



Minerals are essential for development and through that for our quality of life and creation of sustainable communities. Minerals planning ensures that the need for minerals by society and the economy is carefully balanced against the impacts of extraction and processing on people and the environment.



# PLANNING

## Minerals Policy Statement 2: Controlling and Mitigating the Environmental Effects of Minerals Extraction in England

Annex 2: Noise



Office of the  
Deputy Prime Minister

Creating sustainable communities

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Controlling and Mitigating the Environmental  
Effects of Minerals Extraction in England  
Annex 2: Noise

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# Minerals Policy Statement 2: Controlling and Mitigating the Environmental Effects of Minerals Extraction in England

## Annex 2: Noise

This Annex to Minerals Policy Statement 2 (MPS2) *Controlling and Mitigating the Environmental Effects of Minerals Extraction in England* is a statement of the policy considerations in relation to noise from mineral workings and associated operations, and how they should be dealt with in local development frameworks and in considering individual applications. Appendices briefly explain technical terminology and give examples of good practice in noise reduction. The Government expects Mineral Planning Authorities (MPAs) in England to have regard to this Annex alongside the policies contained in the MPS2 overarching document.



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## Introduction

- 2.1 Noise from surface mineral operations can have a noticeable environmental impact and is a common cause of complaint. It is a material planning consideration. Because of the social and economic need for mineral working, the effects of noise need to be evaluated and controlled or mitigated to enable mineral operators to conform to modern good practice and to promote sustainable development. In formulating plans for mineral extraction or related activity and designing mitigation strategies, Mineral Planning Authorities (MPAs) should consider all the effects on the surrounding environment and communities. Where these effects cannot be adequately controlled or mitigated, planning permission should be refused.
- 2.2 The Government looks to the minerals industry to keep noise emissions to a level that reflects the highest environmental standards and to work for continuous improvement. Its policy is to secure reduced noise emissions in both urban and non-urban areas and at noise-sensitive areas and properties. The latter would normally include dwellings, gardens, places of worship, educational establishments, hospitals or similar institutions, livestock farms, some factories or any other property likely to be adversely affected by an increase in noise levels. In *Guidelines for Community Noise* (1999), the World Health Organisation advises 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 55dB L<sub>AEQ</sub> on balconies, terraces, and outdoor living areas. To protect the majority of people from being moderately annoyed during daytime, the outdoor sound level should not exceed 50dB L<sub>AEQ</sub>.”*
- MPAs and others concerned with mineral development should have regard to the national noise strategy, on which the Department for the Environment, Food and Rural Affairs (Defra) consulted in 2001. This aims to map the main sources and areas of noise in order to identify tranquil areas that are to form a national resource, to comply with EC Directive (2002/49/EC) *Assessment and Management of Environmental Noise*.
- 2.3 Most noise from mineral operations is created by equipment used for extraction and processing. MPAs and mineral operators should have regard to EC Directives 98/37/EC (‘The Machinery Safety Directive’) and 86/662/EC (*Limitation of Noise Emitted by Hydraulic Excavators, Rope-operated Excavators, Dozers, Loaders and Excavator-loaders*), which seek to reduce noise emissions from mobile plant and dump trucks. These do not apply to plant with a power rating in excess of 500kW or to a fixed plant. A proposed Directive (*Noise Emission in the Environment for Equipment for Use Out of Doors*), which is likely to come into force in 2005, indicates a further reduction in noise emissions for a range of tracked and wheeled plant. MPAs should be aware of the need to take account of this Directive when considering new applications and reviewing existing permissions after its implementation date. The Government will consider the need for appropriate supplementary guidance on this in due course.

