Reforming the Canadian Environmental Protection Act: The assessment and regulation of toxic substances should be equitable, precautionary, and evidence-based

Brief to the Standing Committee on Environment and Sustainable Development

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Submitted by:

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This brief aims to assist the Standing Committee on Environment with its important review of the *Canadian Environmental Assessment Act, 1999*, SC 1999, c 33 ("*CEPA 1999*" or "the Act").[1] It supports and elaborates on the comments that I will provide as a witness on June 9, 2016.

In my capacity as an Associate Professor at York University, I research, write and teach about topics that include environmental health, chemical regulation and environmental justice. From 2007-2011, I was appointed by the federal Ministers of Health and Environment to the Chemicals Management Plan Challenge Advisory Panel. I served as the past Director of the National Network on Environments and Women's Health, a research institute funded by Health Canada. My edited book, *Our Chemical Selves: Gender, Toxics, and Environmental Health*, was published in 2015. For more information on my qualifications, refer to Appendix A.

In my brief, I address the following two topics in turn:

[1] I gratefully acknowledge the contributions of Lara Tessaro, LL.B., a research associate and environmental lawyer, to the research and preparation of this brief.

This brief will be accompanied, in coming weeks, by an addendum. The Addendum will set out some specific language for legislative amendments that could implement my recommendations.

My intervention is focused on Part 5 of the Act, which is entitled "Controlling Toxic Substances".[2] In particular, I focus primarily on the regime governing assessment, prevention and control of "existing substances".[3] Existing substances refers to the approximately 23,000 substances that, prior to the 1990s, came into use in Canada without environmental or health assessments. My recommended amendments seek to remedy key weaknesses in the assessment and regulation of toxic substances in Canada.

Canadians desperately need better protection from the harmful, long-term effects of endocrine-disrupting chemicals and other toxic substances with carcinogenic, neurotoxic, developmental or reproductive effects. This Committee is uniquely positioned to ensure that outcome, by recommending some much-needed and long-overdue improvements to Part 5 of *CEPA 1999.*

A. Part 5 of *CEPA 1999* is inadequate to achieve pollution prevention

The primary purpose of CEPA 1999 is to contribute to sustainable development through pollution prevention, and the Act confirms that the Government of Canada is committed to implementing pollution prevention as the priority approach to environmental protection.[4] The Act also commits the Government of Canada to implementing the precautionary principle.[5]

However, while these opening provisions declare a commitment to pollution prevention and to precaution, the operative provisions in Part 5 largely fail to implement these objectives. Both in its design and in its implementation by government, Part 5 has failed to prioritize either the prevention of pollution, or the mandatory precautionary action that is necessary to protect the health of Canadians.

Instead, Canadians are exposed to growing volumes, uses and sources of existing toxic substances, and to many new ones. Every day, Canadians encounter significant health risks from toxic substances – from ambient pollution due to industrial releases to air and water, to exposures to toxics in consumer products. These exposures are linked to a myriad of diseases, including cancers, developmental diseases, reproductive disorders and neurological problems.

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[2] For clarity, this should not be taken as implying that other parts of *CEPA 1999* do not require reform.

[3] The regime for "existing substances" is created primarily by ss. 64-79 and 90-103. In this brief, I do not address in detail the regime for "new substances" at ss. 80-89, except where I submit that some of my recommendations for the assessment and control of existing substances should also be adopted in relation to new substances.

[4] *CEPA 1999,* Declaration and Preamble. "Pollution prevention" is defined in the Act, at s. 3, to mean "the use of processes, practices, materials, products, substances or energy that avoid or minimize the creation of pollutants and waste and reduce the overall risk to the environment or human health."

[5] *CEPA 1999,* Preamble and s.2(1)(a).

CEPA 1999 can no longer reasonably be argued to be state-of-the-art legislation up to the task of responding to these challenges. Parliament enacted the Act 17 years ago. The government made the Persistence and Bioaccumulation Regulations (SOR/2000-107) over 16 years ago. A decade ago, government officials devised the Chemicals Management Plan ("CMP").

Meanwhile, the European Union's substantially and broadly reformed chemical law, the REACH Regulation, is a decade old.[6] In 2009, Japan amended its chemical legislation, aligning its approach to risk management more closely with the EU.[7] In the US, a bill to reform the *Toxic Substances Control Act* has just been introduced in the House of Representatives and is currently before the Senate.[8] While the bill has been criticized as inadequate by leading civil society organizations,[9] there are a few limited, discrete elements of the bill that improve upon *CEPA 1999*. In short, Canada's regulatory approach is markedly dated.

Further, *CEPA 1999* has been overtaken by scientific developments. Scientific research is steadily advancing on the health risks posed by household chemicals. Studies have linked environmental disease to exposures to endocrine disrupting chemicals, at very low doses and at key development times (known as "critical windows of vulnerability", such as infancy, puberty and pregnancy). That is, science increasingly rebuts the old idea that "the dose makes the poison" – rather, there seems to be ***no safe thresholds for health effects*** for entire categories of chemicals.[10] Scientific awareness of epigenetic effects has also grown exponentially in recent years – and with it, our understanding of the ways in which environmental exposures can affect the health of future generations. Presently, the Act does not ensure an equitable, precautionary, or evidence-based response to these challenges.

Additionally, since 1999, the environmental justice movement has grown in Canada. It is increasingly recognized that toxic substances, and the laws that regulate them, have differential effects on vulnerable populations and marginalized communities. Women, infants and children, and members of low-income, racialized and indigenous communities, are often more highly exposed to toxic substances, and they experience unequal effects of these exposures. Further,

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[6] Regulation (EC) No 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorisation and Restriction of Chemicals ("EU REACH Regulation").

[7] Kashinho (Japanese Chemical Substances Control Law), Law No. 117 of 1973 ("Japanese CSCL"). The 2009 amendments expand Class 2 substances to cover chemicals like endocrine disrupting substances; they also now require use of exposure data, in addition to hazard data, for the purpose of prioritizing chemicals for assessment. See Adam DK Abelkop et al., *Persistent, Bioaccumulative, and Toxic (PBT) Chemicals: Technical Aspects, Policies, and Practices* (Boca Raton, FL: CRC Press, 2016), at 151-153, 158-160.

[8] S. 697, *A bill to amend the Toxic Substances Control Act to reauthorized and modernize that Act, and for other purposes* (short title as reported to Senate: *Frank R. Lautenberg Chemical Safety for the 21st Century Act*).

[9] See e.g. Environmental Working Group, "New TSCA Bill Falls Short of Protecting Americans From Toxic Chemicals" (May 24, 2016) <http://www.ewg.org/enviroblog/2016/05/new-tsca-bill-falls-short-protecting-americans-toxic-chemicals>.

