

NATIONAL ORPHANED/ Abandoned mines initiative



2002-2008 PERFORMANCE REPORT

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About This Report

Canada's National Orphaned/Abandoned Mines Initiative (NOAMI) is pleased to present its first performance report documenting activities and achievements in its first six years of operation, from 2002 to 2008. The report focuses on the current state of orphaned and abandoned mines in Canada, NOAMI's achievements and those of jurisdictions active in NOAMI, future challenges and opportunities in Canada, and NOAMI's future.

We welcome your feedback on this report. Please contact the NOAMI Secretariat at *abandoned_mines@nrcan.gc.ca* with your questions and comments.

Statement from the Chair



It has been my privilege over the past six years to serve as chair of the National **Orphaned/Abandoned Mines Initiative** (NOAMI). Though NOAMI was formally established in 2002, the roots of this unique national initiative date to the late 1990s. At that time, both environmental and industry interest groups increasingly raised concerns about orphaned and abandoned mines to mines ministers across Canada. The response was a multi-stakeholder workshop to discuss issues, identify common ground and assess opportunities for action. From that foundation workshop in June 2001 came the guiding principles and recommendations for NOAMI as it exists today.

NOAMI's multi-stakeholder nature offers public servants, non-governmental organizations, Aboriginal organizations and the mining industry a forum to discuss issues and barriers associated with clean-up and remediation of orphaned and abandoned mine sites. Their convergence of interests and common commitment have created a successful and unique approach to influencing public policy and addressing issues related to orphaned and abandoned mines. PDAC President Peter Dimmel presents Environmental Award to Christine Kaszycki, 2004

In its report back to mines ministers in 2002, the working group organizing the first multi-stakeholder workshop stated:

"With adequate resources and resolve, significant progress can be made in the assessment, characterization and remediation/reclamation of orphaned and abandoned mine sites within 5–10 years."

Over the past six years, NOAMI has worked diligently to influence policy and build capacity in Canada to address these issues. Through workshops, conferences and publications, we have increased knowledge, explored best practices and created a network that is moving this agenda forward.

This report is a summary of NOAMI's efforts over the first six years. It is evidence of the substantial increase in action – and success – in grappling with this issue in jurisdictions across Canada. NOAMI's pathway to success is illustrated by its stories, which reflect many different approaches and partnerships.

While much work has been done, much more remains. The first six years have moved the yardstick substantially. The next six years will be critical to sustaining our momentum.

Christin Kazzan

Christine Kaszycki NOAMI Chair (2002–2008)

About NOAMI

The National Orphaned/Abandoned Mines Initiative (NOAMI) was created in 2002 based on recommendations put forward at a multi-stakeholder workshop on abandoned mines. NOAMI is guided by an Advisory Committee that brings together representatives from the Canadian mining industry, federal, provincial and territorial governments, non-government organizations and Aboriginal Canadians.¹ Together, they assess issues and make recommendations for collaborative implementation of remediation programs for orphaned and abandoned mines across Canada.

The NOAMI Advisory Committee takes direction from the mines ministers of federal, provincial and territorial jurisdictions in Canada, and reports progress to the annual Mines Ministers' Conference via the Intergovernmental Working Group (IGWG). This conference is an opportunity for the federal, provincial and territorial mines ministers and other mining stakeholders to discuss and plan for the future of mining in Canada.

NOAMI's activities are jointly funded by the federal, provincial and territorial governments, The Mining Association of Canada and the Prospectors and Developers Association of Canada, and administered by a secretariat at Natural Resources Canada. Funding for NOAMI was about



NOAMI Advisory Committee Members (2002–2008)

- Christine Kaszycki (Chair) Province of Ontario
- Brennain Lloyd Northwatch, Canadian Environmental Network
- Chief Glenn Nolan Missanabie Cree First Nation
- Chris Doiron/Charles Dumaresq/Lisa Keller Environment Canada
- Dick Cowan/Cindy Blancher-Smith Province of Ontario
- Elizabeth Gardiner The Mining Association of Canada
- Ernest Armitt/John Fox Province of Manitoba
- Gerald Harper/Philip Bousquet Prospectors & Developers Association of Canada
- Gilles Tremblay/Charlene Hogan (Secretariat) Natural Resources Canada
- Gregg Stewart/Ron Bronstein/Diane Howe Province of British Columbia
- Joan Kuyek Mining Watch Canada, Canadian Environmental Network
- Joanna Ankersmit/Claudia David/Lou Spagnuolo Indian and Northern Affairs Canada
- Lawrence Ignace Assembly of First Nations
- Louis Bienvenu Province of Quebec
- Patrick Reid/Adrianna Stech/Chris Hodgson Ontario Mining Association
- Robert Holmes Yukon Government
- Scott Clausen/Lise-Aurore Lapalme Natural Resources Canada
- Wayne Fraser Hudson Bay Mining and Smelting

Preliminary meeting of the NOAMI Advisory Committee in 2001, Winnipeg, MB

1. The term Aboriginal is defined in s.35 of the Constitution Act as including Indian, Inuit and Métis Peoples.



NOAMI is a good example of how a collaborative approach to the legacy of past mining practices can advance the objectives of sustainable development.

2006 meeting, Whitehorse, YK

\$100,000/year in the first few years, but increased to \$350,000/year when the program was expanded in 2005.

Five task groups undertake in-depth analyses of issues and provide recommendations and advice to the committee. These task groups focus on:

- Information gathering/inventory
- Community involvement
- Legislative and institutional barriers to collaboration
- Funding approaches
- Jurisdictional legislative reviews

Advisory Committee and other leading experts from various organizations. The leader of each task group is a member of the Advisory Committee. Canada is well known for establishing

Task groups include members of the

multi-stakeholder initiatives to address issues of national importance. Our model of cooperation among industry, various levels of government, NGOs and Aboriginal Canadians is used nationally and internationally. NOAMI is a good example of how a collaborative approach to the legacy of past mining practices can advance the objectives of sustainable development.

NOAMI Guiding Principles

'The Guiding Principles will underpin the terms of reference for

- 1. The remediation of orphaned and abandoned mine sites must be based on concern for public health and safety, respect for ecological integrity, and sustainable development;
- 2. All work currently ongoing with respect to inventory building and remediation must continue to be based on sound science and good communication among all parties;
- 3. Work toward eliminating future abandonments must continue, including the tightening of regulatory approaches;
- 4. Implement the 'polluter pays' principle;
- 5. Targeted end-use and reclamation standards must be acceptable to local communities;
- 6. Although the objective must be comprehensive reclamation of all sites, the approach must be cost-effective and based on an acceptable method of prioritizing sites;
- 7. Transparency and disclosure must be present in all decisionmaking processes;
- 8. Encompass the notion of 'fairness' in all endeavours.

