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May 1992

PROSPERITY CONSULTATIONS

Minerals and Metals Sector

A Contribution to the



PROSPERITY INITIATIVE

This report has been prepared by a private sector consultation group at the request of the Honourable Michael Wilson, Minister of Industry, Science and Technology and Minister for International Trade and the Honourable Jake Epp, Minister of Energy, Mines and Resources, as a contribution to the Prosperity Initiative. This document is one of a series of reports setting out the conclusions and recommendations arising from intensive consultations on the competitiveness challenges facing major industry sectors across Canada.



A contribution to the PROSPERITY INITIATIVE



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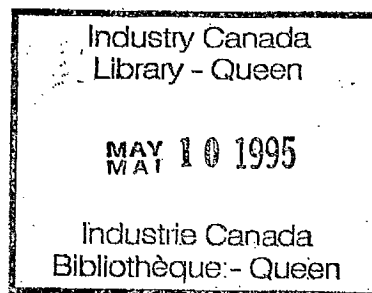
**The Mining Association of Canada
L'Association minière du Canada**

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**REPORT ON
PROSPERITY CONSULTATIONS
WITH THE
MINERALS AND METALS SECTOR**

CHAired BY

**MR. KEITH HENDRICK
CHAIRMAN, NORANDA MINERALS INC.
AND
CHAIRMAN, THE MINING ASSOCIATION OF CANADA**



MAY 1992

REPORT ON PROSPERITY CONSULTATIONS

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May 8, 1992

The Honourable Jake Epp
Minister of Energy, Mines and Resources
Room 607-CB
House of Commons
Ottawa, Ontario
K1A 0A6

The Honourable Michael Wilson
Minister for International Trade
Room 515-S
House of Commons
Ottawa, Ontario
K1A 0A6

Dear Ministers

It is with pleasure that I submit to you the report from the Prosperity Consultations for the minerals and metals sector.

Our consultation process took us across Canada in search of the views and concerns of those involved or associated with the minerals and metals sector of our country.

A wealth of ideas has been generated from the men and women who participated in the discussions. This report is theirs - their opinions and their feelings - and I thank them for their support of the process and for their contributions.

They all feel strongly about the future of this sector and are confident of the important role it can play in the future prosperity of our country. They have put forward their ideas, as Canadians, on ways to deal with some of the major issues which you identified for these consultations. They also recognized that changes are needed and soon.

At the same time, the participants in these discussions are troubled about the business climate in Canada.

They feel part of an industry sector with the economic capability to help Canada's future but one which is also increasingly being viewed with a distinct lack of enthusiasm. They perceive an undercurrent of policy neglect which is gradually forcing the minerals and metals industry to look beyond Canada's borders for its future. Unless current trends are reversed, the contribution of minerals and metals will slowly decline. Its prosperity, and Canada's, will suffer.

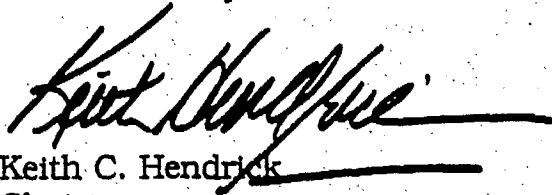
As Chairman of this process, I feel that the discussions have been worthwhile and I have had genuine response from the participants in the process. However, this positive view will rapidly wane if action is not forthcoming. As industry and as governments, we have to take the necessary steps, now.

One disappointment is that significant participation from labour was lacking. You may be aware that I embarked on the consultations with the hope that I would have a labour co-chair. Unfortunately, this did not happen. While we invited direct participation as well, we were able to work with labour delegates in only one of the regional discussions.

As an industry, we will be following up the results of these discussions with the labour movement. We believe that your government must also bring labour into the picture if the necessary changes are to be made.

I would be pleased to discuss the attached report with you at your convenience.

Yours sincerely,

A handwritten signature in dark ink, appearing to read 'Keith C. Hendrick', with a long horizontal line extending to the right.

Keith C. Hendrick
Chairman

I INTRODUCTION AND SYNOPSIS OF FINDINGS

Canada is indeed at a crossroads.

Concerns about Canada's ability to compete in an increasingly competitive and globalized world have been surfacing for some time. Business, labour, governments and the Canadian population at large have all realized that the economic world in which we live is changing as never before. Moreover, the pace of change has been accelerating, requiring responses in ever shorter time.

In 1990, the federal government commissioned a major review of the Canadian economy by Professor Michael Porter. Entitled "Canada at the Crossroads - The New Competitive Realities", Professor Porter's report painted a picture of trade and competitive trends having potential negative implications for Canada. But it was not all gloom and doom - the report also identified strengths and opportunities for many sectors of the economy.

The Porter report has been complemented by the Prosperity Consultations, a sector-by-sector enquiry into the competitive issues and trends facing all parts and players in the Canadian economy.

At the invitation of the Honourable Jake Epp and the Honourable Michael Wilson, Mr Keith Hendrick, Chairman of Noranda Minerals Inc., and Chairman of The Mining Association of Canada (MAC), agreed to lead the discussions for the minerals and metals sector. His efforts were supported

by the staff of the MAC and two expert consultants.

The discussions followed the themes for which Minister Wilson had sought the views of Canadians. However, the Prosperity Consultations afforded the opportunity for participants to look somewhat more broadly at the range of issues facing the continued competitiveness of the minerals and metals sector.

This report reflects the opinions expressed by the participants in the three regional seminars which comprised the consultations. It does not necessarily represent the views of The Mining Association of Canada.

The report attempts to present faithfully the ideas, often passionately presented, of the men and women who make up the minerals and metals sector, its suppliers and its customers, as well as other stakeholders such as aboriginal peoples, the financial community, environmental groups and academics.

It is clear that there are considerable concerns about the economic and political future of Canada, but more particularly, about the future of the minerals and metals industry in the Canadian economy. All of the stakeholders in the industry feel that it has much to offer to Canada's future prosperity if given the opportunity.

"Global competitiveness depends on three elements: company competitiveness, ability to design, produce and/or market products superior to those offered by competitors...; sector competitiveness, extent to which a business sector offers potential for growth and attractive return on investment; country competitiveness, extent to which a national environment is conducive or detrimental to business."

New Compacts for Canadian Competitiveness, produced for Kodak Canada by Joseph D'Cruz and Alan Rugman, University of Toronto, March 1992

As a whole, the country is plagued by a series of competitive shortfalls - an expensive but increasingly ineffective education system, underutilized human resources, a diminishing manufacturing base, a lack of ambition and entrepreneurial spirit, and a desire to be protected. Undoubtedly, the current recession has added to the problems.

But participants felt that the minerals and metals industry is labouring under specific disadvantages. As with other natural resources, the industry is concerned that the policy makers and the public undervalues its contributions. Resource extraction is somehow seen as passé.

"In Canada, the mining industry is tolerated - in other countries, it is encouraged."

Senior mining executive at Vancouver session

There was a marked lack of "government-bashing" in the discussions. Nevertheless, participants did feel that governments must take steps to improve the economic and investment climate, and to reverse some disturbing trends. Mining capital is moving away from Canada and into Latin America because this country is not as attractive a place to do business as it once was. Governments have to bear a major responsibility for curing that situation.

"The suggestion that Canada's mineral potential is played out and developing countries offer far richer prospects has little validity. Major opportunities undoubtedly remain but until the regulatory process is clarified and streamlined, the tax burden eased and federal and provincial conflicts over national objectives resolved, the number of Canadian mining engineers and geologists going to Spanish language evening classes may well increase."

Editorial, Mining Journal, London,
April 10, 1992

But equally, industry participants recognized that there are steps which they must take to ensure a competitive future. They accepted the need for self-help initiatives.

The minerals and metals sector is a major export industry, and one which feels international competitive realities every day. It knows, better than many other sectors, the steps which must be taken to survive. Producers in the sector have made those adjustments throughout the 1980s and are continuing to do so in the 1990s.

It was stressed throughout the consultation that the proposed actions not be limited to any one of the major stakeholders. All parties have a responsibility to address the issues and take a positive and constructive approach to their resolution.

The Prosperity Consultations will only have been a success if concrete actions follow the discussions. In the mineral and metal consultations, a multitude of competitive problems have been identified. Many are common to other sectors as well.

The challenge is now for all the major players - governments, industry and labour - to work together to get the solutions into place, and to get on with the job.

The situation is urgent. We cannot afford inaction. If we procrastinate, we will lose. And Canada's prosperity, which has been the envy of the world will be seriously damaged.

"Canada finds itself at the end of the 20th century in a global marketplace with global competition; with many executives who are not internationally-oriented; a resource base which has become, at least for the moment, somewhat non-competitive; a manufacturing base centred in one industry (automotive) which is strategically managed from outside the country; and government policy which is more appropriate to the past than the future."

James Gillies, The Inside Guide,
December 1991

An Agenda for Governments

1. Role of the Minerals and Metals Sector

The role of and expectations for the minerals and metals sectors in Canada's future must be clearly defined. Do Canadians see a minerals and metals sector in their economic future? A positive answer to that question requires creating a renewed economic and investment climate which will rejuvenate industry confidence that it has a future in Canada. A negative answer means continuing current directions.

2. Education

Canada's expensive education system is failing. Reforms are needed urgently to ensure that our educational infrastructure positions this country's human resources with the necessary skills for the 21st century.

3. A Competitiveness Mentality

Competitiveness is essential. But it is doubtful that this fundamental fact is appreciated on a broad basis by all parts of Canadian society and throughout all government departments. Everything governments do should be judged against this vital parameter. In particular, measures to achieve social and environmental objectives should be designed in such a way that their individual and cumulative impact on competitiveness remains manageable. We cannot be hobbled at home if we are going to compete abroad.

An Agenda for Industry

1. Perception of the Minerals and Metals Sector

Industry must do a much better job explaining itself, its role and its accomplishments to Canadians. Better public understanding of what this industry is and does is a precursor to its acceptance and its sustained prosperity. Industry must mount a concerted effort to deal with this issue.

2. Partnerships

Canadians must do a better job of working together, and industry is no exception. We cannot afford the handicap of our traditional adversarial approach. We must seek co-operative solutions. There is a need for enhanced cooperation among producers in the sector, as well as between producers and

their suppliers. Industry associations can provide vehicles for cooperative initiatives and should build more effective partnerships among themselves. Alliances between business and labour present the greatest challenges but hold the greatest benefit.

3. Continuous Improvement

Canadians must strive to improve in every endeavour.

Leading firms are experiencing the benefits of employing advanced management concepts, including quality management and continuous improvement. Such innovative practices call for new assumptions about the role of supervision and their spread across the industry to other companies be encouraged.

Continuous improvement must apply equally to the environmental field.

4. Human Resources

The minerals and metals sector will carefully review the findings of the current Human Resources Study (details on page 37) and its recommendations for improvements in skills development for competitiveness. Innovative workplace and job design (in cooperation with employees and their representatives) will be needed to empower workers and unlock creative approaches to productivity and operational improvements. Technical and scientific skills needed for innovation should be nurtured and strengthened.

5. Innovation

Co-operative research through structures such as MITEC should be strengthened. In this way, the benefits of R&D can be made accessible to smaller companies in the sector. Producers should continue to focus primarily on "process" innovation for economic benefit in the short and medium term. Joint ventures and research partnerships with suppliers of equipment and services should be emphasized. Industry should work towards a more realistic definition of R&D for this sector.

II BACKGROUND AND PROCESS

In October 1991, Mr Keith Hendrick, Chairman of Noranda Minerals Inc. and Chairman of The Mining Association of Canada, agreed to chair consultations with the minerals and metals sector on the federal government's Prosperity Initiative.

He was assisted by Association staff (Robert Keyes, Vice-President Economic Affairs and George Miller, President), and by two facilitators (Professor John Gordon, School of Business, Queen's University, and Professor Tom Knight, Faculty of Commerce, University of British Columbia).

Discussions were held in Halifax, Toronto and Vancouver with a range of stakeholders involved in the minerals and metals sector: executives from major integrated and junior mining companies; consultants; labour; natives; environmentalists; academia; suppliers; and the financial community. In total, some 150 individuals were involved (see Appendix 1 for a list of participants).

Each meeting involved a mixture of plenary and workshop discussion. Participants were invited to discuss issues under eight general themes. They were, respectively: Canada's macro-business climate; environment; international issues; financing; education and training; innovation; labour and the workplace; alliances and partnerships.

The tasks for workshop participants involved identifying the key issues under each theme, proposing solutions to the problems and suggesting barriers which stand in the way of progress. (See Appendix 2 for the overall design of the workshops and discussion materials).

The ideas generated have been summarized and collated in this report. By necessity, a broad range of thoughts has had to be compressed. If readers wish to receive a copy of the full list of points which were raised in the workshops, it is available from The Mining Association of Canada.

THE MINERALS AND METALS SECTOR

Before proceeding with the substance of the discussion at the workshops, the reader needs to be acquainted with some fundamental characteristics of the industry.

As defined here, the minerals and metals sector includes firms involved in Canada in some or all of the activities of mineral exploration, mining or extraction of ore, milling or concentrating, smelting and refining of metals, and processing of industrial minerals. Depending on the nature of the stages they are involved in, firms may be large or small.

As a rule, the smallest firms are concentrated at the exploration stage, whereas the larger firms are those with major investments in smelting and refining, as well as in all the earlier production stages. Several of Canada's premier integrated metals producers, such as Alcan, Cominco, Falconbridge, Inco, and Noranda, are among the world's leading multinationals in their respective commodities. As such, all these companies have operations in several countries and regions of the world.

Canada is a major player in global markets for metals and minerals. The sector sells its products and participates in investment opportunities around the globe. Not only Canadian mineral products, but also Canadian minerals and metal expertise,

knowhow, and capital are sought by other countries.

Canadian mining, metallurgical and service industries are recognized world-wide for their innovative technologies and advanced operating techniques. Through consistent performance and reliable quality and service, Canadian metal producers have established close and influential positions with consumers in the main export markets.

Even though Canada is a big player, it has no monopoly power. Our companies are in vigorous competition for markets and resources with each other and with a growing number of producers in all parts of the world. Canada's past success has not necessarily been due to an exceptional resource base. On the contrary, while Canada has enjoyed some excellent deposits, comparable deposits have been found elsewhere. Our industry has been successful, and Canada has been able to attract mineral investment, because of the skills and dedication of its managers and workers, because of its hitherto stable and hospitable social and political structure and institutions, and because of access to markets.

Notable features of the minerals and metals sector in Canada and elsewhere include the following:

- ◆ as participants in global commodity markets, individual producers are price takers. They must remain cost-competitive, as they cannot pass on

increased costs to their customers or the final consumer.

- ◆ the industry is capital-intensive. New billion-dollar investments in mines and smelters are beyond the capacity of all but a very few corporations, and joint ventures are the rule today. The impact of financing impediments and high interest rates on the viability of such investments is obvious.
- ◆ the lead times between exploration, discovery, and production are measured in years. Any additional or unnecessary delays between incurring front-end expenditures and receiving revenue flows will sharply reduce a project's rate of return and incentive to invest.
- ◆ metal markets are notoriously cyclical. Prices are determined daily on volatile and sensitive terminal markets. Within the past ten years, the maximum daily prices for several metals on the London Metal Exchange have been up to four times their respective minimum prices. Virtually no other commodities undergo comparable swings.
- ◆ allied to the price cycle, the industry is very vulnerable to fluctuations in relative exchange rates.

For all the above reasons, the risk-reward ratio is high and it is little wonder that companies seek to avoid additional political risk whenever possible.

It must also be said that, in company with other natural resource sectors, the industry can be somewhat intrusive on the environment. It is scarcely possible to

develop a major industrial undertaking without some impact on the environment. The industry is aware of its obligation to take measures to mitigate these effects and to ensure that environmental risks and impacts are limited in extent and maintained within the acceptable range. Modern mining and processing practices and technologies are much more environmentally friendly than those of the past. The Canadian industry is adopting a voluntary approach to continued improvement. It is also supporting research, some of which is in partnership with government, to find effective and affordable solutions to remaining technical problems.

The regional dimension of the minerals and metals sector is a key characteristic. Most activities of this sector take place well away from the major urban centres of Canada. It is a mainstay of employment and industrial activity in some 115 communities with a total population approaching 1 million. The spin-off effects of the sector are felt beyond these centres through infrastructure and supply linkages.

These important industry characteristics coloured both the design and substance of the workshop discussions. It should be noted that not all issues and problems were given equal weight at all workshops. There were important regional differences of emphasis. But there were also very extensive areas of agreement. In this synthesis, we have tried to capture the points that sparked significant discussion.

While the material has been reorganized for clarity and to minimize repetition, every attempt has been made to avoid filtering the various messages sent by the participants.

Specific comments are not attributed to individuals. In general, we also avoid referring to the affiliations of speakers, except where identification of the source of a comment is helpful in interpreting it.

The balance of chapter III is a synthesis of the issues and problems that workshop participants identified with respect to Canada's ability to maintain and improve its competitiveness. It also sets out suggested solutions, and barriers that may stand in the way of implementing them.

The barriers are indicated in italics.

THEME 1

THE CANADIAN MACRO-BUSINESS CLIMATE

The Issues

What is it like to do business in Canada, as compared with other countries? What are the significant factors in the society and the political-economic system surrounding us that affect our ability to compete?

Canada is undergoing an important transition. Profound social and political changes are taking place against a transformed backdrop of international trading patterns and the globalization of the world economy. The comfortable (and apparently successful) assumptions, attitudes and habits of the past are being challenged, not only by rival philosophies in Canada but by unforgiving external economic reality. Industrial forces are shifting and new power blocs emerging.

This is not the place for a detailed catalogue. Suffice it to say that the consultations identified several broad Canadian trends that are impeding the ability of industry to operate efficiently and productively for the benefit of Canadians.

The participants noted that a major review of elements affecting the minerals and metals sector's competitiveness is now underway under the auspices of the Intergovernmental Working Group on Minerals. A report will be submitted to

Federal, provincial and territorial Mines Ministers in September 1992 and should provide important observations on the business and investment climate for minerals.

