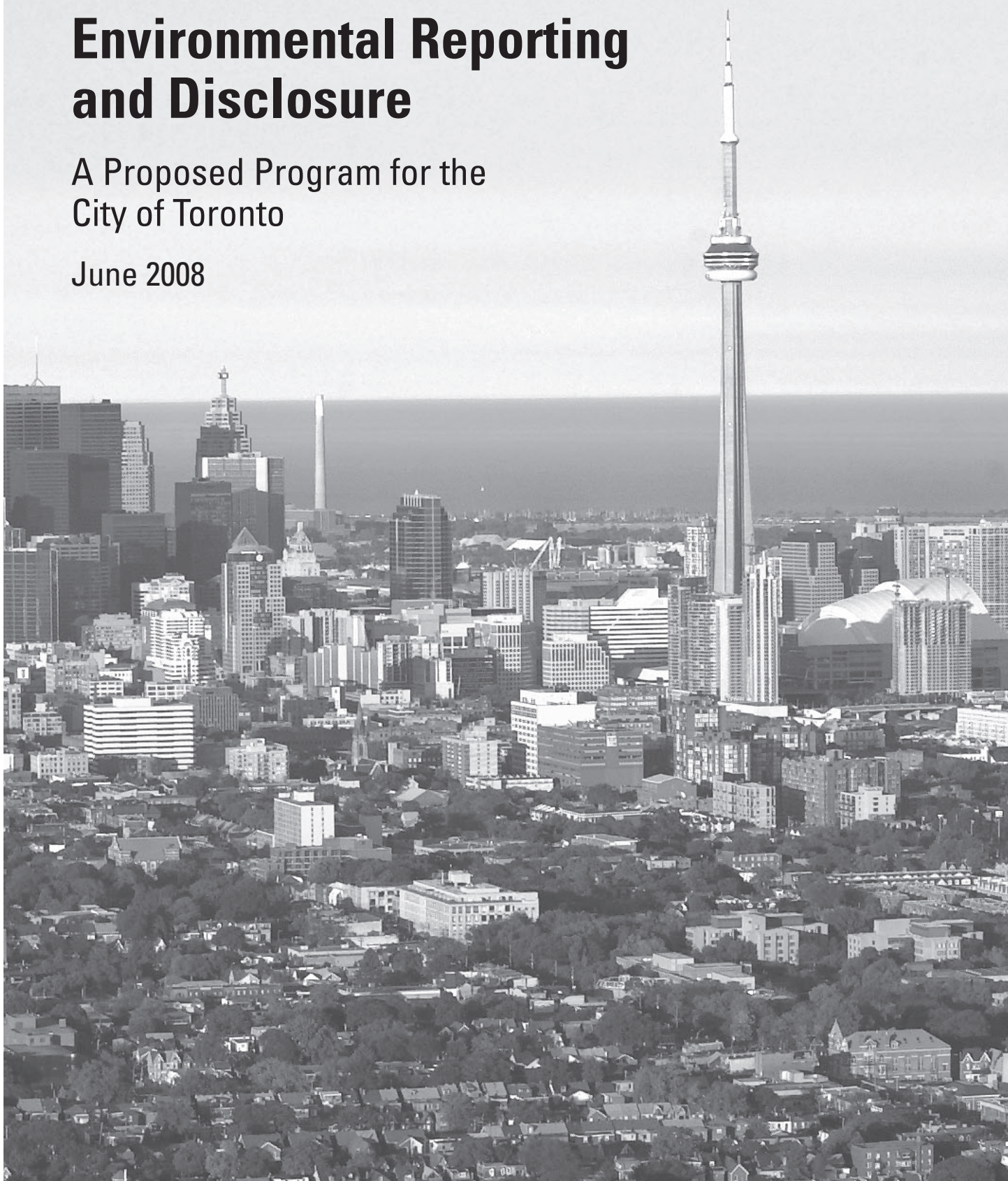


Environmental Reporting and Disclosure

A Proposed Program for the
City of Toronto

June 2008



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 **TORONTO** Public Health

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Executive Summary

Community right-to-know programs exist around the world and collect and publish information about chemicals being used or released by facilities. These reporting programs supplement other regulations aimed at reducing or managing chemicals by providing valuable data to governments, informing the public and stimulating businesses to prevent pollution.

Toronto City Council has made commitments to develop community right-to-know strategies through the Environmental Plan, the Action Plan for Cancer Prevention in the City of Toronto, and most recently in the Climate Change, Clean Air and Sustainable Energy Action Plan.

Over the past three years, Toronto Public Health (TPH) has carefully considered the need for a local community right-to-know program. TPH has researched substances in our local environment and identified 25 substances commonly used by industrial, commercial and institutional facilities that are of health concern. Based on research of similar programs in Canada and other countries, TPH has identified important gaps in the reporting and disclosure of information on these substances. TPH has also consulted City staff, other governments, businesses, residents, agencies representing workers, and health and environmental organizations about options that could work in Toronto.

Based on this research and discussion, TPH has developed an Environmental Reporting and Disclosure Program that would track and reduce key toxic substances present in Toronto's environment, and especially its air. The proposed program would require local businesses and City operations to track and publicly report their use and release of 25 substances of priority health concern, and support them in finding ways to reduce these hazardous substances. The program would not duplicate existing reporting programs, but rather would provide important new information that is not captured through the National Pollutant Release Inventory given its much higher reporting thresholds.

This technical report includes information on the rationale and benefits of the program and includes a draft bylaw, information on the 25 priority substances and a summary of recent stakeholder consultations.

Stakeholder feedback indicates that residents, community organizations and worker agencies strongly support mandatory reporting and disclosure, while the business community tends to oppose a regulatory approach. Although the proposed Environmental Reporting and Disclosure Program includes a bylaw, it reflects many of the business community's suggestions for how best to implement the program in a way that minimizes burden and maximizes benefits for affected facilities.

In March 2008, the Ontario government announced the development of a toxics reduction strategy that will include legislation to reduce toxic substances in the air, water, land, and consumer products. They have appointed an expert panel with representatives from the scientific and medical communities to advise which toxics should be the focus of immediate attention, action and reductions. The advice of the Panel will be considered by government in the development of proposed new legislation, which is expected to be announced later this summer. More information can be found at <http://www.ene.gov.on.ca/en/toxics/index.php>.

As the Province develops its strategy, TPH will work together with provincial colleagues to develop the areas of common interest and work toward a comprehensive toxics reduction program that considers Toronto's needs. This technical report, including a draft by-law, provides details on Toronto's proposed program and may guide the development of the provincial strategy.

Once more details are known, the MOH will report to the Board of Health on the extent of overlap, if any, between the proposed provincial program and the Toronto program, and recommend a course of action that meets the health needs of Toronto residents.

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1.0 Introduction

Toronto City Council has made commitments to expand community right-to-know to empower the public to know the location, sources and health effects of toxic substances in our city. Following these commitments, the Board of Health recommended in 2005 that the Medical Officer of Health (MOH) community right-to-know strategies, including regulation, that the City could implement.

Following extensive research and consultation with stakeholders, the MOH supports new efforts in Toronto to lower our exposure to 25 priority substances that are used and released by industrial, commercial and institutional facilities. TPH has developed this Environmental Reporting and Disclosure Program, which would require local businesses and City operations to track these substances, publicly report them, and find ways to reduce their use and release. This report presents the rationale and key elements of an Environmental Reporting and Disclosure Program and includes a draft bylaw.

The proposed program would address many of the health challenges unique to an urban centre like Toronto. For example, the majority of facilities using or releasing the priority substances are small or medium-sized, and are located within or close to residential neighbourhoods. The long-term cumulative exposure to substances from many facilities in close proximity to where people live creates significant potential for adverse health impacts.

The provincial government recently announced its intention to develop an Ontario-wide toxics use reduction program, and is expected to provide details of their program later this summer. As the Province develops its strategy, TPH will work together with Provincial colleagues to develop the areas of common interest and work toward a comprehensive toxics reduction program that considers Toronto's needs. This technical report, including a draft by-law, provides details on Toronto's proposed Program and may guide the development of the provincial strategy.

Once more details are known, the MOH will report to the Board of Health on the extent of overlap, if any, between the proposed provincial program and the Toronto program, and recommend a course of action that meets the health needs of Toronto residents.

2.0 Background

The Environmental Reporting and Disclosure Program has its origins in the City's 2000 Environmental Plan, in which City Council unanimously recommended that Toronto develop a community right-to-know bylaw that empowers community members to know the location, sources and health effects of toxic substances in their community. A right-to-know strategy was also included in the 2002 "Action Plan for Cancer Prevention in the City of Toronto" adopted by Council that year.

At its January 17, 2005 meeting, the Board of Health recommended that the MOH consider practical and effective community right-to-know strategies, including regulation, that the City could implement.

On June 19, 2006, the MOH presented the Board with a report entitled “Access to Environmental Information: Preventing Pollution, Avoiding Risks” that reviewed opportunities for increasing access to information on chemicals. The MOH concluded that despite existing reporting regulations and voluntary programs, there is a significant lack of data on toxic chemical emissions from Toronto facilities, and that additional reporting could stimulate pollution prevention to reduce potential exposure to these substances. The Board of Health requested further work and consultation with stakeholders on options for future action.

In June 2007, City Council unanimously endorsed its Climate Change, Clean Air and Sustainable Energy Action Plan. This plan included a recommendation to “request the Board of Health to develop a proposed reporting program for the use and release of toxic air contaminants and explore the reporting of greenhouse gas emissions.”

Most recently, the Board of Health recommended at its July 9, 2007 meeting that the MOH consult with the City Solicitor and key stakeholders and report in spring 2008 on a proposed bylaw that would require facilities to report to the City on the use and emissions of specified substances of priority health concern.

Community right-to-know programs exist around the world and collect and publish information about chemicals being used or released by facilities. These reporting programs complement other regulations aimed at reducing or managing chemicals by providing valuable data to governments, informing the public and stimulating businesses to prevent pollution.

Reporting programs can stimulate chemical reductions for several reasons. First, reporting requires facilities to carefully track chemicals. This provides a facility (a term that includes businesses, institutions and the City’s own buildings) with detailed data to help them identify inefficiencies and opportunities for improvements. Secondly, governments and industry associations commonly provide additional guidance to businesses to identify and implement measures to reduce chemicals or find safer alternatives. Finally, disclosing data introduces public scrutiny and enables communities to become informed and engaged in local health issues, which further motivates companies to reduce chemicals.

The National Pollutant Release Inventory (NPRI) is Canada’s primary reporting program. The United States has a similar national Toxics Release Inventory. Some states (e.g. Massachusetts and New Jersey) and municipalities (New York City and Eugene, Oregon) also have reporting programs that go beyond national requirements. Examples of facilities reporting to the NPRI include factories, electricity generation facilities and the City’s water and wastewater treatment plants.

Reporting programs can stimulate chemical reductions for several reasons. First, reporting requires facilities to carefully track chemicals. This provides a facility with detailed data to help them identify inefficiencies and opportunities for improvements. Secondly, governments and industry associations commonly provide additional guidance to businesses to identify and implement measures to reduce chemicals. Finally, disclosing data introduces public scrutiny and enables communities to become informed and engaged in local health issues, which further motivates companies to reduce chemicals.

In Canada, the NPRI has been credited with lowering emissions by 27 per cent (Harrison, K. and W. Antweiler, 2003) since it began in 1993. In the United States, emissions reporting to the Toxics Release Inventory have decreased by 46 per cent between 1988 and 1999. The Massachusetts Toxics Use Reduction Act enabled the state to meet its goal of reducing toxic waste generation by 50 per cent in just 10 years (Massachusetts Department of Environmental Protection, 2003).

These successful programs, however, only track large facilities and emissions. It is estimated that 9,600 facilities may be using or releasing chemicals in Toronto (Morgan, Christopher, 2006). However, these are mostly small or medium-sized facilities, which do not report to the NPRI because current reporting thresholds are high. In 2006, the most recent year for which data are available, only 352 Toronto facilities reported to the NPRI.

In a large urban centre like Toronto it is important to consider the total impact of chemical emissions on human health. Although use or emissions of chemicals from individual small and medium-sized businesses may seem inconsequential or within acceptable limits, the long-term cumulative exposure to chemicals from many facilities in close proximity to where people live creates significant potential for adverse health impacts.

TPH has carefully considered the need for a local community right-to-know program. Over the past three years, TPH has researched chemicals in our local environment, researched similar programs in Canada and other countries, and consulted City staff, other governments, businesses, residents, agencies representing workers, and health and environmental organizations about options that could work in Toronto. Background information, including Board of Health reports and technical research, can be found at www.toronto.ca/health/hphe/enviro_info.htm.

In January 2008 the MOH released a framework for an Environmental Reporting and Disclosure Program for public consultation. It proposed a new bylaw that would require local businesses and City operations to track and publicly report their use and release of 25 substances of priority health concern, and support for them to find ways to reduce these hazardous substances. The MOH sought feedback on this approach, implementation issues, access to the information and supports for affected businesses.

Throughout these consultations, stakeholders have communicated that for such a program to work, it must focus on substances of greatest health concern, minimize burden to affected facilities, ensure that the program supports business and the economic growth of Toronto, and provide public access to the information that is collected.

3.0 Benefits of Local Reporting and Disclosure

This report outlines a local Environmental Reporting and Disclosure Program that would have three key elements:

1. **Chemical use and emissions reporting.** A new bylaw would require affected facilities to report to the City each year if they use or release any of 25 priority substances above specified thresholds;
2. **Assistance for facilities.** The City would provide education programs, easy-to-understand reporting guidelines and tools to help facilities estimate data, report, and identify ways to reduce chemicals and prevent pollution; and
3. **Public access to information.** The City would make data available to businesses, governments, community agencies, workers and residents through a searchable website and annual summary reports.

This approach offers the City, its businesses and residents many benefits, including:

- tracking substances of greatest health concern in Toronto;
- stimulating facilities to pursue pollution prevention;
- complementing existing chemical regulations and initiatives;
- collecting important, local information that is currently not gathered;
- contributing to the greening of our local economy; and
- providing local information to Torontonians.

3.1 Tracking substances of greatest health concern in Toronto

Although many chemicals may be present in our environment from a variety of sources, the proposed program would focus on those that are of greatest concern for health in Toronto. TPH reviewed estimates of chemical emissions from facilities, local air quality data from Environment Canada and the Ministry of Environment, and referenced health benchmarks to identify 25 substances of priority health concern that will be tracked with this new program. These substances are identified in Figure 1. An Environmental Reporting and Disclosure Program would collect important data that are currently missing for these substances. TPH estimates that more than 80 per cent of emissions to air for TPH's 25 priority substances are not reported to the NPRI.

Figure 1: Priority substances to be tracked in the proposed program

Acetaldehyde	Formaldehyde
Acrolein	Lead
Benzene	Particulate matter 2.5 (PM _{2.5})
1,3-Butadiene	Manganese
Cadmium	Mercury
Carbon tetrachloride	Nickel
Chloroform	Nitrogen oxides (NO _x)
Chromium (hexavalent)	Polycyclic aromatic hydrocarbons (PAHs)
Chromium (non-hexavalent)	Tetrachloroethylene (perchloroethylene)
1,4-Dichlorobenzene	Trichloroethylene
1,2-Dichloroethane	Vinyl chloride
Dichloromethane	Volatile organic compounds (VOCs)
Ethylene dibromide	

These substances are commonly used in or released from industrial, commercial and institutional facilities, and occur in the Toronto environment at levels that may pose a risk to health. These health effects are most often the result of breathing in contaminated air. The effects of exposure differ from substance to substance but in general, air toxics are of particular concern with chronic (long-term) exposure, and are associated with serious health outcomes such as cancer and reproductive effects. In some cases the primary health concern may be associated with another route of exposure. Mercury, for example, is of primary concern to humans when it has accumulated in fish and the fish are then consumed by people. Appendix 1 summarizes TPH's approach to identifying these priority substances and provides an overview of each substance, the primary health outcomes from exposure, routes of exposure and their possible sources.

