

# NATIONAL PORTRAIT GALLERY

QUALITY  
MANAGEMENT  
PLAN

June 2008

## 1. OVERVIEW

The Air Quality Management Plan (the Plan) details the policy and procedures utilised by the National Portrait Gallery (the Gallery) in the management of air quality within its building/s. The Gallery is committed to ensuring the health and safety of its employees and all persons who enter the Gallery's premises by providing and maintaining a healthy and comfortable working environment. The Gallery is also committed to the preservation of works of art. The Plan applies to all Gallery buildings which house collection material.

### 1.1 DESCRIPTION & OBJECTIVES

The Plan had been prepared, and is to be regularly reviewed by, Facilities, Registration, and the OH&S Committee, to provide Gallery employees with an increased understanding and awareness of indoor air quality in an air conditioned environment. In addition, the plan provides guidance for the establishment and maintenance of a healthy and comfortable working environment for Gallery staff and visitors.

The plan includes clear direction and consideration to the preservation of works of art and art storage using appropriate technology and systems to care for, manage and protect the national portraiture collection.

There are four main objectives of the management plan:

- a) To ensure that the air quality supplied to the occupants of buildings maintained by the Gallery is satisfactory and does not cause harm or discomfort;
- b) To ensure that should air quality problems arise they are quickly controlled and eliminated, thereby minimising their impact on the building occupants and the collection;
- c) To ensure that a suitable environment for the preservation of works of art of all media is maintained;
- d) To ensure the Gallery complies fully with its legal requirements in relation to indoor air quality.

## 2. SCOPE AND LIMITATIONS

The term 'indoor air quality' refers to a range of characteristics including:

- airborne contaminants
- temperature
- humidity
- air movement

Indoor air quality is typically associated with office-type buildings that are ventilated by mechanical ventilation systems. For the purposes of this document, indoor air quality applies to areas in the Gallery's buildings that are normally occupied, including art and non art areas.

This document does not apply to areas or rooms that are normally unoccupied by people, works of art or other sensitive material, e.g. plant rooms, general store rooms, etc.

### 3. LEGAL AND LEGISLATIVE OBLIGATIONS

#### 3.1 COMMON LAW

Under common law, occupiers of land and premises owe a duty of care to take reasonable care of all persons entering their premises. This duty of care means that occupiers are expected to minimise or prevent any risk that is reasonably foreseeable. Failure to either identify or control a foreseeable risk is considered a breach of duty of care under common law.

#### 3.2 STATUTORY REQUIREMENTS

*Occupational Health and Safety (Commonwealth Employment) Act 1991*

### 4. WHAT IS MEANT BY INDOOR AIR QUALITY

#### 4.1 OVERVIEW

There are no agreed terms or conditions that define indoor air quality. The perception of indoor air quality is influenced by temperature, relative humidity, air movement and air contaminants.

#### 4.2 PEOPLE

The Gallery's air conditioning should provide a thermally comfortable temperature range suitable for people to work in and visit.

#### 4.3 WORKS OF ART

The preservation, display and storage of works of art require the provision and maintenance of a specifically controlled environment where stable conditions of air temperature and relative humidity are paramount, and there is sufficient air movement/air exchange in the environment.

In addition, compliance with OH&S and Conservation standard limits for pollutants and air contaminants also applies. This will be achieved through reduction of excessive accumulation of indoor air contaminants from work activities, building materials, and external sources.

#### 4.4 TEMPERATURE (°C)

Comcare information on "Air-Conditioning and Thermal Comfort in Australian Public Service Offices" states that standards for thermal comfort for indoor sedentary workers recommend an operative temperature range of 20°C to 26°C depending on the season. This information can be found at [www.comcare.gov.au](http://www.comcare.gov.au) or by contacting the Gallery OH&S officer.

The international standard for air temperature in museums/galleries is 21°C ± 1°C, however the agreed temperature range for display and art storage areas within the Gallery and is set at 22°C ± 1°C. Stability of the temperature conditions is essential because of its influence on relative humidity levels.

#### 4.5 RELATIVE HUMIDITY (%RH)

There is no standard for RH levels for indoor sedentary workers.

The international standard for relative humidity in museums/galleries is 55% ± 5%RH, and this is the range set for display and art storage areas within the Gallery. This level is set as a balance between human comfort and an average of the RH equilibrium of various materials.

It is imperative that the RH levels remain as stable as possible because repeated sudden fluctuations in RH are most damaging to works of art. The accepted rate of change tolerance at the Gallery is less than 3% rate of change per hour.