## PURPOSE AND SCOPE OF THIS ANNEX

- 2.4 Annex 2 states the planning considerations the Government expects to be applied to noise emissions from surface mineral operations. It covers both surface mineral extraction and surface operations associated with underground mineral extraction, including waste disposal and recycling operations that form an integral part of a mineral working operation. It is not framed with direct reference to other waste disposal and recycling operations. Since these share many operational features with surface mineral operations, waste management operators and waste planning authorities should take account of this Annex alongside Planning Policy Guidance Note 10 (PPG10) *Planning and Waste Management*<sup>1</sup>. Planning conditions on noise should not duplicate controls placed on the developer under the relevant pollution control regime. This Annex does not cover noise from blasting operations, which will be covered in a future Annex to MPS2.
- 2.5 This Annex replaces Minerals Planning Guidance Note 11 (MPG11) *The Control of Noise at Surface Mineral Workings* (1993), paragraphs C10-C15 in Annex C of Minerals Planning Guidance Note 3 (MPG3) *Coal Mining and Colliery Spoil Disposal* and paragraphs C21-C22 in Annex C of Minerals Planning Guidance Note 2 (MPG2) *Applications, Permissions and Conditions* (1998), all of which are hereby cancelled. The reference to MPG11 in paragraph 109 of Minerals Planning Guidance Note 14 (MPG14) *Environment Act 1995: Review of Mineral Planning Permissions* (1995) should be read as a reference to this Annex. It covers applications for new operations and extensions to existing sites as well as the review and modernisation of conditions on older permitted operations. This Annex complements the general guidance in Planning Policy Guidance Note 24 (PPG24) (1994) *Planning and Noise* for minerals operations. PPG24 deals with the types of development and land use susceptible to exposure from noise and its general principles are applicable to the control of mineral working as well as of development near to mineral workings.
- 2.6 For certain quarry processes, noise emissions are controlled under the Pollution Prevention and Control Act 1999 and the Pollution Prevention and Control (England and Wales) Regulations 2000 ('the PPC Regulations'). Guidance on the interaction between the planning and pollution control regimes is contained in Planning Policy Statement 23 (PPS23) *Planning and Pollution Control*. Enforcement action to control noise when it amounts to a nuisance can be taken under Part III of the Environmental Protection Act (EPA) 1990. However, the Government expects operators to make proposals that are environmentally acceptable from the outset rather than relying on retrospective action and except that MPAs will take due account of this in their decisions on individual applications.

<sup>1</sup> The Consultation Paper on Planning Policy Statement 10 (PPS10) *Planning for Sustainable Waste Management* (2004) should be taken into material consideration alongside PPG10. It will eventually supersede PPG10 in 2005.

This Annex complements the controls under environmental legislation by:

- identifying the significant effects of noise from surface mineral operations (see Appendix 2A);
- outlining the considerations to be taken into account;
- identifying examples of good practice in the control and mitigation of noise emissions (see Appendix 2B)<sup>2</sup>; and
- stating how the planning system can keep noise emissions within environmentally-acceptable limits without imposing unreasonable burdens on mineral operators.

The terminology of noise measurement is explained in Appendix 2A.

<sup>2</sup> Further guidance on good practice in relation to environmental effects of mineral working is available at [www.goodquarry.com](http://www.goodquarry.com)

## General Considerations

- 2.7 The key planning principle is that noise emissions should, as far as possible, be controlled, mitigated or removed at source. Proposals for mineral working operations should, therefore include appropriate proposals for the control or mitigation of noise emissions. Those making development proposals and planning authorities considering such proposals should, therefore:
- consider the main characteristics of the production process and its environs, including the location of noise-sensitive properties;
  - make and consider proposals to minimise, mitigate or remove noise emissions at the source using best available techniques (BAT) in accordance with the European Commission's BAT Reference Documents, taking account of the control of some quarry processes under the PPC Regulations;
  - assess the existing noise climate around the site of the proposed operations, including background noise levels at nearby noise-sensitive properties;
  - estimate the likely future noise from the development and its impact on the neighbourhood of the proposed operations;
  - monitor noise emissions to ensure compliance with appropriate environmental standards and to enable an effective response to complaints.
- 2.8 Research for the former Department for the Environment, Transport and the Regions (DETR) found that practice on the assessment and control of noise at surface mineral workings had improved since the publication of MPG11 in 1993. However, there was still a wide range of quality in the way these issues were addressed. The Office of the Deputy Prime Minister (ODPM) and the Department for Trade and Industry (DTI) have, therefore, commissioned research to identify and encourage good practice in the monitoring, prediction and control of noise at surface mineral workings. This will distil and disseminate good practice in relation to background noise monitoring, plant noise emissions, noise prediction and cumulative impact of noise emissions. The results will be disseminated through a good practice guide by mid 2005, in support of the policy on these issues stated in this Annex.
- 2.9 Emissions assessments should identify all sources of noise and, for each source, consider the proposed operating locations, procedures, schedules and duration of work for the life of the operation. They should consider what emissions are likely to arise and indicate how and where efforts have been made to control, mitigate or remove these at source. The level and character of the existing noise environment and the location of noise-sensitive properties will enable the necessary noise level goals to be incorporated in the design of proposed operations. Monitoring is required to compare changes in noise level and character caused by the operation to the design goals and to manage them in order to achieve those goals. There must be effective liaison with the affected community, and complaints should be dealt with promptly. Guidance on the factors affecting noise levels and methods of noise reduction is in Appendix 2B.