Divisions within Canadian society threaten our prosperity. The constitutional debate and settlement of aboriginal claims, vital in their own right, are nevertheless seen by many as further manifestations of a divisive tendency within Canada. Regional rivalry and distrust are overlain by federal-provincial competition for political profile, by bureaucratic turf fights, by the growing power of special-interest groups, by confrontational labour relations, and by an unfortunate polarization in almost every dimension of Canadian life. If "Canada Incorporated" is the best way to approach the revival of Canadian competitiveness, we are a long way from achieving the necessary consensus on goals and priorities.

The place of the resource industries in Canada (and even their desirability) is being questioned and needs to be clarified by governments. Many Canadians who should be better informed about our country's economic performance appear uninterested in, or negative about, the future role of the natural resource industries within the Canadian economy. On the other hand, key federal Ministers do appear to appreciate the role and contribution of the sector.

Nevertheless, participants felt there is confusion in public policy debates about the government's view of these industries. It is clear that without a supportive policy environment, these industries, which have been the mainstay of the economy, will be unable to sustain the necessary investments in Canada to continue that contribution.

"We have to rethink our ways for the future and, in order to be successful in our efforts, we must build on our comparative advantages, which necessarily include natural resources. In this context, there is little doubt in my mind that the resource industries will play a critical and central role in any strategy this country would eventually adopt in order to achieve those objectives."

Letter to The Mining Association of
Canada from Honourable Michael Wilson
April 27, 1992

Given that the economy should diversify, and is, in fact, diversifying as fast as competitive capabilities allow, the only rational economic strategy for Canada is to encourage our large, competitive resource sectors to support and stabilize the economy while other industries develop the necessary strength and scope.

Mining, for example, provides a vital market that has assisted the development of high-technology manufacturing exports and a world-class mining services export sector. Nothing will be gained by almost wilfully discouraging a basic resource industry that provides such a stimulus to other sectors.

The poor public understanding and

perception of the mineral sector and the resource industries in general was a recurring theme in all workshops. For example, it was noted that the commercial and regulatory misfortunes of the pulp and paper industry, one of Canada's premier exporters, are emphasized by editorial writers and other urban Canadians.

Public dissatisfaction centres around environmental perceptions. In recent polls, all the resource industries share poor ratings for credibility on environmental questions. These perceptions are largely inaccurate but are nonetheless damaging. And they can lead to inappropriate public policies, discussed under Theme 2, Environment. It is difficult for policy makers to defend the most rational policy when the mob is clamouring for blood.

The mix of fiscal and monetary policies that has been produced over the last two decades by successive federal governments and the provinces is one vital element in the business climate. Governments pushed forward with many expensive programs, worthy in their own right, without regard for their affordability or their long-term impact on competitiveness.

As a result, combined federal and provincial debts are a severe burden to the economy. Remedial measures, including high taxation and tight monetary policies (leading to high real interest rates and currency values), are now costing Canadians dearly in terms of jobs and exports. The minerals and metals sector is struggling to remain competitive in the face of these disadvantages.

Governments searching to meet revenue needs are also adding significantly to changes and indirect taxation. These bear no relation to profitability. The cumulative impact of these imposts is of increasing concern to continuing competitiveness.

"Canada's political system is now a massive generator of competitive handicaps induced by policies (CHIPS)."

The Potential for Excellence and the Spectre of Mediocrity
Montreal Board of Trade Report,
March 1992

Partly in response to these "unfriendly" attitudes and policies, mineral investment is flowing out of Canada to an increasing extent. Canadian explorationists are finding a hospitable environment, both geologically, economically and politically, in other countries. There is no doubt that the relative attractiveness of Canada as a place to do business has declined substantially.

The Canadian industry does not welcome this trend, and is not remaining passive. Canadian managers and executives still prefer to do business in Canada. Great efforts are being made to tighten our operations practices and improve our technologies in order to achieve acceptable performance at home. These efforts are the subject of discussion under Themes 4-8 below.

"Canada is the only region with more gold projects at all four stages (new producer, preproduction, feasibility and reserve development) on hold than are currently active. Ratios of active to on-hold are 0.7:1 for Canada, 1.4:1 for the US, 1.9:1 for Latin America and Australia, 3.6:1 for Africa/Middle East, 5.2:1 for Western Pacific."

Mines and Minerals Weekly Bulletin,
April 13, 1992, Ontario Department of
Northern Development and Mines,
quoting 1991 figures from the Metals
Economics Group

The Solutions and Barriers

A Divided Society

- industry should foster collaboration with other groups, including labour, stakeholders and government officials

There is a history of adversarial relations with labour and other groups.

Opinions are divided in industry as to the potential for effective collaboration.

Inertia and lack of trust exist in all camps.

- the education system should promote cooperation

The current education system resists change.

- politicians should resist the temptation to exploit existing regional and ideological

differences for political gain

Place of the Resource Sectors

- there needs to be a greater understanding and appreciation of the resource industries and their contribution. Governments need to clarify their vision and strategies for the resource sectors generally, and the minerals and metals sector specifically

Viewing resource exploitation as an engine of growth and economic development is out of fashion.

- the minerals sector should cooperate more closely with other resource industries
- resource ministers should act as "champions" for the industry, demonstrating their commitment to encouraging wealth creating activities.

There is timidity in government. Ministers and senior bureaucrats often seem unwilling to be visible and to take a definitive position.

- a federal-provincial council of resource industry ministers should be formed, and existing mechanisms (eg the Mines Ministers Conference) be made more effective

Current Ministerial advisory mechanisms are not viewed with much enthusiasm by industry.

- private-sector experience should be an important consideration in hiring and promoting government officials

Many policy-level officials lack career exposure to economic and industry reality.

- industry should promote two-way exchange of personnel with government

Interrupting an industry career path can be difficult for many individuals.

- governments should appreciate and explain the risk-oriented nature of the resource sectors and the volatile nature of risk capital

Governments are reluctant to express support for the role and contributions of the minerals and metals industry.

Public Perception

- industry should improve its communications programs

- . make every employee and mining community an ambassador
- . create a speaker's bureau, with industry associations to provide kits
- . deliver a message stressing the role of minerals and metals in Canada's standard of living
- . target the urban population
- . work more closely with educators and the media
- . demonstrate commitment through actions

The high cost of comprehensive communications programs.

Industry has low credibility: it is not believed.

Fragmentation of industry associations reduces effectiveness of communications.

Public reacts to emotion, not fact; perception, not reality.

Media have little knowledge of industry; tend to be sceptical or negative.

- educators should learn and teach the facts about the resource industries

Many educators have low opinion of resource sectors.

The government is unwilling to let the Canadian dollar find its true level in the international marketplace.

- the results of the study on competitiveness for Mines Ministers by the Intergovernmental Working Group should be looked at carefully.

Economic/Fiscal/Monetary Policies

- governments should undertake an objective evaluation of Canadian competitiveness

Too many government studies seem designed to justify existing policy directions and programs.

- governments should ensure economic performance and competitiveness is a priority in the formulation and assessment of all policies and programs

Competitiveness often takes a back seat to other policy objectives.

- federal and provincial governments should maintain strict control over spending until the public debt is reduced

Governments find it difficult to reduce expenditures.

- reduce the real rate of interest from its current high level

THEME 2

THE ENVIRONMENT

The Issues

No other issue in recent years has captured the attention of the public, both in Canada and elsewhere, to the extent that the environment has. As the spectre of nuclear war has receded, the environment has come to occupy first place as a "doomsday issue" in the popular mind. The pervasiveness and force of this perception has fuelled a movement that has profoundly, and probably irreversibly, changed the policy environment in Canada.

"I've heard a lot today about the shortcomings of environmentalists. There's too much 'us' against 'them'. If mining people expect to earn the respect of other groups, they will have to learn to respect them and work with them."

Representative of a conservation group at Prosperity Consultations

The minerals and metals sector faces a challenge to communicate its concerns to governments, to the public and to environmental groups. Despite the significant progress that has been made in environmental management, the sector has had difficulty in getting its message heard and understood. It faces an uphill battle to overcome historical attitudes, non-believers

and closed minds. Changing existing perceptions will be difficult and frustrating but is essential.

A new condition on the survival and viability of an enterprise is that its operations be carried out under conditions that are broadly acceptable to the public. Legislation and regulations that were acceptable in the past are being altered across a broad front. A rapid and profound change of this kind cannot but affect the competitiveness of industry. While similar changes are occurring in most developed countries, they are not taking place at the same speed or in exactly the same way. As a result, the relative position of Canadian industry is being affected from month to month and week to week.

"The environment requires a comprehensive policy and global commitment by a company to have credibility with its employees, suppliers, customers, shareholders and the people of the communities in which it operates."

William Deeks, Senior Vice-President,
Global Issues, Noranda Inc, from an
address to the Chief Executive Officer's
Round Table, February 21, 1992

Sustainable Development is a powerful concept in reconciling environmental and economic goals. Those involved in the minerals and metals sector subscribe to sustainable development and believe that the continued operation of the sector is compatible with environmental objectives, provided that good will and good judgement are applied by all parties in decision making. Exploitation of metals, a "non-renewable" resource, is compatible with sustainable development when the existing level of, and future potential for, recycling are fully appreciated. The continued discovery of new deposits also make the mining industry sustainable for the future.

"The world's economy and the earth's ecology are one and indivisible. To ignore one is to jeopardize the other. This is the new reality of sustainable development."

Business Council on National Issues

The sector expects to contribute to continuous environmental improvement, as it has in the past, by the application of advanced technology and by research into solutions of existing problems. Under the Environmental Policy of The Mining Association of Canada, member companies pledge to use best management practices, both in Canada and at their operations elsewhere. It is a fact that Canadian mining companies use advanced standards and practices wherever they operate.

The industry's commitment to environmental excellence is not in question, therefore. What is of significance for any discussion of competitiveness is whether in Canada

government policies, legislation, regulation, and practices are well designed to achieve environmental goals and at the same time to foster competitiveness. The sector has serious concerns that regulations are not helping and existing practices are deterring investment in Canada, with minimal gain, or no gain, to the environment. In other words, it is possible to pursue a given environmental objective by methods that are effective or by methods that are not. There is concern that Canada is moving towards the latter.

Land tenure is a vital consideration for the mineral sector. With rare exceptions in Canada, natural resources belong to the public, through their governments. Private operators are induced to explore for and develop these resources by the expectation of profit. In performing the exploration activity, they earn the exclusive right to mine the deposit under appropriate conditions and standards. Security of tenure so earned is a fundamental component of the social contract. Any abrogation of that security by government action will send a clear signal to private-sector operators that their services are not valued in Canada. Such abrogation may take place in several ways.

Denial of land access is one possibility. The implications of the Federal government's Green Plan commitment to set aside 12% of Canada's land mass, along with the impact of such agreements as the proposed United Nations Biodiversity Convention, are of concern. Since exploration is needed to discover mineral deposits, and since deposits may be found almost anywhere, withdrawal of land for conservation purposes reduces the ultimate

scope for wealth-creating activity. This loss may be minimized by: limiting the withdrawals to those required to meet the valid conservation objective; carefully selecting the area in question to exclude land of obvious high mineral potential; and involving all affected interests and stakeholders, including the mining industry, in consultations prior to implementing the withdrawal.

There may also be a case for prior land use planning to identify zones in which mining would: a) be prohibited; b) be allowed with special environmental safeguards; and c) be freely allowed with the usual safeguards. What is to be avoided is the increasingly frequent situation, in which after mineral property rights are acquired by exploration, public pressure may force a political decision to withdraw the land from further development. Compensation for costs, even if paid, can be inadequate and no substitute for getting the process right in the first place.

"To ensure that environmental costs do not force the industry to leave Canada, changes are necessary. First, the present approval system must be accelerated with a defined set of expectations and rules put into place. At present, these requirements are unclear and therefore, meeting them is impossible. To establish an equitable set of developmental guidelines, government, business, the public and special interest groups must first agree on a basic framework."

Tony Petrina, Chairman and CEO, Placer-Dome Inc., *Northern Miner Magazine*, February 1991

Environmental assessment and permitting is also a critical area. Industry experts report that obtaining a permit to mine in Canada may introduce a delay of two years or more and cost \$1 million to \$5 million. This represents about a quadrupling of delay and cost from the past and compares with a very short and more certain approval process in some overseas jurisdictions. Since the applicant may have spent millions on exploration in the early stages, the delay alone may render the project non-viable, turning a wealth generator into a wealth destroyer. It is also possible that public pressure either will force impossibly strict conditions on the project or will force the assessment authorities to prohibit the development altogether.

Environmental assessment processes are expanding to cover much more than just environmental requirements. Social issues, land use planning and market economics are some of the issues being dragged into the assessment process. The trend to broaden the scope introduces greater potential for delay and uncertainty. The process should be re-focussed on core issues, not peripherals.

"Many essential human needs can be met only through goods and services provided by industry, and the shift to sustainable development must be powered by a continuing flow of wealth from industry."

Brundtland Commission Report

The sequence of events that has been described can take place in any Canadian jurisdiction. In addition, the present unsatisfactory state of federal-provincial overlap in the environmental field creates further uncertainty and provides endless opportunities for delay and litigation. This situation clearly denies traditional property rights and destroys investment incentive.

Environmental liability is a further source of concern. Environmental law in Canada is changing rapidly, sometimes with unpredictable consequences. In some provinces, the law prescribes absolute instead of strict liability for environmental damage, and it may hold individual managers liable, as well as corporations. Such liabilities may be retroactive, in the sense that current owners or operators may be required to deal with the results of situations that occurred years ago, under the laws of the day.

It may also impose joint and several liability, and hold creditors or others having a remote interest in property (such as holders of mineral rights) liable for contamination or clean-up costs. The "deep pockets" approach may have been designed to minimize the call on public treasuries, but it seems to be counterproductive. The risks and uncertainties it creates may severely reduce the total financial resources available in our society by frightening off investors. Environmental bills of rights may give a private citizen the right to launch actions against an industrial concern, whether the citizen has a direct interest in the matter or not.

However satisfying these provisions may be to activist groups, they create intense

uncertainty for business and force caution on individual executives. This is especially true for those businesses that are as visible as the resource industries. Investors in such industries may be forgiven for taking a "wait-and-see" attitude to Canada as a place to do business.

Regulations and standards are often the focus of attention, not only within industry, but also among governments and interest groups. While participants had some concerns in this area, they related less to the levels of the required standards than to the processes by which the standards are established and the current pace of change in Canadian standards.

The industry accepts that regulation is needed and expects to meet the standards required to protect the environment. Industry believes that continuous environmental improvement can be achieved by a combination of voluntary effort and intelligent regulation. It is also prepared to contribute to the solution of remaining technical problems by fostering research and investment in advanced technologies. As indicated previously, Canadian companies do not seek "pollution havens" in other countries. Rather, they take their advanced standards of engineering and performance with their foreign investments.

Also, industry is seriously affected by

- overlapping and competing jurisdictions between the federal departments of Environment and Fisheries and the provincial Environment ministries;

- new regulations that are sometimes proposed without a proper scientific basis, and without proper consultation; and

- new regulations that will be implemented without allowing appropriate transition arrangements.

Mine reclamation is an important issue. Provincial governments are changing their mining acts to require detailed plans for decommissioning mine sites and, in some cases, are requiring that cash or equivalent be paid into a fund to guarantee that reclamation will be carried out. It has been estimated that reclamation costs for acid-generating sites in Canada over the next 20 years may amount to over \$6 billion. The requirement to set aside these funds will represent a major drain of capital from the industry. At present, there is an anomaly in the Income Tax Act which does not allow a deduction for monies paid into reclamation funds and under which earnings of the funds are fully taxable.

International trends, in some cases, are driving the Canadian agenda without clear evidence of a problem. This is the case for "full cost pricing", a theory which has not been worked out in practice. If applied to the resource industries in Canada, it could seriously distort our trading patterns. Canada's participation in the Biodiversity Convention could have a significant impact on land access. Another example is the "Risk Reduction Program" of the OECD, which seems to be leading to draconian measures for the reduction in the use of lead, and ultimately other metals, without a valid risk analysis. A fourth example is the uncritical acceptance of the "Precautionary Principle", described in the box below.

"... to take action to avoid the potentially damaging impact of substances that are persistent, toxic and liable to bioaccumulate even where there is no scientific evidence to prove a causal link between emissions and effects ..."

"Emerging Trends in the Development of International Environmental Law at the Regional and Local Level: Implications for Transnational Corporations", United Nations, New York, 1992

The application of such principles to metals, certainly not beyond the realm of possibility, is problematic. It tends to lead one in the direction of elimination and substitution regardless of what the science tells us.

Public knowledge, or rather the lack of it, on environmental matters is a danger to rational decision-making. Where the public's enthusiasm outruns its knowledge, a political response may do more harm than good. Research has shown that both the public and some policy makers have very inadequate understanding of, for example, the role of recycling in today's metals industry. The extent of current recycling practices is seriously underestimated, especially by those who most keenly desire to see more. As well, the progress of the metals industry in meeting environmental goals such as reduction of sulphur dioxide emissions is often not recognized.

Taken together, these factors represent very significant hurdles for Canadian industry. There is no doubt that federal and provincial regulators have a lot of work to do in

establishing a system of environmental management in Canada that is fair, open, scientifically valid, effective, and compatible with continued economic progress for Canadians.

The Solutions and Barriers

Sustainable Development

- industry should pursue its voluntary program with vigour

There are concerns that the legal liabilities of companies and directors could be increased through agreement to voluntary commitments.

- industry must be prepared to deliver continuous improvement in the environmental field, as it does now in the economic field

Some industry officials question the need for, and pace of, additional improvement.

- industry should expand its dialogue with environmental non-governmental organizations (ENGOS) to seek common ground and work with them on a more consistent basis

A lack of trust and a history of confrontational relationships between industry and the environmental movement will limit progress.

Some ENGO's do not appear interested in a constructive dialogue.

- governments should take a balanced approach to environmental policy, recognizing the economic side as well as the environmental side
- governments should stress early and full consultations with all affected interests, and ensure that the economic impact of their actions are assessed

Land Access and Tenure

- industry should work with native groups and conservationists to find common ground and develop a cooperative approach to land use planning

Some environmental groups seem interested only in preservation, not conservation or integrated land use management.

- governments should establish clear and open processes of land allocation and consult all potential users in making conservation/protection decisions

Some environmental agencies appear to have a closed agenda.

