



CANADIAN ENVIRONMENTAL LAW ASSOCIATION
L'ASSOCIATION CANADIENNE DU DROIT DE L'ENVIRONNEMENT

Canadian public interest NGO response to POPRC Draft Risk Profile and Risk Management Evaluation documents

Submitted to

Environment Canada
Existing Substances Branch
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EXECUTIVE SUMMARY

The Canadian Environmental Law Association (CELA) submits the following comments to the Canadian government on five persistent organic pollutants (POPs) candidate substances currently under the review by the POP Review Committee (POPRC) established under the Stockholm Convention on POPs (the Stockholm Convention). CELA's comments and recommendations focus on the Draft Risk Profile for Short chain chlorinated paraffins (SCCPs), Alpha hexachlorocyclohexane (Alpha HCH); Beta hexachlorocyclohexane (Beta HCH); commercial octabromodiphenyl ether (c-octaBDE); and pentachlorobenzene (PeCB).

Since many of the POPs candidates under consideration by the POPRC have been assessed and have been identified as toxic under the Canadian Environmental Protection Act/Pest Control Product Act or managed in Canada, CELA urges the Canadian government to support listing of all POPs candidate substances under Annex A and under Annex C for selected POPs, such as c-octaBDE and PeCB. For SCCPs, CELA recommends the government support proceeding to a risk management evaluation as required under Annex F with the following recommendation "To strengthen the Draft Risk Profile for SCCPs to address and incorporate comments related to gaps and limitations of the document highlighted above." For PeCB, CELA urges the government to support the following recommendation, "The forest fire section of the Draft Risk Management Evaluation should be deleted since it is inconsistent with Canadian and other peer-reviewed data."

In addition, CELA highlighted the need for the Canadian government to enhance public engagement with public interest non-governmental organizations in all phases of implementation of the Stockholm Convention on POPs, particularly in the area of the POPRC work.

The following submission proposes a total of 20 recommendations:

Recommendation 1: The government should establish a formal consultation process with the public interest NGO sector to discuss POPs implementation activities under the Stockholm Convention on POPs, including the activities and reports undertaken in the POPRC.

Recommendation 2: The government should establish a permanent advisory body that will ensure a process for public input and engagement in Canada's efforts to implement the obligations of the Stockholm Convention. This advisory group can coordinate regular meetings/teleconferences which may complement with online consultation.

Recommendation 3: As part of the government's on-going communication efforts on the POPs, CELA requests that the final government submission to the POPRC be distributed to public interest NGO stakeholders.

Recommendation 4: To strengthen the Draft Risk Profile for SCCPs address and incorporate comments related to gaps and limitations of the document highlighted above.

Recommendation 5: The Government of Canada should support further evaluation of SCCPs under Annex F evaluation of the Stockholm Convention.

Recommendation 6: Canada should revise Schedule 1 under CEPA to include short, medium and long chain chlorinated paraffins.

Recommendation 7: The Government of Canada should proceed to take regulatory action to virtually eliminate short, medium and long chain chlorinated paraffins because they meet the criteria set out under the Persistent and Bioaccumulation Regulations under CEPA.

Recommendation 8: CELA urges the government to support the listing of alpha HCH, beta HCH, and lindane with no specific exemptions due to the wide variety of cost-effective alternatives to pharmaceutical uses of lindane that are more efficacious.

Recommendation 9: A one-time transitional exemption could be granted for all three isomers should Parties need a little more time to implement these alternatives.

Recommendation 10: The assessment on lindane completed by the POPRC provides sufficient evidence that supports that Canada should ensure that the termination of pesticide registrations for Lindane remains in place.

Recommendation 11: Canada should develop a regulation on lindane that would aim to prohibit the use, manufacture, sale, import and disposal of lindane (e.g. pharmaceutical and pesticide application). This approach would ensure that other uses for lindane (e.g. in the production of trichlorobenzene) would not be permitted in Canada.

Recommendation 12: The government should support a listing of C-OctaBDE under Annex A and Annex C with no specific exemptions.

Recommendation 13: The Proposed Polybrominated Diphenyl Ethers Regulations in Canada should be amended to address all the homologues of PBDEs found in c-OctoBDEs.

Recommendation 14: The Proposed Polybrominated Diphenyl Ethers Regulations should be amended to address disposal methods of PBDEs or consumer products containing PBDEs.

Recommendation 15: The listing of seven homologues (tetraBDE, pentaBDE, hexaBDE, heptaBDE, octaBDE, nonaBDE and decaBDE) under CEPA Schedule 1 should require the government to develop effective management measures including elimination or prohibition. Such an approach would ensure the cessation of exposure to these BDE congeners as well as those formed by debromination of decaBDE and other congeners to lower BDEs.

Recommendation 16: The government should list these substances under NPRI for reporting despite the Proposed Polybrominated Diphenyl Ethers Regulations. The volume and employee thresholds under NPRI should not apply to reporting for PBDEs.

Recommendation 17: The forest fire section of the Draft Risk Management Evaluation should be deleted since it is inconsistent with Canadian and other peer-reviewed data.

Recommendation 18: CELA would support the listing of PeCB under Annex A and C to ensure that intentional use of PeCB as it pertains to the production and use of quintozene is prevented.

Recommendation 19: The government should undertake a survey under PMRA or other relevant Canadian legislation to assess the volume as well as location of production and use of quintozene for the past 5-10 years. Furthermore, such a survey should include details on methods of disposal (including data on releases of PeCB or other toxic substances from landfills or other disposal methods such as incineration) of quintozene.

Recommendation 20: Canada should take necessary steps to promote and encourage Parties to support listing of the nine POPs candidate substances under Annex A and C for selected POPs candidate substances (i.e., c-octaBDE, PeCB).

