

at the source



published by the Canadian Centre for Pollution Prevention

Air
Quality
Edition



summer 2004

Focus of this Issue

Clean air should never become a luxury item. This issue of *at the source* looks at the sources and substances that contribute to poor air quality in Canada. The chart below illustrates some of the links between air quality players. Articles in this issue profile the projects and programs that various organizations, municipalities and industry sectors have developed and implemented to improve local, regional, and national air quality. Also in this issue are tips about what individuals can do to help reduce harmful emissions, and recent government initiatives that target air pollution.

SMOG

Particulate Matter
↑
Nitrogen Oxides
Sulphur Dioxide
Volatile Organic Compounds

Ground Level Ozone
↑
Nitrogen Oxides
Sunlight (UV)
Volatile Organic Compounds

Idling Buzz

by Kady Cowan, Canadian Centre for Pollution Prevention

Twenty-four wheel heavy-duty diesel trucks generally do not go unnoticed. They are large, loud and there are hundreds of thousands of them on the road across the country. The Department of Energy in the United States reports that the 3 million transport trucks in the United States idle away an estimated 1 billion gallons (3.8 billion litres) of fuel every year. That is equal to about 11 billion kg of greenhouse gases (GHG) and 400,000 kg of particulate matter released into the air from the transport truck industry every year; while they are not transporting.



*Kady Cowan of C2P2 showing idling reduction literature for truckers
photo: Nora Penhale, Sarnia Observer*

Contents:

- Idling Buzz
- The Smell of Summer in the Air
- Car Heaven
- Less VOCs Less Smog
- EMS Hog Story
- Clean City Bus Pilot
- S-M-A-R-T Movement
- Municipal Actions to Reduce Air Pollution
- P2 in Your Personal Life
- Across Canada



100 Charlotte Street
Sarnia, ON N7T 4R2
Tel: 1-800-667-9790
Fax: 519-337-3486
www.c2p2online.com
info@c2p2online.com

These numbers have caught the attention of various industry, government and community organizations. Trucking companies are looking for ways to improve fuel economy, the largest cost to their organization after human resources. Reduced idling has been identified as the easiest way to save fuel and translates into

significant savings for the trucking companies. A single truck idling for one hour will cost the company approximately \$3.00 in fuel. Multiply that by 365 and that truck company is idling away approximately \$1100 in profit per truck per year. If a driver is idling the truck overnight to provide amenities for a comfortable sleep the figures are significantly higher.

At the Canada/U.S. border crossing the effects of idling are experienced first hand. The waiting time can be as much as 4 hours. These trucks keep their engines on and slowly advance in the long queue. Air quality in these zones is particularly bad. A study commissioned by the Ministry of the Environment (MOE) this year in Windsor monitored the truck traffic at the Ambassador Bridge for one year and found correlations between long truck lines and bad air days.

Leaving the issues of better scheduling and more staff for faster immigration and customs procedures aside it is up to the drivers to turn off their engines if they are not going to be moving for more than 15 minutes at a time. This is going to take some serious habit breaking. The trucking industry has been idling engines for decades, many truckers call it a way of life. The Canadian Centre for Pollution Prevention has begun the **Truckers Idling Reduction Program** at the Sarnia Blue Water Bridge border crossing. This program hopes to educate 3000 drivers about the environmental and health impacts of idling and what they can do operate their engines with the least amount of harmful emissions.

Industry has developed various innovative technological fixes to encourage reduced idling times. Mechanical devices externally mounted to the trucks provide some or all of the amenities that drivers need without the main engine running. As well, advanced diesel engine and fuel technology will become available between 2006-2010 that has the potential to eliminate most if not all of the diesel engine emissions.

As emissions standards get tougher and in some municipalities anti-idling regulations are implemented fleet managers and drivers are looking for guidance on how to make the required changes. Programs such as Natural Resources Canada - Office of Energy Efficiency's **FleetSmart** program (<http://oee.nrcan.gc.ca/fleetsmart/home.cfm>) and the USEPA **SmartWay** program (<http://www.epa.gov/smartway/>) have been developing and delivering critical anti-idling tools, incentives and information for the trucking industry across the continent. Members of trucking associations, truck stops, shippers, carriers, manufacturers and industry magazines have demonstrated considerable interest in this issue. The next step involves getting the message out to the millions of drivers on the road, this may take more than a truck load of effort. For more information contact Kady Cowan, Project Coordinator at kady@c2p2online.com or (519)337-3236.

