

***Examining Sustainable Development Challenges and the
Role of Company-Consultancy Partnering in Creating
Value: The Case of the Canadian Mining Industry***

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Foreword

This major paper is significant in the fulfillment of my Plan of Study. My Area of Concentration is *Corporate Sustainable Development and Value Creation*. Environmental stewardship, social responsibility, and economic prosperity are all essential components to ensuring that corporate sustainable development is achieved (Willard, 2002). Corporate sustainable development can contribute to the creation of economic, environmental and social value within an organization itself and throughout the broader community in which an organization operates, thus contributing to the creation of sustainable value. Sustainable value is created through identifying “strategies and practices that contribute to a more sustainable world and, simultaneously, drive shareholder value” (Hart and Milstein, 2003, p. 57).

The intent of this major paper is to determine the current and emerging sustainable development needs of Canadian mining companies and examine how enhanced company-consultancy collaboration can address these needs to contribute to global sustainable development and drive shareholder value. This research paper relates directly to one of my prime learning objectives:

To understand how sustainable development can be incorporated into corporate policies and operations over a broad array of industries operating in North America. I will identify some of the main factors (e.g., public pressure, corporate leadership, communication, employee engagement, amount of time and resources, etc.) that contribute to, or hinder, the success of integrating the principles of sustainable development into the corporate structure. I will also examine what external public and private support exists for mining companies, operating in Canada, that wish to engage in corporate sustainable development. This knowledge will enable me to provide recommendations to North American corporations as to how to integrate the principles of sustainable development into their policies and operations.

In addition to fulfilling this specific learning objective, this paper will address all of my learning objectives to some extent. It will allow me to gain a deeper knowledge of how Canadian businesses are linked to the greater social and environmental context of the communities in which they operate, and to the global ecosystem. The interview process will improve my ability to effectively communicate my ideas and interact with professionals on social and environmental issues. I will expand my knowledge of the business case for sustainable development through background literature research. Lastly, the development, execution, and completion of this project will improve my research, project planning, and implementation skills, and will better prepare me for my future career.

Abstract

This paper examines existing and emerging sustainable development challenges facing the Canadian mining industry. It explores how mining companies and consultancies can work together to address these challenges, and anticipate emerging challenges, in a manner that will simultaneously contribute to sustainable development and drive shareholder value.

Specifically, the goals of the current paper include:

- To determine the current and emerging sustainable development needs of mining companies.
- To determine if consultancies recognize and address, or have the capability to address, the current and emerging sustainable development needs of mining companies.
- To determine if there are gaps between the sustainable development needs of the mining companies and the offerings of consultancies.
- To determine how addressing these current and emerging needs will contribute to sustainable development and drive shareholder value.

The sustainable challenges facing the mining industry are ever-changing; as a result, interviews were conducted as the primary source of qualitative information collection. Eight mining industry professionals and nine consultants were interviewed.

The interview finding identified several current and emerging sustainable development challenges facing the mining industry. These included: improving stakeholder engagement, increasing sustainable development performance disclosure, developing and implementing a sustainable development certification program, incorporating voluntary initiatives into company strategies, articulating the business case

for sustainable development, addressing the challenges associated with developing nations, improving value chain management, incorporating sustainable development principles into mine closure plans, and managing and adapting to climate change.

From the interview results, it is evident that the consultancies understand the sustainable development challenges facing mining companies and are on the forefront of anticipating emerging needs. The industry professionals and consultants agreed that the current needs exist not because the consultants fail to recognize their existence, but rather because both the companies and consultancies lack the capabilities to effectively address all of the complexities involved in dealing with these issues. Sustainable development issues often necessitate quick, adaptable, long-term and dynamic solutions and the structure of many organizations, including mining companies and sustainable development consultancies, may not allow for the flexibility and creativity required to develop such solutions.

Mining companies are currently focused on improving their reputation and legitimacy. Furthermore, in order to ensure future success and competitiveness, mining companies must also address the needs of developing nations, develop and integrate clean technologies into their operations, and facilitate the continual improvement of pollution prevention techniques.

Developing the culture, capabilities, connectivity and commitments that support the principles of sustainable development will equip both mining companies and consultancies with the ability to address the unique and multidimensional challenges of sustainable development in a manner which will maximize the creation of sustainable value; thus, it is important that both mining companies and consultancies develop and

nurture these four key areas of organization. From the current paper, it becomes evident that company-consultancy partnerships are an important strategy that will improve global progress towards sustainable development and drive shareholder value.

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1. Introduction

1.1 Business and the Environment

“By fully abandoning business we would remove ourselves from the creation of wealth and necessary supplies, making the cure much worse than the disease. Mankind needs more subtle approaches to, for instance, increase the individual and collective level of awareness and understanding, support favourable behaviour and restore the imbalance of global institutions.”

(van Marrewijk, 2003, p. 99-100)

Traditionally, the goals of sustainable development and business were often thought to be in continuous conflict with one another (Walley and Whitehead, 2000). As a result, many environmental intellectuals have adopted the view that in order to move towards a more sustainable world the capitalist economic system, to which the majority of global society currently subscribes and businesses work within, must first undergo a fundamental transition. For example, Paul Hawken, an author, environmentalist, and businessman, along with co-authors Amory and Hunter Lovins, suggest that “[i]n the next century...a remarkable transformation of industry and commerce can occur” (Hawken *et al.*, 1999, p. 2). The authors are optimistic that, if done properly, this transformation “can promote economic efficiency, ecological conservation, and social equity” (Hawken *et al.*, 1999, p. 2). Furthermore, Wolfgang Sachs, an academic with expertise in the area of globalization and sustainability, believes that the “globalization of current [Western] patterns of production and consumption will lead to severe disruptions of ecological systems” (Sachs *et al.*, 1998, p. 9).

There is little doubt that the current economic system is, in part, contributing to the increased ecological and social degradation that is being experienced worldwide. Capitalism, currently the dominant global economic ideology, has contributed to “saturation in the developed markets, a widening gap between rich and poor, growing

levels of environmental degradation, and concern that the developing world may be losing control over its own destiny” (Hart and Milstein, 2003. p. 56). It is suggested that social and environmental deterioration is a global concern, and one that will not remain geographically isolated in such an increasingly interconnected world (Hart and Milstein, 2003).

Examples of worldwide ecological and social distress are not difficult to find and include:

- Nearly one in four mammal species is in serious decline, mainly due to human activities (Worldwatch Institute, 2005, p. 86).
- An estimated half of the world’s wetlands have been lost since 1900, and destruction continues apace (Worldwatch Institute, 2005, p. 90).
- Global forest cover stands at approximately half the original extent of 8,000 years ago (Worldwatch Institute, 2005, p. 92).
- A 2000 World Bank study projected that on average 1.8 million people would die prematurely each year between 2001 and 2020 because of air pollution (Worldwatch Institute, 2005, p. 94).
- Global ice melt has led to hunger and weight loss among polar bears, and has altered the habitats as well as feeding and breeding patterns of penguins and seals (Worldwatch Institute, 2005, p. 89).
- Desertification puts some 135 million people worldwide at risk of being driven from their lands. As climate change translates into more intense storms, flooding, heat waves, and droughts, more and more communities will likely be affected (Worldwatch Institute, 2005, p. 66).
- Every day, an estimated 6,000 youth (ages 15 – 24) are infected with HIV (UNFPA, 2005, p. 51).
- The global economy has grown sevenfold since 1950. Meanwhile, the disparity in per capita gross domestic product between the 20 richest and 20 poorest nations more than doubled between 1960 and 1995 (Worldwatch Institute, 2003, p. 88-89).

For some researchers in the field of business and the environment, the focus is beginning to shift towards redefining the goals of the economic system, rather than attempting to work within the current ones that have already created many problems (McDonough and Braungart, 1998). “Increasingly, global capitalism is being challenged to include more of the world in its bounty and protect the natural systems and cultures upon which the global economy depends” (Hart and Milstein, 2003, p. 56). Due to the lack of integration of biological and physical principles into neoclassical economics, the theories underlying neoclassical economics have been questioned by numerous natural scientists. The following is a brief list of some common criticisms of neoclassical economics:

- Neoclassical utility theory solely considers human perceptions and ignores the effects of consumption on the natural environment (Gowdy and Carbonell, 1999);
- Neoclassical economic production is viewed as independent of the anthropology, biology, or physics of the natural world (Gowdy and Carbonell, 1999);
- Neoclassical economics promotes infinite economic activity with no regard for the possibility of a finite environment and thus, ignores the idea of scale (Gowdy and Carbonell, 1999);
- Neoclassical theory is static, not dynamic (Gowdy and Carbonell, 1999);
- Neoclassical economics has a focus on short-term profits and goal setting (Handy, 2003).

As a result, ecological economics, an emerging field that was founded in the late 1980s (van den Bergh, 2001), was developed to combat the narrow focus of the current neoclassical economic system by encouraging a multidisciplinary approach to economic

thinking. This forward-looking discipline “can be associated with the goal of sustainable development, interpreted as both intra- and intergenerational equity; the view that the economy is a subsystem of a larger local and global ecosystem which sets limits to the physical growth of the economy; and, a methodological approach based on the use of physical (material, energy, chemical, biological) indicators and comprehensive systems analysis” (van den Bergh, 2001, p. 13).

Although the ideas underlying ecological economics may become more integrated into future economic systems, as the limitations of the current economic system, as described above, are better understood and acknowledged, this transition will not occur overnight. Shifting the global society towards sustainable development will require significant adjustments to economic policy, trade regulations, tax systems, societal norms and values, and business operations (Daly, 2005). While the current neoclassical economic system within which businesses operate may indeed have some fundamental flaws, this does not suggest that today’s corporations cannot make a positive contribution to improving global sustainability.

The corporate realm is often viewed as the most capable candidate to lead global society towards sustainable development. Companies possess the resource base, organizational framework, global reach and political power necessary to make a significant impact (Whiting and Bennett, 2001). In addition, according to Prahalad and Hart (2002), there is much opportunity to include the 4 billion people living on an annual per capita income¹ of less than \$1,500 in the global market economy. The authors suggest that investing in developing countries “means lifting billions of people out of poverty and desperation, averting the social decay, political chaos, terrorism, and

¹ Based on purchasing power parity in U.S. dollars (Prahalad and Hart, 2002).

environmental meltdown that is certain to continue if the gap between rich and poor countries continues to widen” (Prahalad and Hart, 2002, p. 3). Homer-Dixon (1994, p. 54) suggests that “environmental scarcity causes violent conflict”. Of particular concern are scarcities of cropland, water, forests, and fish, which are suggested to be caused by a combination of environmental degradation and depletion, population growth, and unequal resource distribution. Homer-Dixon concludes that:

Countries experiencing chronic internal conflict because of environmental stress will probably either fragment or become more authoritarian. Fragmenting countries will be the source of large out-migrations, and they will be unable to effectively negotiate or implement international agreements on security, trade and environmental protection. Authoritarian regimes may be inclined to launch attacks against other countries to divert popular attention from internal stresses. Any of these outcomes could seriously disrupt international security (Homer-Dixon, 1994, p. 55).

In both developing and developed nations, companies can advance progress towards sustainable development by improving existing technologies, developing innovative technologies, increasing product stewardship, and enhancing community development through increased transparency and stakeholder engagement (Hart and Milstein, 2003). As a result, rather than belabouring the pitfalls that reside within the current economic system, this paper will take a more pragmatic approach to improving progress towards sustainability. The focus will be on how companies can contribute to a more sustainable society both today and into the future.

1.2 Purpose of the Current Paper

This paper examines existing and emerging sustainable development challenges facing the Canadian mining industry. It explores how mining companies and external support agencies (hereon in referred to as consultancies) can work together to address

these challenges, and anticipate emerging challenges, in a manner that will create sustainable value.²

The primary goals of the current paper include:

- To determine the current and emerging sustainable development needs of mining companies.
- To determine if consultancies recognize and address, or have the capability to address, the current and emerging sustainable development needs of mining companies.
- To determine if there are gaps between the sustainable development needs of the mining companies and the offerings of consultancies.
- To determine how addressing these current and emerging needs will contribute to sustainable development and drive shareholder value.

Although mining is an industry with a long legacy of environmental and social turmoil (Jenkins, 2004)³ this does not mean that the industry should be abandoned. In fact, to do so would likely cause even greater devastation due to the number of societies dependent on the existence of the mining industry. “By fully abandoning business we would remove ourselves from the creation of wealth and necessary supplies, making the cure much worse than the disease” (van Marrewijk, 2003, p. 99). Instead, mining companies must ensure that the principles of sustainable development are incorporated into their operations, policies and goals. (See Appendix A for a summary of sustainable development principles.) In his book entitled *Collapse*, Jared Diamond conveys this idea as he states:

² See section 1.3 of the current paper for detailed definitions of ‘consultancy’, ‘mining company’, and ‘sustainable value’.

³ “Historically, the mining industry has taken a ‘devil may care’ attitude to the impacts of its operations: operating in areas without social legitimacy, causing major devastation, and then leaving when an area has been exhausted of all economically valuable resources” (Jenkins, 2004, p. 24).

All modern societies depend on extracting natural resources, both non-renewable resources (like oil and metals) and renewable ones (like wood and fish). We get most of our energy from oil, gas, and coal. Virtually all of our tools, containers, machines, vehicles, and buildings are made of metal, wood, or petrochemical-derived plastics and other synthetics. ...The economies of dozens of countries depend heavily on extractive industries. ...Thus, our societies are committed to extracting those resources: the only questions involve where, in what amounts, and by what means we choose to do so (Diamond, 2005, p. 441).

Herman Daly and many other environmentalists (e.g., Donella Meadows, Jorgen Randers, Dennis Meadows, and Paul Hawken)⁴ believe that adhering to the principles of sustainable development is not a choice, but rather a necessity as natural resources become more scarce and limits to growth more apparent (Daly, 2005).

According to Bob Willard, “business people pursue sustainable development for three reasons: morality, compliance, or opportunity” (Willard, 2002, p. 11). The morality motivation is driven by the personal values of key senior executives and recognizes that companies have an obligation to positively contribute to society at large. The compliance motivation is driven by the idea that poor environmental and social performance will result in costly fines and negatively impact on the company’s right to operate. The opportunity motivation, however, is the most vital for companies wishing to ensure long-term success and competitiveness to understand, and involves viewing sustainable development as an opportunity to improve shareholder value rather than a necessary cost of doing business (Willard, 2002). For example, improving company sustainable development performance can: facilitate access to markets and ease operational start-ups,

⁴ Meadows, Randers and Meadows exemplify this view in their book “Limits to Growth: The 30-year update” (2004) in which they suggest that a transition to sustainability will be necessary in order to curb current destructive consumption patterns. Paul Hawken in his 1993 book “The Ecology of Commerce” suggests that “having expropriated resources from the natural world in order to fuel a rather transient period of materialistic freedom, we must now restore no small measure of these resources and accept the limits and discipline inherent in that relationship. Until business does this, it will continue to be maladaptive and predatory” (Hawken, 1993, p. 6).

address the value chain, address media and/or activist pressures, lead to lower bank loan rates, lead to lower insurance premiums, increase eco-efficiency of operations, satisfy due diligence requirements regarding partnerships and acquisitions, facilitate divestitures, promote industry self-regulation, promote employee satisfaction and retention, and facilitate inclusion in sustainable development and socially responsible investment funds (Feltmate *et al.*, 2001).

Regardless of the motives behind sustainable development, it is clear that environmentalists and corporate executives are beginning to merge on common ground as the benefits from improving progress towards sustainable development (e.g. pollution reduction, increased social equity, and economic value added potential) appease both groups. The corporate motives for pursuing sustainable development will be examined further in section 2.2 of the current paper.

In order to avoid confusion, terms that will be commonly used throughout the current paper will now be identified and explained.

1.3 Defining the Terms

Sustainable Development

“The term Sustainable Development has been used in many different contexts and consequently has come to represent many different ideas” (Fergus and Rowney, 2005, p. 17). In the past, “development and conservation have been in conflict, because conservation was understood as the protection of resources, and development as the use, or exploitation of resources” (University of the Western Cape, 2001). However, as pointed out by Daly (2005), development refers to a qualitative improvement in human well-being, which does not necessarily involve economic growth but can result in it.

According to Daly (2005), there is an important distinction between growth and development that is largely ignored by traditional economics. Growth is defined as the increase in the production of goods and services, and is often seen as “the panacea for all the major economic ills of the modern world” (Daly, 1996, p. 100). Development, however, is the qualitative improvement in design of products and, consequently, the quality of life. The biosphere has finite resources, is non-growing, or at least not at the rate required to support current Western consumption, and is essentially a closed system (Daly, 2005). Current estimates suggest that the maximum number of people the earth can support, often referred to as carrying capacity, is in the range of 7.7 to 12 billion (del Monte-Luna *et al.*, 2004). Presently, world population stands at around 6 billion people. As a result, concern exists that the carrying capacity of the planet will soon be exceeded (del Monte-Luna *et al.*, 2004). Thus, although growth will remain important, improving global sustainability requires that we shift our primary focus towards development (Daly, 2005).

Within the past two decades the need for integrating environmental, social, and economic considerations into human decision making has emerged as people begin to realize the negative impact that human activities are having on the natural world. As a result, the World Commission on Environment and Development (WCED) was formed in 1983 (University of the Western Cape, 2001).

The WCED was asked by the General Assembly of the United Nations to develop ‘A global agenda for change’ that takes into account the following objectives:

- To propose long-term environmental strategies for achieving sustainable development by the year 2000 and beyond;

- To recommend ways concern for the environment may be translated into greater co-operation among developing countries and between countries at different stages of economic and social development and lead to the achievement of common and mutually supportive objectives that take account of the interrelationships between people, resources, environment and development;
- To consider ways and means by which the international community can deal more effectively with environmental concerns; and
- To help define shared perceptions of long-term environmental issues and the appropriate efforts needed to deal successfully with the problems of protecting and enhancing the environment, a long-term agenda for action during the coming decades, and aspirational goals for the world community (WCED, 1987, p. ix).

In response, the WCED, in its seminal 1987 Brundtland report, “Our Common Future”, defined the term sustainable development as being “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (WCED, 1987, p. 43).

From these objectives and definition, three central themes of sustainable development become evident. First, moving towards sustainable development requires a long-term perspective. Adopting a long-term approach is vital to ensuring that sustainable development solutions are sustainable in that they continue to meet the needs of future generations.