BACKGROUND

CELA (www.cela.ca) is a non-profit, public interest organization established in 1970 to use existing laws to protect the environment and to advocate environmental law reforms. It is also a free legal advisory clinic for the public, and will act at hearings and in courts on behalf of citizens or citizens' groups who are otherwise unable to afford legal assistance. CELA is funded by Legal Aid Ontario (LAO). It is one of 80 community legal clinics located across Ontario, 18 of which offer services in specialized areas of the law. CELA also undertakes educational and law and policy reform projects that are funded by LAO as well as government and private foundations. CELA's public policy reform programs focus on four issue areas: pollution and health, water sustainability, land use planning and access to justice.

CELA's pollution and health program aims to improve laws governing toxic substances at all levels of government with a specific objective to eliminate toxic substances through strategies that promote prevention and precaution. CELA has a long history of involvement with policy reform discussions focused on POPs and other toxic substances in Canada. This engagement includes participation in the international negotiation process that resulted in the global support of the Stockholm Convention. The Stockholm Convention contains many important provisions and principles for identifying and addressing POPs in the global context, such as:

- the establishment of a goal of elimination of POPs including POPs waste/stockpiles;
- recognition of risk of exposure to POPs to vulnerable communities and populations and global ecosystems;
- the establishment of strong support for public engagement and transparency;
- provisions for technical and financial mechanisms to support implementation activities focus; and
- the establishment of a mechanism, through the creation of the POPRC, to consider other POPs for action under the Stockholm Convention.

CELA's participation in implementation activities under the Stockholm Convention continues in several areas. For example over the past few years, CELA has been advocating for effective government processes to enhance public engagement on implementation activities under the Convention, with specific interest in the activities of the POPRC. CELA has participated in the Canadian delegation under the Stockholm Convention and prepared numerous submissions on POPs issues (i.e., National Implementation Plan, National Action Plan, etc.). CELA is a member of the International POPs Elimination Network (IPEN; www.ipen.org), a global network of public interest non-governmental organisations united in support of a common POPs elimination goal.

Hence, CELA is pleased to have the opportunity to provide comments on the draft reports prepared by experts of the Stockholm Convention POPs Review Committee (POPRC). We hope our comments will be carefully considered in the development of the Canadian positions on the five substances: Short chain chlorinated paraffins (SCCPs), Alpha hexachlorocyclohexane (alpha HCH); Beta hexachlorocyclohexane (beta HCH); commercial octabromodiphenyl ether (c-octaBDE); and pentachlorobenzene (PeCB). We are also using this opportunity to support and/or strengthen the Canadian approach on the POPs candidate substances.

Our submission will address the following issue areas:

- 1) Engaging Canadian public interest NGOs on POPRC activities
- 2) Draft Risk Profile for SCCPs
 - a. Need for support under Annex E
 - b. Comments on the Draft Risk Profile
 - c. Additional Canadian context for SCCPs
 - d. Recommendations
- 3) Draft Risk Management Evaluations
 - a. Alpha HCH and Beta HCH
 - b. C-OctaBDE
 - c. PeCB
- 4) Concluding Comments and Recommendation

1) Engaging Canadian public interest NGOs on POPRC activities

The opportunity for public interest NGO stakeholders to provide comments and input on materials or reports produced by the POPRC is welcomed. With the ratification of the Stockholm Convention in 2004, the international community acknowledges the impacts of POPs to the global environment and its population. For Canada, the impacts of POPs are significant. The inclusion of the POPRC enables Parties to add POPs under the Convention. Canada's role in ensuring the mechanism for adding POPs under the Convention is fully transparent, inclusive and comprehensive in scope is well recognized in the global community. This level of commitment by Canada is also evident in the initial work of the POPRC. However, it will be essential for the Canadian government and other Parties to the Convention to elevate its efforts to engage public interest stakeholder on the work of the POPRC. In particular, it will be essential for Parties as they prepare for COP4 where decisions on the nominated POPs are expected to occur. As members of IPEN have demonstrated time and time again, non-governmental organizations contribute in all facet of the POPRC work and the Convention work is essential to

the successful implementation of the Stockholm Convention. NGOs are able to contribute through its networking capacity as well as its contribution to the technical and policy aspects.

Over the past few years, CELA has expressed its interest in establishing a regular dialogue with government departments on the implementation of the Stockholm Convention. Since 1998, the start of the negotiations which lead to the Stockholm Convention, Canada has demonstrated its commitment to public engagement on POPs through coordination of public consultations and inclusion of membership to the Canadian delegation. This level of engagement has been essential for public interest NGOs such as CELA to establish dialogue with government representatives, to gain access to information on activities, and to make progress on POPs-related matters.

Since the Stockholm Convention entered into force, the government's efforts to engage the Canadian public interest sector with a specific focus on POPs implementation activities has constituted a piecemeal approach. Unfortunately, the government correspondence does not outline an approach for public engagement beyond the May 2nd timeline established for receiving comments on the draft chemical profiles and draft evaluation reports. Furthermore, the government has not outlined the criteria that it will apply to review or integrate comments into its position paper nor the plans to distribute its final positions to the public interest NGO stakeholders. CELA urges the government to use this opportunity to initiate dialogue with public interest organizations on these issues because of the relevance of the candidate POPs substances to domestic management activities and the important roles outlined for civil society in the implementation of the Convention. During the government public consultations to develop Canada's National Implementation Plan in 2005, CELA and other environmental organizations recommended:

Environment Canada is strongly urged to establish a permanent advisory body that will ensure a process for public input and engagement in Canada's efforts to implement the obligations of the Stockholm Convention. This advisory group can coordinate regular meetings/teleconferences which may complement with online consultation. (see <http://www.cela.ca/publications/cardfile.shtml?x=2157%20>)¹

Recommendation 1: The government should establish a formal consultation process with the public interest NGO sector to discuss POPs implementation activities under the Stockholm Convention on POPs, including the activities and reports undertaken in the POPRC.

Recommendation 2: The government should establish a permanent advisory body that will ensure a process for public input and engagement in Canada's efforts to implement the obligations of the Stockholm Convention. This advisory group can coordinate regular meetings/teleconferences which may complement with online consultation.

