

BIOMONITORING CONTENT SUMMARY FOR THE CANADIAN HEALTH MEASURES SURVEY

Cycles 1–6 (2007–2019)

December 2021



Health
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Cycles 1 à 6 (2007 à 2019)*

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BIOMONITORING CONTENT SUMMARY FOR THE CANADIAN HEALTH MEASURES SURVEY: CYCLES 1–6 (2007–2019)

These chemicals have been measured or are planned for measurement in blood, urine and/or pooled serum samples collected from 2007 to 2019 as part of the Canadian Health Measures Survey (CHMS). The chemicals were selected based on known or suspected health effects resulting from exposure, level of public concern, evidence of exposure in the Canadian population, and technical feasibility and cost of

measurement. In addition, factors such as emerging Health Canada priorities are considered while selecting chemicals for inclusion in the CHMS. Summary data for these chemicals have been published in Health Canada's reports on human biomonitoring of environmental chemicals in Canada and scientific articles. The primary source of summary data for each chemical, when available, is provided in the table below.

Summary of environmental chemicals measured in the Canadian Health Measures Survey from 2007 to 2019 including data sources.

Chemical	Cycle 1 2007–2009	Cycle 2 2009–2011	Cycle 3 2012–2013	Cycle 4 2014–2015	Cycle 5 2016–2017	Cycle 6 2018–2019
Metals and trace elements						
Lead	HC, 2010	HC, 2013	HC, 2015	HC, 2017	HC, 2019	HC, 2021
Antimony	HC, 2010	HC, 2013	—	—	—	—
Boron	—	—	—	—	HC, 2019	HC, 2021
Cadmium	HC, 2010	HC, 2013	HC, 2015	HC, 2017	HC, 2019	HC, 2021
Cesium	—	HC, 2013	—	—	—	—
Chromium (VI) ^a	—	—	—	—	HC, 2019	HC, 2021
Cobalt	—	HC, 2013	—	—	—	—
Copper	HC, 2010	HC, 2013	—	—	—	—
Fluoride	—	HC, 2013	HC, 2015	HC, 2017	—	—
Manganese	HC, 2010	HC, 2013	—	—	—	—
Molybdenum	HC, 2010	HC, 2013	—	—	—	—
Nickel	HC, 2010	HC, 2013	—	—	—	—
Selenium	HC, 2010	HC, 2013	—	—	HC, 2019	HC, 2021
Silver	—	HC, 2013	—	—	—	—
Thallium	—	HC, 2013	—	—	—	—
Tungsten	—	HC, 2013	—	—	—	—
Uranium	HC, 2010	HC, 2013	—	—	—	—
Vanadium	HC, 2010	HC, 2013	—	—	—	—
Zinc	HC, 2010	HC, 2013	—	—	—	—

