FINANCIAL OPTIONS FOR THE REMEDIATION OF MINE SITES: a preliminary study

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EXECUTIVE SUMMARY

Introduction

Abandoned mines are a key source of pollution in Canada. They are a serious and immediate danger to human health and the environment — they are costing taxpayers millions of dollars in clean-up, health impacts such as cancers, and lost fishery and farm income. And they stand to cost billions more.

A recent Environics poll demonstrated the increasing public concern over contaminated sites: 84% of Canadians felt that cleaning up communities affected by toxic waste was very important and 78% felt it was more important than cutting personal income taxes.

Mines become abandoned for a variety of reasons: bankruptcy and insolvency; inadequate regulation and enforcement; surrender to the crown with remaining liabilities and inadequate or non-existent securities. Sometimes the owner has simply disappeared.

Increasingly, the public is demanding that the financial burden of cleaning up mine sites be recognized as a cost of doing business and internalised by the mining industry. Indeed, sound public policy regarding both new mining developments and abandoned mines can only be formulated when all the costs - as well as the benefits - are on the table.

Definitions

For the purpose of this paper, the terms ***orphaned mine*** and ***abandoned mine*** are used interchangeably, and the following standard definition will be used:
"a mine for which the party or parties responsible for contamination cannot be found or are unwilling or financially unable to carry out necessary remedial measures within a satisfactory time frame."[1]

"Fully closed and remediated " means ***sites where re-contouring, site stabilization work, revegetation and other remediation practices have been completed for all disturbances and wastes generated; ecological productivity has been returned to its pre-mining level; and there remains no long term liability concerns or requirement for water monitoring and treatment***. A site that that will require perpetual care and maintenance, cannot be considered fully remediated, even when funds have been set aside to look after monitoring and maintenance of dams, and water and engineered covers over tailings in the long term. It is impossible to predict the ability of future generations to maintain the site, nor to predict the impact of occurrences such as global warming, earthquakes and drought on the site.

Report Organization

This report is organized into five sections that include:

1. Guiding principles for the reclamation of abandoned mines.
2. A survey of bonding practices and abandoned mine programs in selected mining jurisdictions of Canada (Yukon Territory, British Columbia, Manitoba, Ontario, Quebec).
3. A preliminary survey of programs from other countries (Sweden, the United Kingdom, and several programs from the United States, e. g. , the Superfund, the ***Surface Coal Mining Act*** , the Alaska State bonding pool, mining-specific taxes in Montana and South Dakota, and the federal 3809 regulations).
4. Examples from other industries of financing instruments and of incentives for progressive change.

5. Conclusions and recommendations.

1. Guiding Principles

In 1994, the Canadian Council of Minister of the Environment (CCME) established guiding principles for the reclamation of contaminated sites: polluter/beneficiary pays, fairness, sustainability and emergency response. The abandoned mine programs across Canada are evaluated according to these guiding principles.

2. Preliminary Survey of policies and practice in Canadian jurisdictions

Legislation, permitting requirements and regulatory authorities

All jurisdictions reviewed have regulations and/or government authorities that are responsible for different aspects of reclamation bonding at new mines, as well as health, safety and remediation at operating and abandoned mines. Manitoba, however, has not yet implemented its bonding regulations. The Yukon Territory does not have legislation that outlines the acceptable types and costing analysis for the security required.

Acceptable forms of reclamation securities

A range of securities are accepted by governments across Canada, including cash, cheque, letter of credit, surety, government bonds, treasury bills, investment certificates, term deposits, sinking funds, trust fund, pledging assets, third party guarantee and self-assurance.

In British Columbia, bearer bonds, parent company guarantees and captive insurance are not accepted as securities; nor are surety and self-assurance accepted for sites where there are long-term water quality and liability concerns.

Making sure the security is adequate and can be used in a timely manner

Most Canadian jurisdictions do not calculate security bond amounts equal to the full cost of clean-up. Only British Columbia and Ontario require bond amounts to be calculated with a third party analysis of costs. Only B. C. factors in the administration costs associated with government becoming responsible for the reclamation of a site. In the Yukon Territory, bond amounts, which are calculated by the federal department of Indian Affairs and Northern Development (DIAND), are based on third party costing and a 10-20% contingency fee. To date, however, the Yukon Territory Water Board has consistently licensed mines and set bond amounts lower than DIAND's calculations.

The lack of consistency across Canada in ensuring that bond amounts are calculated to include third-party and administration costs is a disincentive for companies to implement responsible remediation and closure practices, and increases risks to public financial resources and health.

We found no example of a security that was sufficient to cover the full costs of remediating a site if an operator is unable to follow through on his/her closure commitments. Closed mines are left unattended, or the shortfall of the available security has come from federal and/or provincial general revenues.

Contributions to sustainability

To date, sustainability has not been adequately addressed in any of the financial instruments used to bond and reclaim mine sites in Canada. In Manitoba, the ***Mining Tax Act*** has a provision that sets up a Mining Reserve Fund to help communities affected by mining when mines shut down.

Monitoring and Enforcement/ Mine Site Closure

Recent cutbacks to regulatory enforcement and inspection staff across Canada has limited the ability of regulatory agents to effectively monitor and enforce mine site closure requirements.

Abandoned Mine Programs

Across Canada, inventory, site evaluation, reclamation and remediation programs for abandoned mines have been funded primarily through the general revenues of federal and/or provincial governments, with a small contribution from seized securities. Different regions are at varying stages of implementation and experience with abandoned mines programs. Most current remedial work consists of capping shafts and the removal of structures, and/or on-going water treatment and maintenance, rather than capital investment in full remediation and closure.

3. Summary of Policy and Practices in the United States, the United Kingdom, and Sweden

The Surface Mining Control and Reclamation Act (SMCRA), 1977, defines performance standards and public requirements for reclamation of coal operations in the US. It has effectively implemented regulations based on the principles of polluter/beneficiary pays. with provisions like permit blocking which limit repeated damaging offences by companies and the people involved in the companies. Funds generated under SMCRA can be used to address a range of remediation concerns. Additional funds have been provided by the Office of Surface Mining for community initiated projects such as the Appalachian Clean Streams Initiative.

The US ***Comprehensive Environmental Response, Compensation and Liability Act*** of 1980 (***CERCLA***), commonly known as the Superfund, was established to clean up hazardous waste sites in the United States. Feedstock taxes from by 8-9 major oil and chemical companies (85%) and from US federal general revenues contributed $1. 6 billion to the fund in the first 5 years.

The new 3809 Regulations under Title 43 of the Code of US Federal Regulations are an attempt to improve on a 1980 rule written to prevent degradation of public lands. The regulations went into effect on January 20, 2001, but have been revised with the Bush government. These require bonding cost analysis to incorporate third party (including interim maintenance costs) and administration costs. Corporate self-assurance would not be allowed as an acceptable bond.

In Montana, it is policy to “indemnify citizens for loss of long-term value resulting from the depletion of its mineral resource base and for environmental damage caused by mineral development”. A permanent resource indemnity trust fund generated from mining taxes and specifically used to fund public agencies’ efforts to protect and restore the environment has been established to accomplish this end.

In the United Kingdom, the National Groundwork Trust was established in 1981 to work with local governments, business leaders and community groups for economic, social and environmental regeneration. It is funded by private sector sponsorships (eg Barclays Bank) and central government. The agency works on long-term regeneration, contaminated land clean-up and financial planning and training for local communities.

Sweden has an Environmental Code (1999) that applies to mining operations. Everyone who conducts an environmentally hazardous activity, including mine operations, must pay an annual charge to the environmental damage insurance and clean up insurance.

4. Examples from other industries

Keeping all public costs and benefits on one ledger enable improved public forestry policy in the Tongass National Forest. The "Golden Carrot" program stimulates the development of energy efficient refrigerators in the United States. Recycling incentives, tire taxes and stumpage fees provide models. Oil and gas development fund in Alaska and Alberta, use resource royalties to strengthen and diversify the economy.

5. Conclusions and Recommendations

To effectively address the problem of abandoned mines in Canada, we recommend that there be a three-pronged approach:

1. Prevent further abandonment of mines;
2. Remediate currently abandoned mine sites; and
3. Plan for the future.

Legislative tools to prevent the abandonment of mine sites should be a combination of incentives, regulations, monitoring, enforcement and penalties. Bonding criteria must set adequate standards for the types of security, amounts, and costing analysis, and should be subject to public scrutiny. Time frames and responsibilities for reclamation must be well defined in the closure plan and enforced.

The impacts of boom and bust economies and the effects of mine development on community health and well being should be addressed through funds to support alternative economies and social structures.

The cost of remediating mines sites already abandoned in Canada is enormous. We recommend that the funds be generated from a variety of sources: mining sectoral funds, fees, taxes, penalties, fines, cost recovery etc. Funds tied to the use of toxic substances or land disturbance act also deterrents.

Although government funds will continue to be required, every effort should be made to ensure that the mining industry bears responsibility to pay for cleanup in the long term.

Establishing priority sites and distributing the resources of the fund should be based on a nationally recognized rating system, determined through a public process.

To ensure sound business decisions when public financial resources are invested in mines, subsidies to mining and mines should be openly and transparently reported to the public on a jurisdictional basis. Annual status reports on bonding and liabilities should be provided for public review.

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MiningWatch Canada

INTRODUCTION

Why this report has been prepared

- Abandoned mines are a major concern in Canada. Mines for which the owner cannot be found, or for which the owner is unwilling or financially unable to carry out clean-up, are a key source of pollution in Canada. There are at least 10,000 of these "toxic orphans" leaching often-acidic mixtures of cyanide, lead, cadmium, mercury and radioactive wastes. Some sites also have physical dangers like open shafts and empty buildings.

- Abandoned mines are a serious and immediate danger to human health and the environment. They are costing taxpayers millions of dollars in clean-up, health impacts such as cancers, and lost fishery and farm income, and they stand to cost billions more. Every year, mining companies create thousands of tonnes of waste rock and tailings for every tonne of ore. Usually, the tailings have been treated with toxic chemicals. Some of them are radioactive. Sulphur-bearing rock, broken up and exposed to air and water, creates "mine acidic drainage," which can leach heavy metals into rivers, aquifers and soil.

- Public concern about contaminated sites and the physical hazards associated with them is growing. A poll conducted in October 2001 by Environics showed that 84% of Canadians felt that cleaning up communities affected by toxic waste was very important; and 78% felt it was more important than cutting personal income taxes. [2] Too often a focus on remediation of abandoned mines is only initiated once a tragedy has occurred. For example, near Estevan, Saskatchewan, a schoolyard had access to an old coal mine. It was only after a student died due to asphyxiation that there was a concerted effort to cap the site and attend to all other similar health and safety issues in the province.

- There is growing recognition of the need to internalise of the costs of mining in the development of sound public policy. There has been little research in Canada regarding which companies and individuals have benefited from externalising the costs of these mines. Questions that would be useful to answer include: To what extent do present major companies owe their wealth to the externalised ecological costs of their early mines? To what extent should the present industry be responsible for this legacy?

Certainly, the tracing of ownership and wealth generated from historic mines would do much to inform the discussion about liability. The mining industry in Canada has amassed its capital and political power from the mines it has developed historically and from the minerals it has been able to process and sell. Many great companies developed and operated mines that eventually developed severe environmental problems and were abandoned by later owners, e. g. , the Giant Mine in the Northwest Territories once belonged to Falconbridge; and KamKotia mine in Ontario once belonged to Cominco.

- Industry has concerns about how the legacy left by abandoned mines influences government and public perceptions – and how these perceptions, in turn, affect their bottom line. Increasingly, industry is discovering that the legacy of abandoned mines impacts upon their ability to get access to land and resources in un-mined areas both in Canada and abroad.

Why do mines become abandoned?

Bankruptcy and insolvency

- Mining is risky business. Ore grades and the extent of mineable deposits can vary from original expectations; there may be unforeseen costs associated with waste management, transportation, shipping, and mine infrastructure; and markets and commodity prices for mineral-products are volatile. These factors may create insurmountable financial pressures on a company.

- The emphasis of some junior companies has been to gain revenue from stock speculators, rather than from the selling of ore. It has proven to be easier to extract money from gullible investors than to discover and mine a mineral deposit, and these companies have occasionally disappeared, leaving a mess for both investors and the environment.

- Mining is capital intensive. If a company is not large enough to internally generate the capital required to develop a mine, the money must be raised from investors. If the mining operation cannot generate enough revenues to pay back investors, a company may become insolvent.

- Mineral deposits are finite. Consequently, all deposits will become uneconomic when the minerals are depleted. If a company has not saved enough money to properly close the mine (and if reclamation bonds do not exist or are insufficient), a company may have to declare bankruptcy and abandon the operation.

- There are some mines, especially exploration sites, which are truly abandoned – the owner has simply disappeared.

Mining companies are not required to pay the full costs

- Often, governments – encouraged by the industry – are eager to promote regional economic development through mineral extraction, and keeping regulations to a minimum is often seen as the best way to attract investment.
Substantial subsidies and tax breaks are also developed to encourage mines to continue, even when operators themselves might believe them to be uneconomic. The Faro Mine, which received more than $1 billion in public investments in its 25-year life, is a case in point.

Surrender of mining lands to the crown with remaining liabilities and inadequate or non-existent securities

- Since most mining in Canada takes place on Crown lands, surrendering a closed venture to the Crown is an option in some jurisdictions. These “exit tickets” can be problematic, as they may be granted before the full extent of the damage is known. Costs that may be overlooked include those related to treating acid mine drainage, which can take up to 40 years to appear. This problem, once started, is almost impossible to stop.

Other costs that may be underestimated include: perpetual care and maintenance of uranium mines; maintenance of dam stability in perpetuity, and maintenance of water covers over acid generating tailings, particularly in a changing climate.

What are the present funding mechanisms for abandoned mine remediation?

- Most of the costs associated with identifying and remediating abandoned mine sites are absorbed by governments.

- In the last fifteen years, most provinces and territories (and the federal government), have made some attempt to have effective closure plans in place, and to ensure monies for reclamation are set aside at the time a mine is permitted. But mine sites are rarely, if ever, returned to their previous ecological productivity. As a result, securities are often inadequate and/or inaccessible when they are needed.

- There are a few innovative programs for recovering the costs of remediation from companies that benefited from externalising responsibility for reclamation, but these still require substantial government investment, and have only a voluntary commitment from industry.

- There is some interest in involving mining companies in the remediation of old sites where they wish to explore for new mineral deposits. This has been done at the Sullivan and Kam Kotia mines.

- There are sites such as the Faro and Giant Mines where the government agreed to assume responsibility for present and future environmental liabilities in order to interest a company in re-mining the site.

- In Canada, there has been little research into how the costs of remediating abandoned sites can be internalised to the companies and individuals that have profited from their creation.

Main Conclusions

This report is only a preliminary study, but the following conclusions are inescapable:

- New mines and existing mines, or the industry itself (and ultimately consumers), must be forced to internalise the full costs of reclamation so that there are no more abandoned mines. This can be achieved through effective reclamation security legislation. Even the federal government has acknowledged the need to ensure that “financial provisions for the costs incurred in mine closure are accorded a level of priority similar to that given to start-up investment costs.”[3]

- Public fiscal policy in Canadian jurisdictions must address the issue of how to recover the costs of reclaiming and providing perpetual care to abandoned sites from the industry which has benefited from externalising these costs historically.

- The health of the public and ecosystems must be immediately protected against further risks occasioned by abandoned mines. A substantial public investment will be necessary to accomplish this.

How this report is organized

This report is presented in five parts:
1. Guiding principles for the reclamation of abandoned mines.
2. A survey of how remediation of new and abandoned mine sites is funded in selected Canadian jurisdictions (the Yukon Territory, and the provinces of British Columbia, Manitoba, Ontario, and Quebec)
3. A preliminary survey of programs from other countries. A few programs in the United States are examined, and Sweden and the United Kingdom are discussed as international examples.
4. Examples from other industries of financial options for remediation efforts and incentives for making progressive change.
5. Conclusions and recommendations regarding effective financial options for abandoned mine programs in Canada.

Definitions

For the purpose of this paper, the terms ***orphaned mine*** and ***abandoned mine*** are used interchangeably, and the following standard definition will be used:
"a mine for which the party or parties responsible for contamination cannot be found or are unwilling or financially unable to carry out necessary remedial measures within a satisfactory time frame."[4]

"Fully closed and remediated " means ***sites where re-contouring, site stabilization work, revegetation and other remediation practices have been completed for all disturbances and wastes generated; ecological productivity has been returned to its pre-mining level; and there remains no long term liability concerns or requirement for water monitoring and treatment***. A site that that will require perpetual care and maintenance, cannot be considered fully remediated, even when funds have been set aside to look after monitoring and maintenance of dams, and water and engineered covers over tailings in the long term. It is impossible to predict the ability of future generations to maintain the site, nor to predict the impact of occurrences such as global warming, earthquakes and drought on the site.

Mine Acidic Drainage will be used to describe the metal leaching and acidic drainage that is produced when sulphur bearing mine waste rock, tailings and exposed rock contact air and water. (This is also commonly termed Acid Rock Drainage (ARD) and Acid Mine Drainage (AMD)).

A glossary of other terms is provided at the end of the document.

PART 1. GUIDING PRINCIPLES FOR THE FUNDING OF AN ABANDONED MINE REMEDIATION PROGRAM

In 1994, the Canadian Council of Minister of the Environment (CCME) established some guiding principles for the reclamation of contaminated sites. These were: polluter/beneficiary pays; fairness (certainty of process, effectiveness, efficiency, clarity, consistency and timeliness); sustainability; and emergency response. [5] These principles are in agreement with the ***Minerals and Metals Policy of the Government of Canada,*** which includes a "commitment to sustainable development, endorsement of the concept of pollution prevention, affirmation of the precautionary principle, and recognition of the polluter pays principle."[6]

MiningWatch Canada endorses the principles set forth by CCME in 1994. In this report, we have used these principles to assess the provincial and territorial programs studied.

Polluter/Beneficiary Pays

The Government of Canada endorsed the principle of ***polluter pays*** when it signed onto the Rio Declaration. Principle 16 of the declaration, which captures the principle of polluter pays, provides that:

> ***National authorities should endeavour to promote the internalisation of environmental costs and the use of economic instruments, taking into account the approach that the polluter should, in principle, bear the cost of pollution, with due regard to the public interest and without distorting international trade and investment.*** [7]

With abandoned mines, where the party responsible for causing the pollution no longer exists or is unable to remediate the mine site in a timely manner, a strict definition of polluter pays cannot be applied. In these situations, it has been suggested that a more general definition of polluter be applied – one that links the payment of funds to a group who has "a higher likelihood of being responsible," using aggregations based on industry sector or other risk related factors. [8]

The ***beneficiary pays*** principle puts forward that those who have benefited from an activity that has caused contamination should pay for the remediation. [9] For mine sites, ***polluter pays*** and ***beneficiary pays*** will often be synonymous, since it is the mining company and investors that have both enabled and profited from the mine development.

A beneficiary might also be one who benefits from the remediation. [10] In this scenario, net benefit should be considered. For example, a community or business that has been harmfully impacted by a mine would potentially benefit from the cessation or remediation of a polluting activity. They would not, however, derive a net gain from the remediation of the damage.

On the other hand, if a company external to an affected community wanted to develop a new mine or other activity on an old site, it would have an anticipated net gain. Using the beneficiary pays principle, therefore, also requires an assessment of anticipated profit.

Fairness

The ***fairness*** principle includes, "the concepts of certainty of process, effectiveness, efficiency, clarity, consistency and timeliness in achieving environmental objectives." [11]

The application of the ***fairness*** principle to a mine site remediation program would require the establishment of clear priorities, standards and methods. The program must also allow for timely action, particularly in the event of a crisis; it must be cost-effective; and it must provide for effective monitoring and enforcement. Finally, the creation of a funding mechanism to address these concerns must be accomplished with openness, accessibility and the participation of affected communities.

Sustainability

Mining is an inherently unsustainable activity because once mineral resources are excavated they do not regenerate. In applying the concept of ***sustainability*** to mining, the key is to ensure that the mining operation contributes to, rather than undermines the long-term stability of ecological, social and economic systems. For example, to undertake sustainable practices a mine must return the land to previous ecological productivity and ensure that the site is fully closed and remediated (as defined in this paper).

Any sustainable funding mechanism will provide incentives for improved performance, create post-mining options for communities, and be a deterrent to further pollution.