Second, equity or just distribution of income and wealth is an important factor of sustainable development. According to Daly and Farley (2004), just distribution plays a vital role in shifting a society towards sustainable development for several reasons:

- People who are very poor will not be interested in engaging in sustainable development activities as they will be more concerned with meeting their basic needs for survival;

- People with excessive wealth consume large amounts of resources;
- In addition to intragenerational distribution, sustainable development is concerned with intergenerational distribution in meeting the needs of future generations;
- The Earth is a finite planet, with finite resources. As a result, poverty eradication requires a redistribution of existing resources as limits to growth exist (Daly and Farley, 2004).

Overall, sustainable development solutions are not sustainable if they benefit one group of people while disadvantaging another.

Third is the idea that sustainable development is a worldwide concern and must be addressed at a global level. Local solutions are important, but not enough. We are all a part of, and dependent upon, a global ecosystem and must acknowledge the effects of our actions on a global level and put forth a collaborative effort towards improving sustainable development.

Thus, it is evident that although sustainable development has some underlying themes (outlined above) and principles (see Appendix A) it is a difficult term to define and actual definitions will vary depending on numerous factors, including: field of study, cultural and economic background, societal goals and values, and purpose of the definition. (See Appendix B for examples of definitions of sustainable development from diverse organizations.)

Corporate Sustainable Development

Corporate sustainable development is not distinct from sustainable development, but rather should be viewed as a process by which companies strive to incorporate the themes and principles of sustainable development into their corporate policies,

procedures and operations. (Refer to Appendix A for principles of sustainable development.) Although there is no single definition, broadly speaking “corporate sustainability and, corporate social responsibility refer to company activities...demonstrating the inclusion of social and environmental concerns in business operations and in interactions with stakeholders” (van Marrewijk, 2003, p. 102). According to van Marrewijk (2003), it is important that this definition remains flexible so that each individual company can align their process towards sustainability with their individual goals, intentions, ambition level and the external conditions under which they operate.

“Triple Bottom Line”

John Elkington first coined the phrase the “triple bottom line”, which refers to simultaneously creating ecological, social and economic value (Elkington, 1997). Creating ecological value requires that a company minimize its impacts on natural capital. Natural capital takes the form of natural resources (both renewable and non-renewable) and ecosystem services (e.g. climate stabilization, water purification, soil remediation, etc.) (Dyllick and Hockerts, 2002). In order to improve a company’s social value it must nurture its human capital and societal capital. “Human capital concerns primarily aspects such as skills, motivation and loyalty of employees and business partners. Societal capital, on the other hand, includes the quality of public services, such as a good educational system, infrastructure or a culture supportive of entrepreneurship” (Dyllick and Hockerts, 2002, p. 134). Lastly, creating economic value requires a company to manage and sustain its economic capital. According to Dyllick and Hockerts, economic capital can take three forms: “financial capital (i.e., equity, debt),

tangible capital (i.e., machinery, land, stocks) and intangible capital (i.e., reputation, inventions, know-how, organizational routines)” (Dyllick and Hockerts, 2002, p. 133). Thus, in order to contribute to sustainable development a company needs to ensure that it is reducing its impacts on and preserving natural capital, nurturing its social capital and improving economic capital, – in other words, contributing to the “triple bottom line”.

Sustainable Value

Sustainable value is defined as “shareholder wealth that simultaneously drives us toward a more sustainable world” (Hart and Milstein, 2003, p. 65). Sustainable value is created through the implementation of corporate strategies and practices that contribute to global sustainable development and are economically favourable for the company (Hart and Milstein, 2003).

Shareholder Value

Shareholder value is traditionally viewed as the stock price of a company and/or dividends distributed to investors in a company. Although this may be correct, it is important to understand, as emphasized throughout this paper, that increasing shareholder value, and thus enhancing the economic prosperity of a company, is dependent upon ensuring both environmental stewardship and social responsibility.

Mining Company

For the purposes of the current paper, mining companies are defined as publicly-traded companies that are listed on the Toronto Stock Exchange⁵, have head office operations in Canada, and have total assets between 0.7 and 14.0 billion CDN\$ as of December 31, 2005.⁶ The explorative and extractive operations of these companies may

⁵ <http://tsx.com/en/index.html>

⁶ Total assets of specific companies were determined from data available at www.globeinvestor.com.

focus on a variety of materials (e.g., copper, zinc, gold, silver, nickel, cobalt, uranium, and/or metallurgical coal) and may occur within Canada and/or elsewhere globally.⁷

Consultancy

A consultancy, as defined by the current paper, is any organization which provides mining companies with information, research and/or consultancy advice on the topic of sustainable development. These organizations are external to the companies themselves and can be government, non-government, private, academic, and/or industry organizations. In addition, consultancies may be for profit or non-for profit organizations. Examples of specific consultancy organizations interviewed for the current paper, and their core competencies, will be provided in section 3.4.

Partnership

A partnership is defined as a relationship between two organizations in which information, resources, skills, talent and/or knowledge is shared. This sharing may be mutual, and has the ultimate goal of improving global progress towards sustainable development. The focus of this paper is on the partnerships formed between mining companies and consultancies.

⁷ All eight mining companies interviewed for the current paper meet these criteria.

2. Project Background and Theoretical Framework

*“There are strange things done in the midnight sun
By the men who toil for gold;
The Arctic trails have their secret tales
That would make your blood run cold;
The Northern Lights have seen queer sights,
But the queerest they ever did see
Was that night on the marge of Lake Lebarge
I cremated Sam McGee.”*

- Robert W. Service

2.1 The Canadian Mining Industry: Past, Present and Future

As pointed out by Dechert (1999), Robert W. Service’s famous poem “The Cremation of Sam McGee” (excerpt above) acts as a reminder of the strong connection that exists between mining and Canadian history.⁸

As early as 6,000 years before present (B.P.), on the land that would become Canada, First Nations peoples were trading copper excavated from the Lake Superior area (Udd, 2000). Later, about 4,000 B.P., mining occurred in Labrador where materials to make fashion implements were being excavated by the Maritime Archaic Indians, and between 200 B.C. and 200 A.D., silver from Cobalt, Ontario was being traded (Udd, 2000). It wasn’t until 998 A.D. when Europeans first began mining in Canada, which began with the Vikings mining bog iron in Newfoundland. Eventually, in the 16th century, an increase in mining activities throughout Canada was observed as early explorers, followed by European settlers, began to inhabit the country (Udd, 2000).

Improvements in early infrastructure and technology inevitably accompanied this growth period in mining. In the 1860s, railway construction began that would eventually

⁸ “The Cremation of Sam McGee” was originally published in: Service, R.W. 1907. *The Spell of the Yukon and Other Verses*, New York: Barse & Hopkins, p. 50-54.

link many communities and provide a way of shipping the mine products to the markets (Udd, 2000). Furthermore, dynamite, compressed air, Burleigh drills, diamond drills, hollow drill steel, the Blake jaw crusher, cyanide leaching, and the electrification of North America are developments that occurred in the second half of the 19th century and early part of the 20th century that improved the economic success, and ease, of these early mining efforts (Udd, 2000). “The foundation was being laid for the transformation of mining from a brute-force “art” to a more efficient and sophisticated “science” (Udd, 2000, p. 7).

The greatest boom in the Canadian mining industry, however, occurred within the past sixty years. Before this time, according to Cranstone (2002), the mining industry remained relatively immature. The combination of new geophysical methods, appealing market metal prices, and a number of discoveries of base-metal and uranium orebody deposits within Canada contributed to increased exploration expenditures during the early 1950s. As a result, since 1946 Canada has been home to more than 2,000 metal deposit discoveries (Cranstone, 2002).⁹

Thus, the mining industry has played an important role in the development of Canada. As evident in Figure 1, many communities, spanning all regions of Canada, in part owe their existence to the positive economic and social opportunities that the mining and allied industries have presented them (Natural Resources Canada 2006b).

⁹ For a more detailed historical account of Canada’s mining industry refer to: Cranstone, D.A. 2002. *A History of Mining and Mineral Exploration in Canada and Outlook for the Future*, Ottawa: Minerals and Metals Sector Natural Resources Canada.; and Udd, J.E. 2000. *A Century of Achievement: The Development of Canada’s Minerals Industries*, Montreal: Canadian Institute of Mining and Metallurgy, sections available at http://www.nrcan.gc.ca/mms/stude-etudi/chro_e.htm.

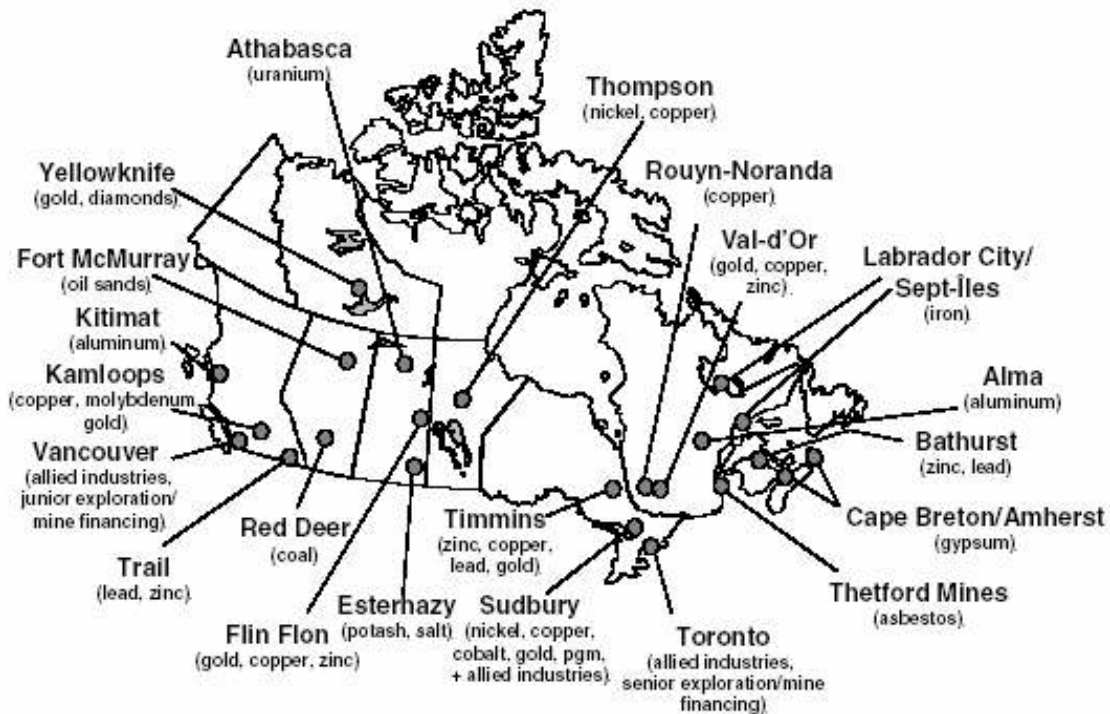


Figure 1. Canadian Communities in which Minerals, Metals, and Allied Industries Have Had a Significant Impact on Development (Natural Resources Canada, 2006b, p. 5)

At present, the mining industry continues to play an important role in all regions of Canada. In 2004, the mining and mineral processing industries directly employed 369,000 Canadians and contributed \$41.8 billion (4% of the national Gross Domestic Product) to the Canadian economy (Natural Resources Canada, 2006a). Furthermore, mining has a significant impact on the Aboriginal population in Canada as over 1,200 Aboriginal communities, constituting 75% of the Aboriginal population, reside within 200 km of mining activities (Natural Resources Canada, 2004). Ranking number one in the production of potash and uranium worldwide, and in the top five for the production of aluminum, asbestos, cadmium, cobalt, gypsum, magnesium, molybdenum, nickel, platinum group metals, salt, titanium concentrate, and zinc, it is obvious that Canada

continues to be a key player in both the domestic and international mineral markets (Natural Resources Canada, 2006a).

Despite its contributions to economic and community development throughout Canada, and in other parts of the world, the Canadian mining industry continues to face many challenges, and how the companies react to these challenges will determine the fate of Canada's mining future. The public image of the industry is growing increasingly negative, and public policies are shifting against the activities of the industry. "While mining has kick-started regional development in the past, it is now seen as a "sunset" or "smokestack" industry – one with low value added, a shrinking work-force, and an activity with very negative environmental externalities" (MacDonald, 2002, p. 24). In reaction, many Canadian companies, frustrated by the negative perceptions of their business in North America, have begun shifting their operations into other countries. Much of this movement has been into developing nations which have limited expertise and capital, but high geological potential (MacDonald, 2002).

More specifically, according to MacDonald (2002), the North American corporate mining sector faces a diverse array of sustainable development challenges, including:

- Incorporating sustainable practices into the "everyday activities of the firm". Progress towards sustainable development requires more than just 'add-on' solutions. Companies must learn how to incorporate sustainable development into their core business strategies, as well as achieve 'buy in' from all levels of employees, especially managers and professionals working closely with local communities and environments.
- Strengthening relationships between junior and senior firms in a way that creates "a stronger, more vital and risk resistant production system".

- Understanding how to create a competitive advantage. Companies must evaluate the opportunities associated with employing “best practices” versus a compliance driven approach.
- Improving public image, both in developed and developing nations, through providing information to all stakeholders in a transparent and meaningful manner, and understanding how to “measure the value of public image bolstering for the industry”.
- Learning how to positively manage the social issues that accompany globalization at both the corporate and project scales.
- “Planning for sustainability in a market-driven industry. ...What other stakeholders need to appreciate is that a strong, vital corporate sector of mining has much more ‘reaction space’ to adhere to sustainable ideals than a weak, survival-oriented corporate sector. It is a question of balance that all stakeholders have to appreciate” (Macdonald, 2002, p. 126).

2.2 The Business Case for Sustainable Development

Why should a mining company carefully consider and address the sustainable development challenges facing the industry? It was suggested in section 1.2 that morality, compliance, and/or opportunity are the three motivations behind corporate sustainable development (Willard, 2002). The opportunity, or business case, motivation is perhaps the most convincing reason why companies pursue sustainable development and will now be discussed.

The following demonstrates the ways in which sustainable development practices can directly influence costs and revenues within a company:

- Facilitate access to markets/ease operational start-ups: ...revenue and share price benefits associated with expanded operational and market access...;
- Address the value chain: customers are increasingly concerned about the harm that corporate practices might cause from environmental, economic or social perspectives...;
- Address media/activist pressures: NGOs such as Greenpeace, the Sierra Club, Natural Step and Friends of the Earth can affect public perceptions of business; these perceptions may influence customers' buying practices, product switching and operational start-ups, which in turn may influence share price...;
- Lead to lower bank loan rates: ...companies that are positioned as sustainable development practitioners may be perceived as presenting less risk, and accordingly banks may charge them lower interest rates on borrowed capital. ...Also, as banks are increasingly concerned with issues of lender liability, the success of a company in securing a loan...is affected by the sustainable development practices of the company;
- Lead to lower insurance premiums: ...sustainable development companies that are not self-insured will generally receive discounted premiums, which translate into savings that can have a positive impact on share price;
- Increase eco-efficiency: ...an eco-efficient company will reduce energy inputs, material requirements and waste production per unit of production...;
- Satisfy due diligence requirements regarding partnerships and acquisitions: due diligence requires that the sustainable development performance of partners or acquired companies be assessed, since engaging in a relationship with a company that has a negative reputation can result in potential liabilities...;
- Facilitate divestitures: ...companies with a positive sustainable development record will generally realize a higher valuation for shareholders upon sale...;
- Promote industry self-regulation: when industry and government share expertise regarding the application of sustainable development best practices, practical and cost-effective self-regulatory programs and/or legislation will often result...;

- Promote employee satisfaction/retention; and
- Facilitate inclusion in sustainable development and socially responsible investment funds (Feltmate *et al.*, 2001, pp. 13-14).

Thus, the business opportunities presented by sustainable development, as outlined above, demonstrate the link between corporate sustainable development and value creation. The Dow Jones Sustainability Index¹⁰ further demonstrates this point as it yielded a total return of 238 percent, compared to 175 percent for the benchmark Morgan Stanley Capital International World Index, between December 1993 and December 2005 (Dow Jones Sustainability Indexes, 2006, p. 6). Additionally, a recent report entitled “The SD Effect: Translating Sustainable Development into Financial Valuation Measures” demonstrates the positive impact that sustainable development practices can have on share price performance (Yachnin and Associates *et al.*, 2006).¹¹

Furthermore, it is suggested that economic strength of a company is increasingly dependent on seemingly intangible assets such as social capital, human capital, and reputation (Wheeler, 1993). Increased public scrutiny regarding corporate activities is placing pressure on companies to adopt a more holistic and transparent “triple bottom line” approach (Bell, 2002). Large corporations are often viewed by the public as the most obvious vehicle by which to implement sustainable development (Whiting and Bennett, 2001).

First, many large corporations have the global reach, political power, resource base, and organizational framework that is necessary for implementing sustainable development initiatives. Second, the public has traditionally viewed large corporations

¹⁰ “The Dow Jones Sustainability World Indexes consist of more than 300 companies that represent the top 10% of the leading sustainability companies in 60 industry groups in the 34 countries covered by the biggest 25,000 companies in the Dow Jones Global Indexes” (Dow Jones Sustainability Indexes, 2005).

¹¹ This report is discussed in further detail in section 2.6.

as a major contributor to an unsustainable society and, thus, holds the belief that businesses must take responsibility for past environmental and social impacts by contributing to sustainable development (Whiting and Bennett, 2001). The mining industry, in particular, has a negative legacy associated with its operations: “[a] widespread public perception of mining is of a low-tech, polluting and avaricious industry” (Veiga *et al.*, 2001, p. 192). Some negative environmental impacts of mining activities, if not properly managed, can include: destruction of landscapes, destruction of agricultural and forest lands, disturbance of watercourses and surface and groundwater pollution, damage to recreational lands, noise pollution, dust, truck traffic, sedimentation and erosion, soil contamination, and air pollution (Sengupta, 1993). Negative social and economic impacts of mining operations can include: loss of cultural and spiritual values, within community antagonism, and failure of mining companies to meet community economic expectations (Veiga *et al.*, 2001). Thus, in combination, these impacts have contributed to negative public perceptions of the industry (Veiga *et al.*, 2001). Third, a healthy economy relies on the natural environment; as a result, companies have a vested interest in ensuring sustainable development (Whiting and Bennett, 2001). As a result, many companies are recognizing the economic, reputation, and risk reduction benefits associated with adopting a broader “triple bottom line” approach to business operations (Willard, 2002).

