# Guideline

***Environmental Protection Act 1994***

## Application requirements for activities with impacts to air

*This guideline outlines the information to be provided to support an environmental authority application for activities with impacts to air.*

# Table of contents



**Version history**

| Version | Date | Description of changes |
|---|---|---|
| 1.00 | 31 March 2013 | First published |
| 2.00 | 2 January 2014 | Fixing broken links |
| 3.00 | 15 October 2015 | Updated for *Environmental Offsets Act 2014*, replaced wild rivers information with areas of regional interest, updated info on acid sulfate soils |
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# 1 Introduction

This guideline focuses on the types of impacts that environmentally relevant activities (ERAs) can have on air, and outlines the information to be provided to the department as part of the ERA application process.

This guideline seeks to assist both regulators and operators of ERAs to identify, quantify and evaluate the impact that air emissions from proposed ERAs may have on environmental values, and to manage the impacts in a way that achieves a balance between the social and economic benefits of development, and maintaining the environmental values of the receiving environment.

In general, there are three key areas to be identified and addressed through the ERA application process:[1]

- Identify the environmental values of the receiving air environment including the identification of any nearby sensitive places.
- Identify the possible impacts of the proposed activity and all associated risks to the environmental values.
- Identify the strategies to mitigate the identified risks to the environmental values.

This guideline describes the types of information that the applicant must provide to address the three key points above. The information provided will assist the department in deciding the application and conditioning the environmental authority.

## 1.1 Using this guideline

The information provided in this guideline is updated regularly by the Department of Environment, Science and Innovation (the department) and is subject to change without notice. Applicants should check the department's website for the latest copy prior to lodgement.

Sections 3–5 set out the information that applicants will need to provide to the department with their application. Section 6 sets out some useful references to help applicants develop their application material.

The information provided in this guideline is general in nature. To assist applicants to identify key areas of concern associated with each ERA, further information on industry specific air impacts can be found at www.business.qld.gov.au.

The level of detail required to support an application will depend on the type of ERA proposed and its likely impact on the receiving environment. Some activities will require a more detailed impact assessment. In order to assist applicants to identify potential areas of concern associated with their individual applications, applicants are encouraged to participate in a pre lodgement meeting.

Applications can now be made to the department online through Online Services. Supporting documentation that addresses each environmental value impacted by the activity can be uploaded electronically. Supporting documentation can be uploaded as a separate document for each environmental value or as one document uploaded at the end of the online application process. For more information and to register to use Online Services go to https://www.qld.gov.au/environment/pollution/licences-permits/onlineservices.

This guideline is relevant for applications for prescribed ERAs and mining ERAs. For applications relating to petroleum, geothermal or greenhouse gas storage ERAs, refer to the guideline 'Application requirements for petroleum activities' (ESR/2016/2357).

[1] Section 125 of the *Environmental Protection Act 1994*

## 1.2 What is 'air'?

'Air' is a common term for the mixture of gases and small solid and liquid particles which make up our atmosphere. It consists primarily of nitrogen (78%) and oxygen (21%), with argon, carbon dioxide, trace gases and air pollutants making up the remainder.

The air is a critical component of our environment which can be affected by pollution. Air pollution can negatively affect environmental values, including:

- human health and wellbeing
- aesthetics of the environment
- the health and biodiversity of ecosystems
- agricultural use of the environment.

Human health impacts of air pollution can include respiratory problems such as coughs, bronchitis or asthma; and cardiovascular problems such as heart failure, arrhythmias and strokes. Environmental aesthetics may be affected by odour, haze, smog and dust. Pollutants can also affect the health and growth of animals and plants, potentially changing natural ecosystems and causing adverse impacts on agricultural crops. Effects may be local or global.

An air pollutant can be a chemical, physical, or biological agent that modifies the natural characteristics of the atmosphere. Pollutants may be in the form of odour, light, dust or other airborne contaminants. Some pollutants come from natural sources (e.g. dust storms, bushfires) while others are caused by human activities, such as motor vehicle use, domestic activities, industry and business. Pollutants may be emitted from specific point sources (e.g. pipes or stacks), or diffuse sources (e.g. dust from roadways).

When conducting an ERA, operators must take all reasonable and practicable measures to avoid or minimise potentially harmful emissions or actions which may adversely affect air quality. An impact assessment should be conducted for residual environmental risks that cannot be avoided. Depending on the identified risks, assessing the impact of an ERA on air can be complex and may require a substantial body of information to be prepared. This may involve predicting resultant air quality and comparing the results to recognised guidelines.