¹ Fe de Leon, Canadian Environmental Law Association; Anna Tilman, STORM Coalition; Andrea Moher Canadian Environmental Law Association. March 30, 2005. *Responding to Canada's National Implementation Plan Under the Stockholm Convention on Persistent Organic Pollutants (POPs) Consultation Draft February 2005*. Submitted to Transboundary Air Issues Branch, Environment Canada. Supported by various environmental organizations.

Recommendation 3: As part of the government’s on-going communication efforts on the POPs, CELA requests that the final government submission to the POPRC be distributed to public interest NGO stakeholders.

2) Draft Risk Profile for Short Chain Chlorinated Paraffins (SCCPs)

a. Need for Support of Annex E

The POPRC report, *Draft Risk Profile on Short Chain Chlorinated Paraffins* provides sufficient evidence that SCCPs meet the criteria outlined in Annex E of the Stockholm Convention. As such, support to proceed to Annex F for SCCPs is adequate with the following additional comments for consideration.

b. Comments on the Draft Risk Profile

The SCCPs Draft Risk Profile provides sufficient data to demonstrate that SCCPs exhibit long-range environmental transport, and that their persistence, bioaccumulation and toxicity are serious enough to warrant global action. Monitoring data has demonstrated the long-range environmental transport of SCCPs, in that they have been measured in Arctic air and sediment,² Arctic animals including ringed seal, beluga whales, walrus, char, and seabirds,³ and in the breast milk of Inuits.⁴ SCCPs should proceed to the next stage of assessment.

Very little toxicological information is available from studies in humans and much of the available animal data does not allow a direct comparison from toxicological endpoint of the effects of SCCPs.⁵ However, the European Commission Scientific Committee on Toxicity, Ecotoxicity and the Environment Opinion on the Risk Assessment of Short Chain Length Chlorinated Paraffins⁶ found that the alveolar/bronchiolar carcinomas in male mice should not be discounted and that finding of lung tumours in male mice may be of importance for humans.

² See Borgen, A.R., M. Schlabach and H. Gundersen. 2000. Polychlorinated alkanes in arctic air. *Organohalogen Compd.* 47: 272–274; Tomy (1997), Bidleman, T.F., M. Alaee and G.A. Stern. 2001. New persistent chemicals in the Arctic environment. In: S. Kalhok (ed.), *Synopsis of research conducted under the 1999–2000 Northern Contaminants Program*. Department of Indian Affairs and Northern Development, Ottawa, Ontario. pp. 93–104; Tomy, G.T., G.A. Stern, W.L. Lockhart and D.C.G. Muir. 1999. Occurrence of C₁₀–C₁₃ polychlorinated n-alkanes in Canadian mid-latitude and Arctic lake sediments. *Environ. Sci. Technol.* 33: 2858–2863; Stern, G.A. and M. Evans. 2003. Persistent organic pollutants in marine and lake sediments. In: *Canadian Arctic Contaminants Assessment Report II. Sources, occurrence, trends and pathways in the physical environment*. Northern Contaminants Program, Department of Indian Affairs and Northern Development, Ottawa, Ontario. pp. 100–115.

³ See Tomy, G.T., D.C.G. Muir, G.A. Stern and J.B. Westmore. 2000. Levels of C₁₀–C₁₃ polychloro-n-alkanes in marine mammals from the Arctic and the St. Lawrence River estuary. *Environ. Sci. Technol.* 34: 1615–1619; Reth, M., Ciric, A., Christensen, G.N., Heimstad, E.S., and M. Oehme. 2006. Short- and medium-chain chlorinated paraffins in biota from the European Arctic- differences in homologue group patterns. *Sci. Tot. Environ.* 367: 252-260.

⁴ Tomy, G.T. 1997. The mass spectrometric characterization of polychlorinated n-alkanes and the methodology for their analysis in the environment. Thesis, University of Manitoba, Winnipeg, Manitoba [cited in Tomy et al. 1998a, 1999].

⁵ SIAM 10, 15-17 March 2000 UK: EU SIDS Initial Assessment Profile

⁶ Available at http://ec.europa.eu/health/ph_risk/committees/sct/docshtml/sct_out23_en.htm

In the Technical Peer Reviews on Short Chained Chlorinated Paraffins (SCCPs) Dossier Submitted under the UNECE-LRTAP POPs Protocol, the authors⁷ highlighted the relatively high concentrations of SCCPs (100-770 mg/kg wet wt.) in beluga and narwhal fat in Canada and Greenland. They stressed the relevance to exposure through traditional foods of Arctic communities, pointing out that Aboriginal peoples living in the Arctic may be exposed to SCCPs at concentrations greater than the WHO health guideline of 11 µg/kg bw for neoplastic effects (tumor formation). This data should signal the Canadian government that current measures on SCCPs are inadequate and appropriate preventative and phase out measures are necessary to reduce the levels observed in marine animals.

In regards to environmental impacts, SCCPs are highly toxic to aquatic invertebrates and are also highly toxic to algae on which many species including fish depend. This toxicity may be relevant to marine mammals and the marine food chain. In addition, there needs to be consideration of the possible relevance of the liver, thyroid and kidney cancers found in rat and mouse studies to the long term exposure of the 1500 other rodent wildlife species worldwide.

The attempt by the chemical industry to establish levels of concern in regards to POP chemicals like SCCPs ignores crucial questions relating to the timing and duration of the exposure, age, nutritional and reproductive status, enzyme function, as well as the additive or synergistic interactions with other substances in the environment.

c. Additional Canadian Context for SCCPs

SCCPs and other chlorinated paraffins were assessed under the Priority Substances List in 1988 and the final assessment results were proposed in 2005. According to the Canada Gazette Vol. 139, No. 24 – June 11, 2005:

[The] Ministers of the Environment and of Health intend to recommend to Her Excellency the Governor in Council that short chain, medium chain and long chain chlorinated paraffins be added to the List of Toxic Substances in Schedule 1 of the Canadian Environmental Protection Act, 1999.

