Envirent MISSISSAUGA



City of Mississauga Smog Alert Response Plan

Introduction

Air pollution occurs all year round. Mississauga City Council established the Mississauga Air Quality Advisory Committee (MAQAC) in February 1998 to recommend ways to reduce harmful air emissions creating local air pollution and climate change. MAQAC has developed and staff has implemented many clean air initiatives. Mississauga's inventory of initiatives is available at the City's web site: www.mississauga.ca.

One of the City's clean air initiatives is a response to provincial smog advisories (or, alerts) when air quality falls well below acceptable health standards (i.e., when the Air Quality Index is above 50). In 1998, a pilot Corporate Smog Alert Response Plan (the Plan) was introduced that included operational modifications in selected department divisions. An internal communications strategy was initiated and a notification procedure tested. For the 1999 smog season, the Plan was expanded to operational modifications throughout the Corporation. The notification was direct to operational staff and general outreach was made to all City staff. The general public was provided information as part of an overall communications strategy.

The implementation of the Plan was reviewed in late 2001, owing to the earliest occurrence of a smog day (May 3, 2001) and a high number of smog advisory days (i.e., 20 days in the Halton-Peel area). Adjustments and improvements to the Plan are made based on staff feedback.

The City Smog Alert Response Plan includes a smog e-mail notification system, revised operational modifications, and a communication strategy for providing smog awareness to staff and the public.

Human Health Effects of Smog

Air pollution affects human health, the environment and the local economy. As one of the most persistent air quality issues in Ontario, air pollution contributes annually to almost 5,800 premature deaths and an estimated 16,000 hospital admissions, while pollution-related illnesses cost about \$1 billion. It is well documented that smog aggravates a wide range of serious cardio-respiratory health problems. For example, emergency hospital admissions for respiratory problems in infants rise by 15% immediately after a smog alert day. The Greater Toronto Area (GTA) has the distinction of being the smoggiest metropolitan area in Canada. For further health information, go to "OMA Smog-Wise" of the Ontario Medical Association's web site at: www.oma.org

What is Smog?

Smog is a complex mixture of many air pollutants, mainly ground-level ozone and fine particulate matter, formed in the air through heat and sunlight. Ground-level ozone is different from the blanket of ozone high above the earth (i.e., stratospheric ozone or the "ozone layer"). The ozone layer protects us from the sun's harmful ultraviolet (UV) rays.

However, with ground-level ozone or particulate matter, there does not appear to be a threshold level below which no human health effects are observed. Ozone is produced when nitrogen oxides (NOx) and volatile organic compounds (VOCs) mix together. Nitrogen oxides and VOCs are referred to as ozone precursors (see <u>Appendix 1: Major Components of Smog</u>).

The main sources of the man-made chemicals that make up smog in Ontario are gasoline-powered vehicles (66%), industrial combustion processes (e.g., coal-burning electric generating plants) and natural and man-made sources of VOCs (e.g., gasoline vapour, oil-based paints and cleaning solvents). Fine particles (e.g. PM_{10}) are by-products of fossil- fuel combustion (e.g., gasoline, diesel, and natural gas). Primary sources are industrial processes, vehicle emissions and residential heating. These emissions are produced both locally and in the United States and drift across Ontario.

How Smog is Measured

High levels of smog occur more often in summer, especially on sunny, hot and humid days. Groundlevel ozone is invisible, but fine particles and nitrogen dioxide give the air a brown, hazy appearance. In Ontario, the Ministry of the Environment (MOE) reports daily on the Air Quality Index (AQI); go to the MOE web site www.airqualityontario.com. The AQI is a real-time measure of the quality of the air. Ozone and particulates are typically the pollutants making up the index.

AQI is rated as follows:

0-15 (very good):	no known harmful effects
16-31 (good):	no known harmful effects; slight odour
32-49 (moderate):	odour; respiratory irritation in sensitive people during
	vigorous exercise
50-99 (poor):	odours; increased symptoms in those with
	cardiorespiratory diseases
100+ (very poor):	increasing or serious symptoms for those with
	cardiorespiratory diseases.

When the index is forecast to be high enough so that health is at risk (AQI = 50 or greater) and combined with certain weather patterns (i.e., high temperatures), the MOE issues an Air Quality Advisory to medical officers of health and the media.