Chemical	Cycle 1 2007–2009	Cycle 2 2009–2011	Cycle 3 2012–2013	Cycle 4 2014–2015	Cycle 5 2016–2017	Cycle 6 2018–2019
Metals and trace elements: Arsenic						
Arsenic (total)	HC, 2010	HC, 2013	—	—	—	—
Inorganic-related arsenic species ^b	—	HC, 2017	HC, 2017	HC, 2017	HC, 2019	HC, 2021
Arsenite	—	HC, 2013	HC, 2015	HC, 2017	HC, 2019	HC, 2021
Arsenate	—	HC, 2013	HC, 2015	HC, 2017	HC, 2019	HC, 2021
Monomethylarsonic acid	—	HC, 2013	HC, 2015	HC, 2017	HC, 2019	HC, 2021
Dimethylarsinic acid	—	HC, 2013	HC, 2015	HC, 2017	HC, 2019	HC, 2021
Arsenocholine and arsenobetaine	—	HC, 2013	HC, 2015	HC, 2017	HC, 2019	HC, 2021
Arsenocholine	—	—	HC, 2015	HC, 2017	—	—
Metals and trace elements: Mercury						
Mercury (total)	HC, 2010	HC, 2013	HC, 2015	HC, 2017	HC, 2019	HC, 2021
Methylmercury	—	—	HC, 2015	HC, 2017	HC, 2019	HC, 2021
Mercury (inorganic)	HC, 2010	—	HC, 2015	HC, 2017	HC, 2019	HC, 2021
Self-care and consumer product chemicals						
Bisphenol A (BPA)	HC, 2010	HC, 2013	HC, 2015	HC, 2017	HC, 2019	HC, 2021
Triclocarban	—	HC, 2013	—	—	—	—
Triclosan	—	HC, 2013	HC, 2015	HC, 2017	—	—
Self-care and consumer product chemicals: Parabens						
Methyl paraben	—	—	HC, 2019	HC, 2017	HC, 2019	HC, 2021
Ethyl paraben	—	—	HC, 2019	HC, 2017	HC, 2019	HC, 2021
Propyl paraben	—	—	HC, 2019	HC, 2017	HC, 2019	HC, 2021
Butyl paraben	—	—	HC, 2019	HC, 2017	HC, 2019	HC, 2021
Nicotine						
Cotinine	HC, 2010	HC, 2013	HC, 2015	HC, 2017	HC, 2019	HC, 2021
Acrylamide						
Acrylamide haemoglobin adduct	—	—	HC, 2015	HC, 2017	HC, 2019	HC, 2021
Glycidamide haemoglobin adduct	—	—	HC, 2015	HC, 2017	HC, 2019	HC, 2021
Chlorophenols						
2,4-Dichlorophenol	HC, 2010	HC, 2013	—	—	—	—
2,5-Dichlorophenol	—	HC, 2013	—	—	—	—
2,4,5-Trichlorophenol	—	HC, 2013	—	—	—	—
2,4,6-Trichlorophenol	—	HC, 2013	—	—	—	—
Pentachlorophenol	—	HC, 2013	—	—	—	—
Dioxins						
2,3,7,8-Tetrachlorodibenzo- <i>p</i> -dioxin (TCDD)	HC, 2020	—	HC, 2020	HC, 2020	HC, 2020	NA
1,2,3,7,8-Pentachlorodibenzo- <i>p</i> -dioxin (PeCDD)	HC, 2020	—	HC, 2020	HC, 2020	HC, 2020	NA
1,2,3,4,7,8-Hexachlorodibenzo- <i>p</i> -dioxin (HxCDD)	HC, 2020	—	HC, 2020	HC, 2020	HC, 2020	NA
1,2,3,6,7,8-Hexachlorodibenzo- <i>p</i> -dioxin (HxCDD)	HC, 2020	—	HC, 2020	HC, 2020	HC, 2020	NA
1,2,3,7,8,9-Hexachlorodibenzo- <i>p</i> -dioxin (HxCDD)	HC, 2020	—	HC, 2020	HC, 2020	HC, 2020	NA
1,2,3,4,6,7,8-Heptachlorodibenzo- <i>p</i> -dioxin (HpCDD)	HC, 2020	—	HC, 2020	HC, 2020	HC, 2020	NA
1,2,3,4,6,7,8,9-Octachlorodibenzo- <i>p</i> -dioxin (OCDD)	HC, 2020	—	HC, 2020	HC, 2020	HC, 2020	NA