Mines Ministers' Conference

The Annual Mines Ministers' Conference is an opportunity for the federal, provincial and territorial mines ministers and mining stakeholders to discuss and plan for the future of mining in Canada. The conference helps to ensure that the benefits of mining are realized in every province and territory, and that opportunities for Canadians in mining continue to grow, now and in the future.

Orphaned and Abandoned Mines in Canada

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WHAT IS AN ORPHANED OR ABANDONED MINE?

Orphaned or abandoned mines are those mines for which the owner cannot be found or for which the owner is financially unable or unwilling to remediate the site. These mines can pose environmental, health, safety and economic problems for communities, the mining industry and governments in many countries, including Canada.

The most serious environmental issues for orphaned and abandoned mines are acidic drainage and metal leaching from underground workings, open-pit mine faces and workings, waste rock piles, and tailings impoundment areas. Public health and safety hazards result from mine openings, mine wastes, abandoned infrastructure and subsidence. Policy implications include standards, fiscal responsibility and funding models, jurisdictional liabilities and possible re-use of the land (for future mining, recreational activities, etc.).

WHY ARE ORPHANED AND ABANDONED MINES AN ISSUE IN CANADA?

Mining has been central to the Canadian economy for over 100 years, and Canada is a supplier of mineral commodities worldwide. However, our long history of mining has left many abandoned sites: more than 10,000 abandoned sites requiring varying degrees of rehabilitation. In the past, mines became "abandoned" because there was no legislation to make mine owners accountable for the entire mine lifecycle from site selection and design through to its closure and decommissioning. Few understood the physical and environmental hazards entailed when companies simply locked the gate and walked away from the site. Today, mining legislation in all Canadian jurisdictions requires mine developers to submit mine closure plans that describe how the site will

"Dealing with mining legacy in Canada is regulated under a plethora of legislation, involves participation by multiple governmental institutions, and requires notification and consultation of the public and, specifically, of aboriginal peoples."

DEALING WITH MINING LEGACY – SOME CANADIAN APPROACHES, APRIL 2007 (LAWSON LUNDELL LLP)

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be progressively rehabilitated throughout its lifecycle and how it will be decommissioned when mining activities end.

WHY IS WORK ON ORPHANED AND ABANDONED MINES IMPORTANT?

The legacy of orphaned and abandoned mines, including environmental liability, human health concerns, and financial cost of clean-up and long-term monitoring and maintenance is a serious issue facing all Canadians.

The number of orphaned and abandoned mines in Canada and their physical, health and environmental impacts and liabilities are not well documented. These details must be documented before we can develop sound policy, cost-efficient planning and sustainable rehabilitation. It is also necessary to ensure transparent decision-making and access to information by governments, civil society, industry and other stakeholders.

Given adequate resources and resolve, we can make significant progress in the remediation of many orphaned and abandoned mine sites. NOAMI's multi-stakeholder model is an ideal structure for achieving this. NOAMI creates a safe space for public servants, NGOs, Aboriginal Canadians and mining industry associations to discuss barriers to clean-up and remediation of these sites. 3

NOAMI Performance

Over the past six years, NOAMI's five task groups have worked diligently to address issues related to orphaned and abandoned mines in Canada.

INFORMATION GATHERING / INVENTORY TASK GROUP

One of NOAMI's objectives is development of a national inventory of orphaned and abandoned mines based on compatible inventories from each province and territory. Several federal agencies and all Canadian provinces and territories with a history of mining maintain inventories of mining and exploration sites that pose a risk to human health, safety, and the environment. However, the level of detail and completeness of these inventories varies from jurisdiction to jurisdiction. A national inventory would introduce standardization, provide single-window access to information and facilitate adding more detailed information in the future.

Mandate

To develop capacity for a national inventory of active, closed and orphaned and abandoned mine sites based on compatible inventories in each province and territory, and to include agreed-upon national definitions and terminology as applied to orphaned and abandoned mine sites.

Activities and Outcomes

NOAMI's report Capacity Building for a National Inventory of Orphaned and Abandoned Mines in Canada (Cal Data Ltd, 2005) reviewed Canadian, U.S. and international efforts to inventory orphaned and abandoned mines. Based on our analysis of this report, we recommended developing an inventory that would include all inactive mineral sites, be web-based and have a map interface. The system would act as a portal to existing inventories maintained within the provinces, territories and federal agencies. A graphic map interface would simplify use.

NOAMI explored various options for a suitable host for the Internet map portal and selected Natural Resources Canada (NRCan). NRCan maintains several sites that map active mines and resource-dependent communities using MapGuide-based technology.

Development of NOAMI's web-based national inventory is well underway and most jurisdictions have finalized agreements to contribute to and integrate their databases with it. The working model is populated with orphaned and abandoned mine data from most Canadian jurisdictions. If available it will include satellite imagery and details displaying infrastructure at

Lynn Lake, MB

"Manitoba is equally committed to supporting the mining industry, protecting the environment and meeting the safety, health and economic needs of communities. Our participation in MEND and NOAMI is helping us achieve these goals."

JIM RONDEAU, MINISTER OF SCIENCE, TECHNOLOGY, ENERGY AND MINES, PROVINCE OF MANITOBA



Addressing orphaned and abandoned mines requires meaningful community involvement and engagement in decision-making on closure and rehabilitation. the regional and national levels. Subsequent phases will integrate data from the remaining jurisdictions to produce a national inventory.

Work is progressing to investigate how best to incorporate mineral site features into the existing NOAMI database and web portal. Once developed, the national inventory will be launched and made public.

COMMUNITY INVOLVEMENT TASK GROUP

Addressing orphaned and abandoned mines requires meaningful community involvement and engagement in decisionmaking on closure and rehabilitation. It must ensure that targeted end-use and rehabilitation standards are acceptable to local communities.

Mandate

To develop a plan to foster community involvement in decision-making about closure and reclamation standards, and to ensure that targeted end-use and reclamation standards are acceptable to local communities.

Activities and Outcomes

The 2003 NOAMI report Lessons Learned on Community Involvement in the Remediation of Orphaned and Abandoned Mines – Case Studies and Analysis included case studies of community involvement in three Canadian "Experience with abandoned and orphaned mines... has shown that public participation and community involvement can provide the essential knowledge, information and insight to enhance the efficiency of administrative decision-making, contribute to conflict resolution and support the implementation of actions and decisions. Such capacity inevitably leads to more sound risk management and trust between parties..."

NOAMI'S "BEST PRACTICES IN COMMUNITY INVOLVEMENT" BROCHURE

mine sites – Mount Washington, BC, Giant Mine, NWT and Deloro, ON. It also reported on community involvement processes at U.S. sites. These mines entail more complicated issues than most orphaned and abandoned mines. The case studies illustrate the importance of effective community involvement to decision-making. The "lessons learned" from these studies were developed into guidelines published in the brochure *Best Practices in Community Involvement: Planning for and Rehabilitating Abandoned and Orphaned Mines in Canada*, 2003.

