

FIRST FULL NATIONAL REPORTS OF THE MINAMATA CONVENTION ON MERCURY 2021



* Question 3.5 amended by Canada on 20 January 2022

REPORTING PERIOD:

16 August 2017 to 31 December 2020

▼ INFORMATION ON THE PARTY

1. Information on the party

Name of party

Canada

Date on which its instrument of ratification, accession, approval or acceptance was deposited

7 April 2017

Date of entry into force of the Convention for the party

16 August 2017

2. Information on the national focal point

Full name of the institution

Environment and Climate Change Canada

Title of National Focal Point

Ms.

Name of National Focal Point

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3. Information about the contact officer submitting the reporting format if different from the above

Focal Point is submitting the national report

- ☒ Information is submitted by the national focal point
- ☐ Information is submitted through the national focal point by the contact officer

▼ ART. 3: MERCURY SUPPLY SOURCES AND TRADE

3.1. Does the party have any primary mercury mines that were operating within its territory at the date of entry into force of the Convention for the party?

- ☐ Yes
- ☒ No

Additional information on this question if needed
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3.2. Does the party have any primary mercury mines that are now in operation that were not in operation at the time of entry into force of the Convention for the party?

- ☐ Yes
- ☒ No

3.3. Has the party endeavoured to identify individual stocks of mercury or mercury compounds exceeding 50 metric tons and sources of mercury supply generating stocks exceeding 10 metric tons per year that are located within its territory?

- ☒ Yes
- ☐ No

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*If the party answered Yes to Question 3 above:

i. Please attach the results of your endeavor or indicate where it is available on the internet, unless unchanged from a previous reporting round.

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i. Please attach the results of your endeavor or indicate where it is available on the internet, unless unchanged from a previous reporting round.

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ii. Supplemental: Please provide any related information, for example on the use or disposal of mercury from such stocks and sources.

Results of the endeavour and supplemental information are included in the supplemental for question 3.3 i

3.4. Does the party have excess mercury available from the decommissioning of chlor-alkali facilities?

- ☐ Yes

☒ No

3.5. *Has the party received consent, or relied on a general notification of consent, in accordance with article 3, including any required certification from importing non-parties, for all exports of mercury from the party's territory in the reporting period?

☐ Yes, exports to parties

☐ Yes, exports to non-parties

☒ No

Additional information if needed

In 2017, Canada introduced comprehensive restrictions on the export of mercury by only allowing export of mixtures that contain elemental mercury at a concentration of 95% or more by weight that:

a) is, or is contained in, a hazardous waste or hazardous recyclable material regulated by the Cross-border Movement of Hazardous Waste and Hazardous Recyclable Material Regulations;

b) is exported for use in a laboratory for analysis, in scientific research or as a laboratory analytical standard, if the total quantity exported by the exporter during the calendar year in question does not exceed 10 kg; or

c) is contained in a manufactured item that during manufacture is formed into a specific physical shape or design and has for its final use a function or functions wholly or partly dependent on its shape or design.

All other exports are not allowed. These comprehensive restrictions on mercury export have been enacted by amending Schedule 3 of the Canadian Environmental Protection Act, 1999 (Export Control List) and the Export of Substances on the Export Control List Regulations.

Over the reporting period, mercury was exported to the United States based on a general notification of consent; however, these exports were comprised of mercury recovered through waste recovery operations that was sent to the United States for environmentally sound disposal and are therefore reported under Article 11.

Mercury shipments to Cuba took place with the re-export of mercury previously imported into Canada under Canada's general notification of consent. These re-exports were conducted by one company in Canada for use in water treatment facilities in Cuba. From August to December 2017, 50.27 metric tons of mercury were re-exported to Cuba and from January to December 2018, 91.03 metric tons of mercury were re-exported to Cuba.

The exports were in contravention of Canada's Export of Substances on the Export Control List Regulations. Environment and Climate Change Canada has taken measures to return the company to compliance with the Regulations.

In December 2020, 0.284 metric tons of mercury were allegedly re-exported to Bulgaria by another company. Further investigation of these mercury exports by Environment and Climate Change Canada's enforcement officers resulted in clarification that the products in question were small boat engines of the brand name "Mercury" and that the customs code had been mislabelled. Therefore, no mercury was exported in 2020.

No mercury exports took place in 2021. Canada will continue to monitor our trade database and conduct routine inspections of exports.

3.6. Has the party allowed the import of mercury from a non-party?

☐ No

☐ Yes

☒ The importing party has relied on paragraph 7 of article 3

If yes, or if the party relied on paragraph 7 of article 3, did the non-party provide certification that the mercury is not from sources identified under paragraph 3 or paragraph 5 (b) of article 3?

☐ Yes

☐ No

☒ The party has submitted its general notification of consent, applied paragraph 9 of article 3, and provided information on the quantities and countries of origin.

Part E – Additional comments on the article in free text if the party chooses to do so

Supplemental for question 3.6 – Information the quantities and countries of origin of mercury imports

In 2017, Canada received imports of mercury from Mexico (30.239 metric tons).

In 2018, imports were received from Tajikistan (57.496 metric tons) and Austria (0.036 metric tons).

In 2019, imports were received from Brazil (4.795 metric tons) and Austria (0.018 metric tons)

In 2020, imports were received from Brazil (6.938 metric tons), Germany (0.152 metric tons), and Austria (0.022 metric tons).

In 2021, Canada received imports of 0.143 metric tons of mercury from India.

▼ ART. 4: MERCURY-ADDED PRODUCTS

4.1. Has the party taken any appropriate measures to not allow the manufacture, import or export of mercury-added products listed in Part I of Annex A of the Convention after the phase-out date specified for those products?

☒ Yes

☐ No

☐ Yes (implementing paragraph 2 of article 4)

If yes, please provide information on the measures.

Canada's Products Containing Mercury Regulations were enacted in 2014 and came into force in 2015. These regulations prohibit the manufacture and import of all products containing mercury with some exemptions for products for which there are no feasible mercury free alternatives. The regulations also set mercury content limits in three lamp categories: linear fluorescent lamps for general lighting purposes, cold cathode fluorescent lamps and external electrode fluorescent lamps. Amendments to these Regulations are planned to adjust the mercury content limits for these lamps to bring them in line with the requirements in the Minamata Convention. The Government of Canada is targeting publication of proposed amended Regulations in early 2022 for a 75-day public comment period.

Some categories of products, including cosmetics, natural health products, pesticides (including biocides), and topical antiseptics are covered by other measures undertaken by the Canadian Federal Government:

- Cosmetics are regulated under the authorities of the Food & Drugs Act (1981) and the Cosmetic Regulations (2004). The Guidance on Heavy Metal Impurities in Cosmetics (2016) was aligned with the Convention to indicate a mercury limit of 1 ppm.
- Natural health products are regulated under the authorities of the Food & Drugs Act (1981) and the Natural Health Products Regulations (2003). The Quality of Natural Health Products Guide (2015) includes a limit of 1 ppm for total mercury in topical products.
- Pesticides (including biocides) are regulated under the authority of the Pest Control Products Act (PCPA), which prohibits the manufacturing, importation, distribution or use of unregistered / unauthorized pest control products. Pesticide formulations containing mercury as an active ingredient have not been registered for use in Canada since 1998. There are no mercury-added pesticides registered in Canada, and the PCPA contains provisions that would allow Canada to prevent their reintroduction into the Canadian market. Amendments to the Products Containing Mercury Regulations (PCMR) are currently proposed to clarify that pest control product devices with

mercury-containing bulbs, (e.g., UV disinfection lamps), are subject to both the PCPA and the PCMR.

- Drugs (including topical antiseptics) are regulated under the Food & Drug Regulations. These regulations prohibit the manufacture and import of drugs for human use that contain mercury or a salt or derivative thereof unless the mercury is present as part of a preservative and the manufacturer or importer has submitted evidence to the Minister demonstrating that the only satisfactory way to maintain the sterility or stability of the drug is to use that preservative
- The Surface Coating Materials Regulations (2016) set limits for the mercury content in consumer paints and a surface coatings material (such as consumer paints) manufactured, imported, advertised or sold in Canada
- The Toys Regulations (2011;) prohibit the manufacture, import, advertising, or sale in Canada of toys intended for children under 14 that have a surface coating material containing any mercury compound

The following regulations reference the Toys Regulations in order to apply the same prohibitions to additional products:

- Carriages and Strollers Regulations (2016), s. 2(1) ;
- Cribs, Cradles and Bassinets Regulations (2016), s. 3;
- Expansion Gates and Expandable Enclosures Regulations (2016), s. 2;
- Playpens Regulations (2019), s. 3.

4.3. Has the party taken two or more measures for the mercury-added products listed in Part II of Annex A in accordance with the provisions set out therein?

☒ Yes

☐ No

If yes, please provide information on the measures.

Canada has implemented three of the measures listed in Part II of Annex A: measure (i) setting national objectives aiming at dental caries prevention and health promotion, thereby minimizing the need for dental restoration, measure (ix) promoting the use of best environmental practices in dental facilities to reduce releases of mercury and mercury compounds to water and land; and measure (viii) restricting the use of dental amalgam to its encapsulated form.

Measure (i) setting national objectives aiming at dental caries prevention and health promotion, thereby minimizing the need for dental restoration

Canada has implemented measure (i) through the implementation of the Canadian Oral Health Framework 2013–2018 and the Canadian Oral Health Strategy 2005–2010. In addition, the Canadian Department of Health (Health Canada) implemented the community-based Children's Oral Health Initiative for First Nations and Inuit, which focussed on the prevention of dental disease and the promotion of good oral health practices among children, their parents/caregivers, and pregnant women. Together, the strategy, framework and initiative work to minimize the need for dental restorations by setting out our national objectives.

From 2007–2020 data collected regionally for First Nations and Inuit communities show that the average level of dental decay has not risen, the burden of untreated dental decay has declined by 10% over the years among children having access to these preventive services. Additionally, in the communities where Children's Oral Health Initiative (COHI) services are offered data show consistent access to primary preventative treatments for caries such as fluoride varnish and sealants.

The introduction of Silver Diamine Fluoride (SDF) as a primary and secondary caries prevention treatment within COHI services will assist in the prevention of deep lesions requiring extensive restorations. SDF arrests decay and if applied to early lesions found in enamel, the client may not require any further treatment. SDF was added to COHI treatment services in 2020.

Measure (ix) promoting the use of best environmental practices in dental facilities to reduce releases of mercury and mercury compounds to water and land

Canada implements measure (ix) through the Notice Requiring the Preparation and Implementation of Pollution Prevention Plans in Respect of Mercury Releases from Dental Amalgam Waste. This

Notice requires dental facilities to prepare and implement a pollution prevention plan if they have not already implemented best management practices for dental amalgam waste.

The Notice on dental amalgam waste was intended to encourage a 95% national reduction of mercury releases to the environment from dental amalgam waste from a base year of 2000 (1,879 kg), a target that was originally established under the Canada-wide Standard on Mercury for Dental Amalgam Waste.

A survey of dental facilities across Canada was commissioned in 2012 with the goal to assess the awareness of the pollution prevention plan notice, the overall implementation of best management practices for dental amalgam waste and the effectiveness of the notice. The survey complemented data collected from two earlier national surveys conducted in 2003 and 2007. The data from all the surveys are summarized in the performance report available online:

<https://www.canada.ca/en/environment-climate-change/services/pollution-prevention/planning-notices/performance-results/dental-amalgam-waste-mercury-overview/report.html>.

Aside from the Notice, the latest data received under Canada's Products Containing Mercury Regulations show a significant decline of the use of dental amalgam in the past few years. In 2019, 1.1 million dental amalgam capsules were imported to Canada, down from 1.5 million in 2016. This change is equivalent to 25% fewer capsules. In terms of the mercury, the quantities went down from 632 kg in 2016 to 485 kg in 2019. It meant that 23% less mercury entered Canada in the form of dental amalgam in 2019 compared to 2016. As a result of less dental amalgam entering Canada, plus the high percentage of separators, further reductions of releases of mercury and mercury compounds to water and land are expected.

Measure (viii) restricting the use of dental amalgam to its encapsulated form

Following decision MC-3/2, Canada undertook a review of the available safety information for dental amalgam and concluded that there is no clear link between mercury in dental amalgam and negative health effects. Although pre-measured dental amalgam capsules are considered safe, bulk dental amalgam powders, which have to be mixed with liquid mercury by hand, are known to pose an unnecessary risk of mercury exposure for the dental healthcare professional.

In Canada, dental amalgam is considered to be a medical device under the Medical Device Regulations of the Food and Drugs Act and its sale for use is controlled through the issuance of medical device licences by Health Canada. At the time of the 2020 review, some dental amalgam products containing bulk metal powder were authorized for sale. However, these products were no longer being used in Canada. Following its safety review, Health Canada worked with manufacturers to discontinue the licenses of bulk dental amalgam powders. This action has allowed Canada to formally implement measure (viii) restricting the use of dental amalgam to its encapsulated form. An amendment to Canada's Products Containing Mercury Regulations is being considered to prohibit the manufacture and import of unencapsulated dental amalgam.

4.4. Has the party taken measures to prevent the incorporation into assembled products of mercury-added products whose manufacture, import and export are not allowed under article 4?

☒ Yes

☐ No

If yes, please provide information on the measures.

Canada's Products Containing Mercury Regulations, enacted in 2014, prohibit the manufacture of products containing mercury, with limited exemptions for the manufacture of mercury-added products with no feasible alternatives.

4.5. Has the party discouraged the manufacture and the distribution in commerce of mercury-added products not covered by any known use in accordance with article 4, paragraph 6?

☒ Yes

☐ No

If yes, please provide information on the measures.

Canada's Products Containing Mercury Regulations, enacted in 2014, prohibit the manufacture of products containing mercury, with limited exemptions for the manufacture of mercury-added products with no feasible alternatives.

Part E – Additional comments on the article in free text if the party chooses to do so

Canada has an exemption until 2025 for:

- Linear fluorescent lamps (CFLs) for general lighting purposes: (a)–(b). Manufacture, import and export of:
 - o triband phosphor < 60 watts with a mercury content exceeding 5 mg per lamp
- Mercury in cold cathode fluorescent lamps and external electrode fluorescent lamps (CCFL and EEFL) for electronic displays: (a)–(c).
 - Manufacture, import and export of CCFLs and EEFLs:
 - o short length (≤ 500 mm) with mercury content exceeding 3.5 mg per lamp
 - o medium length (> 500 mm and $\leq 1\,500$ mm) with mercury content exceeding 5 mg per lamp

▼ ART. 5: MANUFACTURING PROCESSES IN WHICH MERCURY OR MERCURY COMPOUNDS ARE USED

5.1. Are there facilities within the territory of the party that use mercury or mercury compounds for the processes listed in Annex B of the Minamata Convention in accordance with paragraph 5 of article 5 of the Convention?

☒ Yes

☐ No

☐ I do not know

If yes, please provide information on measures taken to address emissions and releases of mercury or mercury compounds from such facilities.

Canada's Products Containing Mercury Regulations requires facilities to report triennially on the quantities of mercury used in catalysts for polyurethane production. In 2016, there were fewer than five polyurethane production facilities using mercury-containing catalysts, all located in the province of Ontario. The five listed measures in Part II of Annex B are addressed predominantly via implementation of the Government of Ontario's Toxics Reduction Act (2009) whereby these facilities have prepared a toxic substance reduction plan for mercury, and are taking measures to reduce the use of mercury in their processes. Since 2017, one of these facilities has phased out its mercury use. Under the proposed amendments to the Products Containing Mercury Regulations the use of mercury for polyurethane production will be prohibited by 2028.

