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Commissioner of the Environment and Sustainable Development

to the House of Commons

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Chapter 2
Risks of Toxic Substances

Office of the Auditor General of Canada

The Fall 2009 Report of the Commissioner of the Environment and Sustainable Development comprises The Commissioner's Perspective—2009, Main Points—Chapters 1 to 4, an Appendix, and four chapters. The main table of contents for the Report is found at the end of this publication.

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Chapter

2

Risks of Toxic Substances

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Risks of Toxic Substances

Main Points

What we examined

Canadians use many types of chemical substances every day that play an important role in modern society. When released into the air, water, or land, however, some of these substances can threaten human health and ecosystems.

The federal government plays an important role in managing chemicals that pose a risk to the environment and human health. The primary tool for doing this is the *Canadian Environmental Protection Act, 1999* (CEPA 1999). Among other things, CEPA 1999 deals with determining whether existing and new substances are harmful to human health or the environment and managing the risks of those determined to be toxic. The Minister of the Environment and the Minister of Health jointly administer the task of assessing and managing the risks associated with toxic substances.

As of September 2008, there were 85 substances listed as toxic under CEPA 1999. We selected seven of these and examined how Environment Canada and Health Canada have managed the risks they pose to the environment and human health and the measures taken by both departments to control, reduce, and prevent these risks.

The toxic substances we selected (and examples of their uses and sources of emissions) are lead (batteries), mercury (thermometers), bis(2-ethylhexyl)phthalate or DEHP (plastic toys, medical devices), chlorobiphenyls or PCBs (older electrical transformers), dioxins and furans (incineration), dichloromethane (paint removal), and polybrominated diphenyl ethers or PBDEs (electronic equipment).

Audit work for this chapter was substantially completed on 30 June 2009.

Why it's important

The seven selected substances represent a range of risks to the environment and the health of Canadians. Health impacts vary by substance and may include learning disabilities, cancer, respiratory illness, and damage to internal organs. The impacts on fetuses and young children are particularly significant, even at low levels of exposure. Some of these substances may not be obvious to those that

come in contact with them. They may be persistent and can be carried by air and water over long distances, causing damage to the health of humans, wildlife, and ecosystems far from where they are produced and used. It is important that the risks associated with their production and release be assessed and managed to minimize their harmful effects.

What we found

- Environment Canada and Health Canada have implemented a number of control measures to manage the risks posed by lead and mercury and have also developed strategies for managing risks related to consumer products that may contain these substances. However, there is no consolidated risk management strategy for either substance that indicates the federal government's objectives and priorities for managing the risks. Clearly outlining its objectives and priorities for these substances would help strengthen transparency and accountability.
- Environment Canada and Health Canada are assessing the performance of a number of the control measures that have been implemented for the toxic substances we examined, and they are taking steps to keep their knowledge of risks up-to-date. However, the departments lack a systematic process for periodically assessing progress made in managing the risks. Periodic assessments would allow department officials and other stakeholders to know how well the risks are being managed, whether actions are sufficient or need to be modified, and whether progress is reasonable and timely.
- While labelling of chemical products in the workplace is required to indicate the hazards of chronic use (such as cancer risks and reproductive toxicity), no similar requirement exists for certain consumer products where multiple or long-term use may pose chronic hazards. Product labels warn consumers of acute hazards such as poisoning and contain instructions on how to safely use the product. However, there is no requirement that labels inform consumers of chronic hazards that may result from multiple or long-term use of the product.
- New biomonitoring initiatives are under way that address a significant gap we identified in our 2002 audit covering toxic substances. These initiatives are part of a broader, more comprehensive approach by Environment Canada and Health Canada to monitoring toxic substances in both humans and the environment. Sustained support for these types of initiatives is important in order to identify progress being made over time in reducing levels of toxic substances.

The departments have responded. The departments agree with all of our recommendations. Their detailed responses follow the recommendations throughout the chapter.

Introduction

Risks to human health and the environment

2.1 Canadians use many types of chemical substances every day. Although they play an important role in modern society, when released into the air, water, or land, or when used in consumer products, some of these substances can threaten human health and the environment.

2.2 Assessing the risks of toxic substances, including the hazards they present and routes of exposure, and managing those risks is a complex process involving multiple actors (international organizations; federal, provincial, territorial, and municipal governments; academia; industry; and the non-profit sector). In Canada, the federal government plays an important role in managing the risks toxic substances pose, primarily through the *Canadian Environmental Protection Act, 1999* (CEPA 1999), and through other federal legislation, such as the *Hazardous Products Act*, the *Food and Drugs Act*, and the *Pest Control Products Act*.

2.3 The *Canadian Environmental Protection Act, 1999*, deals with new and existing substances to determine if they are harmful to human health or the environment and to manage the risks of those determined to be toxic. The Minister of the Environment is accountable to Parliament for the administration of all of CEPA 1999. The Minister of the Environment and the Minister of Health jointly administer the task of assessing and managing the risks associated with toxic substances.

2.4 As per section 64 of CEPA 1999, a substance is toxic if it enters or may enter the environment in a quantity or concentration or under conditions that

- have or may have an immediate or long-term harmful effect on the environment or its biological diversity,
- constitute or may constitute a danger to the environment on which life depends, or
- constitute or may constitute a danger in Canada to human life or health.

2.5 Toxic substances may enter the environment, including indoor environments, in a variety of ways, such as a result of industrial emissions, the use of consumer products, or accidental spills.

2.6 From the enactment of the *Canadian Environmental Protection Act* in 1988 to September 2008, the federal government had added 85 substances or families of substances (representing approximately 700 chemicals) to the List of Toxic Substances in Schedule 1 of CEPA 1999.

2.7 The federal government launched the Chemicals Management Plan (CMP) in December 2006. The CMP aims to improve coordination of the federal government's chemicals management activities by integrating with other federal legislation actions taken under CEPA 1999. An important challenge facing the CMP is the risk assessment of 4,300 chemical substances (to be completed by 2020) and the risk management of those substances considered to be toxic as a result of the assessment process. As of May 2009, 22 of the 51 assessed substances had been determined to be toxic under CEPA 1999 and are in the process of being added to Schedule 1 of the Act.

Toxic substances and their impact on human health and the environment are one of the top issues raised by Canadians in their environmental petitions submitted for a ministerial response through our Office. Of over 330 petitions submitted by Canadians, 82 relate to toxic substances.

