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1997/98 ANNUAL REPORT



LOW-LEVEL
RADIOACTIVE WASTE
MANAGEMENT
OFFICE

MISSION

The Low-Level Radioactive Waste Management Office (LLRWMO) was established in 1982 to carry out the responsibilities of the federal government for low-level radioactive waste (LLRW) management in Canada.

MANDATE

- resolve historic waste problems that are a federal responsibility,
- establish, as required, a user-pay service for the disposal of LLRW produced on an ongoing basis, and
- address general public information needs about low-level radioactive wastes.

The Low-Level Radioactive Waste Management Office is operated by Atomic Energy of Canada Limited (AECL) through a cost recovery agreement with Natural Resources Canada, the federal department which provides the funding and establishes national policy for LLRW management.

LOCATIONS

■ National Office

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Cover Page Photos: Upper left: Malvern Public Information Office – Upper right: Some members of the Malvern Project Steering Committee – Lower left: Excavation along McClure Crescent – Lower right: Passmore Avenue Storage Mound

LETTER OF TRANSMITTAL

Mr. D.R. Whelan
Director General
Energy Resources Branch
Natural Resources Canada
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Dear Sirs:

I have the honour to present to you the Annual Report of the Low-Level Radioactive Waste Management Office for the fiscal year ending 1998 March 31.

This report has been prepared in accordance with the Memorandum of Understanding between Energy, Mines and Resources Canada, now called Natural Resources Canada (NRCan), and Atomic Energy of Canada Limited, for the operation of the Low-Level Radioactive Waste Management Office.

Sincerely,



R.L. Zelmer, P.Eng., RPP
Acting Director

DIRECTOR'S MESSAGE

The 1997/98 year was one of promise, progress and change. As recorded in the following pages of this annual report, the LLRWMO continued to operate facilities and programs established in previous years. Our primary venues of Malvern, Port Hope, Surrey, and the Northern Transportation Route received most attention. However, technical contributions were also made in support of advancement of the field generally through project participation in the International Atomic Energy Agency's waste management program, and in Canada through responsive actions aimed at resolving various needs arising during the year.

As the year progressed, our expectations of finally achieving disposal of the Surrey waste at a site in Alberta heightened. However, this opportunity was withdrawn and the Surrey Siting Task Force quickly responded and turned its attention to a search for other options. In contrast, final closure was brought to the Malvern Remedial Project, successfully closing that chapter.

Every two years, our international colleagues meet to review and share the experiences of national programs in the radioactive waste management and environmental restoration field. The LLRWMO has participated on several occasions, including in October 1997 during our 15th anniversary year.

The feedback I have received personally on such occasions affirms that the approaches taken and the progress being made in Canada's historic waste program are well regarded and of particular and continuing interest to colleagues in Germany, Australia, the United States and other countries. Much time and effort is required to achieve each milestone of note in this field and such positive reinforcement is appreciated.

I cannot complete these remarks without acknowledging the staff changes that occurred in recent months. Several very special people have moved on to new challenges. Brad Franklin retired after many years' service as our Senior Public Affairs Officer. Bhajan Dosanjh completed his term as Project Manager - Malvern Remedial Project. Bob Pollock, our Director was seconded to Natural Resources Canada for six months on special assignment, and then retired to pursue other opportunities in the private sector. Canada has gained great benefit from the contributions of these men in this field. They will be missed personally and professionally by those of us who continue at the LLRWMO.

OPERATIONS REVIEW

The activities of the LLRWMO are carried out within three broad program areas, namely:

- *Historic Wastes Program*
- *Ongoing Wastes Program*
- *Information Program*

Historic Wastes Program

Historic wastes are low-level radioactive wastes for which the original owner can no longer be held responsible and which are managed in a manner no longer considered acceptable. If they are wastes for which the federal government accepts responsibility, their management comes within the mandate of the LLRWMO. Historic wastes are located at various sites across Canada.

The goal of the Historic Wastes Program is to perform cleanup and interim remedial work at historic waste sites in order to protect human health and the environment, and construct and operate interim storage facilities prior to the availability of permanent waste disposal facilities.