Chemical	Cycle 1 2007–2009	Cycle 2 2009–2011	Cycle 3 2012–2013	Cycle 4 2014–2015	Cycle 5 2016–2017	Cycle 6 2018–2019
Furans						
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	HC, 2020	—	HC, 2020	HC, 2020	HC, 2020	NA
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	HC, 2020	—	HC, 2020	HC, 2020	HC, 2020	NA
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	HC, 2020	—	HC, 2020	HC, 2020	HC, 2020	NA
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	HC, 2020	—	HC, 2020	HC, 2020	HC, 2020	NA
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	HC, 2020	—	HC, 2020	HC, 2020	HC, 2020	NA
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	HC, 2020	—	HC, 2020	HC, 2020	HC, 2020	NA
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	HC, 2020	—	HC, 2020	HC, 2020	HC, 2020	NA
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	HC, 2020	—	HC, 2020	HC, 2020	HC, 2020	NA
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	HC, 2020	—	HC, 2020	HC, 2020	HC, 2020	NA
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	HC, 2020	—	HC, 2020	HC, 2020	HC, 2020	NA
Flame retardants						
2,2',4,4',5,5'-Hexabromobiphenyl (PBB 153)	HC, 2010	—	—	—	—	—
Tetrabromobisphenol A (TBBPA)	—	—	HC, 2020	HC, 2020	HC, 2020	NA
Flame retardants: Hexabromocyclododecane (HBCD)						
HBCD α	HC, 2020	—	HC, 2020	HC, 2020	HC, 2020	NA
HBCD β	HC, 2020	—	HC, 2020	HC, 2020	HC, 2020	NA
HBCD γ	HC, 2020	—	HC, 2020	HC, 2020	HC, 2020	NA
Flame retardants: Polybrominated diphenyl ethers (PBDEs)						
4,4'-Dibromodiphenyl ether (PBDE 15)	HC, 2010; HC, 2020	—	—	—	—	—
2,2',4-Tribromodiphenyl ether (PBDE 17)	HC, 2010; HC, 2020	—	—	—	—	—
2,3',4-Tribromodiphenyl ether (PBDE 25)	HC, 2010	—	—	—	—	—
2,4,4'-Tribromodiphenyl ether (PBDE 28)	HC, 2010; HC, 2020	—	—	—	—	—
2',3,4'-Tribromodiphenyl ether (PBDE 33)	HC, 2010	—	—	—	—	—
3,4,4'-Tribromodiphenyl ether (PBDE 37)	HC, 2020	—	—	—	—	—
2,2',4,4'-Tetrabromodiphenyl ether (PBDE 47)	HC, 2010; HC, 2020	—	HC, 2020	HC, 2020	HC, 2020	NA
2,3',4,4'-Tetrabromodiphenyl ether (PBDE 66)	HC, 2020	—	—	—	—	—
2,3',4',6-Tetrabromodiphenyl ether (PBDE 71)	HC, 2020	—	—	—	—	—
2,4,4',6-Tetrabromodiphenyl ether (PBDE 75)	HC, 2020	—	—	—	—	—
3,3',4,4'-Tetrabromodiphenyl ether (PBDE 77)	HC, 2020	—	—	—	—	—
2,2',3,4,4'-Pentabromodiphenyl ether (PBDE 85)	HC, 2020	—	—	—	—	—
2,2',4,4',5-Pentabromodiphenyl ether (PBDE 99)	HC, 2010; HC, 2020	—	HC, 2020	HC, 2020	HC, 2020	NA
2,2',4,4',6-Pentabromodiphenyl ether (PBDE 100)	HC, 2010; HC, 2020	—	HC, 2020	HC, 2020	HC, 2020	NA
2,3',4,4',6-Pentabromodiphenyl ether (PBDE 119)	HC, 2020	—	—	—	—	—
3,3',4,4',5-Pentabromodiphenyl ether (PBDE 126)	HC, 2020	—	—	—	—	—
2,2',3,4,4',5'-Hexabromodiphenyl ether (PBDE 138)	HC, 2020	—	—	—	—	—
2,2',4,4',5,5'-Hexabromodiphenyl ether (PBDE 153)	HC, 2010; HC, 2020	—	HC, 2020	HC, 2020	HC, 2020	NA
2,2',4,4',5,6'-Hexabromodiphenyl ether (PBDE 154)	HC, 2020	—	—	—	—	—
2,3,3',4,5,6-Hexabromodiphenyl ether (PBDE 160)	HC, 2020	—	—	—	—	—
2,2',3,4,4',5,6-Heptabromodiphenyl ether (PBDE 181)	HC, 2020	—	—	—	—	—
2,2',3,4,4',5',6-Heptabromodiphenyl ether (PBDE 183)	HC, 2020	—	—	—	—	—
2,3,3',4,4',5,6-Heptabromodiphenyl ether (PBDE 190)	HC, 2020	—	—	—	—	—

