

James Gunvaldsen Klaassen  
Suite 520, 1801 Hollis Street  
Halifax, Nova Scotia, B3J 3N4  
Telephone: (902) 417-1700 x 642  
Fax: (902) 417-1701  
E-Mail: [jgunvaldsenklaassen@ecojustice.ca](mailto:jgunvaldsenklaassen@ecojustice.ca)  
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Sent via E-mail to [ec.ministre-minister.ec@canada.ca](mailto:ec.ministre-minister.ec@canada.ca)

Hon. Catherine McKenna  
Minister of Environment and Climate Change  
Environment and Climate Change Canada  
200 Sacré-Coeur Boulevard  
Gatineau QC K1A 0H3

Dear Minister McKenna:

**Re: Request for Addition of Single-Use Plastics, Microplastics and Microfibers to Priority Substances List Pursuant to s. 76(3) of the *Canadian Environmental Protection Act, 1999***

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I am writing on behalf of Environmental Defence, Living Oceans, the Toronto Environmental Alliance, Équiterre, the Ecology Action Centre, Greenpeace, the Sierra Club Canada Foundation, the Canadian Environmental Law Association, the Citizens' Network on Waste Management and the David Suzuki Foundation to request, pursuant to subsection 76(3) of the *Canadian Environmental Protection Act, 1999* ("CEPA"), that single-use plastics, microplastics and plastic microfibers be added to the Priority Substances List. This correspondence also serves to bring to the Minister's attention other legislative provisions in CEPA that may have been triggered and may require action in relation to these classes of substances.

We ask you to use the provisions of CEPA as a step toward addressing the plastic pollution threatening Canada's lands, lakes, rivers and oceans.

## **I. Requestors**

**Environmental Defence (ED)** is one of Canada's most effective environmental action organizations. ED challenges and inspires change in government, business and people to ensure a greener, healthier and prosperous life for all. ED has been working on plastics issues since 2016, and recently launched a national campaign challenging Canada to achieve a zero plastic-waste

future by 2025. In May of this year ED brought 15 major environmental and civil society groups together to draft a [Joint Declaration on Plastics](#).<sup>1</sup> The Declaration now has over 40 signatories and has been submitted to the Federal Government for consideration.

**Living Oceans** is a marine conservation organization located in British Columbia. It has worked to *Clear the Coast* of plastic marine debris since 2008, with a focus on the northern Vancouver Island region. Even in this relatively remote and sparsely populated region, the organization has found microfiber contamination in every soil sample taken from foreshores with western exposure. It has removed over 28 tonnes of plastic debris from northern Vancouver Island over the past four years. In 2016, collaborating with several other B.C. organizations, Living Oceans organized the removal of over 40 tonnes of debris from the west coast of Vancouver Island alone.

The **Toronto Environmental Alliance** (TEA) is a non-profit environmental organization that has campaigned locally for more than 30 years to build a green, healthy and equitable city. TEA works with residents, workers, businesses and government to research, promote and advocate for zero waste policies and programs.

**Équiterre** is a not-for-profit environmental organization offering concrete solutions to accelerate the transition towards a society in which individuals, organizations and governments make ecological choices that are both healthy and equitable. For over 25 years, through actions involving research, education, consultation and advocacy, Équiterre has mobilized citizens, community groups, businesses, public organizations, researchers and governments of all stripes to influence practices and policies related to the environment, agriculture and climate change in Quebec and Canada. Équiterre is member of the Coalition for Action on Toxics, working to advocate for stronger laws on toxic substances and pesticides to protect the health and environment of Canadians.

The **Ecology Action Centre** is a membership-based environmental organization in Nova Scotia taking leadership on critical issues from biodiversity to climate change to environmental justice. Founded in 1971, one of the first issues we tackled was recycling of newspapers. Today we are a strong advocate for the recycling of all plastics and preventing plastics from entering our soils, lakes and rivers and, in particular, our oceans.

**Greenpeace**, as part of the #BreakFreeFromPlastic movement, is campaigning globally to stop the plastic pollution crisis at the source by calling on governments and corporations to end the throwaway, single-use plastic era and to promote real solutions and a healthier, plastic-free future for our communities, landscapes, waterways, lakes and oceans.

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<sup>1</sup> *Towards a Zero Plastic Waste Canada*, Joint Declaration on Plastics, June 4, 2018: Web: <https://environmentaldefence.ca/2018/06/04/canadian-organizations-challenge-canada-zero-plastic-waste-future/>

**Sierra Club Canada Foundation** is a national grassroots organization that empowers people to protect, restore and enjoy a healthy and safe planet. We have worked to reduce plastic use by encouraging municipalities and individuals to push for better federal policies that would eliminate unnecessary plastic use, education and awareness of the impacts of plastics, and encouraging alternatives to our overuse of single use plastics. We are currently engaging with a groundswell of members and volunteers across the country to reduce plastic use and waste ([www.sierraclub.ca/en/Our-Plastics-Ourselves](http://www.sierraclub.ca/en/Our-Plastics-Ourselves)).

The **Canadian Environmental Law Association (CELA)** is a public interest law group founded in 1970 to use and enhance environmental laws to protect the environment and safeguard human health. Funded as a specialty legal aid clinic, CELA lawyers represent low-income and vulnerable communities in the courts and before tribunals on a wide variety of environmental and public health issues. CELA has worked on a range of pollution matters including waste management, the elimination and reduction of toxic substances and water pollution that include a focus on plastic materials and additives. To promote the protection of the Canadian environment and the health of its citizens, CELA has engaged extensively in the review and implementation of the *Canadian Environmental Protection Act*.

