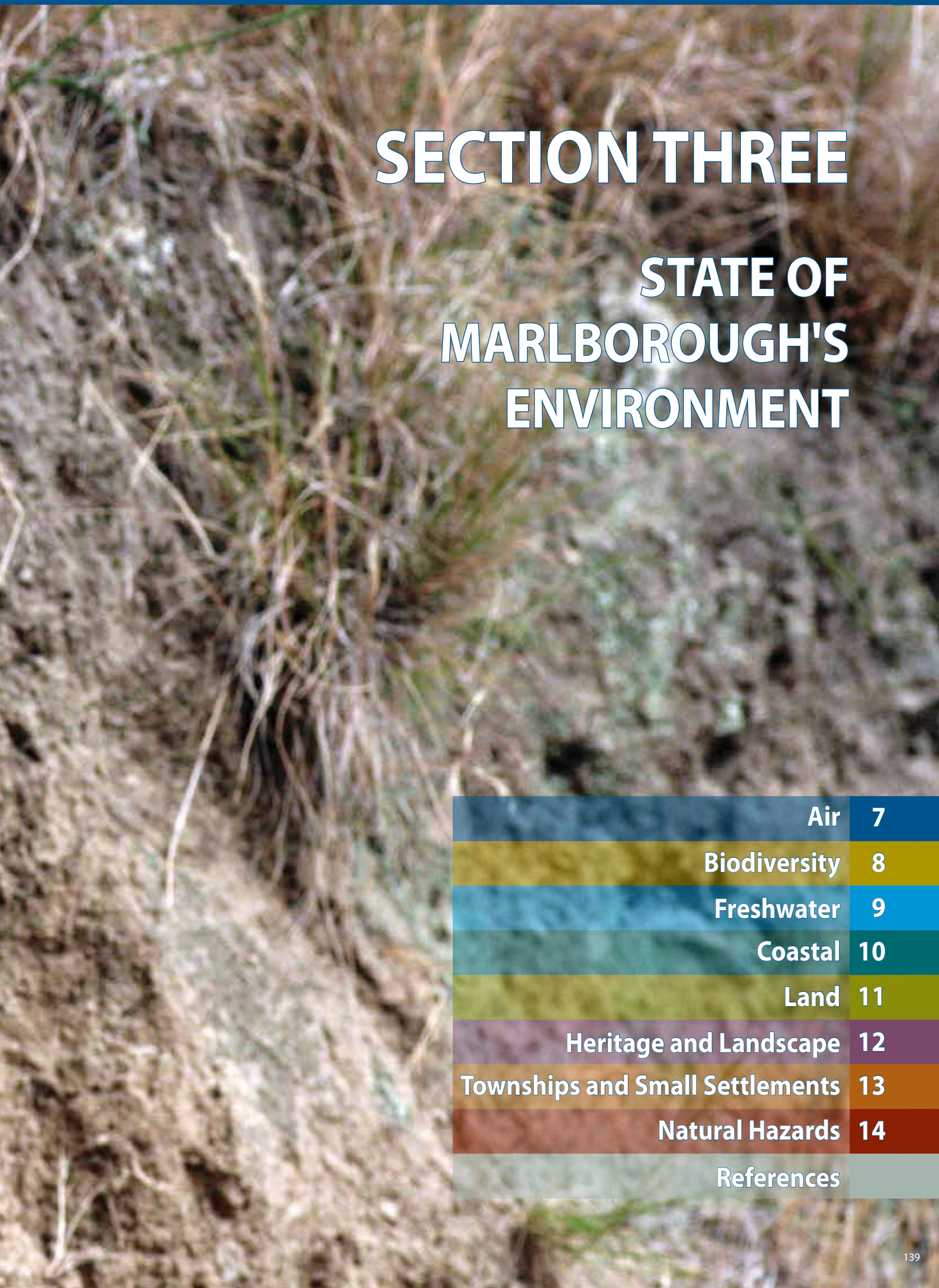


SECTION THREE

STATE OF MARLBOROUGH'S ENVIRONMENT

Chapter 7: Air

CONTENTS

Previous pages: Smoke from single fire spreading over the lower Wairau plain.

Air

Briefly ....

In 1994 the Council reported in its first state of the environment report that air quality in Marlborough was of a high standard, although no monitoring had been carried out to confirm that view. Data on the number of complaints was essentially used as the basis for determining what air quality issues were. In 1999 the Council started monitoring to try and find out what really was the state of Marlborough's air quality.

Over the last five years central government has had a significant influence over how councils manage air quality. The introduction of national environmental standards for air quality means the Council has to meet nationwide methods of monitoring, not exceed defined levels of contaminants and report where standards are exceeded. These changes have influenced and will continue to influence how this Council manages air quality issues into the future.

ISSUES

- Implementing central government standards for managing air quality.
- Managing the impacts on air quality from smoke emissions, spraying of agrichemicals, odour, dust and vehicles.

PRESENT AND FUTURE MANAGEMENT

Air quality monitoring in Marlborough started in 1999 when four sites were established to record visibility. Visibility was recorded as it can be used as an indicator of general air quality and is a measure of the degree to which the atmosphere is transparent. Monitoring was undertaken at two sites in Blenheim, one in Picton and one at the Woodbourne Air Control Tower. Although the results of the monitoring concluded that visibility was good in Marlborough, it also identified times when air quality was likely to be poor. Poor air quality was often linked with inversion events occurring during the winter. The main sources of air pollution identified were from urban and rural burning and from domestic heating.