The Government of Ontario has additional measures in place to address any potential emissions and releases of mercury to the environment from industrial facilities:

Emissions

O. Reg. 419/05 Air Pollution –Local Air Quality under the Environmental Protection Act
Part II.1 of the Environmental Protection Act (EPA) on Environmental Compliance Approvals

Releases

Water Management : Policies, Guidelines, Provincial Water Quality Objectives (PWQO) of the Ministry of Environment and Energy, July 1994, PIBS 3303E (Tables 2 and 3)

Procedure B–1–5 – Deriving Receiving–Water Based Point–Source Effluent Requirements for Ontario Waters, July 1994, PIBS #3302

Part II.1 of the Environmental Protection Act (EPA).

O. Reg. 63/95 Effluent Monitoring and Effluent Limits – Organic Chemical Manufacturing Sector and

O. Reg. 64/95 ("Effluent Monitoring and Effluent Limits – Inorganic Chemical Sector under the Environmental Protection Act (EPA)
O. Reg. 169/03 Ontario Drinking Water Quality Standards under the Safe Drinking Water Act Guideline B-7 – Incorporation of Reasonable Use Concept into MOEE Groundwater Management Activities, August 1994
O. Reg. 347 General Waste Management and O. Reg. 232/98 Landfilling Sites under the Environmental Protection Act (EPA)

If available, please provide information on the number and type of facilities and the estimated annual amount of mercury or mercury compounds used in those facilities.

Based on the most recent available data under Canada's Products Containing Mercury Regulations, in 2019 the remaining facilities using mercury-added catalysts for the production of polyurethane reported using a combined 22.3 kg of mercury. This is a reduction from 2016 when 28.9 kg were reportedly used in polyurethane production. Since reporting is done on a triennial basis, no data is available for the years 2017, 2018 and 2020.

Please provide information on how much mercury (in metric tons) is used in the processes listed in the two first entries of Part II of Annex B in the last year of the reporting period.

Canada does not have any facilities using the processes listed in the first two entries of Part II of Annex B.

5.2. Are measures in place to not allow the use of mercury or mercury compounds in manufacturing processes listed in Part I of Annex B after the phase-out date specified in that Annex for the individual process?

CHLOR-ALKALI PRODUCTION

- ☐ Yes
☐ No
☒ Not applicable (do not have these facilities)

ACETALDEHYDE PRODUCTION IN WHICH MERCURY OR MERCURY COMPOUNDS ARE USED AS A CATALYST

- ☐ Yes
☐ No
☒ Not applicable (do not have these facilities)

5.3. Are measures in place to restrict the use of mercury or mercury compounds in the processes listed in Part II of Annex B in accordance with the provisions set out therein?

VINYL CHLORIDE MONOMER PRODUCTION

- ☐ Yes
☐ No
☒ Not applicable (do not have these facilities)

SODIUM OR POTASSIUM METHYLATE OR ETHYLATE

- ☐ Yes
- ☐ No
- ☒ Not applicable (do not have these facilities)

PRODUCTION OF POLYURETHANE USING MERCURY-CONTAINING CATALYSTS

- ☒ Yes
- ☐ No
- ☐ Not applicable (do not have these facilities)

If yes, please provide information on these measures.

In Canada, no other manufacturing processes use mercury, other than polyurethane production as discussed previously. Canada has and will continue to discourage the development of any facilities that would use mercury or mercury compounds in their processes. This includes engagement with provincial and territorial governments who are the responsible authorities for issuing construction and operating permits. Provincial and territorial governments are prepared to use measures, including setting conditions through construction and operating permits, if and when required, to not allow the use of mercury or mercury compounds in new facilities.

5.4. Is there any use of mercury or mercury compounds in a facility using the manufacturing processes listed in Annex B that did not exist prior to the date of entry into force of the Convention for the party?

- ☐ Yes
- ☒ No

5.5. Is there any facility that has been developed using any other manufacturing process in which mercury or mercury compounds are intentionally used that did not exist prior to the date of entry into force of the Convention?

- ☐ Yes
- ☒ No

Part E – Additional comments on the article in free text if the party chooses to do so

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▼ ART. 7: ARTISANAL AND SMALL-SCALE GOLD MINING

7.1. Have steps been taken to reduce, and where feasible eliminate, the use of mercury and mercury compounds in, and the emissions and releases to the environment of mercury from, artisanal and small-scale gold mining and processing subject to article 7 within your territory?

- ☐ Yes
- ☐ No
- ☒ There is no artisanal and small-scale gold mining and processing subject to article 7 in which mercury amalgamation is used in the territory

7.2. Has the party determined and notified the secretariat that artisanal and small-scale gold mining and processing within its territory is more than insignificant?

- ☐ Yes
- ☒ No

Part E – Additional comments on the article in free text if the party chooses to do so

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▼ ART. 8: EMISSIONS

8.1. Identify any Annex D source categories for which there are new sources of emissions of mercury or mercury compounds as defined in paragraph 2 (c) of article 8.

For each of those source categories describe the measures in place, including the effectiveness of such measures, to implement the requirements of paragraph 4 of article 8.

- ☐ Coal-fired power plants
- ☐ Coal-fired industrial boilers
- ☐ Smelting and roasting processes used in the production of non-ferrous metals
- ☐ Waste incineration facilities
- ☐ Cement clinker production facilities

Has the party required the use of best available techniques or best environmental practices (BAT/BEP) to control and where feasible reduce emissions for new sources no later than 5 years after the date of entry into force of the Convention for the party?

- ☐ Yes
- ☒ No

Please explain

Canada does not have any new sources of emissions in Annex D source categories. Should there be any in the future, existing regulations and permitting regimes for BAT/BEP noted in question 8.2 below would apply.

Attach relevant documentation

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8.2. Identify any Annex D source categories for which there are existing sources of emissions of mercury or mercury compounds as defined in paragraph 2 (e) of article 8.

For each of those source categories, select and provide details on the measures implemented under paragraph 5 of article 8 and explain the progress that these applied measures have achieved in

reducing emissions over time in your territory:

▼ COAL-FIRED POWER PLANTS

- ☐ A quantified goal for controlling and, where feasible, reducing emissions from relevant sources
- ☒ Emission limit values for controlling and, where feasible, reducing emissions from relevant sources
- ☒ Use of BAT/BEP to control emissions from relevant sources
- ☒ Multi-pollutant control strategy that would deliver co-benefits for control of mercury emissions
- ☐ Alternative measures to reduce emissions from relevant sources

Measures

- Canada-wide Standard for mercury emissions from Coal-Fired Electrical Power Generation Plants, 2006
- Mercury Emissions from coal-fired power plants regulations, 2006 (Alberta)
- Reduction of Carbon Dioxide from Coal-Fired Electric Power Plant Regulations, 2012
- An Act to amend the Environmental Protection Act to require the cessation of coal use to generate electricity at generation facilities, 2015 (Ontario)
- Air Quality Regulations, 2014 (Nova Scotia)
- Regulations Amending the Reduction of Carbon Dioxide Emissions from Coal-fired Generation of Electricity Regulations, 2018. These regulations amend the 2012 regulations to accelerate the phase-out of coal-fired electricity by 2030.
- Air Pollution Control Regulations, 2004 (Newfoundland and Labrador)
- E09-02-Environmental Protection Act Air Quality Regulations, 2004 (Prince Edward Island)
- Air Quality Regulation, 1997 (New Brunswick)
- Air Quality Regulations, 2005 (Nova Scotia)
- Reg. 419/05 (Air Pollution – Local Air Quality, Ontario), Amended 2011
- Manitoba Environment Act, 1988
- The Environmental Management and Protection (Saskatchewan Environmental Code Adoption) Regulations, 2010
- Substance Release Regulations, 2006 (Alberta)
- Environmental Management Act, 2003 (British Columbia)
- Yukon Ambient Air Quality Standards, 2019
- Guideline for Ambient Air Quality Standards in the Northwest Territories, 2014
- Environmental Guideline for Ambient Air Quality, 2011 (Nunavut)

Progress

The majority of the mercury emissions reductions in Canada has occurred before the treaty entered into force as the majority of measures were put in place in the late 1990s and early 2000s. Nonetheless, the Air Pollutant Emissions Inventory (APEI) has continued to report reductions for each source D category for mercury between January 1, 2017 and December 31, 2019 (the latest year for which data are available). Coal fired power plant emissions have decreased by 3.5% (0.022 metric tons) between 2017 and 2018 (from 0.61 to 0.59 metric tons) and an additional 7.4% (0.043 metric tons) between 2018 and 2019 (from 0.59 to 0.55 metric tons).

▼ COAL-FIRED INDUSTRIAL BOILERS

- ☐ A quantified goal for controlling and, where feasible, reducing emissions from relevant sources

- ☐ Emission limit values for controlling and, where feasible, reducing emissions from relevant sources
- ☐ Use of BAT/BEP to control emissions from relevant sources
- ☐ Multi-pollutant control strategy that would deliver co-benefits for control of mercury emissions
- ☐ Alternative measures to reduce emissions from relevant sources

Measures

Do not have these facilities

Progress

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▼ SMELTING AND ROASTING PROCESSES USED IN THE PRODUCTION OF NON-FERROUS METALS

- ☐ A quantified goal for controlling and, where feasible, reducing emissions from relevant sources
- ☒ Emission limit values for controlling and, where feasible, reducing emissions from relevant sources
- ☒ Use of BAT/BEP to control emissions from relevant sources
- ☒ Multi-pollutant control strategy that would deliver co-benefits for control of mercury emissions
- ☐ Alternative measures to reduce emissions from relevant sources

Measures

- Canada-wide Standard for Mercury Emissions – for Base Metal Smelting, 2000
- Environmental Code of Practice for Base Metal Smelting & Refineries, 2006
- Pollution prevention plan in respect of specified toxic substances released from Base Metal Smelting and refineries and Zinc plants, 2006
- Règlement sur les attestations d'assainissement en milieu industriel, 2016 (Quebec)
- Environmental Performance Agreements for Base Metals Smelters, 2018
- Air Pollution Control Regulations, 2004 (Newfoundland and Labrador)
- E09-02-Environmental Protection Act Air Quality Regulations, 2004 (Prince Edward Island)
- Air Quality Regulation, 1997 (New Brunswick)
- Air Quality Regulations, 2005 (Nova Scotia)
- Reg. 419/05 (Air Pollution – Local Air Quality, Ontario), Amended 2011
- Manitoba Environment Act, 1988
- The Environmental Management and Protection (Saskatchewan Environmental Code Adoption) Regulations, 2010
- Substance Release Regulations, 2006 (Alberta)
- Environmental Management Act, 2003 (British Columbia)
- Yukon Ambient Air Quality Standards, 2019
- Guideline for Ambient Air Quality Standards in the Northwest Territories, 2014
- Environmental Guideline for Ambient Air Quality, 2011 (Nunavut)

Progress

The majority of the mercury emissions reductions in Canada has occurred before the treaty entered into force as the majority of measures were put in place in the late 1990s and early 2000s. According to the 2021 publication of Canada's Air Pollutant Emissions Inventory (APEI) Report, between 1990 and 2019, mercury emissions decreased by 91% (31 metric tons). This decrease in emissions is mainly due to a large drop in emissions from the Non-Ferrous Refining and Smelting Industry sector (25 metric tons). Reductions in mercury emissions

coincide with the closure of outdated smelters, the implementation of pollution prevention plans, achieving Base Level Industrial Emissions Requirements for particulate matter through Environmental Performance Agreements, increased emission control measures, such as changing feedstocks, improved particulate matter emission controls, and fuel switching.

The APEI has continued to report reductions for each source D category for mercury between January 1, 2017 and December 31, 2019.

Smelting and roasting processes of non-ferrous metals emissions increased by 41% (0.059 metric tons) between 2017 and 2018 (from 0.15 to 0.21 metric tons) and decreased by 56% (0.12 metric tons) between 2018 and 2019 (from 0.21 to 0.09 metric tons). The increase between 2017 and 2018 has been linked to operational problems at one facility, as such a decline in emissions is noted in 2019 from this same facility which explains the subsequent decrease in the sector only a year later.

▼ WASTE INCINERATION FACILITIES

- ☐ A quantified goal for controlling and, where feasible, reducing emissions from relevant sources
- ☒ Emission limit values for controlling and, where feasible, reducing emissions from relevant sources
- ☒ Use of BAT/BEP to control emissions from relevant sources
- ☒ Multi-pollutant control strategy that would deliver co-benefits for control of mercury emissions
- ☐ Alternative measures to reduce emissions from relevant sources

Measures

- Canada-wide Standards (CWS) for Mercury Emissions, 2000
- Incinerators Regulations, 1988 (Manitoba)
- Règlement sur l'enfouissement et l'incinération de matières résiduelles (Regulation respecting the landfill and incineration of residual materials), 2005 (Quebec)
- Technical Document for Batch Waste Incineration, 2010
- Air Pollution Control Regulations, 2004 (Newfoundland and Labrador)
- E09-02-Environmental Protection Act Air Quality Regulations, 2004 (Prince Edward Island)
- Air Quality Regulation, 1997 (New Brunswick)
- Air Quality Regulations, 2005 (Nova Scotia)
- Reg. 419/05 (Air Pollution – Local Air Quality, Ontario), Amended 2011
- Manitoba Environment Act, 1988
- The Environmental Management and Protection (Saskatchewan Environmental Code Adoption) Regulations, 2010
- Substance Release Regulations, 2006 (Alberta)
- Environmental Management Act, 2003 (British Columbia)
- Yukon Ambient Air Quality Standards, 2019
- Guideline for Ambient Air Quality Standards in the Northwest Territories, 2014
- Environmental Guideline for Ambient Air Quality, 2011 (Nunavut)

Progress

The majority of the mercury emissions reductions in Canada has occurred before the treaty entered into force as the majority of measures were put in place in the late 1990s and early 2000s. Nonetheless, the APEI has continued to report reductions for each source D category for mercury between January 1, 2017 and December 31, 2019. Incineration emissions have decreased by 9.9% (0.007 metric tons) between 2017 and 2018 (from 0.08 to 0.06 metric tons) and increased by 10.5% (0.007 metric tons) between 2018 and 2019 (from 0.06 to 0.07 metric tons)*

*note: the 2021 publication of the APEI suggests mercury emissions in 2019 for this sector were 0.55 metric tons; however, a significant revision by a reporting facility occurred after publication. The values presented here include the updated facility report (0.07 metric tons).