## Development Plans

- 2.10 MPAs should set out in their local development documents, policies on noise from surface mineral operations. They should outline the criteria against which they will assess the environmental acceptability of the expected noise emissions from a proposed surface mineral operation, or in reviewing the conditions on existing planning permissions. They should set out the noise limits they will apply in principle and any flexibility entailed in their application. The minerals (or successor) plan should also indicate the extent of technical information required in support of an application.
- 2.11 In identifying areas of search and/or proposed sites for mineral working, MPAs should take account of any information on the existing local noise climate, particularly in areas of tranquillity that should be preserved as part of the national resource. For existing mineral operations, whether or not currently subject to conditions relating to noise, MPAs should consider whether the introduction of buffer zones to separate the mineral operation from existing and possible future noise-sensitive development could be helpful. In doing so, they would need to consider the liability for compensation if this were to involve a restriction of existing working rights that would affect the economic viability of the operation to an unreasonable degree. Such consideration would, however, enable the relevant local planning authority (LPA) to be fully aware of the potential effects of noise when controlling other development in proximity to established mineral workings.

## Development Control

- 2.12 When considering applications for new development or reviewing conditions on existing planning permissions, MPAs should have regard to the environmental acceptability of the likely noise emissions, including the cumulative impact at noise-sensitive properties. Mineral operators should provide sufficient information to enable a full assessment to be made of the effects of the development together with proposals for appropriate control or mitigation.

### PRE-APPLICATION DISCUSSIONS

- 2.13 Discussions on the issues relating to noise (and other environmental impacts) should take place between the mineral operator and the MPA and the local authority (LA) environmental health department before an application is submitted. Developers should also consult the Environment Agency or the LA as the regulator under the PPC Regulations. This will ensure that all parties are fully aware of all the issues and avoid delay in processing the application. Matters that may need to be explored during pre-application discussions include:
- the existing noise climate at the locality, including the need to protect tranquil areas as places where noise intrusion should be minimised, and the location of noise-sensitive properties;
  - the proposed production process, choice of equipment, layout and plant location;
  - the duration and sequencing of operations;
  - the characteristics of noise emissions and methods used to predict them;
  - the likely effects of those emissions, including cumulative effects; and
  - proposed measures to control or mitigate noise emissions.
- 2.14 MPAs should ensure that operators are aware of the need for and provide all the required technical information. They should seek the technical advice of, and preferably involve in the pre-application discussions, the environmental health officers (EHOs) of the area concerned alongside their own expert advisers. MPAs and operators should ensure that there are appropriate consultations and effective liaison with the community likely to be affected by noise emissions.

### ENVIRONMENTAL IMPACT ASSESSMENT

- 2.15 Where an environmental impact assessment (EIA) is required (DETR Circular 02/99 *Environmental Impact Assessment*), it should identify the actual working noise emissions from all equipment to be used on site, having regard to established good practice. It should establish the threshold at which significant effects from noise emissions will be likely in or near environmentally-sensitive locations, and demonstrate that emissions can be successfully maintained below this threshold. Sensitive locations include sites carrying

national and international environmental designations. The significance of effects from noise should be considered in the context of existing development. The additional impacts of site-attributable noise emissions at noise-sensitive properties should be established.