Thus, Canadian mining companies wishing to remain competitive in the future must acknowledge and learn how to positively address the sustainable development issues facing the industry. Companies which successfully manage environmental risks and effectively and strategically invest in sustainable development opportunities will

generate a competitive advantage and superior financial gains over their less sustainable counterparts (Kiernan and Martin, 1998; Kiernan and Martin, 1999).

2.3 The Transition towards Sustainable Development in the North American Mining Industry

“A competitive world has two possibilities. You can lose. Or, if you want to win, you can change.”

- Lester C. Thurow

Upon its introduction in 1987, sustainable development was initially seen by the mining industry as a profit draining initiative that many thought would prove to be nothing more than a regulatory nightmare (Hefferman, 1997). Over the last two decades, however, attitudes in the mining industry towards sustainable development have shifted which has resulted in a less defensive approach: “[i]nstead of wasting time, energy and money fighting constructive regulation, the industry is making environmental protection a priority” (Hefferman, 1997, p. 36). Whether this initial attitude shift was a reaction to increased regulations, a reaction to increasing public pressure and changing societal values, or recognition of the value of preserving a healthy environment for future economic growth is not known for sure (Hefferman, 1997), and, in my opinion, can be best explained by a combination of these and other drivers as summarized in Figure 2.



Figure 2. Major Forces Driving Change in the North American Mining Industry (MMSD North America, Scenarios Work Group, 2002, p. 4)

Regardless of the origin of sustainable development in the mining industry, there is no doubt that environmental and social progress has been made over the past two decades. One study which used data from Canadian companies in the oil and gas, mining, and forestry industries “revealed that corporate sustainable development increased from 1986 to 1995, fuelled primarily by greater concern for social equity especially in later time periods. This suggests that firm commitment to social equity developed later than their commitment to economic prosperity and environmental integrity” (Bansal, 2005, p. 210).

Although improvements towards sustainable development are being made, it is important to ensure that these measures are meaningfully contributing to sustainable development and not merely a public relations ploy. To address this concern, the Mining Minerals and Sustainable Development North America presented a report entitled “Seven Questions to Sustainability”. The framework developed in this report (Figure 3) enables

mining activities to be assessed, on a case by case basis, to determine whether the long-term net impact of an activity will positively or negatively contribute to sustainable development (MMSD, 2002b).



Figure 3. Seven Questions to Assess the Long-Term Net Impact of an Activity on Sustainable Development (MMSD North America, 2002b, p. 1)

2.4 More about the MMSD Project

Acknowledgment of the importance of sustainable development to the future success of the mining industry is evident in the undertaking of the Mining, Minerals and Sustainable Development (MMSD) project. This project, commissioned by the World Business Council for Sustainable Development (WBCSD) and sponsored by the International Institute for Environment and Development (IIED), produced a final report in 2002 entitled *Breaking New Ground* (Anonymous, 2006). This report is based on research and consultation undertaken in Australia, North America, South America, and

Southern Africa, and concludes with four steps that will improve progress towards sustainable development in the global mining industry (MMSD, 2002):

- First, there is a need for an improved understanding of what ‘sustainable development’ means and how it can be incorporated into all aspects of mining – from extraction to accounting. The report indicates that this may be achieved through increased research, as well as incorporating sustainable development education into a broader array of academic fields of study.
- Second, the study suggests that all stakeholders in the industry (e.g., large consumers of mineral products, lenders, institutional investors, government organizations, NGOs, companies themselves, etc.) need to develop, or review existing, sustainable development policies and management systems. Organizations should be viewing their overall goals and operations through the lens of sustainability to ensure that sustainable development becomes integrated into all aspects of the organization and not just viewed as an ‘add-on’ initiative.
- Third, the report recommends increasing cooperation between actors with common roles, responsibilities and interests. “Collaboration may occur from the local to international level and may take a number of different forms – everything from informal information-sharing networks to formal associations requiring membership and adherence to a set of structures and certain norms” (p. xxvi).
- Fourth, the industry must build capacity for effective actions at the community (e.g., community engagement, community sustainable development plans, disputes and conflict resolution mechanisms, etc.), national (e.g., access to information, public participation, land rights regimes and compensation systems, etc.) and global (e.g.,

complaints and dispute resolution mechanism, product stewardship initiative, reporting guidelines, etc.) levels (MMSD, 2002).

In addition to these four steps, the final regional report from the MMSD North America branch, entitled “Towards Change” outlines ten recommendations aimed at addressing the unique needs and sustainable development challenges¹² facing the North American mining sector (MMSD North America, 2002a, pp. 4-5):

The Legacy Issue

Immediate Priority

- i.* Enhance effort to address the legacy of past mining and mineral activities;

Longer Term

- ii.* Strengthen the basket of legislated rules, market incentives and voluntary programs to prevent the same from happening in the future;

Improving Practices

Immediate Priorities

- iii.* Initiate a series of pilot tests as the next step in the collaborative development of the Seven Questions to Sustainability framework¹³;
- iv.* Design and implement effective approaches for rewarding good and discouraging bad performances within the context of sustainability as indicated by the Seven Questions framework;
- v.* Design and implement a set of effective dispute resolution mechanisms tailored for application across the full life-cycle of mining and mineral projects;
- vi.* Review and optimize the rules and systems for designating and controlling recyclable material and hazardous waste to encourage recycling while maintaining safety;

¹² Some of the sustainable development challenges facing the industry have been identified in section 2.1 of the current paper.

¹³ The “Seven Questions to Sustainability” framework is outlined in section 2.3.

- vii.** Develop and implement a practical approach to addressing the equity issue at the project/operational level;

Longer Term

- viii.** Initiate a review of the current financial/business/economic decision support model¹⁴ and the processes used in its application in the mining and minerals industry to identify how ecological and social costs, benefits, and risks can be more effectively incorporated than they are at present;

Enhancing Capacity

- ix.** Strengthen the learning and research/development system in support of the North American mining and minerals industry to avoid serious human resource problems within the next decade; and

Monitoring and Reporting on Follow-up

- x.** Create a mechanism to facilitate follow-up activities and report on [future] MMSD – North America outcomes. (See Appendix C for follow-up information from the International Institute for Sustainable Development.)

2.5 Voluntary Initiatives

To address sustainable development challenges, such as those proposed by the MMSD project, a number of voluntary initiatives have been developed. Voluntary Principles on Security and Human Rights, the Global Reporting Initiative (GRI), the Equator Principles, the Extractive Industries Transparency Initiative, Towards Sustainable Mining and the International Council on Mining and Metals (ICMM) sustainable development principles are a few examples of voluntary programs aimed at improving understanding of and progress towards sustainable development in mining. (See Appendix D for a brief description of these and other voluntary sustainable development initiatives.)

¹⁴ “Current practice in the mining industry...uses a financial/business/economic model that effectively addresses traditional economic costs, benefits and risks from the perspective of the company. However, although significant improvements have been made over the past 20 years, the model and/or its process of application does not adequately deal with more recently emphasized factors that emerge through application of the concept of sustainable development. These factors may be one of any combination of economic, environmental, social, cultural or political in nature” (MMSD North America, 2002a, pp. 64-65).

The Towards Sustainable Mining initiative is of particular interest to the current project because it was launched in 2004 by the Mining Association of Canada (MAC) as “a strategy for improving the mining industry’s performance by aligning its actions with the priorities and values of Canadians” (MAC, 2006). More specifically, MAC, in collaboration with its member companies, developed Towards Sustainable Mining to improve performance in four key areas: crisis communication, tailings management, energy and greenhouse gas emissions management, and external outreach (MAC, 2006). To date, twenty-five mining companies and thirty-six mining related organizations (e.g. consultants, engineering firms, financial institutions, etc.) have joined MAC. As a result, Towards Sustainable Mining is expected to make a significant contribution towards change in the Canadian mining industry.

2.6 Barriers to Sustainable Development in the Mining Industry

Although progress towards sustainable development in the Canadian mining industry is being observed, barriers still exist which are hindering the transition towards a more sustainable society. According to Post and Altman (1994), barriers to change can be classified as either industry specific barriers or organizational barriers. Industry barriers, “which reflect the special and unique features of the business activity in which the firm engages, ...include technical information, capital costs, configuration of current operations, competitive pressures and industry regulations. ...Organizational barriers [to sustainable development] include factors such as employee attitudes, poor communications, past practice and inadequate top management leadership” (Post and Altman, 1994, p. 67).

Perhaps one of the biggest challenges to embedding sustainable development into corporate strategy, as identified in PricewaterhouseCoopers' metals and minerals sustainability survey conducted among 58 chief executives, is "the difficulty in linking [sustainable development] to financial success" (PricewaterhouseCoopers, 2001, p. 473). Thus, moving beyond the mentality that sustainable development requires a tradeoff against profits is an important step that will improve progress towards sustainable development. Being able to quantifiably measure the seemingly intangible benefits (e.g. improved reputation, risk management, increased employee productivity, higher retention of top talent, etc.) of sustainable development will enable companies to place greater importance on sustainable development initiatives, as the primary objective of business remains with increasing shareholder value (Willard, 2002).

To date, work on this topic has been limited, although this is becoming an increasingly important issue as exemplified by a recent analytical framework produced by Yachnin and Associates, Sustainable Investment Group Ltd., and Corporate Knights (2006) entitled "The SD Effect: Translating Sustainable Development into Financial Valuation Measures". Using company-specific sustainable development performance metrics from the Canadian mining sector, this report "sets out a Pilot Analytical Framework for using five traditional financial valuation techniques [(Ratio Analysis, Discounted Cash Flow Analysis, Rules of Thumb valuation, Economic Value Added Analysis, and Option Pricing)] to isolate the potential impact of sustainable development on company valuation and share price performance" (Yachnin and Associates *et al.*, 2006, p. v).

The results of this report indicate that sustainable development performance can be quantified into shareholder value. One example from the report estimates that the risk reduction associated with Teck Cominco's enhanced community and employee relations strategy is valued at \$859 million, or \$4.24 per share. Furthermore, this report highlights two limitations to current sustainable development reporting practices. The first limitation is the absence of specific and quantitative information within sustainable development reports; second, the sustainable development data is often scattered throughout the report making it difficult to assemble and analyze (Yachnin and Associates *et al.*, 2006).

2.7 Partnering for Sustainable Development

Although progress towards sustainable development in the Canadian mining industry to date has been promising, it is evident that barriers and challenges to future improvements persist. To summarize, these may include, but are not limited to: viewing sustainability as a business strategy with value added potential, incorporating sustainable development into the everyday activities and core operations of the firm, developing sustainability standards on a case-by-case basis, achieving 'buy in' from all levels of employees, ensuring strong leadership, improving public image through increased stakeholder engagement, understanding and managing the risks and opportunities associated with increasing globalization of the industry, and improving access to information and knowledge sharing (Macdonald, 2002; Post and Altman, 1994). Thus, the question remains: how can a mining company address these challenges in a meaningful and effective manner?

According to Paul Mitchell, Secretary General of the International Council on Mining and Metals, “we are now reaching the limits of what [mining] companies working alone can do to tackle [the economic, social and environmental] challenges” (Mitchell, 2006, p. 5). Paul Mitchell is calling for greater collaboration between companies and their stakeholders. “Such partnerships are needed if we are to truly realize the positive potential mining offers. This will of course require a greater willingness by all parties to engage substantively, thus necessitating commitment and openness that has not always characterized the sector to date” (Mitchell, 2006, p. 6).

Figure 4 provides a simplified view of the stakeholder groups relevant to mineral production and demonstrates that the primary actors can be divided into three main sectors. First there are governments, which act primarily as regulators of the industry. Next, there is the public domain which includes NGOs, communities, and future generations. This group encourages the corporate sector to improve social and environmental performance, as well as to ensure economic revenue sharing. Last is the corporate sector, including the mining companies themselves as well as related industries. It is the corporate sector that faces the challenge of balancing government regulations, shareholder expectations and the social and environmental demands of the public. As Figure 4 suggests, “only a small, highly constrained portion of the overall picture is made up of the ‘mining industry’ itself, and that very few extremely large firms can break out of the ‘commodity trap’ into value-added manufacturing” (MacDonald, 2002, p. 20).

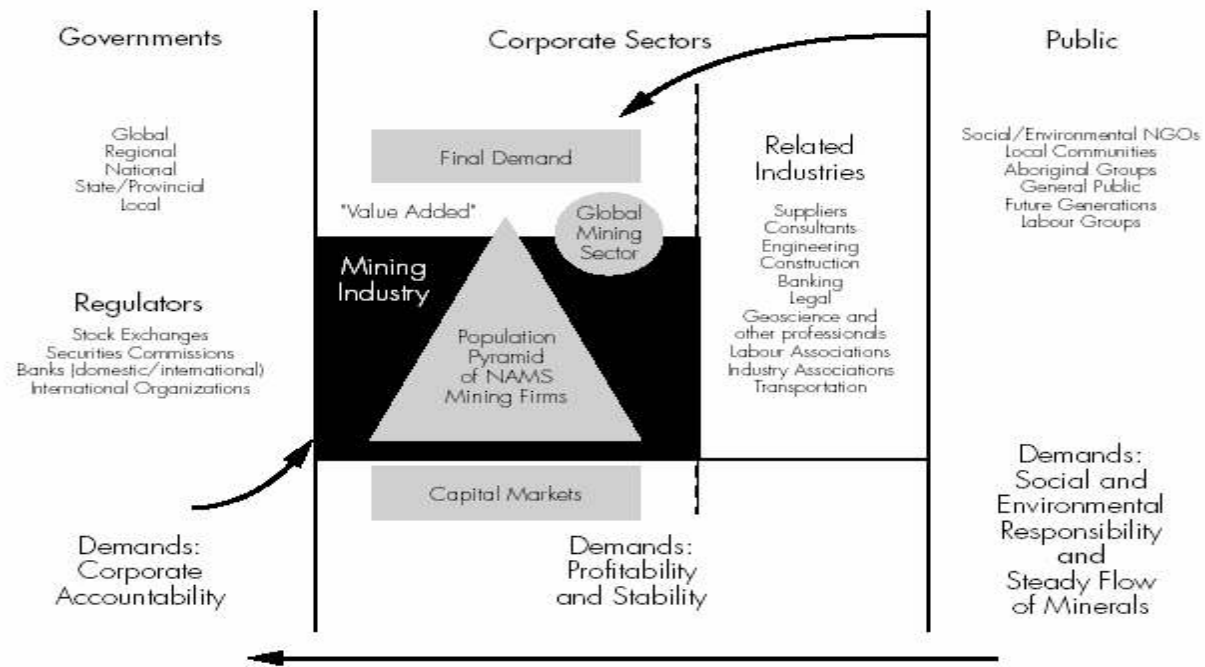


Figure 4. Stakeholders in a Prototypical Mineral Production System (MacDonald, 2002, p. 20)¹⁵

It becomes apparent that although improving the sustainable development performance of each individual mining company is critical to ensuring future progress, there are many other actors which play an important role in the industry and, thus, partnerships are necessary in order to ensure meaningful progress towards a more sustainable society. The contributions of these external actors towards sustainable development in mining must be aligned with the needs of companies as well as the expectations of society.

¹⁵ In Figure 4 the acronym NAMS refers to the North American Mining Sector.

3. Research Methods and Results

3.1 Methods

The purpose of the current paper is to examine the specific sustainable development challenges, as identified by the companies themselves, facing the Canadian mining industry. Furthermore, representatives from various consultancies¹⁶ (including a non-profit NGO, a non-profit think tank, four private for-profit organizations, two industry associations, and one internationally recognized environmental expert) will be interviewed to determine if they are aware of the current and emerging sustainable development challenges facing mining companies and if they are aligning their organizations capabilities to better assist mining companies in addressing these needs. Additionally, the current paper will explore how meeting these needs can support global progress towards sustainable development and drive shareholder value for individual mining companies.

The primary goals of the current paper include:

- To determine the current and emerging sustainable development needs of mining companies.
- To determine if consultancies recognize and address, or have the capability to address, the current and emerging sustainable development needs of mining companies.
- To determine if there are gaps between the sustainable development needs of the mining companies and the offerings of consultancies.
- To determine how addressing these current and emerging needs will contribute to sustainable development and drive shareholder value.

¹⁶ As defined in section 1.3.

The primary method of research was gathering information through telephone interviews with professionals from mining companies¹⁷ and from consultancies that support mining companies in improving their progress towards sustainable development. The interviews were not conducted to collect quantitative data; instead, they act as a primary source of qualitative information. The sustainable development challenges facing the mining industry are ever-changing and as a result, conducting interviews was a means of gathering the most up-to-date information. Although the literature extensively covers a variety of broad topics such as the environmental and social impacts of mining (e.g. Bridge, 2004; Sengupta, 1993; Newbold, 2003; Veiga *et al.*, 2001), and Business - NGO relationships (e.g. Bendell, 2000); the topic of improving progress towards sustainable development through increased company-consultancy collaboration is not covered in any detail. Thus, relying exclusively on literature research for this project would be insufficient.

The interviews were conducted in a semistandardized style. A list of questions was developed prior to the interviews; however, the interviewer was allotted some flexibility in order to maximize the specific insights, knowledge and background of each interviewee (Berg, 2001). Furthermore, all of the interviews, both with industry professionals and consultants, were conducted over the telephone. Although face-to-face interviews may have been preferred, this was not possible due to the extremely busy schedules of the interviewees and, in many cases, geographic limitations.

Initially, sixteen mining industry professionals from thirteen companies were contacted to participate in this project. Fifty percent of those contacted agreed to be

¹⁷All of the mining companies interviewed are publicly-traded companies listed on the Toronto Stock Exchange, have head office locations in Canada, and have total assets of 0.7 to 14 billion CDN\$ as of December 31, 2005. (Refer to section 1.3.)

interviewed. Thus, eight mining industry professionals, from eight different mining companies, were interviewed in order to determine the current and future sustainable development needs of the industry. These industry professionals are vice presidents, directors, or managers in the sustainable development, or analogous (e.g., environment and health, community affairs, etc.), department at their respective companies. Fourteen questions were developed prior to the industry interviews and, using the semistandardized interviewing style, interviewees were asked the questions to provoke discussion and reveal insights into the topic. (See Appendix E for the industry interview questions.) The industry interviews took an average of 40 minutes each, and responses were hand recorded by the interviewer. In order to encourage disclosure of the interviewees' opinions and insights, the interviews were not voice recorded, and anonymity of the interviewee, and their company, was assured at the commencement of each interview.

