

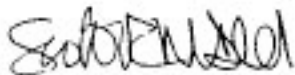
# State of the Air Report 2007

I N B R I T I S H C O L U M B I A

This third report on the State of the Air in British Columbia is the product of a continuing collaboration between the British Columbia Lung Association and a number of municipal, regional, provincial and federal air quality protection agencies that have come together to tackle the complex challenge of protecting the air we breathe. Through this valuable partnership, we are gaining a better understanding of the issues that affect the quality of the air we breathe and we want to share this knowledge with British Columbians to engage them in this important cause.

This year's report touches on several areas of particular interest to British Columbians including details of local and regional air quality measurements, information on climate change and a description of the recently launched Air Quality Health Index pilot for users in BC. We also salute two British Columbians who have made a difference, Dora McMillan of the Quesnel Environmental Society and the late Dr. David Bates of the University of British Columbia.

We are grateful to everyone who helped make this report possible. We invite you to send us your comments and suggestions for future editions.



**Scott McDonald,**  
Executive Director, BC Lung Association



*Haze over Telkwa area*

## TOWARDS A HEALTHIER FUTURE: Meeting Our Air Quality Resolutions

Rapid advances have been made in our understanding of the health impacts of air pollution. We know that poor air quality can lead to eye and throat irritation, breathing difficulties and an aggravation of existing respiratory and cardiac conditions. Air pollution can also increase the need for medication, the number of doctor or emergency room visits, hospital admissions and even premature deaths. People most at risk are those who have pre-existing heart and lung conditions (such as asthma, COPD and atherosclerosis), the elderly and young children.

Air pollution also affects the environment, reducing visibility, damaging plant tissues and depositing pollutants on land and water. Although most BC communities currently meet ambient air quality standards, research shows that even low concentrations of air pollution can affect the health of British Columbians and that continued efforts are required to reduce air emissions. It is for this reason that the provincial and federal governments have endorsed the "Continuous Improvement" and "Keeping Clean Areas Clean" principles of the Canada-wide standards on air quality.

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## BC Lung Association's Air Quality and Health Steering Committee

BC Lung Association's Air Quality and Health Steering Committee is a collaboration of government and health agencies that was formed to promote an understanding of the effects of air pollution on health, the environment and the economy. The steering committee members include the BC Lung Association, BC Ministry of Environment, Environment Canada, Greater Vancouver Regional District, Fraser Valley Regional District, BC Ministry of Health and Health Canada.

In spite of the regulatory programs already in place, there is concern that population growth and increased economic development may lead to a decline in BC's air quality. The Committee supports initiatives that improve air quality in British Columbia and the health of its citizens.

Through research, education and public awareness campaigns, the Committee aims to develop tools and inform policies that will reduce the impact of air pollution on human health, ecosystems and visibility in BC. For more information, see [www.bc.lung.ca/airquality/airquality\\_publications.html](http://www.bc.lung.ca/airquality/airquality_publications.html).

## Common Air Pollutants

### Particulate Matter (PM)

Particulate matter is a broad category of air pollutants that includes a range of small solids and liquids varying in size and chemical composition.

#### Particulate Matter less than or equal to 2.5 microns (PM<sub>2.5</sub>)

PM<sub>2.5</sub> is a subset of PM that consists of very small particles, smaller than 2.5 microns in size. Particles are either directly emitted in the air or they are formed through the chemical transformation of gases released from sources such as motor vehicles, gas plants and forest fires. PM<sub>2.5</sub> is thought to be more dangerous than larger particles because it can be inhaled deeply into the lungs.

### Sulphur Dioxide (SO<sub>2</sub>)

SO<sub>2</sub> is a gas that is produced from the combustion of fossil fuels and by natural sources such as volcanoes. SO<sub>2</sub>, a colourless gas with a pungent odour, irritates the upper respiratory tract in humans and can lead to acid rain.

### Nitrogen Oxides (NO<sub>x</sub>)

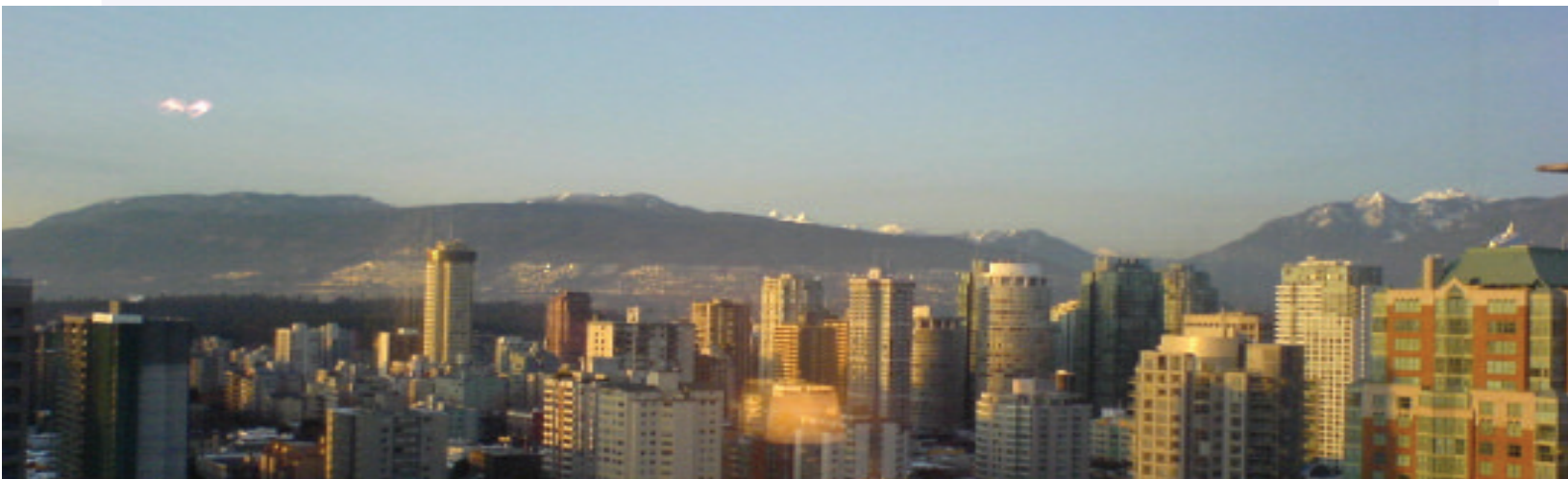
NO<sub>x</sub> is a gas that mostly includes nitric oxide (NO) and nitrogen dioxide (NO<sub>2</sub>). It is produced by combustion processes such as internal combustion engines and furnaces. Nitrogen oxides in the air can produce ozone and PM and can also lead to acid deposition (including acid rain).

### Volatile Organic Compounds (VOCs)

VOCs are organic chemical compounds that quickly change to vapours from solids or liquids. VOCs can produce atmospheric pollution, including the formation of ground-level ozone, a component of smog.

### Ozone (O<sub>3</sub>)

O<sub>3</sub> is a highly reactive gas made up of three oxygen atoms. Depending on where it is in the atmosphere, ozone affects life on Earth in either good or bad ways. Naturally occurring ozone high in the atmosphere helps shield the planet from harmful ultraviolet rays. Ground-level, or 'bad' ozone, created by chemical reactions between NO<sub>x</sub> and VOCs in the presence of heat and sunlight, is a major component of smog.