Activities and achievements during 1997/98 in the specific historic waste projects are detailed below.

● Scarborough, Ontario (Malvern Remedial Project)

The Malvern Remedial Project (MRP), a joint Canada/Ontario project to complete the cleanup in the Malvern area, was announced in 1992 March. The MRP resulted in the removal of radium contaminated soils from more than 60 residential and 3 commercial properties in the Scarborough community of Malvern, resolving a long-standing concern in the community. The planning and approval phase of the project was completed in 1994. Removal of contaminated soil and low-level wastes, along with restoration of the properties took place in 1995 and 1996. Contaminated soil was placed in an engineered storage mound, and stored at Passmore Avenue, a nearby industrial site, while the low-level wastes were sent for storage at AECL Chalk River Laboratories.



Monitoring of the MRP Passmore Avenue site continues with the most recently collected data being posted on a sign at the site.

Site maintenance and environmental monitoring continued at the Passmore Avenue Storage Site and will remain in effect until a permanent disposal site becomes available through 1997/98 to the LLRWMO. Environmental monitoring results are posted at the interim storage mound, and published in an annual monitoring report which is sent to the City of Scarborough and to the community library.

During 1997, radiological monitoring was carried out along McClure Crescent and adjacent streets in support of an underground hydro cable replacement by the City of Scarborough. The LLRWMO was on hand to ensure that it picked up contaminated soils, in the unlikely event that some minor contamination had been left behind. No contaminated soils were found during these activities.

● Port Hope, Ontario

The presence of contamination of soil and building material in Port Hope was discovered in the mid-1970s. A large cleanup program was carried out by the AECB, as the lead agency for the Federal/Provincial Task Force on Radioactivity (F/P Task Force). Cleanup work concentrated on developed residential, public and commercial properties. Large volumes of contaminated soil in vacant areas, and contaminated sediments at the harbour, were left for cleanup at a later date.

The LLRWMO continued to monitor the environment at known major on-land historic waste sites in Port Hope, to provide a level of management and security at these sites until a permanent disposal facility becomes available. The Construction Monitoring Program (CMP), a joint initiative of the town and the LLRWMO, continued operations in Port Hope. The program enables normal development to continue while preventing the inadvertent misuse of contaminated soil as backfill around buildings or at other locations. During the year, approximately 100 applications to the CMP were received. Cleanup was required at two properties resulting in the recovery of 25 m³ of contaminated soil which was taken to the Pine Street Extension Temporary Storage Site in Port Hope. In addition, investigations and remedial work were performed at five residential properties in Port Hope as a result of failure of the F/P Task Force criteria; two of which involved contaminated building materials, two to reduce elevated radon gas concentrations and one property where contaminated soil was removed from below a basement floor. At the conclusion of these activities, all properties met the F/P Task Force criteria. The LLRWMO continued to provide technical and analytical support to the Port Hope Community Health Concerns Committee, a community group examining the health risks associated with the presence of low-level radioactive waste in the Town.



Port Hope environmental monitoring (water sampling) being performed at Rollins Ravine with the Temporary Storage Site in the background.

● Fort McMurray/Northern Transportation Route

In 1992, uranium-contaminated soil and building materials were found at an unused warehouse in Fort McMurray, Alberta. The discovery resulted from an investigation of the 2,200 km water transportation route, used from the 1930s until the 1950s, to transport uranium ore from the Port Radium mine, at Great Bear Lake in the Northwest Territories, to Waterways (now Fort McMurray), Alberta for rail shipment to Port Hope, Ontario.

Northern Transportation Route

The investigation identified an estimated 20,000 m³ of uranium-contaminated soil at eighteen sites along the Northern Transportation Route north of Fort McMurray. Sites, where people were living in close proximity to contaminated materials, were cleaned up during the investigations. In the short-term, there is no need for action at the remaining sites along the Northern Transportation Route unless the use of the affected properties changes. The focus has now shifted to developing, in consultation with residents of the communities and government officials, an overall plan for cleanup and long-term management of the resulting wastes, while continuing to perform any surveys or other work necessary to accommodate local land use requirements.