The consultants that were interviewed were targeted because they deal with sustainable development and business issues, and provide Canadian companies with research information, and/or consultancy advice. Also, some of these consultants interviewed were identified during the mining industry interviews as valuable in assisting mining companies towards sustainable development, thus snowball sampling¹⁸ was employed.

The consultancy interviews were considerably shorter than the industry interviews, as they averaged ten minutes each. Four main questions were posed to the consultancies with the goal of assessing the awareness and capabilities of these consultancies to address the current and future sustainable development needs of the

¹⁸ Snowball sampling occurs when interviewees in a research study identify the names of other potential interviewees that would be useful to the research (Berg, 2001).

mining industry. (See Appendix F for the consultancy interview questions.) Once more, the semistandardized interview style was used in order to extract the most relevant information from the diverse array of consultants interviewed. The findings from the industry interviews were kept confidential during the consultancy interviews in order to avoid influencing the consultants' answers.

Twelve consultants from ten organizations were initially contacted by telephone to participate in this project. In total, nine consultants from nine different organizations (including a non-profit NGO, a non-profit think tank, four private for-profit organizations, two industry associations, and one high profile individual) responded to the request and agreed to be interviewed.

The telephone interviews were again hand recoded; however, this time interviewees were asked if they would allow their name and the name of their organization to be revealed in the current paper. This was done so that readers of this paper would get a sense of the various consultancies that were contacted. A consultancy, in this paper, can refer to a diverse array of organizations, each with a unique structure, set of capabilities and areas of focus.¹⁹ All nine interviewees gave permission to release their name and the name of their organizations; these names will only be found in Appendices G and H, as I have chosen to keep specific answers to all of the interview questions in the current paper confidential in order to protect the opinions of the interviewees. (See Appendix G for a list of the consultancy interviewees.)

¹⁹ Refer to section 1.3.

In addition to interviewing consultants, I attended a presentation given by David Rodier, senior consultant at Hatch Group²⁰, entitled “Sustainable Development in the Mining and Metals Industry” which provided additional insights for my research.²¹ Furthermore, consultancy websites and published materials were examined in order to gather supplementary information regarding the complex sustainable development offerings of these diverse agencies.

Although only eight mining industry professionals and nine consultants were interviewed, “credibility need not be threatened by low sample sizes” (Baxter and Eyles, 1997, p. 513). Qualitative research often uses ‘redundancy’ or ‘saturation’ to assess the sample size. In other words, interviews are often conducted “until no new themes or constructs emerge” (Baxter and Eyles, 1997, p. 513), as was the case in the current paper.

In the remainder of section 3, the interview results will be presented. First, a brief summary of the results will be provided. Next, the detailed findings from the mining industry interviews will be revealed. Finally, the focus will shift to the opinions expressed during the consultancy interviews. The interviews were not voice recorded and, as a result, the findings presented here are summarized and are intended to represent, as accurately as possible, the opinions of the interviewees while assuring their anonymity. Direct quotes from the interviews are included where possible.

3.2 Results Summary

From the interviews, it was revealed that there are several current and emerging sustainable development challenges facing the Canadian mining industry. The industry

²⁰ “The Hatch Group provides process and detail engineering, technologies, business consulting and project and construction management services to the Mining & Metals, Energy and Infrastructure sectors” (Hatch Group, 2006).

²¹ This presentation took place on April 6, 2005 at The Ontario Club, Toronto, Canada.

professionals and the consultants agreed that, in order to improve progress towards sustainable development, greater collaboration between mining companies and consultancies is necessary in the following areas:

- Improving stakeholder engagement;
 - Especially engagement with aboriginal communities;
- Increasing sustainable development performance disclosure;
- Developing and implementing a product and company sustainable development certification program;
- Incorporating initiatives, such as the GRI, MAC's Towards Sustainable Mining program, and the ICMM's sustainable development principles, into company strategies;
- Articulating the business case for sustainable development;
 - This will require a better understanding of how to calculate the impact of sustainable development on share price performance and the ability to communicate this to a wider audience (e.g., shareholders, consumers, employees, general public, etc.); and
- Addressing the challenges associated with developing nations;
 - e.g., health issues, political and civil instability, weak regulations, cross-cultural communication, etc.

Furthermore, the consultants suggested that the following are additional challenges facing large mining companies:

- Continual analysis and innovation of the value chain throughout the entire life cycle process;

- Improvements in integrating social and environmental issues into mine closure planning; and
- Learning how to adapt operations and technologies to manage climate change.

In addition to identifying specific areas of need, the industry professionals recognized that as an increasing emphasis is being placed on sustainable development performance of business, there is a growing requirement for mining professionals to acquire “soft” skills (e.g. cultural sensitivity, cross-cultural communication, critical thinking, etc.). Furthermore, both groups acknowledged that progress towards sustainable development will require quick, adaptable, and dynamic solutions.

Other findings from the interviews include: mining industry opinions regarding different types of consultancies, mining industry opinions regarding the definition of sustainable development, and the major environmental, social and economic impacts of mining operations. These findings will not be analyzed in the current paper; however, the results are detailed in section 3.3 and may be of use in future research projects.

The following results sections will outline the interview findings in detail. In section 4, existing frameworks will be used to analyze some of the results in order to better understand what may be required to meet the sustainable development challenges facing mining companies and, thus, how the Canadian mining industry, with the assistance of consultancies, can improve its progress towards sustainable development.

3.3 Interview Results: Mining Industry

Major Social and Economic Impacts of Mining

The mining industry professionals were asked to describe the major social impacts of mining on the local communities where they operate. All of the interviewees

agreed that the social impacts of mining are diverse and complex, and can be both positive and negative. Inevitably, a diverse array of issues will arise as a community adjusts to a major investment such as a mining operation. Two interviewees suggested that the size and location of the community determines the degree to which social impacts are felt. Smaller and more isolated communities, such as many indigenous communities found in Northern Canada, are more vulnerable to the negative social impacts of mining; however, it is also these communities that have the potential to benefit the most from the economic development that a mining operation can provide.

One of the negative impacts of mining discussed by three of the mining industry interviewees was the risk of corruption. This is especially prevalent in the developing world where regulations may be weak or not well enforced. Corruption can result in non-equitable distribution of wealth leading to social unrest. Furthermore, relocation of communities, loss of traditional culture, short-term employment, creating false expectations, and increased prostitution and HIV rates were also identified as negative impacts that mining operations can, in some cases, generate.

Alternatively, mining operations can have many positive social and economic benefits for local communities. In many cases, according to the interviewees, mining companies are the largest income provider in the regions where they operate. The main benefit, as identified by the interviewees, is overall improvements in the standard of living for local community members. These improvements can be attributed to employment and training opportunities, investment into local services, development of community infrastructure (e.g. health care facilities, educational facilities, community centres, etc.) and contributions, both monetary and other, to community programs (e.g.

skills development and other educational initiatives, community events, etc.), and require that companies ensure cultural sensitivity to the needs of individual communities.

Major Environmental Impacts of Mining

According to the industry professionals interviewed, the environmental impacts of mining are fairly obvious and well documented. A mining operation makes a significant alteration to the land, and although relatively small areas are affected, there is a risk of significant environmental disturbances. Six of the ten interviewees emphasized that mining has a large environmental impact on waterways. Most significant are the negative impacts caused by acid rock drainage²² and mine tailings²³. Furthermore, in arid areas of the world, obtaining water for mining operations can present a massive challenge and may result in drawing down the water table. Other environmental impacts identified include noise pollution, dust, dislocation of materials leading to erosion, air pollution from transportation of the materials, machinery, and smelting operations, and decrease in biodiversity due to destruction of flora and fauna.

Three of the interviewees suggested that because the industry is heavily regulated by provincial and federal environmental legislation (e.g., Environmental Impact Assessments, Permits to Take Water, etc.) the negative environmental impacts of mining operations in Canada are being minimized. Furthermore, many Canadian mining companies have adopted a strong commitment to environmental ethic and this is contributing to improvements in environmental performance being observed across the

²² “Many metal ores (nickel, copper, and lead, for example) occur as sulfides, and in the presence of oxygen and water, these oxidize to form sulfuric acid. The oxidation of sulfide ores can generate acid rock drainable if it is not effectively managed.” Acid rock drainage results in negative impacts on aquatic life (Bridge, 2004, p. 213).

²³ Mine tailings is the primary solid waste produced at mines and may contain toxic compounds (Hilson, 2002).

industry. Lastly, one interviewee emphasized the importance of increased and continued investment into research and design in order to develop new technologies that can significantly minimize the environmental damage of mining (e.g. new water treatment technologies).

Defining ‘Sustainable Development’

When asked how their company defines sustainable development four of the interviewees said that their companies follow the “3 legged stool” or “triple bottom line” model which involves, as one interviewee suggested, “social and environmental improvement within the context of a profitable business”.²⁴ In addition to the triple bottom line definition, the Brundtland definition was also suggested by one interviewee.²⁵ Furthermore, two interviewees regarded sustainable development as a technology challenge in that it requires the minimization of environmental impacts as much as the technology will allow. Three interviewees specifically acknowledged that sustainable development requires not only meeting the needs of current generations, but also meeting the needs of future generations.

It was suggested by one interviewee that the definition of sustainable development itself is too broad, and there is not a clear understanding of how to implement principles that support it. Conversely, two other interviewees suggested that the flexibility in the definition of sustainable development is necessary in order to adapt operations to meet local community needs as well as company goals.

²⁴ Refer to section 1.3 of the current paper for a more detailed definition.

²⁵ The 1987 Brundtland report, *Our Common Future*, defined the term sustainable development as being “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (WCED, 1987, p. 43).

Industry opinions on the external consultancies that offer sustainable development support to mining companies

Six of the interviewees emphasized that the initial motivation to move towards sustainable development needs to come from within the company itself. External consultancies have a role to play in assisting companies move towards sustainable development; however, they must not be relied upon to develop and implement an entire sustainable development strategy. “Companies themselves have to improve and have to have core company values that support sustainable development... [Without that], no amount of external support will help”. All of the interviewees are from companies that have begun to acquire sustainable development strategies and as a result, all eight companies have, at one point or another, formed partnerships with external sustainable development consultancies.

All eight companies interviewed are members of the Mining Association of Canada and/or at least one provincial mining association (e.g., Ontario Mining Association, Mining Association of British Columbia, Mining Association of Quebec, etc.). The interviewees identified these industry organizations, especially the Mining Association of Canada, as key to assisting mining companies towards improving sustainable development performance. In addition to industry associations, private consultants are considered by the interviewees to be critical in providing important sustainable development services. Non-governmental organizations (NGOs), government agencies, and academic institutions and think tanks are not relied on as heavily for such services by these companies. The next section will expand upon these findings as the interview results for each type of consultancy organization are summarized.

Industry Associations / Membership Associations

Throughout the interviews it was revealed that industry associations are critical in providing companies with sustainable development leadership, support, information, and networking opportunities. More specifically, five interviewees emphasized the importance of the Mining Association of Canada's Towards Sustainable Mining principles and performance indicators. Global mining industry organizations such as the International Council on Mining and Metals were also identified as helpful in setting priorities and standards for larger companies.

In addition to mining associations, other organizations, such as Canadian Business for Social Responsibility, provide a venue for professionals to share and learn across industries. It was suggested that knowledge sharing between industries can be particularly constructive and is often undervalued.

Private Consultancies

According to the interviewees, private consultancies also play a large role in assisting mining companies move towards sustainable development. However, it was suggested that many, but not all, private consultancies still have a "fuzzy awareness" of social issues pertaining to mining operations and thus, are more helpful in terms of technical and environmental support and services. Another interviewee suggested that some private consultancies have difficulty dealing with ambiguous problems and this is a concern as many of the social issues that arise in the mining industry are very dynamic and unique. As a result, it was suggested that consultancies need to first acknowledge and understand that there is work out there in the area of sustainable development and

second, do the business development work to make their case as to why mining companies need their sustainable development services.

Non-Governmental Organizations (NGOs)

The interviewees have mixed opinions regarding the utility of NGOs. Six of the interviewees provided examples of how company-NGO partnerships have been successful in improving progress towards sustainable development. It was suggested that NGOs can be especially helpful when it comes to community issues that the companies may not have the understanding or expertise to accurately address. One interviewee suggested that NGOs consisting of community members can be assembled specifically to improve engagement between the company and the local community. These community-based NGOs can be particularly helpful when a company is facing language and/or cultural barriers. However, it was suggested that many NGOs are a hindrance to mining operations because they possess an outside perspective of the industry which is often flawed. One interviewee emphasized this by suggesting that the “traditional NGO model”, which focuses on attacking business, may drive some progress towards sustainable development; however, how much value this confrontational approach actually produces is questionable. It was suggested that some mining companies spend a lot of time and energy dealing with these fringe NGOs, while other NGOs that are attempting to work with business to create ecological, social and economic value are being pushed aside and are not being adequately acknowledged.

Three of the interviewees suggested that there needs to be a greater understanding of the value-added potential that company-NGO partnerships have. In the opinion of one interviewee, companies need to “expand the context of NGOs, as there are a broad

spectrum and many have diverse mandates that are different from the traditional models of NGOs”. The interviewees believed that company-NGO partnerships, with organizations where a synergy can be found, have the potential to increase employee morale, improve company reputation, and contribute towards sustainable development. Also, those NGOs willing to work with business can leverage their own mandates through the increased logistical, technical and monetary support supplied by the mining companies.

Governments

It was suggested that government resources are important and often overlooked. Government is in a place to regulate and assist; however, most companies view the government only as a regulator. Three of the interviewees agreed that the Canadian government is lacking long-term vision and is not engaged in the area of sustainable development. In the words of one interviewee, “they show process over substance”. It was suggested that the government must overcome this by taking on more of a leadership role and promoting its resources and services. Furthermore, it was suggested that government regulations are generally ineffective because they are often aimed at the laggards, and follow what industry leaders have voluntarily implemented.

In addition to opinions regarding the Canadian government, one interviewee mentioned that the American federal land management policies for hardrock mining obstruct progress towards sustainable development by generating legal and regulatory hindrances to the productive use of land following mining activities. Furthermore, two interviewees suggested that corruption, weak environmental and social regulations and/or lack of enforcement of regulations are prevalent within the governments of some

developing nations and thus, obstruct progress towards sustainable development in these regions.

Academic Institutions and Think Tank Organizations

Six of the interviewees provided examples of successful partnerships with academic institutions. These have included incorporating academics on social and environmental advisory committees, partnering for community census projects, and supplying student research opportunities. Throughout the interviews, the importance of think tank organizations, such as the International Institute for Sustainable Development and the Conference Board of Canada, in supplying companies with sustainable development research and providing a venue for knowledge transfer was also acknowledged.

It was suggested, however, that the potential of academic organizations are not being fully realized and thus, this is an area where there is an opportunity for increased consensus building. One of the interviewees suggested that academic institutions could be more valuable to mining companies if they would rethink how they deliver information. The issues facing the mining industry are dynamic and require quick answers and at present, academic institutions are not designed to provide this type of support. Furthermore, one interviewee suggested that the mining industry needs to recognize the importance of these institutions and increase financial and other, non-financial, support to these institutions. Another interviewee suggested that “the idea of sustainable development is very diffuse” and adhering to such an ambiguous concept presents many challenges. Thus, both the government and academic institutions need to

take on the leadership role in assisting companies with understanding how they can, and why they should, contribute to increased global sustainability.

Other Sources of Sustainable Development Support

In addition to the organizations identified above, it was suggested that individuals with many years of experience in the mining industry can provide valuable expertise. These individuals have, in many cases, witnessed the evolution of attitudes towards sustainable development issues in the mining industry, and their years of experience have armed them with the knowledge of how to strategically address social and environmental issues.

Furthermore, five of the interviewees revealed that during their careers they have assisted external mining organizations, such as industry associations and/or research or academic intuitions, in the development of sustainable development related projects. Thus, the interviewees themselves bring sustainable development knowledge to their respective companies gained thorough the experience and networking opportunities provided by these external organizations.

Gaps in the sustainable development information and support services as identified by the mining industry professionals

According to the interviewees, improving sustainable development performance in the mining industry requires “dynamic” strategies. A “cookie-cutter” approach to sustainable development will not prove effective because the challenges facing the industry are variable and, as a result, require adaptable solutions. Thus, external consultancies must be equipped to quickly provide up-to-date and innovative sustainable development information and resources to the industry. The following sections will

describe the main sustainable development areas that the industry professionals identified as requiring increased examination and innovative solutions.

All of the interviewees agreed that there is sufficient access to high quality environmental information and support. Three of the interviewees suggested the current situation is bordering on “information overload” and that the real challenge lies in finding the most accurate information and effective consultancies to match the company’s specific needs. One interviewee suggested that a better understanding of some environmental concepts (e.g. biodiversity) and how to positively contribute to these in practice would be valuable to many mining companies.

Throughout the interviews it was emphasized that understanding and addressing social issues is where the current and/or emerging sustainable development gaps lie. Although, as one interviewee suggested, the company itself needs to acquire the internal capacity to deal with social issues that may arise; a need for external consultancies to assist with this capacity building was acknowledged throughout the interviews.

Soft Skills Development

Traditionally, the mining industry has been viewed as a technical industry requiring hard scientific and engineering skills. Within the past few years, as increasing emphasis is being placed on addressing social issues (e.g., community engagement), there is a growing need for mining professionals to also acquire “softer” skills such as cross-cultural communication, critical thinking and cultural sensitivity. As one interviewee confirmed, “we need to cultivate multidisciplinary teams that have a combination of hard and soft skills to address sustainable development”. It was suggested by the interviewees

that academic and training institutions are beginning to recognize this need by incorporating soft skills training into traditional engineering programs.

