CANADA-WIDE STANDARD FOR MERCURY EMISSIONS (Incineration & Base Metal Smelting)

2010 PROGRESS REPORT

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Introduction

This report presents an update on progress toward meeting the targets of the Canada-wide Standards for Mercury Emissions. Only those jurisdictions with waste incineration or base metal smelting facilities are required to report progress under this Canada-wide standard. More information on the Canada-wide Standards for Mercury may be found on the CCME website at www.ccme.ca.

Since Québec is not a signatory to the Canada-wide Accord on Environmental Harmonization or the agreement on Canada-wide Standards, it is not required to prepare an implementation plan. However, Québec strives to meet environmental standards whose limits are similar to those in the Canada-wide Standards. When it becomes available, information on Québec's progress toward meeting these standards will be posted on the website of the Ministry of Sustainable Development, Environment and Parks at the following address: www.mddep.gouv.qc.ca/index.asp.

Summary

In 2000 the Canadian Council of Ministers of the Environment (CCME) endorsed Canada-wide Standards (CWS) for Mercury Emissions. The CWS set standards for base metal smelting facilities that reflected application of best available technologies and practices. For waste incineration, limits were set that could be met using generally available technology or waste diversion. This report presents 2009 emissions data from those jurisdictions with base metal smelting or waste incineration facilities.

Base Metal Smelting

The following numerical standards for base metal smelting facilities were set for achievement by 2008.

For existing facilities: application by all primary zinc, lead and copper smelters of best available pollution prevention and control techniques economically achievable to achieve an environmental source performance (atmospheric emission) guideline of 2 g Hg/tonne total production of finished metals.

For new and expanding facilities: application of best available pollution prevention and control techniques to minimize mercury emissions throughout the life-cycle of the minerals in question to achieve an environmental source performance (atmospheric emission) guideline of 0.2 g Hg/tonne production of finished zinc, nickel and lead, and 1 g Hg/tonne of finished copper, and consideration of a mercury offset program to ensure no "net" emission increases occur.

In 2009, all base metal smelting facilities met the CWS for emissions intensity except the HBMS facility in Flin Flon, Manitoba. The copper smelter portion of this facility (and source of mercury releases) was permanently closed in June, 2010.

Waste Incineration

For new or expanding facilities of any size, application of best available pollution prevention and control techniques, such as a mercury waste diversion program, to achieve a maximum concentration in the exhaust gases from the facility as follows:

Municipal waste incineration	20 µg/Rm^3
Medical waste incineration	20 µg/Rm^3
Hazardous waste incineration	50 µg Rm^3
Sewage sludge incineration	70 µg/Rm^3

For existing facilities application of best available pollution prevention and control techniques, to achieve a maximum concentration[7] in the exhaust gases from the facility as follows:

Municipal waste incineration	
> 120 Tonnes/year	20 µg/Rm^3
< 120 Tonnes/year	20 µg/Rm^3
Medical waste incineration	
> 120 Tonnes/year	20 µg/Rm^3
< 120 Tonnes/year	40 µg/Rm^3
Hazardous waste incineration	50 µg/Rm^3
Sewage sludge incineration	70 µg/Rm^3

These standards were set for achievement by existing facilities on the following schedule:

Municipal waste incinerations	2006
Medical waste incineration	2006
Hazardous waste incineration	2003
Sewage sludge incineration	2005

Most incineration facilities were in compliance with the CWS in 2009. Several small medical waste incineration facilities in Manitoba are likely not in compliance, though no testing has been done. A new centralized facility for the province was announced in 2010. The new facility will handle waste from these small facilities and will be compliant with the CWS.

The mercury emissions at one of the new thermal treatment units at the Lakeview facility in Ontario have fluctuated and marginal exceedances of the CWS were reported in 2007 and 2009. Granulated activated carbon will however be controlling all four units in the future: equipment installation has been completed on two of the units in October and November 2010 respectively and the remaining two will have controls by June 2011. Typically only two of the four units are operated at one time.

The CWS for Mercury Emissions is due for evaluation in 2010. CCME will consider the results of this report and determine whether an evaluation is warranted. The CWS will remain in effect until a new standard is developed.

