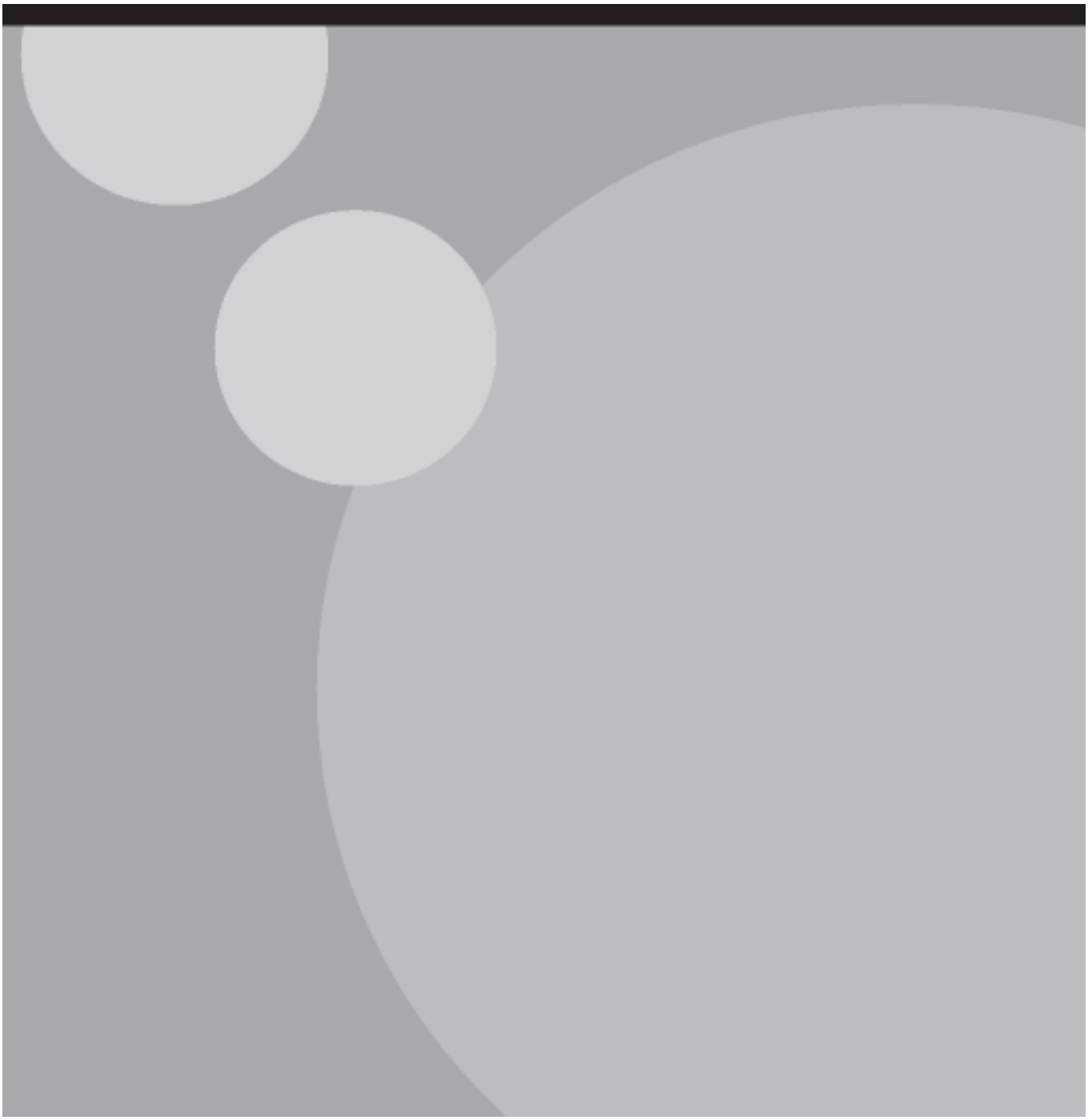
Communities and Local Government

# Technical Guidance to the National Planning Policy Framework




# Technical Guidance to the National Planning Policy Framework

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# Contents

# Introduction

1. This document provides additional guidance to local planning authorities to ensure the effective implementation of the planning policy set out in the National Planning Policy Framework on development in areas at risk of flooding and in relation to mineral extraction. This guidance retains key elements of Planning Policy Statement 25 and of the existing minerals policy statements and minerals planning guidance notes which are considered necessary and helpful in relation to these policy areas. The retention of this guidance is an interim measure pending a wider review of guidance to support planning policy.

# Flood risk

2. As set out in the National Planning Policy Framework, inappropriate development in areas at risk of flooding should be avoided by directing development away from areas at highest risk, but where development is necessary, making it safe without increasing flood risk elsewhere. For these purposes:

   - "areas at risk of flooding" means land within Flood Zones 2 and 3; or land within Flood Zone 1 which has critical drainage problems and which has been notified to the local planning authority by the Environment Agency;

   - "flood risk" means risk from all sources of flooding - including from rivers and the sea, directly from rainfall on the ground surface and rising groundwater, overwhelmed sewers and drainage systems, and from reservoirs, canals and lakes and other artificial sources.

## The Sequential and Exception Tests

3. As set out in the National Planning Policy Framework, the aim of the Sequential Test is to steer new development to areas with the lowest probability of flooding. The flood zones (see table 1) are the starting point for this sequential approach. Zones 2 and 3 are shown on the flood map[1] with Flood Zone 1 being all the land falling outside Zones 2 and 3. These flood zones refer to the probability of sea and river flooding only, ignoring the presence of existing defences.