Smog over Vancouver / Larry Mullan

# WHAT ARE THE AIR POLLUTION LEVELS IN YOUR AREA?

## Fine Particulate Matter

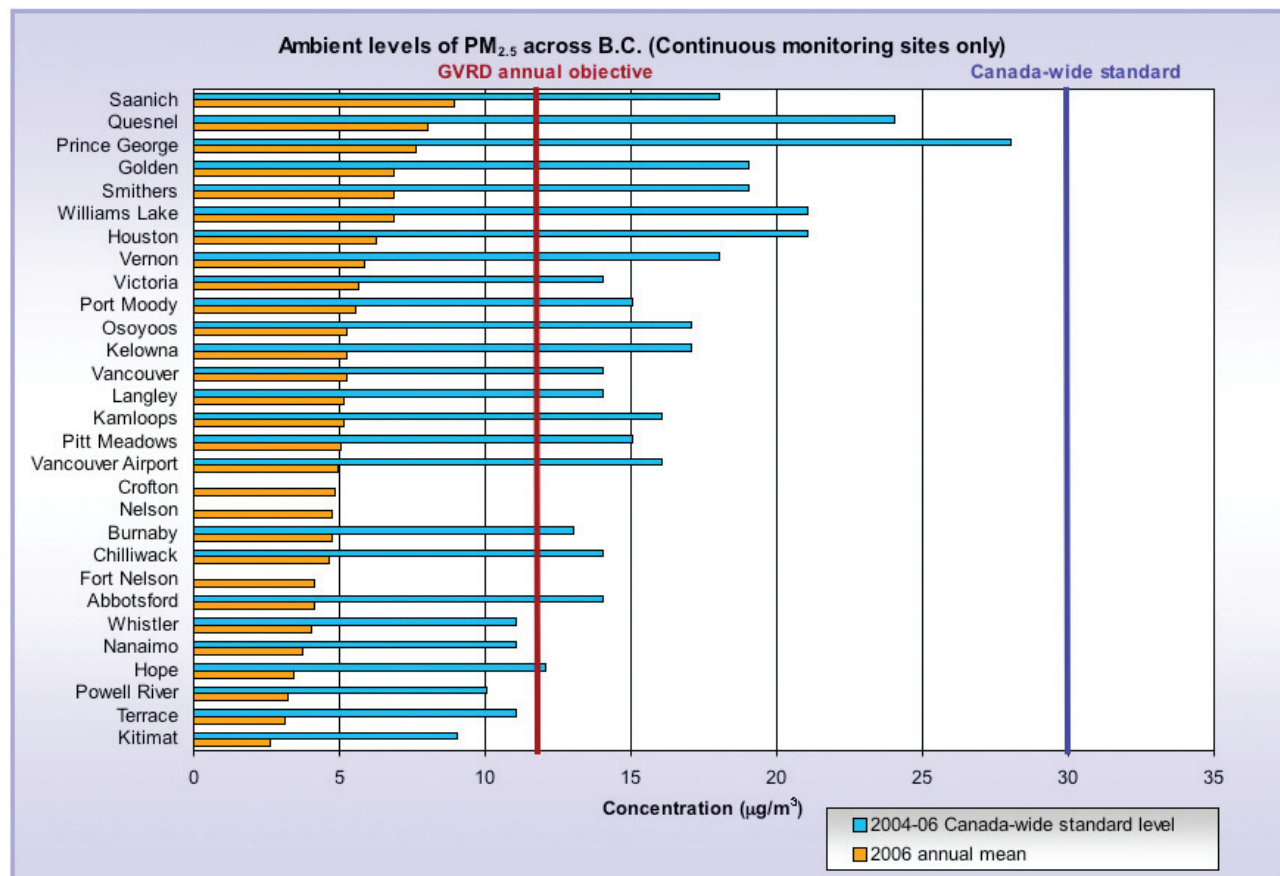
PM<sub>2.5</sub> is emitted from motor vehicles, wood stoves, fireplaces, forest fires, prescribed fires, pulp mills, beehive burners, smelters and other sources. PM<sub>2.5</sub> also forms in the air from reactions between other pollutants. These microscopic particles tend to stay in the air longer and travel farther than larger particles, such as dust from gravel roads. PM<sub>2.5</sub> can cause lung diseases such as emphysema, chronic bronchitis, asthma and lung cancer.

Ambient PM<sub>2.5</sub> levels measured at continuous monitoring stations across BC are shown in Figure 1. Note that the concentrations shown are not necessarily the highest observed concen-

trations in a region but are concentrations considered typical of regional air quality.

All continuous monitoring locations were below the GVRD annual objective of 12 µg/m<sup>3</sup>. Of these stations, the highest annual PM<sub>2.5</sub> concentration was observed at Saanich (8.9 µg/m<sup>3</sup>).

All of the continuous monitoring sites were also below the Canada-wide Standard (30 µg/m<sup>3</sup>). However, the Canada-wide Standard was exceeded at non-continuous monitoring sites in Prince George, Valemount, and Vanderhoof (data not shown).



**Figure 1:** Ambient Levels of PM<sub>2.5</sub> across BC

### Calculating the Canada-Wide Standard

Achievement of the PM<sub>2.5</sub> Canada-wide Standard is based on the three-year average of the annual 98<sup>th</sup> percentile 24-hour average concentration.

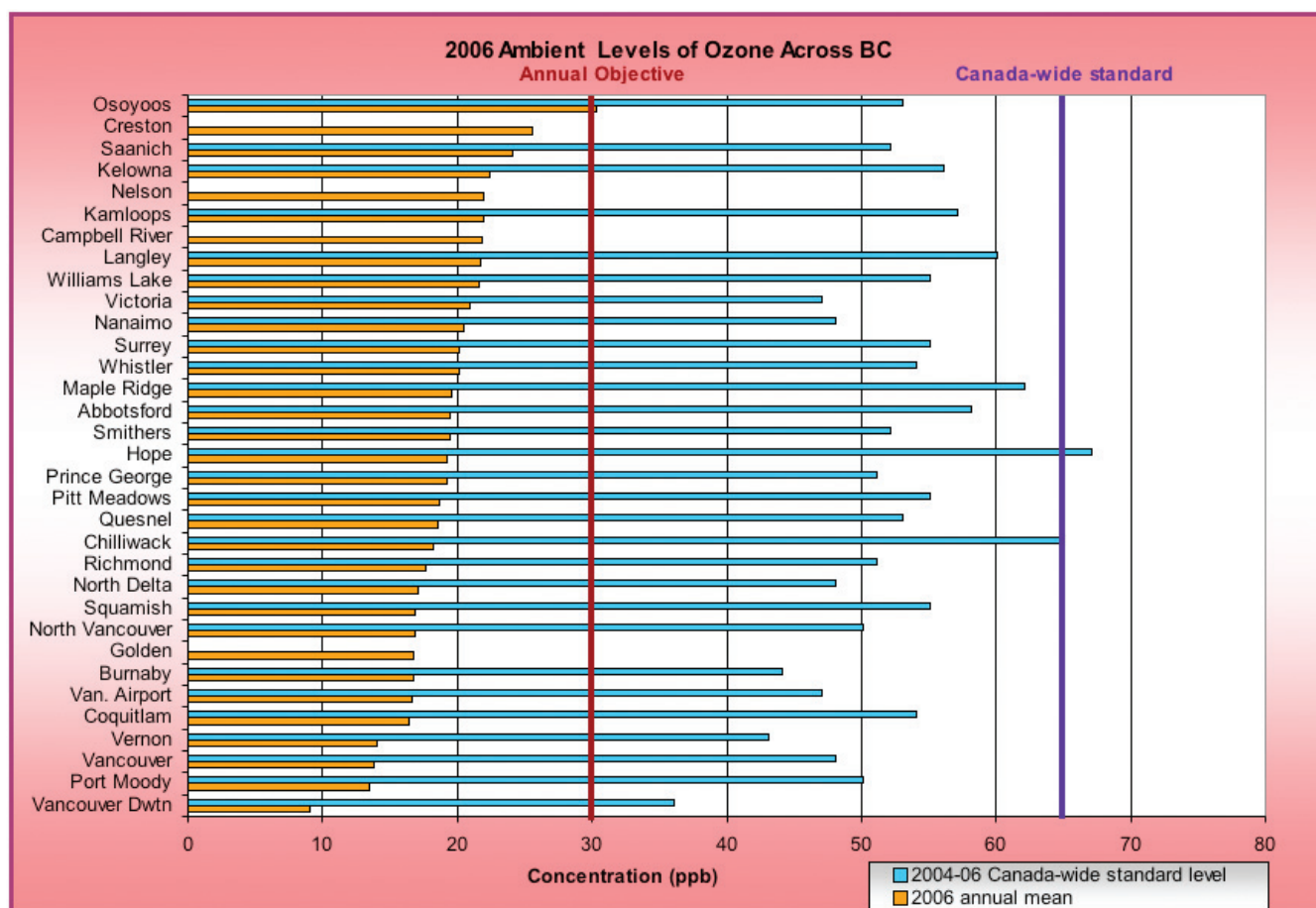
If your community does not appear in the figures showing ambient pollutant concentrations, it may not have operated for all of 2006 or your community may not be equipped with an ambient air quality station.

