Low-Level Radioactive Waste Management Office annual report



WORKING TOWARD COMMUNITY SOLUTIONS WORKING TOWARD C



The Low-Level Radioactive Waste Management Office was established in 1982 to carry out the responsibilities of the federal government for historic low-level radioactive waste (LLRW) in Canada. The Office is operated by Atomic Energy of Canada Limited through a costrecovery agreement with Natural Resources Canada, the federal department that provides the funding and establishes national policy for LLRW management.

The mandate of the Office includes:

- resolving historic LLRW problems that are a federal responsibility;
- establishing, as required, a user-pay service for the disposal of LLRW produced on an ongoing basis; and
- addressing public information needs concerning LLRW.

FOR MORE INFORMATION

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COVER PHOTO

BACKGROUND PHOTO SHOWS AN AERIAL VIEW OF THE EXISTING PORT GRANBY WASTE MANAGEMENT FACILITY, MUNICIPALITY OF CLARINGTON, ONTARIO D. McLellan A/Director General Energy Resources Branch Natural Resources Canada 580 Booth Street Ottawa, Ontario K1A 0E4 Dr. P. A. Brown Director Uranium and Radioactive Waste Division Energy Resources Branch Natural Resources Canada 580 Booth Street Ottawa, Ontario K1A 0E4 W. C. Kupferschmidt General Manager Decommissioning and Waste Management Atomic Energy of Canada Limited Chalk River Laboratories Chalk River, Ontario K0J 1J0

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 March 31, 2002.

This report has been prepared in accordance with section 5.2 of the Memorandum of Understanding between Energy, Mines and Resources Canada (now Natural Resources Canada) and Atomic Energy of Canada Limited, for the operation of the Low-Level Radioactive Waste Management Office.

Sincerely,

Robert L. John

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

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Director's Message

My message in last year's Annual Report showcased the *Principles of Understanding* and the *Legal Agreement* undertaken to address the clean-up and safe management of historic low-level radioactive wastes in the Port Hope, Ontario, area. I am pleased to report that work is now actively under way to assess the community-recommended proposals for the long-term management of the wastes.

The Port Hope and Port Granby Long-Term Low-Level Radioactive Waste Management projects will proceed in three phases: Environmental Assessment and Licensing; Construction, contingent upon receiv-



ing regulatory approval; and Operation and Monitoring. As part of a technical environmental assessment of the projects, several studies have already been conducted and the groundwork laid for further work. A community profile was developed and public consultation activities were initiated.

Cooperation between the Office and the community is the linchpin in the implementation of the proposals, and I wish to acknowledge the contributions of Mayor Austin and his Council and staff in Port Hope and Mayor Mutton in Clarington and his Council and staff toward this end.

Elsewhere, the Office continued its work along the Northern Transportation Route, from the Northwest Territories to Fort McMurray, Alberta. Staff successfully managed the removal of more than 430 cubic metres of historic uranium-contaminated soil in Tulita and Fort Smith, Northwest Territories, and provided technical support to the Department of Indian Affairs and Northern Development on an environmental assessment study of a site at Bear River Landing near Deline, also in the Northwest Territories. Activities were also undertaken in Elliot Lake, Ontario; at the Office's storage facility at the Chalk River Laboratories, Ontario; and at storage sites in the Scarborough, Ontario, area.

While the Office serves mainly an oversight function, using skilled contractors to undertake supporting studies and to implement our larger field projects, I am pleased to report our core staff complement has been strengthened in technical and management areas. During the year, experienced and qualified managers with backgrounds in engineering, environmental health and safety, contracting and administration, and communications were recruited to help us meet our expanding challenges.

I am also pleased to report that together with staff from Natural Resources Canada (NRCan), Gary Vandergaast, Mark Gardiner and I received two awards from NRCan for the Office's contributions in finalizing the *Legal Agreement* for the cleanup and long-term safe management of historic low-level radioactive wastes in the Port Hope area. In December 2001, we received the NRCan Energy Sector 2001 Merit Award and, in March 2002, we received the Departmental Merit Award under the categories of Creativity and Innovation, Exceptional Achievement, and Collaboration and Partnership. I extend to all Office staff my congratulations and thanks.