A Curtiss C-46 aircraft is being loaded at Sawmill Bay with drums of uranium contaminated soil for transport to Yellowknife.

During 1997, a waste removal project was conducted at Sawmill Bay, on Great Bear Lake. The project consisted of excavating 17 m³ of low-level radioactive waste, transporting the waste by air to Yellowknife and then by road to the LLRWMO waste storage warehouse operated by AECL for the LLRWMO at Chalk River Laboratories. The project was funded by the Contaminated Sites Office of Indian and Northern Affairs Canada and administered by the Déline Band. The work force was from the community of Déline; supervision and safety control was provided by the LLRWMO.

A survey to delineate uranium contaminated soil was conducted at a historic uranium contamination site on the Hay River Reserve resulting in the preparation of a remedial work plan. This was requested by Indian and Northern Affairs Canada to accommodate plans to convert the area into parkland. A radiation survey was conducted at the Bushell Wharf near Uranium City at the request of Public Works and Government Services Canada (PWGSC) as part of an environmental assessment. The survey was co-funded by the LLRWMO and PWGSC.

Fort McMurray

In 1997, monitoring continued on the storage area containing 30,000 m³ of mildly contaminated soil placed at the Beaconhill Landfill site, from cleanups at several local sites since 1993. The results confirmed that there was no adverse impact on the environment from this waste.

● Surrey, British Columbia

Approximately 4,000 m³ of contaminated soil and slag exist on two industrial properties in Surrey, British Columbia. The principal radioactive contaminant is thorium, which was contained in niobium ore imported during the 1970s and which remained in the slag following smelting. Cleanup work during the 1980s resulted in the material being placed in interim storage on both sites pending disposal.



Borehole drilling at Anvil Way site to provide additional waste characterization data.

The Surrey Siting Task Force (SSTF), established by the Minister of NRCan to locate a disposal site for this material, made a public announcement of its recommendations in 1997 on a designated disposal site in Alberta. The LLRWMO continued to provide administrative and technical support to the SSTF.

Lack of availability of the designated disposal site delayed activities related to disposal of these wastes. Waste characterization work to determine if further cleanup was required at the Anvil Way site was completed. Cleanup specifications were prepared based on the results of a field investigation. A contractor was selected to carry out in the next fiscal year, additional cleanups identified through the waste characterization work mentioned above and onsite consolidation of the resulting waste. Discussions were held with regulators on cleanup plans and regulatory acceptance was received.

● Non-Specific Sites

Small Scale Cleanups

In addition to remedial work at the major historic waste sites, the LLRWMO undertakes cleanup of small-scale historic waste occurrences, as required. These usually involve buildings used in the past in connection with the radium industry, and include cleanup of old radium dial inventories or small volumes of contaminated soil or building materials. The majority of this work is part of a cooperative program with the AECB to locate and collect inventories of radium-containing materials. In many cases, radium contamination, ranging from minor to widespread, has occurred at these premises.

During the year, a radium cleanup was conducted in Toronto at a former instrument repair shop. A depleted uranium cleanup was also conducted at a scrap yard in Laval. An assessment of contamination was conducted at a former radium recovery operation north of Toronto. This was required in support of plans to convert the site into a conservation area.

Development Work

Development work was carried out on the site characterization techniques for environmental restoration. This work also formed part of a coordinated research project under the auspices of the International Atomic Energy Agency in Vienna.

LLRWMO Central Storage Facility

Wastes from small scale cleanups, and small amounts of AECB-licensable materials from some of the major sites, are routinely transferred to a LLRWMO storage facility located at AECL Chalk River Laboratories. It consists of two metal clad buildings, one constructed in 1984 and the second in 1990, operated as storage warehouses. Additional storage capacity will likely be required within two or three years. Technical and financial assessments of various alternatives for additional storage capacity are under review. During 1997, 29 m³ of materials were shipped to the above storage facility, resulting in a total inventory of 584 m³.

ONGOING WASTES PROGRAM

Ongoing wastes are low-level radioactive wastes which are produced from operational activities of generators who are currently in business. These generators are thus responsible for the management and disposal of their wastes.