▼ CEMENT CLINKER PRODUCTION FACILITIES

- ☐ A quantified goal for controlling and, where feasible, reducing emissions from relevant sources
- ☒ Emission limit values for controlling and, where feasible, reducing emissions from relevant sources
- ☒ Use of BAT/BEP to control emissions from relevant sources
- ☒ Multi-pollutant control strategy that would deliver co-benefits for control of mercury emissions
- ☐ Alternative measures to reduce emissions from relevant sources

Measures

- National Guidelines for the Use of hazardous and Non-hazardous Wastes as Supplementary Fuels in Cement Kilns (1996)
- National Emission Guideline for Cement Kilns (1998)
- Air Pollution Control Regulations, 2004 (Newfoundland and Labrador)
- E09-02-Environmental Protection Act Air Quality Regulations, 2004 (Prince Edward Island)
- Air Quality Regulation, 1997 (New Brunswick)
- Air Quality Regulations, 2005 (Nova Scotia)
- Reg. 419/05 (Air Pollution – Local Air Quality, Ontario), Amended 2011
- Manitoba Environment Act, 1988
- The Environmental Management and Protection (Saskatchewan Environmental Code Adoption) Regulations, 2010
- Substance Release Regulations, 2006 (Alberta)
- Environmental Management Act, 2003 (British Columbia)
- Yukon Ambient Air Quality Standards, 2019
- Guideline for Ambient Air Quality Standards in the Northwest Territories, 2014
- Environmental Guideline for Ambient Air Quality, 2011 (Nunavut)

Progress

The majority of the mercury emissions reductions in Canada has occurred before the treaty entered into force as the majority of measures were put in place in the late 1990s and early 2000s. Nonetheless, the APEI has continued to report reductions for each source D category for mercury between January 1, 2017 and December 31, 2019. Cement clinker production emissions have decreased by 9.5% (0.027 metric tons) between 2017 and 2018 (from 0.28 to 0.25 tonnes) and increased by 4.8% (0.012 metric tons) between 2018 and 2019 (from 0.25 to 0.26 metric tons).

Have the measures for existing sources under paragraph 5 of article 8 been implemented no later than 10 years after the date of entry into force of the Convention for the party?

- ☒ Yes
- ☐ No

8.3. Has the party prepared an inventory of emissions from relevant sources within 5 years of entry into force of the Convention for it?

- ☒ Yes

- ☐ No
- ☐ Have not been a party for 5 years

If yes, when was the inventory last updated?

Wed, 10/20/2021 – 00:00

Please indicate where this inventory is available

Canada maintains a comprehensive inventory of mercury emissions, including from all industrial sources. Under the authority of the Canadian Environmental Protection Act, 1999 owners or operators of relevant facilities that meet specifies reporting requirements must report mercury emissions to the National Pollutant Release Inventory (NPRI) on an annual basis since 1994. Additionally, Canada's Air Pollutant Emissions Inventory (APEI) is compiled from many different data sources. Emission data reported by individual facilities through NPRI and, to a lesser extent, data provided directly by the provinces are supplemented with well-documented, science-based estimation tools and methodologies to quantify total emissions. Together, these data sources provide a comprehensive coverage of air pollutant emissions across Canada.

APEI is available online at: <https://www.canada.ca/en/environment-climate-change/services/pollutants/air-emissions-inventory-overview.html>

NPRI is available at: <https://www.canada.ca/en/services/environment/pollution-waste-management/national-pollutant-release-inventory.html>

Attach

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8.4. Has the party chosen to establish criteria to identify relevant sources covered within a source category?

- ☐ Yes
- ☒ No

8.5. Has the party chosen to prepare a national plan setting out the measures to be taken to control emissions from relevant sources and its expected targets, goals and outcomes?

- ☐ Yes
- ☒ No

Part E – Additional comments on the article in free text if the party chooses to do so

Canada maintains a comprehensive inventory of mercury emissions, including from all industrial sources. Under the authority of the Canadian Environmental Protection Act, 1999 owners or operators of facilities who manufacture, process or otherwise use 5 kilograms or more of mercury per calendar year at any concentration are required to report mercury to the National Pollutant Release Inventory (NPRI) annually, even if they have zero emissions. Additionally, Canada's Air Pollutant Emissions Inventory (APEI) is compiled from many different data sources. Emission data reported by individual facilities through NPRI and, to a lesser extent, data provided directly by the provinces are supplemented with well-documented, science-based estimation tools and methodologies to quantify total emissions. Together, these data sources provide a comprehensive coverage of air pollutant emissions across Canada.

According to the 2021 publication of Canada's Air Pollutant Emissions Inventory Report, between 1990 and 2019, mercury emissions decreased by 91% (31 metric tons). This decrease in emissions is mainly due to a large drop in emissions from the Non-Ferrous Refining and Smelting Industry sector (25 metric tons). Reductions in mercury emissions coincide with the closure of outdated smelters, the implementation of pollution prevention plans, achieving Base Level Industrial

Emissions Requirements for particulate matter through Environmental Performance Agreements, increased emission control measures, such as changing feedstocks, improved particulate matter emission controls, and fuel switching.

Emission reductions from coal-fired electricity generation facilities over the 1990 to 2019 period (1.4 metric tons) are largely due to facility closures and from the addition of mercury controls to plants. For the waste incineration facilities, decreases in emissions resulted from a reduction of mercury in products, such as automotive switches and mercury-containing lamps, going into the waste stream through initiatives such as takeback programs and other recycling measures.

▼ ART. 9: RELEASES

9.1. Are there, within the party's territory, relevant sources of releases as defined in paragraph 2 (b) of article 9?

- ☐ Yes
- ☒ No
- ☐ I do not know

9.2. Has the party established an inventory of releases from relevant sources within 5 years of entry into force of the convention for it?

- ☐ Yes
- ☒ Relevant sources do not exist in the territory
- ☐ Have not been a party for 5 years
- ☐ No

Part E – Additional comments on the article in free text if the party chooses to do so

In Canada, the Canadian Environmental Protection Act, 1999 authorizes Environment and Climate Change Canada to require facilities to report releases of mercury and mercury compounds to land and water to the National Pollutant Release Inventory (NPRI). Based on a review of data contained in this inventory, Canada does not have any relevant sources of releases.

NPRI is available at: <https://www.canada.ca/en/services/environment/pollution-waste-management/national-pollutant-release-inventory.html>

▼ ART. 10: ENVIRONMENTALLY SOUND INTERIM STORAGE OF MERCURY, OTHER THAN WASTE MERCURY

10.1. Has the party taken measures to ensure that the interim storage of non-waste mercury and mercury compounds intended for a use allowed to a party under the Convention is undertaken in an environmentally sound manner?

- ☒ Yes
- ☐ No
- ☐ I do not know

Please indicate the measures taken to ensure that such interim storage is undertaken in an environmentally sound manner and the effectiveness of those measures.

In Canada, environmentally sound management of non-waste mercury and mercury compounds is undertaken by the federal, provincial and territorial governments. Measures to ensure environmentally sound interim storage of mercury are implemented through both environmental measures and occupational health and safety measures at various levels of government.

All provinces and territories have overarching environmental protection acts, which limit releases of harmful substances to the environment, including mercury. In each jurisdiction, regulations typically are not prescriptive of the storage measures required for hazardous substances, rather they focus on the prevention and management of spills as well as emergency response planning. Each jurisdiction also has building codes that must be followed to ensure appropriate ventilation, plumbing, leak detection and other safety measures. Guidance is available for chemical and waste storage facilities in some jurisdictions; for example, Ontario has issued Guidelines for environmental protection measures at chemical and waste storage facilities. Other provinces may take appropriate measures through industrial approvals and permitting.

The federal Environmental Emergency Regulations (E2R) aim to enhance protection of the environment and human life/health during environmental emergencies, by promoting the prevention of accidental releases of hazardous substances, and ensuring industry is prepared to respond when accidents occur. The E2R lists 249 substances, including mercury. Mercury is regulated under the E2R when total quantity onsite is equal or more than 1 tonne. The E2R may require reporting of quantities and container capacities on site, and may also require the development and implementation of an environmental emergency plan. The plan must include elements such as identification of environmental emergency scenarios and their potential consequences, mitigation practices to prevent or to diminish potential consequences and require public communication before, during and after an environmental emergency. The plan must also be exercised regularly and any environmental emergency must be reported. Since the latest amendments to E2 regulations came into force in August 2019, no mercury spills have been reported. Data on mercury spills were not readily available prior to August 2019.

The federal Transportation of Dangerous Goods Regulations set requirements and safety standards for the handling, offering for transport and transportation of dangerous goods in Canada, including requirements on quantity limits for mercury and mercury compounds. Every province and territory has a Dangerous Goods Handling and Transportation Act, and/or accompanying Regulations.

The Workplace Hazardous Materials Information System (WHMIS) is Canada's national hazard communication standard and is implemented through coordinated federal, provincial and territorial legislation. At the federal level, the Hazardous Products Act, and the Hazardous Products Regulations set the requirement, including hazard information on product labels and Safety Data Sheets (SDS), for suppliers who sell or import hazardous products intended for use, handling or storage in Canadian workplaces. Federal agencies, provinces, and territories responsible for the regulation of occupational health and safety have established employer WHMIS requirements within their respective jurisdictions. Employers are responsible for implementing the workplace standards set out by the federal, provincial and territorial governments, which include, among other requirements, ensuring hazardous products are appropriately labeled, workers have access to SDSs, appropriate control measures are in place, and other education and training needs for the safe use of hazardous products.

Part E – Additional comments on the article in free text if the party chooses to do so

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▼ ART. 11: MERCURY WASTES

11.1. Have measures outlined in article 11, paragraph 3, been implemented for the party's mercury waste?

☒ Yes

☐ No

Please describe the measures implemented pursuant to paragraph 3, and please also describe the effectiveness of those measures.

The management of hazardous wastes and hazardous recyclable materials in Canada, including mercury waste, is a shared responsibility between the federal, provincial, territorial and municipal governments.

The federal government regulates international and interprovincial movements of hazardous waste, including mercury waste, and manages waste on federal lands. As a Party to the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, Canada has legislation and regulations to implement requirements for the notification of transboundary movements, prior informed consent, movement tracking, and environmentally sound management of hazardous wastes including mercury wastes. Transboundary movements of mercury waste subject to Canadian regulations may only occur once a permit from Environment and Climate Change Canada is issued. Such permits are authorised when, in accordance to Basel Convention obligations, the consent of the import and transit countries, as applicable, is received. In providing its consent, the importing country confirms that the waste will be managed in an environmentally sound manner. In assessing a notification for imports of waste subject to Canadian regulations, Canada's competent authority for the Basel Convention collaborates with officials in provinces and territories to ensure that the imported waste will be managed in an environmentally sound manner. Furthermore, movements of mercury waste within Canada across provincial or territorial boundaries may also be subject to domestic regulations.

Measures implemented include:

- Canadian Environmental Protection Act (1999)
- Cross-border Movement of Hazardous Waste and Hazardous Recyclable Material Regulations (2021)
- Disposal at Sea Regulations (2001)

In addition to regulating international and interprovincial movements of hazardous wastes, the federal government also develops and implements a reporting inventory, guidance documents, and pollution prevention notices on a variety of waste streams, such as mercury, with the aim to ensure environmentally sound management and environmental protection. Nationwide, the federal government works alongside provincial and territorial counterparts to develop Canada-wide action plans on various environmental issues, including mercury waste.

Measures implemented include:

- Canada-wide Action Plan for Extended Producer Responsibility (2009)
- Canada-wide Standard on Mercury for Dental Amalgam Waste (2001)
- Canada-wide Standards for Mercury Emissions (2000)
- Code of Practice for the Environmentally Sound Management of End-of-Life Lamps Containing Mercury (2017)
- National Pollutant Release Inventory
- National Strategy for the Safe and Environmentally Sound Disposal of Lamps Containing Mercury Act (2017)
- Notice Requiring the Preparation and Implementation of Pollution Prevention Plans in Respect of Mercury Releases from Mercury Switches in End-Of-Life Vehicles Processed by Steel Mills (2007)
- Notice Requiring the Preparation and Implementation of Pollution Prevention Plans in Respect of Mercury Releases from Dental Amalgam Waste (2010)

Provincial and territorial governments regulate and monitor waste management facilities and activities via legislative measures including facility approvals, which set criteria and conditions for facility operations and ensuring mercury waste is managed in an environmentally sound manner. Municipal governments collect and manage waste for recycling and disposal. Many provinces have extended producer responsibility (EPR) programs in place for a variety of products containing mercury (e.g. lamps, batteries, thermostats), which establishes that the end-of-life management of specific products, is the responsibility of the producers or first importers and may include retail take-back programs. Through the Canada-wide Action Plan for Extended Producer Responsibility, Canada supports the expansion of EPR programs. In addition to EPR programs, municipalities may

operate designated collection points for end-of-life products containing mercury at municipal facilities or at targeted take-back facilities. Awareness raising about the Basel Convention technical guidelines on the environmentally sound management of mercury waste, adopted in 2015, was undertaken and officials in Canadian jurisdictions are involved in the development of the latest draft of these guidelines. Provincial and territorial governments can also implement Canadian Council of Ministers of Environment action plans, standards and guidance who support sound management approaches for hazardous waste, including mercury waste.

Measures implemented include:

- Environmental Protection Act (Ontario, 1990)
- Regulation 347 General – Waste Management (Ontario, 1990)
- Environmental Quality Act (Quebec, 1972)
- Regulation Respecting Hazardous Materials (Quebec, 1997)
- Recycling Regulation (British Columbia, 2004)
- The Waste Reduction and Prevent Act (Manitoba, 1990)

In Canada, mercury is only recovered, recycled, reclaimed or directly re-used for a use allowed to a Party under the Convention, for a claimed exemption, or disposed of in an environmentally sound manner. The measures Canada has taken to control the use of mercury apply regardless of whether the mercury has been recovered, recycled, reclaimed or directly re-used. As discussed in detail in the information provided in the responses for reporting questions under Articles 4 and 5, the Products Containing Mercury Regulations (2014) prohibit the use of mercury for all domestic and imported products and manufacturing processes unless they are specifically exempted from the regulations because there are no feasible mercury free alternatives available.

Measures implemented include:

- Cosmetic Regulations (2004)
- Food & Drug Act (1981)
- Food & Drug Regulations
- Guidance on Heavy Metal Impurities in Cosmetics (2016)
- Natural Health Products Regulations
- Pest Control Products Act
- Quality of Natural Health Products Guide (2013)
- Surface Coating Materials Regulations (2016)

11.2. Are there facilities for final disposal of waste consisting of mercury or mercury compounds in the party's territory?

- ☒ Yes
- ☐ No
- ☐ I do not know

If yes, if the information is available, how much waste consisting of mercury or mercury compounds has been subjected to final disposal under the reporting period? Please specify the method of the final disposal operation/operations.

From 2017 to 2020, a total of 123.712 metric tons of waste consisting of mercury or mercury compounds was disposed of between 2017 to 2020 through physiochemical treatment (D9), specially engineered landfill (D5), or a combination of both operations.

Totals for years 2017 to 2020 (January 1 to December 31) are as follows:

2017: 24.936 metric tons
2018: 31.274 metric tons
2019: 24.462 metric tons
2020: 43.030 metric tons

Note: These totals are based on Canada's national definition of waste consisting of mercury and mercury compounds as set out by domestic regulations. However, information was not available for all facilities.

Part E – Additional comments on the article in free text if the party chooses to do so

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▼ ART. 12: CONTAMINATED SITES

12.1. Has the party endeavoured to develop strategies for identifying and assessing sites contaminated by mercury or mercury compounds in its territory?

☒ Yes

☐ No

Please elaborate

The federal, provincial and territorial governments of Canada have various legislation, regulations, guidelines and/or programs in place to identify, assess, remediate and risk manage contaminated sites, including those contaminated by mercury or mercury compounds.

The environment ministers from the federal, provincial and territorial governments participate in the Canadian Council of Ministers of the Environment (CCME), setting the strategic direction and broad outcomes for the Council. Deputy ministers and senior officials establish working groups of experts from the federal, provincial, and territorial environmental ministries to work collaboratively to accomplish specific goals. CCME has published several resources on contaminated sites including guidance documents on site characterization, ecological risk assessment, and site classification. The CCME also develops Canadian Environmental Quality Guidelines (CEQG) for the protection of environmental and human health. The CCME has water quality guidelines, sediment quality guidelines, and soil quality guidelines for inorganic mercury, as well as tissue residue quality guidelines for methylmercury.

