

**National Inventory
of
PCBs in Use and PCB Wastes in Storage
in Canada**

1997 Annual Report

Prepared for

Canadian Council of
Ministers of the Environment

by

Toxics Pollution Prevention Directorate
Environmental Protection Service
Environment Canada

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Foreword

The national PCB inventory is a compilation of PCB-containing items that are in use or in storage at various locations across Canada. The inventory changes continually as PCBs are taken out of service to be placed in storage or destroyed and as new PCB materials are reported. In addition, new storage sites may be established or existing sites consolidated or closed. As a result, differences between the information in this inventory and other PCB inventory information may arise from time to time. These differences should be discussed with the appropriate provincial or federal officials listed in Appendices A and B of this report.

This annual report and reports from previous years are available at Environment Canada's PCB website (www.ec.gc.ca/pcb/eng/inv_e.htm). For more information about the national inventory, please contact:

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Ce rapport annuel et ceux des années précédentes sont disponibles en français au site des BPC d'Environnement Canada (www.ec.gc.ca/pcb/fra/inv_f.htm). Pour plus d'information sur l'inventaire national, veuillez communiquer avec :

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1. Background

The *National Inventory of PCBs in Use and PCB Wastes in Storage in Canada* is an annual report summarizing information in the national PCB inventory database that Environment Canada maintains for the Canadian Council of Ministers of the Environment (CCME). This report presents the status of the PCB inventory as of December 31, 1997.

The first national inventory of Canadian PCBs, which was published by the CCME in 1988, provided data on PCB wastes in storage only. Subsequently, in order to improve the system for reporting on PCBs in Canada and to provide a comprehensive inventory, a national database system was established to include data on both PCBs in use and PCB wastes in storage.

The provision of information for the national database is a joint federal–provincial responsibility. Environment Canada supplies data on in-use PCB-containing equipment, federally regulated PCB wastes, and PCB wastes in Prince Edward Island, Saskatchewan, Yukon, and the Northwest Territories. The provincial governments of Newfoundland and Labrador, Nova Scotia, New Brunswick, Quebec, Ontario, Manitoba, Alberta, and British Columbia supply data on PCB wastes in storage in their respective jurisdictions.

Data for the report are obtained from several sources. Federal and provincial PCB waste storage regulations require PCB owners to report to government on the amounts of PCB wastes in storage. Data on the amounts of PCBs in use in electrical equipment come from two sources: voluntary reporting by PCB owners, and inspections of PCB equipment for compliance with the federal Chlorobiphenyls Regulations.

The present report gives data for five categories of PCBs, namely:

- in-use askarel,
- waste askarel,
- in-use PCB-contaminated mineral oil,
- waste PCB-contaminated mineral oil, and
- other PCB wastes.

The two askarel categories represent high-concentration PCB liquids. Askarels generally contain between 40% and 80% PCBs and were used in electrical transformers when insulating and fire-resistant liquids were required. Pure PCBs were also used in other types of electrical equipment, such as capacitors and fluorescent light ballasts.

The two mineral oil categories represent liquids containing low concentrations of PCBs. Mineral oil is also used as an insulating fluid in electrical transformers, and some of it has become inadvertently contaminated with PCBs. Generally, the PCB concentration in mineral oil is less than 1000 mg/litre.

The final category, “other PCB wastes,” includes drained PCB transformers, capacitors contaminated with residual PCBs, fluorescent lamp ballasts containing PCB capacitors, and PCB-contaminated soil and other solids (e.g., wood and absorbents).

Most of the in-use and waste askarel and mineral oil in Canada is found in electrical equipment; however, liquid PCB wastes may also be stored in drums or other containers.

In reporting the inventory data, both gross and net weights are used. Net weight refers to the weight of the askarel or mineral oil itself, while gross weight is the total weight of the liquid and the electrical equipment in which it is contained. Other PCB wastes, such as soil, are reported only as gross weights. Both gross and net weights are included in the inventory because when PCB management options are being evaluated, PCB liquids, the various types of PCB equipment, and PCB-contaminated soil may each be managed differently. For example, the entire PCB capacitor may be destroyed, whereas PCB transformers may be cleaned to recycle metal and other components. If askarel is drained from a transformer, the transformer casing and internal components (e.g., wire, wood, and paper) may still represent a PCB waste and, as such, will form part of the PCB waste inventory.