4. Strategic Flood Risk Assessments (see paragraphs 7-8) refine information on the probability of flooding, taking other sources of flooding and the impacts of climate change (see paragraphs 11-15) into account. They provide the basis for applying the Sequential Test, on the basis of the flood zones in table 1. Where table 1

[1] To access the flood map, see the Environment Agency's website at: http://www.environment-agency.gov.uk/homeandleisure/floods/default.aspx

indicates the need to apply the Exception Test (as set out in the National Planning Policy Framework), the scope of a Strategic Flood Risk Assessment will be widened to consider the impact of the flood risk management infrastructure on the frequency, impact, speed of onset, depth and velocity of flooding within the flood zones considering a range of flood risk management maintenance scenarios. Where a Strategic Flood Risk Assessment is not available, the Sequential Test will be based on the Environment Agency flood zones.

5. The overall aim should be to steer new development to Flood Zone 1. Where there are no reasonably available sites in Flood Zone 1, local planning authorities allocating land in local plans or determining planning applications for development at any particular location should take into account the flood risk vulnerability of land uses (see table 2) and consider reasonably available sites in Flood Zone 2, applying the Exception Test if required (see table 3). Only where there are no reasonably available sites in Flood Zones 1 or 2 should the suitability of sites in Flood Zone 3 be considered, taking into account the flood risk vulnerability of land uses and applying the Exception Test if required.

### Table 1: Flood zones

*(Note: These flood zones refer to the probability of river and sea flooding, ignoring the presence of defences)*

**Zone 1 - low probability**

**Definition**
This zone comprises land assessed as having a less than 1 in 1,000 annual probability of river or sea flooding (<0.1%).

**Appropriate uses**
All uses of land are appropriate in this zone.

**Flood risk assessment requirements**
For development proposals on sites comprising one hectare or above the vulnerability to flooding from other sources as well as from river and sea flooding, and the potential to increase flood risk elsewhere through the addition of hard surfaces and the effect of the new development on surface water run-off, should be incorporated in a flood risk assessment. This need only be brief unless the factors above or other local considerations require particular attention.

**Policy aims**
In this zone, developers and local authorities should seek opportunities to reduce the overall level of flood risk in the area and beyond through the layout and form of the development, and the appropriate application of sustainable drainage systems[2].

[2] Sustainable drainage systems cover the whole range of sustainable approaches to surface drainage management. They are designed to control surface water run off close to where it falls and mimic natural drainage as closely as possible.

## Zone 2 - medium probability

**Definition**
This zone comprises land assessed as having between a 1 in 100 and 1 in 1,000 annual probability of river flooding (1% – 0.1%), or between a 1 in 200 and 1 in 1,000 annual probability of sea flooding (0.5% – 0.1%) in any year.

**Appropriate uses**
Essential infrastructure and the water-compatible, less vulnerable and more vulnerable uses, as set out in table 2, are appropriate in this zone. The highly vulnerable uses are *only* appropriate in this zone if the Exception Test is passed.

**Flood risk assessment requirements**
All development proposals in this zone should be accompanied by a flood risk assessment.

**Policy aims**
In this zone, developers and local authorities should seek opportunities to reduce the overall level of flood risk in the area through the layout and form of the development, and the appropriate application of sustainable drainage systems.

## Zone 3a - high probability

**Definition**
This zone comprises land assessed as having a 1 in 100 or greater annual probability of river flooding (>1%), or a 1 in 200 or greater annual probability of flooding from the sea (>0.5%) in any year.

**Appropriate uses**
The water-compatible and less vulnerable uses of land (table 2) are appropriate in this zone. The highly vulnerable uses should not be permitted in this zone.

The more vulnerable uses and essential infrastructure should only be permitted in this zone if the Exception Test is passed. Essential infrastructure permitted in this zone should be designed and constructed to remain operational and safe for users in times of flood.

**Flood risk assessment requirements**
All development proposals in this zone should be accompanied by a flood risk assessment.

**Policy aims**
In this zone, developers and local authorities should seek opportunities to:

- reduce the overall level of flood risk in the area through the layout and form of the development and the appropriate application of sustainable drainage systems;

- relocate existing development to land in zones with a lower probability of flooding; and
- create space for flooding to occur by restoring functional floodplain and flood flow pathways and by identifying, allocating and safeguarding open space for flood storage.

## Zone 3b - the functional floodplain

**Definition**
This zone comprises land where water *has* to flow or be stored in times of flood.

Local planning authorities should identify in their Strategic Flood Risk Assessments areas of functional floodplain and its boundaries accordingly, in agreement with the Environment Agency. The identification of functional floodplain should take account of local circumstances and not be defined solely on rigid probability parameters. But land which would flood with an annual probability of 1 in 20 (5%) or greater in any year, or is designed to flood in an extreme (0.1%) flood, should provide a starting point for consideration and discussions to identify the functional floodplain.

**Appropriate uses**
Only the water-compatible uses and the essential infrastructure listed in table 2 that has to be there should be permitted in this zone. It should be designed and constructed to:

- remain operational and safe for users in times of flood;
- result in no net loss of floodplain storage;
- not impede water flows; and
- not increase flood risk elsewhere.

Essential infrastructure in this zone should pass the Exception Test.

**Flood risk assessment requirements**
All development proposals in this zone should be accompanied by a flood risk assessment.

**Policy aims**
In this zone, developers and local authorities should seek opportunities to:

- reduce the overall level of flood risk in the area through the layout and form of the development and the appropriate application of sustainable drainage systems;
- relocate existing development to land with a lower probability of flooding.