- security of and tenure must be maintained

Industry is losing confidence in the mineral tenure system. Obtaining fair compensation may become more difficult.

Environmental Assessment and Permitting

- governments should streamline assessment procedures and reduce the uncertainty and

cost associated with excessive public involvement

Public involvement is an integral element of the ENGO agenda.

- assessments should be limited to environmental effects; issues dealing with land use planning, markets, or social concerns belong in other fora
- the federal assessment process must be integrated with provincial processes to the extent that it applies to industrial projects

Bureaucratic turf fights limit the scope for cooperation.

Environmental Liability

- governments should review all environmental liability laws to ensure that they are compatible with sustainable development and not simply a knee-jerk reaction to past problems

Governments seek "deep pockets".

- governments should evaluate the economic effects of uncertainty created by present and projected laws that increase environmental liability

Regulations and Standards

- industry should seek input to new regulations at an early stage
- federal departments and provincial governments should coordinate their efforts to eliminate overlap and

duplication

- industry, ENGOS, and government should work towards an open, fair and responsive process for developing regulations and standards that address real problems in the least burdensome way
- governments should work towards harmonized standards across Canada

Respective jurisdictions guard their autonomy jealously.

- Canadian regulations should be comparable to other industrialized nations with which we compete

ENGOS and some Ministers/departments want to position Canada at the leading edge of the environmental agenda.

Mine Reclamation

- industry should continue and expand its research on acid drainage and other outstanding environmental problems, in partnership with federal and provincial governments

Cost and availability of funds for research are continuing problems.

- industry and governments should work towards effective and economic rules for mine reclamation and reclamation funding
- the federal government should give tax relief on reclamation fund contributions and earnings

To date, the federal government does not

accept industry arguments in favour of appropriate tax treatment of reclamation funds.

International

- industry should become more knowledgeable and active on environmental issues in the international arena

Industry has few staff resources to spare for work in international fora.

- in cooperation with ENGOs, industry should work with governments to define and represent Canada's interest in international negotiations
- government and industry should work to ensure that international regulations have a sound scientific base, reflect a valid assessment of options, and provide for the selection of the least cost solution

THEME 3

INTERNATIONAL ISSUES

The Issues

Globalization of the world economy is well advanced. It is no longer possible to isolate one country's economy from the competition of other countries and their producers. Canada, with its small, open economy dependent on exports, is particularly exposed to the chill wind of competition.

Economic nationalism, which stresses made-in-Canada protectionist policies in an effort to maintain a comfortable isolation, is bound to fail in the long run. It merely delays the day of reckoning and increases the ultimate cost of doing business in Canada.

Government policies that favour free access to markets and that encourage the development of cost-effective and innovative producers are the best guarantee of prosperity in the long run. Canada cannot avoid the challenge posed by world economic integration, nor should it seek to do so. But it must cope with the challenge by doing whatever is necessary to foster a competitive cost structure and an adaptable society. Several of the rigidities that mark our socio-economic system stand in the way of our competitiveness.

The Canadian minerals and metals sector has successfully gone head-to-head with competitors in world markets for many years. Its success has been partly due to a

supportive policy climate and political stability in Canada as compared with other countries. While the Canadian mineral endowment is good, deposits in other countries are often as good or superior. Moreover, several countries with high mineral potential have recently demonstrated that they are open for business. Potential investors are responding to these invitations.

Because the scale of investment required to be a global player is growing, Canadian firms are forming strategic alliances with other multinationals, and they are investigating global opportunities.

Canada must compete for mineral investment. Maintaining a sizeable mineral sector in Canada is contingent on maintaining a streamlined cost base and a favourable investment climate.

"Our resource sectors have always been the most exposed to the forces of international competition and therefore had to be innovative and progressive in order to survive and thrive...in fact, the success of the mining sector is due more to the ingenuity of Canadians rather than the quality of the resource endowment."

Letter from Honourable Michael Wilson to Mining Association of Canada, August 1991

An open trading framework is vital to Canada's success. Our small economy is not capable of producing all the goods Canadians need and want. We must export specialized products in which we have an advantage, in order to afford to import the goods we cannot produce ourselves. Restrictions on the flow of goods, services and capital can only reduce Canadians' standard of living.

The success of the minerals sector is partly due to the relatively free exchange of raw materials and commodities that has existed in the past. As an exporter, Canada is vulnerable to allegations of subsidies. Protectionist sentiments are to be opposed whether they manifest themselves in Canada or within our trading partners. There is concern that Europe '92 may imply more insular policies.

The industry supports Canada's efforts to negotiate freer access to markets through such regional arrangements as the Canada/U.S. Free Trade Agreement and the NAFTA, as well as through multilateral negotiations under the GATT. There may be opportunities to extend free trade arrangements to the Pacific Rim area. Since accurate information is the key to good decisions, Canada's participation in international commodity study groups is very beneficial.

Marketing skills are critical to the industry's success. Expert knowledge of world trends in supply and demand is required. Canadian metals producers, selling in far-flung markets, have had to persuade local fabricators to treat them as domestic suppliers by offering comparable or superior quality and service. They have provided

value-added alloys and shapes to buyer's specifications, co-operated with just-in-time delivery systems and quality assurance programs, and participated actively in product demand and market promotions both directly and through industry associations.

There are some indications that customer requirements are changing; even closer relationships and more focused customer orientation could sharpen our performance.

Health and environmental concerns regarding the use and disposal of metals and other minerals could threaten our market. We must remain vigilant and respond with good science. The ability to recycle metals is a market advantage and may create profitable opportunities for "product stewardship".

Product mix has been a subject of debate in Canada. Some believe that metal and mineral producers should shift to more highly processed or "value-added" products. Others maintain that we should not compete with our customers, but rather that we should support their use of our products with applications research. The latter strategy has been used for many years by Canadian producers. In addition, however, more highly-processed products have been produced in Canada where economic opportunities have existed. In other cases, Canada's small domestic market has not provided the necessary stimulus and support for the development of such products.

The Canadian cost base is the critical determinant of our ability to make our way in the global village. Many of the factors that affect Canadian costs are discussed in detail in other sections of this report. Let us

note here that among the factors relevant to the minerals and metals sector are: the skills of the workforce, the quality of mineral deposits, social attitudes towards risk vs security as expressed in the regulatory system, the adequacy of management talents and practices, macroeconomic management, entrepreneurship, the existing economic structure and attitudes resulting from a protected market and branch-plant mentality, the ability to innovate, the quality and values of basic education, adequate physical and intellectual infrastructure, and efficiency in government (avoidance of duplication).

"The small size of the Canadian market means that competition policy must take global rivalry, rather than purely domestic rivalry, into consideration."

James Darroch & Isaiah Litvak, York University, "Diamonds and Money", University of Western Ontario Quarterly, Winter 1992

Canada Inc. is the preferred response to the challenges posed by international trade and globalization, in the minds of many workshop participants. Canada Inc. implies that the nation adopt an over-riding priority of restoring our slipping prosperity. This may mean placing a moratorium on other desirable but competing initiatives until we can afford them. It means focusing our efforts on an appropriate framework, the main lines of which are becoming clear. It means putting aside regional, sectoral and cultural differences in order to avoid dissipating our energies while we attend to the main agenda. Taken together, the solutions proposed in the workshops

constitute a good start on the necessary re-thinking.

There is little doubt that those who have had an opportunity to think through the current problems would undertake the necessary sacrifices and support the necessary changes if they were convinced that governments and other interests were prepared to make a concerted effort also.

The Solutions and Barriers

Globalization

- Canadians should become more familiar with the facts of globalization, its benefits and challenges

Current perceptions are that globalization is an option; in fact globalization is occurring whether we wish to acknowledge it or not.

- Canada must work with other governments to level the playing field and achieve comparable standards
- the federal government should ensure that all policies, including fiscal and monetary policies and currency values, are conducive to competitiveness

The federal competitiveness agenda is diluted by other issues such the Constitution, native issues, the national deficit, regional disparities and social goals.

- the federal government should develop its facilitating services further, including tax treaties, effective and well-planned trade

missions, access of business persons, broader approach to aid-trade (including soft loans), focusing of Trade Commissioner Service on minerals and metals opportunities

Some international assistance to the private sector is being reduced to fiscal constraints.

- government and companies should broaden their focus to include Western Hemisphere and the Pacific Rim

The federal government is too oriented to North America and Europe.

- Canadians and Canadian firms should place more emphasis on foreign languages and cultural awareness, especially in Asia

Canadians have a history of comfortable isolation and a low understanding of others' languages and culture.

- companies should become more active internationally and support international business organizations: BIAC, ICC, ICA, IZA, ILZRO, ICME, etc.

Management has too short a focus and is risk-averse. Individual Canadians may be more ready to change their ways than companies are to change their corporate culture.

In a recession, the corporate emphasis is inward on retrenchment.

An Open Trading Framework

- the federal government and industry should support all efforts for a free and open trading environment, through GATT, NAFTA, etc, including agreeing to tariffication or other realistic limitations on use of agriculture support systems

The federal government is hobbled by interprovincial trade barriers and Canadian protection of selected industries.

- the federal government should maintain and strengthen industry involvement through the SAGIT/ITAC organization
- Canada needs to examine the pros and cons of allegiance to particular trade blocs
- industry should promote the advantages of an open trading environment with the public, possibly through SAGIT/ITAC
- provinces should have more input on international trade negotiations, but should dismantle interprovincial barriers
- governments should oppose trade barriers disguised as environmental measures

Marketing

- industry and government should improve intelligence gathering, including support for international study groups
- industry should consider a life-cycle or systems approach to products and marketing, where appropriate

- industry should make the public aware of its global marketing efforts and expertise
- use of industry associations should be expanded where beneficial

Canadian Cost Base

- many of the solutions suggested elsewhere to maintain a competitive cost base were mentioned in this connection as well, including: realistic currency values; improved cost control by producers; use of technology to enhance productivity; streamlining the regulatory system, etc.
- industry has a role in assisting a change of society's values towards a more aggressive competitive position with respect to the resource industries
- governments should consider providing more infrastructure support for remote regions

Canada Inc.

- industry must itself take the lead in building consensus through alliances and partnerships with other groups in society
- horizontal alliances should be explored with other producers in non-competitive areas
- vertical alliances should be built with service and equipment suppliers
- a cooperative relationship with labour is an important objective
- technical alliances should be explored with respect to R&D, acquisition of new technology, and environmental matters

THEME 4 FINANCING

The Issues

The minerals and metals sector is capital intensive. As such, the availability of capital resources are critical to its future. The relatively small size of Canada's capital markets has required considerable inflow of capital to meet developmental needs. Maintaining a suitable investment climate to attract those funds, as well as ensuring that funds earned in Canada are re-invested here, is of increasing concern.

Participants did not identify serious structural problems inhibiting the availability of funds for the minerals and metals sector. But there are serious concerns about several aspects of financing which require attention.

During the period of rapid expansion in the 1950s and 1960s, the industry's capital needs came from retained earnings and internally generated funds. Debt also played an important part as the size of funds necessary to finance new mining developments grew. The major Canadian banks, stock markets and public attitude supported the expansion of the resource industries and mining did not have problems obtaining the capital necessary to sustain its growth.

During the recession of the 1980s, debt-equity ratios inflated as companies turned to borrowing to keep operations afloat. Low

returns on capital significantly worsened the financial health of the sector. The upturn of the late 1980s, brief as it was, helped restore balance sheets to a healthier state, so that, at the present time, companies are on a firmer financial basis and better able to withstand the effects of the current downturn.

But what of tomorrow? Concerns are mounting that the industry may not be able to find the capital necessary to finance the developments of the future.

"The traditional banks are still lending to the mining industry but at a reduced level and are much more cautious in the approach ... it is no longer sufficient to find a good mineral deposit and await a rush of financiers to your door."

Robert McKnight, Endeavour Capital Corp.
Vancouver, CIM Mineral Economics
Symposium, January 1992

Providing funds for exploration and junior mining companies is at the top of the list of concerns. Without exploration, the mining industry will decline. The deposits being mined today must be replaced. Due to the downturn in exploration, ore reserves are dropping.

Many of the deposits currently in production have been the result of junior mining's activities. The current recession, coupled with poor returns over the past decade, has led to fewer funds being available to junior and senior mining companies. Even for the large companies, cash flow from operations is a decreasing source of capital for exploration as companies attempt to conserve expenditures and survive. The exigencies of the moment are taking precedence over the long term future.

Junior companies are finding it tough. Venture capital markets for raising exploration funds are drying up. The banks are more cautious. Major companies are driving hard bargains with junior companies, looking for equity positions rather than offering cash. Offshore funds from Asian or European investors have been a limited source. Everyone is attempting to minimize risk and approaches are far more conservative than in the heady days of the past, when Canada's dynamic junior mining sector was world-famous and successful.

There are fewer places to invest in the mining industry. Industry concentration and restructuring has reduced the number of active mining companies in the market place. Junior companies, once the front-end engine of the sector, are a threatened species. Senior industry financing is often done through corporate conglomerations.

Tax incentives have helped to sustain exploration in the past. Exempting prospectors from capital gains tax encouraged the very front-end of the sector. The use of flow-through shares in the late 1980s provided an influx of capital from hitherto untapped sources. Without that

program, exploration would have been very low during the late 1980s. The flow-through program was responsible for an exploration and development effort which found various promising deposits, some of which have been become mines. Unfortunately, the program had drawbacks. Activity rather than success was rewarded. Furthermore, federal financial constraints led to its demise. Tax-related mechanisms have offered important incentives and perhaps should be revisited. But the problem goes beyond the tax system.

The availability of risk capital in Canada is becoming tighter. Past abuses have led to a significant tightening of stock exchange regulations. Venture capital has felt the impact most of all. The Vancouver Stock Exchange (VSE) was once a lively source of speculative capital and a world-renowned vehicle for raising short-term, high-risk capital. It filled a niche not provided by the Toronto and Montreal Stock Exchanges which took a longer term, lower risk view. Today, the VSE is a shadow of its former self. The recession has played a part but regulatory change has reduced its activity considerably.

Canadians are becoming more risk averse as the economic and political uncertainties linger on. Venture capital is not seen as an attractive place for Canadians to put their money. They prefer lottery tickets over venture capital or the stock market. The chance of instant return and gratification (tax free as well) has more allure than investing in the future of the country. Moreover, the out-of-favour perception of the mining industry does not make attracting funds to this sector an easy proposition.

The increasing cost of discovery and uncertainty of development is also affecting financing. It appears to be taking longer, more money and greater effort to find a mineral deposit in recent years. The lack of major successes in recent years has dulled investor enthusiasm for the mining sector, as have poor returns on investment. Even if a deposit is found, there are the uncertainties of its being developed due to environmental restrictions and development delays. An increasing amount of venture capital and exploration financing previously done in Canada is destined offshore because the opportunities for a return on capital are judged to be superior than in Canada.

The role of financial institutions is changing. Banks are understandably unwilling to fund high-risk ventures like exploration. However, once a decision is taken to go ahead with a new project, the Canadian financial system has generally been able to cope with the necessary financial requirements even though some offshore capital might have been necessary for the largest projects.

Quality deposits and mining developments, even smaller scale ones, have in the past found a receptive banking sector. Today, bank financing favours large, multi-mine or multi-sector entities. Smaller operations with a limited track record and reduced capitalization and assets may encounter greater resistance when they seek financing.

Banks are increasingly risk-averse in the current uncertain economic environment. Their preference is to finance larger companies with a reputation, a preference that reduces the ability of new entrants to break into the mining business. While the

junior mining sector has been an important force in building the Canadian mining industry, small, independent mines and mine developers are becoming a rarity today.

Banks also seek to minimize risk. They spread the financing across several institutions, domestically and internationally, so that if a development should encounter problems, the exposure of any one bank is limited. This may have increased the cost and complexity of financing. Some operations have encountered problems with risk-averse banks demanding greater security for outstanding loans. There have been instances of banks "pulling the plug" earlier than expected due to deteriorating economic circumstances. In earlier times, they might have been prepared to let a borrower ride out its economic troubles. Today, they seem much less tolerant.

The cost of financing remains high. Nominal interest rates have declined significantly over the past year, a development which the business sector welcomes. However, real interest rates remain high. This pushes up the cost of borrowing, requires a high rate of return to justify new investments and reduces the incentive to undertake new projects. Compared to its competitors, Canadian financing costs are not attractive.

"Clearly, third party liability is a big problem for all of us. And collectively - to ensure access to capital - we must convince the federal and provincial governments to address this issue."

Moe Hanley, Vice President, Toronto Dominion Bank, "Environmental Risks and Liabilities: What They Mean To Your Banker And What They Mean To You", March 24, 1992

Environmental liability is another serious problem facing the availability of funds for the minerals and metals sector. Lenders are increasingly concerned that as governments take a "broad and deep pockets" approach, they will be pulled into the search for sources of funds to fix environmental problems. The Canadian Bankers Association (CBA) has recently published a document which sets out its concerns about current trends in environmental jurisprudence. In the CBA's view, the concept of joint and several liability has the potential to drag banks into financing environmental clean-ups.

Accordingly, financial institutions are increasingly careful to ensure that they review not only the business end of a loan proposition but also the environmental aspects. The impact of ever-widening liability has the potential to dry up sources of capital for future mining sector projects. It is also deterring investors from looking at revitalizing former mining operations for fear of being held responsible for cleaning up old problems caused many years ago.

The banks will not get involved if they feel that lender capital is potentially at risk of being grabbed by governments seeking deep pockets. For the mining industry, the resulting lack of capital would be a disaster.

The Solutions and Barriers

Funds for Exploration

- re-examine recent changes to stock market regulations to allow easier raising of venture capital

Governments seem more interested in protecting "public interest".

- revisit the flow-through concept to see how it could be modified for longer term effectiveness. Revisit previously used tax mechanisms to re-create incentives for exploration

Government budgets have limited financial flexibility at the current time.

- exploration should be regarded as research and development, and thereby qualify for more appropriate tax treatment, similar to other R&D expenditures

Governments budgets are constrained and interest in stimulating exploration and development may be lacking.

- a more pro-mining/resource industries stance by governments would encourage Canadians and foreign investors to consider investment in the sector

Some governments do not appear to be interested in having a dynamic and

expanding minerals and metals sector.