Formed in 1981, **the Citizens' Network on Waste Management** is a network of citizens' groups working on waste management issues in their communities. The Network also works to change waste legislation, policies and programs at the federal and provincial levels to avoid the problems that arise locally. Plastics have been a concern of the Network and a focus of its work for several decades. Starting in 1989, the Network became a member of the National Packaging Task Force and worked for ten years on reducing plastics and other packaging. The Network also advocates for producer responsibility - especially around blue box packaging materials – and was a member of the board of Waste Diversion Ontario from 2008 and 2013, overseeing stewardship programs.

Founded in 1990, the **David Suzuki Foundation** is a national, bilingual non-profit organization headquartered in Vancouver, with offices in Toronto and Montreal. Through evidence-based research, education and policy analysis, the David Suzuki Foundation works to conserve and protect the natural environment, and help create a sustainable Canada.

## II. Legislative Framework

The primary stated purpose of *CEPA* is to contribute to sustainable development through pollution prevention. Subsection 2(1) of *CEPA* imposes duties on the Government of Canada, including duties to:

*(a) exercise its powers in a manner that protects the environment and human health, applies the precautionary principle that, where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-*

*effective measures to prevent environmental degradation, and promotes and reinforces enforceable pollution prevention approaches<sup>2</sup>;*

*(a.1) take preventive and remedial measures to protect, enhance and restore the environment<sup>3</sup>;*

...

*(f) facilitate the protection of the environment by the people of Canada;<sup>4</sup>*

...

*(j) protect the environment, including its biological diversity, and human health, from the risk of any adverse effects of the use and release of toxic substances, pollutants and wastes<sup>5</sup>;*

...

*(k) endeavour to act expeditiously and diligently to assess whether existing substances or those new to Canada are toxic or capable of becoming toxic and assess the risk that such substances pose to the environment and human life and health<sup>6</sup>.*

Section 76 of *CEPA* provides for the establishment of a Priority Substances List with respect to the assessment of substances:

### ***Priority Substances List***

*76(1) The Ministers shall compile and may amend from time to time in accordance with subsection (5) a list, to be known as the Priority Substances List, and the List shall specify substances in respect of which the Ministers are satisfied priority should be given in assessing whether they are toxic or capable of becoming toxic.<sup>7</sup>*

Subsection 3(1) of *CEPA* defines a “substance” as “any distinguishable kind of organic or inorganic matter, whether animate or inanimate” and includes for the purposes of section 76:

*(a) any matter that is capable of being dispersed in the environment or of being transformed in the environment into matter that is capable of being so dispersed or that is capable of causing such transformations in the environment<sup>8</sup>;*

...

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<sup>2</sup> *CEPA*, s.2(1)(a).

<sup>3</sup> *CEPA*, s. 2(1)(a.1).

<sup>4</sup> *CEPA*, s. 2(1)(f).

<sup>5</sup> *CEPA*, s. 2(1)(j).

<sup>6</sup> *CEPA*, s. 2(1)(k).

<sup>7</sup> *CEPA*, s. 76(1).

<sup>8</sup> *CEPA*, s. 3(1) “substance”, paragraph (a).

*(f) any manufactured item that is formed into a specific physical shape or design during manufacture and has, for its final use, a function or functions dependent in whole or in part on its shape or design<sup>9</sup>; and*

*(g) any animate matter that is, or any complex mixtures of different molecules that are, contained in effluents, emissions or wastes that result from any work, undertaking or activity<sup>10</sup>.*

In accordance with *CEPA* subsection 3(3), a “substance” includes “a class of substances”.<sup>11</sup> A “class of substances” is defined in subsection 3(1) as:

*class of substances means any two or more substances that*

*(a) contain the same portion of chemical structure;*

*(b) have similar physico-chemical or toxicological properties; or*

*(c) for the purposes of sections 68, 70 and 71, have similar types of use.<sup>12</sup>*

Pursuant to subsection 76(3) of *CEPA*, any person may request the addition of a substance to the Priority Substances List:

#### ***Request for addition to Priority Substances List***

*Any person may file in writing with the Minister a request that a substance be added to the Priority Substances List and the request shall state the reasons for adding the substance to the List.<sup>13</sup>*

Subsection 76(4) of *CEPA* provides that the Minister must respond to such a request with reasons within 90 days:

#### ***Consideration of request***

*The Ministers shall consider a request filed under subsection (3) and, within 90 days after the request is filed, the Minister shall inform the person who filed the request of*

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<sup>9</sup> *CEPA*, s. 3(1) “substance”, paragraph (f).

<sup>10</sup> *CEPA*, s. 3(1) “substance”, paragraph (g).

<sup>11</sup> *CEPA*, s. 3(3) provides : “For the purposes of this Act, other than subsection (1), **substance** includes a class of substances.”

<sup>12</sup> *CEPA*, s. 3(1) “substance”, paragraph (g).

<sup>13</sup> *CEPA*, s. 76(3).

*how the Minister intends to deal with it and the reasons for dealing with it in that manner.*<sup>14</sup>

### ***Toxic substances***

As stated above, pursuant to section 76(1) of *CEPA*, the Minister shall specify substances on the Priority List for which priority should be given in assessing whether they are toxic or are capable of becoming toxic.