The goals of the Ongoing Wastes Program are to provide NRCan with comprehensive analysis of requirements for disposal services and facilities, and to provide technical assessments and advice related to the development and implementation of national policies and strategies for the disposal of these wastes.

During FY 1997/98, the LLRWMO continued to provide technical analyses to NRCan to support implementation of the Policy Framework for Radioactive Waste.

The LLRWMO efforts to support NRCan on the disposal of historic wastes are also being currently managed within the Ongoing Wastes Program. In this respect, the LLRWMO staff participated as members of the federal negotiating team for the proposed Deep River Disposal Project and provided technical data, information and communications support to NRCan on discussions with the councils of the Town of Deep River and the Township of Hope.

INFORMATION PROGRAM

The goals of the Information Program are to provide general information about low-level radioactive waste management and to carry out communications activities in support of specific historic waste projects.

The LLRWMO provided approximately 500 written responses to requests for information from the public for properties in Port Hope, Elliot Lake and other areas of southern Ontario.

In addition, the Port Hope Field Services Office received between 30 and 50 general enquiries for information from residents in the Port Hope area. Responses were provided either locally or requests were forwarded to the National Office in Ottawa for follow-up.

For the Malvern Remedial Project (MRP) the project office provided information to the City of Scarborough, the public in support of real estate transactions and responded to queries arising from work performed on residential properties on McClure Crescent.

Communications activity along the Northern Transportation Route focused on presenting the findings of the environmental assessment and cleanup plans for Sawmill Bay to the community of Déline. Two presentations were made. During 1997, concerns over impacts from the former uranium mine and transportation activities were expressed by the community of Déline. The LLRWMO provided technical support to Indian and Northern Affairs Canada, Natural Resources Canada and Health Canada in their discussions with the community.

The preparation of technical papers and their presentation at scientific conferences is another component of the Information Program. Five papers were published during the fiscal year.

ADMINISTRATIVE MANAGEMENT AND SUPPORT SERVICES

The LLRWMO is operated by Atomic Energy of Canada Limited (AECL) through a cost-recovery agreement with Natural Resources Canada (NRCan), the federal department which provides funding and establishes national policy on radioactive waste management. Administratively, the LLRWMO operates as a division of the Systems Development and Engineering unit of AECL. The LLRWMO functions as a project management organization with a small staff complement.

The LLRWMO routinely participates in AECL programs on health, safety, environment, and quality assurance to demonstrate compliance with requirements and to maintain and improve the quality of its work. Activities were carried out in full compliance with the requirements of the four AECB licenses within LLRWMO's responsibility for sites in Port Hope, and for specific projects and activities carried out at other sites within Canada.

Table 3: LLRWMO Staff List (1998 March 31)

<i>Position</i>	<i>Incumbent</i>
National Office (Ottawa)	
Director	R.W. (Bob) Pollock
Administrative Assistant	L.D. (Lorraine) Delaney
Administrative Assistant	T.A. (Teena) Valentonis
Office Assistant	M.I. (Monique) Rhéaume
Financial Analyst ⁽¹⁾	S.E. (Sylvie) Beauchamp
Technical Program Managers:	
- Special Projects	P.L. (Pab) De
- Engineering & Operations	R.L. (Bob) Zelmer
Technical Specialist	R.C. (Bob) Barker
Manager, Field Services	B.A. (Barry) McCallum
Port Hope Field Services Office	
Scientific Specialist	C.H. (Chris) Clement
Technical Supervisor	M.J. (Mark) Gardiner
Administrative Assistant (p/t)	S.A. (Sharon) Pickering
Technical Analyst	D.M. (Dale) Huffman
Technical Analyst	E.P. (Ted) Rowden
Technical Analyst	S.L. (Susanne) Ledgard
Surrey Disposal Project	
Project Manager	B.S. (Bhajan) Dosanjh

⁽¹⁾ Attached from AECL Finance

FINANCIAL REVIEW

GENERAL

NRCan transfers funds to AECL through a cost recovery agreement (a Memorandum of Understanding) for the operation of the LLRWMO. The major planning document is the annual Business Plan, submitted by the LLRWMO for approval by NRCan prior to the start of each fiscal year. The Business Plan identified which NRCan priorities can be accommodated within the available funding. Adjustments to priorities during the year are accomplished through quarterly progress reviews held between the LLRWMO and staff of the Energy Resources Branch of NRCan.