After completing this project, the NOAMI Advisory Committee continued to examine ways to foster local community engagement in orphaned and abandoned mine remediation. Ideas generated at the workshop **Orphaned and Abandoned Mines: A Workshop to Explore Best Practices** (Winnipeg, 2006) included a recommendation for NOAMI to support a project on building the capacity of local communities to understand abandoned mines. This project is developing a modular capacity-building toolkit for such areas as community engagement, environmental concerns, legal and



NOAMI examines and develops ways to foster meaningful community involvement and engagement in abandoned mine remediation, in particular through workshops and other projects.

"NOAMI has contributed valuable information and experience regarding abandoned mines, particularly with regard to effective methods of public consultation."

DEALING WITH MINING LEGACY – SOME CANADIAN APPROACHES, APRIL 2007 (LAWSON LUNDELL, LLP)

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corporate matters, funding and partnerships, decision-making and Aboriginal issues. The toolkit was piloted and evaluated through a workshop and focus group in 2008 in Ymir, BC. Similar pilot tests are planned in 2009 in the mining districts of Chibougamau, QC and Virginiatown, ON.

LEGISLATIVE AND INSTITUTIONAL BARRIERS TO COLLABORATION TASK GROUP

A better understanding is needed of the legal and institutional barriers that prevent third parties from collaborating on clean-up activities and addressing associated liabilities related to orphaned and abandoned mines. This task group works to increase understanding of these issues, and develops recommendations and approaches for NOAMI's Advisory Committee to address them.

Mandate

To evaluate the efficacy of various approaches, including voluntary rehabilitation legislation, permit blocking, non-compliance registries, and allocative versus joint-and-several liability.

Activities and Outcomes

The NOAMI background study *Barriers to Collaboration: Orphaned and Abandoned Mines in Canada* examined regulatory or institutional barriers, liability disincentives and collaborative opportunities for voluntary abatement, remediation, and rehabilitation of orphaned and abandoned mines in Canada and selected international jurisdictions (Castrilli, 2002). Four approaches were addressed: voluntary rehabilitation legislation; permit blocking; allocative versus joint-and-several responsibility; and noncompliance registries.

The report findings provided background for a multi-stakeholder Legal and Institutional Barriers to Collaboration Workshop held in Ottawa in 2003. The workshop assessed barriers and developed approaches to overcome them. These recommendations were further integrated into a review on jurisdictional legislations (Castrilli, 2007).

FUNDING APPROACHES TASK GROUP

This task group was established to identify funding approaches and preferred options for the remediation of orphaned and abandoned mines across Canada that could be adapted to meet the varying needs of each jurisdiction.

Mandate

To evaluate models and mechanisms to pay for the remediation of orphaned and abandoned sites, including insurance options and contingency funds.

Brittania Mine, BC





Activities and Outcomes

The NOAMI report on *Potential Funding Approaches for Orphaned and Abandoned Mines in Canada* (Castrilli et al., 2003) outlined recommendations for funding approaches for clean-up or management of liabilities related to abandoned sites. The report concluded that no single funding approach was a complete solution; a combination of approaches would likely be required.

NOAMI's subsequent multi-stakeholder workshop on Assessing Liabilities and Funding Options in Ottawa in 2005 further explored funding approaches and related issues for abandoned sites. A roll-up discussion identified gaps and future priorities for NOAMI and recommended development of a funding toolkit. The toolkit would outline options illustrated with case studies to help jurisdictions across Canada evaluate potential funding options for the remediation of abandoned sites. The funding toolkit Rehabilitating Abandoned Mines in Canada: A Toolkit of Funding Options (Cowan Minerals Ltd., 2006) was completed and released at the NOAMI 2006 best practices workshop.

JURISDICTIONAL LEGISLATIVE REVIEWS TASK GROUP

In 2003, the Mines Ministers asked NOAMI to complete a set of guidelines for a jurisdictional legislative review that could be used by jurisdictions to evaluate their own policies with respect to collaboration, liability and funding.

Mandate

To complete guidelines for jurisdictional legislative reviews with respect to collaboration, liability and funding to ensure that approaches across jurisdictions are consistent, certain, transparent, coordinated and efficient.

Activities and Outcomes

NOAMI published *Guidelines for Legislative Review* in 2004, which includes guidelines and a checklist with associated questions to facilitate review of the legislative/ regulatory/policy frameworks related to orphaned and abandoned mines sites across Canada. The checklist establishes a consistent approach to reviewing legislation and related policies and practices, not just for orphaned and abandoned mine sites but also for contaminated and operating sites (if there is demonstrated relevancy to legacy issues).

The framework set out in *Guidelines for Legislative Review* is addressed in the *Report on the Legislative, Regulatory, and Policy Framework Respecting Collaboration, Liability, and Funding Measures in relation to Orphaned and Abandoned, Contaminated, and Operating Mines in Canada* (Castrilli, 2007).

NOAMI consulted with all jurisdictions concerned to ensure that existing legislation, policies and practices were identified and verified. A synthesis of the jurisdictional analysis included an assessment of gaps, limitations, barriers and opportunities, along with a summary of observations. Recommendations to address remediation of orphaned and abandoned mines were drawn from previous NOAMI reports Barriers to Collaboration: Orphaned and Abandoned Mines in Canada (Castrilli, 2002) and Potential Funding Approaches for Orphaned and Abandoned Mines in Canada (Castrilli et al., 2003), as well as the framework set out in the Guidelines for Legislative Review. A toolkit of policy/legislative approaches outlining options for jurisdictions contemplating legislative change is part of the work plan for 2009.

Typical wetland to treat mining effluent

A better understanding is needed of the legal and institutional barriers that prevent third parties from collaborating on clean-up activities and addressing associated liabilities related to orphaned and abandoned mines.

Sharing Information and Knowledge

Orphaned and abandoned mines are a concern in Canada and internationally, and the public wants to be kept informed about the issue. Sharing information and knowledge with NOAMI partners and the public is an important part of this multistakeholder initiative. Workshops are the preferred method of sharing information and knowledge and soliciting feedback from the mining community.

It was such a workshop that launched NOAMI in 2001. Guiding principles and objectives established at that workshop underpin NOAMI's terms of reference and guide its activities today.

Subsequent NOAMI workshops have been organized on the same model. Through facilitated multi-stakeholder dialogue and expert discussion panels, the workshops develop recommendations and a "toolbox" of options to help NOAMI move issues forward. In addition to workshops, NOAMI shares information with a wide network of Canadian and international members of the mining community and other stakeholders. Documents such as the NOAMI Newsletter and other bulletins are distributed electronically to a large mailing list. NOAMI's web site *www.abandoned-mines.org* has been redesigned with a new look and improved organization to facilitate easy access to information. The site is regularly updated with NOAMI reports, workshop proceedings, pamphlets, announcements and newsletters.