Section 64 establishes the characteristics of toxic substances for the purposes of Parts 5 and 6 of *CEPA*:

64 ... [A] *substance is toxic if it is entering or may enter the environment in a quantity or concentration or under conditions that:*

*(a) have or may have an immediate or long-term harmful effect on the environment or its biological diversity;*

*(b) constitute or may constitute a danger to the environment on which life depends; or*

*(c) constitute or may constitute a danger in Canada to human life or health.*<sup>15</sup>

### **Action taken in other jurisdictions**

Section 75 of *CEPA* also provides for the exchange of information with other jurisdictions regarding substances that have been prohibited or substantially restricted for environmental or health reasons. Jurisdictions, for the purposes of section 75 include, “the government of a foreign state or of a subdivision of a foreign state that is a member of the Organization for Economic Cooperation and Development”<sup>16</sup>. Subsection 75(3) provides for the review of decisions by other jurisdictions to prohibit or substantially restrict a substance for environmental or health reasons:

#### ***Review of decisions of other jurisdictions***

*Where the Minister is notified in accordance with procedures developed under subsection (2) of a decision to specifically prohibit or substantially restrict any substance by or under the legislation of another jurisdiction for environmental or health reasons, the Ministers shall review the decision in order to determine whether the substance is toxic or capable of becoming toxic, unless the decision relates to a*

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<sup>14</sup> *CEPA*, s. 76(4).

<sup>15</sup> *CEPA*, s. 64.

<sup>16</sup> *CEPA*, s. 75(1)(b).

*substance the only use of which in Canada is regulated under another Act of Parliament that provides for environmental and health protection*<sup>17</sup>.

Further, Division 7 of Part 7 of *CEPA* requires the Minister of the Environment to take certain actions where “a substance released from a source in Canada into water creates, or may reasonably be anticipated to create, (a) water pollution in a country other than Canada”.<sup>18</sup>

### III. Description of Substance

Plastic pollution takes many forms and is best described in terms of several “classes” of substances which have similar physico-chemical properties and have similar types of uses, primarily as consumer products.<sup>19</sup> All can and do become plastic waste. This submission focuses on three classes of substances:

- i) Single-use plastics<sup>20</sup>;
- ii) Microplastics; and
- iii) Microfibers.

Plastic waste is generated from many different sources, including **single-use plastics** such as plastic bags, cigarette filters, bottle caps, stir sticks, cotton swabs, straws, beverage containers, food wrappers, plates, cups, utensils, take-out food foam packaging and other product packaging.<sup>21</sup> Many of these items are made from forms of polypropylene, polyethylene, polystyrene, polycarbonate, polyvinyl chloride (PVC) and polyamide/nylon.<sup>22</sup> Another major source of plastic pollution is synthetic **microfibers** shed from fleeces and other plastic-based textiles, often when laundered and discharged through waste-water and sewage systems.

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<sup>17</sup> *CEPA*, s. 75(3).

<sup>18</sup> *CEPA*, s. 176.

<sup>19</sup> *CEPA*, ss. 3(1) and 3(3), definition of “*class of substances*”

<sup>20</sup> In this request, the term “single-use plastics” includes **both** (1) plastic items that are designed to be used once and discarded, **and** (2) items that could be recycled or re-used but which are in practice typically discarded and not recycled or re-used. Both types can and do cause serious harm to the environment, and to living things. Both can remain in the environment as harmful macroplastics or can degrade into smaller fragments and microplastics.

<sup>21</sup> Environmental Law Centre, University of Victoria. 2017. Seven Reforms to Address Marine Plastic Pollution. [http://www.elc.uvic.ca/wordpress/wp-content/uploads/2017/08/2017-01-11-MarinePlastics\\_2017Oct23.pdf](http://www.elc.uvic.ca/wordpress/wp-content/uploads/2017/08/2017-01-11-MarinePlastics_2017Oct23.pdf)

<sup>22</sup> Pawar PR, Shirgaonkar S, and Patil RB, 2016, Plastic marine debris: Sources, distribution and impacts on coastal and ocean biodiversity, *PENCIL Pub. Biol. Sci.* Vol. 3(1):40-54 (Table 1. Some common types of plastic wastes.) See also: Anderson JC, Park BJ, Palace VP, Microplastics in aquatic environments: Implications for Canadian ecosystems, *Environmental Pollution* 218 (2016) 269-280. Web: <https://www.sciencedirect.com/science/article/pii/S0269749116305620>.

A relatively small proportion of plastic in Canada is actually recycled – less than 11%.<sup>23</sup> This is true even though some are easily recyclable forms (e.g. polyethylene terephthalate which is used to make many types of beverage bottles and other plastic containers). Consequently most plastic, whether recyclable or not, ends up in landfills, soils, freshwater lakes and rivers, and the oceans.

Due to its resistance to degradation, most plastic will persist in the environment for many centuries<sup>24</sup> and may be transported far from its source, becoming an ubiquitous environmental contaminant. Plastic debris in the soils<sup>25</sup>, and in marine and freshwater environments, can exist as **macroplastics** (>5mm diameter), such as plastic bags or other larger items. It can also exist as smaller **microplastics** (<5mm diameter).<sup>26</sup> **Primary microplastics** are pieces already under 5 mm in diameter when entering the environment. **Secondary microplastics** are plastics that have broken down over time from larger items into fragments less than 5 mm in size.<sup>27, 28</sup> While oceans may be the largest sink for microplastics, 80% is estimated to come from land, and rivers are considered a major pathway.<sup>29</sup>

Recent studies have shown that microplastics, including microfibers, may pose more of a risk to the environment than macroplastics.<sup>30</sup> Both macroplastics and microplastics pose a risk to marine organisms in the natural environment, for example, through ingestion or entanglement.<sup>31</sup> In addition to being found in all forms of marine life, microplastics are found in food and drinking water, posing a risk to human health.<sup>32</sup> Plastic debris of all sizes litter beaches and shorelines, interfering with the use and enjoyment of the marine and freshwater environments: in the words

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<sup>23</sup> Environment and Climate Change Canada website – Share and view ideas: Moving Canada toward zero plastic waste: <https://www.canada.ca/en/environment-climate-change/services/managing-reducing-waste/consultations/moving-toward-zero-plastic-waste>.