The books of account and the financial control and information system of the LLRWMO are consistent with AECL financial policies and control. They provide reasonable assurance that reliable and accurate financial information is available on a timely basis. The financial statements in this Annual Report present fairly, the financial position and the results of operation of the LLRWMO as of 1998 March 31.

The following paragraphs compare actual expenditures with the Business Plan, and provide a summary of expenditures by major program areas.

■ Actual Expenditures Compared to Business Plan for NRCan Funding

Activities in FY 1997/98 were grouped under the three major programs of the LLRWMO, namely

- *Historic Wastes*
- *Ongoing Wastes*
- *Information*

This grouping reflects the three distinct areas within the mandate of the LLRWMO, and has also been adopted in reporting progress in the Operations Review section of this Annual Report. Costs which are of general overhead nature and cannot be directly attributed to one of the three programs are reported under Administrative Management and Support Services.

Table 1 provides the financial summary for funding received from NRCan in 1997/98 with a graphical display in Figure 1.

The initial approved budget was \$3.0 M, including a project-specific allocation of \$1.0 M for the disposal project in Surrey, British Columbia. During the year, when it became apparent that a disposal site for the Surrey waste would not be available, under NRCan's advice, the budget was revised from \$3.0 M to the base budget of \$2.0 M. The approved year-end base budget was thus \$2.0 M.

Table 1: Financial Summary for NRCan Funding for 1997/98 (\$M)

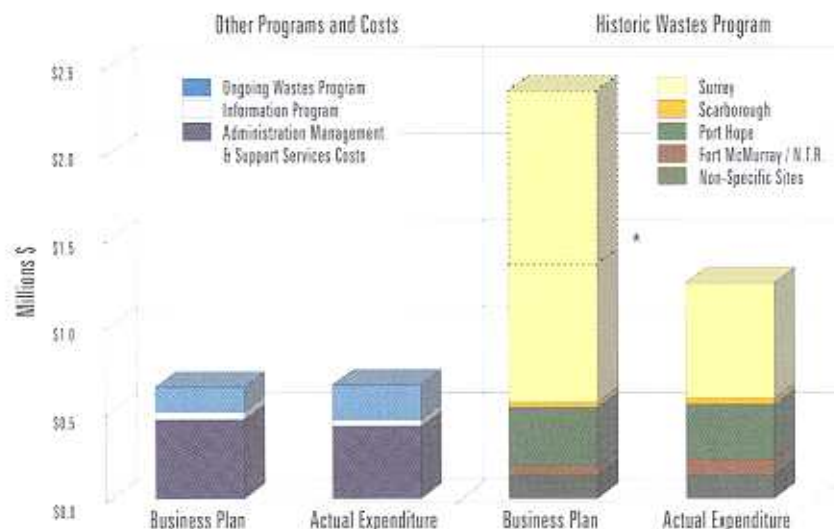
<i>Program Areas</i>	<i>Business Plan</i>	<i>Expenditure</i>
1. Historic Wastes Program		
- Scarborough (Malvern Remedial Project)	0.030	0.035
- Port Hope	0.330	0.314
- Surrey	1.800 *	0.669
- Fort McMurray/Northern Transportation Route	0.060	0.094
- Non-Specific Sites	0.135	0.137
Subtotal: Historic Wastes program	2.355	1.250
2. Ongoing Wastes Program	0.143	0.205
3. Information Program	0.040	0.032
4. Administrative Management & Support Services	0.462	0.421
TOTAL NRCan FUNDING	3.000*	1.908**

* \$1M project-specific funding for Surrey was not authorized due to the unavailability of a suitable disposal site for this waste.

** The unspent amount of \$92 k from the approved budget of \$2.0 M represents work in Surrey which was delayed. This amount was carried forward to FY 1998/99 to be re-allocated to the Surrey disposal project.

