

**SUSTAINABILITY HIGHLIGHTS**

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We all need clean air to be healthy-without it, we're at greater risk of respiratory diseases such as asthma, bronchitis, emphysema and lung cancer, as well as heart attack and stroke. Air pollution is the most significant contributing factor in respiratory disease. Fine particulate matter<sup>i</sup>-very small particles that we inhale deep into our lungs-is considered the most serious form of air pollution in BC. In particular, children, the elderly, asthmatics and those with cardio-respiratory diseases are most at risk. Particulate Matter (PM) and Ground Level Ozone (GLO) both have significant health impacts, including asthma, which is the number one reason for hospital admissions among Canadian children. [1, 2](#)

- The main sources of PM<sub>10</sub> and PM<sub>2.5</sub> within the Fraser Basin are from forestry and industrial sources, vehicle emissions (especially from diesel-powered vehicles), road dust, as well as wood smoke from domestic burning, and forest fires.
- Annual PM<sub>2.5</sub> concentrations have increased every year between 1999 and 2004 in Prince George and exceeded the Canada-Wide Standard (CWS) every year since 2002.
- Annual GLO concentrations exceeded the CWS in Langley, Chilliwack and Hope at least once between 1994 and 2004.

<b>Particulate Matter<sub>2.5</sub></b>	<b>GETTING WORSE</b> - Since 2000 in 4 of 6 communities, with particular concerns in Prince George.
<b>Ground Level Ozone</b>	<b>GETTING WORSE</b> - Since 2000 in 6 of 8 communities, with particular concerns in the Fraser Valley and GVSS regions.

**ISSUES AND TRENDS**

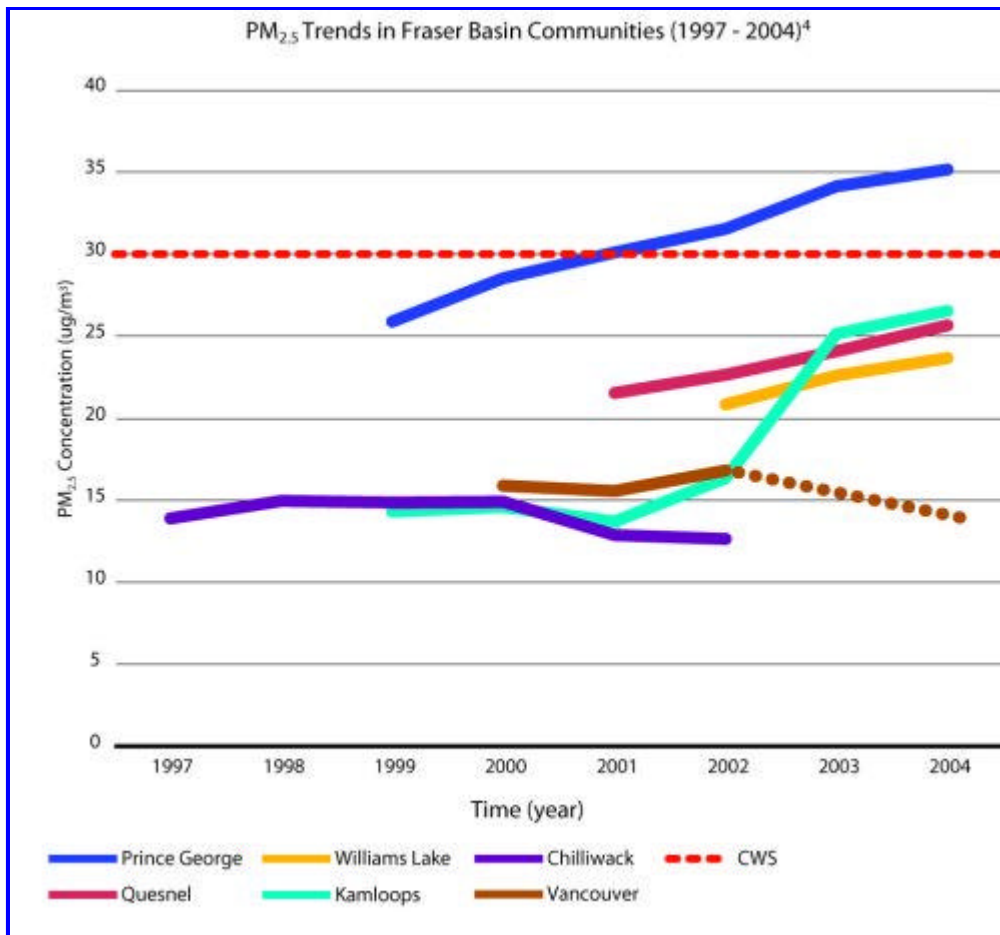
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Air quality data are presented for PM<sub>2.5</sub> and GLO from monitoring stations in select communities throughout the Fraser Basin. For additional data, see the National Air Pollutant Surveillance website. Although the CWS for PM<sub>2.5</sub> has been set at 30 ug/m3, and set at 65 ppb (parts per billion) for GLO, research has not been able to determine an effects-free-or safe-level. Health risks are known to increase with exposure to PM<sub>2.5</sub> and negative health effects occur at very low concentration levels of GLO ([See Health](#)) . [1, 2, 3](#)