The MOE initially determined that the traditional smog season is May to September. However, beginning smog season 2003, the MOE index readings included the air pollutant: *fine particulate matter* ($PM_{2.5}$). This has resulted in an estimated increase of 10 per cent to the total number of smog days, with possible occurrences outside what used to be the typical smog season months between May to September.

The following is an historical profile of smog days for the Greater Toronto Area, including Mississauga ("Halton-Peel").

Year	Duration	No. of Advisories	No. of Days
1993	August 27 th	1	1
1994	June 16 - July 20	2	6
1995	June 16 - Aug 15	6	11
1996	June 28 - Aug 22	3	3
1997	June 24 - July 14	2	5
1998	May 15 - July 16	3	7
1999	May 30 - Sept 4	5	9
2000*	June 9 - July 1	3	3
2001	May 3 - Aug 8	7	20
2002	June 20 - Aug 13	9	18
2003	June 23 - Aug 21	5	13
2004	May 13 – Sept 25	6	14
2005	February 7 – Oct 3	14	48
2006	May 28 – Aug 2	5	11

(* In 2000, there were a low number of advisories owing to a cool, wet summer.)

Municipal Response to Smog

Due to the extent and persistence of smog in Ontario, there are several municipalities that have developed smog alert response plans. Plans to reduce ground-level ozone and fine particulate matter in response to Air Quality Advisories have common elements for those communities implementing them. Those elements are: a **notification procedure** to advise staff of the advisory; specific short term **operational modifications**; a **communications strategy**; and a **long term management plan** to reduce ground-level ozone and fine particles and increase energy conservation. The elements are developed and may be subsequently revised. Most importantly, the actions taken by a municipality demonstrate leadership in the awareness and education to staff and residents on ways to protect human health and improve air quality in the community.

Mississauga Smog Alert Response Plan

The components of the Plan include a notification procedure, corporate operational responses, a communications strategy, and a long term management plan to enhance the response and reduce harmful air emissions. The Plan components are as follows.

1.0 Notification Procedure

The purpose of the Notification Procedure is to provide lead time to allow staff to make the necessary arrangements for that day's or the following day's operations that will reduce their contribution to smog-causing pollutants and conserve energy. The City's notification list of key staff is updated each year with the MOE's on-line smog registry. The MOE provides the public with the following e-mail notices:

- A **smog watch** is issued when there is at least a 50% chance that smog conditions will occur within the next three (3) days.
- A **smog advisory** is issued when there is a high probability of a smog day occurring within the next 24 hours.

• When the Air Quality index readings decrease, the MOE issues a **termination notice** that the smog advisory has been lifted.

2.0 Corporate Operational Responses and Costs

Department management and staff are consulted to identify operational modifications that may be undertaken during smog alert days. These operational modifications are listed in the table titled "Smog/Clean Air Strategies" in Appendix 2. Staff and resource costs to undertake their operational modifications are absorbed in existing department budgets.

3.0 Communications Strategy

Strategies to communicate the Corporate objectives and actions to respond to Air Quality Advisories have been developed in stages: prior and during a smog advisory, and developed for internal and external audiences. Many of the preparatory strategies for both internal and external audiences on internal communications, consultation meetings and the development of print materials for release just prior and during a smog advisory day through various media (fact sheets, e-mail, feature news articles, news releases, voice messaging, Internet and Intranet, etc.). Details are provided in <u>Appendix 3: Communications Strategy</u>.

4.0 Clean Air Management Activities to Reduce Ground-Level Ozone and Fine Particles

Continued responsive actions of the City based on the City Smog Alert Response Plan will include evaluating staff's responses, reviewing other municipal smog strategies, and encouraging others such as businesses, community groups and individuals to develop air emissions reduction and energy conservation strategies.

The Smog Alert Response Plan is but one of several initiatives of the City's Clean Air Strategy. These plans reduce, minimize or eliminate harmful air contaminants and greenhouse gas emissions and conserve energy in program areas such as energy management, emissions profiling, environmentally responsible purchasing, CFCs control, corporate waste management, land use and transportation planning, active transportation, public transit, greening the fleet, tree planting and the naturalization of parks, open areas and stream channels, developing air care partnerships, and staff and public education and awareness outreach programs such as the Mississauga Anti-idling Awareness Campaign.