[10] Dayna Nadine Scott and Sarah Lewis, "Sex and Gender in Canada's Chemicals Management Plan" in Dayna Nadine Scott, ed, *Our Chemical Selves: Gender, Toxics and Environmental Health* (Vancouver: UBC Press, 2015).

the burden of managing exposures falls disproportionately on women.[11] For these reasons, the failure of Part 5 to prevent pollution has had disproportionate and inequitable impacts.

The challenges are not only with the Act itself. In my respectful submission, the government's use of the CMP, since the categorization exercise concluded in 2006, has been disappointing. In the last decade, *CEAA 1999* and the CMP have lead to controversial toxicity assessments that have relied excessively on the need for exposure data and underplayed the risk of adverse effects at very low doses.[12] Further, government officials have created practices under the CMP that are not authorized by the Act and that have created barriers to timely, precautionary action.

In fairness, I acknowledge that the CMP has encouraged some positive practices beyond what is required by the Act, such as inclusion of endocrine disruption data in assessments and use of "substance groupings" that may facilitate safe substitution. However, these practices are not legally codified, and their implementation is neither standardized nor guaranteed.

CEPA 1999 and the CMP have failed to protect Canadians and their environments from a great many harmful substances. As examples, I point to bisphenol A ("**BPA**"), brominated flame retardants such as **PBDEs**, and **siloxane D5**. These examples serve to highlight different ways in which Canada's regulatory approach requires reform.

BPA is an endocrine disrupting chemical that has been linked to breast cancer, amongst other diseases. BPA is used to make hard clear plastics like polycarbonates, which are then used to manufacture many consumer products like water bottles, electronic equipment and appliances. It is also used to make coatings or linings for food and beverage cans, and thermal paper.

The government's assessment of BPA relied heavily on an exposure assessment, underplaying evidence showing BPA to be a hazard. Thus, while the government properly found BPA to be a toxic substance in 2010, it then relied on the exposure estimates to justify a very limited regulatory response – the government banned under the *Hazardous Products Act* the importation, sale and advertising of baby bottles containing BPA in 2012. Believing that, for adults, exposures to the average Canadian would likely be within 'safe' levels, the government did not take any regulatory action under *CEPA 1999* that would address exposures from other types of consumer products.

Many environmental groups lauded the government's decision to remove BPA from baby bottles. However, in my view, BPA was a demonstrable regulatory failure. BPA remains very widely used in Canada, and Canadians remain broadly exposed. Infants may no longer

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[11] *Ibid.* Additionally, I note that gender-based analysis is currently the subject of a House of Commons Standing Committee on the Status of Women. See House of Commons, "Status of Women Committee Invites the Public to Submit Written Briefs for its Study on Gender-Based Analysis in the Federal Government" (May 2, 2016), at http://www.parl.gc.ca/HousePublications/Publication.aspx?Mode=1&Parl=42&Ses=1&DocId=8226138&Language=E.

[12] Dayna Nadine Scott and Sarah Lewis, "Sex and Gender in Canada's Chemicals Management Plan", *supra* note 10, at pp 85-89. See also Dayna Nadine Scott, "Testing Toxicity: Proof and Precaution in Canada's Chemicals Management Plan" (2009) 18:2 RECIEL 59.

consume BPA leaching from baby bottles themselves, yet breast-fed babies continue to consume it through their mothers' milk. Other Canadians, including people in critical windows of vulnerability, continue to consume it daily through water bottles, beverage and food cans. While some manufacturers have responded to regulatory inaction by removing BPA from products voluntarily, other substances such as BPS, a closely related and unregulated chemical, have been quickly adopted as "regrettable substitutes" to BPA. Other jurisdictions have been studying stronger regulatory responses, with California recently banning BPA in most food packaging.

Polybrominated diphenyl ethers (PBDEs) are used as flame retardants in many different industrial processes and consumer products. In addition to causing serious environmental effects, they are linked to endocrine and reproductive disorders, and to neurotoxic harm to children. DecaBDE is ubiquitous in Canadians' homes and workplaces, found in everything from furniture to carpets to electronics. Importantly, the main source of exposures are PBDEs within consumer products already in use in or imported to Canada.

Following the screening assessment, in 2006, the government concluded that PBDEs were toxic substances and listed *most* forms of PBDE under Schedule 1. Controversially, the government did not list or prohibit decaBDE in its PBDE Regulations – despite that decaBDE was the only form of PBDE still widely used in Canada at that time. A number of environmental organizations filed a formal objection in 2008 to this limited regulatory action. In 2010, the government finally committed to regulatory action that would prohibit decaBDE in Canadian consumer products.

However, in the last six years, the government still has not taken its promised regulatory action to ban PBDEs including decaBDE. In April 2015, it proposed to add PBDEs, including decaBDE, to the *Prohibition of Certain Toxic Substances Regulations, 2012*. Yet this regulatory proposal was largely meaningless, as it would not prohibit decaBDE in imported consumer products. Canada has dragged its heals on regulating PBDEs for a decade. By contrast, the EU has restricted or banned PBDEs in many consumer products for years.

Decamethylcyclopentasiloxane, known as **"Siloxane D5" or "D5",** is used in a wide variety of cosmetics and personal care products, in coatings, sealants and lubricants, and in dry cleaning. In 2008, an Environment Canada screening assessment found D5 to be CEPA-toxic, and in 2009, the Ministers proposed to list D5 on Schedule 1. An industry association objected and requested a board of review, which the government agreed to establish. In 2011, that Board of Review disagreed with Environment Canada scientists, finding that D5 did not pose danger to the environment and was not toxic for *CEPA* purposes.[13] The Minister of the Environment decided to accept the Board's findings. As a result, D5 was not listed as a toxic substance in Canada and there are no restrictions on D5 under *CEPA 1999.*

The Board's approach highlights concerns both with *CEPA 1999* and its implementation. The Board reached its conclusion by relying heavily on a lack of data on exposures and

[13] Siloxane D5 Board of Review. 2011. Report of the Board of Review for Decamethylcyclopentasiloxane (D5). Ottawa, ON, Canada. October 20, 2011. 83 pages.

concentrations. Further, it treated the Persistence and Bioaccumulation Regulations as if they were a "regulatory threshold", treating the bioaccumulation value as if it were a necessary precondition to finding D5 to be CEPA-toxic. By contrast, under the REACH Regulation, the EU Member States have concluded that D5 is a "very persistent, very bioaccumulative" substance.[14] Consequently, the United Kingdom has formally sought regulatory restrictions on D5 in personal care products, with regulatory decisions to come shortly.[15] Furthermore, recent research has shown that D5 is found in high concentrations in the tissues of Great Lakes fish.[16] Thus, D5 shows the risks of a regulatory approach that relies on proven exposure data.

Various reforms recommended by Parliamentarians in 2007 could have gone some distance towards implementing pollution prevention and precaution.[17] However, those proposals alone are not enough. They would not have prevented the poor regulatory outcomes for BPA, PBDEs and D5. After a decade of weak implementation of Part 5, resulting in failure to achieve pollution prevention or precautionary outcomes, more substantial amendments are now needed.