According to CEPA Schedule 1 dated December 27, 2006, the government has yet to add chlorinated paraffins (short, medium, or long chained) to Schedule 1 (results retrieved from: www.ec.gc.ca/CEPARRegistry/subs_list/Toxicupdate.cfm, dated April 25, 2008). Furthermore, chlorinated paraffins have not been added to the virtual elimination list under the CEPA (http://www.ec.gc.ca/CEPARRegistry/subs_list/VEList.cfm, dated December 13, 2006). We are concerned that the lack of progress in listing SCCP under Schedule 1 and virtual elimination will result in continued exposure to SCCPs to the environment, wildlife population and Canadians and to the global environment.

In reviewing the draft risk profile, we would direct the government to include the study conducted by Derek Muir et al in 2008 demonstrating the bioaccumulating ability of chlorinated

⁷ Summary Of The Independent Track A Technical Peer Reviews On Short Chained Chlorinated Paraffins (SCCPs) Dossier Submitted Under The UNECE-LRTAP POPs Protocol, 16/1/08 Available at <http://www.unece.org/env/popsxg/2006/5th%20meeting/Final%20Summary%20Report%20SCCP%20May%201.doc>.

paraffins in measurable levels of fish species found in Lake Ontario and Lake Michigan.⁸ This study does not appear to be included in the list of references provided in the draft risk profile but will support other Great Lakes data on chlorinated paraffins.

Given the Canadian assessment results on chlorinated paraffins and the knowledge that Canada is a POPs recipient, the government should be in a position to support the Draft Risk Profile for SCCPs with revisions to ensure that these substances progress to Annex F evaluation.

d. Recommendations

Recommendation 4: To strengthen the Draft Risk Profile for SCCPs; address and incorporate comments related to gaps and limitations of the document highlighted above.

Recommendation 5: The Government of Canada should support further evaluation of SCCPs under Annex F evaluation of the Stockholm Convention.

Recommendation 6: Canada should revise Schedule 1 under CEPA to include short, medium and long chain chlorinated paraffins.

Recommendation 7: The Government of Canada should proceed to take regulatory action to virtually eliminate short, medium and long chain chlorinated paraffins because they meet the criteria set out under the Persistent and Bioaccumulation Regulations under CEPA.

3) Draft Risk Management Evaluations

a. Alpha HCH and Beta HCH

These toxic isomers are inextricably linked to lindane production and serve no use as final end products. Both should be listed in Annex A. CELA advocates the listing of Alpha HCH, Beta HCH, and lindane with no specific exemptions due to the wide variety of cost-effective alternatives to pharmaceutical uses of lindane that are more efficacious. If certain countries need a little more time to implement these alternatives, then a one-time transitional exemption should be granted for all three isomers.

Canadian Context for Alpha HCH and Beta HCH

As of December 31, 2004, Lindane-containing pesticides were no longer registered for use in Canada under the *Pest Control Products Act*. This termination occurred as a result of the conclusions of a Special Review conducted by the Pest Management Regulatory Agency. That

⁸ Magali Houde, Derek C. G. Muir, Gregg T. Tomy, D. Michael Whittle, Camilla Teixeira, and Serge Moore. "Bioaccumulation and Trophic Magnification of Short- and Medium-Chain Chlorinated Paraffins in Food Webs from Lake Ontario and Lake Michigan", *Environ Sci. Tech.* (in press). Article was released on-line on April 9, 2008 at by ACS Publications see: <http://pubs.acs.org/cgi-bin/abstract.cgi/esthag/asap/abs/es703184s.html>.

Special Review, conducted in collaboration with the US Environmental Protection Agency, was done in order to reassess all uses of lindane as part of Canada's broader recognition of the need to restrict or eliminate persistent organic pollutants. The PMRA's reason for terminating all registrations was concern for worker exposure during seed treatment and handling of treated seed both on-farm and in commercial seed treatment facilities. One registrant requested a hearing by a Board of Review. The Board's decision disagrees with the PMRA decision to discontinue Lindane registrations and questions the PMRA use of uncertainty factors during risk assessment. This decision has prompted a broader review by the agency of how safety factors are applied during human health risk assessment. In the meantime, the agency's position to terminate Lindane registrations remains in place.

The pharmaceutical application of lindane for treatment of scabies and lice in Canada continues. However, the Canadian Pediatric Society recommends that lindane-based anti-lice products not be used on infants and children under 17 years of age due to lindane's neurotoxicity and Health Canada's adverse reaction database contains numerous cases linked to lindane use. The Government of Canada should be especially concerned with the finding of lindane in human breast milk among Inuit, and its presence in seabirds, fish, and mammals in the Arctic as reported in the lindane Risk Profile prepared by the POPRC. The lindane Risk Profile notes the special impact that lindane has on Arctic communities that depend on subsistence foods. Given the assessment by the POPRC which concludes that lindane meets the POPs criteria and the availability of alternatives to lindane in the Canadian market, CELA urges the government to discontinue the pharmaceutical use of lindane in Canada.

Despite the current Board of Review on lindane, sufficient evidence exists through work of the POPRC on lindane (including alpha and beta HCH) that suggest a preventative and precautionary approach on lindane is warranted. Canada should ensure that the termination of pesticide registrations for Lindane remains in place. Furthermore, a regulation that would prohibit the use, sale, manufacture, import and disposal of lindane in all applications in Canada would be appropriate to ensure that other uses of lindane would not be permitted.

Recommendations

Recommendation 8: CELA urges the government to support the listing of alpha HCH, beta HCH, and lindane with no specific exemptions due to the wide variety of cost-effective alternatives to pharmaceutical uses of lindane that are more efficacious.

Recommendation 9: A one-time transitional exemption could be granted for all three isomers should Parties need a little more time to implement these alternatives.

Recommendation 10: The assessment on lindane completed by the POPRC provides sufficient evidence that supports that Canada should ensure that the termination of pesticide registrations for Lindane remains in place.

