeding birds), it may be appropriate to restrict certain mineral activities at sensitive times. Guidance on noise reduction is given in Appendix 2B."*

10.43 *"2.19 Planning conditions should be used to apply absolute controls on noise emissions with limits normally being set at particular noise-sensitive properties (the terms used are defined in Appendix 2A). This enables the effect of noise to be related most directly to its impact on local people. In some circumstances, however, it might be more appropriate to set the limits at the site boundary or some other point. Subject to a maximum of 55dB(A)  $L_{Aeq,1h}$  (free field), MPAs should aim to establish a noise limit at the noise-sensitive property that does not exceed the background level by more than 10dB(A). It is recognised, however, that this will in many circumstances, be difficult to achieve 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 (0700-1900) and should not exceed 55dB(A)  $L_{Aeq,1h}$  (free field). Evening (1900-2200) limits should not exceed background level by more than 10dB(A) and night-time limits should not exceed 42dB(A)  $L_{Aeq,1h}$  (free field) at noise-sensitive dwellings. Where tonal noise contributes significantly to the total site noise, it may be appropriate to set specific limits for this element. Peak or impulsive noise, which may include some reversing beepers, may also require separate limits that are independent of background noise — e.g.  $L_{max}$  in specific octave or third-octave bands — and should not be allowed to occur regularly at night."*

10.44 *"2.20 All mineral operations will have some particularly noisy short-term activities that cannot meet the limits set for normal operations. Examples include soil-stripping, the construction and removal of baffle mounds, soil storage mounds and spoil heaps, construction of new permanent landforms and aspects of site road construction and maintenance. However, these activities can bring longer-term environmental benefits. Increased temporary daytime noise limits of up to 70dB(A)  $L_{Aeq,1h}$  (free field) for periods of up to 8 weeks in a year at specified noise-sensitive properties should be considered to facilitate essential site preparation and restoration work and construction of baffle mounds where it is clear that this will bring longer-term environmental benefits to the site or its environs. Where work is likely to take longer than 8 weeks, a lower limit over a longer period should be considered. In some wholly exceptional cases, where there is no viable alternative, a higher limit for a very limited period may be appropriate in order to attain the environmental benefits. Within this framework, the 70 dB(A)  $L_{Aeq,1h}$  (free field) limit referred to above should be regarded as the normal maximum. LAs should look to operators to make every effort to deliver temporary works at a lower level of noise impact. Operators should seek ways of minimising noisier activities and the noise emissions from them when designing the layout*

*and sequencing of temporary operations, and should liaise with local residents prior to such operations taking place."*

10.45 *"2.21 Conditions on planning permissions should identify the noise-sensitive properties at which the noise limits are set, including the relative sensitivity to noise, which may result in different limits for different types of property, and establish a scheme of monitoring that identifies how, where and when noise is to be measured, who should be responsible and how the results will be assessed and used. Alternatively, a condition should be attached requiring a scheme of compliance noise monitoring to be submitted to and approved by the MPA. Where necessary, the MPA should seek to use Agreements under Section 106 of the Town and Country Planning Act 1990, as amended, to ensure access to noise-sensitive sites for monitoring purposes. Conditions should also be used to secure effective procedures for dealing with complaints. Planning obligations can help to ensure continued effective liaison with the local community and others affected by noise emissions."*

10.46 For the continued use of the IWWMF and associated activities, the WBM suggested site noise limits for daytime are set at a level of 10 dB  $L_{Aeq,1\text{ hour, free-field}}$  above the average background noise level measured for daytime at the adjoining residential premises, with an upper limit of 55 dB  $L_{Aeq,1\text{ hour, free field}}$ . This is consistent with the advice contained in MPS 2 for surface mineral operations. The WBM suggested site noise limits for daytime at the dwellings nearest to the IWWMF site are in the range 49 to 55 dB  $L_{Aeq,1\text{ hour, free field}}$ , for Monday to Friday 07:00 to 18:00 and Saturday 07:00 to 13:00.

10.47 The WBM suggested site noise limits for night time are set at a noise level of 5 dB  $L_{Aeq,1\text{ hour, free-field}}$  above the relevant average background noise level measured for the quietest part of the night-time period at the adjoining residential premises, with an upper limit of 42 dB  $L_{Aeq,1\text{ hour, free field}}$ . The WBM approach is based on *"A difference of around +5 dB is of marginal significance"* as stated in BS 4142: 1997, subject to a nominal upper limit for night-time noise from the site of 42 dB  $L_{Aeq,1\text{ hour, free field}}$  as set out in MPS 2 and the Gloucestershire Waste Local Plan. The WBM suggested site noise limits for night-time at the dwellings nearest to the IWWMF site, and in particular the relocated gas engine compound, are around 35 dB  $L_{Aeq,1\text{ hour, free field}}$ .

