

# Looking Beneath the Surface:

## An Assessment of the Value of Public Support for the Metal Mining Industry in Canada

### Report Summary

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### The Environmental and Social Impacts of Mining

Mineral and metal extraction leaves an enormously damaging and lasting environmental footprint, and the consequences of mining accidents, such as tailings dam failures, are potentially calamitous. In addition to major disturbances of the landscape, the destruction of fish, wildlife, and plant habitat, and the disruption of surface and groundwater flows, mining — and metal mining in particular — generates enormous quantities of waste.

Mining is an activity with a short-term life, and long-term consequences. Most new mines in Canada now last less than 15 years before the ore is depleted or working the mine becomes uneconomic.

Mining also creates many costs to individuals, families and communities. Some of these have been quantified but appear on different ledgers from reports on the economic performance of the mining industry. These social costs include impacts on health in both the community and workplace; physically disabling injuries among miners; changes in leadership and social relationships; the impacts of boom-and-bust economic cycles; the destruction of indigenous livelihoods and other distortions of the local economic base; and dramatic changes in regional cultures.

### Materials and Sustainability

Around the world, international organizations, national policy makers and the public are engaging in a pressing debate about the need to promote more sustainable forms of production and consumption. The scale of the environmental and social impacts of mining has been central to arguments regarding the need to reduce the consumption of newly extracted materials.

There is a growing international consensus that society's demand for goods and services will have to be met with a significant reduction in new material inputs. This can be achieved through waste prevention and reduction in the design and delivery of goods, and the recycling and reuse of existing materials stocks, rather than disposing of used materials at one end of the materials cycle and inputting newly extracted ones at the other.

Metals do not lose their mechanical or metallurgical properties when recycled, while retaining their economic value. Although the use of certain metals, such as mercury, need to be phased out due to their extremely toxic properties, other metals can be reused and recycled through the economy almost without limit.



## Britannia Mine

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.



## Giant and Con Mines

The Yellowknife mining camp, one of Canada's major gold mining districts, has two major operating mines – the Con and Giant Mines. Since opening in 1938, the Con Mine has produced more than 156 million grams of gold; the Giant Mine commenced production about 10 years later, and has produced an estimated 201 million grams of gold.

However, the ore mined in the Yellowknife area is associated with arsenopyrite, and therefore releases a considerable amount of arsenic when processed. Both historic and more recently deposited tailings have been found to contain extremely high levels of arsenic: up to 25,000 ppm in the Con Mine tailings and 4,800 ppm in the Giant Mine tailings. (Canadian drinking water standards set the limit at 25 ppm.)

But arsenic in the water is not the only trouble left behind as a legacy of 70 years of gold mining. The Giant Mine has more than a quarter-million tonnes of arsenic trioxide, a highly toxic byproduct of roasting ore to extract gold, placed underground in mined-out stopes.

## Project Objectives

Mining has been portrayed as a sector that “built” Canada. The industry commonly refers to this history while asserting its continuing importance to the Canadian economy. But the industry must now also face questions about its environmental, social and economic sustainability. Public expenditures once viewed as laudable support for a key industry are now being questioned domestically and internationally as distortions of investment signals and market prices, while promoting unsustainable patterns of resource consumption. There is also a growing question about the “legality” of these expenditures in the context of the international trade agreements to which Canada is a signatory.

Given these factors, questions must be asked as to whether public funds should be spent to support primary resource extraction when investment in other types of economic activity may provide for more sustainable uses of natural resources and more sustainable employment in remote communities now facing the disruptions of boom-and-bust cycles in mining.

In this context, this report has three major objectives:

1. To document the level of government expenditures, and governmental assumptions of liabilities and risks, in support of the metal mining sector in Canada, including the identification of major gaps in information regarding the nature and extent of these public expenditures, liabilities and risks, and to identify changes in their structure and levels over time;
2. To assess the economic benefits associated with the Canadian metal mining industry as presented by governments and the mining industry, and to document trends in the generation of benefits by the sector over time; and
3. To present an assessment of the trends in public expenditures, and assumptions of liability and risk, related to the metal mining sector in Canada relative to the sector's economic benefits.

The study took a snapshot of two years, 1994/95 and 2000/1, and compared the data.

