

AIR QUALITY ASSESSMENTS

Introduction

This Information Note has been prepared primarily for technical specialists and professionals dealing with air quality matters, and those having responsibilities and tasks relating to the preparation, and conduct of, reports and studies in this field of work. It is intended to aid the submission of information to the council and to ensure that air quality assessments are suitable for their purpose.

Those needing to undertake or commission air quality assessments who are not specialist or professional practitioners in this area of work are advised to seek professional assistance at the outset, having regard to the content of this Note.

Overview

As part of new developments, construction schemes, engineering projects and transport initiatives, in accordance with national policy guidance, local air quality management or environmental control, it can be necessary to conduct assessments of air quality impacts as a requirement on the part of the council. This can be a material consideration, for example, in determining planning applications; deciding the suitability of sites to be allocated for certain development (or re-development), or activities and operations; or else as part of regulatory control of industrial installations.

This Information Note is designed to assist those making submissions to the council. It should be noted that its scope does not cover odour assessments.

Planning Developments

Whether air quality is relevant to a planning decision will depend on the proposed development and its location. Concerns could arise if the development is likely to have an adverse effect in areas where it is already known air quality is poor, particularly if it could affect the implementation of air quality strategies and action plans, and/or breach legal obligations. Air quality may also be a material consideration if the proposed development would be particularly sensitive to poor air quality in its vicinity.

Prior to commissioning or conducting an air quality assessment in support of a planning application, you are strongly advised to consult Environmental Protection to firstly review the need for such an assessment and, as appropriate, determine its scope and what air pollutants are required to be considered.

Where planning development is proposed and an air quality assessment is necessary, this should be undertaken prior to a planning application being made in order to assess

the viability of the development and suitability of any site, and mitigation measures that may be required.

An air quality assessment is likely to be required where:

- proposed development is in an area of existing or forecast poor air quality;
- proposed development will have a significant impact on air quality, either directly or indirectly;
- people will be exposed to harmful concentrations of air pollutants, including dust. This could be by building new homes, schools, workplaces or other development in places with poor air quality;
- potentially unacceptable impacts (such as dust) during construction, demolition, site investigations, and site preparation or remediation will arise at nearby sensitive locations;
- new point sources of air pollution are introduced. This could include furnaces which require prior notification to local authorities; biomass boilers or biomass-fuelled Combined Heat and Power plant; centralised boilers or plant burning other fuels within or close to an air quality management area or introduce relevant combustion within a Smoke Control Area; or extraction systems (including chimneys) which require approval or permits under pollution control legislation;
- development would lead to changes (including any potential reductions) in vehicle-related emissions in the immediate vicinity or further afield. This could be through the provision of electric vehicle charging infrastructure; altering the level of traffic congestion; significantly changing traffic volumes, vehicle speeds or both; or significantly altering the traffic composition on local roads.
- Proposals that involve the development of a bus station, coach or lorry park;
- Development could add to turnover in a large car or lorry park, or involve construction sites that would generate large heavy goods vehicle flows over a period of a year or more.

Concerning proposed new development, air quality assessments may also need to incorporate associated construction works, demolition of building and structures, site preparation and site remediation activities.

For the purposes of planning applications, air quality assessments can be required to address the following policy considerations:

- Is the development acceptable in principle;
- Whether the environmental objective for sustainable development requiring pollution to be minimised is met;
- Would granting of planning permission fulfil the aim to achieve healthy places;
- Is the delivery of any local strategies to improve health taken into account;

- Is the development an effective use of land that meets the need for homes, whilst safeguarding and improving the environment, and ensuring healthy living conditions are promoted;
- Is the development considered an acceptable use of land and appropriate for its location, taking into account the likely effects (including cumulative effects) of pollution on health and living conditions;
- Will the development function well and add to the overall quality of the area, and create places that are safe, inclusive and accessible, and which promote health and well-being, with a high standard of amenity for existing and future users;
- Have opportunities to improve air quality or mitigate impacts have been identified;
- Does the development contribute to unacceptable air pollution;
- Is the development adversely affected by, or put at an unacceptable risk, due to levels of air pollution;
- Will the development sustain and contribute towards compliance with relevant limit values or national objectives for pollutants in an Air Quality Management Area and is it consistent with any local air quality action plan;
- Can the development be integrated effectively with existing businesses and community facilities;
- Will the development result in unreasonable restrictions being placed on existing businesses and facilities;
- Has suitable mitigation been provided to safeguard against existing business(es) or community facilities in the vicinity, which could have a significant adverse effect on the development.

The Department for Environment, Food and Rural Affairs carries out an annual national assessment of air quality using modelling and monitoring to determine compliance with relevant Limit Values. It is important that the potential impact of new development on air quality is taken into account where the national assessment indicates that relevant limits have been exceeded or are near the limit, or where the need for emissions reductions has been identified.

Consideration of air quality issues at the plan-making stage can ensure a strategic approach to air quality and help secure net improvements in overall air quality where possible.

