

2002



Report of the
**Commissioner of the
Environment and
Sustainable Development**
to the House of Commons

Chapter 3
Abandoned Mines in the North



Office of the Auditor General of Canada

The 2002 Report of the Commissioner of the Environment and Sustainable Development comprises six chapters and The Commissioner's Perspective—2002. The main table of contents is found at the end of this publication.

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Chapter

3

Abandoned Mines in the North

The audit work reported in this chapter was conducted in accordance with the legislative mandate, policies, and practices of the Office of the Auditor General of Canada. These policies and practices embrace the standards recommended by the Canadian Institute of Chartered Accountants.

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Abandoned Mines in the North

Main Points

3.1 Hundreds of thousands of tons of highly toxic chemicals such as arsenic and cyanide are found at northern abandoned mine sites. These chemicals, the result of past mining operations, have accumulated to hazardous levels. Indian and Northern Affairs Canada estimates that the cleanup and closure of these complex contaminated sites will cost Canadian taxpayers at least \$555 million. In many cases, long-term site management will be needed because complete and definitive cleanup will not be possible.

3.2 Every year, Indian and Northern Affairs Canada spends millions of dollars in an effort to stop contaminants from escaping these sites. This year alone, the Department has budgeted up to \$26 million to prevent water contamination and protect human health and the environment.

3.3 This current care and maintenance approach is a band-aid approach that does little to solve the problems in the long term. Further, considering the rapidly growing costs associated with delaying decisive action, it is not an optimal use of public funds. With insufficient financial resources, the Department is scrambling to keep up with the demands. Long-term stable funding and long-term solutions are required.

3.4 In the past, the Department did not collect sufficient financial security from mining companies operating in the North to cover the costs for the eventual cleanup and closure of mine sites. Prior to 1993, there were legislated limits to the amount of financial security that could be collected. These restrictions were removed in 1993. Since then, Indian and Northern Affairs Canada has progressively increased the amount of financial security required from owners of operating mines in the North. Its objective is to obtain full financial security for all mining projects.

3.5 The Department reported that full financial security is being achieved for the two new diamond mines. However, it may not be possible for some older mines still in operation. If these older mines are abandoned, Canadian taxpayers will end up paying the difference for their cleanup and closure.

3.6 The Department's challenge of addressing the problems of northern abandoned mines is two-fold:

- cleaning up the environmental mess it has inherited from the past; and
- ensuring that mining companies operating in the North pay for the cleanup of the environmental problems they create now and in the future.

Background and other observations

3.7 As the key federal department in Canada's north, which includes the Yukon, Northwest Territories, and Nunavut, Indian and Northern Affairs Canada has a broad mandate. It is the land administrator on behalf of the federal government, a key promoter of economic development, and a contributor to the protection of the environment. The Department also has responsibilities for Aboriginal peoples, primarily for Status Indians living on reserve and Inuit.

3.8 An abandoned mine is one whose owner is out of business. When a northern mine is abandoned, the land lease reverts back to the federal government, and Indian and Northern Affairs Canada inherits the associated environmental costs and the day-to-day management responsibility for the mine.

3.9 Over recent years, the Department has made progress toward establishing a comprehensive program to deal with contaminated sites in the North, including abandoned mines. Officials of the Department indicated that full implementation of the related draft management framework will depend on available human and financial resources.

3.10 The method chosen by Indian and Northern Affairs Canada to ensure that mining companies pay for the eventual cleanup of mine sites is the collection of financial security deposits from them prior to start-up and while they are in operation. If a mining company conducts the proper cleanup and closure of its mine site, the financial security collected by the Department is returned.

The Department has responded. Indian and Northern Affairs Canada agrees with our recommendations. The Department has provided us with a clear description of the specific actions it will take to address our recommendations, including time frames within which these actions are to be completed, where appropriate.

Introduction

The issue

3.11 Some abandoned mines in the North represent a serious threat to human health and the environment. As a result of past mining operations, toxic chemicals and acidic mixtures have accumulated over time and have the potential to pollute groundwater and surface water. These chemicals are contained in structures that are deteriorating rapidly and that require regular repairs. In some cases, time is running out, and there could be significant environmental damage if nothing is done.

3.12 Each year, Indian and Northern Affairs Canada spends millions of dollars to contain pollutants inside abandoned mine sites. However, this level of effort is insufficient to provide long-term solutions. At the same time, the Department is taking measures to ensure that new mines do not leave behind environmental problems whose cleanup will be paid for by Canadian taxpayers. Reaching full financial security will likely not be possible for some older mines still in operation. If these older mines are abandoned, Canadian taxpayers will end up paying the difference for their cleanup and closure.

The federal role

3.13 Indian and Northern Affairs Canada is the key federal department in northern Canada (Yukon, Northwest Territories, and Nunavut) and is the land administrator on behalf of the federal government and all Canadians. It has a broad mandate that includes promoting economic development and protecting the environment. The Department also has responsibilities for Aboriginal peoples, primarily for Status Indians living on reserve and Inuit.

3.14 Since 1999, large, heavily contaminated northern mine sites abandoned by bankrupt owners have become the Department's responsibility. The Department must carry out the care and maintenance of these **abandoned mines** until it can implement long-term solutions, such as conducting site cleanups and installing appropriate containment structures and technologies. For a number of other northern mine sites that are not yet legally considered abandoned, the federal government is currently paying all or a significant portion of the care and maintenance costs and will pay for their eventual cleanup.

Mining in the North

3.15 The mining industry in the North dates back to the 1800s and the discovery of gold. Because the land is rich in minerals, mining remains an important industrial activity. However, it causes land disturbances and wastes that can have negative impacts on the environment, particularly on water, if proper care is not taken.

3.16 The protection of the environment in Canadian law is relatively new, dating back to the 1970s when concerns over pollution problems started to be raised. Thus, the mining industry operated for many years in the North

Abandoned mine— A mine site that has not been properly cleaned up and closed down and whose ownership has reverted to the federal government because the owner has gone out of business.

Did you know?

Mining's rank as a waste-generating industry in North America: **second, just behind agriculture.**



Permafrost at the Giant Mine in 1955
 Permafrost on the walls underground at the Giant Mine in 1955. At that time, rock temperatures never rose above the freezing point, not even in mid-summer.

Source: Mining Explained in Simple Terms, 1963

without having to follow strict environmental protection rules. This led to some local pollution problems.

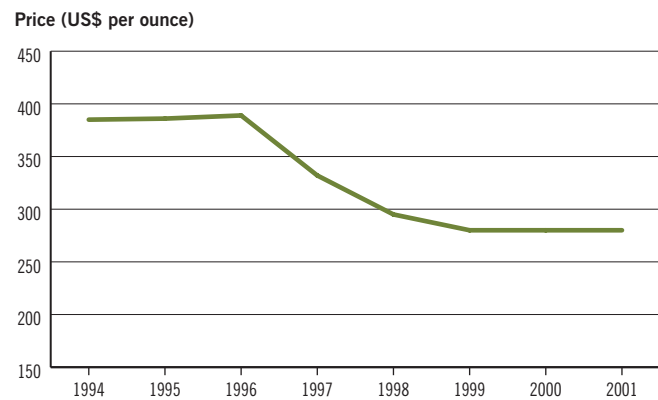
3.17 Basic scientific information and current research on the North are insufficient to fully predict the impacts of environmental changes in the North and to develop comprehensive technical solutions to address them. The assumption that permafrost (permanently frozen ground) could be relied on to stay frozen played a key role in engineering designs of many mines in the North. However, indications are that climate change is affecting the North more than other parts of Canada. Warming temperatures have caused permafrost to melt, which has led to structural damage of mine sites as well as buildings, electrical and telephone lines, and pipelines.