## Key Findings

### British Columbia

- For every dollar invested in exploration in BC, public expenditure on that dollar (federal and provincial combined) is 65 cents.
- Public expenditures in support of the metal mining sector increased by 17% in BC between 1994/5 and 2000/1, from \$13.2 million to \$15.4 million.
- Provincial expenditures in support of the sector will more than double as a result of BC Mining Flow-Through Share Tax Credit and the Sales Tax Exemption for Mining Equipment and Machinery introduced in the province's July 2001 budget. The sales tax exemption alone is expected to provide \$12.5 million in additional tax relief to the sector in 2001/2.
- Employment in the British Columbia metal mining sector fell by 6% and mineral royalty payments from the sector declined by 29.9% between 1994/5 and 2000/1. As well, the sector's contribution to total provincial GDP fell by 12%.
- BC has no formal programs related to abandoned mine rehabilitation and no estimate has been developed for the remediation of the 1170 “historic” metal mining sites that have been identified. The estimated shortfall in financial assurances held by the province for operating mines relative to closure costs is \$85 million.

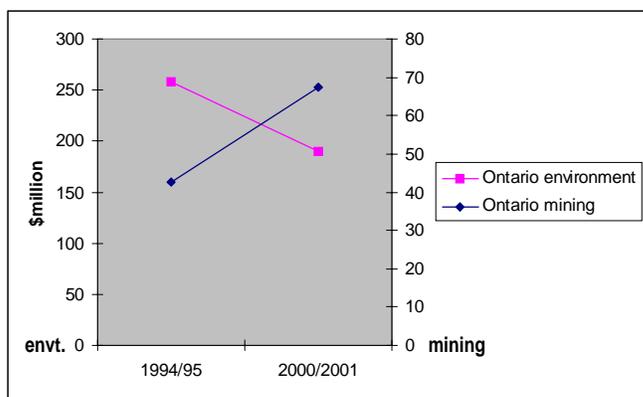
## Ontario

- Public expenditures in support of the metal mining industry have risen dramatically, going from \$42.7 million in 1994/5 to \$67.4 million in 2000/1, an increase of 58%.
- The increases in expenditure are all the more striking given the overall reductions in expenditures related to environmental protection that occurred in the province following the June 1995 election. While support to the mining industry grew sharply, the operating budget of the province's Ministry of Environment fell by 26.2% (\$258 million to \$190 million).
- Employment, mineral royalty payments and contributions to provincial GDP in Ontario from the metal mining sector have all fallen significantly in both absolute terms and relative to the contributions of other sectors of the economy over the study period. Between 1994/5 and 2000/1, total employment in the sector declined by 20%, royalty payments by 45% and contribution to GDP by 24%. The sector's contributions to total employment fell by 30%, to total provincial revenues declined by 57% and to total provincial GDP dropped by 39%.
- The sector's public cost per employee has risen by 97%, from \$3,472 in 1994/5 to \$6,848 in 2000/1.
- The self-assurance arrangements introduced under the 1996 Bill 26 amendments to the *Mining Act*, through which mine owners or operators are no longer required to post realizable financial securities against their mine closure plans, now cover \$449.3 million in potential closure costs for metal mines and mills.

## Quebec

- Quebec provides the highest level of support to the metal mining industry among all of the provinces and territories studied. Quebec's 2000/1 spending was 1.6 times that of Ontario, despite the fact the Quebec sector is only 60% as large as Ontario's.
- Total support to the metal mining sector in Quebec has fallen very slightly (1.4%) over the study period, from \$109 million to \$108 million (2000\$). However, total support will rise significantly over the next three years as a result of the introduction of a Refundable Tax Credit for Resources in the province's March 2001 budget. The program is expected to cost \$15 million in 2001/2, \$28 million in 2002/3, and \$34 million in 2003/4. In addition, tax holidays have been introduced for new mines in the Near and Far North.
- Quebec is unique among the jurisdictions studied in that it has established a number of entities for the specific purpose of making equity investments in the mining sector, particularly junior (exploration) companies. These investments rose substantially between 1994/5 and 2000/1 rising from \$3.4 million to \$11 million. In addition, equity investments of \$2 million were made by the province in more advanced mine operations in 2000/1.
- Employment in the metal mining sector in Quebec fell 15.7% over the 1994/5 to 2000/1 period; the metal mining sector's contribution to total provincial revenues declined 4.8%; and the sector's contribution to total provincial GDP fell by 11.8%.
- Quebec's current practice is to only require financial assurances for 70% of estimated rehabilitation costs on operating mines.

**Ontario Trend in Spending on Environmental Protection Versus Support to the Mining Industry 1994/5 to 2000/1**



## Quebec –

### Ouje-Bougoumou Cree

*The Ottawa Citizen*, 23 Oct. 2001

A study by a U.S. expert on ground water and environmental contamination has found high levels of arsenic, cyanide, lead, mercury and other heavy metals in the water, fish and human beings of the Ouje-Bougoumou Cree nation of northern Quebec.