Following on from the visibility monitoring, the Council began monitoring particulate matter in 2000. Particles of a diameter of 10 microns (PM_{10}) were monitored because particles of this size or less, can be inhaled into the respiratory system and cause health problems.

Studies carried out for the Council in 2007 identified five main sources of PM_{10} in Blenheim. These sources were domestic heating, sea salt, soil, sulphate and a further source that was unidentifiable except as a mixture of a soil and combustion. Domestic heating was highlighted as the main source of PM_{10} in Blenheim, contributing 44% of the annual PM_{10} concentrations and 78% of the average contribution on high pollution days.

National environmental standards and the straight line path

In 2005 regional councils were required to identify areas (termed airsheds) where air quality could reach levels higher than the national environmental standards. Blenheim is currently the only designated airshed in Marlborough. For each airshed council's are required to establish a straight line path to track progress towards compliance with the standard by 2013.

While there appears to be a downward trend in PM_{10} concentrations for Blenheim, the rate (or the certainty) of this trend is not sufficient to say the national environmental standard will be met by 2013. To met the standard by 2013 total emissions to the Blenheim airshed need to be reduced by 25%. The Council has looked at a number of ways on how emissions can be reduced and work on this is ongoing.

PM_{10} concentrations in Marlborough from 2000 to 2008

Results from PM_{10} monitoring in Marlborough from 2000 to 2008 show that, in all monitored locations, concentrations are highest during the winter months. The limited monitoring that has been undertaken in Renwick and Picton has not

shown these towns to be at risk of exceeding the national environmental standard for PM_{10}.

The site at Middle Renwick Road in Blenheim has the longest record of PM_{10} concentrations in Marlborough. There appears to be a very slight downward trend in concentrations at this site since 2000. The monitored site at Redwoodtown in Blenheim is the only one to regularly exceed the national environmental standard for PM_{10} of 50$\mu g/m^3$. (Although exceedances have been recorded at the Middle Renwick Road site they are rare.) There have been on average seven exceedances of the standard for PM_{10} per year at the Redwoodtown site since 2002. The national environmental standard for PM_{10} can only be exceeded once during a calendar year.

Both Blenheim sites show similar downward trends, however the certainty surrounding these trends is poor. 2004 appears to be a worst case year for PM_{10} concentrations in Redwoodtown, although this is not reflected in monitoring at Middle Renwick Road where air quality was recorded as being better than average. At this stage there is insufficient data for the Council to be able to draw a robust conclusion about Marlborough's air quality.

Providing information to the community and industry groups

The Council has been actively trying to provide information to the community, and especially rural land owners, about what to burn and what not to burn in rural bonfires. An example of this is the rural burning guide brochure that is available on the Council's website.

The Council has also been actively working with the viticulture industry on air quality issues, especially about the use of frost protection methods that use heat and smoke in vineyards. Although only clean burning fuels (e.g. diesel) are meant to be used, some burning of waste oil has occurred. This is prohibited by national environmental standards for air. To help get information about the use of frost protection measures to grapegrowers, the Council regularly provides articles for inclusion in the Winepress - a monthly magazine sent to over 1,000 growers, wineries and contractors.

Smoke over Wairau Plain

Air

In depth ....

There are some things in life that we more or less take for granted. Being able to breathe fresh air is one of those things! The only time that most of us probably stop to think about our ability to breathe is if, or when, we suffer from health problems such as hayfever, asthma or other respiratory illnesses. However, even those with otherwise good health can be irritated or affected to some degree by things that affect the quality of air, for instance backyard burning, spray drift, odour or smoke.

Sometimes the effects or impacts from poor air quality aren't human health related but can be classed more of a nuisance. For example, burning garden waste in the backyard can result in sooty particles landing on neighbours' washing or that washing smelling of smoke. Quite a few of the complaints that the Council receives about smoke arise from backyard burning in our towns. Other things that affect air quality can have both human health impacts and environmental effects. Spray drift falls into this category as it can create health problems for people, have consequences for our home gardens, animals (domestic or stock), or on a larger scale, could have a serious economic impact.

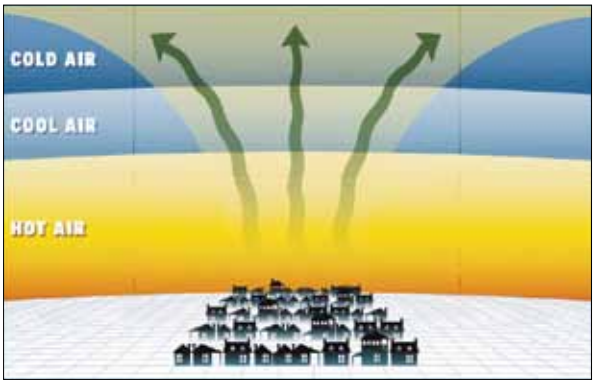
The quality of the air that we breath is dependant on the amount of pollutants that are being released to the atmosphere and also on how quickly these pollutants are dispersed or 'diluted' by atmospheric processes. New Zealand's geographical location and the extent of its coastal environment, along with the wind currents, are constantly changing the air around us. This helps to maintain the quality of air, although there are towns/cities within New Zealand, which because of population size and/or unique geographic situations, do experience significant issues with air quality.