3.18 Mining is an important part of the economy in Canada. It contributes about \$37.5 billion, or four percent, to Canada’s gross domestic product (GDP). The presence of the mining industry is felt even more in the North: in the late 1980s and early 1990s, it produced about 25 percent of the GDP in the territories. In 1998, this was down to about 15 percent in the Northwest Territories and 7.5 percent in the Yukon. In a northern economy that lacked diversification, the well-paid mining jobs were important so there was pressure on the government to continue to support mining projects. Today, due to new diamond mine activities and increased oil and gas development, economic growth in the North is among the highest in Canada.

Mining is a risky business

3.19 The profitability of a mine depends on a number of factors, such as the location of the mine site, the cost of labour, the size of mineral reserves, and especially the market price. Exhibit 3.1 illustrates the decline in the price of gold during the 1990s. In 1999, major northern mines went bankrupt and were abandoned. Indian and Northern Affairs Canada, in its role of land administrator for the federal government, ended up being responsible for them. Currently, there are six older mines still in operation in the North. One new diamond mine opened recently and another is scheduled to open during 2003.

Exhibit 3.1 North American gold prices—1994 to 2001



Source: U.S. Geological Survey, Mineral Commodity Summaries

3.20 Because mining is a risky business, the federal government plays an important role in protecting the interests of Canadian taxpayers in the North. To this effect, Indian and Northern Affairs Canada is responsible for ensuring the application of federal legislation that authorizes the collection of financial security deposits. The security deposits cover the eventual costs of repair, maintenance, cleanup, and closure of mines that the Department would have to assume should the mine owners go bankrupt. If a mining company conducts the proper cleanup and closure of its mine site, the financial security collected by the Department is returned.

3.21 The *Northern Inland Waters Act* of 1972 provided for only partial financial security. It was replaced in 1993 by the *Yukon Waters Act* and the *Northwest Territories Waters Act*, which authorize the collection of full financial security related to water impacts. In 1998, the *Mackenzie Valley Resource Management Act* was passed. It deals with natural resource management in the Mackenzie River Valley and has provisions for the collection of financial security. Earlier this year, new water legislation for Nunavut was passed: the *Nunavut Waters and Nunavut Surface Rights Tribunal Act*. It also authorizes the collection of financial security.

3.22 Under these laws, mining projects must obtain a water licence from one of the water boards. The boards are responsible, as part of a water licence, for setting conditions to minimize negative effects on the water resource and setting the amount of financial security required. Water licences have been the main vehicle for establishing financial security requirements. For major projects, such as hard-rock mining projects, the Minister of Indian and Northern Affairs must approve the water licence. Financial security can also be obtained from mining companies through other means: land leases, environmental agreements, and other contracts. Through these contractual arrangements, financial security for impacts other than those related to water can be included, such as land-related impacts.

3.23 In addition, the Canada Mining Regulations under the *Territorial Lands Act*, the *Yukon Quartz Mining Act*, and the *Yukon Placer Mining Act* require that mining companies operating in the North pay royalties to the federal government. Royalties are payments by mining companies for minerals extracted and vary with profitability. Unlike security deposits, royalties are not collected to cover eventual cleanup costs of mine sites; instead they go into the federal government's consolidated revenue fund.

Focus of the audit

3.24 Our audit focussed on examining the progress that Indian and Northern Affairs Canada has achieved in managing northern abandoned mines over the last several years through its Northern Affairs Program. The audit covers hard-rock mining only, which is mining that extracts the mineral from solid rock by drilling or blasting. We asked the following questions:

- Does the Department have a program in place to identify, assess, and manage abandoned mines, and determine priorities and costs?

Did you know?

The average amount the federal government received a year in royalties from 1966 to 2002 from mining companies operating in the North: **about \$4.16 million** (for a total of \$150 million)

- Does the Department have the necessary systems, policies, procedures, and standards to deal with abandoned mines?
- Is the Department doing enough to ensure that currently operating and future mines in the northern territories do not become a financial burden on Canadian taxpayers?
- Is the Department collecting sufficient financial security from mining companies to cover all costs associated with care and maintenance, cleanup, and closure if they abandon their mines?
- Is the Department conducting the necessary inspections to ensure that it can enforce water licence terms and conditions adequately?

3.25 In addition to interviewing the Department’s regional and headquarters staff and conducting file reviews, we visited four mine sites: the Giant and Colomac mines in the Northwest Territories and the Faro and Mount Nansen mines in the Yukon. More information on our audit objectives, scope, approach, and criteria are provided in the section About the Audit at the end of the chapter.

Observations and Recommendations

3.26 Indian and Northern Affairs Canada has a list of 17 northern abandoned mines that are considered high-priority contaminated sites, each with its own set of challenges. Three of the sites have been cleaned up and now require only ongoing monitoring. For the remaining 14 sites, the Department has assigned priorities and it annually reviews the allocation of the funds to manage them. Four of these sites are in the Yukon and 10 are in the Northwest Territories. The appendix lists the abandoned mine sites in the North that require or could require cleanup action, based on information the Department has provided to the Treasury Board Secretariat. See Chapter 2, The Legacy of Federal Contaminated Sites for further details on the requirement for departments to provide information on their contaminated sites to the Treasury Board Secretariat.

3.27 We visited four recently abandoned mines in the North: Colomac, Giant, Faro, and Mount Nansen (Exhibit 3.2). Two of these mines are not fully abandoned yet. The Giant Mine was sold by Indian and Northern Affairs Canada to a private company, and the Faro Mine is still managed by a court-appointed interim receiver. However, the Department is paying all or a significant portion of the environmental care and maintenance costs of these four mines and has assumed responsibility for their cleanup. We chose these sites because they represent a major portion (almost 90 percent) of the Department’s environmental and financial burden caused by northern abandoned mines.

Did you know?