3.2 Stimulating facilities to pursue pollution prevention

Pollution prevention refers to the use of processes and practices that minimize the creation of pollution or waste. It is more environmentally sustainable and economically beneficial than end-of-pipe measures that control pollution once it has been created.

For facilities using chemicals, pollution prevention strategies include substituting a hazardous substance for a less-toxic alternative, adjusting processes to use chemicals more efficiently and recycling rather than disposal. These strategies typically involve up-front investments but result in ongoing cost savings. Figure 2 presents two case studies of pollution prevention at Toronto companies.

Figure 2: Pollution prevention case studies

Bowne of Canada, Ltd.

Bowne of Canada, Ltd. of Toronto specializes in high-value document management and print solutions for financial and corporate clients across Canada. Its environmental review and process changes included:

- Revisions to processes and investment in new equipment to minimize and recycle solvents used in washing and inks
- Annual reductions of 39,000 litres of chemicals, approximately 1,117,000 litres of water, and the elimination of 18 tonnes of VOCs.
- Eliminating Isopropyl Alcohol and exclusively using vegetable-based inks, which reduce its VOC emissions by 3,000 tonnes annually.

Through these changes, Bowne annually saves approximately \$143,000 in hazardous waste hauling charges, \$76,000 in chemicals purchase and \$1,400 in water charges.

S&C Electric Canada Ltd.

Since 1988, S&C Electric in Etobicoke used a hexavalent chrome seal in their paint-finishing operations to enhance corrosion protection. The company switched to a trivalent chrome seal in January 1999. This eliminated the need and expense of sodium metabisulfite to reduce the chrome and lowered their sulfuric acid usage by 82% and their caustic soda usage by 51% in their wastewater treatment operation. S&C also put in place systems to ensure environmental compliance and minimize internal resources for site inspections, which reduced resource time for on-site inspections and regulatory compliance. Also, there were fewer environmental, health and safety incidents.

Sources:

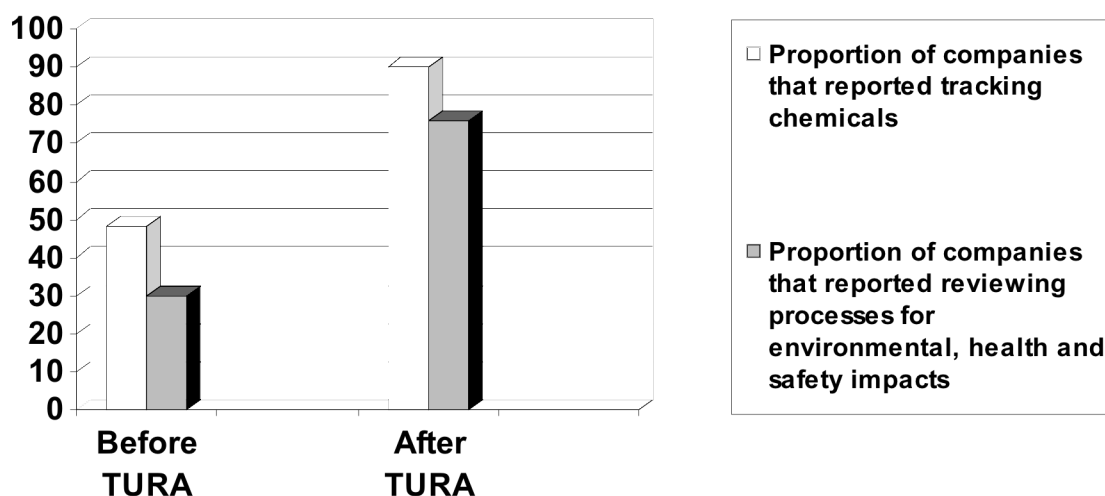
Bowne of Canada: <http://www.ec.gc.ca/pp/en/storyoutput.cfm?storyid=135>

S&C Electric: Canadian Manufacturers and Exporters <http://www.ic.gc.ca/epic/site/dir-ect.nsf/en/uw00951e.html>

Mandatory reporting often leads to the first ever assessment of chemical flows through a facility. This in turn can lead a facility to adopt environmentally-friendly technology and can often lead to cost savings and enhanced efficiency (United Nations Economic and Social Council, 2001). Reducing hazardous substances or substituting safer alternatives reduces costs associated with handling, disposal, worker health and safety and regulatory reporting.

The state of Massachusetts requires companies to report chemical use and release under its 1989 Toxic Use Reduction Act (TURA). In a 1996 survey of Massachusetts companies, 90 per cent reported that they were involved in tracking chemicals after TURA was in place, compared to 48 per cent before TURA (Abt Associates, 1997a), see Figure 3. Only 30 per cent of companies reported “reviewing changes in production processes for their environmental, health and safety impact” before TURA, but that proportion rose to 76 per cent after TURA was in place.

Figure 3: Change reported between 1990 and 1996 by Massachusetts companies as a result of the Massachusetts Toxics Use Reduction Act (TURA)¹



¹Adapted from Abt Associates 1997a (Environment Canada 2006)

Helping small and medium-sized businesses to adopt pollution prevention is a key benefit of the Environmental Reporting and Disclosure Program. Currently, many large companies that manufacture or handle chemicals have some tracking and pollution prevention programs in place. For the 2006 NPRI reporting year, approximately 30 per cent of the 9,000 Canadian facilities that reported indicated that they undertook some form of pollution prevention activity (Lopez, J et al., 2005). However, research and stakeholder feedback highlighted that small and medium-sized facilities often underestimate their environmental impact and seldom measure or track environmental data (Peters, Michael and R.K. Turner, 2004). Canadian small businesses have historically failed to engage in pollution prevention and modernization (Morgan, Christopher, 2006).

3.3 Existing chemical regulations and initiatives

The proposed provincial toxics use reduction initiative is expected to include new chemical reporting regulations. At this time, however, an Environmental Reporting and Disclosure Program would not duplicate reporting of existing federal, provincial and municipal regulations. TPH has reviewed the legislation:

- In June 2006, the MOH described how the program would fill important reporting gaps in chemical regulations in his report entitled, “Access to Environmental Information: Preventing Pollution, Avoiding Risks.”
- In response to perceptions about regulatory overlap identified during the January 2008 consultation, TPH contracted the Canadian Institute for Environmental Law and Policy (CIELAP) to review current and proposed chemical regulations. This review again confirmed no duplication in reporting. The CIELAP report can be found at www.toronto.ca/health/hphe/enviro_info.htm.

Currently, the NPRI reporting requirements offer the closest comparison to what TPH is proposing, and the proposed Toronto approach deliberately mirrors aspects of the NPRI to avoid duplication for larger facilities. For NPRI reporters in Toronto, TPH would aim to create a linkage with the federal One Window for National Environmental Reporting System (OWNERS) so reporting can be done simultaneously, without duplication. Some stakeholders specifically identified Ontario *Environmental Protection Act* requirements for facilities to possess Certificates of Approval (C of A) as an example of reporting overlap for air emissions. Most C of As require an annual status report to the province but do not require the detailed annual reporting of chemical usage and emissions that would be required under the proposed Toronto program.

TPH has also considered whether other chemical regulations to reduce priority substances overlap with the proposed Environmental Reporting and Disclosure Program. TPH sees some common objectives but no overlap with certain policies, particularly federal regulations to minimize the use of tetrachloroethylene by drycleaners and minimize volatile organic compounds (VOCs) in certain products and processes. The impacts of these regulations will not address the full spectrum of facilities and sectors that may use and release VOCs and tetrachloroethylene in Toronto. Furthermore, the information that facilities collect under these federal requirements would help them to easily estimate usage and emissions for Toronto's program. TPH would phase in its reporting requirements to allow collaboration with affected sectors to ensure integration with these federal programs.

In March 2008, the Ontario government announced the development of toxics legislation and a toxics reduction strategy that will require companies that emit toxic substances to reduce emissions over time. The provincial government is expected to announce details of the new policy soon. TPH will continue to consult with the Ministry of the Environment on potential synergies between these programs.

3.4 Collecting important, local information that is currently not gathered

The Environmental Reporting and Disclosure Program would collect data on 25 priority substances from facilities in neighbourhoods throughout the city. No current regulations or voluntary initiatives provide such complete and systematic data.

It is estimated that 9,600 facilities may be using or releasing chemicals in Toronto (Morgan, Christopher, 2006). The NPRI only provides regular and publicly accessible information from approximately 350 of these facilities. The proposed Environmental Reporting and Disclosure Program would track and disclose chemical use and emission data from a larger number of facilities, which will help the City, residents and businesses measure progress in reducing pollution.

3.5 Contributing to the greening of our local economy

A strong economy contributes to income equality, employment, job security and working conditions, which are key social determinants of an individual's health. The proposed program can provide economic benefits to businesses and the community.

A survey of companies participating in the Massachusetts Toxic Use Reduction Act (TURA) demonstrated economic benefits (see Table 1). Between 1990 and 1997, the total cost to all companies from TURA was estimated to be \$76.6 million and the total benefits to be \$90.5 million. This estimate did not include additional benefits, such as human health and ecological benefits from reducing chemical exposure, increased revenue to businesses, and the value of the TURA data to the public. At the facility level, only 40 per cent of facilities reporting to TURA experienced a change in overall costs as a result of TURA activities; of those, 64% reported net reduction in costs, while 8 per cent reported a mix of increases and reductions.

In New Jersey, which has a state-wide reporting program, the Department of Environmental Protection has observed that environmental data saves most companies much more than it costs to collect (Natan, T. et al , 1996).

Table 1: Economic costs and benefits to facilities between 1990 and 1997 under Massachusetts Toxics Use Reduction Act¹

Costs*	
Compliance costs - includes form preparation, pollution prevention plan development, TURA fees	\$49.4 million
Capital investments	\$27.1 million
Total costs	\$76.6 million
Benefits*	
Savings in operating costs	\$88.2 million
Federal grants to TURA program for TUR activities in Massachusetts	\$ 2.3 million
Total benefits	\$90.5 million

¹Adapted from Abt Associates 1997b

*Includes only monetized costs and benefits

TPH recognizes that the economic benefits of pollution prevention typically necessitate some additional costs by facilities. Technological changes commonly require upfront investments that are paid off through increased efficiencies. The Toronto Region Sustainability Program, which helps manufacturers identify pollution prevention options, indicates significant return on investment, and a payback time from implementing certain improvements can be less than a year (Ontario Centre for Environmental Technology Advancement, 2005).

Facilities new to reporting may incur initial costs, but the experience of other reporting programs suggests that costs decrease significantly after the first reporting year, as facilities become familiar with the reporting and submission process costs. TPH would aim to minimize any initial burden of preparing to track and report substances by assisting facilities throughout the process. The program would also be phased in to allow TPH staff to help facilities scan for the 25 substances, do the calculations to estimate use and emissions, report the data, and learn about best practices for pollution prevention.

There is no evidence from other reporting programs to indicate that reporting toxics use and release could hamper strategic directions such as growth, creativity, labour force development, transportation, or promotion of Toronto. Most likely, the Environmental Reporting and Disclosure Program would complement the City's other new initiatives, such as the Climate Change, Clean Air and Sustainable Energy Action Plan, the Green Economic Development Strategy, the Prosperity Agenda and the Pearson Eco-Business Zone. All of these programs are examples of new initiatives that foster the growth of new "green" businesses, support environmental innovation, expand key industry sectors and enhance information sharing between businesses. The Environmental Reporting and Disclosure Program could add value to these efforts in several ways:

- It would gather data on the 25 substances of greatest health concern, which could help identify priorities or opportunities for the City's other "greening" programs.
- It would collect data that will enable the City, businesses and the community to track environmental progress.
- It would engage the public in the greening of Toronto's economy. Public awareness on environmental issues and concerns over pollution and chemicals have increased demand for environmentally-friendly products and services. This demand provides incentives for local businesses, from large manufacturers to small auto body shops, to evaluate their processes and make environmental improvements.
- It would create opportunities for TPH and other City divisions to explore incentives for businesses to encourage and reward their participation in various initiatives.
- It would foster regular communication between the City and Toronto businesses, particularly small and medium-sized facilities. Business stakeholders identified their preference for streamlined, clear communication with the City on this and other programs. The Environmental Reporting and Disclosure Program could link into services such as BizPal (www.toronto.ca/business/index.htm) to expand this "one window" link with governments.

3.6 Providing local information to Torontonians

Public access to information (the community's "right to know") is key to stimulating pollution prevention and consistent with City Council's commitments to openness and transparency.

Making data publicly available can stimulate pollution prevention because information can help government regulators identify environmental priorities and work with companies to develop pollution prevention programs (Bierle, Thomas C, . 2003). Also, companies' desire to improve their image to shareholders, regulators and the public also drives environmental improvement, often beyond that which might be stimulated without public disclosure (Afsah, Shakeb et al, 2000).

Over 400 Toronto residents submitted comments on the January 2008 program proposal, indicating their desire for easy access to information collected through this new program. Toronto Public Health would develop a searchable database and publish annual reports that will present data, maps and contextual health and environmental information.

Residents and businesses have urged TPH to provide the information in a way that is accessible and understandable to all users, and reduces the possibility for misinterpretation. For accessibility

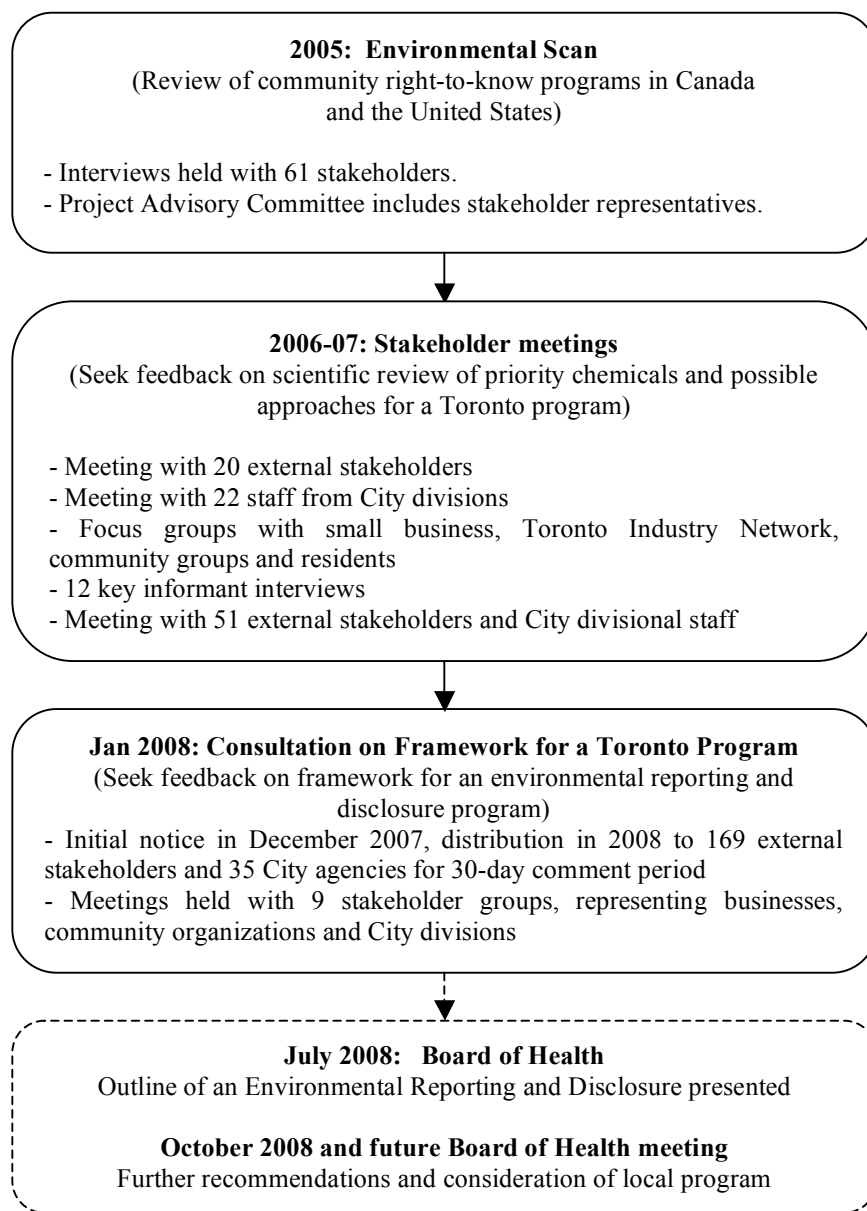
and clarity, TPH would provide an annual report on the internet and public libraries that compiles and interprets the data, and will provide summaries in the top languages spoken in Toronto. Residents would also be able to search an internet database for facility data that would be linked to third-party information on the chemicals and their potential health and environmental impacts. TPH would consider ways to make this database accessible to residents for whom English is not their first language, such as partnering with community agencies on public education programs. In addition, facilities would be invited to submit information about pollution prevention programs to provide context to the data that is published.