Conclusion

Smog, a noxious mixture of air pollutants, is one of the most persistent air quality issues in Ontario and is linked to various human health effects. Council adopted several Air Quality Action Plans as developed by the Mississauga Air Quality Advisory Committee in November of 1998. One of the action plans was to develop a Smog Alert Response Plan. This report identifies the planned responses to provincial air quality advisories as developed through the City's experiences during each smog season since 1998.

The Plan includes the notification procedure, corporate operational modifications to reduce its contribution to ground-level ozone and fine particles, a staff and public communications strategy, and a long term management plan to reduce in harmful air emissions and conserve energy.

APPENDIX 1

MAJOR COMPONENTS OF SMOG

Nitrogen oxides (NO_x), a family of generally colourless and odourless gases (with the exception of nitrogen dioxide), are emitted from many sources including motor vehicles, power plants, incinerators and a wide range of industries. High levels of NO_x irritate the lungs and can cause coughing, dizziness and headache. NO_x emissions also contribute to smog, acid rain and global warming.

Volatile organic compounds (VOCs) are released from a variety of sources including solvents and paints as they are being produced and used, motor vehicles being operated and wood while it is burning. The health effects vary according to the compound and range from relatively non-toxic chemicals to dangerous neuro-toxics and carcinogens. VOCs are also among the precursors of ozone and smog.

Ozone (O_3) , a colourless gas with a sharp electrical smell, is highly unstable and very reactive. A key ingredient in smog, ozone attacks the lungs and respiratory tract and, depending on the concentration and a person's sensitivity, may cause coughing and other breathing problems, watery eyes, headache, reduced vision, fatigue and difficulty concentrating. Ground-level ozone is formed when NO_x and VOCs react together in strong sunlight.

Particulates are usually classified according to size. Inhalable particulates, known as PM10, are smaller than 10 microns in diameter and are composed primarily of soil, soot and dust from construction and roadways. The respirable particulates (PM2.5) are smaller still -- less than 2.5 microns in size -- which means they can be drawn into the deepest parts of the lungs. The PM2.5 fraction is derived primarily from common air pollutants, such as sulphur dioxide, NO_x and VOCs, which are chemically converted into ultrafine particles of sulphate, nitrate and organic compounds, or into minute liquid droplets of acid. High concentrations of particulates are responsible for the dirty haze of smoggy days.

Nitrogen dioxide (NO₂) is a toxic red-brown gas with an irritating odour and is emitted by all combustion processes. NO₂ can irritate the lungs and lower resistance to respiratory infection. It can also damage materials and vegetation. When combined with water, NO₂ forms acid rain. It is also a component of smog and contributes to the formation of ground-level ozone and particulate matter.

Sulphur dioxide (SO₂) is a colourless gas with a pungent, distinctive odour. Exposure to high concentrations of SO₂ can cause breathing discomfort, respiratory illness and the aggravation of existing lung and heart disease. SO₂ can also be chemically transformed into acidic pollutants and fine particles, both of which pose health risks. The main sources of airborne SO₂ are coal-fired generating stations and non-ferrous ore smelters.

Carbon monoxide (CO) is a colourless, odourless and tasteless gas that is released by combustion processes and found in automobile emissions. CO in the bloodstream can impair the transfer of oxygen to the organs and tissues of the body. High concentrations can cause blurred vision, clumsiness and even death. Lower levels can cause discomfort for people with heart or lung disease.

CITY OF MISSISSAUGA SMOG/CLEAN AIR STRATEGIES

STRATEGY DEPT/DIV	SMOG SEASON STRATEGIES	COMMENTS
SMOG ALERT DAY Corporate Operations • Operations staff & management in all departments	Notification Procedure Key City staff are registered with MOE's E-mail Notification System for smog watches, smog advisories and termination notifications.	
SMOG ALERT DAY Corporate Operations • Corporate Services: Facilities Maintenance, Security and Operations	 Reduce non-essential equipment use for energy reductions at Civic Centre, Central Library and Living Arts complexes non-essential uses such as lights system manipulations to reduce energy consumption through A/C system staff to dress comfortably and layering of clothes response similar to peak energy demand day (re: Hydro request) advise major City facilities to reduce energy consumption to community centres & arenas 	
 SMOG ALERT DAY Corporate Operations Community Services: Recreation & Parks Transportation & Works (T&W): Works Maintenance & Ops Traffic Engineering & Maintenance; Works & Transit Fleet Maintenance 	Curtail activities requiring use of oil-based paints , solvents & cleaners, and other products releasing volatile organic compounds (VOCs); e.g. signs, road paint • Community Services: no paints & solvents • T&W: road painting to night operations • T&W: no sign painting w/oil-based paint; alternatives: e.g., picking up advertisements • Fleet Maintenance (Works & Transit) uses aqueous (non-solvent) solutions in cleaning operations	