More Risk Capital

- attract more foreign venture capital for investment in Canadian exploration

Investment climate in Canada is perceived as deteriorating and not attractive, especially for resource industries like mining.

Poor economic returns in the mining industry through the 1980s make it hard to attract capital.

- encourage merchant banks to provide risk capital
- governments should be encouraging Canadians to invest in the future of their country instead of putting funds into lottery tickets

Governments depend heavily on lottery proceeds.

- governments and those in the capital-raising business should be attempting to educate Canadians about the role of stock markets and capital raising mechanisms

Financial Institutions

- imaginative financial instruments should be examined to assist small enterprise to obtain financing

Environmental Liability

- governments should clarify the legal exposure of lenders (and others with an interest in property) to environmental liability

Without clear legislation, this is likely to be determined only by jurisprudence through court decisions, a slow and expensive process.

- industry should ensure through self-regulation that it is seen to be putting its own house in order, thereby limiting concerns that lenders have about environmental liabilities

The perception of the mining industry is an outdated one. Industry will have to continue to work hard to overcome scepticism about its commitment to environmental excellence. There are concerns that commitments to greater "self-regulation" could increase liabilities.

- governments should ensure that environmental legislation does not contain clauses which allow retroactive or retrospective application. Today's industry should be responsible for the consequences of its actions at current operations, not for the actions of others in the past.

Governments are seeking to spread liability across as broad a base as possible in order to limit claims on the public purse.

THEME 5

EDUCATION AND TRAINING

The Issues

"Let me end by being blunt. I do not see a healthy future for our metals and materials industry in the 21st century without a much greater commitment to the human intellect than we have shown ourselves willing to make in the past."

J.K. Brimacombe, Centre for Metallurgical Process Engineering, University of British Columbia, Keynote Presentation to Workshop on Metallurgy and Materials Science in the 21st Century, November 1991

Canada's education system consumes significant financial resources but increasingly, questions are now being asked about its quality, effectiveness, efficiency and relevance. Is it appropriate for a rapidly-changing, more technologically-oriented world? Is it educating students or only baby-sitting them?

The discussion below points to a variety of serious and complex issues involving training and education. The problems are extensive and there is no quick fix. However, participants felt strongly that our ways will have to change if Canada is going to have a workforce attuned to future competitive realities. The solutions lie not

in spending more money but in spending what we currently spend in a more efficient and effective way. Taxpayers are already face a high financial burden for education. It is unrealistic to expect them to spend more.

The need for improvements in Canada's education system was a priority with many participants. In particular, the current quality, format and curricula of education in our schools is of concern. There has been a drift away from a rigorous and goal-oriented system to one in which students have the freedom to take a mix of courses which they feel is right for them or which meets their personal interests and ambitions. A liberal approach to curriculum content has removed national standards and guidelines. There is less emphasis on academic achievement and competition. Various surveys and studies show that Canadian students are falling behind their counterparts in other countries. They also show that Canadian curricula are not as comprehensive or challenging.

Participants questioned the efficiency with which the education system is being run. There may be too many school boards, an inefficient infrastructure and a system which reacts to a changing world far too slowly.

"In kindergarten through Grade 12, we Americans happen to have a system that doesn't work and the incredible fact is you, the Canadians, copy us. It's called local school boards. We're the only two societies in the world that have local school boards, elected school boards, and they don't work because they won't set a quality standard, and almost by definition, the local school board can't set a quality standard."

Lester Thurow, "Lessons for Success",
Challenges, Winter 1992

Inadequate coverage of mathematics and science will affect our future ability to be competitive. Not everyone can be a mathematician or scientist, nor should students be forced into disciplines for which they do not have the aptitude. However, students require certain minimum skills to participate in modern society, and if Canada is to have a human resource base competitive with the rest of the world.

A return to national standards or agreements between provinces on levels of education in core subjects (eg, maths, sciences, writing), or, at a minimum a return to provincial-wide standards, would help to raise the general level of education in these disciplines. It might also encourage deferral of decisions on career paths until a time when students are more mature and better able to determine their future. Although acceptance of fixed standards would mean returning to a system abandoned some time ago, reconsideration is perhaps necessary. But before this can happen, the population at large and educators must accept that change is required. It is debatable whether that

point has been reached.

Too many students leave school prematurely. The current level of student drop-out from our educational system - often quoted to be about 30% - is unsustainable. Canada simply cannot afford to carry uneducated "deadwood" for the future. Furthermore, some two-thirds of students are estimated not to go beyond secondary schooling. It is unlikely such individuals are adequately prepared for the competitive challenges of the future. Students must realize that education is a necessity. They cannot expect to drop out and be carried by the rest of society.

"If present trends continue, Canadian schools will send another one million young people who are functionally illiterate into the workforce during the 1990s."

Economic Council of Canada, A Lot to Learn, April 1992

Business involvement in education has been inadequate, from provincial-level education policy down to local school board matters. Companies, their managers and employees have a duty to work with school authorities to ensure that students learn about economic realities and that they acquire needed skills. Some individual companies and industry associations have successfully introduced appropriate materials into the curriculum with the co-operation of interested educators. While not suggesting that all education should be industry-driven, there may be merit in more regular and systematic interaction between industry and

education planners to ensure that there is reasonable symmetry between what is happening in the economy and what students are pursuing in their academic or technical training. This a role in which industry associations could help.

"Business is in a position to publicize the connection between education and individual and national prosperity. At the same time, it needs to become more involved in education issues and partnerships and to communicate its expectations of the education system."

International Comparisons in Education, a study commissioned by the Alberta Chamber of Resources in partnership with the Alberta Department of Education, March 1992

Few educators have **direct industry experience** to pass on to students. As part of their professional development training, teachers or guidance counsellors could be given the opportunity to spend some time in industry so that they have first hand knowledge of how the business world operates, what industry's needs are, and what students need for the future.

Technical education and trades training are not appreciated within society at large, despite the fact that technology and computer-based jobs are increasingly prevalent. Not everyone in our society can or should go to university. But unfortunately, there is a societal stigma attached to non-university education, as though the learning of technology-based skills is somehow undesirable or inferior. This attitude requires change. Society must place an equivalent value on technology-based learning as on academic-based, if

Canada is to have the highly trained and adaptable workforce which is necessary for the future.

Professional education in earth sciences and minerals-related disciplines is lagging. Lower science content, and in particular earth-science content, is reducing the interest of prospective students in minerals-related careers. In the face of declining enrolments, universities have pared down the scale of their geology, metallurgical and mining engineering departments. Further reductions are possible.

Instead of many institutions offering more or less the same programs across the country to a smaller number of students, a centre of excellence approach might be appropriate or become necessary. Such an approach could boost Canadian expertise in particular areas, make partnerships inside and outside the country more feasible, and stimulate opportunities for research and development with industry.

Gaining on-the-job experience for professionals can be difficult in a cyclic industry. Students who enter professional and technical disciplines at a time of strong industry activity may find that the situation has changed by the time they graduate. The lack of job opportunities can be very discouraging not only for the graduates but also for potential enrolment. While there is no gain from artificially stimulating educational opportunities, professional training in Canada cannot be allowed to wither to the point where it ceases to exist. A decade ago, the MAC and the federal government sponsored an internship program which provided graduates in mining-related disciplines with the opportunity to gain on-the-job training. Companies participated but did not have to commit to hiring these students on a full time basis. Perhaps it is time to consider

resurrecting such a program.

"As of 1988, Canada's private sector provided on average only about seven hours of in-house training for its workers. In Sweden, the comparable figure was 170 hours and in Japan, it was 200. Even now, few Canadian firms provide funds for formal training of their workers."

R. D. Fullerton, Chairman, Canadian Imperial Bank of Commerce, quoted in *Globe and Mail*, February 10, 1992

On-the-job training should be a priority. Canada's record in this area appears to lag that of other developed countries. Education and training go beyond academic opportunities and the classroom. Learning must be a lifelong experience through all levels of a company, from the very top down. It is not just for upgrading the skills of the hourly-rated workforce. Training must also involve basic life skills. There remains an unacceptably high rate of functional illiteracy, particularly among older workers. This is, in part, a hold-over from the days when workers were hired for their backs rather than their minds. As the workplace increasingly becomes a high-technology one, these basic life skills become ever more important for individuals, and for companies fighting to stay competitive. This seems to be an area in which management and labour should work together.

"Close to half of our workforce needs their reading skills improved."

Smelter superintendent

The mining industry, especially larger companies expecting to be in a particular location for many years, already sponsors considerable on-the-job training. Indeed, some industry managers complain that they do more than their share of training on behalf of Canadian industry. Once the mining industry has done the basic training, workers are siphoned off to other sectors which do less.

Apprenticeship training is widely utilized but could perhaps be improved and expanded. This is an area for future review. Apart from existing apprenticeship programs, training is also required when new technology is introduced to the workplace. New machines, mining methods, processing technologies and the use of computers have required workers to learn new skills and to be more flexible in their work. This is a principal reason why the mining industry has remained competitive. It is a trend which will continue.

"It really gets frustrating. We spend good dollars investing in people and they get poached by someone else. Sometimes it makes us wonder why we bother training."

Participant at Prosperity Consultations

An in-depth look at the mining industry's future human resource needs is being undertaken by Employment and Immigration Canada at the request of The Mining Association of Canada, The United Steelworkers of America and the Canadian Institute of Mining, Metallurgy and Petroleum. One of the areas under study is the extent to which the industry must prepare its own employees for future change and how the training system should respond to future human resource needs.

At a time when many companies are laying off employees, it may seem inappropriate to be contemplating strategies for a future supply of trained individuals. Industry views vary. Some executives are not concerned about a future supply of qualified labour - they expect that the dynamic nature of labour markets will provide their needs. Others feel there is a need to consider the situation more systematically because mining-related occupations are increasingly specialized and technologically oriented.

Underlying demographic trends raise questions about training issues. Canada's workforce is aging rapidly. Falling employment and reduced hiring have accelerated the trend, raising the average age of workers significantly (for example, it is 44 at INCO's Sudbury operations). Human resource planners and company managers therefore question how much effort should be put into training workers unlikely to be in the workplace by the end of this decade. Further, can older workers successfully adapt to the new technology? These are difficult but relevant questions and opinions are divided. One particular concern is that the current seniority system protects the older workers and not necessarily the ones who have the best skills and aptitudes.

Adjustment and transition pose special training needs. Workers must make the adjustments to new careers if they are laid off and training for such eventualities is as important as other types of training. In today's world, workers must be prepared to endure considerable upheaval in their lives and to learn new skills required for the future.

The financing of programs for training and retraining raises questions about the respective roles of governments, industry and workers. Many companies invest considerable sums, others next to nothing. Enhanced tax incentives should perhaps be available to employers investing in their employees' skills. Another means might be a mandatory requirement for employers to ensure that a certain percentage of an employee's salary is spent on upgrading skills (akin to Australia's scheme).

Aboriginal peoples are playing an increasing role in Canada's economic fabric. Through land claims settlements and self-government, they will be looking for economic opportunities to improve their standard of living. It is questionable whether the current educational system has adequately prepared them for a significant role in Canada's resource industries. Special programs appear necessary to provide the required skills so that they can take advantage of opportunities. There may be need for a fast-track process to allow native peoples the opportunity to gain necessary scientific and managerial expertise they will need to maximize the benefits they expect from the land and resources they will receive through the land claims process.

"I am here so that I can learn about the issues which our people are going to have to deal with as we develop our land and resources. We want to participate at all levels of development including management."

First Nations' representative at Prosperity Consultations

The Solutions and Barriers

Improving Canada's Education System

- develop a cross-Canada perspective on priority areas for our education systems

Getting agreement across provinces will be very difficult, in view of regional priorities, spending and jurisdictional responsibilities. There will be resistance from vested interests.

- return to a standardized curriculum and measurement of student performance at the primary and secondary levels. At a minimum, this should be done on a province-wide basis but ideally be implemented across the country. It would also provide a basis for evaluating teacher performance

This would mean a significant shift in the philosophy of education which in the past two decades has moved away from comparative standards across jurisdictions.

- re-institute an emphasis on achievement into our school system. The "laissez-

faire" approach to education would appear to be ill-preparing students for a technologically-oriented and competitive world.

Student, parents and teachers have become accustomed to a more relaxed approach to educational content. A return to a more "disciplined" curriculum will go against trends to date and in society generally, where freedom of choice is seen as a fundamental principle. One exception is the private schools whose competitive approach is well appreciated by the achievers in society and results in enrolment queues and competitive entrance exams.

- introduce professional managers into school boards to upgrade the quality of management of the school systems rather than leaving it to elected officials

Current system of elected local school boards is well entrenched.

Role of Mathematics and Science in Secondary School Curricula

- boost the student's exposure to science and mathematics by having all students complete an enlarged general science requirement as part of their core secondary school program. In-depth scientific study can be provided for those intending to specialize

Students with interests in the non-sciences often drop mathematics and science options early in their secondary school program.

Reducing the Drop-Out Rate

- reduce the drop-out rate from secondary schools. Business could perhaps play a role in the counselling of potential drop-outs

Canada's social systems (eg, unemployment insurance, welfare) provide a safety net and reduce the risk of failure for those individuals who drop out.

Role of Business in Education

- facilitate a greater role for business in the education system. Business and educators should sit down on a regular basis to look at competitive trends and curriculum development, and to ensure that students get a "real-world" flavour to their education.

Educators will resist a meaningful business role in their profession.

- communicate "real world" facts to students. This would include encouraging students to complete at least their secondary school education, educating students about current competitive trends, and the types of jobs which will be available upon graduation. A communication program involving speakers from the mining industry could be organized along the lines of the Canadian Institute of Mining, Metallurgy and Petroleum's (CIMM) Distinguished Lecturer Program

Business's communications towards students would need some re-orientation

to ensure less emphasis on industry-specific information and more on generic "real world" advice.

Business groups do not have a cross-sectoral mechanism which is geared to this type of information.

- lend management experience to local school boards

A means for business groups to be more involved with the "business side of education" would need to be developed.

- create opportunities for teachers to serve short-term "business apprenticeships" as part of teacher professional development training in order to give teachers a greater appreciation of the business environment

A new vehicle would have to be created. Some teachers may not be interested in a greater appreciation of the "real world".

- involve business personnel in impartial reviews of school board and teacher performance, in an attempt to boost the performance of the education system.

Any attempt at "external evaluations" of teacher and board performance would likely be resisted by teacher and educational organizations.

The Role of a Technical Education

- overcome the stigma attached to non-academic streams of education so that there is no "shame" to a trades-based or technology-based education

Trades or technologically-based occupations/training do not have the same status in society as academic training. Remuneration levels are partly responsible.

Professional Education in Earth Sciences and Minerals-Related Disciplines

- improve the lagging interest of students in earth sciences-related disciplines by having a greater science content in primary and secondary school curriculums

Departments of education within the provinces do not seem disposed to increasing the science content of curricula.

- re-examine the operational basis of technical schools and universities, due to increasingly scarce financial resources. Canada can no longer afford to have institutions offering all things to all students. Institutions should consider greater use of a "Centre of Excellence" approach where there could be specialization on various disciplines, if necessary, on a regional basis. Business should be invited to help design a re-organization of these institutions in line with anticipated future needs

The relationship between major industry groups and educational organizations is not as close as it could be, notwithstanding a plethora of advisory mechanisms.

- increase the use of "careers fairs" in co-operation with educational authorities, in order to interest students in careers in the

earth sciences

- improve the poor public perception of the resource industries so that students will be encouraged to look at sectors like minerals and metals for career opportunities. The minerals and metals sector needs to do a better job of helping educators to understand the contribution of the minerals and metals sector to the economy and to see the industry as technologically modern

Some educators exhibit considerable scepticism about the resource industries and their contribution. This is often passed on to students.

The public perception of the minerals and metals sector (eg, sunset, low tech, dirty, in remote locations, cyclic nature) does not immediately make it an attractive proposition for students.

Getting-On-The Job Experience

- investigate some form of industry/government-sponsored internship program in order to help recent graduates gain necessary work experience

Funds would have to be found and a program developed.

On-The-Job Training

- encourage industry to take a longer term perspective concerning their employees' future in order to build confidence, dedication and commitment amongst workers

Workers who leave are generally easily replaced.

Unions resist a "big brother" approach and interest by companies.

Some workers see inadequate rewards for increased training.

- continue education on-the-job in both work-related and life skills, in the interest of the long-term development of employees and their competitiveness. Business and labour should work together to assess employee needs (skills training and safety are two potential topics for MAC-USWA cooperation)

On-the-job training is a direct cost which often gets cut in tight economic circumstances.

On-the-job training too often becomes a subject of workplace dispute between management and labour. The historical adversarial approach to labour relations can make progress on such fronts difficult.

Individuals are reluctant to admit they need help in upgrading life skills.

- investigate the implications of requiring all employers, large and small, to spend a mandatory percentage of an employee's wages on skills upgrading (a similar system has been implemented in Australia). Enhanced employer incentives or a reward system are possible alternatives

Employers will resist any notion of mandatory training levies which are seen

to add to operating costs, especially at a time of recession. An employer incentive or reward system would seem preferable.

- encourage workers to become more flexible in their on-the-job tasks and learn a basket of skills. Reduced barriers to job demarcation must continue.

Labour resistance to multi-skilling can be expected. Certification and standards limit the extent to which multi-skilling can go in some fields.

- ensure that on-the-job training prepares employees for adaption to new technology. Programs for upgrading should involve everyone from the most senior management down, as part of company and industry-wide commitments to quality

Many senior managers will not see a need to upgrade their skills.

There may be limits to what can be expected from an aging workforce. A person retiring within a few years cannot be expected to be as interested in learning new skills. Business will want to invest the minimum in a person about to leave the workforce.

Adjustment and Transition Training

- assist workers to develop portable skills which can prepare them for adjustments and transitions if they are faced with having to find a new job. Existing skills may not be sufficient to allow workers to readily find new work

There are conflicting views over the respective financial responsibility of the major players.

Training is expensive; the cyclical nature of the industry can inhibit the availability of funds for training.

- use unemployment time more gainfully by encouraging workers to take re-training
- review existing training assistance programs in the light of Canada's aging workforce, which makes older workers less likely to find themselves employable. For example, the resources devoted to Labour Canada's Program for Older Workers Adjustment can perhaps be better used

Government financial resources available for such programs are limited.