NOAMI's collaborative activities and accomplishments are recognized internationally as an excellent model of partnership in remediation of abandoned mines. The NOAMI Secretariat and members of the Advisory Committee are requested to speak at national and international events to share Canadian expertise, knowledge and approaches to orphaned and abandoned mines.

Headframe at the North Coldstream Mine, ON, dismantled in 2000





After



NOAMI Workshops

- Workshop to Explore Perspectives on Risk Assessment for Orphaned and Abandoned Mines. Vancouver, BC. November 13-14, 2008
- Orphaned and Abandoned Mines: A Workshop to Explore Best Practices. Winnipeg, MB. October 26-27, 2006
- Assessing Liabilities and Funding Options Workshop. Ottawa, ON. November 2-3, 2005
- Legal and Institutional Barriers to Collaboration Workshop. Ottawa, ON. February 24-25, 2003
- Orphaned and Abandoned Mines in Canada Workshop. Winnipeg, MB. June 26-27, 2001

NOAMI Publications

- Report on the Legislative, Regulatory, and Policy Framework Respecting Collaboration, Liability, and Funding Measures in relation to Orphaned and Abandoned, Contaminated, and Operating Mines in Canada (Castrilli, 2007)
- Rehabilitating Abandoned Mines in Canada: A Toolkit of Funding Options (Cowan Minerals Ltd., 2006)
- Capacity Building for a National Inventory of Orphaned and Abandoned Mines in Canada (Cal Data Ltd., 2005)
- Best Practices in Community Involvement: Planning for and Rehabilitating Abandoned and Orphaned Mines in Canada (NOAMI brochure, 2003)
- Guidelines for Legislative Review (NOAMI, 2004)
- Lessons Learned on Community Involvement in the Remediation of Orphaned and Abandoned Mines - Case Studies and Analysis (NOAMI, 2003)
- Potential Funding Approaches for Orphaned and Abandoned Mines in Canada (Castrilli and C.N. Watson and Associates, 2003)
- Barriers to Collaboration: Orphaned and Abandoned Mines in Canada (Castrilli, 2002)

* All NOAMI workshop proceedings and publications are available on the NOAMI website *www.abandoned-mines.org*.

NOAMI's collaborative activities and accomplishments are recognized internationally as an excellent model of partnership in remediation of abandoned mines.

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Jurisdictional Highlights

NOAMI remains an ad hoc initiative that must seek renewed funding commitments from participating jurisdictions and mining organizations each year. Most members participate in NOAMI as an adjunct to their core responsibilities. Since NOAMI's inception in 2002, provinces and territories in Canada have taken significant steps to address orphaned and abandoned mines, whether in response to emerging regulations or through voluntary and proactive initiatives. The potential for new orphaned and abandoned mines is low due to changes in regulatory regimes. However, finding new and innovative ways of managing and rehabilitating existing orphaned and abandoned mine sites remains a priority for the provinces and territories.

These jurisdictions' work on orphaned and abandoned mines has created social, environmental and economic benefits, including job creation, local cultural engagement and preservation, and the reduction of environmental hazards and safety risks. Jurisdictional activities have also provided NOAMI and other national and international organizations with invaluable information on the management of orphaned and abandoned sites through significant contributions to workshop presentations and case studies. Since 2002, the jurisdictions have spent close to \$1 billion addressing these issues.

The following pages highlight success stories from several of the jurisdictions that have made important contributions to NOAMI over the past six years.

YUKON DEPARTMENT OF ENERGY, MINES, AND RESOURCES – ASSESSMENT AND ABANDONED MINES BRANCH

The Yukon and federal governments are taking a cooperative approach to the environmental management of abandoned mines. The majority of identified "Type II" sites are under company control. Three of the mines sites, Faro, Mount Nansen and Clinton Creek mines, have no operator and are termed Abandoned Type II sites. These sites are currently under the care of the Yukon government.

The federal government provides funding for interim care, maintenance and closurerelated work at Faro, Mount Nansen and Clinton Creek. The federal and territorial governments have established a joint project office responsible for the overall coordination of site work. The office consists of the federal government's Type II Mines Project Office (Indian and Northern Affairs Canada) and the Yukon government's Assessment and Abandoned Mines Branch (Energy, Mines and Resources).

The overall goal is to bring these mines to closure as soon as possible, involve First Nations in the process and maximize benefits for Yukoners through employment opportunities associated with closure.

What are "Type II" Sites?

Since devolution in April of 2003, the Government of Yukon took over the environmental responsibilities and obligations associated with lands previously under the management of the Northern Contaminated Sites Program of Indian and Northern Affairs Canada. The term "Type II Mines" comes from the Devolution Transfer Agreement (DTA) and refers to several mine sites in the Yukon that were identified at the time of devolution as having potentially unfunded environmental liabilities related to closure.

Mount Nansen

Management of the Mount Nansen site devolved to the Yukon government in April 2003. From 1999-2004, active treatment of tailings water was required to release water and maintain dam stability. In 2005, water quality had improved enough to release water directly without treatment. From 2004-2007, Yukon conducted ongoing scientific and engineering studies to characterize and assess closure scenarios. A closure office was set up with a full time coordinator in 2006 in the Village of Carmacks (Little Salmon Carmacks First Nation), and public meetings on closure options began in 2007.

PricewaterhouseCoopers (PWC), the appointed interim receiver at Mount Nansen, continues to work on resolving outstanding creditor claims. Work on the final closure and remediation plan for Mount Nansen is progressing. A comprehensive gap analysis verifying the completeness of the technical understanding of environmental issues is due for completion by mid 2009.

Management of the sites includes:

- Development of work plans and budgets for care and maintenance
- Abandonment-related research and development of abandonment options
- Closure plan development
- Preparing environmental assessments and meeting regulatory requirements
- Remediation
- Monitoring
- Consultation

This work has contributed to an increased awareness in communities and First Nations of the issues involved at each mine site, and community closure offices have been established in four First Nation communities. Local work has also been generated through care and maintenance activities, site characterization and closure studies.

Faro Mine

In January 2003, the federal and territorial governments acknowledged that the Faro Mine complex would not reopen. The two governments then entered into a joint agreement with the Ross River Dena Council (on behalf of the Kaska Nation) and Selkirk First Nation to work together on the development of a closure and remediation plan for the entire site. The interim receiver Deloitte & Touche managed ongoing care and maintenance activities at the site, completed scientific and engineering studies to characterize the site and examined suitable closure options.

In the fall of 2004, Yukon established community closure offices with full-time coordinators in Pelly Crossing (Selkirk First Nation) and Ross River (Ross River Dena Council) to work with the Faro Mine Closure Planning Office in Whitehorse.

