355

A TASTE OF CANADA:

A FOOD TESTING CASE STUDY

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Table of Content

1.0 The Problems with Toxic Substances

The recent release of the 1996 National Pollutants Release Inventory (NPRI), Canada's only legislated inventory for toxic pollutants, indicated that 142,613 tonnes of pollutants were released to Canadian water, air, land and underground in 1996 and another 64,626 tonnes of waste was transferred off-site.[1] From these totals some 22,679 tonnes were toxic or carcinogenic pollutants. While the NPRI is able to provide Canadians information on 178 substances, the NPRI can account for only an estimated 5% of all releases into the environment due to its reporting thresholds.[2] Human health and the environment continue to be exposed to these pollutants and other persistent toxic substances (PTS) such as polychlorinated biphenyls (PCBs), DDT, dioxins and furans which are not reported under NPRI. The main pathway for exposure from these pollutants is through food.

The impacts from exposure to toxic pollutants are gradually being revealed. Increasingly, studies are showing the links that exist from exposure to pollutants and their impact on human health. Among the health impacts thought to be attributed to exposure to pollutants include behavioural and developmental problems in children, increase in cancers in human population, and suppression of immune systems in wildlife and human populations. In 1992, the International Joint Commission (IJC), an independent U.S.-Canadian advisory body regarding Great Lakes issues, recommended to the federal government that efforts be taken to:

> ...manage persistent toxic substances after they have been produced or used, or...eliminate and prevent their existence in the ecosystem in the first place... Since it seems impossible to eliminate discharges of these chemicals..., policy of banning or sunsetting their manufacture, distribution, storage, use and disposal appears to be the only alternative[3]

The IJC identified PTSs such as (PCBs) and DDTs to be two substances of concern to the health of Canadians and the environment. The IJC suggested that these substances be targetted for bans and phase-out. Ironically, the Canadian government has passed regulations on PCBs and DDT. However, despite these regulatory actions these substances remain in use in other jurisdictions and are being released into the environment. There is need to ban PTSs such as PCBs and DDTs in Canada and globally.

The Canadian government has various programs and initiatives underway to address toxic pollutants including the review of the *Canadian Environmental Protection Act* (CEPA) and the international negotiations towards a Global Treaty on Persistent Organic Pollutants (POPs) under the auspices of the United Nations (U.N.) Environment Programme. The review of CEPA, Canada's main statute on the management of toxic substances, began in September 1994, and the U.N. Global

Treaty on POPs, aimed to address 12 POPs[4], was initiated in June 1998 in Montreal.

2.0 Purpose of this Report

In April, 1997, the Canadian Environmental Law Association (CELA) released, A Taste of Canada: Comments and Analyses on Toxic Chemicals in Your Meals and Bioengineered Food made in Canada, a report which provided an in-depth discussion on the type toxic pollutants and bioengineered food found in Canada using federal government database. While this report did not undertake actual food testing to determine the extent of exposure to certain toxic pollutants, it did effectively highlight the seriousness of the problems associated with toxic substances in the Canadian environment. The report also indicated the opportunities that the Canadian government has to address these problems, in particular, the strengthening of the *Canadian Environmental Protection Act* (CEPA).

2.1 The Canadian Environmental Protection Act - Bill C-32

This report is a follow-up to A Taste of Canada to further demonstrate a need for strong federal leadership in the area of environmental protection. In March 1998, the federal government introduced Bill C-32: The *Canadian Environmental Protection Act* in the House of Commons for first reading. In early June 1998, Bill C-32 passed second reading and the Standing Committee on Environment and Sustainable Development undertook to conduct public hearings on the Bill. CELA along with other environmental organizations from the Toxics Caucus of the Canadian Environmental Network (CEN) have been active in reviewing CEPA since 1994. The Standing Committee public hearing is a forum to discuss the issues which threaten to weaken the effectiveness of CEPA. The weaknesses of CEPA are briefly summarized in a background document appended to this report as Appendix A.

As a follow-up to the 1997 report, CELA sponsored an analysis of selected food found on the menu in the West Block cafeteria of Parliament Hill in Canada to provide an example on how some of the most insidious pollutants released into the environment make their way into the Canadian diet. This exercise was meant to demonstrate to the Canadian public a simple and undeniable fact of exposure to toxic pollutants and the need for the federal government to address these substances in fora such as the CEPA review. The results of the analysis which are attached to the report as Appendix B are not intended to provide statistically significant sampling of food types, but reaffirm the need to act on these substances, some of which are not even in use in Canada. The report provides background on the impacts of some of the substances tested.

3.0 Summary of Methodology and Results

CELA approached the Centre for Indigenous Peoples' Nutrition and Environment (CINE), a reputatable laboratory at McGill University in Montreal, Quebec to conduct the analyses on food samples taken from the West Block cafeteria of Parliament Hill in Ottawa. Due to a limited budget, CELA chose to test five food samples. The food samples selected were bacon, french fries, orange, broccoli and banana. CINE was given instructions to determine the levels of various polychlorinated biphenyls (PCBs) and a range of organochlorinated pesticides such as DDT/DDE, lindane and others. CINE prepared a report outlining the methodology and summary of findings, attached to this report as Appendix C.

Table 1 is a summary of the results of the food testing on the five food samples.

Table 1: Summary of Results

Food Samples	Bacon* (ppm lipid wt.)	French Fries (ppb wet wt.)	Banana (ppb wet wt.)	Broccoli (ppb wet wt.)	Orange (ppb wet wt.)
Substance					
PCBs	0.0174	0.85	0.43	0.43	0.00
chlorobenzene	0.00466	0.00	0.00	0.00	0.00
lindane	0.0264	0.00	0.00	0.00	0.00
dieldrin	0.00	0.00	0.00	0.00	0.00
DDT	0.0149	33.59	13.55	18.30	11.30
mirex	0.00	0.00	0.00	0.00	0.00
chlordane	0.0302	4.66	1.90	2.35	1.41
heptachlor epoxide	0.00	0.00	0.00	0.00	0.00

* conversion from wet wt. to lipid wt. values

The decision to test for industrial chemicals and pesticides was simple. These industrial chemicals and pesticides are persistent toxic substances. Substances such as DDT breakdown into metabolites that are often equally persistent and hazardous to human health and the environment. Also these substances are known to build up in fatty tissues of wildlife, fish and human populations. Pesticide use in Canada must be approved through the *Pest Control Products Act*. While processes aimed at identifying

the most dangerous types of substances have been put into place in other jurisdictions, in Canada, tens of thousands of substances are currently in commercial use and hundreds more are introduced annually.

Some substances such as DDT enter Canada through long range transport. Communities in Canada's arctic region are chronically exposed to levels of such substances far higher than Canadians living in the south. This is due to the greater persistence of these substances in colder climates, and their ability to bioaccumulate and biomagnify in the Arctic food chain.

It is recognized that action on these substances must extend beyond Canada's borders, therefore initiatives such as the binding global treaty on POPs are currently under negotiations. Appendix D highlights the uses and impacts of the 12 substances on the initial list for the global treaty on POPs.

4.0 Interpretation of Results

As stated in the section outlining the Purpose for this Report, it is not the intention of this report to provide statistically significant data of food samples simply due to the limited budget of the project. However, there are several key observations regarding the data collected which further demonstrate the need for action on many of these substances.

While the data demonstrates that the levels of substances found in all five food samples are within the Canadian guidelines.[5] It is nevertheless of concern that such substances are present at all. This result informs Canadians just how presistent and pervasive these substances are, despite the fact that many of them have been banned or phased out. It also may signal the weaknesses of current and proposed legislation and other initiatives such as the Toxic Substances Management Policy (TSMP)[6] that target substances for action. Under the TSMP, aldrin, chlordane, DDT, dieldrin, endrin, PCBs, and mirex were candidates for Track 1 action for virtual elimination which will allow the continued use, production or generation of these substances. Substances such as dieldrin, chlordane, DDT, mirex and PCBs are also identified on other lists including the *Canada-Ontario Agreement Respecting the Great Lakes Basin Ecosystem.*[7]

In general, it is not surprising that many of the substances analysed were detected in the bacon sample because many of these substances are known to build up in fatty tissue of animals. However, what is surprising is that the level of DDT found (85.72 ng/g wet wt/0.147 ppm lipid weight) were higher than originally expected, given that all uses of DDT was banned in Canada in 1985. It is recognized, however, that DDT is highly persistent, bioaccumulative, and still in wide use for malaria control in many southern countries.

A wide body of evidence exists especially in wildlife - associating the pesticides and industrial chemicals found in the food samples with endocrine disruption. Hormones produced by the endocrine system control development of the male and female reproductive organs, the brain and nervous system, and immune function. These endocrine disrupting chemicals have been known to cause effects at levels much lower than Canadian guidelines allow.

It is also worth noting that lindane, a pesticide which remains in wide use in Canada. Lindane is highly persistent, bioaccumulative and toxic. It is also identified as an endocrine disruptor. While the initial list of substances for the global treaty on POPs does not include lindane, discussions to expand the list of substances for the global treaty have indicated lindane is a priority for addition to the list.