Emergency Response

The policy and administrative framework that would enable substantial financial resources to be deployed in a timely manner is crucial for responding to and preventing emergencies like tailings dam failures. Some abandoned mine sites across Canada are in critical condition, but jurisdictional and regulatory difficulties, as well as a lack of will on the part of governments and industry to allocate sufficient resources, place communities and ecosystems at risk.

PART 2. CANADIAN PROGRAMS

Introduction

The following jurisdictions – the Yukon Territory, British Columbia, Manitoba, Ontario and Quebec – were selected to provide a representation of mining areas across Canada, and for the purpose of highlighting the distinct regulatory influences that exist in each region.

The discussion of each jurisdiction is presented in two parts: 1) bonding requirements of new mines; and 2) abandoned mine programs.

Bonding Requirements

Bonding requirements for new mines were evaluated with the guiding principles in mind. This section is broken into the following categories:

Legislation, permitting requirements and regulatory authorities

The pertinent regulations, permits and regulatory agencies associated with reclamation bonding are summarized for each jurisdiction.

Acceptable forms of reclamation securities

It is important that bonding policies encourage mining companies to follow through on their reclamation and closure plans, and that the forms of securities provide assurance that liabilities associated with mine sites will not fall to the public. The acceptable forms of security and general bonding policies were reviewed for relevance to overall reclamation costs.

Ensuring the security is adequate and can be used in a timely manner

Security amounts were assessed to determine whether or not they are large enough to cover all costs of closure should an operator walk away from a site prematurely.

- Bond calculations methods were examined to determine if a region has considered a third-party cost analysis for conducting and administering remediation work.
It is usually preferable, for a number of reasons, that mine operators carry out their own mine remediation and closure work (e. g. , the sum required for a third party to complete remediation can cost 50-500% more than if the on-site operator carries out the work;[12] and government administration costs increase if the mining company does not fulfill its closure obligations). Often, however, mine operators are unable to carry out remediation work themselves. Consequently, bond amounts should reflect the possibility that someone other than the mine operator may have to complete the remediation, and carry out monitoring and perpetual care afterwards.
This would ensure that all costs are covered in the event that a mine does not operate as long or as profitably as was anticipated, or an operator does not fulfill reclamation responsibilities in a timely fashion.

- An examination was made of methods used to encourage practices that contribute to lower reclamation costs in the long term.
For example, if the bond money has to be paid up front (i. e. , reclamation costs are immediately included in the cost of doing business), concurrent reclamation practices will be encouraged. Concurrent reclamation practices (i. e. , carrying out reclamation while the mine is still in operation) minimize harm to the environment because disturbed areas are not left exposed for as long a period of time. Also, reclamation costs are lower because the remediation work and maintenance can be conducted with the existing

labour force and on-site equipment, and the operators can learn from their experiences and work the lessons into their ongoing operating plans.

➢ Mines where the operator is financially unable to carry out necessary remedial measures within a satisfactory time frame are included in the definition of abandoned mines. Thus, an investigation was made into how each jurisdiction addresses these issues. Some of the questions asked were:

- Do the regulators have enough information to ensure that active mines will not become abandoned?
- What duration of inactivity is required before an unreclaimed mine is proclaimed abandoned?
- How is it ensured that mine closure is accomplished in a timely and effective manner, especially in the cases where security deposits have been insufficient, or the company is financially insolvent or bankrupt?
- In what form are bonds held so that they are available until all reclamation and decommissioning work is completed?

Contributions to sustainability

An investigation was made to determine if provisions (e. g. , funding, infrastructure, training) were available to help communities determine economic alternatives to mining. With an eye on potential mechanisms for a sustainability fund, an examination was made to see whether or not public resources generated by mining revenues were being used effectively to address the full range of public concerns (i. e. , the social, environmental and economic implications of mining).

As well, the reclamation policies and practices in the various jurisdictions were examined to see if they enabled viable options following mine closure.

Monitoring and enforcement

Liability can shift over the course of a mine's life (e. g. , a change in operations may require a change in waste management practices). Therefore, an examination was made to determine if jurisdictions reassess reclamation securities when there are divergences from original mine development plans (and increase the amounts if necessary).

Enforcement and monitoring practices of the jurisdictions are also summarized in this section.

Mine site closure

Each jurisdiction was surveyed in an effort to find positive examples of sites that have been fully reclaimed and closed. As well, there was an evaluation of whether or not the jurisdictions were experiencing ongoing water quality and liability issues.

Abandoned Mines Programs

This section contains general information on which governmental departments are responsible for abandoned sites; what the state of knowledge is with respect to abandoned mines; and what work has and/or is being done to address problems related to these sites.

Funding mechanisms for remediation of abandoned mines

Present funding mechanisms and programs for the remediation of orphaned mine sites are summarized.

Evaluation of the abandoned mines program

The programs were assessed for their effectiveness with respect to the guiding principles of polluter pays, beneficiary pays, sustainability, fairness and emergency response.

Summary of provincial and national findings

At the end of each jurisdictional study is a summary chart. The section wraps up with conclusions and two charts that present a comparison across jurisdictions. These final charts provide a summary of Canadian regions for the relevant regulations and responsible governments, bonding and funding for mine remediation, and details on bonding requirements and the abandoned mine programs.

YUKON TERRITORY

Bonding Requirements

Legislation, permitting requirements and regulatory authorities

- Mining in the Yukon is regulated under the ***Yukon Waters Act*** (1993, formerly the ***Northern Inland Waters Act***) and the ***Yukon Quartz Act*** (1924). The ***Quartz Act*** once had the distinction of being the least amended mining legislation in Canada, and it allowed any mining related work to be conducted on claimed areas without restrictions. [13] In 1996, the ***Quartz Act*** was amended with the Mining Land Use Regulations, which created a land use permit process and stronger guidelines for exploration activity on mining claims.

Mining projects go through an environmental assessment, which is carried out by the Department of Indian Affairs and Northern Development (DIAND). Under the ***Yukon Waters Act***, water-use licences are issued to a company by the Yukon Territory Water Board (YTWB).

- In spring 2001, DIAND circulated a discussion paper entitled ***Towards Regulations Regarding Quartz Mine Development, Production and Reclamation in the Yukon***, for comment. This paper followed similar unsuccessful attempts by DIAND to develop a reclamation policy in 1993 and 1998. [14]

Acceptable forms of reclamation securities

- Security criteria are legislated under the ***Yukon Waters Act*** (Section 12). Acceptable forms of security are a guaranteed promissory note, certified cheque, performance bond, irrevocable letter of credit or cash. The Yukon Territory Water Board can consider the ability of the applicant to a pay and past performance in setting the security.

- Costing methods for setting reclamation bonds are not detailed and the security is not mandatory under the YTWB.

- If a security is required it is included as part of the water licence issues by the YTWB.

- The amount and form of the security must be satisfactory to the Minister of Indian and Northern Affairs. The Minister also has the ability to provide policy direction to the YTWB. This could include reclamation standards and a requirement for sufficient bonding.

Ensuring the security is adequate and can be used in a timely manner

- Generally, DIAND calculates bond amounts based on the costs of having a third party conduct the reclamation work. As well, a 10-20% contingency is added to the DIAND calculation, which could be used for administration costs.

To date, however, the YTWB has consistently set bond amounts in the water licences lower than the amounts calculated by DIAND. The closure cost estimates worked into the water licences are usually based on company predictions of best-case scenarios. They are not calculated to account for unknowns or for a third party to accomplish the work. [15] Thus, the bond sums would not be sufficient to cover the real expenses related to

remediation in the event that the original company is unable or unwilling to take responsibility for the work.

Although the DIAND Minister has the opportunity to challenge the YTWB's bond amounts (because the minister is responsible for signing the licence and enforcing the requirements), this has never been done.

Example: Kud Ze Kayah

Kud Ze Kayah is a copper and zinc mine north of Watson Lake, Yukon. When Cominco's proposal to develop this mine was first permitted by the YTWB, the licence included a requirement for the largest security sum to date in the Yukon ($25 million). This was due to concerns about mine acidic drainage and selenium. The sum was calculated based on Cominco being the operator of the mine and having a reputation as a responsible and experienced company with strong financial backing.

Recently, there was a change of ownership from Cominco to Expatriate, a junior exploration company. The bond amount was not increased when Expatriate bought the mine, which creates concern for a couple of reasons.

First, Expatriate does not have the financial backing of a large, experienced mining company such as Cominco (which was one of the factors in setting the bond amount at the modest sum of $25 million). If serious problems arise at the site, Expatriate, unlike Cominco, will not have quick access to additional funds to remedy the problem. Second, Expatriate is a junior company that lacks experience in operating and maintaining an acid producing mine, as well as site reclamation. Thus, it is highly possible that the closure costs will increase, and that the security deposit will be insufficient to remediate the mine site. [16]

- In the Yukon, bonds may be required to be posted prior to start up of an operation. In some cases, however, sinking funds have been allowed. Sinking funds reduce the start up costs for a company because contributions are made to the fund over time, not up front in a lump sum. The contributions to the fund are determined based on an assumption that the mine will operate profitably for the entire predicted mine life. [17] If a mine prematurely shuts down the additional costs for remediation fall on the government because the sinking fund has not been fully paid up. (See Faro example below)

- Once the YTWB has set the licencing requirements for securities, companies are often slow to make payments. For example, at the Mount Nansen mine, the owner (BYG) never made security payments on time, and didn't pay their last required sum.

Example: Faro Mine

The Faro mine site was taken over by Curragh in 1985. At that time, the YTWB required a security deposit of $500,000, and a trusteed environmental sinking fund was initiated to accrue the balance of the reclamation funds. Curragh agreed to make fund contributions of 25 cents per wet tonne of mineral concentrate shipped, and their contributions were to be capped of $7. 5 million. The annual contribution rate, however, was extremely low, and the fund accrued just over $868,000 between 1988-1993. [18,19] It was impossible at the $0. 25/tonne rate to attain the maximum fund amount of $7. 5 million, and the fund was never sufficient to cover the full costs of reclamation and care. [20]

In 1990, Curragh began to develop the Vangorda and Grum deposits at the Faro mine, and was required by YTWB to provide a $943,700 security and $560,000 annually as a

fixed contribution to the trust fund for these mines. When Curragh went bankrupt in 1993, DIAND seized the security deposits and quickly spent all of the money on remediation work at the site. [21]

In 1994, Anvil Range took over and re-opened the Faro mine site. They were required to post the same security deposits as Curragh. But instead of the 25 cents per tonne of concentrate, a levy was paid on a sliding scale (as a percentage of the quarterly mining revenues based on the price of zinc). [22] A minimum quarterly reclamation payment was required, but if Anvil Range's cash flow in any quarter was less than this minimum, the company was not required to come up with the full payment. It was expected that the remaining reclamation payments would be paid when cash flow permitted.

Unfortunately, cash flow did not permit the company to ever pay the balance of the reclamation costs. When Anvil Range shut down two years later, there was $11. 5 million accumulated in the trust fund, but current environmental liability is estimated at $124 million. The unpaid balance became part of the Federal Government's claim when the company went bankrupt.

Contributions to sustainability

- In the Yukon, there are no examples of adequate reclamation bonds. As a consequence of inadequate money up front, sites are maintained in a holding pattern rather than being fully reclaimed. The holding pattern requires significant financial resources, and consequently, the resources that are available are quickly spent. For example, at the Mount Nansen mine site (an open pit gold mine near Carmacks, Yukon, licensed in 1996) the company, BYG, has walked away from their responsibilities, leaving only $400,000 in securities. Current liability is estimated at $2 million per year for maintenance alone, with a remediation bill of $8-10 million.

Because reclamation bonds in the Yukon are inadequate, there is no assurance that healthy environments will be restored at Yukon mine sites; and there is no extra money to go toward a funding mechanism that would support communities past mine closure, or that would contribute to the creation of sustainable industries.

- Aside from security deposits, other sources of mining-related revenue in the Yukon include royalties and fees collected from the mining industry. It is estimated that between 1992-1997, $1. 3 million in fees and $0. 4 million in royalties were collected annually. [23] With Territorial administration costs related to mining estimated at $2. 3 million and federal costs at $3. 0 million, this puts the Yukon at a deficit of $3. 1 million annually. [24] Clearly, the fees and royalties levied on the Yukon mineral industry do not cover the costs of administration, let alone remediation or funds to be put toward creating sustainable industries and communities.

Monitoring and enforcement

- Significant deviations from a mine plan can be costly in the long term – both for a mining company and the government. If a company does not budget for additional costs related to potential operational changes, it may have to cease operating until the regulators are satisfied that there is enough money in the bond to cover new liabilities created by the mine plan changes. If the regulators fail to address the mine plan changes in the security bond, full reclamation of the mine may not be guaranteed.

In the Yukon, the practice of developing a mine can diverge significantly from the conceptual operating plan approved through environmental assessment and the YTWB

licensing process. For example, Viceroy's Brewery Creek heap leach operation was supposed to be built with cells that could be used successively and be reclaimed as the next cell was being put into operation. The company did not use the successive cell system as planned, and concurrent reclamation practice was not implemented. As a result, it is possible that it will now be more expensive to detoxify and reclaim the large heap.

This example highlights the fact that inspections and enforcement of mine plans are important to ensure that a mine is operating appropriately, and that reclamation costs can be appropriately assessed.

Mine site closure

➢ A successful mine closure has never been achieved in the Yukon. In fact, many sites have been left abandoned, and remain unattended (i. e. , not even government regulators are looking after the sites). In the cases where owners have attempted site remediation, no company has ever been refunded its security deposit, because none has been able to successfully reclaim and close its operation.

For example, despite 14 years of remediation efforts, the Hudson's Bay Mining and Smelting (HBMS) company has not been able to fully remediate and close its Whitehorse Copper mine. There are outstanding problems with revegetation; as well as with tailings, which are often dry and are located in a windy area, blowing onto surrounding areas. [25] The site has been returned to Commissioner's Land (i. e. , crown land), which means the land-based issues are the responsibility of the Yukon government. HBMS's request to DIAND for a Certificate of Closure for Whitehorse Copper, however, has not been approved. Consequently, the company remains liable for any water related issues that might arise. [26]

Similarly, some closure work has been done at the Mount Skukum mine site, but there are ongoing water quality concerns that have prevented the mine from being fully closed and remediated. [27]

Abandoned Mine Programs

➢ In the Yukon, there is no clear mandate for any government department to take responsibility for a newly abandoned site. There is no legislative authority that demands that either the Water Resources or the Contaminated Sites division of DIAND step in to remediate a mine site where the company has abdicated its responsibility; nor is there legislation that precludes such action. [28]

Generally, older abandoned sites are the responsibility of the Contaminated Sites division, while newly abandoned mines fall under the responsibility of Water Resources. When BYG recently abandoned its Mount Nansen mine, Water Resources assumed the responsibility for the site. But this is not always the case.

United Keno Hill's Elsa Mine (UKHM) recently filed for bankruptcy, but was orphaned to the Contaminants division of DIAND. [29] DIAND staff stated that the main reason the Contaminants division assumed responsibility for UKHM was that they had the personnel available to do the work. [30]

In another recent situation, the Faro mine was allowed to be managed by a receiver under the ***Companies' Creditors Arrangement Act*** (CCAA), with DIAND paying the receiver for the remedial and maintenance work required at the mine site.

➢ When mines are abandoned, the securities posted under the ***Yukon Waters Act*** are directed toward site remedation. Any additional funds required for remediation and maintenance are paid out of DIAND general revenues. There have been significant payments from DIAND coffers into abandoned mine site remediation projects. For example, Water Resources, DIAND, has spent approximately $3. 7 million over the last two years for work at Mount Nansen. [31]

In the case of the Faro mine site, the most recent owner, Anvil Range, was registered in Ontario, and consequently, the Ontario court oversees the bankruptcy proceedings for the company. Each year, the receiver presents anticipated costs for maintaining the Faro mine site to the Ontario court. DIAND has been ordered by the Ontario court to commit $10. 1 million (for 2001 and 2002) to the care and maintenance of the Faro mine site.

➢ As mentioned in the definition section of this document, sites can be considered abandoned if remediation has not been or will not be accomplished in a timely fashion. These sites cannot be dealt with by the DIAND because there may still be a responsible party associated with the site, and DIAND has to wait for this to be resolved before it can act.

Example: Ketza River

The Ketza River mine, for all intents and purposes, can be considered an abandoned mine. The water licence for the site expired on December 31, 1998. The company was subsequently notified by government officials that a water licence was required, but to date, the company has taken no action to obtain a new licence.

No further actions have been taken by the federal government, despite the fact that: 1) a storage container (old railway tanker) containing sulphur dioxide leaked its contents into the environment; 2) community water sampling showed metal levels of concern in the tailings area; and 3) a federal study identified concerns regarding the stability of arsenic contained in the tailings. [32]

There is no completed abandonment and reclamation plan for the site. A study commissioned by DIAND estimated reclamation costs for the site at more than a million dollars. [33] The site also has the potential for a serious arsenic problem which would require treatment for more than 100 years; the estimated capital and operating cost of a treatment plant to deal with this problem is $7,186,000. 00. [34].

The amount of security available under the expired water licence is only $100,000.

Funding mechanisms for remediation of abandoned mines

➢ The Waste Management Program, under the Contaminated Sites division of DIAND, receives funds from general revenue to carry out contaminated site assessment and remediation. The amount spent on abandoned mine site evaluation and remediation has been a very small fraction of the total contaminants budget. [35]

➢ The first contaminants programs were carried out under the Arctic Environmental Strategy initiated in 1991. [36] Initially, approximately 100 mine sites were identified, 13 of which were major mine sites. [37] The contaminants program has been responsible for

remediation work done at two mine sites (the Venus Mine and the Arctic Gold and Silver site), as well as minor work such as removal of barrels from exploration sites. [38]

Evaluating the Yukon abandoned mines program

How does the Yukon abandoned mines program measure up to the Guiding Principles?

Polluter/Beneficiary Pays

- The Yukon has not been successful to date in establishing a polluter pay systems for mining.
- Only a fraction of the costs for abandoned mines have been paid using seized securities. The balances of expenses for abandoned mine remediation has been paid from DIAND general revenues.
- Environmental costs have not been internalised on a mining company operational basis, nor on a mining sector basis.

Sustainability

- Funding mechanisms for abandoned mines in the Yukon do not address broader implications of environmental, social and economic impacts.
- No polluting mine in the Yukon has been fully remediated and closed; all require long-term care and maintenance.

Fairness

- While DIAND has attempted to respond to problems presented with the abandonment of new mines, there is no clarity on which department within the Ministry is responsible for remedial actions; and resources and policy are frequently lacking. Consequently, administrative response has sometimes been ad hoc, and there has been unfairness in the treatment of different sites.
- There is no clear mechanism for public involvement in setting priorities for the remediation of abandoned mine sites, and affected communities report great frustration trying to get information and results from DIAND.

Emergency Response

- DIAND has been able to respond in a timely fashion to maintain recently abandoned mine sites and prevent overflows from tailings ponds and catastrophic events.

Summary Of Yukon Mine Remediation

Regulatory Authorities	Department of Indian Affairs and Northern Development; Yukon Territory Water Board
Regulations	***Yukon Waters Act, Yukon Quartz Act, Mining Land Use Regulation***
Security Accepted for New Mines	▪ Guaranteed promissory note; certified cheque; performance bond; irrevocable letter of credit; cash ▪ must be approved by DIAND Minister ▪ licensed by Yukon Territory Water Board
Strengths	▪ DIAND has the authority to recommend and approve security type and amount for new mine proposals ▪ DIAND can remediate mines where the operator has not been responsible
Weaknesses	▪ YTWB does not usually set bond criteria in licence to reflect 3rd party costing analysis ▪ sinking funds have not generated sufficient revenue to cover liabilities ▪ the Yukon government pays for administration and promotion of mining in the Yukon but royalties collected are insufficient sums to cover these costs ▪ No legislated requirement for YTWB to set security
Amount of Security Accepted for New Mines	
Third Party Costing	No*
Administration Costing	No*
Discretionary Changes	DIAND Minister, YTWB Licencing
NOTES:	* DIAND calculates bond amount using 3rd party costing and adds 10-20% contingency, which could be used for administrative costs. But YTWB, which sets the bond amount in the water licence, does not do so based on this analysis.
Abandoned Mine Programs	
Funds Spent	$3. 7 million on BYG in last two years, more recently on Faro and United Keno Hill
Funds Committed	$10. 1 for Faro (for 2001 and 2002) for maintenance
Funding Source	General Revenue
NOTES:	▪ Faro liability approximately $124 million, BYG liability $8-10 million ▪ 120 abandoned mines listed by DIAND; 40 with known chemical or physical instability ▪ securities spent already (UKHM, BYG, Faro) ▪ to date, waste management programs have not focused on abandoned mine sites

BRITISH COLUMBIA

Bonding Requirements

Legislation, permitting requirements and regulatory authorities

- Mining practices in BC are regulated primarily by 3 provincial statutes: approval for mine development is regulated by the ***BC Environmental Assessment Act***; general environmental protection obligations are set out in the ***Waste Management Act***; and permitting, construction operation and mine closure are regulated under the ***Mines Act***.