Managing risks

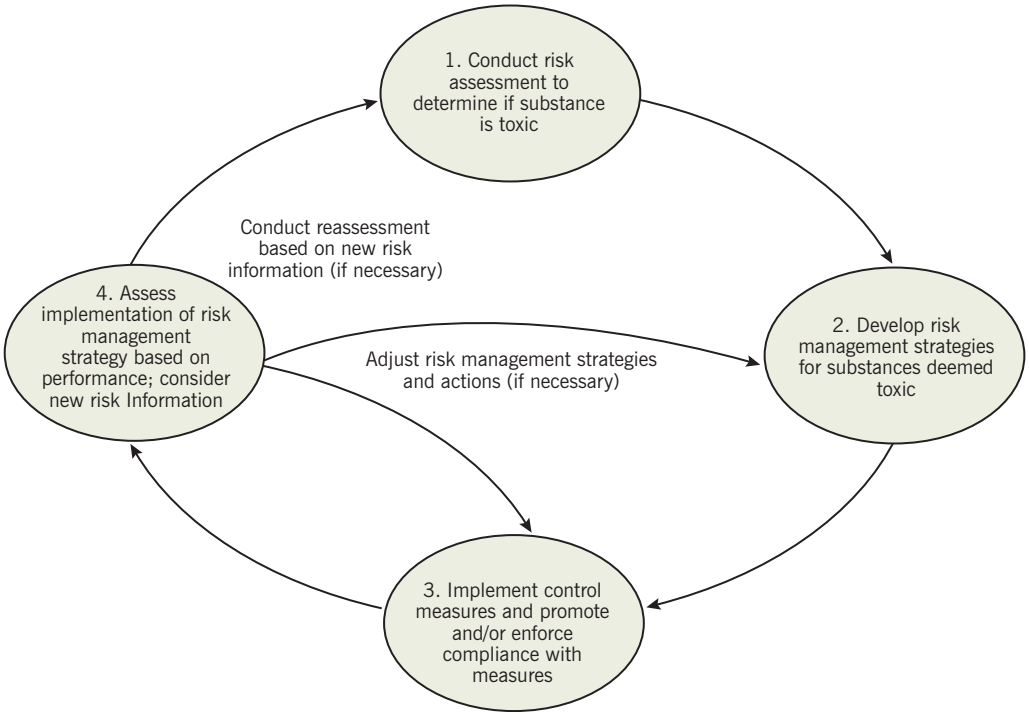
2.8 Exhibit 2.1 illustrates the process for managing risks of toxic substances. The first step in managing the risks of toxic substances is to determine the potential harm or danger a substance can cause to human health or the environment, and the ways in which humans or the environment can be exposed to the substance. A typical risk assessment examines

- how a substance is used;
- how a substance enters the environment, leading to exposure;
- what type of impact a substance has on human health or the environment;
- how great an impact a substance has on human health or the environment; and
- if the substance is listed as toxic under CEPA 1999 and warrants risk management action.

2.9 The second step in managing the risks of toxic substances is to produce a risk management strategy for directing and coordinating multiple risk management actions. With clear objectives, performance expectations, and timelines, these risk management strategies also provide a basis for measuring progress on controlling, reducing, or preventing risks from toxic substances.

2.10 The third step in managing the risks of toxic substances is to implement control measures identified in the risk management

Exhibit 2.1 **Managing the risks of toxic substances is an ongoing, integrated process**



Sources: Adapted from Toxics Management Process (Government of Canada, 2007), Toxic Substances Management Policy (Environment Canada, 1995), and Risk Management Guidelines for Decision Makers (Canadian Standards Association, 1997, 2007)

strategy. Control measures may be mandatory (such as regulations and pollution prevention plan notices) or voluntary (such as codes of practice and environmental performance agreements). Promoting and enforcing compliance with control measures is an important aspect of the federal government's approach to managing toxic substances.

Biomonitoring—The measurement, in people, of a chemical, the products it makes after it has broken down, or the products that might result from interactions in the body. These measurements are usually taken from blood and urine and sometimes in other tissues and fluids such as hair, nails, and breast milk. The measurements are to determine how much of a chemical or its elements are present in that person.

2.11 The fourth step in managing the risks of toxic substances is to evaluate the implementation of the risk management strategy based on the performance of control measures, new scientific information and knowledge, and environmental and **biomonitoring** data. When necessary, risk management strategies or actions can be changed, to help reduce risks to human health and the environment.

Findings from past audits

2.12 Given the importance of controlling toxic substances, the Commissioner of the Environment and Sustainable Development has examined the risk assessment and management of toxic substances several times in the last 10 years. Two chapters in the May 1999 Report

of the Commissioner of the Environment and Sustainable Development (CESD), Chapter 3, Understanding the Risks From Toxic Substances: Cracks in the Foundation of the Federal House, and Chapter 4, Managing the Risks of Toxic Substances: Obstacles to Progress, concluded that the federal government had been slow to take action on substances that had been declared toxic under CEPA 1999. The chapters raised concerns regarding the federal government's lack of progress in developing and implementing risk management strategies as well as its ability to assess the results of its risk management actions. The chapters also concluded that weaknesses in environmental monitoring were impeding the federal government's ability to measure the effectiveness of risk management initiatives.

2.13 A follow-up audit in the October 2002 CESD Report, Chapter 1, Toxic Substances Revisited, concluded that although the federal government had made some progress, its ability to detect, understand, and prevent the harmful effects of toxic substances was still limited. Chapter 1, Chemicals Management—Substances Assessed under the *Canadian Environmental Protection Act, 1999,* of the March 2008 CESD Status Report examined the status of risk assessments that were behind schedule at the time of the 2002 audit and concluded that the federal government had made satisfactory progress. It also examined the federal government's plans for conducting risk assessments under the Chemicals Management Plan. In December 2008, the Commissioner released Chapter 1—Managing Air Emissions, a report on air emissions that included the results of a CEPA 1999 pollution prevention plan notice for acrylonitrile and regulations pertaining to benzene. The chapter concluded that Environment Canada could not demonstrate that the results it had reported had actually been achieved or that processes were in place to verify the results reported by the regulatees.

Focus of the audit

2.14 The objective of this audit was to determine whether Environment Canada and Health Canada have put in place an adequate risk management regime for seven selected toxic substances—lead, mercury, bis(2-ethylhexyl) phthalate or DEHP, chlorobiphenyls or PCBs, dioxins and furans, dichloromethane (DCM), and polybrominated diphenyl ethers or PBDEs.

2.15 We focused on steps two to four of Exhibit 2.1—developing, implementing, and assessing risk management strategies—as the risk assessment process was the subject of the March 2008 CESD Status Report. We expected that Environment Canada and Health Canada

had prepared risk management strategies, were implementing measures to control, reduce, or prevent risks associated with these toxic substances and were promoting and enforcing compliance with these measures. We also expected that the departments were assessing the performance of their control measures and risk management strategies, keeping up to date with new risk-related information, and using this to inform decisions regarding risk management actions.

2.16 The substances selected for this audit were chosen because they have been known to be toxic for an extended period, thus allowing for sufficient time for risk management actions to have been implemented and assessed. These toxic substances also represent a range of risks to human health or the environment and a variety of sources of emissions and exposures, including industrial emissions and exposure through consumer goods, including household products (Exhibit 2.2). CEPA 1999 requires that, once a substance is declared toxic, a control instrument be developed and implemented within three and a half years. As a result, our focus on polybrominated diphenyl ethers (PBDEs) (added in 2006 to the List of Toxic Substances in Schedule 1 of CEPA 1999) was limited to the risk management strategy for this substance.

2.17 More details on the audit objective, scope, approach, and criteria are in **About the Audit** at the end of this chapter.