The Office continues to make steady progress in the management of Canada's historic low-level radioactive waste program and is finding success by working on a case-by-case basis with communities seeking local solutions to complex, long-term waste management issues.

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

Historic Waste Program

What is low-level radioactive waste?

n Canada, low-level radioactive waste (LLRW) is defined by exclusion. If a waste is radioactive, but is neither nuclear fuel waste (also called high-level waste) nor uranium mine and mill tailings, then it is classed as LLRW. Most of Canada's LLRW accumulated to date is historic waste consisting of contaminated soil generated over the past 70 years. Most LLRW today arises from activities associated with nuclear electricity generation, from nuclear research and development, and from the production and use of radioisotopes in medicine, education, research, agriculture and industry. Other examples of LLRW produced on an ongoing basis range from slightly contaminated materials from operational activities to highly contaminated materials and components (such as ion exchange resins and reactor core internals) from operating, maintaining and decommissioning facilities.

Historic waste is low-level radioactive waste (LLRW) that was managed in the past in a manner that is no longer considered acceptable, for which the current owner cannot reasonably be held responsible, and for which the federal government has assumed responsibility.

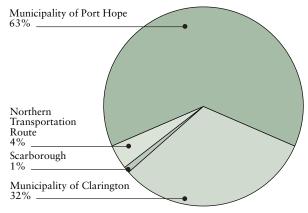
Most historic waste consists of contaminated soil, process residues and contaminated materials. The first waste was produced in the 1930s when radium was refined for medical applications at a refinery in Port Hope, Ontario. Canada has about 1.2 million cubic metres of historic LLRW, mostly stored in interim management facilities in the Port Hope area.

The Office performs clean-up and remedial work and constructs and operates interim storage facilities, as required, until long-term management and disposal facilities are available for historic waste. All activities are carried out in accordance with the requirements of the Canadian Nuclear Safety Commission (CNSC), the federal nuclear regulatory agency.

The main historic LLRW sites in Canada are located in:

- the Municipality of Port Hope, Ontario;
- the Municipality of Clarington, Ontario;
- Scarborough, Ontario; and
- the Northwest Territories and northern Alberta along the Northern Transportation Route.

HISTORIC WASTE IN CANADA



The Port Hope Area Initiative: Environmental Assessment Begins

In the *Legal Agreement* for the Port Hope Area Initiative — an unparalleled undertaking to clean up and build long-term management facilities for LLRW in the area — the federal government committed \$260 million to the Initiative. Public consultation has remained a high priority for the Low-Level Radioactive Waste Management Office as the Initiative now enters the environmental assessment phase.

The government's commitment supports two community-recommended projects:

- the Port Hope Long-Term Low-Level Radioactive Waste Management Project (two proposed sites in the Municipality of Port Hope); and
- the Port Granby Long-Term Low-Level Radioactive Waste Management Project (one proposed site in the Municipality of Clarington).

BACKGROUND

Roughly 1 million cubic metres of LLRW and contaminated soil are located in the Port Hope area as a result of radium and uranium refining that began in the 1930s. This refining was done by a federal Crown corporation, Eldorado Resources Limited, and its private sector predecessors. The waste materials include radium-226, uranium and arsenic in various proportions. This historic waste is now the responsibility of the federal government.

The majority of the waste is located at the Port Granby Waste Management Facility in the Municipality of Clarington and the Welcome Waste Management Facility in the Municipality of Port Hope. Both facilities are owned and managed by Cameco Corporation and licensed by the CNSC. The remaining material, mostly contaminated soil, is located at the Pine Street Extension Temporary Storage Site (PSE TSS) under licence from the CNSC, and at a number of unlicensed sites within the Municipality of Port Hope.

> Upon receiving regulatory approval, the Initiative will see this waste cleaned up and managed in an environmentally safe manner.

ABOVE GROUND MOUND CONCEPTS

The *Legal Agreement* between the municipalities and the Government of Canada calls for three facilities: one in Clarington at the Port Granby Waste Management Facility, one in Port Hope near Highland Drive and another in Port Hope at the Welcome Waste Management Facility. Concepts for these facilities vary according to the community input received, the site conditions, and the character and volume of the waste to be contained. Upon receiving regulatory approval, the Initiative will see this waste cleaned up and managed in an environmentally safe manner. The concepts for above ground long-term management facilities include barriers enclosing the waste, which is primarily composed of contaminated soil. Each design would be engineered to remain safe for over 500 years.