"What I found is staggering," said Christopher Covell, from his home in Lyndeborough, New Hampshire, yesterday.

"It makes the Love Canal look like a dirty back yard," he added, comparing the contamination in Ouje-Bougoumou, a Cree settlement of about 700, to a residential area of Niagara Falls, New York, where polychlorinated biphenyls (PCBs) were dumped with the result that residents developed a high incidence of cancer...-

...His study also found high levels of heavy metals in fish caught in the lakes and in hair samples from Ouje-Bougoumou residents. He found that all the metals detected are toxic to human health and are known to cause cancers of the kidney, liver, lung and skin and have other negative effects on human health.

<b>Trend Summary – British Columbia 1994/5-2000/1</b>	
<b>Factor</b>	<b>1994/5-2000/1 Trend</b>
Public Expenditure	Increased 17%
Change in Metal Mining Contribution to Employment from All Industries	Decreased 15.4%
Change in Metal Mining Contribution to Total Jurisdictional Revenues	Decreased 40%
Change in Metal Mining Contribution to Jurisdictional GDP from All Industries	Decreased 12%

<b>Trend Summary – Ontario 1994/5-2000/1</b>	
<b>Factor</b>	<b>1994/5-2000/1 Trend</b>
Public Expenditure	Increased 58%
Change in Metal Mining Contribution to Employment from All Industries	Decreased 30%
Change in Metal Mining Contribution to Total Jurisdictional Revenues	Decreased 57%
Change in Metal Mining Contribution to Jurisdictional GDP from All Industries	Decreased 39%

<b>Trend Summary – Quebec 1994/5-2000/1</b>	
<b>Factor</b>	<b>1994/5-2000/1 Trend</b>
Public Expenditure	Decreased 1.4%
Change in Metal Mining Contribution to Employment from All Industries	Decreased 36.3%
Change in Metal Mining Contribution to Total Jurisdictional Revenues	Decreased 4.8%
Change in Metal Mining Contribution to Jurisdictional GDP from All Industries	Decreased 11.8%

<b>Trend Summary – Yukon Territory 1994/5-2000/1</b>	
<b>Factor</b>	<b>1994/5-2000/1 Trend</b>
Public Expenditure	Decreased 2%
Change in Metal Mining Contribution to Employment from All Industries	Decreased 25.6%
Change in Metal Mining Contribution to Total Jurisdictional Revenues	Decreased 20%
Change in Metal Mining Contribution to Jurisdictional GDP from All Industries	Decreased 36.5%

<b>Trend Summary – Federal/National 1994/5-2000/1</b>	
<b>Factor</b>	<b>1994/5-2000/1 Trend</b>
Public Expenditure	Increased 5%
Change in Metal Mining Contribution to Employment from All Industries	Decreased 24%
Change in Metal Mining Contribution to Total Jurisdictional Revenues	n/a
Change in Metal Mining Contribution to Jurisdictional GDP from All Industries	Decreased 25%

## Yukon

- Total public expenditures in support of the metal mining industry by the territorial government have fallen slightly from \$6.8 million to \$6.7 million (2%) over the 1994/5 to 2000/1 period.

- The decline in total expenditures reflects the expiry of the federal-territorial Mineral Development Agreement that was in place in the mid-1990s. The agreement was a major source of funding for the territory's mining-related operations.

- In fact, mining-related program spending by the Yukon Territory's Department of Economic Development has fallen significantly. These reductions have been partially offset in terms of total spending by the increase in expenditures flowing from the \$1.8 million per year Temporary Mineral Exploration Tax Credit introduced in January 1999.

- Economic activity in the metal mining sector in the Yukon is extremely cyclical. Output and production rose dramatically in the mid-1990s before falling off by 2000. Overall employment, royalty payments to the territorial government, and contributions to territorial GDP fell over the 1994/5 to 2000/1 period, in both absolute terms and relative to other sectors. Total employment in the sector declined by 8%, royalty payments by 40% and contribution to GDP by 25.5%.

- The sector's contributions to total employment fell by 25.6%, to total territorial revenues by 20% and to total territorial GDP by 36.5%.

- There is no formal territorial program for abandoned mine remediation. The allocation of responsibility between the federal and territorial governments for abandoned mines is part of devolution negotiations currently taking place. Total remediation costs associated with abandoned mines in the territory are estimated at \$269.5 million. Current federal expenditures for the maintenance of abandoned mines in the Yukon Territory are between \$8-\$10 million per year.