Exhibit 2.2 **These toxic substances represent a range of risks**

Substance and date when it was declared toxic under the *Canadian Environmental Protection Act*	Sources of emissions and exposure	Potential hazards*
Lead **1988**	Naturally occurring substance. Emissions result from activities such as metal smelting and processing, coal combustion, and mine waste. Found in some consumer products, such as batteries, children's jewellery, fishing weights, and ammunition.	High blood pressure, kidney damage, nerve disorders, memory and concentration problems, cognitive impairment and learning disabilities in children, difficulties during pregnancy, digestive problems, pain in the muscles and joints. Lead poisoning noted in wildlife.
Mercury **1988**	Naturally occurring substance. Emissions result from activities such as electricity generation from coal-burning facilities, and base metal smelting operations. Found in some consumer products, such as compact fluorescent lights, and thermometers. Primary source of human exposure to methyl mercury is through the consumption of fish.	Permanent damage to the brain and kidneys. Damage or irritation of the lungs, stomach, intestines, and airways. Mercury poisoning noted in wildlife.
Polychlorinated biphenyls or PCBs **1988**	Found in electrical transformers. Historically used as an additive in selected products such as plastics, paints, cements, and sealants.	Liver and kidney cancer. Impairment of the immune system, motor skills, and short-term memory in children born of women who consumed PCB-contaminated fish.
Polychlorinated dibenzodioxins (dioxins) and polychlorinated dibenzofurans (furans) **1992**	By-product of incineration of waste (including industrial, municipal, household, hazardous, and medical waste), production of iron and steel.	Liver problems, impairment of the immune system, the endocrine system, and reproductive functions. Effects on the developing nervous system and other developmental events. Certain types of cancer. May cause a range of negative effects on wildlife such as reproductive failure.
Phthalates (DEHP) **1999**	Used as a plasticizer to make polyvinyl chloride (PVC) soft and flexible. Found in industrial, commercial, and consumer plastic products (PVC, medical devices, cleaning products, and soft vinyl toys).	Suspected carcinogen and endocrine disrupter. Suspected problems include developmental and reproductive outcomes in male children.
Dichloromethane **1999**	Released during the manufacture of pharmaceuticals and polyurethane foam. Found in adhesives, industrial cleaning processes, and paint strippers.	Possible carcinogen. Neurological functions may be impaired from exposure to high concentrations. Lower doses may cause sluggishness, irritability, light-headedness, nausea, and headaches.
Polybrominated diphenyl ethers (PBDEs) **2006**	Fire retardant: Found in electronics, electrical devices, and textiles.	May cause liver, thyroid, and neuro-developmental problems. Secondary poisoning of wildlife that eat prey contaminated with PBDEs.

*Certain health impacts may only result from chronic or high exposure levels. Risks of certain health impacts may be greater in occupational settings.

Source: Environment Canada, Health Canada, United States Environmental Protection Agency, United States Agency for Toxic Substances and Disease Registry

Observations and Recommendations

Risk management strategies

Not all toxic substances we examined are covered by a risk management strategy

2.18 Although the *Canadian Environmental Protection Act, 1999* (CEPA 1999) does not require a formal risk management strategy for individual toxic substances, guidance from the Treasury Board of Canada Secretariat and the Canadian Standards Association and internal guidance on risk management at Environment Canada and Health Canada emphasize the importance of risk management strategies. We examined the risk management strategies that have been prepared for seven toxic substances selected for our audit—lead, mercury, bis(2-ethylhexyl) phthalate or DEHP, chlorobiphenyls or PCBs, dioxins and furans, dichloromethane, and polybrominated diphenyl ethers or PBDEs.

2.19 We expected that risk management strategies were in place and that they contained clear objectives, performance expectations, and timelines. In the absence of risk management strategies, it is difficult to determine what the federal government's overall objectives are for managing a toxic substance, the scope of risk management actions it expects to carry out, its performance expectations, and timelines for measuring progress.

2.20 We found that Health Canada and Environment Canada have prepared risk management strategies for four of the seven toxic substances we selected for our audit—DCM (in 1998), DEHP (in 2002), PCBs (internal draft, in 2006), and PBDEs (in 2006 and 2009). These strategies identified sources of emissions or exposure for these toxic substances and, with the exception of the risk management strategy for DEHP, proposed risk management options and contained clear objectives, performance expectations, and timelines. For DEHP, the strategic options report prepared by Environment Canada and Health Canada concluded the following:

> Since no readily identifiable link between human exposure and the manufacture and/or use of DEHP-containing plastics has been characterized, it would not be advisable that Environment Canada and Health Canada proceed with further risk management actions at this time. Appropriate risk management actions will be taken under the appropriate legislation following the result of the additional research, if necessary.

2.21 Risk management strategies that provide a comprehensive picture of the federal government's approach for managing lead and mercury are not in place. We note that when these substances were added to the List of Toxic Substances in Schedule 1 of CEPA, guidance relating to risk management strategies (and used as sources of criteria for this audit) was not in place.

2.22 **Dioxins and furans.** In Canada, dioxins and furans are managed through a collection of federal control measures, in conjunction with Canada-wide standards entered into by the Canadian Council of Ministers of the Environment. Although a risk management strategy for dioxins and furans has not been prepared yet, Canada's National Implementation Plan under the Stockholm Convention on Persistent Organic Pollutants, which includes objectives, timelines, and reporting requirements, effectively operates as a risk management strategy for these toxic substances.

2.23 **Lead.** Environment Canada and Health Canada have been using a series of regulatory and voluntary control measures targeting selected sources of emissions and exposure to manage the risks posed by lead. This approach has contributed to significant results. For example, Health Canada states that reducing lead in gasoline and paint and virtually eliminating lead solder in food cans has contributed to considerably diminishing Canadians' exposure to lead. Preliminary biomonitoring results from the recent Canadian Health Measures Survey (CHMS) indicate less than one percent of Canadians (aged 6 to 79) have elevated levels of lead in their blood—a significant decline from the 1970s when 25 percent of Canadians (aged 6 and older) had elevated levels of lead in their blood.

2.24 The federal government continues to be involved in managing the risks related to the historical and continuing release of lead into the environment from industrial sources and consumer products (for example, base metal smelters and children's jewellery). It also is involved with managing the risks related to the past use of lead from sources such as contaminated sites and lead-based paints in older homes, some of which are not federal responsibilities. Health Canada has a strategy for reducing lead in selected consumer products and it has indicated that, based on new scientific information (Exhibit 2.3), it is developing a risk management strategy for other Health Canada programs. However, we found that there is no risk management strategy in place that provides a comprehensive or consolidated picture of the federal government's approach related to reducing lead exposure.

Exhibit 2.3 Health Canada is assessing new science on the toxicity of lead

Measurements of blood lead levels above 10 μg/dL (micrograms per decilitre) should result in the consideration of follow-up actions for reducing lead exposure.

In the 1990s, US human health studies indicated a potential correlation between lead levels in blood and a negative impact on children. Health Canada released a final regulation and regulatory impact analysis statement on children's jewellery in 2005. The statement noted that results from a 2000 study indicated that even levels below 5 μg/dL may harm the intellectual development and behaviour of children.

Department officials informed us that, in 2004, they decided the current guidance level of 10 μg/dL should be reviewed, based on emerging science, to determine if it should be adjusted. Health Canada is finalizing its assessment of lead toxicity and expects to publish its results between late 2009 and early 2010.

2.25 **Mercury.** Environment Canada and Health Canada manage the risks associated with mercury with a combination of regulatory and voluntary tools. Some results are being achieved. For example, preliminary results for Canadians aged 20 to 79 from the Canadian Health Measures Survey indicate that nearly all levels of mercury in blood fell below Health Canada's blood guidance value, the level above which follow-up actions may be considered to reduce exposure. Federal government research indicates that mercury levels continue to be high in some Inuit and wildlife populations in Canada's North.

2.26 The federal government continues to be involved in managing the risks associated with mercury, including those related to mercury released into the environment from industrial sources and consumer products. Environment Canada officials stated that the cross-border movement of mercury from foreign sources plays an increasingly important role in exposing Canadians to mercury (especially in Canada's North). Though it remains uncertain, the impact of climate change related to melting ice and permafrost may also be implicated.

2.27 Environment Canada has developed a strategy for dealing with products that contain mercury and, in 2009, Canada agreed to negotiate a new United Nations treaty to control mercury pollution. Just as we found for lead, no risk management strategy exists for mercury where Canadians can find the full story describing the federal government's progress to date, and its approach and commitments to tackle the current risks associated with mercury to human health and the environment.