The concepts also include the following features:

- the waste will be isolated from the underlying soil and groundwater, and from the surface;
- the facility will be monitored to ensure that it is working as designed, and if necessary can be easily repaired; and
 - the waste can be retrieved.

After the facilities are constructed, monitoring will continue and the results will be reported to the community and to government agencies.

PLANNING FOR ENVIRONMENTAL ASSESSMENT

Over the next four years, planning, engineering, environmental studies and public input, along with licensing by the CNSC, will refine the community concepts for LLRW management. After the environmental assessments, another five to seven years will be required to con-

struct the facilities, consolidate the wastes, and clean up and restore waste locations.

The environmental assessments include several technical studies of environmental conditions. Studies completed or undertaken in 2001–2002 include:

- an aerial gamma ray survey of approximately 2 100 kilometres using low-flying helicopters;
- a roadway survey of approximately 320 kilometres using truck-mounted radiation detectors to study the primary transportation routes used for waste transport within the study area;

- a technical evaluation of the shoreline stabilization design concept for the proposed Port Granby Long-term Waste Management Facility;
- an investigation of the potential impacts of thorium-230, a component of the waste;
- an examination of the existing groundwater quality and flow through the Port Granby Waste Management Facility;
- site assessments of four historic industrial properties in the Municipality of Port Hope;
- a comprehensive review of studies, applicable regulations, scientific research and past public input to assist in developing criteria for determining when contaminated sites have been adequately cleaned up; and

• a telephone survey of more than 500 households and discussions with stakeholders and focus groups to determine local people's attitudes about the Port Hope Area Initiative.

Public input was also solicited during open houses held in February and March 2002. Additionally, open houses were hosted by the Responsible Authorities: Natural Resources Canada, the CNSC, and Fisheries and Oceans Canada. These open houses gave the public a chance to obtain information, review material and ask questions about the draft scope of the environmental assessment documents for each of the Port Hope and Port Granby Long-Term Low-Level Radioactive Waste Management projects. The public had 45 days (ending April 11, 2002) to comment on the document. The Office provided technical and communications support to the Responsible Authorities.



TIMELINE FOR PORT HOPE AREA INITIATIVE



KEEPING RESIDENTS INFORMED

Last fall, the Office distributed the first of what will be a regular PHAI newsletter to 13 000 local residents. The newsletter brought residents up-to-date on the Initiative, and featured background information about the LLRW in the area and a question-and-answer section about the project, as well as contact information.

An important part of the Office's outreach program, the Project Information Exchange was set up on the main street in Port Hope to serve as a storefront public information centre. Responses to public comments and questions are researched and provided by e-mail, letter and telephone. Staff at the Exchange have compiled a database of contacts and comments that they update continuously. Comments received will be used and considered during the environmental assessment process and eventually during construction.

PROPERTY VALUE PROTECTION PROGRAM

The Initiative marked a major milestone with the opening of the Property Value Protection (PVP) Program in October 2001, six months after the *Legal Agreement* was signed. The PVP Program compensates property owners who experience financial loss on the sale of their property, loss of rental income or mortgage renewal difficulties as a result of the Initiative.

To be as accessible to the public as possible, the PVP set up an office at 38 Walton Street in Port Hope, where experienced and knowledgeable staff, including compensation officers, are available to assist property owners. During the year, the PVP received a constant stream of requests for information from homeowners about the compensation program. Information received from property owners, as well as compensation decisions, are kept confidential.

To receive compensation, an applicant must:

- be an owner of property within the PVP Program zone, which comprises portions of the municipalities of Port Hope and Clarington — a total area of approximately 90 square kilometres.
- demonstrate that, as a result of the Initiative, financial loss or mortgage renewal difficulties occurred between October 5, 2000, and the termination of the PVP Program, which will occur two years after completion of the facilities; and
- file a claim.

PVP: Compensation for three types of financial loss

- Loss on Sale of Property:
 If a property sold for less than its fair market value because of activities relating to the Initiative.
- Loss of Rental Income: If the owner of a rental property was unable to rent for fair market value because of the Initiative.
- Mortgage Renewal
 Difficulties: If a property owner has difficulty
 renewing a mortgage at
 fair market value as a
 result of the Initiative.