Recommendation 11: Canada should develop a regulation on lindane that would aim to prohibit the use, manufacture, sale, import and disposal of lindane (e.g., pharmaceutical

and pesticide application). This approach would ensure that other uses for lindane (e.g. in the production of trichlorobenzene) would not be permitted in Canada.

b. C-OctaBDE

C-OctaBDE should be listed in Annex A and Annex C with no specific exemptions. C-OctaBDE has already been widely subjected to control measures consistent with elimination of production, use, export, and import as outlined in Annex A. At POPRC3 in November 2007, the Committee concluded that components of the c-OctaBDE mixture are produced in the environment by debromination of c-DecaBDE. This means that Annex C listing is needed because components of c-OctaBDE are unintentionally formed through debromination of higher substituted congeners, including commercial decabromodiphenyl ether (c-DecaBDE) which also has the potential for long range transport. Annex C listing of c-OctaBDE requires control measures that address c-DecaBDE to prevent further formation of components of the c-OctaBDE mixture and other BDE congeners in the environment

The proposal for an Annex C listing of octaBDE will raise questions about the degree of BDE debromination in the environment. When debromination of BDEs was first reported, many disregarded it as an in vitro phenomenon and not relevant to environmental conditions. However, the Committee has agreed in the c-OctaBDE Risk Profile that debromination is occurring in aquatic organisms, mammals, and birds and that components of the c-OctaBDE mixture are produced in the environment by debromination of c-DecaBDE. This debromination has been found to occur in fish⁹, by photolysis^{10 11 12 13 14 15}, and by the action of bacteria in sewage sludge^{16 17}. Recently c-DecaBDE was found to debrominate under normal environmental conditions in house dust forming three c-nonaBDE congeners and several c-OctaBDE congeners¹⁸. Furthermore, there is a sizeable body of data on the properties of c-DecaBDE that should raise concerns about its debromination to form components of c-OctaBDE including:

⁹ Stapleton HM, Alae M, Letcher RJ, Baker JE. Debromination of the flame retardant decabromodiphenyl ether by juvenile carp (*Cyprinus carpio*) following dietary exposure. *Environmental Science & Technology* 2004, 38, (1), 112-119

¹⁰ Ahn MY, Filley TR, Jafvert CT, Nies L, Hua I, Bezares-Cruz, J. Photodegradation of decabromodiphenyl ether adsorbed onto clay minerals, metal oxides, and sediment. *Environmental Science & Technology* 2006, 40, (1), 215-220

¹¹ Eriksson J, Green, N, Marsh G, Bergman, A. Photochemical decomposition of 15 polybrominated diphenyl ether congeners in methanol/water. *Environmental Science & Technology* 2004, 38, (11), 3119-3125

¹² Soderstrom, G, Sellstrom U, De Wit CA, Tysklind M. Photolytic debromination of decabromodiphenyl ether (BDE 209). *Environmental Science & Technology* 2004, 38, (1), 127-132

¹³ Soderstrom, G, Sellstrom U, De Wit CA, Tysklind M. Photolytic debromination of decabromodiphenyl ether (BDE 209). *Environmental Science & Technology* 2004, 38, (1), 127-132

¹⁴ Eriksson J, Green, N, Marsh G, Bergman, A. Photochemical decomposition of 15 polybrominated diphenyl ether congeners in methanol/water. *Environmental Science & Technology* 2004, 38, (11), 3119-3125

¹⁵ Bezares-Cruz J, Jafvert CT, Hua I. Solar Photodecomposition of Decabromodiphenyl Ether: Products and Quantum Yield. *Environ. Sci. Technol.*, 38 (15), 4149 -4156, 2004

¹⁶ He JZ, Robrock KR, Alvarez-Cohen L. Microbial reductive debromination of polybrominated diphenyl ethers (PBDEs). *Environmental Science & Technology* 2006, 40, (14), 4429-4434

¹⁷ Gerecke AC, Hartmann PC, Heeb NV, Kohler HPE, Giger W, Schmid P, Zennegg M, Kohler M. Anaerobic degradation of decabromodiphenyl ether. *Environmental Science & Technology* 2005, 39, (4), 1078-1083

¹⁸ Stapleton H, Dodder N. Photodegradation of Decabromodiphenyl Ether in House Dust by Natural Sunlight. *Environ Sci Technol* 41, Oct, 2007

- DecaBDE is present in humans^{19 20 21 22 23}
- DecaBDE is found in biota^{24 25 26}
- DecaBDE can be absorbed by dietary intake in carp, lake trout and rats^{27 28 29 30}
- Given that animal uptake rates are usually in the range of 1 – 3 % of a given dose of decaBDE³¹, high concentrations in terrestrial animals^{32 33} suggest that decaBDE can bioaccumulate³⁴

These studies indicate the need for the Committee to provide serious consideration for an Annex C listing for c-OctaBDE. Evaluations of this type carry various uncertainties due to availability of data, however, the Convention reminds the POPRC in Article 8 para 7a that, “Lack of full scientific certainty shall not prevent the proposal from proceeding.” This statement codifies the Convention commitment to use available information in protecting public health from the harms caused by POPs.

¹⁹ Hites R. Polybrominated Diphenyl Ethers in the Environment and in People: A Meta-Analysis of Concentrations. *Environ. Sci. Technol.* 38 (4): 945-56

²⁰ Hites, R. op cit.; WWF UK ContamiNATION: National Biomonitoring Survey 2003

<http://www.wwf.org.uk/filelibrary/pdf/biomonitoringresults.pdf>

²¹ Schecter A, Vuk MP, Papke O, Ryan, JJ, Birnbaum L, Rosen, R. Polybrominated diphenyl ethers (PBDEs) in US mothers' milk. *Environmental Health Perspectives* 2003, 111, (14), 1723-1729

²² Schecter A, Papke O, Harris, TR, Tung, KC. Partitioning of polybrominated diphenyl ether (PBDE) congeners in human blood and milk. *Toxicological & Environmental Chemistry* 2006, 88, (2), 319-324