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## Table 2: Flood risk vulnerability classification

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| **Essential infrastructure**<br>• Essential transport infrastructure (including mass evacuation routes) which has to cross the area at risk.<br>• Essential utility infrastructure which has to be located in a flood risk area for operational reasons, including electricity generating power stations and grid and primary substations; and water treatment works that need to remain operational in times of flood.<br>• Wind turbines. |
| **Highly vulnerable**<br>• Police stations, ambulance stations and fire stations and command centres and telecommunications installations required to be operational during flooding.<br>• Emergency dispersal points.<br>• Basement dwellings.<br>• Caravans, mobile homes and park homes intended for permanent residential use[3].<br>• Installations requiring hazardous substances consent[4]. (Where there is a demonstrable need to locate such installations for bulk storage of materials with port or other similar facilities, or such installations with energy infrastructure or carbon capture and storage installations, that require coastal or water-side locations, or need to be located in other high flood risk areas, in these instances the facilities should be classified as "essential infrastructure")[5]. |
| **More vulnerable**<br>• Hospitals.<br>• Residential institutions such as residential care homes, children's homes, social services homes, prisons and hostels.<br>• Buildings used for dwelling houses, student halls of residence, drinking establishments, nightclubs and hotels.<br>• Non–residential uses for health services, nurseries and educational establishments.<br>• Landfill and sites used for waste management facilities for hazardous waste[6].<br>• Sites used for holiday or short-let caravans and camping, *subject to a specific warning and evacuation plan*.[7] |
| **Less vulnerable**<br>• Police, ambulance and fire stations which are *not* required to be operational during flooding.<br>• Buildings used for shops, financial, professional and other services, |

[3] For any proposal involving a change of use of land to a caravan, camping or chalet site, or to a mobile home site or park home site, the Sequential and Exception Tests should be applied.
[4] See Circular 04/00: *Planning controls for hazardous substances* (paragraph 18) at: www.communities.gov.uk/publications/planningandbuilding/circularplanningcontrols
[5] In considering any development proposal for such an installation, local planning authorities should have regard to planning policy on pollution in the National Planning Policy Framework.
[6] For definition, see *Planning for Sustainable Waste Management: Companion Guide to Planning Policy Statement 10* at www.communities.gov.uk/publications/planningandbuilding/planningsustainable
[7] See footnote 3.

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| restaurants and cafes, hot food takeaways, offices, general industry, storage and distribution, non–residential institutions not included in “more vulnerable”, and assembly and leisure.<br>• Land and buildings used for agriculture and forestry.<br>• Waste treatment (except landfill and hazardous waste facilities).<br>• Minerals working and processing (except for sand and gravel working).<br>• Water treatment works which do *not* need to remain operational during times of flood.<br>• Sewage treatment works (if adequate measures to control pollution and manage sewage during flooding events are in place). |
| **Water-compatible development**<br>• Flood control infrastructure.<br>• Water transmission infrastructure and pumping stations.<br>• Sewage transmission infrastructure and pumping stations.<br>• Sand and gravel working.<br>• Docks, marinas and wharves.<br>• Navigation facilities.<br>• Ministry of Defence defence installations.<br>• Ship building, repairing and dismantling, dockside fish processing and refrigeration and compatible activities requiring a waterside location.<br>• Water-based recreation (excluding sleeping accommodation).<br>• Lifeguard and coastguard stations.<br>• Amenity open space, nature conservation and biodiversity, outdoor sports and recreation and essential facilities such as changing rooms.<br>• Essential ancillary sleeping or residential accommodation for staff required by uses in this category, *subject to a specific warning and evacuation plan*. |

**Notes to table 2:**

a. This classification is based partly on Department for Environment, Food and Rural Affairs and Environment Agency research on *Flood Risks to People* (*FD2321/TR2*)[8] and also on the need of some uses to keep functioning during flooding.

b. Buildings that combine a mixture of uses should be placed into the higher of the relevant classes of flood risk sensitivity. Developments that allow uses to be distributed over the site may fall within several classes of flood risk sensitivity.

c. The impact of a flood on the particular uses identified within this flood risk vulnerability classification will vary within each vulnerability class. Therefore, the flood risk management infrastructure and other risk mitigation measures needed to ensure the development is safe may differ between uses within a particular vulnerability classification.

[8] See website for further details.
www.defra.gov.uk/science/Project_Data/DocumentLibrary/FD2320_3364_TRP.pdf

**Table 3: Flood risk vulnerability and flood zone 'compatibility'**

| Flood risk vulnerability classification (see table 2) | | Essential infrastructure | Water compatible | Highly vulnerable | More vulnerable | Less vulnerable |
|---|---|---|---|---|---|---|
| Flood zone (see table 1) | Zone 1 | ✓ | ✓ | ✓ | ✓ | ✓ |
| | Zone 2 | ✓ | ✓ | Exception Test required | ✓ | ✓ |
| | Zone 3a | Exception Test required | ✓ | × | Exception Test required | ✓ |
| | Zone 3b functional floodplain | Exception Test required | ✓ | × | × | × |

**Key:** ✓ Development is appropriate.
× Development should not be permitted.

**Notes to table 3:**
This table does not show:
a. the application of the Sequential Test which guides development to Flood Zone 1 first, then Zone 2, and then Zone 3;
b. flood risk assessment requirements; or
c. the policy aims for each flood zone.

# Flood risk assessment

6. Properly prepared assessments of flood risk will inform the decision-making process at all stages of development planning. A Strategic Flood Risk Assessment is a study carried out by one or more local planning authorities to assess the risk to an area from flooding from all sources, now and in the future, taking account of the impacts of climate change, and to assess the impact that changes or development in the area will have on flood risk. It may also identify, particularly at more local levels, how to manage those changes to ensure that flood risk is not increased. A site-specific flood risk assessment is carried out by, or on behalf of, a developer to assess the risk to a development site and demonstrate how flood risk from all sources of flooding to the development itself and flood risk to others will be managed now, and taking climate change into account. There should be iteration between the different levels of flood risk assessment.

## Strategic Flood Risk Assessment

7. As set out in the National Planning Policy Framework, Local Plans should be supported by Strategic Flood Risk Assessment. The Strategic Flood Risk Assessment should be prepared in consultation with the Environment Agency,

local planning authorities' own functions of emergency response and drainage authority under the Land Drainage Act 1991, and where appropriate, internal drainage boards. Initially the Strategic Flood Risk Assessment will be used to refine information on the areas that may flood, taking into account other sources of flooding and the impacts of climate change, in addition to the information on the flood map. Local planning authorities should use the Strategic Flood Risk Assessment to inform their knowledge of flooding, refine the information on the flood map and determine the variations in flood risk from all sources of flooding across and from their area. These should form the basis for preparing appropriate policies for flood risk management for these areas. The Strategic Flood Risk Assessment should be used to inform the sustainability appraisal (incorporating the Strategic Environmental Assessment Directive) of local development documents, and will provide the basis from which to apply the Sequential Test and Exception Test in the development allocation and development control process.