10.48 If it is considered necessary by the planning authority to impose site noise limits at dwellings for Sundays it is recommended that these are set at the night-time suggested limits, since the only operations or vehicle movements on the IWWMF proposed for Sundays other than in emergencies are the running of the gas engine

compound and the possibility of one or two Air Pollution Control (APC) residue deliveries for offloading at the ash conditioning plant. In order to simplify the position as much as possible, the relationship of the recommended site noise limits to the background noise levels for daytime and the background noise levels for night-time are shown in Appendix 10.5. The recommended IWMF site noise limits are summarised below in Table 10.1 for Daytime and Table 10.2 for Night-time and Sundays, expressed in terms of dB  $L_{Aeq, 1 \text{ hour, free-field}}$ .

10.49 Planning Permission, reference T/04/8446/0118/Ful dated 29 March 2004, for the landfill gas engine and flare and associated plant contains conditions on

noise. Between the hours of 18:00 and 07:00 the noise levels arising from the development shall not exceed 42 dB  $L_{Aeq, 1 \text{ hour, free field}}$  at noise sensitive properties listed in the permission. The WBM suggested site noise limits for night-time noise from the IWMF are well below the nominal night-time limit of 42 dB  $L_{Aeq, T}$  expressed over a time base of 8 hours for night-time in the WHO document in Table 1 “Guideline values for community noise in specific environments”.

**Table 10.1: Suggested Site Noise Limits - Daytime**

Location	Average Daytime Background Noise Level, dB $L_{A90, T}$	Suggested Daytime IWMF Site Noise Limit dB $L_{Aeq, 1 \text{ hour, free field}}$
Home Farm	39	49
Lower Farm	41 (43 unattended)	53*
Stoke Road	50	55
Haydon	46	55
Pussy Willows / Log Cabin	45	55
Court Farm	42	52
Wingmoor Lodge	44 (43 unattended)	53*

\*Note: based on the average daytime background noise levels for the unattended measurements

\*\*Note: the sample measurements made in the vicinity of the Log Cabin were averaged with the sample measurements made in the vicinity of Pussy Willows; both dwellings are associated with the cattery.

**Table 10.2: Suggested Site Noise Limits – Night-time and Sundays**

Location	Lowest Night-time Background Noise Level, dB $L_{A90, T}$	Suggested Night-time & Sundays Site Noise Limit dB $L_{Aeq, 1 \text{ hour, free field}}$
Home Farm	27	32
Lower Farm	28 (30 unattended*)	35**
Stoke Road	32	37
Haydon	30	35
Pussy Willows / Log Cabin	31	36
Court Farm	31	36
Wingmoor Lodge	29 (29 unattended*)	34**

\*Note: the lowest night-time background noise levels for the unattended measurements at Lower Farm and Wingmoor Lodge are the average background noise levels during the quietest part of the night-time period between 1 am and 5 am, rather than the absolute minimum background noise level measured at these locations for the weekdays and weekend period.

\*\*Note: the suggested night-time noise limit for Lower Farm and Wingmoor Lodge are based on 5 dB(A) above the average background noise level value given in brackets in the second column.

**Table 10.3: Summary of Days, Dates and Time Periods of the Noise Surveys**

Date of Survey	Hours Undertaken	Details of Noise Survey Measurements
Thursday 18 September 2008	~10:30 to ~16:15	Daytime samples near IWMF site
Thursday 25 September 2008	~11:30 to ~17:30	Daytime samples near IWMF site
Friday 26 September 2008	~09:15 to ~12:15	Daytime samples near IWMF site
Monday 29 September 2008	~11:30 to ~17:00	Daytime samples near IWMF site
Thursday 25 to 26 September 2008	~22:00 to 02:00	Night-time samples near IWMF site
Thursday 25 to 29 September 2008	~11:30 Thursday to ~16:00 Monday	Continuous monitoring at Wingmoor Lodge
Thursday 25 to 29 September 2008	~13:15 Thursday to ~16:30 Monday	Continuous monitoring at Lower Farm

## THE RECEIVING ENVIRONMENT

10.50 An initial site visit was made by WBM on 18 June 2008. On the same day the opportunity was taken to drive round part of the area to view some of the nearest dwellings to the site and to carry out limited listening tests to identify the principal sources contributing to the noise climate of the area. The approach to noise monitoring, including potential assessment locations, was discussed with the Environmental Health Officer (EHO) at Tewkesbury Borough Council on 15 September 2008. Details of the existing noise climate were obtained by way of attended sample measurements during daytime and night-time periods at eight locations and from longer term unattended measurement exercises for weekdays and a weekend at two locations near to dwellings.

10.51 Attended sample noise surveys were carried out in the area of the IWMF site during four daytime and one night-time period on weekdays in September 2008 using Norsonic 116 and Norsonic 140 sound level meters. Longer term unattended noise monitoring took place at two dwellings during September 2008 using Norsonic 116 sound level meters that enabled continuous noise monitoring. Details of the meters and calibration are set out in Appendix 10.2 and a summary of the days, dates and time periods of the noise surveys is set out in Table 10.3 for the daytime and night-time samples and the longer term measurements.