- With respect to reclamation bonds, the ***British Columbia Bonding Act*** sets out some bonding criteria, and the ***Finance and Administration Act*** covers government liability and cost recovery provisions. It is the ***Mines Act***, however, that requires a company to estimate the cost of a reclamation program; and the bond amount is set out in the ***Mines Act*** permit.

- Securities are viewed by the Ministry of Energy and Mines (MEM) as one of a number of factors required to ensure proper closure. [39] Other important factors include mine development plans, which are supposed to be designed to reduce liability during the course of mining;[40] and inspections by MEM staff, which are carried out to ensure that a mine is operating appropriately. [41]

Acceptable forms of reclamation securities

- Before 1990, there was a statutory limit for reclamation security of $2,500 per hectare, and this continues to apply to mines in existence before that date. [42] For mines in production after 1990, the financial assurance is supposed to cover the full costs of meeting permit requirements.

- Acceptable forms of security under the ***British Columbia Bonding Act*** include letter of credit; cash; registered government bond with a three-year maximum; and surety bonds (see example below). Unacceptable forms include bearer bonds; pledge of assets; parent company guarantees; and captive insurance. [43]

- Securities for AMD and long-term care sites

The ***BC Acid Rock Drainage Policy and Guidelines*** describe financial security requirements for mines with significant metal leaching or acid rock drainage. [44]
Full security is required, as a permitting condition under the ***Mines Act***, to pay for all outstanding reclamation obligations, including long term costs associated with monitoring, maintenance, drainage collection and treatment. [45]

In general, "credible" companies are allowed to self-assure, and they may not be required to post 100% of their bond up front. But in cases where there are long-term water treatment concerns, even credible companies are currently required to post the entire bond up front (e. g. , the Equity Silver mine, owned by Placer Dome). [46]

At the present time, surety bonds are not used to cover AMD and metal leaching sites, water treatment facilities or long term monitoring and maintenance obligations. [47] For these, "hard" security (e. g. , cash, irrevocable letter of credit, Canadian Government bonds, treasury bills, guaranteed investment certificates or term deposits up to three years) must be posted. [48]

However, MEM's policy on the use of surety bonds is currently under review by the Mine Reclamation Security Committee (i. e. , in their Performance Bond policy review), and opens up the possibility of using surety bonds for acid generating mines.

Example: Surety Bonds in BC

Initially, MEM's policy on surety bonds was designed to make credit more available to smaller companies. The ministry was comfortable using surety bonds as a form of security in lower risk (i. e. , conventional, non-acid-generating) situations.

The MEM currently has a moratorium on new surety bonds pending finalization of their Performance Bond policy review. [49] According to MEM, the new bonding criteria for sureties will allow the province and the surety company to negotiate surety conditions that will more effectively assure the availability of funds required for conventional reclamation. [50]

The proposed changes to the policy would also potentially expand the application of surety bonds to non-conventional, long-term treatment or perpetual care sites, if the surety company were to meet certain standards established by the government. [51]

There are obvious concerns with this approach. If companies do not have to bear the expense of hard securities, they may have less incentive to move quickly to reduce the bond amount (i. e. get the reclamation done in a timely manner). Moreover, with less hard security held by government (it will now be in the hands of a surety company), the public has decreased assurance that reclamation will occur if a company goes bankrupt.

As part of their review, MEM tested the use of surety bonds for three mines in BC (Golden Bear, Highland Valley Copper, and Brenda). The surety bond held on the Wheaton River Minerals' Golden Bear heap leach mining operation was found to be inadequate to cover the costs of clean-up. A government review of reclamation obligations showed that reclamation liabilities had not been well tracked by either Wheaton River Minerals or the surety company, and that the surety company had not conducted on-site inspections since the issuance of the bond. [52]

- The details of the reclamation bond are set out in a company's ***Mines Act*** permit. Before the permit is issued, the bond amount must be approved by the Minister of Energy and Mines. At the discretion of the Chief Inspector of Mines, an informal risk assessment may also be conducted to determine acceptable bonding criteria for each company. [53] BC is in the process of developing a policy for this risk assessment. [54]

- Financial securities posted under the ***Mines Act*** must also meet the requirements of the Ministry of Environment, Lands and Parks (MELP). MELP is supposed to have access to the financial security through a protocol agreement with MEM, but there is no case example of this having been applied. [55]

Ensuring the security is adequate and can be used in a timely manner

- As mentioned above, the ***Mines Act*** requires a company to estimate its liability and reclamation costs. Liability for a site is calculated using a standard spreadsheet developed by the MEM. The spreadsheet calculates third-party costs for reclaiming disturbed areas; decommissioning; post-closure monitoring, maintenance and treatment; and administration fees. [56]

- Reclamation plans are supposed to be re-evaluated every 5 years or when there is a significant change in the mine plan. [57] But the securities can be revised more frequently (annually), at the discretion of the Chief Inspector of Mines, if required. [58]

- In the past, reclamation bond payments have been frozen as a result of the BC Jobs Protection Commission (JPC) deals. When metal prices drop, and there are threats that a mine might shut down, a company can request that the JPC step in to negotiate decreases in mine-related expenses (e. g. , hydro rates or wages) to help the mine remain in operation. [59]

JPC deals have occurred at Endako (1999), Mount Polley (1998), Huckleberry (1998) and Highland Valley Copper (1998). These negotiations have managed to keep all four mines in operation.

One of the restrictions put forward by the JPC at the Huckleberry and Endako mines was that there would be no increase to the reclamation security for a period of 2 years, provided there were no material changes to the mine plans that would significantly increase the potential liability to the Province. [60] The Reclamation Manager at MEM acknowledged that by agreeing to the deferral of the security, the province accepts the possibility that public funds could be used to fund some of the reclamation costs. [61]

Huckleberry was in the early stages of mine development and the site was not fully secured when the JPC deal was struck. As a result, the funds available for reclamation did not reflect the costs that could be incurred at the time of closure. Estimates were that in 1999, the year after the JPC deal was worked out, the potential reclamation costs were more than $2 million greater than the fund balance. If the mine had gone into receivership during this period, the government could have been left with a multi-million dollar clean-up bill.

This sets a worrisome precedent for future developments. Allowing reductions in bond amounts to be negotiable based on a company's ability to pay, rather than having the amounts fixed to actual costs and liabilities, sends a signal that reclamation and site remediation are not a high priority.

- The potential for incorporating surety bonds into the category of preferred security instruments raises some important questions and concerns regarding access to reclamation monies.

Because of the involvement of the third-party broker and the extra-regulatory contract, surety bonds are potentially more complex and less flexible for government officials to administer than are hard securities. [62] The result could be additional administrative costs for governments both in the establishment of the bond terms, and in the negotiation of the release of funds for remediation. [63]

There is some question, as well, whether or not surety bonds would cover all potential liabilities at a site. A surety is not an insurance policy; it is simply a line of credit for specified activities. There have been cases in the US where surety companies have refused to allow governments to access the bond money for unanticipated (i. e. , not outlined in the terms and conditions of the surety bond) reclamation activities. [64]

If these sorts of disputes arise, there could be potential delays in accessing the money to do the required reclamation work – especially if the disputes must be settled in court.

Contributions to sustainability

- At the present time, there is no government policy in place, nor the resources available to be put toward sustainability issues following mine closure in BC.

- The Ministry of Energy and Mines (MEM) estimates current liability for all BC mine sites to be $400 million, while the sum available in security bonds is only $172 million. [65] Clearly, there are insufficient funds to fully close and remediate existing mines sites in BC. This raises a couple of issues related to sustainability. First, if the money is not there to adequately close and remediate these sites, it is quite possible that many will not be left in an ecologically productive state. This may limit possible future land-use options for the area. Second, because there is no excess of funding for remediation, it is highly unlikely that any of the funds will go toward issues other than site reclamation (such as alternative community economic development initiatives, etc.).

- Mineral land taxes are paid in BC at a rate that increases with the owner's total mineral land area. These funds contribute to general government revenues and are not tagged for remediation efforts.

- Recently, a precedent involving sustainability issues and mining was set in BC. In March, 1998, at the completion of a two-and-a-half year provincial environmental assessment process, the Tulsequah Chief mine project proposed by Redfern Resources was approved by the BC government. In February, 1999, the Taku River Tlingit First Nation (TRTFN) launched a lawsuit in the BC Supreme Court claiming that the environmental assessment process was marked with striking deficiencies and irregularities. The TRTFN specifically charged that the process was neither "neutrally administered" nor designed to "promote sustainability" as per the ***Environmental Assessment Act***. The ***Act*** requires environmental assessments "to promote sustainability by protecting the environment and fostering a sound economy and social well-being."[66]

On June 28, 2000, the TRTFN won their court case. The BC Supreme Court concluded that "the statutory obligation to promote sustainability, an object of the ***Environmental Assessment Act***, was not fully addressed. . . [and] that the Ministers' obligations under the statute and at common law were not fulfilled." This decision quashed the Project Approval Certificate issued to Redfern Resources until sustainability issues could be duly considered. Subsequently, the environmental assessment project committee has reconvened to try to address what sustainability means in the context of the Tulsequah Chief proposal as well as future mining projects.

This court decision has the opportunity to influence the types and amounts of bonds required upon initiating development of a new mine, as well as change the criteria to include sustainability in the issues addressed during the assessment of mining proposals.

Monitoring and enforcement

- The MEM periodically reviews reclamation bonds, but it is rare for BC to take legal action when a mine does not pay the instalments for their security deposit. [67]

- There has been a continual decline in government capacity to monitor and enforce environmental regulations (including those pertaining to mine sites). A survey conducted by the BC Government and Service Employees' Union, 1999, showed that 88 % of MELP employees surveyed said that BC's permit and monitoring systems do not work effectively; 88 % said they do not have enough resources and support to effectively protect the environment; and 90% said they do not have enough time or resources to do proper field work. [68]

➢ Under the ***Waste Management Act***, the government must be prepared to receive notification of environmental emergencies, such as spills of dangerous substances. It is also responsible for assessment, monitoring, and the establishment of priorities for public safety and environmental protection. [69]

Between 1992 and 1995, out of 10,000 incident reports, 12% of spills in BC were mining related. [70] In practice, reports of spills at mining sites are often not followed by on-site investigations. [71] For example, there is a large file of spill reports from the Kemess mine that dates back to 1996, but the regional spills officer did not make his first trip to the mine site until 2000. [72] This is due, in part, to the relative remoteness of many mining operations. [73]

The ***Waste Management Act*** also forms the basis for cost recovery for spills assessment and clean-up, and is based on the polluter pay principle. [74] Cost recovery tends to be undertaken only for large, complex and expensive events where a declaration of environmental emergency has been made under the ***Environment Management Act.*** [75]

Under the ***Financial Administration Act*** and ***Waste Management Act,***[76] both direct and overhead costs related to spill response and remediation can be recovered for contingency and prevention plans, site management, and cleanup. [77]

➢ Section 10(8) of the ***Mines Act*** states that if an owner fails to comply with the conditions of a permit to the satisfaction of a Chief Inspector of Mines, the Chief Inspector has the discretionary power to cancel the permit or order that the mining operation be shut down until the problem is remedied.

Mine inspectors also have the authority to suspend operations, or shut down equipment if a company is not operating in the best interest of health and safety. For example, when the mines inspector discovered faulting in the Huckleberry dam berm, the company was required to make dam construction a priority and mobilize the necessary resources to address the problem.

Mine site closure

➢ There are two sites in BC that have been largely revegetated (Island Copper and Nickel Plate), and other sites that have portions of revegetated grazing land on waste rock dumps and tailings ponds (Highland Valley Copper, Brenda, Similco and Craigmont). [78] None of these locations has been returned to its pre-mining level of ecological productivity. There is a task force in BC that is currently addressing technical issues around the determination of when a revegetation project can be considered "self-sustaining."[79]

Abandoned Mine Programs

➢ The ***Health, Safety and Reclamation Code***, under the ***Mines Act*** provides MEM with the mandate to fix the hazards associated with inactive or orphaned mines in the interest of preventing injury to the public.

MEM is responsible for abandoned mines that operated prior to 1969, when the first reclamation legislation was enacted. An example of a pre-legislation abandoned mine is Anyox, which was developed in 1910 by the Granby Mining Company, and abandoned in

the mid-1930s. This site is monitored by MEM and Environment Canada because there is a company on site that is re-processing Anyox slag for use as an abrasive on shingles, and because the Anyox mine site is acid generating. It would be expensive and technically challenging to collect and treat the AMD effluent, and there is currently no funding in place to accomplish remediation at this problem site.

MEM is also responsible for sites that have not been remediated in a timely fashion yet still have valid ***Mines Act*** permits. Recently, in the Smithers region there was one permitted mine that had its permit cancelled, and three that had their securities seized by MEM for that reason. Two of the mines with seized securities were permitted before 1989, and therefore, only had securities of $10,000 each. The third had a security of $75,000. The cost for fully reclaiming these sites will likely be more expensive than the security sums available.

- A detailed inventory of abandoned mines in BC does not exist. In 2000, the Ministry of Energy and Mines began to compile a database of existing abandoned mines information. [80] In cooperation with the Historic Sites Program, MEM was able to hire an intern to begin work on the design and development of a database. Part of the project also involved site investigations and water quality sampling at some of the sites that were known to have potential AMD or metals leaching concerns. Of the $89,000 available, $10,000 was spent on helicopters for site visits, and $5,000 on sample analysis. [81] As of June 2001, there was no plan in place or dedicated funding to continue working on the inventory. [82]

MEM estimates that there are 1898 historic (i. e. , abandoned) mine sites in BC. [83] Eight of these sites have known severe environmental impacts associated with them. [84]

Funding mechanisms for remediation of abandoned mines

- MEM can request funds from the BC Treasury Board to remediate a site of concern, particularly if it will be a safety hazard. [85] The ministry can then follow cost recovery procedures with responsible parties after the problem has been ameliorated. This approach has been used only for addressing hazards to public safety such as the need to cap mine shafts, though the same provision could be used to address any remediation concern. [86]

MEM annually records a large number of small expenditures that are related to the remediation of physical hazards at abandoned mine sites (e. g. , the sealing of open portals and shafts). These expenditures are annually in the range of $5,000 to $20,000. [87]

- Any inspector can access funds from consolidated revenue, but would be unlikely to do so if expenses required were large. [88]

- The Minister of Environment, Lands and Parks can set up a Waste Management Trust Fund, and require as a condition of a ***Waste Management Act*** permit, that the owner of a waste management facility make contributions to the fund. [89] The fund would provide money for environmental cleanup necessitated by inadequate closure of waste management facilities, and for long term care and maintenance those facilities. [90] The ***Act*** describes some of the interrelationship with the ***Mines Act***, but does not explicitly define "waste management facility." Thus, there is the potential for tailings and waste rock management facilities to be included under this provision.

- The ***Waste Management Act*** describes penalties for offences, which include requesting compensation or bond money. [91]

➢ The ***Contaminated Site Regulations*** of the ***Waste Management Act*** is a potentially powerful instrument that can be used to hold companies accountable for site clean-up. Under the regulations, anyone that has been involved with a polluted piece of property is potentially liable for remediation costs.

Cominco undertook voluntary action to remediate an abandoned mine (Stemwinder) that was contributing to water quality problems upstream of the company's Sullivan mine. [92] Part of the company's motivation for undertaking this voluntary remediation was the concern that it could be held liable for all impacts stemming from the site – Cominco had active claims and was exploring in the area of the Stemwinder site. [93]

Under the ***Finance and Administration Act***, MELP can exempt a mining company from liability associated with a site. [94] Cominco worked with the Ministry of the Environment to determine a mechanism for limiting liability and indemnifying itself before conducting the remediation work at Stemwinder. [95] Working with MELP, Cominco spent $200,000 on the remediation. Cominco's after-remediation liability for the site was capped at $50,000, but the company did not have to put up a bond to cover it.

➢ The Ministry of Energy and Mines has undertaken remediation work at two of the major abandoned, AMD sites: Mount Washington and Britannia. At Mount Washington, the Ministry spent $1. 5 million over five years in an attempt to seal an acid generating waste dump. [96] At Britannia, MEM spent $75,000 on monitoring under Section 17 of the ***Mines Act***, and filed a lien on the property. [97] Both MELP and Environment Canada have also contributed funds over the years to monitor and study both the Mount Washington and Britannia mines.

Example: Using the Contaminated Sites Regulations at the Britannia Mine [98]

The abandoned Britannia mine, a copper mine 50 kilometres north of Vancouver, shut down in 1974. This site is one of the worst point sources of metals pollution in North America. Daily, 50 million litres of toxic runoff (metals and acidic waters) flow from the site into Howe Sound. This has severely impacted the aquatic life in Britannia Creek and the Sound.

Vancouver-based Copper Beach Estates, the current land owner who purchased the site in 1979, was ordered four times by the provincial government to halt the toxic runoff at Britannia. But the problem was never adequately addressed.

In May 1998, after decades of pollution and ineffective remediation orders, the BC government initiated a process to identify other parties that could possibly contribute financially to addressing the pollution problems at Britannia.

The ***Contaminated Sites Regulation*** of the ***Waste Management Act*** empowered the province to include previous mine owners in a cleanup order. Under the joint and several liability clause, former owners were identified as potentially responsible parties (PRPs) for the cleanup. It was this threat that brought all parties to the negotiation table.

The PRPs and the current landowner have voluntarily negotiated agreements with the province to work toward remediating the Britannia site. The PRPs have agreed to pay $30 million for remediation expenses (the final cost of the cleanup is estimated at between $60 million and $75 million). In return, they will be released from future liabilities related to the site.

Details have not been released as to how the costs will be shared among the parties, which include: Aluminium Company of America (Alcoa), the BC government, the Atlantic Richfield Company (ARCO), Canzinco Ltd. , Ivaco/Arrowhead Metals Ltd. , the Canadian Government, and three of Alcoa's subsidiaries located in Delaware (Intalco Aluminum Corporation, Alumax Inc. and Howmet Holdings Corporation).

Copper Beach has committed $5 million towards cleaning up the site. The company has agreed to pay the estimated $1. 7 million per year total maintenance and operating costs for the treatment plant in perpetuity.

An application has been made to the Canada-BC infrastructure program to finance two thirds of the estimated $12 million cost of building the treatment plant, with the remaining one third provided from the potentially responsible parties' contribution.

Public interest groups have recommended that the money should be put into an independent separate Britannia Reclamation Trust Fund that would oversee remediation expenditures and be subject to public disclosure and review regarding spending. [99] The history of other acid mine drainage sites has demonstrated that costs tend to be unpredictable. These groups also caution that the amount of resources in the trust must be expanded over the next decade to account for additional and unanticipated cleanup costs.

Evaluating the BC abandoned mines program

How does the British Columbia abandoned mines program measure up to the Guiding Principles?

Polluter/Beneficiary Pays

- Most expenses for abandoned mine programs in the BC have been paid by out of provincial general revenues.
- Securities available are a much smaller sum than the estimated liabilities.
- Environmental costs have not been internalised on a mining company operational basis, nor on a mining sector basis.
- BC has some cost recovery provisions that haven't been effectively used.
- Joint and several liability under the ***Waste Management Act*** has recently been effectively put to use with the Britannia mine, returning some of the remediation costs that were being paid by public funds to past owners of the mine.

Sustainability

- Funding mechanisms for abandoned mines in BC do not address broader implications of environmental, social and economic impacts.
- No mine in BC has been fully remediated and closed.
- The environmental assessment process for Tulsequah Chief project may produce an important precedent for considering sustainability issues for new mine proposals.

Fairness

- BC has clear regulatory standards for setting reclamation bonds. At the present time, these require certain forms of hard security (i. e. , cash or letters of credit) where long term water quality impacts are a concern.
- There are a number of creative means of dealing with mine closure, liability and insolvency which can help to increase the duration a mine remains in operation and responsible. But these approaches potentially increase risk to communities in terms of

health impacts, lower wages and benefits and use of taxpayer money to cover mining company deficits.
- There is no clear mechanism for public involvement in setting priorities for the remediation of abandoned mine sites.