2.28 Under the Chemicals Management Plan, proposed risk management documents have been prepared for substances that have recently been determined to be toxic under CEPA 1999. These risk management documents contain background information on the toxic substance (such as the risks it poses and its current uses in Canada) as well as risk management objectives and proposed risk management instruments and tools the federal government is proposing to achieve its risk management objectives. These risk management documents provide a consolidated picture of the federal government's proposed risk management actions that are being considered under CEPA 1999 as well as other federal legislation including those related to food, consumer products, and pesticides.

2.29 Because products containing lead and mercury are still prevalent in society and lead and mercury emissions require active management by the federal government, these toxic substances would benefit from today's approach to risk management strategies. Integrated risk management strategies for these toxic substances would allow the federal government to document progress to date, those risks it considers to be under its jurisdiction, the significance of those risks to human health and the environment, and justification for the range of control measures that have been or will be implemented. Such risk management strategies would provide a more consolidated description of the federal government's actions, thereby increasing transparency and creating a basis for accountability.

2.30 **Recommendation.** Environment Canada and Health Canada should prepare and implement risk management strategies for lead and mercury that provide a comprehensive and consolidated description of the federal government's progress to date. These risk management strategies should outline the remaining objectives, priorities, actions under way or planned, timelines, and monitoring programs in effect to address the ongoing risks associated with these toxic substances to human health and the environment.

The departments' response. Agreed. The departments have already taken significant actions to reduce Canadians' exposures to lead and mercury. Today, less than 1 percent of Canadians (aged 6 to 79) have blood lead concentrations above the Canadian guidance level at which follow-up actions may be considered to reduce exposure. This compares to 25 percent of Canadians (aged 6 and older) in the 1970s. From 1970 to 2008, there was a 99.7 percent reduction of lead in air emissions. Mercury emissions have decreased by 90 percent since the 1960s.

Risk management strategies are updated using new science to address current risks according to their relative priority in protecting human health and the environment.

Based on the latest science, Health Canada is finalizing a comprehensive lead toxicological assessment for consultation (expected by mid-2010) and a revised risk management strategy with clear objectives, performance expectations, and timelines (expected by end of 2010) to build on the existing 20 actions for lead.

To further reduce mercury exposure, Environment Canada has strategies for mercury in products, remaining domestic emissions, and emissions from other jurisdictions. These will be compiled into one mercury strategy with clear objectives, performance expectations, and timelines for publication by winter 2009–10.

Environment Canada and Health Canada will incorporate actions addressing both priority ecological and human health impacts.

Control measures

Control measures are in place or proposed for the toxic substances we examined

2.31 Implementing control measures is an important aspect of the risk management cycle. In accordance with the Treasury Board of Canada Secretariat's Assessing, Selecting and Implementing Instruments for Government Action; the Government of Canada's Toxics Management Process; and the *Canadian Environmental Protection Act, 1999* (CEPA 1999), we expected Environment Canada and Health Canada to have control measures that address sources of emissions or exposures and risks posed to human health and the environment regarding the toxic substances selected for this audit. We examined Environment Canada and Health Canada's use of regulatory and voluntary measures to control and prevent the risks posed by these toxic substances.

2.32 For the toxic substances we examined, Environment Canada and Health Canada have implemented 18 regulations under CEPA 1999, 4 pollution prevention plan notices, and 4 codes of practice. In addition, 18 regulations under other federal legislation (such as the *Food and Drugs Act*, *Hazardous Products Act*, and *Fisheries Act*) are in place. Several other control measures have recently been proposed. The federal, provincial, and territorial governments have also entered into voluntary Canada-wide standards and guidelines through the Canadian Council of Ministers of the Environment (such as standards for mercury emissions for coal-fired electricity generating plants and standards for dioxin and furan emissions from waste incineration).

2.33 With the exception of bis(2-ethylhexyl) phthalate (DEHP), the toxic substances we examined are covered by at least one mandatory regulation or pollution prevention plan notice. These regulations and pollution prevention plan notices have been used to address the following key risks to human health and the environment:

- lead in gasoline;
- lead in children's jewellery and toys;
- lead and mercury emissions from base metal smelting;
- release of mercury from mercury-containing electrical switches from end-of-life or scrap vehicles;
- releases to water of dioxins and furans from pulp and paper mills; and
- dichloromethane in various industrial sectors, such as aircraft paint stripping.

2.34 A regulation pertaining to the release of mercury from consumer products was proposed in 2007, but it has not yet been implemented. The use of lead shot for hunting and lead fishing weights (50 grams or less) has been prohibited on federal lands; however, except for the use of lead shot for hunting migratory waterfowl, there are no Canada-wide controls on these products.

2.35 In the case of DEHP and other selected phthalates, in 1998, Health Canada issued voluntary guidance to industry regarding the use of certain phthalates in the production of products intended to be mouthed by children (such as teethers and pacifiers). A voluntary guide on the safe manufacture of children's toys was prepared by the Department and released in 2006. In June 2009, regulations were proposed under the *Hazardous Products Act* to prevent the use of six phthalates, including DEHP, in soft vinyl toys and child-care articles. These regulations would harmonize Canada's management of phthalates in children's toys and child-care articles with those of the United States and the European Union. Health Canada also added DEHP to the Cosmetic Ingredient "Hotlist" (a list of substances that are restricted and prohibited in cosmetics under the *Food and Drugs Act*). Health Canada has also published a draft position paper on managing the risks related to the use of DEHP in medical devices, such as plastic tubing and bags used to administer blood.

The labelling of chronic hazards from toxic substances contained in consumer products continues to be discussed

2.36 Labelling is a control measure that can be useful in informing consumers of the presence of toxic substances in products they purchase. Regarding two of the toxic substances we examined—dichloromethane and lead—labels for consumer products that may contain these substances do not fully inform consumers of the potential hazards these products may pose.

2.37 Regarding dichloromethane (DCM), labelling can play a role in informing consumers of the existence of this toxic substance in retail paint strippers, aerosols, and aerosol paints. Environment Canada and Health Canada identified inhalation of fumes from these products as a source of exposure to DCM. Health Canada notes that scientists believe prolonged exposure to DCM could cause cancer in humans. When the strategic options report on DCM was released in 1998, it recommended that paint strippers and aerosol products sold for consumer use that contain DCM be labelled to identify the chronic toxicity and possible carcinogenicity associated with the improper use of these products. Labelling of products containing DCM was expected to decrease the use and emissions of this toxic substance in these products by 20 percent.

2.38 The strategic options report also recommended that labelling be implemented when future labelling requirements under the *Consumer Chemicals and Containers Regulations, 2001,* of the *Hazardous Products Act* adopt toxicity criteria. The report further recommended that if a labelling program for paint strippers was not implemented through the *Consumer Chemicals and Containers Regulations, 2001,* the program should be implemented pursuant to the *Canadian Environmental Protection Act, 1999*.

2.39 The *Consumer Chemicals and Containers Regulations, 2001*, requires classification and labelling of consumer chemical products, such as paint strippers. The product label is to inform consumers of inherent hazards associated with unintentional exposure to the product contents, and provides safe handling instructions to minimize risks related to **acute hazards**. The existing labelling requirements do not require informing consumers about the **chronic hazards** such as possible carcinogenicity associated with certain toxic substances found in these products. However, we note that Health Canada has released a pamphlet on the safe use of paint strippers, and DCM is listed as an ingredient in paint strippers.

Acute hazards—Adverse effects, such as poisoning, eye, or skin irritation, from a single or short-term exposure to a toxic substance.