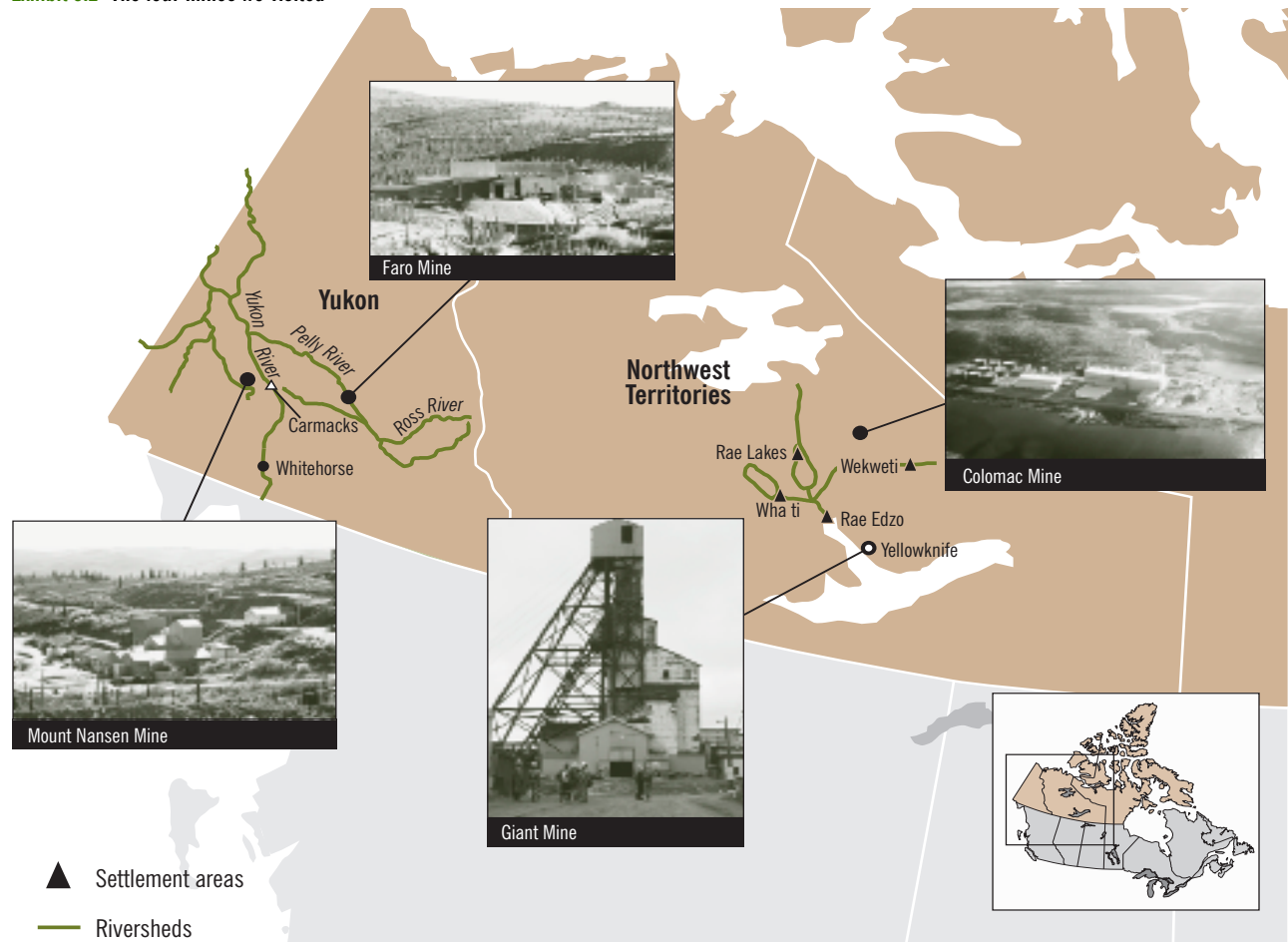
Total estimated cost of dealing with all of the Department’s contaminated sites in the North: **\$723 million**

Estimated cost of cleaning up and closing northern abandoned mines: **\$555 million**

A closer look: Four abandoned mines

Receiver—A person licensed under the terms of the *Bankruptcy and Insolvency Act* to take charge of a company and who may temporarily carry on the business or sell the assets.

Exhibit 3.2 The four mines we visited



Cyanide—A highly toxic substance when ingested or inhaled. Sodium cyanide solution is used as a solvent for extracting gold and silver from ores.



Tailings containment area at the Colomac Mine

3.28 Exhibit 3.3 provides descriptive details on the four mines, including the amount of money the Department is spending on care and maintenance, its estimates of cleanup, and the amounts collected as security deposits from mining companies while the mines were operating.

3.29 Colomac Mine. The most pressing environmental problem at the Colomac Mine site is the mine waste containment area. This area is made up of three lakes, with a total surface of about 76 hectares—an area as big as 93 Canadian football fields. Precipitation and snowmelts are accumulating in this area, and concentrations of contaminants (such as cyanide, metals, and ammonia) in the water are much too high to release into the environment without treatment.

3.30 This is an urgent problem. Currently, there is no single treatment process available that can adequately reduce all of the contaminants. The Department estimates that choosing treatment options, obtaining the regulatory approvals, and constructing a water treatment plant would take up to four years, about the same length of time as it will take for the mine waste containment area to reach its full capacity.

Exhibit 3.3 Abandoned mines—Four case studies

	Colomac Mine	Giant Mine	Faro Mine	Mount Nansen Mine
Description	Open-pit gold mine	Underground and open-pit gold mine	Open-pit lead and zinc mine	Open-pit gold and silver mine
Location	222 km north of Yellowknife, Northwest Territories. Only accessible by air or ice roads.	5 km north of Yellowknife, Northwest Territories (population of 16,541).	15 km north of Town of Faro, Yukon (population of 313) and 200 km northeast of Whitehorse, Yukon (population of 21,405).	60 km west of Carmacks, Yukon (population of 431) and 180 km north of Whitehorse, Yukon.
Period of operation	From 1990 to 1997, with a three-year interruption.	From 1948 to 1999, the mine operated as an underground and open-pit mine and mill. From 1999 to present, it operated only as an underground mine, with ore trucked off-site.	From 1969 to 1998, with a four-year interruption.	From 1968 to 1969, from 1975 to 1976, and from October 1996 to February 1999.
Last owner	Royal Oak Mines went into receivership ¹ in April 1999.	Royal Oak Mines went into receivership in April 1999. Miramar is the present owner while Indian and Northern Affairs Canada currently pays 69 percent of all care and maintenance costs.	Anvil Range Mining Corp. went into receivership in April 1998.	BYG Resources went into receivership in February 1999.
Date Indian and Northern Affairs Canada assumed responsibility for the site	December 1999	December 1999 The Department sold it to Miramar, but kept the responsibility for the cleanup of the underground mine workings.	July 1998 The receiver is now managing the site. The Department was reimbursing the majority of care and maintenance costs, and since April 2001 has been reimbursing all of them. Once the receiver concludes the estate administration, the Department is to inherit this site.	August 1999
Amount the Department spent on care and maintenance	\$11.3 million from December 1999 to April 2002 (includes some cleanup work, assessment studies, and monitoring).	\$1.2 million from April 2001 to April 2002.	\$14 million from July 1998 to April 2002 (includes some cleanup work).	\$4 million from August 1999 to April 2002.

Exhibit 3.3 Abandoned mines—Four case studies

	Colomac Mine	Giant Mine	Faro Mine	Mount Nansen Mine
Department's cost estimates for cleanup	\$70 million	\$52.8 million to \$399.9 million, depending on option selected.	At least \$200 million	\$6.3 million
Amount of financial security collected from owner	\$1.5 million	\$400,000 from Royal Oak Mines and \$7 million from Miramar.	\$14 million	\$445,000
Main environmental problem	Mine waste area is filling up with water that is contaminated with ammonia, cyanide, and metals. There is potential for a dam failure.	237,000 tons of arsenic trioxide dust are stored in underground chambers. Water coming in contact with the chambers is being contaminated with arsenic and is pumped to surface, treated, and released.	Water is contaminated with acid and metals (zinc) and requires continuous treatment. There is potential for a dam failure.	Water is contaminated with arsenic, cyanide, and metals and requires continuous treatment. There is potential for a dam failure.