Jurisdiction Reports

The following information was submitted by signatory jurisdictions in accordance with Annex 1 of the Canada-wide Standard for Mercury Emissions.

BRITISH COLUMBIA

Base Metal Smelting (BMS)

Existing Facilities	**Teck - Trail Operations** Originally constructed 1896, upgraded in 1997	**Total**
Year	*Emission (to atmosphere) intensity (g Hg/tonne of finished metal)*	*Hg Emissions to Air (kg)*
2000	0.41	150
2001	3.00*	670
2002	0.35	123
2003	0.29	109
2004	0.25	95
2005	0.51	150
2006	0.27	106
2007	0.15	56
2008	0.13	46
2009	0.27	83

*3 month shut-down in 2001

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Municipal Waste Incineration

Existing Facilities	MetroVancouver > 120 tonnes waste per year Constructed 1988	
Year	***Hg concentration in the exhaust gas**** ***(µg/Rm^3)***	Hg Emissions to Air (kg)
2000	6.40	9.5
2004	3.70	5.8
2007	0.95	1.6
2008	1.60	2.6
2009	0.7	1.2

The Metro Vancouver Waste-to-Energy Facility (WTEF) had a carbon injection system for mercury control installed in 1993 and subsequently modified in 2004 *to more* consistently control mercury emissions. In addition the Provincial Electronics Stewardship Program, introduced in 2008, has increased the diversion of mercury containing devices away from disposal. The proposed Metro Vancouver Integrated Solid Waste and Resource Management Plan has additional steps for diverting mercury containing materials away from disposal.

Mercury emissions are measured via manual stack testing three times per year by an independent testing company. Sampling was conducted under accepted CWS methods with stack test results being corrected to reference conditions under CCME guidelines, which are 25 ^{o}C, 101.3 kPa, dry basis, corrected to 11% O_2.

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ALBERTA

Municipal/Medical Waste Incineration

Existing Facilities	**FB&D Incinerator, Swan Hills Treatment Centre (municipal waste)** Constructed **1993-1994**		**CE Raymond Incinerator, Swan Hills Treatment Centre (municipal waste)** Constructed **1989-1990**		**Wainwright Incinerator (municipal and medical waste)** > 120 tonnes waste per year		**Total**
Year	*Hg concentration in the exhaust gas (µg/Rm^3)*	*Hg Emissions to Air (kg)*	*Hg concentration in the exhaust gas (µg/Rm^3)*	*Hg Emissions to Air (kg)*	*Hg concentration in the exhaust gas (µg/Rm^3)*	*Hg Emissions to Air (kg)*	*Hg Emissions to Air **(kg)***
2000	71.7	15.74	Shut down	Shut down	6.57	0.307	16.047
2001	39.36	17.18	Shut down	Shut down	N/A	N/A	17.18
2002	3.61	0.831	Shut down	Shut down	N/A	N/A	0.831
2003	7.40	1.127	Shut down	Shut down	N/A	N/A	1.127
2004	7.40*	0.640*	85.70**	0.613**	2.90	0.167	1.420
2005	5.07	0.681	15.07	0.153	0.52	N/A	0.834
2006	75.61	11.619	Shut down	Shut down	5.62	N/A	11.619
2007	4.22	0.379	Shut down	Shut down	25.6	0.976	1.355
2008	19.7	2.816	Shut down	Shut down	97.4	4.925	7.741
2009	14.8	0.959	Decommissioned	Decommissioned	5.46	0.280	1.239

*Stack compliance test not completed in 2004; values based on 2003 stack compliance test results.
**Stack compliance test not completed in 2004; values based on 1997 stack compliance test results.

The Wainwright facility was shut down in late 2008 for repairs and retrofit of a new carbon adsorption baghouse. This delayed the annual source emission survey until March 2009. At that time, elevated levels of mercury (and particulate) were found to be present, necessitating a retesting of the source in May 2009. It is thought that the operating temperature related to the new baghouse was causing unusual results. Compliance with the CWS is determined by annual source emission testing in accordance with the Alberta Stack Sampling Code and a standard USEPA testing method.

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SASKATCHEWAN

Saskatchewan did not have any incinerator facilities that exceeded provincial thresholds to monitor and report mercury emissions between the years of 2000 and 2009. One of the provinces "large" incinerators did stack testing from January 19 to February 5 1999, which tested

for particulates and mercury. This report was broken down into mercury from hospital waste and mercury from veterinary waste.