TPH appreciates concerns expressed by some stakeholders that the disclosure of information could compromise corporate confidentiality or disclose information that could be used for criminal purposes. The draft bylaw contains a provision for the protection of information that may be deemed confidential under the *Municipal Freedom of Information and Protection of Privacy Act* (MFIPPA). With regards to security issues, Environment Canada staff indicate no security concerns with disclosing NPRI data. In fact, reporting programs are often seen to increase safety because industries can use data to identify opportunities to substitute hazardous substances for less toxic ones, making their sites inherently safer in the event of an emergency. In the United States, for example, a recent review of federal Risk Management Plans identified that many facilities reduce or eliminate hazardous substances as a way of reducing the risks that may result from an accident or terrorist attack (Orum, Paul, 2006).

4.0 Overview of Stakeholder Consultation

TPH has consulted extensively with businesses, residents, community organizations, agencies representing workers, governments and City staff throughout the development of the proposed Environmental Reporting and Disclosure Program (see Figure 4). Consultation to date has included interviews, focus groups and meetings.

Figure 4: Overview of stakeholder consultation to date



4.1 Summary of feedback from January 2008 consultation

In January 2008, the MOH released a draft framework for a reporting and disclosure program to stakeholders for a 30-day comment period. The framework reflected previous feedback from stakeholders. The consultation process and stakeholder responses from this consultation as well as details about incorporation of the feedback into the proposed Environmental Reporting and Disclosure Program are described in Appendix 3.

The MOH received 540 written submissions on the proposal:

- 461 from residents
- 33 from community organizations, including health and environmental groups and ratepayer associations
- 6 from agencies representing workers, such as unions and occupational health clinics
- 30 from businesses or business associations
- 10 from City agencies, boards, commissions, corporations and divisions (ABCCDs).

Residents, community organizations and worker agencies overwhelmingly supported the proposed program. The most common reasons given were protecting health, promoting environmental sustainability, improving workplace safety, informing choice, educating and influencing businesses, and enhancing policy. Many offered suggestions for ensuring that the information was made easily available to users.

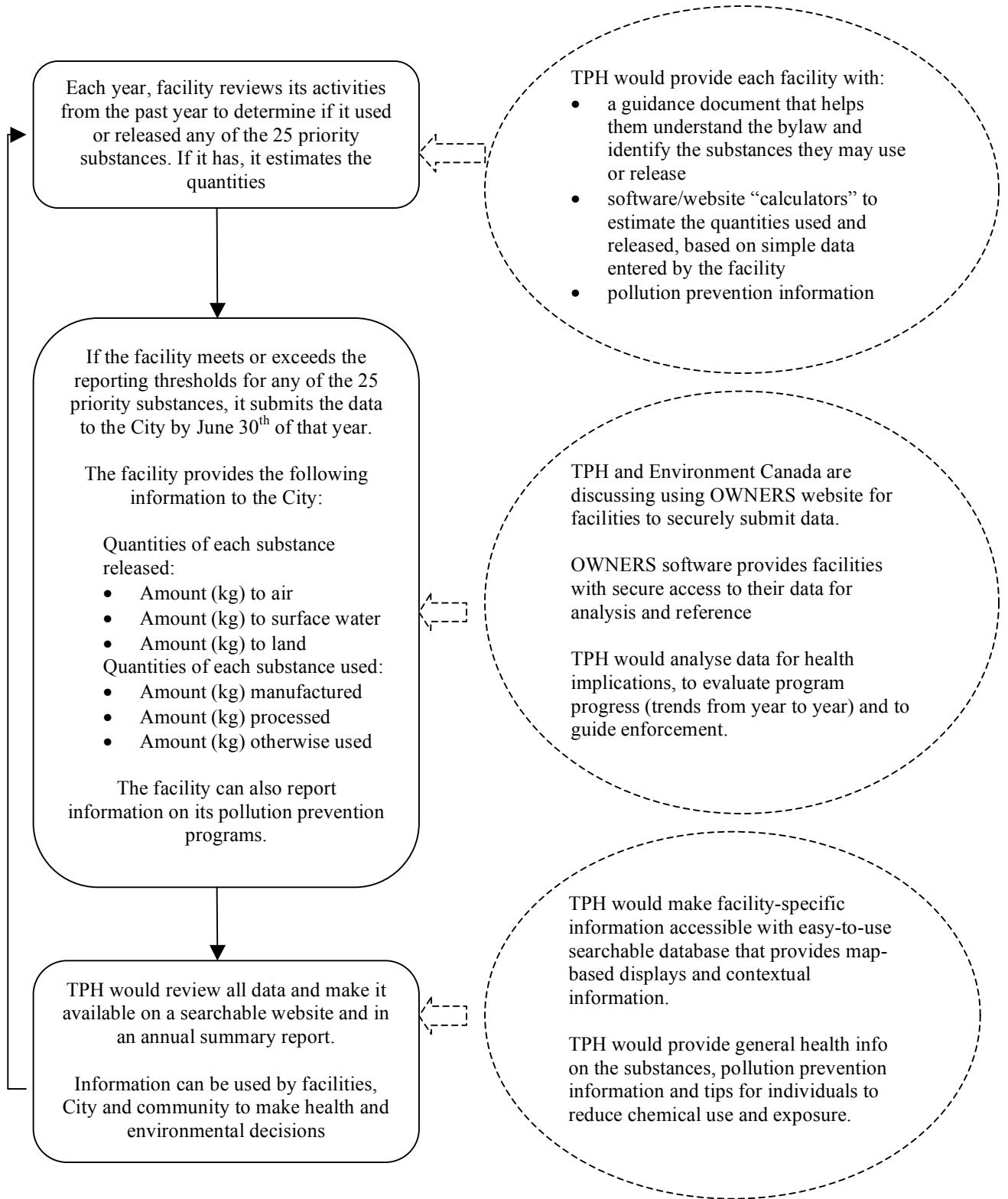
Most businesses and business associations supported the program's intent but opposed the introduction of a bylaw on a local level. Many expressed the need for further clarification on certain elements of the program. Businesses cited duplication with existing reporting laws, overlap with the goals of current regulations, and economic and administrative burden as their reason for opposing a new bylaw. Despite this, many businesses offered helpful suggestions for engaging businesses within and outside of a regulatory approach. Overall, City ABCCDs support the program's intent but some strongly favoured voluntary initiatives over a bylaw.

Stakeholder response to the January 2008 consultation document clearly demonstrates a high level of interest in environmental reporting and disclosure. Although there is disagreement between most businesses and the community regarding the best approach for Toronto, most stakeholders support the program's goal to reduce exposure to priority pollutants and encourage environmental innovation. Although the proposed Environmental Reporting and Disclosure Program includes a bylaw, it reflects many of the business community's suggestions for how best to implement the program in a way that minimizes burden and maximizes benefits for affected facilities.

5.0 Overview of an Environmental Reporting and Disclosure Program

TPH has developed the Environmental Reporting and Disclosure Program to meet Toronto's needs. It draws from successful reporting programs in Canada and the United States, such as Canada's National Pollutant Release Inventory, Massachusetts' Toxics Use Reduction Act and the Toxics Right-to-Know Bylaw in the town of Eugene, Oregon. Figure 5 provides an overview of the program, which is comprised of a new bylaw and supporting elements.

Figure 5: Overview of an Environmental Reporting and Disclosure Program



6.0 A New Bylaw

A key part of the program is a new bylaw that would require facilities to submit annual data to the City on their use and release of any of the 25 priority substances above specified thresholds. Legal Services has prepared a draft bylaw, which is attached as Appendix 2.

The bylaw identifies the priority substances, their reporting thresholds, what information must be reported, which facilities and activities are exempt from reporting, public access to the information, and penalties.

Under the bylaw, a facility would review its processes each year to see if it used any of the 25 priority substances or if any of them were released to the environment. TPH would provide resources, such as electronic tools and written guidance, to help a facility identify chemicals and whether or not it needs to report. If the company used or released any of the substances above a certain amount (known as a “reporting threshold”), then it will have to provide this information to the City.

Facilities exceeding thresholds would have to report quantities of each chemical released into the environment (air, surface water and land) and quantities of each chemical used (defined in the bylaw as “manufactured, processed or otherwise used”).

6.1 Who has to report

Any facility that uses or releases any of the priority substances may have to report. The need to report depends on the amounts and sources of substances used or released. As an example, facilities in the following sectors may have to report because they typically use or release one or more of the priority substances:

- food and beverage manufacturing
- clothing manufacturing
- printing and publishing
- chemical manufacturing
- wood industries
- other manufacturing
- chemical distribution
- waste management
- medical and diagnostic laboratories
- automotive repair and maintenance
- laundry services, including dry cleaning
- funeral services

Some types of facilities and certain uses of substances would be exempted from the reporting requirements of the program. The bylaw has two types of exemptions:

- Sector exemptions - homes and specific types of businesses, such as stores, medical offices and construction sites would not have to report;

- Source exemptions - a business would not have to report substances used or released from specific sources within their facility, such as routine janitorial or maintenance activity, vehicle emissions, space and water heating, and personal use by employees.

TPH considered several factors to determine what exemptions would be appropriate, including how much the chemical or the type of business likely contributes to pollution or personal exposure and minimizing reporting for “minor” uses. In addition, stakeholder feedback in January 2008 resulted in some revisions to the exemptions. For example, TPH has mirrored the NPRI by exempting vehicle repair shops that perform routine maintenance like oil changes or brake repairs, but requiring reporting from those painting and remanufacturing, like auto body shops. Hotels continue to be exempted but those that operate laundry or drycleaning operations are included in the program.

6.2 Reporting Thresholds

Schedule “A” of the draft bylaw identifies the chemical reporting thresholds. TPH reviewed other reporting programs in North America and Europe and considered the nature of our city’s businesses and our program goals to determine the thresholds that would trigger reporting for facilities. TPH considered two types of thresholds commonly used in other programs: number of employees and chemical quantities.

Canada’s NPRI, the Massachusetts TURA and most other reporting programs only require data from large facilities, defined as having the equivalent of 10 or more full-time employees. TPH is not proposing a threshold based on number of employees because it wants to track and reduce substances from all sizes of facilities in Toronto. While a single facility may not have a large impact, taken together they can have significant environmental impacts and can benefit from pollution prevention activities.

The NPRI has a substance reporting threshold of 10,000 kg for most of the chemicals tracked, and lower thresholds for the most toxic substances, such as lead (50 kg) and mercury (5 kg). As a result of these high employee and substance thresholds, only 3 per cent of Toronto facilities using chemicals report to the NPRI. New York City and Eugene, Oregon have reporting thresholds as low as 1kg. TPH is proposing a reporting threshold of 100 kg per year for most substances, which is 100 times lower than the NPRI. Chemicals considered to be extremely hazardous have lower thresholds.

6.3 Phased-in Education and Enforcement Timeline

As currently designed, the bylaw’s reporting requirements would be phased in over five years if enacted by City Council. For example, if the bylaw was enacted in 2009, 2010 would be the first year in which certain facilities would be required to track chemical data, and the deadline for reporting 2010 data would be June 30, 2011. TPH would review the data and aim to make it publicly available by the end of each year.

A phase in will allow facilities, particularly small and medium-sized ones, to learn about the bylaw and ways to track and estimate chemicals. It also allows TPH to develop its bylaw guidance document, sector specific pollution prevention guides and to educate facilities about the program.

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The phase in would be sector-based and facilities would be identified using the North American Industry Classification System (NAICS), a categorization system developed jointly by Canada, the United States and Mexico. In the first year, TPH would require reporting from sectors that are predominantly comprised of larger facilities or have more pollution prevention and data estimation tools available to them, as they would require the least amount of preparation time. TPH anticipates that as many as 2,500 facilities would begin reporting each year, and when fully implemented there could be as many as 5,000 to 7,000 facilities engaged.

If passed by City Council, education and enforcement of the bylaw could occur through the following process:

Year One:

The first phase would focus on education to all facilities about the purpose of the bylaw and their potential requirements for reporting. The education would provide information about how to determine if they are using the priority substances and how to determine reporting thresholds. The first phase would also include additional supports to the following sectors, which would be required to collect data in, for example, 2010 for reporting in 2011:

- food and beverage manufacturing
- printing and publishing
- chemical manufacturing
- wood industries
- power generation

Education information would be provided to facilities that may be required to report. TPH would consult Economic Development, Culture and Tourism and Toronto Water to develop complete lists of Toronto facilities that may be affected by this program.

Year Two:

Education would continue for all facilities, particularly those beginning reporting in, for example, 2011 and 2012:

- chemical wholesale
- waste management and remediation services
- medical and diagnostic laboratories
- dry cleaning and laundry services
- automotive repair and maintenance
- funeral services

Year Three:

All remaining facilities would be required to report.

Enforcement during the later phases of the bylaw would occur through periodic “paper audits” of the facilities that were expected to report. An audit would be done to ensure the facility determined the use of the priority substances and reporting thresholds. An information letter would be sent to the facility requesting confirmation of their assessment and threshold calculations. If the information is not obtained, enforcement would escalate to a warning or, under the Provincial Offences Act, a facility may be issued a ticket or a summons to appear in

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court. A company that knowingly submits inaccurate data or does not submit the data requested by the Medical Officer of Health would be guilty of an offence and is liable to a fine of not more than \$5,000 for a first offence; \$25,000 for a second offence; or \$100,000 for a third or subsequent offence.

In addition, periodic audits would be conducted on the reports submitted by the facilities. The bylaw would require companies to retain the information for a minimum of three years from the date the report is submitted and, upon request, provide it to the medical officer of health for audit purposes. Facilities would be contacted by TPH staff, if needed, to clarify the information. This desktop audit would be conducted by TPH staff trained to review the accuracy and completeness of the data reporting by the facilities.

7.0 Supporting Elements and Implementation Aspects of the Program

TPH would coordinate the implementation of the Environmental Reporting and Disclosure Program. Where possible, TPH would draw on the expertise of City divisions, the business community, worker agencies and community organizations to implement the program. For example, TPH would consult affected business sectors to create training resources and deliver outreach programs for affected facilities. TPH is also continuing to collaborate with Environment Canada's NPRI team to identify successful outreach, data management and communication approaches. TPH would also draw on worker and community representatives to ensure the engagement of workers and residents.

7.1 Bylaw guidance document and pollution prevention guides for facilities

TPH is developing a "bylaw guidance document" to accompany the bylaw that will provide facilities with:

- questions and answers about the bylaw, such as who must report and what information must be reported;
- common sources and activities that involve the 25 priority substances;
- lists of tools to help estimate quantities of substances used and released; and
- how to report data.

The guidance document is what most facilities would consult on a regular basis and prior to reporting. TPH will update it as needed to reflect user feedback and technological innovations, such as new tools to estimate emissions. It could be made available in different formats (e.g. CD-ROM, website, hard copy) to enable facility operators to comply with the program. A draft version of the bylaw guidance document, entitled "Understanding the Environmental Reporting and Disclosure Bylaw" is available at www.toronto.ca/health/hphe/enviro_info.htm.