<sup>24</sup> Barnes D, Galgani F, Thompson R, and Barlaz M. 2009. Accumulation and fragmentation of plastic debris in global environments. *Phil. Trans. R. Soc. B.* 364, 1985–1998  
< <http://rstb.royalsocietypublishing.org/content/royptb/364/1526/1985.full.pdf>>

<sup>25</sup> de Souza Machado AA, Werner Kloas W, Zarfl C, Hempel S, Rillig MC. Microplastics as an emerging threat to terrestrial ecosystems. *Global Change Biology*, 2018; DOI: [10.1111/gcb.14020](https://doi.org/10.1111/gcb.14020)

<sup>26</sup> Environmental Law Centre, University of Victoria. 2017. Seven Reforms to Address Marine Plastic Pollution. [http://www.elc.uvic.ca/wordpress/wp-content/uploads/2017/08/2017-01-11-MarinePlastics\\_2017Oct23.pdf](http://www.elc.uvic.ca/wordpress/wp-content/uploads/2017/08/2017-01-11-MarinePlastics_2017Oct23.pdf)

<sup>27</sup> Dauvergne, P. 2018. Why is the global governance of plastic failing the oceans? *Global Environmental Change* 51:22-31.

<sup>28</sup> Microplastics include **Nanoplastics**, which are very small plastic fragments measured in nanometers (millionths of a millimeter). See de Souza Machado AA, Werner Kloas W, Zarfl C, Hempel S, Rillig MC. Microplastics as an emerging threat to terrestrial ecosystems. *Global Change Biology*, 2018; DOI: [10.1111/gcb.14020](https://doi.org/10.1111/gcb.14020)

<sup>29</sup> Rochman CM, 2018. Microplastics research—from sink to source Microplastics are ubiquitous not just in the ocean but also on land and in freshwater systems. *Science*. Vol 360 ISSUE 6384

<sup>30</sup> Walker, T.R. and Xanthos, D. 2018. A call for Canada to move toward zero plastic waste by reducing and recycling single-use plastics. *Resources Conservation and Recycling* 133: 99-100.

<sup>31</sup> Li WC, Tse HF, and Fok L. 2016. Review: Plastic waste in the marine environment: A review of sources, occurrence and effects. *Science of the Total Environment*. 566-567 (2016) 333-349.

<sup>32</sup> Kontrick AV. 2018. Microplastics and Human Health: Our Great Future to Think About Now. *Journal of Medical Toxicology* (2018) 14:117–119.

of the legislature of the State of Hawaii “single-use plastics have created a blight on Hawaii’s natural beauty and an economic burden for the counties to clean up”.<sup>33</sup>

### **Evidence that plastic is causing harm**

Plastic waste and microplastics are an issue of global concern, including in Canada. Marine litter is now recognized as one of the most widespread sources of pollution in the world's oceans, and plastic waste is having a negative impact on the environment and all levels of the food-chain, including humans.<sup>34</sup>

Microplastics are ingested by many organisms, including plankton, invertebrates, fish, birds and mammals<sup>35</sup>. For example, **studies have shown that 90% of seabirds have plastic in their guts, 1 in 3 sea turtles have eaten plastic, and over half of all whales and dolphin species have ingested plastic.**<sup>36</sup> Documented physical and toxicological effects include internal abrasions or blockages resulting in reductions in food consumption, stunted growth and starvation.<sup>37</sup> Microplastics ingested by fish can cause liver toxicity and endocrine system disruption.<sup>38</sup> Observed effects of microplastics ingestion by fish include intestinal blockage, physical damage, histopathological alterations in the intestines, change in behavior, change in lipid metabolism, and transfer to the liver.<sup>39</sup> Simply put, plastic can fill the stomachs of organisms, leaving no room for food, puncture and obstruct their intestinal tracts, which can cause starvation or prevent proper absorption of nutrients, and may also give off toxins.

When marine organisms ingest or are entangled by plastic, it is sometimes with fatal consequences. Mortalities due to entanglement in plastic fishing nets and bags have been reported for marine mammals, turtles and seabirds, and over 690 marine species have been reported to ingest plastics.<sup>40</sup> For example, Leatherback Sea Turtles in the Atlantic Ocean feed on various species of jellyfish, but because they are indiscriminate feeders, they feed on anything resembling jellyfish, leading to

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<sup>33</sup> [A Bill for an Act Relating to Environmental Protection, H.B. No. 1507, H.D. 2, 2015, section 1](#) (A Bill presented to the State Legislature of Hawaii).

<sup>34</sup> Ibid.

<sup>35</sup> Ivar do Sul, JA and Costa, MF. 2014. The present and future of microplastic pollution in the marine environment. *Environmental Pollution* 185: 352e364.

<sup>36</sup> Canadian Wildlife Federation. Animals Affected by Plastic. Available at: <http://cwf-fcf.org/en/events/rivers-to-oceans-week/wildlife.html>

<sup>37</sup> New York State Attorney General Eric T. Schneiderman. 2014. Unseen threat: How Microbeads Harm New York Waters, Wildlife, Health And Environment. Available at: [https://ag.ny.gov/pdfs/Microbeads\\_Report\\_5\\_14\\_14.pdf](https://ag.ny.gov/pdfs/Microbeads_Report_5_14_14.pdf)

<sup>38</sup> Rochman, CM, Kurobe, T., Flores, I. and Teh, S. 2014. Early warning signs of endocrine disruption in adult fish from the ingestion of polyethylene with and without sorbed chemical pollutants from the marine environment. *The Science of the Total Environment*. 493C. 656-661.