Chronic hazards—Adverse effects, such as cancers or reproductive toxicity, from multiple or long-term exposure to a toxic substance.

2.40 One barrier to labelling a product for chronic hazards is the debate about what approach to take. The hazard-based approach labels a product simply because it contains a substance that poses a chronic hazard, regardless of a consumer's level of exposure to the substance. The risk-based approach labels a product for the likelihood of injury occurring based on the hazard and the expected consumer exposure and normal use of the product. The effectiveness of labelling consumer products for chronic hazards is also debated. We note that information on and labelling of acute and chronic hazards, such as carcinogenicity, as well as worker training, is required for chemical products in the workplace, where levels and duration of exposure are greater than those typically faced by consumers.

2.41 To address the issue of labelling acute and chronic hazards related to consumer chemical products, Health Canada has participated in the international Globally Harmonized System of Classification and Labelling of Chemicals (GHS). The GHS also relates to pest control products, workplace chemicals, and products regulated under the transportation of dangerous goods. Efforts to develop the GHS began after the 1992 United Nations Earth Summit, when a commitment was made to harmonize the classification and labelling of chemicals by 2000, if feasible. The Plan of Implementation, adopted at the 2002 World Summit on Sustainable Development, encouraged countries to implement the GHS by 2008. Although the United Nations released the first edition of the GHS in 2003, full implementation of the GHS has not yet occurred in Canada, nor is there a definite date for this to happen. Health Canada has indicated that one of the guiding principles for GHS implementation in Canada is the harmonization, to the greatest extent possible, with the United States, Mexico, and other trading partners (the European Union recently introduced regulations to align its previous legislation to the GHS on classification, labelling, and packaging of chemicals). It is important to note that once the GHS is incorporated into the *Consumer Chemicals and Containers Regulations, 2001*, it would apply only to consumer chemical products—for example, solvents and cleaning products, but not to general consumer products that may contain a toxic substance, including those selected for this audit, for example, DEHP, PBDEs, lead, and mercury.

Proposed GHS pictogram for products containing toxic substances that present a chronic hazard to human health.

2.42 Inexpensive jewellery, including children's jewellery, is one consumer product that has been found to contain hazardous levels of lead. In 1999, a five-year-old child was found to have elevated blood lead levels following exposure to lead in an item of children's jewellery. In response to this, Health Canada sought the voluntary assistance of

manufacturers, distributors, importers, and retailers to refrain from selling lead-containing children's jewellery and to use labelling to warn consumers of the presence and hazards of lead in jewellery meant for children aged 15 years and older and adults. In 2000 and 2001, Health Canada conducted targeted marketplace surveys of products suspected to contain lead and found that the voluntary measures had been ineffective in removing lead-containing jewellery from the Canadian marketplace. During the Department's inspection activities, the recommended warning label for lead in jewellery was observed only once.

2.43 In the late 1990s, Health Canada began work to introduce regulatory limits for jewellery items for children younger than 15 years. Health Canada also considered requiring that all lead-containing jewellery have a label warning of its lead content attached to the jewellery itself or to its packaging, or displayed next to the jewellery, as part of the proposed *Children's Jewellery Regulations* under the *Hazardous Products Act*. During consultations on the proposed regulations, retailers believed such labels would be a considerable disincentive to the consumer; it was also determined that labels posted next to or directly on the product would not be effective. The Department decided not to use warning labels. Instead, when the *Children's Jewellery Regulations* came into force in 2005, the Department set specific limits for lead content (children's jewellery containing lead above the set limits have since been added as a prohibited product under the *Hazardous Products Act* and the regulations have been repealed).

2.44 Health Canada continues to conduct targeted testing of products suspected to contain lead to determine if they are in compliance with the regulations. These marketplace tests show that there continues to be children's jewellery on the market that contains hazardous levels of lead; however, because the tests focus on samples expected to contain lead, the results are not representative of the overall marketplace compliance rates (that is, the percentage of total items in the marketplace that contain lead). The Department is also undertaking efforts, such as working with foreign suppliers, to prevent foreign products from entering Canada that do not meet Canadian lead-content requirements. For those products that contain lead above the regulated limits, Health Canada lacks powers that would allow it to issue mandatory product recalls; rather, it must negotiate voluntary recalls with industry. We note that Bill C–6, the *Canada Consumer Product Safety Act*, which was being considered by Parliament at the time of our audit and is a key component of the Government of

Canada's Food and Consumer Safety Action Plan, would provide Health Canada with powers to issue mandatory recalls.

Not all control measures are subject to active compliance promotion and enforcement

2.45 Regulations, pollution prevention plan notices, and voluntary control measures are aimed at controlling, reducing, or preventing emissions of and exposures to toxic substances. Compliance promotion and enforcement are important aspects in ensuring that regulations and control measures achieve their objectives. Compliance promotion involves the development and delivery of information to those people or industries that are subject to the control measures developed under CEPA. Enforcement involves activities such as intelligence gathering, inspections to verify compliance, responding to complaints, investigations, and follow-up activities such as issuing warnings and legal proceedings. We examined the extent to which Environment Canada was promoting and enforcing compliance with the CEPA-related control measures in place to manage the risks of the substances we examined.

2.46 In regard to all of the toxic substances listed in Schedule 1 of CEPA 1999, Environment Canada is currently responsible for enforcing and promoting compliance with 46 regulations, 8 pollution prevention plan notices, 6 environmental protection agreements, 25 codes of practice, and 49 guidelines. It is also responsible for enforcing 6 regulations under the *Fisheries Act* as well as regulations related to wildlife-related legislation. At the time of our audit, Environment Canada employed approximately 290 enforcement officers, 193 of whom were responsible for enforcing measures related to pollution, with the balance dedicated to wildlife enforcement. Budget figures for activities specific to the toxic substances we examined were not available. We note that the number of control measures the Department is responsible for has increased in the last decade. This growth will likely continue due to additional substances being added to the List of Toxic Substances in Schedule 1 of CEPA 1999 as a result of the 4,300 risk assessments currently being undertaken as part of the Chemicals Management Plan.

2.47 Given the resources expended, compliance promotion and enforcement activities, the number of control measures involved, and the risks associated with each control measure, Environment Canada does not exert a uniform level of effort promoting or enforcing compliance across all of the control measures for which it is responsible. Accordingly, the Department prioritizes its work, taking

into consideration factors such as risks to human health and the environment, historic compliance rates, and international commitments. The Department's Environmental Protection Board approves the results of this process. Only a limited number of the control measures related to the toxic substances we examined in this audit have been considered a priority for compliance promotion and enforcement actions. For most of the control measures, compliance promotion and enforcement actions are mainly reactive in nature, responding to referrals, complaints, inquiries, and incidents.

2.48 Parliamentarians and the public need timely information on which control measures have and have not been actively promoted and enforced. Otherwise, there is a risk that people will be left with the incorrect assumption that all control measures to manage the risks of toxic substances are actively promoted and enforced. Disclosing priorities and non-priorities—and the rationale for not actively enforcing these control measures—would provide a more complete and transparent picture of the Department's compliance and enforcement actions. In certain cases, it may be reasonable that some control measures are not priorities, for example, the industry being regulated may have changed significantly, making the regulation or control measure less relevant.

2.49 The *Canadian Environmental Protection Act, 1999*, requires that the Minister of the Environment prepare and table in Parliament, as soon as possible after the end of each fiscal year, a report on the administration and enforcement of the Act. At the time of our audit, the 2006–07, 2007–08, and 2008–09 CEPA 1999 annual reports had not been tabled. The most recent CEPA 1999 annual report, 2005–06, clearly identified the regulations that Environment Canada considered priorities for enforcement action. However, the report did not identify control measures that were not priorities. Nor did the report identify the reasons for not actively enforcing these control measures or the potential consequences of not enforcing them. In addition, the compliance rates related to the priority control measures were also not reported.