TPH will also produce sector-specific pollution prevention guidance that will provide facilities with detailed information about the substances they may use and options for environmental best
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practices. TPH is consulting with technical experts, local business representatives, Toronto and Region Conservation, Toronto Water and Economic Development, Culture and Tourism, on how to best develop and market these guides.

7.2 Data Reporting and Management

TPH and Environment Canada are discussing using the federal OWNERS reporting system to enable facilities to submit data. TPH Information & Technology will collaborate with Environment Canada to develop a secure, robust data reporting and management system. The program would be phased-in to allow TPH and its partners to make this system operational in time for reporting.

TPH would create a new website and database to serve as the primary point-of-contact for all users (businesses, community, etc.) of the program. Environment Canada's OWNERS website would serve as the reporting mechanism for facilities.

Facilities would use the City website to:

- find easy-to-understand information about the bylaw, including guidance documents and program updates for the current reporting year;
- calculate usage and release estimates based on entering simple data or linking to tools provided; and
- link securely to OWNERS to submit data and, if desired, contextual information on the facility's pollution prevention activities.

The community could use the City website to:

- search for data on a facility, a chemical or a neighbourhood
- view data using map-based software that includes linkages to information on toxicological and health data of the substances;
- review annual summary reports;
- access information about other sources of pollution and how to reduce their personal use of chemicals; and
- link to other environmental information related to the City.

7.3 Disclosure of Information

The data collected through the Environmental Reporting and Disclosure Program would be made publicly available and be used to support business innovation and TPH research, education and health policy.

The proposed online system would allow individuals to search and summarize information according to their preferences. For example, users could search data by facility name, chemical, neighbourhood or other attributes. A mapping tool would present the information in geographic format. The website would also link to pollution prevention information provided by the facilities and health and environmental effects associated with the priority substances.

TPH would also create an annual summary report of the data, which could include release trends over time, by sector, chemical and neighbourhood. The report format allows for full and transparent descriptions of TPH analysis methods and interpretation of results. TPH would also collaborate with the Toronto Environment Office to ensure local NPRI data is integrated into the annual summary report.

Under the *Municipal Freedom of Information and Protection of Privacy Act* (MFIPPA), most information submitted to the City would be made publicly available. MFIPPA includes provisions to protect the confidentiality of certain personal or financial information, but data on the use and emissions of substances would not be considered confidential. TPH does not anticipate that this provision will significantly limit information disclosure, as experience from reporting programs in Canada and the United States indicates that less than one per cent of facility reports contain confidential information (Commission for Environmental Cooperation, 2002).

7.4 Evaluation

A framework for evaluation has been developed based on the "program logic model" shown in Appendix 4. A logic model is a tool that outlines how a program would be evaluated, which helps to identify at the outset what indicators and data to collect.

The stated goal of the by-law is to protect the health of Toronto residents by reducing their exposures to toxic substances. TPH would evaluate progress towards this goal by measuring indicators such as levels of air toxics present in Toronto's air, numbers of facilities who report, trends in reported data and the public's interest in this information, which would be gauged, for example, by number of hits on the city's web pages related to reports on the Environmental Reporting and Disclosure program.

8.0 Next Steps

It is important that action be taken to reduce exposure to the 25 priority substances in Toronto and to assist local businesses to pursue environmental best practices. TPH will continue discussions with the Ministry of Environment to learn more about the province's emerging toxics use reduction strategy so as to ensure that the proposed Toronto program does not conflict with or duplicate the provincial program.

More details of the provincial program are anticipated to be released soon. The MOH will report in October 2008 on the status of the provincial program and, as soon as details of the provincial program are known, on the extent of overlap, if any, between it and the City's proposed program. Based on the extent to which the provincial program addresses the health needs of Toronto's residents, the MOH will make recommendations on the appropriateness of adopting the proposed Environmental Reporting and Disclosure Program for Toronto.

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Appendices

- Appendix 1: Health Rationale for 25 Priority Chemical Substances
- Appendix 2: Draft Environmental Reporting and Disclosure Bylaw
- Appendix 3: Feedback from January 2008 Stakeholder Consultation
- Appendix 4: Evaluation Framework

Appendix 1: Health Rationale for 25 Priority Chemical Substances

In an urban environment like Toronto, the public's health may be affected by a number of environmental factors, including chemicals that local businesses and government operations use or emit to our air, land or water. Toxic substances are released in Toronto in vastly different quantities ranging from a fraction of a tonne to over 5,000 tonnes per facility each year. These substances also vary in their toxicity. Some substances are extremely toxic such that even very small quantities can pose a significant health risk if present. Individuals who are exposed to these toxic substances may suffer from a range of health concerns. These are varied and include, for example, neurological symptoms, respiratory illness and cancer.

Toronto Public Health (TPH) conducted research and consulted with City staff and external stakeholders on options to reduce health risks from pollution through enhanced reporting and access to environmental information (also known as "Community Right-to-Know"). It was established that there is an increased need for environmental reporting in Toronto. The need to increase environmental reporting was based on whether current reporting is capturing the majority of substances released. Data that were readily accessible to the public were used to estimate the total emissions and the gaps in reporting of emissions of substances of concern.¹ The gaps in reporting were estimated by a team led by Marshall Macklin Monaghan and Dr. Harvey Shear of the University of Toronto. The study method and findings are described in detail in the report "Substances of Concern, Release and Transfer Reporting in Toronto: Analysis of Gaps" available at http://www.toronto.ca/health/hphe/enviro_info.htm. The analysis provides estimates of the amount of substances released (emitted),² transferred and used, by substance and by sector. The gaps in reporting were estimated as the amounts released by weight. No estimates were made of storage of substances because no databases or methods were available to provide estimates.

Furthermore, TPH examined a variety of chemical substances that may be released from institutional, commercial and industrial operations in the city and identified toxic substances of priority health concern. These substances occur in the Toronto environment at levels that may a risk to health. (TPH Board of Health Report, July 2007)

Human Exposure

Once released the contaminant must travel through the environment from its sources to reach the human body, described as the exposure pathway. Air is a dominant pathway of concern from

¹ Substances of concern are defined as those substances that are reported to the National Pollutant Release Inventory.

² Releases – refers to the amount of chemicals or toxic substances that are released from sites into the environment through:

- a) Air emissions from point sources (example, stacks), operational losses, fugitive emissions, spills and accidents;
- b) Discharges to surface water either through direct discharge, leaks or spills; or
- c) Discharge or disposal to land within the site.

point source releases to air, water, and land. Furthermore, individuals are consistently exposed to contaminants via this pathway as they must constantly inhale the air.

Although, an individual may be exposed to a substance the dose that finally ends up in the body ultimately has the impact on health. Recent studies have indicated that some of the established priority substances have been measured in people. The United States Centre for Disease Control (US CDC) published exposure data related to a series of chemicals or classes of chemicals in their Third National Report on Human Exposure to Environmental Chemicals. The report measured for 148 chemicals in the American population, and it was established that levels of cadmium, lead, mercury, and PAHs could be detected. Similarly Environmental Defence, measured cadmium, lead, mercury and VOC levels in a smaller sample of Canadian individuals, and found detectable levels of all these substances in their participants, which was documented in their report Toxic Nation: A Report on Pollution in Canadians. Statistics Canada will shortly be conducting The Canada Health Measures Survey which intends on measuring mercury, lead and cadmium, which may give a better indication of health risk for residents of Toronto.

Human Health and Air Pollution

Over the last decade, a large body of scientific evidence has accumulated which confirms that acute exposure to low levels of air pollution, such as those experienced in Toronto, can produce a wide range of health outcomes including reduced lung function, acute bronchitis, asthma attacks, an increase in the number of emergency room visits and hospitalizations for respiratory and cardiovascular conditions, and elevated mortality rates.

Several long-term studies have indicated that chronic exposure to low levels of air pollution can increase the risk of developing lung cancer and ischemic heart disease. Chronic exposure can also permanently affect lung function, elevate mortality rates, and reduce life expectancy as well (Pope, 2002; Gauderman, 2000; Hoek, 2002). A large number of these studies have indicated that children, the elderly and those with pre-existing conditions, such as asthma, diabetes, and congestive heart failure, are more susceptible to the negative impacts of air pollution (Gent, 2003; Gauderman, 2000; Gong; 1997; McConnell, 2003; Steib, 2002).

Furthermore, scientists have long recognized that air pollution contributes to a 'pyramid' of health effects with the least common but most serious health outcomes appearing at the peak of the pyramid and the less serious but more numerous health outcomes such as asthma symptom days and respiratory infections, appearing in progressive levels below that peak.

Based on the current burden of illness study, Toronto Public Health estimates that air pollution in our city contributes to about 1,700 premature deaths and 6,000 hospitalizations on an annual basis. The current mortality estimate is based on the health risk associated with exposure to the criteria air contaminants that is, ozone, nitrogen dioxide, carbon monoxide sulphur dioxide, and fine particles (PM_{2.5}). Three of these have either been identified as priority substances, or are a product of priority substances. Scientific studies by others have demonstrated that fine particles are associated with chronic endpoints such as cancer (TPH, Air Pollution Burden of Illness in Toronto).

The remainder of priority substances are considered air toxics which occur in the air in much smaller amounts than 'criteria' pollutants, but which are much more potent in terms of adverse impacts. In general, air toxics are of particular concern with chronic (long term) exposure, and are associated with serious health outcomes such as cancer and reproductive effects.

Cancer and Environmental Pollutants

Cancer is of particular concern as it is second only to circulatory disease as the leading cause of death in Toronto, and it is a common risk from many of the toxic substances found in the city. Between 1991 and 1995, cancer was responsible for an average of 4,620 deaths each year in Toronto. While cancer incidence increases as the population ages, approximately 40% of new cancer cases occur in Toronto residents who are between the ages of 20 and 64. Cancer rates in young adults, 20-44 years are also on the rise. Cancer in childhood is rare but it is the most common illness related cause of death in children ages 1 to 19 years. While there has been a significant improvement in the survival rate of children with cancer in the last twenty years, there has been no consistent decrease in the incidence of childhood cancers in Canada.

A number of “known and probable human carcinogens” are present in outdoor air and in other media to which the general population is regularly exposed. In communities with large point sources of carcinogens, where adjustments have been made for tobacco and occupational exposures, the risk of lung cancer is proportional to the proximity of the household to these point sources. (TPH, Ten Key Carcinogens in Toronto)

Priority Substances

The substances of priority health concern, identified by TPH (TPH Board of Health Report, July 2007), are found in Toronto’s environment at unacceptably high levels at which adverse effects may be occurring. These adverse effects differ considerably from substance to substance. Cancer is a health outcome of concern related to many of the priority substances.

These health effects are most often the result of breathing in contaminated air. However, in some cases due to the nature of the chemical, the primary health concern may be associated with another route of exposure. Mercury, for example, is of primary concern to humans when it has accumulated in fish and the fish are then consumed by people.

Approach to Establishing Health Priorities for Enhanced Environmental Reporting In Toronto

Two complementary approaches were used to identify priority substances for enhanced environmental reporting based on the potential health impact to Toronto residents. (see Process to Identify Priority Substances of Health Concern for Enhanced Environmental Reporting: Technical Summary (<http://www.toronto.ca/health/hphe>).

1. Estimated emissions data were assessed using a health-based ranking scheme

Using the estimates of chemical emissions from facilities in Toronto, TPH applied a ranking scheme known as Toxicity Equivalence Potentials (TEP), which is based on a method developed at the University of Berkeley, California (Hertwich et al., 2001). The method uses estimates of the amount of substances released and then:

- Considers the movement of the substance (from point of release to contact with a person);
- Factors in the toxicity of the substance (cancer and non-cancer effects); and
- Provides a risk score (to enable comparison of substances with different toxicities).

The method was developed to compare the potential health impact of substances by combining the amount of the substance released with its toxicity. In this risk scoring system, all releases of substances are converted into a common unit of TEPs (related either to benzene [carcinogen] or toluene [non-carcinogen]). The individual TEPs generated for each substance can be compared between substances, businesses, sectors, years, and policy-scenarios, thereby providing a ranking of the toxicity-weighted releases. Table 1 presents the substances of priority health concern based on; the amount released to air, their TEP value (their relative toxicity to benzene for carcinogens and toluene for non-carcinogens), and their resultant TEP scores. The higher the TEP score number, the higher the health risk associated with release of the substance. Each value is followed by a number in brackets. This number is the ranking of the substance relative to the 96 substances that were included in this analysis.

TPH found that much of the risk associated with air emissions in Toronto can be attributed to three substances: mercury, cadmium, and lead. These three substances are released in relatively small quantities in Toronto's air. However, they are very toxic substances.³ When air emissions are ranked by toxicity, cadmium, mercury and lead are the most important to health.

2. Current air quality data were compared to health-based benchmarks

TPH obtained air quality data from Environment Canada and the Ontario Ministry of the Environment (OMOE).⁴ We used air quality data of samples taken from Toronto to assess whether there were any toxic substances in Toronto air that currently exceeded health-based benchmarks. We used the health-based benchmarks developed by California Environmental Protection Agency (CalEPA) and the OMOE (described below).⁵

A substance was considered a priority if the maximum air concentration measured in Toronto's air exceeded either the CalEPA health-based benchmarks or OMOE ambient air quality criteria (AAQC).⁶ Table 2 presents the substances of priority health concern with the exposure ratio for

³ Cadmium and lead are carcinogens. Mercury and lead are neurotoxins.

⁴ The air data were provided by Tom Dann, Environment Canada. The air samples were taken between 2003 and 2005 at three NAPS stations in Toronto. The sample sizes were different for contaminant classes (VOC = 616; metals = 281; PAHs = 183). Criteria air contaminant concentrations were taken from the OMOE's annual summary on criteria air contaminants (CACs) in Ontario for 2005. The OMOE uses continuous monitoring instruments. There are five sample sites in Toronto. Only four of these samples were used because one is 444 metres above ground (CN Tower) and not considered relevant to human exposure. Mercury air concentrations were taken from Senes. 2000. Report on Ambient Air Monitoring and Source Testing at the St. John's Norway Crematorium. Senes Consultants Limited. Only three samples were available.

⁵ The CalEPA toxicological database was used (unit risk and chronic reference exposure levels [CRELs]) because it is a reputable source of toxicological information and it provides more complete coverage of substances of concern. The OMOE ambient air quality criteria (AAQC) were used because of its regulatory relevance to Toronto.

⁶ The maximum air concentrations were used in this assessment because there were limited sample sites and it is known that the average concentrations at these sites can underestimate the air concentrations of contaminants to which people are exposed (TPH, 2005). Thus, TPH used the maximum air concentration measured in order to be health protective.

the substances concentration in Toronto's air compared to a health-based benchmark. The benchmark that is exceeded is also presented in Table 2.

We identified substances that currently exceed health-based benchmarks in Toronto's air. These substances are often found in Toronto's air at levels that exceed one-in-a-million cancer risk and/or a level at which unacceptable adverse effects may occur (such as neurotoxicity, reproductive effects, and effects on the kidney).

MOE health-based benchmark

The Ontario Ministry of the Environment air standards are based on scientific health data and were developed using a multi-step process involving priority setting, risk assessment, risk management and public consultation. The process aims to base MOE standards on the best scientific information available, to protect the most sensitive receptor, including children, and finally, to incorporate socio-economic considerations (OMOE, 2007). This method has identified a number of priority candidates for which air standards have been developed, or are being developed. The published information reports and draft documents indicate the levels, or health-based benchmarks, at which adverse effects to human health may be observed, and they describe extensively the scientific research (both human and animal data) which documents the specific health outcomes of each substance that may be observed when these benchmarks are exceeded.