<sup>39</sup> Jovanović, B. 2017. Ingestion of microplastics by fish and its potential consequences from a physical perspective: Potential Consequences of Fish Ingestion of Microplastic. *Integrated Environmental Assessment and Management*. 13. 510-515.

<sup>40</sup> Provencher JF et al., 2017. Quantifying ingested debris in marine megafauna: a review and recommendations for standardization. *Analytical methods* 9: 1454-1469.

plastic bag ingestion.<sup>41</sup> One of the greatest threats to Stellar Sea Lions, a species whose populations have declined by 80 per cent over the past three decades, is entanglement from plastic packing bands.<sup>42</sup> Baleen whales, such as the endangered North Atlantic Right Whale, feed by opening their mouths wide on the surface of the water, catching invertebrates, as well as plastic debris and microplastics.<sup>43</sup>

Microplastics also accumulate throughout the aquatic food web, and their bioaccumulation potential increases with decreasing size<sup>44</sup>. When microplastics are in the water, species like zooplankton mistake them for food and ingest them. Since plankton are low on the food chain and the prey of choice for species like mussels and oysters, and predatory fish like salmon and herring, they are passed up the food chain.<sup>45</sup> A recent study found that zooplankton in BC are showing signs of plastic ingestion which, in turn, poses a risk to the salmon that feed on them.<sup>46</sup> The researchers estimated that consumption of microplastic-containing zooplankton may lead to the ingestion of over 90 microplastic particles per day in returning adult salmon.

Another recent study found high amounts of microplastics in the sediment in an area of BC where 130 shellfish farms are located, with about 90 per cent of the plastic coming from the shellfish industry itself, including from plastic equipment and abrasives for cleaning boats.<sup>47</sup> It is uncertain how the plastic, when eaten by shellfish, affects them and the animals that feed on them, but research has shown that animals that ingest microplastics have lower reproductive success.<sup>48</sup>

In addition to posing risk from direct ingestion, microplastics also adsorb other organic contaminants from the environment<sup>49</sup>, and thus may function as a vector for transmission of organic pollutants to aquatic species.<sup>50,51</sup> Harmful chemicals transferred to wildlife from ingested

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<sup>41</sup> Canadian Wildlife Federation. Animals Affected by Plastic. Available at: <http://cwf-fcf.org/en/events/rivers-to-oceans-week/wildlife.html>

<sup>42</sup> Ibid.

<sup>43</sup> Ibid.

<sup>44</sup> Wright SL, Thompson RC, Galloway TS. 2013. The physical impacts of microplastics on marine organisms: a review. *Environ Pollution* 178:483–492.

<sup>45</sup> Borrelle S, Rochman C, Liboiron M, Bond AL, Lusher A, Bradshaw H, Provencher JF. 2017. Why we need an international agreement on plastic pollution. *PNAS* 114 (38): 9994-9997.

<sup>46</sup> Desforges, J.P.W., et al. 2015. Ingestion of microplastics by zooplankton in the Northeast Pacific Ocean. *Archives of environmental contamination and toxicology*, 69(3): 320-330.

<sup>47</sup> Kazmiruk TN, Kazmiruk VD, and Bendell LI. 2018. Abundance and distribution of microplastics within surface sediments of a key shellfish growing region of Canada.

<sup>48</sup> CBC. May 23, 2018. 'Alarmingly high' amounts of plastic microbeads found in B.C. shellfish farming areas. Available at: <http://www.cbc.ca/news/canada/british-columbia/shellfish-microplastics-bc-aquaculture-1.4675672>

<sup>49</sup> Bakir A, Rowland SJ, Thompson RC. 2012. Competitive sorption of persistent organic pollutants onto microplastics in the marine environment. *Mar Pollut Bull* 64:2782–2789.

<sup>50</sup> Oehlmann J, Schulte-Oehlmann U, Kloas W, Jagnytsch O, Lutz I, Kusk KO, Wollenberger L, Santos EM, Paull GC, Van Look KJ, Tyler CR. 2009. A critical analysis of the biological impacts of plasticizers on wildlife. *Philos Trans R Soc Lond B Biol Sci* 364:2047–2062.

<sup>51</sup> Zarfl C, and Matthies M. 2010. Are marine plastic particles transport vectors for organic pollutants to

plastic include hydrophobic pollutants, which collect on the surface of the plastic once in water and can be adsorbed by microplastics.<sup>52</sup> These persistent organic pollutants, such as polychlorinated biphenyls (PCBs), dichlorodiphenyltrichloroethane (DDT), polybrominated diphenyl ethers (PBDEs), and polycyclic aromatic hydrocarbons (PAHs) can leach out and transfer into the guts and tissues of aquatic organisms.<sup>53</sup> A recent study<sup>54</sup> in the intertidal regions in Burrard Inlet in Vancouver, BC, found that microplastics can ferry traces of metals, such as zinc, copper and cadmium, into the food chain. These metal toxins can enter the water by leaching directly from the plastic, and can pose a cumulative stress on the intertidal ecosystem. Copper, for example, is extremely toxic to fish in its aqueous form.

Likewise, plastic pollution is found in freshwater rivers and lakes<sup>55</sup>, including the Ottawa and St. Lawrence Rivers and the Laurentian Great Lakes. Plastic microfibers were 70% to 100% of the plastic particles in open water and sediment of the Ottawa River adjacent to Ottawa-Gatineau. Plastic concentrations were significantly higher downstream of the wastewater treatment plant than in upstream areas, suggesting that the effluent from the plant was a major source.<sup>56</sup> Plastic pollution is an increasing concern in the Laurentian Great Lakes, with surveys showing that in certain areas of the Great Lakes, surface water densities of plastics are as high as those reported for areas of litter accumulation within oceanic gyres.<sup>57</sup> They are also being found in species within the Great Lakes. For example, researchers have found synthetic polymer fibers and plastic pellets in the digestive tracts of fish in Lake Erie.<sup>58</sup> Samples from Lake Superior found microplastic concentrations similar to that of the ocean, and the frequency of microfibers suggested that atmospheric deposition and wastewater effluents are significant sources.<sup>59</sup> The St.

