

## 5.0 INDOOR AIR QUALITY ASSESSMENTS

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Examples of A.W.N. (Air Water Noise) Consultants experience in the field of indoor air quality monitoring and assessment are given in the following project summaries:-

### 1. Unflued Gas Appliance Emissions Study

In 2003, A.W.N. (Air Water Noise) Consultants, in consortium with Team Ferrari Environmental, conducted the largest indoor air quality study undertaken in Australia, evaluating the impact of unflued gas appliances in domestic residences located in Sydney, Melbourne, country Victoria and Canberra.

The Department of Environment and Heritage commissioned the study following the formulation of the study protocol by a reference network of experts. The aim of the study was to compile scientific indoor air quality data from Australian homes where unflued gas heaters were in use. Through measurement of indoor air quality parameters, it was intended that an increased knowledge of the relationship between specific contaminants and unflued gas heater use could be determined, as could influencing factors.

Specifically, indoor air quality was determined through measurement and notation of the following parameters:

- Indoor concentrations of nitrogen dioxide, nitric oxide, carbon monoxide, carbon dioxide and formaldehyde;
- Outdoor concentrations of nitrogen dioxide and nitric oxide;
- Indoor temperature and relative humidity;
- Ventilation rate;
- Ambient wind speed, wind direction, rainfall, barometric pressure, temperature and relative humidity;
- Gas appliance details;
- House construction age.

Mobile Laboratories connected to the study area via PTFE tubing were used for nitrogen oxides sampling, as instruments could be located in a secure environment with minimal inconvenience to study participants. Handheld devices for carbon monoxide, carbon dioxide, temperature and relative humidity were also set up in test rooms. The scale of the project (greater than 150 homes tested) ensured that a range of heater brands, types and ages were tested.

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PHOTO  
Mobile Monitoring Van:  
Set up in front of a  
domestic residence



In general, the results of the study indicated that the levels of nitrogen dioxide, carbon monoxide and carbon dioxide in rooms where unflued gas heaters were operating were substantially higher than the highest concentrations measured in ambient air in Australia. This was particularly true for rooms which were under-ventilated, or where the heater size was not practical for the room in which it was being used. In many cases the nitrogen dioxide concentrations were significantly above the recommended human health based indoor air quality criteria.

## 2. Australian National Line

Identification and monitoring of airborne asbestos fibre levels in accommodation areas of all ANL ships operating in Australian waters.

## 3. Australian Radiation Laboratories, Victoria

Monitoring of sulphuric acid, phosphoric acid, nitric acid and hydrochloric acid concentrations and identification of volatile organic compounds (VOC) (by gas chromatography/mass spectrometry) present in laboratory office/workshop areas.

## 4. ACI Technology, Victoria

Assessment of general indoor air quality – monitoring of carbon dioxide, ozone, total colony forming units (TCFU) and formaldehyde concentrations.

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## 5. Greater Dandenong City Council, Victoria

Monitoring of airborne asbestos fibre levels in public swimming pool area. Assessment of health risk and control strategies.

## 6. Community Services Victoria

Indoor air quality assessment at two Victorian Government office buildings to determine employee exposure to total colony forming units (TCFU), methyl ethyl ketone (MEK), methyl isobutyl ketone (MIBK), toluene, formaldehyde and carbon monoxide.

## 7. Yarra City Council, Victoria

Monitoring of airborne asbestos fibre levels in public swimming pool area. Assessment of health risk and control strategies.

## 8. Boroondara City Council, Victoria

Monitoring of airborne asbestos fibre levels in Council office buildings. Assessment of health risk and control strategies.

Assessment of airborne fungal spore contamination of a public building and identification of the fungal species. Assessment of health risk and methods of control.

## 9. Municipal Council, Victoria

Indoor air quality assessment to determine public exposure to Legionella sp., total colony forming units (TCFU) and particulate matter.

## 10. Shopping Centre Complex, Victoria

Monitoring of carbon monoxide concentrations in a car park to assess public and employee health risk.

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## 11. Monash City Council, Victoria

Assessment of employee exposure to airborne asbestos fibres and particulate matter. Identification of particulate matter chemical composition.

## 12. Police Association, Victoria

Monitoring of carbon dioxide, carbon monoxide, particulate matter, formaldehyde and total colony forming units (TCFU) concentrations to assess employee health risk.