Where relevant, the environmental values and air quality objectives defined in the Environmental Protection (Air) Policy 2019 (EPP (Air)) should also be addressed in the application.

## 1.3 Queensland environmental law

In Queensland, the environmental impacts of air emissions associated with ERAs are regulated under the *Environmental Protection Act 1994* (EP Act) and subordinate legislation, including the Environmental Protection Regulation 2019 (EP Regulation) and EPP (Air). The EP Act provides a framework for the regulation of ERAs. An environmental authority is required to conduct an ERA, and this authority may include conditions to protect the environmental values of air from environmental harm. Environmental harm is any adverse effect or potentially adverse effect on an environmental value.

The EP Regulation and EPP (Air) provide further information on how an application will be assessed and decided. The EPP (Air) identifies environmental values to be enhanced or protected and specifies air quality objectives for indicators (selected contaminants) to protect these values. These objectives are derived from national and international standards, including the National Environment Protection (Ambient Air Quality) Measure, National Environment Protection (Air Toxics) Measure, World Health Organization Guidelines for Europe (2000) and United States Environmental Protection Acency.

As a participating jurisdiction in the National Environmental Protection Measure (Ambient Air Quality) and National Environmental Protection Measure (Air Toxics), the Queensland Government conducts ambient air quality monitoring for a range of air pollutants. Information obtained through this monitoring, as well as that conducted by other jurisdictions, will inform future air quality goals and standards. Further information, including the results of this monitoring, is available on the department's website.

The term 'environmental value' is generally used to describe the physical, aesthetic, social and cultural values of a location or proposed site. Specific environmental values relevant to air are defined in the EPP (Air).

Under the EPP (Air), the following environmental values are to be enhanced or protected:

- the qualities of the air environment that are conducive to protecting the health and biodiversity of ecosystems
- the qualities of the air environment that are conducive to human health and wellbeing
- the qualities of the air environment that are conducive to protecting the aesthetics of the environment, including the appearance of buildings, structures and other property
- the qualities of the air environment that are conducive to protecting agricultural use of the environment.

# 2 Making an application involving air emissions

The EP Act[2] specifies the information that must be included with applications for environmental authorities. This guideline outlines the information requirements in further detail as they relate to air emissions, and clarifies how the department will use this information to make a decision on the application.

When deciding an application, the department is required to assess the application against requirements stipulated in the EP Act, including considerations stated in the EP Regulation and any relevant Environmental Protection Policy, including the EPP (Air).

For environmental authority applications that have the potential to impact air, the application must describe how one of the following environmental objective and performance outcomes for the ERA will be achieved. Under Schedule 8, part 3, division 1 of the EP Regulation, the environmental objective and performance outcomes for air are:

**Environmental objective**

The activity will be operated in a way that protects the environmental values of air.

**Performance outcomes**

There is no discharge to air of contaminants that may cause an adverse effect on the environment from the operation of the activity, or

All of the following:

(a) Fugitive emissions of contaminants from storage, handling and processing of materials and transporting materials within the site are prevented or minimised.

(b) Contingency measures will prevent or minimise adverse effects on the environment from unplanned emissions and shut down and start up emissions of contaminants to air.

(c) Releases of contaminants to the atmosphere for dispersion will be managed to prevent or minimise adverse effects on environmental values.

[2] Section 125 of the EP Act

# 3 Environmental values

The first step in making an application for an ERA is to accurately identify the environmental values of the site and surrounding areas including any nearby sensitive places. The following table outlines a number of different tools, strategies and suggestions to assist applicants in identifying the environmental values of the proposed site.

In addition to general information about the site and the environmental values there are a number of key environmental priority areas which, if applicable, should be addressed in detail by the applicant. If they are applicable, these environmental priorities have regulatory assessment requirements and are required to be assessed by the department.

**Surrounding land**

Describe what the area surrounding the site is used for (e.g. residences, schools, offices, hospitals, commercial, industrial or agricultural purposes) and identify the distance to any sensitive places.

A sensitive place could include but is not limited to:

- a dwelling, residential allotment, mobile home or caravan park, residential marina or other residential premises
- a motel, hotel or hostel
- a kindergarten, school, university or other educational institution
- a medical centre or hospital
- a protected area under the *Nature Conservation Act 1992*, the *Marine Parks Act 2004* or a World Heritage Area
- a public park or garden
- a place used as a workplace including an office for business or commercial purposes.