Chemical	Cycle 1 2007–2009	Cycle 2 2009–2011	Cycle 3 2012–2013	Cycle 4 2014–2015	Cycle 5 2016–2017	Cycle 6 2018–2019
2,3,3',4,4',5,5',6-Octabromodiphenyl ether (PBDE 205)	HC, 2020	—	—	—	—	—
2,2',3,3',4,4',5,5',6,6'-Decabromodiphenyl ether (PBDE 209)	HC, 2020	—	HC, 2020	HC, 2020	HC, 2020	NA
Organochlorines						
Aldrin	HC, 2010	—	—	—	—	—
Hexachlorobenzene	HC, 2010; HC, 2020	—	HC, 2020	HC, 2020	HC, 2020	NA
Mirex	HC, 2010; HC, 2020	—	—	—	—	—
Organochlorines: Chlordane						
α-Chlordane	HC, 2010	—	—	—	—	—
γ-Chlordane	HC, 2010	—	—	—	—	—
cis-Nonachlor	HC, 2010	—	—	—	—	—
trans-Nonachlor	HC, 2010; HC, 2020	—	HC, 2020	HC, 2020	HC, 2020	NA
Oxychlordane	HC, 2010	—	HC, 2020	HC, 2020	HC, 2020	NA
Organochlorines: Dichlorodiphenyltrichloroethane (DDT)						
o,p'-Dichlorodiphenyldichloroethylene (o,p'-DDE)	—	—	HC, 2020	HC, 2020	HC, 2020	NA
p,p'-Dichlorodiphenyldichloroethylene (p,p'-DDE)	HC, 2010; HC, 2020	—	HC, 2020	HC, 2020	HC, 2020	NA
p,p'-Dichlorodiphenyltrichloroethane (p,p'-DDT)	HC, 2010; HC, 2020	—	—	—	—	—
Organochlorines: Endosulfan						
Endosulfan I	—	—	HC, 2020	HC, 2020	HC, 2020	NA
Endosulfan II	—	—	HC, 2020	HC, 2020	HC, 2020	NA
Organochlorines: Hexachlorocyclohexane (HCH)						
β-HCH	HC, 2010	—	—	—	—	—
γ-HCH	HC, 2010	—	—	—	—	—
Organochlorines: Toxaphene						
Toxaphene parlar 26	HC, 2010	—	—	—	—	—
Toxaphene parlar 50	HC, 2010	—	—	—	—	—
Per- and polyfluoroalkyl substances						
Perfluorobutanoic acid (PFBA)	—	HC, 2013	—	—	HC, 2019	HC, 2021
Perfluorobutane sulfonate (PFBS)	—	HC, 2013	—	—	HC, 2019	HC, 2021
Perfluorohexanoic acid (PFHxA)	—	HC, 2013	—	—	HC, 2019	HC, 2021
Perfluorohexane sulfonate (PFHxS)	HC, 2010	HC, 2013	—	—	HC, 2019	HC, 2021
Perfluorooctanoic acid (PFOA)	HC, 2010	HC, 2013	—	—	HC, 2019	HC, 2021
Perfluorooctane sulfonate (PFOS)	HC, 2010	HC, 2013	—	—	HC, 2019	HC, 2021
Perfluorononanoic acid (PFNA)	—	HC, 2013	—	—	HC, 2019	HC, 2021
Perfluorodecanoic acid (PFDA)	—	HC, 2013	—	—	HC, 2019	HC, 2021
Perfluoroundecanoic acid (PFUnDA)	—	HC, 2013	—	—	HC, 2019	HC, 2021
Pesticides: 2,4-Dichlorophenoxyacetic acid (2,4-D)						
2,4-D	HC, 2010	HC, 2013	—	—	—	—
Pesticides: Atrazine						
Atrazine mercapturate	—	HC, 2013	—	—	—	—
Desethylatrazine	—	HC, 2013	—	—	—	—
Diaminochlorotriazine	—	HC, 2013	—	—	—	—