STRATEGY DEPT/DIV	SMOG SEASON STRATEGIES	COMMENTS
SMOG ALERT DAY Corporate Operations • Community Services: Recreation & Parks	Curtail gasoline powered (two-stroke) equipment curtail all gasoline or diesel powered tools & equipment (trimmers, pumps, generators, mowers, tractors) after 11:30 a.m. alternative work: "hand" labour jobs a priority, e.g.: hand raking of ball diamonds, picnic areas; spreading woodchips; hand weeding of shrub/flower beds, playground sand, warning tracks; litter picking of natural areas/woodlots/creeks; removal of graffiti using water-based paints and chemicals; removal of dead trees; filling turf/tree depressions, etc. 	 on forecast hot days, Parks staff may report 30 minutes earlier (re: 6:30 a.m.) applies only to City staff; contractors may continue grass cutting on boulevards depending on schedule
SMOG ALERT DAY Corporate Operations • Community Services: Recreation & Parks	 Curtail pesticide/herbicide spraying activities no spraying activities of pesticides, insecticides & herbicides 	<u>Note</u> : pesticide application has been reduced to less than 1% of City owned lands
SMOG ALERT DAY Corporate Operations • T&W: Maintenance & Operations	Reschedule street sweeping to night operations; flexible hours included in contracts	
SMOG ALERT DAY Corporate Operations • all Departments	 Reduced emissions of VOCs during sunlight hours by scheduling re-fuelling activities (after sundown & before sunrise; min. before 8:00 a.m./after 3:30 p.m.) Community Services: Recreation & Parks staff Corporate Services: Facilities Maintenance, Security and Operations Planning & Building: Building Division Inspectors Transportation & Works: Enforcement Division Works Maintenance & Operations; Engineering Technical Services staff owners of light duty vehicles; Transit fleet is refuelled at night All City staff encouraged to refuel at specified times 	Signs are posted at pumps of City service centres regarding applicable fuelling times on a smog alert day

STRATEGY DEPT/DIV	SMOG SEASON STRATEGIES	COMMENTS
SMOG ALERT DAY	Reduce/minimize vehicle engine idling	
Community Services: Recreation & Parks	 Community Services: reduce/limit idling time of necessary vehicles & equipment to one minute max., except with hydraulic lift equipment 	
 Corporate Services: Facilities Maintenance, Security and Operations T&W: Works Operations & Maintenance; Fleet Maintenance; Engineering Technical Services 	 Parks & Forestry staff crews to be re-assigned to fewer vehicles to ensure necessary vehicles are at full passenger capacity suspend non-essential vehicle idling time for vehicles used to transport field staff "No engine idling" message as part of departments' driver training programs request to staff to not idle vehicles used as part of their duties, e.g. inspectors in: T&W: Engineering Technical Services; Transit Community Services: Fire; Facility Maintenance, Security and Operations Corporate Services: Enforcement Division Planning & Bldg: Building Division All staff encouraged to curtail idling through the Mississauga Anti-Idling Awareness Campaign; reminder posters in workplaces; windshield stickers; etc. 	Transit policy of buses idling to not exceed a maximum of 5 minutes
SMOG ALERT DAY Corporate Operations	 Suspend training with demonstration fires 	
Community Services: Fire & Emergency Services		
SMOG ALERT DAY Corporate Operations	 Suspend or reschedule to night operations of incinerator 	
T&W: Animal Control		
SMOG ALERT DAY Corporate Operations	Corporate Smog Response Policy A policy outlines the notification procedure, operational modifications: staff responsible, etc.	
Community Services, Manager, Environment		
SMOG ALERT DAY STAFF Outreach Program • Corporate Services: Communications Division	 Staff smog awareness campaign Intranet <i>Inside Mississauga</i> smog alert reminders & tips feature articles on smog (with tips) in summer issue of <i>Network</i> publication Smog Alert brochures in all City facilities 	A component of MAQA Committee's Communications Plan for air quality and climate change