Port Hope: Interim Waste Management Program

BACKGROUND

In Port Hope, low-level radioactive waste is located at four CNSC-licensed facilities, nine major unlicensed sites, and on various other properties, all under regular inspection and monitoring by the Office.

The Office also continues to monitor new construction in Port Hope to prevent the spread of contaminated soil. Under the Construction Monitoring Program (CMP), jointly operated by the Office and the Municipality of Port Hope, the Office tests soil at proposed construction sites and transfers contaminated soil to the



Pine Street Extension Temporary Storage Site (PSE TSS). Large projects and small projects requiring building permits are automatically referred to the CMP. Property owners removing soil for a project that does not require a building permit can also apply to use the services of the CMP, which are provided free of charge.

2001-2002 ACTIVITIES

- Under the CMP, contaminated fill was found at five sites, resulting in a total of 370 cubic metres of material placed into temporary storage at the PSE TSS.
- The Office completed a second asphalt storage pad for the PSE TSS that augments the original one, which had nearly reached its capacity. The pad increases the storage capacity from 6 000 cubic metres to 12 000 cubic metres. The new storage area is located to the east of the present one but rotated 90° to the north, making best use of the topography of the area and minimizing the view of the mound from the south.
- Nearly 500 radiological status letters were issued this year. These letters, requested by homeowners wanting information about their property, typically provide information on radon and gamma levels. In April 2001, remedial work was completed in a Port Hope home identified as having several areas exceeding the 1977 federal-provincial task force criteria for interior contamination.



Northern Transportation Route

BACKGROUND

From 1991 to 1993, the Office investigated the 2 200-kilometre route used from the 1930s to the 1960s to ship uranium and radium ores and concentrates from the Northwest Territories to Alberta, and identified an estimated 47 000 cubic metres of uranium-contaminated soil at several sites.

During the investigation, the Office took action in areas where there was a potential for unacceptable radiation exposure in the short term. This included removing small amounts of uranium ore and concentrates at some sites and, in one case, removing about 200 cubic metres of contaminated soil to a local temporary storage site.

From 1993 to 1996, the Office moved approximately 31 000 cubic metres of mildly contaminated soil from several sites in Fort McMurray, Alberta,

> to an engineered containment cell at the local landfill that the Office monitors regularly.

> In 2001–2002, steps were taken toward the implementation of the Northern Sites Initiative. This project is designed to address the historic waste sites identified along the Northern Transportation Route (NTR). Sites in communities in the Northwest Territories along the route where historic radioactive waste has been found by the Office — including Fort Smith, Fort Fitzgerald, Tulita and Hay River — are awaiting cleanup.

2001-2002 ACTIVITIES

- The Office completed a three-week field program in July. The program involved visits to Fort Smith, Fort Fitzgerald and Tulita to meet with community leaders and advance the clean up of private and public lands in these communities. Visits were also made to Hay River, Yellowknife, Inuvik and Tuktoyaktuk to investigate more than 60 barges used by Northern Transportation Company Limited (NTCL) along the NTR between the Port Radium mine and Fort McMurray, Alberta.
- Field staff from Port Hope travelled to Tulita and Fort Smith to remove historic uraniumcontaminated soils from private residential properties. Remedial work in Tulita resulted in 305 cubic metres (61 truck loads) added to the existing storage mound near the airport, and in Fort Smith 126 cubic metres (18 truck loads) were added to the existing storage mound.
- Office staff continued to provide technical support where needed. Staff worked with the interdepartmental committee (Indian and Northern Affairs Canada, Natural Resources Canada and Health Canada) which investigates the historic uranium operations around Great Bear Lake, Northwest Territories, and gave support to the Canada-Deline Uranium Table, a forum for Indian and Northern Affairs Canada and the Deline Dene Band to determine how to address the community's concerns about the impact of historic mining at Port Radium.