## Ground-Level Ozone

Ground-level ozone can irritate our lung airways and cause inflammation. Repeated exposure to ozone pollution may cause permanent lung damage. Ozone can also harm plants by interfering with their ability to produce and store energy, which reduces crop yields and makes them more vulnerable to diseases.

Figure 2 shows the 2006 ground-level ozone levels across BC. The highest annual average concentrations were observed at

background sites in Osoyoos and Creston. In contrast, the highest short-term average O<sub>3</sub> concentrations, as represented by the Canada-wide Standard level, were measured in the eastern Lower Fraser Valley. In particular, O<sub>3</sub> measured in Hope was above the Canada-wide Standard of 65 ppb in 2006, and O<sub>3</sub> measured in Chilliwack equalled the standard.



**Figure 2:** Ambient Levels of Ozone across BC

### Calculating the Canada-Wide Standard

Achievement of the O<sub>3</sub> Canada-wide Standard is based on the three-year average of the annual 4<sup>th</sup> highest eight-hour average concentration

If your community does not appear in the figures showing ambient pollutant concentrations, it may not have operated for all of 2006 or your community may not be equipped with an ambient air quality station.

## Nitrogen Dioxide

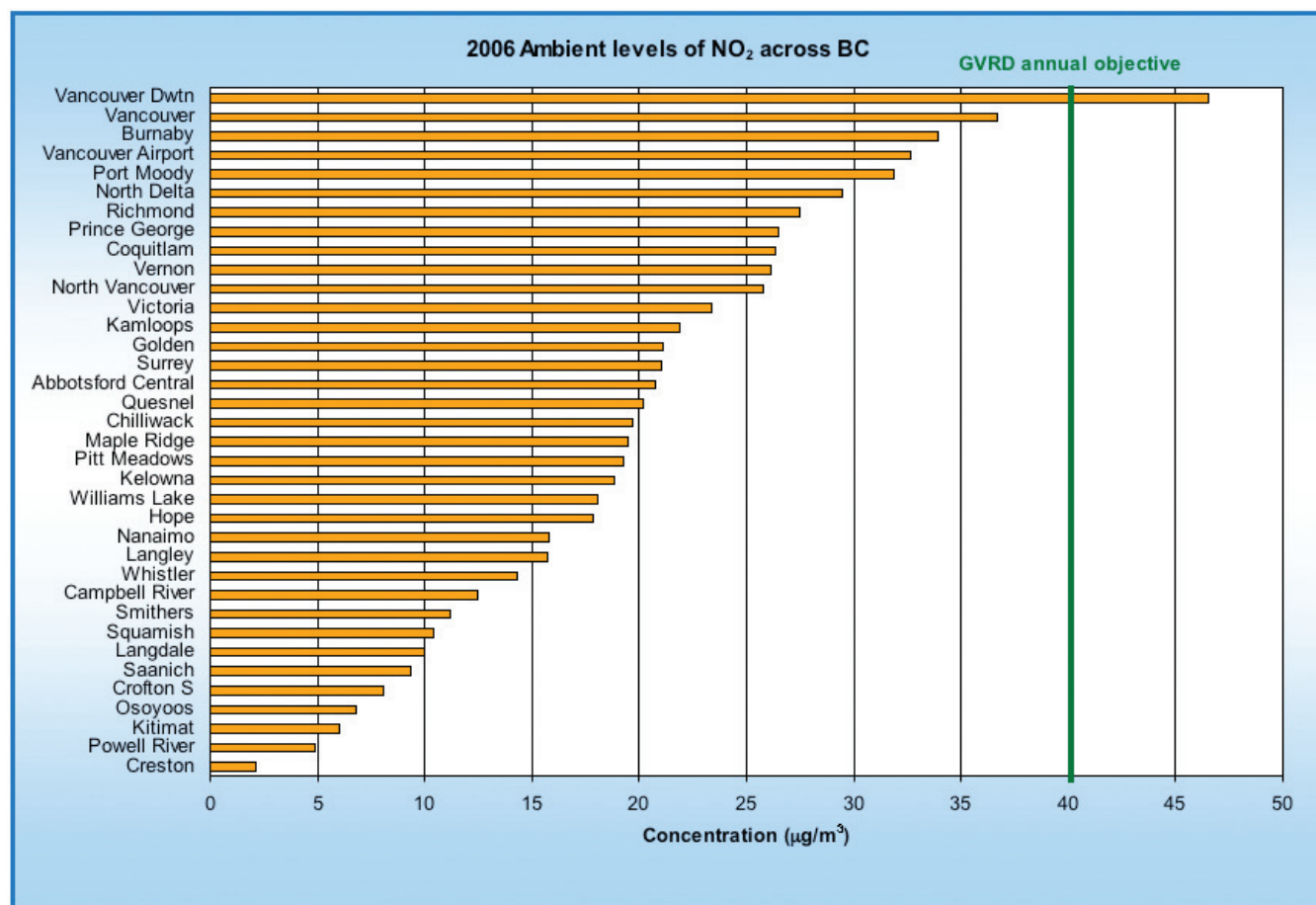
Nitrogen dioxide is a common air pollutant and can be seen as a reddish-brown layer over many urban areas. From a health perspective, exposure to high NO<sub>2</sub> levels may trigger serious respiratory problems. People with asthma, bronchitis and heart diseases are most at risk.

The annual average NO<sub>2</sub> concentrations observed in various regions of BC are illustrated in Figure 3.

Since a large portion of NO<sub>x</sub> emissions come from motor vehicles, it is not surprising to see that the highest NO<sub>2</sub> concentra-

tions in 2006 were recorded in highly populated regions such as Vancouver and Burnaby. The highest annual average NO<sub>2</sub> concentration of 46 µg/m<sup>3</sup> (micrograms per cubic metre) was observed at the Vancouver Downtown monitoring station. This concentration exceeded the GVRD objective of 40 µg/m<sup>3</sup>.