In 2006 the first round of public consultations on preliminary site closure options began. In early 2007 an independent peer review committee of nine technical experts assessed the closure options for technical feasibility. The formal assessment and selection process started in December 2007.

In late fall 2008, Canada, Yukon and affected Yukon First Nations agreed on a closure and remediation plan for the Faro Mine complex. The plan balances the needs and expectations of Yukoners with technical requirements, protection of human health and the environment, and addresses long-term liabilities in a cost-effective manner.

Canada, Yukon and affected Yukon First Nations together have selected a final closure and remediation plan for the Faro Mine complex. The plan proposes completion of environmental and socioeconomic impact assessments and submission of the project proposal to the Yukon Environmental and Socio-Economic Assessment Act process by fall 2009.

Closure planning continues for Mount Nansen and Clinton Creek sites; the target is to develop options and select a final closure and remediation plan for each of these sites by the 2009-10 fiscal year end.

The Keno Hill Mine was sold to a private company in 2007 and is no longer considered an abandoned site. However, the federal government will continue to fund care and maintenance, and reclamation at Keno Hill under an agreement with the company.



Former Keno Hill Mine, YK

BRITISH COLUMBIA MINISTRY OF AGRICULTURE AND LANDS – CROWN LAND RESTORATION BRANCH

One of the mandates of the British Columbia Ministry of Agriculture and Lands (MAL) is to manage Crown land in a manner that contributes to the economic, societal and environmental goals of government. MAL's Crown Land Restoration Branch (CLRB) was established in 2003 to address a broad range of contaminated sites, including many abandoned sites. A Provincial Contaminated Sites Committee (PCSC) comprised of resource and central agency ministries assists CLRB's work. This PCSC helps identify potential contaminated sites and determines priorities based on risk to human health and the environment. It provides a forum for identifying program issues, developing policy, setting priorities, ensuring a coordinated approach and reporting on financial liabilities.

CLRB's remediation of contaminated sites is subject to the provisions of the *Environmental Management Act* and Contaminated Sites Regulation, which is based on a "polluter pays" principle. The regulation sets out a prescriptive process for addressing and managing contamination based on the source-pathway-receptor model and also prescribes assignment of liability. Therefore, the government of BC spends public funds only on those sites where no responsible person can be found and the site (in many instances) has reverted to the Crown.

Since 2001, the BC government has committed over \$221.35 million to the remediation and management of contaminated sites. While there are currently no partnership funding programs in BC with the mining industry and no "Good Samaritan" programs, NOAMI's work provides a starting point for advancing these policy areas. The program reports financial expenditures and liabilities on an annual basis and program accomplishments in a biennial report.

CLRB has developed a site prioritization process (risk ranking methodology) that is a scientifically based, defensible and systematic methodology for evaluating and ranking Crown-contaminated sites based on potential risk to human health and the environment. CLRB has undertaken remediation work that is either underway or has

Britannia Mine Site Remediation

Under a private public partnership (P3), EPCOR designed and built the Britannia Mine water treatment plant. The water treatment plant has successfully been removing contaminants from mine water discharge before it enters Howe Sound since November 2005. There has also been significant remedial work at the mine, including installation of water management structures, groundwater remediation, ecological impact, monitoring and risk assessment.

Yankee Girl Mine Tailings Remediation Project

Remedial work on Yankee Girl Mine began in 2005. Detailed investigations identified metal contamination from the uncontained tailings deposit and process fines around the former mill site in soil, sediments, surface water and groundwater at the site. A human health and ecological risk assessment identified unacceptable risks at the site and a remediation plan was developed to address these issues. CLRB has almost completed the approved remediation plan which leaves the upper tailings in place and consolidates other reactive materials in a secure engineered containment system on top of the upper tailings. To protect the contaminated soils and compensate for lost habitat, erosion-control barriers, fish habitat structures and revegetation are part of the approved remediation plan.

Polluter Pays Principle

A principle under which users and producers of pollutants and wastes should bear the responsibility for their actions. Companies or people that pollute should pay the costs they impose on society.



Britannia Mine Water Treatment Plant, BC

been completed at 67 contaminated sites across BC. Most of these sites are orphaned and abandoned mine sites that have been identified based on potential risk to human health and the environment.

MANITOBA SCIENCE, TECHNOLOGY, ENERGY AND MINES

Manitoba's Orphaned and Abandoned Mine Site Rehabilitation Program was established in 2000 in response to the Mine Closure Regulation adopted in 1999. The regulation requires that environmental liabilities incurred during mining operations be financially secured to cover future remediation costs. In addition, mine closure plans and financial security must be filed and approved prior to a permit being granted for a new mine. The Mine Closure Regulation is now undergoing a formal review to ensure that it is relevant and consistent with government policies and programs.

The program's mandate is to address the public safety and environmental concerns associated with abandoned sites. The program received \$2 million initial funding to address safety issues and identity environmental concerns at five high-priority sites: Lynn Lake, Sherridon, Gods Lake, Snow Lake and Baker Patton. Consultants retained by the province completed environmental and risk assessments at these sites. An additional 144 orphaned and abandoned sites were also inspected to identify hazards. Based on these inspections and preliminary engineering work, 31 sites were identified as high-hazard sites. In response, a risk-based matrix was created and a schedule was developed to remediate these high-hazard sites by 2012.

The program's mandate is to address the public safety and environmental concerns associated with abandoned sites.

Lynn Lake

The Farley Nickel Mine operated from 1953 to 1976; the East Tailings Management Area (ETMA) was established in 1953 and the mill operated from 1953 to 2002. Primary production was nickel, copper, zinc and, in later years, gold.

From 2001 to 2006, under a memorandum of understanding, Viridian Inc. and the province carried out investigations that formed the basis of a rehabilitation plan for the ETMA. All parties have agreed upon the rehabilitation plan and the province and Viridian have entered into a 50:50 agreement to share rehabilitation costs.

Some rehabilitation activities are complete, including the construction of clean water diversion systems and groundwater treatment systems. Activities now underway include revegetation trials, strategies for covering the tailings, relocation of the solid-waste facility and implementation of the ETMA rehabilitation plan.

Where the province has sole responsibility for ground contamination remediation, accomplishments to date include demolition of the headframe, rail loadout and buildings in the mill complex, and the construction of a new domestic waste disposal ground (required to decommission the solid waste facility from the tailings area).

Future rehabilitation will include consolidation of the demolition waste and implementation of an engineered cover, extension of a freshwater diversion ditch, relocation of the town diversion ditch, and conceptual design of a water treatment plant for the site.

Snow Lake

Mines have operated in the Snow Lake area since the 1950s. Most mines addressed environmental concerns when they closed; however issues remain – specifically at the New Britannia Mine, which closed in 2004.

A rehabilitation plan for the site is being developed based on recommendations from a human health and environmental risk assessment. Implementation will begin in the summer of 2009.

To date, the province has spent over \$20 million on orphaned and abandoned mine site rehabilitation.



