

Report 04.627
Date 16 November 2004
File ENV/06/01/03

Committee Environment
Author Perry Davy, Air Quality Scientist

2004 Annual Air Quality Monitoring Report for the Wellington Region

1. Purpose

To present the results of the air quality monitoring that has been carried out at various locations within the Wellington Region since October 2003.

2. Background

The Regional Air Quality Management Plan (Air Plan) contains the following primary Objective:

4.1.1 *“High quality air in the Region is maintained and protected, degraded air is enhanced, and there is no significant deterioration in ambient air quality in any part of the Region.”*

The primary issue at the time the Air Plan was written was that there was a *“Lack of adequate data and information on ambient air quality, contaminants in discharges and climatic effects in the Wellington Region”* (Issue 2.1.1). In order to assess whether Regional air quality meets this objective the Air Plan sets out a number of Methods, the most important being the establishment of an ambient air quality monitoring network:

6.1.2 *Develop and implement an ambient air quality monitoring programme, within four years of the adoption of this Plan, sufficient to provide appropriate information on which to base future air quality management decisions.*

During 2003/2004 ambient air quality monitoring was undertaken at Upper Hutt, Wainuiomata, Masterton, Lower Hutt and Central Wellington.

3. Regional Policy implementation

Chapter 8 of the Regional Policy Statement contains policies and methods for air quality management within the Wellington Region. The ambient air quality monitoring programme implements Policies 1-4, relating to air quality management and Methods 2 and 3 in particular.

4. Strategic context

Clean, fresh air is an objective set for the Region in our strategic plan. The target for that objective is that by 2013 there will be no recorded instances when air pollution reaches the “Alert” levels of the National Ambient Air Quality Guidelines.

5. Air quality indicators, guidelines and standards

Ambient air quality is the general quality of the air that surrounds us. Ambient air quality reflects the cumulative effects of contaminants discharged to air from all sources, both anthropogenic (from human activities) and natural sources.

The contaminants that are currently being monitored in the Wellington Region are particulate matter (PM₁₀), carbon monoxide (CO), and nitrogen oxides (NO_x). These contaminants are identified in the Regional Air Quality Management Plan as air quality indicators for the Region. Several meteorological parameters are also being monitored, (these are wind speed, wind direction, relative humidity and temperature), as they all have an effect on air pollutant concentrations.

5.1 National environmental standards for air quality

The Ministry for the Environment has promulgated a series of National Environmental Standards, including standards for Air Quality. National standards have the force of regulation and supersede the Regional Ambient Air Quality Guidelines. The standards are presented as a package consisting of:

- **ambient standards** for carbon monoxide (CO), particles (PM₁₀), nitrogen dioxide (NO₂), sulphur dioxide (SO₂) and ozone (O₃);
- **prohibitive standards**, which prohibit various activities that discharge unacceptable quantities of contaminants into the air;
- **an emission standard** for the design of small, domestic solid-fuel-burning appliances.

The Standards for Air Quality are similar to the previous national guidelines, except that provision for an ‘allowable’ number of exceedences has been included. The implementation of National Standards will have implications for Greater Wellington. For example;

- (i) all exceedences of the Standard will need to be publicly notified;
- (ii) Agencies responsible for managing emissions to air under the Resource Management Act 1991 (RMA) will need to implement policies and rules to achieve the National Standards.

5.2 Air quality indicators

A useful method to illustrate the significance of the results is to depict the percentage of time that the results fall into certain categories. This method is described by the Ministry for the Environment in the discussion document on

Environmental Performance Indicators (Ministry for the Environment, October 1997). Table 5.1 provides a description of these categories.

Table 5.1: Air quality categories

Category	Maximum Measured Value	Comment
Action	Exceeds Guideline	Completely unacceptable by national and international standards.
Alert	Between 66% and 100% of the guideline	A warning level which can lead to guidelines being exceeded if trends are not curbed.
Acceptable	Between 33% and 66% of the guideline	A broad category, where maximum values might be of concern in some sensitive locations, but are generally at a level that does not warrant dramatic action.
Good	Between 10% and 33% of the guideline	Peak measurements in this range are unlikely to affect air quality.
Excellent	Less than 10% of the guideline	Of little concern.

6. Ambient air quality monitoring results

6.1 Summary of monitoring results

The results of the air quality monitoring are presented in Figure 1. The results have been assessed using the National Environmental Standards and the categories described in Table 5.1. A full analysis of the results is provided in the 2004 Annual Air Quality Monitoring Report for the Wellington Region.