Aboriginal Training

- special programs may be necessary to give native peoples the managerial and scientific expertise necessary to manage the land and resources they will be receiving

THEME 6

INNOVATION, RESEARCH AND DEVELOPMENT

The Issues

"Far from reducing our need to invest in knowledge, rapidly developing technologies in natural resources management and industries call for even greater attention to scientific education, professional training, research and product development. Our dilatory effort in this is undoubtedly the biggest threat to our long-term economic performance."

Professor Peter Pearse, University of British Columbia, Globe and Mail, "Building On Our Strengths", January 10, 1992

Important questions are being raised about the role of innovation in the Canadian economy, and of research and development (R&D) as a specific product of the innovation process. As the world changes, only industries, individuals and countries which can make the necessary adaptations will survive. But technology can provide a bridge to future competitiveness. Technology is not only embodied in equipment and processes. It is also the knowledge and know-how which people apply to their work.

Recognizing the R&D that already takes place is fundamental to an understanding of the sector. The minerals and metals sector is "high tech" and getting more so every

day. To survive in an increasingly competitive world, Canadian companies have had to make better and more creative use of technology in the way minerals and metals are found, extracted, transformed and used.

Adaptations are made to processes and equipment on an ongoing and day-to-day basis. Each company has its own unique operating characteristics which require it, even if it is small, to modify off-the-shelf processes and equipment before they can be effectively used. However, these activities are not generally counted in the statistics nor do they qualify for special tax deductions. They remain hidden from general view but are a vital part of the industry's R&D effort and the drive for productivity.

"The bulk of innovative activity is coming from continuous improvement, those hundreds or thousands of small innovations that when added together, can make enormous differences."

Jeffrey Gandz, Western Business School, Business Quarterly, Autumn 1990

Highly-scientific mineral exploration activities are considered a key part of R&D, a difference from other sectors. The

statistics used to make inter-industry and inter-country comparisons generally do not include such activities. Without new mineral deposits, the minerals and metals sector would quickly dwindle. Therefore, the search for new deposits is as much "research" as the effort by manufacturing companies to find new raw materials or new products. Furthermore, the exploration effort itself is continually being upgraded and made more high tech as new means are used find mineral deposits hidden deep in the earth's crust. The new thrust by the Mining Industry Technology Council (MITEC) on the development of exploration techniques for deeper deposits is a case in point.

Canadians are world leaders in exploration and remote sensing. Some of this has been achieved using home grown technology, some with technology imported from other countries and adapted to Canadian conditions. In mining and metallurgy, Canadian companies are also world class. Advances in production processes and equipment have allowed Canadian industry to take the steps necessary to remain competitive with countries which can offer such advantages as easier climates, better infrastructure, significant domestic markets or higher quality deposits. But these competitive improvements have also spawned foreign sales of technology. Noranda's recent smelting technology sales to China are an example.

The question of boosting R&D levels is controversial, as the industry is currently in the trough of a very difficult business cycle. Some believe that a long-term industry "vision" is lacking, but this does not get high billing against current short term

imperatives. It is also recognized that existing institutional arrangements and industry priorities are not focused in this direction. With the exception of larger companies with multiple facilities and integrated operations, this situation will not change quickly. Short-term priorities command attention over long-term objectives.

R&D on a large scale is limited to only a few companies. It is not a model which is generally applicable across the industry. Due to their size and diversity of interests, such companies undertake R&D-oriented activities directed at improving their own operations. Eventually, some of these activities bring benefits to the sector as a whole. However, such R&D activities must demonstrate economic benefit to the company if they are to survive and be given access to scarce capital resources.

A "corporate champion" was suggested as a means to ensure that R&D goals do not get overlooked in corporate priorities. Such a champion or an internal implementation team could also play a role in overcoming resistance to change, a problem perceived by some participants. Perhaps the lack of an R&D-oriented culture within a company inhibits management's continuing commitment to R&D and to using R&D's results.

"Innovation is fostered first by creating a working environment conducive to innovation. It must be fully supported by senior management, with adequate funds made available for research, development and large-scale demonstration and implementation."

Walter Curlook, Vice-Chairman, INCO Ltd, Northern Miner Magazine, February 1991

Participants commented on varying perceptions of R&D-oriented personnel. Some are held in very high regard by their colleagues in the production end. Others noted that the researchers are seen as the ones who "tinker and play" while others do the hard slogging of producing an economic product. In some cases, those dedicated to R&D had a difficult time within corporate ranks getting their priorities heard.

The rewards of innovation were also questioned. Much time and effort can be spent with little gain - this often happens in original research. Further, the time frame for a return on investment can be many years, difficult to quantify and very uncertain. There is considerable risk with little guarantee of payoff. Some companies in the minerals and metals industry have taken this gamble over the years in view of its importance to a continuing future. Others have not.

"Canada should spend the lions' share of its R&D on development rather than basic research. Even if Canada made discoveries at the same rate as other countries, we wouldn't discover many new things because of its small population. Better to learn how to build the same mousetrap with fewer components or to build it faster. This is how you increase your productivity."

Jean de Grandpré, Chairman, BCE Inc, "Can Canada Compete", Globe and Mail, April 1991

Funding is seen as a major hurdle to longer term R&D in the industry. The cyclic nature of the industry squeezes both profits and the funds available for discretionary expenditures like exploration and R&D. Unless industry is willing to "guarantee" a continuing level of expenditure regardless of economic circumstances, maintaining a professional team to provide a consistent level of R&D can be difficult. Greater co-operation through organizations like MITEC can help to even out the flow of funds into R&D.

Implementing R&D, or transferring technology to the shop floor, is the acid test of innovation. Opinions are divided on the best and fastest way of gaining the benefits of applied technology.

The question of "make vs buy", or developing indigenous technology vs buying it, has been the subject of continuing debate within the industry, and between industry and academia. Opinions are divided. Academics and bureaucrats often argue for a significant R&D effort which can produce

indigenous technology that can in turn produce spin-offs benefits from new manufacturing or export opportunities. Industry prefers a pragmatic and cost-effective approach which involves being constantly on the look-out for new technology which can be bought and applied or adapted to give competitive advantage, including technology not necessarily designed for the minerals and metals sector. Being a "fast follower" is seen as expeditious. The pace of technological change is such that the competitive advantages to be gained from indigenous development are only transitory, and the development of technology is a time-consuming and expensive process.

Improved institutional arrangements were seen as a way of spreading the benefits of research. For one thing, the research needs of smaller companies are diverse and difficult to meet. Moreover, they do not have the requisite funds or corporate personnel base to get heavily into R&D. One remedy is to do more co-operative work through organizations such as the Mining Industry Technology Council of Canada (MITEC) which essentially acts as a research broker on behalf of the varied diverse interests in the industry.

Progress in innovation requires clarifying the respective roles of industry, governments, universities, and specialized research establishments in R&D for the minerals sector. The roles of the public and private sectors in mineral sector innovation have been a subject of debate. The public sector, through the federal and provincial geological agencies, has provided valuable baseline information to the minerals and metals sector, and in an increasingly high-

tech form. Further, some provinces, and the federal government, have sizeable mineral R&D establishments. These have been criticized in the past for not being sufficiently attuned to the needs of industry but this situation is changing. Participants felt that these organizations have an important role but must continue their efforts to be relevant and practical so that the impact of governments' R&D investments is maximized. There was debate on whether their proper role is one of generic pre-competitive research which can assist industry generally or whether they should have only a "for hire" role, in competition with private sector research organizations.

Centres of excellence were suggested as a potential way to increase R&D, as well as to improve mineral education. Historically, it was felt that the links between governments, universities and industry have been inefficient and fragmented. Progress on changing this situation has been slow. There was a view that Canada lacks identifiable institutions with particular R&D interests. If these existed, it was suggested they might be a means to focus R&D targets, bring a collective effort to the table on critical issues and integrate the efforts of various related disciplines. It could also stimulate a prioritization of R&D topics which could benefit Canadian companies overall or lead to providing Canada with specific market niches. The role of Laurentian University in rock burst research was cited. The use of centres raises questions as to the proprietary nature of some work and the resulting ownership of intellectual property. It was suggested that the industry is perhaps not as well equipped as it should be to facilitate technology

transfer. Research done collectively or in consortia outside of the corporation might be more effectively transferred.

Appropriate R&D strategies were seen to depend on the situation of the particular firm or business. Obviously, company size and perception of its principal business has much to do with corporate approaches to innovation. Smaller companies are essentially producers and marketers of specific commodities. Their ability and interest in R&D is limited. There is inherently nothing wrong with this focus: it has brought considerable benefits to Canada. It also maximized returns from the high value-added that is available at Stage I of the value-added chain, ie, the mining end.

Most mining R&D is not undertaken with the explicit goal of producing intellectual property which will be saleable or transferable. Generally, it is necessity driven, has a short-term focus and is unglamorous stuff. Companies are in the mining business first, and in the R&D business second. They do R&D to raise productivity, increase metallurgical recovery, assist health and safety or improve environmental performance. Rarely do companies set out deliberately to develop a product or process which will have a life of its own. They undertake research to help their own situation, and if a saleable or transferable product results, it is a bonus.

"R&D in my company has to be practical and let us cut our costs and boost productivity. It is day-to-day stuff that is not exciting but saves us a lot of dollars each year, and it involves everyone in the operation."

Mining company middle manager at
Prosperity Consultations

Participants reject the validity of forward integration as a panacea. Total forward or downstream integration is not realistic. The minerals and metals sector produces intermediate products which other industries use, rather than final consumer products. The sector does work closely with its customers to ensure product quality and reliability. As required, there are often close collaborations on new products to meet market trends. For the mining industry to integrate downstream into manufactured products is getting beyond its area of expertise. Companies who have tried to do so have generally found it to be an unsatisfactory experience and have retreated.

Participants did raise the industry's role in product development, long-term research directions and using R&D for strategic development. It was conceded that there may indeed be long run benefits to be derived from such activities. However, participation on such a basis was felt to be a luxury when so many companies are struggling to find ways to cut costs and survive. But this does not mean that the minerals and metals sector rejects the need for continuing R&D. Far from it. Participants felt strongly that the industry's record of technological innovation is good

and must continue.

Development of alliances and partnerships in the innovation area is a natural step for companies interested in gaining a larger contribution from R&D. This could apply both upstream and downstream with both suppliers to the industry and customers as well.

"One intriguing issue is whether and how a new wave of innovations can occur given the negative perception of the industry as a place to follow a technical career."

Peter Crimes, Director of Technology,
American Mining Congress

Human resources for R&D was an issue of concern. The availability of skilled researchers is critical to a sustained R&D effort. Within Canada, the R&D establishment is small, even when active researchers in governments, industry and universities are totalled. Canadian efforts are dwarfed in comparison to other countries. Even those that do exist are often hobbled by inadequate facilities, uncertain funding and lack of priority attention. For the future, concerns are even greater as the number of specialized graduates shrinks and budgets are tightened. Companies have fewer human resources to devote to R&D. Unless innovation is made an explicit priority with a clear mandate, it will not receive the management and human resource support it requires.

The Solutions and Barriers

Recognizing R&D

- exploration and the considerable effort industry makes to modify equipment and processes to fit individual mine or plant circumstances and metallurgy must be recognized as R&D. This would present a better understanding of industry's expenditures and approach to R&D, and facilitate creation of a more appropriate policy environment

Many parts of government and some academia misunderstand industry processes. The type of R&D essential to the minerals and metals sector's competitiveness does not have enough "sex appeal" for the grand visions being espoused in some quarters.

Boosting R&D Levels

- identify how to make effective expenditures instead of focusing on total funds spent. Enhanced identification of R&D targets or niches would help this process

Activity is often confused with effectiveness.

The potential range of targets for R&D expenditures is very broad. Narrowing priorities can be difficult.

- better co-operation between government, industry and universities could boost total funds available

Each group is faced with cutbacks.

- a long-term strategy for coordinating industry R&D could assist planning for the necessary expenditures

Perception of what is R&D is too narrow both in terms of researchers and funding agencies.

Available funds in the industry for R&D are very limited.

Long-term R&D plans run up against current industry financial constraints.

- demonstrating rewards from technology would boost interest

Return from investment in R&D activity can be calculated but difficult to prove.

- the tax system could give greater encouragement to R&D expenditures than at present

Government budgetary deficits limit the extent of tax change.

- there should be a greater sharing of generic R&D costs within the industry. This would allow smaller companies with fewer resources to be involved

Persuading companies to agree on cost sharing on common priorities is difficult.

- co-operative funding arrangements should be set at realistic levels which can be maintained at a consistent level from year to year, so as to provide continuity to researchers

Cyclic profits in the industry disrupt even honourable intentions on funding.

Implementing R&D/Technology Transfer

- better demonstration that process R&D lowers costs may increase applications
- companies should have an internal "champion" or an implementation team within the corporate structure for encouragement and implementation of R&D. For example, a senior executive should chair R&D committees if a company is serious about R&D implementation

R&D personnel often see themselves as scientists and not entrepreneurs.

- the linkage of new technologies to both short and long term competitiveness needs to be reinforced

Risks in the use of new technologies can inhibit their implementation.

Improved Institutional Arrangements

- identification of centres of excellence could help focus R&D efforts and maximize the use of scarce financial and human resources

Certain government and academic institutions would have to make changes.

- governments should continue to take measures to make sure that their R&D efforts are relevant to industry needs

Government R&D establishments are still sheltered from real world economics.

- increased inter-disciplinary interchanges and co-operation on industry R&D needs (eg, research, operations, engineering)

R&D Strategies

- there should be ways for companies to collaborate on R&D priorities across the industry and to identify the ways and means for those to be undertaken

Industry needs to take a less narrow view on what is proprietary research.

- organizations like MITEC should have a larger and more aggressive role in terms of working across the industry to identify priorities and in brokering the best way to make the necessary R&D happen

Funding availability restricts the activities of an organization like MITEC.

- smaller companies should ensure that their research needs are reflected in the work programs of governments or of organizations like MITEC

Smaller companies are often so preoccupied with operating concerns that their research needs are overlooked. They have to be "sold" by MITEC or others.

Alliances/Partnerships for R&D

- industry must continue to strengthen its relationships with suppliers and customers
- not all R&D results are necessarily useable. These should be sold off to other sectors or partners

Human Resources for R&D

- industry must create R&D research opportunities for the best and brightest science graduates

The perception of the industry as unstable and lacking security works against attracting good graduates.

- companies should encourage everyone involved in their operations to think creatively. Ideas for innovation should be well rewarded

The contributions which operational personnel can make to equipment/process modification are often overlooked or not sufficiently recognized.

- companies need to ensure that those engaged in R&D do not stagnate

Staff engaged full-time in pure research staff can get stale.

- rotational schemes from operations to research may boost the totality of a company's research efforts and motivate broader thinking about the implementation and application of R&D

Moving staff between operations and research activities can be difficult and disruptive.

Human resource reductions have limited the numbers of personnel available for R&D oriented activities.

THEME 7

LABOUR IN THE WORKPLACE

The Issues

The mining industry has been a prominent industry in Canada for many decades. Over that time, it has developed a fairly traditional and well-established style of management leadership. In certain years, the time lost due to labour disruptions has been very high, at great cost to companies, employees and the country. Poor economic conditions in the past few years have improved the overall record of industrial settlements, but there have been individual instances of long and bitter disruptions.

Improving communications between management and labour was seen as fundamental, notwithstanding scepticism about the degree of progress that would realistically be possible. Adversarial relations appear to be deep rooted in the industry's, and indeed the Canadian, approach to labour relations. Historical baggage will be difficult to leave behind.

"We are capable of consultation. We are capable of co-operation. And, we are capable of confrontation...We have prepared this document, in part, to underscore our willingness to seek out common ground with government, with employers and with other sectors of society."

Empowering Workers in a Global Economy, United Steelworkers of America, October 1991

The ability of management and labour to respond to the impact of change is a concern, possibly as an outgrowth of the traditional approach to legislation and regulation. Management often perceives the need to make changes in response to rapidly changing economic circumstances. However, its attempts to effect change are often resisted by labour because of the impact on jobs, wages and working conditions. It seems that management must improve its ability to communicate effectively the need and rationale for change. If management cannot be trusted by the workforce, such resistance will always continue. Change might be more readily accepted by labour if workers were confident that their needs for adjustment, education and retraining were being taken into account.

There was a sense that labour does not fully appreciate the issues facing the industry in a competitive, and especially globally competitive, environment. The traditional cyclical nature of the industry which has introduced employment uncertainties for employees has been reinforced by worldwide structural changes which have put further pressure on operating margins. This in turn adds additional elements of uncertainty for employees. Such uncertainty can have a major impact on the workforce and its relationships with management. There is either a reluctance to listen and accept the new realities, or management has failed to adequately communicate the situation. It

may be that the sector's management structures, within both industry and labour, is inadequate to allow effective communication.

Expectations play a large role in workplace relations. Society at large has certain expectations with respect to workplace conditions, safety, job security and status. These also affect the image of the industry and how the workforce itself views its job. An unfavourable perception of the mining industry reinforces traditional stereotypes about mining. It does not help workers and mining communities to be proud of their role and contribution if society at large does not appreciate what they do and how they do it.

An industry which feels good about itself and its role has a much easier time of motivating the workforce and looking to the future with a positive attitude. An industry which is constantly being criticized for down sizing or is seen as having no future will have a much harder time. Participants felt that as with other topics, the question of perception has a vital role to play in addressing workplace-related issues.

The collective bargaining framework is perceived as a kind of strait-jacket constraining the ability of the parties to move beyond the adversarial relationship into a partnership mode. Union and management ultimately have to sit at a table and hammer out a wage settlement. Labour sees its mission as getting as much as possible - the employer wants to give up as little as possible. Often, it leads to a strike or worse. As long as so many aspects of working conditions are settled under this type of system, participants felt that closer

working relationships with labour were going to be subject to stress.

"I'm not sure that the collective bargaining system can make the kind of changes we need. At the moment, there are still expectations that people are being short-changed by their employer if they aren't getting a big raise. They and the system won't accept that a 3 or 4 % raise today is good."