Often the gross weight of electrical equipment is unknown. However, as was outlined in previous inventory reports, the gross weight of the equipment can be estimated if the volume of fluid in the equipment is known. For transformers and other large equipment containing askarel, the gross weight in kilograms is calculated by multiplying the fluid capacity in litres by a factor of 4.5. For askarel-containing capacitors, the comparable factor is 6. PCB-contaminated mineral oil is usually referred to in terms of net weight, because transformers that contain this oil are often reused after being cleaned and retrofilled with clean oil. The net weight of the oil can be calculated assuming a density of 0.9 kg/litre for mineral oil.

The principal components of this inventory report are the national inventory, the federal inventory, and the non-federal inventory. The national inventory represents all PCBs in Canada. The federal inventory includes only those PCBs owned or controlled by federal departments, boards, agencies, and Crown corporations. The non-federal inventory includes only those PCBs owned or controlled by provincial and territorial governments and the private sector. Some highlights from the 1997 inventory report are given in the next section.

2. Inventory Highlights

2.1 National Inventory

As of December 1997, the national inventory of PCBs in use and in storage was as shown in Tables 1–3.

Table 1: National Inventory of In-use and Waste Askarels

Item	In-use askarels (net weight, tonnes)	Waste askarels (storage) (gross weight, tonnes)
Transformers	7 878	9 312
Capacitors	1 506	6 529
Other equipment	63	91
Bulk storage	N/A	1 774
Total	9 447	17 706

Table 2: National Inventory of In-use and Waste Mineral Oil

Item	In-use mineral oil (net weight, tonnes)	Waste mineral oil (storage) (net weight, tonnes)
Transformers	1 795	327
Capacitors	N/A	N/A
Other equipment	104	0
Bulk storage	N/A	2 652
Total	1 899	2 979

Table 3: National Inventory of Other Stored Wastes

Item	Other stored wastes (gross weight, tonnes)
Soil	94 580
Fluorescent light ballasts	4 903
Drained equipment	3 491
Other wastes	3 593
Total	106 567

2.2 Federal Inventory

As of December 1997, the federal inventory of PCBs in use and in storage was as shown in Tables 4–6.

Table 4: Federal Inventory of In-use and Waste Askarels

Item	In-use askarels (net weight, tonnes)	Waste askarels (storage) (gross weight, tonnes)
Transformers	448	155
Capacitors	28	425
Other equipment	23	10
Bulk storage	N/A	86

Total	499	677
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Table 5: Federal Inventory of In-use and Waste Mineral Oil

Item	In-use mineral oil (net weight, tonnes)	Waste mineral oil (storage) (net weight, tonnes)
Transformers	117	17
Capacitors	N/A	N/A
Other equipment	2	0
Bulk storage	N/A	15
Total	119	32

Table 6: Federal Inventory of Other Stored Wastes

Item	Other stored wastes (gross weight, tonnes)
Soil	98
Fluorescent light ballasts	488
Drained equipment	54
Other wastes	93
Total	733

2.3 Non-federal Inventory

As of December 1997, the non-federal inventory of PCBs in use and in storage was as shown in Tables 7–9.

Table 7: Non-federal Inventory of In-use and Waste Askarels

Item	In-use askarels (net weight, tonnes)	Waste askarels (storage) (gross weight, tonnes)
Transformers	7 430	9 156
Capacitors	1 478	6 104
Other equipment	40	81
Bulk storage	N/A	1 688
Total	8 948	17 029

Table 8: Non-federal Inventory of In-use and Waste Mineral Oil

Item	In-use mineral oil (net weight, tonnes)	Waste mineral oil (storage) (net weight, tonnes)
Transformers	1 678	310
Capacitors	N/A	N/A

Other equipment	102	0
Bulk storage	N/A	2 637
Total	1 780	2 947

Table 9: Non-federal Inventory of Other Stored Wastes

Item	Other stored wastes (gross weight, tonnes)
Soil	94 482
Fluorescent light ballasts	4 416
Drained equipment	3 347
Other wastes	3 500
Total	105 835

3. PCB Waste Storage Sites

As of December 1997, there were 2 857 PCB waste storage sites in Canada. Of these, 298 sites were federal and 2 559 were non-federal. The sites are divided into seven categories according to the quantities of wastes stored in them (i.e., from <100 kg to ≥10 000 tonnes) (Tables 10–12).