- Mercury emissions from hospital waste: 14.0 mg/h; 5.8 g/year (incinerator operated for 416 hours during 1998 with biomedical hospital waste).
- Mercury emissions from veterinary waste: 4.6 mg/h; 4.8 g/year (incinerator operated for 1040 hours during 1998 with veterinary animal waste).

The report further stated that during hospital burns most of the mercury was particle bound (43%) and oxidized (37%). For veterinary waste burns, most of the mercury was in elemental form (70%).

The total calculated mercury emissions for that year was 10.6 g/year or 0.0106kg/yr. This incinerator stopped incineration of biomedical waste in 2002.

All incinerators in the reportable CWS categories have been decommissioned.

MANITOBA

Base Metal Smelting (BMS)

Mercury emission data from existing base metal smelters in Manitoba

Existing Facilities	**HBMS – Flin Flon** *Constructed ~1930*	**Vale – Thompson** *Constructed 1958*	**Total**
Year	*Emission intensity (g Hg/tonne of finished metal)*	*Emission intensity (g Hg/tonne of finished metal)*	*Hg Emissions to Air (kg)*
2000	8.2	Data not available	1266
2001	6.2	Data not available	1061
2002	6.9	Data not available	1334
2003	4.8	Data not available	959
2004	7.9	Data not available	1482
2005	6.6	Data not available	1319
2006	4.4	Data not available	912
2007	5.5	Negligible*	1108
2008	4.4	Negligible*	857
2009	3.8	Negligible*	632

*Negligible – less than 0.05 g Hg/tonne

In Manitoba, the Hudson Bay Mining and Smelting Co., Limited (HBMS) zinc-copper facility in the City of Flin Flon has been identified as one of the two BMS facilities emitting mercury into the atmosphere. With the commissioning of the pressure leaching process (wet process) for zinc in 1993, significant reductions in mercury emissions were achieved. Since 1994, a continuing small annual decrease in mercury emissions per tonne of metal produced has been realized. For the year 2009, HBMS emitted 0.631 tonnes of mercury at a rate of 3.8 grams of mercury per tonne of total metal production from its operation.

Since the endorsement of the Canada Wide Standards (CWS), Manitoba has liaised with HBMS to voluntarily work towards achievement of the CWS for Mercury - BMS for existing facilities.

In recognition of the age of the facility and the uncertain future for the copper smelter, determined efforts have been pursued over the years to reduce mercury emissions within the context of best available pollution prevention and control techniques, technically and economically achievable. HBMS has undertaken the following activities to reduce the emission of mercury:

- HBMS commissioned, in 2005, the Mill regrind circuit which consisted of re-circulating copper middling streams from the flotation circuit back to the ball mill. This has resulted in a reduction of zinc contamination of the copper concentrates. Since mercury is associated with zinc, this has resulted in less mercury contamination of the copper smelter feed materials. In 2006, the full benefit from the regrind process was realized with a drop in observed mercury contamination from 2005 to 2006 of about 30%.
- Researchers from the University of Toronto worked with HBMS personnel starting in 2005 to investigate mercury removal techniques. The mercury removal technology identified for testing was the use of sulfur-impregnated activated carbon (SIAC). Federal government funding had been obtained for the development of a pilot-scale plant. However, in 2007 the project was expanded by the University of Toronto to include application to coal-fired power plant. Pilot testing was delayed and its application to HBMS was not further pursued.
- HBMS undertook a smelter-wide sampling campaign of the gas handling system to determine where mercury accumulates in the smelter process. A consultant was retained to review the results and to identify current technology available to reduce mercury emissions. However, the review of the current technologies indicated that they were not viable for HBMS's smelting operations.
- HBMS implemented continuous process improvements towards reducing mercury emissions through research and by selecting concentrates with minimal mercury content.

Over the years, determined efforts were pursued by HBMS to work towards mercury emission reduction and possibly to meet the performance guideline for mercury as stated in the CWS. Notwithstanding the measures pursued by HBMS, mercury emissions could not be reduced to the CWS target of 2.0 g/t of finished product.