Stakeholder Engagement

The interviewees expressed the need to educate a wider range of mining companies on the value that a core commitment to transparency and openness can bring. As one interviewee suggested, “transparency and openness can disarm a lot of skepticism and cynicism regarding the industry”. Thus, improving stakeholder communication is a growing area where external consultancies can play a role. Especially lacking, as suggested by the interviewees, is effective communication with external stakeholders such as First Nations communities. Furthermore, one interviewee suggested that because the needs of different stakeholder groups are very diverse, there is no one vehicle to communicate with them all. Thus, companies need assistance with finding innovative ways to reach all stakeholders. “The real magic comes in figuring out how to engage, and not just communicate, with stakeholders so that the diversity of views is properly reflected in the sustainable development strategies and goals of the company”.

Sustainable Development Performance Disclosure

Sustainable development messaging to external stakeholders was also identified as a growing area with room for improvement. However, it was suggested during the interviews that companies themselves are hesitant to overemphasize their positive sustainable development performance fearing that this may make them a target for environmental groups who may accuse them of corporate greenwashing. For this reason, the interviewees suggested that incorporating initiatives such as the Global Reporting Initiative (GRI) into company communication strategies is becoming increasingly

important in the mining industry. The GRI can be verified by a third party, and it is believed that verification is critical to curbing public skepticism and gaining support.

Product and Company Certification

Another interviewee believes that the mining industry will follow the lead of the forestry industry by implementing a certification program similar to that developed by the Forest Stewardship Council. One interviewee suggested that “the benefits from publishing sustainable development reports are just not there; however, certification is independent and can verify that, yes, a company is moving forward.” Verification and certification of sustainable development performance of companies and products was recognized by two of the interviewees as an emerging area that requires increased support.

Implementing Voluntary Initiatives

There are a wide variety of voluntary initiatives that many mining companies are joining (see Appendix D for examples). In particular, the importance of the GRI, MAC’s Towards Sustainable Mining program, and the ICMM’s principles for sustainable development were emphasized throughout the interviews. The interviewees suggest that the implementation of these initiatives can become confusing and often overlapping. Thus, there is a role for external consultancies in assisting mining companies in prioritizing, organizing, and implementing strategies to satisfy the diverse goals of these initiatives.

Articulating the Business Case for Sustainable Development

Another potential gap, as identified by the interviewees, is the need to articulate the value proposition around sustainable development. Internally “many leading

companies understand the business case surrounding sustainable development; however, there are an equal number [of companies] that aren't convinced". In general, "the jury is still out on the value of sustainable development to business". According to the interviewees, some people still believe that the responsibility of companies is to their shareholders and that the government is responsible for taking care of the people. Skepticism still exists as industry and financial analysts continue to question if sustainable development is critical to building long-term value. Part of this skepticism resides in the lack of companies' abilities to measure the financial value that sustainable development initiatives can create.

Addressing the Challenges Associated with Developing Nations

During the interviews, the most commonly identified area where mining companies could benefit from increased support arises from the increasingly global nature of the industry. As companies expand their operations into other countries, an array of challenges will inevitably develop. Although it is vital that company representatives are involved in all stages of community engagement, from the point of first contact through to the mine closure, external consultancies can provide added knowledge and support in this process. The interview findings reveal that there is a tremendous gap in social information and resources available to companies moving into developing nations. The interviewees believe that the developing world challenges are massive and complex and it was suggested that this area may present the greatest opportunity for research, development, and growth.

Challenges of moving into developing countries, as identified by the interviewees, include understanding and mitigating health issues such as HIV/AIDS, minimizing the

risks associated with political and civil instability, and ensuring effective cross-cultural communication with local governments and communities. In addition, increased capacity building with local communities is important as many communities are not prepared to handle the social and economic benefits that a large investment, such as a mining operation, can provide. The mining companies themselves are hesitant to assist in this area due to perceptions that this support would be viewed as a form of colonialism. Thus, there is an opportunity for external consultancies to work with communities and assist them in building their capacity to manage community funds and plan community infrastructure. Increased capacity building can ensure that the benefits provided by a mining operation to the local community are maximized. This can become especially important in areas where informal governance structures exist, as is often the case in developing nations.

3.4 Interview Results: Consultancies

Nine representatives from nine consultancies (hereon in referred to as consultants) were interviewed over the telephone, and one consultant delivered a presentation, which was attended by the author of this paper. These ten consultancy organizations are diverse in nature, and it should be emphasized once again that the term consultancy is defined in this paper as any external organization that provides companies with a means of improving their sustainable development performance. The means by which the consultancies interviewed for this paper assist mining companies are very diverse and are summarized in Appendix H. (See Appendix H for core competencies of the consultancy organizations interviewed.) Thus, these consultants are from a broad array of organizations (see Appendices G and H) and as a result, a general consensus regarding

the current and emerging sustainable development needs of the mining industry, and whether or not these consultancies are addressing these needs, can be determined.

In the next sections the current and future sustainable development needs of the mining industry, according to the consultants, will be identified. As expressed by the consultants, it is important to understand that there is a fine, and sometimes non-existent, line between what is a current need and what is a future need. Frequently, needs identified as current are in fact long-term needs that will require continual improvement and attention into the future. As a result, it is perhaps more accurate to define the needs as current needs and emerging needs, as both will be important well into the future.

The Current and Emerging Sustainable Development Needs of Mining Companies as Identified by the Consultants

The consultants agreed that both companies and consultancy organizations currently have substantial data and capacity to meet the environmental needs of mining companies. Conversely, addressing social issues, which are often ambiguous and unique in nature, poses challenges for both companies and consultancy organizations at present. One interviewee suggested that in Canada there are gaps in capacity when it comes to assisting mining companies with social issues because many consultancies simply lack the experience to fully understand and address these complex issues.

Stakeholder Engagement

Stakeholder engagement is an area that the consultants emphasized as a growing field that will require increased attention and support. “For the past fifteen or twenty years there has been increasing participation in mining from more stakeholders. This participation will continue to grow and companies need to ... [acquire] the ability to engage multiple stakeholders in a coherent manner”. The consultants especially

recognized the need to improve the capacity of mining companies to effectively engage with aboriginal communities. One consultant noted that currently, both companies and aboriginal groups are being exposed to a tremendous learning curve in terms of how each party can effectively engage the other.

Sustainable Development Performance Disclosure

Communicating corporate sustainable development performance to mining company stakeholders is another area where consultancies can play an assisting role. The consultants recognize that many companies do not wish to flaunt their sustainable development performance for fear of becoming an increased target for activists. However, as one consultant suggested, the investment community is becoming increasingly interested in the impact that environmental, social and governance factors are having on company performance. As a result, that these factors will increasingly be incorporated into investment decision-making. “Companies need to be able to quantify the value of implementing change”, and they must be able to communicate this value to their internal and external stakeholders if they wish to remain competitive into the future.

Company and Product Certification

As well as improving sustainable development performance disclosure, there is an emerging interest in certifying companies themselves and the products they sell. One interviewee suggested that ‘green marketing’ is an emerging field as the public is displaying an increasing interest in green products and services; however, “there is still a huge gap between what people say they will do and what they actually do”. Thus, there is a need to better understand how behaviour modifications can be achieved in order to increase the existing market for green products and services. Gaining an increased

understanding of how metals can be certified, and implementing a certification program is important according to one interviewee who believes that product certification is a critical step towards making sustainable development progress in the mining industry. It was suggested that, at present, certification is mainly limited to gold and precious gems, and that understanding how certification can be expanded to include other materials and what this will mean for the mining industry are important areas that need attention.

Value Chain Management

Another need identified by the consultants is “life cycle assistance”. Continual understanding, analysis and improvement of value chain management is critical to improving progress towards sustainable development. Value chain management requires a detailed analysis of the product at each stage of its life cycle, from raw materials through to end use and disposal. “Putting physical and market instruments in place to ensure the capture and recovery” of materials will contribute to eco-efficiency by reducing the consumption of raw materials.

Implementing Voluntary Initiatives

Two consultants suggested that many companies have made numerous voluntary sustainable development commitments (see Appendix D for examples) and that the implementation of these commitments can often pose challenges. Companies need assistance in understanding and organizing the commitments they have made in order to operationalize them in a manner that will meet the goals of the commitments and maximize the benefits to the company.

Articulating the Business Case for Sustainable Development and “Helping the Leaders Win”

According to the consultants, there is a need to articulate the business case for sustainable development to a wider audience (e.g., shareholders, consumers, employees, general public, etc.). The consultants agreed that the majority of large companies operating in Canada understand the value and risk mitigation that improving progress towards sustainable development can provide; however, many of these companies lack the understanding and ability to actually calculate the impact of sustainable development on share price performance. Furthermore, there are still many companies, referred to as ‘laggers’, that “don’t realize the importance of sustainable development to their future competitiveness”.

In addition to improving knowledge of how to translate sustainable development performance into financial terms and assisting the laggers in acknowledging the business case for sustainable development, there is a need to “help the leaders win” as one consultant phrased it. “Organizations at the forefront of sustainable development can only progress so far until they hit both market and political barriers”. Thus, leading companies, operating in developed nations, need to improve their trans-organization collaboration in order to achieve government support. Shifting government policies and putting mechanisms in place to reward leaders in sustainable development will encourage more companies to improve their performance and in turn, strengthen the business case for sustainable development in developed nations.

Addressing the Challenges Associated with Developing Nations

Two of the consultants suggested that companies expanding their operations overseas, especially in developing nations, need to build the capacity to address the

complex issues this will present. Companies need to ensure positive economic development, human rights, and security when operating in any environment; this becomes especially important and difficult with the added complexities posed by developing nations where “regulatory standards are often sub par or immature” and risks, such as civil strife, are often more extensive. It was suggested that all companies need to develop a set of social and environmental performance indicators and that these must be implemented at all operating sites, regardless of location.

Mine Closures and Legacy Sites

Furthermore, issues such as planning mine closures and dealing with legacy sites are huge challenges facing the mining industry. Companies need to integrate social and environmental considerations into mine closure plans in order to provide communities with alternate income options and maintain the environmental integrity of the mining area after closure.

Addressing and Adapting to Climate Change

Another issue, mentioned by three consultants, is managing the challenges that climate change will present. Not only do companies need to minimize their energy consumption and green house gas emissions, but it will become increasingly important for companies to develop the capacity to adapt their operations and technologies to the changing climate. For example, companies need to understand “how...melting permafrost [will] affect tailings management”, as one method of management involves encapsulating the tailings in permafrost. Thus, climate change will present many challenges that companies will need to address.

What must happen for these needs to be met?

The consultants were asked how they thought some of these sustainable development needs could be addressed. Their answers are summarized below and this question will be examined in more detail in section 4 by drawing on ideas from existing frameworks.

One consultant suggested that sustainable development must become a guiding principle for all organizations, both consultancies and companies. Also, companies need to define what they can promise from a sustainable development point of view, and communicate how this strategy will create value for the business. Essentially, this will require that the principles of sustainable development be incorporated into the core values of the business, and that this strategy is effectively communicated to both internal and external stakeholders through various means (e.g. workshops, online training, sustainable development reports, public meetings, etc.).

In addition to communicating to local communities by means of standard reporting methods, companies must learn how to engage the communities they are working with. This will require companies and consultancies to be available for “on the ground” consultations with community members.

Lastly, increased collaboration between all stakeholders is an important strategy to improving progress towards sustainable development. Meeting the sustainable development needs of mining companies is a complex process as the industry is very “diverse in its culture and business”, and as a result, solutions must be adaptable and dynamic. The consultants acknowledged mining associations (e.g. MAC, ICMM, etc.) as an important platform where industry level collaboration can improve. Furthermore,

building a network between companies and external consultancies (e.g. NGOs, academic institutions, private consultancies, etc.) can improve the capacity of companies to address the sustainable development challenges that have been identified by all of the interviewees.

4. Critical Analysis

“...[t]he global challenges associated with sustainability, viewed through the appropriate set of business lenses, can help to identify strategies and practices that contribute to a more sustainable world and, simultaneously, drive shareholder value.”

(Hart and Milstein, 2003, p. 56)

The following are the sustainable development challenges identified by both the mining professionals and the consultancies as requiring immediate attention:

- Improving stakeholder engagement;
 - Especially engagement with aboriginal communities;
- Increasing sustainable development performance disclosure;
- Developing and implementing a product and company sustainable development certification program;
- Incorporating initiatives, such as the GRI, MAC’s Towards Sustainable Mining program, and the ICMM’s sustainable development principles, into company strategies;
- Articulating the business case for sustainable development;
 - This will require a better understanding of how to calculate the impact of sustainable development on share price performance and the ability to communicate this to a wider audience (e.g., shareholders, consumers, employees, general public, etc.); and
- Addressing the challenges associated with developing nations;
 - e.g., health issues, political and civil instability, weak regulations, cross-cultural communication, etc.

Furthermore, the consultants suggested that the following are additional challenges facing large mining companies:

- Continual analysis and innovation of the value chain throughout the entire life cycle process;
- Improvements in integrating social and environmental issues into mine closure planning; and
- Learning how to adapt operations and technologies to manage climate change.

It is evident from the interview results that the consultants understand the sustainable development challenges facing mining companies, and are on the forefront of anticipating emerging needs. The consultants acknowledged all of the needs that were identified by the industry professionals in addition to recognizing three additional needs. The industry professionals and consultants agreed that the current needs exist not because the consultants fail to recognize their existence, but rather because both the companies and the consultancies currently lack the capabilities to effectively address all of the complexities involved in dealing with these issues. Sustainable development issues often necessitate quick, adaptable, long-term and dynamic solutions and the structure of many organizations, including mining companies and sustainable development consultancies, may not allow for the flexibility, stakeholder inclusiveness, and creativity required to develop such solutions.

Furthermore, these identified needs support the broad findings of the MMSD – North America project as outlined in section 2.1 of the current paper. To summarize, MacDonald (2002) suggested six broad challenges facing mining companies:

- Incorporating sustainable practices into the “everyday activities of the firm”;
- Strengthening the relationships between junior and senior firms;
- Understanding the business case associated with sustainable development;

- Improving public image, both in developed and developing nations;
- Learning how to manage the social issues associated with increasing globalization; and
- “Planning for sustainability in a market-driven society” (MacDonald, 2002, p. 126).

In section 4.1, Hart and Milstein’s (2003) Sustainable Value Framework will be used to analyze the sustainable development needs that have been identified by the mining industry professionals and the consultants interviewed for the current paper. Using the framework, each of the issues identified by the interviewees will be examined to determine how improving progress in these areas will create sustainable value for a company. Sustainable value is created through identifying “strategies and practices that contribute to a more sustainable world and, simultaneously, drive shareholder value” (Hart and Milstein, 2003, p. 57). Furthermore, this framework will be used to identify areas where mining companies and consultancies, wishing to ensure their future success and competitiveness, should improve their capabilities. In section 4.2, four key areas of organization (culture, capabilities, connectivity and commitments) that “managers must establish and nurture” to enable improvement towards sustainable development will be explored (Wheeler, 1993, p. 195).

4.1 The Sustainable Value Framework

Figure 5 demonstrates the multidimensional challenges associated with creating shareholder value. The vertical axis reflects the need to not only manage today’s business, but also enable growth into the future. The horizontal axis emphasizes the need for companies to protect and grow their internal capabilities while allowing external knowledge and perspectives to penetrate their business and enhance company performance (Hart and Milstein, 2003).

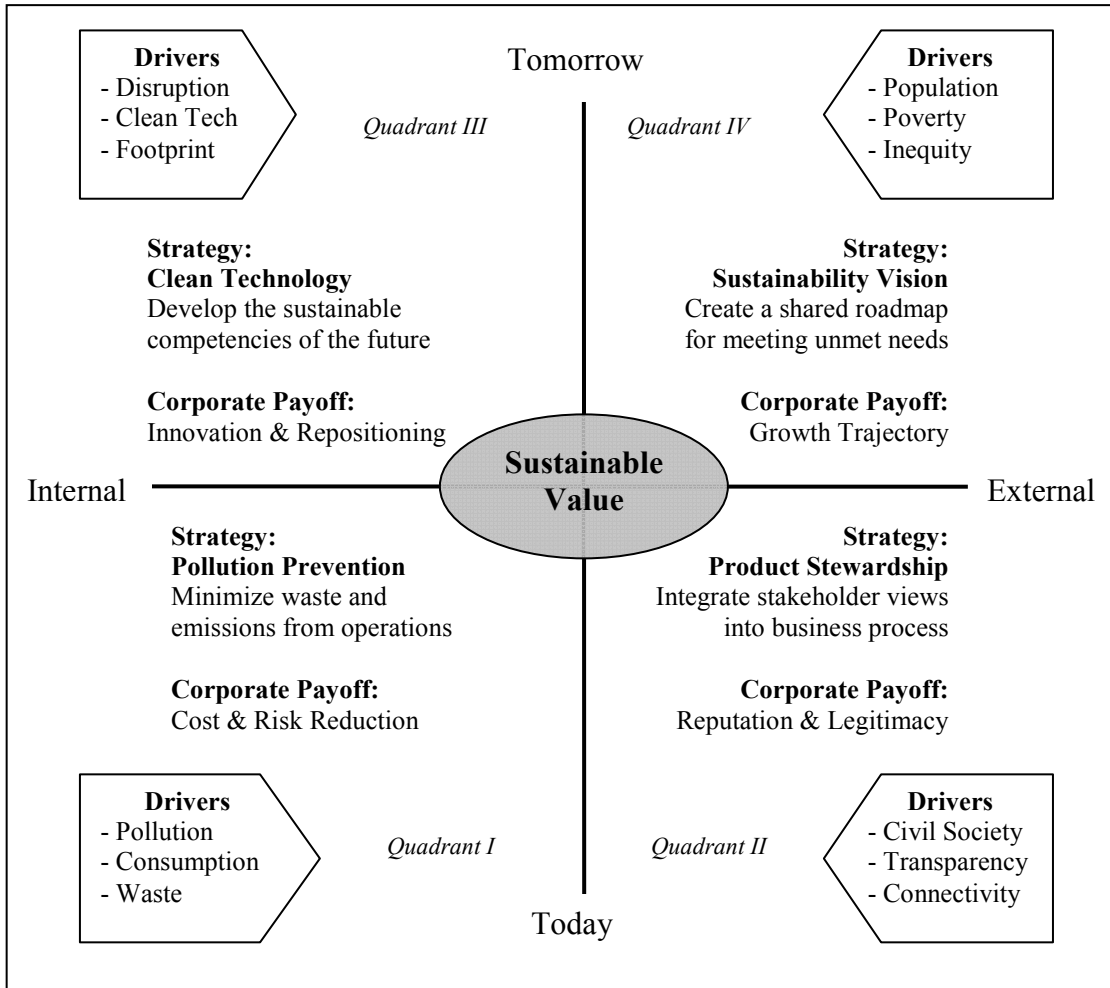


Figure 5. The Sustainable Value Framework (Hart and Milstein, 2003, p. 60)

To maximize shareholder value, companies must ensure continual positive performance in all four quadrants. Hart and Milstein propose that “just as the creation of shareholder value requires performance on multiple dimensions, sustainable development is also a multidimensional challenge... The multiple challenges associated with global sustainability, seen through the appropriate business lenses, can help to identify strategies and practices which improve performance in all four quadrants of the [sustainable] value framework” (Hart and Milstein, 2003, p. 58).