Detailed information on waste storage sites under provincial or territorial jurisdiction can be obtained from the provincial or territorial environment offices listed in Appendix A. Information on specific sites owned or operated by the federal government can be obtained from the Environment Canada regional or district offices listed in Appendix B.

Table 10: PCB Storage Sites (National)

Province		< 100 kg	100 kg to < 1 tonne	1 to <10 tonnes	10 to <100 tonnes	100 to <1000 tonnes	1000 to <10 000 tonnes	≥10 000 tonnes	Total sites Total tonnes
Nfld.	Sites	15	17	12	19	2			65
	Tonnes	0.6	5.5	32.7	689.7	379.8			1 108.3
P.E.I.	Sites	2	3	1		1			7
	Tonnes	0.1	0.8	3.5		147.4			151.8
N.S.	Sites	9	17	16	8		1		51
	Tonnes	0.2	6.7	50.6	205.3		2 457.0		2 719.8
N.B.	Sites	2	9	15	2	1			29
	Tonnes	0.1	5.0	54.8	61.0	227.0			347.9
Que.	Sites	114	122	120	56	8			420
	Tonnes	4.4	47.7	524.7	1 682.4	3 133.4			5 392.6
Ont.	Sites	126	560	486	221	40	3	1	1437
	Tonnes	4.5	227.8	1 704.0	6 348.8	8 679.5	17 485.9	64 000.0	98 450.5
Man.	Sites	10	56	33	7	2			108
	Tonnes	0.2	19.7	119.3	266.7	473.2			879.1
Sask.	Sites	28	93	38	3				162
	Tonnes	0.5	32.7	66.7	40.1				140.0
Alta.	Sites	19	31	15	13	2	1		81
	Tonnes	0.8	12.9	48.0	560.4	1 869.6	2 299.4		4 791.1
B.C.	Sites	115	169	124	48	9	3		468
	Tonnes	4.1	69.8	475.6	1 265.2	1 800.8	9 605.8		13 221.3
Yukon	Sites	12	6	2					20
	Tonnes	0.3	1.2	4.0					5.5
N.W.T.	Sites	1	2	5	1				9
	Tonnes	0.0	1.0	26.2	17.2				44.4
Total	Sites	453	1085	867	378	65	8	1	2 857
	Tonnes	15.8	430.8	3 110.1	11 136.8	16 710.7	31 848.1	64 000.0	127 252.3

Note: Totals may not add up due to rounding.

Table 11: PCB Storage Sites (Federal)

Province		< 100 kg	100 kg to < 1 tonne	1 to <10 tonnes	10 to <100 tonnes	100 to <1000 tonnes	1000 to <10 000 tonnes	≥10 000 tonnes	Total sites Total tonnes
Nfld.	Sites	5	5	4	3				17
	Tonnes	0.0	2.0	11.6	105.7				119.3
P.E.I.	Sites								0
	Tonnes								0.0
N.S.	Sites	2	5	4	1				12
	Tonnes	0.1	2.5	9.2	18.3				30.1
N.B.	Sites		5	2	1				8
	Tonnes		3.1	8.6	14.5				26.2
Que.	Sites	7	6	10	4				27
	Tonnes	0.2	3.3	64.4	137.2				205.1
Ont.	Sites	8	19	15	6	2			50
	Tonnes	0.3	9.4	56.8	152.2	248.6			467.3
Man.	Sites	1	5	5					11
	Tonnes	0.0	2.6	21.8					24.4
Sask.	Sites	10	68	26					104
	Tonnes	0.0	25.6	41.0					66.6
Alta.	Sites	1	6	2					9
	Tonnes	0.0	3.3	3.5					6.8
B.C.	Sites	26	8	11	5	2			52
	Tonnes	0.5	4.3	47.7	119.2	313.8			485.5
Yukon	Sites	3	1						4
	Tonnes	0.1	0.1						0.2
N.W.T.	Sites	1	1	2					4
	Tonnes	0.0	0.2	9.8					10.0
Total	Sites	64	129	81	20	4	0	0	298
	Tonnes	1.2	56.4	274.4	547.1	562.4	0.0	0.0	1 441.5

Note: Totals may not add up due to rounding.