In June 11, 2010, the HBMS copper smelter operations were shut down permanently. With the closure of the copper smelter, there will be no expected mercury emission to the atmosphere from the facility.

Manitoba's other base metal smelter, Vale in the City of Thompson, process ores that contain very low levels of mercury and, therefore, emissions of mercury are accordingly low.
Vale announced in November 2010 that it was phasing out its smelting and refining at its Thompson operation by 2015.

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Municipal Waste Incineration

No data is available for incineration emissions.

Most municipal waste incinerators in Manitoba are currently managed under the Incinerators Regulation (MR 91/88R, referred to as the Regulation hereafter) under the Manitoba Environment Act (C.C.S.M. c. E125, referred to as the Act hereafter). Incinerators approved under the current Regulation have to comply with emission limits for particulates and opacity only. Other incinerators are captured under the Classes of Development Regulation (MR 164/88) of the Act. These units are assessed on a case-by-case basis and, if approved, an EA License is issued and included in the license clauses are the emission requirements and limits. A proposed regulation is under development to replace the current Regulation and to consolidate regulatory coverage for all types of incinerators. The proposed regulation will consolidate emission limits including CWS for Mercury, Dioxin and Furans. The new regulation also plans to include emission limits for arsenic, cadmium, CO, chlorobenzene, chlorophenol, chromium, HCl, lead, NOx, PM, PAH, PCB and SO_2.

There are no large existing municipal waste incinerator installations in the province. However, there are a number (~54) of very small units typically at schools, commercial and industrial establishments that technically could meet the criteria for being considered as "municipal" waste incinerators. Volumes of waste incinerated are very small. Under the proposed regulation, these incinerator units will be covered and have to comply with the prescribed emission requirements and guidelines, including the CWS for Mercury. An active information campaign to facility operators of such incinerators is being delivered by inspection/enforcement staff of Manitoba Conservation to draw attention to the forthcoming changes and the more stringent standards.

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Medical Waste Incineration

No data is available for mercury emissions from medical waste incineration.

Medical waste incinerators in Manitoba are currently managed under the Incinerators Regulation (MR 91/88R, referred to as the Regulation thereafter) under the Manitoba Environment Act (C.C.S.M. c. E125, referred to as the Act thereafter). Incinerators approved under the current Regulation have to comply with emission limits for particulates and opacity only. A proposed regulation is under development to replace the current Regulation and to consolidate regulatory coverage for all types of incinerators. The proposed regulation will consolidate emission limits including CWS for Mercury, Dioxin and Furans. The new regulation also plans to include emission limits for arsenic, cadmium, CO, chlorobenzene, chlorophenol, chromium, HCl, lead, NOx, PM, PAH, PCB and SO_2.

Manitoba's strategy for hospital waste management is a combination of recycling non-medical cardboard, wood and papers; shredding and sterilizing sharps, gloves and other non-recyclable materials; and incineration of biomedical waste materials. There are about 20 (down from 35 in 2005) medical waste incinerators in the province, mostly located at health care institutions operated by rural health authorities. Most burn very small quantities of waste of which only a small portion actually meets the definition for biomedical waste. While these biomedical waste incinerators have had no stack testing, it is most likely that they do not comply with the CWS for Mercury.

In August 2010, the Manitoba Government announced plans for the construction of a centralized biomedical waste facility to be located in the City of Brandon. The facility will include the operation of a biomedical waste incinerator. Manitoba will invest more than $7 million and the construction period is estimated to be approximately 15 months. The facility will not only handle the current medical waste being generated but will also keep up with the expanding health services in the province.

The new biomedical waste facility in Brandon will comply with Canada Wide Standards for mercury, dioxins and furans, and other toxic emissions released when plastic products are burned.

The existing incinerators operated by the rural health authorities will be phased out as soon as the Brandon waste management facility is in operation. However, medical waste requiring disposal from medical centers under the Winnipeg Regional Health Authority will continue to be shipped to a regulated facility operating with appropriate environmental licenses/permits in the United States.

Since the CWS came into effect in 2001, no new construction or expansion of medical incinerators has occurred in Manitoba.

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Hazardous Waste Incineration
There are no hazardous waste incineration facilities in Manitoba.

Sewage Sludge Incineration
There are no sewage sludge incineration facilities in Manitoba.