Where there is potential for rezoning or subdivision of nearby land that may be impacted by air emissions, the applicant should also identify potential future land uses.

To identify potential future land uses applicants may refer to the relevant local government planning scheme, and/or discuss this with the relevant local authority.

**Scaled map**

Provide a scaled map showing the location of sensitive receptors in relation to the site boundary and proposed activities.

**Site topography**

Provide a description of the site topography and built environment, including features such as hills, valleys, buildings, or thick stands of vegetation. An aerial photograph of the site will be of benefit. More complex applications should also include a topographic map with contour lines.

These features may affect the way that air contaminants are dispersed in the environment.

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| **Wind direction**<br><br>Describe the prevailing wind direction and speed.<br><br>Wind can dilute and disperse air pollutants, move them towards or away from sensitive receptors, and in some cases increase pollutants (e.g. dust emissions from unsealed surfaces). |
| **Description of ambient air quality**<br><br>Provide a general description of ambient air quality at the location of the proposed activity. This should include a description of any nearby activities that may emit air pollutants (including odour, dust, smoke and other contaminants).<br><br>If air dispersion modelling is required, more detailed information describing ambient air quality, including existing sources of contaminants, and background concentrations of any contaminants that may be generated by the proposed activity, must be provided. Applicants should use ambient air quality monitoring methods as recommended by the Australian Standards.<br><br>Sources of data include site-specific air monitoring, data collated from national pollutant inventory (NPI) reporting or ambient air quality monitoring undertaken by the Queensland Government which can be found on the department's website. |

## 3.1 How information provided on environmental values will be used by the department

The information outlined in this section will be used to establish the contextual details of the activity, the site and the surrounding environment. This will enable the department to evaluate the character, resilience and environmental values of the receiving environment.

This information will be considered when determining whether the ERA and its components can be operated on the site in a way that minimises the impacts to environmental values. Also, if the application is approved, this information will be used to inform the conditions placed upon the environmental authority.

# 4 Possible impacts and associated risks to identified environmental values

Once the environmental values of the site and surrounding areas have been identified, the second step in the application process is to identify the potential impacts which are likely to arise from the proposed activity. This can include emissions of contaminants to air from point sources and fugitive emissions.

In addition to providing details of any emissions or releases likely to be generated from the proposed activity, the EP Act[3] requires applicants to provide a description of the relative risks and likely magnitude of impacts on the environmental values.

The following table includes a number of key areas which, if applicable, should be addressed by an applicant in the application documentation.

**Overview of emissions and processes**

Provide a scaled plan showing the layout of the site and the location of all sources of air emissions.

Provide a process flow diagram detailing all sources of air emissions associated with the ERA, including dust, odour, and other air contaminants/ air toxics. Include all point sources (e.g. chimney stacks, process flares, conveyors, transfer chutes, crushers, storage bins, hoppers, stockpiles and biological treatment lagoons) and diffuse sources (e.g. dust from unsealed areas of the site).

Provide a list of the plans, policies, standards, guidelines or other reference material that the applicant has identified to be applicable to the types of emissions proposed and the application.

**Emissions**

Describe the characteristics, including physical properties and chemical composition, of emissions from each source. Where the chemical composition of an emission is not known (e.g. dust emissions from unsealed areas), the applicant should describe the characteristics of the release to the best of their knowledge.

For each emission source, describe how contaminants will or may be released. For point source emissions this should include:

- The total quantity and concentration of each contaminant to be released.
- The maximum concentrations of each contaminant (mg/Nm$^3$) if available.
- The rate of release of each contaminant (mass emission rates (g/sec) and minimum efflux velocity (m/s)).
- The frequency, timing and duration of each release (including whether the process or activity is batch or continuous in nature, operating hours, and when intermittent releases are likely to occur).
- A description of each release point. Where applicable this should include stack height, stack diameter, exhaust velocity and temperature.
- Any variation in the quantity and quality of each contaminant released (e.g. due to meteorological variables such as ambient temperature, humidity or rainfall, or the production rate).

For diffuse source emissions the applicant should describe the situations under which contaminants may be released.

The applicant should also identify ‘worst case’ emissions (e.g. those that may occur during commissioning, start-up, shutdown, or maintenance and emergencies outside of normal operating conditions). If these

[3] Section 125 of the EP Act

emissions are likely to be significantly higher than those for normal operations, it will be necessary to conduct additional modelling specifically to evaluate the worst-case impact of emissions.