Purpose and Scope of Air Quality Assessments

The purpose of an air quality assessment will often be to quantify both existing and future changes in pollutant concentrations, along with exposure of relevant receptors to poor air quality. This may result from proposed planning development, and in turn it is important to appraise the significance of impacts and consider scenarios of 'do nothing' and 'do something' in so far as mitigation is concerned. This may result in

establishing that development is undesirable or untenable, or is premature in terms of its delivery.

For new development purposes, air quality impacts are required to be assessed in context of relevant national and international requirements which incorporates limit values, latest guidelines, objectives and targets, together with reference to local planning, policies or local guidance where appropriate or as considered necessary by the council. Emerging policies, guidelines (including World Health Organisation Air Quality Guidelines) and changes to objectives, targets or limits are considered to be within scope of air quality assessments and the safeguarding of relevant receptors.

In context to planning developments, an air quality assessment must take commensurate account of both discrete and cumulative air quality impacts of committed developments and schemes (inclusive of proposals and schemes that have been granted planning permission at the time an assessment is undertaken, which can feasibly be explored with the council's planning team). This ensures that current and likely future '*with development*' and '*without development*' scenarios are represented.

Alternatively, an air quality assessment may be required to understand and evaluate impacts upon human health and the local amenity, tailored to specified operations, processes and activities. The bespoke nature of such studies can also require consideration and scrutiny by external third parties.

Air Quality Modelling and Monitoring

Suitable air quality assessments often need to incorporate the completion of a detailed air quality modelling study to the satisfaction of Environmental Protection.

Where this is the case air quality modelling should only be carried out once data and information to be used, along with modelling method(s), have been confirmed and agreed with Environmental Protection. The scope of this normally includes, but is not restricted to:

- Traffic data used for the assessment, including trip rates associated with the development, the frequency of the trips, the length and route of the trips, traffic congestion and the nature and types of vehicles being used;
- Emission source data (e.g. using emissions factor toolkits, point source mass emission rates and measured pollutant concentrations) Suitable meteorological data and representation of area over a suitable time frame;
- Baseline pollutant concentration(s) including any monitoring undertaken;
- Background pollutant concentration(s) and proxy monitoring stations;
- Choice of modelling base year(s);
- Means of model verification;
- Geographical information inputs, including topographical features and buildings.

- Representation of pollutant sources (e.g. multi-lane vehicle carriageways as a series of individual source lines; queuing traffic; road gradients;
- Model resolution (e.g. 5m²) versus specified receptor points.

It is advised that air quality modelling should be carried out using a recognised local scale dispersion model agreed with Environmental Protection prior to commencement of work.

From time to time, a programme of specific pollutant monitoring may be required, notably in regard to construction, demolition site preparation and site remediation activities, which should be agreed in advance of commissioning with Environmental Protection. This will need to account for: monitoring methods and techniques; monitoring locations; monitoring periods and conditions of monitoring; analyses, where appropriate; reporting of results; and validation and interpretation of results.

Components of an Air Quality Assessment

This will normally comprise several phases, which include, but are not limited to:

1. Assessment of the existing 'baseline' air quality situation in a defined study area for the agreed baseline year(s) and selection of acceptable specific receptor points agreed with the council prior to commencement.
2. Validation of the model against acceptable monitoring data. In some cases this will have to be acquired prior to a study, or carried out for specific time periods to compare directly with model outputs. This can also require acquisition of other modelling input data, for example traffic flows and compositions.
3. Prediction of future air quality without the proposed development in place using geographical and pollutant source data.
4. Prediction of future pollutant emissions and air quality with any proposed development in place.
5. An assessment of the effect(s) proposed development will have on air quality associated with road transport, industrial and commercial pollutant emissions, and including proposed mitigation measures.

Note: for Stages 3 and 4 above, the future scenario year(s) will need to be agreed in advance with the local authority prior to commencement of work.

The assessment will also need to include:

- Relevant details of any proposed development
- Details of applicable air quality standards, objectives, limit values etc.
- Details of the agreed assessment method

- Vehicle fleet composition and emission factors as necessary
- An assessment, where required, of construction related air quality impacts;
- Details of the modelling software and its validation;
- Results of the modelling exercise, including uncertainties, errors, adjustments and verification;
- A sensitivity test carried out using real world emission data in line with current best practice
- Summary of the assessment results and air quality impacts arising; and;
- Mitigation measures to be taken to safeguard against unacceptable air quality impacts.

Construction, Demolition and Other Site Activities

Construction phase impacts in a general sense quite often (but not exclusively) relate to deposited dust(s) and elevated levels of particulate matter in air which for the main part are expressed as PM_{2.5} and PM₁₀ (and potentially other PM fractions).

In some cases construction plant and machinery may have a tangible impact in regard to gaseous emissions (e.g. nitrogen dioxide), and a balanced view is necessary as to whether an air quality impact assessment which includes pre and post construction monitoring is necessary for all or specified pollutants of concern. This will potentially need to incorporate the likelihood of both long term and short-term air quality criteria being exceeded along with amenity criteria, and should be approached on a site specific basis having regard to the location of relative receptors.