Chemical	Cycle 1 2007–2009	Cycle 2 2009–2011	Cycle 3 2012–2013	Cycle 4 2014–2015	Cycle 5 2016–2017	Cycle 6 2018–2019
Pesticides: Carbamates						
Carbofuranphenol	—	HC, 2013	—	—	—	—
2-Isopropoxyphenol	—	HC, 2013	—	—	—	—
Pesticides: Ethylene bisdithiocarbamates						
Ethylene thiourea (ETU)	—	—	—	—	HC, 2019	HC, 2021
Pesticides: Organophosphates						
Acephate	—	—	HC, 2019	—	—	—
Dimethylphosphate (DMP)	HC, 2010	HC, 2013	—	—	HC, 2019	HC, 2021
Dimethylthiophosphate (DMTP)	HC, 2010	HC, 2013	—	—	HC, 2019	HC, 2021
Dimethyldithiophosphate (DMDTP)	HC, 2010	HC, 2013	—	—	HC, 2019	HC, 2021
Diethylphosphate (DEP)	HC, 2010	HC, 2013	—	—	HC, 2019	HC, 2021
Diethylthiophosphate (DETP)	HC, 2010	HC, 2013	—	—	HC, 2019	HC, 2021
Diethyldithiophosphate (DEDTP)	HC, 2010	HC, 2013	—	—	HC, 2019	HC, 2021
Malathion dicarboxylic acid	—	—	HC, 2019	HC, 2017	—	—
Methamidophos	—	—	HC, 2019	—	—	—
3,5,6-Trichloro-2-pyridinol	—	—	HC, 2019	HC, 2017	—	—
Pesticides: ortho-Phenylphenol (OPP)						
OPP-glucuronide	—	—	—	—	HC, 2019	HC, 2021
OPP-sulfate	—	—	—	—	HC, 2019	HC, 2021
Pesticides: Pyrethroids						
3-Phenoxybenzoic acid (3-PBA)	HC, 2010	HC, 2013	—	—	HC, 2019	HC, 2021
4-Fluoro-3-phenoxybenzoic acid (4-F-3-PBA)	HC, 2010	HC, 2013	—	—	HC, 2019	HC, 2021
<i>cis</i> -3-(2,2-Dibromovinyl)-2,2-dimethylcyclopropane carboxylic acid (<i>cis</i> -DBCA)	HC, 2010	HC, 2013	—	—	HC, 2019	HC, 2021
<i>cis</i> -3-(2,2-Dichlorovinyl)-2,2-dimethylcyclopropane carboxylic acid (<i>cis</i> -DCCA)	HC, 2010	HC, 2013	—	—	HC, 2019	HC, 2021
<i>trans</i> -3-(2,2-Dichlorovinyl)-2,2-dimethylcyclopropane carboxylic acid (<i>trans</i> -DCCA)	HC, 2010	HC, 2013	—	—	HC, 2019	HC, 2021
Plasticizers: Phthalates						
Monomethyl phthalate (MMP)	HC, 2013	HC, 2013	—	—	HC, 2019	HC, 2021
Monoethyl phthalate (MEP)	HC, 2013	HC, 2013	—	—	HC, 2019	HC, 2021
Mono(3-carboxypropyl) phthalate (MCPP)	HC, 2013	HC, 2013	—	—	HC, 2019	HC, 2021
Mono- <i>n</i> -butyl phthalate (<i>Mn</i> BP)	HC, 2013	HC, 2013	—	—	HC, 2019	HC, 2021
Monoisobutyl phthalate (MiBP)	—	HC, 2013	—	—	HC, 2019	HC, 2021
Mono-3-hydroxy- <i>n</i> -butyl phthalate (3OH-MBP)	—	—	—	—	HC, 2019	HC, 2021
Monocyclohexyl phthalate (MCHP)	HC, 2013	HC, 2013	—	—	HC, 2019	HC, 2021
Monobenzyl phthalate (MBzP)	HC, 2013	HC, 2013	—	—	HC, 2019	HC, 2021
Mono[2-(carboxymethyl)hexyl] phthalate (MCMHP)	—	—	—	—	HC, 2019	HC, 2021
Mono(2-ethylhexyl) phthalate (MEHP)	HC, 2013	HC, 2013	—	—	HC, 2019	HC, 2021
Mono(2-ethyl-5-carboxypentyl) phthalate (MECPP)	—	—	—	—	HC, 2019	HC, 2021
Mono(2-ethyl-5-oxohexyl) phthalate (MEOHP)	HC, 2013	HC, 2013	—	—	HC, 2019	HC, 2021
Mono(2-ethyl-5-hydroxyhexyl) phthalate (MEHHP)	HC, 2013	HC, 2013	—	—	HC, 2019	HC, 2021
Mono-carboxy- <i>n</i> -heptyl phthalate (MCHpP)	—	—	—	—	HC, 2019	HC, 2021
Mono- <i>n</i> -octyl phthalate (MOP)	HC, 2013	HC, 2013	—	—	HC, 2019	HC, 2021