Emergency Response
- There are pieces of legislation and protocol agreements that outline roles and responsibilities of certain departments in emergency response. These responsibilities tend to overlap and details of response have not been well tested.

Summary Of British Columbia Mine Remediation

Regulatory Authorities	Ministry of Energy and Mines; Ministry of Environment, Lands and Parks; Ministry of Labour
Regulations	***Mines Act; Bonding Act; Financial Administration Act; Waste Management Act; Job Protection Act; Health, Safety and Reclamation Code***
Security Accepted for New Mines	▪ cash; letter of credit; term deposit; government bonds; treasury bills; investment certificates; surety*, self-assurance* ▪ * acid mine drainage and long-term water quality issues are not covered by these types
Strengths	▪ criteria for security type and amount for new mine proposals is clear ▪ more certain forms of security are required for long term water treatment & maintenance ▪ MEM can remediate mines where the operator is not willing or able ▪ ARD policy and guidelines for remediation ▪ cost recovery provisions exist under the ***Waste Management Act***
Weaknesses	▪ Jobs Protection Commission deals can result in decreases to security payment requirements ▪ expensive remediation projects generally are not initiated by MEM or MELP ▪ spill reports at mines are often not investigated ▪ enforcement lacks consistency ▪ criteria for securities are not always followed
Amount of Security Accepted for New Mines	
Third Party Costing	Yes
Administration Costing	Yes
Discretionary Changes	Minister of Energy and Mines; Chief Inspector of Mines
NOTES:	▪ securities posted before 1989 are only $1,000/acre before 1989; full liability is covered for newer operations
Abandoned Mine Programs	
Funds Spent	▪ $89,000 abandoned mines inventory/database ▪ $1. 5 million Mt. Washington ▪ $75,000 monitoring Britannia
Funds Committed	None
Funding Source	General Revenue
NOTES:	▪ inventory incomplete ▪ 8 major sites with known severe impacts ▪ $400 million liability for all sites ▪ securities available $172 million ▪ joint and several liability in ***Waste Management Act*** can help find past responsible parties to pay for remediation

MANITOBA

Bonding Requirements

Legislation, permitting practices and regulatory authorities

- The ***Mine Closure Regulation (1999)*** under the ***Mines and Minerals Act*** (1992) outlines the reclamation, closure and financial security requirements for operating and suspended mining operations in Manitoba. [100] Because the closure and rehabilitation provisions were only recently brought into effect, this aspect of the legislation is in a transitional state. [101]

Manitoba Energy and Mines (MEM) is responsible for the enforcing the provisions of this ***Act***.

Acceptable forms of reclamation securities

- As mentioned above, the legislation governing closure and rehabilitation of mines in Manitoba is in transition. Guidelines for financial assurance in Manitoba are in the process of being developed. [102]

- At the present time, there are currently several acceptable forms of security in Manitoba. These include cash deposit, bond, letter of credit, good rating, pledging of assets, corporate self-assurance, or third party guarantee. [103] The acceptability of the form and amount of security is determined by the director of MEM.

- There is a cost recovery provision for cases where the security does not cover the full costs of rehabilitation – if this provision is used, the debt is owed to the Crown. [104]

Ensuring the security is adequate and can be used in a timely manner

- As mentioned above, Manitoba's financial assurance guidelines are currently under development.

Contributions to sustainability

- Section 4 of the ***Manitoba Mining Tax Act*** provides for the collection of funds to assist communities affected by mining and mine closure. The Mining Reserve Fund is generated from a portion (3-5%) of royalties and taxes collected from mining companies in Manitoba. The fund, which is currently $20 million, can be used for a wide range of programs including job training, support of municipalities and schools when a mine shuts down, or community economic development plans, etc. [105]

Community members have expressed concern that the Mining Reserve Fund has been used for purposes outside the mandate of the fund (e. g. , to cover general revenue expenses in Manitoba, or for exploration subsidies). [106] The administration of the fund should be carried out with public input and scrutiny to ensure that it is being spent according to its intended objectives. [107]

Example: The Lynn Lake Story

The communities involved:

- Lynn Lake, which celebrates its 50th anniversary this year as a mining town and home to Manitoba's first nickel mine, has an estimated population of 750-800 – 190 of whom are registered in school. The town of Lynn Lake is in severe financial difficulties and in need of major support for infrastructure upgrading (particularly a $2. 56 million upgrade for their water treatment plant, and replacement of piping that has been corroded by metal tailings that were used as foundation material for half of the old town-site, including the hospital).

- The Marcel Colomb First Nations (MCFN), which was established as a band in 1999, is in the process of building a road and infrastructure to support a small reserve 40 kilometres outside of Lynn Lake. At the present time, MCFN members live off reserve. MCFN children, many of whom have severe learning disabilities, comprise 40% of the Lynn Lake school population. Due to limited funding available from the federal government, resources on reserve will be extremely limited, and it is unlikely that they will have the capacity to establish a school, clinic or business base on their new reserve.

Some issues that Lynn Lake is facing:

- Lynn Lake is presently suing Black Hawk Mining for failure to pay back taxes amounting to some $3-4 million. In 1996, the town commenced the legal against the mining company following a decision by the province to unilaterally change Lynn Lake's legal status from a local government district to a municipality, which meant the town would have to assume all costs for servicing and liability for contamination within the townsite.

- The town is seeking a legal opinion with regard to its liability associated with potentially contaminated soil, air and water within the town-site and as a result of mine waste areas adjacent to the townsite.

- Last year the town made headlines when it legally seized the last gold shipment out of town in order to settle its accounts with Black Hawk. The company was obliged to put up a bond of $250,000 and its mill property to secure the release of the gold for its customer.

- Records from the Manitoba Department of the Environment show that there are at least 11 contaminated sites within the town boundaries, most of which were inherited from the period of local government status. Initial investigation suggests that at least four of these sites have major contamination issues (the rail yard; the hospital; possible contamination of drinking water due to metals leaching from the open pit and tailings; and areas of the town built on mine tailings).

- Successive Manitoba governments have consistently refused to conduct scientific studies into the extent of the contamination and possible remediation measures. No ecological risk assessments have been performed, and minimal financial resources have been invested in remediation of hazards such as crumbling dykes and containment ponds, which pose a serious acid mine drainage problem compromising potential fishing lakes and watersheds downstream.

- According to Mayor Audie Dulewich, the present government denies they have any orphan mine sites in Lynn Lake, and refuses to acknowledge that there is a serious contamination problem affecting human health or the environment.

- Lynn Lake has requested that the province provide funds (either through the Manitoba Mineral Reserve Fund or other sources) for environmental health and ecological risk assessments. The community wants these studies to be immediately undertaken to determine potential threats to humans and wildlife in the town and surrounding areas that have been impacted by 50 years of mining and industrial activity.

One resident of the town is demanding that the regional health authority conduct a cancer study, as he has found clusters of cancer cases within certain geographic areas of the community.

Lynn Lake's experience with the Mineral Reserve Fund:

- In the past, Lynn Lake municipality has accessed the Mining Reserve Fund for a variety of reasons. Following the first mine closure in the early 90's, the fund helped to offset the deficit in the local budget for five years. [108] The mine has since reopened and closed again. Recently, the town applied for similar funding, to cover hydro payments ($113,000), but was turned down due to the pending court decision between Lynn Lake and Black Hawk Mining company over back taxes owed to the town. [109] In an earlier decision, the courts had decided in favour of Lynn Lake, but the company appealed the decision. This legal process could still take many years to resolve. Meanwhile the town is struggling financially. [110]

- The Mining Reserve Fund currently pays for an economic development officer and a community adjustment committee – they are using short and long-term community planning techniques to determine how the community can respond effectively to changes as the mine shuts down. [111] This funding has been difficult to access and the application process is cumbersome without a clear government body looking after disbursements. [112]

- The town of Lynn Lake is interested in applying for funds to address the serious health concerns associated with the 25 million tonnes of tailings that were left by the previous mine owners in the 1970's. [113] These have breached dykes and dry tailings that are blowing over the region. [114] It is estimated that there would not be enough money in the Mining Reserve Fund to cover these remediation expenses. [115]

Monitoring and enforcement

➢ There are significant deficiencies in the Manitoba environmental licensing process, which can lead to difficulties in ensuring environmental protection during mine development and closure. [116] For example, no Environmental Impact Statement has considered cumulative impacts.

➢ Many of water quality monitoring and enforcement programs have experienced funding cuts and are no longer able to ensure that mine site conditions are monitored and the regulations enforced. [117]

➢ It would be appropriate to fully fund a regional environmental office in northern Manitoba where mining is most prevalent, to monitor emissions and effluents and ensure compliance with environmental standards.

Mine site closure

- In the Flin Flon and Snow Lake areas, Hudson's Bay Mining and Smelting (HBMS) began a mine and mine site rehabilitation program following the shut down of a number of their mines during the 1980s. [118]

A total of 14 sites were remediated, costing the company $7-8 million. After monitoring water quality of ponded water and run-off for three years, HBMS considers these sites to have no long-term liabilities or water quality concerns. [119] The tailings generated by these sites, which are located near HBMS's Flin Flon smelter, do remain an ongoing concern for water quality. [120]

The decommissioning work conducted by HBMS in the early 1990s consisted of the removal of mine structures and the replacement of waste rock in to underground workings. [121] Overall, surface disturbance was low and waste rock remaining on surface was revegetated or provided with fertilizer and/or soil to promote natural regeneration of native species. [122] Since these mines were all underground mines and ore was processed off site, the reclamation practices were simplified on site – the wastes could be deposited underground. As mentioned above, the more toxic tailings are located in Flin Flon. [123]

The sheer size of the contaminated area in Flin Flon makes it impossible to remediate. In particular, there is a large volume of tailings that blow in the wind, and the metal content (copper, cadmium and lead) makes it difficult for vegetation to establish. [124] Community concerns have historically not been adequately addressed, and much information, including that collected by Health Canada (e. g. , toxic metal levels in blueberries) has not been made available to the residents of Flin Flon. [125]

- There are concerns regarding environmental quality in northern Manitoba because the metals continue to cycle in the natural systems, and the acid deposition makes the problem worse by making the metals readily assimilable. [126] Revegetating areas such as tailings dumps would really require sealing the tailings off from access by roots, otherwise the metals will continue to recycle. [127] The higher the metal content of the soil, the higher the metal content of the plant. [128]

Abandoned Mine Programs

- Abandoned sites return to the crown, but if they do not pose an environmental problem they will be left unreclaimed. [129] Mines in Manitoba that closed "temporarily" and never reopened have no financial securities available for remediation. [130]

- Manitoba Labour, Workplace Safety and Health, as well as Manitoba Conservation (environment section), would be involved in incidents that put people at risk. [131] To date, a process such as this has not been used. [132]

- No abandoned mines inventory work has been done, but some academic researchers have investigated mine acidic drainage at some of abandoned mine sites. [133] For example, it is know that the abandoned Sheraton mine site in northern Manitoba has 8 million tonnes of acid generating tailings. [134] This site has not been well cared for and maintained.

There are a number of mines that were established in 1939 through the ***War Measures Act*** to extract minerals necessary for war (e. g. , tungsten and chrome). These do not

show up in the public registry because they are the responsibility of the Department of National Defence. [135] A full inventory of all these sites is needed in Manitoba to determine the extent of environmental and safety impacts. [136]

➢ In the early 1990s, when Hudson's Bay Mining and Smelting decommissioned and revegetated their sites, it also completed similar work at some sites that had been developed in the area in the 1920's and that no longer had a known responsible company associated. [137]

Funding mechanisms for abandoned mines

➢ In the case of an emergency, such as a tailings dam failure at an abandoned mine, a site could be declared a contaminated site. If this occurred, the site could be remediated, and there would be a follow up process to pursue all responsible parties and recover the costs. [138]

➢ From 1992-94, 187 abandoned quarries were rehabilitated at a cost of $1. 5 million (over 4000 were counted as Manitoba's legacy). [139] This work was made possible because the ***Mines and Minerals Act*** established the Quarry Rehabilitation Reserve Account to fund the Quarry Rehabilitation Program. A levy of 10 cents per tonne of aggregate produced is collected annually for the fund, which brings in $1. 5-$2 million each year for rehabilitation. [140] There is now approximately $8 million in the Quarry Rehabilitation Reserve Account. [141] The program does not apply to hard rock mines, but is an example to learn from in considering the establishment of a remediation fund.

➢ The Manitoba Treasury Board recently approved $1 million to be used over the next four years for the top five hard rock mine sites of concern. [142] Work to date has focused on capping of shafts and fencing tailings areas. [143]

Evaluating the Manitoba abandoned mines program

How does the Manitoba abandoned mines program measure up to the Guiding Principles?

Polluter/Beneficiary Pays

- Most expenses for abandoned hard rock mine programs in the Manitoba have been paid through provincial general revenues.
- Security requirements have not yet been implemented.
- The Quarry Rehabilitation Reserve Account is a good program reflecting the polluter pays principle on a sector basis, since every quarry operation contributes to the rehabilitation account.
- Environmental costs in hard rock mines in Manitoba have not been internalised on a mining company operational basis, nor on a mining sector basis.
- Manitoba has some cost recovery provisions that haven't been effectively used.

Sustainability

- Funding mechanisms for abandoned mines in Manitoba do not address broader implications of environmental, social and economic impacts.
- No mine in Manitoba has been fully remediated and closed.
- The ***Manitoba Tax Act*** has a provision that generates a Mining Reserve Fund ($20 million) that could be used to offset the impacts for communities affected by mining. But there has been difficulty accessing the fund in recent years, and some of the fund has been used for purposes that do not fall under the original mandate of helping communities with the impacts of mining.

Fairness

- There is no clear mechanism for public involvement in setting priorities for the remediation of abandoned mine sites.
- The Mining Reserve Fund is an innovative program that uses tax and royalty contributions to assist communities affected by mining, but has no clear guidelines for accountability and transparency of decisions made for the spending of the fund.

Emergency Response

- Emergency response in Manitoba would be implemented through Labour, Workplace Safety and Health and Manitoba Conservation when there is a threat to public safety. There is a process outlined in regulations for response to environmental impacts, but it is not well used.

Summary Of Manitoba Mine Remediation

Regulatory Authorities	Manitoba Energy and Mines; Manitoba Industry, Trade & Tourism; Manitoba Environment
Regulations	***Mines and Minerals Act; Mine Closure Regulation; Workplace Safety and Health Act; Environment Act; Contaminated Sites Remediation Act***
Security Accepted for New Mines	▪ cash; letter of credit; bonds; government bonds; pledging assets; third party guarantee; good rating; corporate self-assurance
Strengths	▪ criteria for security type and amount for new mine proposals ▪ cost recovery provisions ▪ quarry fee accrues substantial revenue for quarry rehabilitation ▪ a fund (currently at $20 million) is generated under Section 4, Mining Tax Act, which addresses concerns of communities affected by mining
Weaknesses	▪ guidelines for self-assurance not finished ▪ bonding requirement has not yet been implemented, and are thus untested
Amount of Security Accepted for New Mines	
Third Party Costing	No
Administration Costing	No
Discretionary Changes	Minister of Energy and Mines
NOTES:	▪ guidelines for acceptable types and amounts of securities currently under development
Abandoned Mine Programs	
Funds Spent	$1. 5 million quarries*
Funds Committed	$1 million over four years
Funding Source	General Revenue
NOTES:	* quarry levy 10 cents/tonne; $8 million in Quarry Rehabilitation Reserve Account ▪ no abandoned mine inventory completed

ONTARIO

Bonding Requirements

Legislation, permitting practices and regulatory authorities

- Under Part VII of the Ontario ***Mining Act***, reclamation and closure were originally regulated by the Ministry of Northern Development and Mines (MNDM). Additional reviews of closure plans were provided by the Ontario Ministries of Natural Resources, Labour, and Environment.

In January, 1996, the Ontario government enacted Bill 26, ***An Act to achieve Fiscal Savings and Efficiency and to implement other aspects of the Government's Economic Agenda***. This omnibus bill included a section that amended the ***Mining Act*** in a number of significant ways.

One major change was the removal of the requirement that the MNDM review and approve closure plans. As a result of this amendment, mining companies can now simply file closure plans – there is no requirement for MNDM or other Ministries to reviews the plans, nor is approval from the Director of Mines Rehabilitation needed for the plans (i. e. , mining companies are essentially permitted to regulate themselves). Closure plans must be certified by a professional engineer and submitted to MNDM, but the engineer is allowed to be an employee of the company, which might be viewed as a conflict of interest. [144]

Another significant change was the removal of the requirement for annual reporting to MNDM on fulfilment of rehabilitation requirements outlined in a company's closure plan.

A third change created an opportunity for companies to apply for "exit tickets" based on having fulfilled their closure responsibilities, and allowed companies to meet a financial means test instead of having to post hard financial assurances.

The implications of all of these changes are discussed below.

Acceptable forms of reclamation securities

- The kinds of financial assurance acceptable for a mine in Ontario include: letter of credit; cash; bond of a guarantee company; mining reclamation trust; and other approved securities.

Ensuring the security is adequate and can be used in a timely manner

- The ***Mining Act*** of Ontario was revised on June 30, 2000, to include a self-certification process for determining the cost of closure. This process allows for consultants to estimate third-party closure costs (based on meeting closure standards, which are detailed in the Mine Rehabilitation Code). [145] This self- certification process raises several concerns:

First, the criteria for determining which companies are allowed to self-assure may not be reliable. Companies can self-assure if they pass a financial test (approval is determined based on credit rating, life of the mine, and proven and probable reserves). [146]

Investigations into abandoned mines in Ontario have shown that there is no correlation between the size of the company and the amount of environmental degradation left unremediated once production finishes. [147] In other words, just because a company is large (or has a high credit rating), it does not mean that the company will be conscientious in its remediation efforts.

Second, the change to self-certification may increase the public's financial exposure to cleanup costs for environmental degradation caused by mining activities. [148] The financial circumstances of mining companies can change very rapidly, and in most cases there will not be adequate mechanisms in place to track these changes, let alone to respond in a manner that is both timely and forceful enough to require a self-assured company to post bonds (particularly since this would be required at a time when the company is rapidly losing solvency). [149]

Third, the amount required for assurance deposit is considered confidential,[150] and is exempt under ***the Freedom of Information and Protection of Privacy Act***. Consequently, the amount of security calculated by the company's consultant is not available for public scrutiny, and as a result the public has no way to determine whether or not the sum requested of a mine will be sufficient to complete closure requirements.

Northwatch, an environmental non-governmental organization in North Bay, Ontario, went through the Freedom of Information process to find out the assurance amount for a Placer Dome site. The group was denied the information on the grounds that the information was "proprietary and confidential."[151]

- Full public disclosure of bond requirements will be increasingly important as the province moves toward the issuance of "exit tickets", since funds available for long-term maintenance, remediation and emergency, as well as the labour, will become the responsibility of the crown. After the exit ticket is issued, any extra costs for remediation will, presumably, come from the public purse. [152] This is worrisome, since past experience in Ontario has shown that the requirement for public funds can result in sites being left partially or fully unremediated. [153]

- Ontario can issue "exit tickets" to mines meeting closure requirements,[154] as determined by the responsible departments (i. e. , Natural Resources, Labour, Environment, and MNDM). [155] MNDM representatives maintain that an exit ticket will only be approved for sites with minimal hazards, or if a company pays a sum of money sufficient to cover long-term costs. [156] And long-term responsibility for monitoring and maintenance will remain with the company if there is a requirement for ongoing collection and treatment of effluent. [157]

Despite the assurances from MNDM, there remains concern that the provision of exit tickets will result in the transfer, to the crown, of liabilities that have not been accounted for in the bonding practice. [158]

Contributions to sustainability

- At a conceptual level, Ontario has in place many of the regulatory and policy components that could greatly contribute to mining occurring within a framework of overall sustainability. At a practical level, however, recent changes in legislation and a broader government program of promoting mine development are at odds with the actual adoption of a sustainable development approach. [159]

For example, while the Province requires that reclamation funds be in place, companies are no longer required to post financial bonds or hard financial assurances. And while

there is an abandoned mines program, there are no mechanisms in place to generate revenue through ongoing mining activities to offset the strain on the public purse (which will be significant if the mine rehabilitation program is to make any significant headway in remediating the thousands of abandoned mine sites). [160]

And, perhaps most notably, the Province is encouraging greatly increased levels of mineral exploration activity via a flow-through shares program and significant subsidies to the mineral exploration sector. But there has been no concomitant regulatory requirement to rehabilitate exploration sites, and no program put in place for monitoring the environmental impacts of an exploration boom. [161] The only regulatory change has been a reduction in permitting requirements for exploration activities on crown land, which is likely to be detrimental to long-term ecological health. [162] Indeed, industry and business surveys have confirmed the importance of strong laws and regulations in achieving environmental protection. [163]

Sustainable practices cannot be achieved with this unbalanced approach.