ONTARIO

Base Metal Smelting

Facilities	**Xstrata Nickel - Sudbury** Start up 1930, major modification 1978		**Xstrata Copper – Kidd Creek** start up 1981		**Vale - Copper Cliff** Original construction 1930, modifications 1952, 1954, 1968, 1991, 1993		**TOTAL** *Hg Emissions to Air (kg)*
Year	*Emission intensity (g Hg/tonne of finished **nickel, copper and cobalt**)*	*Hg Emissions to Air (kg)*	*Emission intensity (g Hg/tonne of finished **copper**)*	*Hg Emissions to Air (kg)*	*Emission intensity (g Hg/tonne of finished **nickel and copper**)*	*Hg Emissions to Air (kg)*	
2000	<0.01	0.6		NR*	<0.01	1.2	1.8
2001	<0.2	9.1	<0.1	0.8	<0.1	11	20.9
2002	<0.2	9.4	<0.1	0.9	<0.1	10	20.3
2003	<0.1	5.7	<0.1	0.8	<0.1	2.9	9.4
2004	<0.1	1.4	<0.1	0.8	<0.1	10	12.2
2005	<0.1	6.7	<0.1	0.7	<0.1	9.6	17.0
2006	<0.1	5.3	<0.1	0.8	<0.1	11	17.1
2007	<0.1	5.8	<0.1	6.9	<0.1	5	17.7
2008	<0.1	7.6	<0.1	5.9	<0.01	2	15.5
2009	<0.3	20	<0.1	6.5	<0.01	0.4	26.9

*NR - facility did not report any mercury emissions to the NPRI.

- Emission intensities for existing nickel smelters are provided in the above although existing nickel smelters are not subject to the mercury CWS.
- Data for production rates required for calculation of the emission intensities was obtained directly from each facility.
- Annual emission to air from each facility is the annual release as reported by each facility to the National Pollutant Release Inventory (NPRI). It is noted however that the 2008 and 2009 annual mercury releases for Vale were obtained from the facility directly as the releases were below the threshold to be reported to the NPRI.
- Vale had only nine operating months in 2003 and five in 2009.
- It is noted that the copper smelter (and zinc refinery) at Xstrata Copper at Kidd Creek ceased production on May 1, 2010 and the smelter (together with the zinc refinery) will be dismantled in 2011.
- All facilities are in compliance with the CWS.

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Municipal Waste Incineration

Facilities	Algonquin Power Energy from Waste, Brampton		De Beers, Victor Mine Site		Total *Hg Emissions to Air (kg)*
	facility capacity >120 tonnes waste per year; start up 1992, modification 2002, 2003		facility capacity > 120 tonnes waste per year; construction 2006-2007		
Year	*Hg concentration in the exhaust gas (µg/Rm^3)*	*Hg Emissions to Air (kg)*	*Hg concentration in the exhaust gas (µg/Rm^3)*	*Hg Emissions to Air (kg)*	
2000	72.6	96	-	-	96
2001	36.6	50	-	-	50
2002	14	15	-	-	15
2003	7.9	7.6	-	-	7.6
2004	8.7	7.4	-	-	7.4
2005	8.2	7.1	-	-	7.1
2006	5.8	5.6	-	-	5.6
2007	11.6	11	0.9	NR*	11
2008	17.3	18	0.4	NR*	18
2009	9.4	9.2	5.7	NR*	9.2

*NR - facility did not report any mercury emissions to the NPRI.

- The stack concentrations in the above table are the results obtained during annual source testing in accordance with the Ontario Source Testing Code and requirements of the Certificates of Approval under the Environmental Protection Act.
- Algonquin Power started operation of one additional thermal treatment unit in 2002 thus bringing the total number of units to five. The expansion also included improvements to air pollution control equipment such as mercury control.
- The two municipal waste thermal treatment facilities in the above table have demonstrated their capability of complying with the CWS for mercury.
- In addition to the above two facilities, Ontario also has three pilot/ developmental facilities that thermally treat municipal waste. Data for these facilities is not included in the table because in some cases the data is not available yet and in all cases the facilities are not operating on a continuous, full time basis and providing waste disposal services using a fully developed technology.

