



Environmental Factor Guideline

Air Quality

The environmental objective of the *Air Quality* factor is:

To maintain air quality and minimise emissions so that environmental values are protected.

Purpose

The purpose of this guideline is to communicate how the *Air Quality* factor is considered by the Environmental Protection Authority (EPA) in the environmental impact assessment (EIA) process.

Specifically, the guideline:

- defines *Air Quality*
- explains the associated objective
- describes how this factor links with other environmental factors
- describes EIA considerations for this factor
- discusses the environmental values of good air quality, and their significance
- identifies activities that may be considered under this factor
- provides a summary of the information that may be required by the EPA to undertake EIA related to this factor
- describes issues commonly encountered by the EPA during EIA of this factor.

What is air quality?

For the purposes of EIA, the EPA defines air quality as:

The chemical, physical, biological and aesthetic characteristics of air.

'Air' refers to all the air above the ground up to and including the stratosphere.

The environmental objective for the *Air Quality* factor

The objective recognises the fundamental link between good air quality and the environmental values it supports. It also recognises the principle of waste minimisation as set out in the *Environmental Protection Act 1986*.

In the context of this factor and objective, the EPA recognises that maintaining good air quality and minimising emissions protects human health and amenity, as well the broader environment. Therefore, the focus of this environmental factor and its objective is:

- the impacts of emissions on air quality and other environmental values
- how discharges of waste into the air is avoided and managed
- how any discharge of waste will significantly impact on air quality and the environmental values that air quality supports.

How this factor links with other environmental factors

The EPA recognises that there are inherent links between the *Air Quality* factor and other environmental factors. For example, changes to air quality can affect human health, social surroundings, flora and vegetation, terrestrial environmental quality or marine environmental quality. While impacts to these environmental values will be considered under the relevant environmental factor, the EPA will consider the impact to Air Quality in concert with these other factors, where appropriate, in order to assess impacts to an ecosystem's integrity as a whole.

Due to the particular significance of greenhouse gas emissions on climate, and the unique pathways by which those emissions come to impact the Western Australian environment, greenhouse gas emissions are considered under the *Greenhouse Gas Emissions* factor.

Environmental values of air quality and its significance

'Environmental values' is defined under the *Environmental Protection Act 1986* as a beneficial use, or an ecosystem health condition. The ecosystem health values related to air quality as applied in EIA are human health and amenity.

From time to time, poor air quality can also impact other environmental factors. For example, dust may smother flora and vegetation. In these circumstances, EIA of the potential impacts will be undertaken against the relevant environmental factor, in this example the *Flora and Vegetation* factor.

Activities that may be considered under this factor

Development activities that have the potential to impact on air quality include, but are not necessarily limited to:

- waste to energy plants where the emissions from the combustion of waste is discharged to the air
- the capture, processing and refining of oil and gas
- the burning of fossil fuels for the production of energy
- heavy industries that emit atmospheric waste such as metal smelting and refineries
- bulk handling and transport (via road and rail) of materials, including the loading and unloading of bulk materials
- port operations that include the transport, loading, unloading and storage of bulk materials
- stockpiling of bulk material
- the crushing and screening of materials
- incineration of wastes, for example medical waste
- mining, handling and processing of metallic and non-metallic minerals that include activities that cause dust or burn fossil fuels
- chemical manufacturing and processing.

Considerations for EIA

Considerations for EIA for the *Air Quality* factor include, but are not necessarily limited to:

- application of the mitigation hierarchy to avoid and minimise emissions, where possible
- characterisation of potentially harmful emissions and the pathways by which they may be released to air
- whether numerical modelling and other analyses to predict potential impacts has been undertaken using recognised standards and accepted inputs and assumptions

- whether existing background air quality, including natural variations, has been established through monitoring and accepted proxy data
- whether analysis of potential health and amenity impacts has been undertaken using recognised criteria and standards, where relevant, informed by Australian and international standards
- the application of technology appropriate to the potential environmental impacts and risks
- the significance of the likely change to air quality as well as the environmental values affected by those changes, in the context of existing and predicted cumulative impacts
- whether proposed mitigation is technically and practically feasible
- whether siting of the proposal's main emission sources takes into consideration current and future sensitive land uses.