Quadrant I in figure 5 demonstrates how, through eco-efficiency, companies can minimize pollution and reduce consumption. This can result in decreased costs and risks associated with waste disposal, pollution regulations, and raw materials use. Quadrant II demonstrates how civil society is placing increased pressure on companies to improve social and environmental performance and, at the same time, company information is becoming ever more available to a wider array of stakeholders. As a result, improving product stewardship and positive stakeholder engagement is important to ensure a positive reputation and legitimacy. Quadrant III demonstrates how technological innovations that leapfrog the standard routine present firms with an opportunity to reposition themselves and acquire sustainable competencies that will prove critical for the development of future markets. Finally, by addressing the needs of developing nations, “in a way that facilitates inclusive wealth creation and distribution”, companies can tap into the market potential that resides within these nations (Quadrant IV) (Hart and Milstein, 2003, p. 59).

The sustainable development challenges that were identified by the mining industry professionals and the consultants during the interviews will now be placed into the sustainable value framework in order to determine how improvements in these areas will contribute to the creation of sustainable value and to determine if there are any quadrants that require increased consideration from both mining companies and consultancies. In figure 6, the challenges have been placed in the quadrant(s) that, based on the interview findings, mining companies are currently addressing them in. The dotted arrows have been added to demonstrate that many of these challenges are

multidimensional and as a result, can be expanded into additional quadrants and by doing so a company can increase the creation of sustainable value.

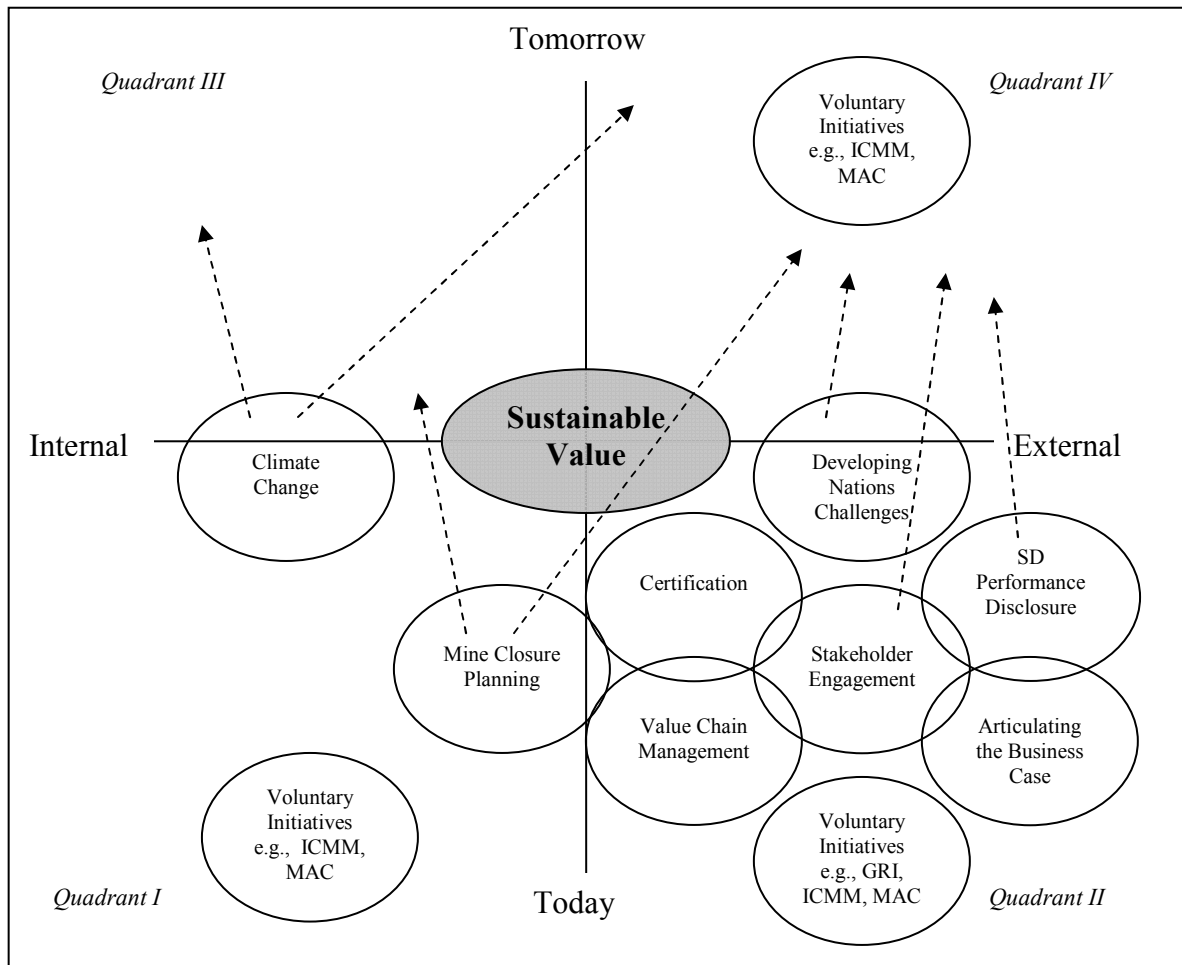


Figure 6. Framing the Current Sustainable Development Needs, as Identified During the Interviews, of Canadian Mining Companies. The arrows demonstrate that some of these needs can be addressed in multiple quadrants, and by doing so a company can increase the creation of sustainable value.²⁶

Figure 6 demonstrates that the majority of sustainable development needs, as identified by the mining industry professionals and the consultants, currently reside within quadrant II of the sustainable value framework. Thus, mining companies are currently focused on improving their reputation and legitimacy. Improving reputation and legitimacy is critical to the mining industry for several reasons. First, the mining

²⁶ The particular placement of a challenge/need within a specific quadrant has no bearing on the analysis. Instead, the focus should be on the quadrant(s) in which they reside.

industry has been, and is still currently, associated with many negative social and environmental externalities (MacDonald, 2002). Furthermore, as globalization increases, the role of civil society organizations in monitoring, and sometimes enforcing, corporate environmental and social performance also increases due to the lack of an international regulatory body. At the same time, the information age, and the internet in particular, facilitate information sharing and availability. “Sustainable development thus challenges firms to operate in a transparent, responsive manner due to a very well-informed, active stakeholder base” (Hart and Milstein, 2003, p. 59). Thus, companies that are able to successfully integrate stakeholder views into business processes will improve their corporate reputation and legitimacy. Specific benefits that may result from improving reputation and legitimacy include: improved public perceptions and increased customer base, easier hiring and higher retention of the top talent, increasing employee satisfaction and productivity, improved access to new markets, lower bank loan rates and insurance premiums, inclusion in sustainable development and socially responsible investment funds, and elevated share price (Feltmate *et al.* 2001; Willard, 2002).

In Figure 6 quadrant I remains relatively empty. This is not because mining companies are ignoring the need to reduce wastes and improve pollution prevention techniques. Instead, from the interview results it was apparent that companies have been recognizing this need for at least the past two decades and have been developing and improving upon existing pollution prevention techniques during this time. Thus, although mining companies continually improve upon their pollution prevention techniques, they do not view it as an area where assistance is required because the internal capacity to improve in this area is already well developed.

Quadrant III in Figure 6 also remains relatively empty. Although some progress is being made as exemplified by one interviewee who discussed a recent investment into developing an innovative water biotreatment technique, there remains much opportunity for improvement in this area. Companies need to recognize the potential of clean technologies to place them at an advantage over their competitors.

Quadrant IV in Figure 6 also remains relatively empty. From the interviews, it is suggested that performing well in this quadrant currently presents the biggest challenge to mining companies; however, those companies which are able to succeed will gain the greatest edge over their competitors. According to Prahalad and Hart (2002, p. 2), “the real source of market promise is not the wealthy few in the developing world, or even the emerging middle-income consumers: It is the billions of aspiring poor who are joining the market economy for the first time.” Increasing operations within emerging markets will create a ‘win-win’ situation by improving growth and profits for the company and alleviating poverty within the local communities (Prahalad and Hart, 2002).

Increasingly, Canadian mining companies are expanding their operations overseas in pursuit of untapped resources. It is apparent from the interviews that many companies are beginning to address the needs of these developing communities through their operations; however, this remains a daunting task. Companies must develop skills such as cultural awareness, cultural sensitivity, critical thinking and community engagement, and must ensure that they operate in a transparent and inclusive manner. Companies need to understand and address the specific needs of the communities in proximity to their operations.

According to the interviewees, progress towards engaging developing nations, and thus creating “a shared roadmap for meeting unmet needs” (Hart and Milstein, 2003, p. 60), has been slow as each geographic region presents a new and unique set of risks (e.g., health issues, political and civil instability, security, etc.) and opportunities (e.g., untapped resources, meeting unmet needs, new market growth, etc.) which must be addressed on a case-by-case basis. The complex nature of these challenges presents an opportunity for the formation of company-consultancy partnerships which will facilitate the development of dynamic and adaptable solutions that will simultaneously contribute to sustainable development and drive shareholder value.

Thus, the sustainable value framework (Figure 5) demonstrates the value to companies of ensuring long-term positive performance in all four quadrants. Figure 6 demonstrates that Canadian mining companies are currently focused on improving their reputation and legitimacy through stakeholder engagement and product stewardship. Furthermore, in order to ensure future success and competitiveness mining companies must also acquire the capabilities to develop and incorporate clean technologies into their operations, address the needs of developing nations, and facilitate continual enhancement of pollution prevention techniques.

The sustainable value framework provides a means for companies to ensure that they are addressing the challenges associated with sustainable development in a multidimensional manner. Not only is this framework useful for individual companies to assess their sustainable development performance, but it may also be a valuable tool for consultancies. Consultancies can use this framework to assess the strengths and weaknesses of a particular company and develop strategies that would improve the

creation of sustainable value for that company. The sustainable value framework also provides a means for consultancies to frame their own sustainable development consulting capabilities and address areas that may require additional development for them to provide value to mining companies in the future. Thus, instead of passively waiting for companies to approach them, consultancies can use this framework to develop innovated strategies that will address the diverse drivers of sustainable development and actively seek out companies with whom to form partnerships that will create sustainable value.

Developing strategies to address all four quadrants of the sustainable development framework is challenging. Notably, as suggested by the interviewees, sustainable development is a complex and global issue requiring dynamic and adaptable solutions. “Cookie-cutter” strategies will prove useless due to the diverse nature of the mining industry and the variety of challenges associated with sustainable development. Thus, specific strategies for mining companies wishing to improve their progress towards sustainable development will not be suggested in the current paper as this is a task that must be undertaken on a case-by-case basis. Instead, the following section will describe four requirements that will improve an organization’s ability to navigate the multidimensional challenges associated with sustainable development.

4.3 Managing for Organizational Sustainability: Culture, Capabilities, Connectivity and Commitments

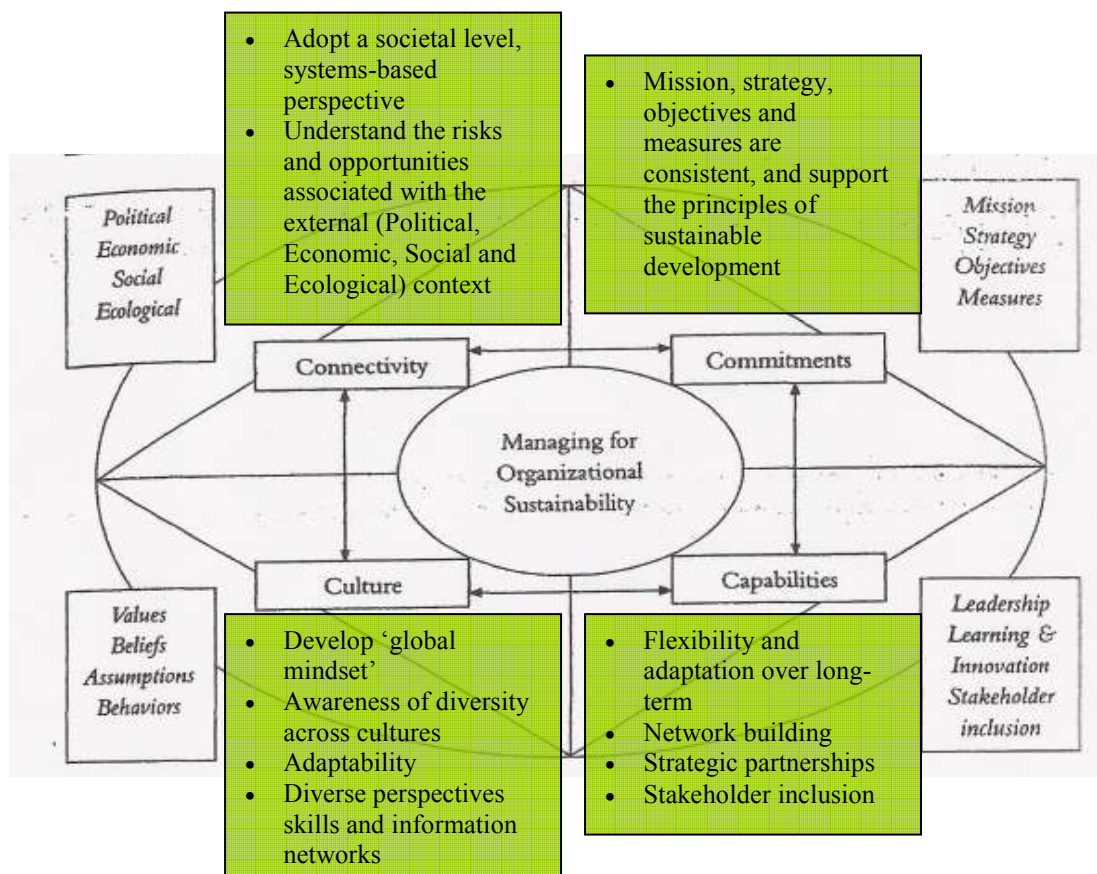


Figure 7. Four Key Areas of Organization Necessary in Order to Manage for Sustainability (adapted from Wheeler, 1993, p. 199)

Figure 7 identifies four key areas of organization – culture, capabilities, connectivity and commitments – that “managers must establish and nurture” to enable improvement towards sustainable development (Wheeler, 1993, p. 195). Companies must develop their ‘global mindset’ by becoming increasingly adaptable to local conditions, and enhancing global information networks. Also, companies must increase their awareness of diversity across cultures, and transfer this diversity to the types of projects they implement, and ways in which they implement these projects. Additionally, companies must understand the interconnectedness of their own operations with the

external political, economic, social and ecological context. Companies must also ensure consistency between their policies and operations and improve communication to internal and external stakeholders. Ensuring transparency, stakeholder inclusion and cultural sensitivity is especially important to achieving success in developing markets. Furthermore, to develop the skills needed to expand operations to developing nations and remain successful in developed nations, companies must continue to form strategic partnerships with other firms, government agencies, non-governmental organizations, and academic institutions. This will help companies gain the necessary skills and leverage their brands into additional markets.

It is evident that culture, capabilities, connectivity and commitments are not independent of each other, but rather are highly interdependent. Ensuring the ability to manage each area in a positive manner is a challenge that will require open-mindedness, improved communication strategies and flexibility to adapt to diverse circumstances both on the part of mining companies themselves, and the consultancies which assist them. Mastery of these four areas will equip an organization, such as a mining company or a consultancy, to address the unique and multidimensional challenges of sustainable development in a manner which will maximize the creation of sustainable value.

5. Concluding Remarks and Recommendations

5.1 The Goals of the Current Paper

Goal I: To determine the current and emerging sustainable development needs of mining companies

Several current and emerging sustainable development challenges facing the mining industry were identified during the interview process. The industry professionals and the consultants agreed that, in order to improve progress towards sustainable development, greater collaboration between mining companies and consultancies is necessary in the following areas:

- Improving stakeholder engagement;
 - Especially engagement with aboriginal communities;
- Increasing sustainable development performance disclosure;
- Developing and implementing a product and company sustainable development certification program;
- Incorporating initiatives, such as the GRI, MAC's Towards Sustainable Mining program, and the ICMM's sustainable development principles, into company strategies;
- Articulating the business case for sustainable development;
 - This will require a better understanding of how to calculate the impact of sustainable development on share price performance and the ability to communicate this to a wider audience (e.g., shareholders, consumers, employees, general public, etc.); and
- Addressing the challenges associated with developing nations;

- e.g., health issues, political and civil instability, weak regulations, cross-cultural communication, etc.

Furthermore, the consultants identified three additional challenges facing large mining companies:

- Continual analysis and innovation of the value chain throughout the entire life cycle process;
- Improvements in integrating social and environmental issues into mine closure planning; and
- Learning how to adapt operations and technologies to manage climate change.

Goal II: To determine if consultancies recognize and address, or have the capability to address, the current and emerging sustainable development needs of mining companies

From the interview results, it is evident that the consultants understand the sustainable development challenges facing mining companies, and are on the forefront of anticipating emerging needs. The consultants identified all of the needs that were noted by the industry professionals in addition to recognizing three additional needs. The industry professionals and consultants agreed that the current needs exist not because the consultants fail to recognize their existence, but rather because both the companies and the consultancies currently lack the capabilities to effectively address all of the complexities involved in dealing with sustainable development issues.