Wind speed and direction play an obvious role in the dispersal of pollutants but other factors such as the temperature structure of the atmosphere e.g. inversion layers (Figure 7.1) and local topography e.g. open plains versus narrow valleys, also affect how pollutants disperse and move within the atmosphere.

A significant factor in managing air quality in Marlborough and nationally over the last five years has arisen through central government intervention. This has seen 'climate change' as a specific matter that needs to be planned for by councils. The introduction of national environmental standards for air quality has also resulted in a need to meet nationwide methods of monitoring, to meet defined levels of contaminants and to report where standards are exceeded. These changes have influenced and will continue to influence how this Council manages air quality issues into the future.

FIGURE 7.1

Normal Situation



Temperature Inversion

In the normal situation hot air rises and disperses pollutants upwards, but during a temperature inversion event a layer of warm air traps the movement of pollutants, effectively creating a ceiling and concentrating the pollutants close to ground level. The height of the inversion layer is not fixed and can vary (from: www.ec.gc.ca/cleanair-airpur/).

Inversion layers, Picton

AIR QUALITY ISSUES IN MARLBOROUGH

In 1994 the Council reported in its first state of the environment report that air quality in Marlborough was of a high standard even though there was no monitoring available to confirm that view. Data on the number of complaints was essentially used as the basis for determining what an air quality issue was. Complaints were received at that time about odour, dust, smoke and use of agrichemicals. Subsequent state of the environment reports have identified the following local air quality problems:

- Smoke emission being a cause of winter smog conditions in Blenheim and other residential areas with associated health, odour, visual and amenity effects.
- Emissions from the open burning of garden, household, farm and other waste having localised effects on visibility, amenity values and enjoyment of an area, or releasing toxic or hazardous chemicals to the environment.
- Emissions from industrial and trade processes.
- Spraying of agrichemicals that can cause plant, animal and human health effects.
- Odour issues associated with some land use activities e.g. from industrial premises, sewage treatment ponds and some agricultural activities. On some occasions odour problems do not always come just from human related activities but can arise through, or in combination with, natural processes - see box 'Odour at Tirimoana'.
- Dust is generally a localised and temporary problem from a small range of activities.
- Vehicle emissions including particulates, aerosols, gases like carbon monoxide and carbon dioxide, and contaminants such as benzene.

While Marlborough's air quality has always been assumed to be relatively good, in 1999 the Council began monitoring to find out what the community thought air quality concerns were and also to determine what the overall quality of air was like. The results from this monitoring means the Council now has a better understanding of ambient or background air quality in Marlborough. An improved system for recording complaints made by individuals in the community on a whole range of issues has also helped to gain a better appreciation of specific air quality issues.

ODOUR AT TIRIMOANA

The Council has received complaints over a number of years about a foul odour at Tirimoana at the head of Queen Charlotte Sound. This culminated in a petition being sent to the Council by the Anakiwa/Tirimoana Residents' Association in 2007 requesting that something be done to address the odour problem.

In looking at the possible sources of the odour, the Council carried out investigations in 2007/2008 involving weekly sampling of water quality in Grove Arm and the major streams draining the Tirimoana and Anakiwa catchments. The water samples were analysed for bacterial contamination. To date the results show that water quality within the Grove Arm is periodically affected by heavy rainfall events, with increased bacteria numbers in the bay coinciding with increased numbers in the streams. It is thought that a combination of poorly performing septic tanks and run-off from agricultural land are the main contributing sources. However, this bacterial contamination is not thought to be the cause of the foul odour observed at Tirimoana, nor is it thought to contribute to it in any significant way.

The foul odour is most likely due to rotting vegetation and detritus, which accumulate at a specific point along the shore. The area is characterised by soft dark muds at low tide, whilst at high tide the water is thick with black detritus and rotting algae particularly sea lettuce. A foul odour of rotting vegetation and rotten eggs (presumably from the release of hydrogen sulphide from within the sediments) pervades the area. It appears that the point at which the odour occurs is a natural deposition area for detritus in the bay. In addition, the warm shallow waters are favourable for algal growth, again water currents will tend to deposit this algal growth at Tirimoana where it decays and contributes to the foul odour. Excessive nutrients within the bay will contribute to algal growth and make the problem worse, but the extent to which human inputs of nutrients contributes to the problem is unknown.

Information to date suggests that there is no one point source of pollution creating the foul odour at Tirimoana. If this was the case, then one (or several) point sources could be easily and effectively dealt with to eliminate the odour. However, it appears that the foul odour is as a result of a combination of naturally occurring processes in a sensitive environment, which are perhaps being exacerbated by human activities.

TABLE 7.1: NEW ZEALAND NATIONAL ENVIRONMENTAL STANDARDS FOR AIR QUALITY

Pollutant	Averaging time period	Maximum allowable concentration	Number of allowable exceedances
Carbon monoxide	8 hours	10 mg/m^3	1
Nitrogen dioxide	1 hour	200 μg/m^3	9
Ozone	1 hour	150 μg/m^3	0
Sulphur dioxide	1 hour	350 μg/m^3	9
	1 hour	570 μg/m^3	0
Particulate matter (PM_{10})	1 day	50 μg/m^3	1

Types of air pollutants

There are essentially three categories of air pollutants:

- criteria pollutants;
- air toxics; and
- biological pollutants.