5.0 Where do we go from here

The Canadian population should ensure that their concerns regarding toxic substances are addressed in a decisive manner by the Canadian federal government. The presence of industrial chemicals and pesticides in food are signals for action. The Canadian population and the government are unsure what impacts these substances have on human health even at these low levels. To ensure the safety to the health of Canadians and their environment, the following should be priority with respect to environmental protection legislation in Canada.

- Departments of Health and Environment should conduct more frequent and routine testing of our food. A "national food testing inventory" should be established to provide Canadians with the most recent data on all contaminants in all major food products.

- The "national food testing inventory" should be publicly available. The inventory would demonstrate which substance requires legislative action to ensure the levels of that substance do not increase.

- Standards to protect human health populations from impacts due to exposure to substances should include consideration of sensitive populations such as infants and pregnant women. In 1996, the U.S. Environmental Protection Agency (EPA) announced that EPA standards will be based on risk of pollutants to children. The Canadian government should also revise its standards to protect children's health.

- The thresholds under NPRI should be reduced to include more facilities and increase the number of substances reported under the inventory.

- That the Government revise specific sections in Bill C-32: The *Canadian Environmental Protection Act* to ensure protection of the Canadian population and

environment.[8] These would include taking a precautionary approach to the management and use of toxic substances.

• That the Government recognize the threat that endocrine disrupting substances pose to wildlife and human health by amending screening and testing protocols to better ascertain when harm is occurring.

• Canada must demonstrate leadership by negotiating for a strong global treaty on POPs to address the flow of toxic substances from other countries. Instruments such as the TSMP, the current CEPA and Bill C-32 greatly constraint Canada's role in catalysing an effective POPs treaty. Such leadership is essential to maintaining Canada's hard-fought international reputation in this area. Canada also has an obligation to protect the constitutional right of its aboriginal people, who are in the forefront in terms of exposure to these substances.

List of Appendices

Appendix A - Background to the Bill C-32: The *Canadian Environmental Protection Act*
Appendix B - Test Results
Appendix C - Summary of Methodology and Results
Appendix D - Table of Effects for 12 persistent organic pollutants

Appendix A

BACKGROUND
BILL C-32: THE *CANADIAN ENVIRONMENTAL PROTECTION ACT*

1) The proposed Harmonization Accord will take precedence over Bill C-32.

In January 1998, the federal Minister of the Environment and her provincial colleagues endorsed an agreement, the *Canada-Wide Accord on Environmental Harmonization* (Accord) and three sub-agreements to harmonize federal and provincial environmental laws and policies. The Accord has been severely criticized by public interest groups for many reasons. The focus of this criticism has been the withdrawal of the federal government from its responsibility for environmental matters.

This direction is reflected in Bill C-32. Under section 2 of Bill C-32, for example, it is clear that the Accord will take precedence over CEPA; the Bill creates a statutory duty that CEPA be administered in a manner consistent with the Harmonization Accord. In addition, the federal government's ability to act without the agreement of the provinces would be severely constrained in key areas such as environmental emergencies and the implementation of Canada's environmental obligations under international treaties and customary international law. Moreover, Bill C-32 provides for the expanded use of "equivalency" agreements through which federal environmental laws and regulations do not apply in particular provinces.

2) Bill C-32 will make CEPA a residual statute.

Unlike the present CEPA, Bill C-32 proposes to make the Act applicable only where measures taken by other departments of the federal government are not "sufficient" according to the Environment Minister and the Minister responsible for those other measures. The effect of this provision is to make CEPA apply **only** when nothing else does. In other words, CEPA would become a residual statute rather than the cornerstone of federal environmental law and policy.

3) Bill C-32 will legitimize the continued generation and use of the worst toxic substances.

The proposed Bill was supposed to aggressively tackle the problem of toxic substances by providing for the "virtual elimination" (VE) or phasing-out of the most harmful toxic substances. The framework of the legislation is, however, problematic for several reasons. "Virtual elimination" is defined in a way that allows industry to continue to use or generate extremely dangerous substances, such as dioxin, so long as they are not released at detectable levels where harm can be established. In addition, the Bill creates a labyrinth of requirements for risk assessment and cost-benefit analysis before any action can actually be taken to "virtually eliminate" what the government itself has

labelled the "very worst" of pollutants. Rather than working toward the phase-out of these substances, the proposed law is actually a step backward by entrenching the old "end-of-the-pipe" pollution control approach. This approach has been decisively rejected by the International Joint Commission (IJC)[9] and others, including the federal government in its own Pollution Prevention Framework Policy.[10]

4) The citizen rights provisions of CEPA are ineffective.

Bill C-32 proposes a new right for Canadian citizens to commence court action against those that are violating the provisions of CEPA. The right to bring such an action, however, is subject to many qualifications that it is, in effect, a hollow right. Moreover, the section is only applicable when there has been an **actual** violation. It is not applicable where there is a **likelihood** of such a violation. In this way it is inconsistent with the approach in the Ontario *Environmental Bill of Rights* similar laws in the Yukon, the Northwest Territories, and in the United States (U.S.).

5) Bill C-32 will weaken the existing requirements of CEPA that <u>all</u> biotechnology products and new chemicals undergo environmental and human health evaluations before being introduced into Canada.

Bill C-32 includes a new part dealing with biotechnology products, such as genetically engineered plants, microorganisms and fish. However, its primary effect would be to permit Ministers other than the Minister of the Environment to exempt biotechnology products from CEPA's existing requirements that they undergo environmental and human health impact reviews prior to their introduction into Canada. The same charges are proposed for CEPA's provisions dealing with new chemicals, such as pesticides, regulated under statutes other than CEPA.

Appendix B

Parliament Hill samples										
August 14, 1998										
	PH-1 bacon		PH-2 fries		PH-3 banana		PH-4 broccoli		PH-5 orange	
	Fr1	Fr2	Fr1	Fr2	Fr1	Fr2	Fr1	Fr2	Fr1	Fr2
SURR (ng/ul)										
	1	1	1	1	1	1	1		1	1
CB 3-*C6/#S	0.17	0	0.26	0	0.04	0	0.25		0.25	0
g-HCH-*C6/#S	0.17	0.01	0.26	0	0.08	0	0.45		0.42	0.02
TrCB-28-*C12/#S	0.21	0	0.26	0	0.03	0	0.44		0.28	0
Dieldrin-*C4/#S	0	0.29	0	0.75	0	0.32	0		0	2.32
TeCB-77-*C12/#S	0.23	0	0.32	0	0.03	0	0.63		0.37	0
PnCB-118-*C12/#S	0.22	0	0.34	0	0.03	0	0.61		0.33	0
HxCB-153-*C12/#S	0.24	0	0.35	0	0.03	0	0.58		0.28	0
p,p'-DDT-*C12/#S	0.46	0.01	0.59	0	0.08	0.64	1.11		0.61	0.01
OCB-202-*C12/#S	0.21	0	0.33	0	0.02	0	0.56		0.3	0
DeCB-209-*C12/#S	0.24	0	0.32	0	0.02	0	0.64		0.31	0.01
ng/ul		Fr1+Fr2		Fr1+Fr2		Fr1+Fr2		Fr1+Fr2		Fr1+Fr2
CB 3-*C6/#S		0.17		0.26		0.04		0.25		0.25
g-HCH-*C6/#S		0.18		0.26		0.08		0.45		0.44
TrCB-28-*C12/#S		0.21		0.26		0.03		0.44		0.28
Dieldrin-*C4/#S		0.29		0.75		0.32		0		2.32
TeCB-77-*C12/#S		0.23		0.32		0.03		0.63		0.37
PnCB-118-*C12/#S		0.22		0.34		0.03		0.61		0.33
HxCB-153-*C12/#S		0.24		0.35		0.03		0.58		0.28
p,p'-DDT-*C12/#S		0.47		0.59		0.72		1.11		0.62
OCB-202-*C12/#S		0.21		0.33		0.02		0.56		0.3
DeCB-209-*C12/#S		0.24		0.32		0.02		0.64		0.32

Parliament Hill Cafeteria Samples

Parliament Hill samples

August 14, 1998

PCB (ng/ul)