STRATEGY DEPT/DIV	SMOG SEASON STRATEGIES	COMMENTS
SMOG ALERT DAY PUBLIC Outreach Program • Corporate Services: Communications Division	 Broad Public smog awareness campaign: Air Quality tabletop display Facts About Smog brochure Article & tips in homeowners ACTIVE MISSISSAUGA on smog and engine idling Smog Alert posters in City facilities Information on City Web site: "Air Quality", "Smog" information on Environment web page News releases, etc. on smog & air quality as required 	A component of City Air Quality Communications Plan for air quality and climate change
CLEAN AIR PRACTICES Vehicle Fleet • T&W: Transit & Works, Fleet Maintenance	Buses/heavy duty vehicles and light duty vehicles are emissions tested; transit driver program for increased fuel efficiency and safety; engine idling policy. Conducting a fleet emissions reduction study.	Fleet Maintenance Program includes regular maintenance and annual inspections for vehicle efficiencies
CLEAN AIR PRACTICES Traffic Signal Lights • Transportation & Works	Conversion of all City traffic signals at all 390 intersections to light emitting diodes (L.E.D. has 85% energy reduction)	
CLEAN AIR PRACTICES Green Development • Planning & Building: Development & Design Division	Through planning applications, encourage green design of development (i.e. site layout and building design) that is energy and water efficient (re: encourage LEED standards). Mississauga Plan objectives include promoting the conservation and reduction of air pollution and greenhouse gas emissions through site and community design.	
CLEAN AIR PRACTICES Sustainable Transportation • Transportation & Works • Community Services • Mississauga Cycling Advisory Committee	Update and promote walking & cycling routes through bike rides; use of trail map; inventory of bicycle rack storage facilities throughout City. Promotion of the Smart Commute Initiative, partnered with the Mississauga Board of Trade.	
CLEAN AIR PRACTICES Air Quality Action Plans • All Departments	Ongoing implementation of Air Quality Action Plans, e.g. energy management, emissions profiling, environmentally responsible purchasing, CFCs control, corporate recycling, land use and transportation planning, public transit, active transportation, corporate rideshare program, street tree planting and maintenance, naturalization of parks, open areas and creek channels, and developing air care partnerships and staff and public outreach programs (e.g., Mississauga Anti- Idling Awareness Campaign).	

CITY OF MISSISSAUGA SMOG ALERT RESPONSE COMMUNICATIONS STRATEGY

GOAL: To increase awareness and understanding of smog and to advise stakeholders about the City of Mississauga's activities during a smog alert.

THE STAKEHOLDERS: KEY PARTNERS

City of Mississauga

Mayor & Council/Senior N Transportation & Works	 lanagement Team Environmental Services Maintenance & Operations Service Centres Engineering Technical Services Mississauga Transit Enforcement
Planning & Building	- Building Division
Community Services	Recreation & ParksEnvironmental ManagementFire & Emergency Services
Corporate Services	 Communications Information Technology Facilities & Property Management Materiel Management

Region of Peel Environmental Health

GTA Clean Air Council

Ministry of the Environment, Air Quality Office, Environmental Monitoring & Reporting Branch

MEDIA CONTACT

A Public Affairs representative may speak with the media (in general terms) about the Mississauga Air Quality Technical Advisory Committee and air quality issues. Key spokespersons (as listed below) will be contacted in most cases. Call:

Marie Rochon, Team Leader, Media/External Communications, 905-615-3200, ext. 5818.

SPOKESPERSONS

Those who can speak to the media in more detail about the air quality committee's initiatives and air quality issues are listed below.