The Government of Canada makes use of the CCME guidance and guidelines to identify and assess contaminated sites, including those contaminated by mercury or mercury compounds. In addition, Canada has developed the Federal Contaminated Sites Inventory (FCSI), published a 10-step process for contaminated sites management in A Federal Approach to Contaminated Sites, and established the Federal Contaminated Sites Action Plan (FSCAP), all of which focus on the identification and management of federal contaminated sites. Provinces have their own strategies and inventories for contaminated sites within their jurisdiction.

Between 2000 and 2002, the Treasury Board of Canada approved a policy framework for the management of federal contaminated sites. The framework was a collection of policies and best practices to guide federal organizations (custodians) in the management of federal contaminated sites and was accompanied by the public release of the FCSI. The FCSI includes information on all known federal contaminated sites under the custodianship of departments, agencies and consolidated Crown corporations, as well as those that are being or have been investigated to determine whether they have contamination arising from past use that could pose a risk to human health or the environment. The inventory also includes non-federal contaminated sites for which the Government of Canada has accepted some or all financial responsibility. It does not include sites where contamination has been caused by, and which are under the control of, enterprise Crown corporations, private individuals, firms or other levels of government.

The FCSI contains, for each site, information such as the location of the site, the severity of contamination, the contaminated medium, the nature of the contaminant, progress made to date in identifying and addressing contamination, and how much liquid and solid-based media have been treated. The FCSI offers a variety of search criteria, such as site name, province or territory, Census Metropolitan Area, Federal Electoral District, and contaminants; the results can be displayed as a table or on an interactive map. Please note that mercury and mercury compounds would be included in the "metal, metalloid, and organometallic" contaminant category in the FCSI.

The 10-step process used to identify, assess, classify, and remediate or risk manage federal contaminated sites was published in 2000. The Federal contaminated sites decision-making framework was later developed to assist custodians and their consultants in making the most informed decisions at each step of the 10-step process. Briefly, Step 1 involves identifying suspected contaminated sites. Steps 2, 3, and 5 correspond to Phase I, II, and III environmental site assessments, as described by the Canadian Standards Association. Steps 4 and 6 correspond to classification and prioritization using the National Classification System for Contaminated Sites (NCSCS) developed by the Canadian Council of Ministers of the Environment (CCME) or the Aquatic Site Classification System (ASCS) developed by FCSAP. Using the NCSCS and ASCS, sites are classified as high (with a score of 70 – 100), medium (with a score of 50 – 69.9), or low priority for action (with a score of 37 – 49.9), according to their known or potential adverse impacts to human health and/or the environment. Steps 7 and 8 correspond to the development and implementation of a remediation / risk management strategy. Step 9 involves confirmatory sampling and final reporting. Step 10 corresponds to long-term monitoring, if required.

FCSAP was established in 2005 as a 15-year program with funding of \$3.67 billion USD from the Government of Canada. The program was renewed for another 15 years (2020 to 2034) with \$940 million USD announced in the 2019 federal budget for the first five years (Phase IV, 2020 to 2024). The objective of FCSAP is to reduce environmental and human health risks from known federal contaminated sites and associated federal financial liabilities, while focusing on the highest priority sites. Identification of the highest priority sites is accomplished, in part, through the site classification approaches described above. Since the establishment of the FCSAP program (i.e. 2005–06 to 2020–21), assessment activities have been conducted at close to 11,000 federal contaminated sites and completed at approximately 7,770 of those sites. Similarly, remediation activities have been conducted at more than 2,450 federal contaminated sites and completed at almost 1,100 of those sites, during that same time period.

Part E – Additional comments on the article in free text if the party chooses to do so

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▼ ART. 13: FINANCIAL RESOURCES AND MECHANISM

13.1. Has the party undertaken to provide, within its capabilities, resources in respect of those national activities that are intended to implement the Convention in accordance with its national policies, priorities, plans and programmes?

- ☒ Yes
☐ No

Please specify

Canada has provided resources for national activities to implement the Convention through the implementation of programs, policies, plans, and regulations. The Government of Canada makes regulations and develops guidelines and objectives that apply across the country. Provincial and territorial governments also apply their own environmental protection policies, guidelines and regulations. The implementing government provides financial resources for each activity (including salary and capital costs) and in the case of regulations or obligatory measures, resources may include efforts for compliance promotion and enforcement. At the federal level, resources are also provided to evaluate the success programs, policies, plans, and regulations to ensure that the measures taken to implement the Convention are working to reduce the risks of mercury to Canadians and their environment.

Due to the large number of national activities with work that touches on mercury, as well as the complexities of aggregating information on the financial resources allocated only to the Convention

implementation, it is not possible to provide an estimate of the direct costs for implementation. Resources are provided by the Government of Canada and Provincial and Territorial Governments to implement each of the programs and regulations mentioned throughout this report, as well as those mentioned in Canada's submission for Article 30.4 which was provided upon ratification.

Please provide comments, if any.

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13.2. Supplemental: Has the party, within its capabilities, contributed to the mechanism referred to in paragraph 5 of article 13?

☒ Yes

☐ No

Please specify

Canada makes significant contributions (\$185.73 million USD) over the four-year-period (2018–19 to 2022–23) of the seventh replenishment of the Global Environment Facility (GEF–7). As direct funding for Minamata Convention is 5.1% of GEF–7 programming, Canada's contribution is approximately \$9.50 million USD over that period. The GEF's commitment has funded projects that reduced over 600 metric tons of mercury per year from key sectors including artisanal and small-scale gold mining (ASGM) and the production of vinyl chloride monomer (VCM); supported 110 countries to conduct Minamata Initial Assessments and 32 countries to conduct ASGM National Action Plans; and provided support to synergies both within the chemicals and waste cluster and with other focal areas of the GEF. In addition, the GEF–7 Impact Programs on Food, Land Use, and Restoration, Sustainable Cities, and Sustainable Forest Management are expected to deliver global environmental benefits by reducing the harmful effects of chemicals and waste, including mercury.

Please provide comments, if any.

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13.3. Supplemental: Has the party provided financial resources to assist developing-country parties and/or parties with economies in transition in the implementation of the Convention through other bilateral, regional and multilateral sources or channels?

☒ Yes

☐ No

Please specify

Canada has regularly provided developing countries and countries with economies in transition with assistance in the implementation of the Convention through bilateral, regional, and multilateral channels. Funds are provided by Global Affairs Canada (GAC) and are primarily targeted to support capacity building and technical assistance for activities related to the implementation of Article 7. Some of these projects are described below. The total support for the implementation of these projects provided by the Government of Canada is \$97,029,505 USD. Information on each of these projects and their results can be found on Global Affairs Canada's Project Browser (<https://w05.international.gc.ca/projectbrowser-banqueprojets/project-projet/details/a034222001?Lang=eng>):

- Improving Environmental Management of Mining and Energy Activities in Peru

This project aims to streamline how the Peruvian Government handles environmental impact assessments for mining and energy projects while strengthening the rigour and analysis of these assessments. Specifically, the project intends to consolidate the leadership role of the Ministry of the Environment over environmental issues related to large mining and energy projects and strengthen the capacity of regional governments responsible for handling the environmental impact assessments of small and medium-scale mining projects. (2013–2022, \$13,226,190 USD)

- The African Mineral Development Centre (AMDC)

The AMDC aims to provide strategic technical advice and assistance on mineral development issues to the African Union, African Regional Economic Communities and member states. The Centre addresses a wide range of mining issues, including artisanal and small-scale gold mining (ASGM). Canada's support to the AMDC contributes to better mineral governance and revenue management in Africa and helps ensure that Africans receive greater benefits from mineral resource exploitation (2013–2018, \$1.62 million USD).

- GAC–Partnership Africa Canada Collaboration on Conflict Minerals

The project aims to improve the governance of the supply chains for conflict-prone and high-value minerals in the Great Lakes Region of Africa and increase participation of ASGM communities in legal and 'conflict free' sales channels that contribute to local economies and state revenues (2014–2019, over \$12.18 million USD).

- IMPACT: Just Gold

While the primary purpose of IMPACT's Just Gold project is to promote the participation of ASGM communities in legal and 'conflict-free' trade of artisanal gold, the project also includes an environmental component focused on mercury reduction. As part of its activities, IMPACT has raised awareness on the effects of mercury on health and community through sensitization campaigns. IMPACT has provided mercury reduction training to ASGM miners and introduced equipment to enable miners to process gold without the use of mercury. As part of the Just Gold project in the Democratic Republic of the Congo, IMPACT has tested a mercury-free processing plant that allows miners to process their gold without using mercury. Now that the plant has been tested, it can be replicated in other project sites in similar mine sites. On a global scale, IMPACT is part of the UNEP Global Mercury Partnership, which shares field expertise and lessons learned on mercury reduction, elimination and alternative technologies. These initiatives are funded by GAC for the Building Responsible Mineral Supply Chains in the Great Lakes Region of Africa project. (2014–2021, \$12,631,409 USD).

- IMPACT: Foundations for Peace in the Artisanal Gold Mining Sector in Burkina Faso

This two-year project aims to enhance the ability of women and men in the ASGM sector of Burkina Faso to integrate into the legal gold trade, thereby better contributing to the stability and security of their communities. This project will increase the financial autonomy and economic resilience of women and men in artisanal mining communities. It will reduce their vulnerability to extortion by those who provide exploitative loans or investments in exchange for gold sales with conditions that are exploitative. This work will be combined with capacity building for authorities, the private sector and civil society linked to proven techniques to incentivize legal trade, while improving their enforcement strategies to hinder and marginalize the worst offenders of illicit trade. (2021–2023, \$809,320 USD).

- IMPACT: Digging for Equality

This project aims to improve security, gender equality, and women's empowerment in the artisanal mining sectors across three countries—Democratic Republic of the Congo, Uganda, and Zimbabwe. The project will support women working in the ASGM sector to reduce the barriers that they face and support their efforts towards gender equality. (2020–2023, \$1.62 million USD).

- Sustainable development of artisanal and small-scale gold mining in Indonesia

The project improved mining, environmental and social practices for men and women involved in ASGM, including identifying alternatives to mercury use and training on safe handling of cyanide. The project also supported targeted subnational governments in improving collaboration with the formal extractive sector and promoted formalization of ASGM activities through legal trade of responsible artisanal gold and value-added products in domestic and international markets (2015–2020, \$6,776,474 USD).

- Natural Resources for Development Program

This project supports central and subnational governments in Indonesia to better coordinate, formulate and implement sustainable policy reforms in the extractive sector to improve extractive sector governance. The project also strives to increase the benefits received by women and men from extractive sector revenues and reduce negative environmental impacts. Included as part of the project activities is a one-time baseline study carried out to identify mercury exposure in five ASGM areas with recommendations on policy and investment priorities to inform Indonesia's National Action Plan on the ASGM sector. The project also conducted research on gender mainstreaming in

ASGM sector as well as the broader extractive sector and hosted workshops with government representatives. (2015–2021, \$10.42 million USD).

- **Mongolia: Strengthening Extractive Management**

This project builds government capacity to formulate policy and regulatory frameworks that benefit all Mongolians and to increase evidence-based decision making that is environmentally and socially sustainable. The project supported the development of Mongolia's Gender Policy for the Extractive Sector. This project applies to the extractive sector as a whole, including ASGM operations (2015–2020, \$6.49 million USD).

- **Mongolia – Enhancing Resource Management**

The MERIT project strengthens the capacity of public institutions and local communities to manage natural resources effectively, responsibly and sustainably. Technical Advisors (TAs) and the MERIT team in Mongolia combine the skills and knowledge to provide strategic support through volunteer assignments to effectively implement best practices, tools and systems adapted to local needs. This project applies to the extractive sector as a whole, including ASGM operations. The project is implemented through a partnership between two Canadian non-profit organizations: CESO (Canadian Executive Service Organization) and WUSC (World University Service of Canada). MERIT is an eight-year project (2016–2024) funded by GAC with a maximum contribution of \$14.94 million USD.

- **Canadian International Resources and Development Institute (CIRDI)**

Supporting Capacity-Building and Multi-Level Governance of Small-Scale Gold Mining: A Collaborative Project on Mercury, Deforestation and Rural Livelihoods in Indonesia.

In 2017–18 several products addressing the data-limited nature of the ASGM sector in Indonesia were developed, and significant contributions were made to planning and decision-making concerning ASGM at local, regional and national levels. The project produced two draft field reports documenting the realities of ASGM and primary mercury mining in the province of Central Kalimantan, Indonesia; the reports were shared with the leading national environmental authority responsible for coordinating the government's various agencies involved in the Minamata Convention National Action Plan in June 2017. Gender-mapping, life-history interviews, research to 'ground-truth' the contextual meanings surrounding the satellite images of a United Nations report on mining impacts in Central Kalimantan, and a successful photo-voice exhibition all were some of the other innovative data-capturing components of this period fieldwork. (2016–2019, \$145,854 USD).

The aforementioned project outputs increase access to information about the realities of ASGM and beneficiaries have reported increased understanding. A project workshop was held in Central Kalimantan with provincial government officials to improve understanding of the Minamata Convention on Mercury and its requirements, and to develop a joint plan of action (next steps). Additional activities include a Community-Led Planning methodology and ongoing engagement with national level policy stakeholders.

- **Intergovernmental Forum on Mining, Minerals, Metals and Sustainable Development (IGF) ASGM Guidance Document**

Canada is providing financial support to the Intergovernmental Forum on Mining, Minerals, Metals and Sustainable Development, part of which supported the IGF's development and implementation of guidance for governments on managing ASGM. The IGF undertook global consultations on best practices in the management and governance of artisanal mining and provides ongoing technical assistance and advice to member states to support efforts for the elimination of mercury use in artisanal mining and compliance with the Minamata Convention. IGF member states that undergo a mining policy framework assessment with the IGF Secretariat receive specific recommendations on improving mercury abatement within the context of their national regulatory and legislative regimes (2015–2023, \$16.24 million USD).

Please provide comments, if any.

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Part E – Additional comments on the article in free text if the party chooses to do so

▼ ART. 14: CAPACITY-BUILDING, TECHNICAL ASSISTANCE AND TECHNOLOGY TRANSFER

14.1. Has the party cooperated to provide capacity-building or technical assistance, pursuant to article 14, to another party to the Convention?

- ☒ Yes
☐ No

Please specify

Canada has regularly provided bilateral and multilateral mercury-related capacity building and technical assistance to developing countries and countries with economies in transition, and expects to continue to assist them in future.