Criteria pollutants

'Criteria air pollutants' is a term used to describe air pollutants that have been regulated and are used as indicators of general air quality. Sources of criteria pollutants can either be of natural origin or anthropogenic (as a result of human activity) origin.

The initial monitoring of air quality in Marlborough was carried out by following the Ministry for the Environment's ambient air quality guidelines first published in 1994. These guidelines were later updated in May 2002 and were further replaced by National Environmental Standards in 2004. These national environmental standards (regulated under the Resource Management Act), include standards for five criteria air pollutants: carbon monoxide; nitrogen dioxide; ozone; particles; and sulphur dioxide. These are set out in Table 7.1. The standards are set to protect human health and are based on internationally recognised health and epidemiology studies.

(More on the standards can be found in the box 'National Environmental Standards for air quality').

Regional councils around New Zealand have to monitor air quality to find out whether the standards are being met. Rules set by councils in resource management plans (also referred to as regional plans) can be more stringent than the national environmental standards but they cannot be less stringent. If existing rules in a plan are less stringent then it is the national environmental standard that becomes the relevant standard.

Air toxics

Air toxics are also known as hazardous air pollutants and can be present in the atmosphere as gaseous, aerosol or particulate pollutants. They include the following general categories of compounds:

- volatile and semi volatile organic compounds;
- polycyclic aromatic hydrocarbons;
- heavy metals; and
- aldehydes.

These compounds are emitted from a variety of domestic, commercial, agricultural and industrial sources. Air toxics are generally present in the air in low concentrations, but it is their toxicity and/or persistence that make them a hazard to human, plant or animal life.

Biological pollutants

Pollen is probably the biological pollutant that most people will be familiar with but there are other types of biological pollutants that can also impact on our health. These arise mainly, but not exclusively, in indoor environments and include moulds, animal and human skin, dust mites, bacteria etc. Outbreaks of certain diseases, for example Legionnaires' disease, can also be caused by breathing in poor air. People become infected with the bacteria through breathing in mist or steam containing the bacteria.

Indoor and outdoor air pollution

Often when one thinks about air pollution or air quality, it is usually outdoor air pollution that comes to mind. However, indoor air pollution can be just as big a problem. In fact it is such a big problem that the term 'sick building syndrome' has been coined to describe when acute illness arises from persons spending time in a building, and when no specific cause for the illness can be identified. Another term, building related illness, is

used when illnesses are diagnosed and are specifically identified with airborne building contaminants. This includes Legionnaires' disease, which can be circulated through air conditioning systems in buildings. According to the World Health Organization up to 30% of commercial buildings have significant indoor air quality problems.

Domestic buildings can also suffer from indoor air pollution problems. Studies have shown that in winter, in areas that are affected by high concentrations of particulate matter less than 10 microns (μm) in size, indoor air quality is also affected.

RESPONDING TO AIR QUALITY ISSUES

Monitoring air quality in Marlborough

In Marlborough people expect and demand to breath in clean air. The quality of the air can be inferred from the clarity of the air, especially on a fine day, and Marlborough has many fine crystal clear days during the year. However, that is not to say that all is well with Marlborough's air quality.

Air quality monitoring in Marlborough started in 1999 when four sites were established to record visibility. Visibility was initially recorded because it can be used as an indicator of general air

NATIONAL ENVIRONMENTAL STANDARDS FOR AIR QUALITY

Central government approved the national environmental air quality standards in July 2004 and they become effective through regulation on 1 October 2004. The standards apply nationally, meaning that each local council must enforce the same standard, although they can impose stricter standards when local conditions permit.

There are four major benefits of national environmental standards:

- They protect public health and the environment by providing an environmental "bottom-line" below which councils cannot go.
- They provide greater certainty for industry, by setting a "level-playing field" across councils that clarifies environmental expectations to guide resource consent applications and decision making.
- They can express the national interest by providing clear direction to all local councils about the required national standards.
- They demonstrate how New Zealand is meeting its international obligations (e.g., the Stockholm Convention, which is a United Nations environmental treaty on toxic chemicals. The objective of the treaty is to protect human health and the environment from persistent organic pollutants.)

On the whole New Zealand has relatively good air quality because of a relatively low population density, close proximity to the sea, and remoteness from other continents and sources of pollution. But, from monitoring that has taken place, it is known a number of urban centres around New Zealand do at times have unacceptable levels of air pollution. This is caused mostly by coal and wood use for home heating and exhaust emissions from vehicles.

From 1 October 2005, regional councils must monitor air quality and publicly report whether the air in their regions is within, or exceeds, the standards. Regional councils with air pollution levels that exceed the standards, are expected to make a plan for improvement and show how the standards will be achieved by 2013.

When deciding on whether to grant resource consents, councils must consider the net result of all activities in their regions and how they affect air quality. After 2013, councils will not be able to grant new discharge consents for emission of fine particles to air in areas that exceed the standard.

There are seven standards for dioxins and other toxics, five for outdoor air quality, one for the design of new wood burners in urban areas, and one requiring landfill operators to collect and destroy their greenhouse gas emissions. The first of the standards came into effect on 1 October 2004, banning specific activities that discharge dioxins and other toxics to air. These included burning coated wire in the open to recover metals, landfill fires, burning of tyres in the open, burning of road tar seal and burning waste oil in the open. From September 2005, the design standard for new wood burners in urban areas applied. From October 2006, school and hospital incinerators were banned unless a resource consent was obtained to allow burning to continue.