The Smell of Summer in the Air

by Eva Ligeti, Clean Air Partnership www.cleanairpartnership.org

What's that smell in the air? Is it summer? No, it's car exhaust. Summertime has become smog season as heat and sunlight 'cook' air pollutants accelerating the formation of ground level ozone. "Smog" has worked its way into the popular vernacular to mean a murky brown haze hanging over the city. Even on a clear day the absence of smog advisory does not mean there's no air pollution. Public health officials are concerned that the smog alert system under-communicates the health risks of air pollution. Research shows that commuters who spend as little as an hour a day on the highway receive enormous exposures to fine particles of pollution. When it

comes to air pollution the smaller the particle, the greater the health concerns. Because of their size, fine particles which result from incomplete combustion from smoke stacks and vehicles are breathed deep into our lungs where they lodge in lung tissue, become absorbed into the blood system and eventually damage or kill individual cells. According to the Ontario Environment Ministry's most recent air pollution update report, carbon monoxide and sulphur dioxide have been reduced by as much as 85 and 82 per cent respectively since the 1970's. But thinking air pollution is no longer a problem is a big mistake. Earlier air
(continued on the next page)

pollution reduction efforts were largely focused on emissions from large industrial sources and power plants. These efforts continue, but today dispersed sources are the most significant contributors to air quality problems. Wherever fossil fuels are burned for energy is a targeted source of air pollution. Examples include on and off road personal and fleet vehicles, water craft, gas lawnmowers, and furnaces. Protecting ourselves from air pollution means controlling the large emitters as well as appealing to millions of individuals.

Car Heaven

by Ersilia Serafini, Clean Air Foundation

Automobiles are significant contributors to air pollution and greenhouse gas emissions. In fact, vehicles are forecast to be the leading contributor of carbon dioxide (CO₂) emissions in Ontario by 2020. In Ontario, we are approaching one vehicle for every two people. Emissions of carbon dioxide are being linked to climate change which could lead to an increase in extreme weather events and on a local basis an increased frequency and intensity of high smog days. High smog days and poor air quality have been linked by the Ontario Medical Association to an estimated 1900 deaths annually in Ontario.

Developing and implementing programs that reduce vehicle emissions is an enormous challenge. People love their cars. Each year in Canada, over 500,000 vehicles are declared unfit for the road for reasons such as failed emissions testing. Since 2000, the Clean Air Foundation has managed the delivery of Car Heaven -an accelerated vehicle retirement program. The Car Heaven program (www.carheaven.ca) offers car owners in Ontario and Calgary and Edmonton, Alberta, a convenient and cost-effective way to retire their older, high-polluting cars. The vehicle is towed for free (up to a \$200 value), recycled, and the proceeds from the vehicle are donated to affiliated charities with the donor receiving a minimum \$60 tax receipt. In addition, any motorist that donates their old car is entered into a prize draw for a chance to win a cross Canada rail trip, bicycles and transit passes. Car Heaven has retired over 11,000 vehicles since inception - making it the most successful program of its kind in Ontario.

For information or to donate a car visit:

www.carheaven.ca or call

In Ontario 1-888-731-7311

In Alberta 1-888-441-2277

Less VOCs, Less Smog

by Alex Cavadias, Tim Archer and Shiv Sud

Volatile Organic Compounds (VOCs) are released into the atmosphere every time we fill up and drive our cars, and are also released through the use of a variety of consumer products ranging from paints to cleaning fluids. As one of the four key smog forming pollutants, VOC reductions are on the agenda of federal and provincial governments across Canada. VOCs are any compound of carbon, excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate, which participates in atmospheric photochemical reactions.

Major VOC emission sources are the organic solvents used in many consumer and commercial products such as oil-based paints, household cleaning products and commercial printing inks; transportation sector activities such as the exhaust emissions from cars and trucks; various industrial processes such as chemical manufacturing; and residential/commercial fuel wood combustion.

Across Canada, governments are taking action to reduce VOCs. The Federal Agenda on Reducing VOCs from Consumer and Commercial Products constitutes one element of the federal government's action plan in this area, for more information visit www.ec.gc.ca/nopp/voc. VOC reductions in the transportation sector, the largest source of VOC emissions in Canada, are being addressed by the Federal Agenda on Cleaner Vehicles, Engines and Fuels.