The Government of Canada, through the department of Global Affairs Canada (GAC), provides funding to projects fostering a feminist and human rights-based approach to natural resource governance. This includes funding for projects piloting new approaches to managing artisanal and small-scale gold mining (ASGM) to promote the inclusion and economic empowerment of women and traditionally marginalized groups. In the past, GAC has also funded projects managing ASGM with particular attention to addressing conflict risks, providing technical assistance, and promoting local revenue management and formalization. Some of these projects are listed below (for complete project descriptions see the supplemental information provided for article 13):

- Improving Environmental Management of Mining and Energy Activities in Peru (2013–2022)
- The African Mineral Development Centre (AMDC) (2013–2018)
- GAC–Partnership Africa Canada Collaboration on Conflict Minerals (2014–2019)
- IMPACT: Just Gold (2014–2021)
- IMPACT: Foundations for Peace in the Artisanal Gold Mining Sector in Burkina Faso (2012–2023)
- IMPACT: Digging for Equality (2020–2023)
- Sustainable development of artisanal and small-scale gold mining in Indonesia (2015–2023)
- Natural Resources for Development Program (2015–2021)
- Mongolia: Strengthening Extractive Management (2015–2020)
- Mongolia – Enhancing Resource Management (2016–2024)
- Canadian International Resources and Development Institute (CIRDI) (2016–2019)
- Intergovernmental Forum on Mining, Minerals, Metals and Sustainable Development (IGF) ASGM Guidance Document (2015–2023)

Providing technical assistance for atmospheric mercury monitoring

In addition to the financial support provided for capacity building, Canada provides technical assistance to researchers in other countries to measure mercury in the atmosphere through the department of Environment and Climate Change Canada's Air Quality Research Program. The work of this program has contributed to the development of a novel passive mercury air sampler that is simple and inexpensive, and which works in many different climates and environments. Through the program, samplers are mailed to participating researchers in various countries where they are deployed for a set amount of time, before being returned to Canada by pre-paid mail for laboratory analysis. Data collected from the samplers are provided to the participants and are publicly available on Environment and Climate Change Canada's data portal. Since 2019, the mercury passive samplers have been deployed in 47 locations in 26 countries, 14 of which are considered developing. Following the COVID pandemic, additional sites are planned for deployment in Latin America and the Caribbean.

This technical assistance supports developing countries to collect their own data on atmospheric mercury concentrations in their jurisdiction. The work also helps to enable countries and regions to build up the technical capacity required to participate in regional monitoring networks.

14.2. Supplemental: Has the party received capacity-building or technical assistance pursuant to article 14?

☐ Yes

☒ No

Please specify

Canada has not requested any capacity-building or technical assistance

Please provide comments, if any.

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14.3. Has the party promoted and facilitated the development, transfer and diffusion of and access to, up-to-date environmentally sound alternative technologies?

☒ Yes

☐ No

☐ Other

Please specify

As mentioned in question 1 and in Article 13 supplemental materials, Canada has provided funding for several projects piloting new approaches to managing artisanal and small-scale gold mining (ASGM). These projects include:

- IMPACT: Just Gold (2014–2021)
- Sustainable development of artisanal and small-scale gold mining in Indonesia (2015–2023)
- Intergovernmental Forum on Mining, Minerals, Metals and Sustainable Development (IGF) ASGM Guidance Document (2015–2023)

Part E – Additional comments on the article in free text if the party chooses to do so

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▼ ART. 16: HEALTH ASPECTS

16.1. Have measures been taken to provide information to the public on exposure to mercury in accordance with paragraph 1 of article 16?

☒ Yes

☐ No

Supplemental: If yes, describe the measures that have been taken.

Health Canada provides information on exposure and health concerns related to mercury, foods and consumer products containing mercury, regulatory measures that the government has taken, and steps which can be taken to reduce mercury exposure through its website Mercury and Human Health.

In December 2021, Health Canada released a fact sheet on Mercury in Canadians. The fact sheet provides information on human biomonitoring of mercury in Canada with results from the Canadian Health Measures Survey. The fact sheet also provides analyses of mercury exposures in Canadians by age and sex groups as well as comparisons with vulnerable sub-populations in Canada.

As well, as part of its engagement under the Arctic Council Arctic Contaminants Action Program (ACAP), Environment and Climate Change Canada participates on the Expert Group on Persistent Organic Pollutants and Mercury. This Expert Group is currently producing a Fact Sheet on Mercury, which will be made publicly available on the Arctic Council website. The purpose of this fact sheet is

to provide high-level information on how mercury is released, as well as its potential health impacts. This product targets northern residents, particularly Indigenous Peoples, who are exposed to elevated levels of contaminants in fish and wildlife species that are important to their traditional diets.

The main source of exposure to mercury for most Canadians is eating fish and other seafood. Health Canada has assessed the risks and benefits of fish consumption and provides consumption advice that aims to minimize exposure to mercury from certain types of retail fish species that contain higher levels of mercury. This consumption advice is provided for the general population, women who are/may become pregnant or who are breastfeeding, and children. Health Canada also advises Canadians to be aware of provincial and territorial advisories related to fish caught in local waters that are harvested for recreational or subsistence purposes.

In addition to programs delivered by Health Canada for the general Canadian population, the federal government provides a suite of health programs, services and strategies specifically for First Nations and Inuit communities through the First Nations and Inuit Health Branch of Indigenous Services Canada. The First Nations and Inuit Health Branch supports community-based biomonitoring for mercury (conducted upon request) for selected First Nations communities around the English – Wabigoon river system in Ontario. The biomonitoring results are always communicated back to participants and accompanied by personalised letters explaining the meaning of results as well as a risk communication pamphlet providing regionally specific advice on ways of decreasing mercury exposure, while continuing consumption of local fish.

16.2. Have any other measures been taken to protect human health in accordance with article 16?

☒ Yes

☐ No

Supplemental: If yes, describe the measures that have been taken.

The administration and delivery of public health and health care services in Canada is the responsibility of each province and territory, guided by the provisions of the federal Canada Health Act. Through Health Canada and Indigenous Services Canada, the Government of Canada provides programs and services to protect the health of all Canadians.

The Workplace Hazardous Materials Information System is Canada's national hazard communication standard. WHMIS, which is implemented through coordinated federal, provincial and territorial legislation, focuses on proper labelling of hazardous products, the provision of Safety Data Sheet(s), and worker education and training programs, thereby ensuring that workers have the necessary information, tools and training required to use, handle, and store hazardous products containing mercury and mercury compounds.

Health Canada has developed Guidelines for Canadian Drinking Water Quality which establishes a maximum acceptable concentration of 0.001 mg/L for mercury in drinking water. The Northern Contaminants Program works with Territorial and Regional health authorities to develop public information and advice related to mercury in traditional foods, and how to reduce dietary exposure to mercury.

Health Canada has established methyl mercury health-based guidance values of 2 ppm ($\mu\text{g/g}$) in hair and 8 $\mu\text{g/L}$ in blood (both measured as total mercury) for women of childbearing age, infants and children which corresponds to a Tolerable Daily Intake of 0.2 $\mu\text{g/kg-bw/day}$ methyl mercury in the diet. These values represent levels of exposure to methyl mercury which are not considered to be a concern for human health.

As mentioned above, the main source of exposure to mercury for most Canadians is eating fish and other seafood. Higher mercury exposure also occurs in specific subgroups of Canadians with very high dietary intakes of fish (e.g. subsistence fishers) and marine mammals (e.g. northern populations consuming seal and whale). The Government of Canada recognizes that both retail fish and traditional/country foods (foods caught for personal consumption through hunting or fishing) have significant nutritional benefits. Health Canada has set maximum levels for mercury in all retail

fish, which were developed using the mercury concentrations and consumption patterns of retail fish and therefore do not apply to fish harvested for sport or subsistence purposes. These levels are enforced by the Canadian Food Inspection Agency. The Canadian Food Inspection Agency conducts ongoing regularly testing of domestic and imported commercial fish, both freshwater and marine, to enforce the mercury guidelines. Health Canada and the Canadian Food Inspection Agency also monitor the levels of mercury in other foods sold in Canada. Any elevated results are assessed by Health Canada on a case-by-case basis and if a potential health concern is identified, immediate and appropriate action will be taken.

Health Canada (HC), in its role as an expert department under the Canadian Environmental Assessment Act, 2012 (CEAA 2012) and the Impact Assessment Act, 2019 (IAA), provides specialist or expert information or knowledge to responsible authorities (e.g., the Impact Assessment Agency of Canada, review panels, provincial governments) in their assessment of the potential health impacts from major resource and infrastructure projects and in their subsequent decision-making. Risks to human health from methylmercury contamination of country/traditional foods (e.g., fish, shellfish, birds, marine mammals), with a focus on impacts to Indigenous health, has previously been evaluated by HC in the context of a number of major development projects. More specifically, HC provides, for example, expertise on human health risk assessment methodologies, methylmercury monitoring of country/traditional foods and consumption advisories. HC may also serve on multi-stakeholder committees (which may include provincial and local governments, industry, Indigenous communities or local residents, etc.) that provide recommendations for and oversee methylmercury monitoring programs and provide health-related advice.

Blood mercury is measured in the general population by the Canadian Health Measures Survey (CHMS), in pregnant women and their children in the Maternal Infant Research on Environmental Chemicals (MIREC) study.

Canada supports a number of biomonitoring health surveys and studies assessing mercury exposure for First Nations, and ongoing annual First Nations community-based participatory research program on environmental contaminants, including mercury. Canada's Northern Contaminants Program (NCP) supports human biomonitoring and health research in the Canadian Arctic to assess the impacts of these environmental contaminants on Inuit, First Nations, and Métis communities. Blood mercury is measured among men, women and children living in northern Canada, and time trend data has been collected for pregnant women. These projects also provide data to health authorities as needed, and particularly if the concentrations exceed reference values, for risk assessments, and subsequent communications about contaminant levels in traditional/country foods are also coordinated with the health authorities.

Indigenous Services Canada funds a suite of programs, services and strategies provided primarily to First Nations and Inuit individuals, families and communities living on-reserve or in Inuit communities. It encompasses health promotion and disease prevention programs to improve health outcomes and reduce health risks, public health protection, including surveillance, to prevent and/or mitigate human health risks associated with communicable diseases and exposure to environmental hazards, and primary care where individuals are provided diagnostic, curative, rehabilitative, supportive, palliative/end-of-life care and referral services. Between 2008 and 2018, Indigenous Services Canada supported the first regionally representative total diet study involving 93 First Nations, which resulted in the development of the regionally representative hair mercury levels in Canadian First Nations adults living on reserves south of the 60th parallel (Tikhonov C. et al, 2021; DOI: 10.17269/s41997-021-00508-5). The study was more than a 10-year collaboration between the principal investigators at the Assembly of First Nations, University of Ottawa and the University of Montreal. The results of the study are published in the Canadian Journal of Public Health, 2021, but are also available online at www.fnfnes.ca.

Canada has also recently completed an Evaluation of the Effectiveness of Risk Management Measures for Mercury which assessed the collective performance of the actions Canada has taken to reduce human exposure to mercury and its compounds. The results indicated that for the general population, mercury levels are low and relatively stable. Mercury levels tended to be higher in indigenous communities than the general population, especially indigenous communities in the north. Northern Inuit populations had higher levels of mercury than the general Canadian population, but their levels have been decreasing over time. This decline may be due to a decrease in consumption of certain traditional/country foods rather than a decrease in mercury concentrations in the food web. The complete results of the evaluation for the human health

component can be found in Chapter 4 report which is available online <https://www.canada.ca/en/environment-climate-change/services/management-toxic-substances/evaluation-effectiveness-risk-management-measures-mercury/mercury-human-health.html>.

Part E – Additional comments on the article in free text if the party chooses to do so

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▼ ART. 17: INFORMATION EXCHANGE

17.1. Has the party facilitated the exchange of information referred to in article 17, paragraph 1?

☒ Yes

☐ No

Please provide more information, if any

Canada has and will continue to undertake a range of extensive activities designed to facilitate the exchange of information related to mercury, including making information available via databases/inventories, assessments and evaluations, formal bilateral and international exchanges, as well as more informal exchanges. Examples of how Canada has facilitated information exchange in the categories listed in paragraphs 1 of article 17 are indicated below.

a) Scientific, technical, economic and legal information concerning mercury and mercury compounds, including toxicological, ecotoxicological and safety information

Canada has adopted a Directive on Open Government. The objective of the directive is to maximize the release of government information and data of business value to support transparency, accountability, citizen engagement, and socio-economic benefits through reuse, subject to applicable restrictions associated with privacy, confidentiality, and security. Under this directive, the Open Data Portal was established and provides public access to data collected and managed by the Federal Government. Examples of datasets that are available on the Open Data Portal and other information sharing platforms are listed below:

- National atmospheric mercury data, including data from the Canadian Air and Precipitation Monitoring Network (CAPMoN) is available through the Environment and Climate Change Canada Data Catalogue on the Open Data Portal. In addition, Canada provides funding for the Polar Data Catalogue, a database of metadata that describes research in the Arctic, including mercury research and monitoring by the Northern Contaminants Program (NCP). Canada also collaborates with other national networks collecting mercury data, where data and information are exchanged.
- Canada's Department of Environment (Environment and Climate Change Canada – ECCC) uses the eggs of colonial waterbirds as indicators of mercury pollution, given the bioaccumulation of mercury through the marine and freshwater food webs. Mercury levels measured in eggs as part of ECCC's colonial waterbird monitoring programs from the Atlantic region, Quebec, Ontario, the Prairies, Pacific and the Arctic are available on ECCC's Data Catalogue within the Open Data Portal. Reports on mercury in colonial waterbirds in the St. Lawrence can be found on the St. Lawrence River Action Plan website, and data can also be found on the Open Data Portal. Canada reports on mercury levels in colonial waterbird eggs from the Great Lakes through the State of the Great Lakes (SOGL) reports, which are publicly available and are generally released biannually. Mercury data in colonial waterbirds from Lake Melville from the Muskrat Falls hydroelectric reservoir project is also available.
- ECCC monitors freshwater quality and aquatic ecosystem health on federal lands, in transboundary watersheds, and in in-land waters of federal interest. While mercury in water is not routinely sampled across the national freshwater quality monitoring network, it is monitored within this network as part of ecosystem initiatives in the St. Lawrence River, the Great Lakes, and in British Columbia. In addition, surficial sediments are monitored for mercury in both the Great Lakes and

the St. Lawrence River. In the Great Lakes, mercury is also monitored in fish whole body homogenates. Results are shared with partners and stakeholders and available to the public via the Open Data Portal.