More information on the standards can be found on the Ministry for the Environment website or by contacting the Council.

quality and is a measure of the degree to which the atmosphere is transparent. Poor visibility can be caused by haze, which obscures the clarity, colour and form of what is seen through the atmosphere. Visibility can also be enhanced or reduced by weather conditions so observations of what the weather was like were recorded.

Sources of contaminants that cause reduced visibility include natural processes (windblown dust, coastal processes, volcanic eruptions), industrial discharges, agricultural discharges such as dust from cultivation and smoke from rural burn-offs, and domestic sources, including home heating and outdoor burning, and discharges from motor vehicles.

The visibility monitoring was undertaken at two sites in Blenheim (one from the Council office and one from Elisha Drive), one in Picton and one at the Woodbourne Air Control Tower. Although the results of the study concluded that visibility was good in Marlborough, it also identified times when air quality was likely to be poor. Poor air quality was often linked with inversion events occurring during the winter. The main sources of air pollution identified were from urban and rural burning and from domestic heating.

As a result of the visibility study, monitoring of particulate matter and specifically particulate matter less than 10 microns (μm) in size (PM_{10}) began in 2000. PM_{10} has continued to be monitored in Marlborough since 2000. The visibility studies were discontinued after 5 years as it was considered that direct monitoring of PM_{10} was more useful.

Passive sampling of nitrogen dioxide and sulphur dioxide was carried out from July 2002 to November 2003 at five sites in Marlborough, however the results showed that these contaminants were not of concern. Annual reporting of air quality since 2000 shows that the contaminant of concern for Marlborough is PM_{10}.

An emissions inventory carried out in Blenheim in 2005 studied potential sources of air contaminants, including domestic heating, motor vehicles, industry and outdoor burning. The contaminants investigated in the study were: particulate matter; carbon monoxide; nitrous oxides; sulphur dioxide; volatile organic carbons; carbon dioxide; and benzene. The report prepared after the inventory was completed concluded that carbon monoxide, nitrous oxides, sulphur dioxide, volatile organic carbons, carbon dioxide and benzene were unlikely to be an air quality concern in Blenheim. However, it was also noted that the uncertainty surrounding the estimates of benzene were high. The air contaminant that was identified as of most concern was PM_{10}.

Although the studies to date show that currently PM_{10} is the only air contaminant identified as a concern, if sources or the relative risk of concentrations of other contaminants change, then monitoring of these contaminants may be necessary in the future.

Particulate matter

Particulate matter, in air quality terms, can be divided between coarse particulate matter and fine particulate matter. Coarse particulate matter is made up of dust, some pollens, fine sand etc. It is of a size that is generally visible to the naked eye. In contrast fine particulate matter is invisible to the naked eye and is further defined based on its size. PM_{10} consists of particles less than 10 microns (μm) in diameter and $PM_{2.5}$ consists of particles less than 2.5 microns (μm) in diameter. PM_{10} comes from a variety of sources ranging from combustion (from home heating, cars, industrial processes etc.) to pollens and sea spray.

Why is PM_{10} a health concern?

The reason PM_{10} is a health concern is because particles of this size or less can be inhaled into the respiratory system, whereas larger particles can be readily filtered out in the nasal cavity. Health impacts from inhaling the smaller particles range from coughing and wheezing, to asthma attacks and bronchitis to high blood pressure, heart attack, strokes and premature death. These effects can result in aggravation of existing respiratory disease, increased hospital admissions, increased lost work days and school days and an increase in restricted activity days.

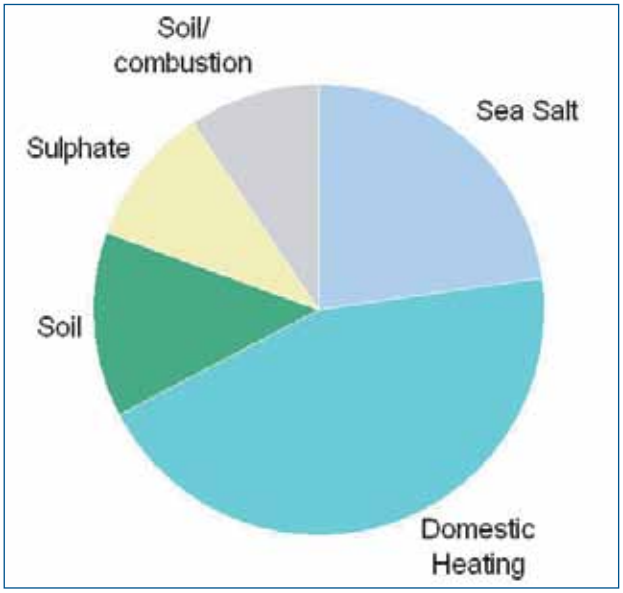
There have been numerous national and international studies done to examine the relationship between health impacts and poor air quality and also the mechanisms by which this occurs. There are also studies which show the different health impacts that arise from PM_{10} from different sources.