At the provincial/territorial level, governments are developing implementation plans to meet the Canada-Wide Standards for particulate matter 2.5 and ozone by 2010. For instance, Ontario is examining the use of a flexible set of *(continued on the next page)*

regulatory and non-regulatory policy tools in developing a VOC Emission Reduction Plan. Stakeholders from more than 70 sub-sectors have been identified for a VOC data collection and analysis exercise in Ontario. This will provide the basis for proposing policy options and VOC emission reduction targets for various sub-sectors.

Municipalities across Canada have been active in developing measures to help reduce VOC emissions from the solvent use sector. The Greater Vancouver Regional District (Nancy Knight, 604-436-69-68 or nancy.knight@gvrd.bc.ca) and the Montreal Metro Community (Luc Lefebvre, 514-280-4338 or luclefebvre@ville.montreal.qc.ca) have a number of VOC emission management measures. For more information about this article contact Shiv Sud or Tim Archer (Ontario Ministry of the Environment) at: 416-314-7936, shiv.sud@ene.gov.on.ca and 416-314-4136, tim.archer@ene.gov.on.ca respectively; or Alex Cavadias (Environment Canada) at: alex.cavadias@ec.gc.ca

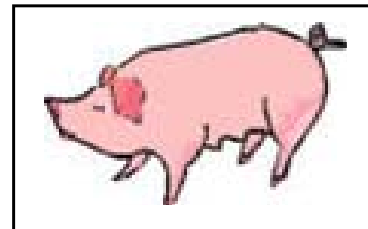
EMS Hog Story

By Andrea Notarianni, WESA

Industry big and small is doing it, hospitals are doing it even the hog farmers are doing it. That is the design and implementation of Environmental Management Systems (EMS) to systematically improve environmental management and performance. With a little help from the Canadian Standards Association, and Oxegen a web based tool used to help design, develop and deliver EMS the Canadian Pork Council (CPC) has created CAN/CSA-Z771 a national standard for all types of hog operations across the country.

Producers, government, and communities have a considerable interest in the processes and protocols of pork production and the associated impacts on the soil, water and air. The comprehensive EMS specifies requirements for air emissions including pollutants, odours and dust in several key areas:

Fertilizer handling and storage, Manure handling and storage, Manure/nutrient storage, Pesticide handling and storage, Manure treatment, disposal and retail, Petroleum handling and storage, Barn management, and Yard management.



One of the major environmental aspects identified throughout all areas of a hog operation was air emissions - air that is potentially odourous, dusty, or polluted is an environmental issue at hog operations. With the electronic EMS tool, the hog operation can view potential air emission aspects that may be applicable to them. This helps the user identify problem areas that may not have been considered without the software. A hog operation is specifically required to commit to controlling odour and dust emissions, to the greatest extent possible. The standard also requires that a formal odour and dust management plan be implemented.

By reviewing the information provided in the CPC EMS software, a hog operation can receive extensive guidance in how to implement specifics, in order to establish a CAN/CSA-Z771 EMS, and experience all the benefits that EMS establishment has to offer. These benefits may include better awareness, understanding, control, monitoring and correction of air pollution issues. For more information contact the author at (905)318-3009 or andi@wesa.ca

Clean City Bus Pilot

Public awareness about harmful emissions coming from transportation in urban centres is increasing; as a result governments and industry are under growing pressure to curb the rise of vehicle emissions. In January 2003, the Clean Air Strategic Alliance (CASA) and its partners initiated the *CleanBus.ca* pilot project in Edmonton, Alberta to investigate if reductions of emissions from two urban transit buses could be achieved by using diesel particulate filters (DPF). Although this technology has shown positive results in other cities around the world, a prime objective of *CleanBus.ca* is to evaluate DPF performance under harsher (colder) environmental conditions. (continued on the next page)

The DPF is typically designed as a replacement for a vehicle's existing muffler. One of the most attractive characteristics of DPF technology is that it is economical in relation to fleet conversions to alternative fuels. The technology operates exclusively with ultra-low sulphur diesel fuel that contains less than 30 parts per million of sulphur. The DPF removes exhaust pollutants using a two-stage process:

1. An initial oxidation stage, which converts carbon monoxide and hydrocarbons into carbon dioxide and water.
2. A second stage where particulate matter is trapped on the walls of the filter.