Therefore, this Committee should recommend a number of simple, feasible reforms to the Act that would clarify and strengthen its operation, would actually *prevent* pollution, and would better protect Canadians from the risks posed by toxic substances. Most of these proposed reforms are uncontroversial. The Standing Committee recommended some similar changes in 2007. Further, some of these proposed reforms would simply codify practices that the assessors in Health Canada and Environment Canada are already employing. Other recommendations seek to modify existing assessment practices and, to create new requirements to control toxic substances through mandatory precautionary action.

With only one exception, industry representatives testifying before this Committee have opposed any reforms to Part 5.[18] This position is no more constructive or credible now than

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[14] European Chemicals Agency, Member State Committee Opinion on persistency and bioaccumulation of Octamethylcyclotetrasiloxane (D4) EC Number: 209-136-7 CAS Number: 556-67-2 and Decamethylcyclopentasiloxane (D5) EC Number: 208-764-9 CAS Number: 541-02-6 according to a MSC mandate, 22 April 2015 at <http://echa.europa.eu/documents/10162/13641/art77-3c_msc_opinion_on_d4_and_d5_20150422_en.pdf >. See also European Chemicals Agency, "Opinions of the MSC adopted under specific ECHA's Executive Director requests" at <http://echa.europa.eu/about-us/who-we-are/member-state-committee/opinions-of-the-msc-adopted-under-specific-echa-s-executive-director-requests>.

[15] UK Proposal for a Restriction, June 2015, at <http://echa.europa.eu/documents/10162/9a53a4d9-a641-4b7b-ad58-8fec6cf26229>. See also European Chemicals Agency, *Public Consultation Notice: UK proposes restriction on octamethylcyclotetrasiloxane (D4) and decamethylcyclopentasiloxane (D5) in personal care products that are washed off in normal use* ("ECHA Public Consultation Notice, 2015") at <http://echa.europa.eu/documents/10162/12e03ccd-7c84-4325-bde1-9daeb562a6be>.

[16] DJ McGoldrick and EW Murphy, Concentration and distribution of contaminants in lake trout and walleye from the Laurentian Great Lakes (2008-2012), Environmental Pollution (2015), http://dx.doi.org/10.1016/j.envpol.2015.12.019.

[17] Standing Committee on Environment and Sustainable Development. *The Canadian Environmental Protection Act, 1999 – Five-Year Review: Closing the Gaps* (House of Commons, April 2007) ("2007 Standing Committee Report").

[18] To date, one only witness appearing for an industry association has advocated a change to Part 5. In response to a question from a member, Bob Masterson indicated that his association would have one recommendation around

when the Standing Committee proposed reforms in 2007. Respectfully, it is wrong to conclude that experiences under the Act or the CMP have been overwhelmingly positive. Apparently, the experience of industry has been positive, as its representatives to date have testified.[19] However the experience has been negative for people bearing the burden of environmental disease from increasing exposures to industrial chemicals. This Committee should reject the status quo and act to protect the health of Canadians.

Each of the amendments that I offer would advance one or more of these four fundamental principles:

1. ***CEPA 1999* should better protect vulnerable populations and communities**. **Put another way, the Act should advance environmental justice**. In order to protect vulnerable populations, Part 5 must be amended to allow harmful chemicals to be more readily designated as toxic substances (s. 64). Further, Part 5 must require mandatory precautionary action for substances declared toxic (s. 77). The current default approach under Part 5 – which expects Canadians to reduce their own exposures to under-regulated toxic substances *via* consumption choices – is inequitable and risky.

2. **Part 5 should implement the precautionary principle by lowering barriers to listing toxic substances and by requiring mandatory preventative or control actions.** Among other things, precaution would require industry to demonstrate that a substance can be used safely, if mandatory preventative or control actions are to be relaxed.

3. **The assessment and regulation of toxic substances under Part 5 should be evidence-based.** A scientific evidence-based approach (that is also precautionary) would take greater account of emerging science; for example, for endocrine disrupting chemicals, assessments would consider cumulative exposures and low dose exposures in critical windows of vulnerability. Assessment and risk management actions taken under Part 5 of the current Act routinely ignore or underplay such relevant data.

4. **Part 5 should require consideration of alternatives and of safe substitution, in the assessment and regulation of toxic substances.** Currently, Part 5 fails to prevent "regrettable substitutions", whereby industry replaces regulated toxic substances with other equally (or more) harmful substances for the same uses. In this respect, Part 5 is outdated and ineffective compared to chemical regulation in the European Union.

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the definition of "toxic" in the Act, in its written comments. These written comments are not yet publicly available. Evidence of Bob Masterson, Chemical Industry Association of Canada, March 10, 2016 at 12:25.

[19] Bob Masterson, Chemical Industry Association of Canada, March 10, 2016 at 11:05; Shannon Coombs, Canadian Consumer Speciality Products Association, May 19, 2016 at 11:10; Darren Praznik, Canadian Cosmetic, Toiletry and Fragrance Association, May 19, 2016 at 11:20.

B. Recommended amendments to strengthen *CEPA 1999*

My recommendations arise from the four principles set out above – equitable protection of vulnerable populations, precaution, evidence-based decision making and substitution.

1. Amend section 64 to ensure that harmful chemicals are designated as toxic substances

Section 64 sets out the test for determining if a substance is toxic for the purpose of Part 5 (referred to informally as "CEPA-toxic").

Under s. 64, a toxic substance is one that "*is entering or that 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*.*

This test has limited capacity to produce precautionary regulatory outcomes. It permits government to conclude that harmful chemicals, which may constitute a danger to the environment or human health, are *not CEPA*-toxic. As a result, these harmful chemicals may not be listed in Schedule 1 (List of Toxic Substances) nor regulated under the Act. One well-known example is the government's decision not to list D5 as a toxic substance.

Additionally, some harmful chemicals have been determined to be toxic substances as a result of satisfying one of the three criteria in s. 64 but not the other two criteria. While meeting one criterion is enough to be listed as a toxic substance, this often leads Ministers to narrow and limit their proposed regulatory actions, as they believe they must be responsive only to the one criterion deemed satisfied.

Likewise, the focus in the opening language of s. 64 on exposure has lead the government to later limit regulatory action on substances found to be toxic to only a few select exposures. As set out above, this occurred with BPA, where regulatory action was limited to baby bottles.

Further, as occurred with both BPA and D5, assessors often underestimate exposures. Only a few years after weak Canadian regulatory decisions on BPA and D5, other jurisdictions have proposed or taken stronger action based on approaches that give less weight to exposure. Exposure estimates are made for the "average" person, and thus cannot take into account the level and effect of exposures on vulnerable people and marginalized populations. The systematic under-estimation of exposures makes the s.64, as it is currently constructed, ineffective as a precautionary instrument.