Results from monitoring PM_{10}

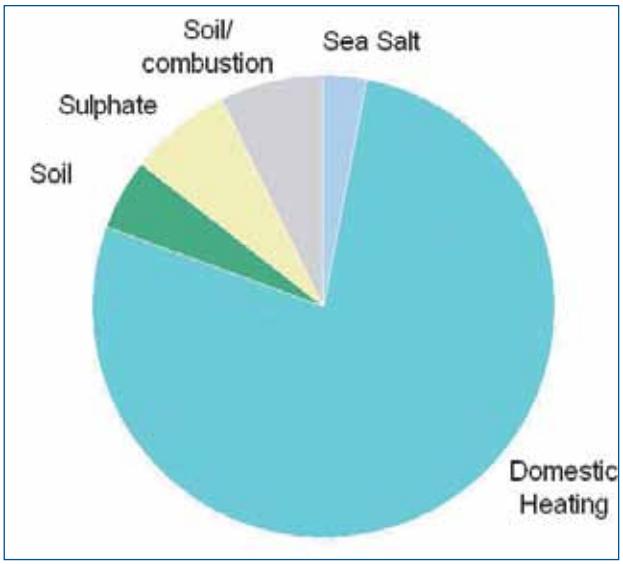
A study carried out by GNS Science and Environet Ltd. in 2007 identified five main sources of PM_{10} in Blenheim. These sources were domestic heating, sea salt, soil, sulphate and a further source that was unidentifiable except as a mixture of a soil and combustion. The relative proportions of these sources are shown in Figure 7.2. The results from this study supported the findings of the earlier emissions inventory study.

FIGURE 7.2:

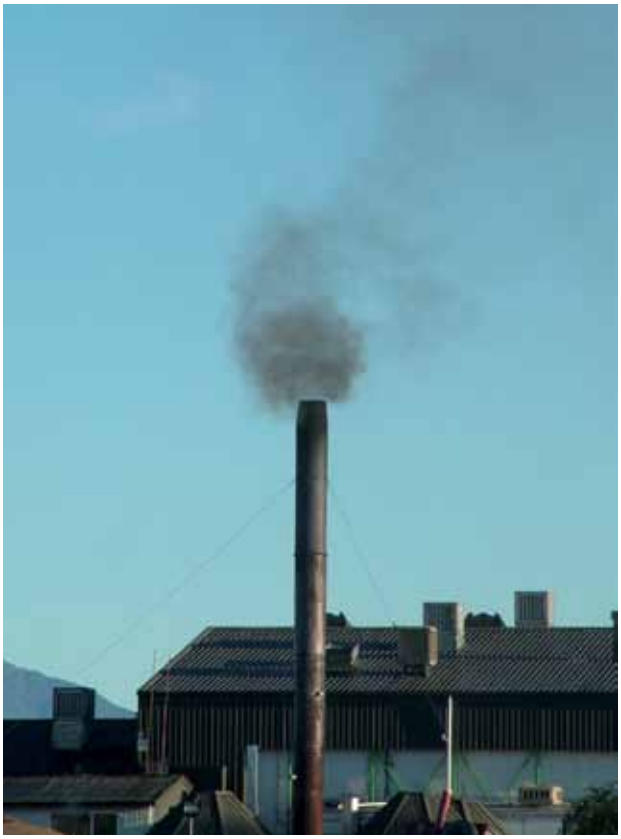
(a) Contribution of sources to annual PM_{10} concentrations



(b) Average contributions from the sources on high pollution days (i.e. PM_{10} > 50$\mu g/m^3$)



Domestic heating was highlighted as the main source of pollution during the winter months. It is worth noting that while there is good evidence to show that outdoor air quality is adversely impacted by pollution from domestic fires, there is also the concern that indoor ambient quality may be poor in houses with fires. Therefore, it is important that solid fuel fires are operated in a way that reduces the total emissions from them, in order to benefit both indoor and outdoor air quality.



Industrial air pollution

Air pollution

FIGURE 7.3: NUMBER OF EXCEEDANCES PER YEAR OF THE NATIONAL ENVIRONMENTAL STANDARD FOR PM_{10} RECORDED AT REDWOODTOWN, BLENHEIM