Table 12: PCB Storage Sites (Non-federal)

Province		< 100 kg	100 kg to < 1 tonne	1 to <10 tonnes	10 to <100 tonnes	100 to <1000 tonnes	1000 to <10 000 tonnes	≥10 000 tonnes	Total sites Total tonnes
Nfld.	Sites	10	12	8	16	2			48
	Tonnes	0.5	3.5	21.2	584.0	379.8			989.0
P.E.I.	Sites	2	3	1		1			7
	Tonnes	0.1	0.8	3.5		147.4			151.8
N.S.	Sites	7	12	12	7		1		39
	Tonnes	0.2	4.2	41.5	187.0		2 457.0		2 689.9
N.B.	Sites	2	4	13	1	1			21
	Tonnes	0.1	1.8	46.2	46.5	227.0			321.6
Que.	Sites	107	116	110	52	8			393
	Tonnes	4.3	44.4	460.3	1 545.3	3 133.4			5 187.7
Ont.	Sites	118	541	471	215	38	3	1	1387
	Tonnes	4.2	218.4	1 647.2	6 196.3	8 431.0	17 485.9	64 000.0	97 983.0
Man.	Sites	9	51	28	7	2			97
	Tonnes	0.2	17.1	97.5	266.7	473.2			854.7
Sask.	Sites	18	25	12	3				58
	Tonnes	0.5	7.1	25.7	40.1				73.4
Alta.	Sites	18	25	13	13	2	1		72
	Tonnes	0.8	9.5	44.4	560.4	1 869.6	2 299.4		4 784.1
B.C.	Sites	89	161	113	43	7	3		416
	Tonnes	3.6	65.5	427.9	1 146.0	1 487.0	9 605.8		12 735.8
Yukon	Sites	9	5	2					16
	Tonnes	0.2	1.1	4.0					5.3
N.W.T.	Sites		1	3	1				5
	Tonnes		0.8	16.4	17.2				34.4
Total	Sites	389	956	786	358	61	8	1	2 559
	Tonnes	14.7	374.2	2 835.8	10 589.5	16 148.4	31 848.1	64 000.0	125 810.7

Note: Totals may not add up due to rounding.

4. Summary of National PCB Inventory Data from 1990 to 1997

National PCB inventory data from 1990 to 1997 are summarized in Table 13.

Table 13: Summary of National PCB Inventory Data from 1990 to 1997

ITEMS IN USE	1990	1991	1992	1993	1994	1995	1996	1997	1998
Askarels in use (net weight, tonnes)	14 450	13 256	12 488	11 505	12 245	10 781	9 732	9 447	9 158
CMO* in use (net weight, tonnes)	N/A	N/A	2 043	2 160	2 233	1 775	1 726	1 899	1 929
Total - In use (net weight, tonnes)	N/A	N/A	14 531	13 665	14 478	12 556	11 458	11 346	11 087

WASTE ITEMS (STORAGE)	1990	1991	1992	1993	1994	1995	1996	1997	1998
Askarel waste (gross weight, tonnes)	11 461	14 543	15 665	15 247	14 710	17 294	13 187	17 706	13 900
CMO* waste (net weight, tonnes)	5 110	4 511	4 362	3 787	3 496	3 423	3 270	2 979	2 442
Other PCB waste (gross weight, tonnes)	113 640	122 876	123 258	107 991	115 300	120 735	118 432	106 567	95 955
Total - Wastes (tonnes)	130 211	141 930	143 285	127 025	133 506	141 452	134 889	127 252	112 297

Waste storage sites (number)	3 089	3 106	3 130	3 216	3 278	2 857	2 823	2 857	2 301
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* Contaminated mineral oil.

Appendix A: Provincial/Territorial Contacts for Information on PCB Inventories

Newfoundland and Labrador

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Note: To obtain information on PCB inventories for Prince Edward Island, Yukon, and the Northwest Territories, contact the Environment Canada regional office in that province or territory (see Appendix B).

Appendix B: Federal Contacts for Information on the PCB Inventories

Newfoundland

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