Notably, the s. 64 test will be more problematic going forward into the medium and lower priority chemicals categorized prior to 2006. Many chemicals in this class were under-prioritized

because endocrine disruption potential was not assessed.[20] . As the evidence now tells us that harmful effects of endocrine disrupting chemicals in fact result at very low doses, the emphasis on exposure data in s. 64 could create barriers to listing and severely restrict our capacity to regulate so as to protect human health.

Put another way, the overreliance on exposure assessment within s. 64 **puts people at risk.** It does not adequately take account of scientific evidence rebutting the notion that the "dose makes the poison". It often causes delays in screening assessments while ministry staff attempt to obtain exposure and use data that are increasingly irrelevant. It is often used to justify narrowly scoping risk management measures. **None of these outcomes are equitable, evidence-based or precautionary.**

Furthermore, the overemphasis on exposure assessment is weaker than the precautionary approach employed in the EU and Japan. In the EU, the initial registration stage separates hazard from risk, by only requiring registrants to provide information about exposure for those substances that have been assessed to be harmful (for example, if persistent, bioaccumulative and toxic).[21] Further, REACH treats persistent, bioaccumulative and toxic substances, and certain other categories of hazardous substances, for the purposes of authorization (prohibition), as not able to be "adequately controlled" – in other words, it recognizes that there is no safe level of release or exposure, which leads to prohibition or restriction.[22] Japan's Chemical Substances Control Law (Kashinho) likewise focuses many elements of its prioritization, assessment and management processes on hazard characteristics – persistence, bioaccumulation and toxicity, with increased emphasis since 2009 on endocrine disruption – and less focus on exposure.[23]

RECOMMENDATION #1 – Section 64 should be amended to ensure that harmful chemicals are designated as toxic substances.

Specifically, the Committee should remove the excessive emphasis in s. 64 on exposure and use, by removing the words "*is entering or may enter the environment in a quantity or concentration or under conditions that".*

[20] Dayna Nadine Scott and Sarah Lewis, "Sex and Gender in Canada's Chemicals Management Plan", *supra* note 10, at pp 85-89.
[21] EU REACH Regulation, Arts 14 and 31.
[22] EU REACH Regulation, Arts 60(2)-(3). However, through the use of burden-shifting provisions, if a registrant can demonstrate that the socioeconomic benefits outweigh the risks and that there are no suitable alternatives, such substances can still be authorized; REACH Regulation Art 60(4)(a)-(d).
[23] Japanese CSCL, Arts 2(2)-(4), and Arts 13-16. As in the EU, the automatic management restrictions on hazardous substances may be lifted or exempted through burden-shifting provisions, if applicants can demonstrate *inter alia* an "essential use", that the quantify is needed, and that substitution chemicals are difficult to obtain; see Art 25. See also Adam DK Abelkop et al., *Persistent, Bioaccumulative, and Toxic (PBT) Chemicals: Technical Aspects, Policies, and Practices* (Boca Raton, FL: CRC Press, 2016), at 153-154 and 157-160.

2. **<u>In the alternative to Recommendation #1, add a new section 64.1 clarifying that for some harmful chemicals there may be no safe exposure thresholds, and requiring toxicity assessments to consider exposure data relevant to vulnerable populations.</u>**

If this Committee declines to endorse Recommendation #1, it has a second option that would still allow it to respond to the concerns justifying Recommendation #1. The second option for remedying the s. 64 test is to ensure that exposure assessments examine the *type* of exposure data that matters to vulnerable populations and marginalized communities, and to clarify how s. 64 should apply where there is no evidence of safe exposure thresholds.

Specifically, the Committee could recommend the addition of section 64.1. Section 64.1 would *require* the Ministers or their delegates, when determining if a substance is toxic, to assess:

- exposures of vulnerable populations and marginalized communities, including exposures during critical windows of vulnerability; with appropriate use of safety factors;[24] and
- Aggregate exposure to and cumulative and synergistic effects of the substance, and to the class of substances with similar modes of action from all relevant sources.

Furthermore, section 64.1 would confirm, for greater clarity, that in some circumstances, such as for endocrine disrupting substances, the *"quantity or concentration*" at which a substance may constitute a danger to the environment or to human life or health may involve very low doses or there may be no safe exposure threshold.

To be clear, this second option is weaker that Recommendation #1. By contrast, Recommendation #1 would provide ***all*** Canadians with stronger protection, including vulnerable populations and marginalized communities.

RECOMMENDATION #2:

As an alternative to Recommendation #1, add a new section 64.1 to clarify that, for some substances, there may be no safe exposure thresholds.

Section 64.1 would also require assessment of exposure and use data relevant to vulnerable populations and marginalized communities, such as exposures during critical windows of vulnerability, and assessment of aggregate and cumulative exposures to the substance and the class of substances with a similar mode of action.

[24] See also 2007 Standing Committee Report, Recommendation 17.

3. Add a mandatory duty to conduct alternatives assessment in all screening assessments

Under s. 68(a)(xii) of the Act, in the course of a screening assessment (or other assessments of whether a substance is toxic), either Minister currently has the discretion to investigate the "development and use of alternatives to a substance". However, this is purely discretionary.

Alternatives assessment should be a mandatory requirement of all screening assessments. Alternatives assessment involves identifying and comparing relative risks of similar substances, or classes of substances, that may be used by industry as functional alternatives to the substance under review. Alternative assessments ensure that decision-makers can identify safer substitutes. Such information is necessary to prevent "regrettable substitutions", whereby industry replaces a toxic substance that is newly subject to regulatory controls with an equally harmful chemical. As noted above, this has clearly occurred with regrettable substitutes to BPA.

Under the CMP, the government has already introduced a "substance groupings initiative" that contains elements of alternatives assessment, but has not yet applied this approach widely.

Further, alternatives assessment at the screening assessment stage is critical to timely, efficient and fair application of the substitution principle at the later regulatory action stage. Absent early identification of alternatives, there is a risk of information gaps on safe or regrettable substitutes.[25]

RECOMMENDATION #3:

Add a mandatory duty to assess alternatives as part of all screening assessments (and in other assessments of whether a substance is toxic or capable of becoming toxic) of existing substances.[26]

4. End the use of inappropriately stringent criteria for persistence and bioaccumulation in screening assessments (or in other reviews of whether a substance is toxic)

There are at least two concerns with the Persistence and Bioaccumulation Regulations.

First, these Regulations create a higher bar in Canada than in any other industrialized country to identify a substance as persistent or bioaccumulative. Their cutoff values for persistence and bioaccumulation are very high, creating the least protective standards in the industrialized world. For a table comparing the cutoff criteria in Canada's *Persistence and Bioaccumulative Regulations* to more protective criteria in Europe, the US and Japan, see **Appendix B.**

[25] This proposed new requirement of mandatory alternatives assessment for existing substances is equally important to the regulation of new substances.

[26] This recommendation is intended to complement Recommendation #7 (on substitution) below.