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the Arctic? *Mar Pollut Bull* 60:1810–1814.

<sup>52</sup> New York State Attorney General Eric T. Schneiderman. 2014. Unseen threat: How Microbeads Harm New York Waters, Wildlife, Health And Environment. Available at: [http://ag.ny.gov/pdfs/Microbeads\\_Report\\_5\\_14\\_14.pdf](http://ag.ny.gov/pdfs/Microbeads_Report_5_14_14.pdf)

<sup>53</sup> Engler, RE. 2012. The complex interaction between marine debris and toxic chemicals in the ocean. *Environmental Science and Technology*. 46(22):12302-15.

<sup>54</sup> Munier B, Bendell LI (2018) Macro and micro plastics sorb and desorb metals and act as a point source of trace metals to coastal ecosystems. *PLOS ONE* 13(2): e0191759. <https://doi.org/10.1371/journal.pone.0191759>

<sup>55</sup> Bucci K, Rochman C, Beyond our oceans: Microplastics pollute rivers and lakes too, *The Conversation*, April 26, 2016. Web: <https://theconversation.com/beyond-our-oceans-microplastics-pollute-rivers-and-lakes-too-94559>

<sup>56</sup> Vermaireab JC, Pomeroya C, Herczegha SM, Haggarta O, and Murphy M. 2016. Microplastic abundance and distribution in the open water and sediment of the Ottawa River, Canada, and its tributaries. *FACETS* 2: 301–314.

<sup>57</sup> Alexander GJD, Dürr HH, Mitchell K, and Van Cappellen P. 2015. Plastic debris in the Laurentian Great Lakes: A review. *Journal of Great Lakes Research*. Vol. 41, Issue 1. Pp. 9-19. See also: Eriksen M, Mason S, Wilson S, Box C, Zellers A, Edwards W, Farley H and Amato S, Microplastic pollution in the surface waters of the Laurentian Great Lakes, *Mar Pollut Bull* (2013) 77:177-182.

<sup>58</sup> Canadian Wildlife Federation. Animals Affected by Plastic. Available at: <http://cwf-fcf.org/en/events/rivers-to-oceans-week/wildlife.html>

<sup>59</sup> Hendrickson E, Minor EC, and Schreiner K. 2018. Microplastic Abundance and Composition in Western Lake Superior As Determined via Microscopy, Pyr-GC/MS, and FTIR. *Environ. Sci. Technol.*, 2018, 52 (4), pp 1787–1796.

Lawrence River upriver from Quebec City has been found to have plastic contamination similar in magnitude to the world's most contaminated marine sediments.<sup>60</sup>

Soils and land-based ecosystems are also at risk, as soils are often the first point of contact for discarded plastics and microplastic fragments. Microplastic soil contamination, especially where nanoplastics are present, is becoming pervasive and is potentially toxic, interacting with terrestrial organisms that mediate essential services and functions within terrestrial ecosystems.<sup>61</sup>

### **Effects on Human Health**

Research is now also showing that microplastics are in drinking water and foods like salt, honey, sugar, and beer, as well as the dust in our homes.<sup>62</sup> The long-term health impacts of microplastics on human health remains largely unknown since most studies to date have been limited to impacts on marine life.<sup>63,64</sup>

However, it is becoming clear that some of the most ubiquitous plastic ingredients are inherently hazardous to human health, such as vinyl chloride and styrene. Vinyl Chloride, a monomer used to produce polyvinyl chloride (PVC), is listed by the International Agency for Research on Cancer (IARC) as "*carcinogenic to humans (Group 1)*".<sup>65</sup> PVC is one of the most widely used plastic polymers worldwide and is commonly found in microplastics recovered from marine environments.<sup>66</sup> The World Health Organization and IARC also recently upgraded styrene to "*probably carcinogenic to humans*".<sup>67</sup> Styrene is the precursor for polystyrene, a polymer used to make disposable cutlery and styrofoam packaging, among other products.

In a recent study, researchers at McGill University tested samples of Canada's leading bottled water brands (Aquafina, Dasani, Eska, Naya and Nestle Pure Life) and found 12 types of

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<sup>60</sup> Castaneda RA, Avlijas S, Simard MA and Ricciardi A, Microplastic pollution in St. Lawrence River sediments. Canadian Journal of Fisheries and Aquatic Sciences, 2014, 71(12): 1767-1771.

<sup>61</sup> de Souza Machado AA, Werner Kloas W, Zarfl C, Hempel S, Rillig MC. Microplastics as an emerging threat to terrestrial ecosystems. Global Change Biology, 2018; DOI: [10.1111/gcb.14020](https://doi.org/10.1111/gcb.14020)

<sup>62</sup> Kontrick AV. 2018. Microplastics and Human Health: Our Great Future to Think About Now. Journal of Medical Toxicology (2018) 14:117–119.