- Under Ontario's ***Environmental Bill of Rights***, each scheduled ministry, including the MNDM, is required to have in place a Statement of Environmental Values (SEV). The MNDM wrote their statement in 1995. It includes a mission statement, which is "To promote, advocate and support the economic and social well-being of northern Ontario residents."[164]

Further, with respect to mineral development, one of MNDM's goals is "To generate new wealth and benefits for residents of Ontario by stimulating environmentally and economically sustainable use of the province's geology and mineral resources." [165]

The SEV also emphasizes the importance of fostering partnerships at the community level, and contributing advice and funds toward the development of local projects. Mining is recognized as a temporary use of the land, which is replaced in the long-term with alternative land uses. [166]

The SEV seeks to promote the accomplishment of environmentally sustainable development activity through: sound environmental planning; public input; giving high priority to environmental protection during all phases of mining; minimizing environmental disturbances during all phases of mining; recognizing that prevention is more effective than remediation and rehabilitation of an environmental problem; and assessing the full accounting of cost and benefits.

Despite MNDM's statements to move toward a more "environmentally sustainable" mining industry, the SEV appears to still be in draft form. It has not yet been finalized or revised to resolve the many tensions that now exist between the SEV's principles, goals and objectives and the changed regulatory environment. [167]

Monitoring and enforcement

- The significant amendments to the ***Mining Act*** discussed above (i. e. , removal of government approval of closure plans, and introduction of exit tickets), coincided with a reduction in the number of MNDM inspection staff from fourteen to two. [168] This severely reduced MNDM's ability to verify compliance with closure plans. [169]

During the same period of time, there was a 30% reduction in Ministry of the Environment staff. As well, reporting requirements under the Municipal Industrial Strategy for

Abatement (MISA) program (discussed below in the Abandoned Mines Programs) were reduced, while the number of MISA program approvals increased. [170]

Taken individually or as a package, these changes lower the level of protection to the environment and severely reduce the province's ability to verify compliance with regulatory requirements and with closure plans. [171]

Mine Site Closure

- Under the ***Mining Act,*** if a mine is considered "inactive" when its operations have been suspended indefinitely with a closure plan, and the site is 'no longer being monitored by the proponent on a continuous basis" **.** [172]

- The 2000 amendments to Part VII of the ***Mining Act*** provide the option of returning mining lands to the Crown[173] This is the "exit ticket" provision. The amendments also changed and clarified post-decommissioning environmental liabilities.

- The ***Mining Act*** also has a provision that places funds in a special purpose account. The government can use these funds to address remaining rehabilitation issues when a responsible party has not fulfilled its obligations. The monies in the fund can be used on any mine site. [174] It is not yet known whether the fund will cover all of the long-term or unanticipated costs for mines that are returned to the crown.

- MNDM estimates approximately five mines are currently in the closure process in northern Ontario. [175] Substantially more mines have been declared closed by the companies and/or are in a state of long-term care and maintenance.

Renabie mine, north of Wawa, is negotiating for an exit ticket but the liability will stay with the company until they return their patents to the crown or sell them to another mining company. [176] Renabie had 17 tailings spills into Braminco Lake between 1982 and 1984. To date, there has been no consultation with the public or First Nations regarding Renabie's application for an exit ticket, and it is uncertain what the process of consultation, if any, will be. [177]

Abandoned Mine Programs

- Over the years, responsibilities for abandoned mines have been variously divided among the provincial ministries of Northern Development and Mines, Natural Resources, Environment, and Labour, with some involvement from federal agencies. [178] This has led to some difficulty in pinpointing direct responsibility and required actions in enforcement and remediation.

- While there is a general prohibition under both the ***Environmental Protection Act*** and the ***Ontario Water Resources Act*** against the impairment of water quality, there are no mechanisms for monitoring or enforcement of water quality standards at abandoned mines. This results in an absence of regulatory pressure to maintain and reclaim these sites. [179]

In 1995, the Municipal Industrial Strategy for Abatement program (under the Metal Mining Sector Monitoring and Effluent Regulation of ***the Environmental Protection Act***) was amended to clarify the non-application of these water regulations to abandoned or closed mines. In the long term, this deregulation is likely to increase the impact of abandoned mines on aquatic ecosystems, and hence, increase environmental liability as well. [180]

Funding mechanisms for remediation of abandoned mines

➢ In Ontario, the ***Pits and Quarries Control Act*** required a contribution to a reclamation fund of 8 cents per tonne of material removed. The maximum amount required was $3,000 per hectare to be reclaimed. This act, now called the ***Aggregates Resources Act*** (1990), has been revised to require a lower rate of 6 cents per tonne of material removed, with only 0. 5 cents per tonne going to the reclamation fund (the remaining 5. 5 cents is considered a royalty payment to municipalities and the provincial government).

These reclamation fund contributions do not apply to hard rock mines, but serve an example for consideration in the establishment of an abandoned mines remediation fund.

➢ Following a serious tailings dam accident on the Montreal River, the Ontario government set up a $10 million fund to start assessing the 4,000 abandoned hard rock mine sites and 2,000 quarry sites on file. [181] The money came from general revenue, and was to be used between 1991-94. A total of $8 million was spent, primarily on site assessments, before the funding was cut. [182]

A paper inventory of abandoned sites in Ontario was conducted and a database created using prospectors records, the mineral deposit inventory and files. [183] Approximately 40% of identified abandoned mines were verified with site visits. [184] Site investigations were not prioritised based on an estimated hazard level. [185]

➢ In September, 1999, the Ontario government allocated a budget of $27 million, to be used over 4 years, for dealing with abandoned mines. [186] To date, $4 million has been spent, with much of the money being used to cap old mine shafts and deconstruct buildings. [187] While this effort has reduced liability associated with physical hazards of open mine shafts, it has not really addressed the broader range of contaminant and environmental issues. [188]

Approximately $1. 9 million of the $27 million budget have been used to provide resources for preventing further subsidence of the Hollinger and McIntyre Mines within Timmins (back-filling and capping), and as financial restitution for the garage and golf course that had been affected by the cave in of the old mine workings. [189]

Another use for the funding has been the initial evaluation and engineering work for the rehabilitation of the Kam Kotia mine site, which has an estimated $40 million reclamation cost. $9 million over two years have been committed to the first two phases of a five-stage remediation plan. [190]

In general, although the $27 million in budgeted funds are being used effectively, the sum available for remediation of abandoned mines in Ontario remains substantially insufficient to cover the costs. [191] Kam Kotia alone will use one third of the funds for only the first two phases of its remediation.

Evaluating the Ontario abandoned mines program

How does the Ontario abandoned mines program measure up to the Guiding Principles?

Polluter/Beneficiary Pays

- Most expenses for abandoned hard rock mine programs in the Ontario have been paid by Ontario general revenues.
- New security requirements have recently been implemented.

- The ***Pits and Quarries Control Act*** reflected the polluter pays principle on a sector basis since a fee of 8 cents per tonne is paid by every quarry operation to contribute to the rehabilitation fund. The sum contributed to the fund has been substantially reduced with the implementation of the ***Aggregates Resources Act***, to only 0. 5 cents per tonne.
- Environmental costs in hard rock mines in Ontario have not been internalised on a mining company operational basis, nor on a mining sector basis.
- Under Ontario's new regime, funds that will be placed in a special purpose account for rehabilitiation of mine sites when exit tickets are granted may increase revenues from polluter pay sources, although it is not yet determined whether they will cover the long term costs for the mines that are to be returned to the crown via this new mechanism. It is not expected that any revenues generated through this new approach will be available for existing inventory of abandoned mines.

Sustainability

- Funding mechanisms for abandoned mines in Ontario do not address broader implications of environmental, social and economic impacts.
- There is a disturbing trend toward unsustainable practices through increasing direct mining subsidies and decreasing company liability, while also increasing public liability through corporate self-assurance.
- No mine in Ontario has been fully remediated and closed.

Fairness

- There is a special fund set up under the ***Mining Act*** that can be used to remediate any mine site where the responsible party has not fulfilled its obligations.
- Bond amounts and types are not open to public review in Ontario. This does not allow for sufficient scrutiny of bond estimates to ensure that the company will be able to effectively reclaim a site, particularly where a company is allowed to self-assure.
- There is concern that premature or inappropriate approval of exit tickets may unfairly increase liability to public funds.
- There is no clear mechanism for public involvement in setting priorities for the remediation of abandoned mine sites.
- The exit ticket system affords no opportunity to the Province to go back to the company or industry-at-large for compensation if the actual costs of the remediation are higher than originally estimated.

Emergency Response

- Emergency response in Ontario is accomplished using the funds committed to remediation of abandoned mines. This response mostly addresses risks to public safety such as open shafts and subsidence concerns rather than environmental impacts (such as water treatment).

Summary Of Ontario Mine Remediation

Regulatory Authorities	Ministry of Northern Development and Mines; Ministry of Labour; Ministry of Natural Resources; Ministry of Environment
Regulations	***Mining Act***; ***Environmental Protection Act***; ***Water Resources Act***
Security Accepted for New Mines	▪ cash; letter of credit; trust fund; third party guarantee; approved securities; self-assurance
Strengths	▪ the public has an opportunity to review closure plans ▪ MNDM's Statement of Environmental Values addresses sustainability and minimizing impacts ▪ there is an abandoned mine program with start up funding
Weaknesses	▪ security amounts are not open to public review ▪ corporate self-assurance financial test is based in part on markets (which change) ▪ exit ticket criteria too discretionary (MEM) ▪ there is no requirement for responsible authority to maintain water quality standards for abandoned mines ▪ closure plans need only be approved by an engineer and submitted to MNDM – there's no longer a required review by Ministries of Labour, Environment, or Natural Resources
Amount of Security Accepted for New Mines	
Third Party Costing	Yes*
Administration Costing	No
Discretionary Changes	Energy and Mines Minister
NOTES:	* amount not disclosed to the public
Abandoned Mine Programs	
Funds Spent	$8 million on inventories
Funds Committed	$27 million between1999-2002 ($4 million spent to date)
Funding Source	General Revenue
NOTES:	▪ quarry levy of 8 cents/tonne for rehabilitation has decreased to 6 cents/tonne with only 0. 5 cents contributed to the rehabilitation fund (only for quarries) ▪ inventory incomplete, only 40% verified with site visits ▪ special purpose account, used at any mine site ▪ 4000 abandoned hard rock mine sites on file, plus 2000 quarry sites

QUEBEC

Bonding Requirements

Legislation, permitting practices and regulatory authorities

- The ***Quebec Mining Act*** regulates mine site rehabilitation and restoration requirements, and the payment of securities. [192] Reclamation plans and criteria under the ***Mining Act*** are reviewed by the Ministère des Resources Naturelles (MRN) and the Ministère de l'Environnement.

Acceptable forms of reclamation securities

- The forms of securities that are accepted under the ***Mining Act*** include: cheque; a guaranteed bond issued by government or municipality; guaranteed investment certificate; letter of credit; security or guarantee policy issued on behalf of government; an immovable hypothec provided by a third party; or a trust.

- Financial guarantees must correspond to 70% of the estimated costs of rehabilitation of the "accumulation" areas (i. e. , sites for accumulation of mineral substances, overburden, concentrates or tailings). [193] Annual payments are established based on the type and anticipated duration of activity. [194]

Ensuring the security is adequate and can be used in a timely manner

- The required amount of a financial guarantee may be increased or decreased by the MRN to maintain a security that is sufficient to cover the costs of the reclamation plan. [195] The rehabilitation plan is reviewed every 5 years unless a shorter time frame is set out by the MRN. [196]

The guarantee is refundable only when the work described in the rehabilitation plan has been completed. A certificate of release is issued by MRN to verify that the operator has been released from further obligations. The amount may be refunded in part or increased following re-evaluation of the cost of work required.

- Where an operator does not carry out rehabilitation work within the specified time, the Government may carry out the work and recover costs from the defaulter. [197]

Mine site closure

- Over the past 25-30 years, eleven major mining sites have been given back to the Quebec government.

- The 1998 amendments to the ***Mining Act*** included the addition of a provision that renders leases un-renewable if the title holder has defaulted on royalty payments or has not produced reports required by the Minister. At the same time royalty payments were reduced. [198]

Abandoned Mine Programs

➢ In Quebec, there are 74 orphan mine sites, with a total liability estimated at $75 million. [199] Of these, $40 million would be needed to remediate the top 15 priority sites. [200]

➢ The Waswanipi Cree First Nation in northern Quebec is located between the 49th and 51st parallels. The First Nation is spread over the entire area, and there are 51 traditional traplines within the territory. The Waswanipi report that they have six abandoned mines on their territory, the largest of which was closed five years ago.

Only one of these mines, a gold mine operating from 1924-1994, was "remediated". The community has seen no evidence that the tailings from that mine are being monitored. The other mines have open shafts (young teenagers have been caught exploring in the shafts), but there is no monitoring at these sites. The people who live near these mines report that no work has been done to restore the tailings areas. One of the mines has water up to the fifth level, and the people are concerned about acid mine drainage. When they try to talk with the Ministry of the Environment, they are told that there is no money to clean it up – that only $2 million was set aside last year by the province for abandoned mines. [201]

Example: Schefferville

At Schefferville, the Iron Ore Company (IOC) closed its iron mines twenty years ago, but nothing has been done to clean up the massive pits or tailings in the area. The company houses and the community centre (which included a swimming pool) were destroyed, but the warehouses and diesel fuel tanks remain on site. The 700 Innu and 750 Naskapi people who live there, and whose land the mines were on, have been attempting to negotiate remediation of the site with IOC, but they have been excluded from negotiations by the government and the company. There is no reclamation bond in place, and now that the company has been sold to Rio Tinto, the community is concerned that the land will never be restored. [202]

Funding mechanisms for abandoned mines

➢ As of 2002, $20 million will have been spent since 1987 on the remediation of mine sites that have been returned to the crown. [203] Of these, 80% have problems with mine acidic drainage. [204]

➢ Other commitments to mitigating acid generating sites (both abandoned and active mines) have been through the Mine Environment Neutral Drainage program for which funding was provided by Quebec ($1. 97 million), Canada ($1. 67 million) and industry ($1. 37 million) [205].

➢ Between 1993 and 1997, Phase I of the Ecological Mines Program contributed $493,000 toward remediation work at both active and abandoned mines. [206]

➢ Between 1994 and 1997, $1. 5 million was spent by the Quebec government on a restoration program for private sites that had been abandoned for more than 15 years, with an additional $3 million from the private sector (none of the funds was provided by securities). [207]

Evaluating the Quebec abandoned mines program

How does the Quebec abandoned mines program measure up to the Guiding Principles?

Polluter/Beneficiary Pays

- Most expenses for abandoned mine programs in Quebec have been paid out of Quebec general revenues, though there has been some contribution from the private sector.
- Environmental costs in Quebec mines have not been internalised on a mining company operational basis, nor on a mining sector basis.
- New security requirements have recently been implemented.

Sustainability

- Funding mechanisms for abandoned mines in Quebec do not address broader implications of environmental, social and economic impacts.
- No mine in Quebec has been fully remediated and closed, but 11 of the major mine sites, including acid generating sites, are currently being remediated.

Emergency Response

- Emergency response to environmental impacts has not commonly occurred in Quebec.

Summary Of Quebec Mine Remediation

Regulatory Authorities	Quebec Ministère des Resources Naturelles; Quebec Ministère de l'Environnement
Regulations	***Quebec Mining Act***
Security Accepted for New Mines	▪ no specified criteria for type of security ▪ must be approved by DIAND Minister ▪ licensed by Yukon Territory Water Board
Strengths	▪ criteria for security type and amount for new mine proposals
Weaknesses	▪ securities required do not reflect liability or 3rd party cost analysis ▪ annual payments calculated on expected mine life may fall short of cost at time when prices drop & mine stops development early
Amount of Security Accepted for New Mines	
Third Party Costing	No
Administration Costing	No
Discretionary Changes	Ministère de Resources Naturelles
NOTES:	▪ calculated as 70% of estimated cost of rehabilitation
Abandoned Mine Programs	
Funds Spent	$10 million*
Funds Committed	$20 million** by 2002 for sites returned to crown
Funding Source	*General Revenue & Private Sector ****** General Revenue
NOTES:	▪ inventory complete ▪ remediating 11 major sites, some generating acid ▪ $75 million liability estimated, for sites returned to Crown ▪ 15 priority abandoned mine sites

SUMMARY OF CANADIAN PROGRAMS

Bonding Requirements

The major findings concerning bonding requirements in the various Canadian jurisdictions are summarized by category. These results, and the results of the abandoned mines programs investigation, are summarized in a table below.

Legislation, permitting practices and regulatory authorities

Relevant regulations and responsible governments have been summarized for each region in a table below. The major findings are that:

- All regions reviewed have applicable regulations and/or government authorities that are responsible for different aspects of bonding new mines, health and safety and remediation of abandoned mines.
- Manitoba has not yet implemented their bonding regulations, and the Yukon Territory has no legislation that outlines the acceptable types and costing analysis for the amount of security required.

Acceptable forms of reclamation securities

It is common practice in Canada for jurisdictions to require the posting of reclamation securities prior to the commencement of mining activities. The various jurisdictions are at different stages of policy development and analysis with respect to the acceptable forms of securities. The major findings from the review are that:

- Security deposits are generally required by most the Canadian regions reviewed in this report. The exception is the Yukon, where the requirement for a security is a discretionary decision on the part of the Yukon Territory Water Board.
- A range of bond types are acceptable across Canada, including: cash; cheque; letter of credit; surety; government bonds; treasury bills; investment certificates; term deposits; sinking funds; trust fund; pledging assets; third party guarantee; and self-assurance.
- Manitoba does not yet have guidelines regarding acceptable forms of financial assurance.
- In British Columbia, bearer bonds, parent company guarantees and captive insurance are not accepted as securities. Additionally, in British Columbia, surety and self-assurance are currently not accepted as securities for sites where there are long-term water quality and liability concerns. For these “hard cash” must be put up as security.

Ensuring the security is adequate and can be used in a timely manner

The major finding from this review is reclamation liabilities related to mine sites greatly exceed the amount of funds that are captured in securities. This places an undue burden of liability on provincial and Canadian taxpayers, as well as risks to health and ecological integrity. More specific findings are that:

- There is no example where a security had been calculated to sufficiently cover all costs of mine site remediation, nor where a security was available for accomplishing full remediation of a site when the operator was unable to follow through on closure commitments.
- For the mining regions reviewed, only BC and Ontario require bond amounts to be calculated with a third-party analysis of costs. The administration costs associated with the government agency becoming responsible for the reclamation of a site are only accounted for in the BC costing analysis. In the Yukon Territory, DIAND calculates the bond amounts based on third-party costing and 10-20%

contingency, but to date, the Yukon Territory Water Board has not licensed a mine based on this calculation. The lack of consistency across Canada in ensuring that bond amounts are calculated with a third-party and administration cost analysis decreases incentives for companies to act responsibly through full remediation and closure, and increases the risk to public financial resources and health.

- In the jurisdictions surveyed, the bond amounts are set at a fixed rate, sometimes at a legislated cap, sometimes per acre of the property, and sometimes per tonne mined. In general, these fixed rates have not been set high enough to sufficiently cover the full costs of remediation and do not provide incentive for concurrent reclamation. [208]
- Additional costs required to cover the shortfall of the available security have generally been paid from federal and provincial general revenues. In other cases, the sites have been left unattended.
- Annual status reports are not provided on bonding and liabilities of all mine sites. These should be provided for public review. [209]

Contributions to sustainability

It is clear, from this review, that most jurisdictions are not adequately addressing the issue of how mining fits into the long-term sustainability of the lands, water and communities affected by mining.

- To date, sustainability has not been adequately addressed in any of the financial instruments used to bond and reclaim mine sites in Canada.
- One positive initiative in the Manitoba ***Mining Tax Act*** is a provision that sets up a Mining Reserve Fund to help communities affected by mining when mines shut down.

Enforcement and Monitoring

Enforcement of permits and bonding requirements at new mines must be effective to ensure mine site remediation is accomplished by the responsible or a third party. Otherwise new mines will be added to the list of orphans. What became clear from this review is that commitment to enforcement of bonding and closure requirements varies across the country.