	PH-1 bacon		PH-2 fries		PH-3 banana		PH-4 broccoli		PH-5 orange	
	Fr1	Fr2	Fr1	Fr2	Fr1	Fr2	Fr1	Fr2	Fr1	Fr2
TrCB-18	0	0	0	0	0	0	0		0	0
DiCB-15	0	0	0	0	0	0	0		0	0
TeCB-54	0	0	0	0	0	0	0		0	0
TrCB-31	0.01	0	0.01	0	0.01	0	0.01		0	0
TeCB-52	0	0	0	0	0	0	0		0	0
TeCB-49	0	0	0	0	0	0	0		0	0
TeCB-44	0	0	0	0	0	0	0		0	0
TeCB-40	0	0	0	0	0	0	0		0	0
PnCB-103	0	0	0	0	0	0	0		0	0
TeCB-74	0	0	0	0	0	0	0		0	0
TeCB-70	0	0	0	0	0	0	0		0	0
PnCB-95+121	0	0	0	0	0	0	0		0	0
TeCB-60	0	0	0	0	0	0	0		0	0
PnCB-101	0.01	0	0	0	0	0	0		0	0
PnCB-99	0.01	0	0	0	0	0	0		0	0
PnCB-86	0	0	0	0	0	0	0		0	0
PnCB-87	0	0	0	0	0	0	0		0	0
PnCB-110	0	0	0	0	0	0	0		0	0
HxCB-154	0	0	0	0	0	0	0		0	0
TeCB-77	0	0	0	0	0	0	0		0	0
HxCB-151	0	0	0	0	0	0	0		0	0
PnCB-118	0.01	0	0	0	0	0	0		0	0
HxCB-143	0	0	0	0	0	0	0		0	0
PnCB-114	0	0	0	0	0	0	0		0	0
HxCB-153	0.01	0	0	0	0	0	0		0	0
PnCB-105	0	0	0	0	0	0	0		0	0

Parliament Hill Cafeteria Samples

HxCB-141	0	0	0	0	0	0	0		0	0
HxCB-137	0	0	0	0	0	0	0		0	0
HxCB-163	0	0	0	0	0	0	0		0	0
HxCB-138+158	0	0	0	0	0	0	0		0	0
HxCB-129	0	0	0	0	0	0	0		0	0
HpCB-178	0	0	0	0	0	0	0		0	0
HpCB-182+187	0	0	0	0	0	0	0		0	0
HxCB-159	0	0	0	0	0	0	0		0	0
HpCB-183	0	0	0	0	0	0	0		0	0
HxCB-128	0	0	0	0	0	0	0		0	0
HpCB-185	0	0	0	0	0	0	0		0	0
HpCB-174	0	0	0	0	0	0	0		0	0
HpCB-177	0	0	0	0	0	0	0		0	0
OCB-202	0	0	0	0	0	0	0		0	0
HpCB-171	0	0	0	0	0	0	0		0	0
HpCB-173	0	0	0	0	0	0	0		0	0
OCB-201	0	0	0	0	0	0	0		0	0
HxCB-156+157	0	0	0	0	0	0	0		0	0
HpCB-172	0	0	0	0	0	0	0		0	0
HpCB-180	0	0	0	0	0	0	0		0	0
HpCB-191	0	0	0	0	0	0	0		0	0
HpCB-170	0	0	0	0	0	0	0		0	0
OCB-199	0	0	0	0	0	0	0		0	0
OCB-196+203	0	0	0	0	0	0	0		0	0
HpCB-189	0	0	0	0	0	0	0		0	0
NCB-208	0	0	0	0	0	0	0		0	0
OCB-195	0	0	0	0	0	0	0		0	0
NCB-207	0	0	0	0	0	0	0		0	0
OCB-194	0	0	0	0	0	0	0		0	0
OCB-205	0	0	0	0	0	0	0		0	0
NCB-206	0	0	0	0	0	0	0		0	0
DeCB-209	0	0	0	0	0	0	0		0	0
(ng/ul)		Fr1+Fr2		Fr1+Fr2		Fr1+Fr2		Fr1+Fr2		Fr1+Fr2

Parliament Hill Cafeteria Samples

TrCB-18		0		0		0		0		0
DiCB-15		0		0		0		0		0
TeCB-54		0		0		0		0		0
TrCB-31		0.01		0.01		0.01		0.01		0
TeCB-52		0		0		0		0		0
TeCB-49		0		0		0		0		0
TeCB-44		0		0		0		0		0
TeCB-40		0		0		0		0		0
PnCB-103		0		0		0		0		0
TeCB-74		0		0		0		0		0
TeCB-70		0		0		0		0		0
PnCB-95+121		0		0		0		0		0
TeCB-60		0		0		0		0		0
PnCB-101		0.01		0		0		0		0
PnCB-99		0.01		0		0		0		0
PnCB-86		0		0		0		0		0
PnCB-87		0		0		0		0		0
PnCB-110		0		0		0		0		0
HxCB-154		0		0		0		0		0
TeCB-77		0		0		0		0		0
HxCB-151		0		0		0		0		0
PnCB-118		0.01		0		0		0		0
HxCB-143		0		0		0		0		0
PnCB-114		0		0		0		0		0
HxCB-153		0.01		0		0		0		0
PnCB-105		0		0		0		0		0
HxCB-141		0		0		0		0		0
HxCB-137		0		0		0		0		0
HxCB-163		0		0		0		0		0
HxCB-138+158		0		0		0		0		0
HxCB-129		0		0		0		0		0
HpCB-178		0		0		0		0		0
HpCB-182+187		0		0		0		0		0
HxCB-159		0		0		0		0		0

Parliament Hill Cafeteria Samples

HpCB-183		0		0		0		0		0
HxCB-128		0		0		0		0		0
HpCB-185		0		0		0		0		0
HpCB-174		0		0		0		0		0
HpCB-177		0		0		0		0		0
OCB-202		0		0		0		0		0
HpCB-171		0		0		0		0		0
HpCB-173		0		0		0		0		0
OCB-201		0		0		0		0		0
HxCB-156+157		0		0		0		0		0
HpCB-172		0		0		0		0		0
HpCB-180		0		0		0		0		0
HpCB-191		0		0		0		0		0
HpCB-170		0		0		0		0		0
OCB-199		0		0		0		0		0
OCB-196+203		0		0		0		0		0
HpCB-189		0		0		0		0		0
NCB-208		0		0		0		0		0
OCB-195		0		0		0		0		0
NCB-207		0		0		0		0		0
OCB-194		0		0		0		0		0
OCB-205		0		0		0		0		0
NCB-206		0		0		0		0		0
DeCB-209		0		0		0		0		0
Sample Wt prepared (g)		2.1942		5.1042		10.01526		10.148		10.1148
Uncorrected for surrogate recovery										
TrCB-18		0.00		0.00		0.00		0.00		0.00
DiCB-15		0.00		0.00		0.00		0.00		0.00
TeCB-54		0.00		0.00		0.00		0.00		0.00
TrCB-31		0.46		0.20		0.10		0.10		0.00
TeCB-52		0.00		0.00		0.00		0.00		0.00
TeCB-49		0.00		0.00		0.00		0.00		0.00
TeCB-44		0.00		0.00		0.00		0.00		0.00
TeCB-40		0.00		0.00		0.00		0.00		0.00

Parliament Hill Cafeteria Samples

PnCB-103		0.00		0.00		0.00		0.00		0.00
TeCB-74		0.00		0.00		0.00		0.00		0.00
TeCB-70		0.00		0.00		0.00		0.00		0.00
PnCB-95+121		0.00		0.00		0.00		0.00		0.00
TeCB-60		0.00		0.00		0.00		0.00		0.00
PnCB-101		0.46		0.00		0.00		0.00		0.00
PnCB-99		0.46		0.00		0.00		0.00		0.00
PnCB-86		0.00		0.00		0.00		0.00		0.00
PnCB-87		0.00		0.00		0.00		0.00		0.00
PnCB-110		0.00		0.00		0.00		0.00		0.00
HxCB-154		0.00		0.00		0.00		0.00		0.00
TeCB-77		0.00		0.00		0.00		0.00		0.00
HxCB-151		0.00		0.00		0.00		0.00		0.00
PnCB-118		0.46		0.00		0.00		0.00		0.00
HxCB-143		0.00		0.00		0.00		0.00		0.00
PnCB-114		0.00		0.00		0.00		0.00		0.00
HxCB-153		0.46		0.00		0.00		0.00		0.00
PnCB-105		0.00		0.00		0.00		0.00		0.00
HxCB-141		0.00		0.00		0.00		0.00		0.00
HxCB-137		0.00		0.00		0.00		0.00		0.00
HxCB-163		0.00		0.00		0.00		0.00		0.00
HxCB-138+158		0.00		0.00		0.00		0.00		0.00
HxCB-129		0.00		0.00		0.00		0.00		0.00
HpCB-178		0.00		0.00		0.00		0.00		0.00
HpCB-182+187		0.00		0.00		0.00		0.00		0.00
HxCB-159		0.00		0.00		0.00		0.00		0.00
HpCB-183		0.00		0.00		0.00		0.00		0.00
HxCB-128		0.00		0.00		0.00		0.00		0.00
HpCB-185		0.00		0.00		0.00		0.00		0.00
HpCB-174		0.00		0.00		0.00		0.00		0.00
HpCB-177		0.00		0.00		0.00		0.00		0.00
OCB-202		0.00		0.00		0.00		0.00		0.00
HpCB-171		0.00		0.00		0.00		0.00		0.00
HpCB-173		0.00		0.00		0.00		0.00		0.00

Parliament Hill Cafeteria Samples

OCB-201		0.00		0.00		0.00		0.00		0.00
HxCB-156+157		0.00		0.00		0.00		0.00		0.00
HpCB-172		0.00		0.00		0.00		0.00		0.00
HpCB-180		0.00		0.00		0.00		0.00		0.00
HpCB-191		0.00		0.00		0.00		0.00		0.00
HpCB-170		0.00		0.00		0.00		0.00		0.00
OCB-199		0.00		0.00		0.00		0.00		0.00
OCB-196+203		0.00		0.00		0.00		0.00		0.00
HpCB-189		0.00		0.00		0.00		0.00		0.00
NCB-208		0.00		0.00		0.00		0.00		0.00
OCB-195		0.00		0.00		0.00		0.00		0.00
NCB-207		0.00		0.00		0.00		0.00		0.00
OCB-194		0.00		0.00		0.00		0.00		0.00
OCB-205		0.00		0.00		0.00		0.00		0.00
NCB-206		0.00		0.00		0.00		0.00		0.00
DeCB-209		0.00		0.00		0.00		0.00		0.00
				??		??		??		??