¹ Receivership: The status of a company whose affairs have been put in the hands of a receiver because it is unable to pay its bills and meet other obligations.
 Note: Indian and Northern Affairs Canada provided the financial information for this exhibit.



Colomac mine site from the air
 Large fuel storage containers (left) are leaking into the lake. Heavy equipment and hazardous materials have been abandoned at the mine site.

Arsenic trioxide—A white, odourless, tasteless powder (also known as crude arsenic), which is a poisonous and cancer-causing chemical.

3.31 If the dam containing the waste fails, an uncontrolled discharge of contaminated water will enter the Indin River system. This system is the water supply source for Dogrib First Nations communities located downstream, and the Indin Lake has a spiritual significance to the community. Departmental officials recognize the potential liability of a dam failure, which could be catastrophic to the environment, and that immediate action is needed.

3.32 The Department estimates the cost of cleaning up the Colomac Mine at about \$70 million. Only \$1.5 million in security deposits was collected for this mine when it was in operation. This leaves a gap of \$68.5 million that the federal government will have to pay. The mine has not generated any royalties to the government.

3.33 Giant Mine. The Giant Mine is perhaps the most publicized contaminated site in northern Canada. The processing of ore to extract gold at this mine produced at least 237,000 tons of arsenic trioxide dust, enough to fill seven 11-storey buildings. During the first three years of operation, this toxic by-product was released directly into the air, resulting in surface contamination of the mine site.

3.34 In 1951, the mine operator decided to capture and store the arsenic trioxide underground. This was considered to be a permanent solution on the assumption that permafrost would re-establish itself underground and seal the arsenic trioxide in place. This assumption is now proving to be wrong.



Contaminated shore line of Great Slave Lake

Commissioner of the Environment and Sustainable Development staff observe a beach area contaminated with arsenic from the Giant Mine.

Acid rock drainage—The results from a reaction of sulphur-containing minerals exposed to air and water, producing a toxic, acidic runoff that can potentially cause damage to ecosystems downstream. Acid rock drainage is associated mainly with the mining of coal, copper, other base metals, and precious metals.



Vangorda Pit at the Faro Mine

High zinc levels in the water are a pressing problem.

Snowmelt and storm water entering the mine are being contaminated with arsenic and the water is being captured and treated.

3.35 In addition to surface and sub-surface contamination, there are hazardous materials and dangerous goods around the Giant Mine site. In April 2001, a hazardous waste management plan was developed and is being implemented by the current owner. During our field visit in September 2001, we observed that there was still a significant amount of cleanup work needed.

3.36 Indian and Northern Affairs Canada commissioned a human health risk assessment of the Giant Mine in 2001. The risk assessment concluded that in the absence of an operating water collection and treatment system, the mine would release unacceptable amounts of arsenic into the surrounding fresh water. This could significantly increase the risks of cancer to people in the area should they drink contaminated water and consume substantial quantities of contaminated fish and ducks. However, those risks are controlled because a water collection and treatment system is in place. Moreover, drinking water for the city of Yellowknife comes from another source.

3.37 The Department is considering four alternatives ranging from \$52.8 million to \$399.9 million to manage the arsenic trioxide problem. These include the following: leaving the arsenic trioxide dust underground and freezing the bedrock around it; removing the dust to the surface and recovering both the gold and the arsenic trioxide for sale; removing the dust to the surface, recovering the gold, and then stabilizing the arsenic; or removing the dust to the surface and stabilizing it. Regardless of the method used to store or remove the underground arsenic, water that leaves the mine area will likely require treatment forever.

3.38 Faro Mine. The Faro Mine was one of the largest open-pit lead and zinc mines of its day in Canada. The mine has several sources of **acid rock drainage**, which has led to heavy contamination of surface water by metals, particularly zinc. Ongoing collection and treatment of the contaminated surface water is necessary. On a number of occasions, the interim receiver had to take action to prevent or deal with uncontrolled discharges of contaminated water in nearby water courses. A March 2001 study commissioned by Indian and Northern Affairs Canada indicated that groundwater in the area had not been contaminated.

3.39 According to Environment Canada and Fisheries and Oceans Canada, the acid-generating material on-site, if not properly stabilized, has the potential to release metals into the Pelly River for centuries to come. The Pelly River supports salmon and is a tributary of the Yukon River, which drains into the United States.

3.40 Up until late 2001, the Department continued to explore the economic potential of parts of the Faro Mine before deciding to close it for good. It finally concluded that the mine was no longer economically viable. The Department informed us that scientific studies are now required to resolve technical uncertainties related to the cleanup of this site before completing

Did you know?

Proportion of the Yukon's economy accounted for by the Faro Mine when it was operating fully: **25 percent**



Seepage collection pond at the Mount Nansen Mine

The pond collects water contaminated with cyanide leaking from the tailings containment area.

Compliance direction— An order by a water inspector of Indian and Northern Affairs Canada for specific action to protect the environment.

Did you know?

Amount the Department spends annually on fuel alone at the Colomac and Mount Nansen abandoned mines to run equipment that collects or treats contaminated water: **\$940,000**

Federal government actions

the closure plan. Because of the characteristics of this mine, and the nature and size of the contamination, this site will likely require long-term management, even after cleanup.

3.41 Mount Nansen Mine. There has been intermittent exploration around the Mount Nansen Mine since 1917. Two attempts at exploiting this site, one in the sixties and the other in the seventies, both failed within two years. In 1996, mining was attempted for the third time. This time, the mine was supposed to operate for four years; however, once again, it shut down after just over two years of operation. Today, further mining would not be economically feasible.

3.42 The last mining operation at this site left behind an environmental mess and did not put up enough financial security to deal with the environmental problems. Indian and Northern Affairs Canada is currently spending \$1.5 million a year for the care and maintenance of this site. Furthermore, the mine generated no royalties to the federal government. This is not sustainable development.

3.43 The owner of the Mount Nansen Mine failed to meet its water licence requirements, almost from the start of construction in 1996. Between May 1997 and July 1999, the Department issued the owner 11 **compliance directions** under provisions of the *Yukon Waters Act*. The owner was found guilty of three infractions and fined \$300,000. The Department could have closed down the mine but did not.

3.44 Over the short period of time this mine was operating (1996–1999), 10 different environmental co-ordinators worked for the mining company at the site. This resulted in a lack of continuity in the management of environmental matters and made it difficult for the Department's inspectors to do their work.

3.45 According to departmental officials, this mine site could be cleaned up to acceptable standards within three years for less than \$6.3 million. However, officials stated that they do not have the necessary funds for the cleanup and cannot do it right away because of legal issues that still need to be resolved; further, such a cleanup project would trigger an environmental assessment. While the final cleanup is delayed, and the Department continues to spend money on care and maintenance, the amount of Canadian taxpayers' money spent on this site continues to grow.

3.46 Dealing with the problems of northern abandoned mines is complex and costly due to the size and nature of the contamination and the technical difficulties involved in the cleanup. We examined the Department's programs to determine if it has the capacity to deal with the legacy of abandoned mines and ensure that currently operating and future mines do not become part of that legacy.