Second, the government has been using the Persistence and Bioaccumulation Regulations for a purpose for which they were not intended. These Regulations were intended for two purposes. First, to allow the Ministers to determine which substances must be virtually eliminated.[27] Second, to help the Ministers to decide which substances they would categorize as the highest priority substances, by 2006.[28]

However, government officials routinely use these Regulations for the unintended purpose of assessing whether a substance is toxic under *CEPA.* That is, government officials have treated the criteria in s. 77(3), including whether a substance is "persistent and bioaccumulative in accordance with the regulations", as preconditions that must be met before a substance will be found to be toxic under s. 64 Combined with the unduly high cutoff criteria in the Persistence and Bioaccumulation Regulations, this approach effectively requires that a substance must be **'ultra-toxic'** – very persistent, very bioaccumulative and inherently toxic – before it can be listed or regulated as a toxic substance.

This approach is inconsistent with other jurisdictions internationally. A good example of this D5. As noted above, Canada declined to regulate in reliance on a Board of Review approach that effectively required D5 to be "ultra-toxic". By contrast, the EU has assessed D5 as "very persistent and very bioaccumulative" and proposed regulatory restrictions under REACH.[29]

This sets the bar far too high. Section 64 does not, and should not, require a harmful chemical to be persistent or bioaccumulative in order for it to be "CEPA-toxic". While it is appropriate for officials to consider if a substance is persistent or bioaccumulative in the course of a screening assessment, including for the purpose of determining whether virtual elimination is required, it is problematic to require such criteria to be met as a legal precondition to a toxicity determination under *CEPA 1999*.

RECOMMENDATION #4:

Amend the outdated Persistence and Bioaccumulation Regulations to be consistent with criteria under the EU REACH Regulation.

Add section 64.2 to confirm, for greater clarity, that a substance need not be persistent or bioaccumulative to be determined to be toxic under *CEPA.*

5. Strengthen the duties on industry to provide information, data and test results

Sections 70-72 of the Act create relatively weak duties on industry to provide the government with information about the chemicals that it uses. In 2007, the Standing Committee made useful recommendations about strengthening government's powers to obtain relevant information.

[27] *CEPA 1999,* ss. 77(3) and (4).
[28] *CEPA 1999,* s. 73(1).
[29] See discussion *supra* at notes 13, 14 and 15.

Currently, only the Minister of Environment and not the Minister of Health has the power under these provisions to request information from industry. As both Ministers are responsible for assessing and regulating substances, both should be able to request information to those ends.

Industry's duties to provide information are triggered in two circumstances. First, where industry obtains information that reasonably supports the conclusion that the substance is toxic of capable of becoming toxic, it shall provide it to the Minister of Environment (s. 70). Second, industries must provide information if the Minister gives notice in the *Canada Gazette* requiring them to identify if they engaged in an activity or to provide information and samples (s. 71).

This approach is cumbersome, and has only rarely been used. If the government requires industry to provide information or data, or to conduct testing, for the purposes of assessing whether a substance is toxic or determining whether and how to regulate a toxic substance, the government should be able to ask without formal notice in the *Gazette,* and industry should be required to respond to all such requests.

Additionally, the Ministers should be able to request *any* documents, information, data or testing that is for the purposes of assessing whether a substance is toxic or capable of become toxic, or assessing whether or how to regulate or control a substance. Further, the Ministers should be able to request information relevant to assessment or regulation of a substance at any time.[30]

Section 70-72 create an unfortunate incentive for industry to not gather information, data or test results unless they receive a formal request from government.

By contrast, the EU puts the burden of producing safety data on industry – a principle stated as "no data, no market".[31] Under REACH, any manufacturer or importer of a substance in quantities of more than 1 tonne per year is required to submit a registration dossier to the European Chemical Agency. These dossiers provide basic information on the company, the properties of the substance, the manufacture and use of the substance, environmental fate and pathways, toxicological information, guidance on safe use, and research summaries.[32] As of today, it appears that registrants have submitted 45,373 dossiers for 9472 unique substances.[33]

Furthermore, if a registrant produces more than 10-tonnes of a substance, it must also submit a Chemical Safety Report with information on hazards posed by the substance and an assessment of whether the substance is "persistent, bioaccumulative or toxic" or "very persistent, very bioaccumlative". If the substance is indeed "PBT" or "vPvB" or otherwise hazardous, industry must then provide further information, including on exposure and risk.[34]

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[30] See also 2007 Standing Committee Report, Recommendation 5.
[31] EU REACH Regulation, Art 5.
[32] EU REACH Regulation, Arts 6, 7 and 10(1).
[33] European Chemicals Agency, "Registration Statistics" at <http://echa.europa.eu/regulations/reach/registration/registration-statistics> (accessed on June 2, 2016).
[34] EU REACH Regulation, Arts 14 and 31.

Finally, all of these requirements apply regardless of whether the substance is ongoing a substance evaluation (akin to a screening assessment). During a dossier evaluation or substance evaluation, Member State regulators may request more information from industry – without the various restrictions and formalities that characterize ss. 70-72.[35]

RECOMMENDATION #5:

Amend ss. 70-72 so as to:

- **Extend powers to request information to both Ministers;**
- **Empower the Ministers to request any information relevant to assessing or regulating a substance, at any time;**
- **Oblige industry to respond in a timely manner to all such requests; and**
- **Consistent with "no data, no market", require manufacturers and importers of substances, above a certain volume, to submit similar dossiers and chemical safety reports that they must provide in the EU.**

6. Amend s. 77 to require mandatory precautionary action for toxic substances, by removing the "do nothing" regulatory option, and by requiring consideration of vulnerable populations and cumulative effects when determining preventative or control measures

To create a more precautionary and equitable regime for regulating toxic substances, s. 77 of the Act requires thorough revision.[36] My main concerns with s. 77, and with the weak regime for regulating toxic substances under *CEPA 1999*, are threefold.

First, a key shortcoming of *CEPA 1999* is that determining a substance to be "toxic" under the Act does not lead automatically to any obligation on the part of the government to prevent or control its release into the environment. Currently, once a substance is declared to be "toxic", Canada becomes authorized to act to reduce exposure – but it is not required to do anything specific.

Indeed, in s. 77(2)(a), the Act explicitly allows the government to "do nothing" in response to a finding that a substance is toxic.[37] This option needs to be removed from the legislation.[38]

[35] EU REACH Regulation, Arts 40-42 (dossier evaluation) and Arts 46 and 50 (substance evaluation).
[36] More specific legislative language for the Committee's consideration will follow in the addendum to this brief.
[37] *CEPA 1999,* s. 77(2)(a).
[38] It is anticipated that industry may submit that the "do nothing" option is appropriate in the circumstance where all manufacture, use, sale and import of a toxic substance and products containing that substance are already fully regulated under other federal legislation. Should that be a concern, the Act could easily be amended to provide that this is the *only* circumstance in which the "do nothing" option is permissible.