- In all jurisdictions, the networking difficulties are apparent between different levels of government, federal, provincial, territorial and First Nation governments, which all have roles in the regulatory process. [210] There remains across a lack of coordination between the various agencies responsible for certain aspects of environmental or health and safety concerns with abandoned mines, as well as with the regulation and enforcement of mine closure practices. [211] This limits the effectiveness of emergency response. As well, it means that coordinated efforts in enforcement to ensure that closure costs do not escalate with changes in operations are rare.
- The trend towards decreasing the number of inspection and enforcement staff across Canada has also limited the ability of regulatory agents to effectively monitor and enforce mine site closure requirements.

Mine Site Closure

No examples were found that show a successfully remediated and fully closed mine.

Abandoned Mine Programs

For abandoned hard rock mines in Canada, all inventory, site evaluation, reclamation and remediation programs have been primarily funded through general revenues of the federal and/or provincial governments, with some contribution from seized securities.

Each region is in a different phase of considering abandoned mines. Quebec and Ontario have committed substantial resources towards inventories and some site assessment work ($10 million and $8 million respectively), though inventories are still incomplete. The Yukon Territory has a list of the abandoned mine sites. Manitoba and British Columbia, however, have not yet completed paper inventories of their abandoned sites.

Most of the remedial work currently conducted on abandoned mine sites in Canada is ongoing water treatment and maintenance rather than working toward full remediation and closure.

Summary Of Canadian Regions: Relevant Regulations and Responsible Governments, Bonding and Funding for Mine Remediation

REGION	RELEVANT REGULATIONS	RESPONSIBLE GOVERNMENTS
Canada	***Canadian Environmental Assessment Act*** ***Fisheries Act*** ***Metal Mining Liquid Effluent Regulations (Fisheries Act)***	Environment Canada Fisheries and Oceans Canada
Yukon Territory	***Yukon Waters Act, 1992*** ***Quartz Mining Act*** ***Mining Land Use Regulation***	Indian Affairs and Northern Development (Water Resources; Contaminants Division; Mineral Resources) Environment Canada (Environmental Protection Service) Yukon Territory Water Board Yukon Government: Economic Development, Renewable Resources
British Columbia	***Mines Act (RSBC, 1996) Chapter 293*** ***Bonding Act (RSBC 1996) Chapter 30*** ***Financial Administration Act (RSBC 1996) Chapter 138*** ***Health, Safety and Reclamation Code (RSBC 1996) Chapter 293*** ***Environmental Management Act (RSBC1996),Ch 118, 1981*** ***Waste Management Act, amended 1997*** ***Emergency Program Act, 1993*** ***Mineral Land Tax Act (RSBC 1996) Chapter 240*** ***B. C. Health Safety and Reclamation Code, 1997*** ***B. C. Acid Rock Drainage Guidelines and Policy, 1998*** ***Job Protection Act, 1991, amended 1997***	BC Ministry of Energy and Mines BC Ministry of Environment, Lands and Parks BC Labour

Manitoba	***Mines and Minerals Act*** ***Mine Closure Regulation, 1999 (Mines and Mineral Act)*** ***Mines and Metallurgy Compensation Act*** ***Mining Tax Act*** ***Workplace Safety and Health Act, 1994*** ***Environment Act, 1988*** ***Contaminated Sites Remediation Act***	Manitoba Energy and Mines Manitoba Industry, Trade and Tourism Manitoba Environment Manitoba Labour, Workplace Safety and Health
Ontario	***Ontario Mining Act, amended 2000*** ***Municipal Industrial Strategy for Abatement, amended 1995***	Ontario Northern Development and Mines Ontario Natural Resources Ontario Labour Ontario Environment
Quebec	***Quebec Mining Act, amended 1998.***	Quebec Ministere des Resources Naturelles Quebec Ministere de l'Environment

Summary Of Canadian Regions: Bonding Requirements and Abandoned Mine Programs

BONDING REQUIREMENTS	**REGION**				
Kind of Security Accepted:	**YUKON**	**BRITISH COLUMBIA**	**MANITOBA**	**ONTARIO**	**QUEBEC**
Cash	yes	yes	Yes	yes	yes
Cheque	yes (certified)				yes
Letter of Credit	yes	yes	Yes	yes	yes
Surety	yes*	yes*			yes
Government Bonds		yes	Yes		yes
Treasury Bills		yes			
Investment Certificates		yes			yes
Term Deposit		yes			
Sinking Fund					
Trust Fund				yes	yes
Pledging Assets			Yes		
Bearer Bonds		no			
Parent Company Guarantee		no			
Captive Insurance		no			
Third Party Guarantee			Yes	yes	yes
Self-Assurance		yes*	Yes	yes	
NOTES	*guaranteed promissory note. YTWB discretion; DIAND minister approved	mine acidic drainage and long term water quality not covered	bonding requirement has not been implemented		

BONDING REQUIREMENTS	REGION				
	YUKON	BRITISH COLUMBIA	MANITOBA	ONTARIO	QUEBEC
Amount of Security Accepted					
Third Party Costing	no*	yes	No	yes*	no
Administration Costing	no*	yes	No	no	no
Discretionary Changes	DIAND Minister YTWB	Energy and Mines Minister			Ministere de Resources Naturelles
Remediated & Closed Mine	None	none	None	none	none
NOTES:	*DIAND calculates bond amount using 3rd party costing & 10-20% contingency -could be used for admin. YTWB has not licensed based on this analysis	-$1,000/acre before 1989 -newer-full liability covered	Guidelines are being developed	*amount not available to public -special purpose account, used at any mine site	-70% of estimated cost of rehabilitation
Abandoned Mine Programs					
Funds Spent	$3. 7 million since 1991*	$89,000- database $1. 5 million- remediation	$1. 5 million- quarries	$8 million -inventories	$10 million*
Funds Committed	$10. 1 million -Faro	none	$1 million, 4 years	$27 million, 1999-2002	$20 million by 2002
Funding Source	General Revenue	General Revenue	General Revenue	General Revenue	General Revenue *(+ some Private)
NOTES:	DIAND: *Water Resources for Mount Nansen and Faro	- $400 million liability, securities available $172 million; -inventory incomplete	-quarry levy 10 cents/tonne, $8 million in Quarry Rehabilitation Reserve Account	quarry levy 8 cents/tonne for rehabilitation	remediating 11 major sites, some generating acid

PART 3. INTERNATIONAL

In the following section, the various pieces of legislation and initiatives are discussed using the categories (where applicable) set out in the preceding Canadian jurisdictional studies.

UNITED STATES

Surface Mining Control and Reclamation Act *(*SMCRA*)*

As will be discussed below, ***SMCRA*** has effectively implemented regulations based on the principles of polluter/beneficiary pays. The legislation has provisions that limit repeated damaging offences by companies and the people involved in the companies, which is important for moving toward the consideration of sustainability in mining regulation and practice.

Furthermore, there is a provision for a mechanism to fund the clean-up of abandoned coal mines, through a production-based tax on operating coal mines. This Abandoned Mine Lands fund sets a good example of a potential funding mechanism to address the remediation of abandoned hard rock mines.

Legislation, permitting requirements and regulatory authorities

- The ***Surface Mining Control and Reclamation Act*** (***SMCRA***), 1977, defines performance standards and bond requirements for reclamation of coal operations. It also outlines provisions for public participation and government responsibilities. [212] Originally, this law was designed to apply to both hard rock and coal mining, but it was passed only for coal. [213]

The regulation is federal, but each state is able to define and regulate their own reclamation law if it is comparable to ***SMCRA*** and approved by the federal Office of Surface Mining Reclamation and Enforcement (OSM). [214] Once approved, the state law has primacy over ***SMCRA***, but the federal office still has an oversight role. [215] Most of the 24 main coal-producing state laws have primacy over ***SMCRA*** (exceptions are Tennessee and Oklahoma). [216] The OSM currently oversees 4. 4 million acres in 26 states and on the lands of three tribes. [217]

Ensuring the security is adequate and can be used in a timely manner

- Bonds are collected in two ways, depending on the method chosen by the state. First, a full bond can be paid up front to cover all costs for reclamation. The alternative method, which is more common, is to pay a nominal fee up front and then contribute 1 cent per ton of coal mined to the Special Reclamation Fund. Given that coal sells for about $20 per ton, the 1 cent fee is minimal. [218]

- It has been found that the majority of the currently operating coal mines do not forfeit their bonds. But where bonds have been forfeited there are generally insufficient funds available to cover all reclamation costs. [219,220]

- Performance standards for reclamation are clearly defined within a specified timeframe to give incentives for concurrent reclamation practices. [221] For example, it is regulated that operators must reclaim disturbed areas within six months (or after a certain distance has been mined). If this is not done, further work cannot proceed. It has been found that carrying out mining operations in this manner is much less costly in the long run. [222]

- If a company forfeits its bond, the government takes over reclamation operations. Although the government is responsible for enforcing the performance standards with operating mines, they are not held responsible for maintaining these same standards themselves. [223]

➢ While the ***SMCRA*** bonding system has been effective at getting surface contouring and re-vegetation reclamation completed concurrently, [224] the bond sums are defined based on the assumption that surface disturbance is the only concern.

Problems with more serious contamination such as mine acidic drainage and metal leaching with both coal and hard rock mines can be covered by the ***SMCRA*** Abandoned Mine Lands (AML) funds (discussed below). For example, there are provisions for the use of the funds on prevention, abatement, treatment and control of water pollution,[225] particularly if there is concern for danger to public health, safety or general welfare. [226] But the funds available have been insufficient to cover these costs, since addressing these issues was not the intended purpose of the fund. [227]

The 1990 amendments to ***SMCRA*** made specific mention of adverse economic impacts on local communities as a reason for giving priority to certain sites for reclamation. In the 1995 amendment, "general welfare" impacts began to be considered in terms of the economic impact on communities as well. This interpretation gives water contamination a higher priority and allows them to compete more easily for AML funds. [228]

Monitoring and enforcement

➢ One part of the law that effectively decreases repeated offences against the ***Act*** is the "ownership and control" or "permit blocking" provision. [229] Responsible parties (including the company officers, anyone with 10% ownership and the company itself) who have had serious violations of ***SMCRA***, such as bond forfeiture and unabated violations, are listed and are not allowed new permits for new operations until they have proven that their problems have been mitigated.

This has been effective at curbing the worst environmental abuses, for example the "shoot and shove" practices in the steeper coal regions of East Kentucky where the coal was blasted and pushed over the edge of the mountain. [230] Many smaller operators went out of business because they didn't plan ahead for reclamation and couldn't afford to complete reclamation to appropriate standards (or didn't set reclamation as a priority). [231]

From 1977 to 1996, the number of producing coal mines diminished from 6,169 to 2,475 while total production doubled. [232] The more responsible operators viewed this as a benefit because the poor environmental standards reflected badly on the coal industry as a whole; and also because the companies that were operating without heeding environmental standards were cut-rate competition because they weren't paying the full costs related to mining. [233]

In practice, there are problems with permit blocking. Responsible parties can only be listed for permit blocking after an administrative adjudication has been finalized, and this process is often slowed by extensive lawsuits and appeals. [234] For example, Peabody, one of the biggest coal companies in the United States, has dozens of permit violations, but no administrative adjudication has been made.

Often the difficulty is in getting enforcement action. The Citizen's Coal Council cites an example of a person whose house was caving into a coal mine. He tried for eight years to get an inspector to the site and when the inspector finally did carry out a site investigation, there was no violation declared. [235]

➢ In the early years of the regulation, it was difficult to effectively track ***SMCRA*** violations across the country, so a company could cross to another state and start up operations, employ contract miners to assume liabilities, and form new corporations that were severely undercapitalised or concealing assets. [236] In 1981, environmental groups brought a lawsuit against the Secretary of the Interior alleging a systemic nationwide failure to enforce ***SMCRA.*** [237]

Subsequently, in the early 1990s, a computer clearinghouse system was developed (the Applicant Violations System or AVS), to link violation information from all 26 coal-mining states to one system. [238] The operator of the AVS estimates that at any given time there would be thousands of applicants who would be unable to get a permit until they cleared their outstanding violations. [239]

SMCRA has complete and thorough regulations for public participation, which help to ensure that the responsible state departments are enforcing the law. [240] These includes full public access to permit files in local offices, as well as payment of legal and expert witness fees if a litigation case is won by a citizen. In practice, however, paying up-front for litigation is an onerous cost for citizens, and in some cases, reimbursement of fees has been held back. [241]

Funding mechanisms for remediation of abandoned mines

- All coal mines pay the Abandoned Mine Lands reclamation tax (AML) at a rate of 35 cents per ton for surface mining and 15 cents per ton for underground operations. [242] The AML fund is used by the federal government to reclaim pre-1977 coal mines.

Annually, approximately 1 billion tons of coal are mined in the United States (about half each from surface and underground mining), which represents a contribution to the fund of $250 million per year . [243] In March 2000, the Office of Surface Mining estimated that it would cost $2. 5 billion to remediate the sites that threaten the public health and safety of coalfield citizens and that have mine acidic drainage problems and severe environmental hazards. As well, an additional $3. 6 billion would be required for watershed and general welfare problems in Pennsylvania alone. [244] Clearly the amount in the fund falls short of achieving full remediation of all the identified sites.

- The AML fund was set up because there was a general deficit at the federal level, and thus, no money available to address abandoned mine remediation. As a result, the AML was initially kept to pay the general debt rather than being used for its intended purpose of reclamation. [245] This set a precedent of inaction, and it was difficult to get the financial resources effectively spent on reclamation. [246]

The emergency response time for this fund has been more effective when implemented by the federal agency than by some of the state run operations,[247] but there are still challenges at the federal level. The federal Department of the Interior points to structural problems that do not allow for sufficient appropriations from the fund each year, which hinders the department's ability to act effectively. [248] These structural problems include a distribution formula which is not directly related to priority reclamation needs; a lack of mine inventory information; and, as mentioned above, the use of the fund for non-reclamation purposes. [249]

There is a provision whereby that 50% of the reclamation fees collected on Indian lands will be allocated annually to the Indian tribe having jurisdiction. [250] In practice, this has not been effectively implemented. [251]

- In 1995, the Office of Surface Mining contributed $1. 5 million towards starting the Appalachian Clean Streams Initiative. The program, which involves industry, government, researchers and communities, is a coordinated effort to eliminate acid mine drainage from coal mines. [252]

The program initially focused on the impacts of mine acidic drainage on four streams in Pennsylvania. Since 1996, AML funds have been eligible to be used for local share funds in application for the ***Clean Water Act***. [253] For example, in 1999, the OSM provided $750,000 in grants to not-for profit groups for clean up programs. [254] The ability to access AML funds has aided the funding of the Appalachian Clean Streams Initiative.

Superfund

As will be discussed below, the Superfund is a sectoral approach to polluter/beneficiary pays, whereby the oil and gas industry, along with the federal government, fund the clean-up of hazardous waste sites. A similar system could be implemented that would have mining companies contributing to a fund that would begin reclaiming abandoned mines sites.

Legislation, permitting requirements and regulatory authorities

- In 1980, the ***Comprehensive Environmental Response, Compensation and Liability Act*** (***CERCLA***), commonly known as the Superfund, was established to clean up hazardous waste sites in the United States. Under this law, the Environmental Protection Agency (EPA) identifies and investigates sites with hazardous emissions. The worst sites are placed on the National Priorities List (NPL) for emergency intervention and priority cleanup. [255]

Superfund sites are listed in CERCLIS, which is the database of hazardous waste sites of concern. There are currently 235 hard rock mine sites in the western United States that are listed as Superfund sites in CERCLIS. [256] Twenty-two of these sites also appear on the NPL, and in total, mining sites represent approximately 6% of all NPL sites. [257]

- Actions that are authorized under ***CERCLA*** include the short-term removal of wastes as well as longer-term remedial response. [258] There are also provisions that allow states or tribes with land management authorities to sue for damages for natural resources injury. [259]

- In 1986, the ***Superfund Amendments and Reauthorization Act (SARA***) added new enforcement and settlement tools. [260] ***SARA*** also required the EPA to revise the Hazard Ranking System to ensure it accurately assessed the relative degree of risk to human health and environment in determining the uncontrolled hazardous waste sites to be added to the NPL. [261]

Ensuring the security is adequate and can be used in a timely manner

- Under the response action provisions, EPA can order polluters to clean up contamination. [262] There are serious penalties (for example $75,000 per day of non-compliance) that give some weight to these regulations. [263] The ***CERCLA*** standards are among the most stringent in the USA,[264] and have proven to be act as an effective hammer to get companies to take responsibility for remediation. [265]

The threat of EPA intervention has aided both state governments and local activists to motivate companies to carry out remedial work. Consistency in EPA efforts, however, are sometimes lacking because there is often change-over of the EPA point people who are responsible for a large case load. [266] There are additional concerns such as the ability of EPA's to waive technical standards if they are not considered practicable for a site. [267]

- Occasionally, a state government has settled for clean up funds that are too low to pay for the work required. [268] For example, the State of Idaho settled for $4 million for the Silver Valley site, but the Coeur d'Alene tribe estimates real costs at $2 billion. [269] The Coeur d'Alene tribe is currently in court trying to get $1. 996 billion to cover the rest of the liability associated with this site. [270]

- There have been difficulties with EPA being able to access sufficient funds in a timely way and to respond quickly for remedial actions. [271] The Superfund has been criticized because the active remedial work can be slowed down by political and administrative processes. [272] For example, political opposition has been generated because litigation from major mining companies can hamper the EPA's ability to quickly respond and remediate a contaminated site. Companies have proven extremely effective at drawing everyone remotely involved at the site into the

court battles,[273] because this can be a more cost effective route for the company than contributing to remediation costs (e. g. , a company can fight $100 million liability with about $4 million in litigation costs). [274]

Contributions to sustainability

- The Spokane Tribe is challenging the ***CERCLA*** requirements to protect human health and safety. The tribe is arguing that the receptor population must be considered in this analysis. [275] For example, those with subsistence life style and culture connected to the land must be protected under a different set of criteria for risk analysis and exposure scenarios. [276] This approach will soon be adopted by the EPA. [277]

Funding mechanisms for remediation of abandoned mines and other sites

- The Superfund is funded from inputs and a targeted feedstock tax provided by 8-9 major oil and chemical companies (85%), and by US federal general revenues (15%). [278] An EPA study has shown that the list of potentially responsible parties is much broader than the few companies who contribute to the fund, and it has thus been criticized as a "deep pockets" approach that may not be fair to all companies. [279]

In the first five years, this payment system contributed $1. 6 billion to the trust fund to clean up abandoned or uncontrolled hazardous waste sites. [280]

- In 1986, ***SARA*** added a broad-based Corporate Environmental Tax to the fund, which increased the size of the trust fund to $8. 5 billion. [281]

The 3809 Regulations

The 3809 regulations have created new bonding requirements for mines on public lands. These requirements are more meaningful than what previously existed, but may be circumvented through the use of some types of securities (e. g. , blanket bonds).

It remains to be seen if the 3809 regulations will be implemented in a manner that addresses the guiding principles of polluter/beneficiary pays, sustainability, fairness and emergency response.

Legislation, permitting requirements and regulatory authorities

- The 3809 regulations govern hardrock mining, and its environmental impacts, on the publicly owned lands managed by the federal Bureau of Land Management (BLM). The 3809 regulations are an attempt to improve on a 1980 rule, which was written to ensure implementation of provisions to prevent degradation of public lands under the ***Federal Land Policy and Management Act*** (1976).

The new rule went into effect on January 20, 2001, but has since been revisited by the Bush government, which has proposed to revert to the old rule. This proposal, which was released in May, 2001, was subject to a 45-day public review and comment period. It is expected that a decision to will be made as to the fate of the 3809 regulations in July of this year. [282]

Acceptable forms of reclamation securities

Acceptable forms of security under the 3809 regulations include surety bonds; insurance; cash; irrevocable letters of credit; certificates of deposit; investment grade securities; US, state and municipal bonds; and BLM-sanctioned bond pools. [283] Corporate guarantees are not allowed. And the BLM can refuse state-sanctioned bonding mechanisms if they consider them insufficient to cover the costs of reclamation.

Blanket financial guarantees are allowed under the new regulations. These cover multiple operations of the same company (notice or plan-level). [284] There are concerns, however, that

the blanket bond mechanisms have not been effective in the past due to inadequate accrual of resources to cover all reclamation costs. [285]

Ensuring the security is adequate and can be used in a timely manner

- In the 3809 regulations, the BLM approves bonding amounts estimated by the company – and the BLM can reject the bond estimate if it is too low. [286] Public review of bond amounts takes place during National Environmental Policy Act (NEPA) review, but the BLM has acknowledged that the mine plan at that time of the review may not include the operator's bond estimate. [287]

- The 3809 regulations require an analysis that includes third-party costs to complete reclamation (including interim maintenance costs) and administration costs. [288] This applies to all mines except casual and grandfathered notice mines. [289] Also, the regulations have discretionary provisions for the BLM to require funds to cover long-term treatment.