Chemical	Cycle 1 2007–2009	Cycle 2 2009–2011	Cycle 3 2012–2013	Cycle 4 2014–2015	Cycle 5 2016–2017	Cycle 6 2018–2019
Mono(carboxyisooctyl) phthalate (MCiOP)	—	—	—	—	HC, 2019	HC, 2021
Monoisononyl phthalate (MiNP)	HC, 2013	HC, 2013	—	—	HC, 2019	HC, 2021
Monocarboxyisononyl phthalate (MCiNP)	—	—	—	—	HC, 2019	HC, 2021
Monooxoisonyl phthalate (MOiNP)	—	—	—	—	HC, 2019	HC, 2021
Monohydroxyisononyl phthalate (MHiNP)	—	—	—	—	HC, 2019	HC, 2021
Monoisodecyl phthalate (MiDP)	—	—	—	—	HC, 2019	HC, 2021
Monooxisodecyl phthalate (MOiDP)	—	—	—	—	HC, 2019	HC, 2021
Monohydroxyisodecyl phthalate (MHiDP)	—	—	—	—	HC, 2019	HC, 2021
Plasticizers: Di(isononyl)cyclohexane-1,2-dicarboxylate (DINCH)						
<i>trans</i> -Cyclohexane-1,2-dicarboxylic mono isononyl ester (<i>trans</i> -MINCH)	—	—	—	—	HC, 2019	HC, 2021
Cyclohexane-1,2-dicarboxylic mono oxoisonyl ester (oxo-MINCH)	—	—	—	—	HC, 2019	HC, 2021
Cyclohexane-1,2-dicarboxylic mono hydroxyisononyl ester (OH-MINCH)	—	—	—	—	HC, 2019	HC, 2021
<i>cis</i> -Cyclohexane-1,2-dicarboxylic mono carboxy-isononyl ester (<i>cis</i> -cx-MINCH)	—	—	—	—	HC, 2019	HC, 2021
<i>trans</i> -Cyclohexane-1,2-dicarboxylic mono carboxy-isononyl ester (<i>trans</i> -cx-MINCH)	—	—	—	—	HC, 2019	HC, 2021
Cyclohexane-1,2-dicarboxylic acid (CHDA)	—	—	—	—	HC, 2019	HC, 2021
Plasticizers: 2,2,4-Trimethyl-1,3-pentanediol diisobutyrate (TXIB)						
2,2,4-Trimethyl-1,3-pentanediol (TMPD)	—	—	—	—	HC, 2019	HC, 2021
2,2,4-Trimethyl-3-hydroxy valeric acid (HTMV)	—	—	—	—	HC, 2019	HC, 2021
Plasticizers: Tri-(2-ethylhexyl) trimellitate (TEHT)						
1-Mono(2-ethylhexyl)trimellitate (1-MEHTM)	—	—	—	—	HC, 2019	HC, 2021
2-Mono(2-ethylhexyl)trimellitate (2-MEHTM)	—	—	—	—	HC, 2019	HC, 2021
4-Mono(2-ethylhexyl)trimellitate (4-MEHTM)	—	—	—	—	HC, 2019	HC, 2021
Polychlorinated biphenyls (PCBs)						
Aroclor 1260	HC, 2010	—	—	—	—	—
2,2',5'-Trichlorobiphenyl (PCB 18)	HC, 2020	—	—	—	—	—
2,4,4'-Trichlorobiphenyl (PCB 28)	HC, 2010; HC, 2020	—	—	—	—	—
2,2',4,5'-Tetrachlorobiphenyl (PCB 49)	HC, 2020	—	—	—	—	—
2,2',5,5'-Tetrachlorobiphenyl (PCB 52)	HC, 2010; HC, 2020	—	—	—	—	—
2,3',4,4'-Tetrachlorobiphenyl (PCB 66)	HC, 2010; HC, 2020	—	—	—	—	—
2,4,4',5'-Tetrachlorobiphenyl (PCB 74)	HC, 2010; HC, 2020	—	HC, 2020	HC, 2020	HC, 2020	NA
3,3',4,4'-Tetrachlorobiphenyl (PCB 77)	HC, 2020	—	HC, 2020	HC, 2020	HC, 2020	NA
3,4,4',5'-Tetrachlorobiphenyl (PCB 81)	HC, 2020	—	HC, 2020	HC, 2020	HC, 2020	NA
2,2',4,4',5'-Pentachlorobiphenyl (PCB 99)	HC, 2010; HC, 2020	—	HC, 2020	HC, 2020	HC, 2020	NA
2,2',4,5,5'-Pentachlorobiphenyl (PCB 101)	HC, 2010; HC, 2020	—	—	—	—	—
2,3,3',4,4'-Pentachlorobiphenyl (PCB 105)	HC, 2010; HC, 2020	—	HC, 2020	HC, 2020	HC, 2020	NA
2,3,3',4',6'-Pentachlorobiphenyl (PCB 110)	HC, 2020	—	—	—	—	—
2,3,3',4,4'-Pentachlorobiphenyl (PCB 114)	HC, 2020	—	HC, 2020	HC, 2020	HC, 2020	NA
2,3',4,4',5'-Pentachlorobiphenyl (PCB 118)	HC, 2010; HC, 2020	—	HC, 2020	HC, 2020	HC, 2020	NA
2',3,4,4',5'-Pentachlorobiphenyl (PCB 123)	HC, 2020	—	HC, 2020	HC, 2020	HC, 2020	NA
3,3',4,4',5'-Pentachlorobiphenyl (PCB 126)	HC, 2020	—	HC, 2020	HC, 2020	HC, 2020	NA