Project expenditures were generally in line with original estimates. It can be seen that over 80% of the funds from NRCan were utilized in direct support of historic waste projects, reflecting the consistently high priorities assigned to historic waste cleanups and remediation.

Figure 1: Financial Summary for NRCan Funding for 1997/98



* The amount shown within the dotted line represents \$1 M project specific Surrey funding which was approved initially, but was not ultimately authorized due to the unavailability of a disposal site for this waste.

■ Total LLRWMO Expenditures

In addition to NRCan funding, LLRWMO also received money from other sources on a cost-recovery basis. This money amounted to \$0.275 M, the sources being:

- \$0.071 M from the Government of Ontario under a cost-sharing agreement between Ontario and Canada for the Malvern Remedial Project.
- \$0.072 M from Indian and Northern Affairs Canada for their share of costs at non-residential historic waste sites in the Northwest Territories.
- \$0.132 M from other cost-recovery work: This work resulted in 410 person-hours equivalent of overhead cost recovery for staff at the Port Hope Field Services Office.

Table 2 shows the total LLRWMO expenditures for 1997/98, which includes funding from NRCan (Table 1) and costs recovered from non-NRCan sources as highlighted above.

Table 2: LLRWMO Expenditures for 1997/98 (\$M)

<i>Program Areas</i>	<i>NRCan Funding</i>	<i>Cost Recovery from Non-NRCan Sources</i>	<i>Total Expenditures</i>
1. Historic Wastes Program			
- Scarborough (Malvern Remedial Project)	0.035	0.071	0.106
- Port Hope	0.314		0.314
- Surrey	0.669		0.669
- Fort McMurray/Northern Transportation Route	0.094	0.072	0.166
- Non-Specific Sites	0.137		0.137
- Cost Recovery Work		0.132	0.132
Subtotal: Historic Wastes program	1.250	0.275	1.525
2. Ongoing Wastes Program	0.205		0.205
3. Information Program	0.032		0.032
4. Administrative Management & Support Services	0.421		0.421
TOTAL	1.908	0.275	2.183

Overall, the ongoing cooperation between the LLRWMO and staff of the Uranium and Radioactive Waste Division of NRCan has resulted in a flexible and cost-effective approach to changes in priorities. Funding from other sources has also helped to maintain progress. During most of the years of the LLRWMO's existence, resolution of the technical and social issues required to initiate projects at historic waste sites has controlled the implementation schedules.

■ Comparison of FY 1997/98 Expenditures to Previous Year Expenditures for NRCan/Treasury Board Funding

Table 3 shows a comparison of actual expenditures against approved funding for the last five years, 1993/94 to 1997/98. This is shown graphically in Figure 2.

It should be noted that, since FY 1995/96, costs for administrative management and support services were reduced substantially. This was due to the fact that the LLRWMO National Office staff time which could be reasonably attributed to specific projects was directly charged against those projects, instead of being charged to the LLRWMO overhead account. This provided a fairer picture for both project and overhead costs. In addition, costs to meet commitments arising from AECB licenses, legal agreements, and other mandatory needs, were, since FY 1995/96, charged directly to the relevant historic waste projects.

Table 3: LLRWMO Actual Expenditures Versus Approved Funding from NRCan/Treasury Board from 1993/94 to 1997/98 (\$M)