8. Where local planning authorities have been unable to allocate all proposed development and infrastructure in accordance with the Sequential Test, taking account of the flood vulnerability category of the intended use, it will be necessary to increase the scope of the Strategic Flood Risk Assessment to provide the information necessary for application of the Exception Test. This should, additionally, consider the beneficial effects of flood risk management infrastructure in generally reducing the extent and severity of flooding when compared to the flood zones on the flood map. The increased scope of the Strategic Flood Risk Assessment will enable the production of mapping showing flood outlines for different probabilities, impact, speed of onset, depth and velocity variance of flooding taking account of the presence and likely performance of flood risk management infrastructure.

## Site-specific flood risk assessment

9. As set out in the National Planning Policy Framework, local planning authorities should only consider development in flood risk areas appropriate where informed by a site-specific flood risk assessment[9]. This should identify and assess the risks of all forms of flooding to and from the development and demonstrate how these flood risks will be managed so that the development remains safe throughout its lifetime, taking climate change into account. Those proposing developments should take advice from the emergency services when producing an evacuation plan for the development as part of the flood risk assessment.

[9] The Environment Agency provides 'standing advice' on flood risk – see the Agency's website at: http://www.environment-agency.gov.uk/research/planning/82584.aspx . Applicants for planning permission will find this advice helpful when preparing a site-specific flood risk assessment for, and before designing, a lower risk development (and for ensuring extensions or alterations are designed and constructed to conform to any flood protection already incorporated in the property and include flood resilience measures in the design). The Agency also provides standing advice to enable local planning authorities to clearly identify the type of planning applications on which they should consult the Agency, and to make decisions on low risk applications where flood risk is an issue, without directly consulting the Agency for an individual response.

10. Minor developments[10] are unlikely to raise significant flood risk issues unless they would:

    - have an adverse effect on a watercourse, floodplain or its flood defences;
    - would impede access to flood defence and management facilities; or
    - where the cumulative impact of such developments would have a significant effect on local flood storage capacity or flood flows.

## Taking climate change into account

11. Global sea level will continue to rise, depending on greenhouse gas emissions and the sensitivity of the climate system. The relative sea level rise in England also depends on the local vertical movement of the land, which is generally falling in the south-east and rising in the north and west. In preparing a Strategic Flood Risk Assessment or a site-specific flood risk assessment, the allowances for the rates of relative sea level rise shown in table 4 should be used as a starting point for considering flooding from the sea, along with the sensitivity ranges for wave height and wind speed in table 5.

## Table 4: Recommended contingency allowances for net sea level rises

| | **Net sea level rise (mm per year) relative to 1990** | | | |
|---|---|---|---|---|
| | **1990 to 2025** | **2025 to 2055** | **2055 to 2085** | **2085 to 2115** |
| East of England, east midlands, London, south-east England (south of Flamborough Head) | 4.0 | 8.5 | 12.0 | 15.0 |
| South-west England | 3.5 | 8.0 | 11.5 | 14.5 |
| North-west England, north-east England (north of Flamborough Head) | 2.5 | 7.0 | 10.0 | 13.0 |

**Notes to table 4**:

a. For deriving sea levels up to 2025, the 4mm per year, 3mm per year and 2.5mm per year rates (covering the three geographical groups respectively), should be applied back to the 1990 base sea level year. From 2026 to 2055, the increase in sea level in this period is derived by adding the number of years on from 2025 (to 2055), multiplied by the respective rate shown in the table. Subsequent time periods 2056 to 2085 and 2086 to 2115 are treated similarly.

[10] Minor development means:
- Minor non-residential extensions: industrial/commercial/leisure etc. extensions with a footprint less than 250sqm.
- Alterations: development that does not increase the size of buildings e.g. alterations to external appearance.
- Householder development: e.g. sheds, garages, games rooms etc. within the curtilage of the existing dwelling in addition to physical extensions to the existing dwelling itself. This definition excludes any proposed development that would create a separate dwelling within the curtilage of the existing dwelling e.g. subdivision of houses into flats.

b. Refer to Department for Environment, Food and Rural Affairs *FCDPAG3 Economic Appraisal Supplementary Note to Operating Authorities – Climate Change Impacts,* October 2006, for details of the derivation of this table. In particular, Annex A1 of this Note shows examples of how to calculate sea level rise.

c. Vertical movement of the land is incorporated in the table and does not need to be calculated separately.

12. The rise in sea level will change the frequency of occurrence of high water levels relative to today's sea levels, assuming no change in storminess. There may also be secondary impacts such as changes in wave heights due to increased water depths, as well as possible changes in the frequency, duration and severity of storm events. A 10 per cent sensitivity allowance should be added to offshore wind speeds and wave heights by the 2080s.

13. In making an assessment of the impacts of climate change on flooding from the land, rivers and sea as part of a flood risk assessment, the sensitivity ranges in table 5 may provide an appropriate precautionary response to the uncertainty about climate change impacts on rainfall intensities, river flow, wave height and wind speed.