For activities likely to generate air contaminants the following support information on the chemical and physical properties of common air contaminants may be of assistance.

**Chemical properties of contaminants:**

Air contaminants are commonly categorised into 'criteria pollutants', 'air toxics', and 'other air pollutants'.

Criteria pollutants are common air pollutants found in relatively high concentrations. The National Environmental Protection (Ambient Air Quality) Measure identifies and provides target ambient concentrations for the following criteria pollutants:

- carbon monoxide (CO)
- lead and compounds
- oxides of nitrogen ($NO_X$)
- particulate matter < 10µm ($PM_{10}$)
- particulate matter < 2.5µm ($PM_{2.5}$)
- sulfur dioxide ($SO_2$)
- ozone as a surrogate for photochemical oxidants.

It is important to note that ozone is a secondary pollutant formed in the air. It is not regarded as a contaminant released through a stack.

Air toxics are gaseous, aerosol or particulate contaminants that are present in the ambient air in trace amounts with characteristics (toxicity, persistence) so as to be a hazard to human health, plant and animal life (OECD, 1995).

The chemical nature of particles and their interaction with human tissue can influence health impacts. The EPP (Air) provides air quality objectives for a number of criteria pollutants and air toxics.

'Other air pollutants' are those not included in the above categories. These contaminants are generally less hazardous and less common. These contaminants are less likely to have published quality standards. Individual chemical species which have the potential to cause odour nuisance but do not have an established toxicity threshold, can be considered in this list. For example, diacetone alcohol which has an odour threshold of 1.3mg/$m^3$.

Further information regarding air pollutants can be found on the department's website.

The NPI website also includes data on a number of substances that have possible effects on human health or the environment.

**Physical properties of contaminants**

It is commonly recognised that the potential health effects of particles are closely related to their size. Human health effects of airborne particles are mainly associated with particles less than 10µm in size (commonly termed $PM_{10}$), which are small enough to be inhaled into the lower respiratory tract. Nuisance effects can be caused by particles of any size, but are most commonly associated with those larger than 20µm. The size of particles also affects contaminant dispersion patterns and may determine the success of pollution control measures.

**Evaluating impacts of emissions**

Describe what impact air emissions from the proposed activity will have on each of the environmental values identified for the site and receiving environment.

When providing information on emissions to be released, applicants must describe the extent to which the proposed activity is able to comply with the performance outcomes as well as whether the emissions will adversely impact upon the environmental values listed in the EPP (Air).

**The environmental values of air are as follows:**

- **Air emissions from the proposed development will not adversely affect human health and wellbeing**

The impact of air emissions on human health and wellbeing can range from causing nuisance or inconvenience, to causing significant health impacts and even death. To determine the potential impact of air emissions consideration must be given to:

  - the chemical and physical properties of air emissions (refer to advisory information below)
  - the concentration and quantity of contaminants released
  - the effect of this release on ambient ground level concentrations of contaminants.

- **Impacts on health and biodiversity of ecosystems**

Schedule 1 of the EPP (Air) includes air quality objectives for fluoride, nitrogen dioxide, ozone, and sulfur dioxide, to protect the health and biodiversity of ecosystems.

If a proposal involves the release of contaminants to air in a location where natural ecosystems may be affected (e.g. adjacent to national parks), the applicant must identify whether emissions are at levels that may impact on the health and biodiversity of the ecosystem. If contaminants are not listed in the EPP (Air), a literature search may be required to determine potential risks. In some situations site-specific studies may be required to assist in identifying the impacts.

- **Impacts on agriculture**

Schedule 1 of the EPP (Air) includes air quality objectives for fluoride, ozone and sulfur dioxide, to protect agriculture. When they exist in concentrations above these levels these contaminants are known to adversely affect vegetation.

Elevated levels of dust may also adversely affect agricultural crops by reducing photosynthesis, increasing the incidence of plant pests and diseases, reducing the effectiveness of sprays due to reduced penetration, rejection and downgrading of produce (source: NZ Ministry for the Environment).

If the proposed activity is within an agricultural area, the applicant must detail whether air emissions from the proposed development pose a risk to crops. If the proposal involves contaminants other than those listed in the EPP (Air), a literature search may be required to determine potential risks. In some situations site-specific studies may be required.