Gods Lake, MB

To date, Manitoba has completed site remediation at 14 high-hazard sites and rehabilitation work has been undertaken (or is ongoing) at all high-priority sites. Major contracts have been awarded at all of the high-priority sites and some of the high-hazard sites. After the 2008 summer site investigations, two more sites emerged that require complex remediation: Central Manitoba located in the Bissett mining area and Jack of Diamonds Mine located in the Island Lake area.

The Sherridon tailings rehabilitation project began during the winter of 2008-2009 and is targeted for completion by 2012. As part of this rehabilitation project, the first phase of the Sherlett Creek restoration and diversion work has been completed.

Manitoba has conducted site-detailed risk assessment at EL Mine site, located near Lynn Lake, Manitoba. Buildings have been demolished and closure planning is underway. New technologies have been used for shaft capping and/or trench filling to minimize environmental impact, land disturbance and cost. The Ruttan Mine site has become a highpriority site based on its site evaluation. Scoping studies of treatment options have begun and a water treatment plant will now be required by 2014 instead of 2037 as previously estimated. The remediation costs at Ruttan site, including the capital cost of the water treatment and tailings rehabilitation, are now estimated at \$45 million.

In 2006, Manitoba established a provincial environmental liability account for orphaned and abandoned mines in response to the auditor general's report on contaminated sites. Updated cost estimates were completed based on site investigations conducted in 2007 and 2008, increasing construction costs in remote areas, and the need for consultation where sites are located in Aboriginal traditional territories.

To date, the province has spent over \$20 million on orphaned and abandoned mine site rehabilitation. Up to December 2008, Manitoba Science, Technology, Energy and Mines had spent over \$9 million for remediation projects at Lynn Lake tailings management area, Sherridon, Gods Lake, EL Mine site, Snow Lake, Ruttan Mine site and five other high-hazard sites. Manitoba has retained engineering consultants for each major site to develop and implement closure and remediation plans.

ONTARIO MINISTRY OF NORTHERN DEVELOPMENT AND MINES – MINES AND MINERALS DIVISION

Ontario established its Abandoned Mine Rehabilitation Fund (AMRF) in 1999 as a four-year, \$27 million fund to rehabilitate Crown-held abandoned mine sites. The fund was extended in 2003 for another four years, with an additional investment of \$41 million. In March 2006, the Ontario

Kam Kotia Mine

The Kam Kotia Mine has been long regarded as one of the worst abandoned mines sites in Canada. Its remediation began in 2000 and is expected to be completed during fiscal year 2010/11.

Kam Kotia is a former copper and zinc mine near Timmins, Ontario, that produced over 6 million tonnes of copper and zinc during its life span. The base metal mine began operations during World War II. Mining stopped in 1972 and surface and mining rights were forfeited to the Crown in 1988. The Kam Kotia Mine had approximately 6 million tonnes of unmanaged acid-generating tailings covering more than 500 hectares. Significant local environmental impacts include acidic leachate, dusting, aesthetics and physical safety.

Government's budget included a further \$60 million; the fund will now run until at least 2012.

Between 1999 and 2008, \$88 million was spent on rehabilitating the highest priority Crown-held mine sites in Ontario. This includes more than \$52 million rehabilitating the Kam Kotia Mine located in the Timmins area. Long regarded as one of the Canada's worst abandoned mine sites, Kam Kotia is now more than 80% rehabilitated.

Other examples of rehabilitation under the AMRF include the Berens River Mine and the Central Patricia Bridge in north-western Ontario, the Toburn Mine in Kirkland Lake and the CanMine in the Cobalt area. The Toburn Mine site is now a cultural heritage site. Removal and reprocessing of approximately 2000 barrels of toxic metal concentrate at the CanMine site prevented this material from leaching into the environment. More than 70 other abandoned mine sites have been rehabilitated throughout Ontario. The works undertaken by MNDM under the AMRF have significantly reduced the risk to public health, public safety and the environment at these sites.

The Ontario Ministry of Northern Development and Mines (MNDM) has participated in two partnership agreements that provide the framework for collaboration and costsharing on mine rehabilitation projects.

MNDM and the Porcupine Gold Mines:

This cost-sharing agreement addresses minesubsidence-related issues in and around the former Hollinger and McIntyre Mine sites in the City of Timmins. To date, the partners have invested over \$8.2 million under this agreement. "This initiative to clean up the Kam Kotia environmental legacy represents a refreshing model of leadership in environmental stewardship for the mining industry... I look forward to a new era of partnerships between government and industry."

ONTARIO ENVIRONMENTAL COMMISSIONER GORD MILLER AS QUOTED IN ONTARIO MINING ASSOCIATION AND PROVINCE OF ONTARIO NEWS RELEASE: INVESTING IN ABANDONED MINE RECLAMATION – MCGUINTY GOVERNMENT AND ONTARIO MINING ASSOCIATION FUNDING WORK AT KAM KOTIA SITE. FEBRUARY 5, 2008.



Subsidence in vicinity of Hollinger Mine, ON

MNDM and the Ontario Mining Association (OMA): This Agreement establishes costsharing for rehabilitation at Crown-held mine sites. In 2003-2004 MNDM and the OMA top-dressed and hydro-seeded more than 3 kilometres of impoundment dams at the Kam Kotia Mine site. Another example of the MNDM/OMA partnership at work is the recent forebay construction at the Kam Kotia Mine site. (The forebay collects contaminated water that would otherwise leave the site.)

In 2005-2006, MNDM began comprehensive updates to its Abandoned Mines Information System (AMIS). One outcome is the Abandoned Mines Priority Ranking System, developed in 2007. This risk-based tool is being used to help assign priorities and manage the rehabilitation of Crown-held mine sites in Ontario.

Amendments to the Ontario Mining Act in 2007 made it possible for "Good Samaritan" companies and individuals to carry out progressive rehabilitation at orphaned mine sites without incurring historical responsibility and associated liabilities under Ontario's environmental legislation.

Quebec will also adopt a contaminated site management policy under which it will inventory, classify and apply standardized management to contaminated sites under its responsibility.

QUÉBEC MINISTÈRE DES RESSOURCES NATURELLES ET DE LA FAUNE

In the wake of Quebec's April 2006 Sustainable Development Act, the Quebec government is undertaking a major plan to restore contaminated sites, chiefly mining sites, backed by long-term funding. According to a recent government inventory, more than 45 contaminated mining sites fall under Quebec's responsibility. Their restoration began in 2007 and will extend over 10 years. The rehabilitation cost for all the contaminated sites is estimated at \$789 million (as at March 2008) and will be entered in the financial statements as an "environmental liability".

Quebec will also adopt a contaminated site management policy under which it will inventory, classify and apply standardized management to contaminated sites under its responsibility. Of the \$789 million, \$264 million is allocated to mining sites (\$130 million for actual abandoned sites and \$134 million for potential abandoned sites, which are those where the probability of being handled by the government is at least 70%).