2.50 **Recommendation.** Environment Canada should release the outstanding *Canadian Environmental Protection Act, 1999* annual reports and ensure that future reports are released in a timely manner. In these reports, Environment Canada should present a complete and transparent picture of its previous year's compliance promotion and enforcement activities and related results, including compliance rates.

Environment Canada's response. Agreed. Environment Canada's *Canadian Environmental Protection Act, 1999* (CEPA 1999) Annual Report covers actions and accomplishments within the scope of the Act, including research, enforcement, administration of the Act and progress on issues such as the management of chemical substances. Most of these activities are also reported on the CEPA Environmental Registry, which is maintained daily as required. The Department will ensure that the CEPA 1999 annual reports are completed in a timely manner. By early 2010, Environment Canada, with the support of Health Canada, will be up-to-date with tabled reports and from then on will table reports annually in the fall.

Environment Canada has identified compliance rates as an important component of its Strategic Enforcement Framework, which defines performance indicators for various toxic substances, and will continue work on the determination of compliance rates for reporting in future annual reports.

Performance assessment

Performance of a number of control measures is being assessed

2.51 Once a control measure has been put in place, it is important to assess its performance, including levels of compliance and its impact on reducing emissions or exposure to toxic substances. Performance assessment helps department officials know whether a control measure is achieving results, whether progress is on track, and whether additional action is required. We examined whether Environment Canada and Health Canada had assessed control measures to determine if they were achieving intended objectives. Our focus was those control measures under the *Canadian Environmental Protection Act, 1999* (CEPA 1999) that target the toxic substances we examined as well as children's jewellery under the *Hazardous Products Act*. We further examined whether the departments used information from performance assessments to inform and improve their risk management actions.

2.52 We found that Environment Canada and Health Canada were assessing the performance of a number of the control measures we examined. We noted that the current process assesses each control measure independently, rather than comprehensively by toxic substance. A variety of methods have been used to assess performance such as formal evaluation and review, progress reporting on pollution prevention plan notices, compliance monitoring, and the use of monitoring data. The results of these performance assessments present a mixed description of how control measures are achieving their

objectives. In some cases, the measure performed unsatisfactorily, leading to changes in the way the toxic substance is managed (Exhibit 2.4). In other cases, such as regulations pertaining to releases to water of dioxins and furans from pulp and paper mills and lead in gasoline regulations, the departments conclude that the control measures have contributed positively to reductions in emissions. For selected control measures such as the new polychlorinated biphenyls (PCB) regulations, the proposed bis(2-ethylhexyl) phthalate (DEHP) regulations, and recently introduced pollution prevention plan notices, it is too early to expect them to have been assessed.

Exhibit 2.4 Assessing performance of control measures has resulted in new approaches to managing risks

PCBs. The United Nations Stockholm Convention on Persistent Organic Pollutants commits Canada to make determined efforts to eliminate the use of PCBs in equipment by 2025. When Environment Canada assessed the state of PCBs in Canada, it determined that the existing regulatory regime for controlling PCBs would not allow Canada to meet its obligations under the Convention. As a result, a new regulatory regime, reflected in the 2008 PCB regulations, was implemented. This regulatory regime is expected to eliminate PCBs in equipment (in concentrations at or above 50 mg/kg) from use and storage by 2025.

Mercury. Research shows that mercury from dental practices is released into waste water every year. The Canadian Council of Ministers of the Environment developed a Canada-wide standard, the objective of which was for 95 percent of dentists in Canada to modify their procedures in order to remove mercury from their waste stream. In 2007, a survey showed that 70 percent of dentists were complying. In April 2009, acting on this information, Environment Canada published a proposed notice requiring that dentists who have not implemented this standard develop pollution prevention plans.

Environment Canada and Health Canada do not have formal processes for tracking new information and emerging risks

2.53 Given that scientific information and research is not static, it is important for Environment Canada and Health Canada to keep up to date with new information regarding toxic substances, such as hazards and routes of exposure. Although re-assessing substances already deemed toxic is not required under CEPA 1999, we expected that Environment Canada and Health Canada were keeping current with new knowledge. Keeping current helps to minimize the risk of missing new and significant information that may otherwise inform and, if necessary, change risk management actions.

2.54 We found that Environment Canada and Health Canada do not have a formal process for assessing new information on the substances we examined. Nor do they have specific criteria for determining if or when risk management actions should be changed based on new

information such as new toxicity studies for a substance or significant changes in the quantities used or released to the environment. We made similar observations in our 1999 audit on managing the risks of toxic substances. In order to support the assessment process, including the reassessment of substances, Environment Canada and Health Canada undertake their own research projects and studies on toxic substances and track new scientific research. As well, officials from both departments monitor and attend scientific conferences and exchange information with international partners on a formal and informal basis. Environment Canada and Health Canada also have a number of processes for tracking new information as a result of provisions in CEPA 1999. For example, section 70 requires a person to inform the ministers of Health and the Environment if they obtain information that reasonably supports the conclusion that a substance they are using is toxic or capable of becoming toxic, and section 75 requires the Minister of the Environment to develop, to the extent possible, procedures for exchanging information with other jurisdictions.

2.55 PCBs in building sealants. The release of an updated State of the Science Report on deca-BDE (a form of polybrominated diphenyl ether (PBDE)) by Environment Canada, in early 2009, and Health Canada's response to new science on the toxicity of lead are two examples of how these departments have identified and responded to new scientific research. One issue that these departments have not fully addressed is the historic use of PCBs in building sealants. To enhance durability and elasticity, this substance was added to sealants and caulking and used in the construction of buildings such as schools, hospitals, office buildings, and residential buildings between the 1950s and mid-1970s. Regulated in Canada since 1977, the use of PCBs in such products is now prohibited. The disposal of PCBs in waste products, including caulking and paint, has also been regulated. However, research conducted by a number of different organizations since the 1990s indicates that the use of PCBs in sealants may represent a source of ongoing exposure to low-levels of PCBs, present risks to workers restoring or demolishing these structures, and result in localized soil contamination and contaminated waste. We found that neither Environment Canada nor Health Canada has responded to this research, for example, by conducting research to determine the existence and significance of PCBs in building sealants, including federal facilities and buildings on federal lands. We note that several members of the Stockholm Convention have recognized this issue.

Monitoring of toxic substances is becoming more comprehensive

2.56 We expected that Environment Canada and Health Canada were monitoring the releases of toxic substances and their presence in humans and wildlife to understand the progress made on managing toxic substances. Information on the presence of toxic substances in humans can help physicians, policy makers, and regulators identify opportunities to reduce exposure and health risks. Trends are important as they can provide information on progress in protecting human health and the environment.

2.57 In our 2002 audit on toxic substances, we noted the lack of knowledge about levels of toxic substances found in the bodies of Canadians (for example, in breast milk and blood). We also noted that Health Canada did not have a program to evaluate this kind of information nationally, although it has done some regional studies of a few specific toxic substances.

2.58 Health Canada has launched several major studies to better assess the presence of toxic substances in Canadians that will provide important baseline data for assessing whether efforts on managing toxic substances are resulting in better health.