Chemical	Cycle 1 2007–2009	Cycle 2 2009–2011	Cycle 3 2012–2013	Cycle 4 2014–2015	Cycle 5 2016–2017	Cycle 6 2018–2019
2,2',3,3',4,4'-Hexachlorobiphenyl (PCB 128)	HC, 2010; HC, 2020	—	—	—	—	—
2,2',3,4,4',5'-Hexachlorobiphenyl (PCB 138)	HC, 2010; HC, 2020	—	HC, 2020	HC, 2020	HC, 2020	NA
2,2',3,4,5,5'-Hexachlorobiphenyl (PCB 141)	HC, 2020	—	—	—	—	—
2,2',3,4',5,5'-Hexachlorobiphenyl (PCB 146)	HC, 2010	—	HC, 2020	HC, 2020	HC, 2020	NA
2,2',4,4',5,5'-Hexachlorobiphenyl (PCB 153)	HC, 2010; HC, 2020	—	HC, 2020	HC, 2020	HC, 2020	NA
2,3,3',4,4',5-Hexachlorobiphenyl (PCB 156)	HC, 2010; HC, 2020	—	HC, 2020	HC, 2020	HC, 2020	NA
2,3,3',4,4',5'-Hexachlorobiphenyl (PCB 157)	HC, 2020	—	HC, 2020	HC, 2020	HC, 2020	NA
2,3,3',4',5,6-Hexachlorobiphenyl (PCB 163)	HC, 2010	—	—	—	—	—
2,3',4,4',5,5'-Hexachlorobiphenyl (PCB 167)	HC, 2010; HC, 2020	—	HC, 2020	HC, 2020	HC, 2020	NA
3,3',4,4',5,5'-Hexachlorobiphenyl (PCB 169)	HC, 2020	—	HC, 2020	HC, 2020	HC, 2020	NA
2,2',3,3',4,4',5-Heptachlorobiphenyl (PCB 170)	HC, 2010; HC, 2020	—	HC, 2020	HC, 2020	HC, 2020	NA
2,2',3,3',5,5',6-Heptachlorobiphenyl (PCB 178)	HC, 2010; HC, 2020	—	—	—	—	—
2,2',3,4,4',5,5'-Heptachlorobiphenyl (PCB 180)	HC, 2010; HC, 2020	—	HC, 2020	HC, 2020	HC, 2020	NA
2,2',3,4,4',5',6-Heptachlorobiphenyl (PCB 183)	HC, 2010; HC, 2020	—	—	—	—	—
2,2',3,4',5,5',6-Heptachlorobiphenyl (PCB 187)	HC, 2010; HC, 2020	—	HC, 2020	HC, 2020	HC, 2020	NA
2,3,3',4,4',5,5'-Heptachlorobiphenyl (PCB 189)	HC, 2020	—	HC, 2020	HC, 2020	HC, 2020	NA
2,2',3,3',4,4',5,5'-Octachlorobiphenyl (PCB 194)	HC, 2010; HC, 2020	—	HC, 2020	HC, 2020	HC, 2020	NA
2,2',3,3',4,4',5,6-Octachlorobiphenyl (PCB 195)	HC, 2020	—	—	—	—	—
2,2',3,3',4,5,5',6-Octachlorobiphenyl (PCB 201)	HC, 2010; HC, 2020	—	—	—	—	—
2,2',3,4,4',5,5',6-Octachlorobiphenyl (PCB 203)	HC, 2010; HC, 2020	—	—	—	—	—
2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl (PCB 206)	HC, 2010; HC, 2020	—	—	—	—	—
2,2',3,3',4,4',5,5',6,6'-Decachlorobiphenyl (PCB 209)	HC, 2020	—	—	—	—	—
Polycyclic aromatic hydrocarbons: Benzo[a]pyrene						
3-Hydroxybenzo[a]pyrene	—	HC, 2013	HC, 2015	HC, 2017	—	—
Polycyclic aromatic hydrocarbons: Chrysene						
2-Hydroxychrysene	—	HC, 2013	HC, 2015	HC, 2017	—	—
3-Hydroxychrysene	—	HC, 2013	HC, 2015	HC, 2017	—	—
4-Hydroxychrysene	—	HC, 2013	HC, 2015	HC, 2017	—	—
6-Hydroxychrysene	—	HC, 2013	HC, 2015	HC, 2017	—	—
Polycyclic aromatic hydrocarbons: Fluoranthene						
3-Hydroxyfluoranthene	—	HC, 2013	HC, 2015	HC, 2017	—	—
Polycyclic aromatic hydrocarbons: Fluorene						
2-Hydroxyfluorene	—	HC, 2013	HC, 2015	HC, 2017	—	—
3-Hydroxyfluorene	—	HC, 2013	HC, 2015	HC, 2017	—	—
9-Hydroxyfluorene	—	HC, 2013	HC, 2015	HC, 2017	—	—
Polycyclic aromatic hydrocarbons: Naphthalene						
1-Hydroxynaphthalene	—	HC, 2013	HC, 2015	HC, 2017	—	—
2-Hydroxynaphthalene	—	HC, 2013	HC, 2015	HC, 2017	—	—
Polycyclic aromatic hydrocarbons: Phenanthrene						
1-Hydroxyphenanthrene	—	HC, 2013	HC, 2015	HC, 2017	—	—
2-Hydroxyphenanthrene	—	HC, 2013	HC, 2015	HC, 2017	—	—
3-Hydroxyphenanthrene	—	HC, 2013	HC, 2015	HC, 2017	—	—
4-Hydroxyphenanthrene	—	HC, 2013	HC, 2015	HC, 2017	—	—
9-Hydroxyphenanthrene	—	HC, 2013	HC, 2015	HC, 2017	—	—