When considering the significance of potential impacts to air quality, the EPA may have regard to the various matters outlined in Section 5 of the [Statement of Environmental Principles, Factors and Objectives](#).

Information required for EIA

Where *Air Quality* has been identified as a preliminary environmental factor, the EPA may require the proponent to provide information or studies including, but not limited to the following:

- characterisation of the feedstock and the pollutants and contaminants that are likely to be emitted
- characterisation of and proximity to sensitive receptors
- background ambient air modelling and the impact of emissions on sensitive receptors, including likely impacts during worst, best and most likely case scenarios
- assessment against published standards and criteria
- identification of emission reduction equipment and proposed technologies, and where relevant, demonstration of the use of proven technologies
- description of proposed management and monitoring arrangements.

Issues

The following issues are matters that are commonly encountered by the EPA due to the nature of proposals that are referred to it. Background on these issues is provided here to help proponents and the community engage with EIA. This issues section will be updated from time to time to reflect new issues as they arise in referrals and EIA.

Reasonable and practicable measures to minimise harmful emissions to air

Consistent with the principle of waste minimisation as set out in section 4A of the *Environmental Protection Act 1986*, the EPA encourages the application of all reasonable and practicable measures to minimise harmful emissions to air. This might include facility design, technology choice, operation and closure, and should reflect the current state of knowledge and leading global technological capabilities as appropriate to local conditions and circumstances.

Under some circumstances, the EPA may expect more stringent standards such as Maximum Extent Achievable, particularly where hazardous contaminants are involved. Maximum Extent Achievable requirements incorporate technology and environmental management procedures which are the most stringent measures available and achievable, at a scale relevant to the proposal, to control the level of risk imposed by the hazardous pollutants being considered. Hazardous contaminants include known or suspected carcinogens, mutagens, teratogens, highly toxic or highly persistent substances.

In undertaking EIA, the EPA will consider the choice of technology to ensure that it is capable of achieving appropriate emission standards and minimising emissions commensurate with the risk to the environment.

Maintaining ambient air quality to protect human health

It is well recognised that air pollution can have an adverse effect on human health. Maintaining or improving ambient air quality is important for public health outcomes.

When undertaking EIA and making judgements about the acceptability of potential impacts to ambient air quality and, therefore, human health, the EPA's assessment will typically be informed by accepted air quality standards and criteria¹, which are based on epidemiological studies.

Where there is an absence of a recognised standard or criteria to determine likely risk to human health, there may be the need to develop standards based on the available information and knowledge and, where appropriate, consultation with technical experts. This will depend on the circumstances and identified sensitive receptors.

Particulates

In recent years, there has been scientific evidence that fine particles have the potential to impact human health irrespective of their chemical composition.

Emission of fine particles may be associated with vehicle emissions and any activities which generate dust. This form of air pollution is particularly relevant when located in close proximity to residential and other sensitive land uses.

It is likely that EIA will increasingly consider particle size and occurrence, as well as chemical composition in emissions assessment.

Air sheds and cumulative impacts

An air shed is a geographical area within which air is frequently confined or channelled. All parts of the air shed are, therefore, subject to similar conditions of air pollution.

This becomes particularly important when there are cumulative impacts from multiple emitters within an air shed. There will be a point at which combined emissions mean that the air shed no longer meets established standards or human health is affected.

When undertaking EIA, existing or future cumulative impacts to an air shed will be an important consideration.

¹ The Ambient Air National Environment Protection Measure (NEPM) provides a common national goal to best protect human health and well being from the adverse impacts of air pollution.

Version	Change	Date
1.0	Initial document	16 December 2016
2.0	Updated to remove references to greenhouse gas emissions, minor changes for consistency with other environmental factor guidelines	16 April 2020

As EPA documents are updated from time to time, users should consult the EPA website (www.epa.wa.gov.au) to ensure they have the most recent version.

Environmental Protection Authority 2020, *Environmental Factor Guideline: Air Quality*, EPA, Western Australia.

This document is available in alternative formats upon request.

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