If a risk is posed to crops, then the department will determine whether the risk is acceptable taking into account the location, size, scale and duration of the activity as well as any long-term economic or social impacts.

- **Air emissions from the proposed development will not adversely affect aesthetics of the environment**

The applicant must describe how emissions from the proposed development will be managed to ensure they do not affect aesthetic values. As per section 7 of the EPP (Air), aesthetics of the environment to be protected also include the appearance of buildings, structures and other property.

The general aesthetics of the environment can be expressed using measurable parameters such as:

- odour
- dust
- visibility reducing particles
- light.

**Odour**

One of the environmental values for air is that the air emissions from the proposed development will not adversely affect aesthetics of the environment.

Odour impacts are a frequent and significant cause of environmental nuisance and require thorough consideration. If an application involves any activity or process that is likely to generate odour it may be appropriate to undertake an odour impact assessment. For further information on conducting an odour assessment, please refer to departmental guideline entitled: Odour impact assessment from developments.

However, it is unlikely that an odour impact assessment will be required if:

- The proposed facility or expansion of an existing facility is designed for best practice environmental management.
- Recommended buffer distances are met. DES has some industry specific guidance on buffer distances, for example for a landfill refer to Queensland “Guideline landfill siting, design, operation and rehabilitation”. If DES industry specific guidance on buffer distance is not available, then refer to the Victorian Environmental Protection Authority (EPA), ‘Recommended separation distances for industrial residual air emissions’, Publication No. AQ *1518.*
- There is no complaint history for the type of industry.
- The nature of the emissions is insignificant.

As a guide, activities that have been given an attribute score of 3 or 4 for odour in Appendix 5 of the departmental guideline ‘Environmental emission profile - Environmental Protection Regulation’ (available via the department’s library catalogue at https://www.qld.gov.au/environment/library/) are generally recognised as potentially odorous. When determining the level of information to be provided with an application the proximity of sensitive receptors should be considered.

Odorous emissions can often have a significant impact on environmental amenity. The EPP (Air) provides ambient air quality objectives for the following odour-causing compounds: carbon disulfide, formaldehyde, hydrogen sulphide, toluene, styrene and tetrachloroethylene.

While odour can be caused by individual and easily identifiable compounds such as those listed above, it is also often the result of a complex mixture of air pollutants (such as emissions from a sewage treatment plant, food processing and intensive agricultural activities). Whether emissions cause nuisance is influenced by a large range of factors including their frequency, intensity, duration, offensiveness and location/sensitivity of the receiving environment.

If odour could be an issue, conduct odour impact assessment according to the DES guideline Odour Impact Assessment from Developments.

**Dust**

Dust can cause nuisance by settling on surfaces and possessions, affecting visibility, and contaminating tank water supplies. The EPP (Air) provides air quality objectives for total suspended particulate as 90µg/$m^3$ (annual average). In some circumstances dust nuisance may be caused at this level, which is based on a long-term averaging period, if a short-term (24-hour average) total suspended particulate concentration at a sensitive receptor is greater than 90µg/$m^3$. For impact assessment, it is advisable to estimate short-term maximum total suspended particulates (24-hour average) concentrations and compare the results against the trigger levels provided in the New Zealand Ministry for the Environment: Good practice guide for assessing and managing the environmental effects of dust emissions. These trigger levels can be used to identify when additional remedial actions will be required at the site.

Potential dust deposition rates should also be considered. A dust deposition parameter is dust that settles out of the air onto the surface of buildings or onto the ground. It is measured by means of a collection gauge, which catches the dust settling over a fixed surface area and over a period of about 30 days.

There are no national air quality guideline values for the nuisance dust effect that can be used to assess the impact of dust on the receiving environment. However, there are a number of criteria commonly used by regulatory agencies in Australia. Generally, the criteria have been derived from subjective observations and investigation of dust levels and nuisance effects. A dust deposition limit of 120 milligrams per square metre per day, averaged over 1 month, when monitored in accordance with 'AS3580.10.1 Methods for sampling and analysis of ambient air – Determination of Particulates – Deposited Matter – Gravimetric method of 1991', is frequently used in Queensland.

In some areas there may already be relatively high background levels of dust. If dust is a potential concern, deposition gauges should be used by the applicant to collect data near sensitive receptors and the proposed ERA site. The dust deposition data collected from the site can be analysed and the results compared against the above standards. The dust deposition rate could also be estimated at the sensitive receptors using the dispersion models and the cumulative effect can be determined by considering the background dust deposition data of the site.