The lowest annual average NO<sub>2</sub> concentrations in 2006 were recorded at background sites in Creston and Osoyoos, and in communities in coastal BC such as Powell River, Kitimat, Crofton, Saanich, Langdale and Squamish.



**Figure 3:** Annual Mean Concentrations of NO<sub>2</sub> across BC

If your community does not appear in the figures showing ambient pollutant concentrations, it may not have operated for all of 2006 or your community may not be equipped with an ambient air quality station.



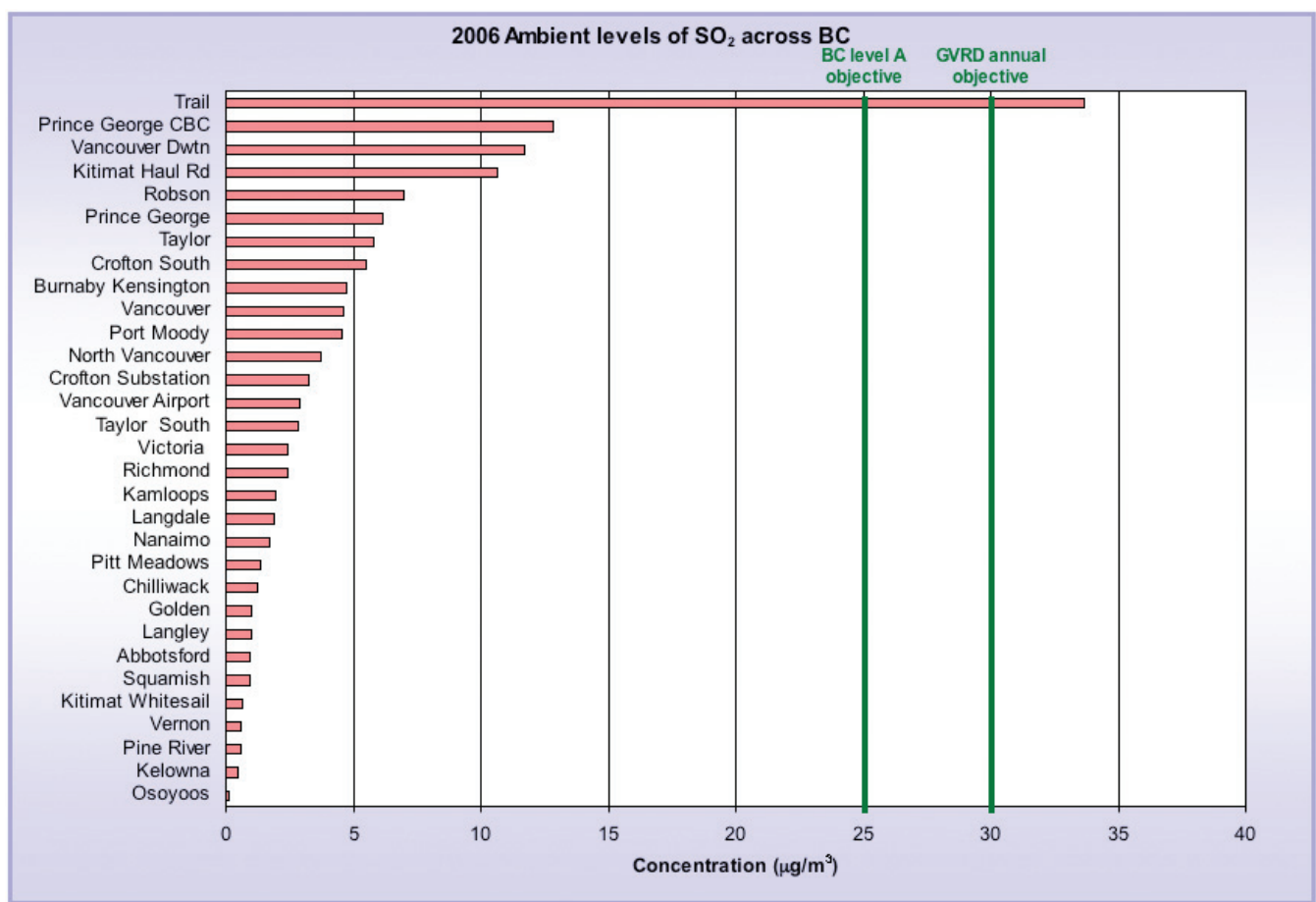
## Sulphur Dioxide

SO<sub>2</sub> mainly comes from burning fossil fuels. Pulp mills and smelters are other significant SO<sub>2</sub> sources. Over 90% of the sulphur in fossil fuels becomes SO<sub>2</sub> during combustion. SO<sub>2</sub> in the air can lead to acid rain, which can directly and indirectly harm forests and aquatic ecosystems.

In terms of health, SO<sub>2</sub> can harm our respiratory systems and irritate our eyes.

Shown in Figure 4 are the annual ambient levels of SO<sub>2</sub> across BC in 2006. The highest concentrations were observed in com-

munities that are home to a large industrial sources of SO<sub>2</sub> (e.g. a pulp mill or refinery) or major rail and port activities. The only site that exceeded the BC Level A objective of 25 µg/m<sup>3</sup> was in Trail, in close proximity to one of the largest zinc and lead smelting and refining complexes in the world. Extensive upgrades have been made to the smelter complex over the past decade, and further upgrades are anticipated over the next two years.



**Figure 4:** Annual Mean Concentrations of SO<sub>2</sub> across BC

If your community does not appear in the figures showing ambient pollutant concentrations, it may not have operated for all of 2006 or your community may not be equipped with an ambient air quality station.

# CLIMATE CHANGE AND AIR QUALITY

## What is Climate Change?

The Earth receives energy from the sun in the form of radiation. The Earth reflects about 30% of the rays back into space and the remaining 70% are absorbed and converted to heat, warming the land, atmosphere and oceans. Part of this heat becomes trapped in the atmosphere by gases such as water vapour, carbon dioxide, methane, ozone, and nitrous oxide. Together, these are commonly known as greenhouse gases (GHGs). They trap the sun's energy in much the same way that the glass of a greenhouse does; the glass allows the sun's energy in but prevents the escape of heat. This phenomenon is known as the "greenhouse effect". Without the natural greenhouse effect, the surface of the earth would be about 33°C colder than it is.

Over the last 150 years, the rate of emissions of GHGs has increased dramatically from the burning of fossil fuels. Atmospheric concentrations of carbon dioxide are now

higher than any time in the last 650,000 years. This has enhanced the greenhouse effect, causing the average temperature of the earth to rise at unprecedented rates.

Most scientists now believe that the warming in the last 50 years can be largely attributed to human-generated emissions. The increasing global temperatures are causing climate change, which may alter weather patterns around the world.

## How Will Climate Change Affect Air Quality?

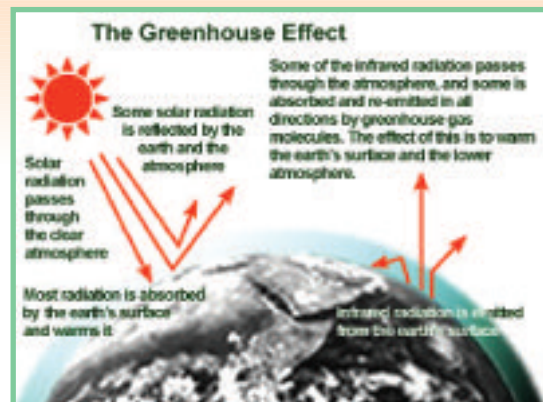
Warmer temperatures are expected to result in higher concentrations of ground-level ozone, which is one of the main components of smog. Scientists are predicting an increase in the number of smog-related deaths as a result of global warming.