In contrast to "doing nothing", Canadians expect that mandatory precautionary action will follow upon a finding of toxicity, such that toxic substances are automatically subject to some controls that prevent or reduce our exposure to them.

This is the approach taken in many other industrialized countries. Other jurisdictions automatically impose certain restrictions on toxic substances, unless industry can demonstrate that the substance is safe, or that socio-economic considerations should outweigh pollution prevention, in which case mandatory restrictions may be relaxed. Such "burden-shifting" requirements exist under the EU's REACH Regulation, which allows prohibitions on hazardous substances to be avoided if a registrant can demonstrate that the substance's socio-economic benefits outweigh the risks and that there are no suitable alternatives to the substance.[39] Likewise, under Japan's CSCL, management restrictions that are imposed automatically on certain categories of hazardous substances may be lifted or exempted if applicants can demonstrate, under various provisions, an "essential use", the quantity of the substance that is needed, and that substitution substances are difficult to obtain.[40]

This is not a new idea in Canada, either. In 2007, the Committee endorsed the principle that industry should hold the burden of demonstrating that a substance's risks are acceptable.[41] However, this principle is not meaningfully operationalized through any provisions in Part 5.

Second, and relatedly, another key shortcoming of *CEPA 1999* is its failure to provide the government with any principled criteria guiding decisions on how to regulate a toxic substance according to the precautionary principle. Remarkably, s. 77 provides no guidance at all in deciding what preventative or control actions should be taken for substances found to be toxic. Beyond indicating that certain substances must be listed in Schedule 1 and proposed for virtual elimination, [42] s. 77 is otherwise silent on the critical question of *what preventative or control actions should be taken.*

The only provision that provides any specific guidance on what preventative or control actions should be taken to regulate toxic substances is s. 90(1.1), which requires the Ministers to "give priority to pollution prevention actions" when developing proposed regulations or instruments. This is useful as a general, high-level principle. However, it is not sufficient to ensure precautionary regulatory outcomes, as demonstrated by the Canadian experience with BPA and PBDEs.

I submit that certain matters should be investigated in every decision about how to regulate a toxic substance. Indeed, the *Charter of Rights and Freedoms* may require that impacts on

[39] EU REACH Regulation, Arts 60(4)(a)-(d).
[40] Japanese CSCL, Arts 13-16 and 25. See also Adam DK Abelkop et al., *Persistent, Bioaccumulative, and Toxic (PBT) Chemicals: Technical Aspects, Policies, and Practices* (Boca Raton, FL: CRC Press, 2016), at 157-160.
[41] 2007 Standing Committee Report, Recommendation 2.
[42] *CEPA 1999,* ss. 77(3) and (4). Subsection 77(3) requires mandatory listing under Schedule 1 for what I have described, above, as "ultra-toxic" substances.

vulnerable populations and marginalized communities be taken into account in certain regulatory decisions.

In particular, the Act should be amended to require investigation of the effects of any proposed or final regulation or instrument on vulnerable populations and marginalized communities.

Similarly, the Act should also be amended to require investigation of aggregate exposures, and cumulative and synergistic effects, in determining how to regulate a toxic substance.

Environment Canada queried whether the Act adequately considered vulnerable populations in the last statutory review of *CEPA 1999,* in 2006.[43] The Standing Committee likewise recommended, in 2007, that vulnerable populations be taken into account in assessments, including so as to better operationalize the precautionary principle.[44] The Senate did the same in its report in 2008.[45] Indeed, the US bill aimed at reforming the *Toxic Substances Control Act* would, if enacted, require the US government to consider the most vulnerable populations in assessments.[46]

As an alternative recommendation, I would submit that if s. 64 is not revised to better protect Canadians, the Act should at minimum require the Ministers to investigate exposures of vulnerable populations and marginalized communities, as well as aggregate exposures and cumulative and synergistic effects, in all screening assessments (and other assessments of whether a substance is toxic).

Finally, it may be that investigation of matters set out in section 68 should also be made mandatory rather than discretionary, should they have implications for vulnerable populations.[47]

Third, there is presently no duty on government, to undertake monitoring programs in relation to toxic substances. To measure the effectiveness of preventative or control actions over time, I recommend a new requirement of mandatory monitoring of listed toxic substances in environmental media and in human bodies. Accomplishing this will require substantial improvement to the National Pollutant Release Inventory (NPRI) and biomonitoring programs such as the Canadian Health Measures Survey.

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[43]Environment Canada, *Scoping the Issues: Preparation for the Parliamentary Review of the Canadian Environmental Protection Act, 1999* (Environment Canada, 2004), p 11 at <https://www.ec.gc.ca/lcpe-cepa/documents/examen-review/diagnostique-scoping/diagnostique-scoping-eng.pdf>.

[44] 2007 Standing Committee Report, pp. 27-28 and Recommendation 17.

[45] Senate Standing Committee on Energy, the Environment and Natural Resources, *The Canadian Environmental Protection Act (1999, c. 33): Rx: Strengthen and Apply Diligently* (Senate of Canada, March 2008), pp 20 and 40-41 at <http://www.parl.gc.ca/Content/SEN/Committee/392/enrg/rep/rep06mar08-e.pdf>.

[46] Bill S. 697, *supra* note 8, see e.g. s. 2(3) and s. 3(3) (defining "potentially exposed or susceptible population").

[47] Section 68 sets out matters that *may* be investigated "for the purpose of assessing whether to control, or the manner in which to control, a substance". However, s. 68 by itself is insufficient. For one thing, it is entirely discretionary. Further, Canadians expect mandatory precautionary action for all toxic substances, whereas s. 68 reflects the possibility of the unacceptable "do nothing" option (with its use of the word "whether"). Further, its focus is on *control* not on prevention of toxic substances, in tension with the Act's purpose and with s. 90(1.1).

I wish to stress, however, that monitoring environmental exposures is not equivalent to preventing them. We must use monitoring tools in a way that moves us closer to the goal of pollution prevention. If we are to spend scarce resources on monitoring, those programs should be tied to regulatory duties to reduce exposures, and to keep government accountable to those commitments.

For the foregoing reasons, s. 77 should be amended to achieve these reforms:

1. After a screening assessment (or other assessment under the Act), as soon as the Ministers determines whether a substance is toxic or capable of becoming toxic, the Ministers may take only one of two steps:

    a) If the assessment determines that the substance is not toxic or capable of becoming toxic, then only in this situation should the option of "taking no further action" be permitted; and

    b) If the assessment determines that the substance is toxic or capable of becoming toxic as defined under s. 64 of the Act, then regardless of whether the substance is also persistent, bioaccmulative and/or inherently toxic, the Ministers must recommend to the Governor in Council that the substance be added to Schedule 1.

2. If the assessment determines that the substance is toxic or capable of becoming toxic, then mandatory preventative or control actions would follow within a certain time period, with the priority continuing to be on pollution prevention (s. 90(1.1)).