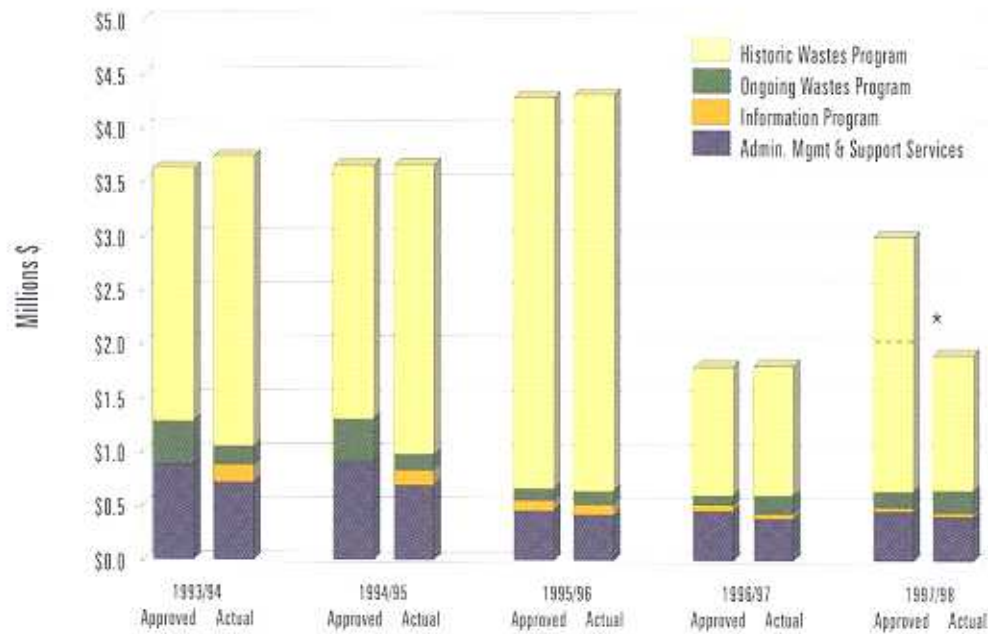
Program Areas	1993/94		1994/95		1995/96		1996/97		1997/98	
	T.B. App'd*	Actual	T.B. App'd	Actual	NRCan	Actual App'd	NRCan	Actual App'd	NRCan	Actual App'd
1. Historic Wastes Program										
- Scarborough	1.300	0.417	1.300	0.985	2.125	2.544	0.219	0.211	0.030	0.035
- Port Hope	0.500	0.064	0.000	0.372	0.425	0.470	0.331	0.326	0.330	0.314
- Surrey	0.000	0.116	0.000	0.197	0.365	0.301	0.260	0.426	1.800	0.669
- Fort McMurray/Northern Transportation Route	0.000	1.728	0.000	0.433	0.245	0.252	0.160	0.092	0.060	0.094
- Non-Specific Sites	0.250	0.352	0.250	0.695	0.170	0.101	0.120	0.150	0.135	0.137
Subtotal: Historic Wastes Program	2.050	2.677	1.550	2.682	3.330	3.668	1.090	1.205	2.355	1.250
2. Ongoing Wastes Program	0.400	0.172	0.400	0.143	0.110	0.122	0.090	0.165	0.143	0.205
3. Information Program	0.000	0.174	0.000	0.139	0.090	0.100	0.060	0.044	0.040	0.032
4. Administrative Management & Support Services	0.899	0.714	0.916	0.699	0.470	0.429	0.460	0.397	0.462	0.421
TOTAL ORIGINAL TREASURY BOARD/NRCAN APPROVAL	3.349	3.737	2.866	3.664	4.000	4.319	1.700	1.811	3.000	1.908
Subsequent Government-Wide Cost Reduction Program	(0.200)		(0.200)							
Subtotal: Initial Budget	3.149		2.666		4.000		1.700		3.000	1.908
NRCan - Additional Funding	0.495		0.995		0.300		0.100		(1.000)**	
TOTAL	3.644	3.737	3.661	3.664	4.300	4.319	1.800	1.811	2.000**	1.908

* Treasury Board Approval for five-year funding ended in FY 1994/95.

** STM project-specific funding for Surrey was not authorized due to unavailability of a disposal site for this waste.

Government program review reductions, resulting in a base budget of \$2 M per year, have been implemented since FY 1995/96. However, a specific budget of \$2,125 M was authorized in FY 1995/96 to complete the Malvern Remedial Project. A significant fraction of the base budget of \$2 M is required for ongoing environmental and construction monitoring programs, particularly in Port Hope. Consequently, there will be an increased reliance on project-specific funding, even for relatively small projects, if cleanup projects are to make progress when opportunities become available.

Figure 2: LLRWMO Actual Expenditures Versus Approved Funding from NRCan/Treasury Board from 1993/94 to 1997/98



* NOTE: For 1997/98, the amount shown above the dotted line represents \$1 M project-specific Surrey funding which was approved initially, but was not ultimately authorized due to the unavailability of a disposal site for this waste.