- The Oil Sands Monitoring (OSM) program tracks mercury levels in air, water, sediment, invertebrates, fish and wildlife, related to oil sands development. Data on the levels of mercury in the environment and in wildlife, and the effects of mercury can be found on ECCC's Data Catalogue, the Government of Canada's OSM Portal, and is also being launched on the Government of Alberta's OSM Portal. A list of publications and presentations from research and monitoring from the oil sands region is updated annually, with external links to the publications.
- The Northwest Territories Cumulative Impact Monitoring Program (NWT CIMP) publishes datasets, maps and research summaries, including those related to mercury levels in water, fish, and caribou, through a fully searchable and interactive interface in the NWT Discovery Portal. The interface allows for researchers to be directly contacted regarding the monitoring and research programs. Further details of ECCC's activities regarding mercury through CIMP can be found on the Government of the Northwest Territories Department of Environment and Natural Resources website, as well as on the publicly available on the Mackenzie DataStream web portal. Lastly, the results are regularly published in peer reviewed journals and public reports, including the Northern Environmental Research Bulletin.
- For over 25 years, Canada, through the Northern Contaminants Program (NCP) (led by Crown and Indigenous Relations and Northern Affairs Canada-CIRNAC) has contributed mercury-related data and information to the Arctic Council's Arctic Monitoring and Assessment Programme (AMAP). Canada's contribution includes information on levels of mercury in air, water, fish, (terrestrial and marine) wildlife and humans, and research on environmental processes as well as biological and human health effects, all of which are included in reports which AMAP publishes on its website. For example, two upcoming AMAP Assessment, updates to the 2011 assessment on mercury and 2015 human health reports, will be released in 2021 and will feature up-to-date information on mercury levels in the environment, wildlife, and human populations in the Arctic. Canada is leading some of the chapters in this AMAP report. Results from NCP monitoring, research, and communication projects are reported annually in the Synopsis of Research Report Series, and most NCP-related publications (including journal articles) are catalogued and linked in the NCP Publications Database hosted by the Arctic Institute of North America. Syntheses and summaries of past and current research findings are also available in the Canadian Arctic Contaminant Assessment Report Series. Metadata and data on NCP-funded mercury research are catalogued in the open-access Polar Data Catalogue. The NCP also hosts a biennial workshop to communicate results with participants, northerners and program partners, share technical and scientific information, share and build capacity, and effectively engage with participants and observers in the work of the NCP, including scientists and Northern rights-holders across Canada and internationally.
- The Government of Canada operates Networks of Centres of Excellence of Canada including the research program ArcticNet. ArcticNet has been ongoing since 2003 and brings together researchers and northern communities and indigenous organizations studying human health, natural and social sciences in the Arctic. Through this program, mercury continues to be a focus of many researchers and community members.
- The Canadian Health Measure Survey (Canada's national biomonitoring program) publishes scientific reports with concentrations of total mercury in whole blood from a nationally representative sample of Canadians aged 3–79. The data are presented by sampling years for the total population, as well as separated by sex and age groups. The data are accompanied by background information on mercury including common uses, potential sources of exposure, possible health effects, existing Canadian biomonitoring data and relevant acts and regulations in Canada. The Sixth Report on Human Biomonitoring of Environmental Chemicals in Canada with new data from cycle 6 (2018–2019) and updated background information on mercury will be published in December 2021. These reports are available to the public at canada.ca/biomonitoring and the data are also available to download on the Open Data Portal. Temporal trends in hair mercury levels and the health effects of mercury exposure during pregnancy and early life have been studied using the Maternal–Infant Research on Environmental Chemicals (MIREC) Research Platform.
- Health Canada published technical details for the update of the risk management approach for mercury in retail fish. This document provided the risk assessment for mercury exposure from fish

consumption and consumption advice on how to minimize exposure to mercury.

- The Government of Canada's Open Data Portal provides mercury data from specific programs, including surveillance of mercury in commercial foods, consumer products, animals, and the environment, human biomonitoring, and data on sources of environmental contamination. Surveillance data on mercury in foods is also exchanged between federal, provincial and territorial food safety authorities through the Canadian Food Safety Information Network.

In 2016, Canada published its first comprehensive, national synthesis and evaluation of scientific mercury research, the Canadian Mercury Science Assessment (CMSA). This Assessment summarizes national research and monitoring activities within the past 20 years, providing an in-depth look at biotic, abiotic and human biomonitoring data. The CMSA concluded that mercury remains a risk to Canadian ecosystems and the report identified areas in Canada that have the highest risk to mercury exposure. Numerical modelling predictions suggested that over 95% of the anthropogenic mercury deposited in Canada comes from sources outside of the country. Canada has also contributed to efforts to develop the Global Mercury Assessments (2013 and 2019).

Canada responds to calls for technical information from the Minamata Convention Secretariat, who makes the information available on the Minamata Convention website. For example, Canada has provided technical documents relevant to best available techniques and best environmental practices for the reduction of mercury emissions, contaminated sites, releases, mercury-added products and processes, mercury waste thresholds, and environmental monitoring and modelling. Canada also participates in the UNEP Global Mercury Partnership.

More informally, Canadian scientists present their mercury research at national and international conferences, including the International Conference on Mercury as a Global Pollutant, and publish their work in peer reviewed journals. For a list of recent publications please see the supplemental information provided for this article.

Lastly, Canada engages in bilateral work in order to exchange information and assist other countries. For example:

- In 2020, Rwanda was provided with the National Classification System for Contaminated Sites (NCSCS) developed by the Canadian Council of Ministers of the Environment (CCME) and the Federal Contaminated Sites Action Plan (FCSAP) Decision-Making Framework (DMF).
- In 2021, Slovakia was provided with the NCSCS and the DMF, as well as the FCSAP Ecological Risk Assessment Guidance.
- Also in 2021, Canada provided Brazil with information on existing Canadian studies and research related to mercury exposure to help inform and support their domestic working group activities on research for Minamata Convention implementation

More formally, Canada collaborates with the United States and the province of Ontario to monitor, assess, report, and manage the risks of mercury in the Great Lakes area. Mercury is both a Chemical of Mutual Concern under Annex 3, Chemicals of Mutual Concern of the Great Lakes Water Quality Agreement (GLWQA) and is a Chemical of Concern under Annex 2, Chemicals of Concern of the Canada-Ontario Agreement on Great Lakes Water Quality and Ecosystem Health (COA). Reports and other information have been published with respect to risk assessment and management of mercury under these two agreements. Reports under the GLWQA include the Binational Summary Report: Mercury and the Great Lakes Binational Strategy for Mercury Risk Management. Under the COA, the Water Quality in Ontario 2014 report. These reports also outline past research and monitoring that is specific to the Great Lakes Basin for both Canada and the United States.

Canada participates in international food safety liaison groups that share scientific and technical information on contaminants in food. Canada also actively participates annually in the Codex Committee on Contaminants in Food which develops international food safety standards and codes of practice for contaminants in foods, including mercury in fish. Health Canada subject experts have also contributed to scientific evaluations by the Joint WHO/FAO Expert Committee on Food Additives (JECFA) including reviews of the toxicological and safety information related to methyl mercury and inorganic mercury in the diet.

b) Information on the reduction or elimination of the production, use, trade, emissions and releases of mercury and mercury compounds

Canada engages in bilateral and trilateral work in order to exchange information and assist other

countries in relation to mercury management and trade. This occurs through joint projects as well as via general discussions between governments, including delegations visits to Canada. For example, Canada, Mexico and the United States work together under the Commission for Environmental Cooperation (CEC). In 2017 the CEC published a report on Enhancing the Alignment of North American Trade Statistics on Elemental Mercury and Mercury-added Products.

As part of its engagement under the Arctic Council Arctic Contaminants Action Program (ACAP), Environment and Climate Change Canada participates on the Expert Group on Persistent Organic Pollutants and Mercury. This Expert Group is currently producing a Fact Sheet on Mercury, which will be made publicly available on the Arctic Council website. The purpose of this fact sheet is to provide high-level information on how mercury is released, as well as its potential health impacts. This product targets northern residents, particularly Indigenous Peoples, who are exposed to elevated levels of contaminants in fish and wildlife species that are important to their tradition diets.

The Arctic Council Arctic Contaminants Action Program Persistent Organic Pollutants and Mercury Expert Group is currently approaching the implementation phase of its ARCRISK – Mercury Risk Evaluation, Risk Management, and Risk Reduction Measures in the Arctic project. This project aims to develop an action plan to target mercury releases from key sources across the circumpolar Arctic, focusing on exposure from rivers and remobilized mercury from thawing permafrost. This project aims to work in collaboration with local and national authorities, industrial enterprises and Indigenous peoples to develop a risk management guide that can be used to support local, national and state-level action.

The National Pollutant Release Inventory (NPRI) is Canada's legislated, publicly accessible inventory of pollutant releases (to air, water and land), disposals and transfers for recycling, and includes mercury. Some of the features of the NPRI include detailed facility-reported information on mercury emissions, releases, and transfers from industrial and non-industrial sources since 1993 and mapping functions. NPRI data is collected and published annually. Canada also shares information on mercury industrial emissions through the Air Pollutant Emission Inventory (APEI). Both of these inventories also have published detailed methodologies for how to calculate emissions and releases of mercury and other pollutants.

Canada's Products Containing Mercury Regulations, which came into force in 2015, require importers and manufacturers of products containing mercury to report on the quantity of mercury-containing products that they imported or manufactured in Canada every three years. The analysis of these triennial reports provides valuable information on the current trends in products containing mercury in Canada. The key results are published online, and are available for the years 2016 and 2019.

The Government of Canada aims to reduce the risks posed by toxic substances to Canadians and their environment through risk management actions under the Chemicals Management Plan, such as: regulations, release guidelines, pollution prevention planning notices, recalls and safety alerts or substances described on Health Canada's cosmetic ingredient hotlist. These actions result from risk management strategies implemented by the Government of Canada to help protect Canadians and their environment from the risks posed by certain toxic substances. Performance measurement evaluation is an important part of the overall chemicals management process under the Chemicals Management Plan. Following risk assessment and risk management implementation phases, performance measurement helps to ensure that Canadians can have confidence that their health and the environment are being protected from harmful substances. Providing results to Canadians on how well risk management strategies and tools have performed will enable stakeholders and the public to better understand how effectively their health and the environment are protected from toxic substances. Environment and Climate Change Canada and Health Canada undertook a performance measurement evaluation for mercury that was published in 2020. This report included information on mercury levels and trends in biota and humans, sources of emissions and releases, and the success of risk management instruments.

c) Information on technically and economically viable alternatives to: mercury-added products; manufacturing processes in which mercury or mercury compounds are used; and activities and processes that emit or release mercury or mercury compounds; including information on the health and environmental risks and economic and social costs and benefits of such alternatives
Canada's Products Containing Mercury Regulations, which came into force in 2015, require importers and manufacturers of products containing mercury to report on the quantity of mercury-

containing products that they imported or manufactured in Canada every three years. The analysis of these triennial reports provides valuable information on the trends in using mercury in products in Canada. The key results are published online, and are available for the years 2016 and 2019.

Canada also contributed to the Secretariat's call for information in support of the review of Annexes A&B by providing information on mercury products and their alternatives, including information on the risks and benefits and their technical and economic feasibility.

d) Epidemiological information concerning health impacts associated with exposure to mercury and mercury compounds, in close cooperation with the World Health Organization and other relevant organizations, as appropriate.

Mercury biomonitoring and dietary exposure data collected directly by the Government of Canada or through projects partially funded by the Canadian government have contributed to epidemiologic research to help characterize exposure and health effects of mercury in the general population of Canadians as well as vulnerable subgroups including pregnant women/children, and higher exposed groups such as northern populations.

For example, general population levels of blood mercury and factors associated with mercury exposure have been characterized using data from the Canadian Health Measures Survey (CHMS), a bi-annual cross-sectional study led by Statistics Canada, in partnership with Health Canada and the Public Health Agency of Canada. The Maternal-Infant Research on Environmental Chemicals (MIREC) Study, funded in part by Health Canada, is a prospective birth-cohort of pregnant women and their offspring recruited from 10 Canadian cities. Publications based on MIREC data have characterized prenatal exposure to mercury and investigated potential health effects on birth outcomes, and effects in children. Another prospective Canadian birth-cohort study, the Nunavik Child Development Study (NCDS), is partially funded by the Northern Contaminants Program (NCP) and has investigated mercury exposure and potential health effects in a higher-exposed northern Canadian population. Historic biomonitoring survey data of First Nation communities across Canada has been used in collaboration between academia and First Nations groups to investigate chronic effects of high mercury exposure. For a sample list of epidemiological publications using the above data sources, please see the supplemental information provided for this article.

Health Canada has also been involved in review of epidemiological evidence related to the health effects of mercury and has contributed to reviews of the epidemiology data related to the health effects of dietary methyl mercury through involvement in scientific evaluations of the Joint WHO/FAO Expert Committee on Food Additives (JECFA). In addition, Health Canada has recently evaluated the epidemiological evidence related to health effects of mercury exposure from dental amalgam.

Part E – Additional comments on the article in free text if the party chooses to do so

Recent journal publications from Canada relevant to scientific, technical, economic and legal information concerning mercury and mercury compounds, including toxicological, ecotoxicological and safety information

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Blukacz-Richards, E.A., Visha, A., Graham, M.L., McGoldrick, D.L., de Solla, S.R., Moore, D.J., Arhonditsis, G.B. 2017. Mercury levels in herring gulls and fish: 42 years of spatio-temporal trends in the Great Lakes. *Chemosphere*, 172, pp. 476–487.

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A sample of epidemiological journal publications concerning health impacts and exposure to mercury and mercury compounds based on data collected directly by the Government of Canada or through projects partially funded by the Canadian government.

CHMS:

Lye E, Legrand M, Clarke J, Probert A. 2013. Blood total mercury concentrations in the Canadian population: Canadian Health Measures Survey cycle 1, 2007–2009. *Canadian Journal of Public Health*, 104(3):e246–51.

MIREC:

Arbuckle TE, Liang CL, Morisset AS, Fisher M, Weiler H, Cirtiu CM, Legrand M, Davis K, Ettinger AS, Fraser WD. 2016. Maternal and fetal exposure to cadmium, lead, manganese and mercury: The MIREC study. *Chemosphere*, 163:270–282.

Ashley–Martin J, Dodds L, Arbuckle TE, Lanphear B, Muckle G, Bouchard MF, Fisher M, Asztalos E, Foster W, Kuhle S. 2019. Blood metal levels and early childhood anthropometric measures in a cohort of Canadian children. *Environmental Research*; 179(Pt A): 108736.

Louopou RC, Trottier H, Arbuckle TE, Fraser WD. 2020. Dental amalgams and risk of gestational hypertension in the MIREC study. *Pregnancy Hypertension*; 21: 84–89.

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Thomas S, Arbuckle TE, Fisher M, Fraser WD, Ettinger A, King W. 2015. Metals exposure and risk of small–for–gestational age birth in a Canadian birth cohort: The MIREC study. *Environmental Research*; 140: 430–439.

Nunavik Child Development Study:

Boucher O, Muckle G, Ayotte P, Dewailly E, Jacobson SW, Jacobson JL. 2016. Altered fine motor function at school age in Inuit children exposed to PCBs, methylmercury, and lead. *Environment International*; 95: 144–151.

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Biomonitoring held by Indigenous Services Canada:

Philibert A, Fillion M, Mergler D. 2020. Mercury exposure and premature mortality in the Grassy Narrows First Nation community: a retrospective longitudinal study. *The Lancet Planetary Health*; 4(4): e141–e148.

▼ ART. 18: PUBLIC INFORMATION, AWARENESS AND EDUCATION

18.1. Have measures been taken to promote and facilitate the provision to the public of the kinds of information listed in article 18, paragraph 1?

☒ Yes

☐ No

If yes, please indicate the measures that have been taken and the effectiveness of those measures

Canada provides its citizens with public information, awareness and education related to mercury and mercury compounds in numerous ways, most of which are accessible on-line. This information has been and will continue to be disseminated through webpages, reports, posters, fish consumption guidelines and/or advisories, public consultations, and journal publications. Examples of the measures that have been taken to communicate each kind of information listed in article 18 paragraph 1 are provided below:

(i) The health and environmental effects of mercury and mercury compounds;

Information on efforts to communicate on health aspects have been noted under reporting for Article 16. These include publication of information on the health risks and exposure pathways for mercury, effects of mercury on human health, consumption advice for certain retail fish, occupational health and safety information, and information on safe handling procedures for the disposal of mercury-added products such as compact fluorescent lamps. Health Canada also provides guidance to provincial and territorial agencies, water treatment facility operators, and the Canadian public on the occurrence, treatment technology, health considerations, and maximum acceptable concentrations of mercury in drinking water.

In addition to the publicly available information noted under reporting for Article 17, information on mercury in the environment is communicated on Environment and Climate Change Canada's (ECCC) web pages. These pages provide plain-language information to the public on federal actions on mercury, mercury cycling in the environment, sources of mercury in the environment, and mercury containing products and their disposal.