3. Mandatory precautionary action to prevent or control exposures would be accompanied by "burden-shifting" provisions. For example, if it were shown that exposures to a toxic substance could be minimized, uses of the substance were safe, no safe substitutes to the substance were feasible, or socio-economic considerations justify less restrictive action, the actions could be reversed or made less restrictive.

4. If the assessment determines that the substance is toxic or capable of becoming toxic, then in determining how to regulate the toxic substance, the Ministers must investigate the effects of regulatory options on vulnerable populations and marginalized communities, and give priority to avoiding such effects.

5. If the assessment determines that the substance is toxic or capable of becoming toxic, then in determining how to regulate the toxic substance, the Ministers must investigate aggregate exposures and cumulative and synergistic effects.

6. If the assessment determines that the substance is toxic or capable of becoming toxic, the Ministers must conduct an analysis of whether safe substitutes exist. This requirement is addressed further below in the context of Recommendation #7.

7. If the assessment determines that the substance is not toxic, the Ministers should also be given the option of initiating further studies [to address any identified gaps].

8. More specific time limits should be included throughout s. 77 and related provisions.

RECOMMENDATION #6:

Section 77 of the Act should be revised to require mandatory preventative or control actions for all substances found to be toxic or capable of becoming toxic, ending the current "do nothing" option.

These amendments should include "burden-shifting" powers that would allow for loosening or lifting of mandatory regulatory action where, for example, it is shown that exposures to a substance are minimal, that certain uses are safe, that no safe substitutes are available or that other socio-economic considerations justify less restrictive action.

Amend the Act to require the Ministers to investigate the effects on vulnerable populations and marginalized communities, when determining how to regulate a toxic substance.

Amend the Act to require the Ministers to investigate aggregate exposures, and cumulative and synergistic effects, when determining how to regulate a toxic substance.

Additionally, there should be a new provision requiring mandatory monitoring of toxic substances listed in Schedule 1.

7. Amend Part 5 to incorporate a substitution test into the regulation of toxic substances

As discussed above in the context of Recommendation #3, when a toxic substance is regulated on a "chemical by chemical" basis without any consideration of alternative substances, other substances may come onto the market as equally or more harmful "regrettable substitutions".

Under s. 68(a)(xii), when determining how to regulate a substance, the Ministers have discretion to investigate the "development and use of alternatives to a substance". This is not mandatory.

I submit that a substitution test in the regulation of toxic substances is long-overdue. In 2007, considering substitution tests in the then-proposed REACH, the Committee recommended that the Act be amended "to include specific instructions to strengthen current efforts by which replacement of toxic substances by suitable alternative substances or technologies are considered in pollution prevention, risk assessment and management, and virtual elimination, including their risks and the technical and economic feasibility of substitution."[48]

[48] 2007 Standing Committee Report, pp. 38-39 and Recommendation 26.

While there are different articulations of the "substitution principle",[49] generally, substitution involves ensuring that harmful substances are ultimately replaced with safer alternatives.

In one simple formulation, a substitution test could require government to determine if safer substitutes exist before determining how it will regulate a toxic substance. If safer substitutes do exist, then the toxic substance would be prohibited or phased out over time.

In another formulation, a substitution test might require government to determine if *riskier* or equally harmful substitutes to a toxic substance exist. If riskier substitutes exist, that are not themselves subject to regulatory controls, this may auger in favour of the toxic substance not being prohibited or phased out until harmful substitutes are also regulated.

This proposal for a substitution test when regulating toxic substances goes hand in hand with Recommendation #3, which proposes mandatory alternatives assessment when assessing substances. By assessing alternatives together, the government will be better placed to make informed and timely substitution decisions when later regulating toxic substances.

RECOMMENDATION #7:

Add a mandatory substitution test to the regulation of existing substances under Part 5, to ensure that decisions about how to regulate toxic substances are based in part on information about substitutes, with a goal of replacing toxic substances with safer alternatives.

Further, add a substitution test to the regulation of new substances.

8. Canada must begin implementing virtual elimination under *CEPA 1999*

The Preamble to *CEPA 1999* acknowledges the need to virtually eliminate the most persistent and bioaccumulative toxic substances.[50] While the concept of virtual elimination arises from the *Great Lakes Water Quality Agreement,* virtual elimination of certain substances is also closely tied to Canada's ability to fulfil certain treaty obligations under the *Stockholm Convention.*[51]

Under *CEPA 1999,* the Ministers must compile a "Virtual Elimination List".[52] For any toxic substance that meet three virtual elimination criteria, the Ministers must propose implementation of virtual elimination,[53] and must implement virtual elimination by prescribing the quantity or

[49] For information how the substitution principle is employed in legislation in the EU, USA and China, and in international treaties, see the Substitution Support Portal at http://www.subsport.eu/substitution-in-legislation.
[50] Virtual elimination is defined, at s. 65(1), as "…the ultimate reduction of the quantity or concentration of the substance in the release below the level of quantification specified by the Ministers in the List referred to in subsection (2)."
[51] *Stockholm Convention on Persistent Organic Pollutants,* 22 May 2001, 2256 UNTS at 119 (entered into force 17 May 2004), Arts 3-5 and Annexes A, B and C.
[52] *CEPA 1999,* s. 65(2).
[53] *CEPA 1999,* s. 77(4).

concentration of the substance that may be released into the environment.[54] For any substance that meets the virtual elimination criteria, the Ministers may require industry to submit a plan describing the proposed actions by which the industry will implement virtual elimination.[55]

It is very troubling to note that, to date, only two substances have been listed on the Virtual Elimination List.

Environment Canada's position is that Canada is "not able to implement all of those obligations for all substances that meet those criteria; moreover, some of those obligations are redundant". In particular, Environment Canada argues that it need not meet its virtual elimination duties because when a toxic substance meets the virtual elimination criteria, instead "typically what we do is add it to the Governor in Council regulation known as the "prohibition of various substances".[56] Rather than virtual elimination, Environment Canada claims to eliminate the use of such substances through the *Prohibition of Certain Toxic Substances Regulations, 2012.*[57]

Environment Canada took largely the same position ten years ago in the last statutory review. In its 2007 Report, the Standing Committee deemed s. 65 of the Act an "abject failure". Further, the Committee effectively proposed that the virtual elimination provisions be weakened to better allow government to comply. [58] In my assessment, however, the failure with virtual elimination has been the government's refusal to implement those provisions, and not with the Act itself.

Environment Canada's position raises at least three concerns.

First, the *Prohibition of Certain Toxic Substances Regulations, 2012,* contrary to their name, do not always prohibit the use of the toxic substances or the products that contain them. They allow many potentially broad exceptions – including for toxic substances present in manufactured items or for personal use (s.6). Thus the Regulations are not equivalent to virtual elimination.