## CONSIDERING APPLICATIONS

- 2.16 When considering applications, MPAs should ensure that operators have provided the required technical information and considered all reasonable options to minimise noise at source. In the light of the existing noise climate of the locality, they should consider the cumulative effects of noise emissions. MPAs should consult the EHO, as the pollution control regulator for the area, and other relevant stakeholders (e.g. English Nature for sites designated for nature conservation value) on the effects of noise emissions, and the adequacy of proposed control or mitigation measures. Where the effects of noise emissions cannot be adequately controlled or mitigated, permission should be refused.
- 2.17 When considering granting permission, MPAs should establish what noise-reduction practices will be used and what their effects will be. They should identify all noise-sensitive properties that might be affected and what the effects of the proposals will be on them. MPAs should consider the need for, timing, length and frequency of temporary noisy activities that are outside normal operations but which can bring long-term benefits to local residents and those using the area, such as the construction of baffle mounds.

## PLANNING CONDITIONS

- 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.
- 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  $55\text{dB(A)}L_{\text{Aeq},1\text{h}}$  (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  $10\text{dB(A)}$ . 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.

- 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.
- 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.

## MONITORING OF COMPLIANCE

- 2.22 Monitoring, in accordance with an agreed scheme, should normally be carried out in the free field at noise-sensitive properties and should pick up all noise from static and mobile sources that could affect the property. Where monitoring has to be conducted near the façade of a building, the microphone should be located 1m from the façade at a height of 1.2–1.5m above the ground and a 3dB façade reflection correction should be applied. If monitoring has to be other than at the noise-sensitive property, the noise limit must be converted into equivalent noise limits at the monitoring points using the noise-prediction technique in Part 1 of BS5228 *Noise and Vibration Control on Construction and Open Sites* (1997).
- 2.23 Equipment used for monitoring should correspond to that specified in BS-EN 61672-1 *Electroacoustics, Sound Level Meters, Specifications* (2003), capable of measurement in  $L_{Aeq,1h}$  and be calibrated before and after use. Where it is not possible by use of the pause button to exclude extraneous noise not directly attributable to the operation being monitored, an appropriate allowance should be made. Guidance on this is contained in BS4142 *Method of Rating Industrial Noise Affecting Mixed Residential and Industrial Areas* (1997).
- 2.24 Monitoring should be undertaken during normal production working hours and should avoid meal times and periods of plant maintenance or breakdown. Measurements should ideally be taken in calm conditions or where there is a component of wind blowing from the site towards the measurement location. However, at many sites, such conditions may be rare. BS4142 suggests that measurement should be avoided in conditions of wind speeds greater than 5m/sec, rain and temperatures less than 3°C. BS4142 also requires that a record be kept of weather conditions prevailing during all measurements. Where noise monitoring is undertaken when weather conditions are not ideal and noise levels appear to be of concern, the impact of weather conditions on ambient noise should be considered as well as noise propagation from the site.
- 2.25 The detailed requirements for monitoring (location, period and frequency) should be decided on a site-specific basis as part of the monitoring scheme, taking account of any monitoring required under the terms of any authorisation for quarry processes under the PPC Regulations. Unnecessarily onerous requirements should be avoided. Conditions should require operators to report periodically to the MPA on the results of monitoring and to inform it as soon as possible if there is evidence of the limits being breached, including an explanation and a statement of action to remedy it. MPAs and/or EHOs should carry out periodic checks of permitted sites in their areas, particularly if complaints are received, and inform the operator and complainants of the results. If monitoring demonstrates that noise limits continue to be exceeded, MPAs should consider what enforcement action would be appropriate.

## Conclusion

- 2.26 The Government looks to the minerals industries to keep noise emissions at or below the levels set out in this Annex, and to use BAT to reduce the impact of noise from their operations. It expects MPAs to have regard to the principles of this Annex in considering the impacts of noise on the environment and the local community in the minerals and waste development plans, the development documents that will succeed these and in determining applications and reviewing conditions on existing permissions. This Annex will be supplemented on completion of current research by good practice guidance on monitoring, prediction and control of noise at surface mineral workings. This is currently expected in mid 2005.