Information on the results of mercury monitoring activities were included as part of the 2020 Evaluation of the Effectiveness of Risk Management Measures for Mercury report. The report built on the results of the 2015 Canadian Mercury Science Assessment to provide updated information on the results of monitoring in humans and key environmental media.

(ii) Alternatives to mercury and mercury compounds

Canada has published information on mercury containing products, their alternatives, and how to safely dispose of spent products. This include a factsheet for importers and manufacturers of products containing mercury, a guide "What you need to know", a User Guide on the reporting mechanism, and webpages on products containing mercury. Various activities such as sending letters to stakeholders and delivering presentations at forums were carried out since 2015 to raise awareness about the prohibition of importing and manufacturing products containing mercury in Canada.

(iii) The topics identified in paragraph 1 of Article 17;

In addition to the information that is publicly available and mentioned in the response to question 17.1 and supplemental information provided for that question, Canada has taken the following additional measures to communicate with the public:

- ECCC has collected emissions and release data on over 300 pollutants since 1993 under the National Pollutant Release Inventory. The inventory is publicly available on the website Explore data – Canada.ca. The public can use a data search tool to look up pollutant releases in their neighbourhood by using their postal codes, or more globally via Google Earth.

Using NPRI data, ECCC has also developed Factsheets and Sector Overviews on specific topics to highlight how the NPRI data can be used to show improvements or trends in the Canadian environment. The mercury substance overview explores releases, disposals and transfers of mercury that are reported to the NPRI by industries in Canada. It also summarizes what facilities do to mitigate their environmental impacts.

The National Pollutant Release Inventory Indigenous Series: Cree Nation of Eeyou Istchee serves as an informational overview, within the scope of the NPRI and the substances it tracks. This specific overview examines facilities located near Cree communities in Québec and the pollutants they report to the NPRI. It also examines sectors of interest to Cree communities and the actions taken by facilities to mitigate environmental impacts. It was developed with input from representatives at the Cree Nation Government (CNG), the Cree Board of Health and Social Services of James Bay, and the James Bay Advisory Committee on the Environment (JBACE).

- The Canadian Environmental Sustainability Indicators (CESI) program provides data and information to track Canada's performance on key environmental sustainability issues including climate change and air quality, water quality and availability, and protecting nature. The environmental indicators are based on objective and comprehensive information and convey environmental trends in a straightforward and transparent manner.

The indicators are prepared by Environment and Climate Change Canada with the support of other federal government departments, such as Health Canada, Statistics Canada, Natural Resources Canada, Agriculture and Agri-Food Canada, as well as provincial and territorial government departments. Designed to be relevant to the Government's policy, the indicators are built on rigorous methodology and high quality, regularly available data from surveys and monitoring networks.

The CESI website ensures that national, regional, local and international trends are readily accessible and transparently presented to all Canadians through the use of graphics, explanatory text, interactive maps and downloadable data. Indicator results are linked to their key social and economic drivers and information is provided on how the issues are influenced by consumers, businesses and governments. Each indicator is accompanied by a technical explanation of its calculation.

CESI is the prime instrument to measure progress of the Federal Sustainable Development Strategy and responds to Environment and Climate Change Canada's commitments under the Canadian Environmental Protection Act and the Department of the Environment Act to report to Canadians on the state of the environment.

For mercury specifically, the CESI program prepares annual reports on releases of harmful substances to air and to water.

(iv) the results of its research, development and monitoring activities under Article 19; In addition to the publications mentioned in the supplemental for article 17, the results of research, development, and monitoring activities under article 19 is also communicated publicly via the following:

- The key results from the analysis of the triennial reports under Canada's Products Containing Mercury Regulations were published online in a format accessible to the public. They provide valuable information on the trends in using mercury in products in Canada. They are available for the years 2016 and 2019.
- Mercury is both a Chemical of Mutual Concern under Annex 3, Chemicals of Mutual Concern of the Great Lakes Water Quality Agreement (GLWQA) and is a Chemical of Concern under Annex 2, Chemicals of Concern of the Canada-Ontario Agreement on Great Lakes Water Quality and Ecosystem Health (COA). Reports and other information have been published with respect to risk assessment and management of mercury under these two agreements. Reports under the GLWQA include the Binational Summary Report: Mercury and the Great Lakes Binational Strategy for Mercury Risk Management. ECCC contributes to reporting of mercury in fish, wildlife and abiotic indicators in technical reports through the State of the Great Lakes reports. Public reports including mercury data are produced on a biannual basis, and report both on spatial and temporal trends in mercury in the Great Lakes in both Canada and the United States of America in joint publications. Under the COA, there is the Water Quality in Ontario 2014 report. These reports also outline past and research and monitoring that is specific to the Great Lakes Basin for both Canada and the United States. ECCC also provides information to the public on the levels of mercury in wildlife in the Great Lakes Region through public meetings with stakeholders.
- The Oil Sands Monitoring (OSM) program tracks mercury levels in wildlife and abiotic matrices to assess the cumulative effects of contaminants, including mercury, related to oil sands development to wildlife. Summary reports of the ongoing activities and results were provided to collaborating Indigenous communities and other stakeholders. Information provided includes levels of mercury in the environment and body burdens in wildlife, and an assessment of the effects of mercury on wildlife. Data from the monitoring activities have been used to inform consumption advisories of gull and tern eggs in northern Alberta. Further, a data source geared towards Indigenous land-users, trappers and hunters, on the effects of pollutants including mercury can be found on the Kotowan Portal, released Sept 15th, 2021.

- Northwest Territories Cumulative Impact Monitoring Program (NWT CIMP) reports the results of research and monitoring of mercury in the NWT and supports work that evaluates how mercury in the environment is affected by changes in land use, natural environmental processes, and anthropogenic activities. Researchers present the results of mercury monitoring to communities in the NWT near where the research or monitoring is occurring, as is required by the NWT CIMP and communities are often involved as partners in research activities.
- In Northern Canada, risk communication messaging and public health information related to mercury in the environment, particularly as it relates to human health, is disseminated by territorial and regional health authorities in conjunction with Health Canada, Environment and Climate Change Canada and Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC). Under CIRNAC, the Northern Contaminants Program (NCP) supports monitoring and research activities related to mercury and other contaminants in the Canadian Arctic and releases annual "Synopsis of Research" reports which provide both technical and plain language information and summaries of ongoing mercury research in Canada's Arctic. NCP provides an annual synopsis of research reports on mercury research in Canada's Arctic to communities in the north. Plain language summaries of the work are produced. Communities are engaged in the development and consulted on the progress of the research programs. Recipients of NCP project funding are also required to deliver results and information to the relevant northern communities and regions in technical and plain language formats.
- As noted in Canada's response for Article 17, finalization of the 2021 AMAP Mercury Assessment report and Human Health in the Arctic reports are underway. Canada is contributing heavily to these AMAP reports, which will provide an up to date compilation of mercury in the environment and in humans the Arctic. As with all AMAP reports, AMAP will be releasing summaries for policy-makers and disseminate them widely to stakeholders of all types throughout circumpolar Arctic.
- Canada has also contributed to efforts to develop the Global Mercury Assessments (2013 and 2019). The Global Mercury Assessment includes a summary for policy makers which provides high-level information on the results of the assessment and is intended for a non-technical audience.
- In 2017, Canada, the United States, and Mexico, through the Commission for Environmental Cooperation, published a report on Enhancing the Alignment of North American Trade Statistics on Elemental Mercury and Mercury-added Products. The report presented an assessment of the available information on trade in mercury, mercury compounds, and certain mercury-added products among Canada, Mexico and the United States, and on primary and by-product mercury production in North America.

(v) activities to meet its obligations under this Convention;

Environment and Climate Change Canada leads the domestic implementation of the Convention. ECCC provided information on the activities taken to meet its obligations in its Article 30.4 notice, which is publicly available on the Convention website. Prior to and following each COP meeting, ECCC hosts consults with and updates stakeholder groups on technical matters for consideration by the COP.

Additionally, the Government of Canada maintains a publicly available compendium of information for the international agreements to which it is a party. Information on the Minamata Convention includes a plain language summary, overview of the convention, expected results, efforts to implement the convention, and progress to date.

(vi) Education, training and public awareness related to the effects of exposure to mercury and mercury compounds on human health and the environment in collaboration with relevant intergovernmental and non-governmental organizations and vulnerable populations, as appropriate Environment and Climate Change Canada scientists provide lectures on mercury research in Canada to students in northern colleges including the Arctic College in Iqaluit, Inuvik and Pond Inlet and the Yukon University. In working with the Northern Contaminants Program, researchers have been welcomed by high school schools in many communities in and around the Canadian north to discuss the transport, transformation and deposition of mercury in the Arctic.

The Northern Contaminants Program (NCP) supports capacity building in Northern Canada through its "Communications, Capacity and Outreach" subprogram. This includes workshops that provide

both information and hands-on training to Northerners in practical field and laboratory skills in association with northern post-secondary institutions. The NCP has also supported training, capacity building and technology transfer through funding for the purchase of modern equipment for communities in the North (e.g., a direct mercury analyser for Yukon University), and through funding for regional contaminants committees and Inuit Research Advisor positions, which provide social-cultural and technical assistance for research and monitoring activities. A biennial NCP Results Workshop which brings together project leaders, participants and rights-holders from across Canada serves an important role in knowledge transfer and public awareness.

The NCP Results Workshop is held biennially and is a venue for Canadian scientists, Northerners and policy-makers to meet and focus attention on the breadth of issues related to contaminants from long-range sources in Canada's North, to learn about and discuss the latest results, current state of knowledge and policy implications, and to plan for future contaminants-related initiatives. Mercury monitoring and research, including on the effects of exposure to mercury and mercury compounds on human health and the environment are an important part of the workshop due to international, national and local interest in levels of mercury in the environment, wildlife and people. Human biomonitoring projects funded through the Human Health subprogram of the NCP also regularly hold public engagement events and consultations before, during and after projects are completed with results communicated in conjunction with appropriate public health authorities.

For NCP-supported work on mercury and other contaminants in polar bears, researchers give presentations in Nunavut and elsewhere, e.g. at Arctic College in Iqaluit and at high schools and hunters and trappers associations for partner communities in Arviat, Whale Cove, Rankin Inlet, Sanikiluaq, Pond Inlet and Clyde River.

Part E – Additional comments on the article in free text if the party chooses to do so

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▼ ART. 19: RESEARCH, DEVELOPMENT AND MONITORING

19.1. Has the party undertaken any research, development and monitoring in accordance with paragraph 1 of article 19?

☒ Yes

☐ No

If yes, please describe these actions

Canada has many research and monitoring programs that contribute to its implementation of Article 19. These are organized below according to subparagraphs (a) through (g) of paragraph 1 of Article 19. Additional research has been published in scientific journals with citations available in the supplemental annex provided for reporting questions under Article 17. Canada's response to the reporting questions for Article 18 also contain relevant information on research, development, and monitoring activities as well as information on how the results of these endeavours were made available to the public.

(a) Inventories of use, consumption, and anthropogenic emissions to air and releases to water and land of mercury and mercury compounds

Canada maintains a comprehensive inventory of mercury emissions, including from all industrial sources. Under the authority of the Canadian Environmental Protection Act, 1999 owners or operators of relevant facilities that meet specified reporting requirements must report mercury emissions to the National Pollutant Release Inventory (NPRI) on an annual basis. Additionally, Canada's Air Pollutant Emissions Inventory (APEI) is compiled from many different data sources. Emission data reported by individual facilities through NPRI and, to a lesser extent, data provided directly by the provinces are supplemented with well-documented, science-based estimation tools and methodologies to quantify total emissions. Together, these data sources provide a

comprehensive coverage of air pollutant emissions across Canada.

APEI is available online at: <https://www.canada.ca/en/environment-climate-change/services/pollutants/air-emissions-inventory-overview.html>

NPRI is available at: <https://www.canada.ca/en/services/environment/pollution-waste-management/national-pollutant-release-inventory.html>

(b) Modelling and geographically representative monitoring of levels of mercury and mercury compounds in vulnerable populations and in environmental media, including biotic media such as fish, marine mammals, sea turtles and birds, as well as collaboration in the collection and exchange of relevant and appropriate samples;

Freshwater Quality Monitoring and Surveillance (FWQMS) program

ECCC monitors freshwater quality and aquatic ecosystem health on federal lands, in transboundary watersheds, and in in-land waters of federal interest. While mercury in water is not routinely sampled across the national freshwater quality monitoring network, it is monitored within this network as part of ecosystem initiatives in the St. Lawrence River, the Great Lakes, and in British Columbia. In addition, surficial sediments are monitored for mercury in both the Great Lakes and the St. Lawrence River. In the Great Lakes, mercury is also monitored in fish whole body homogenates. Results are shared with partners and stakeholders and are available to the public on the Open Data Portal.

Atmospheric Mercury Measurement program

Mercury is monitored in air and/or precipitation at seven active monitoring sites across Canada. Combining several programs, the Environment and Climate Change Canada Atmospheric Mercury Measurement (ECCC-AMM) Network provides long term mercury monitoring data. This network works with other international networks such as the National Atmospheric Deposition Network (NADP) and the Asia Pacific Mercury Monitoring Network (APMMN) to provide data, standard operating procedures and work together to ensure comparable data. In addition to total gaseous mercury (TGM), the ECCC-AMM program measures mercury speciation at three monitoring locations and wet mercury deposition at five locations. Mercury monitoring also takes place at a number of locations in the Arctic through a network of passive samplers in coordination with the Northern Contaminants Program. Through this program, a peer reviewed quality assurance/quality control program for atmospheric mercury was developed and implemented and can be used as a path forward for ensuring data consistency between sites/countries and programs.

Atmospheric Mercury Modelling

A global process-based atmospheric mercury model (Global Environmental Multiscale – Modelling Air quality and Chemistry–Mercury, GEM-MACH–Mercury) representing primary and legacy mercury emissions of anthropogenic and geogenic origin, meteorological processes, chemistry, and deposition processes was developed. The ECCC mercury model is applied to develop: mercury transport and deposition pathways; spatial distributions and mass budgets of mercury concentrations in air and deposition over land and oceans; source apportionment (linking mercury deposition to regional and extra-regional emission sources); and impacts of emission reduction scenarios. ECCC mercury model results were provided to inform international mercury assessments (such as undertaken by Arctic Monitoring and Assessment Program (AMAP) and UNEP Global Mercury Partnership); the ECCC mercury model results were combined with results from other international mercury models to develop robust ensemble mean modelling products, reported in the international mercury assessments. The ECCC mercury model was applied to develop source apportionment of mercury deposition in Canada to inform domestic mercury assessments undertaken by Northern Contaminants Program (NCP) and Canadian Mercury Science Program, and the Evaluation of the Effectiveness of Risk Management Measures for Mercury report (2020). Impacts of Athabasca oil sands and wildfire mercury emissions on mercury levels in Canada were demonstrated using the model. In addition, the ECCC atmospheric model was coupled to terrestrial, aquatic and bioaccumulation models, and impacts of mercury emission reductions on future fish mercury concentrations in five ecosystems across Canada were demonstrated.

Whales Initiative Science and Contaminants Monitoring

The Whales Initiative is conducting scientific research and monitoring of contaminants of concern, including mercury, in different media (i.e. air, freshwater, sediment, landfill leachate, wastewater influent, effluent, and biosolids, and biota) that are affecting Southern Resident Killer Whales and St. Lawrence Estuary Belugas as well as their prey. The five-year program, which started in 2018, aims

to support the recovery and survival of the two iconic endangered species from numerous anthropogenic threats, including exposure to contaminants.