10.52 The measurement heights were between 1.2 metres and 1.5 metres above local ground level, unless otherwise specified, and windshields were used throughout the surveys. The measurement locations were free-field. The longer term noise measurement locations, described in Appendix 10.10, have been selected to be representative of the dwellings nearest to the IWMF site and are shown on Figure 10.1. Eight noise measurement locations were selected for attended weekday daytime

**Table 10.4: Dwellings Corresponding to Noise Measurement Locations**

No.	Location	Comment
1	Home Farm	Northernmost dwelling at Brockhampton
2	Lower Farm	Closest dwelling to east of the site
3	Stoke Road	Dwellings by junction with Stoke Orchard Road
4	Haydon	Bungalow on north side of Stoke Orchard Road
5	Pussy Willows	Dwelling on south side of Stoke Orchard Road
6	Court Farm	Dwelling associated with farm buildings
7	Wingmoor Lodge	Currently owned by Grundon
8	Log Cabin	Associated with Pussy Willows Cattery

samples, with measurements carried out at six locations for attended night-time samples. The nearest dwelling or group of dwellings, corresponding to the two longer term noise measurement locations and the sample measurement locations, are listed in Table 10.4.

10.53 In general, the area noise climate is affected by road traffic noise, aircraft movements and trains running on the line to the west of the site. Other noise sources noted at some locations at times were activity at the Grundon Waste Management site, activity at the Cory Environmental site to the west of the railway, activity at the industrial / commercial site adjacent to Stoke Orchard Road, local activity, birdsong and slight wind movement in trees. The survey dates and weather conditions during the surveys and the times of the measurements along with

the results of each survey are tabulated in Appendix 10.3. The weather conditions during the surveys are summarised in Table 10.5.

10.54 The measurements for the daytime periods and night-time periods were carried out under relatively calm weather conditions for the weekdays and weekend, with no significant contribution from wind generated noise.

10.55 The results comprise a total of sixty one, mainly 15 minute duration, attended sample surveys at locations around the site and continuous measurements over approximately four days at two dwellings, namely Lower Farm and Wingmoor Lodge.

10.56 The nearest noise sensitive properties to the IWWMF site are isolated dwellings within about 300 metres to the north, east and south of the site boundary, and dwellings in the nearest part of Bishop's Cleeve, at

the junction of Stoke Orchard Road and Stoke Road. The noise measurement locations, described in Appendix 10.10 and shown on Figure 10.1, have been selected to be representative of the dwellings nearest to the IWWMF. Potential noise sensitive locations are set out in a list in Appendix 10.11. It is considered dwellings adjacent to these locations or further away from the IWWMF would potentially be affected the same or less by noise arising from the IWWMF than the dwellings selected for assessment.

10.57 The arithmetic average of the existing background noise levels, dB  $L_{A90,T}$  and the logarithmic average of the existing dB  $L_{Aeq,T}$  noise levels are tabulated in Appendix 10.4 for the daytime periods (7 am to 7 pm) for the weekday samples, and for the weekdays and Saturday (7 am to 1 pm) for the unattended noise monitoring, and are reproduced in Table 10.6.

10.58 The averages of the measured weekday sample daytime background noise levels, dB  $L_{A90,T}$  range from 39 dB(A) at Home Farm to 50 dB(A) at Stoke Road. The average daytime background noise level for weekdays and Saturday morning was 43 dB  $L_{A90,T}$  for the unattended measurements at Lower Farm and Wingmoor Lodge. The averages of the measured weekday sample daytime ambient noise levels, dB  $L_{Aeq,T}$  range from 47 dB(A) at Lower Farm to 67 dB(A) at Stoke Road.

10.59 Table 10.1 is reproduced to show the relationship between the average daytime background noise levels and the suggested daytime site noise limits for the IWWMF.

### Notional Do Nothing Scenario

10.60 In the absence of the IWWMF the noise climate would continue to be affected by road, rail and air traffic movements, some of which could be expected to increase over time. The main effect for variations in future noise levels at receiver locations affected by noise from main roads will continue to be wind strength and direction. As an example, an easterly wind component would tend to increase A435 road traffic noise levels at Lower Farm and a westerly wind component would tend to decrease A435 road traffic noise levels at Lower Farm. Increasing wind strength would tend to increase wind movement in trees and bushes which would tend to increase background noise levels at receiver locations, particularly those well removed from major road traffic noise sources.

10.61 For the notional do nothing baseline scenario the first step in the process for the noise assessment is to identify the receiver locations / attended sample noise measurements where Grundon site noise was noted. The

tables in Appendix 10.3 summarise all of the attended sample daytime noise measurements from September 2008. From the site notes made at the same time as the measurements and presented in Appendix 10.3, references to site noise have been extracted and associated with each measurement. In many cases site noise was "not noted" and this is taken to infer that site noise was not audible.

