To: Ms. Lorraine Anderson, First Secretary
Permanent Mission of Canada

Ms. Rana Burley, Deputy Director
Oceans and Law Division (JLO)
Global Affairs Canada

Ms. Christina Paradiso, Executive Director
Chemicals Management Division
Environment and Climate Change Canada

Ms. Gwen Goodier, Director General
Industrial Sectors, Chemicals, and Waste Directorate
Environment and Climate Change Canada

From: Health and Environment Justice Support (HEJSupport) and the Canadian Environmental Law Association

Date: 16 April, 2019

Re: Withdrawing the Stockholm Convention recycling exemptions for TetraBDE, PentaBDE, HexaBDE and HeptaBDE

Dear Ms. Anderson, Ms. Burley, Ms. Paradiso, and Ms. Goodier,

Health and Environment Justice Support (HEJSupport) and the Canadian Environmental Law Association (CELA) are writing to you in your capacities as official Stockholm Convention contact points with concerns about Canada's recycling exemptions under the Stockholm Convention for materials such as plastics and foam containing the following persistent organic pollutants used as flame retardant chemicals, TetraBDE, PentaBDE, HexaBDE and HeptaBDE.[1] These concerns are based on a review of recycling practice of products containing these POPs completed by the Stockholm Convention POPs review committee and recent monitoring of consumer products on the Canadian market.

As you know, the recycling exemption for materials containing these four flame retardant substances was part of the listing decisions at the 4th Conference of the Parties(COP) in 2009 and allows the practice to continue until 2030. However, Parties at the COP also tasked the treaty's expert committee to evaluate the recycling practice and provide recommendations.

The expert committee's findings are described in Decision POPRC-6/2 contained in the meeting report. Key recommendations included taking action to *"…eliminate brominated diphenyl ethers [BDEs] from the recycling streams as swiftly as possible."* The Committee noted that, *"Failure to do so will inevitably result in wider human and environmental contamination and the dispersal of brominated diphenyl ethers into matrices from which recovery is not technically or economically feasible and in the loss of the long-term credibility of recycling."* Subsequent testing of consumer products has demonstrated that these concerns are valid.

[1] Known collectively as polybrominated diphenylethers or PBDEs.

Recent efforts by members of the International POPS Elimination Network tested consumer products made of recycled plastic which also included products found in the Canadian market in 2019. The results showed that these toxic chemicals along with another toxic flame retardant chemicals are making their way into products, exactly as the Stockholm Convention expert committee predicted in 2010.

Product	Commercial OctaBDE (HexaBDE + HeptaBDE) (ppm)	DecaBDE[1] (ppm)
Pocket calculator	**41**	**452**
Hair rack	**26**	**332**
Hair comb	**18**	**124**
Toy car	**17**	**36**
Hair rack	**11**	**147**

[1]DecaBDE was listed in the Stockholm Convention for global elimination in 2017

Methods are described in Annex 1.

Among the products tested include pocket calculators, hair racks, combs, and toy cars products that do not pose a fire hazard and should certainly not contain some of the most hazardous substances listed for global elimination under the Stockholm Convention.

An earlier study conducted in 2009 of recycled foam products on the Canadian market used as underlay for carpets also found high levels of flame retardant chemicals. In a study with samples from Canada, Hungary, Kyrgyzstan, Nepal, Thailand and USA, the two highest levels of commercial PentaBDE (listed in the treaty as TetraBDE and PentaBDE) were from samples purchased in Ottawa (1130 ppm) and Victoria (1052 ppm). The three highest levels of commercial OctaBDE (listed in the treaty as HexaBDE and HeptaBDE) were from Toronto (263 ppm), Winnipeg (145 ppm), and Ottawa (86 ppm).

The principal consequence of the recycling exemption is contamination of products made of recycled plastic or foam with toxic chemicals. The flame retardant substances at issue resemble PCBs and are known to disrupt human hormone systems, adversely impacting the development of the nervous system and children's intelligence. They are also known to be released into household dust, causing exposure. Foam recyclers and carpet layers in the USA have high body burdens of flame retardants and researchers note that they, *"may be at higher risk from adverse health effects associated with brominated flame retardant exposure."* No studies have been conducted in Canada to determine occupational exposure of these POPS in recycling facilities.