²³ Jakobsson K, Thuresson K, Rylander L, Sjodin A, Hagmar L, Bergman A. Exposure to polybrominated diphenyl ethers and tetrabromobisphenol A among computer technicians. *Chemosphere*. 2002 Feb;46(5):709-16

²⁴ Johnson-Restrepo B, Kannan K, Addink R, Adams DH, Polybrominated diphenyl ethers and polychlorinated biphenyls in a marine foodweb of coastal Florida. *Environmental Science & Technology* 2005, 39, (21), 8243-8250

²⁵ Bixian M, Song J, Suin Q, Zeng E, Hale RC. Polybrominated Diphenyl Ethers in Birds of Prey Collected from Northern China, SETAC, Montreal, Quebec, 2006; Montreal, Quebec, 2006

²⁶ Christensen JR, Macduffee M, Macdonald RW, Whittar M, Ross PS. Persistent organic pollutants in British Columbia grizzly bears: Consequence of divergent diets. *Environmental Science & Technology* 2005, 39, (18), 6952-6960

²⁷ Kierkegaard A, Balk L, Tjarnlund U, De Wit CA, Jansson B. Dietary uptake and biological effects of decabromodiphenyl ether in rainbow trout (*Oncorhynchus mykiss*). *Environmental Science & Technology* 1999, 33, (10), 1612-1617

²⁸ Stapleton HM, Alae M, Letcher RJ, Baker JE. Debromination of the flame retardant decabromodiphenyl ether by juvenile carp (*Cyprinus carpio*) following dietary exposure. *Environmental Science & Technology* 2004, 38, (1), 112-119

²⁹ Tomy GT, Palace VP, Halldorson T, Braekevlt, E, Danell R, Wautier K, Evans B, Brinkworth L, Fisk AT. Bioaccumulation, biotransformation, and biochemical effects of brominated diphenyl ethers in juvenile lake trout (*Salvelinus namaycush*). *Environmental Science & Technology* 2004, 38, (5), 1496-1504

³⁰ Morck A, Hakk H, Orn U, Wehler EK. Decabromodiphenyl ether in the rat: Absorption, distribution, metabolism, and excretion. *Drug Metabolism and Disposition* 2003, 31, (7), 900-907

³¹ Stapleton, H. Brominated Flame Retardants: Assessing DecaBDE Debromination in the Environment. Health and Environment Alliance, www.env-health.org, May 2006

³² Christensen JR, Macduffee M, Macdonald RW, Whittar M, Ross PS. Persistent organic pollutants in British Columbia grizzly bears: Consequence of divergent diets. *Environmental Science & Technology* 2005, 39, (18), 6952-6960

³³ Voorspoels S, Covaci A, Lepom P, Escutenaire S, Schepens P. Remarkable findings concerning PBDEs in the terrestrial top-predator red fox (*Vulpes vulpes*). *Environmental Science & Technology* 2006, 40, (9), 2937-2943

³⁴ Stapleton H. Summary of Scientific Studies on Accumulation and Debromination of DecaBDE. Health and Environment Alliance, www.env-health.org, December 2006

Canadian Context for c-octaBDE

Canada is in position to support the draft risk management evaluation report for c-octaBDE if it is revised to address the important issue of debromination of decaBDE and other BDE congeners. The seven homologues of polybrominated diphenyl ethers (tetra-, penta-, hexa-, hepta-, octa-, nona- and decaBDE) are listed under Schedule 1 of CEPA (results retrieved from: www.ec.gc.ca/CEPARRegistry/subs_list/Toxicupdate.cfm, dated April 25, 2008). Furthermore, the government's assessment also concluded that tetraBDE, pentaBDE and hexaBDE meet the criteria outlined in the Persistence and Bioaccumulation Regulations, made under CEPA 1999, that should result in the virtual elimination of these substances (see <http://www.ec.gc.ca/CEPARRegistry/orders/OrderText.cfm?intOrder=293&intDocument=682>). To date penta- and hexaBDE which make up c-octaBDE have not been added to the Virtual Elimination List. However, the US based company which produced penta and octaBDE voluntarily discontinued the manufacture of these substances at the end of 2004.

Under *Canada Gazette* Part 1, Vol. 140, No 50 (December 16, 2006), the government Proposed the Polybrominated Diphenyl Ethers Regulations which will prohibit the manufacture of PBDEs (tetraBDE, pentaBDE, hexaBDE, heptaBDE, octaBDE, nonaBDE and decaBDE). The proposed Regulations will also prohibit the use, sale, offer for sale and import of tetraBDE, pentaBDE, hexaBDE, and mixtures, polymers and resins containing these substances and will prohibit the manufacture of these mixtures, polymers and resins. (see <http://www.ec.gc.ca/CEPARRegistry/regulations/DetailReg.cfm?intReg=108>). This proposal has not been finalized. CELA identifies several limitations to the proposed regulations:

- i) Focusing on tetraBDE, pentaBDE, and hexaBDE, means that c-octaBDE is not fully regulated. This may mean continued exposure to c-octaBDE. Other measures are expected to be developed by government to address c-octaBDE as indicated in the Regulatory Impact Analysis Statement (http://www.ec.gc.ca/ceparegistry/documents/regs/g1-14050_r2.pdf)
- ii) The proposed Regulations do not fully address the life cycle of PBDEs by excluding action on appropriate disposal methods of these substances or consumer products containing these substances. Large quantities of products that contain these PBDEs will be produced before the regulations are finalized. The proposed regulations' failure to address appropriate methods for waste handling of PBDEs or articles containing them will mean that PBDEs will continue to be released to the environment and the Canadian population may be exposed to PBDEs. To avoid the creation of other POPs or toxic substance, the government should ensure that appropriate disposal methods that do not include incineration or other technologies that generate POPs are utilized to prevent continuation of exposure from PBDEs.

The commercial mixture of Deca-BDE is unregulated in Canada and is not addressed through the proposed Regulation on Polybrominated Diphenyl Ether despite designation of its individual homologues as toxic under Schedule 1 of CEPA. This designation of CEPA toxic is relevant given that management strategies for octaBDE are to be developed. It is appropriate and necessary to address all PBDE homologues found in the commercial mixtures of BDEs because of the debromination of higher BDEs to lower BDEs.