Percentage emissions decrease in round one and two of testing		
Test Date	January 2003	January 2004
Total Hydrocarbons	51-60	61-87
Carbon Monoxide	68-80	83-89
Total Particulate Matter	60-73	73-75

The preliminary *CleanBus.ca* project results are very positive. Some of the data is summarized in the table above. The preliminary emissions testing reports are on the project Web site at <http://CleanBus.ca>. The final report is expected to be finished and posted on the project Web site during October 2004.

S-M-A-R-T Movement

by Julia Della Rosa, Pollution Probe

SMART - **S**ave **M**oney and the **A**ir by **R**educing **T**rips, Pollution Probe's workplace trip reduction programme, is both an information resource and a support service to help medium to large sized Greater Toronto Area organizations increase awareness and provide a range of sustainable commuting options for their employees.

These include group commuting (e.g. public transit and carpooling), schedule changes (e.g. teleworking or flexible work hours), and active commuting (e.g. bicycling or walking). The *S-M-A-R-T* manager assists participating companies with conducting employee transportation surveys and corporate profiles, using the results to develop a customized workplace trip reduction programme. The manager assists companies with measuring and evaluating their programmes' goals and savings, and provides access to on-line software to track employee participation and emissions saved.

Beneficial results to both the workplace and the employees include:

- Cost savings (reduce parking costs and employee turnover);
- Improved employee moral because of more flexible workplace;
- Recognition as an environmental leader; and
- Reduced impact on the environment.



Pollution Probe is currently working with seven workplaces: DuPont, Enbridge Gas Distribution, Exhibition Place, Nelvana, the Town of Markham, Transamerica Life Canada and University Health Network, comprised of Princess Margaret Hospital, Toronto General Hospital and Toronto Western Hospital. Our champion workplaces are committed to implementing and tracking their trip reduction initiatives through the *S-M-A-R-T Movement* programme.

So how do *you* get to work every day? What is *your* company doing to support the use of alternative modes of commuting and improve air quality? For more information about workplace trip reduction and *S-M-A-R-T Movement*, contact Julia Dalla Rosa, *S-M-A-R-T Movement* Project Manager, at 416-926-1907 x259 or smart@pollutionprobe.org.

Municipal Actions to Reduce Air Pollution

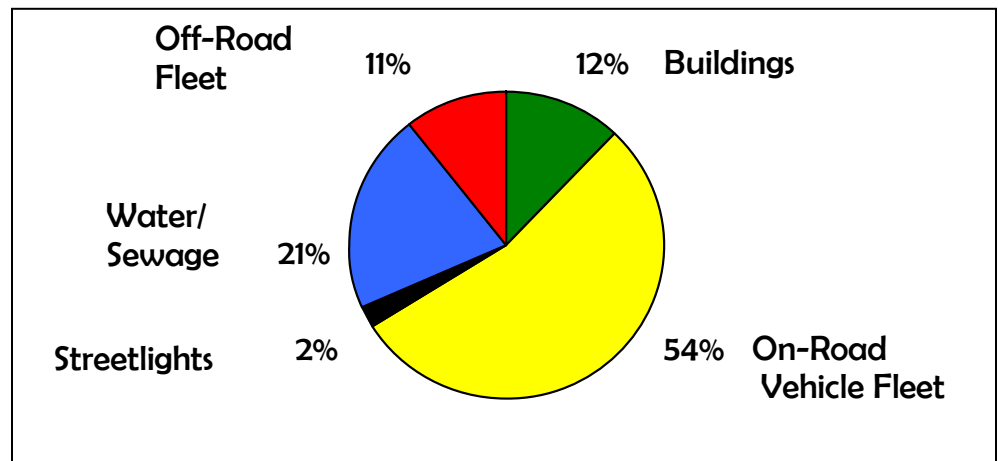
by David Roewade, Regional Municipality of Waterloo

Improving air quality has become a public health priority across Canada. It is well known that the Windsor to Quebec corridor has the worst air pollution in the country as well as being one of the most populated areas. With an estimated 3 million Canadians suffering from serious respiratory conditions, an aging population as well as the vulnerability of children's developing lungs, the burden of illness from this type of pollution is of growing concern. Several Canadian municipalities are implementing initiatives to reduce the amount of air pollution they produce in an effort to minimize their impact on the environment.