**Visibility reducing particles**

The objective of visibility reducing particles is prescribed in Schedule 1 of EPP (Air). Particles less than 1µm may remain suspended in the atmosphere for long periods and obscure visibility. Monitoring is usually conducted to determine the loss or impairment of visibility due to fine particles present in the air, usually smoke or haze. Monitoring of fine particles (aerosols) is achieved by measuring how light is scattered by the airborne particles using an instrument known as a nephelometer.

The Queensland Government monitors visibility reducing particles at a number of locations in South East Queensland. Hazard-reduction burning and bushfires are the most common sources of high fine particle levels. Elevated levels occur most often during the calm, stable meteorological conditions of winter and early spring when particles are not dispersed by winds.

**Air dispersion modelling**

- For activities which are likely to have a high impact to air, it may be appropriate for the applicant to conduct air dispersion modelling. In these instances the applicant should provide details of additional meteorological characteristics which will be used for the air dispersion modelling (e.g. ambient temperature and atmospheric stability class). For further guidance on measuring meteorological

parameters for applications that require air dispersion modelling, please refer to the AS 3580.14 - 2014: Methods for sampling and analysis of ambient air, Part 14, Meteorological monitoring for ambient air quality monitoring applications.

Air dispersion modelling will typically be required if there is a risk that emissions from the proposed activity (with any proposed pollution control devices in place) may cause levels of contaminants to meet or exceed:

- Air quality objectives prescribed in Schedule 1 of the EPP (Air) for applicable environmental values
- Other recognised criteria, standards or guidelines relevant to protecting the identified environmental values of the receiving environment (e.g. human health and wellbeing, health and biodiversity of ecosystems, aesthetics of the environment, and agricultural land uses).

Dispersion modelling should predict maximum ground level concentrations (GLC) for contaminants of interest, including contributions from the proposed activity and all existing sources.

Early discussion with the assessing officers is recommended to determine if dispersion modelling is required for the project. Agreement on the database to be used, modelling techniques to be applied and the overall technical approach, prior to the actual analyses, helps to avoid misunderstandings concerning the final results and may reduce the need for additional analyses.

The most widely used air dispersion models in Australia are CALPUFF, TAPM and AERMOD. A combination of TAPM and CALPUFF is the most advanced modelling system currently extensively used in Queensland. For applicants undertaking air dispersion modelling the following support information may be of assistance.

- The department does not require the use of any particular air dispersion model (e.g. CALPUFF or AERMOD models). Early discussion with the assessing officers is recommended if a model other than CALPUFF or AERMOD will be used for impact assessment.
- A dispersion model must be selected based on the complexity of the site (e.g. meteorological and topographical conditions) and the availability of the model input data.
- In Queensland there are many areas where the frequency of very light winds is high and the topography is complex. CALPUFF is technically better formulated for these conditions and it is expected to provide more accurate results than a steady-state Gaussian model. For these locations, dispersion modelling must be conducted using CALPUFF model.
- If CALPUFF model is selected, then the optimal model setting to incorporate meteorological data into CALMET (a CALPUFF preprocessor) must be based on the NSW EPA guidelines, entitled: “Generic Guidance and Optimum Model Settings for the CALPUFF Modelling System for Inclusion into the ‘Approved Methods for the Modelling and Assessments of Air Pollutants in NSW, Australia’, March 2011.
- If the AERMOD model is selected, then the meteorological data file must be prepared in accordance with the Victorian DES document entitled ‘Construction of input meteorological data files for DES Victoria Regulatory Air Pollution Model (AERMOD)’, Publication No. 1550, 2013.
- The results of modelling should be interpreted using applicable EPP (Air) air quality objectives, National Environmental Protection (Ambient Air Quality) Measure or other relevant criteria, guidelines and standards.

Where a proposal involves the release of a chemical species which is not listed in the EPP (Air) or National Environmental Protection (Ambient Air Quality) Measure, the department will typically refer to the following:

- WHO Air Quality Guidelines for Europe

- Victorian EPA Guideline for Assessing and Minimising Air Pollution in Victoria, Publication 1961, February 2022.
- Texas Commission on Environmental Quality (TCEQ) prescribed standards known as: Effects Screen Levels (ESL).

## 4.1 How information provided on environmental risks will be used by the department

This information will assist the department to establish the contextual details of the site and to identify the plans, policies, standards, guidelines or other reference material that is applicable to the types of emissions proposed. This will assist the department in evaluating the risks to environmental values.