## Federal Government

- The federal government is by far the largest source of support for the sector, with total spending of \$383 million in 2000/1.

- Federal public contribution per employee went from \$10,945 in 1994/5 to \$13,095 in 2000/1.

- Much of the federal spending is in the form of long-standing tax expenditures, such as the Canadian Exploration Expense, Canada Development Expense and the Resource Allowance, and program activities of Natural Resources Canada, such as the Geological Survey of Canada.

■ Although federal government has moved to bring taxation levels for other sectors into line with those of the non-renewable resource sectors like mining, the key tax and institutional supports for the mining sector remain in place and new supports continue to be added, both through the tax system, and on a one-off basis, as has happened with the Voisey's Bay project.

■ Federal liabilities for abandoned mine restoration are concentrated in the Yukon and Northwest Territories and under discussion with the territorial governments as part of the wider devolution negotiations taking place. Total liabilities for abandoned metals mines are estimated at \$269.5 million in Yukon, and \$370 million in the NWT, for a total of \$639.5 million. However, the NWT figure does not fully account for key mines, such the Giant Mine in Yellowknife. Estimates of the potential remediation costs for that mine alone range from \$39-\$409 million.

■ At the national level, employment in the metal mining sector fell by 12% between 1994/5 and 2000/1. The sector's contributions to GDP fell by 8%. The decline of the sector's contributions to total employment and GDP are even more dramatic, with the mining industry accounting for 24% less of total employment, and 25% less of total GDP in 2000/1 relative to 1994/5.

## Conclusions

Overall, there has been significant rise in support to the metal mining industry over the study period particularly in Ontario, but also in British Columbia and at the federal level. Total public expenditures fell marginally in Quebec and the Yukon Territory between 1994/5 and 2000/1. However, support to the metal mining industry will increase significantly in Quebec between 2001/2 and 2003/4 as a result of the Refundable Tax Credit for Resources introduced in March 2001. Similarly, support will grow dramatically in British Columbia as a result of the Sales Tax Exemption for Mining Equipment and Machinery introduced in July 2001, as well as the BC Mining Flow-Through Share Tax Credit.

The expenditure figures provided in this study are likely underestimates as governments were unable to provide expenditure figures for a number of new or otherwise significant tax initiatives.

It is also important to consider that this analysis has not taken into account the full range of forms of support provided to the sector by governments. This includes issues related to the price of access to the resource itself, access to water and energy resources at no or reduced cost, and the preferred status granted mineral development and extraction in land-use planning processes.

Nor has this assessment taken into account the full range of social and environmental costs associated with the industry. Rather, it has focussed on those costs that were most readily identified and documented. The remediation costs associated with abandoned mines provide a proxy for some of the industry's long-term environmental costs, particularly with respect to surface disturbances and surface and groundwater quality. However, other costs, such as the health impacts of air and water pollution associated with the industry, permanent changes to surface and groundwater flows and supplies, and the social impacts of the industry's cyclical and transitory patterns of development have yet to be estimated. It is far from inconceivable that these costs could rival the industry's contributions to GDP.

The benefits from the metal mining sector are in decline in terms of employment, royalties, and contribution to GDP, in both absolute and relative terms. Employment in the sector has fallen in all jurisdictions studied, and 12% nationally between 1994/5 and 2000/1.

## 200 = 1?

Mining requires removing from the Earth metal-bearing ore together with "overburden," the dirt, rock and biological systems that cover the ore. Only a very small portion of the material removed is actually used. On average, for example, 200 tonnes of ore and overburden are removed to produce one tonne of copper.



## Faro Mine

When Curragh Resources began in 1990 to develop the Vangorda and Grum deposits at the Faro mine, the Yukon Territory Water Board required them 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.

When Curragh's successor, Anvil Range, shut down in 1998, there was \$11.5 million accumulated in the trust fund, but current environmental liability is estimated at \$124 million.

A number of other factors need to be considered when assessing the benefits derived from government expenditures in support of the sector. New and proposed mines in Canada tend to have much shorter operating lives than has been the case in the past (see sidebar “Short-Lived New Mines” on page 4 of the full report). This means that their benefits in terms of employment, revenues and contributions to GDP are becoming increasingly transitory.

## Abandoned Mines

There are at least 10,000 abandoned mines in Canada. Estimates of the costs of cleaning up just some of the sites under federal responsibility are at least \$1 billion. The Mining Association of Canada itself has estimated the cost of abandoned mine remediation in Canada at \$6 billion.