2.59 One such study is the 2007 Canadian Health Measures Survey (CHMS). Undertaken by Statistics Canada in partnership with Health Canada, the study is testing 5,500 people, randomly chosen across Canada, over two years (2007 to 2009) to determine the level of toxic substances, such as lead, mercury, PBDEs, and phthalates, in their blood (biomonitoring). Health Canada notes that the current design of the CHMS is representative of 96 percent of the Canadian population aged 6 to 79. Although the first cycle of the CHMS excludes children under six, the next cycle is expected to include children aged three to five. Additional biomonitoring studies focusing on children are also in progress. Residents of Indian reserves are excluded from the CHMS; however, a First Nations biomonitoring program has been initiated by Health Canada to cover this population group.

2.60 Another important study is the 2007 Maternal-Infant Research on Environmental Chemicals (MIREC). This five-year study is testing 2,000 women and their newborn babies for toxic substances, such as lead and mercury. Although it was conceived as a longitudinal study, thus requiring ongoing funding, only the first phase is currently funded. Consideration is being given to exploring ways to acquire ongoing funding.

2.61 Environment Canada and Health Canada are implementing a broader, more comprehensive approach to monitoring toxic substances, of which the CHMS, MIREC, and other biomonitoring studies are a part. Other studies under way or under development include monitoring leachate from landfill sites, monitoring municipal waste water effluent, and studying the presence of toxic substances in Canadian homes (Canadian House Dust Study) (Exhibit 2.5).

Exhibit 2.5 Toxic substances are present in household dust

Several studies have shown that household dust plays a role in exposing people to toxic substances. Toxic substances such as lead, mercury, PBDEs, phthalates, and PCBs are present in household dust in countries around the world.

Products within the home, from electronic equipment and plastic toys to household cleaners, may contain toxic substances that are released when the product is used or breaks down. These substances, some of which bond with dust particles, can be inhaled or ingested, especially by young children.

Health Canada launched a four-year Canadian House Dust Study in 2007 to look at background levels of chemicals in house dust from 1,040 randomly selected houses in 13 cities. Sampling is to be completed in 2010. To date, the study has primarily focused on lead in house dust. A number of other substances are also expected to be measured.

2.62 These studies are in addition to existing monitoring and research initiatives, such as Health Canada's Total Diet Study; regional monitoring programs, such as in the Great Lakes and Canada's North; and Environment Canada's monitoring of contaminants in wildlife.

2.63 The National Pollutant Release Inventory (NPRI) is an important tool in the federal government's monitoring program. The NPRI is used to assess the performance of control measures and to help increase public understanding of pollutant releases in Canada. The NPRI, which contains data from facilities that meet certain reporting thresholds, identifies who is releasing pollutants, the types of pollutants, and the communities in which the pollutants are found. A separate audit on the NPRI was conducted concurrently by the Commissioner of the Environment and Sustainable Development and is contained in Chapter 3 of this report.

A more formal and timely process for assessing risk management strategies is needed

2.64 Having processes in place to assess the overall progress made on risk management strategies is important as it provides an opportunity to take a comprehensive view of how toxic substances are being managed, facilitates continual improvement, and is integral to the overall process of managing risks. We examined whether Environment

Canada and Health Canada had processes in place that provided for periodic assessments of progress on risk management strategies and related risk management actions for selected toxic substances. We observed that the departments are assessing the performance of certain control measures. However, we found that they do not have processes in place that periodically assess overall progress against the objectives set out in the existing risk management strategies for the toxic substances we examined. Periodic reviews that are documented and demonstrate the involvement of senior management would provide greater assurance that the departments are considering important questions, such as the sufficiency and success of risk management actions, whether new risk management actions or changes to existing control measures are required, and whether risk management strategies need to be updated. Incorporating information on new research (for example, the use of PCBs in sealants) and the results of monitoring and actions taken by other jurisdictions would provide a more comprehensive assessment of progress made on managing toxic substances.

2.65 Several observations made during our audit raised questions about the timeliness of federal government actions, which is also important to consider when assessing progress. For example, DEHP was assessed as toxic in 1994 but was not added to the List of Toxic Substances in Schedule 1 of CEPA 1999 until 1999, and proposed regulations pertaining to DEHP and five other phthalates were only introduced 15 years after DEHP was assessed as toxic. As noted in paragraph 2.35, some voluntary measures were taken in the interim. A Health Canada working group paper from 2002 noted environmental waste containing phthalates as a priority, but no actions have yet been taken. Progress on labelling consumer chemical products for acute hazards and safe handling instructions has been made; however, the labelling of these products for chronic hazards has not yet occurred. Even though research from the 1990s indicated that children may be more susceptible to lower levels of lead than previously thought, regulated limits on lead in children's jewellery came into force only in 2005 following voluntary measures.

2.66 **Recommendation.** Environment Canada and Health Canada should ensure that the implementation of risk management strategies are periodically assessed, documented, and reviewed by senior management. Specific criteria should be put in place to prompt earlier assessments if warranted by new information.

The departments' response. Agreed. The departments have assessed and refined risk management strategies. Since 2008, the government

has required performance frameworks for all high-impact regulations. Both departments are complying with this directive including substances regulated under the Chemicals Management Plan, and will consider applying the government standard more broadly to all new instruments, not just those demonstrating a high impact. The departments will develop specific criteria for this broader application of performance frameworks by fall 2010.

The departments already have information sources in place to help determine if there are risks that current risk management strategies are not addressing. Environment Canada and Health Canada will further elaborate and document this process and criteria.

Conclusion

2.67 This audit examined Environment Canada and Health Canada's management of seven substances declared toxic under the *Canadian Environmental Protection Act, 1999*. The departments have implemented or proposed a range of control measures to address important sources of emissions and exposure related to these toxic substances. In addition, the departments have been assessing the performance of a number of these control measures and have established biomonitoring and environmental monitoring initiatives that, if sustained over the long term, will generate important information for determining the success of risk management actions and identifying where additional actions may be required. For these reasons, we conclude that the risk management regime adopted is adequate. At the same time, we identified important areas for improvement that need to be addressed, particularly the preparation and periodic assessment of risk management strategies.

2.68 An area for improvement relates to the use of risk management strategies for lead and mercury. Although managed for over 30 years, these two toxic substances do not have risk management strategies that provide a consolidated picture of the federal government's objectives and priorities for managing these toxic substances. Clearly outlining its objectives and priorities for these substances would help strengthen management of these substances as well as transparency and accountability.

2.69 An important gap in the risk management regime is the labelling of chronic hazards associated with the use of chemical consumer products. One of the toxic substances we examined, dichloromethane, is used in paint strippers. Existing labels for paint strippers indicate the

presence of dichloromethane, inform users of acute hazards associated with the product (for example, poisoning), and contain instructions on how to safely use the product. However, they do not warn consumers that the product contains a substance that is inherently toxic and possibly carcinogenic.

2.70 Health Canada, along with other federal partners, has begun several major biomonitoring studies to assess the presence of toxic chemicals in Canadians that will provide important baseline data for assessing whether efforts related to the management of toxic substances are resulting in better health outcomes. These biomonitoring initiatives are part of a broader, more comprehensive approach to monitoring toxic substances being implemented by Environment Canada and Health Canada as part of the Chemicals Management Plan.

2.71 Environment Canada and Health Canada are assessing the performance of a number of the control measures they have implemented and are taking steps to keep their knowledge of risks up to date. However, the departments lack a systematic process for periodically consolidating this information and assessing overall progress made in managing the substances we examined. Periodic assessments would allow department officials and other stakeholders to know how well the risks of these toxic substances are being managed, whether control measures are sufficient, whether overall progress is reasonable and timely, and whether changes to risk management actions and strategies are required.