CalEPA health-based benchmarks

The CalEPA has three health-based benchmarks when air quality is considered:

- CalEPA Unit Risk describes the threshold level of a contaminant in the air at which there would be no expected excess incidence of cancer in a population following exposure, which is defined as less than one in a million excess cancer risk.
- Chronic Reference Exposure Levels (CREL) describes the threshold level of a contaminant in the air at which there would be no expected excess adverse non-cancer effects on human health in a population following chronic exposure.
- The Acute Reference Exposure (Acute REL) describes the threshold level of a contaminant at which there would be no expected excess adverse effects on non-cancer human health effects in a population following acute exposure.

Each of these benchmarks was developed through similar methods as for the OMOE – AAQC, using risk assessment methodology. The CalEPA however, has taken a more health protective approach when considering benchmarks for some of the priority substances. A technical support document provides further information on each one of the benchmarks and describes the derivation calculation procedures and the scientific research (both human and animal data) which supports the standard for each chemical (CalEPA, 1999).

Priority Substances - Summary of health effects

Acetaldehyde

Benchmark Exceeded: CalEPA Unit Risk

Acetaldehyde is possibly carcinogenic to humans. Risk to human health occurs when acetaldehyde in the air is inhaled. The entire human respiratory tract, including the lungs, is at risk for cancer induction by chronic exposure to low levels of inhaled acetaldehyde.

Possible sources: Acetyldehyde is used as an intermediate in the synthesis of other chemicals. It is a byproduct of incomplete wood combustion, pulp and paper production, stationary internal combustion engines and turbines and wastewater processing. It is also used in the production of perfumes, polyester resins and dyes. Furthermore, acetyldehyde is used as a fruit and fish preservative, a flavouring agent, a denaturant for alcohol, in fuel compositions, for hardening gelatine, and as a solvent in the rubber and tanning industries.

Acrolein

Benchmarks Exceeded: MOE AAQC; CalEPA CREL; CalEPA Acute REL

Acrolein is primarily an irritant of the respiratory tract. Chronic exposure can lead to congestion of the respiratory system in addition to irritation of the eyes, nose and throat. Similar symptoms are displayed with short term exposure including tearing of the eyes, and irritation of the mucus membranes of the respiratory tract.

Possible sources: Acrolein is used as an intermediate in the manufacture of acrylic acid. It is used commercially and industrially in the formulation of herbicides, biocides, slimicides, and algicides; leather tanning, pharmaceutical production, and photography. Other sources include fossil fuel combustion, motor vehicle exhaust, tobacco smoke, burning of animal and vegetable fats, heating of lubrication oils, burning of wood and plastics, and aquatic and terrestrial pesticide use.

Benzene

Benchmark Exceeded: CalEPA Unit Risk

There is sufficient evidence to indicate that benzene is carcinogenic to humans. Chronic exposure to benzene leads primarily to disorders of the blood. Benzene is a cancer initiator that has been clearly linked to acute myeloid leukemia (i.e. a cancer of the blood system). Benzene can enter the body by inhalation, ingestion and absorption through the skin.

Possible sources: Benzene is a constituent in motor fuels. It is used as a solvent for fats, waxes, resins, oils, inks, paints, plastics, and rubber; in the extraction of oils from seeds and nuts; and in photogravure printing. It is also used as a chemical intermediate, in the manufacture of detergents, explosives, pharmaceuticals, and dyestuffs.

1,3-Butadiene

Benchmark Exceeded: CalEPA Unit Risk

1,3-Butadiene is probably carcinogenic to humans. It has been linked to cancers of the blood and lymph systems, including leukemia. It has also been linked to disorders of the heart, blood and

lungs, and to reproductive and developmental effects. Risk to human health occurs predominately when 1, 3-Butadiene is inhaled.

Possible sources: 1,3-Butadiene is used in the production of synthetic plastics and rubber. It is also a by-product of manufacturing, processing, wastewater and combustion.

Cadmium

Benchmarks Exceeded: CalEPA Unit Risk, MOE Proposed AAQC

Cadmium and cadmium compounds are carcinogenic to humans. Cadmium is most clearly linked to lung cancer by inhalation. Kidney disease and damage have also been associated with exposure by ingestion as well as inhalation. Cadmium was identified as one of the top priority toxic substances using the TEP ranking approach.

Possible sources: Cadmium is released into air from zinc, lead, or copper smelting. It is also used to manufacture pigments and batteries and in the metal plating and plastics industries. It is also released as a result of burning fossil fuels and in the incineration of municipal waste materials.

Carbon tetrachloride

Benchmark Exceeded: CalEPA Unit Risk

Carbon tetrachloride is possibly carcinogenic to humans. Individuals chronically exposed to carbon tetrachloride may be at an increased risk of cancer of the liver. The primary route of exposure is inhalation, as a result of breathing air contaminated with carbon tetrachloride.

Possible sources: Carbon tetrachloride is used primarily as an intermediate in the manufacture of refrigerant. It is also used to a lesser extent as an industrial solvent and metal degreasing agent.

Chloroform

(also known as Trichloromethane)

Benchmark Exceeded: CalEPA Unit Risk

Chloroform is possibly carcinogenic to humans. Individuals chronically exposed to chloroform may be at an increased risk of both kidney and liver tumours. The risk of cancer is associated with exposure as a result of ingestion and inhalation of chloroform.

Possible sources: Most chloroform is used to manufacture HCFC-22 (a refrigerant for air conditioners). It may also be released into the air from a large number of sources related to its manufacture and use, as well as from its formation as a by product of chlorinating drinking water, wastewater and swimming pool water for disinfection purposes.

Chromium

Chromium can be used and emitted in multiple forms. Hexavalent chromium (i.e. chromium VI) is much more toxic than other forms of chromium and is the primary form emitted to air. Reporting of hexavalent chromium separate from the other forms of chromium enables the tracking of the different forms of chromium, although only hexavalent chromium is of particular concern to health. Tracking of the different forms of chromium will stimulate pollution prevention activities in the areas that will afford the greatest risk reduction for Toronto residents.

Possible sources: Chromium is a metal used mainly for making steel and other alloys and it can be released during welding and cutting stainless steel. It also occurs in leather tanning, textile

production, photography, stained glass working; chemicals used as a pigment in paints, inks, and plastics; as an anti-corrosion agent in protective coatings; in chrome plating.

Chromium (VI)

Benchmark Exceeded: CalEPA Unit Risk

Chromium (VI) is carcinogenic to humans. It has been most clearly linked to lung cancer by inhalation. Food is the most important pathway of exposure for the general population. However, given that chromium (VI) is known to be carcinogenic by inhalation and not by ingestion, indoor and outdoor air would be the levels of greatest concern for cancer risk.

1,4-Dichlorobenzene

(also known as para-Dichlorobenzene)

Benchmark Exceeded: CalEPA Unit Risk

1,4-Dichlorobenzene is possibly carcinogenic to humans. It has been linked to an increased risk of tumours of both the liver and kidneys. Individuals may experience this increased risk of cancer as a result of chronically breathing contaminated air containing 1,4-dichlorobenzene.

Possible sources: 1,4-Dichlorobenzene is used as an intermediate in chemical production, as a fumigant and a space deodorant.

1,2-Dichloroethane

(also known as Ethylene dichloride)

Benchmark Exceeded: CalEPA Unit Risk

1,2-Dichloroethane is possibly carcinogenic to humans. Individuals may experience this increased risk of cancer as a result of chronically breathing contaminated air containing 1,2-dichloroethane.

Possible sources: 1,2-Dichloroethane is primarily used in the production of vinyl chloride and other chemicals. It is also used as a solvent in closed systems for various extraction and cleaning purposes.

Dichloromethane

(also known as Methylene chloride)

Benchmark Exceeded: CalEPA Unit Risk

Dichloromethane is possibly carcinogenic to humans. It has been linked to an increased risk of tumours of both the liver and kidneys. Individuals may experience this increased risk of cancer as a result of chronically breathing contaminated air containing dichloromethane.

Possible sources: Dichloromethane is used as a solvent in paint strippers and removers. It is used as a process solvent in the manufacture of drugs, pharmaceuticals, and filmcoatings. It is also used as a metal cleaning and finishing solvent in electronics manufacturing; aerosol propellant, and as an agent in urethane foam blowing. Dichloromethane sources also include landfills and wastewater processing.

Ethylene dibromide

(also known as dibromoethane)

Benchmark Exceeded: CalEPA Unit Risk

Ethylene dibromide is probably carcinogenic to humans. It has been linked to an increased risk of a variety of cancers in many different organs. Individuals may experience this increased risk of cancer as a result of chronically being exposed to ethylene dibromide by any or all exposure routes. The exposure route of concern to TPH is breathing, as acceptable benchmarks for ethylene dibromide were exceeded in the air.

Possible sources: Ethylene dibromide is used as an intermediate for dyes, resins, waxes, and gums.

Formaldehyde

Benchmarks Exceeded: CalEPA Unit Risk, CalEPA CREL

Formaldehyde is carcinogenic to humans. It is considered a weak initiator of cancer and a strong promoter of cancer. It is also a highly reactive substance that can be irritating to the nose, eyes, skin, throat and lungs at fairly low levels of chronic exposure. People with asthma may be more sensitive to the irritating effects of inhaled formaldehyde. Individuals may be at an increased risk of these health conditions after being chronically exposed to formaldehyde in the air.

Possible sources: Formaldehyde is used primarily to produce resins used in particleboard products and as an intermediate in the synthesis of other chemicals. It is released from stationary internal combustion engines and turbines, pulp and paper plants, and other manufacturing facilities. It may also be released when it is used as a fumigant, soil disinfectant, embalming fluid, and leather tanning agent.

Lead

Benchmark Exceeded: none

Lead was identified as a priority using the TEP ranking approach. Lead however, was not found to currently exceed any health-based benchmarks in Toronto's air. This is not unexpected. Due to the physical- chemical properties of lead it has been found in other media (soil, sediment and biota) at levels that exceed health-based benchmarks.

Exposure to lead can lead to health effects in almost every organ and system in the human body, including adverse effects on the reproductive, gastrointestinal, renal, cardiovascular, hematopoietic, immune and nervous systems. These health effects are consistent regardless of the route of exposure (inhalation or ingestion). Chronic exposure mainly affects the nervous system. Symptoms of exposure may include a decrease in neurological function, and damage of the brain and kidneys. Children are especially vulnerable to lead poisoning. Recent science shows that even at low levels of exposure lead has adverse impacts on neurobehaviour in children and on blood pressure in adults. Lead is probably carcinogenic to humans. Exposure to lead may lead to an increased risk of cancer of the kidneys.

Possible sources: Lead is used in the manufacture of batteries. It can be released during combustion of solid waste, coal and oils, and during iron and steel production and lead smelting.

Manganese

Benchmark Exceeded: CalEPA CREL

Manganese primarily affects the nervous system and neurobehavioral functions in humans. Individuals who are chronically exposed to manganese may experience impairment of motor

skills such as difficulty performing fast movements and maintaining balance. TPH is concerned with population exposure as a result of individuals chronically inhaling air contaminated with manganese.

Possible sources: Manganese is used in the production of steel and alloys, batteries, matches, fireworks and as a chemical intermediate. It is also released into the air by combustion of coal and oil and by power plants.

Mercury

Benchmark Exceeded: None

Mercury was identified as a priority using the TEP ranking approach. However, mercury was not found to currently exceed health-based benchmarks in Toronto's air. This is not unexpected. Due to the physical- chemical properties, mercury has been found in other media (soil, sediment and biota) that exceed health-based benchmarks. Once mercury is released into the air it tends to settle in soil and sediments where it is changed to an organic form, methyl mercury, which biomagnifies or concentrates up the food chain, particularly the aquatic food chain. As a result, humans can be exposed to mercury (in the form of methyl mercury) when they consume fish and shellfish.

Mercury is of concern to human health as it can have harmful effects throughout the body. Most notably, mercury is known as a potent human neurotoxin however, exposure has also been linked to an increased risk of reproductive toxicity and cardiovascular disease. Adverse effects on the nervous system are of increased concern to the fetus, infant and child as this subgroup is particularly vulnerable.

Possible sources: Mercury is used in the production of thermometers, barometers, batteries, dental amalgams, fluorescent lights and lubrication oils. It is also released in the combustion of fossil fuels in electric power generation.

Nickel compounds

Benchmark Exceeded: CalEPA Unit Risk

Nickel compounds are carcinogenic to humans. Individuals who breath in air contaminated with nickel are at an increased risk of developing diseases of the respiratory system. These diseases include chronic bronchitis, reduced lung function, and cancer of the lung and nasal sinus.

Possible sources: Nickel compounds are used for electroplating and the production of batteries, industrial plumbing, machinery parts, resistance wiring and chemical catalysts They are also released from utility oil and coal combustion, nickel metal refining, and lead smelting.

Nitrogen oxides (NO_x)

Benchmark Exceeded: MOE AAQC

NO_x is the term used to describe a category of chemicals that contain nitrogen oxide. The main source of NO_x is human activity as a result of combustion of fossil fuels particularly from vehicles. NO_x is produced by all combustion processes in the presence of air, and NO₂ is a major byproduct. NO₂ was identified as one of five common air pollutants of significant health concern that contributes to the burden of illness in Toronto. Individuals are exposed by inhaling air that contains NO₂. NO₂ affects mainly the respiratory system. Exposure leads to a decrease in the lungs' ability to fight infection. There is an association with nitrogen dioxide concentrations and an increase in daily mortality and hospital admissions as a result of respiratory disease. People with asthma and bronchitis, young children and adults with heart and respiratory disorders are especially sensitive to NO₂ exposure.

Possible sources: Nitrogen oxides are released as a by-product of combustion and from some chemical processes.

Particulate matter 2.5 (PM_{2.5})

Benchmark Exceeded: MOE AAQC

Fine particulate matter (PM) is a term used to describe solid and liquid particles found in the air we breathe. These particles are composed of acid aerosols, organic chemicals, smoke, metal fumes, fly ash, dust and pollen. PM that is smaller than 2.5 microns in diameter is called PM_{2.5}. PM_{2.5} leads primarily to irritation of the eyes, throat and lungs. These particles may worsen the condition of those individuals who are afflicted by respiratory conditions, such as asthma, bronchitis, or lung disease, and also affects those with pre-existing cardiovascular disease. Children and the elderly have an increased sensitivity to PM. Particles may also reduce an individual's capacity to combat infection.

Possible sources: PM_{2.5} is released as a by-product of combustion and industrial processes.

Polycyclic aromatic hydrocarbons (PAHs)

Benchmark Exceeded: CalEPA Unit Risk

Polycyclic aromatic hydrocarbons are a group of chemicals that are formed as a result of incomplete burning of organic substances. PAHs are present in the environment as complex mixtures that are difficult to measure and identify. Some PAH-rich mixtures are carcinogenic and some are not. Similarly, some individual PAHs are carcinogenic, and some are not. Benzo[a]pyrene (B[a]P) was used as a surrogate for the group of PAHs, when determining cancer potency, because it is the most toxic member of the PAH family of compounds. Individuals may be exposed to a number of PAHs through both ingestion and inhalation. Although food is the major source of exposure to PAHs, since PAHs are a more potent carcinogen when inhaled than ingested, the risk of lung cancer due to inhalation exposure may not be higher than the risk of stomach cancer from oral intake.

Possible sources: PAHs are released as a by-product of combustion and certain industrial processes. They are a component of asphalt, coal tar and other bituminous products.

Tetrachloroethylene

(also known as perchloroethylene)

Benchmark Exceeded: CalEPA Unit Risk

Tetrachloroethylene is probably carcinogenic to humans. It has been linked to an increased risk of a variety of cancers in several systems of the human body, including both mononuclear cell leukemia and liver tumours. Individuals may experience this increased risk of cancer as a result of being chronically exposed to tetrachloroethylene by inhalation.

Possible sources: Tetrachloroethylene is widely used for dry-cleaning fabrics and textile processing. It is used as a chemical intermediate and in metal degreasing operations. It is also used in the manufacture of paint removers and printing inks, the formulation of adhesives and specialized cleaning fluids, and as aerosols and dye carriers.