Participant at Prosperity Consultations

On a society-wide level, the adversarial approach is so well established that it is difficult to imagine a complete melding of management and union perspectives. The collective bargaining framework does not encourage either management to be overly forthcoming or labour to be accommodating. It was suggested that co-operation can be encouraged to a certain level but beyond that, greater harmony between management and labour is impossible. Change will have to be gradual and incremental, not revolutionary.

The specialized legislative and regulatory framework to which the sector is subject may be a barrier to change. Many in the industry view the legislation and regulation and the inconsistencies between various jurisdictions as very constraining. A tight regulatory framework has become entrenched in the traditional mining workforce management and union culture. It can restrict the flexibility available to management to make necessary operational changes, and impede the willingness and

necessity for labour to respond to changing conditions. Apart from mining specific rules, there was a feeling that current labour laws are not aiding the drive for quality and participation but are reinforcing the traditional adversarial approach.

Employee empowerment and involvement may well be a key that will help to boost the next wave of productivity and assist the industry in remaining competitive. It may also take forward the relationship between management and labour. The term "empowerment" is an umbrella descriptor for a process which gives employees, at all levels of an enterprise, greater responsibility and authority in their jobs. There is not any one particular action which results in "empowerment" - it can be any or all of a basket of steps. Participants noted that empowerment is happening across the industry, particularly as middle levels of supervision are trimmed. Traditional management structures are being altered to give employees, either individually or in teams, greater autonomy to get the job done. The process is not necessarily easy as both management and labour have to change their attitudes and approach. Continuation of these trends was seen as essential.

"The number one motivator is to see one's ideas implemented."

Mark Daniels, Conference Board of Canada, April 1992

"We have undergone a fundamental change in "culture" in our company and the changes are still occurring. We've have had as much problem getting some senior managers to loosen the strings as we've had in getting workers to pick them up."

Participant in Prosperity Consultations

Today's mineral workplace is changing rapidly and markedly. The basic nature of the industry is that it sells commodities in cyclic and international markets. To meet competitive pressures, significantly higher productivity has been achieved. In part this has been done through reduced workforces using new techniques and technology, thereby significantly affecting the way individuals work. It has not been accomplished without putting significant pressures on labour-management relations.

Traditional management and leadership styles may no longer be appropriate. Participants observed that workforce practices have altered markedly and so have workforce expectations. Management structures may not have kept pace. A reluctance to accept change amongst both management and employees was noted, especially at the level of first line supervision. There may still be too many layers of intermediate management, an observation reinforced by the fact that middle management ranks are currently a major target for corporate slimming.

Participants also remarked on the drive for quality. "Total quality management" (TQM), like empowerment, is an overriding

term for a basket of measures aimed at improving employee performance, commitment, motivation, etc. Despite the popularity of the TQM movement, participants observed that some of the practices being advocated have been in place for some time in mining operations. Others may have limited applications due to the nature of the business. This is not to say that their application and effectiveness cannot be improved, or that employers do not have to instill a "quality mentality" in every part of every operation from top management down. In the interest of maximum productivity from all factors of production - human resources, capital, equipment and so on - a quality approach is necessary. Everyone through an operation has to have a part to play in solving problems - it is not just a management responsibility. Equally, TQM is not a solution in itself. It is a means to an end.

"If Canada is to compete, it must make quality a hallmark of everything it produces ... as things stand, it is not the Mexican work force we're afraid of, it's the Canadian workforce."

New Brunswick Premier Frank McKenna

The traditional adversarial relationship between labour and management was a key concern to participants. Parenthetically, it is interesting to note the attention paid by the media recently on the retirement of the president of a large Canadian mining firm that he was one of the very few of his predecessors who had survived his tenure in office without a strike. Labour-management

relationships are still fundamentally seen as "us and them", a situation which makes it extremely difficult for both management and labour to contemplate a major change in relationships.

Many participants felt that a more positive working relationship had to evolve, for the good of the sector. Others felt that change would be very slow, if not impossible. It is management which is responsible to shareholders and owners - it must have the means to manage in such a way as to produce the best results. This would inevitably mean confrontation over "power".

Some participants expressed the view that unions and their basic philosophies stand in the way of productivity and competitiveness. Their sole interest is in protection of jobs and in achieving high or unrealistic wages. Such expectations of continuing confrontation represented a minority view among participants overall. By and large, the need for change was accepted and encouraged.

Greater employee involvement in improving the productivity and competitiveness of operations was seen as necessary. Management cannot do it alone. Achieving progress, however, requires changes in operating styles of both labour and management. Labour must be more willing to accept change, exhibit flexibility and maintain a consistent philosophy of supporting better performance. Multi-skilling amongst workers is a precursor to greater productivity. However, it has implications for job demarcation and union membership which some labour leaders find unpalatable. It also implies change in training systems. Some workers are

reluctant to take the training necessary to diversify their skills. Others may be of an age where greater challenge is not of interest. The seniority system, a sacred item for all labour organizations, is perhaps outdated. Companies need to ensure that the brightest and best employees move into key areas, not necessarily the most senior.

Labour politics was seen as a restraining factor in encouraging change. Some union leaders are progressive - others view the confrontational system as their power base and are unwilling to give it up. There was a feeling that senior labour leaders have a significant education task amongst their own members to convince them that their lot and the company's are necessarily the same, in the interest of future prosperity. On the other hand, there may be times when senior union leadership may be out of touch with the interests of individual union members who are willing to entertain significant changes but are restricted by union politics and policies.

But if employees must change, management change is necessary as well. Companies have to encourage their employees to feel part of the team, and to get everyone involved in solving productivity and competitiveness problems. Workers must be encouraged to solve problems in their workplace and not to rely just on management to provide solutions. Employee "empowerment" includes creating a culture wherein employees feel encouraged to take operating decisions in their area of responsibility to innovate, to share risks and to encourage idea creation. Employees must see the rewards of their efforts. To be effective, employees must feel part of a company's vision and mission, they must

feel proud of what they are doing. Continuous training and upgrading of employee skills was seen as an essential step in established greater employee involvement. Establishing such principles was recognized as requiring a major and likely difficult culture change in the traditional ways of doing business.

"The global competition can duplicate technology and generally, has ready access to capital. Only proper cultivation and encouragement of a company's human resources can lead to a long-term competitive edge."

George Peapples, President, General Motors of Canada Ltd, Business Quarterly, Autumn 1990

The Solutions and Barriers

Improving Communications

- management must endeavour to ensure that its communications processes are thorough, consistent and effective, if it is to win the trust, understanding and co-operation of employees

The traditional style of mining management.

Senior industry executives and management lack credibility and effective communications skills.

- communication must emphasize the common interest in success

The traditional "us and them"

approach inhibits effective communication.

Lack of worker comprehension due to illiteracy.

- management must share the economic realities of specific operations openly with its workforce

Management can be reluctant to be open and forthcoming about economic prospects for "competitive" reasons.

Workers' expectations for significant wage increases may be raised when economic conditions are good.

Difficulty of predicting future economic conditions.

- management and labour must be more open about each others' expectations

The traditional management-union system discourages openness and honesty on both sides due to fear of giving away tactical advantage.

Employee Empowerment and Involvement

- commitment of top company management right through all ranks of a company to encourage new approaches

Effecting meaningful change requires continual effort, is time-consuming and requires patience.

- unions must take a more responsible attitude to their "power" if they are to be accepted by industry as partners

Unions are unwilling to compromise their "powers" and act responsibly.

- industry must accept employees as partners and not just as workers

Fundamental shifts in philosophy are required.

Management does not want to give up power or compromise its ability to manage for the best results to shareholders.

- change at the first and second levels of management (ie, the worker-management interface) is critical. Better training and communication is necessary

It is difficult for some front-line managers to change and others resist change if their "power" is affected.

Reluctance to accept that new approaches are necessary.

- gain union support and trust for new initiatives through credibility, trust, and honesty. A realistic time frame is required as changes will take time

Union suspicions of management initiatives, overtures and credibility.

Local union structure may be out of touch with international competitive realities which dictate new approaches.

- labour legislation must encourage partnership not confrontation

Governments are afraid to take a positive stand and free up the system.

Union intransigence.

Public apathy.

THEME 8

STRATEGIC ALLIANCES AND PARTNERSHIPS

The Issues

Broader horizons for all industrial sectors, including the minerals and metals sector, is the challenge from the theoretical work of Porter and that of D'Cruz and Rugman (Michael Porter, Canada At The Crossroads, 1991, Joseph D'Cruz and Alan Rugman New Compacts for Canadian Competitiveness, 1992).

The increasing globalization of the world's economy has prompted calls for a reexamination of the strategies which Canada and its industrial sectors are employing to remain competitive and productive. The extent to which Canada's industrial sectors are part of a broader network of alliances and partnerships which together can enhance performance, market access and competitiveness requires consideration.

As noted earlier, the minerals and metals sector can no longer be viewed as being bounded nationally. We are moving towards the global marketplace. It is therefore important to view alliances and partnerships on both a domestic and international, if not global, basis. Developing alliances within one's own geographical and political area presents major challenges. Doing so in the context of multi-dimensional global stakeholders poses greater challenges.

Identifying potential partners and their needs is the first step. In the discussions, a wide range of stakeholders was identified as potential targets for enhanced partnerships. Domestically, they would include labour, transportation, suppliers, equipment manufacturers, educational institutions, customers, First Nations, minerals services, environmentalists and technology developers. Each of these various and numerous stakeholders represents an opportunity for the development of bilateral and possibly multilateral relationships.

"We have worked hard with our rail carrier to reduce costs by re-defining our business relationship and the jobs that each company will do. It took three years, but it was worth it. Our traffic movements are cheaper, less manpower is involved and the rail car fleet has been cut in half."

Chief executive of a mining/smelting company at the Prosperity Consultation

Cross-industry alliances are also a possibility. Just as it is important to think about the international or global nature of the mining industry, it is also important to identify cross-industry similarities. A broader definition of the mining industry puts it in the category of a resource-based industry. Considering these sectors in

Canada, there may be opportunities for alliances with industries like forestry and energy. They face similar problems and issues. Solutions to their problems may help with mining problems.

The process of forming partnerships occupied the attention of participants, though the road ahead is unclear. Much is made in the literature and public pronouncements by governments about developing competitive advantages through alliances. Some participants felt that the theory was interesting but that the practicalities were not as obvious. It was noted that some partnerships have been failures. Some major Canadian companies have tried downstream integration but their experiences have not been particularly rewarding. They have felt that it was of more use to stick to their principal businesses and work with customers, rather than being involved in the activities themselves.

The elements for a meaningful alliance are several. There must be an identifiable need which brings two parties together. Both sides must understand each other, including respective strengths and weaknesses. Mutual needs must be anticipated. Open communication between partners is essential. Perhaps of critical importance is the perception that the partnership will add value for both sides. There should not be, and will not be, a successful alliance if there is a perception of a winner and loser in such a relationship. Put another way, costs to both parties should be reduced, producing gains that can be shared. This is sometimes best exemplified by the increasingly common practice of a long-term relationship with a supplier who ultimately becomes one's single source. This implies that both

the supplier and the customer are going to be winners and neither one is taking advantage of the other.

"As a medium-sized contractor with a strong record of performance and environmental protection, I have been trying to establish a "preferred supplier" relationship with mining companies. But the customers refuse to consider any factor except the cost per foot. They give the job to the hungry guy with one rig and no track record."

Diamond drilling contractor

A partnership with labour, in the form of a new consensus, was accepted by most participants as potentially desirable. However, considerable frustration exists about the process for building such a consensus, given the negative history of labour/management relations in mining. Labour has rarely seen itself as having synergy with management. To make an industry-labour partnership work will require time, effort and patience on both sides. Most participants felt that the effort involved would be worthwhile. Others remain to be convinced that labour can make the necessary adjustments.

"Our union is prepared to work hard to achieve sustainable prosperity for our members and for society as a whole. To this end, we are open to dialogue with all who genuinely seek to achieve the same goals."

Empowering Workers in the Global Economy. United Steelworkers of America, October 1991

Industry clusters of suppliers, producers and customers may offer potential for strategic advantage both domestically and internationally. They are also the first step in a "Canada Incorporated" approach which could broaden opportunities. Closer linkages could provide all participants with benefits. Smaller companies might capitalize on opportunities to be part of a larger enterprise than their size would normally allow. Suppliers could enter into more permanent arrangements which could enhance their interaction with major customers. Technological development might occur on a broader industry basis rather than sector by sector. Technology transfer could be enhanced within the cluster. The requirements of the market place might be anticipated earlier. Labour would have the opportunity to move between cluster components, thereby increasing job security and opportunities. Canadian manufacturers might find increased opportunities. International clout could be increased. Against these possibilities is the feeling that much of the theory of clusters applies to companies or sectors involved in the production of final consumer products. Nevertheless, applicability of the theory to the resource sectors should be looked at closely.

Internationally, extensive linkages exist already. As a major exporter, the industry has developed relationships with customers in most parts of the globe. Canadian companies do work closely with their customers. The upstream part of the sector (exploration and mineral services) has moved beyond its Canadian roots to develop a world-wide clientele. Canadian companies are also increasingly linked to other mining groups, traders and customers in other countries. International joint ventures are increasing. Companies are exploring preferred arrangements with suppliers to

their mutual benefit.

Continuing globalization may require enrichment of these linkages to improve strategic advantage and form the basis for bringing broader benefits to the Canadian economy. Examples include alliances for technology development, exploiting new business opportunities, commodity-based partnerships, technology transfer, exploration, financing.

Canada does not have a large mining equipment manufacturing industry. However, it does successfully meet various market niches, both inside the country and for export. The mining industry has worked closely with the equipment sector to help develop those products. These efforts are continuing.

Notwithstanding potential cluster advantages, a basic conflict between competition and co-operation was noted by participants, even though alliances are viewed as a potentially valuable development. Traditional values which have been reinforced over the years through legislation have led many to believe that in a capitalistic or free enterprise society competition does not involve co-operation with other stakeholders. Governments have traditionally discouraged co-operation among major players in an industry, and there was, in a sense, a certain schizophrenia in dealing with alliances. Extensive vertical integration has been interpreted in a negative fashion.

The Solutions and Barriers

Broadening Horizons

- the possibilities of new alliances should be explored and tried, if benefits can be

demonstrated

Scepticism about the benefits of alliances.

A catalyst is needed to bring various partners together.

- documentation of successful alliances would help to build an awareness of both the value and the process involved. A "partnership" mentality and strategy has never been explicitly promoted

Alliances must be based on real mutual benefits. Partners cannot be brought together artificially - there must be a valid synergy.

- open communications between potential partners is required to start a process of mutual acceptance of joint benefits

Difficulty in getting a discussion process going.

Identifying Potential Partners and Their Needs

- alliances cannot be developed until potential partners are identified and their needs are understood

Misunderstanding of partner requirements.

- industry should look specifically for partnership opportunities within its area of operations, ie, with customers, suppliers, other producers of a commodity

There has never been a careful review of potential partnerships on a systematic basis. To the extent they exist, they have been the result of specific initiatives based on mutual need.

Forming Partnerships

- industry must become attuned to the potential for new alliances

Industries and companies which have traditionally been in competition may find it difficult to contemplate co-operation.

- the philosophical and legal framework should be examined for its ability to enhance partnerships

Government attitudes and legislation have been a barrier to commercial co-operation.

Society and the media have rejected some forms of business co-operation as not being in the best interests of the consuming public.

Some major market countries have not looked favourably on co-operation between multinational companies.

- associations should be pro-active in promoting partnerships where opportunities are perceived to exist

Lack of resources and mandate.

- associations should rationalize their structures within the mining industry and across related industries to streamline operations and increase effectiveness
- there needs to be a mentality which encourages actively looking for areas of co-operation

There has not been a history of encouraging co-operation and alliances, and the process for forming consensus is poor.

Going it alone has been a dominant mentality. Fragmentation of effort has prevailed.

Partnerships with Labour

- a priority alliance would be a closer relationship with labour

The traditional adversarial relationship between labour and industry requires a significant change to turn around.

Industry Clusters

- industry-supplier relationships would be enhanced by early involvement on both sides in new developments

For various reasons, preferred supplier relationships have rarely been developed.

- suppliers have to ensure quality and competitiveness to mining industry customers

There has been reluctance to become overly dependent on few suppliers because of the potential for cost complacency and labour disruption.

- the mining industry must ensure fair treatment of suppliers

Suppliers feel that they have been disadvantaged in the past.

The Prosperity Consultations with the minerals and metals sector raised various concerns affecting the future competitiveness and prosperity of the industry. It has also suggested the basis for two agendas for action - one for governments and one for industry.

A major theme running through every session and topic was the future role of the resource industries and that of the minerals and metals sector in particular. The mining industry has made major contributions in the past to the prosperity of Canada, it is still making a significant contribution and it is confident that it can continue to do so in the future. However, the overarching question to participants is whether the governments and people of Canada want it to do so. It was far from clear what the sector's role is expected to be.

"Mining is doing what it can to remain economically viable through maximizing operating efficiency and overall productivity. But industry cannot do it alone. It needs the support of the government that regulates it."

The State of the Minerals Industry in British Columbia - Working Towards 2000, Mining Association of British Columbia, September 1991

If minerals and metals production is to be encouraged, significant changes are necessary to ensure that the sector makes the contribution which it is capable of making. If it is discouraged, the industry will continue to shrink and drift away from Canada.

Industry must make itself better understood by the public. To do so, everyone involved in it - through all ranks - must be an ambassador. The key to improving public perception is through industry's actions. Part of this involves listening to what people are saying about the industry as well as explaining.

At the same time, governments must clearly indicate the essential role which the resource industries have in the Canadian economy. Industrial strategies must focus on using our natural comparative advantages, building on the strengths that resources have brought to Canada, and using them for strategic advantage to diversify our economy. Further, the economic policy climate is framed by governments. It is their responsibility to design a business environment which is conducive to a dynamic, healthy economy and to its future growth. At the current time, it is questionable that such an environment exists.

A new "social agreement" is required in Canada that competitiveness matters. Industry understands this. If a business is not competitive, it closes. Some governments and government departments understand competitiveness and are setting policies accordingly. But this does not seem to be the case for all departments. Labour appears to be continually improving its understanding of competitiveness and is taking steps to develop better working relationships with employers. If this effort is to be successful, industry must respond in kind.