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Medical Waste Incineration

Facilities	**Stericycle, Brampton** facility capacity > 120 tonnes waste per year; start up 2001		*Total Hg Emissions to Air (kg)*
Year	*Hg concentration in the exhaust gas (µg/Rm^3)*	*Hg Emissions to Air (kg)*	
2000	-	-	-
2001	0.4	NR*	NR*
2002	1.8	0.007	0.007
2003	-	0.04	0.04
2004	0.9	0.01	0.01
2005	62.4	0.38	0.38
2006	22.1	0.28	0.28
2007	0.6	0.01	0.01
2008	11.9	0.17	0.17
2009	8.1	NR*	NR*

*NR - facility did not report any mercury emissions to the NPRI.

- The stack concentrations in the above table are the results obtained during annual source testing in accordance with the Ontario Source Testing Code and requirements of the Certificate of Approval under the Environmental Protection Act.
- The biomedical waste thermal treatment facility in the above table has demonstrated its capability of complying with the CWS for mercury.
- In 2005 and 2006 the facility experienced higher than normal mercury emissions during source testing. While the mercury content of waste may vary, it was also determined that the activated carbon used to control mercury emissions was not of the quality expected. The Company changed the supplier of the carbon and no further exceedances have been reported.
- The company has also implemented a carbon monitoring and replacement plan to ensure that a good carbon bed is available at all times.

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Hazardous Waste Incineration

Facilities	**Cameco - Blind River** construction 1981, modifications 2007		**Clean Harbours** construction 1983, modifications 1985, 1997, 2003 and 2009		**Gary Steacy Dismantling** construction 1998, modification 2009		**Material Resource Recovery Inc. (MRRI)** construction 1998, modifications 2001, 2006		**Ontario Power Generation Western Waste Management Facility (radioactive waste incinerator)** Start up of replacement incinerator in 2004		**Total**
Year	*Hg concentration in the exhaust gas* (µg/Rm^3)*	*Hg Emissions to Air (kg)*	*Hg concentration in the exhaust gas* (µg/Rm^3)*	*Hg Emissions to Air (kg)*	*Hg concentration in the exhaust gas* (µg/Rm^3)*	*Hg Emissions to Air (kg)*	*Hg concentration in the exhaust gas* (µg/Rm^3)*	*Hg Emissions to Air (kg)*	*Hg concentration in the exhaust gas* (µg/Rm^3)*	*Hg Emissions to Air (kg)*	*Hg Emissions to Air* (kg)*
2000	-	NR*	2150	407	-	NR*	24.8	NR*	-	NR*	407
2001	-	NR*	230	240	-	NR*	340	NR*	-	0.032	240.032
2002	59.4	NR*	187	94	-	NR*	16.7	NR*	-	NR*	94
2003	2.2	NR*	7.3	-	1	NR*	-	NR*	-	NR*	0
2004	3.9	NR*	38.9	19	0.5	NR*	2.0	NR*	-	NR*	19
2005	6.6	NR*	90.4	6.7	<0.001	NR*	94.7/2220	NR*	0.2	NR*	6.7
2006	7.3	NR*	39.9	10	4.9	NR*	0.7	NR*	<0.1	NR*	10
2007	-	NR*	45.5	17	0.6	NR*	0.1	NR*	0.2	NR*	17
2008	0.3	NR*	42.1	15	-	NR*	0.2	NR*	0.3	NR*	15
2009	0.4	NR*	17.8	7.8	1.4	NR*	1.6	NR*	1.2	0.357	8.2

*NR - the facility did not report any mercury emissions to the NPRI.

- The stack concentrations in the above table are the results obtained during annual source testing in accordance with the Ontario Source Testing Code and requirements of the Certificates of Approval under the Environmental Protection Act.
- The five hazardous waste thermal treatment facilities in the above table have demonstrated their capability of complying with the CWS for mercury.
- One of the facilities (Material Resource Recovery) had an exceedance in 2005 which was attributed to a mercury containing switch being included in the waste feed. Since that time the company has implemented a protocol for separating the switches from the waste feed to the thermal treatment equipment.
- Clean Harbors installed mercury control (activated carbon) in 2003 which reduced the mercury emissions significantly from this facility. After this modification the facility experienced, however, one incident of a high source testing result in 2005. The company determined that the exceedance was caused by insufficient activated carbon feed. Procedures were implemented to ensure a minimum carbon feed.
- Ontario Power Generation's radioactive waste incinerator (commissioned 2004) replaced an older unit at the site.