10.62 For the average daytime background noise level, dB  $L_{A90,T}$  at each location the  $L_{A90,T}$  values used in the averages for the notional do nothing scenario were selected if site noise was "not noted", "barely audible", "in distance" or where "reversing alarms" were noted as it is considered that none of these would have affected the measured  $L_{A90,T}$  values. The average background noise levels from all the sample measurement data and then for the selected  $L_{A90,T}$  values for the do nothing scenario are summarised below in Table 10.7 for each location. It is not possible to undertake a similar exercise for the results from the installed sound level meters as no personnel were in attendance to make notes about the noise climate and whether site noise was audible.

10.63 For Home Farm, five of seven samples have been selected for the notional baseline average and the two  $L_{A90,T}$  values not included are within the range of  $L_{A90,T}$  values that have been selected. Since the average daytime background noise level for the notional do nothing is the same as the average presented in Table 10.1, the suggested site noise limit for this dwelling would not change from that presented in Table 10.1.

10.64 For Lower Farm, three of seven samples have been selected for the notional baseline average and the four  $L_{A90,T}$  values not included are the lowest values that

**Table 10.5: Weather Conditions During the Attended & Unattended Surveys**

Date of Survey	Hours Undertaken	Summary of Weather Conditions
Thursday 18 September 2008	~10:30 to ~ 16:15	Dry, clear & sunny, 18°C, 2 m/s north easterly breeze
Thursday 25 September 2008	~ 11:30 to ~ 17:30	Dry, cloudy, 16°C, 2 m/s north easterly breeze
Thursday 25 to 26 September 2008	~ 22:00 to 02:00	Dry, very light and variable wind, ~ 1m/s, clear
Friday 26 September 2008	~ 09:15 to ~ 12:15	Dry, 17°C, very light <1m/s northerly / variable wind
Saturday 27* September 2008	Day & Night	Dry, 17°C highest, wind ~ 1 m/s average, westerly
Sunday 28* September 2008	Day & Night	Dry, 17°C highest, wind 1 - 2 m/s south south easterly
Monday 29 September 2008	~ 11:30 to ~ 17:00	Dry, bright, 16°C, westerly breeze ~ 2m/s

\*Note: the weather conditions for the Saturday and Sunday are based on summary data from the on-site weather station since WBM were not present on site over the weekend period to observe and note weather conditions.

**Table 10.6: Summary of Noise Levels for Day Time Periods**

Location	Average Daytime Background Noise Level, dB $L_{A90,T}$	Average Daytime Ambient Noise Level, dB $L_{Aeq,T}$
Home Farm	39	48
Lower Farm	41 (43 unattended)	47 (51 unattended*)
Stoke Road	50	67
Haydon	46	59
Pussy Willows / Log Cabin	45	56
Court Farm	42	55
Wingmoor Lodge	44 (43 unattended)	58 (59 unattended*)

\*Note: the average daytime noise levels for Lower Farm and Wingmoor Lodge exclude the Sunday noise measurements since there are no operations or vehicle movements on the IWWMF proposed for Sunday daytime, other than the possibility of one or two Air Pollution Control (APC) deliveries.

**Table 10.1: Suggested Site Noise Limits - Daytime**

Location	Average Daytime Background Noise Level, dB $L_{A90,T}$	Suggested Daytime IWWMF Site Noise Limit dB $L_{Aeq, 1 \text{ hour, free field}}$
Home Farm	39	49
Lower Farm	41 (43 unattended)	53*
Stoke Road	50	55
Haydon	46	55
Pussy Willows / Log Cabin	45	55
Court Farm	42	52
Wingmoor Lodge	44 (43 unattended)	53*

\*Note: based on the average daytime background noise levels for the unattended measurements

\*\*Note: the sample measurements made in the vicinity of the Log Cabin were averaged with the sample measurements made in the vicinity of Pussy Willows; both dwellings are associated with the cattery.

**Table 10.7: Average Background Noise Levels - Daytime**

Location	Average Daytime Background Noise Level, dB L <sub>A90,T</sub>	Average Daytime Background Noise Level, dB L <sub>A90,T</sub>	Difference in Average Background Noise Level, dB L <sub>A90,T</sub>
	From Table 10.1	Notional Do Nothing Baseline	
Home Farm	39	39	0
Lower Farm	41 (samples)	43	+ 2
Stoke Road	50	49	- 1
Haydon	46	46	0
Pussy Willows / Log Cabin	45	44	- 1
Court Farm	42	42	0
Wingmoor Lodge	44 (samples)	44	0

were measured and accordingly the average figure has increased. This demonstrates that site noise was not controlling the measured background noise level at this location and supports the view that background noise levels at Lower Farm are more likely to change due to wind speed and direction. For the do nothing scenario it is suggested that the site noise limit for this dwelling would not change from that presented in Table 10.1.