Oil Sands Monitoring (OSM) Program

The Oil Sands Monitoring (OSM) Program funds and undertakes ambient environmental monitoring to improve the characterization of the condition of the environment, and enhance the understanding of cumulative effects related to oil sands development. The Program is collectively managed by the Governments of Canada and Alberta, together with representatives from Indigenous communities and industry.

Under a multi-stakeholder Oversight Committee of the OSM Program, which represents Indigenous communities, industry and government, an annual work planning process and monitoring plan is coordinated and approved. The monitoring plan is comprised of a series of work plans focused towards understanding environmental impacts of oil sands development across key thematic areas. Under such work plans, the monitoring of key variables such as mercury and other metals in key environmental media is considered and included. With respect to mercury, one goal of the program is to determine whether or not levels of mercury in the environment in northern Alberta as a result of oil sands industrial operations are rising to levels that are likely to cause adverse human and/or environmental health effects.

ECCC is monitoring mercury levels annually or near annually (since as early as 2009 to present) in gull and tern eggs, amphibians, semi-aquatic mammals, along with air, snow, water and sediment. Further, activities in OSM are tracking both mercury sources and environmental fate, and how development of the Oil Sands changes the release and distribution of mercury. Data on the levels of mercury in the environment and in wildlife, and the effects of mercury can be found on ECCC's Data Catalogue, the Government of Canada's OSM Portal and the Government of Alberta's OSM Portal.

Freshwater and Marine Colonial Waterbird Contaminant Monitoring Programs

The Great Lakes Herring Gull Contaminant Monitoring Program, as well as related programs in the Atlantic, St. Lawrence, and Pacific has provided long term data concerning levels of environmental contaminants in colonial waterbird eggs, including mercury. These waterbird monitoring programs have been used to track mercury annually in the Great Lakes, St. Lawrence, and east and west coasts since the mid 1970s. Further, information on the diet and trophic level of colonial waterbirds is also used to assess how changes in the food web affect the dynamics of mercury in fish-eating birds. The Great Lakes Herring Gull Contaminant Monitoring Program has also been used to assess Great Lakes Areas of Concerns, where mercury levels may be elevated due to human activities. Information on these programs can be found on the Open Data Portal.

(c) Assessments of the impact of mercury and mercury compounds on human health and the environment, in addition to social, economic and cultural impacts, particularly in respect of vulnerable populations

The Northern Contaminants Program

The Northern Contaminants Program (NCP) led by Crown-Indigenous Relations and Northern Affairs Canada engages Northerners and scientists in the research and monitoring of long-range contaminants such as persistent organic pollutants (POPs) – linked to the Stockholm Convention on POPs – and mercury in Northern Canada. In addition to human biomonitoring of mercury in blood and hair, the core monitoring program of the NCP includes long-term temporal trend assessments of contaminants in the air and water as well as key/sentinel fish and terrestrial and marine wildlife species that are harvested as traditional food sources by Northern Indigenous Peoples. For example, contaminants in the tissues of polar bears, ringed seals, beluga, caribou, seabird eggs, lake fish (Arctic char, trout, burbot) and sea-run Arctic char are routinely monitored. Monitoring under the NCP is also a key source of information that is provided to the Arctic Monitoring and Assessment Program (AMAP), a working group of the Arctic Council.

The NCP also coordinates an AMAP-wide inter-laboratory Quality Assurance/Quality Control (QA/QC) program for mercury, methylmercury and other contaminants to ensure accuracy and consistency across Arctic monitoring programs. Through AMAP, Canada collaborates regularly with other Arctic Council member states in regards to ongoing monitoring of mercury in various media.

NWT Cumulative Impact Monitoring Program

The Northwest Territories Cumulative Impact Monitoring Program (NWT CIMP) is a source of environmental monitoring and research in the Northwest Territories. Although a Territorial program,

NWT CIMP funds support research and monitoring of mercury by ECCC scientists who evaluate the effects of landscape-level environmental change, such as forest fires and mining, on wetland and terrestrial ecosystems. Monitoring projects include the tracking of mercury in water, sediment and invertebrates, and projects to assess the role of aerial deposition on the long distance transport and environmental fate of mercury. Data will be used to track the effectiveness of remedial measures and regulatory decisions.

Chemicals Management Plan Monitoring and Surveillance Program

This national program builds off the environmental monitoring programs previously mentioned to support monitoring of chemicals, including mercury, in various environmental media (air, water, sediment, fish and wildlife). The program assesses both spatial and temporal trends in mercury levels in biotic and abiotic matrices, as well as determines if the mitigation of mercury releases by ongoing management and regulations are sufficient for reducing mercury contamination or emissions in Canada. Further, this program will help determine the importance of specific anthropogenic activities as sources of mercury to the environment.

Research-related Activities to Improve Health Canada's Risk Assessment of Methylmercury in Country Foods in Impact Assessment

Health Canada's Environmental Impact Assessment (EIA) Division is undertaking, through the Impact Assessment Research Fund and in collaboration with external researchers, two research projects to examine and challenge some of the standard assumptions that Health Canada applies in its assessment of the health risks associated with exposure to mercury and methylmercury through the consumption of country (i.e., traditional) foods, particularly among Indigenous populations in Canada. The overall goal is to improve Health Canada's approach when evaluating such risks in order to provide more realistic advice regarding this issue as an expert department under the Canadian Environmental Assessment Act, 2012 and the Impact Assessment Act. The projects include: (1) the creation of a master database of Mercury and methylmercury levels in country foods items contributing most to Mercury exposure among Indigenous communities; and (2) a study of the effects of country food preparation on concentrations and bioaccessibility of mercury and associated metals used in vitro digestion experiments. The EIA Division also created the Methylmercury Impact Assessment Resource Group to help guide the EIA Division in advancing the department's expertise in the risk assessment of methylmercury in country (i.e., traditional) foods based on the most recent scientific findings. Resource Group membership includes Canadian academics who are subject-matter experts, Indigenous organization representatives, and Health Canada employees.

Monitoring of Food

The Canadian Food Inspection Agency (CFIA) conducts ongoing testing of domestic and imported commercial fish to enforce the maximum levels for mercury in fish established by Health Canada. Health Canada and the CFIA also monitor the levels of mercury in fish and a wide variety of other foods sold in Canada through targeted surveys as well as the CFIA's Children's Food Project and the National Chemical Residue Monitoring Program. Reports are available on the CFIA web page <https://inspection.canada.ca/food-safety-for-industry/food-chemistry-and-microbiology/food-safety-testing-bulletin-and-reports/eng/1453324778043/1453327843364>

Canadian Health Measures Survey

Biomarkers of mercury exposure in the general Canadian population aged 3–79 is measured on an ongoing basis as part of the nationally-representative Canadian Health Measures Survey. This survey began in 2007 and is led by Statistics Canada in partnership with Health Canada and the Public Health Agency of Canada. The survey includes assessment of blood, urine, and hair collected from survey participants for a wide variety of environmental chemicals. Total mercury in whole blood has been measured in each CHMS cycle since 2007 and select CHMS cycles have additionally measured inorganic mercury in blood and urine, methyl mercury in blood, and total mercury in hair. Summary statistics of mercury biomarkers for the whole population, and by age and sex subgroups are published for each CHMS cycle as the data are released and can be found here.

Canadian House Dust Study

The Canadian House Dust Study provides an indication of typical Canadian exposures to mercury in the indoor residential environment. Sampling for the Canadian House Dust Study was conducted between 2007 and 2010 and included vacuum sampling and wipe sampling. The results are published in the Journal of Environmental Science and Technology.

Maternal–Infant Research on Environmental Chemicals (MIREC)

Mercury was measured in maternal blood, cord blood, meconium, hair, breastmilk and child blood (22 months – 5 years), as part of the MIREC cohort study. These data were collected between 2007 and 2013 from approximately 2000 participants. Mercury was also measured in blood samples collected between 2017 and 2021 from over 200 MIREC children aged 7–11 years. Researchers continue to use these data to investigate health effects associated with early life mercury exposures. More information about MIREC is available here: <https://www.mirec-canada.ca/en/>

(d) Harmonized methodologies for the activities undertaken under subparagraphs (a), (b) and (c); Research and Development of Mercury Passive Sampler

In collaboration with Environment and Climate Change Canada, the University of Toronto Scarborough developed a passive air sampler for gaseous mercury. This sampling device has been fully characterized and is now in commercial production by Tekran Instrument Corporation and is sold under the MerPAS® name. The Government of Canada has committed to funding a 2-year pilot study to investigate applying this passive air sampler globally. The intent of this study is to assess the feasibility of a globally implemented monitoring program using the MerPAS to establish a baseline concentration in remote locations. This will serve in conjunction with currently deployed active and passive mercury sampling investigations by other research/monitoring groups. Journal articles comparing the various passive samplers, including the MerPAS® are listed in the supplemental information provided in Canada's response to reporting questions under Article 17.

With the COVID-19 global pandemic, the program was extended because it was not possible to deploy or receive samplers for most of 2020. As of January 2021, data collection has restarted at 47 sites around the world. In 2021, the goal is to increase the number of sites in areas where there are little data including South America, Africa, parts of Asia, Russia and the South Pacific.

(e) Information on the environmental cycle, transport (including long-range transport and deposition), transformation and fate of mercury and mercury compounds in a range of ecosystems, taking appropriate account of the distinction between anthropogenic and natural emissions and releases of mercury and of remobilization of mercury from historic deposition;

Aquatic Contaminants Research

This program evaluates the long-range transport and deposition through time of mercury in the environment across Canada. Seasonal and annual biomonitoring of moss and lichens, air, precipitation, water (e.g., lake, stream, groundwater) and sediment provide spatial resolution of mercury atmospheric deposition as well as mercury speciation measurements. Current and historical mercury and multielement deposition at both near field and remote sites across Canada are also assessed using dated lake sediment cores. Relationships to permafrost melting related to climate change are being investigated. The work includes collaboration with atmospheric deposition and climate modellers.

(f) Information on commerce and trade in mercury and mercury compounds and mercury added products

The Canada Border Services Agency (CBSA) provides clearance, control and examination services, on behalf of other government departments and agencies, for travellers, importers and exporters at close to 1,200 points of entry. Information on commerce and trade in mercury, mercury compounds, and mercury-added products is provided from the CBSA to Statistics Canada who is mandated to produce and manage statistics on the Canadian population, resources, economy, society and culture, including trade statistics. Statistics Canada organizes this information and has developed the Canadian International Merchandise Trade (CIMT) online database. This database offers detailed trade data using the Harmonized System (HS) classification of goods, based on the 6-digit commodity level (e.g., country, province, state, year, month, or frequency). The database is updated monthly and trade in mercury and mercury compounds and mercury-added products is monitored regularly.

(g) Information and research on the technical and economic availability of mercury-free products and processes and on best available techniques and best environmental practices to reduce and monitor emissions and releases of mercury and mercury compounds

Monitoring through the Products Containing Mercury Regulations

Canada's Products Containing Mercury Regulations, which came into force in 2015, require importers and manufacturers of products containing mercury to report on the quantity of mercury-containing products that they import or manufacture in Canada every three years. These reports enable to monitor the reduction of total mercury in products in Canada, and to identify trends and

gaps where awareness activities are needed or where potential reduction in mercury in products could be achieved.

Part E – Additional comments on the article in free text if the party chooses to do so

{Empty}

▼ COMMENTS

Part C: Comments regarding possible challenges in meeting the objectives of the Convention (Art. 21, para. 1)

{Empty}

▼ SUPPLEMENTAL – ADDITIONAL COMMENTS

Supplemental: Part D: Comments regarding the reporting format and possible improvements, if any

National reporting is an important part of the Convention as it provides information critical for the determination of any systemic issues that should be addressed and the information provided by parties as part of their national reports is proposed for use in informing indicators for the effectiveness evaluation. For this reason it is essential that the reporting form be as clear as possible as well as establishing clear links between the questions and treaty obligations. In this spirit, Canada offers the following comments and suggestions for improvement:

- Reporting period:
 - o We found it difficult to prepare the report to include information for the same year in which the report is due. It would be more appropriate to ask for information from the previous year.
 - o It also seems duplicative to provide the same information for the years which were covered by the short report for the applicable questions. For these questions, parties could simply provide information for the two years not covered by the previous report unless there are corrections or updates to make to the information submitted in the previous report.
 - o For questions requesting the effectiveness of the measures implemented, we found that in some cases, for example for questions related to Article 8, it was challenging to communicate the effectiveness of the measures over the reporting period because the measures were implemented long before the convention entered into force. This resulted in the majority of effects of the measures being outside of the reporting period.
- Timing for report submission: it was challenging to prepare the long national report in the same period as preparations for the COP meeting. Many groups needed to be consulted both within the federal government and externally with provincial and territorial governments before the information can be compiled, approved and submitted.
- Formatting of the online reporting portal: it is unfortunate that it is not possible to insert hyperlinks into the textboxes. We prepared our report to include many links to online resources but these are not able to be included in the text copied into the online form. Additional abilities to format with bold, underline, or italics could also help to make the text a bit easier to read.
- Article 3
 - o Question 3.5: The significance of a “no” response is not clear, as a “no” could mean that the party did not export mercury or that the party did export mercury but did not receive a general notification of consent. Suggest splitting this into two parts: 1) did the party export mercury during the reporting period? and 2) was a notification of consent received for all exports or did the party

rely on a general notification of consent?

- Article 4

- o Question 4.1: It seems that there should be an option for parties to indicate that they have taken measures to implement the obligations in Article 4 while also having registered for an exemption for certain products. We would suggest removing the “If no:” in the third paragraph to effectively split the question into two parts, the first being: “has the party taken any appropriate measures to not allow the manufacture, import, or export of mercury added products listed in part I of Annex A to the Convention after the phase out date specified for those products? If yes, provide information on those measures; if no, provide an explanation why no measures have been taken. The second part of the question would then be: has the party registered for an exemption pursuant to Article 6? If yes, for which products?”

- Article 11

- o Question 11.2: Most facilities that perform final disposal operations for mercury waste do not track whether the waste falls into the consisting, containing, or contaminated with categories established under the Convention. Significant efforts to distinguish the categories of mercury wastes were required. Additionally, this question does not appear to have strong links to the treaty obligations in Article 11 or the overall treaty objectives. A better question should be developed that would link more strongly to paragraph 5 of Article 11.

- Article 13

- o Question 13.1: We attempted to quantify the financial resources provided for domestic implementation, but found this exercise to be very complicated given the interdisciplinary nature of Canada’s policies and programs implemented by provincial, territorial, and federal governments.
- o Question 13.3: This question seems to overlap with questions 14.1 and 14.2 in situations where financial resources were provided alongside technical assistance and technology transfer to help build capacity.

- Articles 17 and 18

- o It was challenging to divide information between questions 17.1 and 18.1. We interpreted that question 17.1 was intended to cover information exchange for more technical audiences such as other parties or academia whereas question 18.1 was intended to refer to information shared with the public. However, the majority of the information provided under question 17.1 is also publicly available and paragraph 1(a)(iii) of article 18 refers to the topics identified in paragraph 1 of article 17. To avoid duplicative responses for these two questions we recommend that the reporting guidance be strengthened to clarify the information requested for each article.