Goal III: To determine if there are any gaps between the sustainable development needs of the mining companies and the offerings of consultancies

Although the consultancies interviewed recognize the sustainable development needs of mining companies, they often lack the capabilities to help companies address these needs, especially social issues (e.g. challenges associated with expanding into

developing nations), as they require quick, adaptable and innovative solutions. Developing the culture, capabilities, connectivity and commitments (Figure 7) that support the principles of sustainable development will help to equip both mining companies and consultancies with the ability to address the unique and multidimensional challenges of sustainable development in a manner which will maximize the creation of sustainable value; thus, it is important that both mining companies and consultancies develop and nurture these four key areas of organization.

Goal IV: To determine how addressing these current and emerging needs will contribute to sustainable development and drive shareholder value

From the interviews, it was determined that mining companies are currently focused on improving their reputation and legitimacy. “Sustainable development...challenges firms to operate in a transparent, responsive manner due to a very well-informed, active stakeholder base” (Hart and Milstein, 2003, p. 59). Thus, companies that are able to successfully integrate stakeholder views into business processes will improve their corporate reputation and legitimacy. Specific benefits that may result from improving reputation and legitimacy include: improved public perceptions and increased customer base, easier hiring and higher retention of the top talent, increasing employee satisfaction and productivity, improved access to new markets, lower bank loan rates and insurance premiums, inclusion in sustainable development and socially responsible investment funds, and elevated share price (Feltmate *et al.* 2001; Willard, 2002).

Furthermore, to ensure future success and competitiveness, mining companies must also acquire the capabilities to develop and incorporate clean technologies into their

operations, address the needs of developing nations, and facilitate continual enhancement of pollution prevention techniques.

From the current paper, it becomes evident that company-consultancy partnerships are an important strategy that will improve global progress towards sustainable development and drive shareholder value. Mining associations (e.g. MAC, ICMM, etc.) provide an important platform where industry level collaboration can improve, while increased networks between companies and other external consultancies (e.g. NGOs, academic institutions, private consultancies, etc.) can assist companies in building the culture, capabilities, connectivity and commitments necessary to address the multidimensional sustainable development challenges that have been identified by the interviewees.

These conclusions may be applied to a broad array of industries operating worldwide as globalization and increasing pressure on companies to operate in a more sustainable manner is not unique to the Canadian mining industry.

5.2 Recommendations

Business-academic partnering

The interview findings revealed that the potential of academic institutions to assist mining companies towards sustainable development is not being fully realized, and thus this is an area where there is an opportunity to increase collaboration between companies and academic institutions. The sustainable development issues facing the mining industry often require quick, adaptable, long-term and dynamic solutions and many academic institutions are not currently structured in such a way to facilitate the flexibility this requires. It was suggested that academic institutions could be more valuable to

mining companies if they rethink the manner in which they deliver information and increase opportunities for engagement with the private sector. Thus, in order to ensure that the value of academic research is being maximized it is recommended that both companies and academic institutions actively seek out opportunities to collaborate on practical research that will contribute to the creation of sustainable value.

Company-NGO partnering

The research findings revealed that there is a need for companies to better understand the value-added potential of company-NGO collaboration. Company-NGO partnerships, with organizations in which a synergy can be found, have the potential to increase employee morale, improve company reputation, and contribute towards sustainable development. Also, those NGOs willing to work with business can leverage their own mandates through the increased logistical, technical and monetary support supplied by the mining companies. Two specific examples where company-NGO partnerships could contribute to the creation of sustainable value include the development of a metals certification program and the implementation of programs to meet the needs of developing communities (e.g., health programs, education programs).

Government leadership and sustainable development policies

It was suggested by the interviewees that government resources are important and often overlooked. The Canadian government is in a position to regulate and assist; however, most companies view the government only as a regulator. Furthermore, it was suggested that some government regulations are inadequate because they are often aimed at the sustainable development laggards, and fail to recognize and reward industry leaders. As a result of these findings, it is suggested that increased research be conducted to

understand how the Canadian government can become more of a sustainable development leader by creating and implementing policies that will facilitate progress towards sustainable development in the mining, and other industries.

The implementation of voluntary initiatives

The interview findings suggest that mining companies are currently struggling with the implementation of voluntary sustainable development initiatives such as the Global Reporting Initiative (GRI), the International Council on Mining and Metals' (ICMM) sustainable development principles and the Mining Association of Canada's (MAC) Towards Sustainable Mining initiative. The implementation of these initiatives can often become confusing and redundant and as a result, there is an opportunity for consultancies to undertake research to determine if some of these voluntary initiatives can be combined in a manner that will decrease complexity and redundancy, and facilitate implementation. Furthermore, there is a growing need for consultancies to assist mining companies in understanding and implementing these commitments in a manner that will maximize the benefits to the company and thus, contribute to the creation of value.

Appendices

Appendix A: Sustainable Development Principles

This appendix summarizes the guiding principles of sustainable development in each of four areas: economic, social, environmental and governance. These four areas are highly interrelated and as a result, must be viewed in combination. Furthermore, these principles should be viewed as “high-level aspirations and be interpreted in a way that recognizes diversity, limitations in knowledge and capacity, and society’s need for minerals” (MMSD, 2002, p. xvi).

Economic Sphere

- Maximize human well-being
- Ensure efficient use of all resources, natural and otherwise.
- Seek to identify and internalize environmental and social costs.
- Maintain and enhance the conditions for viable enterprise

Social Sphere

- Ensure a fair distribution of the costs and benefits of development for all those alive today
- Respect and reinforce the fundamental rights of human beings, including civil and political liberties, cultural autonomy, social and economic freedoms, and personal security.
- Seek to sustain improvements over time; ensure that depletion of natural resources will not deprive future generations through replacement with other forms of capital.

Environmental Sphere

- Promote responsible stewardship of natural resources and the environment, including remediation of past damage.
- Minimize waste and environmental damage along the whole of the supply chain.
- Exercise prudence where impacts are unknown or uncertain.
- Operate within ecological limits and protect critical natural capital.

Governance Sphere

- Support representative democracy, including participatory decision-making.
- Encourage free enterprise within a system of clear and fair rules and incentives
- Avoid excessive concentration of power through appropriate checks and balances.
- Ensure transparency through providing all stakeholders with access to relevant and accurate information.
- Ensure accountability for decisions and actions, which are based on comprehensive and reliable analysis.
- Encourage cooperation in order to build trust and shared goals and values.
- Ensure that decisions are made at the appropriate level, adhering to the principle of subsidiarity where possible.

Source: MMSD (IIED and WBCSD). 2002. *Breaking New Ground*. London: Earthscan.
<http://www.iied.org/mmsd/finalreport/> (accessed February – May, 2006), p. xvi.

Appendix B: Examples of Diverse Definitions of Sustainable Development

Although sustainable development has common underlying themes and principles, it is a difficult term to define due to diverse understandings and opinions regarding its actual meaning. This appendix demonstrates how definitions of sustainable development can vary due to differing organizational goals.

DEFINITION	SOURCE
Sustainable development is the implementation of practices and policies that contribute to the well-being of the environment, economy and society to address the needs of customers, suppliers, shareholders, employees, government, the general public and the communities in which we operate, without compromising the ability of future generations to meet their own needs.	Falconbridge Ltd. (2006) (http://www.falconbridge.com/sustainable_development/our_values.htm)
Sustainable development is a dynamic process which enables all people to realize their potential and to improve their quality of life in ways which simultaneously protect and enhance the Earth's life support systems.	Forum for the Future (2005) (http://www.forumforthefuture.org.uk/)
In practice [sustainable development] means identifying, managing and mitigating the negative impacts of activities while at the same time adding value, for example, by contributing to biodiversity conservation and bringing employment, infrastructure and community development programs which last beyond the life of an operation or facility.	Paul Mitchell, ICMM (2005) (http://www.icmm.com/publications/1184SDFbrochure.pdf)
In the sustainable society, nature is not subject to systematically increasing: <ol style="list-style-type: none"> 1. concentrations of substances extracted from the Earth's crust. 2. concentrations of substances produced by society, 3. degradation by physical means And, in that society... <ol style="list-style-type: none"> 4. people are not subject to conditions that systematically undermine their capacity to meet their needs. 	The Natural Step Canada (2006) (http://www.naturalstep.ca/system_conditions.html)
...we define sustainability as the exploration, design, construction, operation and closure of mines in a manner that respects and responds to the social, environmental and economic needs of present generations and anticipates those of future generations in the communities and countries where we work.	Placer Dome Inc. (2005) (http://www.placerdome.com/sustainability.htm)

Appendix C: Follow-up to the MMSD – North America

The final regional report from the Mining Minerals and Sustainable Development (MMSD) North America branch, entitled “Towards Change”, outlines ten recommendations (see section 2.4) aimed at addressing the unique needs and sustainable development challenges (see section 2.1) facing the North American mining sector. Within these recommendations the creation of a mechanism to facilitate follow-up activities and report on future MMSD-North America outcomes is suggested (MMSD North America, 2002a). In response, the International Institute for Sustainable Development (IISD) Mining/Minerals Team has developed the following four follow-up tasks:

<i>Follow-up Task 1</i>	<p>Progress Oversight Group</p> <p>Creation of a mechanism to: (1) affect coordination between the activities of all the various players; (2) serve as a kind of clearinghouse of information; and (3) report to the Mines Ministers of Canada AGM on progress achieved.</p>
<i>Follow-up Task 2</i>	<p>Pilot Applications of the Seven Questions (7QS) Assessment Framework.</p> <p>Generation of a number of pilots of the 7QS; subsequent reconvening of the various interests (corporate, First Nation, government, non-government, academic) to collaboratively revise the system based on field experience.</p>
<i>Follow-up Task 3</i>	<p>Support the Convening of Collaborative Efforts.</p> <p>Follow-up on Recommendations 4 (Performance), 6 (Dispute Prevention and Resolution), 2 (Legacy Future), 8 (Decision-Support), and 9 (Learning/Research Support).</p>
<i>Follow-up Task 4</i>	<p>Equity Review.</p> <p>Follow-up on Recommendation 5. Undertaking a review of the distribution of costs, benefits, and risks associated with mining and mineral activities: how to best identify all of the costs, benefits, and risks; how to fairly distribute them between implicated interests.</p>

Source: International Institute for Sustainable Development. 2006. *Follow-up to MMSD-NA*, www.iisd.org/mmsd/followup.asp (accessed May 3, 2006).

Appendix D: Voluntary Sustainable Development Initiatives

Several voluntary initiatives have been developed to assist companies in meeting the challenges presented by sustainable development. Of particular importance to the Canadian mining industry, determined through the findings of the current paper, are the Global Reporting Initiative (GRI), the Towards Sustainable Mining program, and the International Council on Mining and Metals (ICMM) sustainable development principles/charter. This appendix summarizes the scope of these and other sustainable development initiatives relevant to large Canadian mining companies. (The * signifies initiatives that that were committed to by Placer Dome Inc. prior to Barrick's acquisition of Placer Dome on January 20th, 2006.)

INTERNATIONAL COMPACTS	Sponsor	Scope
Global Compact*	United Nations	Ten principles. Annual reporting on progress required.
International Cyanide Management Code*	Six gold mining companies and producers; code developed with United Nations, non-governmental organizations (NGO's), labour and financial institution participation	Best practices and management standards for cyanide used in gold mining. Companies developing implementation and certification process.
Mine Certification Evaluation Project*	World Wildlife Fund, Oxfam Community Aid Abroad, other NGO's, organizations and mining companies	Research project to investigate potential for certification of mining industry based on the ten principles and 46 elements of the International Council on Mining and Metals. Initially focused on Australia. Draft criteria developed, being tested at five sites in Australia and one in Brazil.
Voluntary Principles on Security and Human Rights	USA and U.K. governments, NGO's and mining companies	Likely to be incorporated into World Bank safeguard policy and Equator Principles. Program being implemented.
MINING INDUSTRY INITIATIVES	Sponsor	Scope
Minerals Council of Australia Sustainability Framework: Enduring Value*	Minerals Council of Australia and member companies	Sustainability performance standards. Reporting required. Framework replaces the Council's Environmental Code. Based on the ten ICMM Principles.
Global Reporting Initiative*	GRI and International Council on Mining and Metals (ICMM) companies	Develop mining sector sustainability reporting indicators (Mining and Metals Sector Supplement). Closely linked to ICMM charter principles. Indicators developed by multi-stakeholder taskforce.
Towards Sustainable Mining*	Mining Association of Canada and member companies	Sustainability performance standards. Reporting required.
International Council on Mining and Metals (ICMM) Sustainable Development Charter*	ICMM	Commitment to ten high-level principles covering ethics, integrating sustainable development, human rights, risk management, health and safety, environmental performance, biodiversity and land use, product stewardship, community development and disclosure.
Protected Areas*	ICMM and International Union for the Conservation of Nature	Agreement not to mine or explore in UNESCO designated world heritage sites. Plans to discuss other protected areas and biodiversity.
Community Development Good Practice Tools	ICMM and World Bank	Community Development Best Practice Guidance.

FINANCIAL SECTOR INITIATIVES	Sponsor	Scope
World Bank—IFC Performance Standards	World Bank and International Finance Corporation	The following performance standards are key components of this policy: 1. Social and environmental assessment 2. Labour and working conditions 3. Pollution prevention 4. Community health and safety 5. Land acquisition and involuntary resettlement 6. Conservation of biodiversity 7. Indigenous peoples 8. Cultural heritage 9. Management systems.
Equator Principles	Major International banks	Incorporates IFC Performance Standards for all projects greater than \$50 million.
OTHER INITIATIVES	Sponsor	Scope
Extractive Industries Transparency Initiative	U.K. government along with other institutions (World Bank, etc.)	Template for disclosure on payments made by companies to governments. Initial implementation underway. Expected to be included in Mining and Metals Sector Supplement of Global Reporting Indicators.
International Standard on Social Responsibility	International Standards Organization	Developing a standard for social responsibility. Working group and taskforce to be established to develop standard.
World Economic Forum Anti-Corruption Initiative	World Economic Forum	Set of business principles to counter bribery and corruption. Two codes of practice developed.
Business Principles for Countering Bribery	Transparency International	Guidelines for addressing bribery.
Labour Conventions	International Labour Organization, eight core conventions	Freedom of association, child labour, non-discrimination, etc.
Universal Declaration of Human Rights	United Nations	Definition of fundamental human rights.
CORPORATE INITIATIVES	Sponsor	Scope
Environmental, Safety and Corporate Social Responsibility Reporting*	Placer Dome Inc.	Preparation of annual sustainability reports.
Code of Business Conduct*	Placer Dome Inc.	Code of ethics and business practices.
A Mine Standard*	Placer Dome Inc.	Internal project to upgrade and implement business processes including installing the SAP system. Safety and Sustainability are included in the program.

Source: Placer Dome Incorporated. 2004. Measuring Progress: Corporate Sustainability Report Summary. http://www.placerdome.com/_shared/assets/Placer_Dome_2004_Sustainability_Report2749.pdf (accessed March 15, 2006), p. 7.

Appendix E: Industry Interview Questions

Eight mining industry professionals, from eight mining companies, were interviewed, between March 3 and April 5, 2006, in order to determine the current and future sustainable development needs of the industry. These industry professionals are vice presidents, directors, or managers in the sustainable development, or analogous (e.g., environment and health, community affairs, etc.), department at their respective companies. The mining companies are all publicly-traded companies that are listed on the Toronto Stock Exchange, have head office operation in Canada, and have total assets between 0.7 and 14.0 billion CDN\$ as of December 31, 2005. The explorative and extractive operations of these companies may focus on a variety of materials (e.g., copper, zinc, gold, silver, nickel, cobalt, uranium, and/or metallurgical coal) and may occur within Canada and/or elsewhere globally. The following fourteen questions were developed prior to the industry interviews and the semistandardized interviewing style was used to provoke discussion and reveal insights useful to the current paper.

1. In your opinion, what are the major impacts of your business on communities and the environment?

What are the biggest initiatives or success stories at your company that the people involved with sustainable development are working on?

2. How does your company define 'sustainable development'?
3. Offhand, can you name any organizations, external to your company (e.g., NGOs, industry, private, government, academic, etc.), that are equipped to assist large mining companies in improving their sustainable development performance?
4. Are you involved with any of these organizations outside of your job position?
5. Do you believe your company has sufficient access to high-quality environmental information and support services (e.g., pollution abatement, energy consumption, environmental management systems development and implementation, evaluation of environmental risks and liabilities, Bill 133, emissions, effluents and wastes, biodiversity and habitat conservation, etc.)?

If so, what are your primary sources of this environmental information/support (e.g., internal company capabilities, private consultancies, industry organizations, government resources and agencies, academic institutions, etc.)?

If not, in what environmental areas do you believe your company would benefit from having more information?

6. Do you believe your company has sufficient access to high-quality social information and support services (e.g., country risk assessments and human rights issues, stakeholder engagement and sustainable development reporting, community involvement, sustainable development strategy formulation, etc.)?

If so, what are your primary sources of this social information/support (e.g., internal company capabilities, private consultancies, industry organizations, government resources and agencies, academic institutions, etc.)?

If not, in what social areas do you believe your company would benefit from having more information?

7. Do you believe your company has sufficient access to information and support services regarding the value added potential of sustainable development initiatives?
If so, what are your primary sources of this information/support (e.g., internal company capabilities, private consultancies, industry organizations, government resources and agencies, academic institutions, etc.)?
8. Does your company use sustainable development (social, environmental, and/or economic) information, consulting services and/or other resources or services provided by external organizations such as:
 - a. NGOs
(e.g., Natural Step Canada, Canadian Aboriginal Minerals Association, etc.)
 - b. Private Consultancies
(e.g., Stratos Inc., CANTOX Environmental, Golder Associates Ltd., EthicScan Canada Ltd., etc.)
 - c. Industry and Membership Organizations
(e.g., CAMIRO Canadian Mining Industry Research Organization, Mining Association of Canada, Ontario Mining Association, Canadian Business for Social Responsibility, etc.)
 - d. Government Organizations
(e.g., Industry Canada, Natural Resources Canada, etc.)
 - e. Academic Institutions and Think Tanks
(e.g., Universities, The Conference Board of Canada, The Fraser Institute, etc.)
 - f. Other
(e.g., Corporate Knights Inc., etc.)

If your company does not make use of resources provided by the organizations listed above what are the main reasons for this?