## Appendix 2A: Technical Terminology

### UNDERSTANDING NOISE

- 2A.1 Sound is measured in decibels (dB). When measuring environmental noise, a weighting network is used, which filters the frequency of sound to mimic the characteristics of human hearing. This is expressed as dB(A). The scale is logarithmic. Two machines emitting exactly the same noise level of 80dB(A) produce a total noise of 83dB(A), not 160dB(A). A 10dB(A) increase in sound level represents a doubling of loudness. An average living room would typically have a noise level of about 40dB while busy road traffic would generate about 80dB.
- 2A.2 Noise emissions are measured using sound level meters, which detect and record changes in sound pressure. Integrating meters also perform statistical analysis and descriptors of interest (e.g.  $L_{A90,T}$ ,  $L_{Aeq,T}$ ) can be determined directly from the meter. Noise from any particular source is reflected by any façade that directly faces that source. Thus, a microphone 1-2m in front of a building would typically yield a level 3dB(A) higher than a free-field measurement (i.e. at least 3.5m away from a façade).
- 2A.3 Background noise levels can be established by continuous monitoring over a period sufficient to provide a representative picture of the noise environment. Noise prediction requires the combination of noise from each item of plant/activity to arrive at the equivalent continuous sound level ( $L_{Aeq,T}$ ) after taking account of the noise generated, the amount of time in use, the distance of the reception point from the noise generator and whether there will be any screening. Part 1 of BS5228 (1997) provides generalised data on noise emissions from various plant and activities and methodologies for calculation of how much noise is reduced by distance, by barriers and over soft ground. A current ODPM research project aims to provide by mid 2005, good practice guidance on monitoring, prediction and control of noise at surface mineral workings to achieve greater consistency in noise assessments.
- 2A.4 The effects of noise on the neighbourhood can vary. They include the sensation of loudness, interference with verbal communication, disturbance of work, leisure or sleep, or annoyance. Noise may also have effects on mental and physical health. Individual sensitivity to noise varies. The reaction of livestock and wildlife to noise varies from species to species. Many learn to ignore a regular noise source even including impulsive noise such as bird scarers. Others are easily disturbed. Noise can interfere with communication, mask the sounds of predators and prey, cause stress or avoidance reactions and damage hearing.
- 2A.5 Noise from surface mineral operations (other than from blasting, which will be dealt with in a separate Annex) arises from engines used to power both static and mobile plant, tipping and processing of material, vehicle movements and the erection, maintenance and movement of plant. The timing, frequency and duration of particular activities may attract more complaints from the public than others, particularly at night or in the evening. Tonal noises such as audible reversing alarms, squealing of dry caterpillar tracks, whistles and sirens and the operation of certain equipment may be particularly annoying. Earthmoving operations to strip soil, form baffle mounds and soil/overburden mounds, the body slap of empty vehicles and plant start-up noise can also give cause for complaint.

## GLOSSARY OF TECHNICAL TERMS

(Adapted from Department of the Environment's *Report of the Noise Review Working Party*, 1990, HMSO).

**Ambient noise:** Includes both the residual noise and specific noise (from site operations) when present.

**Residual noise:** The ambient noise remaining at a given position in a given situation when the specific noise is suppressed to such a degree that it does not contribute to the ambient noise.

**Specific noise:** Noise from the source under investigation.

**A-weighting:** Normal hearing covers the frequency (pitch) range from about 20 Hz to 20,000 Hz but sensitivity is greatest between about 500 Hz and 5,000 Hz. The "A-weighting" is an electrical circuit built into noise meters to approximate this characteristic of human hearing.

**Background:** The underlying noise level in the absence of the specific noise resulting from the proposed mineral working, usually measured as  $L_{A90,T}$  (see below).

**Decibel (dB):** The logarithmic measure of sound level. 0 dB is the threshold of normal hearing. 140 dB(A) is the level at which instantaneous damage to hearing is caused. A change of 1 dB is detectable only under laboratory conditions.