- Bond payments can be made incrementally to correspond with the amount of work done at the mine and the costs associated with reclamation at any given time. [290]

- Under the 3809 regulations, the security amount must be periodically reviewed by the BLM to determine if it is still considered an adequate amount. [291]

Since the security only covers what the mine operator says will happen in its plan, a company cannot be required to cover costs associated with potential impacts to the environment (because these aren't part of any mine plan). [292] With periodic review of the bond amount, however, a company that has had violations should have their bond amount increased. [293]

- When the company finishes earth works, 60% of the bond is released. The remaining 40% is returned after revegetation and water quality monitoring results show compliance with permitted levels for one year. [294] There is a provision allowing public comment on the release of a bond.

Release of a financial guarantee does not release the operator from liability under the Comprehensive Environmental Response, Compensation and Liability Act (1980). [295]

- The BLM can initiate forfeiture of the financial guarantee when an operator has failed to carry out required reclamation or plan of operation, however the time required is not well defined in the regulation. [296] Once notified of forfeiture, a company may still obtain permission to have a surety or another party complete the reclamation. [297] In failing to do so, the BLM collects forfeited funds to implement the reclamation plan. [298] If the funds available are not enough to cover the reclamation costs, the BLM can recover the extra funds from the operators and mining claimants who retain liabilities associated with the site. [299]

Alaska State Bonding Pool

The following section focuses on a particular mechanism, the Alaska State Bonding Pool, as an example how one state attempts to ensure that there is funding available to remediate all new mines sites.

The Alaska State Bonding Pool was created in 1990, as a mechanism for covering the reclamation costs associated with hard rock and placers mines that have not been paid by the mining company (despite the Department of Natural Resource's (DNR) reasonable efforts to recover the costs). [300]

Another idea behind the creation of the bonding pool was that it would support small-scale mining companies by allowing them access to a larger pool of money if it is needed to complete their reclamation. [301]

As will be outlined below, the Alaska State Bonding Pool does not appear to be a successful mechanism for generating adequate funds for the reclamation of new mines, let alone for addressing the legacy of abandoned mines.

Acceptable forms of security

- In Alaska, mining companies are given the choice of : 1) contributing to the statewide bonding pool; 2) posting a bond (in the form of a corporate surety bond or a personal bond accompanied by a letter of credit, certificate of deposit, or deposit of cash or gold) with the commissioner to ensure complete compliance with the approved reclamation plan; 3) posting a bond with another government agency; or 4) posting a general performance bond with an amount not less than $750 per acre. [302]

To participate in the bonding pool, mining companies make annually payments equal to 15% of the total bond amount (determined by the regulation). As well, the companies pay an annual non-refundable fee that equal 5% of the total bond amount for that year. [303] No reclamation plan is approved until the fees have been paid. [304]

- The Department of Environmental Conservation can require additional bonds for the deposition of solid waste (tailings, waste rock etc.).

Ensuring the security is adequate and can be used in a timely manner

- The Alaska State Bonding Pool does not generate a large enough fund to cover the cost of reclamation of all mines that contribute to the pool.

The non-refundable amount added to the bonding pool each year is only $37. 50 per unreclaimed acre. [305] The problem with this approach is that there will never be enough in this fund to cover all the reclamation costs of all the mines because the mine operators have not been required to put sufficient amounts in to the fund in the first place. [306]

The total funds available in the Alaska State Bonding Pool have been increasing over the past five years, but these funds currently only amount to $500,000. [307] Clearly, if the Red Dog mine, or any other hard rock mine associated with the bonding pool, were to go bankrupt, the cost of rehabilitating the mine would far exceed the entire amount of total funds available in the pool. [308]

- As mentioned above, companies contribute 15% of their total bond amount to the bonding pool. When the Alaska State Bonding Pool was originally set up, most of the mining in Alaska was placer mining and the total bond requirement of $750/acre reflected was based on cost estimates of the day for reclaiming the land impacted by placer mining. [309] The bonding pool has been used since then for hard rock mines as well as placer.

It has been estimated that the cost of reclaiming hard rock mines in the western United States covers a wide range from less than $1,000 to more than $50,000 per acre. [310] It is clear that the flat rate of $750 per acre is not always an appropriate bond amount.

- Some of the Alaskan hard rock mines are calculating bonds at $2,000 per acre. [311] The Fort Knox mine has chosen to exempt itself from the bonding pool and has posted a $6 million bond, which is substantially more than would have been required if they were participating in the bonding pool. The $6 million is not, however, sufficient to cover the costs of a third party undertaking the work if the mine operators are unable to accomplish the reclamation. [312]

- A bond is released after reclamation is completed in accordance with the reclamation plan. If reclamation is unsatisfactory, the company or individual miner remains liable for additional reclamation costs. [313]

- Violations of the reclamation plan result in the bonding pool deposit becoming non-refundable,[314] and a reclamation assessment fee is applied to non-compliant operations each year until they have two consecutive years in complete compliance. [315]

- Alaskan placer mines that are on federal lands are regulated by the Bureau of Land Management (BLM). The BLM has entered into a Memorandum of Understanding to use the Alaska State Bonding Pool for these mines. The administration and permitting is handled by DNR. [316]

In practice, BLM has had difficulty accessing funds from the bonding pool where placers mines that have forfeited their reclamation obligations and the BLM is trying to take over the closure operations. [317] It is likely that the US attorney general would have to take up litigation with the small operator to get the funds released from the pool, which would seem like a bullying tactic. [318] Not surprisingly, there has been little support from BLM management to go this route. [319] This barrier to accessing funds is problematic, as it may prevent the BLM from carrying out adequate emergency response at placer mines. [320]

If a hard rock mining company associated with the bonding pool were to walk away from its obligations, the bonding pool money can be more easily accessed for emergency response. [321]

Funding mechanisms for remediation of abandoned mines

- In Alaska, the Abandoned Mine Land (AML) Program has been more effective than the State Bonding Pool for cleaning up abandoned mines. [322] The Alaska AML program is funded by a fee of $100 per claim for any company with more than 10 claims. The program has also received funds from the Clean Water Action Plan. [323]

In 2001, the Clean Water Action Plan will devote $32 million to help address water quality problems from abandoned mines across the United States. [324]
To use this funding, though, the BLM has to first try and determine a responsible party. If no responsible party can be found, then the fund may be used for remediation. [325] If it is unknown whether or not a responsible party exists, the site can be cleaned up and if the responsible party is later found a cost recovery process can be employed . [326]

Mining Taxes in Montana and South Dakota

Contributions to sustainability

- Montana has a policy to "indemnify its citizens for loss of long-term value resulting from the depletion of its mineral resource base and for environmental damage caused by mineral development."[327]

This policy of indemnification is achieved by a permanent Resource Indemnity Trust Fund, as required by Article IX, Section 2, of the Montana constitution. [328]

The fund is generated through a tax on resource extraction, and is used by public agencies in their efforts to protect and restore the environment from damages resulting from mineral development. It is also used to support a variety of development programs that benefit the economy of the state and the lives of Montana citizens. [329] The Resource Indemnity Trust Fund has been effective in cleaning up mine sites, but in recent years some of the finances intended

for this fund have been taken back into general revenue instead of being ear marked specifically for reclamation. [330]

- The Montana Legislature has also established a Renewable Resource Grant and Loan Program to enhance Montana's renewable resources. [331] The program is funded by interest accrued on the Resource Indemnity Trust Fund. Water-related projects are provided with grants or loans, and these have included assessment studies and reclamation plans and efforts. [332] The program is administered by the Resource Development Bureau of the Department of Natural Resources and Conservation (DNRC), and applicants can be private individual or government entities. [333]

Funding mechanisms for remediation of abandoned mines

- In South Dakota, a fee of 2 cents per pound of cyanide has been used to establish a Mining Inventory Fund. This fee was levied for a limited time and the fund is being used to conduct an inventory of abandoned mines in the Black Hills.

United Kingdom

Funding mechanisms for remediation of abandoned mines

In the United Kingdom, there are a variety of programs that fund the clean up of abandoned mine sites:

- Derelict Land Grants are used to reclaim abandoned mine sites. The funds available are not sufficient to address the need because other industries draw on the same fund.

- The UK uses the term "brownfield sites" for contaminated sites, and many of these are abandoned mine sites. Since the late 1980's, the UK government has been promoting the redevelopment of mine sites through the provision of grant aid. [334] The ***Environment Act*** (1995) contains provisions for identification and remediation of contaminated sites in the UK. This act imposes a duty on local authorities to inspect and verify contaminated land. The ***Act*** aims for the "polluter pay" principle, but in reality it is often difficult to identify the responsible party. [335]

- The European Commission for Remedying Environmental Damage reviewed joint compensation mechanisms and recommended that funds be set up with contributions from the economic sectors most closely associated with the type of damage to be prevented and remediated. [336]

- The UK instituted a Landfill Tax (1996), which taxes inactive wastes (equivalent $5/ tonne) and active wastes (equivalent $18/tonne) to fund an Environmental Trust for remediation (20% of over $1 billion equivalent per year goes to this fund)

- The National Groundwork Trust was established in 1981 to work with local governments, business leaders and community groups for economic, social and environmental regeneration. [337] This program is funded by private sponsorships (for example Barclays Bank) and from the central government (equivalent $8 million). [338] The agency works on long-term regeneration projects, contaminated land clean-up, and provides financial planning and training for local communities. [339] One specific program, called ***Changing Places***, focused on derelict lands left following the demise of the coal mining industry. The total budget, which includes additional funds from the Millennium Commission, is equivalent to $120 million. [340]

Sweden

Funding mechanisms for remediation of abandoned mines

- In 1994, it was estimated that 20% of the abandoned contaminated sites in Sweden were from the metals sector. [341]

- In Sweden, companies developing new mines are required to reclaim old mines in the area where they are undertaking development. [342]

- Provisions for environmental damage insurance are contained in the 1989 amendments to the Swedish ***Environmental Protection Act.*** [343] This regulation includes an ordinance requiring payment to a government administered environmental damage insurance fund to be used to clean up environmental problems where no liable party is available. [344]

- Sweden has an Environmental Code (1999) that applies to mining operations. [345] The Environmental Code describes criteria to promote sustainability and environmental protection. A series of principles are outlined in the Code:
  - Precautionary measures- including polluter pays and the precautionary principle - to ensure that the health of the environment is not harmed;
  - Use of best available technology;
  - The knowledge required to determine the environmental effects that may result from an operation must be acquired by the proponent before the operation is carried out;
  - Localization - describes criteria that must be respected in regard to environmental disturbances, land and water use in choice of sites;
  - Eco-cycle resource management - requires that measures be taken to conserve raw materials and energy, to use renewable energy, and to create opportunities for re-use and re-cycling;
  - Product choice based on replacing products which are harmful to human and environmental health due to their method of development ,use or disposal. It also states that some products are too hazardous to allow under any circumstances.
  - Reasonableness- balances the benefits of the precautionary principle with expense and with neglect of environmental quality;
  - The polluter is liable to remedy damages, no matter if the operation has been discontinued or the ownership transferred;
  - The Stop Rule - recognizes that an operation meeting all the Code criteria may still be unacceptable. [346]

Under this code, everyone who conducts an environmentally hazardous activity, including mine operators, must pay an annual charge for environmental damage insurance and clean up insurance. [347] Compensation is paid to those suffering personal injury or property damage if the responsible party is unknown or unable to pay. [348] Compensation is also paid to the State for abandoned mine site clean up expenses when the responsible party cannot pay. [349]

PART 4: OTHER INDUSTRIES

Forestry in the Tongass National Forest

In the United States, the General Accounting Office (GAO) reports on the distribution of timber sale receipts across the country. The GAO tallies all subsidies, charges, total receipts, purchaser road credits, salvage sale, interest, penalties, associated charges, attributable payments to states, preparation and administration outlays, program costs for the forestry industry in each national forest. [350]

By these books, forestry in the Tongass National Forest in Alaska lost more than $69 million (US) between 1995-1997. [351] The Department of the Interior has announced that in Region 10, where the Tongass is located, no timber sales shall be advertised if the indicated rate of harvest results in a deficit (when appraised under the transaction evidence appraisal system using domestic Alaska values for western cedar). [352]

The accounts for subsidies to the mining industry and administrative costs related to mineral development have not been tracked in a transparent way in Canada (or other jurisdictions). Setting up regional accounting mechanisms similar to the General Accounting Office in the United States may help to determine the types of deficits and surpluses associated with mining that are currently difficult to review.

Golden Carrot

American utilities sponsored the Golden Carrot program to provide incentives for design and development of energy efficient refrigerators. This program was initiated, in part, as a result of new regulations that required higher efficiency standards. The Golden Carrot offered a $30-million reward to the manufacturer that could produce a refrigerator meeting specific efficiency goals. [353]

There is potential to provide a similar approach using incentives and criteria to initiate the development of progressive technologies for better resource management and remediation of mine sites.

Recycling Initiatives

Recycling initiatives offer examples of a wide range of consumer-based fees designed to provide incentives and funds for recycling programs.

- For example, any beverage container brought into the Yukon has a fee for recycling. Each aluminum can has a 10 cent deposit paid by the consumer, and for each can brought into the recycling centre a refund of 5 cents is given. The remaining 5 cents is divided as follows: 2 cents go to the recycling center; 2 cents go toward the costs of shipping the recyclable materials to recycling plants outside the territory; and 1 cent goes to the Renewable Resources department of the Yukon government. The deposit for cans that are not recycled remain in the general fund. [354]

- In British Columbia and Alberta, a tire tax is charged to cover the safe collection and storage of used tires. Businesses that dispose of or reuse old tires can access the fund to subsidize their operations. [355] Similarly, in Alberta oil filters and oil cans have a deposit to help pay for their recycling.

- Also in Alberta, dairy producers contribute voluntarily to a fund designed to ensure the recycling of milk jugs. [356] A similar industry driven voluntary effort is a levy on paint sales, which is paid by hardware stores and paint producers in British Columbia. The levy goes toward a recycling and disposal fund.

Consumer-based fees could be attached to certain products and the fund generated could be applied directly to the remediation of mines related to the specific products.

Stumpage Fees for Reforestation

In forestry, stumpage fees are paid to cover the costs of administration. In the Yukon, stumpage fees are calculated at $2. 62 per cubic metre, and there is an additional $5 reforestation charge. The fees are too low to cover the costs. In fact, nowhere in North America are the full costs of administration covered by stumpage fees. [357]

A "tonnage fee" could be applied to mining specifically to cover expenses of administration and enforcement.

Oil and Gas Development Funds

In the 1970's, Alaska and Alberta set up funds to invest resource rents and use the dividends to address sustainability concerns and fairness in profit sharing with oil and gas development.

- In Alaska, the Permanent Fund dividend is paid out annually to every resident of the state. The Alaska state constitution requires that 25% of the state's share of oil field profits is contributed to the Permanent Fund. The remaining portion of the royalty finances state government activities. For newer oil fields (since 1980), 50% of the royalties collected are contributed to the Fund. However, a bill has just passed the House State Affairs Committee (March 13, 2001) which decreases the required contribution to the Permanent Fund once again to 25% of royalties collected. [358] The amount in the Fund is now approximately $2. 2 billion.

- In Alberta, the Heritage Savings Trust Fund is used to reduce Alberta taxes and invest in Alberta-based projects to strengthen and diversify the province's economy. The Alberta Heritage Savings Trust Fund was created in 1976 as a means of saving a portion of revenues received from non-renewable resource industries (i. e. , oil and gas). The fund grew to a sum of $12. 7 billion in 1987. Prior to 1982, the fund kept its investment income as well. Annually until 1995, the fund paid the expenditures of the Capital Projects Division. [359] On January 1, 1997, the Heritage Fund was restructured in response to public review. The review resulted in a new governance structure, clearer investment objectives and performance measures. [360]

Funds could be set up to invest resource rents from mining and use the dividends to address sustainability concerns and fairness in profit sharing.

Oil Spill Liability Trust Fund

The United States Coast Guard's National Pollution Funds Center oversees the Oil Spill Liability Trust Fund. [361] Under the ***Oil Pollution Act***, 1990, the owner or operator of a facility from which oil is discharged is liable for the costs associated with contaminants clean up and any damages related to the spill. The Environmental Protection Agency first tries to ensure that the responsible party pays for the clean up. The trust fund, however, pays the costs when the responsible party is unknown or cannot pay. [362]

The primary source of revenue for the fund is a five-cent-per-barrel fee on imported and domestic oil. Collection of this fee ceased on December 31, 1994 due to a “sunset” provision in the law. Other revenue sources for the fund include interest on the fund, cost recovery from the responsible parties, and any fines or civil penalties collected. [363]

The fund can provide up to $1 billion for any single oil pollution incident, including up to $500 million for the initiation of natural resource damage assessments and claims. [364]

Revenue could be generated for mine remediation in this way if a fee was levied per tonne of ore or concentrate shipped across borders (within Canada and abroad). Funds could be used for alternative local economic development,. The fund could also be used for environmental remediation.

Workers Compensation Board

The Workers Compensation Board is set up so that employers collectively fund the system. In return, they are protected from legal suits from workers and employers covered under the ***Workers Compensation Act***. Employers have the responsibility of making the working environment safe for workers. There is a system that assesses risk categories based on of type of work, and a company is charged fees based on the associated risk. Rates can be altered depending on occurrence of accidents.

PART 5: CONCLUSIONS AND RECOMMENDATIONS:

The following are a set of conclusion and recommendations derived from this preliminary study. Based on the guiding principles of polluter/beneficiary pays, sustainability, fairness and emergency response, the major conclusions are presented according to the following categories:

1. prevention
2. remediation
3. planning for the future

Prevention

Mechanisms for preventing the abandonment of mine sites should be drawn from a combination of incentives, regulations, monitoring, enforcement and penalties. To ensure that remediation and closure responsibilities are fulfilled by each company, in a timely manner, the following should be considered:

1. Key to the prevention of abandoned mines is assuring that funds sufficient to cover the full costs of clean-up (and any long-term monitoring, care and maintenance) are set aside in a security before the mine is developed.

2. Bond sums must be easy to access in the event that a mine goes bankrupt, or becomes insolvent. "Hard" securities are the preferred form. Therefore, types of securities such as bearer bonds, parent company guarantee, captive insurance, surety, self-assurance and other less certain forms of financial backing, should not be accepted, particularly where there are long-term water quality, ecological and/or health impacts.

3. Public access to, and a full process for the public review of, bonding calculations is crucial to ensure that securities will adequately cover the required remediation work. As well, there should be frequent reports available to the public on the status of securities and liabilities.

4. The full costs of clean-up and remediation must be based on the costs of having a third-party carry out the remediation. Furthermore, calculations must include administration costs. The requirements will provide an incentive for a company to complete its own reclamation work because it can do so less expensively than a third party. At the successful conclusion of mine site remediation, the company would be refunded the remaining funds.

5. Concurrent reclamation practices are less expensive in the long term because remediation work can be carried out as part of regular mine operations – using on-site equipment, workers (trained personnel and supervision), power, communications, and staff support. [365] As well, the company will be able to draw on knowledge of on-site technical issues and experiences, which will greatly aid in the reclamation planning process. As a result of reduced remediation costs, more of the bond can be returned to the operator upon completion of remediation. It also means that overall environmental impact can be minimized.

6. Clearly defined time frames and responsibilities for reclamation in the closure plan, such as those outlined in regulations like ***SMCRA***, provide a point of entrance to require and enforce the completion of remediation work to proper standards. As well, it makes clear when the company has abdicated its responsibility for reclamation, and sets out the moment at which government can seize securities and other assets in order to undertake the work.

7. Sinking funds and revolving funds can be used to augment the sums provided in the up front bonds. Fees can be paid per tonne or ounce produced, and can be calculated to provide a

certain amount at a certain time in the mine life. This could be effectively used to pay for concurrent reclamation.

8. Incentives could be provided, through bonding and taxation systems, for a company to continue to mine lower grade ores toward the end of the mine life. This would improve the mineral efficiency of a mine, and could encourage better mixing of low- and high-grade ore from the start of production (which would help to maintain a more consistent feedstock and increase the duration of the mine operating life). It could also reduce the incidence of high-grading, which tends to lead to earlier abandonment of properties than estimated in mine development plans. The requirement to mine until all the resource is depleted could promote innovation for the design and development of progressive techniques for mining, milling, waste management and reclamation.