Second, the facts do not support a claim that the government uses the *Prohibition of Certain Toxic Substances Regulations, 2012* to achieve virtual elimination. For example, PBDEs are still not prohibited under those Regulations (although the government proposed to do so in April 2015). Instead, in 2008, the government made the *Polybrominated Diphenyl Ethers Regulations*, which do not have the effect of virtually eliminating all uses of PBDEs in Canada. Neither the *PBDE Regulations* nor the amendments proposed to the *Prohibition of Certain Toxic Substances Regulations, 2012* prohibit the import of consumer products containing PBDEs. Yet these consumer products are the largest source of Canadians' exposure to PBDEs.

Similar concerns exist for other toxic substances such as the flame retardant HBCD. HBCD was listed on Annex A (Elimination) of the *Stockholm Convention* in 2013, and was banned in the EU

[54] *CEPA 1999,* s. 65(3).
[55] *CEPA 1999,* s. 79.
[56] John Moffat, Environment Canada, March 8, 2012 at 11:45.
[57] *Prohibition of Certain Toxic Substances Regulations, 2012*, SOR/2012-285.
[58] 2007 Standing Committee Report, pp. 33-35.

in 2015. In Canada, HBCD is not on the *Prohibition of Certain Toxic Substances Regulations, 2012,* despite that six years ago a screening assessment found that it qualified for virtual elimination.[59] Since then, the government has not imposed any preventative or control actions on HBCD.[60]

Third, virtual elimination in *CEPA 1999* is also meant to remedy unintentional releases. Article 5 of the *Stockholm Convention* requires Canada to take measures to reduce total releases from anthropogenic sources of Annex C chemicals, with a goal of continuing minimization and, where feasible, *ultimate elimination*. The mandatory measures include developing and implementing an action plan to identify, characterize and address the release of Annex C chemicals.

In refusing to implement virtual elimination in *CEPA 1999,* it is not clear how the government believes itself to be complying with Article 5 of the *Stockholm Convention.* In any event, s. 79 does not impose any duties on the government itself to develop or to implement an action plan; rather, it creates only a discretionary ability to require various industries to submit a plan. The *Prohibition of Certain Toxic Substances Regulations, 2012* do not require development or implementation of action plans to eliminate unintentional releases, and so are not legally equivalent to virtual elimination.

Annex C substances like PCBs, dioxins and furans, pose grievous health risks. In particular, they threaten the health of vulnerable populations and marginalized communities living in pollution "hotspots", like residents of the Aamjiwnaang First Nation near Sarnia's Chemical Valley, where chemicals including dioxins and furans are released through industrial processes.

RECOMMENDATION #8:

The government should remedy its long-standing failure to implement the virtual elimination scheme under *CEPA 1999,* by listing on the Virtual Elimination List, prescribing the quantity or concentration of the substance that may be released into the environment, and ensuring action planning.

Section 79 should be amended to conform more closely to the action planning requirements of Article 5 of the *Stockholm Convention,* including by requiring the Ministers to develop and implement action plans for Annex C chemicals.

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[59] Subsection 77(1) Publication after a Screening Assessment of Cyclododecane, 1,2,5,6,9,10-hexabromo-(hexabromocyclododecane), *Canada Gazette*, Part 1, vol 144, no 35, pp 2314-2315, August 28, 2010 <http://www.gazette.gc.ca/rp-pr/p1/2010/2010-08-28/pdf/g1-14435.pdf>.

[60] Proposed Regulations Amending the Prohibition of Certain Toxic Substances Regulations, 2012, *Canada Gazette,* Part 1, vol 149, no 14, April 4, 2015, p 748 <http://www.gazette.gc.ca/rp-pr/p1/2015/2015-04-04/pdf/g1-14914.pdf>.

APPENDIX A

Summary of Qualifications of Dr. Dayna Nadine Scott

Professor Scott is an Associate Professor at Osgoode Hall Law School and the Faculty of Environmental Studies at York University, where she has been a faculty member since 2006. She teaches courses in Administrative Law, Environmental Law, and Risk & Regulation. Her expertise relates primarily to environmental justice, toxics regulation, gender and environmental health, precaution and risk regulation.

Her edited volume *Our Chemical Selves: Gender, Toxics, and Environmental Health,* was published in 2015.

As a member of an interdisciplinary team of researchers funded by CIHR and Health Canada, Professor Scott has been engaged in two long-term research projects examining social, legal and ethical aspects of the effects of brominated flame retardants, and of phthalates and "green" plasticizers, on reproductive health.

From 2008-2013, Professor Scott served as the Director of the National Network on Environments and Women's Health, a research institute at York University that was funded by Health Canada. In this capacity, she oversaw various research, conference and public education initiatives. She chaired the *Forum on Endocrine Disrupting Chemicals*, in partnership with the Canadian Auto Workers and Breast Cancer Action Montreal, in 2013. She chaired the *"Consuming" Chemicals Policy Forum*, in partnership with Health Canada, in 2009.

From 2007-2011, she served as a member of the Challenge Advisory Panel, which advised the government on its Chemical Management Plan Challenge. In this role, she provided advice on the application of precaution and weight of evidence to screening assessments of the roughly 200 "high priority" substances identified through categorization.

From 2008-2011, she conducted a long-term, funded research project in partnership with the Health and Environment Committee of the Aamjiwnaang First Nation, near Sarnia's Chemical Valley. This project examined the sources of industrial pollution that could be responsible for the high burden of environmental health harms experienced in the community.

Her Ph.D. dissertation, defended in 2005, explored the use of the precautionary principle for managing environmental health risks. In 2004-2005, she was a Fulbright Scholar and Global Research Fellow in the Hauser Global Law Program at NYU School of Law. In 2005-2006, she was a SSHRC-funded Postdoctoral Research Fellow at McGill University's Faculty of Law.

A full CV, including a list of relevant publications, is available at:
http://www.osgoode.yorku.ca/wp-content/uploads/2014/08/daynascottcv2014.pdf

APPENDIX B

A comparison of the cutoff criteria for persistence and bioaccumulation in the EU, US, Japan and Canada

Jurisdiction	**Persistence**	**Bioaccumulation**
EU REACH, "persistent bioaccumulative toxic" category	Half life in marine water > 60 days In freshwater > 40 days In marine sediment > 180 days In fresh water sediment > 120 days OR In soil > 120 days	BCF > 2000
EU REACH, "*very* persistent, *very* bioaccumulative" category	Half life in marine or fresh water > 60 days In marine or fresh water sediment > 180 days, OR In soil, > 180 days	BCF > 5000
US, TSCA, Toxics Release Inventory	Half life in soil, sediment or water > 2 months OR half life in air > 2 days	BCF > 1000, OR BAF > 1000
Japan, CSCL	Not readily biodegradable	BCF > 5000, if BCF is between 1000 and 5000, use sources other than BCF
Canada, *CEPA 1999*	Half life in air > 2 days In water > 182 days In sediment > 365 days OR In soil > 182 days	BAF > 5000 BCF > 5000 OR Log Kow >5