<sup>63</sup> Ibid

<sup>64</sup> European Commission. 2018. A European Strategy for Plastics in a Circular Economy. Available at: <http://ec.europa.eu/environment/circular-economy/pdf/plastics-strategy-brochure.pdf>

<sup>65</sup> Vinyl Chloride Monograph, International Agency for Research on Cancer, (IARC). <http://monographs.iarc.fr/ENG/Monographs/vol100F/mono100F-31.pdf>

<sup>66</sup> Anderson JC, Park BJ, Palace VP, Microplastics in aquatic environments: Implications for Canadian ecosystems, Environmental Pollution 218 (2016) 269-280. Web: <https://www.sciencedirect.com/science/article/pii/S0269749116305620>

<sup>67</sup> Aarhus University. "After 40 years in limbo: Styrene is probably carcinogenic." ScienceDaily, 30 May 2018. [www.sciencedaily.com/releases/2018/05/180530113105.htm](http://www.sciencedaily.com/releases/2018/05/180530113105.htm) .

microplastics, including the types found in water bottles and caps, as well as others.<sup>68</sup> While the effect on human health of such materials is not yet known, researchers consider it to be a significant concern.

It is clear that food, drinking water and the air humans breathe are contaminated with microplastics. Continual exposure to microplastics requires a better understanding of the impacts on human health.

#### **IV. Matter of International Concern**

Plastic pollution is a global problem. In 2017 the Head of the United Nations Environment Programme said:

It is past time that we tackle the plastic problem that blights our oceans. Plastic pollution is surfing into Indonesian beaches, settling onto the ocean floor at the North Pole, and rising through the food chain onto our dinner tables....According to some estimates, at the rate we are dumping items such as plastic bottles, bags and cups after a single use, by 2050 oceans will carry more plastic than fish and an estimated 99 percent of seabirds will have ingested plastic.<sup>69</sup>

Plastic microfibers from Canada's sewage/wastewater treatment plants and waste plastic from Canadian land-based sources are entering rivers, lakes and oceans. Ocean currents eventually carry some of the waste plastics away from the sources to other coastal areas and beaches, or accumulate far out to sea in ocean gyres.<sup>70</sup> Plastic pollution from Canadian sources must therefore be reasonably anticipated to cause water pollution in U.S. and International waters.

In light of the above, the Minister should, in addition to considering the subsection 76(3) request, consider whether actions should be taken pursuant to *CEPA*'s international water pollution provisions as set out in Part 7, Division 7.

#### **V. Action in Other Jurisdictions**

As stated above, subsection 75(3) of *CEPA* requires the Minister to review a decision by another jurisdiction to prohibit or substantially restrict a substance for environmental or health reasons. OECD member France has passed legislation to ban, or substantially restrict, single-use plastic

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<sup>68</sup> CBC. April 6, 2018. Microplastics found in some Canadian bottled water: Tests show tiny particles but any effect on human health not known. Available at: <http://www.cbc.ca/news/technology/marketplace-canadian-bottled-water-microplastics-1.4606182>

<sup>69</sup> Erik Solheim, UN Environment Programme Press Release. UN declares war on ocean plastic. 23 Feb 2017. <https://www.unenvironment.org/news-and-stories/press-release/un-declares-war-ocean-plastic>

<sup>70</sup> Pawar PR, Shirgaonkar S, and Patil RB, 2016, Plastic marine debris: Sources, distribution and impacts on coastal and ocean biodiversity, *PENCIL Pub. Biol. Sci.* Vol. 3(1):40-54.

bags<sup>71</sup>, as has Italy<sup>72</sup>. France has also enacted a ban on plastic tableware, which will take effect in 2020.<sup>73</sup> Within OECD countries, state governments have taken similar action, including California<sup>74</sup>, and the Australian states of South Australia<sup>75</sup>, Tasmania<sup>76</sup>, Northern Territory<sup>77</sup> and the Australian Capital Territory.<sup>78</sup> Local governments, including U.S. and Canadian counties, municipalities and cities, have also implemented bans on single-use plastic bags, and others are contemplating bans.<sup>79</sup> Montreal QC<sup>80</sup> and Victoria BC<sup>81</sup> have enacted by-laws prohibiting most single-use bags, and several other local governments in Canada are considering similar action. The City of Malibu, California, has prohibited polystyrene foam take-out containers, plastic cutlery, stir sticks, single-use plastic bags and other single-use items.<sup>82</sup>

Many more such bans are being considered. The European Union has very recently proposed a ban on a wide variety of single-use plastics.<sup>83</sup>

Provided that notification has been given in accordance with the processes contemplated by subsections 75(2) and 75(3) of *CEPA*, the Minister is required to review all these decisions from other jurisdictions in order to determine whether the substances are toxic, or capable of becoming toxic.

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<sup>71</sup> S. Rosemont, B. Strand and C. Kerr, [Lessons from the Countries Fighting to Kick the Plastic Bag Addiction](https://www.earthday.org/2018/04/20/lessons-from-the-countries-fighting-to-kick-the-plastic-bag-addiction/), Earth Day Network, 20 Apr. 2018. <https://www.earthday.org/2018/04/20/lessons-from-the-countries-fighting-to-kick-the-plastic-bag-addiction/>

<sup>72</sup> See Italy's Official Gazette at <http://www.gazzettaufficiale.it/eli/id/2017/08/12/17G00139/sg>. The measure requires use of biodegradable bags.

<sup>73</sup> R. Rupp, [France Just Banned Plastic Forks. What's Next?](#) National Geographic 3 Nov. 2016. The bans were enacted via France's [Energy Transition for Green Growth Act](#) of 2015 (**LOI n° 2015-992 du 17 août 2015 relative à la transition énergétique pour la croissance verte**) as amended.

<sup>74</sup> [Cal Pub Res Code § 42280-42288, Chapter 5.3. Single Use Carryout Bags](#)

<sup>75</sup> South Australia, [Plastic Shopping Bags \(Waste Avoidance\) Act 2008, 1.1.2009](#) (Parliament of South Australia).