9. Broadly speaking, what types of sustainable development (social, environmental, and/or economic) information/services does your company obtain from each type of organization listed below, and how does your company use these external sustainable development offerings?
 - a. NGOs
 - b. Private Consultancies
 - c. Industry and Membership Organizations
 - d. Government Organizations
 - e. Academic Institutions and Think Tanks
 - f. Other
10. In general, do you find the information and services provided by each of the above organizations useful in addressing the specific sustainable development needs of your company? Why or why not?
11. Can you give me an example of how incorporating the information or services from an external organization has helped to develop an initiative at your company which improved the company's sustainable development performance?
12. Do you believe that the sustainable development performance and the sustainable development messages of your company are reaching all stakeholders as effectively as possible (e.g., host communities, analysts, employees, First Nations, government, shareholders, media, NGOs, academia, etc.)?

If so, how does your company determine that it has positive stakeholder engagement? (i.e., what indicators do you use to measure the strength of your stakeholder relationships?)

If not, how do you believe your company could improve its sustainable development communication, and what role could external agencies play in facilitating this process?

13. Can you name any other major sustainable development areas that you believe your company would like to pursue but are not convinced that there are sufficient external resources, information, support and/or services available to assist your company?
 14. Are there any other issues relating to corporate sustainable development and the role of external support agencies that were not covered by this interview and you believe are important to discuss?
-

Appendix F: Consultancy Interview Questions

Nine consultants from nine different organizations (including a non-profit NGO, a non-profit think tank, four private for-profit organizations, two industry associations, and one high profile individual) were interviewed between April 19 and May 2, 2006. These consultants were targeted because they deal with sustainable development and business issues, and provide Canadian companies with research information, and/or consultancy advice. Also, some of these consultants interviewed were identified during the mining industry interviews as valuable in assisting mining companies towards sustainable development, thus snowball sampling²⁷ was employed. The following four questions were developed prior to the industry interviews and the semistandardized interviewing style was used to provoke discussion and reveal insights useful to the current paper.

1. Presently, what do you believe are your organization's core competencies with regards to assisting mining companies in improving their progress towards sustainable development?
 2. In your opinion, what are the current sustainable development needs of large mining companies that are not being recognized or sufficiently addressed?
 3. What are the emerging needs?
 4. Will your organization be equipped to address any of these emerging needs? If so how?
-

²⁷ Snowball sampling occurs when interviewees in a research study identify the names of other potential interviewees that would be useful to the research (Berg, 2001).

Appendix G: Consultancies Interviewed

The following is a list of consultants interviewed between April 19 and May 2, 2006. These consultants were interviewed to determine if they are aware of the current and emerging sustainable development challenges facing Canadian mining companies, and if they are aligning their organizations capabilities to better assist mining companies in addressing these needs.

<i>Consultancy Name</i>	<i>Interviewee Name</i>	<i>Interviewee Job Position</i>
Conference Board of Canada	David Greenall	Senior Research Associate, Governance and Corporate Social Responsibility
EcoStride Group	Sandi Delaney	President
EthicScan Canada Ltd.	David Nitkin	Founder and President
Five Winds International	Kevin Brady	Director
Frank Frantisak Associates	Frank Frantisak	
International Council on Mining and Metals	Anne-Marie Fleury	Associate Program Director
Mining Association of Canada	Pierre Gratton	Vice President, Sustainable Development and Public Affairs
Natural Step Canada	Chad Park	Sustainability Advisor
Stratos Inc.	George Greene	Chair

Appendix H: Core Competencies of the Consultancy Organizations Interviewed

Nine consultants from nine consultancy organizations were interviewed between April 19 and May 2, 2006 to determine if they are aware of the current and emerging sustainable development challenges facing Canadian mining companies, and if they are aligning their organizations capabilities to better assist mining companies in addressing these needs. One question that the consultants were asked during the interviews was: presently, what do you believe are your organization's core competencies with regards to assisting mining companies in improving their progress towards sustainable development? This appendix summarizes the consultants' answers to this question.

Consultancy Organization	Core Competencies
Conference Board of Canada	<ul style="list-style-type: none"> ▪ Present a balanced analysis of the issues ▪ Bring together key leaders from the industry to create collaborative solutions ▪ Have a scale and reach that other organizations don't have ▪ Integrated, holistic approach to CSR ▪ Key areas of research include: stakeholder engagement, disclosure, energy and climate change, and supply chain management
EcoStride Group	<ul style="list-style-type: none"> ▪ Views sustainable development as a strategy ▪ Assists organizations in developing their market, communications and brand strategy
EthicScan Canada Ltd.	<ul style="list-style-type: none"> ▪ Research and consulting (Canada's largest ethics consulting firm) ▪ Stakeholder engagement identified as a key area
Five Winds International	<ul style="list-style-type: none"> ▪ Strategic Consulting ▪ Custom Solutions ▪ Global Perspective ▪ Systems Approach ▪ Focus on implementation ▪ Emphasized work on life-cycle assistance
Frank Frantisak Associates	<ul style="list-style-type: none"> ▪ Years of experience in the industry; has witnessed the evolution of corporate culture in the mining industry over the last 3 decades ▪ Strategic planning
International Council on Mining and Metals	<ul style="list-style-type: none"> ▪ An advocacy group for the mining industry ▪ Platform to engage with other stakeholders ▪ Represent the interests of the industry ▪ Work on projects and tools to fill the gaps as identified by their members (the companies themselves) ▪ Identified a wide array of areas, including: biodiversity, mine closure, stakeholder engagement, life cycle analysis, etc.
Mining Association of Canada	<ul style="list-style-type: none"> ▪ An advocacy group for the mining industry ▪ Facilitating, coordinating and leadership function ▪ Act as a platform for collective action
Natural Step Canada	<ul style="list-style-type: none"> ▪ Natural Step Framework (strategic, flexible) ▪ International network ▪ Education – provide a common language for sustainable development ▪ Ability to bring together various stakeholders (from cross-sector engagement to cross-department engagement)
Stratos Inc.	Assist companies on three levels: <ul style="list-style-type: none"> ▪ Identify and address environmental and social issues relevant to the organization ▪ Assist in the development of management systems (including internal guidance and public reporting) ▪ Verify results

References

- Anonymous. 2006. Taking Corporate Social Responsibility Underground. *Business and the Environment* 17(3):1-4.
- Bansal, P. 2005. Evolving Sustainability: A Longitudinal Study of Corporate Sustainable Development. *Strategic Management Journal* 26:197-218.
- Baxter, J. and J. Eyles 1997. Evaluating Qualitative Research in Social Geography: Establishing 'Rigour' in Interview Analysis. *Transactions of the Institute of British Geographers* 22(4):505-525.
- Bell, D.V.J. 2002. The Role of Government in Advancing Corporate Sustainability. Prepared under contract to Environment Canada for the *G8 Environmental Futures Forum (EFF)*. Vancouver, March.
- Bendell J. (ed.) 2000. *Terms for Endearment: Business, NGOs and Sustainable development*. Sheffield: Greenleaf Publishing Limited.
- Berg, B.L. 2001. *Qualitative Research Methods for the Social Sciences* (4th Edition). Needham Heights, MA: Allyn & Bacon.
- Bridge, G. 2004. Contested Terrain: Mining and the Environment. *Annual Review of Environment and Resources* 29:205-259.
- Daly, H.E. 2005. Economics in a Full World. 2005. *Scientific American*, September (Special Issue): 100-107.
- Daly, H.E. and J. Farley 2004. *Ecological Economics, Principles and Applications*. Washington, DC: Island Press.
- Daly, H.E. 1996. *Beyond Growth: The Economics of Sustainable Development*. Boston, Massachusetts: Beacon Press.
- Dechert, R. J. 1999. Published in Badovinac, E.P. (ed.) *The Empire Club of Canada Speeches 1999-2000*, Toronto: The Empire Club Foundation, p. 146-157.
<http://www.empireclubfoundation.com/details.asp?SpeechID=39&FT=yes> (accessed March 20, 2006).
- del Monte-Luna, P., Brook, B.W., Zetina-Rejon, M.J. and V.H. Cruz-Escalona 2004. The Carrying Capacity of Ecosystems. *Global Ecology and Biogeography* 13:485-495.
- Diamond, J. 2005. *Collapse: How Societies Choose to Fail or Succeed*. New York: Penguin Group (USA).

- Dow Jones Sustainability Indexes. 2006 (April). *Monthly Update*.
http://www.sustainability-index.com/djsi_pdf/news/MonthlyUpdates/DJSI_Update_0604.pdf (accessed June 1, 2006)
- Dow Jones Sustainability Indexes. 2005. <http://www.sustainability-indexes.com/default.html> (accessed February 10, 2005).
- Dyllick, T. and K. Hockerts 2002. Beyond the Business Case for Corporate Sustainability. *Business Strategy and the Environment* 11:130-141.
- Elkington, J. 1997. *Cannibals with Forks: The Triple Bottom Line of 21st Century Business*. Oxford, UK: Capstone Publishing Ltd.
- Falconbridge Limited. 2006.
http://www.falconbridge.com/sustainable_development/our_values.htm (accessed May 3, 2006).
- Feltmate, B.W., Schofield, B.A. and R.W. Yachnin 2001. *Sustainable Development, Value Creation and the Capital Markets*. Ottawa: The Conference Board of Canada.
- Fergus, A.H.T. and J.I.A. Rowney 2005. Sustainable Development: Lost Meaning and Opportunity? *Journal of Business Ethics* 60:17-27.
- Forum for the Future. 2005.
http://www.forumforthefuture.org.uk/aboutus/sd_page170.aspx (accessed May 3, 2006).
- Gowdy, J.M. and A.F. Carbonell 1999. Towards consilience between biology and economics: the contribution of Ecological Economics. *Ecological Economics* 29(3):337-348.
- Handy, C. 2003. What's a Business For? In *Harvard Business Review on Corporate Responsibility*. Boston: Harvard Business School Publishing, 65-82.
- Hart, S.L. and M.B. Milstein 2003. Creating Sustainable Value. *Academy of Management Executive* 17(2):56-69.
- Hatch Group. 2006. www.hatch.ca (accessed April 6, 2006).
- Hawken, P., Lovins A. and H. Lovins 1999. *Natural Capitalism: Creating the Next Industrial Revolution*. Boston: Little Brown and Company.
- Hawken, P. 1993. *The Ecology of Commerce*. New York: HarperCollins Publishers.

- Hefferman, V. 1997. A united effort [Sustainable development under discussion at SWEMP 96 in Sardinia]. *Canadian Mining Journal* 118(4):36.
- Hilson, G. 2002. Eco-efficiency: Improving Environmental Management Strategy in the Primary Extraction Industry. *Journal of Environmental Systems* 29(1):1-14.
- Homer-Dixon, T. 1994. Environmental Scarcities and Violent Conflict: Evidence from Cases. *International Security* 19(1):5-40.
- International Institute for Sustainable Development. 2006. *Follow-up to MMSD-NA*, www.iisd.org/mmsd/followup.asp (accessed May 3, 2006).
- Jenkins, H. 2004. Corporate Social Responsibility and the Mining Industry: Conflicts and Constructs. *Corporate Social Responsibility and Environmental Management*, 11:23-34.
- Kiernan, M.J. and J.S. Martin 1999. Eco-efficiency warriors. *Investments and Pensions Europe Magazine*, 46.
- Kiernan, M.J. and J.S. Martin 1998. Wake-up Call for Fiduciaries: Eco-efficiency drives shareholder value. *Today's Corporate Investor*, 17-18.
- MAC (Mining Association of Canada). 2006. http://www.mining.ca/www/Towards_Sustaining_Mining/index.php (accessed January - May, 2006).
- MacDonald, A. (Talmac Consulting) 2002. *Industry in Transition: A Profile of the North American Mining Sector*. Winnipeg: International Institute for Sustainable Development.
- McDonough, B. and M. Braungart 1998. The Next Industrial Revolution. *Atlantic Monthly*, 282 (4): 82-92.
- Meadows, D.H. Randers, J., and D.L. Meadows 2004. *Limits to Growth: The 30-Year Update*. White River Jct., VT: Chelsea Green Publishing.
- Mitchell, P. 2006. *The End of the Beginning: The Journey towards Sustainable Development in the Mining Sector*. Speech to the World Ministries Forum, Toronto. <http://www.icmm.com/events/1044WMMF-PaulMitchell.pdf> (accessed March 8, 2006).
- Mitchell, P. In ICMM. 2005. Sustainable Development Framework Brochure. <http://www.icmm.com/publications/1184SDFbrochure.pdf> (accessed May 1, 2006).
- MMSD (IIED and WBCSD). 2002. *Breaking New Ground*. London: Earthscan. <http://www.iied.org/mmsd/finalreport/> (accessed February – May, 2006).

- MMSD North America (IIED and WBCSD). 2002a. *Towards Change*. Winnipeg: International Institute for Sustainable Development. <http://www.iisd.org/mmsd/summary.asp> (accessed February - May, 2006).
- MMSD North America (IIED and WBCSD). 2002b. *Seven Questions to Sustainability: How to Assess the Contribution of Mining and Minerals Activities*. Winnipeg: International Institute for Sustainable Development. http://www.iisd.org/pdf/2002/mmsd_sevenquestions.pdf (accessed February - May, 2006).
- MMSD North America, Scenarios Work Group (IISD and WBCSD). 2002. *Learning from the Future: Alternative Scenarios for the North American Mining and Minerals Industry*. Winnipeg: International Institute for Sustainable Development.
- Natural Resources Canada. 2006a. *Canadian Mining: The Importance of Mining to the Canadian Economy*. http://www.nrcan.gc.ca/ms/pdf/econo06_e.pdf (accessed March 30, 2006).
- Natural Resources Canada. 2006b. *Sector Priorities 2004-2006*. http://www.nrcan.gc.ca/mms/pdf/secpriorities_e.pdf (accessed March 17, 2006)
- Natural Resources Canada. 2004. *The Importance of Mining to Canadian Communities*. http://www.nrcan.gc.ca/mms/pdf/com04_e.pdf (accessed March 30, 2006).
- Natural Step Canada, The. 2006. <http://www.naturalstep.ca/systemconditions.html> (accessed May 3, 2006).
- Newbold, J. 2003. *Social Consequences of Mining and Present Day Solutions – Region II in Chile Highlighted*. *Sustainable Development* 11:84-90.
- Placer Dome Incorporated. 2005. <http://www.placerdome.com/sustainability.htm> (accessed May 3, 2006).
- Placer Dome Incorporated. 2004. *Measuring Progress: Corporate Sustainability Report Summary*. http://www.placerdome.com/_shared/assets/Placer_Dome_2004_Sustainability_Report2749.pdf (accessed March 15, 2006) p. 7.
- Post, J.E. and B.W. Altman. 1994. *Managing the environmental change process: Barriers and Opportunities*. *Journal of Organizational Change Management* 7(4):64-81.
- Prahalad C.K. and S.L. Hart 2002. *The Fortune at the Bottom of the Pyramid*. *Strategy and Business* 26:2-14.

- PricewaterhouseCoopers. 2001. 'Sustainability' Under Scrutiny (second Global Metals and Mining Conference), *Mining Journal* 336 (8639):472-473
http://find.galegroup.com/itx/infomark.do?&contentSet=IAC-Documents&type=retrieve&tabID=T002&prodId=EAIM&docId=A76547819&source=gale&userGroupName=yorku_main&version=1.0 (accessed April 2, 2006).
- Sachs, W., Loske, R. and M. Linz 1998. *Greening the North: a post-industrial blueprint for ecology and equity*. London: Zed Books.
- Sengupta, M. 1993. *Environmental Impacts of Mining: Monitoring, Restoration, and Control*. Boca Raton: CRC Press LLC.
- Service, R.W. 1907. *The Spell of the Yukon and Other Verses*. New York: Barse & Hopkins, 50-54.
- Udd, J.E. 2000. *A Century of Achievement: The Development of Canada's Minerals Industries*. Montreal: Canadian Institute of Mining and Metallurgy, sections available at http://www.nrcan.gc.ca/mms/stude-etudi/chro_e.htm (accessed February 20, 2006).
- UNFPA (United Nations Population Fund). 2005. *State of the World Population 2005: The Promise of Equality*. New York.
http://www.unfpa.org/swp/2005/pdf/en_swp05.pdf (accessed March 24, 2006).
- University of the Western Cape. 2001.
<http://www.botany.uwc.ac.za/Envfacts/facts/sustain.htm>(accessed November 14, 2005).
- Utting, P. 2000. *Business Responsibility for Sustainable Development*. Geneva: United Nations Research Institute for Social Development.
- van den Bergh, J.C.J.M. 2001. Ecological Economics: Themes, Approaches, and Differences with Environmental Economics. *Regional Environmental Change*, 2(1):13-23.
- van Marrewijk, M. 2003. Concepts and Definitions of CSR and Corporate Sustainability: Between Agency and Communion. *Journal of Business Ethics* 44:95-105.
- Veiga, M.M, Scoble, M. and M.L. McAllister. 2001. Mining with communities. *Natural Resources Forum* 25:191-202.
- Walley, N., and B. Whitehead 2000. It's Not Easy Being Green. In *Harvard Business Review on Business and the Environment*. Boston: Harvard Business School Press, 85-104.
- WCED, World Commission on Environment and Development.1987. *Our Common Future*. Oxford, England: Oxford University Press.

- Wheeler, D. 1993. The Successful Navigation of Uncertainty: Sustainability and the Organization. In Burke, R.J. and C.L. Cooper (eds.) *Leading in Turbulent Times: Managing in the New World of Work*. Malden: Blackwell Publishers, 182-207.
- Whiting, M.A. and C.J. Bennett 2001. *The Road to Sustainability: Business' first steps*. New York: Conference Board Inc.
- Willard, B. 2002. *The Sustainability Advantage: Seven business case benefits for a triple bottom line*. Gabriola Island: New Society Publishers.
- Worldwatch Institute. 2005. *Vital Signs 2005: The Trends that are shaping our Future*. New York: W.W. Norton & Company Inc.
- Worldwatch Institute. 2003. *Vital Signs 2003: The Trends that are Shaping our Future*. New York: W.W. Norton & Company Inc.
- Yachnin and Associates, Sustainable Investment Group Ltd., and Corporate Knights. 2006. *The SD Effect: Translating Sustainable Development into Financial Valuation Measures*. Toronto: Corporate Knights Inc.