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Sewage Sludge Incineration

Facilities	Greenway - London construction 1930; modification 50's & 60's, 2003, 2009		Highland Creek construction 1980; modification 1988		Duffin Creek construction 1978, Modifications 2006		Lakeview Replacement units in 2006, 2007, 2009; mercury control in 2010, 2011		Total *Hg Emissions to Air (kg)*
Year	*Hg concentration in the exhaust gas (µg/Rm^3)*	*Hg Emissions to Air (kg)*	*Hg concentration in the exhaust gas (µg/Rm^3)*	*Hg Emissions to Air (kg)*	*Hg concentration in the exhaust gas (µg/Rm^3)*	*Hg Emissions to Air (kg)*	*Hg concentration in the exhaust gas (µg/Rm^3)*	*Hg Emissions to Air (kg)*	
2000	-	6.2	-	28	-	-	-	0.009	34.209
2001	-	4.2	71.4	21	-	6.4	-	0.003	31.603
2002	-	3.8	-	11	181	50	-	15	79.8
2003	-	17	-	14	-	49	-	15	95
2004	-	17	-	20	-	34	12.6	15	86
2005	74.1	16	20	19	42.1	20	50.7	17	72
2006	41.9	13	17.8	6.6	42.68	18	45.9[H]	20	57.6
2007	28.6	8.4	52.0[A] (24.0, 4.0)[B] (1.2 , 1.2)[C]	12	44.3	17	71.6[H] 43[I]	46	83.4
2008	64.7	11	40.5[A] (64.4, 64.4)[D]	17	56.3[F] 27.9[G]	23	28.5[H]	9.5	60.5
2009	13.2	4.0	(35.9, 49.5)[E] (45.8, 53.6)[D]	9.6	38[F] 37.8[G]	39	27[K] 72.6[J]	20	72.6

Highland Creek: A - Main Incinerator Stack, B - Aug '06 Bypass (Stub Stack #1 , Stub Stack #2), C - Aug '07 - Bypass (Stub Stack #1 , Stub Stack 2), D - Oct '08 (Stub Stack #1 , Stub Stack #2), E - Main Incinerator (Stack #1 , Stack #2)
Duffin Creek: F - Incinerator #1, G - Incinerator #2
Lakeview: H - TOX 4, I - TOX3, J - TOX 2, K - TOX

- The stack concentrations in the above table are the results obtained during annual source testing in accordance with the Ontario Source Testing Code and requirements of Certificates of Approval under the Environmental Protection Act.
- The four biosolids thermal treatment facilities in the above table have demonstrated their capability of complying with the CWS for mercury consistently.
- Greenway Water Pollution Control Plant in London experienced an exceedance in 2005; however, this exceedance was so minor that in view of measurement error the facility is not considered to have been noncompliant.
- Lakeview Wastewater Treatment facility had originally three sludge incinerators, two of which were commissioned in 1982 and the third one in 1996; all three were "cold wind box" type fluidized bed incinerators. Two new "hot wind box" type fluidized bed incinerators were commissioned in 2006 and 2007 respectively and as a result one of the old incinerators (1996 installation) was decommissioned in 2007. Two more "hot wind box" fluidized bed incinerators were commissioned in 2009 and as a result the remaining two old incinerators (1982 installations) were decommissioned in 2009.
- None of the new thermal treatment units at Lakeview were originally equipped with mercury control and therefore the mercury levels reported in source testing reports have fluctuated and marginal exceedances of the CWS were reported in 2007 and 2009. Granulated activated carbon will however be controlling all four units in the future: equipment installation has been completed on two of the units in October and November 2010 respectively and the remaining two will have controls by June 2011. Typically only two of the four units are operated at one time.