**dB(A):** Decibels measured on a sound level meter incorporating a frequency weighting (A weighting) which differentiates between sounds of different frequency (pitch) in a similar way to the human ear. Measurements in dB(A) broadly agree with an individual's assessment of loudness. A change of 3 dB(A) is the minimum perceptible under normal conditions and a change of 10 dB(A) corresponds roughly to doubling or halving the loudness of a sound.

**Free Field:** A sound field in which no significant sound reflections occur.

$L_{A10,T}$ : The "A weighted" noise level exceeded for 10 per cent of the specified measurement period (T). It gives an indication of the upper limit of fluctuating noise.

$L_{A90,T}$ : The "A weighted" noise level exceeded for 90 per cent of the specified measurement period (T). In BS4142, this is used to define the background noise level.

$L_{Aeq,T}$ : The equivalent continuous sound level – the sound level of a steady sound having the same energy as a fluctuating sound over a specified measuring period (T). This is used to describe many types of noise, and can be measured directly with an integrating sound level meter.

$L_{max}$ : The maximum level of noise measurements over the measuring period.

**Tonality:** The degree to which a noise contains audible pure tones. Broadband noise (across a wider range of frequencies) is generally less annoying than noise with identifiable tones.

## Appendix 2B: Examples of Good Practice in Noise Reduction

### INTRODUCTION

- 2B.1 Surface mineral operations can be, by their nature, noisy, in common with many activities of an industrial character. It is not practicable to stop all noise emissions but a variety of practices can assist in reducing emissions from a mineral operation and reducing its impact on the surrounding area and properties.

### SITE LOCATION AND LAYOUT

- 2B.2 While the location of mineral extraction is clearly dictated by the location of the mineral resource, it may be possible to avoid some impacts on noise-sensitive properties without undue effect on the amount of mineral available for extraction. Incorporation of buffer zones into the design of the site and its environs can help to mitigate noise emissions and is particularly useful in resisting the encroachment of new development towards mineral operations. This may assist in keeping available for exploitation, mineral resources of value to the economy and society that would otherwise be sterilised. Not all noise-sensitive properties and land uses are equally sensitive and this should be taken into account in establishing stand-off zones and noise limits.
- 2B.3 Noise emissions should be fully considered in the design of mineral operations. The site should be laid out in such a way as to minimise the noise impact. Fixed plant and facilities, including maintenance areas, should be located accordingly, taking advantage of any shielding available from the natural topography. It may also be possible to use the quarry face or existing tips, or overburden or soil mounds to shield fixed plant and facilities. Plant that generates noise emissions, including pumps operated at night, should be located as far as possible from noise-sensitive properties. In some cases, it may be appropriate to use mobile plant on the quarry floor rather than a fixed plant at normal ground level. Site buildings may also be grouped to form a barrier between site operations and noise-sensitive properties. Haul roads should not be routed along exposed locations and should have as low a gradient as possible and as smooth a surface as is feasible.

### CHOICE OF EQUIPMENT

- 2B.4 Where a choice of methods or plant is available, the quieter should be chosen. For example, it is possible to reduce emissions by 5–10dB(A) using a quieter, earth-moving plant. Mineral operators should ensure they know the level of noise emissions (in comparable working conditions to those expected on site) from a plant under consideration, and manufacturers should include sound level output in the specification of their equipment. Operators should consider the use of an electrically-powered plant with its power source in an acoustic enclosure.
- 2B.5 Vehicle-reversing alarms, because of their tone, are one of the principal causes of complaints about noise from mineral operations. The need for safety in operation is clearly paramount but consideration should be given to the use of adjustable or directional audible

alarms or other alternative warning systems – e.g. white noise alarms give a full spectrum of noise rather than a single tone, which is claimed to be as good as single tone alarms at close range and at a distance, it blends into the background noise. Operators should discuss with the Health & Safety Executive and the MPA whether less intrusive systems can be safely used. Where such alternatives are not feasible then it may be possible to arrange site layout and working practices so that vehicles reverse away from noise-sensitive properties.