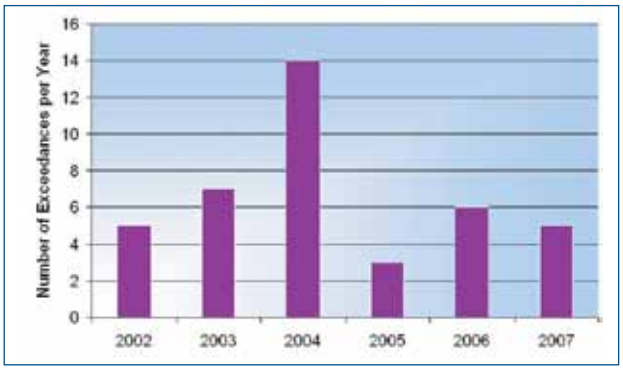


FIGURE 7.4: MONTHLY AVERAGES OF PM_{10} RECORDED AT MIDDLE RENWICK ROAD, BLENHEIM FROM 2000 - 2007

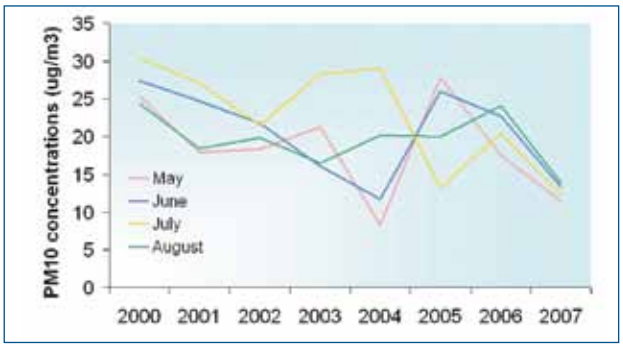
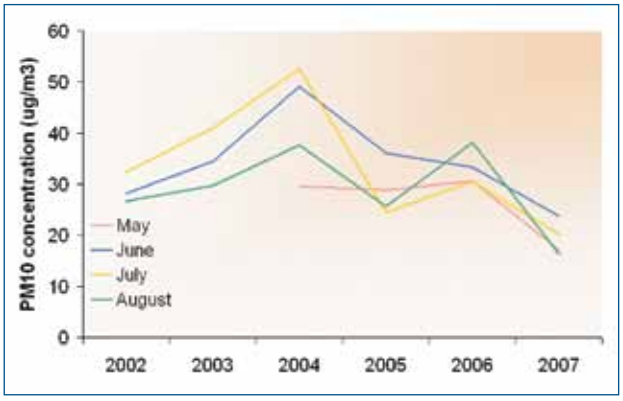


FIGURE 7.5: MONTHLY AVERAGES OF PM_{10} RECORDED AT REDWOODTOWN, BLENHEIM FROM 2002 - 2007



PM_{10} concentrations in Marlborough from 2000 to 2007

Results from PM_{10} monitoring in Marlborough from 2000 to 2008 show that, in all monitored locations, concentrations are highest during the winter months. The monitored site at Redwoodtown is the only one to regularly exceed the national environmental standard for PM_{10} of 50$\mu g/m^3$. Although exceedances have been recorded at the Middle Renwick Road site they are rare.

Renwick and Picton have not been routinely monitored for PM_{10}. However, the monitoring that has occurred in these townships to date, has not shown results which indicate there is a risk of exceeding the national environmental standard for PM_{10}.

The national environmental standard for PM_{10} can only be exceeded once during a calendar year. There have been on average seven exceedances of the standard for PM_{10} per year in Blenheim since 2002 as can be seen in Figure 7.3, which shows the exceedances recorded at the Redwoodtown monitoring site.

How have PM_{10} concentrations changed over time?

The site at Middle Renwick Road has the longest record of PM_{10} concentrations in Marlborough and is the most appropriate site for examining how PM_{10} concentrations have changed over time. The average monthly concentrations of PM_{10} since 2000 are shown in Figure 7.4. There appears to be a very slight downward trend in concentrations since 2000.

The poorest air quality has been recorded in Redwoodtown. When data for Redwoodtown is examined there also appears to be a very slight downward trend in the average monthly concentrations of PM_{10} - see Figure 7.5.

Winter averages for these sites are shown in Figure 7.6. Both sites show similar downward trends, however the certainty surrounding these trends is poor. 2004 appears to be a worst case year for PM_{10} concentrations in Redwoodtown, although this is not reflected in monitoring at Middle Renwick Road, where air quality was recorded as being better than average. One explanation for this discrepancy would be that the air monitor was moved from its usual site at the Bowling Club on Weld Street, Redwoodtown to Brooklyn Drive in Redwoodtown for the winter months in 2004. It is possible that the air monitor was unduly influenced by local sources and is not representative of ambient air quality in Redwoodtown.

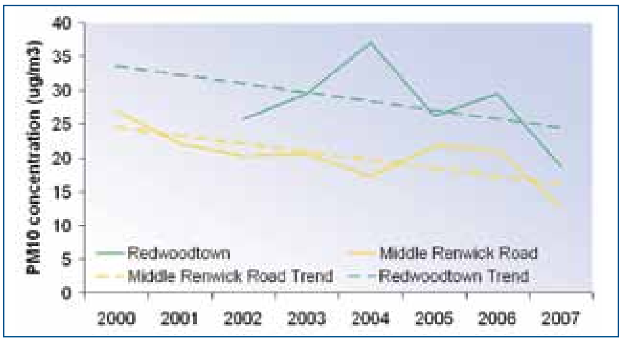
Although it may appear that air quality in Blenheim is improving, this may not necessarily be the case. As described earlier,

meteorological conditions play a vital role in determining ambient air quality conditions. At this stage there is insufficient data to be able to draw a robust conclusion, this is particularly evident with air monitoring at Redwoodtown.

National environmental standards and the straight line path

In 2005 regional councils were required to identify urban areas where air quality could reach levels higher than the national environmental standards. These areas were termed airsheds and have been identified based on councils knowledge of existing air quality data and the location of significant sources and factors

FIGURE 7.6: WINTER (MAY TO AUGUST INCLUSIVE) AVERAGES OF PM_{10} RECORDED AT MIDDLE RENWICK ROAD AND REDWOODTOWN, BLENHEIM FROM 2000 TO 2007



that affect the spread of pollution (for instance local geography and weather). There have been 42 airsheds identified around New Zealand. For Marlborough, Blenheim is currently the only designated airshed (Figure 7.7) because monitoring has shown that it regularly exceeds the standard for PM_{10}.