Trichloroethylene

Benchmarks Exceeded: CalEPA Unit Risk, MOE Proposed AAQC

Trichloroethylene is probably carcinogenic to humans. Individuals who are chronically exposed to low levels of trichloroethylene by inhalation, may experience an increased risk of liver, kidney or lung cancer. Chronic exposure may also lead to liver injury and acute central nervous system effects such as headaches and fatigue.

Possible sources: Trichloroethylene is used in industrial degreasing of metal parts, as a chemical intermediate, as an industrial solvent and in the production of consumer products such as paint strippers, adhesives and rug cleaning fluids.

Vinyl chloride

Benchmark Exceeded: CalEPA Unit Risk

Vinyl chloride is considered a human carcinogen. Exposure to vinyl chloride shows a strong and consistent association primarily with cancer of the liver. People may experience this increased risk of cancer as a result of breathing air contaminated with vinyl chloride.

Possible sources: Vinyl chloride is primarily used to make polyvinyl chloride (PVC) plastic which is then used to make a variety of plastic and vinyl products. A smaller portion of vinyl chloride is used in furniture and automobile upholstery, wall coverings, housewares and automotive parts.

Volatile organic compounds (VOCs)

VOCs are a group of organic chemicals that easily evaporate into the air from their direct use, from products containing them, or as a by-product of industrial processes. VOCs react with other pollutants to create ozone, a major contributor to smog. Ozone has been associated with acute symptoms like coughing and wheezing to more chronic conditions such as asthma and chronic obstructive pulmonary disease (COPD), which includes chronic bronchitis and emphysema. In 2004, TPH reported that exposure to five common smog pollutants, including ozone, contributed to about 1,700 premature deaths and 6,000 hospitalizations of Toronto residents each year. While VOCs can act as precursors of smog, they can also be toxic and impact directly on human health. People who chronically breathe air contaminated with VOCs may experience an increased risk of cardiovascular and respiratory problems.

Possible sources: VOCs easily evaporate into the air from their direct use, from products containing them or as by-products of industrial processes. Since there are many hundreds of VOCs it is somewhat difficult to summarize all possible sources. The most common sources however, include vehicle use, fossil fuel combustion, steel-making, petroleum refining, fuel-refilling, industrial and residential solvent use, paint application, manufacturing of synthetic materials (e.g. plastics, carpets), food processing, agricultural activities and wood processing and burning.

Conclusion

It is clear from this brief review, that based on current science and known contaminant levels in Toronto's air currently, the priority substances may adversely impact on Toronto's population in a variety of ways. Tracking information on the use and release of these chemical substances from local facilities is necessary to improve understanding of health hazards, stimulate businesses to prevent pollution, and to enable governments and the public to make better decisions to protect health.

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Table 1: Substances of Priority Health Concern presented with the Amount Released to Air, Toxic Equivalency Potential (TEP) Values, TEP-Scores¹, and Relative Rank².

Priority Substance of Health Concern	Amount Released (Rank)	TEP-Carcinogen	TEP Score ¹ for Carcinogens (Rank)	TEP-Non Carcinogen	TEP Score ¹ for Non-Carcinogens (Rank)
	A (tonnage)	B	=A×B	C	=A×C
VOCs	43400(1)	n/a	n/a	n/a	n/a
Nitrogen Oxides	6900 (2)	n/a	n/a	2.2	35,000,000 (8)
PM _{2.5}	2400 (6)	n/a	n/a	17	90,000,000 (4)
Tetrachloroethylene	2 (14)	1	480,000 (4)	65	32,000,000 (9)
Dichloromethane	165 (18)	0.2	73,000 (5)	7	2,600,000 (18)
Lead	36 (29)	28	2,200,000 (2)	580000	47,000,000,000 (2)
Formaldehyde	24 (30)	0.02	1,000 (11)	16	840,000 ()
Mercury	13 (38)	n/a	n/a	5000000	140,000,000,000 (1)
Cadmium	8 (40)	26000	430,000,000 (1)	190000	3,200,000,000 (3)
Chromium (non-hexavalent)	5 (43)	n/a	n/a	n/a	n/a
Trichloroethylene	3 (50)	0.05	260 (12)	0.6	3,200 (50)
Nickel	1 (55)	3	6,000 (9)	3200	6,800,000 (14)
Manganese	1 (56)	n/a	n/a	780	1,600,000 (20)
Chromium (hexavalent)	1 (58)	130	200,000 (5)	3100	35,000,000 (7)
Benzene	0.1 (67)	1	210 (13)	8	1,700 (53)
Carbon Tetrachloride	n/ed	270	n/ed	2300	n/ed
Acrolein	n/ed	n/a	n/ed	1600	n/ed
Vinyl chloride	n/ed	2	n/ed	68	n/ed
Chloroform	n/ed	2	n/ed	14	n/ed
Acetaldehyde	n/ed	0.01	n/ed	9	n/ed
1,2-Dichloroethane	n/ed	3	n/ed	4	n/ed
1,4-Dichlorobenzene	n/ed	1	n/ed	2	n/ed
1,3-Butadiene	n/ed	0.5	n/ed	2	n/ed
Ethylene dibromide	n/ed	n/a	n/ed	n/a	n/ed
PAHs	n/ed	6300 ³	n/ed	n/a	n/ed

n/a No TEP available

n/ed No emissions data available

¹ TEP Score = Amount Released (converted to pounds) × TEP (carcinogen; non-carcinogen)

² Substances were ranked against the total list of substances released in Toronto. Ninety six substances were assessed. Ranks are presented in brackets ().

³ Benzo(a)pyrene used as a surrogate for the group of substances

Table 2: Substances of Priority Health Concern presented with Measured Air Concentrations for 2003 to 2005, Exposure Ratios, and the health-based benchmarks exceeded.

Priority Substances	Exposure Ratio ¹ (max)	Expose Ratio (mean) ²	Benchmarks Exceeded ³
Chromium (hexalent) ⁴	1150	2	CalEPA Unit Risk
Benzene	176	30	CalEPA Unit Risk
PAHs ⁵	302	20	CalEPA Unit Risk
1,3-Butadiene	102	26	CalEPA Unit Risk
Formaldehyde	67	27	CalEPA Unit Risk; CalEPA CREL
1,4-Dichlorobenzene	41	2	CalEPA Unit Risk
Carbon tetrachloride	34	26	CalEPA Unit Risk
Cadmium		13	CalEPA Unit Risk; MOE Proposed AAQC
Acrolein	20	2	MOE AAQC; CalEPA CREL; CalEPA Acute REL
Acetaldehyde	15	6	CalEPA Unit Risk
Dichloromethane	14	0.9	CalEPA Unit Risk
Tetrachloroethylene	12	2	CalEPA Unit Risk
Ethylene dibromide	7	3	CalEPA Unit Risk
Trichloroethylene	6	0.6	CalEPA Unit Risk; MOE Proposed AAQC
Nickel compounds	4	0.8	CalEPA Unit Risk
Vinyl chloride	4	0.8	CalEPA Unit Risk
Chloroform	3	0.6	CalEPA Unit Risk
NO _x	3	0.3	MOE AAQC
1,2-Dichloroethane	3	0.8	CalEPA Unit Risk
PM _{2.5}	2	0.3	MOE AAQC
Manganese	2	0.08	CalEPA CREL
Lead	0.4	0.07	None
Mercury	0.00018	0.00016	None
Chromium (non-hexvalent)	n/a	n/a	n/a
VOCs	n/a	n/a	n/a

n/a No health-based benchmark available

¹ Exposure Ratio = Maximum measured air concentration ÷ health based benchmarks. The highest exposure ratio is presented, if multiple benchmarks were exceeded.

² Exposure Ratio = Mean measured air concentration ÷ health based benchmarks.

³ CalEPA Unit Risk = California Environmental Protection Agency Unit Risk;
CalEPA CREL = California Environmental Protection Agency Chronic Reference Exposure Levels (Acute when indicated);

MOE AAQC = Ontario Ministry of the Environment Ambient Air Quality Criteria

⁴ It was assumed that 15% of the total chromium air concentration was hexavalent chromium. CEPA 1994 states that 3 - 8 % of urban air concentrations of total chromium are Cr VI. The MMM estimates show that 13% of the total chromium air emissions are Cr VI. We selected 15% to be a health protective, reasonable estimate

⁵ Air concentration used is the sum of 20 individual PAHs. Benchmarks for benzo(a)pyrene used as a surrogate for the group of substances.

Benchmarks Extracted From:

MOE. 2005. Summary of O. Reg. 419/05 Standards and Point of Impingement Guidelines and Ambient Air Quality Criteria (AAQCs). Standards Development Branch. Ontario Ministry of the Environment. December 2005.

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<http://www.ene.gov.on.ca/envision/techdocs/6041e.pdf>

CalEPA CRELs (chronic) http://www.oehha.ca.gov/air/chronic_rels/AllChrels.html

CalEPA Cancer Unit Risk http://www.oehha.ca.gov/air/hot_spots/pdf/TSDlookup2002.pdf

CalEPA CRELs (acute) http://www.oehha.ca.gov/air/acute_rels/allAcRELS.html

Table 3: Carcinogenicity defined by the International Agency for Research on Cancer (Cancer Care Ontario, 2005)

Group	Classification	Definition
1	Carcinogenic to humans	Sufficient evidence of carcinogenicity in humans
2A	Probably carcinogenic to humans	Limited evidence in humans, and sufficient evidence in experimental animals
2B	Possibly carcinogenic to humans	Limited evidence in humans and less than sufficient in experimental animals or Inadequate evidence in humans and sufficient evidence in experimental animals
3	Not classifiable as to carcinogenicity to humans	Inadequate evidence in humans inadequate or limited evidence in experimental animals
4	Probably not carcinogenic to humans	Evidence suggests a lack of carcinogenicity in humans and in experimental animals

Table 4: Substances of Priority Health Concern presented with Possible Sources, Health-Based Benchmarks Exceeded and Health Outcomes.

Priority Substance	Benchmarks Exceeded	Health Outcomes⁷
Acetaldehyde	CalEPA Unit Risk	Cancer
Acrolein	MOE AAQC; CalEPA CREL; CalEPA Acute REL	Respiratory irritation Eye irritation
Benzene	CalEPA Unit Risk	Cancer
1,3-Butadiene	CalEPA Unit Risk	Cancer
Cadmium	CalEPA Unit Risk; MOE Proposed AAQC	Cancer Kidney disease and damage
Carbon tetrachloride	CalEPA Unit Risk	Cancer
Chloroform	CalEPA Unit Risk	Cancer
Chromium (hexavalent)	CalEPA Unit Risk	Cancer
Chromium (non- hexavalent)	none	n/a ⁸
1,4-Dichlorobenzene	CalEPA Unit Risk	Cancer
1,2-Dichloroethane	CalEPA Unit Risk	Cancer
Dichloromethane	CalEPA Unit Risk	Cancer
Ethylene dibromide	CalEPA Unit Risk	Cancer
Formaldehyde	CalEPA Unit Risk; CalEPA CREL	Cancer Nose, eye, skin, throat and lung irritation
Lead	none	Cancer Reproductive, gastrointestinal, renal, cardiovascular, hematopoietic, immune, and nervous system effects
Manganese	CalEPA CREL	Nervous system effects
Mercury	none	Nervous system, reproductive and cardiovascular effects
Nickel compounds	CalEPA Unit Risk	Cancer
Nitrogen oxides (NOx)	MOE AAQC	Respiratory irritation
Particulate matter 2.5 (PM_{2.5})	MOE AAQC	Eye, throat and lung irritation Reduced capacity to combat infection
Polycyclic aromatic hydrocarbons (PAHs)	CalEPA Unit Risk	Cancer
Tetrachloroethylene (perchloroethylene)	CalEPA Unit Risk	Cancer
Trichloroethylene	CalEPA Unit Risk, MOE Proposed AAQC	Cancer Liver injury Headaches and fatigue
Vinyl chloride	CalEPA Unit Risk	Cancer
Volatile organic compounds (VOCs)	none	Contributor to smog Cardiovascular and respiratory effects

¹ Health outcomes relate directly to the health-based benchmarks. When benchmarks are surpassed an excess of one-in-a million cancer risk and/or an elevated level of the specified health outcomes is expected.

²Although there are health outcomes associated with non-hexavalent chromium, hexavalent chromium is much more toxic and is the primary form emitted to air. Reporting of hexavalent chromium separate from the other forms will enable the tracking of the different forms of chromium and will stimulate pollution prevention activities in the areas that will afford the greatest risk reduction for Toronto residents

Appendix 2: Draft Environmental Reporting and Disclosure Bylaw

DRAFT

FOR DISCUSSION PURPOSES ONLY

Authority: Community Council/Committee Item No., as adopted by City of Toronto Council
on

Enacted by Council:

CITY OF TORONTO

Bill No.

BY-LAW No. -

To adopt a new Municipal Code Chapter XX, Environmental Reporting and Disclosure.

WHEREAS the presence of toxic substances in the workplace and the environment can have an adverse impact on the health, safety and well-being of persons, and on the economic, social and environmental well-being of the City of Toronto; and

WHEREAS the Medical Officer of Health for the City of Toronto Health Unit has determined that health and environmental risks from pollution can be reduced by enhanced reporting of toxic substances by Toronto businesses, and improved access to environmental information on toxic substances; and

WHEREAS the citizens of Toronto have a fundamental right to know the identity and amounts of toxic chemicals that are released in to the workplace and in to the environment through chemical releases to the air, water and land in their community; and

WHEREAS the use of a substance indicates a potential for release either through fugitive emissions or accidental release; and

WHEREAS the *City of Toronto Act, 2006* (the “Act”) provides that Council may pass by-laws in respect of the health, safety and well-being of persons and the economic, social and environmental well-being of the City; and

WHEREAS the Act further provides that Council may pass by-laws to establish a system of escalating fines;

The Council of the City of Toronto HEREBY ENACTS as follows:

1. Schedule “A” to this by-law is enacted as Chapter XX, Environmental Reporting and Disclosure, of the City of Toronto Municipal Code.

ENACTED AND PASSED this day of , A.D. 2008.

SANDRA BUSSIN,
Speaker

ULLI S. WATKISS
City Clerk

(Corporate Seal)

SCHEDULE “A” TO BY-LAW No. -2008

Chapter

ENVIRONMENTAL REPORTING AND DISCLOSURE

**ARTICLE I
Interpretation**

§ XX-1. Definitions.

As used in this chapter, the following terms shall have the meaning indicated:

ARTICLE a manufactured item that does not release a priority substance when it undergoes processing or other use.

BY-PRODUCT a substance which is incidentally manufactured, processed or otherwise used at the facility at any concentration, released on site to the environment, or disposed of.

DE MINIMIS CONCENTRATION the concentration of a priority substance expressed as a weight to weight ratio set out in column 3 of Schedule “A”.

DWELLING UNIT real property used or designated for use as a home or as a place in which one or more persons may sleep.

ENVIRONMENT the air, land or water of the City of Toronto.

FACILITY a building, equipment, structure, and other stationary items that are located on a single site or on contiguous or adjacent sites and that are owned and are operated by the same person, or by a person who controls, is controlled by, or is under common control with such person, but does not include a dwelling unit.

MANUFACTURE produce, prepare or compound a priority substance and includes the coincidental production of a priority substance as a by-product as a result of the manufacturing, processing or other use of any other priority substances.

MASS REPORTING THRESHOLD the threshold value for each priority substance set out in column 2 of Schedule “A”.

MEDICAL OFFICER OF HEALTH the medical officer of health for the City of Toronto Health Unit or his or her delegate.

NATIONAL POLLUTANT RELEASE INVENTORY means the most current National Pollutant Release Inventory Canada Gazette Notice.

OTHER USE AND OTHERWISE USED any use, disposal or release of a priority substance at a facility or transfer from a facility that does not fall under the definitions of manufacture or process. This includes the use of the priority substance as a chemical processing aid, manufacturing aid or some other use.