Parliament Hill Cafeteria Samples

Parliament Hill samples										
August 14, 1998										
PST (ng/ul)										
	PH-1 bacon		PH-2 fries		PH-3 banana		PH-4 broccoli		PH-5 orange	
	Fr1	Fr2	Fr1	Fr2	Fr1	Fr2	Fr1	Fr2	Fr1	Fr2
Pentachlorobenzene	0	0	0	0	0	0	0		0	0
a-HCH	0.01	0	0	0	0	0	0		0	0
HCB	0.01	0	0	0	0	0	0		0	0
b-HCH	0.04	0	0	0	0	0	0		0	0
g-HCH	0	0.01	0	0	0	0	0		0	0
Heptachlor	0	0	0	0	0	0	0		0	0
Heptachlor Epoxide	0	0	0	0	0	0	0		0	0
t-Chlordane	0.03	0	0.02	0	0.02	0	0.02		0.01	0
c-Chlordane	0.02	0	0.02	0	0.01	0	0.02		0.01	0
t-Nonachlor	0.02	0	0.01	0	0.01	0	0.01		0.01	0
4,4'-DDE	0.07	0	0.04	0	0.03	0	0.1		0.02	0
Dieldrin	0	0	0	0	0	0	0		0	0
c-Nonachlor	0.01	0	0	0	0	0	0		0	0
4,4'-DDD	0.11	0.01	0.1	0.01	0.07	0.02	0.11		0.05	0.01
4,4'-DDT	0.34	0.07	0.37	0.05	0.26	0.07	0.36		0.25	0.07
Photomirex	0	0	0	0	0	0	0		0	0
Mirex	0	0	0	0	0	0	0		0	0
(ng/ul)		Fr1+Fr2		Fr1+Fr2		Fr1+Fr2		Fr1+Fr2		Fr1+Fr2
Pentachlorobenzene		0		0		0		0		0
a-HCH		0.01		0		0		0		0
HCB		0.01		0		0		0		0
b-HCH		0.04		0		0		0		0

Parliament Hill Cafeteria Samples

g-HCH	0.01	0	0	0	0
Heptachlor	0	0	0	0	0
Heptachlor Epoxide	0	0	0	0	0
t-Chlordane	0.03	0.02	0.02	0.02	0.01
c-Chlordane	0.02	0.02	0.01	0.02	0.01
t-Nonachlor	0.02	0.01	0.01	0.01	0.01
4,4'-DDE	0.07	0.04	0.03	0.1	0.02
Dieldrin	0	0	0	0	0
c-Nonachlor	0.01	0	0	0	0
4,4'-DDD	0.12	0.11	0.09	0.11	0.06
4,4'-DDT	0.41	0.42	0.33	0.36	0.32
Photomirex	0	0	0	0	0
Mirex	0	0	0	0	0
Sample Wt prepared (g)	2.1942	5.1042	10.01526	10.148	10.1148
Uncorrected for surrogate recovery					
PST					
(ng/g sample)	PH-1 bacon	PH-2 fries	PH-3 banana	PH-4 broccoli	PH-5 orange
Pentachlorobenzene	0.00	0.00	0.00	0.00	0.00
a-HCH	0.46	0.00	0.00	0.00	0.00
HCB	0.46	0.00	0.00	0.00	0.00
b-HCH	1.82	0.00	0.00	0.00	0.00
g-HCH	0.46	0.00	0.00	0.00	0.00
Heptachlor	0.00	0.00	0.00	0.00	0.00
Heptachlor Epoxide	0.00	0.00	0.00	0.00	0.00
t-Chlordane	1.37	0.39	0.20	0.20	0.10
c-Chlordane	0.91	0.39	0.10	0.20	0.10
t-Nonachlor	0.91	0.20	0.10	0.10	0.10
4,4'-DDE	3.19	0.78	0.30	0.99	0.20

Parliament Hill Cafeteria Samples

Dieldrin		0.00		0.00		0.00		0.00		0.00
c-Nonachlor		0.46		0.00		0.00		0.00		0.00
4,4'-DDD		5.47		2.16		0.90		1.08		0.59
4,4'-DDT		18.69		8.23		3.30		3.55		3.16
Photomirex		0.00		0.00		0.00		0.00		0.00
Mirex		0.00		0.00		0.00		0.00		0.00

Parliament Hill samples										
August 14, 1998										
Surr (ng/ul)										
	PH-1	bacon	PH-2	fries	PH-3	banana	PH-4	broccoli	PH-5	orange
		Fr1+Fr2		Fr1+Fr2		Fr1+Fr2		Fr1+Fr2		Fr1+Fr2
CB 3-*C6/#S		0.17		0.26		0.04		0.25		0.25
g-HCH-*C6/#S		0.18		0.26		0.08		0.45		0.44
TrCB-28-*C12/#S		0.21		0.26		0.03		0.44		0.28
Dieldrin-*C4/#S		0.29		0.75		0.32		0		2.32
TeCB-77-*C12/#S		0.23		0.32		0.03		0.63		0.37
PnCB-118-*C12/#S		0.22		0.34		0.03		0.61		0.33
HxCB-153-*C12/#S		0.24		0.35		0.03		0.58		0.28
p,p'-DDT-*C12/#S		0.47		0.59		0.72		1.11		0.62
OCB-202-*C12/#S		0.21		0.33		0.02		0.56		0.3
DeCB-209-*C12/#S		0.24		0.32		0.02		0.64		0.32
PCB (ng/ul injected)										
	PH-1	bacon	PH-2	fries	PH-3	banana	PH-4	broccoli	PH-5	orange
		Fr1+Fr2		Fr1+Fr2		Fr1+Fr2		Fr1+Fr2		Fr1+Fr2
TrCB-18		0		0		0		0		0
DiCB-15		0		0		0		0		0
TeCB-54		0.01		0.01		0.01		0.01		0
TrCB-31		0		0		0		0		0
TeCB-52		0		0		0		0		0

Parliament Hill Cafeteria Samples

TeCB-49		0		0		0		0		0
TeCB-44		0		0		0		0		0
TeCB-40		0		0		0		0		0
PnCB-103		0		0		0		0		0
TeCB-74		0		0		0		0		0
TeCB-70		0		0		0		0		0
PnCB-95+121		0		0		0		0		0
TeCB-60		0.01		0		0		0		0
PnCB-101		0.01		0		0		0		0
PnCB-99		0		0		0		0		0
PnCB-86		0		0		0		0		0
PnCB-87		0		0		0		0		0
PnCB-110		0		0		0		0		0
HxCB-154		0		0		0		0		0
TeCB-77		0		0		0		0		0
HxCB-151		0.01		0		0		0		0
PnCB-118		0		0		0		0		0
HxCB-143		0		0		0		0		0
PnCB-114		0.01		0		0		0		0
HxCB-153		0		0		0		0		0
PnCB-105		0		0		0		0		0
HxCB-141		0		0		0		0		0
HxCB-137		0		0		0		0		0
HxCB-163		0		0		0		0		0
HxCB-138+158		0		0		0		0		0
HxCB-129		0		0		0		0		0
HpCB-178		0		0		0		0		0
HpCB-182+187		0		0		0		0		0
HxCB-159		0		0		0		0		0
HpCB-183		0		0		0		0		0

Parliament Hill Cafeteria Samples

HxCB-128		0		0		0		0		0
HpCB-185		0		0		0		0		0
HpCB-174		0		0		0		0		0
HpCB-177		0		0		0		0		0
OCB-202		0		0		0		0		0
HpCB-171		0		0		0		0		0
HpCB-173		0		0		0		0		0
OCB-201		0		0		0		0		0
HxCB-156+157		0		0		0		0		0
HpCB-172		0		0		0		0		0
HpCB-180		0		0		0		0		0
HpCB-191		0		0		0		0		0
HpCB-170		0		0		0		0		0
OCB-199		0		0		0		0		0
OCB-196+203		0		0		0		0		0
HpCB-189		0		0		0		0		0
NCB-208		0		0		0		0		0
OCB-195		0		0		0		0		0
NCB-207		0		0		0		0		0
OCB-194		0		0		0		0		0
OCB-205		0		0		0		0		0
NCB-206		0		0		0		0		0
DeCB-209										