### Table 5: Recommended national precautionary sensitivity ranges for peak rainfall intensities, peak river flows, offshore wind speeds and wave heights

| **Parameter** | **1990 to 2025** | **2025 to 2055** | **2055 to 2085** | **2085 to 2115** |
|---|---|---|---|---|
| Peak rainfall intensity | *+5%* | *+10%* | *+20%* | *+30%* |
| Peak river flow | *+10%* | *+20%* | | |
| Offshore wind speed | *+5%* | | *+10%* | |
| Extreme wave height | *+5%* | | *+10%* | |

**Notes to table 5:**

a. Refer to Department for Environment, Food and Rural Affairs *FCDPAG3 Economic Appraisal Supplementary Note to Operating Authorities – Climate Change Impacts,* October 2006, for details of the derivation of this table.

b. For deriving peak rainfall, for example, between 2025 and 2055 multiply the rainfall measurement (in mm per hour) by 10 per cent and between 2055 and 2085 multiply the rainfall measurement by 20 per cent. So, if there is a 10mm per hour event, for the 2025 to 2055 period this would equate to 11mm per hour; and for the 2055 to 2085 period, this would equate to 12mm per hour. Other parameters in table 5 are treated similarly.

14. Sensitivity testing of the flood map produced by the Environment Agency, using the 20 per cent from 2025 to 2115 allowance for peak flows, suggests that changes in the extent of inundation are negligible in well-defined floodplains, but can be dramatic in very flat areas. However, changes in the depth of flooding under the same allowance will reduce the return period of a given flood. This

means that a site currently located within a lower risk zone (e.g. Zone 2 in table 1) could in future be re-classified as lying within a higher risk zone (e.g. Zone 3a in table 1). This in turn could have implications for the type of development that is appropriate according to its vulnerability to flooding (see table 2). It will therefore be important that developers, their advisors and local authorities refer to the current flood map and the Strategic Flood Risk Assessment when preparing and considering proposals.

15. Flooding in estuaries may result from the combined effects of high river flows and high sea surges. When taking account of impacts of climate change in flood risk assessments covering tidal estuaries, it will be necessary for the allowances for sea level rise in table 4 and the allowances for peak flow, wave height and wind speed in table 5 to be combined.[11]

## Managing residual flood risk

16. Residual risks are those remaining after applying the sequential approach and taking mitigating actions. It is the responsibility of those planning development to fully assess flood risk, propose measures to mitigate it and demonstrate that any residual risks can be safely managed. Flood resistance and resilience measures should not be used to justify development in inappropriate locations.

### Flood resilience and resistance

17. The relative benefits of resilient and resistant construction have been assessed both through risk assessment and the real time testing of model forms of construction. Resilient construction is favoured because it can be achieved more consistently and is less likely to encourage occupiers to remain in buildings that could be inundated by rapidly rising water levels.

18. Flood-resilient buildings are designed to reduce the consequences of flooding and facilitate recovery from the effects of flooding sooner than conventional buildings. This may be achieved through the use of water-resistant materials for floors, walls and fixtures and the siting of electrical controls, cables and appliances at a higher than normal level. The lower floors of buildings in areas at medium and high probability of flooding should be reserved for uses consistent with table 1. If the lowest floor level is raised above the predicted flood level, consideration must be given to providing access for those with restricted mobility. In considering appropriate resilience measures, it will be necessary to plan for specific circumstances and have a clear understanding of the mechanisms that lead to flooding and the nature of the flood risk by undertaking a flood risk assessment.

19. Flood-resistant construction can prevent entry of water or minimise the amount of water that may enter a building where there is flooding outside. This form of construction should be used with caution and accompanied by resilience

[11] Refer to Defra *FCDPAG3 Economic Appraisal Supplementary Note to Operating Authorities – Climate Change Impacts*, October 2006. Annex A2 gives details of joint probability analysis. www.defra.gov.uk/environ/fcd/pubs/pagn/climatechangeupdate.pdf

measures, as effective flood exclusion may depend on occupiers ensuring some elements, such as barriers to doorways, are put in place and maintained in a good state. Buildings may also be damaged by water pressure or debris being transported by flood water. This may breach flood-excluding elements of the building and permit rapid inundation. Temporary and demountable defences are not normally appropriate for new developments.

# Minerals policy

## Proximity of mineral workings to communities

20. As set out in the National Planning Policy Framework, minerals planning authorities are expected to ensure that plan proposals do not have an unacceptable adverse effect on the natural or historic environment or human health. Residents living close to mineral workings may be exposed to a number of environmental effects and particular care should be taken in respect of any conditions they attach to a grant of permission for working in proximity to communities.

21. A programme of work should be agreed which takes account, as far as is practicable, of the potential impacts on the local community over the expected duration of operations. The programme of work and/or the location of plant within the mineral working should take account of the proximity to occupied properties, as well as legitimate operational considerations.

22. In some circumstances, new or extended permissions for minerals extraction close to residential property may not provide adequate protection. In such cases, it may be justified to consider adequate separation distances. Any such distance should be effective but reasonable, taking into account:

    - the nature of the mineral extraction activity (including its duration);
    - the need to avoid undue sterilisation of mineral resources, location and topography;
    - the characteristics of the various environmental effects likely to arise; and
    - the various amelioration measures that can be applied.

    Working in proximity to residential property may be necessary where there are clear, specific achievable objectives such as the removal of instability and preparing land for subsequent development. Such working should be for a limited and specified period, without scope for extension.

## Dust emissions

### General considerations

23. The National Planning Policy Framework makes it clear that unavoidable dust[12] emissions are controlled, mitigated or removed at source. A dust assessment study should be undertaken by a competent person/organisation with acknowledged experience of undertaking this type of work.

[12] Dust is the generic term which BS6069 (Part 2) *Characterization of air quality Glossary* (1987) uses to describe particulate matter in the size range 1–75 µm (micrometres) in diameter. Particles that are less than or equal to (≤ ) 10 µm in diameter are commonly referred as PM10.

24. The scope of a dust assessment study should be agreed with the minerals planning authority and local planning authority. Such studies should be used to:

    - establish baseline conditions of the existing dust climate around the site of the proposed operations;
    - identify site activities that could lead to dust emission without mitigation;
    - identify site parameters which may increase potential impacts from dust;
    - recommend mitigation measures, including modification of site design; and
    - make proposals to monitor and report dust emissions to ensure compliance with appropriate environmental standards and to enable an effective response to complaints.