Gaps in capacity and policy have caused delay

3.47 Insufficient capacity. The Department has staff dedicated to handling northern contaminated sites, but not enough resources to match the size of

the problem. With the addition of major abandoned mines, such as our four case studies, departmental officials acknowledge that the situation has become dramatically worse since 1998. The management structure currently dealing with abandoned mines is both diffuse and inconsistent; no single entity within the Department has been given the lead, and there is no standard approach to managing the sites. The Department was not prepared for this situation and is having serious difficulties keeping up with the demands.

3.48 Contaminated Sites Management Policy. In 1996, the Auditor General reported that the federal government needed a comprehensive environmental policy including a cleanup action plan to ensure a consistent approach in dealing with federal contaminated sites. Since then, Indian and Northern Affairs Canada has drafted its own policy, based on the draft Contaminated Sites Management Policy of the Treasury Board. In addition, in February 2001, the Department started to develop a long-term management plan for contaminated sites and abandoned mines in the North, including a management framework. However, neither the policy nor the framework elaborates sufficiently on abandoned mines, even though they represent the major portion of the Department's contaminated site problems.

3.49 In our view, a policy is the central piece of an organization's management system because it defines senior management's direction and commitment. Officials of the Department said they had been waiting for the Treasury Board Secretariat to finalize the government-wide policy on contaminated sites to ensure that the Department's policy is consistent with it. Given the urgency of the situation, we did not view this as reason enough for the Department's further delay. The government-wide policy was recently completed in July 2002. In the meantime, officials of the Department indicated that their draft Contaminated Sites Management Policy had been guiding their actions. The policy was finally approved in late August 2002.

3.50 The situation is different in the Yukon. On 1 April 2003, administration and control of land and resources will be transferred from the federal government to the Yukon government. However, the federal government will retain the financial responsibilities related to implementing abandonment and restoration plans for abandoned mines, such as Faro and Mount Nansen. Management regimes for these mine sites are currently being developed by the federal government along with the Yukon government and affected First Nations.

3.51 Mine site closure policy—What took so long? The Department had been developing the Mine Site Reclamation Policy for the Northwest Territories since the late 1980s. The Department made several commitments to deliver such a policy—for example, in the two sustainable development strategies it has developed since 1997. It finally released two policies at the end of our audit: one for the Northwest Territories and the other for Nunavut. These policies are a critical tool as they will guide all parties in specifying requirements and determining related costs of mine site cleanups and closures, and setting financial security at appropriate levels.

3.52 A mine site closure policy, similar to those for the Northwest Territories and Nunavut, is being developed for the Yukon. Since the legislative base is different in the Yukon, this policy must harmonize with the regulatory requirements of the *Yukon Quartz Mining Act*. Provisions for collecting sufficient financial security to cover terrestrial disturbances are to be included in the Yukon Mine Production and Reclamation Regulations under the *Yukon Quartz Mining Act*. These draft regulations also cover issues not addressed by water licences, such as land use and mining processes.

3.53 The regulations under the *Yukon Quartz Mining Act* have been in development since 1996 and are to ensure that mine closures meet appropriate standards. This is another commitment the Department made in its sustainable development strategy that it still has not met. In 1994, a departmental internal audit examining land and water resource issues associated with mining activities in the Yukon identified the urgency of developing these regulations to avoid having to pay for the cleanup of mines eventually abandoned. However, the Department said that it is unlikely that these regulations will be completed because of the transfer of responsibilities now being negotiated with the Yukon territorial government.

3.54 Even though the Department has just recently released the mine site closure policies for the Northwest Territories and Nunavut, we acknowledge that it has made good progress since 1997 in increasing the financial security from operating and new mines. However, we also note that while the policies were being developed, the Mount Nansen and Colomac mines experienced costly financial failure. Earlier implementation of the policies could have protected Canadian taxpayers.

3.55 **Guidelines for planning mine closures are outdated.** Mine site closure plans provide important information for determining the anticipated cleanup costs and security deposit requirements. Part of applying for a water licence under the territorial waters acts of 1993 is the applicant's obligation to submit a mine site closure plan. Water boards do not require a fully detailed plan initially; a partial plan is acceptable. However, water boards set a date for the applicant's completion of a detailed closure plan.

3.56 For one mine, the water licence approved in 1995 required the submission of a detailed closure plan by 1998. We observed that the mine did not submit the final plan until 2001, and this plan is still awaiting final approval, pending completion of an environmental assessment. Officials of the Department noted several deficiencies with the final plan. In our view, it would be good practice to require detailed plans from mining companies as early as possible after a mine is approved.

3.57 In 1992, a consulting company working for the Department developed mine site closure guidelines for application in the Yukon and Northwest Territories administrative regions. In 1995, the Yukon regional office prepared draft updated guidelines but never finalized them. It will be important to update the 1992 guidelines to support the new mine site closure policies for the Northwest Territories and Nunavut and the Yukon's mine site closure policy when it is released.

Transferring costs back to the private sector

3.58 Creative and interim solutions are partial and short-term.

Considering the Department's limited resources currently available, its most creative and constructive alternative is to try to minimize the costs to the federal government by finding new owners for abandoned mines that still have the opportunity to make a profit. However, abandoned mines often have serious environmental issues associated with them. It is therefore not easy to find a private owner interested in reopening a mine and, at the same time, willing to assume all or a portion of the costs for cleaning up the environmental mess left by others. As such, finding private owners tends to be only a partial and short-term solution.

3.59 One mine site in the Yukon Territory is an example of new ownership. This mine became the responsibility of Indian and Northern Affairs Canada in January 2001, and as of September 2001 a new private owner is in place. Although the new owner is paying for the required water treatment at the site, the owner does not yet have a water licence. Nor has the owner paid any of the \$250,000 security deposit associated with the previous licence. At the time of the audit, the Department stated that it would consider taking enforcement action against the owner for using water and depositing waste in water without a licence.

3.60 Another example of new ownership is the Giant Mine. In December 1999, soon after the Department inherited this mine, it sold it for \$10 to a private company. The deal was such that the company could operate the mine and extract gold but was required to pay for keeping the mine in full compliance with environmental requirements. The Department was to retain the responsibility for site cleanup, including the arsenic trioxide dust problem. This agreement kept 50 jobs at the site. After renegotiating the agreement with this company, since January 2002 the Department has been reimbursing the company 69 percent of the cost of environmental care and maintenance, amounting to \$300,000 each month.

Will there be enough money?

3.61 Security deposits in the past—A serious gap. As noted in Exhibit 3.3, for the four mines that we visited there is a serious discrepancy between the amount of security deposits collected from private mine operators and the amount of money now required for the mines' cleanup and closure. In fact, security deposits collected are not even enough to cover the amount the Department has spent to date on care and maintenance costs. For older mines, such as the Giant Mine established in 1948, the gap in security deposits is the result of legislative limits to the amount of security that could be collected. Full financial security coverage has been possible only since 1993.