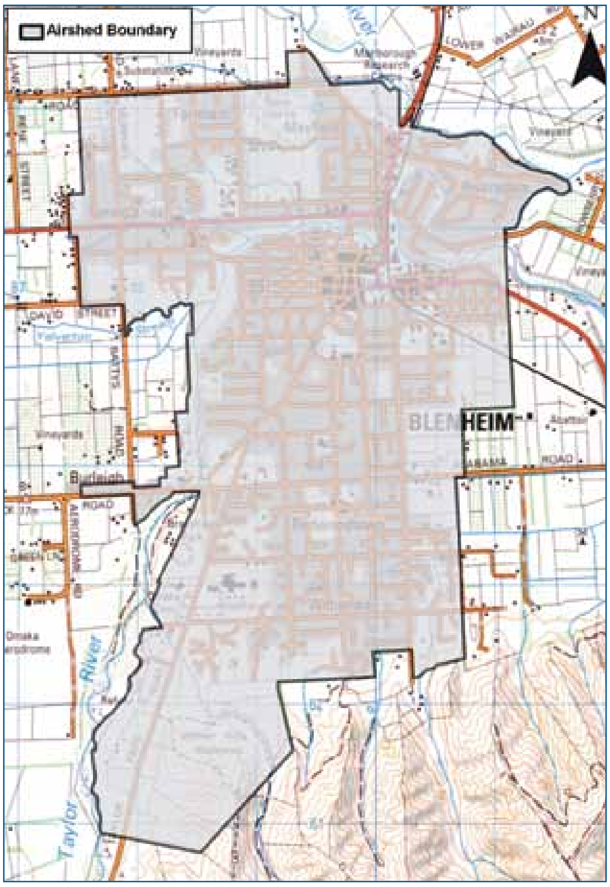
For airsheds where the standard is breached, councils must plan to improve air quality so the standard is met by 1 September 2013. For each airshed council's are required to establish a straight line path to track progress towards compliance with the standard by 2013. The straight line path is based on the worst recorded air pollution day and assumes a linear decrease in emissions from 2005 to 2013. Effectively the straight line path tightens every year until the standard is met by 2013. Details of the straight line path for Blenheim are available on www.mfe.govt.nz.

In order to ensure that the standard is met, councils will not be able to grant resource consents for any process that makes the levels worse. However, the resource consent could be granted if the proposed emissions are offset by reductions elsewhere in the airshed. After 2013, no resource consents to discharge PM_{10} will be granted if the air quality standard is still being breached.

Although as outlined previously, there appears to be a downward trend in PM_{10} concentrations for Blenheim, the rate (or the certainty) of this trend is not sufficient to ensure compliance with the national environmental standard by 2013. Neither is there evidence that this apparent downward trend is occurring in conjunction with a corresponding decrease in total PM_{10} emissions to the airshed.

In order to ensure the standard is met by 2013 total emissions to the Blenheim airshed need to be reduced by 25%. The Council has investigated a range of options to achieve this, with the most effective measures examined including a combination of a ban on outdoor rubbish burning, a ban on the use of open fires and the application of the national environmental standard design criteria for wood burners for multi fuel burners. The

FIGURE 7.7: BLENHEIM'S AIRSHED BOUNDARY



analysis suggested that this option may be sufficient to achieve the standard by 2013, particularly if existing wood burners are replaced 15 years following installation.

The use of financial incentives to encourage households to use cleaner heating options was also considered an option as this would improve the likelihood of meeting the standard and/or mitigate any socio-economic impacts. A further option considered was making the burner replacements mandatory after a specified time (e.g. 15 or 20 years) to ensure burners are replaced as predicted.

Rural fires

Over time burning in rural areas has been used as a method to clear land and to get rid of unwanted farm rubbish. While there has been a decline in black smoke visible in rural areas in recent years, which indicates that most people are getting the message not to burn tyres, spray guards, plastics, etc, there are still some problems in how people burn green materials and use accelerants. The billowing thick, white smoke that can be seen at times is a sign that the materials being burnt have not had adequate time to dry out. It is important that any vegetation is allowed to dry out properly before burning. With the exception of when a fire is first lit or dying down, a well managed fire that is burning only dry vegetation does not generally produce excessive amounts of thick smoke.

The Council has been actively trying to provide information to the community, and especially rural land owners, about what to burn and what not to burn in rural bonfires. An example of this is the rural burning guide brochure that is available on the Council's website.

The Council has also been actively working with the viticulture industry on air quality issues. In particular, the Council has been providing information about the use of frost protection methods that use heat and smoke in vineyards. There are two main types of burners that have been used in Marlborough vineyards. The first is a smoke/smudge pot, which is simply a container in which fuel is burnt. It does not have a chimney and works by producing excess smoke and heat. The second is a return stack burner, which is a double burning vineyard heater with a chimney that operates by producing heat. These burners are considerably cleaner burning than the traditional smoke/smudge pot and do not produce excessive smoke.

Return stack burner

Although only clean burning fuels (e.g. diesel) are meant to be used in return stack burners and smoke/smudge pots, some burning of waste oil has occurred. This is prohibited by law in terms of the national environmental standards. The Council can take enforcement action by issuing infringement notices and abatement notices if people are found to be using inappropriate materials for burning.

To help get information about the use of these frost protection measures to grapegrowers about this form of frost protection, the Council regularly provides articles for inclusion in the Winepress - a monthly magazine sent to over 1,000 growers, wineries and contractors.

Rural burnoff after clearing land for vineyard development