Warmer temperatures are also likely to increase the number and frequency of forest fires, which will raise the levels of particulate matter (PM) suspended in the air.

Predicted changes to weather circulation and precipitation patterns will affect the transport of pollutants and how long they remain suspended in the atmosphere.

## By Improving Air Quality, Can We Reduce GHG Emissions?

Greenhouse gases and air pollutants share a number of common sources, so there are many opportunities to achieve complementary benefits. Fossil fuel combustion from sources such as automobiles and power generation facilities is a



*Schematic of the greenhouse effect.*

Source: U.S. EPA (<http://epa.gov/climatechange/science/index.html>)

major contributor to both GHGs and air pollutants. Most actions that reduce fossil fuel combustion will benefit air quality and reduce GHG emissions.

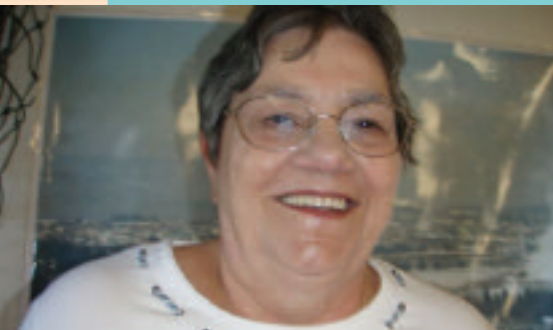
However, measures to reduce climate change should not take place at the expense of air quality. Relative benefits must be carefully considered when one type of fuel is replaced with another. For example, switching from gas to diesel vehicles can result in lower GHG emissions but increases in toxic PM emissions. Similarly, combustion of sustainably harvested wood is not considered a net source of GHGs but is a source of PM and other pollutants that can degrade air quality.

## What Can I Do?

There are many positive and simple things you can do to improve the quality of the air we all breathe and reduce the impacts of climate change. These include using alternative or efficient forms of transportation (such as walking or public transit), installing an automatic thermostat in your home, using a push or electric mower, planting trees on your property to cool your home in summer and keep it warmer in winter, making your home more energy-efficient and buying locally produced goods.

## IMPROVING AIR QUALITY IN QUESNEL

### One breath at a time



*Quesnel Environmental Society's Dora McMillan*

Air quality has long been a concern in Quesnel. This city is home to two pulp mills, a plywood plant, other industrial sources - and Dora McMillan. In 1987 Dora banded together with other concerned residents to form the Quesnel Environmental Society (QES) to address air quality problems in the city.

Like many BC communities, Quesnel lies in a geographic "bowl" that limits wind movement. Air inversions trap emissions, including fine particulate matter, near the valley floor. Studies have shown that particulate matter, including particulate produced from fossil fuel combustion, is a grave concern for human health. "It isn't just the lung issues, it can cause heart attacks and it can cause death" says Dora.

Dora and her group approached local industries to find air quality solutions together. "It wasn't one single industry that was the problem so we needed to monitor everything and to look at the situation as a whole," she says. With the QES and local industry leaders in agreement, government agencies stepped in with support.

In 1999 the Quesnel Air Quality Roundtable was formed, made up of the QES, industry, the city and other government officials. With funding from all levels of government, the Roundtable established five air quality monitoring stations throughout the valley for an initial three-year monitoring program.

Based on the findings from the air quality monitoring program, the Roundtable made recommendations to governing agencies through the development of an Airshed Management Plan, which eventually led to changes at the municipal level. Quesnel has since introduced burning bylaws that restrict the use of outdoor, wood-fired boiler furnaces. Additionally, any new wood stoves installed in the district have to be certified by the Canadian Standards Association or by the US Environmental Protection Agency. The City and the Cariboo Regional District have also incorporated the group's recommendations into municipal planning processes.

Dora admits that changing air quality is a long process. "This is a long-term goal and we will monitor conditions over 10 years, that way we can see the improvements." Dora and the QES have seen that their action has led to improvements in their community. "It doesn't happen overnight. Communities facing these problems must not get discouraged," she says. "We've recognized that industries cannot just up and change in a matter of a year or so and so you must keep working at it."

Local industries have set a timetable for necessary upgrades and Quesnel aims to reduce particulate matter by 30% by 2014. Dora says "I think it's really great. It requires a lot of public education but changes happen quicker if you have a community group leading it instead of relying on the government."

The Quesnel Airshed Management Plan can be found on the city's website at: [www.city.quesnel.bc.ca/LivingInQuesnel/AirshedMgmt/qairshedmngt.asp](http://www.city.quesnel.bc.ca/LivingInQuesnel/AirshedMgmt/qairshedmngt.asp).

## AIR PLAY TODAY: The BC Air Quality Health Index Pilot

### What is the Air Quality Health Index?

The Air Quality Health Index (AQHI) is a scale designed to help you understand what the air quality around you on a given day means to your health. It is a new tool developed by environmental and health professionals to communicate the health risk posed by local air pollution conditions. The AQHI is based on several pollutants and will eventually replace the Air Quality Index (AQI), which represents the value of a single pollutant with the highest concentration relative to environmentally-based regulatory criteria.

### Where is it Available?

The AQHI is currently available in fourteen communities throughout Greater Vancouver and the Lower Fraser Valley as well as in Kamloops, Kelowna, Nanaimo, Osoyoos, Prince George, Quesnel, Vernon, and Victoria. If you live within or near one of these communities, you can access the AQHI for your area by choosing the monitoring station closest to you.



*Tourism Vancouver / Tom Ryan*



Details and updates describing the health risks and implications on outdoor activity are available along with current and forecast (or predicted) AQHI values at [www.airplaytoday.org](http://www.airplaytoday.org). In 2007 the AQHI program will be expanded to more regions as part of a national AQHI program. It is expected that the BC website will be replaced by a national AQHI website late in 2007.

### How Do I Use It?

The AQHI is updated hourly and provides the following health risk information:

1. A number between 0 and 10 indicating the health risk associated with the air pollution conditions. Occasionally when the amount of air pollution is very high, the number may be greater than 10.
2. A message that describes the level of health risk associated with the index reading (e.g., Moderate Health Risk).
3. Health messages customized to each level of air quality for both the General Population and At Risk Population.
4. Forecast AQHI values and levels of health risk for the same day and next day.

The AQHI is measured on a scale ranging from 0-10+:

- 0-3 Low health risk
- 4-6 Moderate health risk
- 7-10 High health risk
- >10 Very high health risk

The AQHI is designed to give you this information in one easily accessible location along with some suggestions on how you might adjust your day-to-day activity levels depending on your individual health risk from air pollution. Precautions taken over the long term may help minimize the health impacts caused by chronic exposure to low levels of air pollution.



## EXPERTS AGREE – IT'S TIME TO ACT!



*NERAM V Conference*

Policy-makers and air quality and health researchers from around the world met at the Network for Environmental Risk Assessment and Management (NERAM) conference, held in Vancouver in October 2006, to help turn research into policies that improve human health.