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NEW BRUNSWICK

Existing Facilities	**Xstrata – Belledune Lead Smelter** Constructed 1968	
Year	*Emission intensity (g Hg/tonne of finished metal)*	*Hg Emissions to Air (kg)*
2000	0.73	76.3
2001	1.00	99.1
2002	0.73	67.8
2003	0.44	26.2
2004	1.21	103.6
2005	0.58	34.8
2006	0.64	44.8
2007	0.51	35.7
2008	0.74	59.9
2009	0.62	51.0

Medical Waste Incineration

Existing Facilities	**Stericycle - Moncton** > 120 tonnes waste per year Modilfied 2007	
Year	*Hg concentration in the exhaust gas* (µg/Rm3)*	*Hg Emissions to Air (kg)*
2000	9.0	0.175
2001		0.175
2002		0.175
2003		0.175
2004		0.175
2005	5.0	0.175
2006		0.350
2007		0.350
2008	9.2	0.400
2009	16.8	0.720

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NOVA SCOTIA

Municipal/Medical Waste Incineration

There are no municipal or biomedical waste incinerators operating in Nova Scotia. Any proposed facility would be subject to an environmental assessment under the *Environmental Assessment Regulations* and an approval under the *Activities Designation Regulations*. Canada-Wide Standards would be used when establishing emission limits for these facilities.

Nova Scotia had one municipal solid waste/biomedical waste incinerator with two units/stacks which closed on December 31, 2005. The incinerator processed approximately 36,500 tonnes/yr of municipal solid waste and approximately 2200 tonnes/year of biomedical waste, when operating.

Annual source testing was conducted at each unit in accordance with US EPA 40 CFR Part 60, Method 29. The test results were expressed in relation to dry cubic metres of flue gas at 25°C and 101.3 kPa and the degree of dilution air in the gas stream was defined at 11% oxygen.

Existing Facilities	**Cape Breton Regional Municipality Incinerator** > 120 tonnes waste per year Closed December 31, 2005		**Total**
Year	*Hg concentration in the exhaust gas (µg/Rm3) Unit #1*	*Hg concentration in the exhaust gas (µg/Rm3) Unit #2*	*Hg Emissions to Air (kg)*
2000	4.8	2.9	1.2
2001	11.2	2.42	2.1
2002	10.3	6.1	2.3
2003*		2.59	
2004	1.93	1.64	0.62
2005*	1.70		
Closed in 2005			

*Insufficient testing

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Hazardous Waste Incineration

There are no hazardous waste incinerators operating in Nova Scotia. Any proposed facility would be subject to an environmental assessment under the *Environmental Assessment Regulations* and an approval under the *Activities Designation Regulations*. Canada-Wide Standards would be used when establishing emission limits for these facilities.

Sewage Sludge Incineration

There are no sewage sludge incinerators operating in Nova Scotia. Any proposed facility would be subject to an environmental assessment under the *Environmental Assessment Regulations* and an approval under the *Activities Designation Regulations*. Canada-Wide Standards would be used when establishing emission limits for these facilities.

PRINCE EDWARD ISLAND

In 2009, the latest year for which data is available, the municipal solid waste incinerator in Charlottetown released 0.5 kg of mercury.

YUKON

Medical Waste Incineration

Existing Facilities	**Whitehorse General Hospital** >120 tonnes waste per year Constructed before 1999	
Year	Hg concentration in the exhaust gas (µg/Rm^3)	Hg Emissions to Air (kg)
2008	0.25	874
2009	Closed in 2008	

Yukon's only biomedical waste incinerator was first permitted under the Air Emissions Regulations in 1999. At the time the operator estimated that the amount of biomedical waste incinerated was about 6.2 tonnes/year. Accordingly, permits issued after the Canada-Wide Standard for Mercury Emissions came into effect in 2000 required the facility to "make determined efforts" to achieve a mercury concentration at the stack of 40 µg/Rm^3, including development and implementation of a "pollution prevention plan", to be followed by a one-time stack test.

As part of Yukon's environmental assessment process, the operation of the incinerator was reviewed in 2007 and the estimate of the amount of biomedical waste incinerated each year was revised to approximately 195 tonnes (owing to the acceptance of waste from outlying Yukon communities as well as a neighbouring jurisdiction). Accordingly the permit issued to the facility was amended to require annual stack tests, in accordance with the CWS.

The stack test conducted in 2008 showed mercury levels well below the CWS standard of 20 µg/Rm^3. However, dioxin/furan levels exceeded the CWS standard and the incinerator was shut down in late 2008.

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