3.62 Indian and Northern Affairs Canada is accountable on behalf of all Canadians for assuming risks if financial assurance is inadequate. In the case of newer mines that have been recently abandoned, such as Mount Nansen in 1999, it is clear that there was not enough security set aside. There is a major

gap between the amount set by the Water Board when it issued the water licence for Mount Nansen and the amount required to clean up the site today.

3.63 Water licences are renewed, on average, every seven years. Recently, the Water Board renewed two water licences for mines in Nunavut without seeking the Minister's approval. Departmental officials indicated that they were concerned about this situation that arose because the Nunavut Water Board believed that the Minister's approval was not required. The recent *Nunavut Waters and Nunavut Surface Rights Tribunal Act* now makes it clear that the Minister's approval must be obtained.

3.64 **New security deposit policy now in place.** In September 2001, the Policy for Security Deposits, Manual of Water Policy Statements was finalized. This policy clarifies the principles to be followed by the Department in establishing a recommendation to the Water Board for financial security to cover impacts on water resources. The document specifies that the amount should cover the costs necessary for the federal government to restore an abandoned mine site at any point during the life of a project, such that there are no costs to the public. This includes the costs of ongoing measures required to maintain sites during periods of temporary closure. We were surprised to see that such a policy was not prepared earlier to support the water legislation of 1993, but we are encouraged to see that it is now in place. We believe it would be good practice for the Department to ensure that the respective water boards are fully aware of departmental policy.

3.65 **Closing the financial security gap for operating mines.** In 1993 the legislative limits to the amount of financial security that could be collected were removed. Between 1997 and 2002, licence requirements increased the amount of security on deposit. However, for some currently operating mines, a shortfall still remains between the amount of security required by the water licences and the amount that the Department estimates it will cost to clean up the mines should they be abandoned before being adequately cleaned up. Officials of the Department said that the objective is to achieve full financial security, but they recognize that this may not be possible for some older mines still operating.

3.66 **Learning from past mistakes.** For two new diamond mines in the North, Indian and Northern Affairs Canada has initiated new procedures to increase the amount of financial security to be collected from mining companies. It uses a combination of tools: water licences, surface leases, and environmental agreements. Surface leases and environmental agreements are contracts between mining companies and the federal government. The environmental agreements cover various aspects, including provisions for adjusting the financial security requirements on a regular basis, if necessary, during the life of the mine. Officials of the Department consider this type of agreement an important supplement to the existing statutory tools.

3.67 The Department reported that full financial security will be achieved for the two new diamond mines. For one of the mines, an estimate by Indian and Northern Affairs Canada in 1996 determined cleanup costs for the life of

the mine to be \$79.4 million. Financial security obligations were established under a water licence and an environmental agreement with the mining company. In 2001, the Department recalculated the cleanup costs to be \$136.4 million. Under the terms of the environmental agreement with the mining company, cleanup costs and financial security requirements are to be reviewed every two years and readjusted accordingly. Future financial security requirements for this mine are to be determined by the Mackenzie Valley Land and Water Board and the Minister of the Department, taking into consideration the advice of a multi-stakeholder group. The multi-stakeholder group will review any proposed new developments, the current liability costs, the current security required, and the new cleanup estimates.

3.68 The second new diamond mine has also incorporated a review process in its environmental agreement. Cleanup costs are to be recalculated on an annual basis and financial security adjusted accordingly. The review process is consistent with the recently released mine site closure policies for the Northwest Territories and Nunavut. The goal of Indian and Northern Affairs Canada is to ensure that the total financial security is equal to the total outstanding cleanup costs at any time during the life of the mine.

Law enforcement: Conflicting demands

3.69 Indian and Northern Affairs Canada follows a co-operative approach to enforcing the law. It works with companies to obtain their compliance with water legislation obligations. Enforcement is viewed as a tool of last resort and is applied only when the co-operative approach fails to achieve compliance. A 1990 audit by the Auditor General of Canada, pertaining to land use planning, water resources management, and development and management of minerals, raised issues on water licence inspections. These concerned the need to enforce water licence terms and conditions more vigorously and to improve the inspection process. At the time, the Department cited insufficient resources as the main cause of these problems.

3.70 We found that the Department's regional offices in the Yukon and Northwest Territories do not prepare annual inspection plans concerning water licences for hard-rock mining. In the Yukon, departmental officials acknowledge that staff are too busy dealing with the day-to-day problems of abandoned mines. In the Northwest Territories, a risk assessment benchmark was developed and three inspections each year are recommended for mining activities; however, compliance rates related to these inspections are not systematically reported.

3.71 The Department has conducted inspections and occasionally identified compliance issues at the four mines we visited. In another case involving a mine not abandoned but currently not in operation, the Water Board had suspected water contamination and notified the Department in November 2001. We found that the Department has not conducted inspections that include water samples since 1999. Departmental officials said that the problems of abandoned mines are creating pressure on available staff, and they are concerned that the Department does not have a sufficient number of water inspectors.

3.72 Indian and Northern Affairs Canada is in the difficult position of having to enforce water licences and, at the same time, promote mining development in the North and carry out its management responsibility with respect to abandoned mines. This situation generates tension within the Department, as it often needs to balance sufficient enforcement of the law against pressure to keep a mine in operation, protect employment, and avoid being seen as the single agent responsible for the ultimate failure of a mining venture. Officials of the Department are aware of these conflicting demands and need to develop mechanisms and tools to avoid a potential conflict of interest situation involving their department.

3.73 In our view, the Department should make public its internal compliance and enforcement policies and report annually on its compliance and enforcement actions. In addition, dissemination of these policies within the Department would help inform staff of their existence. We found that these policies were not well known to the staff.

Application of the “polluter pays” principle

3.74 The federal government has embraced the “polluter pays” principle and refers to it in both the preamble of the *Canadian Environmental Protection Act* and the Minerals and Metals Policy of the Government of Canada. This principle recognizes the responsibility of users and producers for toxic substances, pollutants, and wastes. In other words, those that pollute should pay for the cleanup.

3.75 It is impossible to apply the “polluter pays” principle after a mining company has declared bankruptcy. That is why it is so important for the Department to obtain adequate financial security deposits from mining companies while they are in operation; failing that, Canadian taxpayers will have to foot the bill.

3.76 Although specific mining companies have created the environmental problems at northern abandoned mines, the whole industry bears the impact of the negative social and environmental legacy of these mines. The sites provide negative publicity for the industry, which is a major obstacle to building trust with the local population. It would clearly be in the interest of the industry to contribute to solutions.

3.77 The mining industry recognizes that the issues of abandoned mines need to be resolved. In 2000, an industry-government working group was created, which later convened the Orphaned/Abandoned Mines Workshop in Winnipeg in June 2001. At the Mines Ministers Conference in September 2001, Ministers asked that an Orphaned/Abandoned Mines Advisory Committee be established. This committee is tasked with exploring solutions to the problems, but action on the ground is slow. Four federal departments, including Indian and Northern Affairs Canada, are part of this committee. We believe that this initiative is an opportunity for the federal government to play a leadership role.

3.78 Some jurisdictions, both in Canada and abroad, use industry-sponsored funds to pay for the cleanup of mine sites, while others use a variety of legal

tools to address the issue. The federal government, in consultation with industry and the public, and northerners in particular, needs to consider a variety of options to solve the problems associated with abandoned mines. The Orphaned/Abandoned Mines Advisory Committee has formed a task group to examine this issue.