<sup>76</sup> Tasmania, [Plastic Shopping Bags Ban Act 2013](#) (Parliament of Tasmania).

<sup>77</sup> Northern Territory, [Environment Protection \(Beverage Containers and Plastic Bags\) Act](#), 2017 (Parliament of Northern Territory).

<sup>78</sup> Australian Capital Territory, [Plastic Shopping Bags Ban Act 2010](#), A2010-49 R3 (Parliament of Australian Capital Territory).

<sup>79</sup> E.g. [San Francisco CA](#), [District of Columbia](#), [Seattle WA](#), the island counties of [Maui](#) and [Big Island Hawaii](#) within the State of Hawaii, [Leaf Rapids MB](#) and [Mexico City, Mex.](#)

<sup>80</sup> City of Montreal, by-law 16-051, [By-law prohibiting the distribution of certain shopping bags in retail stores](#), 22 Aug 2016.

<sup>81</sup> City of Victoria, by-law No. 18-008, [Checkout Bag Regulation Bylaw](#), 1 July 2018.

<sup>82</sup> [Malibu Municipal Code, Chapter 9.24 Ban on Plastic Food Packaging and other Plasticware.](#)

<sup>83</sup> European Commission Press Release, [Single-use plastics: New EU rules to reduce marine litter](#), 28

May 2018 (Details set out in EU [Proposal for a Directive on the reduction of the impact of certain plastic products on the environment](#))

Non-OECD countries have also taken action, and in some cases dramatic action, to ban or restrict use, manufacturing and distribution of plastics to control plastic waste, including Kenya,<sup>84</sup> Zimbabwe, Vanuatu, Bangladesh, Morocco, Rwanda<sup>85</sup> and China.<sup>86</sup>

## VI. Conclusion

Given emerging evidence regarding the prevalence and toxicity of domestic plastic pollution in Canada's soils, freshwater and marine areas, and the likelihood that this pollution has, and will continue to, spread outside Canadian territorial waters, the Minister should, in keeping with the precautionary principle take urgent action to assess and address this environmental threat. In particular, the Minister should:

1. Add single-use plastics, microplastics and plastic microfibers to the Priority Substances List for assessment pursuant to the subsection 76(3) request contained herein;
2. Assess whether obligations in relation to international water pollution under Part 7, Division 7 of *CEPA* have been triggered, and if so, take the required actions; and
3. In accordance with notification procedures contemplated under subsection 75(2) of *CEPA*,<sup>87</sup> assess whether the notification the Minister has received of legislation in OECD states and subdivisions of OECD states, as requisite notice to trigger the requirement to act under subsection 75(3) of *CEPA*.

Thank you for your consideration of this request and we look forward to receiving a response within the legislated timeframe.

Sincerely,



James Gunvaldsen Klaassen  
Barrister and Solicitor

<sup>84</sup> Kenya has issued a [Notice, dated 28 Feb 2017](#), under its *Environmental Management and Co-ordination Act, 1999*, Cap. 387, prohibiting the use, manufacture and importation of certain plastic bags for commercial and household packaging, and which can result in imprisonment and fines for breach.

<sup>85</sup> I. Calderwood, 16 Times Countries and Cities Have Banned Single-Use Plastics, *Global Citizen* 25 Apr 2018, Web: <https://www.globalcitizen.org/en/content/plastic-bans-around-the-world/>

<sup>86</sup> World Watch Institute: China Reports 66-Percent Drop in Plastic Bag Use, May 30, 2018; Web: <http://www.worldwatch.org/node/6167>.

<sup>87</sup> Environment and Climate Change Canada, Implementing Section 75 of the *Canadian Environmental Protection Act, 1999*, Draft for Public Comments, April 2016, available at <https://www.ec.gc.ca/ese-ees/default.asp?lang=En&n=F251F2AB-1>

c.

**Environmental Defence**

Muhannad Malas, Program Manager, Toxics - Email: [mmalas@environmentaldefence.ca](mailto:mmalas@environmentaldefence.ca)

**Living Oceans**

Karen Wrysten, Executive Director - Email: [kwristen@livingoceans.org](mailto:kwristen@livingoceans.org)

**Toronto Environmental Alliance**

Emily Alfred, Waste Campaigner - Email: [emily@torontoenvironment.org](mailto:emily@torontoenvironment.org)

**Équiterre**

Karen Ross, Project Manager, Pesticides and Toxic Substances  
– Email: [kross@equiterre.org](mailto:kross@equiterre.org)

**Ecology Action Centre**

Mark Butler, Policy Director - Email: [action@ecologyaction.ca](mailto:action@ecologyaction.ca)

**Greenpeace Canada**

Farrah Khan, Campaigner Arctic and Plastics - Email: [farrah.khan@greenpeace.org](mailto:farrah.khan@greenpeace.org)

**Sierra Club Canada Foundation**

Gretchen Fitzgerald, National Program Director - Email: [gretchenf@sierraclub.ca](mailto:gretchenf@sierraclub.ca)

**Canadian Environmental Law Association**

Joseph Castrilli, Counsel – Email: [castrillij@sympatico.ca](mailto:castrillij@sympatico.ca)  
Fe de Leon, Researcher and Paralegal - Email: [deleonf@cela.ca](mailto:deleonf@cela.ca)

**Citizens' Network on Waste Management**

John Jackson, Coordinator - Email: [jjackson@web.ca](mailto:jjackson@web.ca)

**David Suzuki Foundation**

Lisa Gue, Senior Researcher and Analyst - Science and Policy  
- Email: [lgue@davidsuzuki.org](mailto:lgue@davidsuzuki.org)

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