PBDEs including c-octabromodiphenyl ether are not reported under NPRI despite the extensive use of this substance in industrial processes and consumer products. Some efforts should be undertaken to monitor releases or transfers of these substances through existing pollution inventories such as NPRI. Despite the Proposed Polybrominated Diphenyl Ethers Regulations, these substances should be listed under NPRI for reporting. The volume and employee thresholds under NPRI should not apply to reporting for PBDEs.

Recommendations

Recommendation 12: The government should support a listing of C-OctaBDE under Annex A and Annex C with no specific exemptions.

Recommendation 13: The Proposed Polybrominated Diphenyl Ethers Regulations in Canada should be amended to address all the homologues of PBDEs found in c-OctoBDEs.

Recommendation 14: The Proposed Polybrominated Diphenyl Ethers Regulations should be amended to address disposal methods of PBDEs or consumer products containing PBDEs.

Recommendation 15: The listing of seven homologues (tetraBDE, pentaBDE, hexaBDE, heptaBDE, octaBDE, nonaBDE and decaBDE) under CEPA Schedule 1 should require the government to develop effective management measures including elimination or prohibition. Such an approach would ensure the cessation of exposure to these BDE congeners as well as those formed by debromination of decaBDE and other congeners to lower BDEs.

Recommendation 16: The government should list these substances under NPRI for reporting despite the Proposed Polybrominated Diphenyl Ethers Regulations. The volume and employee thresholds under NPRI should not apply to reporting for PBDEs.

c. PeCB

PeCB should be listed in Annex A and Annex C. The draft PeCB Risk Management Evaluation cites data from forest fire simulations in the US and concludes that forest fires could be a major source of both dioxins and PeCB. Given the large discrepancy between simulations (US experience) and actual measurements (Australia, Spain, Canada) and the fact that the EC does not consider forest fires to be major dioxin sources, this text cannot be scientifically justified, despite the insistence of the chlorine industry. The draft should not contain a blanket statement that forest fires could be a major source of PeCB. Forest fires are simply not a major source of dioxins or PeCB in the world.

This claim is inconsistent with Canadian data that shows that forest fires are not major dioxin sources:

- Van Oostdam (1995) found no detectable dioxins in three soil samples and four ash samples taken immediately after a forest fire in British Columbia, Canada.³⁵
- Ikonomou et al. (1999) reported that “data do not show levels high enough and/or distinct patterns that would suggest that the sediments in the streams examined have been impacted by PCDDs/Fs produced from the forest fires.”³⁶
- Gabos et al. (2001) reported only very low concentrations of dioxins in sediments following extensive forest fires in Canada.³⁷

A TNO report on dioxin emissions in several EU candidate countries does not list forest fires as major sources:³⁸

Countries examined included Bulgaria, Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Romania, Slovak Republic, Slovenia, and Turkey. The largest contributions of dioxin emissions to air were from incineration of wastes, cement kilns, and iron ore sintering. Forest fire emissions of dioxins were estimated at 5 ug I-TEQ/ton using the UNEP dioxin toolkit. In contrast, dioxin emissions from landfill fires were estimated at 1000 ug I-TEQ/ton.

The European Commission does not regard forest fires as major dioxin sources:

Martinez et al. (2000) analyzed vegetation and soils in forest fire areas in Spain and concluded that “natural fires seem not to be an important source of dioxin-like compounds.”³⁹ See these references:

- Wenborn, M., King, K., Buckley-Golder, D., Gascon, J., 1999. Releases of Dioxins and Furans to Land and Water in Europe. Final Report. Report produced for Landesumwamt Nordrhein-Westfalen, Germany on behalf of European Commission DG Environment. September 1999
- Quass, U., Fermann, M., Broker, G., 2000. The European Dioxin Emission Inventory, Stage II. Vol. 3: Assessment of dioxin emissions until 2005. Nordrhein-Westfalen, Germany: Landesumweltamt NRW. December 2000
- Quass, U., Fermann, M., 1997. Identification of Relevant Industrial Sources of Dioxins and Furans in Europe (The European Dioxin Inventory). Final Report No. 43, Essen, Germany: Landesumweltamt Nordrhein-Westfalen, Germany

Studies from Australia indicate that forest fires and bush fires are not major dioxin sources:

A recent study of dioxin emissions from crop and bush fires in Australia revised the estimated contribution from these sources downwards by 70%.⁴⁰ An Australian government report notes

³⁵ Van Oostdam, J.C. and Ward, J.E.H. (1995) *Dioxins and Furans in the British Columbia Environment*, BC Environment, Environmental Protection Department, Victoria, British Columbia.

³⁶ Ikonomou, M, Gabos S, Schopflocher D, White J, Prepas E, Prince D, Chen W, 1999. Dioxins, furans and PCBs determinations in sediment and fish tissue following forest fires. *Organohalogen Cpd.* 43: 299-302.

³⁷ Gabos S, Ikonomou M, Schopflocher D, Fowler B, White J, Prepas E, Prince D, Chen W, 2001. Characteristics of PAHs, PCDD/Fs and PCBs in sediment following forest fires in northern Alberta. *Chemosphere* 43: 709-719

³⁸ Pulles T, Kok H, Quass U, Juery C, Mategovicova J (2005) Dioxin emissions in candidate countries, TNO Environment and Geosciences R&I-A R2005/054

³⁹ Martinez, M., Diaz-Ferrero, J., Marti, R., Broto-Puig, F., Comellas, L., Rodriguez-Larena, M., 2000. Analysis of dioxin-like compounds in vegetation and soil samples burned in Catalan forest fires. Comparison with the corresponding unburned material. *Chemosphere* 41: 1927-1935.

that the measured dioxin emissions in the field were substantially different from laboratory tests used to estimate inventory values for various open burning sources.⁴¹ Total dioxin emissions to air from these sources was revised downward from 1,708 TEQ to 152 TEQ. For forest fires and wildfires the previous estimates from 2002 were 7 – 400 g TEQ/y. The new results after actual measurements were conducted ranged from 1.2 – 15.2 g TEQ/y.