Urgent issues have been identified

3.79 Defining the issues. Indian and Northern Affairs Canada has achieved progress in identifying and assessing abandoned mine sites and establishing priorities and costs for them. However, cleanup costs for these sites are only estimates because detailed assessments and engineering designs have not been completed; for some sites, including the four sites we visited, more detail is available. The Department has developed a database of its contaminated sites, including abandoned mines. It is currently working on the database, which will require regular updating to reflect the evolving situation.

3.80 Since the early 1990s, the Department has cleaned up 32 abandoned mine sites, four of which are still being monitored. These four sites are included in the list of 30 priority abandoned mine sites that the Department recently provided to the Treasury Board Secretariat (see the Appendix). Sites on this list have a varying degree of priority.

3.81 The Department estimates the cost for cleaning up all contaminated mine sites to be at least \$555 million. However, this figure could change significantly depending on which option the Department decides to implement at priority mines, including the Giant and Faro mines, and on whether new abandoned mines are added. Also, when detailed site assessments are complete, more precise cleanup costs will be established. Another 23 sites not included on the list in the Appendix are suspected of being contaminated and require an assessment; no cleanup costs have been estimated for these sites.

3.82 Officials of the Department indicated that, over the last three years, they have had no choice but to take money away from other departmental activities to pay for the care and maintenance work at northern abandoned mines. In the fall of 2001, the Department laid out options to the federal government to deal with the problems of abandoned mines in the North, as it does not have the necessary funds to implement long-term solutions.

A band-aid approach is ineffective

3.83 The financial burden of dealing with the legacy of northern abandoned mines is huge, and the federal government has not yet come to grips with it. Northern abandoned mines represent a new issue for the government. Consequently, there are no funding strategies in place to support the Department's recent efforts. Without sufficient funding to implement long-term solutions, Indian and Northern Affairs Canada is currently covering only the basic care and maintenance work. This entails merely patching and reacting to problems instead of preventing them. This band-aid approach is not an optimal use of public funds, considering the rapidly growing costs of

care and maintenance associated with delaying decisive action. In addition, decisions are required on whether to clean up the accumulated toxic chemicals at these sites or do a major retrofit of containment structures that are deteriorating and near capacity. We hope that the federal government will not wait until a major environmental incident happens before it fixes the problems.

3.84 In our view, there are a number of steps that Indian and Northern Affairs Canada needs to take in order to ensure that abandoned mines in the North do not represent a threat to human health and the environment.

3.85 Recommendation. Indian and Northern Affairs Canada should secure adequate resources to implement long-term solutions.

Department's response. Indian and Northern Affairs Canada agrees with this recommendation. The Department has established a dialogue with central agencies to address the resource shortages and is working with them to secure long-term funding to address contaminated sites and abandoned mines.

3.86 Recommendation. Indian and Northern Affairs Canada should conduct the cleanup, containment, and closure of abandoned mines, based on priorities.

Department's response. Indian and Northern Affairs Canada accepts this recommendation. Priorities have been established for all our contaminated sites, including abandoned mines, by using the Canadian Council of Ministers of the Environment National Classification System. Workplans are in place for the Department's priority sites, and the Department annually allocates available resources to sites that are deemed to pose the most risk to human health and the environment. The Department cannot determine the completion date for cleanup, containment, and closure of abandoned mines as this will depend on the availability of resources and the technical constraints on each individual site.

3.87 Recommendation. As soon as possible, Indian and Northern Affairs Canada should put in place its management framework and long-term management plan for contaminated sites and abandoned mines in the North.

Department's response. Indian and Northern Affairs Canada accepts this recommendation. The Northern Affairs Program's Contaminated Sites Management Framework, which includes a long-term management plan, is being finalized in the fall of 2002 and will be updated on an annual basis.

3.88 As well, Indian and Northern Affairs Canada needs to take measures to ensure that currently operating and future mines in the North do not become an additional financial burden to Canadians.

3.89 Recommendation. Indian and Northern Affairs Canada should make public its water compliance and enforcement policies and report annually on its water compliance and enforcement actions.

Department's response. Indian and Northern Affairs Canada accepts this recommendation. Water compliance and enforcement policies will be made

more readily available to the public and an annual summary of compliance and enforcement actions will be prepared by the Northwest Territories and Nunavut regional offices.

3.90 Recommendation. Indian and Northern Affairs Canada should complete the Yukon Mine Production and Reclamation Regulations.

Department's response. Indian and Northern Affairs Canada agrees with this recommendation; however, the Government of Yukon (GY) now has the lead on this issue due to Yukon Devolution, 1 April 2003. The Department will continue to work with GY to ensure the completion of the regulations, but ultimately the timing will be determined by GY, and the regulations will be promulgated under Yukon legislation after devolution.

3.91 Recommendation. Indian and Northern Affairs Canada should update the guidelines on the preparation of proper mine site closure plans.

Department's response. Indian and Northern Affairs Canada accepts this recommendation. The Department will work with the Northwest Territories and Nunavut regulatory boards to update and improve the guidelines on the preparation of mine closure plans within two years.

3.92 Recommendation. Indian and Northern Affairs Canada should provide clear policy directions to water boards on the setting of appropriate security deposit requirements.

Department's response. Indian and Northern Affairs Canada accepts this recommendation. The Department has recently provided the Northwest Territories and Nunavut mine site reclamation policies to the boards responsible for issuing water licences. It will follow up on the ongoing application of these policies through submissions to the boards on specific applications and ministerial review of major licences issued by the boards.

3.93 Recommendation. For all mining projects, Indian and Northern Affairs Canada should continue to

- establish cleanup cost estimates,
- ensure sufficient financial security deposits are set,
- review the cleanup cost estimates regularly, and
- apply adjustments to financial security deposit requirements as needed.

Department's response. Indian and Northern Affairs Canada agrees with this recommendation. The Department will continue to prepare mine closure and reclamation cost estimates for new mines. When appropriate, the Department will update estimates for existing mines. Provisions in the environmental agreements for the two diamond mines, which allow for adjusting the amount of security periodically throughout the life of the mine, will continue to be implemented. Departmental decisions on security requirements, as well as submissions to regulatory licensing boards, will be guided by the principles and objectives of the new Northwest Territories and Nunavut mine site reclamation policies.

Conclusion

3.94 The current situation of abandoned mines in the North demonstrates the importance of integrating the social, economic, and environmental dimensions of development. Indian and Northern Affairs Canada is now tasked with managing serious environmental problems but lacks the necessary long-term, stable funding. The handling of this situation is far from a good example of “environmental excellence,” a goal that the federal government set for itself in the 1999 Speech from the Throne.

3.95 The Department now has a good grasp of the size and the complexity of the problems and has set priorities for further site assessments and cleanup work. However, its information base on northern abandoned mines needs regular updating. For example, the current cleanup costs it has provided to the Treasury Board are only estimates, with the level of detail varying from site to site.

3.96 Over recent years, the Department has made progress toward establishing a comprehensive program to deal with contaminated sites in the North, including abandoned mines. Officials of the Department indicated that full implementation of the related draft management framework will depend on available human and financial resources. No annual inspection plans related to water legislation enforcement are prepared; however, the Department has conducted inspections and occasionally identified compliance issues at the four mines we visited.