City of Mississauga

Brenda Sakauye, Manager, Environmental Management, Community Services at 905-615-3200 x 3217

Region of Peel Health Paul Callanan, Director, Environmental Health, Region of Peel at 905-791-7800, ext. 2802

<u>Ministry of Environment, Air Quality Office</u> Air Quality Index Office, MOE at 416-235-6051

KEY MESSAGES ON SMOG

1. What is Smog?

Smog refers to hazy air that causes difficult breathing conditions. Smog most often occurs on hot summer days. Heat and sunlight react with gases and fine particles in the air to form smog. The most harmful components of smog are:

- ground-level ozone produced by chemical reactions of nitrogen oxides (NO_x), emitted mainly by the transportation sector, and
- volatile organic compounds (VOCs) from human and natural activities, in the presence of sunlight.

Definitions

Nitrogen oxides (NO_x) - come from the combustion of coal, gas, and oil in motor vehicles, homes, industries and power plants.

Volatile organic compounds (VOCs) - derive from burning gasoline and the evaporation of liquid fuels, solvents and organic chemicals (e.g., oil-based paints, cleaners).

Airborne inhalable particles - suspended in the atmosphere are derived from dust, smoke, pollen and vehicle emissions.

2. Health effects of smog

Smog can:

- cause eye, nose and throat irritation
- cause coughing, wheezing and shortness of breath
- lower resistance to infections
- make heart and lung conditions worse; leads to hospitalization and premature death.

Smog is especially harmful to: children, seniors, pregnant women, people with heart and lung conditions, and smokers.

3. City Smog Alert Response Activities

The following summarizes the operational responses by City staff on smog advisory days:

- *Parks* will curtail gas and diesel powered tools and equipment after 11:30 a.m. and will be replaced with hand labour jobs. This applies to City staff only; contractors may continue to grass cut along boulevards.
- *Parks, Transit* and *Traffic Maintenance* will curtail the use of oil-based paints and solvents; road paint will be restricted to night operations.
- *Works* will reschedule street sweeping to night operations.
- *Fire & Emergency Services* will discontinue training with live fires.
- Animal Control will suspend or curtail evening incineration operations.
- *Inspectors in all departments* will reduce engine idling & refuel the night before a smog day.
- *Communications* will implement various internal & external communications strategies.

4. Resident activities during a smog alert (tips)

Everyone can help reduce smog formation by:

- Reducing the use of your car by walking, car pooling or taking public transit;
- Ensuring your car is in good repair (tires inflated/engine tuned) if you must drive; do not leave cars idling; and
- Reducing energy consumption by setting air conditioners a few degrees warmer and postponing laundry activities until evening hours.

On smog days:

- Avoid strenuous exercise/outdoor activities;
- Do not use oil-based paints, glues and pesticides;
- Do not use gas-powered garden equipment; and
- Refuel your car in the evenings after the sun has set/air is cooler (vapours escape when gas is pumped).

STRATEGIC STEPS

PRIOR to Smog Alert

(Internal)

- 1. Meet with stakeholders (managers/supervisors) to brief them on the Smog Alert Response Plan and review departmental responsibilities and course of action.
- 2. Write *Network* (staff newsletter) article on smog in summer issue.
- 3. Introduce Intranet Reminders brief messages from Mississauga Air Quality Committee which includes a smog warning, smog tips for staff and links to the Environment Web page.
- 4. Ensure Smog articles on the Environment Web page are up-to-date.

(External)

- 1. News releases on an as-needed basis.
- 2. Redistribute Smog brochure on City's smog alert response plan to all city facilities i.e., arenas, community centres, libraries.
- 3. Include smog information in City's Air Quality display.
- 4. Your Guide, Active Mississauga (guide to all city homeowners) include an article on the myths of engine idling and smog information in this annual publication.
- 5. Provide the Weather Network with City Smog Alert Response Plan to use during their local A.M. news show on smog advisory days.

DURING a Smog Alert

(Internal)

- 1. Ensure news release/message is posted on Intranet.
- 2. Record smog message on City Voice Messaging (through Inquiries ext. 5000).

(External)

- 1. Issue news release(s) to be determined.
- 2. Ensure the news release(s) is posted on the City's Internet and Intranet sites.
- 3. Record smog message on City Voice Messaging (through Inquiries, ext. 5000).
- 4. Liaise with media requesting live interviews with spokespersons on this issue.
- 5. Provide Mayor information to use on the Mayor's Hour a weekly cable show (if timely).

TARGET AUDIENCES

- Council Members
- Municipal Staff
- Residents
- Media

MEDIA TARGETS

Southern Ontario, GTA, local-community, business and health (print & broadcast)