The results of any air dispersion modelling undertaken will inform the limits set in the environmental authority. Limits applied must ensure that, where possible, emissions do not cause ambient levels of contaminants to exceed recommended levels, and must ensure that the activity generates the lowest levels of emissions practically achievable given relevant industry standards and available technology.

Where it is deemed unnecessary to conduct air dispersion modelling for an application no further assessment will be required. Applicants are encouraged to attend a pre lodgement meeting in order to refine the scope of assessment likely to be required.

If insufficient information is provided to characterise emissions, the department may request additional information or determine that the application must be refused.

# 5 Proposed management practices

Once the magnitude and risk of each impact to the environmental values is known, the next step for the applicant is to identify mitigation strategies to address the risk.

These strategies can include physical works, processes or treatments. Similarly, they could include management or monitoring practices. In many cases, adequate environmental management will require both physical works as well as management practices.

When identifying mitigation strategies the applicant should clearly detail how the works or practices will link back to and address the previously identified risk.

The following table provides general information to assist all applicants in identifying the type of information required to support the selected mitigation strategies.

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| **Describe proposed control measures**<br><br>Describe what measures will be implemented to minimise the emission of contaminants to air, including pollution control equipment and management techniques for all emission sources.<br><br>This should include a description of any fugitive emission capture strategies (e.g. hooding, ducting), treatment (e.g. scrubbers, bag filters) and discharge systems (e.g. stacks).<br><br>Applicants must describe the control measures to be implemented to minimise the emission of air pollutants from a proposed development. This includes adopting strategies which are consistent with the management hierarchy for air emissions set out in the EPP (Air), i.e. to avoid, recycle, minimise and manage emissions, in that order of preference.<br><br>Applicants must describe monitoring programs to establish control measures are achieving required outcomes (e.g. meters to measure contaminant flow rate)<br><br>For new stationary emission sources, in the absence of guidelines specific to the industry or equipment proposed, reference is made to the Victorian or NSW guidelines on air emissions when deciding best practice. The most recent source emission standards are available from the NSW EPA Protection of the Environment Operations (Clean Air) Regulation 2022. |
| **Contingency plans**<br><br>Identify any foreseeable failures in emission control systems, and describe the contingency plans to be implemented in the event of these failures. |

## 5.1 How information provided on management practices will be used by the department

The information provided may be used by the department to condition the environmental authority.

When setting the conditions, assessing officers will consider best practice industry guidelines relevant to the proposed activity.

# 6 Information and references

| Type | Title |
|---|---|
| Plans/policies | Environmental Protection (Air) Policy 2019<br><br>*Environmental Protection Act 1994*<br><br>Environmental Protection Regulation 2019 |
| Departmental documents and guidelines | Ambient air quality reports<br><br>Odour impact assessments from developments<br><br>Environmental emissions profile - Environmental Protection Regulation (available from the DES Library) |
| Relevant Australian Standards: | AS/NZS 3580.1.1:2016<br>Methods for sampling and analysis of ambient air - Guide to siting air monitoring equipment<br><br>AS/NZS 3580.2.2:2016<br>Methods for sampling and analysis of ambient air - Preparation of reference test atmospheres - Compressed gas method<br><br>AS 3580.3.1-1990<br>Methods for sampling and analysis of ambient air - Determination of acid gases - Titrimetric method<br><br>AS 3580.4.1-2008<br>Methods of sampling and analysis of ambient air - Determination of sulfur dioxide - Direct reading instrumental method<br><br>AS 3580.5.1-2011<br>Methods for sampling and analysis of ambient air - Determination of oxides of nitrogen - Direct-reading instrumental method<br><br>AS 3580.6.1-2011<br>Methods for sampling and analysis of ambient air - Determination of ozone - Direct-reading instrumental method<br><br>AS 3580.7.1-2011<br>Methods for sampling and analysis of ambient air - Determination of carbon monoxide - Direct-reading instrumental method<br><br>AS 3580.7.1-2011/Amdt 1-2012<br>Methods for sampling and analysis of ambient air - Determination of carbon monoxide - Direct-reading instrumental method<br><br>AS 3580.8.1-1990<br>Methods for sampling and analysis of ambient air - Determination of hydrogen sulfide - Automatic intermittent sampling - Gas chromatographic method<br><br>AS/NZS 3580.9.10:2017<br>Methods for sampling and analysis of ambient air - Determination of suspended particulate matter - PM (sub)2.5(/sub) low volume sampler - Gravimetric method |