Parliament Hill Cafeteria Samples

PCB (ng/100 ul corrected for recovery)										
	PH-1 bacon		PH-2 fries		PH-3 banana		PH-4 broccoli		PH-5 orange	
		Fr1+Fr2		Fr1+Fr2		Fr1+Fr2		Fr1+Fr2		Fr1+Fr2
TrCB-18		0		0		0		0		0
DiCB-15										
TeCB-54		4.3478		4.3478		4.3478		4.3478		0
TrCB-31		0		0		0		0		0
TeCB-52		0		0		0		0		0
TeCB-49		0		0		0		0		0
TeCB-44		0		0		0		0		0
TeCB-40		0		0		0		0		0
PnCB-103		0		0		0		0		0
TeCB-74		0		0		0		0		0
TeCB-70		0		0		0		0		0
PnCB-95+121		0		0		0		0		0
TeCB-60		4.3478		0		0		0		0
PnCB-101		4.5455		0		0		0		0
PnCB-99		0		0		0		0		0
PnCB-86		0		0		0		0		0
PnCB-87		0.01		0		0		0		0
PnCB-110		0		0		0		0		0
HxCB-154		0		0		0		0		0
TeCB-77		0		0		0		0		0
HxCB-151		4.1667		0		0		0		0
PnCB-118		0		0		0		0		0
HxCB-143		0		0		0		0		0
PnCB-114		4.5455		0		0		0		0
HxCB-153		0		0		0		0		0
PnCB-105		0		0		0		0		0

Parliament Hill Cafeteria Samples

HxCB-141		0		0		0		0		0
HxCB-137		0		0		0		0		0
HxCB-163		0		0		0		0		0
HxCB-138+158		0		0		0		0		0
HxCB-129		0		0		0		0		0
HpCB-178		0		0		0		0		0
HpCB-182+187		0		0		0		0		0
HxCB-159		0		0		0		0		0
HpCB-183		0		0		0		0		0
HxCB-128		0		0		0		0		0
HpCB-185		0		0		0		0		0
HpCB-174		0		0		0		0		0
HpCB-177		0		0		0		0		0
OCB-202		0		0		0		0		0
HpCB-171		0		0		0		0		0
HpCB-173		0		0		0		0		0
OCB-201		0		0		0		0		0
HxCB-156+157		0		0		0		0		0
HpCB-172		0		0		0		0		0
HpCB-180		0		0		0		0		0
HpCB-191		0		0		0		0		0
HpCB-170		0		0		0		0		0
OCB-199		0		0		0		0		0
OCB-196+203		0		0		0		0		0
HpCB-189		0		0		0		0		0
NCB-208		0		??		??		??		??
OCB-195		??		??		??		??		??
NCB-207		??		??		??		??		??
OCB-194		??		??		??		??		??
OCB-205		??		??		??		??		??

Parliament Hill Cafeteria Samples

NCB-206		??		??		??		??		??
DeCB-209		0		0		0		0		0
Sample Wt prepared (g)		2.1942		5.1042		10.0152 6		10.148		10.1148
PCB ng/g wet weight										
TrCB-18		0.00		0.00		0.00		0.00		0.00
DiCB-15		0.00		0.00		0.00		0.00		0.00
TeCB-54		1.98		0.85		0.43		0.43		0.00
TrCB-31		0.00		0.00		0.00		0.00		0.00
TeCB-52		0.00		0.00		0.00		0.00		0.00
TeCB-49		0.00		0.00		0.00		0.00		0.00
TeCB-44		0.00		0.00		0.00		0.00		0.00
TeCB-40		0.00		0.00		0.00		0.00		0.00
PnCB-103		0.00		0.00		0.00		0.00		0.00
TeCB-74		0.00		0.00		0.00		0.00		0.00
TeCB-70		0.00		0.00		0.00		0.00		0.00
PnCB-95+121		0.00		0.00		0.00		0.00		0.00
TeCB-60		1.98		0.00		0.00		0.00		0.00
PnCB-101		2.07		0.00		0.00		0.00		0.00
PnCB-99		0.00		0.00		0.00		0.00		0.00
PnCB-86		0.00		0.00		0.00		0.00		0.00
PnCB-87		0.00		0.00		0.00		0.00		0.00
PnCB-110		0.00		0.00		0.00		0.00		0.00
HxCB-154		0.00		0.00		0.00		0.00		0.00
TeCB-77		0.00		0.00		0.00		0.00		0.00

Parliament Hill Cafeteria Samples

HxCB-151		1.90		0.00		0.00		0.00		0.00
PnCB-118		0.00		0.00		0.00		0.00		0.00
HxCB-143		0.00		0.00		0.00		0.00		0.00
PnCB-114		2.07		0.00		0.00		0.00		0.00
HxCB-153		0.00		0.00		0.00		0.00		0.00
PnCB-105		0.00		0.00		0.00		0.00		0.00
HxCB-141		0.00		0.00		0.00		0.00		0.00
HxCB-137		0.00		0.00		0.00		0.00		0.00
HxCB-163		0.00		0.00		0.00		0.00		0.00
HxCB-138+158		0.00		0.00		0.00		0.00		0.00
HxCB-129		0.00		0.00		0.00		0.00		0.00
HpCB-178		0.00		0.00		0.00		0.00		0.00
HpCB-182+187		0.00		0.00		0.00		0.00		0.00
HxCB-159		0.00		0.00		0.00		0.00		0.00
HpCB-183		0.00		0.00		0.00		0.00		0.00
HxCB-128		0.00		0.00		0.00		0.00		0.00
HpCB-185		0.00		0.00		0.00		0.00		0.00
HpCB-174		0.00		0.00		0.00		0.00		0.00
HpCB-177		0.00		0.00		0.00		0.00		0.00
OCB-202		0.00		0.00		0.00		0.00		0.00
HpCB-171		0.00		0.00		0.00		0.00		0.00
HpCB-173		0.00		0.00		0.00		0.00		0.00
OCB-201		0.00		0.00		0.00		0.00		0.00
HxCB-156+157		0.00		0.00		0.00		0.00		0.00
HpCB-172		0.00		0.00		0.00		0.00		0.00
HpCB-180		0.00		0.00		0.00		0.00		0.00
HpCB-191		0.00		0.00		0.00		0.00		0.00
HpCB-170		0.00		0.00		0.00		0.00		0.00
OCB-199		0.00		0.00		0.00		0.00		0.00
OCB-196+203		0.00		0.00		0.00		0.00		0.00

HpCB-189		0.00		0.00		0.00		0.00		0.00
NCB-208		0.00		ERR		ERR		ERR		ERR
OCB-195		ERR		ERR		ERR		ERR		ERR
NCB-207		ERR		ERR		ERR		ERR		ERR
OCB-194		ERR		ERR		ERR		ERR		ERR
OCB-205		ERR		ERR		ERR		ERR		ERR
NCB-206		ERR		ERR		ERR		ERR		ERR
DeCB-209		0.00		0.00		0.00		0.00		0.00
PCB (ng/g wet wt) :										
Total		**10.01**		**0.85**		**0.43**		**0.43**		**0.00**
Aroclor 1260		0		0		0		0		0

Parliament Hill samples

August 14, 1998

Surr (ng/ul)

	PH-1 bacon		PH-2 fries		PH-3 banana		PH-4 broccoli		PH-5 orange
		Fr1+Fr2		Fr1+Fr2		Fr1+Fr2		Fr1+Fr2	Fr1+Fr2
CB 3-*C6/#S		0.17		0.26		0.04		0.25	0.25
g-HCH-*C6/#S		0.18		0.26		0.08		0.45	0.44
TrCB-28-*C12/#S		0.21		0.26		0.03		0.44	0.28
Dieldrin-*C4/#S		0.29		0.75		0.32		0	2.32
TeCB-77-*C12/#S		0.23		0.32		0.03		0.63	0.37
PnCB-118-*C12/#S		0.22		0.34		0.03		0.61	0.33
HxCB-153-*C12/#S		0.24		0.35		0.03		0.58	0.28
p,p'-DDT-*C12/#S		0.21		0.33		0.72		0.56	0.30
OCB-202-*C12/#S		0.21		0.33		0.02		0.56	0.30
DeCB-209-*C12/#S		0.24		0.32		0.02		0.64	0.32

PST (ng/ul injected)