## It's a Waste

It has been estimated that the Canadian mineral industry generates one million tonnes of waste rock and 950,000 tonnes of tailings *per day*, totalling 650 million tonnes of waste per year. This is more than 20 times the amount of municipal solid waste generated each year by all of the residences, industries, commercial establishments, and institutions in Canada combined.

## Recommendations

The findings of this study indicate that the provision of additional support to the metal mining industry cannot be rationalized, and that the existing supports being provided need to be seriously reconsidered. In this context, the study makes the following recommendations.

### *New Subsidies: Flow-Through Shares*

1. The tax credit programs for flow-through shares in the mining sector introduced in 2000 and 2001 at the federal level and in Ontario, British Columbia and Quebec should be terminated.

### *Federal Tax Measures*

2. The federal government should not reduce the general corporate tax rates for the mining sector to those provided to sectors other than mining and oil and gas in the February 2000 budget, unless the federal tax measures specific to the mining sector identified in this report, such as the Canada Exploration Expense, Canada Development Expense, and Resource Allowance, are removed. The removal of these programs would be consistent with the recommendations of the OECD to the Government of Canada.

### *Provincial Tax Measures*

3. Provincial and territorial governments should move to bring corporate tax levels for the mining sector into line with those for other sectors. Tax expenditures and credits specific to the sector, such as British Columbia's recently introduced sales tax exemption for the sector, and the exploration tax credits provided in British Columbia, Yukon, and Quebec, should be removed.

### *Mining Royalty Regimes*

4. Canadian governments should ensure that their mining royalty regimes realize the full value of the resource to the public. Mining tax “holidays” and exemptions for new or remote mines, such as those offered in Ontario and Quebec, should be removed. Mining royalty systems should be reviewed to make certain that they do not provide access to resources below their true value.

### *The Role of Mine Ministries and Departments*

5. The federal and provincial governments should seek to re-orient the activities of mines departments to better serve the needs of the broader public interest rather than those of the mining industry alone. This could include, for example, re-directing the work of geological surveys away from the identification of mineral resources and towards the investigation, understanding and protection of renewable resources, such as groundwater.

### *Other Forms of Support: Infrastructure, Water, Energy, and Land*

6. The provision by governments of infrastructure to support the development of new mines, as the federal government has recently done in the case of the proposed Voisey's Bay mine in Labrador, should be ended. Mine operators should be required to internal-

ize the costs of providing the capital infrastructure, such as roads and rail lines, needed to support their operations.

7. The mining industry is a major consumer of water resources. The practice of permitting industrial users almost unlimited access to public water resources at no cost, as has been the case in Ontario and Quebec, should be terminated. Measures should be adopted to ensure that levels of water use are sustainable, and that charges are introduced on industrial water use to encourage efficiency and conservation.

8. In some provinces and territories, such as British Columbia and the Yukon, individual mines have been provided access to electricity from public utilities at reduced cost. These practices should be ended, as they encourage the inefficient use of energy, and increase costs to other consumers.

9. In light of the need to consider the full range of environmental, social and economic factors in land-use decisions, the overriding priority granted non-renewable resource development, such as mining, in provincial land-use planning systems and policies, as is the case in Ontario, should be removed. Similarly, British Columbia's compensation regime for changes in land-use for lands on which mining claims have been established should be terminated.

#### *Repairing the Legacy of the Past*

10. The accumulated public liabilities for abandoned mines should be retired through the remediation of these sites within a reasonable time frame.

#### *Economic Strategies for Mine-Dependent Communities*

11. Economic strategies for communities and workers that have been mine dependent, but for whom mining is declining as a source of employment and economic activity, should be developed and implemented.

#### *Preventing Future Damage and Liabilities*

12. Regulatory frameworks, with adequate staffing and budgets to prevent environmental damage from operating mines, and the accumulation of future environmental liabilities on the public's account, should be established and implemented.

#### *Investing in Materials Sustainability*

13. Investments should be made in strategies for waste reduction and materials sustainability, including the design of products and production processes to facilitate the reuse and recycling of materials, including metals, and the research, development and expansion of capacity to process and utilize secondary materials within the Canadian economy.

#### *Financial Assurances*

14. Governments must ensure the provision of adequate and realizable financial securities against the risk of abandonment and closure for operating mines. Policies of self-assurance or acceptance of unassured risks by the Crown should be terminated. Information on closure and long-term care costs and financial assurances held by the Crown should be made available to the public.