Chemical	Cycle 1 2007–2009	Cycle 2 2009–2011	Cycle 3 2012–2013	Cycle 4 2014–2015	Cycle 5 2016–2017	Cycle 6 2018–2019
Polycyclic aromatic hydrocarbons: Pyrene						
1-Hydroxypyrene	—	HC, 2013	HC, 2015	HC, 2017	—	—
Volatile organic compounds						
Carbon tetrachloride	—	—	—	—	HC, 2019	—
1,4-Dichlorobenzene	—	—	—	—	HC, 2019	—
2,5-Dimethylfuran	—	—	—	—	HC, 2019	—
Ethylbenzene	—	—	HC, 2015	HC, 2017	HC, 2019	—
Isopropylbenzene	—	—	—	—	HC, 2019	—
Methyl isobutyl ketone	—	—	—	—	HC, 2019	—
Nitrobenzene	—	—	—	—	HC, 2019	—
Styrene	—	—	HC, 2015	HC, 2017	HC, 2019	—
1,1,1,2-Tetrachloroethane	—	—	—	—	HC, 2019	—
Tetrachloroethylene	—	—	HC, 2015	HC, 2017	HC, 2019	—
Tetrahydrofuran	—	—	—	—	HC, 2019	—
Toluene	—	—	HC, 2015	HC, 2017	HC, 2019	—
Trichloroethylene	—	—	HC, 2015	HC, 2017	HC, 2019	—
<i>m</i> -Xylene and <i>p</i> -xylene	—	—	HC, 2015	HC, 2017	HC, 2019	—
<i>o</i> -Xylene	—	—	HC, 2015	HC, 2017	HC, 2019	—
Volatile organic compounds: Benzene						
Benzene	—	—	HC, 2015	HC, 2017	HC, 2019	—
<i>trans,trans</i> -Muconic acid	—	HC, 2013	HC, 2015	HC, 2017	—	—
Phenol	—	HC, 2013	—	—	—	—
S-Phenylmercapturic acid	—	HC, 2013	HC, 2015	HC, 2017	—	—
Volatile organic compounds: Trihalomethanes						
Bromodichloromethane	—	—	HC, 2015	HC, 2017	HC, 2019	—
Dibromochloromethane	—	—	HC, 2015	HC, 2017	HC, 2019	—
Tribromomethane (bromoform)	—	—	HC, 2015	HC, 2017	HC, 2019	—
Trichloromethane (chloroform)	—	—	HC, 2015	HC, 2017	HC, 2019	—
General characterization						
Creatinine	HC, 2010	HC, 2013	HC, 2015	HC, 2017	HC, 2019	HC, 2021

— Not measured

NA Measured but data not yet available

a Chromium (VI) was measured indirectly as total chromium in red blood cells

b Sum of arsenate, arsenite, dimethylarsinic acid, and monomethylarsonic acid

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