PERSON includes a corporation, partnership or any other business association, as well as an individual.

PARTICULATE MATTER 2.5 (PM_{2.5}) particulate matter with a diameter less than or equal to 2.5 micrometres.

POLYAROMATIC HYDROCARBONS (PAHs) substances listed in Schedule 1, Part 2 of the National Pollutant Release Inventory, as may be amended from time to time.

PRIORITY SUBSTANCE a substance or group of substances identified in Schedule "A", but does not include a substance that is:

- (A) present in an article;
- (B) used as a structural component of a facility but not the process equipment;
- (C) present in a product used for routine janitorial, facility building or grounds maintenance;
- (D) present in personal items used by persons at a facility;
- (E) present in emissions from vehicles;
- (F) present in intake water or air;
- (G) present in road dust;
- (H) present in emissions from space heaters, or hot water heaters for domestic or commercial purposes but not process equipment;
- (I) present in materials used for the purpose of maintaining motor vehicles operated by the facility.

PRIORITY SUBSTANCE USER means a person who owns or operates a facility that releases, manufactures, processes or otherwise uses any priority substance.

PROCESS includes: 1) the preparation of a priority substance, after its manufacture, for distribution in commerce; 2) the preparation of a priority substance with or without changes in physical state or chemical form; 3) the processing of a mixture or formulation that contains a priority substance as one component; and 4) the processing of articles.

RELEASE spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into the environment.

REPORT a report to the medical officer of health in a form and submitted in a manner prescribed by the medical officer of health.

STATEMENT OF CERTIFICATION a statement made by a person reporting information pursuant to this by law or on behalf of a person required to report, stating that the information in the report is true, accurate and complete.

VOLATILE ORGANIC COMPOUNDS (VOCs) volatile organic compounds as defined in item 65 in the List of Toxic Substances in Schedule 1 of the *Canadian Environmental Protection Act, 1999*, as may be amended from time to time.

ARTICLE II **Duty to Report**

§ XX -2. Duty to report.

- A. A priority substance user for each facility shall submit a report in relation to a priority substance listed in Group A of Schedule “A” that is released, manufactured, processed or otherwise used at that facility,
- (1) if the priority substance was manufactured, processed or otherwise used in a quantity equal to or greater than the mass reporting threshold for the substance; and
 - (2) the concentration by weight of the substance was equal to or greater than the de minimus concentration for the substance, unless the substance is a by-product or there is no corresponding value set out in Schedule “A” for the substance.
 - (3) for the purposes of Subsection A(2), by-products shall be included in the calculation of mass reporting threshold of the priority substance, regardless of concentration.
- B. A priority substance user for each facility shall submit a report in relation to a priority substance listed in Group B of Schedule “A” when,
- (1) there is a release, disposal and/or transfer for recycling of the substance from a facility if the sum total of the substances listed in Group B of Schedule “A” released on site, disposed of, and/or transferred off site for recycling as a result of manufacturing, processing or other use is 10 kg or more; or

- (2) there is a release, disposal and/or transfer for recycling of any quantity of the substance from a facility if:
 - (a) the priority substance user carried out at any time wood preservation using creosote at that facility; and
 - (b) the substance was released on site, disposed of and/or transferred off site for recycling as a result of wood preservation using creosote.
- C. A priority substance user for each facility shall submit a report in relation to a priority substance listed in Group C of Schedule “A” when there is a release to air of the substance from a facility in a quantity equal to or greater than the mass reporting threshold for that substance.
- D. The reports referred to in Subsections A, B and C shall be submitted annually and shall be submitted to the medical officer of health by June 30 of the year following the calendar year covered by the reporting in a form and in a manner prescribed by the medical officer of health.

§ XX-3. Exemptions from reporting requirement.

The duty to report in § 2 does not apply to the following facilities:

- A. facilities engaged solely in retail sales;
- B. medical or dental offices;
- C. construction and building maintenance sites;
- D. accommodation services, but not laundry and dry cleaning facilities located within such facilities;
- E. food services;
- F. facilities for the distribution, storage or retail sale of fuels; or
- G. facilities for the maintenance and repair of vehicles, such as automobiles, trucks, locomotives, ships or aircraft, but not painting or stripping of vehicles or their components, or the rebuilding or remanufacturing of vehicle components.

§ XX-4. Content of report.

In addition to information prescribed by the medical officer of health, a report under this by-law shall include:

- A. the name and location of the facility;

- B. contact information regarding the person at the facility responsible for the report;
- C. statement of certification in a form prescribed by the medical officer of health;
- D. the quantity of each priority substance manufactured, processed or otherwise used;
- E. the quantity of each priority substance released to the environment; and
- F. the methods used to calculate the quantity of each priority substance.

§ XX-5. Record-keeping.

The information upon which reports referred to in this by-law are based shall be retained for a minimum of three years from the date the report is submitted and, upon request, shall be provided to the medical officer of health for audit purposes.

ARTICLE III
Access to Information

§ XX-6. Access to information.

- A. All information submitted to and collected by the City in a report will, except as otherwise provided in this section, be available for disclosure to the public in accordance with the *Municipal Freedom of Information and Protection of Privacy Act* (MFIPPA).
- B. Where information submitted to the City or to the medical officer of health in any form, as required under this By-law, is confidential or proprietary or may otherwise be exempt from disclosure under MFIPPA, the person submitting the information shall identify that information upon its submission to the City or to the medical officer of health and shall provide sufficient details as to the reason for its purported exemption from disclosure.
- C. Public access to information reported pursuant to this By-law, unless such access is restricted by MFIPPA, shall be provided on the basis that the City of Toronto makes no representation or warranty as to the accuracy or completeness of the information so provided.

ARTICLE IV
Penalty

§ XX-7. Offence.

Every person who contravenes the provisions of this chapter and every director or officer of a corporation who knowingly concurs in a contravention of the provisions of this chapter by the corporation, is guilty of an offence and is liable to a fine of not more than:

- A. \$5,000 for a first offence;

- B. \$25,000 for a second offence; or
- C. \$100,000 for a third or subsequent offence.

§ XX-8. Implementation.

This by-law comes in to force on January 1, 2009.

SCHEDULE A TO CHAPTER XX
Priority Substances, Mass Reporting Thresholds and De Minimis Concentration
Thresholds

Chemical Name	CAS No.	Mass Reporting Threshold kg/yr	<i>de minimis</i> concentration % w/w
<i>GROUP A</i>			
Acetaldehyde	75-07-0	100	1.0
Acrolein	107-02-8	100	1.0
Benzene	71-43-2	100	1.0
1,3-Butadiene	106-99-0	100	1.0
Carbon tetrachloride	56-23-5	100	1.0
Chloroform (Trichloromethane)	67-66-3	100	1.0
Chromium, Non-hexavalent ^a	-	100	1.0
1,2-Dibromo ethane (Ethylene dibromide)	106-93-4	100	1.0
1,4-Dichlorobenzene	106-46-7	100	1.0
1,2-Dichloroethane (Ethylene dichloride)	107-06-2	100	1.0
Dichloromethane (Methylene chloride)	75-09-2	100	1.0
Formaldehyde	50-00-0	100	1.0
Manganese ^a	7439-96-5	10	1.0
Nickel ^a	7440-02-0	100	1.0
Tetrachloroethylene (Perchloroethylene)	127-18-4	100	1.0
Trichloroethylene	079-01-6	100	1.0
Vinyl chloride	75-01-4	100	1.0
Cadmium ^a	7440-43-9	1.0	0.1
Chromium, Hexavalent ^a	7440-47-3	10	0.1
Lead ^a	7439-92-1	10	0.1
Mercury ^a	7439-97-6	1.0	0.0
<i>GROUP B</i>			
Polyaromatic Hydrocarbons	-	10 ^c	n/a ^d
<i>GROUP C</i>			
NO _x ^b	11104-93-1	200	n/a
PM _{2.5}	-	30	n/a
VOCs total	-	100	n/a

a. and its compounds, expressed as the metal

b. NO + NO₂, expressed as NO₂

c. PAHs released as a result of wood preservation using creosote must be reported even if below the mass reporting threshold

d. n/a = not applicable

Appendix 3: Feedback from January 2008 Stakeholder Consultations

Introduction

Over the past three years, Toronto Public Health (TPH) has consulted extensively with businesses, residents, community organizations, agencies representing workers, governments and City staff on the development of an Environmental Reporting and Disclosure Program. Consultation has included interviews, focus groups and meetings.

In January 2008, the Medical Officer of Health (MOH) released a draft framework for an Environmental Reporting and Disclosure Program to stakeholders for a 30-day comment period. The framework reflected previous feedback from the Board of Health and stakeholders.

Over 500 stakeholders provided written comments on the proposed reporting program. This report presents key findings from the consultation and describes how TPH has integrated these views into the current proposal being recommended to the Board of Health.

How TPH Consulted Stakeholders

The January 2008 consultation was part of a process that engaged stakeholders since 2005. Figure 1 illustrates the main activities TPH undertook to identify and consult those who may be affected by this program.

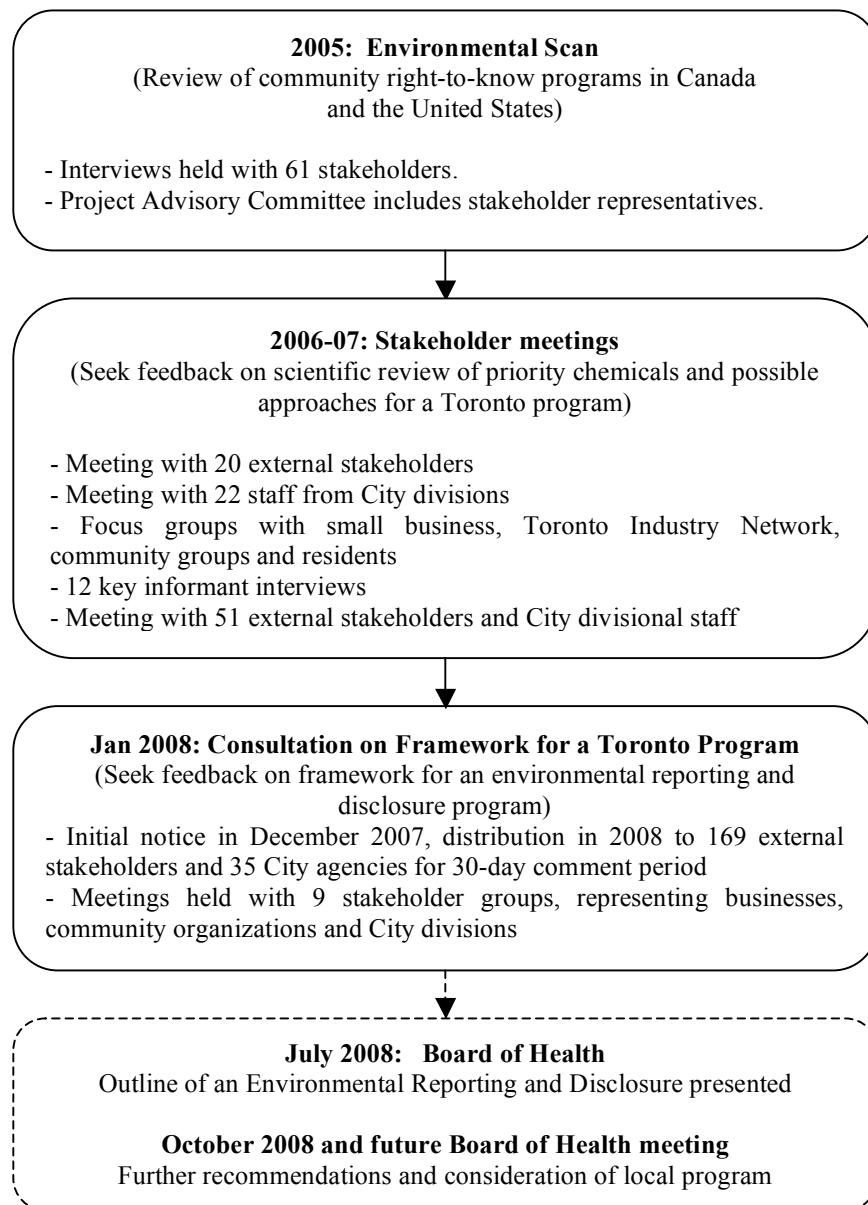
To identify stakeholders for its January 2008 consultation, TPH reviewed lists from previous consultations, requested lists and advice from Economic Development and other City divisions and contacted associations representing all of the business sectors and community interests that were anticipated to be affected by the program. In December 2007, TPH informed these stakeholders via email, phone and a website posting, that it would release a proposal for public comment, and invited them to identify additional parties to whom TPH should send the document. Based on this early work, on January 7, 2008, TPH posted the consultation document⁹ and background information on its webpage and emailed it to 35 city agencies and 169 known stakeholders. Stakeholders were offered 30 days to submit comments on the proposal. TPH also accepted comments after this time.

During the consultation period, the document was further circulated with the assistance of many stakeholders, including the Toronto Association of Business Improvement Areas (TABIA) and several health, environmental and worker organizations. TPH also held individual meetings with 9 key stakeholder groups, including TABIA, the Toronto

⁹ Consultation document and background information are available at www.toronto.ca/health/hpbe/enviro_info.htm

Industry Network, E.I. DuPont Canada, the Korean Drycleaners Association and the Toronto Cancer Prevention Coalition.

Figure 1: Overview of stakeholder consultation



In the consultation document, the following questions were asked:

To business and government sectors:

1. *In what ways might the proposed program impact your business?*
2. *Do you think your business would be required to report to the City the use or release of any of the 25 chemical substances described in this document? If yes, please estimate how many chemicals you may report.*

3. *What assistance would be helpful to your business to report on the chemical substances proposed in the Environmental Reporting and Disclosure Program?*
4. *Does your business currently report the use or release of these chemicals or any other substances through an existing environmental reporting program? If yes, please indicate which program(s):*
 - a. *National Pollutant Release Inventory (NPRI)*
 - b. *Ontario Regulation 127/01 (under the Ontario Environmental Protection Act)*
 - c. *City of Toronto Sewer Use Bylaw*
 - d. *Other (please describe)*
5. *Would 'pollution prevention' information be helpful to your business operations? If yes, what type of assistance would be most helpful?*
6. *How could the City make the information, collected under this program, accessible, understandable and relevant for users?*
7. *Any additional comments?*

To residents, community organizations and other stakeholders:

1. *In what ways might the proposed program impact you or your community/organization?*
2. *How would you make use of the information collected through the Environmental Reporting and Disclosure Program?*
3. *How could the City make the information accessible, understandable and relevant for users?*
4. *Any additional comments?*

TPH received feedback by e-mail and mail.

Summary of Stakeholder Feedback

TPH received 541 written submissions on the proposal:

- 461 from residents
- 33 from community organizations
- 6 from agencies representing workers (e.g. unions, occupational health clinics)
- 31 from businesses or business associations
- 10 from City agencies, boards, commissions, corporations or divisions (ABCCDs)

A list of stakeholders (except residents) that submitted feedback is included at the end of this report.

Areas of Stakeholder Agreement

There was general support from all stakeholders for:

1. the program's intent to stimulate pollution prevention among local facilities, citing the potential social, health and economic benefits of environmental innovations;
2. the value of environmental information for protecting health, educating the community, encouraging pollution prevention and helping businesses and the community;
3. an approach that supported and engaged all users, from residents to businesses.

Areas of Stakeholder Disagreement

Stakeholder views differed on whether the proposal outlined by TPH was the best way to accomplish the program's goal.

- Residents, agencies representing workers, and health and environmental organizations supported the approach being proposed, identifying many health, environmental and economic benefits of the program.
- Most businesses and many City ABCCDs opposed a new bylaw and favoured a voluntary approach. Many sought additional details before offering more specific feedback. Notwithstanding their opposition to a regulatory approach, many businesses made helpful suggestions for improving the proposed approach.