	PH-1 bacon		PH-2 fries		PH-3 banana		PH-4 broccoli		PH-5 orange
		Fr1+Fr2		Fr1+Fr2		Fr1+Fr2		Fr1+Fr2	Fr1+Fr2
Pentachlorobenzene		0		0		0		0	0
a-HCH		0.01		0		0		0	0
HCB		0.01		0		0		0	0
b-HCH		0.04		0		0		0	0

g-HCH		0.01		0		0		0		0
Heptachlor		0		0		0		0		0
Heptachlor Epoxide		0		0		0		0		0
t-Chlordane		0.03		0.02		0.02		0.02		0.01
c-Chlordane		0.02		0.02		0.01		0.02		0.01
t-Nonachlor		0.02		0.01		0.01		0.01		0.01
4,4'-DDE		0.07		0.04		0.03		0.1		0.02
Dieldrin		0		0		0		0		0
c-Nonachlor		0.01		0		0		0		0
4,4'-DDD		0.12		0.11		0.09		0.11		0.06
4,4'-DDT		0.41		0.42		0.33		0.36		0.32
Photomirex		0		0		0		0		0
Mirex		0		0		0		0		0
PST (ng/100 ul corrected for recovery)										
	PH-1 bacon		PH-2 fries		PH-3 banana		PH-4 broccoli		PH-5 orange	
		Fr1+Fr2		Fr1+Fr2		Fr1+Fr2		Fr1+Fr2		Fr1+Fr2
Pentachlorobenzene		0		0		0		0		0
a-HCH		5.5555556		0		0		0		0
HCB		5.8823529		0		0		0		0
b-HCH		22.222222		0		0		0		0
g-HCH		5.5555556		0		0		0		0
Heptachlor		0		0		0		0		0

Heptachlor Epoxide		0		0		0		0		0
t-Chlordane		14.285714		9.5238095		9.5238095		9.5238095		4.7619048
c-Chlordane		9.5238095		9.5238095		4.7619048		9.5238095		4.7619048
t-Nonachlor		9.5238095		4.7619048		4.7619048		4.7619048		4.7619048
4,4'-DDE		33.333333		19.047619		14.285714		47.619048		9.5238095
Dieldrin		0		0		0		0		0
c-Nonachlor		4.7619048		0		0		0		0
4,4'-DDD		57.142857		52.380952		42.857143		52.380952		28.571429
4,4'-DDT		97.619048		100		78.571429		85.714286		76.190476
Photomirex		0		0		0		0		0
Mirex		0		0		0		0		0
Sample Wt prepared (g)		2.1942		5.1042		10.01526		10.148		10.1148
PST ng/g wet weight										
Pentachlorobenzene		0.00		0.00		0.00		0.00		0.00
a-HCH		2.53		0.00		0.00		0.00		0.00
HCB		2.68		0.00		0.00		0.00		0.00
b-HCH		10.13		0.00		0.00		0.00		0.00
g-HCH		2.53		0.00		0.00		0.00		0.00

Heptachlor		0.00		0.00		0.00		0.00		0.00
Heptachlor Epoxide		0.00		0.00		0.00		0.00		0.00
t-Chlordane		6.51		1.87		0.95		0.94		0.47
c-Chlordane		4.34		1.87		0.48		0.94		0.47
t-Nonachlor		4.34		0.93		0.48		0.47		0.47
4,4'-DDE		15.19		3.73		1.43		4.69		0.94
Dieldrin		0.00		0.00		0.00		0.00		0.00
c-Nonachlor		2.17		0.00		0.00		0.00		0.00
4,4'-DDD		26.04		10.26		4.28		5.16		2.82
4,4'-DDT		44.49		19.59		7.85		8.45		7.53
Photomirex		0.00		0.00		0.00		0.00		0.00
Mirex		0.00		0.00		0.00		0.00		0.00
PESTICIDES (ng/g wet wt) :										
Total		**120.96**		**38.25**		**15.45**		**20.65**		**12.71**
Chlorobenzene		2.68		0.00		0.00		0.00		0.00
Lindane		15.19		0.00		0.00		0.00		0.00
Dieldrin		0.00		0.00		0.00		0.00		0.00
DDT		85.72		33.59		13.55		18.30		11.30
Mirex		0.00		0.00		0.00		0.00		0.00
Chlordane		17.36		4.66		1.90		2.35		1.41
Heptachlor epoxide		0.00		0.00		0.00		0.00		0.00

10/14/98

Sample ID: PH-1 Bacon	
PCB (ng/g wet wt) :	
Total	10.01
Aroclor 1260	0.00
PESTICIDES (ng/g wet wt) :	
Total :	120.96
Chlorobenzene	2.68
Lindane	15.19
Dieldrin	0.00
DDT	85.72
Mirex	0.00
Chlordane	17.36
Heptachlor epoxide	0.00

Sample ID: PH-1 Bacon

PCB (ng/g wet wt) :		PESTICIDES (ng/g wet wt) :	
TrCB-18	0.00	Pentachlorobenzene	0.00
DiCB-15	0.00	a-HCH	2.53
TeCB-54	1.98	HCB	2.68
TrCB-31	0.00	b-HCH	10.13
TeCB-52	0.00	g-HCH	2.53
TeCB-49	0.00	Heptachlor	0.00
TeCB-44	0.00	Heptachlor Epoxide	0.00
TeCB-40	0.00	t-Chlordane	6.51
PnCB-103	0.00	c-Chlordane	4.34
TeCB-74	0.00	t-Nonachlor	4.34
TeCB-70	0.00	4,4'-DDE	15.19
PnCB-95+121	0.00	Dieldrin	0.00
TeCB-60	1.98	c-Nonachlor	2.17
PnCB-101	2.07	4,4'-DDD	26.04
PnCB-99	0.00	4,4'-DDT	44.49
PnCB-86	0.00	Photomirex	0.00
PnCB-87	0.00	Mirex	0.00
PnCB-110	0.00		
HxCB-154	0.00		
TeCB-77	0.00		
HxCB-151	1.90		
PnCB-118	0.00		
HxCB-143	0.00		
PnCB-114	2.07		
HxCB-153	0.00		

				PnCB-105	0.00				
				HxCB-141	0.00				
				HxCB-137	0.00				
				HxCB-163	0.00				
				HxCB-138+158	0.00				
				HxCB-129	0.00				
				HpCB-178	0.00				
				HpCB-182+187	0.00				
				HxCB-159	0.00				
				HpCB-183	0.00				
				HxCB-128	0.00				
				HpCB-185	0.00				
				HpCB-174	0.00				
				HpCB-177	0.00				
				OCB-202	0.00				
				HpCB-171	0.00				
				HpCB-173	0.00				
				OCB-201	0.00				
				HxCB-156+157	0.00				
				HpCB-172	0.00				
				HpCB-180	0.00				
				HpCB-191	0.00				
				HpCB-170	0.00				
				OCB-199	0.00				
				OCB-196+203	0.00				
				HpCB-189	0.00				
				NCB-208	0.00				
				OCB-195	0.00				
				NCB-207	0.00				
				OCB-194	0.00				
				OCB-205	0.00				
				NCB-206	0.00				
				DeCB-209	0.00				

Sample ID: PH-2 Fries					
		Sample ID: PH-2 Fries			
PCB (ng/g wet wt) :		PCB (ng/g wet wt) :		PESTICIDES (ng/g wet wt) :	
Total	0.85	TrCB-18	0.00	Pentachlorobenzene	0.00
		DiCB-15	0.00	a-HCH	0.00
Aroclor 1260	0.00	TeCB-54	0.85	HCB	0.00
		TrCB-31	0.00	b-HCH	0.00
		TeCB-52	0.00	g-HCH	0.00
PESTICIDES (ng/g wet wt) :		TeCB-49	0.00	Heptachlor	0.00
		TeCB-44	0.00	Heptachlor Epoxide	0.00
Total :	38.25	TeCB-40	0.00	t-Chlordane	1.87
		PnCB-103	0.00	c-Chlordane	1.87
Chlorobenzene	0.00	TeCB-74	0.00	t-Nonachlor	0.93
Lindane	0.00	TeCB-70	0.00	4,4'-DDE	3.73
Dieldrin	0.00	PnCB-95+121	0.00	Dieldrin	0.00
DDT	33.59	TeCB-60	0.00	c-Nonachlor	0.00
Mirex	0.00	PnCB-101	0.00	4,4'-DDD	10.26
Chlordane	4.66	PnCB-99	0.00	4,4'-DDT	19.59
Heptachlor epoxide	0.00	PnCB-86	0.00	Photomirex	0.00
		PnCB-87	0.00	Mirex	0.00
		PnCB-110	0.00		
		HxCB-154	0.00		
		TeCB-77	0.00		
		HxCB-151	0.00		
		PnCB-118	0.00		
		HxCB-143	0.00		
		PnCB-114	0.00		

				HxCB-153	0.00					
				PnCB-105	0.00					
				HxCB-141	0.00					
				HxCB-137	0.00					
				HxCB-163	0.00					
				HxCB-138+158	0.00					
				HxCB-129	0.00					
				HpCB-178	0.00					
				HpCB-182+187	0.00					
				HxCB-159	0.00					
				HpCB-183	0.00					
				HxCB-128	0.00					
				HpCB-185	0.00					
				HpCB-174	0.00					
				HpCB-177	0.00					
				OCB-202	0.00					
				HpCB-171	0.00					
				HpCB-173	0.00					
				OCB-201	0.00					
				HxCB-156+157	0.00					
				HpCB-172	0.00					
				HpCB-180	0.00					
				HpCB-191	0.00					
				HpCB-170	0.00					
				OCB-199	0.00					
				OCB-196+203	0.00					
				HpCB-189	0.00					
				NCB-208	0.00					
				OCB-195	0.00					
				NCB-207	0.00					
				OCB-194	0.00					
				OCB-205	0.00					
				NCB-206	0.00					
				DeCB-209	0.00					