Leading experts agreed there is enough scientific evidence of the effects of air pollution on human health and the environment to support global efforts to further reduce outdoor pollution levels. This applies even to locations that meet ambient air quality standards.

The 70 delegates representing countries from North America, Europe, Asia and Australasia said in a collective statement that there is a need to increase public awareness of the links between air quality and climate change. Better communication of the evidence will educate the public and increase the demand to improve air quality management policies locally, regionally and internationally. Policies to reduce people's exposure to particulate matter from sources such as burning wood and fossil fuels should be a priority. The scientists at NERAM stated that there is enough evidence to justify policies to reduce tailpipe exhaust.

The conference delegates also agreed that the effectiveness of policy measures must be evaluated to confirm that expected benefits to air quality, human health and the environment are being achieved.

Because air pollution does not recognize borders, the delegates emphasized the need for better international agreement on air quality measurements, methods, tools and guidelines.

### What does this mean for air quality management in BC?

There is strong evidence to support continued air quality management in BC. As the population and economy grow, the air quality in British Columbia will need to be carefully managed and the health risks clearly communicated to its citizens. Efforts to reduce exposure to traffic emissions should be closely linked to transportation and urban planning. British Columbia needs to continue to work with the global community to reduce the amount of pollutants that cross our borders.

You can read a statement that summarizes the collective messages from conference delegates at [www.irr-neram.ca](http://www.irr-neram.ca).

# THE ENGINES THAT COULD

## Locomotive Emissions in Canada

Locomotive emissions account for about 9% of the nitrogen oxides and about 4% of the particulate matter (PM) from all transportation sources in Canada. These numbers may seem small but railways and switching yards are often located near communities. Exhaust emissions from diesel locomotives can cause potential health concerns for both workers and local residents.

In 2003, the Federation of Canadian Municipalities and the Railway Association of Canada signed an agreement to prevent and resolve issues that arise when people live and work in close proximity to railway operations. You can find more information at [www.proximityissues.ca](http://www.proximityissues.ca).

Environment Canada, Transport Canada and the Railway Association of Canada recently signed a new agreement, effective through 2010, that aims to align Canadian air pollution standards with those of the US Environmental Protection Agency and ensure that the rail industry continues to improve its greenhouse gas emissions performance.



Diesel Locomotive/ CN

Transport Canada will develop and implement new regulations to take effect after 2010. For more information, see: [www.tc.gc.ca/mediaroom/releases/nat/2007/07-gc018e.htm#bg](http://www.tc.gc.ca/mediaroom/releases/nat/2007/07-gc018e.htm#bg).

The 1999 Canadian Environmental Protection Act requires a 97% reduction of sulphur in diesel fuel used by locomotives by 2012. This will reduce emissions of sulphur oxides, PM and other pollutants, and allow for the use of advanced ultra-low sulphur diesel emissions controls on new locomotives.

Locomotive exhaust emissions can be further reduced by improved diesel engine technology, the introduction of new rolling stock designs, better train handling protocols, and infrastructure upgrades that help reduce fuel consumption.

For further information about the action Canadian rail operators are taking to improve air quality, you can refer to the Locomotive Emissions Monitoring Program at [www.railcan.ca](http://www.railcan.ca)

## BURNING ISSUES: WOODSTOVE UPDATE

### Major efforts underway to reduce air pollution from wood burning in BC homes

In 2004, the Bulkley Valley - Lakes District (BVLD) in northwestern British Columbia adopted a Community Action Plan for Clean Air. Among the many actions identified in this plan was a five-year target for removing non-emission-certified wood burning appliances in the airshed. Smoke-related particulate emissions are a significant air quality concern in this airshed and about 12% of the total annual PM<sub>2.5</sub> emissions come from wood stoves.

New Canadian Standards Association or US Environmental Protection Agency-certified wood stoves emit up to 70% less pollution and use 1/3 less wood than conventional wood stoves.

In 2006 the District of Houston passed the first bylaw in Canada to set a mandatory removal date for non-certified appliances. This bylaw requires that:

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# BETTER WAYS TO DISPOSE OF AGRICULTURAL PLASTICS

Plastics are increasingly used for storage and maintenance structures in the agriculture sector because they help make agricultural production more efficient, reduce agricultural costs, and offer users flexible storage options. Examples include silage bags, silo covers, bale wraps, twines, trays, containers, greenhouse coverings, row covers, mulch films and pesticide containers. However, with the increased usage of these products comes the demand for a 'greener' way to dispose of them.

## Current Disposal Options for Agricultural Plastics

Current disposal options include:

- open burning - releases toxic pollutants into the air,
- burying - plastics are not biodegradable,
- sending to landfill - not all landfills accept agricultural plastics,
- re-using - no widespread secondary use on farms,



- using as fuel source - ship to the US at high cost, or
- recycling.

## Recycling of agricultural plastics has three main challenges:

1. Agricultural plastics are often contaminated with chemical residues or degraded.
2. Agricultural plastics are spread across wide areas making collection costly and difficult.
3. It is difficult to ensure plastic can be collected on a regular basis to make recycling economically viable.

## Agricultural Plastics & Air Quality

In BC most agricultural plastics are disposed of by open burn-

ing and the remainder is buried or dumped on-farm.

Emissions from open burning are much greater per mass of material burned than emissions from controlled incineration (e.g., 20 times as much dioxins, 40 times as much particulate matter). This poses a significant health risk to the public and agriculture workers by polluting local air and by deposition of harmful dioxins onto soil, crops and water.

## What's been done?

From Fall 2006 to Spring 2007 the Regional District of Okanagan-Similkameen (RDOS) ran the first agricultural plastics recycling program in BC. The objective was to develop a convenient, effi-

northwest counties in Washington State.

The RDOS pilot assessed how practical it would be to separate, stockpile, and transport the plastics. Partners were identified in the plastics processing sector that could develop recycling methods and determine what volumes of plastic would make such an undertaking economically worthwhile. It is likely that plastics recycling will occur in future phases of the project.

The pilot program also sought to educate, inform and encourage farmers through measures such as a multilingual media campaign and incentives such as waived tipping fees.

cient and easily accessible regional collection and recycling program that could become a model for other regions wishing to adopt a similar program. Similar agricultural plastics recycling programs are currently underway in seven





Woodsmoke in Nelson, BC/ Garry Bell

- new wood burning appliances installed in any premises must meet Canadian or US particulate emission standards, and
- existing wood burning appliances that are non-certified must be removed by 2010, or rendered permanently inoperable.

The bylaw authorizes incentives for energy conservation and air quality improvement that include household insulation and non-certified wood stove replacement.

The Town of Smithers and Village of Burns Lake have also set target phase-out dates for conventional wood stoves of 2010 and 2012, respectively. To support the removal of non-certified wood stoves, the BVLD Airshed Management Society worked with a group of partners on a provincial woodstove exchange pilot.

The BVLD Airshed Management Society details six great reasons to exchange your old wood stove for a new, high-efficiency stove at [www.cleanairplan.ca](http://www.cleanairplan.ca).

Targeted marketing campaigns and 'Burn-it-Smart' demonstrations and workshops have been held in Houston to educate the public about the change-out program and proper wood stove use. Between November 2006 and June 2007, over 110 conventional wood stoves were exchanged. Province-wide, 'Burn-it-Smart' workshops were held in a total of 8 communities, involving over 340 members of the public.