25. The key stages of the dust assessment study are set out in table 6 below.

### Table 6: Key stages of a dust assessment study

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| **Stage 1: Establish existing baseline conditions**<br>Existing ambient conditions should be recorded over a period sufficient to identify seasonal variations in the range of existing conditions which naturally exist (ideally by a dust-monitoring programme). It should take into account the principal existing dust sources (other than the site) such as air pollution from urban and industrial areas, existing mineral operations, agricultural activities and construction activities.<br><br>The location of residential areas, schools and other dust-sensitive land uses should be identified in relation to the site, as well as proposed or likely sources of dust emission from within the site.<br><br>The assessment should explain how topography may affect the emission and dispersal of site dust, particularly the influence of areas of woodland, downwind or adjacent to the site boundary, and of valley or hill formations in altering local wind patterns.<br><br>The assessment should explain how climate is likely to influence patterns of dispersal by analysing data from the UK Meteorological Office or other recognised agencies on wind conditions, local rainfall and ground moisture conditions. |
| **Stage 2: Identify site activities that could lead to dust emission without mitigation**<br>Potential dust sources should be identified and their potential to emit dust assessed with respect to the duration of the activity or the potential of dust to become airborne. |
| **Stage 3: Identify site parameters which may increase potential impacts from dust**<br>This brings together information collected in Stages 1 and 2 with information on sensitive land uses around the site in order to understand how these uses could be affected by dust. Computer modelling techniques can be |

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| used to understand how dust could disperse from a site. Alternatively, a more qualitative approach, relying on professional judgement, could be used to bring together the data collected in Stages 1 and 2. |
| **Stage 4: Recommend mitigation measures and site design modifications**<br>Measures to control dust should be specified and described in terms of their potential to reduce dust and consequent impacts. This is important in paving the way to prepare effective planning conditions. |

## Health effects of dust

26. The relationship of the activities within mineral workings to surrounding land uses will vary from site to site. Since the nature of those land uses varies, so will their sensitivity to dust. Table 7 below gives broad categories of uses in terms of their sensitivity to nuisance dust.

### Table 7: Examples of dust-sensitive facilities (after *Ireland M,* 1992)

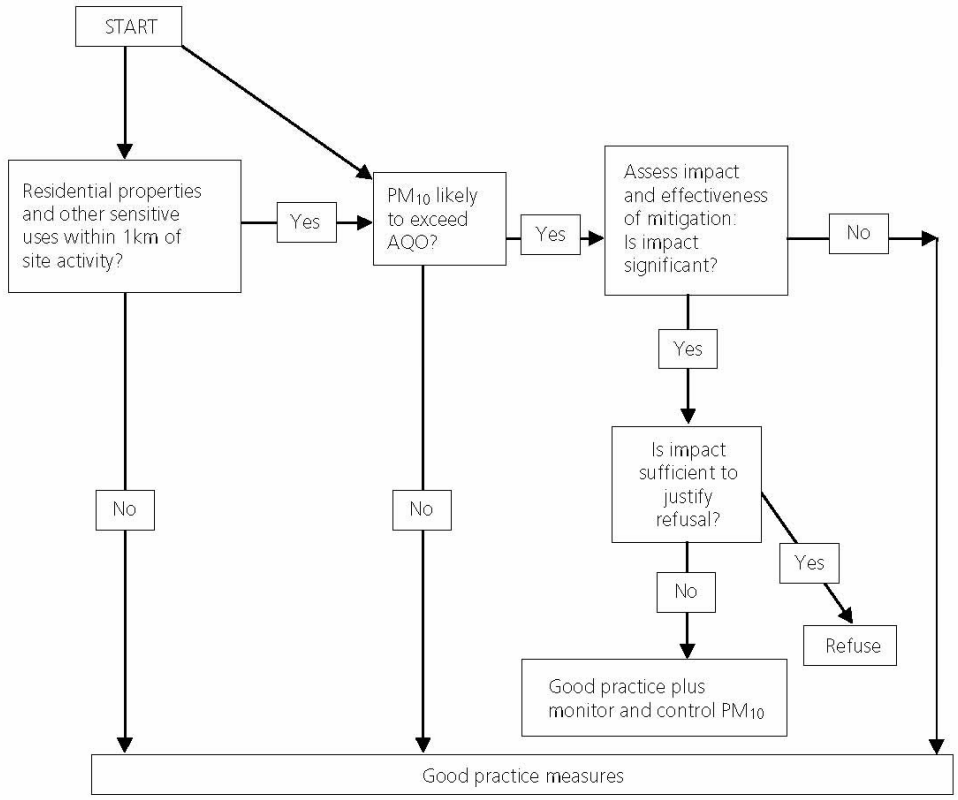
| High sensitivity ← | --> Medium sensitivity ← | --> Low sensitivity |
|---|---|---|
| Hospitals and clinics<br>Retirement homes<br>Hi-tech industries<br>Painting and furnishing<br>Food processing | Schools<br>Residential areas<br>Food retailers<br>Glasshouses and nurseries<br>Horticultural land<br>Offices | Farms<br>Light and heavy industry<br>Outdoor storage |

27. In line with research carried out by Arup Environmental/Ove Arup and Partners[13] and the University of Newcastle upon Tyne[14] in 1995 and 1999 respectively, additional measures to control $PM_{10}$ might be necessary if, within a site, the actual source of emission (e.g. the haul roads, crushers, stockpiles etc.) is within 1,000m of any residential property or other sensitive use. Operators should follow the assessment framework in figure 1.1 below for considering the impacts of $PM_{10}$ from a proposed site[15]. However, the cut-off point for individual proposals (and consideration of additional assessments) may vary according to local circumstances (such as the topography, the nature of the landscape, the respective location of the site and the nearest residential property or other sensitive use in relation to the prevailing wind direction and visibility). The Newcastle research suggests that impacts can be assessed against two potential sources of information:

- site/community-monitored $PM_{10}$ data; and
- any available air quality-monitoring network data.