If RH levels reach above 60% many types of mould spores are activated, and mould growth can become a problem.

#### 4.6 AIR MOVEMENT

Too little air flow may create stuffy and uncomfortable conditions, and can create a favourable environment or microclimate for mould spores to be activated. Too much air movement may result in draughts and a perception of low temperatures. High velocity air flows in close proximity to works of art can cause physical damage.

Factors influencing air movement include:

- Internal Partitioning

Rooms created by full height partitions in areas originally designed as 'open plan' can become dead spaces where air has no exit path when doors are closed.

Air flow into the room or in an exhibition gallery may be affected and may make the room stuffy and uncomfortable and also affect the temperature and relative humidity levels.

- Balanced Air-conditioning Systems

The air-conditioning system is balanced if there is optimum air flow in all the areas supplied. To achieve such conditions it is usually necessary to adjust flow in individual ducts after all internal building works are completed. Systems should also be adjusted whenever substantial changes in the activities, layout and occupancy of the workplace, art storage areas, or gallery spaces occurs.

- Filter Maintenance

Regular maintenance of filters will ensure optimum air flow through the air-conditioning system and filter efficiency in capturing particulate contaminants.

#### 4.7 AIR CONTAMINANTS – INSIDE

Common sources of indoor air contaminants include:

- Dust mites
- Unpleasant odours
- Microbiological pollutants – viruses, bacteria and fungi
- Environmental tobacco smoke (ETS) – as of 1 January 2005 the ban on smoking within Gallery premises was extended to include entrances and exits, thus reducing the likelihood of ETS entering the Gallery
- Radon and radon products – found in building materials
- Airborne particles - combustion particles from cooking, heating, clothing dust & fibres etc
- Other volatile organic compounds – building materials, cosmetics, cleaning agents, waxes, carpets, furnishings, adhesives and paints.

#### 4.8 AIR CONTAMINANTS – OUTSIDE

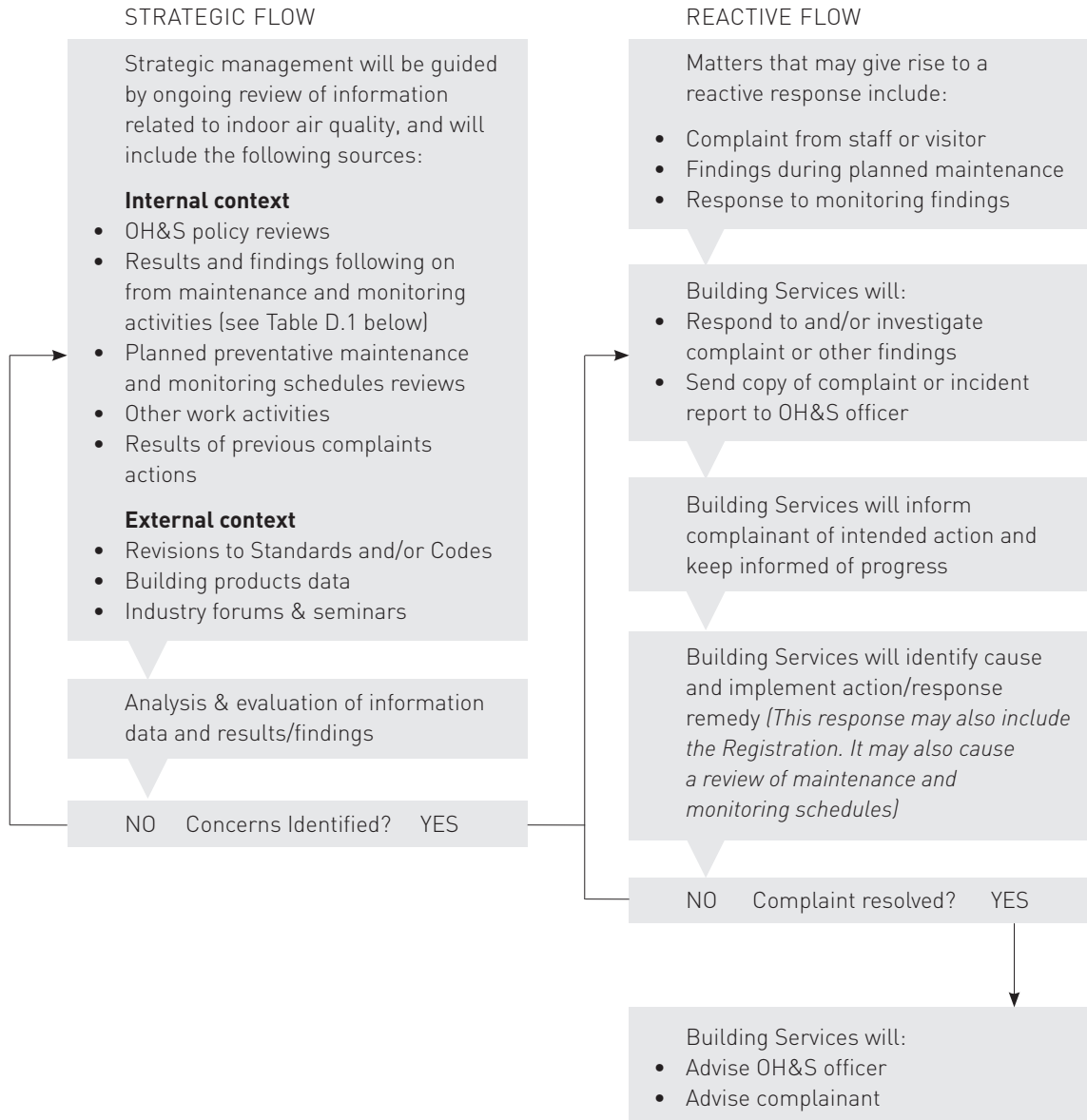
Common sources of air contaminants from outside the workplace include but are not limited to:

- motor vehicles
- pollen and fungi spores
- smoke and dust

## 5. MANAGEMENT OF INDOOR AIR QUALITY

Indoor air quality in the workplace should be managed by implementing a management program (see flowchart). Concerns should be addressed in a timely manner. If an indoor air quality concern is identified in the course of the program, investigation will start immediately. If no problem is apparent, the assessment will still be performed on a regular basis. Significant changes to the workplace such as refurbishment also warrant conducting another assessment.

### 5.1 INDOOR AIR QUALITY MANAGEMENT FLOW CHART



## 5.2 INVESTIGATION

When there is a reported problem with the quality of indoor air, initial investigation steps shall focus on identifying the source. Solutions may be associated with:

- temperature
- relative Humidity
- air flow
- contaminants
- population levels – how many people occupy the area?

## 5.3 WORKPLACE OR WORK PROCESS MODIFICATION

Plans for introducing new building materials or work processes shall always include a risk assessment and early liaison with the OH&S Committee and/or Risk Manager, Registration and/or Facility and Building Services regarding any precautions necessary to minimise the potential of indoor air quality problems.

## 5.4 VENTILATION

Ventilation is one of the means by which indoor air is treated to achieve acceptable indoor air quality. Mechanical ventilation measures include the use of:

- Improved dilution ventilation through the introduction of controlled amounts of outside air to the recirculated air in the building. This method is the primary means of reducing airborne gaseous, odorous, and minute particulate contaminants (such as smoke).
- High efficiency air filters to remove airborne contaminants such as dust, some pollens, and wood and paper dust
- Local exhaust ventilation designed to remove air contaminants close to their source. This method is useful in controlling local individual contaminant sources such as conservation activities. Consideration should be given to local exhaust ventilation where devices or processes likely to emit fumes, heat or odours are used such as photocopiers.

**6. SCHEDULE OF MAINTENANCE AND MONITORING**

**6.1 SCHEDULED MAINTENANCE HEATING, VENTILATION AND AIR CONDITIONING (HVAC) PLANT AND ASSOCIATED EQUIPMENT**

All maintenance and operation of air conditioning systems and associated equipment shall be carried out in compliance with relevant workplace health and safety legislation, advisory standards, and Australian Standards.

TABLE 6.1 MAINTENANCE OF AIR CONDITIONING PLANT AND EQUIPMENT

The activities listed in this table are to be carried out by Building Services.

Equipment	Maintenance Activity	Minimum Requirement (relevant standard, code or manufacturers recommendation)	NPG Requirement
Cooling Towers	Inspection	monthly	monthly
	Laboratory analysis for Total Bacteria Count	monthly	monthly
	Laboratory analysis for Legionella	monthly	monthly
<b>Air Handling Systems</b>			
Air Filters			
Humidifiers	inspection	monthly	monthly
- Steam	inspection	monthly	monthly
- Ultrasonic	inspection	6 monthly	monthly
Reverse Osmosis (RO) Plant	inspection	nil	monthly
Cooling & heating coils	inspection	monthly	monthly
Ductwork adjacent to humidifiers and cooling coils	inspection	annually	annually
Fans (including drive belts)	inspection	annually	monthly
Airborne Mould Sampling		n/a	3 monthly
Chilled Water Plant	inspection	monthly	monthly
Heating Hot Water Plant	inspection	monthly	monthly

**6.2 REPORTING**

Reports on the status of maintenance activities undertaken in Table 6.1 shall be made available on request.