Measuring PCDD/F emissions at 20 sites across Australia, Ivory and Mobbs (2004) found dioxin emissions from laboratory tests were up to ten times higher than those from field measurements but were comparable to other laboratory tests.⁴² Meyer et al. (2004) elaborated further as follows:⁴³ “Laboratory tests do not adequately simulate the combustion processes occurring in the field. ... The key difference between field and laboratory emissions may be the duration for which the smoke plume remains at high temperature. In field burns, air entrained into the smoke plume rapidly cools to temperatures that will not support the heterogeneous reactions required for dioxin synthesis.”

The paragraph claiming forest fires as a major PeCB source should be deleted from the Draft Risk Management Evaluation for PeCB.

Canadian Context for PeCB

PeCB is listed under the Prohibition of Certain Toxic Substances Regulations under CEPA 1999. It is noted in p. 8 of the Draft Evaluation report that exemptions to PeCB are allowed under the Chlorobiphenyls Regulations and Storage of PCB Materials Regulations. However, the report does not include reference to the proposed Regulatory Provision for an Extension to the 2009 End-of-Use Deadline for the Proposed PCB Regulations which consolidates the two PCB regulations noted earlier. It is our position that this proposed regulation will ensure that PCB containing equipment will be targeted for end of use by 2009 (with exemptions no longer than 2014).⁴⁴ This proposal will promote the further reduction of PCBs in Canada and if applicable also PeCB.

The following recommendations were highlighted in a joint submission by CELA, Great Lakes United and Société pour vaincre la pollution the government’s proposed

⁴⁰ Meyer CP, Black RR, Tolhurst KG, McCaw L, Cook G, Symons R, Mueller JF (2007) An emission budget for dioxins from crop and bush fires in Australia, *Organohalogen Cpd*s 69:2419-2422

⁴¹ Meyer CP, Beer T, Mueller J (2004) Technical report No. 1: Dioxins emissions from bushfires in Australia, National Dioxins Program, Department of the Environment and Heritage

⁴² Ivory, A., Mobbs C (2004) Dioxin levels in Australia: key findings of studies. *Organohalogen Cpd*s. 66: 3446-3451

⁴³ Meyer C, Beer T, Muller J, Gillett R, Weeks I, Powell J, Tolhurst K, McCaw L, Cook G, Marney D, Symons R, 2004. Dioxin Emissions from Bushfires in Australia. National Dioxins Program Technical Report No. 1. Canberra: Australian Government Department of the Environment and Heritage. <http://www.deh.gov.au/industry/chemicals/dioxins/index.html>.

⁴⁴ ENGO Comments Regarding Environment Canada’s Proposed Regulatory Provision for an Extension to the 2009 End-of-Use Deadline for the Proposed PCB Regulations, prepared for the Canadian Environmental Network Toxics Caucus, Prepared by John Jackson, United and Citizen’s Network on Waste; Fe de Leon, Canadian Environmental Law Association; Daniel Green, Société pour vaincre la pollution, see at http://cela.ca/uploads/f8e04c51a8e04041f6f7faa046b03a7c/597_PCBsExt.pdf

Regulatory Provision for an Extension to the 2009 End-of-Use Deadline for the Proposed PCB Regulations.

1. *We support Environment Canada's proposal to maintain the 2009 end-of-use deadline for PCBs.*
2. *We support Environment Canada's proposal to allow regulatees to request an extension to the end-of-use deadline by a maximum of five years to 2014, provided none of the provisions in Environment Canada's proposal are weakened. (page 2 and 3)*⁴⁵

Recommendations

Recommendation 17: The forest fire section of the Draft Risk Management Evaluation should be deleted since it is inconsistent with Canadian and other peer-reviewed data.

Recommendation 18: CELA would support the listing of PeCB under Annex A and C to ensure that intentional use of PeCB as it pertains to the production and use of quitozene is prevented.

Recommendation 19: The government should undertake a survey under PMRA or another relevant Canadian legislation to assess the volume as well as location of production and use of quitozene for the past 5-10 years. Furthermore, such a survey should include details on methods of disposal (including data on releases of PeCB or other toxic substances from landfilling or other disposal methods such as incineration) of quitozene.

4) Concluding Comments and Recommendation

As we proceed to consider the nomination of up to nine substances for addition to the Stockholm Convention at the Fourth Conference of the Parties (COP4) in 2009, CELA notes its concerns that the goals set out in the Stockholm Convention for the elimination and reduction of POPs will be significantly weakened if open-ended exemptions are granted to Parties. Extended use of POPs nominated through the POPRC process should not be allowed simply based on protecting the interest of an industrial sector. All exemptions should be time-limited or one-time in the case of lindane, alpha HCH, and beta HCH. Furthermore, all POPs candidate substances including PFOS should be listed in Annex A of the Convention to codify the commitment of the Parties to true elimination of these POPs. Annex B is best suited to substances that have an essential public health use or some other equivalently essential use since this type of listing restricts uses instead of eliminating them. It will be critical for the Parties of the Convention to take appropriate steps to promote the adoption of new POPs under the Convention with the aim of achieving elimination of POPs under Annexes A and C in the months leading up to COP4.

Parties should remain diligent in their work to implement the obligations under the Stockholm Convention. It is our view that the expansion of the list of POPs addressed under the Stockholm Convention through the work of the POPRC is essential if the global environment and human

⁴⁵ Ibid.

population are to be effectively protected from exposure to POPs. Furthermore, to ensure that the goal of elimination is achieved over time, listing of POPs under Annex A and C is appropriate. It also establishes a society where non-POPs or non toxic substitutes are promoted and implemented.

Recommendation 20: Canada should take necessary steps to promote and encourage Parties to support listing of the nine POPs candidate substances under Annex A and C for selected POPs candidate substances (i.e., c-octaBDE, PeCB).