3.97 At the time of our audit, the Department had just approved the mine site closure policies for the Northwest Territories and Nunavut, although it had been working on these policies since the late 1980s. The Department has made notable improvement over recent years in setting financial security for mining companies. Its objective is to attain full financial security for all mining projects. It reported that full financial security will be achieved for the two new diamond mines, but this will not likely be possible for some older mines still in operation. Therefore, Canadian taxpayers are not fully protected should some of these mines be abandoned.

3.98 Overall, Indian and Northern Affairs Canada is making progress in dealing with the problems of abandoned mines in the North. So far, it has successfully contained the contaminants from these mines and avoided serious impacts to human health and the environment. However, the current band-aid approach, covering care and maintenance only, is not sustainable in the long term. The existing containment structures are deteriorating and reaching their capacity. Decisions on whether to do a major retrofit of these structures and/or clean up the accumulated toxic chemicals will be required. Long-term, stable funding and long-term solutions are needed.

3.99 The Department says its message to the mining industry is now loud and clear: 100 percent financial security is part of the cost of doing business in the North. An inadequate security deposit means no mine. On behalf of all Canadian taxpayers, Indian and Northern Affairs Canada needs to continue its efforts to resolve the current situation and ensure that it does not happen again.

About the Audit

Objective

Our overall audit objective was to determine the progress the federal government has made in the last several years in managing contaminated sites resulting from abandoned mines in northern Canada, including the Yukon, the Northwest Territories, and Nunavut.

Our two sub-objectives were the following:

- Determine the extent to which the federal government has identified abandoned mine sites, completed site assessments, set priorities for funding, selected and implemented site remediation options, and contained the risks posed by these sites.
- Determine whether the federal government has the necessary administrative structures, resources, safeguards, and policies to effectively manage these sites and any future sites that it might inherit.

Scope and approach

We examined the management by Indian and Northern Affairs Canada of abandoned hard-rock mines in northern Canada. We chose four mines to examine in detail: the Giant and Colomac mines in the Northwest Territories, and the Faro and Mount Nansen mines in the Yukon. These represent a significant portion of the potential environmental liabilities for Indian and Northern Affairs Canada.

We visited each of these mine sites and we interviewed departmental officials from the territories and other personnel working on the sites. We took detailed notes and hundreds of photographs during our visits. We reviewed departmental files and collected many key documents. We also interviewed senior personnel in Ottawa representing Indian and Northern Affairs Canada, Natural Resources Canada, Mining Watch Canada, and the Mining Association of Canada. In addition, we had a close look at the approach for setting financial security deposits for mining operations.

Criteria

In conducting this audit, we expected that Indian and Northern Affairs Canada would have done the following:

- developed consistent principles, practices, and standards for conducting environmental liability assessments for its abandoned mines;
- estimated environmental costs, liabilities, and risks associated with these sites and set priorities for further assessment or remediation;
- put in place a system for establishing priorities for all northern contaminated sites, including abandoned mines;
- established a contaminated sites management program north of 60th parallel;
- conducted the necessary inspections to ensure that water licence terms and conditions are adequately enforced;
- put in place policies for reclaiming mine sites;
- ensured that comprehensive plans for the reclamation of disturbed areas are developed, including the provision of satisfactory financial assurance to cover the costs of reclamation and, where necessary, long-term maintenance; and
- identified funding means for reclaiming old mine sites where responsibility cannot be assigned and initiated reclamation at those sites posing the greatest risk.

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Appendix Action status of abandoned mine sites

According to Indian and Northern Affairs Canada, out of a total of 30 sites, 17 are classified as “action required” and are considered high-priority sites by the Department, 8 are classified as “action likely required,” and 5 are classified as “action may be required.”

Mine	Location	Action	Status
Arctic Gold and Silver	Yukon	Required	Under remediation (monitoring*)
Clinton Creek Mine site	Yukon	Required	Under risk management
Colomac Mine	Northwest Territories	Required	Under assessment
Contact Lake	Northwest Territories	Required	Under assessment
Discovery	Northwest Territories	Required	Under remediation
Faro	Yukon	Required	Under assessment
Giant Mine	Northwest Territories	Required	Under remediation
Ketza River	Yukon	Required	Under assessment
Mount Nansen	Yukon	Required	Under risk management
North Rankin Inlet	Nunavut	Required	Remediated and under risk management (monitoring*)
Port Radium and Eldorado Mine	Northwest Territories	Required	Under assessment
Rayrock	Northwest Territories	Required	Under remediation (monitoring*)
Terra No. 1 (North Mine)	Northwest Territories	Required	Under assessment
Terra No. 2 (Northrim Mine)	Northwest Territories	Required	Under assessment
Terra No. 3 (Norex Mine)	Northwest Territories	Required	Under assessment
Terra No. 4 (Smallwood Mine)	Northwest Territories	Required	Under assessment
Tundra-Taurcanis	Northwest Territories	Required	Under assessment
Crestaurum	Northwest Territories	Likely required	Under assessment
Hidden Lake Mine	Northwest Territories	Likely required	Under assessment
Hope Bay	Nunavut	Likely required	Under remediation
Indore Gold and Hottah Lake	Northwest Territories	Likely required	Under assessment
North Inca Mine	Northwest Territories	Likely required	Under assessment
Outpost Island	Northwest Territories	Likely required	Under remediation
Venus Tailings and Mill Site	Yukon	Likely required	Remediated and under risk management (monitoring*)
West Bay and Black Ridge Gold Mine	Northwest Territories	Likely required	Under assessment
Liten Mine and Old Parr No. 2	Northwest Territories	May be required	Under assessment
Old Parr No. 1	Northwest Territories	May be required	Under assessment
Pensive Mine	Northwest Territories	May be required	Remediated and under risk management
Ruth Gold Mine	Northwest Territories	May be required	Under assessment
Sun Rose Claim Group	Northwest Territories	May be required	Under assessment

Source: Indian and Northern Affairs Canada

* The Department indicated that these sites were cleaned up and are now being monitored.

Meaning of terms used in this table*

Action required. The available information indicates that action (for example, further site characterization, risk management, or remediation) is required to address existing concerns. Typically, there are several factors of high concern, and measured or observed impacts have been documented.

Action likely required. The available information indicates a high potential for adverse off-site impacts, although the threat to human health and the environment is generally not imminent. There is probably no indication of off-site contamination; however, the potential for this was rated high and therefore some action is likely required.

Action may be required. The available information indicates that the site is currently not a high concern. However, additional investigation may be carried out to confirm the site classification, and some degree of action may be required.

Under assessment. The site is currently undergoing further investigation, and in some cases a remediation plan is being developed.

Under remediation. Remediation is being implemented (site cleanup is being done).

Remediated and under risk management. The remediation has been completed and the site is being risk managed. The remediation may be partial/interim or limited.

Under risk management. No active remediation is currently planned but the site is being risk managed.

*(Adapted from the Federal Contaminated Sites Inventory – Input Guide of Treasury Board of Canada Secretariat)

Report of the Commissioner of the Environment and Sustainable Development to the House of Commons—2002

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