



Questions and Answers

Ground Level Ozone

Why is ground level ozone a concern?

Ground level ozone at high concentrations is a pollutant that has detrimental effects on human and animal health and the environment. It can reduce lung function, cause chest tightness, coughing or wheezing and aggravate existing respiratory illness as well as irritate eyes, nose and throat. Chronic exposure can cause permanent damage to the alveoli of the lungs. Additionally it can reduce crop yields and plant growth and contribute to noticeable leaf damage.

Because air quality can rapidly deteriorate under certain weather conditions which trap ozone producing pollutants, it can lead to incidents of smog, reduced visibility, health concerns, limiting outdoor activity, damaged vegetation and reduced quality of life for area residents.

Is all ozone harmful?

No, ozone in the upper atmosphere (stratosphere) plays an important role in shielding the earth from harmful rays from the sun, particularly from ultraviolet rays.

What are the main causes of ground level ozone formation in the PAMZ area?

Emissions from transportation, the oil and gas industry, chemical industry, agriculture, residential heating, motorized equipment and other activities form nitrous oxides and volatile organic compounds which undergo chemical reactions to form ground level ozone or smog.

What are nitrous oxides and volatile organic compounds?

Nitrous oxides (nitrogen oxide and nitrogen dioxide) are products of high temperature combustion from transportation and motorized equipment, industry and power generation. Volatile organic compounds include compounds of hydrocarbons like alkanes, alkenes, alkynes, benzene, toluene and several others and are linked to elevated cancer risks.

Is all ground level ozone created by human activities?

No, lightning, forest fires, vegetation and animals also help create precursors that lead to ozone formation. However the primary cause is anthropogenic activity (human caused).

If our air quality is still good, why the Ozone Management Plan?

Analogous to the green light (all is well) yellow light (caution) and red light (major alert) we could say the air quality for the PAMZ area is at the "yellow light" stage. While air quality is still generally good in the PAMZ region there were exceedances on occasion in past years in the Red Deer and Caroline area which triggered the need for an Ozone Management Plan. The Management Plan is meant to prevent ground level ozone from becoming a problem in the future. With increased population and industrial activity growth expected along the Queen Elizabeth Highway corridor, we need to be vigilant today to prevent exceedances of ozone in the future.

How do our ozone levels compare to other areas in the province?

Compared to large urban areas in the province our ozone levels are generally lower, but occasional high levels have been distressing. However, in more remote sites within the PAMZ area, these higher levels are not suspected to be caused by human activity. Other airsheds have also triggered a need to implement an ozone management plan. They are the Capital Airshed Partnership (an Edmonton and surrounding area collaboration of the Alberta Capital Airshed Alliance, the West Central Airshed Society and the Fort Air Partnership) and the Calgary Region Airshed Zone.

What will happen if PAMZ does not get effective voluntary action on the Ozone Management Plan?

Without effective voluntary actions to reduce ozone, we may be forced into future reactive crisis management and possibly more stringent requirements which could have serious consequences for industry, agriculture, businesses and many everyday activities.

What can I do to help?

Be aware of how your actions contribute to poor air quality. Don't idle your vehicle, drive less, insulate your home and business, look at alternative energy sources, patronize businesses and industries that find ways to reduce emissions and lessen the formation of nitrous oxides and volatile organic compounds. You can also build awareness about ozone within your company, organization or community and explore ways you can help reduce emission both as an individual and as an organization.

Why should I stop idling my vehicle?

An idling vehicle contributes to pollution, wastes fuel, is bad for your engine and is completely unnecessary. This minor change in your habits costs you nothing; in fact, it saves money. It is the most simple and immediate step you can take to reduce emissions.

- **Pollution:** Studies by Health Canada and community health departments show a direct link between contaminants in vehicle emissions and significant respiratory health effects. These studies conclude that poor air quality and smog, caused in part by vehicle exhaust, result in increased hospital admissions, respiratory illnesses and premature deaths, particularly in urban areas.
- **Fuel waste:** Ten seconds of idling uses more fuel than turning off and restarting the engine. For a typical three-litre engine, ten minutes of idling will consume approximately 0.3 litres of fuel per day. Over the course of a year, that adds up to some 100 litres of fuel, or about \$90 at current gasoline prices.
- **Decreases engine life:** Because an idling engine doesn't combust fuel completely, the resulting fuel residues can condense on cylinder walls, where they can contaminate oil and damage parts of the engine. Excessive idling also lets water condense in the exhaust system, leading to corrosion. Tuning the engine on and off has little impact on engine components such as the battery and starter.
- **Unnecessary:** It is not true that idling is the best way to warm up a car. With today's fuel-injected cars, driving is much more effective than idling for warming up the whole car - including engine oil, transmission, tires, suspension, steering, wheel bearings and catalytic converter - and it does so in half the time. Even in cold weather it's best to start driving after no more than 30 seconds of idling. Just remember to avoid high speeds and rapid acceleration for the first five kilometres.

How can I find out more?

PAMZ has a list of things you can do on its website and there are a number of linked websites providing ideas for individuals, municipalities, businesses and industries alike. Incentive programs are also available through the provincial and federal governments to explore new energy saving or energy alternative initiatives. Go to the PAMZ website at:

www.pamz.org