[13] Arup Environmental/Ove Arup & Partners 1995. *The Environmental Effects of Dust from Surface Minerals Workings*. Report on behalf of the Department of the Environment.
[14] University of Newcastle upon Tyne, 1999. *Do Particulates from Opencast Coal Mining Impair Children's Respiratory Health?* Report on behalf of the Department of Health and the Department of the Environment, Transport and the Regions (TSO).
[15] Air Quality Objectives in figure 1.1 refer to objectives set out in the Air Quality (England)(Amendment) regulations 2002 (SI 2002/3043).

**Figure 1.1 Site Assessment Flow Chart**




# Noise emissions

28. The National Planning Policy Framework makes it clear that minerals planning authorities should ensure that unavoidable noise emissions are controlled, mitigated or removed at source. It further recognises that mineral planning authorities should also establish appropriate noise limits for extraction in proximity to noise sensitive properties.

29. Those making development proposals should carry out a noise emissions assessment, which 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. Proposals for the control or mitigation of noise emissions should consider:

    - the main characteristics of the production process and its environs, including the location of noise-sensitive properties;
    - proposals to minimise, mitigate or remove noise emissions at source;
    - assessing the existing noise climate around the site of the proposed operations, including background noise levels at nearby noise-sensitive properties;
    - estimating the likely future noise from the development and its impact on the neighbourhood of the proposed operations;

- monitoring noise emissions to ensure compliance with appropriate environmental standards.

### Noise standards

30. Subject to a maximum of 55dB(A)LAeq, 1h (free field), mineral planning authorities 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 in many circumstances it will be difficult to not exceed the background level by more than 10dB(A) without imposing unreasonable burdens on the mineral operator. In such cases, the limit set should be as near that level as practicable during normal working hours (0700-1900) and should not exceed 55dB(A) LAeq, 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) LAeq,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 bleepers, may also require separate limits that are independent of background noise - e.g. Lmax in specific octave or third-octave bands - and should not be allowed to occur regularly at night.

31. 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) LAeq 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) LAeq 1h (free field) limit referred to above should be regarded as the normal maximum.

## Stability in surface mine workings and tips

32. The National Planning Policy Framework makes it clear that amongst other issues, environmental criteria should address the issue of tip-and quarry-slope stability. The consideration of slope stability that is needed at the time of application will vary between mineral workings depending on a number of factors, e.g. depth of working; the nature of materials excavated; the life of the working; and the nature of restoration proposals and, thus the length of time slopes are expected to be in place. Appraisal of slope stability issues for new workings should be based on existing information, which aims to:

- identify any potential hazard to people and property and assess its significance;
- establish the basis for reserve calculation;
- identify any features which could adversely affect the stability of the working to enable basic quarry design to be undertaken.

# Restoration and aftercare of mineral sites

33. The National Planning Policy Framework requires that planning authorities should provide for restoration and aftercare at the earliest opportunity to be carried out to high environmental standards. This should include through provision of a landscape strategy, restoration conditions and aftercare schemes as appropriate. For the purposes of the Framework and this technical guide:

    - restoration means operations associated with the winning and working of minerals and which are designed to return the area to an acceptable environmental condition, whether for the resumption of former land use or a new use; and
    - aftercare means the use that land, used for minerals working, is put to after restoration.

## Landscape strategy

34. A site-specific landscape strategy to accompany applications for either a new site or any significant extension to an existing working site should include:

    - defining the key landscape opportunities and constraints;
    - considering potential directions of working, significant waste material locations, degrees of visual exposure etc;
    - identifying the need for additional screening during operations;
    - identifying proposed after-uses and preferred character for the restored landscape.

35. Landscape and reclamation plans should address the impacts which mineral extraction can have on the existing landscape. These will include the working face and operations at the face, locations of waste tips, and haul roads. Coordination of phasing, provision of temporary or permanent screening, and progressive reclamation can together minimise visual impact and the impact on landscape quality.

## Reclamation conditions/schemes

36. Reclamation schemes should indicate how the restoration and aftercare of the site is to be integrated with the working scheme, and should demonstrate the suitability of the proposals of the proposed after-use. Before designing a reclamation scheme, the operator should undertake a comprehensive site survey to identify any existing features on the site that may be incorporated

into the reclamation scheme, together with a survey of the soil resource and site hydrology. Consideration should also be given to the potential impacts of the reclamation proposals on adjacent land.

37. To demonstrate that a site can be reclaimed to an acceptable standard and after-use, the applicant is advised to prepare, at the outset, a working plan which includes restoration proposals and is based upon findings from the site investigation.

38. Where a permission is granted, the conditions should be drafted in such a way that, even if the interest of the mineral operator applying for permission is subsequently disposed of, the requirements for reclamation can still be fulfilled, whether by a new operator or in the case of default, by the land-owner.

39. Planning conditions for reclamation should be specific to the proposed site and should normally be framed with the intended after-use in mind. They will vary according to:

    - the characteristics of the individual site;
    - the intended after-use;
    - the type of mineral to be worked;
    - the method of working;
    - the timescale of the working;
    - the general character of, and planning policies for the area.

40. For after-uses which involve some form of plant growth (e.g. for agriculture, forestry or amenity including some forms of nature conservation), the plan will usually involve a number of key stages:

    i. stripping of soils and soil-making materials and either their storage or their direct replacement (i.e. 'restoration') on another part of the site;
    ii. storage and replacement of overburden;
    iii. achieving the landscape and landform objectives for the site, including filling operations if required, following mineral extraction;
    iv. restoration, including soil placement, relief of compaction and provision of surface features;
    v. aftercare.

41. Where possible, it is normally desirable to have 'progressive' or 'rolling' reclamation to minimise the area of land occupied at any one time by the mineral working, unless to do so would be likely to affect adversely the standard of reclamation achieved, or would be impractical having regard to the type of operation and nature of the site. Conditions for progressive reclamation normally limit the area taken for mineral working at any one time and relate it to the rate of restoration of earlier phases of the operation. It is, however, important that conditions permit a sufficient area of land to be stripped of soils in advance of mineral extraction to allow for wet years when soil stripping operations may be impracticable. It is not advisable to specify

actual dates in conditions for phasing unless there are overriding reasons to do so.