Up until this new program was introduced, little funding was available to address contaminated sites. As a result, the Québec Ministère des Ressources naturelles et de la Faune (MRNF) focused on a partnership approach to address contaminated sites. A diverse partnership base is essential to the success of rehabilitating closed mines, and it is critical to involve partners early in the process. Five different types of partnerships have been used in Quebec over the past 15 years for the rehabilitation of closed mines:

Partnership between Ministries: The Sullivan Mine was retroceded to the government in 1978. At the beginning of the process, MRNF and Ministère de du Développement

FRAN: The Fonds Restor-Action Nunavik

FRAN: The Fonds Restor-Action Nunavik was created to contribute to the restoration of abandoned mining exploration sites in Northern Quebec (Nunavik Region), in cooperation with the provincial government and local Inuit participation.

Fonds Restor-Action Nunavik is a partnership between mining and exploration companies currently active in Quebec, all working cooperatively towards the common purpose of the cleanup and restoration of abandoned mining exploration sites.

Participants are cognizant that earlier restoration conventions were not in accordance with modern and responsible regulations. The new generation of mining and exploration companies wishes to demonstrate that social and environmental responsibilities are priorities. They are demonstrating that they have adopted leading environmental management practices, and have taken concrete actions to remediate selected sites and ensure proper compliance during ongoing and future activities.

It is hoped that this initiative will inspire others to act in a similarly proactive and responsible manner in other jurisdictions. It is also hoped that, through promotion of environmentally responsible practices, the **Fonds Restor-Action Nunavik** will demonstrate how Quebec's mining and exploration industries act as proactive leaders.

Manitou Mine, QC

durable, de l'Environnement et Parcs (MDDEP) signed a cooperative agreement to facilitate rehabilitation. The 2001 site restoration plan included measures to restore the site's natural environment and encourage the development of wildlife habitat at the cost of \$1.5 million.

Partnership with Mining Industry:

- The government established a partnership with Barrick Gold whereby Barrick rehabilitated governmentowned tailings from the Malartic Goldfield Mine at the same time as it rehabilitated tailings from its own Terrains Aurifères site. This arrangement saved the government \$500,000.
- More recently, alkaline tailings from the Agnico-Eagle Mines Goldex Mine have been used to rehabilitate the acid-generating tailings on the abandoned Manitou Mine site. The tailings are deposited on the old Manitou tailings. This will raise the water level, which will result in an





Remediated final effluent

elevated water table, thus saturating the acid-generating tailings. Over the 12-year life of the mine, the estimated savings are \$8 million for the Quebec government.

Partnership with the Forest Industry: The East Sullivan rehabilitation plan proposed putting a dyke around the tailings as well as covering the tailings to stop the acid mine drainage problem. Since wood

East Sullivan Mine

The East Sullivan Mine produced copper, zinc, silver and cadmium from 1949 to 1966, leaving behind approximately 15 megatonnes of tailings and over 200,000 tonnes of acidic waste rock. The site covers an area of 228 hectares, with over 200 of those hectares occupied by mine waste.

A 6 kilometre-long containment dam was constructed between 1992 and 1996 around the tailings site and spillage areas. A geomembrane anchored in the underlying clay ensures that the dam remains watertight, and an organic covering containing a minimum thickness of 2 metres of forest residue creates an oxygen barrier over the mine tailings. Sludge from the Val-d'Or water treatment plant is incorporated as a surface additive to allow plants to become firmly established. In 1997, a system was reintroduced to recirculate draining water from the tailings site through the organic covering to neutralize acidity and precipitate dissolved metals within the site. A natural 35-hectare wetland completes the water-treatment process.

The waste rock and piles of pyrite concentrate were relocated on the site and in the glory hole secured by a fence. The headframe and other structures were completely dismantled and the zone planted with trees. Forest residue currently covers roughly 85% of the tailings.

The restoration work at East Sullivan began in 1992 and has cost \$9.7 million to date. If the techniques generally used at the time to restore acidic sites had been implemented, the restoration would have cost almost \$50 million. The development of more effective and economic technologies for restoring the site were made possible by detailed hydrogeochemical survey, an analysis of the alteration phases between the solid, liquid and gaseous states, and many different studies of passive water-treatment systems and the use of residual materials.

INAC's Northern Contaminated Sites Program (NCSP) has received considerable funding from FCSAP and its expenditures have increased from less than \$10 million in 1999 to a budget of over \$110 million today. waste is an adequate cover and the forest industry needed a place to stock its wood waste products, the tailings were covered with two metres of wood waste from the forest industry (in addition to a six kilometre impervious dam). Without this cooperation, remediation of the East Sullivan site would have cost the government \$50 million. Instead, the project cost \$9.7 million.

Partnership with Local Organizations:

The Albert Mine is owned by a non-profit organization that wanted to develop the site as an historic, educational and recreation area. Quebec brokered a partnership between this organization, the paper industry (which needed somewhere to stock residues) and the compost industry (which also needed somewhere to dispose of its products). The site was rehabilitated for a total cost of \$1.3 million, \$450,000 of which came from the government. This partnership saved the government \$850,000.

Partnership with Aboriginal Peoples: MRNF recognizes the importance of including Aboriginal people as partners for sustainable development and has established two partnership agreements with the Cree and the Inuit:

 Blue Lake mineral exploration site is an abandoned exploration site 70 kilometres north of Schefferville. A local Cree community conducted rehabilitation work with support from MRNF. Partnership between MRNF, the Kativik Regional Government, Makivik Corporation and the Nunavik Restor-Action Fund (made up of mining exploration companies) is restoring 18 mining exploration sites in Nunavik (\$4.1 million invested). The management of the works will be under the responsibility of the Kativik Regional Government. This initiative helps to further demonstrate Quebec's position that the "environmental and social dimensions are henceforth inseparable from mining development activities in Quebec."

INDIAN AND NORTHERN AFFAIRS CANADA – NORTHERN CONTAMINATED SITES PROGRAM

As the custodian of most federal lands in the North, INAC's Northern Affairs Organization (NAO) has the largest contaminated sites liability of all federal custodial departments – estimated at over \$1.4 billion. The NAO became involved with abandoned mines in 1998-1999 when large mines such as Giant, Faro, Colomac and others went bankrupt.

In 2003, the federal government budget allocated \$175 million to address contaminated sites, which in 2004 was rolled into a \$3.5 billion commitment to address contaminated sites over 15 years (to 2020). The fund, called the Federal Contaminated Sites Action Plan (FCSAP), is available to federal government departments and Crown corporations



Faro Mine Complex – Vangorda Plateau, YK

to implement the polluter-pays principle, reduce overall federal liability and address human health and environmental risk through risk management and remediation. Depending on the size of the project, between 80% and 90% of NAO's funding comes from FCSAP.