## ENVIRONMENT CANADA

### National Pollutant Release Inventory

Environment Canada operates the National Pollutant Release Inventory, which provides Canadians with access to information on the releases and transfers of key pollutants in their communities. For more information, see [www.ec.gc.ca/pdb/npri](http://www.ec.gc.ca/pdb/npri).

### Industrial sources

The Government of Canada recently announced its regulatory framework to control emissions of greenhouse gases and air pollutants from industrial sources, such as forestry and thermal electricity generation.

### Marine and ports sector

- Environment Canada and its American counterparts are exploring a Sulphur Emission Control Area around North America to reduce SO<sub>x</sub> emissions from ship traffic.

- With support from several partners including Environment Canada and the BC Ministry of Environment, in the summer of 2007 Holland America Line is demonstrating emission-reducing technology on its MS Zaandam cruise ship travelling between Vancouver and Alaska.

### On-road vehicles and fuels

- Thanks to Environment Canada's regulations on vehicle emission standards and fuel sulphur content, diesel engines manufactured from 2007 onward produce far less harmful pollutants. Environment Canada continues to work with partners to reduce emissions and impacts from existing on-road and off-road diesel engines.

- Environment Canada is working with school districts across BC to decrease the



number of motor vehicles idling in school zones, which will reduce children's exposure to harmful pollutants at schools.

- Environment Canada is exploring means of distributing biodiesel and ways to develop the biodiesel market so that systems will be in place well before the mandated date for renewable fuels.

### **Residential wood combustion emissions**

In collaboration with several partners, Environment Canada has produced a model municipal by-law for regulating wood-burning appliances.

### **Agricultural air emissions**

In collaboration with government and industry partners from the agriculture sector, Environment Canada is developing best management practices to reduce air emissions from agriculture.

### **Visibility and air quality**

Environment Canada and its partners (the BC Ministry of Environment, the Fraser Valley Regional District and the Greater Vancouver Regional District) are exploring a framework to manage visibility in BC as it relates to air quality.

### **Assessments and regulations**

- To ensure that clean air considerations are adequately addressed, Environment Canada reviews environmental certifi-

cate and permit applications for new projects that may degrade air quality.

- In October 2006, Environment Canada committed to new regulations to significantly reduce VOC emissions from commercial and consumer products, including paints and coatings.

### **Transboundary efforts**

Environment Canada and the US Environmental Protection Agency participate in a multi-agency international cooperative effort to manage air quality in the western coastal region of Canada and the US. To read more about initiatives under way, see [www.pyr.ec.gc.ca/airshed/index\\_e.htm](http://www.pyr.ec.gc.ca/airshed/index_e.htm).

## **HEALTH CANADA**

The mandate of Health Canada's Safe Environment Programme is to promote and protect the health of Canadians by managing health risks posed by environmental factors in living, working and recreational environments.

Health Canada is supporting ongoing scientific research in the Georgia Basin-Puget Sound airshed on the potential links between air pollution and health. A series of research studies will help determine:

- the emission sources of greatest concern in the airshed,

- an understanding of air quality conditions across boundaries,
- potential future trends, and
- associated impacts on human health.

Exposures to specific categories of emissions sources will be assessed at both the community and individual level. For more information on these studies, please visit [www.cher.ubc.ca/UBCBAQS/welcome.htm](http://www.cher.ubc.ca/UBCBAQS/welcome.htm). For information on other Health Canada air quality activities, please visit [www.hc-sc.gc.ca/hecs-ses/air\\_quality](http://www.hc-sc.gc.ca/hecs-ses/air_quality).

## **BC MINISTRY OF ENVIRONMENT**

Over the past year, the province has developed a number of initiatives designed to meet its goal of the best air quality – bar none. The current budget identifies \$13.5 million over the next three fiscal years to achieve air quality improvements in communities throughout BC. Planned initiatives include emission reduction requirements (retrofits) of heavy-duty diesel vehicles by license year 2009, incentives to reduce the use of conventional wood stoves and encouraging industry to adopt better emission technologies.

In 2006, the BC Ministry of Environment provided support for:

- the development and implementation

**Continued on page 14**



*Industrial Area in Quesnel*

of airshed plans in BC communities,

- scientific studies in Golden, Prince George and Kelowna, the results of which will guide future airshed decisions,
- the Clean Air Toolkit ([www.cleanairkit.ca](http://www.cleanairkit.ca)), an online tool to help local governments develop emission reduction programs in their communities,
- a pilot study in the Bulkley Valley-Lakes District to assess the most effective way to encourage exchange of conventional wood stoves with new low emission-certified wood stoves,
- wood stove exchange programs in the Cariboo and the Okanagan Regions,
- increased biodiesel use in the province, and
- ongoing development of a GIS-based tool to produce local emission inventories for airshed planning.

In the fall of 2006, the Ministry began an intensive Air Monitoring Network review. The objectives of the review were twofold: 1) to make recommendations towards maximising efficiency and allocating resources appropriately within the existing network and 2) to develop criteria for the selection of future monitoring sites in BC based on current objectives and future priorities. A report on recommendations for the existing network is expected during the summer of 2007.

The BC Ministry of Environment continues to support opportunities to engage local government and the public on clean air issues, including support for the Fraser Basin Council's Clean Air Forum and the BC Lung Association Air Quality/Health Workshop.

## GREATER VANCOUVER REGIONAL DISTRICT

### AirCare Program

The third phase of the AirCare program was approved by the GVRD and the Fraser Valley Regional District Boards as well as the Provincial Government in 2006. Under the new AirCare III program, launched January 1, 2007, vehicles that are seven years of age or newer need not be tested. The new program ensures that AirCare keeps up with new technologies that reduce emissions, and the program continues to have a significant impact on reducing harmful vehicle emissions. AirCare has been the single largest emission reduction program in the GVRD since it began in 1992.

### Diesel Emission Reduction Program

Since 2006, GVRD has been partnering with Environment Canada and the Fraser Valley Regional District to reduce diesel emissions from on-road trucks and buses and non-road engines. GVRD also initiated a corporate diesel emission reduction program in 2006, identifying strategies to reduce emissions from diesel engines operated by the GVRD and its contractors and sub-contractors, and developing guidelines for diesel engines purchased/leased/operated by the GVRD or its contractors.

### Local Air Quality Study

The Air Quality Management Plan for Greater Vancouver, adopted in 2005, includes an action to assess and monitor possible local air quality priority areas and, where needed, partner with the appropriate governments, health agencies, the public and owners/operators of emission sources to develop and carry out local air quality action plans. The Burrard Inlet area was selected as the

first local air quality area to be studied. The study will consist of three key components: 1) a detailed emission inventory and forecast; 2) air quality monitoring; and 3) air quality modelling.

### Monitoring Network Review

The Air Quality Management Plan for Greater Vancouver requires the GVRD to "update and improve the ambient monitoring network to respond to ongoing changes in regional and local air quality management priorities and needs". In partnership with the FVRD and Environment Canada, the GVRD has commissioned a wide-ranging review of the current network, which consists of 27 stations operated cooperatively with network partners at the federal, provincial and regional levels. The review will seek to establish objectives and priorities for the network, develop a framework to guide continued enhancement in a coordinated fashion, and make recommendations for any changes to meet identified data and information needs over the next decade. The study is scheduled for completion in the summer of 2007.

### Air Quality Management Bylaw Amendments

The GVRD is considering amendments to the regional Air Quality Management Bylaw and is consulting with all those involved during 2007 on several key issues and options, including regulation of emissions from boilers and heaters, and revisions to the system of permit and regulatory fees to better reflect the harmful impacts of different air contaminants.