Resident Feedback

461 Toronto residents submitted written comments on the proposed program. All but one expressed strong support for the program.

Main points:

- Program has many benefits:
 - protects the environment
 - helps build a local environmental protection strategy
 - protects the health of the community
 - helps residents make informed choice about where to live and work
 - helps develop research questions
- City should consider the most cost-effective implementation strategy
- Data should be:
 - Easily accessible via variety of electronic and non-electronic formats
 - Available as raw data, interpreted summaries and in map-based displays
 - Searchable by location, chemical and company
 - Available (at least in summary form) in major languages spoken in Toronto

Selected comments:

"The program would provide the relevant information needed in order to confidently approach and negotiate with businesses in my community in an effort to decrease their toxic harm."

"I am hugely in favor of the proposed new Environmental Reporting and Disclosure bylaw. As a concerned citizen, parent of two young children, and a long time asthma patient, I believe this bylaw will be a big step toward ensuring the health and safety of the public put in danger by the chemical substances in our environment."

"I would choose among services, such as dry cleaners, on the basis of their ability to reduce or eliminate harmful emissions."

“The bottom line for me is that you ‘get what you measure,’ and this proposal would be an initial step towards gathering the data required to make informed decisions in the future.”

Community Organization Feedback

Thirty-three community organizations, including health agencies, ratepayers and neighbourhood associations and environmental groups, submitted written comments. All expressed strong support for the proposed program.

Main points:

- Echoed benefits raised by residents
- Chemical regulation is increasing globally to reflect scientific learning and public concern over avoidable health risks – Toronto’s program is part of this change, and will make the City a global leader
- More types of workplaces and chemicals should be tracked by the program, or at least TPH should identify how more chemicals or facilities could be added in the future
- Urged easily accessible data for variety of users

Selected comments:

“The information...will enable physicians in Toronto to become much better informed about contaminants in their areas...”

“As a group committed to working to prevent cancer we support this by-law as a significant step to reducing the risk of cancer by reducing environmental exposure to potential carcinogens.”

“When governments support community, consumers and business groups by helping them to identify where and what the hazardous chemicals are, knowledge bases are broadened and solutions can be created.”

“It is essential that this information be presented to the public in a meaningful way. Lists of chemical names and concentrations are a good first step, but the public needs to know what the different chemical levels means and what type of health risk or danger they pose.”

“...to better understand sources of pollutants within Toronto is it also necessary to know sources located outside of the City’s borders. Toronto’s by-law would be a stimulus to improve data availability beyond its borders.”

“... concerned residents and business owners committed to their communities are the best guarantee of safe and healthy neighbourhoods.”

Worker Feedback

Six worker agencies, including unions, occupational health clinics and legal agencies, commented on the proposal. All supported the proposal.

Main points:

- Program is necessary because it will provide more information to workers and the community than what is currently provided by the Workplace Hazardous Materials Information System (WHMIS) program. Compared to WHMIS, this program would allow workers, particularly those in workplaces with poor health and safety programs, to more easily investigate what substances are being used and what their individual exposures might be.
- New immigrants to Toronto often work in workplaces with poor access to information about the substances that they may be working with. This program would allow these workers to seek information without fear of reprisals from employers.
- Program would be an important step in an essential municipal strategy to engage our local manufacturing sector in innovations and modernization, to ensure employment.

Selected comments:

“This program would honor a community and worker’s right to know about potential hazardous exposures and health and environmental risks we face, so that we can make informed decisions regarding where we work and live.”

“By educating our workers and communities about toxic chemical exposure and their environmental and health effects, community members and workers have an incentive to work together to reduce risk and prevent exposure.”

“Put simply, this program will provide the tools required for businesses, workers and community members to work together to green Toronto’s businesses.”

“Cost savings to companies could be realized through safer conditions for workers and lower compensation claims due to occupational diseases.”

“...this information could be extremely useful in the diagnosis and treatment of occupational disease within the community.”

“While community right to know will not end the crisis in manufacturing in our city, it is a good first step towards creating an environment in which manufacturing has a future here.”

“Many of our clients work in unorganized workplaces where health and safety procedures are not followed...many are not even aware of their rights to a healthy and safe working environment. For those who try to enforce their rights, they often face reprisal from their employers.”

Businesses and Business Association Feedback

TPH circulated the document to 101 business stakeholders, representing all sectors that may be affected by this program. Where possible individual facilities were contacted, in other cases TPH engaged their businesses associations. Thirty-one businesses or sector

associations offered their comments on the proposal. Most supported the intent of the program but opposed a regulatory approach. Many sought additional clarification before offering more specific comments, and offered suggestions for alternative approaches.

Main points:

- Concerns with program:
 - adds to existing burden of reporting to federal, provincial and City programs
 - duplicates information currently being collected by other governments
 - certain sectors (e.g. autobody and automotive coatings manufacturers) are facing changes to federal or provincial laws that will burden facilities and stimulate pollution prevention better than a bylaw
 - usage information could compromise corporate confidentiality and could be used for criminal activity
 - certain substances or sectors should be exempted while others should be added
 - little public interest in information currently collected, so no reason to collect more
 - public will be unable to understand or respond appropriately to information that is made available to them
 - small and medium-sized businesses will be hardest hit economically
- If the City decides to proceed with the program, the City should:
 - provide contextual information to minimize public overreaction
 - establish clear health priority for the programs
 - ensure adequate educational programs and enforcement resources to support participation and compliance of smaller operations
 - consolidate services to business – single web portal, coordinated City team for businesses to access, no duplication of requirements
 - clarify how data will be used
 - clarify costs to City and to businesses
 - pilot the program in certain sectors before proceeding with the full list of substances and sectors

Selected comments:

“A blanket by-law compelling all but exempted businesses that use chemicals to report usage and emissions will be costly to administer, be very disruptive and difficult to enforce.”

“...(company name) recommends that TPH abandon the traditional by-law approach and work with other City divisions to develop an incentive package that will encourage businesses to reduce their environmental footprint.”

“...(company name) fully supports this proposed reporting structure. With the cooperative efforts of all involved, the program can assist all in creating a safe environment. We look forward to having the opportunity to work alongside the City of Toronto in this very important endeavour.”

“We believe the current regulatory controls in place for the chemical industry by Federal and Provincial regulators adequately protect the health of the citizens of the City of Toronto.”

“...without addressing the management of toxics, additional information on emissions made available to the community may only serve to further frustrate the public who are likely equally interested in what businesses are doing to curb emissions.”

“Should an environmental issue (be) taken care of, the party to be affected should be taken care of too.”

“Although the objectives of these programs are noble and important, governments are imposing significantly greater administrative burden on manufacturers at a time when we are struggling for our very survival.”

“As the regulatory requirements increase, simplicity is paramount to their ability to stay in business and earn a profit.”

City ABCCD Feedback

Ten ABCDDs submitted written comments. Overall, they support the program’s intent to stimulate pollution prevention and environmental best practices by Toronto businesses and those that regularly examine environmental contaminants would welcome the additional data that the program would generate. However, some divisions strongly oppose a new bylaw and recommend new voluntary incentives program to stimulate environmental innovation.

Main points:

- environmental information would be useful to relate to the monitoring data currently collected by some ABCCDs, and help to inform outreach programs and other initiatives to reduce environmental contamination
- some ABCCDS are concerned about adding to existing burden of reporting for their facilities
- City should provide ABCCDs with financial and technical resources to enable compliance, and facilitate more intradivisional collaboration to assess combined facilities and operations
- Will unfairly burden Toronto businesses and encourage some to leave the City for the GTA.

Selected comments:

“(ABCCD) supports the idea of openness and transparency. (ABCCD) would be happy to have information on its chemical usage and emissions made publicly available.”

“The information collected could assist with risk management and improve Health and Safety by minimizing exposure.”

“We would hope that there is a systematic method of reporting, corporate database created/developed for maintaining and accessing the collected information and user-friendly reporting tool for submitting the data.”

“Our Division, as might others, may require assistance in carrying out assessments, estimation and/or monitoring of released chemicals.”

“In lieu of a proposed by-law...recommends that the City encourage a phased approach to deliver a much more comprehensive program...”

“...the proposed Environmental Reporting and Disclosure Program (should) be replaced with an Environmental Incentive Program for Industry.”

Responding to Stakeholder Concerns

The proposal circulated in January 2008 reflected feedback from earlier consultation with businesses and community agencies. For example, TPH proposed linkages to the federal government's OWNERS reporting system after hearing the need for simple electronic reporting, particularly from facilities already reporting to the National Pollutant Release Inventory. TPH also proposed an accessible web-based disclosure system to enable maximum involvement with the community.

Table 1 describes how the MOH's current recommendations and draft bylaw reflect the feedback from stakeholders from this recent 2008 round of consultations:

Table 1: Incorporating Stakeholder Feedback into the Proposed Program

Key Stakeholder Views and Recommendations	How Feedback is Addressed in the Proposed Program
<p>Ensure effective public disclosure</p> <ul style="list-style-type: none"> Information must be accessible, easy to understand and relevant for users. 	<p>Like the NPRI, Toronto will have a searchable website that will enable users to search data by chemical, facility and neighbourhood and see results in map-based and table format.</p> <p>Data will be linked to authoritative third-party information related to chemicals, health and environmental impacts.</p> <p>TPH will compile and interpret data in annual electronic and hard-copy report. Summaries will be translated into top Toronto languages.</p>

<ul style="list-style-type: none"> • Provide context to data so residents are not unnecessarily alarmed or business operations misinterpreted. • Disclosure must protect business competitiveness and public security. 	<p>TPH will promote program to public so they can understand how it works and become meaningfully engaged.</p> <p>Businesses will have the option to provide contextual information about their pollution prevention programs.</p> <hr/> <p>The proposed bylaw contains confidentiality provisions, subject to the requirements of the <i>Municipal Freedom of Information and Protection of Privacy Act</i>.</p>
<p>Avoid duplication with existing regulations</p> <ul style="list-style-type: none"> • Proposed program duplicates current chemical reporting requirements of other governments. • Chemicals are already well-regulated by all levels of government • Consider voluntary approach instead of a bylaw 	<p>TPH has conducted additional reviews of existing regulations and confirmed that the proposed program does not duplicate the reporting requirements of other policies. Where policies are most comparable (e.g. the NPRI), TPH has avoided duplication through integrated electronic reporting.</p> <hr/> <p>The program complements existing chemical regulations.</p> <p>The program will focus on local businesses, particularly small and medium-sized facilities, which are less active in pollution prevention activities.</p> <hr/> <p>Bylaw is necessary to ensure level playing field for facilities, and that program would collect sufficient data.</p> <p>TPH will consider, in consultation with stakeholders, incentives or recognition programs to encourage voluntary pollution prevention activities by facilities</p>
<p>Minimize impact on facilities</p> <ul style="list-style-type: none"> • Adds to administrative costs of business, particularly for small and medium-sized facilities. 	<p>TPH will minimize reporting burden, particularly in the first years, through training workshops, bylaw guidance documents, sector-specific reporting guides, electronic calculators to estimate usage and emission data, and online</p>

<ul style="list-style-type: none"> • Toronto facilities unfairly singled out as polluters, while other sources within and beyond city not captured. • Proposed exemptions for facilities and activities should be revised. 	<p>reporting.</p> <p>TPH will phase in program to give smaller facilities and more affected sectors additional time to learn and prepare for compliance.</p> <p>TPH will work with stakeholders and City divisions to explore incentives to encourage participation and minimize reporting burden.</p> <p>TPH will create sector-specific pollution prevention guides to facilitate environmental improvements.</p> <hr/> <p>Other City programs will continue to address other sources of pollutants. TPH will seek out opportunities for linkages with these programs.</p> <p>Program can stimulate local innovation and leadership, which gives Toronto companies competitive advantage within GTA.</p> <p>City website will provide users with information about other sources of pollutants, and how individuals can reduce use and emissions of the 25 priority chemicals in their own lives and workplaces.</p> <p>TPH will consider ways to recognize facility leaders (e.g. through annual awards, case studies in summary reports)</p> <hr/> <p>Exemptions have been modified to reflect some stakeholder feedback.</p>
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Conclusion

Stakeholder response to the January 2008 consultation document clearly demonstrates a high level of interest in environmental reporting and disclosure. Although there is disagreement between most businesses and the community regarding the best approach for Toronto, most stakeholders support the program's goal to reduce exposure to priority pollutants and encourage environmental innovation. Stakeholders offered many suggestions for how to minimize the burden of such a program on affected facilities, and the proposed approach reflects this helpful input.

**List of Stakeholders that Submitted Written Comments
(not including 461 residents)**

BUSINESS & BUSINESS ASSOCIATIONS:

1. Baking Association of Canada
2. BASF Canada
3. Canadian Manufacturers and Exporters
4. Canadian Plastics Industry Association
5. Careful Hand Laundry
6. Chemtura Ltd.
7. Dominion Colour Corporation
8. E.I. DuPont Canada
9. Enwave Energy Corporation
10. Halogenated Solvents Industry Alliance Inc.
11. Hamilton District Autobody Repair Association
12. Korean Drycleaners Association
13. Maple Leaf Foods
14. Nestle Canada Confectionary – Sterling Road
15. Ontario & Toronto Automobile Dealers Association
16. Ontario Association of Cemetery and Funeral Professionals
17. Ontario Energy Association
18. Ontario Environment Industry Association
19. Ontario Fabricare Association
20. Ontario Funeral Service Association
21. ORTECH Environmental
22. Pinchin Environmental
23. Portlands Energy Centre
24. Sanofi Pasteur
25. Teknion Corporation
26. Toronto and District Funeral Directors Inc.
27. Toronto Industry Network
28. Unidentified business
29. Unidentified business
30. Vacuum Metallizing Limited
31. Vinyl Council of Canada

LABOUR UNIONS & AGENCIES REPRESENTING WORKERS

1. Occupational Health Clinics for Ontario Workers Inc.
2. Toronto and York Region Labour Council
3. Toronto Workers' Health and Safety Legal Clinic
4. Unidentified legal clinic
5. UNITE HERE Local 75
6. United Steelworkers

NON-GOVERNMENTAL ORGANIZATIONS

1. Canadian Association of Physicians for the Environment

2. Canadian Cancer Society
3. Canadian Environmental Law Association
4. Canadian Institute for Environmental Law and Policy
5. David Suzuki Foundation
6. Don Watershed Regeneration Council
7. East Toronto Climate Action Group
8. EcoSchool Committee, Northern Secondary School
9. Environmental Health Clinic, Women's College Hospital
10. Etobicoke-Mimico Watersheds Coalition
11. Great Lakes United
12. Green Enterprise Toronto
13. Harbord Village Residents' Association
14. Humber Watershed Alliance
15. Indoor Air Quality Work Group
16. International Institute of Concern for Public Health
17. Joint Watershed Working Committee
18. Labour Environmental Alliance Society
19. Mount Dennis Community Association
20. North Leaside Residents' Association
21. Ontario Bar Association
22. Pollution Watch
23. South Riverdale Community Health Centre
24. St. Lawrence Neighbourhood Association
25. St. Stephen's Community House
26. The Canadian Partnership Against Cancer
27. The Environmental Hypersensitivity Association of Ontario
28. The Safe Sewage Committee / The Ashbridges Bay Treatment Plant
Neighbourhood Liaison Committee
29. The Taylor Massey Project
30. Toronto Cancer Prevention Coalition
31. Toronto Energy Coalition
32. Toronto Environmental Alliance
33. York Quay Neighbourhood Association

CITY OF TORONTO ABCCDs

1. Economic Development, Culture and Tourism
2. Ted Reeve Arena
3. Toronto and Region Conservation
4. Toronto District School Board
5. Toronto Fleets
6. Toronto Hydro Corporation
7. Toronto Police Service
8. Toronto Transit Commission
9. Toronto Water
10. Transportation Services

Appendix 4: Evaluation Framework for Environmental Reporting and Disclosure Program