Building Services will report to the OH&S committee biannually on maintenance activities

## 7. ORGANISATIONAL RESPONSIBILITIES

The following personnel are responsible for the implementation and management of the control measures discussed in this document:

TABLE 7.1

Personnel	Responsibility
OH&S Committee	Review and endorse the Air Quality Management Plan. Promote awareness of the IAQMP.
Risk Manager	Obtain expert advice on related health issues and investigate/make recommendations on associated health risks.
Registration	Report / pass on any reports of problems with indoor air quality or environment relating to works of art/ art areas. Provide expert advice on environmental standards for works of art; recommend tests or investigations required to be carried out in relation to incidents or problems.
Manager, Facilities and Building Services	Ensure policy application throughout Building Services section and Building Services suppliers. Allocate funding for indoor air quality management Ensure that mechanical plant design, installation and maintenance are consistent with relevant legislation and requirements of this Plan. Maintain regular communication with Assistant Manager, Facilities and Building Services in relation to Building Services mechanical maintenance systems relating to indoor air quality.
Assistant Manager, Facilities and Building Services	Ensure Gallery maintenance staff and contractors comply with the requirements of this Plan. Maintain regular logging system (MEX) of Building Services mechanical maintenance relating to indoor air quality. Maintain regular communication with Manager, Facilities and Building Services in relation to Building Services mechanical maintenance systems relating to indoor air quality.
All Gallery Employees	Ensure that individual activities are in accordance with indoor air quality and are in accordance with the requirements of this Plan.

### 7.1 ADMINISTRATIVE MEASURES

Administrative measures may include:

- developing relevant communication channels between employees and managers to facilitate identification of indoor air problems. Key people to communicate about the environment and air quality include: Assistant Manager, Facilities & Building Services, Risk Manager (OH&S advice), and Manager Registration.
- cleaning the workplace, for example, the building fabrics or ventilation systems to eliminate sources of contaminants from spilt materials, deposited dust and absorbed materials on surfaces
- regular monitoring to ensure that control measures are working effectively.
- pest control - where possible, all pest control spraying is to be carried out after hours. Building occupants are to be given advance notice via email before the spraying takes place. MSDS are required for all chemicals used
- loading bays – vehicles’ motors and/or engines shall be turned off while loading and unloading to reduce the risk of exhaust fumes entering the buildings
- air conditioning plant rooms - air conditioning plant rooms should be maintained in a clean and tidy state and are not be used as general storage space.

## 8. REFERENCE DOCUMENTS

### 8.1 STANDARDS AND CODES

- AS/NZS 3666  
Air handling and water systems of buildings – Microbial control
- AS/NZS 1668.2:1991  
Mechanical ventilation for acceptable indoor air quality
- AS/NZS 2243.8:2001  
Safety in laboratories – Fume cupboards
- Building Code of Australia (BCA) (2004).
- ACT Cooling Towers and Warm Water Storage Systems Code of Practice (2000)

### 8.2 OTHER REFERENCES

- Standards Australia HB32—1992  
Control of Microbial Growth in Air Handling and Water Systems in Buildings
- Worksafe Australia  
Exposure Standards for Atmospheric Contaminants in the Occupational Environment, 1991
- Australian Government – Comcare  
Fact sheet 12 – Jan 2002 - Indoor Air Quality
- Australian Government – Comcare  
Air Conditioning and Thermal Comfort in Australian Public Service Offices - 1995
- National Health and Medical Research Council  
Ambient Air Quality Goals and Interim National Indoor Air Quality Goals - 2002
- National Health and Medical Research Council [NOHSC:3008(1995)]  
Guidance Note on the Interpretation of Exposure Standards for Atmospheric Contaminants in the Occupational Environment
- International Council Of Museums  
Standard for indoor air quality environment for works of art (August 2000)

## 9. DOCUMENT CONTROL

Endorsed by Assistant Director, Business and Operations	XX/XX/200X
Date of effect	XX/XX/200X
Review date	XX/XX/200X