**Particulate Matter <sub>2.5</sub> (1997-2004)<sup>4</sup>**

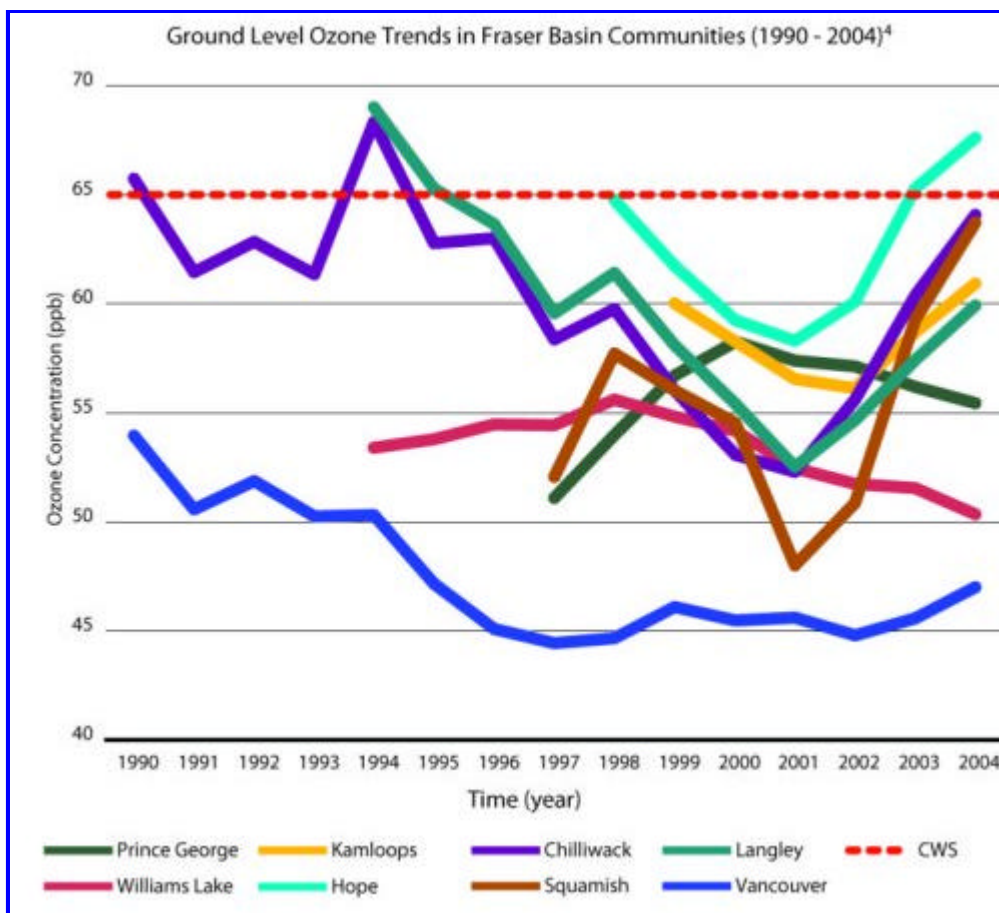
PM<sub>2.5</sub> refers to all airborne particles that are less than 2.5 microns in diameter. These very small particles have

the most significant impact on health as they are inhaled deep into our lungs. PM<sub>2.5</sub> concentrations<sup>ii</sup> have increased in four of six Fraser Basin monitoring locations since 2000, with Kamloops experiencing the largest increase across all locations between 2002 and 2003. Prince George exceeded the PM<sub>2.5</sub> Canada-Wide Standard of 30 ug/m<sup>3</sup> each year since 2002, while the Williams Lake, Quesnel and Kamloops monitoring sites have recorded annual PM<sub>2.5</sub> concentrations greater than 20 ug/m<sup>3</sup> since 2002.



### Ground Level Ozone (1990-2004) <sup>2,3,4</sup>

Ground Level Ozone (GLO) is a significant air pollutant in BC and is the main component of smog. GLO is formed when compounds such as nitrogen oxide and volatile organic compounds react with the atmosphere in the presence of sunlight. Meteorological factors, such as sunlight intensity and high temperatures increase the formation of GLO, which partly explains why smog is often worse during summer months. Exposure to GLO irritates the respiratory tract and can lead to impaired lung function and increased risk of developing asthma.<sup>2</sup> GLO concentrations<sup>iii</sup> have increased at six of eight monitoring locations since 2000, with considerable increases recorded at five of the eight locations. In 2003 and 2004, the Hope monitoring location exceeded 65 ppb, while in 2004, Squamish and Chilliwack monitoring locations exceeded 63 ppb. On the other hand, GLO concentrations have continued to decrease at Williams Lake and Prince George monitoring locations in recent years.