INAC's Northern Contaminated Sites Program (NCSP) has received considerable funding from FCSAP and its expenditures have increased from less than \$10 million in 1999 to a budget of over \$110 million today. NCSP's priorities are dictated by FCSAP, driven largely by human health and environmental risks, as well as the engineering risk of inaction. INAC's Contaminated Sites Management Policy, developed in August 2002, provides guidance for the management of sites under INAC's responsibility.

The NCSP maintains an electronic inventory of contaminated sites that is updated regularly to provide an accurate record of the extent and nature of contaminated sites in the North. As of March 31, 2008, 917 sites require assessment, remediation or risk-management. Of these 917 sites, 437 are considered contaminated sites and are NCSP's main focus.

From 2002-2008, INAC NCSP has spent over \$570 million on the management of contaminated sites in the North. The NCSP divides its activities into seven categories: care and maintenance, monitoring, regulatory approvals, consultations, site investigation and assessment, site remediation, and project management. Remediation of sites is the ultimate goal and the most costly activity, involving major civil works (e.g., new dams, tailings capping, demolition of mills and other buildings, land-filling of waste, excavation and treatment of contaminated soil and groundwater, and offsite disposal of hazardous waste). Since 2002, 13 sites have been completely remediated, including the Port Radium Mine site in 2008-2009. Remediation of many other sites is well advanced, including the Tundra and Colomac Mine sites.

Giant Mine

The Giant Mine is a former gold mine located within the City of Yellowknife, NWT. It produced more than seven million ounces of gold during its more than 50 years of operation.

The Government of the NWT (GNWT) and INAC signed a cooperation agreement to work together on the site's remediation plan, and to coordinate their efforts in all aspects of the environmental assessment proceedings.

The Giant Mine remediation plan completed in 2005-2006 integrates long-term management of the arsenic trioxide dust with the surface abandonment and reclamation plan. After review by the Independent Peer Review Panel (IPRP), the GNWT, the Department of Resources, Wildlife and Economic Development (RWED), the Department of Municipal and Community Affairs (MACA) and FCSAP expert departments (Environment Canada, Fisheries and Oceans and Health Canada), the plan was modified and improved to reflect reviewer comments and recommendations. The resulting Giant Mine remediation plan was finalized and received agreement in principle by the GWNT.

The remediation plan was submitted to the Mackenzie Valley Land and Water Board (MVLWB) as part of a water licence application in October 2007. The MVLWB subsequently referred the project to environmental assessment, which is expected to take two years to complete. Implementation of the plan will begin after the EA is complete, likely in 2011.

In July 2005 Deton'Cho/Nuna, an Aboriginal and northern company joint venture, took full responsibility for maintenance of the Giant Mine site.



Tailings at Faro Mine, YK, before remediation

6

Looking Ahead – Sustaining the Momentum

To sustain this momentum into the future, we need to focus attention on both short- and longterm priorities. NOAMI is an example of a unique multistakeholder partnership approach to a complex problem of national importance. Over the past six years, NOAMI's five task groups have made significant contributions to the state of knowledge of orphaned and abandoned mines in Canada and approaches for addressing them. The successful remediation work that has occurred in jurisdictions across the country has been rooted in creative approaches involving diverse partnerships. Examples of these successes are reflected in this report.

NOAMI has garnered interest and accolades both domestically and internationally. To sustain this momentum into the future, we need to focus attention on both short- and long-term priorities.

IN THE SHORT-TERM

NOAMI's short-term plans are described throughout this performance report, but in general are as follows:

Develop a national inventory of orphaned and abandoned mines: One of the first objectives of the program identified in 2002 has proven difficult to achieve. A national inventory is necessary to provide a Canada-wide perspective on numbers, features and status of orphaned and abandoned mines. NOAMI will work to complete and make this product publicly available as soon as possible.



Butchart Gardens, BC, the site of a former limestone quarry



Legislative framework toolkit:

Another important task has been reviewing policy and legislation across Canada to ensure that approaches taken for remediation of orphaned and abandoned mines within each jurisdiction are effective. We have begun work on a legislative framework toolkit that will identify gaps, limitations, challenges and opportunities to assist jurisdictional governments that are contemplating changes in their approach to orphaned and abandoned mines.

Community toolkit: There is also a need for tools to help communities understand the legacy issues associated with orphaned and abandoned mines, and to build their capacity to deal with these sites in an effective, practical and meaningful way.

INTO THE FUTURE

The activities and priorities described above will certainly help to sustain the momentum built by NOAMI over the past six years. That momentum and commitment must reach farther into the future if NOAMI is to continue to be a positive influence on Canadian policy and program development. The economic, social and environmental backdrop will continue to change and will drive the need for new approaches. In particular, the cost of clean-up will inevitably rise over time; we must seek new and creative approaches to fund this work. NOAMI must continue to receive funding support from governments and industry to undertake this work successfully.

The mining industry, governments and civil society are beginning to recognize a shared stewardship for addressing and solving the problem of orphaned and abandoned mines. NOAMI's success to date has been largely due to its unique partnership approach to defining problems and designing ways to address them in a collaborative manner. It will be important that NOAMI continue this partnership approach in future work.

The NOAMI Advisory Committee has identified new initiatives to pursue over the next several years. These include:

- Preparing case studies that examine contributing factors to a successful holistic approach for orphaned and abandoned mines. These factors include funding mechanisms, legislative frameworks, risk assessment, and engagement with communities and Aboriginal Canadians;
- Examining the legislative tools and policy approaches across Canada to ensure that currently operating mines can be closed properly so they do not become abandoned mines in the future;
- Exploring the effect on "green jobs" of orphaned and abandoned mine cleanup;
- Studying the effect of climate change on infrastructure related to orphaned and abandoned mines; possibly in cooperation with the Canada Mining Innovation Council;
- Effective long-term monitoring and maintenance programs at orphaned and abandoned mines in the face of climate change and other social, economic and environmental challenges;

Momentum and commitment must reach farther into the future if NOAMI is to continue to be a positive influence on Canadian policy and program development.



- Examining how climate change is being incorporated into mine closure plans;
- Investigating best practice standards for remediation at orphaned and abandoned mines, and possibly following up with a workshop illustrating successful examples; and
- Identifying linkages between NOAMI and other organizations and initiatives, with the objective being to share information of interest.

The members of the NOAMI Advisory Committee are committed to the future of NOAMI and to ensuring that this important initiative continues to be both relevant and influential in helping Canada manage its legacy of orphaned and abandoned mines.

Stream stabilization, Clinton Creek Mine, YK





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NOAMI Secretariat Natural Resources Canada 555 Booth Street Ottawa, Ontario K1A 0G1

Fax: (613) 947-5284 Email: *abandoned_mines@nrcan.gc.ca*