Participants felt strongly the need for recognition that all of us are in the same economic boat. Lasting competitiveness cannot be achieved unless consensus is developed and all interests are willing to put "a little water in their wine".

A supportive business climate would improve competitiveness. The Canadian economy generally and the resource industries particularly have been hobbled by past economic and social policies that encouraged excessive government borrowing. The recent remedies designed to drive down inflation, reduce the deficit and lower government expenditures are necessary but their effects, especially the impact on exporters, have been devastating. The only long-term answer is fiscal and monetary responsibility.

Participants recognized that changes to macro-economic policies do not offer a quick cure to Canada's competitiveness woes. However, they did urge those controlling the economic levers to clearly understand the significant impact of their actions.

Minerals and metals investment and capital are international. They will not necessarily come to Canada but will seek the best opportunities, anywhere in the world. As other countries offer attractive prospects and an improving investment climate, Canada must work hard to compete for and attract that investment. A sector which is competitive in itself is only part of the story - the macro-economic climate must be competitive as well. This is not the current situation.

"We must beat a path to world markets. And we can do it, providing we find out more about our resources, husband and enhance them, and then harvest them with ever-increasing skill. It's a formidable challenge but an enviable opportunity."

Professor Peter Pearce, University of British Columbia, Globe and Mail, "Building on our Strengths", January 10, 1992

Environmental issues are critical. They will remain at the top of government, industry and public agendas. The minerals and metals sector is working hard to continue the improvements in its performance. Doing so is essential from two perspectives - meeting increasingly stringent performance requirements and meeting public expectations. The latter is particularly important if the industry is to boost its reputation.

The environmental approval process requires immediate attention. There are unnecessary delays and costs due to an uncertain, open-ended and discretionary

process. Federal and provincial governments dispute each other's jurisdiction. Within each level of government, there are turf battles. Our domestic environmental goalposts are moving quickly, perhaps too quickly for Canada to remain competitive with its peers. Industry supports the maintenance of and continuous improvement towards, high standards of environmental management but questions whether we are moving too far, too fast. The uncertainty and the fallout affects industry plans and confidence, the perception of Canada as a place to invest, and inevitably our competitiveness.

A free and fair international trading system is vital. Participants voiced strong support for government's efforts at reducing trade barriers. Increasingly, protectionist trends, especially through environment-related mechanisms, require close attention. As an internationally-oriented sector in the centre of globalization trends, industry itself must devote increased attention to what is happening in international fora. The sector must cooperate actively with governments to protect its interests.

Discussions on financing-related issues demonstrated that to a significant degree, the capital needs of the minerals and metals sector have been well-served by the capital formation system. However, participants are concerned about the availability of funds for exploration and junior mining. Maintaining exploration is especially critical, given declining reserves. The risk and venture capital system in Canada has almost been shut down by risk-averse investors, tighter securities regulations, and uncertainty about the mineral development and approval process. Large companies have an easier

time finding development funds and financing, while smaller companies are experiencing some problems.

Increasing Canadians' interest in venture capital was seen as important. Canadians prefer to take a chance on a lottery ticket than on investments in new projects or equity. They do not understand the role of venture capital or the stock market. A close examination of our capital market structure is recommended.

Environmental liability concerns have the potential to disrupt the capital formation system. The search for "deep pockets" by governments to cover the cost of environmental clean-ups has led banks to tighten their loan criteria. Jurisprudence seems to be moving in the direction of broadening rather than narrowing liability. If this trend continues, the implications for an environmentally sensitive industry like mining are serious.

As can be seen from the volume of ideas on the subject, participants had strong views about the quality and direction of Canada's education system. Canada expends an enormous amount on education - we are second highest in the world on a per capita basis - but it is clear that there is widespread dissatisfaction and concern that our education system is failing. The nature of the education system itself is seen as faulty, accompanied by social breakdown, reduced motivation and challenge to students, and a lack of clear national educational priorities. Mediocrity seemingly prevails. This is clearly inadequate in the face of the competitive challenges which lie ahead.

There was recognition that learning must be continuous. Increased co-operation with the labour force is necessary to encourage better life skills such as literacy and numeracy. Job skills must be continually upgraded to prepare for the use of new technology. Many workers will face adjustment and transition to other jobs - industry, governments and labour have a shared responsibility to ensure that this transition occurs as smoothly as possible.

Concerns were expressed about the nature of the mining industry's trades training and apprenticeship systems. Some larger companies do extensive training - others do little, relying on a dynamic labour market to fulfil their human resource needs.

Whichever approach is used, participants voiced concern about the apparent stigma attached to trades and technological training. This must be reversed. An effective vocational training system which produces well-trained, versatile and effective individuals will go far to ensuring that Canada has the human resources necessary to meet the competitiveness challenges.

Continuous innovation was accepted as vital. R&D applications to date have played a major role in retaining the competitiveness of the sector. The continued application of technology can help to maintain that competitiveness. The sector has been under fire for its R&D record, undeservedly so in the view of participants. Comparisons are repeatedly drawn between Canada's innovation record with that of other countries but participants questioned the validity of many of the comparisons. What is good for Japan or Germany is not necessarily good for Canada, given the different circumstances, industrial structures,

demographics and comparative advantages. Further, what may be good for a manufacturing dominated economy is not necessarily right for one which is more resource dominated.

Participants felt strongly that exploration must be recognized as R&D. It fits all the criteria: high tech, high risk, potentially high benefit and necessary for survival. Much of the innovation in the minerals and metals sector is site specific - it is driven by the need for process and productivity improvements to lower costs and improve competitiveness. Because it is often not picked up in the R&D statistics, it is not recognized as research.

Contrary to popular opinion, participants felt that a R&D culture does exist in the minerals and metals sector. There is continuous innovation within the sector by both small and large companies to ensure that productivity and competitiveness are maintained. Some of this effort is not recognized in R&D statistics. While the minerals and metals industry makes intermediate rather than final products, it does work closely with its customers in product development. Some companies have owned downstream integrated operations but by and large, the experience has not been positive. Notwithstanding the already sizeable R&D effort, participants did suggest that more and better focused R&D, in co-operation with related sectors, is needed for the future.

In today's changing workplace, ensuring quality in all parts of the sector is essential. Some participants questioned the applicability of some advanced management systems to its situation but generally agreed

that the sector must move away from its traditional approaches to the organization and management of the workplace. There was also comment that industry has taken certain innovative steps already. Continued productivity improvements are going to require workers to use their brains as much or more than their backs.

Employee empowerment, in whatever form or guise, was seen as an evolving trend. The concepts are well known but vary from company to company in application. Employee empowerment will result in pushing responsibility levels lower in organizations and give every individual an opportunity to assume greater responsibility for what he or she does in the workplace.

Continuous improvement in the relationship with labour is seen as necessary. Without it, competitiveness will be lowered. Industry and labour must each move beyond the historical ideological baggage standing in the way of improvements. Some participants felt that the traditional approach of labour, and even of labour organization, was outdated.

Strategic partnerships for the future should be developed but not artificially. As an internationally-oriented sector, looking beyond the short term and beyond Canada is vital. Partnerships are also helpful inside Canada. The sector must have an open line with all stakeholders - employees, natives, suppliers, environmentalists. "Industry clusters" could lead to more productive supplier/customer relationships, in the process fostering innovation and reducing costs to both sides.

In summary, the Prosperity Consultations have revealed the concerns of the minerals and metals sector and they have also identified many steps which can be taken to enhance the contribution of mining and minerals to Canada. Participants believe this sector is vital to Canada and expect all parties - governments, labour and the general public - to recognize the need and make the necessary adjustments.

There are two agendas for the future, one for the minerals and metals sector, and one for governments. The industry will be taking the results forward into its own fora and examining how the ideas which have come out of this process can be moved forward. It is prepared to exercise leadership in its part of the competitiveness agenda.

Leadership by government on its part of the competitiveness agenda must be forthcoming as well. The industry will be looking for complementary government actions. Success or failure in implementing the recommendations rests with each and all of us.

APPENDIX 1

PARTICIPANTS - PROSPERITY CONSULTATIONS

<u>NAME</u>	<u>ORGANISATION</u>
HALIFAX	
Mr. John Amirault	Jacques, Whitford and Associates Limited
Mr. David Armstrong	Chamber of Mineral Resources of N.S.
Mr. William Burton	Bedford Resource Management
Mr. John Carrington	Brunswick Mining & Smelting Corp. Ltd.
Mr. Gerald Cluney	Mining Association of N.B.
Mr. Fraser Conrad	Conrad Brothers Ltd.
Mr. Alan Davidson	Canadian Salt Co. Ltd.
Mr. Terry Davis	Little Narrows Gypsum Company
Mr. George Flumerfelt	Brunswick Mining & Smelting Corp. Ltd.
Mr. Patrick Hannon	Chamber of Mineral Resources of Nova Scotia
Mr. K.C. Hendrick	Noranda Minerals Inc.
Ms. Lois Hooge	Energy, Mines & Resources Canada
Mr. John Hopkinson	Victoria Mining Services
Mr. Robert J. Keyes	The Mining Association of Canada
Mr. Jean-Guy Lirette	Potash Company of America
Mr. Garry MacEwen	Natural Resources and Energy, Province of N.B.
Mr. Ross MacFarland	Westminer Canada Ltd.
Mr. Gary MacLeod	CN Rail
Dr. C. George Miller	The Mining Association of Canada
Mr. John Mullally	Department of Natural Resources
Mr. Bruce Neil	Brunswick Smelting & Fertilizer
Mr. Clive Oldreive	Nova Scotia Dept. of Environment
Mr. James Patterson	J.M. Patterson & Assoc. Ltd.
Mr. Pat Phelan	Department of Natural Resources
Mr. Jim Schnarr	Brunswick Mining & Smelting Corp. Ltd.
Mr. Scott Smith	Nova Scotia Sand & Gravel
Mr. Dick Smyth	Chamber of Mineral Resources of Nova Scotia
Mr. Robert Stairs	New Brunswick Prospectors and Developers Association

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Dr. G Anders	Ontario Ministry of Northern Development and Mines
Mr. Rick Anderson	Noranda Inc.
Dr. Anthony Andrews	Prospectors & Developers Association of Canada
Dr. Claudio Barsotti	Inco Exploration and Technical Services Inc.
Dr. William Bawden	Queen's University
Mr. Ian Bayer	Hemlo Gold Mines Ltd.
Mr. S. Bharti	Bharti Laamanen Mining Inc.
Mr. Gilles Blouin	Aluminerie Alouette Inc.
Mr. Mario Caron	Corpomin Management Inc.
Mr. Kenneth Casey	ETI Explosives
Mr. Normand Champigny	The Cooper & Lybrand Consulting Group
Mr. Kingsley Cole	International Union of Operating Engineers
Mr. Bruce R. Conrad	Inco Limited
Mr. Marc Couse	Ministry of Northern Development & Mines
Mr. Don Cumming	Rio Algom Limited
Mr. William Deeks	Noranda Inc.
Mr. Gabriel Echum	Matawa First Nations Management Inc.
Mr. Brian Felske	Felske Associates
Professor James A. Finch	McGill University
Mr. Wayne Fraser	Hudson Bay Mining & Smelting Corp. Ltd.
Mr. Adrian Golbey	Royal Bank of Canada
Mr. David Harquail	Beutel Goodman & Co. Ltd.
Mr. Glenn D. Harrington	Conservation Council of Ontario
	c/o Harrington & Hoyle Ltd.
	Noranda Minerals Inc.
Mr. Keith Hendrick	Energy, Mines and Resources Canada
Ms. Lois Hooge	The Mining Association of Canada
Mr. Jacques Hudon	Queen's University
Ms. Moira Jackson	Mining Industry Technology Council of Canada
Mr. Jeff Jeffery	Hudson Bay Mining & Smelting Corp. Ltd.
Mr. A.F. Johnstone	CANMET, Mineral Technology Branch
Dr. J. Trevor Jubb	International Union of Operating Engineers
Mr. Richard Kennedy	George R. Kent & Associates
Mr. George Kent	The Mining Association of Canada
Mr. Robert J. Keyes	Prospectors & Developers Assoc. of Canada
Mr. Lionel Kilburn	Davy Canada Inc.
Mr. Nick Krpan	York University
Dr. I.A. Litvak	Rio Algom Limited
Mr. Colin MaCaulay	Ingersoll-Rand Canada
Mr. W.L. Mallory	Falconbridge Limited
Ms. Marguerite Manshreck-Head	

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Mr. Giorgio Massobrio
Mr. L.R. MacDonald
Mr. Jack McOuat
Mr. George Miller
Mr. Bruce Miller
Mr. Jacques Nantel
Mr. John Needham
Mr. Stan Parker
Mr. Robert Parsons
Mr. John Postle
Mr. Patrick Reid
Mr. Fenton Scott
Mr. Len Shaw
Mr. Denis Simoneau
Mr. Robert Smith
Mr. Kerry Smith
Mr. Weldon Thoburn
Mr. Richard Vernon
Mr. Margot Wojciechowski
Mr. Donald Worth

Quebec Cartier Mining Co.
Cominco Ltd.
Watts, Griffis and McOuat Limited
The Mining Association of Canada
FMC of Canada Limited
Noranda Technology Centre
C.A.M.E.S.E.
Canadian Association of Recycling Industries
Price Warehouse
Roscoe Postle Associates Inc.
Ontario Mining Association
Prospectors Developers Association of Canada
Industry, Science and Technology
SOQUEM
American Barrick Resources Corp.
Broad Oak Associates
Hatch Associates Ltd.
Toronto-Dominion Securities Inc.
Queen's University
Canadian Imperial Bank of Commerce

VANCOUVER

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Dr. Gerald Bolton
Mr. Chuck Brawner
Ms. Susan Campbell
Mr. Don Currie
Mr. Cliff Davis
Mr. Dick Drozd
Mr. R.A. Dujardin
Mr. Lory Fairfield
Mr. Ted Fletcher
Mr. Robert Hornal
Mr. Stu Hunter
Mr. Glen Kendall
Mr. Pierre Lebel
Mr. Garfield MacVeigh

Kilborn Engineering Pacific Ltd.
Sherritt Gordon Limited
Brawner Engineering
Mining Association of BC
Alberta Chamber of Resources
Peat Marwick Thorne
Teck Corporation
Kerr Addison Mines Limited
Placer Dome Inc.
Cominco Ltd.
Hornal Consultants Ltd.
The Coal Association of Canada
Energy, Mines & Resources Canada
Imperial Metals Corporation
Lac Minerals

Mr. Bruce McRae

Mr. Harlan Meade

Mr. Jan Merks

Mr. Ross Mitchell

Mr. Garth Moore

Mr. Donn Morgan

Mr. Guff Muench

Mr. Ken Munro

Mr. John Murphy

Mr. Donald Mustard

Mr. Jean-Paul Nicolet

Mr. Anders Ourum

Mr. R. Quartermain

Mr. Robert Ripley

Mr. John Robinson

Mr. H.W. Sellmer

Mr. Wayne Spilsbury

Mr. Keith Steeves

Mr. Micheal Sudbury

Mr. Martin Sutherland

Mr. Yosuke Suzuki

Mr. Roger Taylor

Mr. Gordon Thompson

Mr. Don Thompson

Mr. John Vincent

Dr. William Wolfe

Ministry of Energy, Mines and Petroleum
Resources

Westmin Resources Limited

Matrix Consultants Ltd.

Westmin Resources Limited

Saskatchewan Mining Association

Placer Dome Ltd.

Cummins British Columbia

Highland Valley Copper

Cominco Ltd.

Canadian Geoscience Council

Minatco Limited

Federation of Mountain Clubs of British Columbia

Silver Standard Resources Inc.

Syncrude Canada

Price Warehouse

Total Energold Corporation

Teck Exploration Ltd.

Teck Corporation

Falconbridge Ltd.

Industry, Science & Technology Canada

Metal Mining Agency of Japan

PRM Resources Ltd.

Cominco Ltd.

Syncrude Canada Ltd.

Cheni Gold Mines Inc.

Cominco Exploration

MINERALS AND METALS SECTOR PROSPERITY CONSULTATIONS

WORKSHOP FORMAT:

MACRO ISSUES	Plenary: Introduction - Keith Hendrick				8:30-9:00
	Business and Economic Climate	Environment	International Issues	Financing	9:00 - 11:15
	Plenary Reporting & Discussion				11:15-12:30
Lunch					12:30-1:15
MICRO ISSUES	Afternoon Briefing				1:15 - 1:30
	Education & Training	Innovation & R/D	Labour & Workplace Issues	Alliances & Partnerships	1:30 - 3:15
	Plenary Reporting & Discussion				3:15 - 4:30
	Wrap-up				4:30 - 5:00
Workshop Tasks	IDENTIFY ISSUES → GROUP → RANK → SOLUTIONS/ACTIONS				

Attendees will be broken into 4 small groups for the workshop discussions, with each participant to be involved in workshop discussions on two of the themes.

**THE FOLLOWING DISCUSSION DOCUMENT WAS SENT TO ALL
PARTICIPANTS AS A GUIDE TO DISCUSSION**

PROSPERITY AND COMPETITIVENESS

KEY THEMES AND QUESTIONS

The following short discussion papers and questions are meant to guide the workshop discussions but they are by no means comprehensive. It is to be expected that many other views, issues and questions will emerge.

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OVERVIEW

A prosperous, competitive economy brings more than economic security - it also means improving our quality of life.

Canada faces competitiveness challenges which will entail new approaches to innovation, financing, trade, and partnerships. Significant structural changes are once again facing every sector of the Canadian economy, including minerals and metals. Cyclical factors are also at work, depressing current commodity prices and returns to very low levels, with consequent poor returns to most mining operations.

Nonetheless, through remarkable productivity gains over the past decade, Canadian managers and employees have worked together to ensure our minerals and metals sector remains a world competitor. This effort must continue if the important economic contribution which mining makes to this country is to be sustained.

The solutions to restoring and maintaining the prosperity of the Canadian mineral and metal industry are not simple. Tinkering with government policies or lowering the value of the Canadian dollar may ease short-term pressures but such steps do not address long-term competitive issues.

The solutions require co-operative, creative, long-term, and visionary thinking. And they also require incisive decisions and actions now.