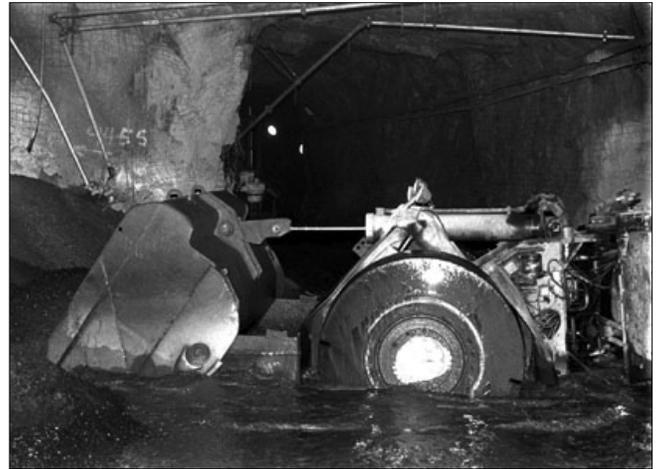
#### *Tax Expenditures*

15. The Government of Canada and the governments of the provinces and territories should adopt policies of providing clear estimates of costs of tax measures when they are introduced in jurisdictional budgets in terms of the likely forgone revenues or refundable tax credits to be provided.

16. Jurisdictions should report annually on the costs of tax measures in their public accounts, broken down by program, sector and activity.

## **Gold and Waste**

It has been calculated that to create a pair of gold wedding rings, the ore processed is the equivalent of a hole in the ground that is three metres long, two metres wide and two metres deep.



## **Water Use**

Mining is a major industrial use of water. Water is pumped out of open pits and underground mines, "dewatering" them to allow mining operations. Water is used to wash ore, and in milling and refining processes. Water is also used to slurry tailings from the mill to the tailings management areas, and is frequently used in a water cover of acid-generating mining tailings as a means of reducing acid generation. While the mining industry describes these uses as "temporary," the fundamental fact remains that clean water goes in, and contaminated water comes out.

In a survey of water-taking permits for one district in northeastern Ontario, 77% of the permits issued within one year were for mining purposes. Not all of the permits included totals or limits for the amount of water use permitted, but, of those that did, average water-taking volumes were 6.4 million litres per day. Some permits are much higher, such as one issued to North American Palladium Ltd. for their Lac Des Iles Mine northwest of Thunder Bay, for water taking at a rate of 30 million litres per day for a period of five years.



### *Abandoned Mine Inventories*

17. British Columbia should complete an estimate of the costs of remediating “historic” sites on the basis of thorough chemical and physical site assessments of existing, closed and abandoned mines and exploration sites. This information for all jurisdictions should be updated and made available to the public on a regular basis.

### *Unaccounted Environmental and Social Costs*

18. The exemption for the extraction phase of mining from the National Pollutant Release Inventory should be removed. This would be an important step in understanding the environmental costs of mine operations.

19. A pilot study of the full social and environmental costs of mineral development, mine operation and closure should be initiated in selected communities.



### **Final Observations**

This study makes it clear that despite growing government efforts to support the metal mining sector, the sector’s contribution to Canada’s economy is in decline. At the same time, the sector continues to generate major social and environmental costs, and to expose the public to long-term risks of liability in relation to damage that is often only remediable at extraordinary cost, if at all.

The public resources committed to support the sector approached \$600 million in 2000/1. The support provided to the sector is expected to expand even further over the next few years, particularly as new initiatives in British Columbia and Quebec come into effect.

This is a substantial expenditure of public resources, and one that has grown in a context of major reductions in government spending in other areas, including environmental protection. The evidence gathered through this study indicates that, not even considering the alternative uses to which the support provided to the sector might have been put, Canadian governments’ expenditures in support of the metal mining industry are an increasingly poor investment, as the economic contribution from the sector continues to diminish.

This leads to the conclusion that the public resources being used to support the industry would be better employed elsewhere, including the restoration and protection of environmental and social assets affected by metal mining. More broadly, Canadian governments should move towards the promotion of forms of economic development that are less vulnerable to shifts in international economic conditions, and that will provide economic, social and environmental benefits to Canadian society that are sustainable over the long term.



For the full context, methodology, details and sources of the material in this summary, please refer to the full report, *Looking Beneath the Surface: An Assessment of the Value of Public Support for the Metal Mining Industry in Canada*. To order your copy, contact MiningWatch Canada or Pembina Institute. © 2002



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