## MAINTENANCE OF PLANT

- 2B.6 Regular and effective maintenance of plant can play an important role in keeping noise within reasonable standards as well as contributing to greater efficiency in operation. Particular attention should be paid to the lubrication of bearings, the sharpness of cutting edges and the integrity of silencers and any acoustic enclosures around plant.

## SITE OPERATIONS

- 2B.7 Some operations are inherently noisy but consideration in use can help to reduce the impact of such operations. Examples of how noise reductions can be achieved include:
- minimising the height from which material drops from lorries or other plant, emptying dragline buckets as near as possible to the final placement area of spoil and minimising the clanging of dragline chains and buckets by careful operation;
  - use of rubber linings in chutes, dumpers, transfer points etc. to reduce the noise of rock falling on metal surfaces;
  - using simple baffles around washing drums, rubber mats around screening, crushing and coating plants;
  - enclosing pumps, covering conveyors, cladding the plant (ensuring that cladding is kept free of holes) and keeping noise control hoods closed when machines are in use;
  - within the constraints of efficient production, limiting the use of particularly noisy plant, limiting the number of items in use at any one time, starting plants one-by-one and switching off when not in use;
  - avoiding unnecessary revving of engines, reducing speed of vehicle movement, particularly to avoid body slap from empty lorries, keeping lorry tailgates closed where possible, designing and maintaining haul roads to minimise vehicle noise; and
  - pointing directional noise away from sensitive areas where possible.

## SEQUENCING OF ACTIVITIES

- 2B.8 Where possible, workings should be arranged so that earlier operations provide screening for noise-sensitive properties from noise generated by subsequent activities. This could influence both the direction of working of the quarry, subject to any other constraints on it, and the placement of overburden and soil mounds on the site perimeter. For example,

working away from noise-sensitive properties means the noise received will reduce with time. If excavation proceeds towards noise-sensitive properties, the quarry face can itself provide protection by acting as a screen to those properties. Mineral operators should liaise with the local community to enable noisy operations near to noise-sensitive properties to take place at times when they would have the least impact on the occupiers.

## ACOUSTIC SCREENING

- 2B.9 Acoustic screening can be effective both near the source of noise and near the noise-sensitive property. Reductions of 5–10dB(A) can generally be obtained depending on whether the noise is partly or completely screened from the measurement point.
- 2B.10 Maximum opportunity should be taken in laying out and sequencing operations to enable screening of noisy activities. As far as reasonably possible, sources of significant noise should be enclosed. BS5228 provides advice on various types of acoustic enclosures. Acoustic fencing between the operation and noise-sensitive properties can provide protection against noise, particularly where space is limited. It can be used on its own or in combination with other methods of screening. A simple wall of straw bales can significantly reduce noise emissions.
- 2B.11 Baffle mounds around the perimeter of the site or at other appropriate locations can make a significant reduction in the exposure of local people to noise from mineral operations. Such mounds are frequently constructed of soil or overburden that has to be removed and stored to enable access to the mineral.
- 2B.12 The process of baffle mound construction, though short-lived, is itself one of the noisiest aspects of mineral working. It will generally be appropriate for higher noise levels to be allowed for a limited period to allow construction to take place. While this will lead to temporary inconvenience, the longer-term benefits will be substantial. MPAs and mineral operators should liaise with the local community to explain this.
- 2B.13 Acoustic screening can also be used at the point of impact. It may, exceptionally, be appropriate to reduce the impact of noisy operations by installing acoustic secondary glazing or acoustic fencing at noise-sensitive properties. Requests to do so should be considered in the light of advice on the use of planning obligations in DETR Circular 01/97 *Planning Obligations*. Action at the property should not be seen as an alternative to reducing noise at source, or a means of legitimising higher noise limits. It should be seen as an additional safeguard to the quality of life for local residents to be used in exceptional circumstances and only with the agreement of owners/occupiers of noise-sensitive properties.







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Annex 2 *Noise* to MPS2 sets out the policy considerations in relation to noise from mineral workings and associated operations, and how they should be dealt with in local development plans and in considering individual applications. The main policy statement and Annex 1 *Dust* are published alongside this annex.

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