Industry does not expect, or even seek, "quick fixes" from changes in government policies to solve current economic problems but it does expect that governments will look closely and realistically at how they affect the business climate. Equally, however, industry is going to continue the efforts it has made in recent years to improve its productivity and competitiveness.

The objective of these workshops is to have participants look beyond current day to day concerns and think in a longer term manner about where the metals and minerals industry specifically, and Canada's economy generally, is headed. It is becoming painfully clear that Canada must change its ways if we are to regain and retain our competitiveness in the global economy. We need to take a visionary look forward.

The future prosperity of Canada's mineral and metal sector is not only critically dependent on business conditions and international markets. The macro-economic framework, particularly monetary, fiscal and investment policies, also exert a decisive influence.

Exchange and interest rates are critical. The mining industry is at the mercy of international markets - it has no control over the prices it realizes. However, when domestic economic policies designed to cure Canada's economic problems raise the value of the Canadian dollar, industry's competitive position and its direct returns are eroded. Further, real high interest rates increase the cost of capital for new investment.

Governments also set the regulatory climate within which industry must operate. Taken together, all of these policies affect Canada's ability to attract the foreign capital and to encourage re-investment by Canadian companies. Unfortunately, there are significant concerns that this investment climate is deteriorating rapidly. In particular, the continuing flow of Canadian funds to overseas mineral targets raises questions.

Conditions in the domestic marketplace also affect Canada's ability to compete abroad. A domestic framework that encourages competition and innovation will promote long-term productivity, and that means a better chance to compete globally. Laws governing incorporation, bankruptcy, competition, intellectual property and other aspects of corporate behaviour help to determine how well Canadian business can respond to changing world market conditions. In addition, modern and efficient infrastructure, especially for transportation, can lower the costs of getting our products to markets.

Ultimately, questions arise about Canada's industrial strategy and the future role of the resource industries in Canada. If our future prosperity is to be linked to a healthy and competitive export sector which includes mining, then the macro-policy framework must support these goals. Industry must not have to compete in international markets with one hand tied behind its back due to an uncompetitive domestic policy framework.

Key Questions for Discussion:

- * Do governments want a strong and competitive minerals and metals industry? Does the economic policy framework adequately reflect our current industrial structure, ie, a significant dependence on resources, and the likely continuance of this for some time?
- * Is Canada's macro-economic policy and industrial strategy out of touch with the reality of our economic framework? Strategically, are we making the right choices?
- * What are the key domestic barriers affect mining's international competitive position?
- * Does the Canadian economic policy framework offer too much 'political risk' and too much uncertainty? Is Canada's investment climate conducive to mineral exploration, development and production? Is that climate deteriorating?
- * Does the tax system adequately encourage the mining industry to make the necessary investments to boost productivity?
- * Do governments need to review the cumulative burden/impact of the regulatory climate on industry? How does it affect the industry's ability to compete?
- * Has Canadian economic policy been too much geared to short-term economic priorities and problems at the expense of the long term well-being of export-dependent sectors?

TOPIC 2: ENVIRONMENT

In a relatively short period of time, environmental issues have become a pre-eminent public concern. The array of environmentally related issues is vast and the industry's capacity to deal with the issues will be critical for its future competitiveness. Also critical will be its integration of environmental and economic decision-making.

"Sustainable development" poses challenges. What does it mean for an industry like mining and how do perceptions of non-renewability affect future growth and acceptability? Mining does not have a favourable public image, despite the significant progress which it has made in environmental terms. Unfortunately, outdated public perceptions create the demand for governments to "control" the activities of the mining industry.

The sector is taking pro-active approaches to perceived and real environmental questions. Do these voluntary initiatives go far enough? Ongoing research on mine acid drainage, safe use of metals, land use management and hazardous wastes are cases in point. Much of this involves working closely with governments. Nevertheless, provincial and federal initiatives continue to grow, often resulting in uncoordinated and duplicatory regulation.

Access to land is a prerequisite, if the exploration and development necessary to future mineral activities is to occur. However, conservationist and preservationist pressures are limiting the amount of land available and the perception is that industrial activities like mining are incompatible with environmental aims.

The growing environmental pressures raise questions about industry's response, its activities and whether the right message is getting through. Despite widespread environmentally-related activities, is industry sufficiently pro-active in terms of getting its own house in order and demonstrating its commitment to a sceptical public and governments? Is environment and economy sufficiently linked?

Key Questions for Discussion:

- * Is the mineral and metals industry being appropriately and sufficiently pro-active to counter the environmental issues which are arising? Should it develop a "responsible care" program?
- * Are environmental concerns adequately integrated into industry's economic decisions? What would be the impact of having to internalize previously uncoded inputs (eg, air, water)?
- * How can environmental and competitive pressures be reconciled between industry, governments and environmental activists?
- * Is Canada out of step, as a nation, with the environmental stance of our major competitors? Are we consciously pricing ourselves out of being competitive?
- * Do governmental jurisdictional divisions and processes help or hinder the industry and its efforts at better environmental performance? Is constitutional realignment of environmental responsibilities required?
- * What specific steps could governments and industry take to lessen the conflict between competitive and environmental pressures?
- * How can employee know-how be mobilized in support of environmental goals?

Canada's prosperity is linked to our ability to perform well within the global economy. As the eighth largest trading nation in the world, and with one in every three jobs depending on trade, Canada must trade smarter. This means not only improving our ability to compete, but also exploiting opportunities in international markets.

As a major exporter, the minerals and metals industry is keenly aware of the international trading environment. Without continued free and fair access for our mineral products, the industry's future would be seriously jeopardized. However, Canada has no corner on the world's supply of mineral commodities - it is locked in fierce competition with suppliers around the world, all trying to gain market advantage.

In the past three decades, the Canadian minerals and metals sector has had to adjust to vast changes in competing producers, especially in the less developed world. These new sources will continue. In addition, the dramatic political restructuring of the past two years points to potentially new competition from the vast mineral resources of central and eastern Asia. Should Canada be assisting this growth which will in itself create expanded consumption?

With its small and open economy, Canada is highly dependent upon an effective and open world trading system. On a multilateral basis, the GATT system is critical to efficient world trade. On a bilateral basis, the FTA with the United States is helping to provide secure access to our largest foreign market.

The minerals and metals industry has long had a global market perspective but now corporate structures are realigning along international lines and global alliances continue to grow. This has resulted in an increasing degree of corporate concentration in the sector, producing larger and more resilient corporate units which can not only better survive global business and mineral cycles but also pursue international opportunities more easily.

Key Questions for Discussion:

- * Does Canada's minerals and metals industry need to strengthen its trade links with the rest of the world? How can we market our goods and services more effectively?
- * Does the Canadian minerals and metals industry have an appropriate market strategy and system of strategic alliances in metal markets, given the increasing globalization in the world's industry?
- * Does the Canadian minerals and metals industry have the correct mix of products and services to service future markets?
- * Are we taking best advantage of the international institutions that might promote even freer trade?
- * What barriers are inhibiting a greater flow of mineral and metal products into overseas markets? Are there specific measures which the minerals and metals industry should be encouraging to ensure that better market access is achieved?
- * Does the minerals and metals industry pay sufficient attention to emerging institutional and governmental barriers to trade? Is it effective in bringing its concerns to the governments concerned?

TOPIC 4:

FINANCING

Investment capital is critical if Canada's productivity is to grow, and our standard of living to remain high. More investment means our economy expands, and we get more and better jobs. To ensure an adequate flow of investment capital, we must have a stable, attractive economic climate that encourages investment. That climate must be attractive to foreign capital as well because as a small country, Canada's internal capital markets cannot generate all of the funds necessary for future growth.

Creating a favourable investment climate involves a number of interrelated steps - an appropriate tax regime; high domestic savings for investment purposes; competitive financial institutions and instruments; strong and modern public infrastructure; and a stable regulatory and political climate.

International capital is extremely mobile and the lack of an adequate investment climate may drive capital elsewhere. Trends are already apparent in the growing Canadian presence in the mineral industries of Central and South American countries. As the Canadian minerals and metals industry increases its global orientation, will it still seek opportunities for investment at home?

A growing concern is the potential for environmental liabilities to affect the willingness of financial institutions to provide adequate financing for future developments. In a sector like minerals and metals which has the potential to have significant environmental impacts if not undertaken properly, the environmental liability question is potentially very serious.

Key Questions for Discussion:

- * Is the Canadian investment climate for minerals and metals sufficiently attractive? What are the incentives to invest in mining? Are macro-economic policies sufficiently supportive?
- * Is industry overburdened with taxes and charges? Is this affecting the desirability of Canadian mineral development as a target for investment?
- * Are the necessary investment funds going to be available to Canadian companies to finance future growth? In particular, how should the legal and policy framework deal with the threat of environmental liabilities constraining the availability of capital?
- * Is the federal/provincial structure in financial matters, both regulatory and in its capital raising institutions, a hindrance or a help in the healthy availability of investment funds?
- * Do our financial institutions and instruments need to be made more efficient and appropriate to the increasing globalization of the industry? Is the cost of capital to minerals and metals competitive with that of our competitors?
- * Is there sufficient investment in public infrastructure to ensure that the needs of the mineral and metals industries will be met? In an era of tight fiscal restraint, how can this infrastructure best be funded?
- * How can Canada's mineral and metal industries secure a bigger share of global mining investment?

Canadians must have the skills and access to the lifelong learning opportunities necessary to improve their job prospects and keep pace in an increasingly technologically-oriented world. Increasingly however, there are questions as to whether our current approach to learning is adequate for the times. For an industry like minerals and metals which needs highly skilled and technologically-oriented workers, the questions are particularly relevant.

This country invests great sums of money on education but are we getting the right return on that investment? Is our learning system adequately preparing us for the future? High-skills jobs, a competitive economy, economic prosperity and a good quality of life are inter-dependent. To maintain the necessary level of knowledge, we must build a learning system that boosts basic capabilities and encourages a higher level of advanced skills. We also need "quality" throughout the country's educational system so that in either educational institutions or on the job, Canada is assured of a quality workforce.

Learning covers a broad range of activity - from preschool to cooperative education programs, from on-the-job training to post-doctoral university studies. What should be the priorities for action?

Canada's mining and mineral processing workforce is aging rapidly, reflecting the fact that in the 1980s, younger workers were the first to be laid off. At some companies, average workforce age exceeds 40. Demography poses significant challenges not only in training for high tech jobs but also for corporate decisions which should contain strategies for absorbing new employees, technology training and balancing its workforce age.

Key Questions for Discussion:

- * Does the educational system provide a sufficiently skilled and flexible workforce (operating, technical and professional) to meet the changing needs of the minerals and metals sector?
- * Are employers, organized labour and workers meeting their responsibilities vis-a-vis training of the workforce? Is there sufficient on-the-job training in the sector?
- * Are basic skill levels in the mining industry keeping pace with the productivity improvements required to maintain competitiveness, notably with respect to literacy and numeracy?
- * Can the industry's aging workforce be trained adequately to prepare for the high tech jobs which the industry increasingly offers? Is training in "older workers" wasted, given the likelihood of earlier retirement dates and their attitudes to skill improvements?
- * How can mining be made an attractive career possibility for young people?
- * How can we ensure better linkages between education and the workplace? Would expanded formal transition programs such as apprenticeship schemes help?
- * Enrolment is falling in mathematics, science, engineering and technology-related specialties but the demand for such skills is growing. How can the decline be reversed?
- * How do our university mining and mineral processing departments rate? Are they relevant? Are there too many? Should Canada foster excellence in one or more "schools of mining"?

TOPIC 6:

INNOVATION, RESEARCH AND DEVELOPMENT

Technology is not only embodied in the equipment we use, it is also the knowledge and know-how that people apply to their work. It takes highly skilled people to make effective use of technology, especially as it changes so rapidly.

The minerals and metals industry has had to become a "high-tech" industry to survive. In the front end, upstream part of the sector, the industry is a world leader. Some of this has been done with home grown technology, some with technology imported from other countries and adapted to Canadian conditions. Both approaches have worked well, although developing indigenous technology may impart only temporary competitive advantage. The question is whether the time and expense is worth the short-term gain.

Canada's minerals and metals sector is highly export-oriented. Its products are sold to customers around the world. For many companies, the market emphasis has been on selling concentrate or smelted/refined metal products, not on involvement in semi-fabricating and downstream manufacturing.

This strategy has allowed Canada's mining industry to become one of the world's major mineral exporters, to the considerable economic benefit of the country. As the industry continues to globalize, is such a strategy still appropriate and will it bring the same returns that it has in the past?

Investment in R&D by Canada's private sector generally does not match similar investment in other leading industrial nations, and some observers feel that many Canadian companies may also be behind in their use of new technology. Moreover, Canada has fewer scientists and engineers per capita than our international competitors. Given the structure of the Canadian economy, should we expect a different picture?

It is argued that much of minerals and metals R&D is in exploration, the value of which is rarely included in the industry's investment statistics. However, for what is conventionally termed "R&D", is the minerals and metals sector doing enough or is it doing the right work?

Key Questions for Discussion:

- * Do Canadian minerals and metals firms need to boost their R&D performance? If so, how can they do it and on what areas should they concentrate?
- * Given Canada's small size, should firms buy and adapt technology, rather than try to develop their own? How can firms acquire and adopt best practice technology?
- * Does the minerals and metals industry need to rethink its approach to strategic alliances with suppliers and customers, in terms of process, equipment and product technology?
- * Can the industry assist in developing a stronger equipment and technology industry?
- * Can or should companies create an R&D environment/culture to provide attractive career opportunities for skilled young engineers, scientists and technology specialists?
- * Are federal and provincial R&D investments used in the most effective way? Are government R&D agencies adequately and appropriately sensitive to industry's needs?
- * What is the role of universities in providing R&D of the right calibre and direction?

The mineral and metal industry workplace is changing rapidly and markedly, especially in the face of competitive pressures. Significantly higher productivity has occurred, as the introduction of new technology has transformed the mining workplace. But equally, it has also introduced new pressures into labour-management relations and significant changes in the way jobs are done. These changes will continue.

To remain competitive, Canadian mines and mineral processing facilities must continue the investment in new technologies which will lower costs and assure environmental standards are met. This process will challenge management and labour to re-examine how they work together to meet the workplace issues which will arise. Conventional management-labour approaches may no longer be adequate or appropriate.

Workers seek "sustainable prosperity", offering quality jobs, high wages and job security. They want the highly skilled jobs which minerals and metals offer. Equally, they do not want the wage and working condition gains which they have made to be eroded.

Workers increasingly realize that competitive pressures and the use of new technology are likely to reduce the size of the mining workforce. In that event, they are looking to humane and effective adjustment measures which can provide relocation, retraining, and hopefully, new opportunities. They also want full and frank communication.

How well management and labour deal with the range of workplace issues will affect the industry's ability to compete globally. Questions are being asked whether existing frameworks for employer-employee relations in the workplace are adequate for the future. Do they need changing? Workers seek to be an integral part of the "decision-making" process. Is this realistic, necessary or achievable?

Key Questions for Discussion:

- * What are the major workplace issues facing management and labour?
- * Are existing workplace approaches, systems and teamwork adequate to allow workers and management to cope with the changing workplace?
- * Other industries are adopting systems of "Total Quality Management" and "employee empowerment". Is this appropriate for the minerals and metals industry?
- * Technology can make the workplace safer, cleaner, more rewarding and more productive. Are new technology and human resources being successfully integrated?
- * Are existing adjustment measures adequate in the event of layoffs and closures?
- * Is there sufficient dialogue between workers, unions and the industry on the strategic issues facing the sector? Is there a common "vision" about how to meet the competitive forces facing the sector internationally?
- * Are employer-employee relations and mechanisms adequate to allow both groups to adequately respond to the structural changes currently taking place? Would a formal consultative mechanism similar to that in place for the steel industry assist in furthering common understanding between employers and workers?
- * Are inter-provincial barriers impeding mobility and skill development?

TOPIC 8:

PARTNERSHIPS AND STRATEGIC ALLIANCES

A strategy to assure Canada's future prosperity must recognize the different strengths, needs and concerns of all stakeholders - investors, companies, workers and unions, governments, and individual Canadians. It must also be a strategy that recognizes that actions are necessary at many levels in our society, both nationally and regionally.

But a strategy for the future must also consider how we use natural resources and Canada's comparative advantage in them to further the country's return from resource development and the diversification of our economy. The benefits which the sector has brought to the country in the past are the result of its growth. However, has sufficient effort been made to ensure that upstream and downstream linkages are maximized in order to increase spin-off benefits and the return to the country?

In strategic terms, the upstream part of the sector (exploration, mineral services) has moved beyond its Canadian roots and has developed a world-wide reputation for excellence. For example, Canada has a vigorous and expert service industry comprising geological and geophysical consultants, mine contractors, consulting engineers, etc.

Moreover, technological development linkages would not seem to be extensive nor are producer-customer alliances and product development. In short, the Canadian minerals and metals sector does not seem to have had a strategic outward-looking, diversification-oriented strategy. The sector, by and large, has "stuck to its knitting".

Linkages would not seem to have taken place with the mining equipment sector. Canada imports much mining equipment and machinery although it has a large domestic mining industry. Are there missed opportunities for diversification?

There are many good reasons for past strategies but are they appropriate for the future? Will such an approach bring the benefits of the past, or with the globalization of the industry and economies, are redirection and new strategies required?

Canada's should not only be internationally competitive but it should be a base to allow broader benefits to the economy. Current market strategies should be reviewed and questioned as to whether current strategic alliances with customers, suppliers, technology centres) are appropriate. Moreover, does the Canadian policy, economic and legal framework support the formation and effective functioning of such alliances?

Key Questions for Discussion:

- * Does the mineral and metal industry have sufficient "vision" as to how it should respond to the changing competitive world, and to the kind of partnerships which are needed? Is it prepared to take new and innovative steps?
- * Can the sector help to build a stronger Canadian mining equipment, mineral processing and machinery industry? How can the success of the mineral services sector be duplicated elsewhere in areas tangential to minerals and metals?
- * Does Canada's legal framework inhibit corporate combinations which could share capabilities and increase competitive strengths?
- * Can there be more co-operation with our fabricating customers to help them develop new or more economic product lines?

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