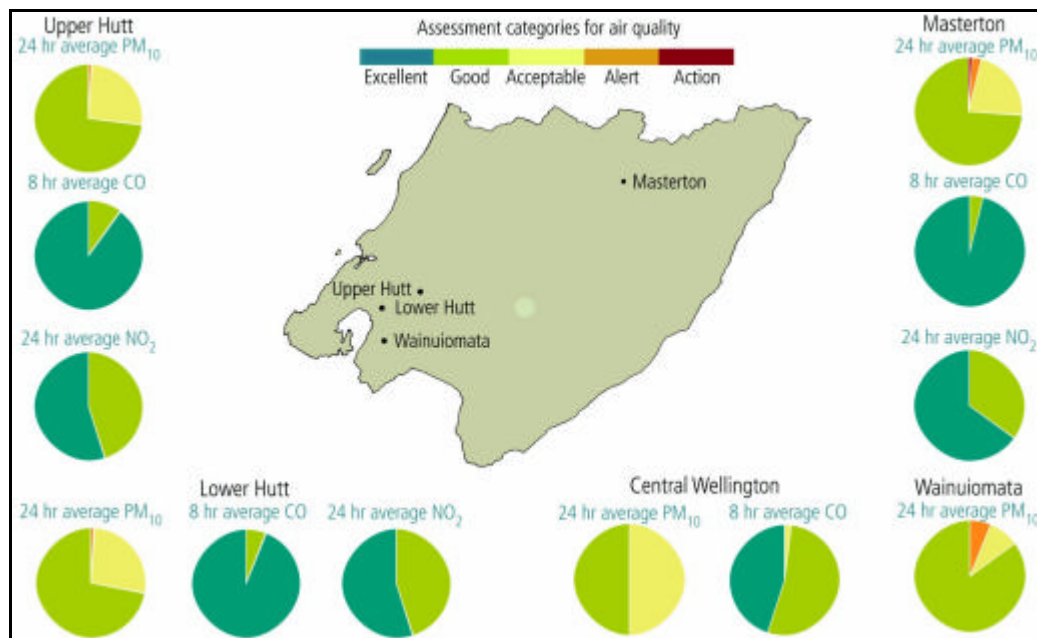


Figure 1. Air quality monitoring results for the Wellington Region

7. Discussion

The results of the ambient air quality monitoring carried out in the Wellington Region over the past year have indicated that the highest concentrations of air pollutants occurred during the winter. The ambient air quality monitoring station at Wairarapa College in Masterton recorded three exceedences of the NES for PM₁₀. Elevated levels of PM₁₀ (maximum of 47µg/m³) were also recorded at Wainuiomata. The higher winter time air pollution levels are the consequence of periods of cold, calm weather combined with emissions from combustion sources to atmosphere. Cool, calm conditions restrict the dispersion of air pollutants. The major pollution sources are most likely to be motor vehicles and residential and commercial heating.

8. Conclusion

Ambient air quality monitoring within the Wellington Region shows that air quality is generally good during the summer months at suburban locations. However, at times during the winter, certain areas experience degraded air quality that may pose a risk to the health of the local community. With the establishment of a permanent air quality monitoring network clear trends in air pollution levels are becoming evident, with winter being the likely time for pollution episodes to occur, the severity of which are entirely dependent on the type of winter we experience.

The introduction of National Environmental Standards for Air Quality will require Greater Wellington to manage air quality in the Region in order to meet these Standards. Ambient air quality monitoring during the past year indicates that, during the winter, air quality in Masterton does not meet the National Environmental Standard for fine particles.

9. Future monitoring

The Resource Investigations Department, in conjunction with the Transport Division, is now in the process of establishing a mobile air quality monitoring station. The monitoring station will monitor local air quality at various locations in order to assess the impact of motor vehicle emissions including trends in air pollution levels and the health implications for the local population.

10. Communications

The results of the air quality monitoring will be reported to the public by media releases and the information is available on Greater Wellington's web site.

Copies of the 2004 Annual Air Quality Monitoring Report will be sent out to constituent Councils, the Public Health Service, the Ministry for the Environment, other Regional Councils and tertiary academic institutions. Copies of the report will also be available on request to members of the public. The 2004 Annual Air Quality Monitoring Report also contains the monitoring results and statistics necessary to fulfil our part of the Environmental Monitoring Partnership Protocol Agreement between Greater Wellington and Ministry for the Environment.

Information about air quality has also been summarised into an Annual Report Card which will be available for more general distribution to the public.

11. Recommendation

It is recommended that the Committee:

- 1. receive this report; and*
- 2. note the contents.*

Report prepared by:

Perry Davy
Air Quality Scientist

Report approved by:

John Sherriff
Manager Resource
Investigations

Report approved by:

Jane Bradbury
Divisional Manager
Environment