10.65 For Stoke Road, five of seven samples have been selected for the notional baseline average and the two L<sub>A90,T</sub> values that are not included were higher than the values that have been selected and accordingly the average figure has decreased. However, the nominal daytime noise limit of 55 dB L<sub>Aeq,1 hour, free field</sub> would still apply as the average background noise level for the notional baseline scenario is above 45 dB L<sub>A90,T</sub>. For the notional do nothing scenario it is suggested that the site noise limit for this dwelling would not change from that presented in Table 10.1.

10.66 For Haydon, all of the measurement results mention the Grundon construction site activity for the MRF but road traffic was the dominant noise source and all the L<sub>A90,T</sub> values have been selected. Since the average daytime background noise level for the notional do nothing scenario is the same as the average presented in Table 10.1, the suggested site noise limit for this dwelling would not change from that presented in Table 10.1.

10.67 For Pussy Willows and the Log Cabin, two of the measurement results near the Log Cabin were affected by the temporary operation of vibratory roller (giving rise to the noted low frequency noise) and five of seven samples have been selected for the notional baseline average. The suggested site noise limit for the notional do nothing would be 54 dB L<sub>Aeq,1 hour, free field</sub> which is 1

dB(A) lower than the site noise limit presented in Table 10.1.

10.68 For Court Farm, five of seven samples have been selected for the notional baseline average and the two L<sub>A90,T</sub> values that are not included are within the range of L<sub>A90,T</sub> values that have been selected. Since the average daytime background noise level for the notional do nothing is the same as the average presented in Table 10.1, the suggested site noise limit for this dwelling would not change from that presented in Table 10.1.

10.69 For Wingmoor Lodge, six of seven samples have been selected for the notional baseline average and the one L<sub>A90,T</sub> value that is not included is within the range of L<sub>A90,T</sub> values that have been selected. Since the average daytime background noise level for the notional do nothing is the same as the average presented in Table 10.1, the suggested site noise limit for this dwelling would not change from that presented in Table 10.1.

10.70 Accordingly the suggested site noise limits for daytime in the notional do nothing scenario would be the same as suggested in Table 10.1, with the exception of a 1 dB(A) reduction for Pussy Willows and the Log Cabin.

### Minimum Engineered Scheme

10.71 The minimum engineered scheme would involve the continuation of the proposed site activities in order to leave the site in a safe and suitable managed state as outlined in Chapter 7 of this ES. It is considered that the existing noise levels measured by WBM in September 2008 represent an appropriate baseline for the minimum engineered scheme in so far as the noise measurements included site activity noise at some of the locations for some of the time. For the minimum

engineered scheme the suggested site noise limits are those set out in Table 10.1.

### IMPACT IDENTIFICATION

10.72 The operations and activities considered in this noise chapter are set out below and are considered for both the do nothing scenario and the minimum engineered scheme:

- extraction processing and export of sand and gravel;
- extraction of clay for engineering restoration and export;
- restoration, by the importation of waste;
- operation of the waste management plant;
- operation of the materials recovery facility (MRF) including vehicle servicing facilities;
- operation of the gas engine (which use landfill gas to produce electricity);
- use of weighbridges, mess facilities, offices, and workshops;
- HGV traffic on Stoke Orchard Road and A435.

### Notional Do Nothing Scenario

10.73 The assessment of noise impacts considered below are set against the noise limits set out in Table 10.1, except for Pussy Willows and the Log Cabin which is 1 dB(A) lower for the notional do nothing scenario.

#### *Extraction, processing and export of sand and gravel*

10.74 One of the main plant items not in use during a site visit in October 2008 was the sand and gravel processing plant, due to limited demand for material at that time.

10.75 The existing extraction and processing operations are relatively small scale, corresponding to the quantity and rate at which material is extracted and processed, and at least 300 metres from the nearest dwellings. The noise impacts will be negative, direct, medium term and temporary for occupants of the nearest dwellings and cumulative with other activity on the IWWMF.

10.76 The calculated site noise levels at the selected dwellings for the sand and gravel extraction and processing operations are in the range 36 to 46 dB L<sub>Aeq,1 hour, free field</sub>. The site noise calculations assume no barrier attenuation from the existing landform although that does exist for the dwellings adjacent to Stoke Orchard Road.

10.77 The calculated site noise levels for sand and gravel extraction and processing operations are below the limits suggested in this chapter for daytime operations, based on the advice in MPS 2 Annex 2 Noise. The magnitude of the impact is therefore low.

#### *Extraction of clay for engineering and restoration*

10.78 For most dwellings in the area, clay extraction is to occur at distances greater than 300 metres. For the dwellings adjacent to Stoke Orchard Road and in the vicinity of the railway line, clay extraction within 100 metres of these dwellings has largely ceased. The only exception is for the log cabin associated with the Pussy Willows Cattery where extraction of clay will take place at a distance of less than 100 metres.

10.79 The noise impacts will be negative, direct, medium term and temporary for occupants of the nearest dwellings and cumulative with other activity on the IWWMF. The calculated site noise levels at the nearest dwellings from the clay extraction operations are in the range 52 dB L<sub>Aeq,1 hour, free field</sub> at Court Farm to 60 dB L<sub>Aeq,1 hour, free field</sub> at the Log Cabin.