42. For short-term workings it is usually appropriate to impose a detailed set of conditions at the time of granting planning permission. For longer-term workings, early agreement on the details of at least the later stages of reclamation may not be appropriate. However, in such cases, it would still be appropriate to provide a general outline of the final landform and intended after-use.

43. It would also be appropriate to agree at the outset outlines of requirements covering the main stages (e.g. filling, restoration and aftercare), together with detailed schemes for stripping and storage of soil materials. This must be sufficient to clearly demonstrate that the overall objectives of the scheme are practically achievable. Such workings should then normally require the submission of a detailed scheme or schemes for restoration and aftercare, for agreement, by some specific stage towards the end of the life of the permission. Sites where progressive reclamation is to be carried out can require submission of schemes for agreement from time to time as appropriate.

## Aftercare schemes

44. The preparation of a successful aftercare scheme requires two levels of information from the mineral operator:

    - an outline strategy of commitments for the five year aftercare period; and
    - a detailed programme for the forthcoming year.

45. The outline strategy should broadly outline the steps to be carried out in the aftercare period and their timing within the overall programme. These should include, as appropriate:

    - timing and pattern of vegetation establishment;
    - cultivation practices;
    - secondary treatments;
    - drainage;
    - management of soil, fertility, weeds etc;
    - irrigation and watering.

46. A map should accompany the outline, identifying clearly all areas subject to aftercare management, with separate demarcation of areas according to differences in the year of aftercare and proposed management. Where a choice of options is retained this should be made clear together with criteria to be followed in choosing between them.

47. The detailed programme should cover requirements for the forthcoming year. It should:

- amplify the outline strategy for work to be carried out in the forthcoming year;
- confirm that steps already specified in detail in the outline strategy will be carried out as originally intended;
- include any modifications to original proposals e.g. due to differences between actual and anticipated site conditions.

48. The programme should provide for specific steps where appropriate, including:

    - vegetation establishment;
    - vegetation management;
    - secondary treatments;
    - field drainage;
    - irrigation/watering;
    - tree and hedge establishment.

### Financial guarantees

49. Responsibility for the restoration and aftercare of mineral sites lies with the operator and, in the case of default, with the landowner. Applicants should, therefore, demonstrate with their applications what the likely financial and material budgets for restoration, aftercare and after-use will be, and how they propose to make provision for such work during the operational life of the site. No payment of money or other consideration can be required when granting planning permission except where there is specific statutory authority.

50. Exceptional cases where it will be reasonable for a minerals planning authority to seek a financial guarantee to cover restoration (including aftercare) costs, through a voluntary agreement/planning obligation at the time a planning permission is given include:

    - for very long-term new projects where progressive reclamation is not practicable, such as a super-quarry or some types of industrial or metalliferous mineral sites, where incremental payments into a secure fund may be made as the site develops;
    - where a novel approach or technique is to be used, but the minerals planning authority considers it is justifiable to give permission for the development;
    - where there is reliable evidence of the likelihood of either financial or technical failure, but these concerns are not such as to justify refusal of permission.

51. However, where an operator is contributing to an established mutual funding scheme, such as the Mineral Products Association Restoration Guarantee Fund, it should not be necessary for a minerals planning authority to seek a guarantee against possible financial failure, even in such exceptional circumstances.

## Landbanks for industrial minerals

52. For cement raw materials, there should be a stock of permitted reserves ("landbank") calculated for each proposed site for a cement plant. The size of the cement industry's landbank should be directly linked to the scale of capital investment envisaged at a site.

53. The landbank requirements for silica sand should be calculated by multiplying the average of the last three years production for which figures are available by the appropriate number of years or by reference to levels of provision set out in the local plan. The calculations should have regard to the quality of sand and the use to which the material is put.

## Definitions in the National Planning Policy Framework

54. The National Planning Policy Framework refers to specific categories of minerals. For the purposes of the Framework, the following definitions should be used:

- aggregate minerals – sand and gravel, and crushed rock;

- energy minerals - minerals used in the generation of energy, including shallow and deep-mined coal, oil and gas (including unconventional hydrocarbons such as shale gas); and

- industrial minerals - minerals which are necessary to support industrial and manufacturing processes. These include: brickclay (especially Etruria Marl and fireclay), silica sand (including high grade silica sands), cement raw materials, gypsum, salt, fluorspar, tungsten, kaolin, ball clay and potash.

# Glossary of technical noise terms

**Ambient noise:** Total encompassing sound in a given situation at a given time usually composed of sound from many sources near and far. Includes both the residual noise and the 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 such that it does not contribute to the ambient noise.

**Specific noise:** The noise source under investigation.

**Background noise level:** The A-weighted sound pressure level of the residual noise at the assessment position that is exceeded for 90 per cent of a given time interval, T, i.e. $L_{A90,T}$.

**Decibel (dB):** A unit of level derived from the logarithm of the ratio between the value of a quantity and a reference level. For sound pressure level the reference quantity is 20 micro-pascals, the threshold of hearing (0 dB). 140 dB(A) is the threshold of pain.

**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 people's assessment of loudness.

**Free Field:** An external sound field in which no significant sound reflections occur (apart from the ground).

**LA10,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.

**LA90,T:** The "A weighted" noise level exceeded for 90 per cent of the specified measurement period (T).

**LAeq,T:** The "A weighted" equivalent continuous sound level – the sound level of a notionally steady sound having the same energy as the actual fluctuating sound over the same time period (T).

**Lmax:** The highest noise level recorded during a noise event or measuring period.

**Tonality:** The degree to which a noise contains clearly discernible pure tones. Noise without such tonal content (Broadband noise) is generally less annoying than noise with identifiable tones.