Ironically, recycling practice such which is supposed to be environmentally friendly can lead to toxic substances in products as they are carried along in the recycling process. In this case, PBDEs have been widely used in plastic enclosures for electronics. In essence, toxic chemicals in electronic waste are being recycled into consumer products, including children's products. At a time when many countries including Canada have made commitments to increase recycling through a circular economy, the presence of toxic chemicals in products made from recycled materials reveals a gap not well addressed within a circular economy framework. As a result, the ongoing presence of toxic chemicals in products such as these POPS diminishes the overall credibility of recycling.

For these reasons, we respectfully request Canada to withdraw its recycling exemptions for TetraBDE, PentaBDE, HexaBDE and HeptaBDE under the Stockholm Convention at the next COP. Lifting these exemptions will contribute to the achieving the ultimate goal of elimination under the Convention for these POPs.

We note that other Parties have already withdrawn their recycling exemptions for these substances or they have expired. Czech Republic, Iran, and Vietnam no longer have recycling exemptions for TetraBDE and PentaBDE as of 2014 – 2015 and Japan withdrew their exemptions for a variety of uses including recycling automobile shredder residues, refuse paper and plastic fuel, recycling automobile shredder residues to sound-proofing products, and recycling plastics from used specific home appliances (air conditioner, television sets, refrigerator, freezer, washing machine and clothes dryer) and personal computers to construction material and daily necessities such as hangers and bookends. Czechia and Iran also no longer have recycling exemptions for HexaBDE and HeptaBDE as of 2014 – 2015 and Japan withdrew recycling exemptions for the uses described above.

We note that technical solutions exist for separation of PBDE-contaminated waste including Creasolv, x-ray fluorescence devices, x-ray transmission devices, and even low-cost sink-float methods. Techniques for destruction of PBDEs as required under the Stockholm Convention include non-combustion techniques such as super critical water oxidation (SCWO), gas phase chemical reduction, and mechanochemical processes such as high-energy ball milling.

Canadian consumers should be able to purchase products made of recycled materials without having to worry that they contain substances that are globally banned. ***We hope that Canada will announce its withdrawal of the recycling exemptions for TetraBDE, PentaBDE, HexaBDE and HeptaBDE at the upcoming 9th Conference of the Parties 29 April – 10 May in Geneva.***

We welcome an opportunity to discuss this important matter for Stockholm Convention implementation and protection of Canadian consumers. Please do not hesitate to contact us.

Thank you for your consideration to our recommendation.

Cordially,

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Annex 1. Methods for sampling and analysis of chemicals in Canadian consumer products.

Between January and March 2019, plastic items were purchased in stores and markets in Ottawa, Canada. Mainly black parts of the products were screened using a handheld NITON XL3t 800 XRF analyser in order to identify samples with significant bromine (over 1000 ppm) and antimony levels (over 400 ppm). Positive samples were analysed in a laboratory at the University of Chemistry and Technology, Prague, Czech Republic (GC-MS-NICI). For purposes of calculation, the components of the commercial OctaBDE mixtures include the following congeners: BDE 153, 154, 183, 196, 197, 203, 206, and 207. The main congener of the commercial DecaBDE mixture is BDE 209.

The study of foam carpet underlay included samples purchased in 2010 in Ottawa, Toronto, Victoria, and Winnipeg. Most samples were screened for bromine using an Olympus InnovX Delta XRF device and positive samples were analyzed for PBDEs at the Institute of Chemical Technology, an accredited laboratory in the Czech Republic. Polybrominated diphenyl ethers (PBDEs) were extracted from the foam samples in a Soxhlet apparatus (7hrs, dichloromethane), the solvent evaporated, and samples re-dissolved in a mixture of hexane:dichloromethane (1:1, v/v). Clean-up of crude extract was employed on florisil mini-column for GC/MS analysis with a quadrupole analyzer operated in negative chemical ionization (NCI). The samples were injected onto the GC system using a pulsed split-less injection technique and a DB-XLB capillary column (15m x 0.18 mm x 0.07 um) was used for the chromatographic separation of target analytes. Uncertainty in measurements varied 15 – 20%. For purposes of calculation: components of PentaBDE include the following congeners: BDE47, 49, 66, 85, 99, 100; components of OctaBDE include the following congeners: BDE153, 154, 183, 196, 197, 203, 206, and 207; and DecaBDE included BDE209. Note that in most samples (88%), congeners 196, 197, 203, 206, and 207 contributed less than 10% of the total concentration.