10/14/98

Sample ID: PH-3 Banana					
		Sample ID: PH-3 Banana			
PCB (ng/g wet wt) :		**PCB (ng/g wet wt) :**		**PESTICIDES (ng/g wet wt) :**	
Total	**0.43**	TrCB-18	0.00	Pentachlorobenzene	0.00
		DiCB-15	0.00	a-HCH	0.00
Aroclor 1260	**0.00**	TeCB-54	0.43	HCB	0.00
		TrCB-31	0.00	b-HCH	0.00
		TeCB-52	0.00	g-HCH	0.00
PESTICIDES (ng/g wet wt) :		TeCB-49	0.00	Heptachlor	0.00
		TeCB-44	0.00	Heptachlor Epoxide	0.00
Total :	**15.45**	TeCB-40	0.00	t-Chlordane	0.95
		PnCB-103	0.00	c-Chlordane	0.48
Chlorobenzene	**0.00**	TeCB-74	0.00	t-Nonachlor	0.48
Lindane	**0.00**	TeCB-70	0.00	4,4'-DDE	1.43
Dieldrin	**0.00**	PnCB-95+121	0.00	Dieldrin	0.00
DDT	**13.55**	TeCB-60	0.00	c-Nonachlor	0.00
Mirex	**0.00**	PnCB-101	0.00	4,4'-DDD	4.28
Chlordane	**1.90**	PnCB-99	0.00	4,4'-DDT	7.85
Heptachlor epoxide	**0.00**	PnCB-86	0.00	Photomirex	0.00
		PnCB-87	0.00	Mirex	0.00
		PnCB-110	0.00		
		HxCB-154	0.00		
		TeCB-77	0.00		
		HxCB-151	0.00		
		PnCB-118	0.00		
		HxCB-143	0.00		
		PnCB-114	0.00		

				HxCB-153	0.00					
				PnCB-105	0.00					
				HxCB-141	0.00					
				HxCB-137	0.00					
				HxCB-163	0.00					
				HxCB-138+158	0.00					
				HxCB-129	0.00					
				HpCB-178	0.00					
				HpCB-182+187	0.00					
				HxCB-159	0.00					
				HpCB-183	0.00					
				HxCB-128	0.00					
				HpCB-185	0.00					
				HpCB-174	0.00					
				HpCB-177	0.00					
				OCB-202	0.00					
				HpCB-171	0.00					
				HpCB-173	0.00					
				OCB-201	0.00					
				HxCB-156+157	0.00					
				HpCB-172	0.00					
				HpCB-180	0.00					
				HpCB-191	0.00					
				HpCB-170	0.00					
				OCB-199	0.00					
				OCB-196+203	0.00					
				HpCB-189	0.00					
				NCB-208	0.00					
				OCB-195	0.00					
				NCB-207	0.00					
				OCB-194	0.00					
				OCB-205	0.00					
				NCB-206	0.00					
				DeCB-209	0.00					

10/14/98

Sample ID: PH-4 Broccoli					
		Sample ID: PH-4 Broccoli			
PCB (ng/g wet wt) :		PCB (ng/g wet wt) :		PESTICIDES (ng/g wet wt) :	
Total	**0.43**	TrCB-18	0.00	Pentachlorobenzene	0.00
		DiCB-15	0.00	a-HCH	0.00
Aroclor 1260	**0.00**	TeCB-54	0.43	HCB	0.00
		TrCB-31	0.00	b-HCH	0.00
		TeCB-52	0.00	g-HCH	0.00
PESTICIDES (ng/g wet wt) :		TeCB-49	0.00	Heptachlor	0.00
		TeCB-44	0.00	Heptachlor Epoxide	0.00
Total :	**20.65**	TeCB-40	0.00	t-Chlordane	0.94
		PnCB-103	0.00	c-Chlordane	0.94
Chlorobenzene	**0.00**	TeCB-74	0.00	t-Nonachlor	0.47
Lindane	**0.00**	TeCB-70	0.00	4,4'-DDE	4.69
Dieldrin	**0.00**	PnCB-95+121	0.00	Dieldrin	0.00
DDT	**18.30**	TeCB-60	0.00	c-Nonachlor	0.00
Mirex	**0.00**	PnCB-101	0.00	4,4'-DDD	5.16
Chlordane	**2.35**	PnCB-99	0.00	4,4'-DDT	8.45
Heptachlor epoxide	**0.00**	PnCB-86	0.00	Photomirex	0.00
		PnCB-87	0.00	Mirex	0.00
		PnCB-110	0.00		
		HxCB-154	0.00		
		TeCB-77	0.00		
		HxCB-151	0.00		
		PnCB-118	0.00		
		HxCB-143	0.00		
		PnCB-114	0.00		

10/14/98

				HxCB-153	0.00					
				PnCB-105	0.00					
				HxCB-141	0.00					
				HxCB-137	0.00					
				HxCB-163	0.00					
				HxCB-138+158	0.00					
				HxCB-129	0.00					
				HpCB-178	0.00					
				HpCB-182+187	0.00					
				HxCB-159	0.00					
				HpCB-183	0.00					
				HxCB-128	0.00					
				HpCB-185	0.00					
				HpCB-174	0.00					
				HpCB-177	0.00					
				OCB-202	0.00					
				HpCB-171	0.00					
				HpCB-173	0.00					
				OCB-201	0.00					
				HxCB-156+157	0.00					
				HpCB-172	0.00					
				HpCB-180	0.00					
				HpCB-191	0.00					
				HpCB-170	0.00					
				OCB-199	0.00					
				OCB-196+203	0.00					
				HpCB-189	0.00					
				NCB-208	0.00					
				OCB-195	0.00					
				NCB-207	0.00					
				OCB-194	0.00					
				OCB-205	0.00					
				NCB-206	0.00					
				DeCB-209	0.00					

10/14/98

Sample ID: PH-5 Orange							
			Sample ID: PH-5 Orange				
PCB (ng/g wet wt) :			PCB (ng/g wet wt) :			PESTICIDES (ng/g wet wt) :	
Total	0.00		TrCB-18	0.00		Pentachlorobenzene	0.00
			DiCB-15	0.00		a-HCH	0.00
Aroclor 1260	0.00		TeCB-54	0.00		HCB	0.00
			TrCB-31	0.00		b-HCH	0.00
			TeCB-52	0.00		g-HCH	0.00
PESTICIDES (ng/g wet wt) :			TeCB-49	0.00		Heptachlor	0.00
			TeCB-44	0.00		Heptachlor Epoxide	0.00
Total :	12.71		TeCB-40	0.00		t-Chlordane	0.47
			PnCB-103	0.00		c-Chlordane	0.47
Chlorobenzene	0.00		TeCB-74	0.00		t-Nonachlor	0.47
Lindane	0.00		TeCB-70	0.00		4,4'-DDE	0.94
Dieldrin	0.00		PnCB-95+121	0.00		Dieldrin	0.00
DDT	11.30		TeCB-60	0.00		c-Nonachlor	0.00
Mirex	0.00		PnCB-101	0.00		4,4'-DDD	2.82
Chlordane	1.41		PnCB-99	0.00		4,4'-DDT	7.53
Heptachlor epoxide	0.00		PnCB-86	0.00		Photomirex	0.00
			PnCB-87	0.00		Mirex	0.00
			PnCB-110	0.00			
			HxCB-154	0.00			
			TeCB-77	0.00			
			HxCB-151	0.00			
			PnCB-118	0.00			
			HxCB-143	0.00			
			PnCB-114	0.00			
			HxCB-153	0.00			

				PnCB-105	0.00					
				HxCB-141	0.00					
				HxCB-137	0.00					
				HxCB-163	0.00					
				HxCB-138+158	0.00					
				HxCB-129	0.00					
				HpCB-178	0.00					
				HpCB-182+187	0.00					
				HxCB-159	0.00					
				HpCB-183	0.00					
				HxCB-128	0.00					
				HpCB-185	0.00					
				HpCB-174	0.00					
				HpCB-177	0.00					
				OCB-202	0.00					
				HpCB-171	0.00					
				HpCB-173	0.00					
				OCB-201	0.00					
				HxCB-156+157	0.00					
				HpCB-172	0.00					
				HpCB-180	0.00					
				HpCB-191	0.00					
				HpCB-170	0.00					
				OCB-199	0.00					
				OCB-196+203	0.00					
				HpCB-189	0.00					
				NCB-208	0.00					
				OCB-195	0.00					
				NCB-207	0.00					
				OCB-194	0.00					
				OCB-205	0.00					
				NCB-206	0.00					
				DeCB-209	0.00					