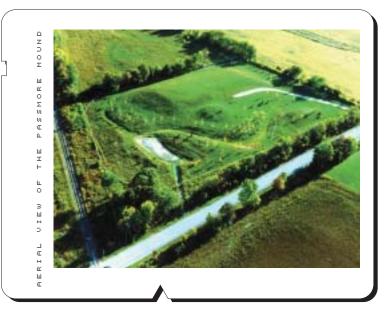
- Office staff provided technical advice and equipment to Public Works and Government Services Canada's consultant (Earthtech) as part of a Phase 3 environmental assessment study of a site near Deline at Bear River Landing.
- Prerequisites for the cleanup of the CN Waterways property in Fort McMurray including the planning, design, public consultation and environmental assessment ---began in June. The cleanup is planned for 2002. Designs for the cleanup and for receipt of the contaminated soils at the existing management cell at the municipal landfill were completed. The drawings will be finalized for construction tendering with consideration for comments from the environmental assessment review. Open houses held in October 2001 and February 2002 focused on the remedial program planned for the CN Waterways site and preliminary design and construction information.



Scarborough

BACKGROUND

In 1995, the Office removed 16 000 cubic metres of radium-contaminated soil from more than 60 residential and commercial properties in Scarborough, Ontario. The contamination was the result of radium-recovery operations on a farm in the mid-1940s. The Office transferred 50 cubic metres of licensable soil to the Office's storage facility at the Chalk River Laboratories of Atomic Energy of Canada Limited, and the remaining, mildly contaminated soil to a storage site in an industrial area at Passmore Avenue.



2001-2002 ACTIVITIES

The Office continued to maintain and monitor the Passmore Avenue storage site. Environmental monitoring includes gamma radiation and radon gas detection, as well as groundwater and physical inspection. Results indicate no impacts on the environment surrounding the site for the parameters measured. Results of the environmental monitoring program are posted at the site and the annual monitoring reports are available at the Toronto Public Library, Malvern Branch.

Other Historic Waste Sites

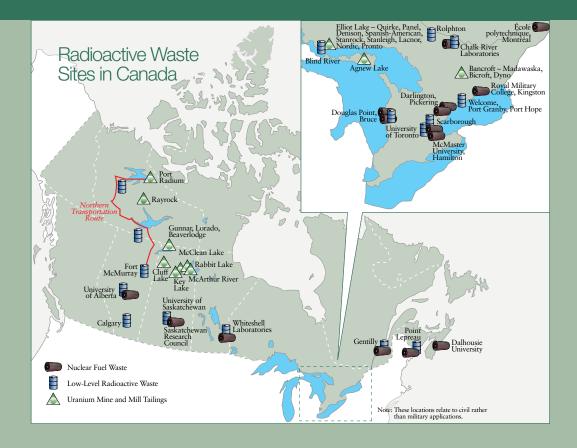
BACKGROUND

The Office, on a case-by-case basis, cleans up small quantities of historic waste from companies that have used radium for a variety of applications. Waste, which includes small amounts of contaminated soil and building materials, has been recovered in several provinces. The Office receives radium materials for storage, where resources permit, in response to requests from the CNSC or from those who possess such waste.

2001-2002 ACTIVITIES

- The Office received requests for the disposal of radium dial artifacts from several aircraft maintenance companies and community colleges (located in Alberta, Manitoba, Ontario, Quebec and New Brunswick) teaching aircraft repair and maintenance. Experienced contractors based in Alberta, Ontario and Quebec coordinated preparation for delivery (appropriate packaging and inventory control) of these dials to the Office's storage building at the Chalk River Laboratories.
- A program of quarterly radon monitoring has been established in Elliot Lake to confirm that radon and radon decay products are below criteria set by the Federal–Provincial Task Force on Radioactivity.
- Following an inspection of the Office's two storage warehouses at the Chalk River Laboratories, the Office conducted some remedial work and developed a long-term program to maintain the integrity of containers within the storage building.
- The Office transported 5 cubic metres of radium-contaminated building materials from a home in Mono Mills, Ontario, to the storage building at the Chalk River Laboratories.

Ongoing Waste Program



Electrical utilities, nuclear research organizations, nuclear fuel manufacturers, and the producers and users of medical and other radioisotopes are some of the producers of "ongoing waste." They are held responsible for the approximately 4 000 cubic metres of waste they produce each year. There are about 600 000 cubic metres of this waste in Canada.