10.80 The site noise calculations include some existing barrier attenuation for the dwellings in the vicinity of the railway line when clay extraction is taking place at its highest level on the site. The calculated site noise levels for clay extraction operations are above the limits suggested in this chapter for daytime operations, based on the advice in MPS 2 Annex 2 Noise, for Pussy Willows and the Log Cabin.

10.81 The magnitude of the impact is therefore low for most dwellings and medium to high for two dwellings.

#### *Restoration, by the importation of waste*

10.82 For most dwellings in the area, restoration by the importation of waste is to occur at distances greater than 300 metres. For the dwellings adjacent to Stoke Orchard Road and in the vicinity of the railway line, restoration within 300 metres of these dwellings will take some years to be completed. For Pussy Willows and the Log Cabin associated with the Pussy Willows Cattery, restoration is to occur at a separation distance of about 100 metres and less.

10.83 The noise impacts will be negative, direct, medium term and temporary for occupants of the nearest dwellings and cumulative with other activity on the IWWMF. The highest calculated site noise levels from the restoration operations are up to 56 dB L<sub>Aeq,1 hour, free field</sub> at

Court Farm, up to 59 dB  $L_{Aeq,1 \text{ hour, free field}}$  at Pussy Willows and up to 62 dB  $L_{Aeq,1 \text{ hour, free field}}$  at the Log Cabin.

10.84 The site noise levels indicated above include no barrier attenuation for the existing bunds between the site and the dwellings in the vicinity of the railway line when restoration is taking place at the highest level on the nearest part of the site. The calculated site noise levels for restoration are above the limits suggested in this chapter for daytime operations, based on the advice in MPS 2 Annex 2 Noise, for Court Farm, Pussy Willows and the Log Cabin.

10.85 The magnitude of the impact is therefore low for most dwellings and medium to high for three dwellings.

10.86 Prior to the importation of material for restoration into a particular area of the landfill site, clay is placed and compacted using specialised plant as part of a short term and temporary activity. Low frequency noise from a piece of vibrating machinery, either a sheepsfoot roller or flat roller, was observed at the Log Cabin during the attended noise measurements in September 2008. During a site visit in October 2008 it was observed that this piece of machinery was not in use.

10.87 It is considered that there is no need to mitigate this activity but it is recommended that occupants of the nearest dwellings are informed in advance of a period of use of the vibrating machinery so that they are aware of the likely occurrence of low frequency noise. The noise impacts from the piece of vibration machinery will be negative, direct, short term and temporary for occupants of the nearest dwelling and cumulative with other activity on the IWMF. The magnitude of the impact is therefore low.

#### *Waste Treatment Plant*

10.88 The ash conditioning plant is a fixed facility situated in the central part of the IWMF site that treats Air Pollution Control (APC) residues and liquid wastes prior to transport of that material by dump truck to the hazardous landfill area. This facility is over 300 metres from Wingmoor Lodge, which is shielded from it by the full height of the completed landform, and 500 metres or more from other dwellings closest to the IWMF.

10.89 The operation of the plant and movement of material from it takes place during the normal operational hours of the IWMF. Tankers bringing in the APC residues can arrive at the site day and night for weekdays with tankers off-loading on weekdays and Saturdays with one or two arrivals possible on Sundays. The noise impacts will be negative, direct, long term and temporary for

occupants of the nearest dwellings and cumulative with other activity on the IWMF for daytime.

10.90 During the night-time period and on Sundays, the noise is cumulative with noise arising from the existing gas engine and gas flare compound which operates continuously. The calculated site noise levels at the selected dwellings from the tankers off-loading at the ash conditioning plant are in the range 26 to 32 dB  $L_{Aeq,1 \text{ hour, free field}}$ . The site noise calculations take into account barrier attenuation from the existing landform for the dwellings adjacent to Stoke Orchard Road and assume two tankers off-loading simultaneously at night-time.

10.91 The calculated site noise levels for the tankers off-loading at the ash conditioning plant are below the limits suggested in this chapter for night-time operations. The magnitude of the impact is therefore low for night-time and daytime on Sundays.

#### *Materials Recovery Facility (MRF)*

10.92 In October 2008 the materials recovery facility was under construction. A noise assessment and report was prepared to accompany the planning application for the MRF and two vehicle-servicing bays, parts storage, staff changing and mess facilities plus offices. The submitted noise report presents calculated site noise levels at the nearest dwellings and the hours of operation used in the assessment. The previous report concluded no loss of amenity and permission was granted (Planning Permission Ref: T/05/4037/1317/Ful) with constraints on the hours of operation but no noise limits at dwellings.

10.93 The primary purpose of the MRF is to divert incoming waste that would have gone to the landfill and to separate and sort it so that it may be recycled. Unloading and loading is done within the MRF. If any outside loading is required this would only occur when a vehicle was onsite during the 07:00 to 18:00 period. Activities outside normal working hours all occur inside the MRF.