About the Audit

All of the audit work in this chapter was conducted in accordance with the standards for assurance engagements set by The Canadian Institute of Chartered Accountants. While the Office adopts these standards as the minimum requirement for our audits, we also draw upon the standards and practices of other disciplines.

Objective

The objective of this audit was to determine whether Environment Canada and Health Canada have implemented an adequate risk management regime for selected toxic substances.

Scope and approach

We examined the following seven substances from the List of Toxic Substances in Schedule 1 of the *Canadian Environmental Protection Act, 1999* (CEPA 1999):

- lead,
- mercury,
- bis(2-ethylhexyl) phthalate [also known as di(2-ethylhexyl) phthalate or DEHP],
- chlorobiphenyls (polychlorinated biphenyls or PCBs),
- polychlorinated dibenzodioxins (dioxins) and polychlorinated dibenzofurans (furans),
- dichloromethane (DCM), and
- polybrominated diphenyl ethers (PBDEs).

These toxic substances were selected for this audit because they represent a range of risks to Canadians and a variety of sources of exposure, including industrial emissions and consumer goods, including household products. Not only do these toxic substances affect human health or the environment, but they may also persist in the environment. There has also been sufficient time to implement and assess the results of risk management actions related to these substances. CEPA 1999 requires that, once a substance is declared toxic, a control instrument be developed and implemented within three and a half years. As a result, our focus on PBDEs (which in 2006 were added to the List of Toxic Substances in Schedule 1 of CEPA 1999) was limited to the risk management strategy for this toxic substance. We did not examine the conduct of risk assessments to determine if a substance is toxic as this was the subject of the Commissioner's March 2008 Report. Our audit work consisted of interviews with Environment Canada and Health Canada officials (to determine how the departments reviewed, evaluated, promoted, and enforced compliance with the respective preventive and control measures) and various stakeholders, including environmental non-government organizations, industry, selected international organizations, and academia. We also reviewed documentation from Environment Canada and Health Canada related to the toxic substances we examined.

Criteria

Listed below are the criteria that were used to conduct this audit and their sources.

Criteria	Sources
We expected that Environment Canada and Health Canada would have prepared strategies for managing the risks of selected toxic substances that contain clear objectives, performance expectations, and timelines for controlling, reducing, or preventing risks.	*Canadian Environmental Protection Act, 1999* • Section 2(j), Administrative Duties • Part 4, Pollution Prevention • Part 5, Controlling Toxic Substances • Part 7, Controlling Pollution and Managing Wastes Environment Canada, Toxics Management Process (2007) • Responsibilities in the Toxics Management Process • The Risk Management Strategy • Management Tools including Instruments Environment Canada, Toxic Substances Management Policy (1995) • Track 1—Virtual Elimination • Track 2—Life-cycle Management Treasury Board of Canada Secretariat, Assessing, Selecting, and Implementing Instruments for Government Action (2007), steps 2 to 7 Canadian Standards Association, Risk Management: Guideline for Decision Makers (CAN/CSA-Q850-97 (R2009)) Treasury Board of Canada Secretariat, Preparing and Using Results-based Management and Accountability Frameworks (2005), sections 1.1 and 1.3 Treasury Board of Canada Secretariat, Results for Canadians: A Management Framework for the Government of Canada (2000), Section B: Four Management Commitments, pages 5 and 6
We expected that Environment Canada and Health Canada would be implementing control measures that address risks and sources of emissions or exposures identified as part of the risk assessment phase and promoting compliance with these control measures.	
We expected that Environment Canada and Health Canada would be assessing implementation of their strategies for managing the risks of selected toxic substances (including the coverage and performance of its control measures as well as new and emerging information on risks) and using this information to inform and improve its risk management actions.	

Management reviewed and accepted the suitability of the criteria used in the audit.

Period covered by the audit

Our audit examined risk management actions undertaken since the time the substances were added to the List of Toxic Substances in Schedule 1 of CEPA. However, our focus was primarily on risk management actions taken since 1999.

Audit work for this chapter was substantially completed on 30 June 2009.

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Appendix List of recommendations

The following is a list of recommendations found in Chapter 2. The number in front of the recommendation indicates the paragraph number where it appears in the chapter. The numbers in parentheses indicate the paragraph numbers where the topic is discussed.

Recommendation	Response
Risk management strategies	
2.30 Environment Canada and Health Canada should prepare and implement risk management strategies for lead and mercury that provide a comprehensive and consolidated description of the federal government's progress to date. These risk management strategies should outline the remaining objectives, priorities, actions under way or planned, timelines, and monitoring programs in effect to address the ongoing risks associated with these toxic substances to human health and the environment. **(2.18–2.29)**	Agreed. The departments have already taken significant actions to reduce Canadians' exposures to lead and mercury. Today, less than 1 percent of Canadians (aged 6 to 79) have blood lead concentrations above the Canadian guidance level at which follow-up actions may be considered to reduce exposure. This compares to 25 percent of Canadians (aged 6 and older) in the 1970s. From 1970 to 2008, there was a 99.7 percent reduction of lead in air emissions. Mercury emissions have decreased by 90 percent since the 1960s. Risk management strategies are updated using new science to address current risks according to their relative priority in protecting human health and the environment. Based on the latest science, Health Canada is finalizing a comprehensive lead toxicological assessment for consultation (expected by mid-2010) and a revised risk management strategy with clear objectives, performance expectations, and timelines (expected by end of 2010) to build on the existing 20 actions for lead. To further reduce mercury exposure, Environment Canada has strategies for mercury in products, remaining domestic emissions, and emissions from other jurisdictions. These will be compiled into one mercury strategy with clear objectives, performance expectations, and timelines for publication by winter 2009–10. Environment Canada and Health Canada will incorporate actions addressing both priority ecological and human health impacts.

Recommendation	Response
Control measures	
2.50 Environment Canada should release the outstanding *Canadian Environmental Protection Act, 1999* annual reports and ensure that future reports are released in a timely manner. In these reports, Environment Canada should present a complete and transparent picture of its previous year's compliance promotion and enforcement activities and related results, including compliance rates. **(2.31–2.49)**	Agreed. Environment Canada's *Canadian Environmental Protection Act, 1999* (CEPA 1999) Annual Report covers actions and accomplishments within the scope of the Act, including research, enforcement, administration of the Act and progress on issues such as the management of chemical substances. Most of these activities are also reported on the CEPA Environmental Registry, which is maintained daily as required. The Department will ensure that the CEPA 1999 annual reports are completed in a timely manner. By early 2010, Environment Canada, with the support of Health Canada, will be up-to-date with tabled reports and from then on will table reports annually in the fall. Environment Canada has identified compliance rates as an important component of its Strategic Enforcement Framework, which defines performance indicators for various toxic substances, and will continue work on the determination of compliance rates for reporting in future annual reports.
Performance assessment	
2.66 Environment Canada and Health Canada should ensure that the implementation of risk management strategies are periodically assessed, documented, and reviewed by senior management. Specific criteria should be put in place to prompt earlier assessments if warranted by new information. **(2.51–2.65)**	Agreed. The departments have assessed and refined risk management strategies. Since 2008, the government has required performance frameworks for all high-impact regulations. Both departments are complying with this directive including substances regulated under the Chemicals Management Plan, and will consider applying the government standard more broadly to all new instruments, not just those demonstrating a high impact. The departments will develop specific criteria for this broader application of performance frameworks by fall 2010. The departments already have information sources in place to help determine if there are risks that current risk management strategies are not addressing. Environment Canada and Health Canada will further elaborate and document this process and criteria.

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