Appendix C

FOOD SAMPLES FROM PARLIAMENT HILL

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Methodology and Summary of Result

Levels of total PCBs (the sum of 51 congeners) and chlorinated solvents and pesticides (chlorobenzene (CBZ), hexachlorocyclohexane (HCH), dieldrin, heptachlor epoxide, chlordane, DDT, mirex, and toxaphene) were measured in the five samples. Food samples were slightly thawed and cut into pieces and homogenized with an Osterizer blender. Two grams of bacon, five grams of fries and ten grams of broccoli, banana (de-skinned) and orange (de-skinned) were spiked with an aliquot of surrogate internal standard solution containing ^{13}C-labelled PCB IUPAC No 3, 28, 77, 118, 153, 202 and 209, $^{13}C_{12}$-p, p'-DDT, dieldrin and $^{13}C_6$-g-lindane. The sample was ground with 60 g of anhydrous sodium sulphate in a mortar until a free flowing powder was obtained. The ground food sample was packed into a glass column (2.5 cm i.d. x 30 cm) filled with 75 ml of solvent (1:1 methylene chloride/hexane) and soaked for 30 minutes. The solvent was eluted at a flow rate of 3-5 ml/min and further extracted with 150 ml of solvent. The extract was concentrated to 1-2 ml on a rotary evaporator and transferred to a conical tube. The extract was filtered through a 0.45 mm Teflon filter (SPE Ltd, Concord ON.) and made up to 5.3 ml with solvent (1:1 methylene chloride/hexane). Each sample was passed through a SX-3 Biobeads gel permeation column (3 cm i.d. x 70 cm; solvent:

1:1 methylene chloride/hexane; flow rate: 5 ml/min) connected to a Beckmann Gold HPLC system (Beckmann, Fullerton CA). The first 150 ml, containing higher molecular weight lipids, were discarded. The next 150 ml containing the PCB and chlorinated pesticides were collected and concentrated under a gentle stream of dry nitrogen to 300- 500 ml, and made up to approximately 1 ml with 15:85 methylene chloride/hexane. The extract was then applied onto a Florisil (Supelco, Mississauga, ON.) column (1 cm. i.d. x 30 cm) for additional purification and fractionation. Two fractions were collected: the first fraction (50 ml 15:85 methylene chloride/hexane) contained PCB congeners, CBZ, HCH, chlordanes, DDT, and mirex; and the second fraction (50 ml 1:1 methylene chloride/hexane) contained heptachlor epoxide and dieldrin. The two fractions were concentrated to 50 ml, spiked with the volumetric internal standard d_{12}-chrysene and brought to 100 ml with isooctane for GC analysis.

The two fractions were characterized using a Varian Saturn III GC-Ion trap mass spectrometer (Varian Scientific, Mississauga,ON). A DB-5MS (J&W Scientific) (30 m x 0.25 mm i.d. and 0.25 mm film thickness) capillary column was used. Samples were loaded onto a Varian 8200CX autosampler and 1 ml injections were made with the SPI injector using the sandwich injection technique. The initial injecting temperature was 110 ^{o}C for 1 minute then raised to 280 ^{o}C at 150 ^{o}C/min and held for 50 minutes. Initial column temperature was 80^{o}C and held for 1 minute, raised to 150 ^{o}C at 10 ^{o}C/min, raised to 265 ^{o}C at 3 ^{o}C/min, raised to 300 ^{o}C at 15 ^{o}C/min and held for 5 minutes. Ion trap temperature was kept at 270 ^{o}C with the electron multiplier set at 1800 V over the 10^5 tuning voltage and the transfer line was kept at 260 ^{o}C.

A total of 51 PCBs and 17 chlorinated pesticides was screened in the samples.

Levels were measured using the internal standard method in conjunction with the corresponding external standards. Detection limits were 0.1 ng/g for all organochlorine compounds. With each batch of sample, standard reference materials measured were CLB-1 PCB solutions from the National Research Council of Canada and SRM 1588 organics in cod liver oil from the National Institute of Standards and Technology. Results were consistently within 1 SD of certified values. Stringent quality control measures were built in all the analyses. Our laboratory also participated in the QA/QC intercomparison exercise for organochlorine and heavy metals organized by the Northern Contaminants Program of Indian and Northern Affairs Canada.

Fat Contents of samples (%)

Bacon	**57.5**
Fries	**8.2**
Banana	**0.45**
Broccoli	**0.35**
Orange	**0.12**

Only trace amount of orgranochlorines were found in the food samples. Maximum residue limit (MRL) used by Health Canada 1.0 ppm for DDT and 0.2 ppm for PCB. The concentrations in the bacon sample which has the highest concentrations of these two contaminants (85 ppb DDT and 10 ppb PCB on a wet weight basis, or 0.147 ppm for DDT and 0.017 ppm for PCB on lipid weight basis) were about ten times lower than the MRL.

The tolerable intake levels TDI used by Health Canada are (in ug/kg body weight/day): 20 for DDT, 1 for PCB, 0.05 for chlordane, 0.3 for HCH and 0.27 for chlorobenzene. Assuming a person weighing 60 kg and eat 200 g of bacon per day, the daily intake will be 0.28 for DDT, 0.03 for PCB, 0.05 for chlordane, 0.05 for HCH and 0.008 ug/kg bw/day. Since it is unlikely that someone can eat that much bacon, the risk of consuming these food items is minimal.

Appendix D

List of twelve POPs on initial list for global treaty

Persistent Organic Pollutant	Use	Selected Effects
DDT	Pesticide – still widely used in southern countries for malaria control	- egg shell thinning in birds - associated with chronic human health effects - endocrine system disruptor
PCBs	Coolant in electrical transformers; heat exchange fluid; additive in paints, plastics and paper	- lethal to fish at high doses - reproductive failures in wildlife - associated with immune system suppression, behavioural abnormalities and developmental problems in humans
Dieldrin	Insecticide	- highly toxic to fish and other aquatic life - frog embryos exhibit spinal deformities
Endrin	Insecticide	- highly toxic to fish
Aldrin	Insecticide	- toxic to humans, fish and other wildlife
Chlordane	Insecticide	- toxic to humans and wildlife - possible human carcinogen - may affect human immune system
Mirex	Insecticide; fire retardant	- toxic to plants, crustaceans and fish - possible human carcinogen
Toxaphene	Insecticide	- highly toxic to fish - possible human carcinogen
Dioxins	Unintentional byproduct of combustion; pesticide manufacture	- toxic to wildlife - associated with enzyme disorders, immune system disorders, chloracne and cancer in humans
Furans	Unintentional byproduct of combustion; PCB manufacture; pesticide manufacture	- effects similar to dioxins - possible human carcinogen
Heptachlor	Insecticide	- associated with bird population declines - lethal to mink, rats, rabbits - adverse behavioural changes and lowered reproductive success in wildlife - possible human carcinogen
Hexachlorobenzene	Fungicide; industrial solvent; byproduct	- lethal to some wildlife - associated with adverse reproductive effects in wildlife - accidental poisonings in humans resulted in wide range of effects

Prepared by Craig Boljkovac, World Wildlife Fund Canada

ENDNOTES

1. Environment Canada, Summary Report 1996: National Pollutants Release Inventory (July 1998), Supply and Services, pp. 21 and 31.

2. Environment Canada, National Pollutants Release Inventory, 1993.

3. International Joint Commission, Sixth Biennial Report on Great Lakes Water Quality (Ottawa-Washington, 1992).

4. The 12 substances targetted under the UN Global Treaty on POPs are DDT, PCBs, Dieldrin, Endrin, Aldrin, Chlordane, Mirex, Toxaphene, Dioxins, Furans, Heptachlor, Hexachlorobenzene.

5. See Health Canada's *Food and Drug Act* updated in May 1996. The Act provides the Maximum Residue Limits (MRL) of agricultural chemicals. For example, the MRL for Lindane is 3 ppm (vegetable and fruits), 2 ppm (meat and meat products - hogs, cattle, sheep, goat), 0.07 ppm (poultry), 0.02 ppm (butter, milk and other dairy products). The MRL for PCBs is 0.2 ppm (meat and meat products), 0.5 ppm (poultry) and 2 ppm (fish).

6. Environment Canada, Toxic Substance Management Policy, June 1995.

7. See: Environment Canada and Ministry of the Environment and Energy, *Canada-Ontario Agreement Respecting the Great Lakes* Basin *Ecosystem*, 1994.

8. See: Submission on Bill C-32: the *Canadian Environmental Protection Act* prepared by Paul Muldoon, Canadian Environmental Law Association (Brief No. 350), and Mark Winfield, Canadian Institute for Environmental Law and Policy (Brief No. 98/4), October 1998.

9. See: International Joint Commission Sixth Biennial Report on Great Lakes Water Quality (Ottawa-Washington D.C.).

10. Government of Canada, Pollution Prevention: A Federal Strategy for Action (1995).

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