10.94 There is an opening in the northern facing façade of the recently constructed MRF building. It is understood that this opening facing north is related to the vehicle servicing area and this area does not open into the main MRF building. The vehicle servicing area will operate between the hours of 07:00 to 18:00 and has been included in the site noise calculations.

10.95 The site noise calculations for this noise assessment use a noise output value for the main openings of the MRF facing east that results in a calculated site

noise level 2 dB(A) higher than the value previously presented, of 32 dB(A) at the nearest dwellings in Bishop's Cleeve. For Haydon, an isolated dwelling adjacent to Stoke Orchard Road, the value previously presented was 33 dB(A) for noise from activity within the MRF.

10.96 The noise impacts will be negative, direct, long term and temporary for occupants of the nearest dwellings and cumulative with other activity on the IWMF for the hours of operation considered, namely 06:30 to 21:00. Based on the calculated noise levels from the previous report for noise arising from within the MRF the magnitude of impact is therefore low for the period 06:30 to 21:00.

#### *Gas engines (existing and proposed locations)*

10.97 The existing gas engine will be replaced in the near future with a larger capacity gas engine in the existing compound location. The gas engine will then be moved to the proposed environmental compound during the later stages of the site's operation. This is the proposed location for the engine for the closure and post closure period of the site and will also contain a long term leachate management plant.

10.98 The noise impacts will be negative, direct, long term and temporary for occupants of the nearest dwellings and cumulative with other activity on the IWMF for daytime. During the night-time period and on Sundays, the noise from the gas engine in the existing compound location is cumulative with noise arising from tankers off-loading at the ash conditioning plant. When the proposed environmental compound is in place the ash conditioning plant will have been removed and the potential impact of these noise sources for the night-time period would not be cumulative.

10.99 The calculated site noise levels at the selected dwellings from the existing environmental compound combined with tankers off-loading at the ash conditioning plant or for the proposed environmental compound are in the range 27 to 37 dB  $L_{Aeq,1 \text{ hour, free field}}$ . The calculated site noise levels for the gas engines compound and tankers off-loading at the ash conditioning plant comply with the limits suggested in this chapter for night-time operations.

10.100 The magnitude of the impact is considered to be low for night-time and daytime on Sundays.

#### *Weighbridges, mess facilities, offices, and workshops*

10.101 These functions are daytime operations only and the offices and workshops will move to the MRF part of the IWMF. A weighbridge will remain at both site entrances. With the exception of the isolated dwelling of Haydon these functions are more than 300 metres from dwellings. The noise impacts will be negative, direct, long term and temporary for occupants of the nearest dwellings and cumulative with other activity on the IWMF for daytime.

10.102 For dwellings at 300 metres or more away from the MRF and for Haydon it is considered that the magnitude of the impact is low for daytime operations.

#### *HGV traffic on Stoke Orchard Road and A435*

10.103 HGV traffic on the internal access and haul roads has been considered as part of the site generated noise and is included in the overall calculated noise levels for the IWMF site. Site HGV traffic on the public highway network will give rise to road traffic noise levels alongside Stoke Orchard Road and on the A435 north and south of the junction with Stoke Orchard Road. For dwellings adjacent to Stoke Orchard Road, between the site entrances and the A435 roundabout, the calculated potential increase in road traffic noise levels at 10 metres distance is 0.8 dB LA10, 18 hour, free field for weekdays in 2024. On the A435, the calculated potential increase in road traffic noise levels at 10 metres distance is less than 0.5 dB LA10, 18 hour, free field for weekdays in 2024 both north and south of the junction with Stoke Orchard Road.

10.104 Guidance from the Government on highway design advises that changes in noise level of less than 1 dB(A) are not significant. For Stoke Orchard Road and the A435, the changes in noise level are negligible and would be quite imperceptible and lie well within the normal daily variation that occurs on the road. In any event, the calculated increases in road traffic noise level use the traffic flows in 2024 for the notional do nothing scenario and add in the site HGV flows for 2024. On the basis that site HGV traffic is continuous to 2024 there would be no change in site HGV movements and therefore no change in road traffic noise levels.

10.105 Research by the Transport Research Laboratory has found that people's reaction to vibration arising from HGV movements is very similar to their reaction to HGV noise but is less marked. In other words, people would complain more about the effect of vehicle noise than about any associated vibration. As such, it is usual to

disregard vehicle induced vibration and concentrate on vehicle noise. Provided any noise increase is acceptable, the corresponding change in vibration would also be acceptable. In practice, ground borne vibration is only perceptible within a few metres of a very bad pothole and imperceptible on roads complying with relevant design standards.

### Minimum Engineered Scheme

10.106 The impacts of the proposals are considered against the noise limits set out in Table 10.1. for the minimum engineered scheme. The only difference from the notional do nothing limits are for Pussy Willows and the Log Cabin which is 1 dB(A) lower for the notional do nothing scenario.