The Office assists Natural Resources Canada with the task of developing policies and strategies for the long-term management of this waste. The Office also assisted Natural Resources Canada in meeting its commitments to international organizations such as the International Atomic Energy Agency (IAEA) and the Nuclear Energy Agency (NEA) of the Organisation for Economic Co-operation and Development (OECD).

2001-2002 ACTIVITIES

The Office was nominated by Natural Resources Canada to act as the official focal point (national coordinator for Canada) to support the IAEA's initiative on the Net-Enabled Waste Management Database. The database is designed to provide information required by the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management and for the United Nations indicator of sustainable development on radioactive waste management. The Office will assemble data from nuclear utilities, Atomic Energy of Canada Limited, uranium production companies and other waste generators. Consultations have occurred with major stakeholders and an analysis of the implications for Canada has been initiated.

Information Program

he Office provides information on low-level radioactive waste in Canada. Staff at the National Office in Ottawa and in Port Hope, Ontario, answer enquiries received by phone, by electronic and regular mail, and in person.

The Office responded to approximately 600 requests for information from people across Canada, and a number of international requests received via the Web site.

For more information, visit the Office's Web site at

www.llrwmo.org

STREET

EXCHANGE

IN PORT



Management

ONTARIO

Robert L. Zelmer Director

110

WALTON

G. Glenn Case Manager, Engineering and Operations

Paul J. Conlon Manager, Environment, Health and Safety

Bernard Gerestein Manager, Communications and Community Relations

Rose Mary T. Rozak Manager, Contracting and Project Support

Financial Review

Natural Resources Canada transfers funds to Atomic Energy of Canada Limited through a cost-recovery agreement (Memorandum of Understanding) for the operation of the Office. The major planning document is the Office's annual Business Plan, submitted to Natural Resources Canada (NRCan) for approval before the start of each fiscal year. The Business Plan identifies how NRCan priorities can be accommodated with the available funding. Adjustments to priorities during the year are accomplished through joint quarterly progress reviews by the Office and staff of NRCan's Uranium and Radioactive Waste Division. The Office's accounts and financial control system conform with AECL's financial policies and control. These provide assurance that reliable and accurate financial information is available on a timely basis. The financial statements in this annual report present the costs of operation of the Low-Level Radioactive Waste Management Office up to March 31, 2002.

Table 1 shows how NRCan funding was used for the Office's basic mandated areas in 2001–2002. Table 2 provides this information for fiscal year 2000–2001.

TABLE 1.
EXPENDITURES
FUNDED BY
NRCAN FOR
2001-2002

PROGRAM AREAS	TOTAL EXPENDITURE (\$ THOUSANDS)
PORT HOPE AREA INITIATIVE	
Port Hope Area — Long-Term Storage Project	3 414
Port Hope Area — Property Value Protection Program	361
Port Hope Interim Waste Management	546
Subtotal: Port Hope Area Initiative	4 321
NORTHERN SITES INITIATIVE	
Fort McMurray	473
Northern Transportation Route	117
Subtotal: Northern Sites Initiative	590
Scarborough (Malvern)	21
Historic Waste at Other Locations	78
Subtotal: Other Historic Waste Initiative	99
THER MANDATED ACTIVITIES	
Ongoing Waste Program	21
Information Program	33
éar-End Credits:	
Payroll Variance Credit	(17)
Surrey — Invoice accrual reversal	(26)
Subtotal: Other Mandated Activities	11
Less Cost Recovery from Ontario Scarborough (Malveri	n) (21)

* Funding provided by the Government of Ontario for this project.

TABLE 2. EXPENDITURES FOR 2000-2001

OGRAM AREAS	TOTAL EXPENDITUR (\$ THOUSANDS)
INDED BY NRCAN	
Historic Waste Program	
Surrey	101
Port Hope	267
Port Hope Area Long-Term Management	499
Scarborough	_
Northern Transportation Route	199
Other Sites, General	239
Ongoing Waste Program	76
Information Program	135
Management, Administration and Support Services	383
Sub-total: NRCan Funding	1 899
DN-NRCAN FUNDING	
Scarborough — Government of Ontario Funding	30
Other Funding	40
Sub-total: Non-NRCan Funding	70
TAL FUNDING	1 969

Note: With the launch of the Port Hope Area Initiative, the Office restructured its financial reporting. As a result, last year's expenditure figures are not strictly comparable to this year's on a line-by-line basis.