### Lower Fraser Valley Emission Inventory

The GVRD is developing the next comprehensive update to the Lower Fraser Valley emission inventory, an important tool for identifying the sources of most concern and tracking progress towards reducing emissions.

## FRASER VALLEY REGIONAL DISTRICT

The FVRD continues to be concerned about increasing air pollution in the Fraser Valley. The Canada-wide Standard for O<sub>3</sub> was exceeded at Hope in 2004, 2005 and 2006. Ozone levels in the Cities of Abbotsford and Chilliwack are some of the highest in the Lower Fraser Valley airshed and are approaching the levels seen in Hope, making this area the highest ozone region in BC. Investigations into the cause of, and possible solutions to, this problem are currently being conducted.

The FVRD is also participating in a review of the ambient air quality monitoring network to ensure that air pollution in the Fraser Valley is accurately measured and assessed. Reduced visibility due to air pollution is also a concern in the FVRD and work is progressing to establish a program to reduce emissions that lead to and contribute to the summertime "white haze." In terms of PM, the FVRD has participated with the federal and provincial governments and the GVRD in an effort to reduce diesel PM, which has been identified as toxic due to both particle size and make-up. The FVRD will soon be updating its air quality management plan to reflect the latest health and medical knowledge.

Finally, the FVRD is continuing to work with the Ministry of Environment and all those involved locally to determine if it would be possible to grant the FVRD authority for regulating and enforcing its air quality. This would complement its existing air quality management planning powers.

## THE PASSING OF A PIONEER: Dr. David Bates

It is with great sadness that we note the passing of Dr. David Bates in November 2006. For over 50 years, Dr. Bates was a physician, researcher and consultant in the fields of occupational and environmental medicine, specializing in respiratory disease related to air pollution. David Bates was also a pioneer who trained numerous leading respiratory physicians and researchers who now work around the world.

Dr. Bates conducted ground-breaking research into the relationships between air pollution and health outcomes in the community. He received his medical education in England where as a young doctor he treated victims of the 1952 London Smog Disaster. Approximately 12,000 deaths were attributed to the yellow-black fog that enveloped the city and this experience undoubtedly set the path for the rest of Dr. Bates' medical career. He believed that the death toll of the London Fog was initially underestimated because of a general reluctance on the part of policy makers to acknowledge the true magnitude of the effects of air pollution on health.

Dr. Bates favoured an environment of openness and information sharing.



Much of his research served to inform public policy and public health initiatives. After formally retiring from academic life, he devoted much of his efforts to public education and making scientific air pollution information available to ordinary citizens. He worked well into his 80s, as an advisor to local, regional, national and international communities grappling with clean air policies. Dr. Bates frequently met with concerned citizens and served on numerous air quality advisory boards. In 2003, Dr. Bates was inducted into the Order of Canada in recognition of his dedication, commitment and passion for the science of air quality and human health effects.

# Visit or contact the following agencies FOR MORE INFORMATION:

## **British Columbia Lung Association**

[www.bc.lung.ca](http://www.bc.lung.ca)  
2675 Oak Street  
Vancouver, BC V6H 2K2  
(604) 731-5864  
or toll-free at 1-800-665-5864 (in BC  
but outside the Lower Mainland)

## **Environment Canada, Pacific and Yukon Region**

[www.pyr.ec.gc.ca](http://www.pyr.ec.gc.ca)  
401 Burrard Street  
Vancouver, BC V6C 3S5  
(604) 664-9100

## **Health Canada**

**Safe Environment Programme**  
[www.hc-sc.gc.ca/hecs-ses/air\\_quality](http://www.hc-sc.gc.ca/hecs-ses/air_quality)  
400-4595 Canada Way  
Burnaby, BC V5G 1J9  
(604) 666-2671

## **BC MINISTRY OF ENVIRONMENT**

### **Environmental Quality Branch**

[www.env.gov.bc.ca/air/wamr](http://www.env.gov.bc.ca/air/wamr)  
PO Box 9341  
Stn Prov Govt  
Victoria, BC V8W 9M1  
(250) 387-9932

### **Vancouver Island Region**

[wlapwww.gov.bc.ca/vir/](http://wlapwww.gov.bc.ca/vir/)  
2080-A Labieux Road  
Nanaimo, BC V9T 6J9  
(250) 751-3100

### **Lower Mainland Region**

[wlapwww.gov.bc.ca/sry/](http://wlapwww.gov.bc.ca/sry/)  
2<sup>nd</sup> floor, #10470 152<sup>nd</sup> Street  
Surrey, BC V3R 0Y3  
(604) 582-5200

### **Cariboo Region**

[wlapwww.gov.bc.ca/car/](http://wlapwww.gov.bc.ca/car/)  
#400 640 Borland Street  
Williams Lake, BC V2G 4T1  
(250) 398-4530

### **Kootenay and Okanagan Regions**

[wlapwww.gov.bc.ca/kor/](http://wlapwww.gov.bc.ca/kor/)  
#401 333 Victoria Street  
Nelson, BC V1L 4K3  
(250) 354-6333

### **Skeena Region**

[wlapwww.gov.bc.ca/ske/](http://wlapwww.gov.bc.ca/ske/)  
PO Box #5000 3726 Alfred Avenue  
Smithers, BC V0J 2N0  
(250) 847-7260

### **Omineca and Peace Regions**

[wlapwww.gov.bc.ca/nor/](http://wlapwww.gov.bc.ca/nor/)  
3<sup>rd</sup> Floor, 1011 Fourth Avenue  
Prince George, BC V2L 3H9  
(250) 565-6135

### **Thompson Region**

[wlapwww.gov.bc.ca/sir/](http://wlapwww.gov.bc.ca/sir/)  
1259 Dalhousie Drive  
Kamloops, BC V2C 5Z5  
(250) 371-6200

### **GREATER VANCOUVER REGIONAL DISTRICT**

[www.gvrd.bc.ca](http://www.gvrd.bc.ca)  
4330 Kingsway  
Burnaby, BC V5H 4G8  
(604) 432-6200

### **FRASER VALLEY REGIONAL DISTRICT**

[www.fvrd.bc.ca](http://www.fvrd.bc.ca)  
45950 Cheam Avenue  
Chilliwack, BC V2P 1N6  
(604) 702-5000  
1-800-528-0061

## **BRITISH COLUMBIA HEALTH AUTHORITIES**

### **Northern Health Authority**

[www.northernhealth.ca](http://www.northernhealth.ca)  
300-299 Victoria Street  
Prince George, BC V2L 5B8  
(250) 565-2649

### **Interior Health Authority**

[www.interiorhealth.ca](http://www.interiorhealth.ca)  
2180 Ethel Street  
Kelowna, BC V1Y 3A1  
(250) 862-4200

### **Vancouver Island Health Authority**

[www.viha.ca](http://www.viha.ca)  
1952 Bay Street  
Victoria, BC V8R 1J8  
(250) 370-8699

### **Vancouver Coastal Health Authority**

[www.vch.ca](http://www.vch.ca)  
10<sup>th</sup> Floor, 601 West Broadway  
Vancouver, BC V5Z 4C2  
(604) 875-4252 or 1-866-884-0888

### **Fraser Health Authority**

[www.fraserhealth.ca](http://www.fraserhealth.ca)  
300, 10334 -152A Street  
Surrey, BC V3R 7P8  
(604) 587-4600 or 1-877-935-5669

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