## INSPIRED ACTION

### What is being done?

- The BC Clean Air Committee released *A Teacher's Guide to Clean Air* in the fall of 2005. Designed for Grade 5 students, the guide explains how children can become involved in enhancing air quality and keeping the air clean. The BC Clean Air Committee consists of BC Transit, BC Ministry of Environment and Environment Canada, and the main purpose of the Committee is to encourage and support Clean Air Day activities across BC. <sup>5</sup>
- The BC School Bus Emission Reduction Project recently retrofitted about 550 school buses with diesel oxidation catalysts and closed crankcase ventilation to reduce emissions of particulate matter, carbon monoxide, and air toxics such as aldehydes. <sup>2</sup>
- In 2005, 70 municipal trucks were retrofitted with diesel oxidation catalysts through a partnership between Environment Canada, GVRD and nine municipalities, including North Vancouver, Delta, New Westminster and Richmond.
- The BC Clean Air Research Fund has been established to promote research into air quality issues. The

project is jointly managed by the Canadian Petroleum Products Institute, GVRD and BC Ministry of Environment: [www.env.gov.bc.ca/air/airquality/carf/index.html](http://www.env.gov.bc.ca/air/airquality/carf/index.html).

→ The Fraser Basin Council sponsored a series of Clean Air Forums in 2005 and 2006 to bring together various stakeholders in BC and focus on community-based airshed planning, tools used to protect air quality and the protection of air quality in the future.

→ Clean Air Day is held on the first Wednesday in June. It originally started as a BC event in 1992, but has since become a national day. The aim of Clean Air Day is to encourage people to adopt clean air choices as lifelong habits: [www.env.gov.bc.ca/air/cad/index.html](http://www.env.gov.bc.ca/air/cad/index.html).

### **What else can be done?**

→ Individuals can walk, cycle, carpool or take public transit instead of driving alone, especially to work or on short trips in the neighbourhood, and employers and governments can provide related incentives, facilities and infrastructure.

→ Governments can maintain and expand air quality monitoring and reporting initiatives to track air pollution trends, such as the National Air Pollutant Surveillance Network, the National Pollutant Release Inventory and the Air Quality Health Index.

→ Individuals can adopt alternatives to burning for home heating. These include certified wood stoves, clean energy sources and improved home energy efficiency.

→ Governments can set and enforce more stringent air quality objectives or national standards as well as support the development of cleaner technology to minimize emissions.

→ All communities, even those with relatively low concentrations of PM<sub>2.5</sub> or GLO, should act to reduce emission sources, as there is no known safe level of exposure to these pollutants.

### **A new Air Quality Health Index**



The Air Quality Health Index identifies the health risks posed by local air pollution conditions, a key tool for the public and media. The index was piloted in 14 BC communities in 2006 -10 in the Fraser Basin. In each location, a daily health risk rating is calculated on a scale of 0-10, based on a combination of four air pollutants: GLO, PM<sub>2.5</sub>, Nitrogen Dioxide and Sulphur Dioxide. The tool comes with recommendations on when at-risk individuals and the general population should limit their outdoor activities: [www.airplaytoday.org](http://www.airplaytoday.org).

## REFERENCES

1. BC Ministry of Health Services, Provincial Health Officer's Annual Report 2003, *Every Breath You Take-Air Quality in British Columbia, a Public Health Perspective* (Chapter 4).
2. BC Lung Association, *State of the Air in British Columbia 2006*.
3. Boyd, D.R (2006) *The Air We Breathe-An international comparison of air quality standards and guidelines*. David Suzuki Foundation.
4. Environment Canada National Air Pollution Surveillance Network 2006:  
[www.etcentre.org/NAPS/index\\_e.html](http://www.etcentre.org/NAPS/index_e.html).
5. BC Ministry of Environment, Environmental Quality Branch-*Air Protection. A Teachers Guide to Clean Air* (2005) [www.env.gov.bc.ca/air/cad/index.html](http://www.env.gov.bc.ca/air/cad/index.html).

## FOOTNOTES:

- i. Particulate Matter (PM) refers to a combination of very small solid and liquid particles that are suspended in the air we breath. The size of the particles is measured in microns, which are one millionth of a metre in size. Particles smaller than 10 microns are referred to as PM<sub>10</sub>, and fine particulate matter includes particles smaller than 2.5 microns and is often referred to as PM<sub>2.5</sub>, which is about 30 times smaller than the diameter of a human hair.
- ii. The yearly PM<sub>2.5</sub> concentration is calculated by the average of the 98th percentile for each of the three previous years.
- iii. GLO concentration is calculated by the average of the 4th highest reading for each of the three previous years.