9. Fees could be paid based on the release of substances listed on the National Pollutant Release Inventory, the use of cyanide (as in South Dakota, 2 cents per pound) or ANFO, or the calculation of per acre of land disturbed/reclaimed. This could provide incentives for minimizing the use of toxic chemicals (while increasing chemical recycling and promoting closed-loop systems), or for minimizing land disturbance.

10. It is important to prevent the impacts of boom-and-bust economies by planning for a change to alternative revenue sources once a non-renewable resource is depleted. For oil and gas development, funds such as the Alaska State Permanent Fund and The Alberta Heritage Savings Trust Fund invest resource rents and use the dividends to address sustainability and profit sharing concerns that arise with the use of non-renewable resources. Hard rock mining development should follow their lead.

11. Mining affects communities in a variety of ways (e. g. , through degradation of the ecosystem, water and air quality; and changes in social systems and subsistence activities, etc.). Funds similar to the Mining Reserve Fund set up under the ***Manitoba Tax Act***, should be created in other jurisdictions. Communities affected by mining should have direct access to these funds to address their locally identified priority concerns. These funds should be available at any time during the mine life (exploration through post-closure), as deemed appropriate by the affected community.

12. Guiding principles for the remediation of abandoned mines should be enshrined in law. Regulations must be clear in their statement of bonding and reclamation requirements and time frames.

13. Adequate resources for enforcement, and effective delegation of monitoring and assessment responsibilities among departments must be in place to ensure that mine developments are proceeding according to their plans. In the long term, proper management of mine operations keeps closure costs reasonable. As on-site problems go unchecked, challenges for remedial action escalate in difficulty and costs required to remedy the problems at hand.

14. Policies should be developed to address issues of economic rent and royalties. To date, the Canadian public has borne the cost of mining remediation and administration instead of being paid for the loss of the minerals and other uses of the land and water resources.

15. Enforceable penalties with substantial repercussions for non-compliance are important to ensure that responsible action will be cheaper and easier for a mine operator than irresponsible practices. ***CERCLA*** has fines up to $75,000 per day of non-compliance for a mine that has been ordered to clean up a source of contamination. ***SMCRA*** has clearly defined performance standards and the permit blocking provisions wherein responsible parties who have had serious violations of ***SMCRA*** are listed in the Applicant Violator system. Violators are not

allowed permits for new operations until they have proven that their problems have been mitigated. These regulations have been effective at encouraging responsible behaviour, and have taken privileges away from those who have a proven bad track record.

Remediation

The costs of remediating existing abandoned mines sites in Canada will be enormous. Funding will have to come from a variety of sources such as mining sectoral funds, fees, taxes, penalties, fines, cost recovery, etc. Initially, government funds will continue to be required. But every effort should be made to ensure that the mining industry bears responsibility for replenishing these funds in the long term.

A mining sectoral fund for reclamation and remediation of abandoned mine sites can be generated from a mixed fund composed of programs similar to the following:

1. Taxes calculated on a per tonne basis could generate substantial sums. This approach is used for abandoned coal mine reclamation under ***SMCRA*** (35 cents per ton for surface and 15 cents per ton for underground); as well as abandoned quarries (10 cents per tonne in Manitoba and 6 cents per tonne in Ontario).
2. "Deep-pockets" taxes that target inputs and feedstock from major oil and chemical companies have been used under ***CERCLA*** to fund the Superfund.
3. Non-refundable contributions (calculated annually as a percentage of the overall security estimate, or calculated on a rate per unreclaimed acre), such as those in the Alaska State Bonding Pool. Could be required. Unfortunately, the Alaska pool does not require a high enough rate to accrue a significant fund: only 5% of the total bond amount for that year, $37. 50 per unreclaimed acre.
4. The National Groundwork Trust in the United Kingdom enables programs to sponsor financial planning and training for communities where mining is no longer viable, along with long-term regeneration and clean up of contaminated lands. Part of the funding for this comes from private sponsorships (such as Barclays Bank).
5. Environmental damage insurance and clean up insurance are required in Sweden for environmentally hazardous activities. This insurance compensates individuals for injury, as well as the state for clean-up expenses.
6. In the US a proposed National Environmental Trust Fund would generate $53 billion over 10 years and be funded by a 2% surcharge on commercial liability insurance.
7. The Oil Spill Liability Trust Fund managed by EPA in the United States is used as a back-up when cost-recovery is not successful.
8. Provisions for joint and several liability, such as those in the ***British Columbia Waste Management Act***, are effective as a means to hold former owners of a mine site accountable.

Planning for the Future

To ensure a sustainable future that includes mining, fundamental changes in the way the mining business is currently out in Canada have to take place. We recommend the following:

1. Legislation be enacted to establish a hard rock mining reclamation fund that will derive its finances from a variety of sources, such as those described aove.

2. Expenditures from the fund should be based on a transparent nation-wide inventory and hazard ranking system, informed by a public process.

3. Public accounts should reflect all public income derived frommines including royalties, taxation and fees on the same ledger as public costs, including infrastructure development and

reclamation. Accounting practices of the General Accounting Office in the United States for forestry operations in national forests do this and it enables sounder business decisions when public financial resources are to be invested. If such a system of accounts were implemented for mining, it might become clear that a special reclamation fee or tax should be implemented.

4. Subsidies to mining and mines should be openly and transparently reported to the public, on a regional and jurisdictional basis.

5. Incentives to the mining industry and others - similar to the Golden Carrot program - to innovate technologies and programs for remediation of sites and the management of resources in a holistic sustainable development approach should be introduced.

6. The use of “Tonnage fees” - similar to stumpage fees in forestry - to pay for administration, environmental assessment, and enforcement of mining development - should be investigated.

7. Consumer-based fees should be considered. Such a program could tie the use of metals of greatest concern for environmental and health impacts to their final product. The program could also drive mineral efficiency by encouraging research and development for metals re-use and re-cycling.

GLOSSARY

Abandoned Mine: A mine for which the party or parties responsible for contamination cannot be found or are unwilling or financially unable to carry out necessary remedial measures within a satisfactory time frame. Also called Orphaned Mine.

Abandonment: Controlling party giving up rights to property voluntarily.

Acid Mine Drainage: See Mine Acidic Drainage.

Acid Rock Drainage: See Mine Acidic Drainage.

Accrual bond :A bond on which interest accrues but is not paid to the investor during the time of accrual. The amount of accrued interest is added to the remaining principal of the bond and is paid at maturity.

Accrued Liability: A liability which has been incurred but not yet paid. For example, if mortgage interest is to be paid annually on February 1, 11 months of interest would have accrued by January 1 although the cash payment is not yet due.

Agency securities: Securities issued by federally related institutions and U. S. government-sponsored entities. Such agencies were created to reduce borrowing costs for certain sectors of the economy, such as agriculture.

Asset: Any item that is long-lived, purchased for the service it renders over its life and for what one will receive when one sells it. Something that you own. For a person, assets can be financial, like money, stocks, bonds, bank accounts, and government securities, or they can be physical things, like cars, boats, houses, clothes, food, and land. The important assets for our economy are the output we have produced and the resources, capital, and natural resources used to produce that output.

Assurance: Insurance, the act of insuring, or assuring, against loss or damage by a contingent event; a contract whereby, for a stipulated consideration, called premium, one party undertakes to indemnify or guarantee another against loss by certain specified risks, a binding commitment to do or give or refrain from something

Bearer bond: Bonds that are not registered on the books of the issuer. Such bonds are held in physical form by the owner, who receives interest payments by physically detaching coupons from the bond certificate and delivering them to the paying agent.

Bearer form: Describes issue form of security not registered on the issuing corporation's books, and therefore payable to its bearer.

Bearer share :Security not registered on the books of the issuing corporation and thus payable to possessor of the shares. Negotiable without endorsement and transferred by delivery, thus avoiding some of the control associated with ordinary shares. Dividends are payable upon presentation of dividend coupons, which are dated or numbered. Applies mainly to international equities.

Bond: Bonds are debt and are issued for a period of more than one year. The federal government, local governments, water districts, companies and many other types of institutions sell bonds. When an investor buys bonds, he or she is lending money. The seller of the bond agrees to repay the principal amount of the loan at a specified time. Interest-bearing bonds pay interest periodically.

Bond agreement :A contract for privately placed debt.

Bond anticipation note (BAN) :A short-term debt instrument issued by a state or municipality to borrow against the proceeds of an upcoming bond issue.

Bond covenant :A contractual provision in a bond indenture. A positive covenant requires certain actions, and a negative covenant limits certain actions.

Bond discount :The difference by which a bond's market price is lower than its face value. The antithesis of a bond premium, which prevails when the market price of a bond is higher than its face value. See: Original issue discount.

Bond fund : A mutual fund that emphasizes income—consistent with risk, rather than growth—by investing in corporate, municipal, or government debt obligations, or some combination of them.

Bond indenture: Contract that sets forth the promises of a corporate bond issuer and the rights of investors.

Bond indexing :Designing a bond portfolio so that its performance will match the performance of some bond index.

Bond power : A form used in the transfer of registered bonds from one owner to a different owner.

Bond rating: A rating based on the possibility of default by a bond issuer. The ratings range from AAA (highly unlikely to default) to D (in default).

Capital: As used in capital assets, capital investments, capital improvements; to describe money (owned or borrowed) invested in anticipation of a return.

Capital gain : The increase in the value of an asset between the time it is purchased and the time it is sold. When a stock is sold for a profit, the capital gain is the difference between the net sales price of the securities and their net cost, or original basis. If a stock is sold below cost, the difference is a capital loss.

Capital gains distribution : A distribution to the shareholders of a mutual fund out of profits from selling stocks or bonds, that is subject to capital gains taxes for the shareholders.

Capital gains tax :The tax levied on profits from the sale of capital assets. A long-term capital gain, which is achieved once an asset is held for at least 12 months, is taxed at a maximum rate of 20% (taxpayers in 28% tax bracket) and 10% (taxpayers in 15% tax bracket). Assets held for less than 12 months are taxed at regular income tax levels, and, since January 1, 2000, assets held for at least five years are taxed at 18% and 8%.

Captive finance company : A company, usually a subsidiary that is wholly owned, whose main function is financing consumer purchases from the parent company.
captive insurance

Cash Flow : Actual cash coming into or going out of the business.
government bond

Contingent Liability : A liability or debt incurred only if some specific event should occur, such as the sale of an asset or business.

Equity: The part of an asset or an entire business own ed outright by the operator. For example, equity in a business is the value of the business less the amount owed. Sometimes expressed as percent of ownership.

Fixed Costs: Expenses that do not vary with level of production, such as depredation and personal property taxes. For example, personal property taxes are the same on a tractor, regardless of whether that tractor is used on 1 acre or 300 acres, or is not used at all.

Fully Closed and Remediated: Refers to a mine site where all re-contouring and site stabilization work, revegetation and other remediation practices have been completed for all disturbances and wastes generated by the mine such that it is returned to its previous ecological productivity and there remains no long term liability concerns or requirement for water monitoring and treatment. Funds have been provided to look after monitoring and maintenance of dams, and water and engineered covers over tailings in the long term.

Government securities: interest-bearing debts of the federal government in the form of Treasury bills, Treasury notes, and Treasury bonds. Financial instruments used by the federal government to borrow money. Government securities are issued to cover the federal government's budget deficit.

Guarantee: The assumption of responsibility for payment of a debt or performance of some obligation if the liable party fails to perform to expectations.

Guarantee letter: A commercial bank's letter assuring payment of the exercise price of a client's put option.

Guaranteed bond: A type of bond for which a firm other than the issuer guarantees its interest and principal payments.

Guaranteed replacement cost coverage insurance: A policy that covers the full cost of replacing damaged property without any allowances or deductions, e. g. , depreciation.

Hard currency: A freely convertible currency that is not expected to depreciate in value in the foreseeable future.

Hard dollars: Actual separate payments made by a customer for services, including research, provided by a brokerage firm. Antithesis of soft dollars.

Indemnify: Used in insurance policy agreements as to compensation for damage or loss. Hold harmless.

Hypothecation: The commitment of securities to serve as collateral for margin loans at the broker-dealer firm.

Indenture: Agreement between lender and borrower that details specific terms of the bond issuance. Specifies legal obligations of bond issuer and rights of bondholders. An indenture spells out the specific terms of a bond, as well as the rights and responsibilities of both the issuer of the security and the holder.

Instruments: Financial securities, such as money market instruments or capital market instruments.

Insurable interest: An insurance term referring to the relationship between a policy's insured person or property and the potential beneficiary. The beneficiary must have an insurable interest in the insured person or property to receive payment of the policy if the insured died while the policy was in force.

Insurance: Guarding against property loss or damage making payments in the form of premiums to an insurance company, which pays an agreed-upon sum to the insured in the event of loss.

Investment certificates: A certificate is a formal declaration of a fact, such as a stock certificate, CD, certificate of incorporation, or mortgage-backed security.

Letter of credit : A document issued by a bank which guarantees the payment of a customer's drafts for a specified period and up to a specified amount. see also credit.

Letter of intent : A letter from one company to another acknowledging a willingness and ability to do business. see also letter security.

Letter security: A security sold directly by the issuer to an investor, without SEC registration. Can be done only if the buyer signs and sends a letter of intent to the SEC, indicating that the purchase is for investment rather than resale.

Leverage: Use of borrowed funds as supplemental equity capital. The leverage ratio measures the degree to which borrowed capital exceeds net worth.

Liability: A debt or obligation expressed in terms of money.

Marginal Costs: Marginal cost is a concept related to the production function and related cost curves, and represents the additional cost of one additional unit of output. Marginal cost is defined as a change in total cost divided by a related change in output.

Marginal Revenue: Marginal revenue is a concept related to the production function. It is defined as the additional revenue generated by an additional unit of output, i. e. , change in total revenue divided by change in output. In most agricultural commodities, an individual farmer or rancher cannot affect price; therefore, marginal revenue is the unit price of the output.

Mine Acidic Drainage: Describes the metal leaching and acidic drainage which is produced when sulfur bearing mine waste rock, tailings and exposed rock contact air and water. Also commonly termed Acid Rock Drainage (ARD) and Acid Mine Drainage (AMD).

Municipal bond: State or local governments offer muni bonds or municipals, as they are called, to pay for special projects such as highways or sewers. The interest that investors receive is exempt from some income taxes.

Municipal bond insurance: An insurance policy which guarantees payment on municipal bonds in the event of default .

Municipal bond fund: A mutual fund that invests in tax-exempt bonds issued by state, city, and/or local governments. The interest obtained from these bonds is passed through to shareholders and is generally free of federal (and sometimes state and local) income taxes.

Opportunity Cost : Cost of using a resource in one enterprise when it could be used in alternative enterprises or investment opportunities. This is measured in terms of the return that would be obtained from using the resource in the alternative investment. For example, if cash used to buy inputs for production of a crop could also be invested at a 10% rate of interest, the opportunity cost of cash to the crop would be 10%.

Orphaned Mine: A mine for which the party or parties responsible for contamination cannot be found or are unwilling or financially unable to carry out necessary remedial measures within a satisfactory time frame. Also called Abandoned Mine.

Parent company: A company that controls subsidiaries through its ownership of voting stock, as well as runs its own business.

Performance bond: A surety bond between two parties, insuring one party against loss if the terms of a contract are not fulfilled.

Performance evaluation: The assessment of a manager's results, which involves, first, determining whether the money manager added value by outperforming the established benchmark (performance measurement) and, second, determining how the money manager achieved the calculated return (performance attribution analysis).

Performance fund: A growth-oriented mutual fund investing in growth stock and performance stock with low dividends and high risk.

Permanent financing: Long-term financing using either debt or equity.

Perpetual bond: Non-redeemable bond with no maturity date that pays regular interest rates indefinitely.

Perpetuity: A constant stream of identical cash flows without end.

Pledging: See Hypothecation

Present Value: An estimate of today's value of money that will be received or spent at some future date.

Rate of Return on Investment : Net operating profit divided by the total machinery, equipment and land investment. It measures profitability of assets in percentage terms.

Reclamation: Ecosystem structure and function is replaced after land disturbance, this more closely approaches restoration with better re-introduction of native species diversity and complexity of the original system

Remediation: Mitigation of water quality and land impacts for the long term.

Rent : A contractual (verbal or written) obligation to use some asset belonging to another individual for a specified time period and for a specified fee. Only a fine distinction exists between a rental agreement and a lease. Seldom will a rental agreement contain a clause for eventual purchase. Under most rental agreements, repair and maintenance costs are borne by the owner.

Revenue bond : A bond issued by a municipality to finance either a project or an enterprise in which the issuer pledges to the bondholders the revenues generated by the operation of the projects financed. Examples are hospital revenue bonds and sewer revenue bonds.

Revenue fund : A fund accounting for all revenues from an enterprise financed by a municipal revenue bond.

Revolving credit agreement: A legal commitment in which a bank promises to lend a customer up to a specified maximum amount during a specified period.

Revolving line of credit : A bank line of credit on which the customer pays a commitment fee and can take and repay funds at will. Normally a revolving LOC involves a firm commitment from the bank for a period of several years.

Royalty: Payment for the right to use intellectual property or natural resources.

Security: Piece of paper that proves ownership of stocks, bonds, and other investments.

Self-assurance, ***Self insurance***: Establishing reserves for future losses instead of purchasing insurance or posting bonds.

Self-Regulatory Organization (SRO): Non-government organization which has statutory responsibility to regulate its own members through the adoption and enforcement of rules of conduct for fair, ethical and efficient practices. Examples include NASD and the national securities and commodities exchanges.

Self-supporting bond : Bond sold to finance a project whose revenues will be used to pay off the obligation. see also revenue bond.

Sinker: A bond with interest and principal payments coming from the proceeds of a sinking fund.

Sinking fund: A fund to which money is added on a regular basis that is used to ensure investor confidence that promised payments will be made and that is used to redeem debt securities.

Sinking fund requirement: A condition included in some corporate bond indentures that requires the issuer to retire a specified portion of debt each year. Any principal due at maturity is called the balloon maturity.

Solvency: A term used to describe the long-term financial position of the business. A business is called solvent if the value of assets exceed liabilities, and insolvent (or technically bankrupt) if liabilities exceed assets.

Subsidy: A payment from government to individuals or businesses without any expectations of production. The best way of thinking about a subsidy is as a negative tax. Government extends subsidies for many different reasons. They go to students, unemployed workers, the poor, farmers, wealthy friends of political leaders, businesses trying to fend off foreign competitors, and the list could go on. Subsidies are frequently used to redirect resources from one good to another. Sometimes this is justified on efficiency grounds and other times it's just the result of political power.

Surety: A pledge or formal promise made to secure against loss, damage, or default; a guarantee or security. One who is contracted to be responsible for another, especially one who assumes responsibilities or debts in the event of default.

Time Value of Money: A concept which reflects the fact that the present value of a given amount of money is greater if received now than if received in the future. The reduction of value is caused by inflation, risk, interest that could be earned or because of preference for money now rather than in the future. The sooner a dollar is to be received, the greater is its present value.

Tax: Any sort of forced or coerced payment to government. The primary reason government collects taxes is to get the revenue needed to finance public goods and pay administrative expenses. However, the more astute leaders of the first estate have recognized over the years that taxes have other effects, including--(1) redirecting resources from one good to another and (2) altering the total amount of production in the economy. As such, taxes have been used to correct market failures, equalize the income distribution, achieve efficiency, stabilize business cycles, and promote economic growth.

Term: The period of time during which a contract is in force.

Term bonds :Bonds whose principal is payable at maturity. Often referred to as bullet-maturity bonds or simply bullet bonds. Related: Serial bonds.

Term certificate: A certificate of deposit with a longer time to maturity.

Term Fed funds: Fed funds sold for a period of time longer than overnight.

Term insurance: Provides a death benefit only, no build up of cash value.
term deposit

Third party guarantee: guarantee by someone other than the principals directly involved in a transaction or agreement

Treasury bills (T-bills): bills the government sells in return for a promise to pay a certain amount in a short period, usually less than 180 days

Treasury security: A financial instrument or legal claim used by the federal government to borrow money. Treasury securities are issued by the Treasury to cover the federal government's budget deficit. They are classified as either Treasury bills, Treasury notes, or Treasury bonds.

Treasury direct: A system allowing an individual investor to make a noncompetitive bid on US Treasury securities and thus avoid broker-dealer fees.

Treasury stock : Common stock that has been repurchased by the company and held in the company's treasury.

Trust fund: Assets held in a trust.

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