In 2002, Region of Waterloo Public Health facilitated an interdepartmental evaluation of different options to reduce air pollution created by Regional operations. An emissions inventory was conducted to identify current sources and volumes of air pollution emitted by Regional activities. Staff and Management from several departments (Clean Air Plan Committee) contributed the data required to carry out the analysis. The consulting firm, Torrie Smith Associates, calculated emissions of five criteria air contaminants (NO_x, SO_x, CO, VOCs and PM₁₀) associated with all Regional operations. Using the consultant's modeling software, a detailed emissions profile was developed (summarized by sector in Figure 1).

Fig. 1. Region of Waterloo Corporate Air Emissions (2001)

As expected, the on-road fleet represented the largest source of air emissions. The Region is responsible for services such as waste collection and recycling, by-law/ environmental enforcement, transit, ambulance and police that require the use of on-road vehicles.



at the source, a newsletter produced by the Canadian Centre for Pollution Prevention, highlights pollution prevention programs and provides up-to-date information on Canada wide activities.

Editorial Board:

Kady Cowan
Tania Del Matto
Linda Varangu
Tammy Middleton
Phil Webber
Lori Fryzuk
George Murphy
Jean-Francois Ferry
Laurie Streich
Ross Borthwick
Brigitte Roth
Judy Zaczkowski

The Committee brainstormed several different opportunities and suggested approximately 30 reduction options. There were a total of 11 reduction measures recommended, 6 of which have payback periods associated with energy cost savings. Once implemented, these 11 options will reduce the Region's annual air emissions by over 100,000 kg of criteria air contaminants and approximately 7500 tonnes of CO₂. Total costs include one-time capital expenditures of \$7.5 million (including financing) and approximately \$440,000 in annual operating expenses.

Some of the lessons learned from this initiative to date include:

- Support from senior management (i.e. Directors/Commissioners) is needed in order to gain broad participation for this type of initiative
- Conduct this within a broader Clean Air Plan that has goals, methods, targets and timelines.
- There are a wide variety of funding initiatives that should be explored from agencies such as the federation of Canadian Municipalities, and Natural Resources Canada.

For more information contact David Roewade at: rdavid@region.waterloo.on.ca or download a copy of their report at (www.region.waterloo.on.ca/ph) - under resources/environmental health.

Pollution Prevention in Your Personal Life

This section will feature the personal stories of people who are working in pollution prevention. Do you have a story to share with your colleagues? We want to hear it! Please contact the C2P2 staff at info@c2p2online.com to discuss your ideas.



Photo of François walking

Carless Life

by François Huppé, Toxic Substances and Pollution Prevention Coordinator at Environment Canada

I almost became a victim of the smoking doctor syndrome, the attitude of not practicing in private what you preach at work. The story goes like this: I come from a typical suburb with big houses and big cars. It was natural for me to replicate the suburban lifestyle, longing for mobility as I grew up. As a new graduate I did not have the means to attain my suburbanite ambitions. I worked as a junior chemical engineer, owned a small Renault and lived in a flat in a not so recommendable part of town.

Unexpectedly, the company I worked for offered me a position in its environmental department. I never seriously thought of the environmental field as a career opportunity nor did I feel particularly touched by environmental issues at the time. I took it, believing it would be like any other engineering job. Soon after I was able to shift back to the suburbs and upgrade to a Saturn. I enjoyed the Saturn as it is reliable and provided me with good mobility, except during rush hour. I don't desire performance or big cars. Don't I work in environment after all...eh, wait a minute. Why I am thinking this way? It's just a job.

Cool! My company offers me a position abroad. Roads are bad there so I need a big four wheel drive with a bull bar and air conditioning. Mobility is key in this project to improve the environment. That's why I came to this country and why I use a four wheel drive, which produces a lot of fumes. Oops! Is my reasoning wrong? Am I missing something? The incongruity I felt during my stay abroad leaves me with afterthoughts about car ownership.