10.107 The calculated noise levels for all the proposed operations and activities listed in paragraph 10.72 will remain the same as those presented above for the notional do nothing scenario.

10.108 The impacts of the proposals assessed against the minimum engineered scheme will be the same as for do nothing Scenario except for the following where the noise impact will be medium rather than long term:

- treatment of waste prior to landfill;
- materials recovery facility (MRF) including vehicle servicing facilities, and
- weighbridges, mess facilities, offices, and workshops.

### MITIGATION MEASURES

10.109 For clay extraction and restoration in the north western corner of the site, within about 200 metres of the nearest dwellings, the perimeter bunds will be increased in height.

10.110 For Court Farm the site noise calculations use a ground height for the dwelling of 32.5 m AOD. The bund height used is 37.5 m AOD with an apex at 125 metres from the dwelling. The site noise calculations with the bund in place demonstrate compliance with a noise limit of 52 dB  $L_{Aeq, 1 \text{ hour, free field}}$ .

10.111 For Pussy Willows the site noise calculations use a ground height for the dwelling of 32.5 m AOD. The bund height used is 37.5 m AOD with an apex at 100 metres from the dwelling. The site noise calculations demonstrate compliance with a noise limit of 54 dB  $L_{Aeq, 1 \text{ hour, free field}}$  (corresponding to the “do-nothing” scenario).

10.112 For the Log Cabin the site noise calculations use a ground height for the dwelling of 33.0 m AOD. The

bund height used is 40.0 m AOD with an apex at 55 metres from the dwelling. The site noise calculations demonstrate compliance with a noise limit of 54 dB  $L_{Aeq, 1 \text{ hour, free field}}$  (corresponding to the “do-nothing” scenario).

10.113 The bunds discussed above are shown on Figure 3.21.

10.114 With the above bund heights in place the on the north western boundary of the site, the calculated site noise levels for clay extraction and restoration operations will comply with the suggested site noise limits for daytime for the nearest dwellings against the notional do nothing baseline.

10.115 For the proposed environmental compound, the surrounding landform provides a height differential of 5 metres. Figure 3.1 in chapter 3 of this ES shows a ground height for the compound at 37 m AOD with height contours up to 42 m AOD between the proposed gas engine location and receiver locations at Wingmoor Lodge and Haydon. With the proposed bunding the calculated site noise level at night would be in the range 27 to 34 dB  $L_{Aeq, 1 \text{ hour, free field}}$ . The calculated night-time noise levels comply with the suggested night-time noise limits and are significantly less than the night-time limits set in the planning permission for the existing landfill gas compound.

10.116 This mitigation is considered to be required in order to implement the minimum engineered scheme as well.

### SIGNIFICANCE OF THE RESIDUAL IMPACTS

10.117 The calculated site noise levels for clay extraction and restoration in the north western corner of the site comply with the limits for both the do nothing scenario and the minimum engineered scheme suggested in this chapter for daytime operations. This is based on the advice in MPS 2 Annex 2 Noise, with values in the range 52 to 54 dB  $L_{Aeq, 1 \text{ hour, free field}}$  at the nearest dwellings. The magnitude of the impact is therefore considered to be medium and the residual impact for the nearest dwellings is considered to be of minor significance.

10.118 The calculated site noise levels at the selected dwellings from the proposed and existing locations of the gas engine compound and tankers off-loading at the ash conditioning plant are in the range 27 to 34 dB  $L_{Aeq, 1 \text{ hour, free field}}$ . The magnitude of the impact is considered to be low for night-time and daytime on Sundays for both the do nothing scenario and the minimum engineered

scheme. The residual impact for all dwellings is therefore considered to be of minor significance.

### CUMULATIVE IMPACTS

10.119 There are considered to be no other planned developments in the area that are likely to have effects in combination with the proposals. Accordingly, the potential cumulative impact of noise from the IWWMF with other potential noise generating developments in the area is of low significance.

### SUMMARY

10.120 This chapter considers the noise implications of the proposed continuation of mineral extraction and restoration through the importation of wastes at Wingmoor Farm Integrated Waste Management Facility (IWWMF).

10.121 The main conclusions of the noise assessment is that the magnitude of the impact is low for most daytime operations, due primarily to the large separation distances to most dwellings.

10.122 The exception to this conclusion is for operations in the north western corner of the site associated with the hazardous landfill where clay extraction and restoration activities give a magnitude of impact of medium to high for three dwellings.

10.123 With mitigation in the form of increased bund heights in the north western corner of the site, the magnitude of impact is medium and the residual impact for the nearest dwellings is considered to be of minor significance.

10.124 The calculated night-time noise levels comply with the suggested night-time noise limits and are significantly less than the night-time limits set in the planning permission for the existing landfill gas compound.

10.125 For Stoke Orchard Road and the A435, the changes in noise level are negligible and would be quite imperceptible and lie well within the normal daily variation that occurs on the road.