| Type | Title |
|---|---|
| | AS/NZS 3580.9.11:2022<br>Methods for sampling and analysis of ambient air - Determination of suspended particulate matter - PM10 beta attenuation monitors<br><br>AS/NZS 3580.9.3:2015<br>Methods for sampling and analysis of ambient air - Determination of suspended particulate matter - Total suspended particulate matter (TSP) - High volume sampler gravimetric method<br><br>AS/NZS 3580.9.6:2015<br>Methods for sampling and analysis of ambient air - Determination of suspended particulate matter - PM(sub)10(/sub) high volume sampler with size-selective inlet - Gravimetric method<br><br>AS/NZS 3580.9.7:2009<br>Methods for sampling and analysis of ambient air - Determination of suspended particulate matter - Dichotomous sampler (PM10, coarse PM and PM2.5) - Gravimetric method<br><br>AS 3580.9.8-2022<br>Methods for sampling and analysis of ambient air - Determination of suspended particulate matter - PM10 continuous direct mass method using a tapered element oscillating microbalance analyser<br><br>AS/NZS 3580.9.9:2017<br>Methods for sampling and analysis of ambient air - Determination of suspended particulate matter - PM(sub)10(/sub) low volume sampler - Gravimetric method<br><br>AS/NZS 3580.10.1:2016<br>Methods for sampling and analysis of ambient air - Determination of particulate matter - Deposited matter - Gravimetric method<br><br>AS 3580.11.1-2013<br>Methods for sampling and analysis of ambient air - Determination of volatile organic compounds - Methane and non-methane volatile organic compounds - Direct-reading instrumental method<br><br>AS/NZS 3580.12.1:2015<br>Methods for sampling and analysis of ambient air - Determination of light scattering - Integrating nephelometer method<br><br>AS 3580.13.1-2013<br>Methods for sampling and analysis of ambient air - Determination of fluorides - Gaseous and acid-soluble particulate fluorides - Automated, double paper tape sampling<br><br>AS 3580.13.2-1991<br>Methods for sampling and analysis of ambient air - Determination of fluorides - Gaseous and acid-soluble particulate fluorides - Manual, double filter paper sampling<br><br>AS 3580.14-2014<br>Methods for sampling and analysis of ambient air - Meteorological monitoring for ambient air quality monitoring applications |
| | AS/NZS 4323.3:2001<br>Stationary source emissions, Part 3: Determination of odour concentration by dynamic olfactometry |

| Type | Title |
|---|---|
| | AS 4323.1 – 2021<br>Stationary source emissions, Method 1: Selection of sampling positions and measurement of velocity in stacks. |
| International Standards /guidelines | International Programme on Chemical Safety (IPCS) 1994. Environmental health criteria 170: Assessing human health risks of chemicals: Derivation of guidance values for health-based exposure limits. Geneva: International Programme on Chemical Safety, World Health Organization.<br>OECD 1995, Control of hazardous pollutants in OECD countries, OECD Publications Service, Paris<br>USEPA-. 2004. Introduction to air toxics risk assessment EPA-453-K-04-001A. Washington, D.C.: United States Environmental Protection Agency.<br>World Health Organisation - Air quality guidelines. Global update 2005. Particulate matter, ozone, nitrogen dioxide and sulfur dioxide.<br>World Health Organisation - 2000a. Air quality guidelines for Europe, Second Edition, WHO regional publications. European series, no. 91. Copenhagen: World Health Organization, Regional Office for Europe. |
| Other government publications /legislation within Australia and New Zealand | Australian National Environmental Protection Council National Environment Protection (Air Toxics) Measure<br>Australian National Environmental Protection Council National Environment Protection (Ambient Air Quality) Measure (NEPM)<br>Australian Government, National pollutant inventory (NPI) website<br>NSW Office of Environment and Heritage (ex EPA), Protection of the Environment Operations (Clean Air) Regulation, 2022<br>New Zealand Ministry for the Environment: Good practice guide for assessing and managing the environmental effects of dust emissions (2001)<br>Victorian EPA, Construction of input meteorological data files for DES Victoria's regulatory air pollution model (AERMOD), Publication No.1550, 2013<br>Victorian EPA, Recommended separation distances for industrial residual air emissions, Publication No. 1518, March 2013. |