I am back in Montreal, ready to start afresh. I wait before buying a car. From where I am staying I have access to everything. The subway station is a few minutes walk. Stores and restaurants are plentiful and nearby. To relax, Mont Royal Park is a stones throw away. A friend lets me use his car, but I rarely do. Didn't I need mobility? Maybe that's where I got it wrong. I may not really need mobility after all.

Now I get it! It's accessibility. Accessibility can square my living needs with my growing environmental consciousness. I search for a living place walking distance from the job, the grocery store and subway stations. These become my three essential search criteria. I find such a spot and forget about purchasing cars. Today, I live a happy "carless" life.

That's how I avoided the smoking doctor syndrome. Bit by bit, I came to practice a kind of "design for the environment", redesigning my lifestyle, changing my mind set from mobility to accessibility and acting on it. The rewards are good. Not only do I save a fortune by not owning a car, I walk a lovely ten minutes through Old Montreal to go to work instead of wasting time commuting. Without a car, I barely produce greenhouse gases. I used the One-Ton Challenge calculator (<http://www.climatechange.gc.ca/onetonne>) and found out my emissions total less than half a ton per year, a tenth of the Canadian average.

I don't believe most people can make the radical move of foregoing car ownership. North American cities are not yet designed for that. Although people can still manage their lifestyle by thinking more in terms of accessibility. For more information contact François at (514) 496-6856, Francois.Huppe@ec.gc.ca.



Across Canada

Pollution Prevention Activities and Events



Car Sharing For "Carless" People

Car sharing associations that lease cars by the hour are spreading. In Montreal there is Communauto (www.communauto.com). In Toronto there is AutoShare (www.autoshare.com). Cars are available at parking lots scattered across town. Through the Internet, you reserve a car from the closest parking lot and collect the keys in a nearby safe. It suits people who need vehicles occasionally, avoiding expensive car ownership and using cars more sparingly

There are many ways to increase fuel efficiency and reduce emissions while your car is on the road!

- **Keep Your Tires Properly Inflated** - The Be Tire Smart campaign (www.betiresmart.ca) estimates that with properly maintained tires, the average Canadian driver could save the equivalent of two weeks worth of gas every year.
- **Tune Up Your Engine** - A well-tuned engine burns less fuel and reduces emissions.
- **Don't Let Your Car Idle** - If you expect to stop your vehicle for longer than one minute, turn the engine off.
- **Slow Down** - Increasing your highway speed from 100km/h to 120 km/h will increase fuel consumption by about 20 percent.
- **Pick-up Truck Drivers** - Remove the tail gate and replace it with a net that offers less wind resistance.
- **Remove Excess Weight** - No need for additional traction weight in the nice weather. To improve wind resistance take off ski carriers, luggage bins and other weights when they are not needed.

The One-Tonne Challenge Time To Take Action On Climate Change

Each Canadian generates, on average, five tonnes of greenhouse gas (GHG) emissions every year through the use of energy from fossil fuels – driving, heating and cooling our homes, using lights, appliances and electronic equipment. Together we generate more than a quarter of Canada's annual GHG emissions.

Tools and tips are being published in various forms to help individuals meet the One-Tonne Challenge. The 22-page brochure, *Your Guide to the One-Tonne Challenge*, is available by calling 1 800 O-Canada (1 800 622-6232) or 1 800 465-7735 (teletype for the hearing impaired) or by visiting www.climatechange.gc.ca. The One-Tonne Challenge web site also features an on-line calculator that helps individuals determine the sources of current GHGs and the actions they can take to achieve a one-tonne reduction.

The One-Tonne Challenge is working with partners such as retailers, industry, manufacturers and utilities to help spread the word. Support is being provided to youth leaders who, as spokespersons, can engage their peers and educators to develop and promote One-Tonne Challenge learning materials. For more information about partnerships, community challenges and the youth initiative contact Debby Corbin at (613) 947-0703 or at dcorbin@nrcan.gc.ca, Michel Gareau at (819) 994-1054 or michel.gareau@ec.gc.ca and Dany Drouin at (819) 953-6879 or dany.drouin@ec.gc.ca respectively.

The operation of Canada's foremost pollution prevention resource is possible through the generous support of our sponsors.

Canadian Vehicle Manufacturers' Association
DaimlerChrysler Canada Inc.
Ford Motor Company of Canada Limited

General Motors of Canada Limited
Ontario Ministry of the Environment – Environmental
Innovations Branch